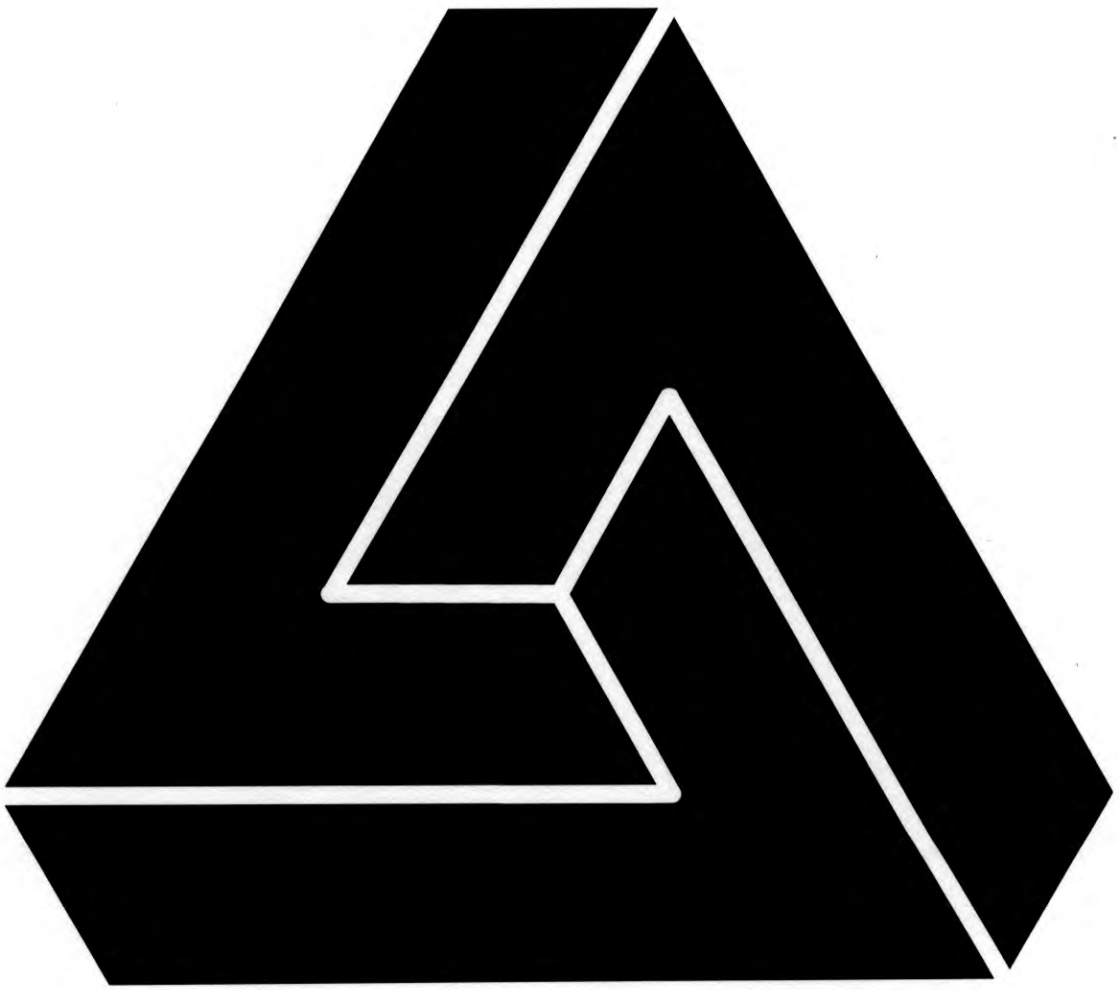
FUTURE.RETRO

FR-777

operator's manual



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INTRODUCTION

Thank you for purchasing the FR-777!

Hello and welcome to the expanding world of Future Retro and the 777 synthesizers. The 777 was developed from a dream, that one could have all the controls and features of the original TB-303 bassline, plus the ability to create analog percussion, lead synth parts, and bizarre sound effects. The 777 does this just as the original with pure old-school analog synthesis. Every parameter in the analog sound section has it's own dedicated control knob or switch, allowing users to instantly change the sound in any way possible. Those of you who are familiar to step sequencing will find the sequencer in the 777 very easy to use. The sequencer provides 16 song locations, and each song is broken down into one measure parts, called patterns. Each pattern is then divided into 12 or 16 steps depending on it's time signature. There are 256 programmable patterns in all that can be combined in any fashion to create a song, or be selected and manipulated in real-time. Each pattern contains the time signature, notes, pitches, accents, glides, and loop point. The sequencer also includes features like real-time editing and saving of patterns while they are playing, copy and pasting of patterns, multiple pattern cueing, pattern shifting and much more. In addition, the 777 can be used in conjunction with yesterday's control voltage synthesizers as well as today's midi machines.

Please read through the entire manual for a full understanding of the features and functions the 777 is capable of.

Power

Use only a 12 volt AC/AC 1Amp output power adapter, which is supplied with the 777.

Care

Avoid exposing the 777 to smoke, damp, dusty, or extreme hot and cold environments.
To clean the unit use a soft damp cloth. Do not use any abrasive cleaners!

Memory Backup

The 777 contains an internal 3 volt backup battery for the sequencer's RAM. The battery should last for years. If the memory begins to fail you will want to replace the battery. To replace the battery, remove the four black screws at the front of the bottom panel, and the four black screws on the rear panel. Now remove all the knobs, and the nuts on the switches. Next pull the top panel off and locate the battery holder on the sequencer board. Remove the old battery and replace with a 3 volt coin type lithium battery. Put the unit back together and off you go.

Fuse

Should the fuse in your 777 need to be replaced, use the same method to open the unit as described in the Memory Backup procedure for the battery. The fuse is located on the bottom of the analog board near the power switch. Replace the fuse with a 1 Amp fast-blow fuse only.

Product warranty

The 777 comes with a 1 year limited warranty covering any mechanical or electrical defects. This warranty does not cover damage due to misuse or neglect of this product. To validate your warranty, fill out the warranty card included with your unit and return it within one month of the original purchase date. Should you experience problems with your machine please contact us by phone or email. You must have an authorization to return a unit for repair.
Our office is open Monday through Friday, 10am to 6pm central time.
Phone: 785-827-9278
Email: support@future-retro.com

Product support

Product support can be found on the world wide web at www.future-retro.com.

GETTING STARTED

I WANT TO HEAR IT NOW!

I know, you just got this cool new toy and don't want to read the entire manual before you at least get to hear what it sounds like, right?

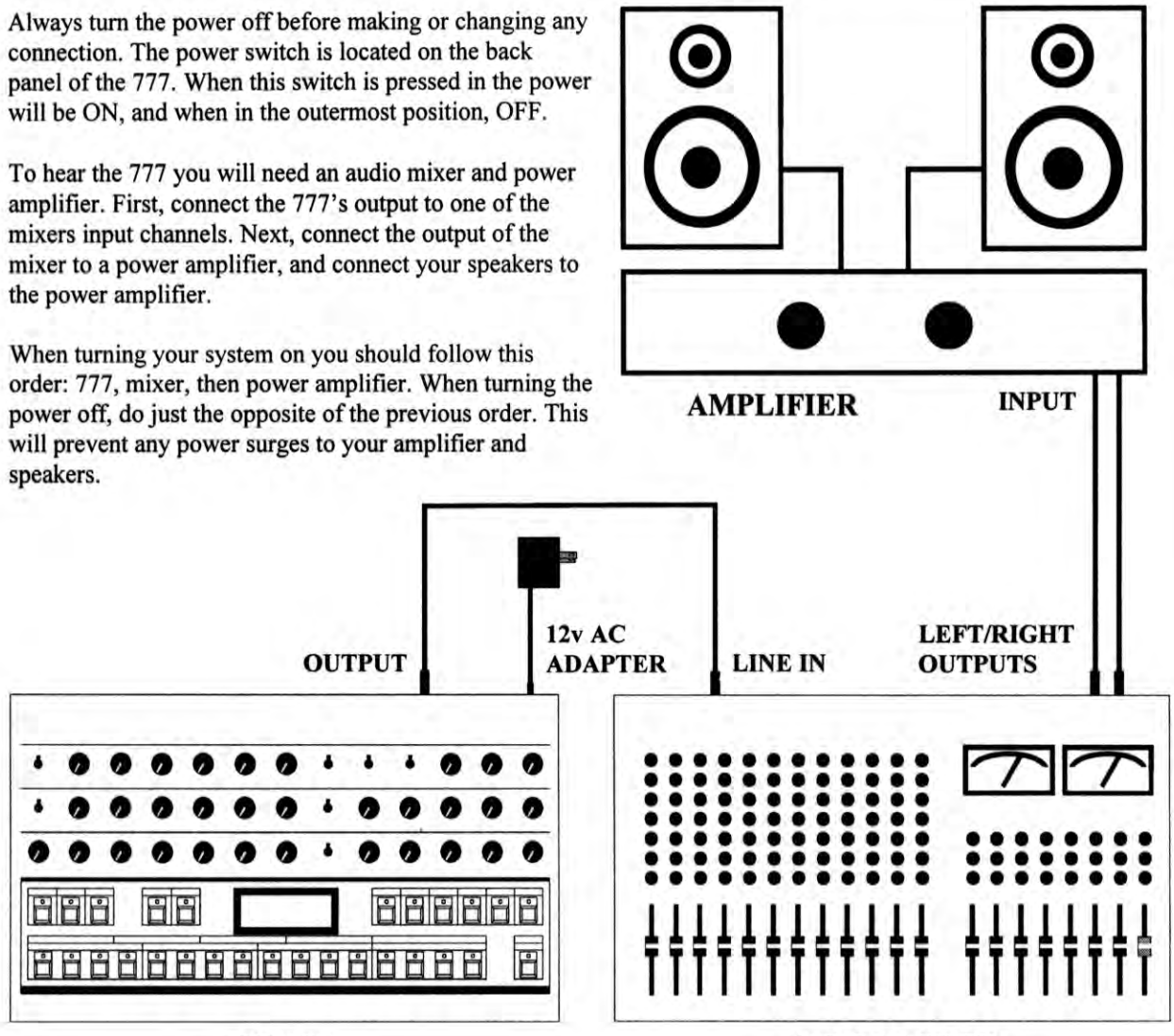
To play the 777 follow these directions in order.

1. Connect the 777 to an audio system as shown below.
2. Set the analog control section up as shown in the TB-303 patch sheet, located in the back of this manual.
3. Turn the power on by pressing the power switch located on the back panel of the 777. The display will light up showing that power is on. The display shows the current pattern bank selected, and keys 1-16 are used to select one of the 16 patterns in each of the 16 banks, when the BANK key indicator is on.
4. Press the RUN/STOP key and the pattern currently selected will start playing. You can select patterns by pressing step keys 1-16. To change the pattern bank you are selecting patterns from, use the UP/DOWN keys.
5. You can change the tempo patterns are currently playing at by pressing and holding the TEMPO key, and using the UP/DOWN keys to change the tempo setting. When the TEMPO key is pressed the display shows the currently selected tempo setting.
6. Go ahead and tweak the knobs as described in the TB-303 patch sheet.
7. Press the RUN/STOP key again to stop playback.

Always turn the power off before making or changing any connection. The power switch is located on the back panel of the 777. When this switch is pressed in the power will be ON, and when in the outermost position, OFF.

To hear the 777 you will need an audio mixer and power amplifier. First, connect the 777's output to one of the mixers input channels. Next, connect the output of the mixer to a power amplifier, and connect your speakers to the power amplifier.

When turning your system on you should follow this order: 777, mixer, then power amplifier. When turning the power off, do just the opposite of the previous order. This will prevent any power surges to your amplifier and speakers.



INTRODUCTION TO ANALOG

The 777 contains a complete analog synthesizer section, which is capable of producing an almost infinite amount of sound textures. All the elements of a sound can be changed instantly by the control knobs and switches on the front panel.

For those who have never been exposed to analog synthesizers, or how sounds are created, all that is needed is a simple understanding and before you know it, just about any sound you can imagine will be coming out of your speakers.

All sounds can be broke down into three basic elements which are **frequency** (pitch), **harmonic content** (tone), and **amplitude** (volume).

Frequency is measured in Hertz (abbreviated as Hz). Hz is the amount of cycles an oscillator produces within one second. For example the range of human hearing is from approximately 20Hz to 20,000Hz. To better understand, a frequency of 100Hz would be perceived as having a low pitch in the bass range, while a frequency of 10,000Hz would be perceived as a very high pitch. The frequency of the oscillators on the 777 can be controlled by the input of different notes into the sequencer, by the oscillator's FREQUENCY control knob, the FREQUENCY MODULATION section, as well as any external control voltage from 0 to +5.33 volts.

Harmonic content refers to the amount of frequencies contained within a sound. The most dominant, or perceived pitch in a sound is called the fundamental frequency. All other frequencies in the sound are the harmonics of the fundamental frequency. The shape of an oscillator's waveform is relative to it's harmonic content. A sine wave for instance is the most basic waveform, having only a fundamental frequency and no additional harmonics. Sine waves sound very thin and pure. A square wave is more complex than a sine wave, and contains not only a fundamental frequency, but also all odd harmonics of that frequency. Square waves sound rather hollow, but are more full sounding than a sine wave. A sawtooth wave is one of the most complex waveforms, which contains a fundamental frequency and all harmonics of that frequency. Sawtooth waves are very full sounding and have a unique raspy quality to them. Each oscillator in the 777 is continuously variable from sawtooth to square wave, allowing the ability to change the harmonic content instantly and create rather odd complex waveforms. For even more control, you can mix all of the oscillators together in any way you desire. This is a form of what is called additive synthesis. The 777 is also capable of subtractive synthesis, where the harmonics of a sound are taken away rather than being added together. This is done by use of the filter section. The lowpass filter starts with the high frequencies of a waveform and reduces their volume until all that is heard is the remaining lower frequencies. You can manually adjust the cutoff point of the filter with the cutoff knob or let the filter modulation sources control the cutoff automatically. You can use both methods at the same time. The highpass knob is used to do just the opposite of the lowpass filter, by removing all the lower frequencies until all that is heard is the higher frequencies remaining in the sound.

Amplitude is a term used to describe the level of a waveform, or it's overall volume. All sounds have their own unique shape of volume. This shape is known as the volumes envelope. In the 777 there are three envelopes, but only one is used to control the level in the amplifier section. This envelope has an adjustable decay only, so when a note is played it starts out at full volume and then dies away until no sound is heard. This is most useful when creating percussion type sounds. You may also select a gate to control the level in the amplifier section instead of the envelope. The gate simply turns the amplifier on to full volume for the duration a note is played. When that note is finished playing the amplifier will shut off.

Keeping these three elements in mind when creating sounds should help your work go much faster, and you will have a better chance of accurately creating the sounds you wish. For a better understanding, read over the ANALOG CONTROLS section that follows.

BACK PANEL CONNECTIONS

Always remember to turn the power off before making new connections.

12V AC
This is the power jack for the AC wall adapter. Use only the 12 volt AC adapter supplied with this unit. Should you lose the adapter, replace only with a 12 volt AC output rated at 1 Amp adapter

OUTPUT
Connect the output (using a 1/4" mono cable) to a mixer's input channel. The output signal will be that which is created in the analog sound section.

ACCENT OUT
When an accented note is played by the sequencer, a +5 volt gate will be transmitted from this jack. Use this to trigger various analog equipment.

GATE OUT
When notes are played by the sequencer, a +5 volt gate signal will be transmitted for the duration of each note. Use this to trigger various analog equipment.

CV OUT
When the sequencer is playing notes, their pitches will be equal to 1 volt per octave. The control voltage output can range from 0 to +5.33 volts, depending on notes played. Use this when you want to control the pitch of an external analog synth's oscillators.

FILTER IN
Here you may route any external audio signal to the filter's input and then through the amplifier section. Avoid plugging direct voltages into this jack. When a cable is inserted into this jack the SUBA/EX LEVEL control will adjust the amount of external signal fed to the filter.

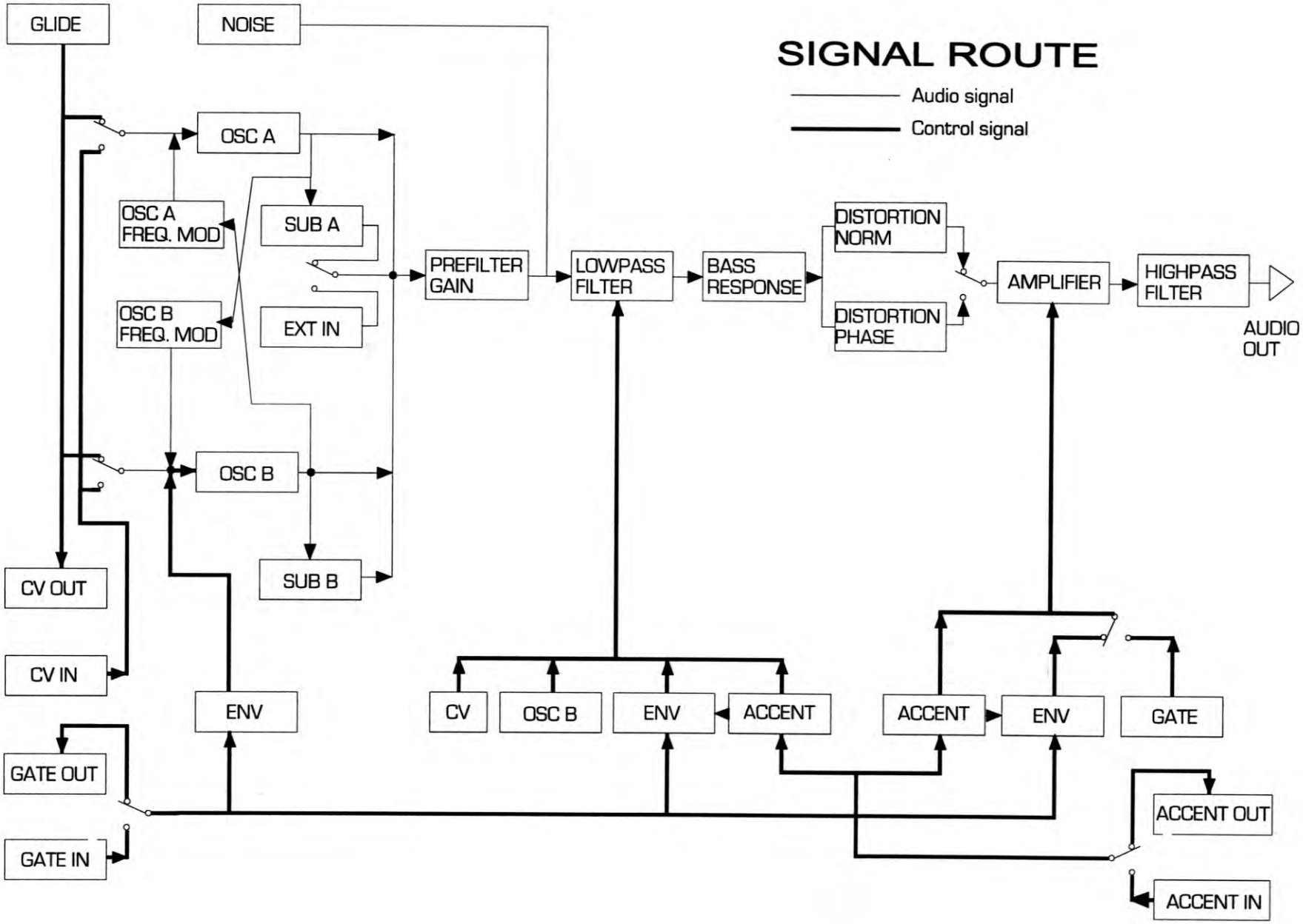
ACCENT IN
Connect any +5 volt gate signal when you want to trigger accented notes from an external device.

GATE IN
Connect any +5 volt gate signal when you want to control the note-on and duration of a note from an external device.

CV IN
Connect any control voltage source from 0 to +5.33 volts, to control the internal oscillators pitch when external is selected for that oscillator. This voltage will be routed to the filter's cutoff frequency where you can use the CV TYPE switch in the filter modulation section to determine how the external CV affects the filter. DO NOT INPUT NEGATIVE VOLTAGES OR ANYTHING HIGHER THAN +5.33 VOLTS!

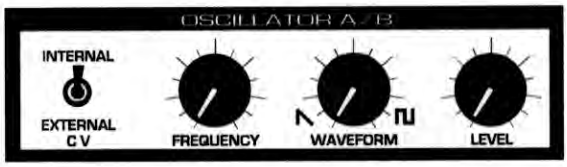
MIDI OUT
Use a midi cable to connect the 777's MIDI OUT to other MIDI equipment's MIDI IN. This allows the 777 to control other MIDI equipment.

MIDI IN
Use a MIDI cable to connect the 777's MIDI IN to other equipment's MIDI OUT. This allows other MIDI equipment to control the 777.


SIGNAL ROUTE
Audio signal
Control signal
GLIDE
NOISE
OSC A
OSC A FREQ. MOD
SUB A
OSC B FREQ. MOD
EXT IN
PREFILTER GAIN
LOWPASS FILTER
BASS RESPONSE
DISTORTION NORM
DISTORTION PHASE
AMPLIFIER
HIGHPASS FILTER
AUDIO OUT
OSC B
SUB B
CV OUT
CV IN
ENV
CV
OSC B
ENV
ACCENT
ACCENT
ENV
GATE
GATE OUT
GATE IN
ACCENT OUT
ACCENT IN

ANALOG CONTROLS

This section describes the function of each knob and switch in the analog control section.



OSCILLATOR A & B Oscillator A and B have identical controls and ranges for these controls.

CV INTERNAL/EXTERNAL SWITCH > When set to INTERNAL, the oscillators will follow the pitches programmed into the sequencer. When set to EXTERNAL, the oscillators will follow any external control voltage from 0 to +5.33 volts, that is plugged into the CV IN jack on the back panel. NOTE: *If nothing is plugged into the CV IN jack and external is selected, the oscillators will continue to play the internal pitches programmed into the sequencer.* The oscillators in the 777 follow a 1 volt per octave standard, which means you can achieve more than 5 octaves in range with an external source. **WARNING: NEVER USE AN EXTERNAL SOURCE WITH NEGATIVE VOLTAGES OR VOLTAGES ABOVE +5.33. FAILURE TO DO SO MAY CAUSE DAMAGE TO THE INTERNAL ELECTRONIC CIRCUITS.**

FREQUENCY > The FREQUENCY knob adjusts the oscillator's pitch over a range that is approximately 1.66 octaves. This allows you to tune the oscillators to other instruments, or to detune them when used together to achieve those fat analog sounds everyone loves. When this knob is set to the middle position the oscillator will play the same pitch as notes programmed into the sequencer.

WAVEFORM > The WAVEFORM knob is used to continuously vary the harmonic content of the oscillator from having all harmonics (sawtooth), to having only odd harmonics (square).

LEVEL > The LEVEL knob controls the amount of signal generated by the oscillator to go to the filter's input. In the left most position no signal will be heard, and when turned to the right the full signal will be sent to the filter.

SUB B SUB B is a sub frequency of OSCILLATOR B. It's frequency is exactly one octave lower than that of OSCILLATOR B. It's waveform is a square wave.

LEVEL > The SUB B LEVEL knob adjusts the amount of SUB B signal to be sent to the filter's input.

SUB A/EX This section actually has two functions. When an external audio source is plugged into the FILTER IN jack, this will control the amount of signal that goes to the filter. When nothing is plugged into the FILTER IN jack, this section works as a SUB A. In other words, it works just like SUB B except it's frequency is 1 octave lower than that set by the FREQUENCY knob of OSCILLATOR A. It's waveform is square wave.

LEVEL > The SUB A/EX LEVEL knob adjusts the amount of either the SUB A frequency, or the external audio source to be sent to the filter.

NOISE This is a white noise source which contains an even amount of frequencies throughout the audio spectrum.

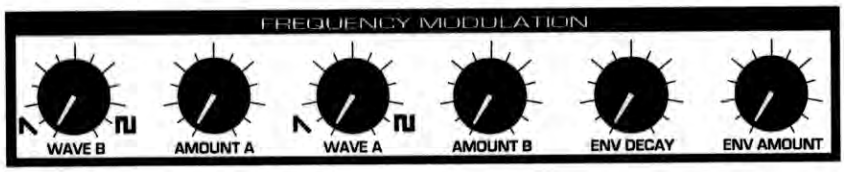
LEVEL > The NOISE LEVEL knob adjusts the amount of white noise to go to the filter.

ANALOG CONTROLS

GLIDE The GLIDE section is used to adjust the portamento effect on a note's pitch.

TIME > The GLIDE TIME knob adjusts the amount of time it takes for one note's pitch to smoothly transition to another note's pitch, when a glide is programmed for that step in the sequencer. In the left most position notes will reach their new pitch much faster than if the knob is turned to the right.

FREQUENCY MODULATION In this section you can adjust each oscillator to modulate the other oscillator's frequency, for cross-modulation effects. A decay envelope is also available to sweep OSCILLATOR B's frequency.



WAVE B > The WAVE B knob is used to adjust the shape of OSCILLATOR B to modulate OSCILLATOR A's frequency. The shape is continuously variable from sawtooth to square wave.

AMOUNT A > The AMOUNT A knob is used to adjust the amount of affect OSCILLATOR B has on the pitch of OSCILLATOR A. At the left most position there will be no modulation. As the knob is turned right, the modulation amount will increase.

WAVE A > The WAVE A knob is used to adjust the shape of OSCILLATOR A to modulate OSCILLATOR B's frequency. The shape is continuously variable from sawtooth to square wave.

AMOUNT B > The AMOUNT B knob adjusts the amount of affect OSCILLATOR A has on the pitch of OSCILLATOR B. At the left most position there will be no modulation. As the knob is turned right, the modulation amount will increase.

ENV DECAY > The ENVELOPE DECAY knob adjusts the decay time for the envelope. The decay time will be shortest in the leftmost position and increase as the knob is turned to the right.

ENV AMOUNT > The ENVELOPE AMOUNT knob adjusts the amount of affect the envelope has on OSCILLATOR B's frequency.

ANALOG CONTROLS

FILTER The filter section contains a selectable 3 or 7 pole lowpass filter with resonance, and an adjustable high-pass filter. Use this section to remove unwanted frequencies from the oscillator waveforms, or any external audio signal.

GAIN > The GAIN knob adjusts the prefilter gain stage used to overdrive the input of the filter. This is useful to warm up and fatten a sound. NOTE: Overdriving the input hard may cause the filter's resonance to become less noticeable. You can make up for this with the RES MAX control.

SLOPE > The SLOPE switch selects the roll off characteristics of the lowpass filter. Select from either 3 pole (18db) or 7 pole (42db). For every octave above the cutoff frequency, the high frequencies will be reduced by either 18db or 42db. NOTE: The 7 pole filter can reduce the high frequencies so drastically that it may be more suitable for sounds containing very little high frequency content.

CUTOFF > The CUTOFF knob adjusts the point at which high frequencies begin to be reduced. When this knob is turned to the right most position, as many high frequencies as possible will be allowed to pass through the filter. When turned to the left most position the high frequency content of a sound will be reduced.

RESONANCE > The RESONANCE knob is used to increase the frequencies closest to the cutoff point of the filter, set by the CUTOFF knob. When this knob is turned full left no resonance will be heard. When turned to the right, sounds will tend to become thin sounding and sometimes watery.

RES MAX > The RESONANCE MAXIMUM knob adjusts the maximum amount of resonance the filter has when the RESONANCE knob is turned to it's right most position. Here the filter may be set to self oscillate by turning the RES MAX knob all the way right, producing a sine wave.

ACCENT > This ACCENT knob adjusts the amount of affect accent has on the filter's cutoff frequency. An accent causes the filter's cutoff frequency to sweep up allowing higher frequencies to pass, when an accent is programmed into the sequencer, or a gate signal is inserted in the ACCENT IN jack.

HIGH PASS > The HIGH PASS knob is the only adjustment there is for the high pass filter. Turn this knob to the right to remove unwanted low frequencies from a sound.

ANALOG CONTROLS

FILTER MODULATION The filter modulation section gives the user three sources to modulate the lowpass filter's cutoff frequency. The three sources include the control voltage produced by the sequencer or CV IN jack, the frequency of oscillator B, and a decay envelope dedicated to the filter only.

CV TYPE > The CV TYPE switch selects the type of effect the control voltage produced by the sequencer has on the filter's cutoff frequency. When set to NORMAL the cutoff frequency will follow the same movement as the pitches programmed into the sequencer. The lower the pitch programmed into the sequencer, the lower the filter's cutoff frequency will be. When set to WARP the filter's cutoff reference point moves according to the pitches programmed into the sequencer (this mode will basically have the opposite effect as NORMAL mode). You will notice a slight amount of the filter's modulation waveform affecting the filter when using the WARP mode. In WARP mode the CV AMOUNT knob when in the middle position has the least affect, when turned to the left subtle reverse sweeping can be achieved, and when turned right some of the stranger effects occur, but it all depends on the pitches programmed into the sequencer. When neither of the two modes are desired, place the CV TYPE switch in it's middle position, turning it's function off.
NOTE: If an external control voltage is inserted into the CV IN jack, the CV TYPE switch will control the way the external control voltages will affect the filter's cutoff frequency.

CV AMOUNT > The CV AMOUNT knob adjusts the amount of control voltage produced by the sequencer or external control voltage, to affect the filter's cutoff frequency when either of the two modes are selected with the CV TYPE switch.

WAVE B > The WAVE B knob adjusts the shape of oscillator B's frequency to modulate the filter's cutoff frequency. The shape is continuously variable from sawtooth to square wave.

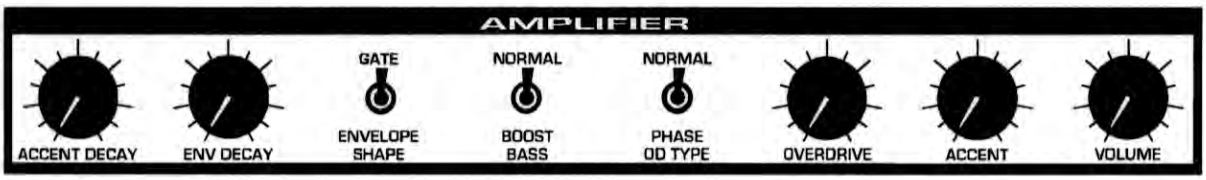
MOD AMOUNT > The MODULATION AMOUNT knob adjusts the amount of affect oscillator B has on the filter's cutoff frequency. In the left most position there will be no modulation. When turned right the modulation amount will increase.

ENV DECAY > The ENVELOPE DECAY knob adjusts the decay time for the envelope dedicated to the filter. When this knob is in it's left most position the shortest decay time will be selected. As the knob is turned to the right the decay time will increase. On accented notes, no matter where the ENV DECAY knob is set, the envelope will jump to the shortest decay time possible, creating two separate envelope times to modulate the filter.

ENV AMOUNT > The ENVELOPE AMOUNT knob adjusts the amount of affect the filter's envelope has on the filter's cutoff frequency. When turned to the left most position, there will be no envelope modulation for the filter. As the knob is turned to right the envelope will have more affect on the filter.

ANALOG CONTROLS

AMPLIFIER The amplifier section is used to control the shape of a sound's volume. Also contained in this section is the ability to adjust the overall bass response and the overall distortion amount for sounds.



ACCENT DECAY > The ACCENT DECAY knob adjusts the decay time for the amplifier when an accent is programmed into the sequencer, or a gate signal is inserted into the ACCENT IN jack. In the left most position, the shortest decay time possible will be heard if the SHAPE switch is set to ENVELOPE.

ENV DECAY > The ENVELOPE DECAY knob adjusts the decay time for the amplifier when non-accented notes are programmed into the sequencer, or a gate signal is inserted into the GATE IN jack. The total decay time for the amplifier's envelope is the sum of the accent decay and the envelope decay for non-accented notes. In other words, as you increase the accent's decay time, the envelope's decay time also increases.

SHAPE > The SHAPE switch selects either the gate or envelope to control the amplifier's output. The envelope setting is most useful for percussion type sounds, but can have other uses. The gate setting simply turns the amplifier ON and OFF for the duration of a note programmed into the sequencer or gate signal inserted into the GATE IN jack.

BASS > The BASS switch selects the bass response of a sound. When in the NORMAL position, sounds will tend to have less low frequency content resulting in a more nasal sound. When BOOST is selected, sounds containing lower frequencies will have an improved bass response, resulting in warm and full sounds.

OD TYPE > The OVERDRIVE TYPE switch selects either NORMAL or a PHASE type of distortion to affect the sound. NORMAL is more of a standard type of distortion and is adjustable from no distortion to super-crunch. PHASE has a phasey quality to it and it's sound is not quite as harsh. It's amount is adjustable from very thin (and possibly no sound), to a nice warm distortion. The PHASE type of distortion characteristics depends not only on the overdrive knob, but also the level of signal that passes through the filter.
NOTE: *Both types of distortion will cause an increase in the overall signal output. For best results you may wish to adjust the volume knob when adjusting the distortion amount.*

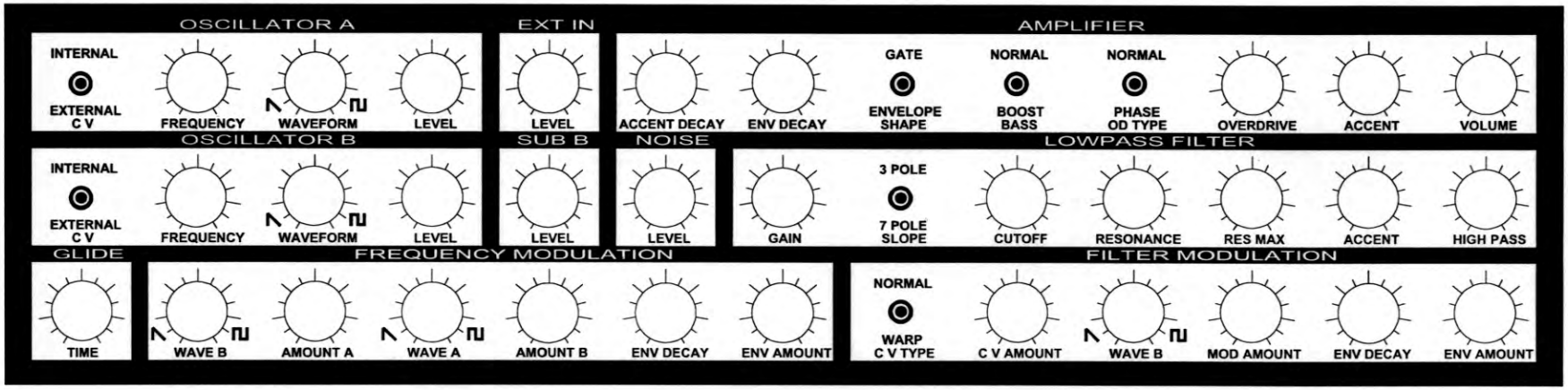
OVERDRIVE > The OVERDRIVE knob adjusts the amount of effect the distortion has on both types of overdrive.

ACCENT > The ACCENT knob adjusts how loud accented notes will play compared to those not accented by the sequencer.

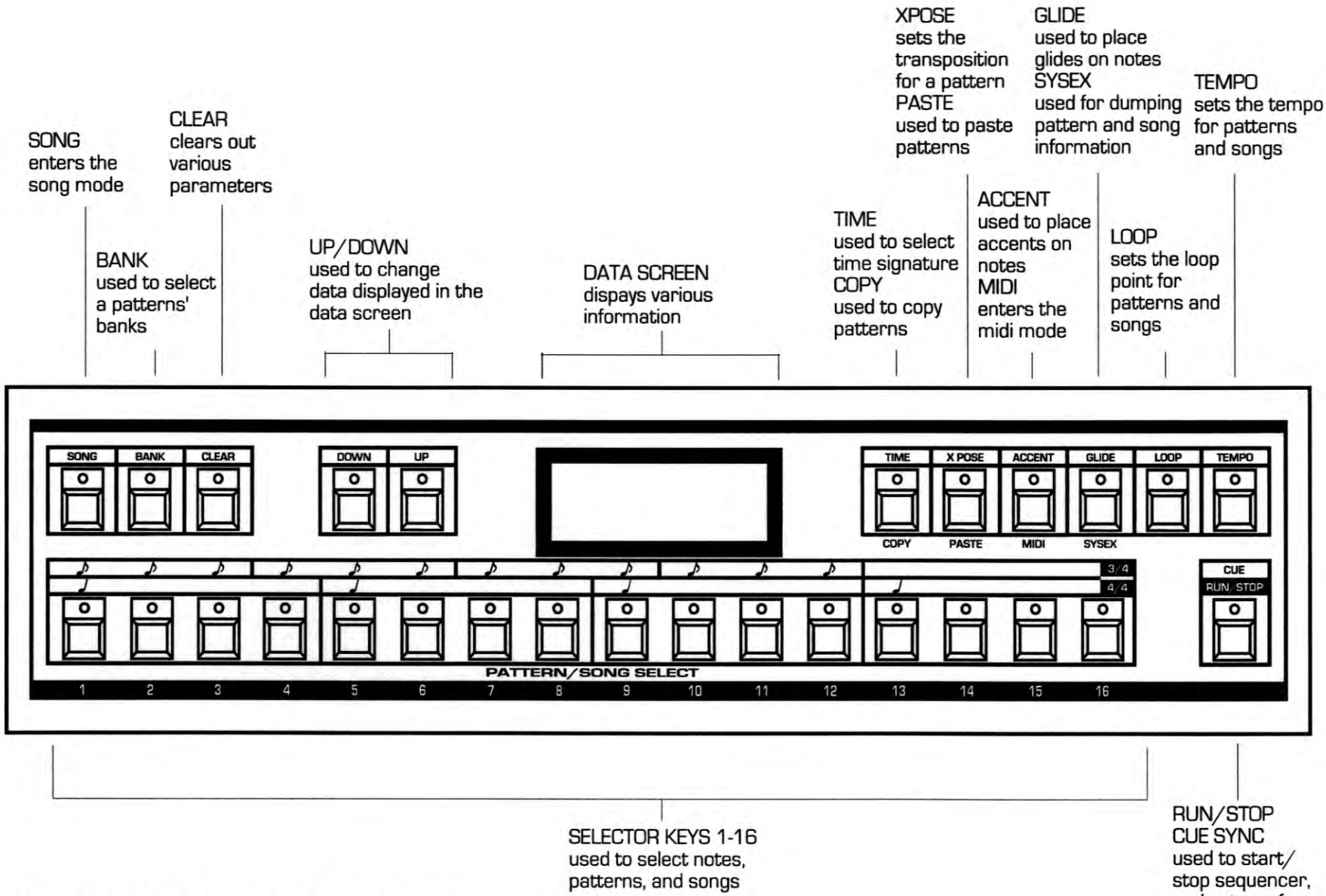
VOLUME > The VOLUME knob adjusts the amount of audio signal sent to the OUTPUT jack on the back panel.

Included on the following page is a blank patch sheet. Photo copy it, and use it to record your settings for a particular sound.

PATCH NAME



DESCRIPTION



SEQUENCER CONTROLS

OPERATIONS

Using the sequencer

When using the sequencer there are two main modes for selecting, editing, and playing. The SONG key's indicator determines which of two modes are selected. When the SONG key's indicator is on, you are in the song mode. When the SONG key's indicator is off, you are in the pattern mode. To change from one mode to the other, the sequencer must first be stopped, then by pressing the SONG key you will change modes.

In the song mode you can do the following:
-Select a song
-Edit a song
-Play a song
-Change a song's tempo
-Change the midi parameters

In the pattern mode you can do the following:
-Select a pattern
-Edit a pattern
-Play a pattern
-Adjust the global tempo setting for patterns
-Set the global transposition amount to affect all patterns.

Playing patterns

The RUN/STOP key is used to start and stop the playback of patterns and songs. To start the sequencer press the RUN/STOP key. This key's indicator will come on and be flashing at the tempo the sequencer is playing at. To stop the sequencer press the RUN/STOP key again. The key's indicator will now be off showing that the sequencer is stopped.

Selecting patterns

Patterns are arranged in 16 banks of 16 patterns for a total of 256 patterns in all.
Before selecting a pattern, you must first make sure you are in the pattern mode. This is shown by the SONG key's indicator being off. To enter pattern select mode, press the BANK key so that it's indicator is on. The display will now show the bank number (1-16) and one of the 16 selector key indicators will be on to show which pattern in that bank is currently selected. If none of the 16 selector key indicators are on, the current pattern selected is in another bank. If this is the case, use the UP/DOWN keys to go through the other banks and see what pattern is currently selected. To select a different pattern, use the UP/DOWN keys to select the bank and then press one of the 16 pattern locations for that bank.

Selecting a pattern can be done while the sequencer is playing. If one pattern is currently playing and you select another, the new pattern's key indicator will be on at half the brightness as when usually selected. This shows that the pattern is waiting until the previous pattern has reached it's loop point before it is to begin playing. You can change the pattern that is to play next at any time until the previous pattern reaches it's loop point, at that time the new pattern will begin playing. Each pattern will continuously play until either a new pattern is selected or the sequencer is stopped.

Multiple pattern cueing

It is possible to chain up to 16 patterns in a bank to create longer looping arrangements while playing patterns in pattern mode. Enter the pattern select mode as you normally do when selecting patterns. Press and hold the first pattern you wish to play and then press the last pattern that is to be included in the loop. All the patterns between these two will then sequentially play from left to right. Once multiple patterns have been cued and are playing, you can select another group of patterns to play when the first group reaches it's last step. When cueing up a second group you can select patterns in any bank and even partially overlapping those currently playing.

OPERATIONS

Editing patterns

Pattern edit mode is where 1 measure of music can be recorded or edited for each pattern, to later be arranged into a song. Each pattern records the notes and their pitches, accents, glides, the time signature, and loop point for that pattern. Every time a pattern is edited, the changes are automatically saved by the sequencer. *You must make sure not to change a pattern you wish to keep, by doing so you will overwrite the old pattern with new data. This can be avoided by using the copy/paste functions described later in the manual.*

To edit patterns you must first be in the pattern mode (SONG key indicator is off). To edit a pattern, select the desired pattern then press the BANK key until it's indicator is off, indicating you are now in pattern edit mode.
All pattern editing can be done while the sequencer is stopped or playing, which allows you to actually hear the changes you are making, while you make them. In this way you can select a pattern, edit it, and then select another pattern to play or edit while the sequencer continues to play. Instant live improv! Since the sequencer automatically saves all changes made there is no need to stop the music.

When multiple patterns have been cued and are playing you can enter the pattern edit mode to edit individual patterns. To edit a cued pattern, wait until the desired pattern is playing and then enter the pattern edit mode. The current pattern will loop by itself so you can hear all the changes you are making. Once the pattern has been changed as desired, you may exit the pattern edit mode. Now the cued patterns will continue playing sequentially as before.

When the sequencer is playing and a pattern is being edited, you will notice that the 16 step key indicators will blink to show the current step being played. You can use this as a quick way to pin point steps you wish to edit. It can also be useful to serve as a visual indication of where the loop point is set for that pattern.

Entering notes

When in the pattern edit mode the 16 step key indicators will be used to display where notes are placed in that pattern. The brightness of the indicators will determine where notes start, their duration, and rests.

1. A note on (or where a note begins) will be shown by the key's indicator being on.
2. The sustained portion for a note will be shown by the key's indicator being on, but only half as bright as a note on.
3. A rest is shown by the key's indicator being off.

To enter notes you must be in pattern edit mode. Placing 16th or 12th notes (depending on which time signature is selected) is done in the same way. By using the 16 step keys, simply press the keys one at a time where you wish notes to be. The indicators for the notes you enter will now be on in their brightest state.

To place sustained notes, press and hold the step key where the note is to start and while doing so press the step key (to the right of the one you are holding) that represents the last step you want that note to sustain to. The first step indicator of a sustained note will be on and brightest, while the sustained portion of the notes indicators will be on at half brightness. For example, place and hold a 16th note and press the first step key to the right of the one being held. Doing this you just wrote an 8th note. Use this method to create notes of various durations.

Placing rests is actually done by just leaving notes off, or clearing notes that appear in the position you want a rest. Rests will be visually seen as a steps indicator being off.

There is a way to write new notes without having to clear previous notes. For instance, if you place a new note in the sustained portion of a note, the new note will now be in the position you selected. This now shortens the previous sustained note, and it will sustain until the step the new note was written. The step key indicators for these positions will also change to show how the previous sustained note was shortened. By writing a sustained note over previous notes, the previous notes will no longer be heard. You can use this method to change a sustained note's duration. Any new notes written over a sustained note's note-on will override the entire sustained note, with the exception that you can't write a 16th note over a sustained note's note-on. To do this, you must first clear the sustained note and then write the 16th note.

Clearing notes

There are two ways to clear previous note data that may exist from a previous pattern. You can either clear all the notes at once or individual notes one at a time.

To clear all the notes for a pattern, press the BANK key and select the pattern you want to clear all the notes from. While holding that pattern's step key, press the CLEAR key. Now by pressing the BANK key and entering pattern edit mode, you will see all the step key indicators are off, showing no notes exist in that pattern.

To clear individual notes, press and hold the CLEAR key, then press the step key that represents the note-on for the note you want to clear. you can clear as many notes as you want while holding the CLEAR key. Once clearing is done you may release the CLEAR key. All the notes step key indicators you cleared should now be off.

Changing a note's pitch

Once notes exist in a pattern, you can change the pitch each one is to play. Select a pattern you would like to edit, and enter the pattern edit mode. When in the pattern edit mode, one of the 16 step key indicators will be on or flashing showing it is the current note being edited. You can change which note is to be edited by pressing the step key where that note starts. *Notice that by pressing any keys other than where a note starts will write a new note as described in the previous section.* Once a note is selected, the display will show the pitch of that note, ranging from C1 to D#6. *Notice that the display will show an = sign for sharp notes.* Using the UP/DOWN keys select the desired pitch that the note is to play at.
When the sequencer is playing and you change a notes pitch in this way, each time the pattern reaches this step the new notes pitch will be played. If you hold a note's step key while you change the note's pitch the new pitch will not take affect until you release that notes step key. You can use this method to ensure that only the desired pitches will be heard while the sequencer is running.

Recording accents

To record or place accents for notes, first select the pattern you want to edit and enter the pattern edit mode. One of the step key indicators will be flashing to show the current note to be edited. Select any note by pressing the step key where that note starts. When a note is selected the ACCENT key will be on when a note is to be accented, and off when no accent is to occur. By pressing the ACCENT key you can turn accents on or off for that step.
Placing accents can be done while the sequencer is playing or stopped.

Clearing accents

To clear all the accents in a pattern, press and hold the CLEAR key and press the ACCENT key.

Recording glides

To record or place glides for notes, first select the pattern you want to edit and enter the pattern edit mode. One of the step key indicators will be flashing to show the current note to be edited. Select any note by pressing the step key where that note starts. When a note is selected the GLIDE key will be on when a note is to glide, and off when no glide occurs for that note. By pressing the GLIDE key you can turn glides on or off for that step.
Placing glides can be done while the sequencer is playing or stopped.

Clearing glides

To clear all the glides in a pattern, press and hold the CLEAR key and press the GLIDE key.

OPERATIONS

Selecting a time signature

There are two time signatures to choose from when writing a pattern, they are 3/4 and 4/4. Each time signature simply divides the measure of a pattern into either 12 equal parts (3/4) or 16 equal parts (4/4). The music bars located above the 16 step keys represent the two different time signatures. The top bar being 3/4, and the bottom 4/4.
To change the time signature for a pattern, select the pattern to be edited and enter pattern edit mode. By holding the TIME key, the display will show either 3-4 or 4-4. Using the UP/DOWN keys, select the appropriate time signature. Once the time signature is set you may release the TIME key. You can change a pattern's time signature while the sequencer is playing or stopped

Setting the loop point

Each pattern has it's own loop point that is used to set the number of notes a pattern will play before it begins to repeat itself. With a 3/4 time signature there can be as many as 12 steps per pattern, while a 4/4 pattern can contain up to 16 steps per pattern.

To set the loop point, select the pattern you wish to edit and enter the pattern edit mode. Press the step key that represents the last step you wish the pattern to play. Then by pressing the LOOP key you will place a loop point on that step. This is shown by the LOOP key's indicator being on. Pressing the LOOP key repeatedly will turn the loop point on and off for that step.

A pattern may contain more than one loop point, but it will only loop at the first loop point it comes across. Changes may be made to a pattern's loop point while the sequencer is playing or stopped.

Clearing all loop points

To clear all the loop points in a pattern, press and hold the CLEAR key and press the LOOP key.

Adjusting the tempo

When in the pattern mode, the tempo setting will determine the rate at which all patterns will be played. To adjust the tempo, press and hold the TEMPO key. The display will show the current tempo selected. Use the UP/DOWN keys to adjust the tempo from 20 to 250 beats per minute or B.P.M.. When the tempo is changed and a sequence is playing, the tempo change will have an immediate affect on rate at which it is played. This tempo setting is saved even when the power is turned off.

Transposing patterns

When playing patterns in the pattern mode, the transpose function has a global affect on all the patterns. The transpose function allows you to shift all of a patterns notes up or down 36 half steps from the pitches originally programmed into that pattern.

To change the transpose setting, first enter the pattern edit mode. Press and hold the XPOSE key, and the display will show the current value (-36 to 36) of transposition. Use the UP/DOWN keys to change the transpose setting. This transpose setting will be saved even when the power is turned off. You can clear the transpose setting to 0. While in the pattern edit mode, hold the CLEAR key and press the XPOSE key.

You can permanently transpose all the notes for a pattern. To transpose a pattern in this way, first select the desired pattern to be edited and enter the pattern edit mode. Press and hold the XPOSE key and the display shows the current value of transposition. Use the UP/DOWN keys to change the transpose setting. Once you have the transpose value set, press the TIME key while holding the XPOSE key and the pattern's notes will permanently be rewritten. This operation can be executed while the sequencer is running.

The global transpose setting in pattern mode has no affect on patterns when they play in a song. The range of notes the 777 will play is from C1-D#6. If a pattern's notes are transposed beyond this range, the notes will be interpreted as a rest.

OPERATIONS

Shifting patterns

It is possible to shift all the contents of a pattern forwards or backwards in time from where they currently are.
To shift a pattern, select the desired pattern to be edited and enter the pattern edit mode. Press and hold the CLEAR key and then use the UP/DOWN keys to shift the pattern UP/right or DOWN/left. If pattern shifting is done while the sequencer is stopped you will shift the pattern one step for every key press of either the UP or DOWN key. If pattern shifting is done while the sequencer is playing, the pattern will shift one step every time a new step position is reached.

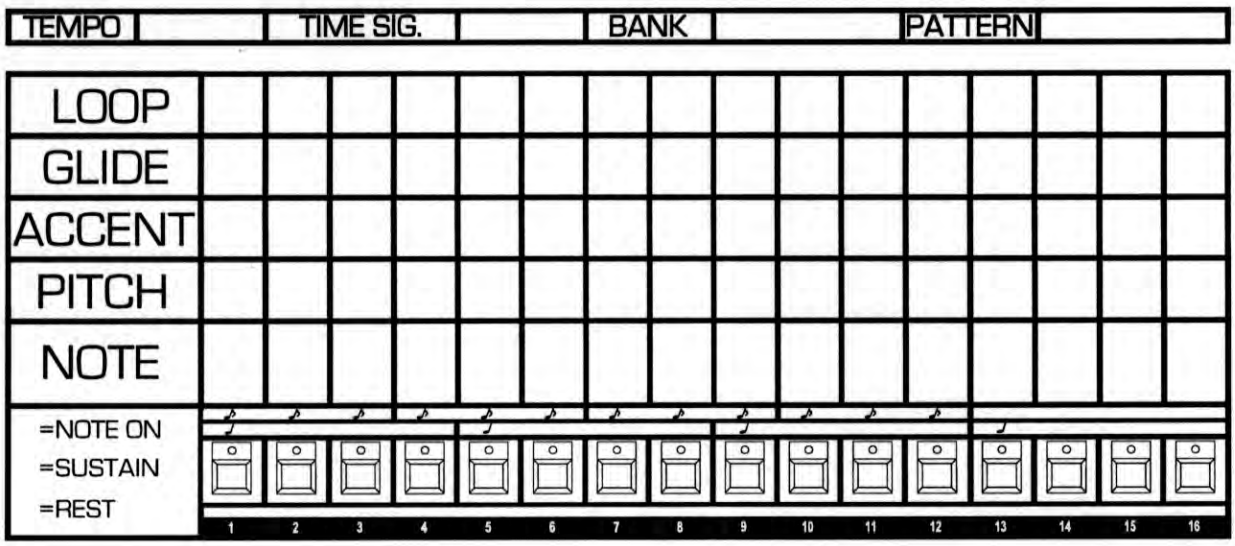
When you shift a pattern you are shifting the note duration and pitch along with glides and accents for those notes. The loop point however will not be shifted. When shifting patterns you should also be aware that all 16 notes possible are shifted even if the loop point is set to any value less than 16 steps. When a pattern has a shorter loop point set, and you shift that pattern, you will hear new notes start playing in the loop replacing those shifted beyond the loop point.

Note: By setting a patterns loop point at different steps and then continuously shifting the pattern left or right, the pattern can play it's notes in a completely different way. It may seem somewhat random at first but there is logic behind it, so we will leave it to you to figure it out. Notice how many ways you can play a pattern just by changing it's loop and continuously shifting the pattern. The way notes play for a sequence in this manner also depends on what step you start shifting on. Try setting the loop point on step 1 and continuously shifting the pattern right. The pattern will now be playing backwards. Experiment!

Copying patterns

Before editing any patterns you like, it would be wise to copy them to another location to be edited. Copying patterns can also be useful when creating several patterns with slight variations.
To copy a pattern from one location to another, stop the sequencer and enter the pattern select mode. Select the pattern you wish to copy. While holding the pattern's step key, press the COPY key. This places a copy of that pattern in a temporary memory location, where it will remain until either a new pattern is selected to copy, or the power is turned off. Since a copy of the pattern is placed in temporary memory, you can now go and play other patterns to find a location to paste the pattern in. When you have found a location, stop the sequencer, hold the pattern's step key and press the PASTE key. The pattern you had copied will now be written in this location. You can continue to place the copied pattern in as many locations as you want by selecting each location individually, and pressing the PASTE key.

Below is a blank pattern sheet that you can photocopy and use to write down the contents for a pattern.



OPERATIONS

Selecting songs

Selecting a song is done in the same way patterns are selected, except you must be in the song mode.
To select a song, press the step key indicator (1-16) to select one of the 16 song locations. If the sequencer is playing a song and another song is selected, the newly selected song key's indicator will be on at half brightness showing it is cued up and will begin playback as soon as the first song reaches it's loop point.

Playing songs

You must be in the song mode to play songs. Select a song to play by pressing one of the 16 step keys. Press the RUN/STOP key to begin playback of the song. By pressing the RUN/STOP key again playback of the song stops, but the song remains in the location it was stopped. Pressing the RUN/STOP key once more begins playback from where the song was stopped. If you want to start playback from the beginning of the song, press the CLEAR key before starting playback.

Editing songs

All song editing is done in the song mode. To enter the song mode, stop the sequencer, and press the SONG key until it's indicator is on. All editing in the song mode will be done while the sequencer is stopped. The song edit mode is used to arrange the patterns into a song. There are 16 song locations available and each is capable of recording up to 3580 one-measure patterns. Each song step records the pattern that will play for that step, how much the pattern is to be transposed from it's original pitch, and whether or not that is to be the last pattern played in the song before it starts over again or loops. Each song also records the tempo for that song to playback.

Selecting patterns for a song's step

When in the song mode, the display will show the current step being edited. You can select the desired song step by using the UP/DOWN keys. You can also reset the song to step 1 at any time by pressing the CLEAR key.

To edit a song, you simply select the patterns in the order they are to play in the song, and set a loop on the last step you wish to play in the song. *Not having a song clear function prevents any accidental erasure of an entire song.*
To change the pattern a song step will play, select the song step, press and hold the BANK key. The display will now show the bank and step key 1-16 are used to select the pattern of that bank. While holding the BANK key, use the UP/DOWN keys to select the bank and the press the patterns step key. Release the BANK key once you have made your selection. Select the pattern for each step in this way until all the patterns are in their correct order.

To see how your song sounds so far, press the CLEAR key to reset the song to step 1, and press the RUN/STOP key. To stop the song's playback, press the RUN/STOP key again. If you need to make changes to the song, use the UP/DOWN keys to select the step to edit and make the necessary changes.
All changes you make when editing the song are automatically saved by the sequencer.

Transposing a song's step

Each song step's pattern can be transposed up or down 36 half steps in pitch, from the notes originally programmed in that pattern.

To transpose a song step's pattern, select the song step and press the XPOSE key. While holding the XPOSE key the display will show the current transpose setting for that step's pattern. Use the UP/DOWN keys to change the transpose setting for that song step. Release the XPOSE key when you are done and the sequencer will automatically save your changes.

To reset the transposition to a value of 0 for all the song steps, press and hold the CLEAR key, then press the XPOSE key. This will allow all the patterns in the song to play at their original programmed pitch.

Setting the loop point for a song

A loop point is recorded into a song step to indicate this will be the last step played before the sequencer goes back to step 1 and begins to play again. If you want to find what song step is set to loop, you can use the UP/DOWN keys to step through the song and see which step is set to loop. This is indicated by the LOOP key's indicator being on.

To set a loop point for a step, press the LOOP key while that step is selected. In the same way if you wish to remove a loop point you may press the LOOP key turning the loop point off. You may also clear all the loop points from a song by pressing and holding the CLEAR key, press the LOOP key. This will be most useful when creating new songs rather than finding the existing loop point one at a time, and clearing them out.
All changes you make to the loop point settings are automatically saved by the sequencer.

Setting a song's tempo

Each song records the tempo it will playback. Select the song you wish to change the tempo of, and press the TEMPO key. As you hold the TEMPO key, the display will show the current tempo setting. Using the UP/DOWN keys you change the song's tempo from 20-250 beats per minute. Once the tempo is correct, release the TEMPO key and the sequencer will automatically save your changes.

Advanced song editing

It is possible to jump from the currently selected song step, to the pattern edit mode and edit the pattern used for that song step. If a song is at any point other than the first step and you exit song mode, the pattern used for the current song step will be automatically selected with all it's song parameters, for editing in the pattern mode.

To clarify, let's say you are on step 3 of a song and that song step uses pattern 1 in bank 1with a transpose value of +12. If you exit the song mode, pattern 1 of bank 1 will be the pattern currently selected. If you hold down the transpose key you will notice it is set for +12, just as it was for the song step. In addition, the tempo the pattern plays at will be the same as set for the song. This allows you to easily edit a pattern and hear what it will sound like for the song. You can now make any changes to the pattern or even select a different pattern you would like to use for that song step. You may change the transpose value for the pattern while in the pattern edit mode, which will change the transpose setting for that step in the song. If you change the tempo while in the pattern mode, it will change the entire song's tempo as well.

Once you are through editing the pattern for the current song step, return to the song mode and all changes will be accepted and saved by the sequencer. If you are in the song mode and wish to return to the pattern mode without the sequencer automatically selecting the current song step's pattern, press the CLEAR key before you exit the song mode.

Note: to access the MIDI and SYSEX modes you must enter the song mode. Once changes are made in either of these modes if the current song selected is at any location other than step 1, you will activate the advanced song editing function. In this case, it would be a good habit to hit the CLEAR key before you exit the song mode, which will return you to where you previously were in the pattern mode before making adjustments to the MIDI parameters.

A blank song sheet is provided on the following page. Photocopy it and use it to write down your song information.

SONG NAME:		TEMPO:	

STEP	BANK	PATTERN	TRANSPOSE	STEP	BANK	PATTERN	TRANSPOSE

MIDI MODES

Using the 777 as a master clock

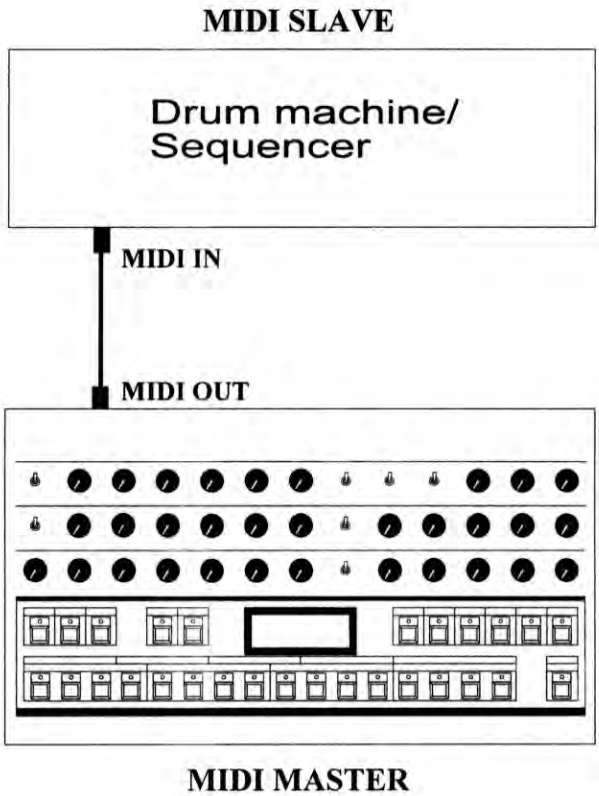
Using the 777 as a master clock allows other sequencers and drum machines to synchronize their playback with the 777. In this configuration the 777 acts as a master device, which allows the 777 to control the start, stop, and tempo for all the sequencers connected.

For this set up, connect the MIDI OUT of the 777 to the MIDI IN of the devices you wish to synchronize to the 777. To set up the MIDI controls in the 777, press the SONG key (SONG key indicator should be lit). Now press the ACCENT key (sub-titled MIDI). This key's indicator lights when you are in MIDI mode. At this point the display will show INT or EXT. Use the UP/DOWN keys to select INT. Now press the ACCENT/MIDI key again. The display now shows which MIDI channel the 777 sends and receives information on (1-16). You can change the MIDI channel with the UP/DOWN keys, but it does not matter what channel is selected for this configuration because the start, stop, and tempo information of the 777 is sent no matter what channel is selected. Press the ACCENT/MIDI key once more, this exits the MIDI mode and the ACCENT/MIDI key's indicator is now off to show this.

Now you will need to refer to the device's owners manual you wish to sync to the 777. You will need to set the MIDI slave's clock to external, and set the playback in some sort of ready to receive clock information mode. When this has been done, starting and stopping playback of the 777 will control the start and stop of the slave devices. The tempo of the slave device is now controlled by the 777's tempo.

The tempo of the 777 can be changed by holding the TEMPO key while using the UP/DOWN keys to select a new tempo setting. When TEMPO is pressed the B.P.M. is shown in the 777's display.

Remember that you can change the pattern the 777 is playing by selecting a different bank and pattern. This can be done at any time while the 777 is playing or stopped.



MIDI MODES

Syncing the 777 to an external clock

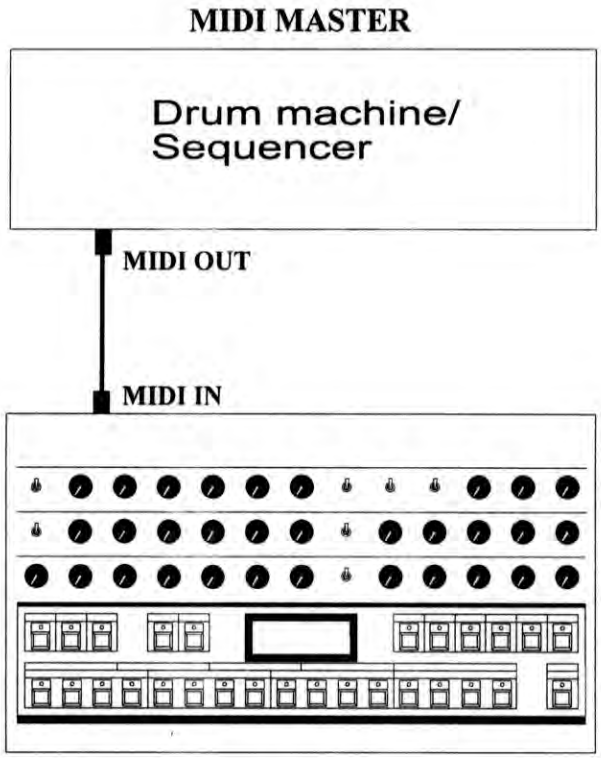
The 777 can synchronize it's playback to any other MIDI sequencer. In this set up the 777 acts as a slave where it's start, stop, and tempo are all controlled by the master sequencer that is connected.

For this set up, connect the MIDI OUT of the master sequencer to the MIDI IN of the 777. To set up the MIDI mode of the 777, first press the SONG key (SONG key indicator should be lit). Now press the ACCENT/MIDI key to enter the MIDI mode. The ACCENT/ MIDI key's indicator should be lit to show you are in the MIDI mode, and the display will show if MIDI is set for INT or EXT. Use the UP/DOWN keys to change the MIDI mode to EXT. Press the ACCENT/MIDI key again, the display now shows which MIDI channel information is to be sent and received on. For the 777 to synchronize to a master sequencer it does not matter what MIDI channel is selected, just make sure MIDI is set for EXT. Once again press the ACCENT/MIDI key to exit the MIDI set up mode. Now select the song or pattern you want the 777 to play. Next, press the RUN/STOP key, it's indicator stays lit showing the 777's sequencer is now in cue mode. At this point the 777's sequencer is waiting for the master sequencer to tell it to start playing.

Make sure the master sequencer is set to a mode that allows it to act as a master and send the start, stop, and tempo information. Once this is done starting, stopping, and changing the tempo of the master device will also control the 777.

Remember that while the 777 is syncing you can change which pattern is playing by selecting a different bank and pattern. You can also perform any edits to a pattern while it is syncing. You can not edit songs while the 777 is syncing.

NOTE: if the RUN/STOP key indicator is on, the 777 works as a slave (syncing). When it's indicator is off and MIDI is set to EXT, the 777 will receive MIDI note data on the selected MIDI channel.



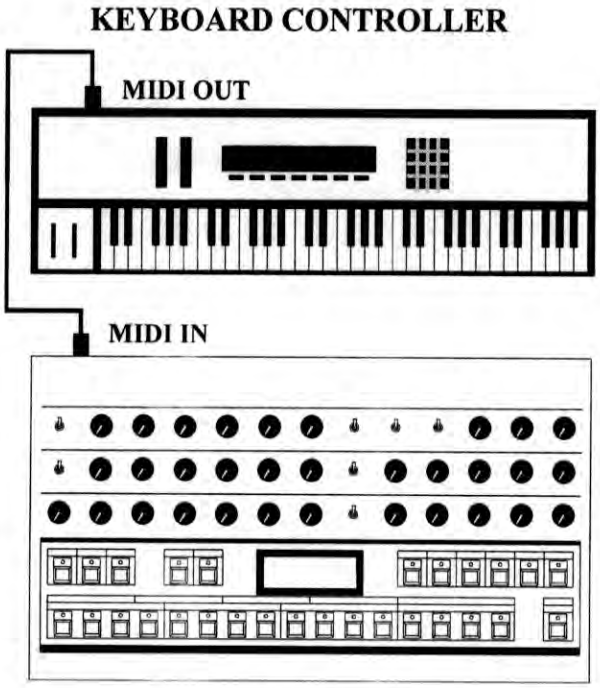
MIDI MODES

Playing the 777 with an external controller

You can play the analog section of the 777 with an external MIDI controller or MIDI sequencer. This allows the user to play the 777 with a keyboard for live sessions or play the 777 with any other external sequencer.

For this set up, connect the MIDI OUT of the keyboard controller or external sequencer to the MIDI IN of the 777. To set up the MIDI mode of the 777, press the SONG key (SONG key indicator is lit). Now press the ACCENT/ MIDI key to enter the MIDI mode. The display will show INT or EXT. Use the UP/DOWN keys to set the MIDI to EXT. Once this is done, press the ACCENT/ MIDI key again. Now the display shows the MIDI channel the 777 will receive information on. Select from 1-16 using the UP/DOWN keys. When the MIDI channel is set, press the ACCENT/MIDI key again to exit the MIDI mode. The 777 is now ready to play any notes that are sent on the MIDI channel it is set for. Make sure the keyboard controller or external sequencer is set to send MIDI information on the same MIDI channel set in the 777.

Remember the 777's analog section can only play one note at a time (monophonic). If the external controller is playing more than one note at a time, the 777's pitch will glide to the last note played. The 777 can remember the order that the last 8 notes were pressed and held. If the last key you pressed is released, the 777 will glide to the note you played and held just before the one you released. If only one note is played at a time no glides will be heard. To trigger the 777 to play an accented note, the note must have a velocity value greater than 63. Any notes received with a velocity less than 64 will not be accented.



MIDI MODES

Playing an external sound module with the 777

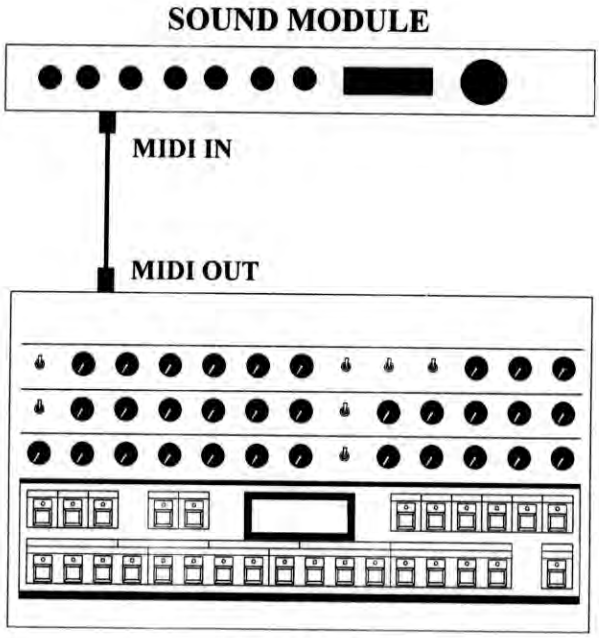
You can play external MIDI sound modules with the 777's sequencer. This allows the user to take advantage of the real-time editing in the 777's sequencer, which other sequencers might not offer.

For this set up, connect the MIDI OUT of the 777 to the MIDI IN of the external MIDI sound module. To set the MIDI mode of the 777, press the SONG key (SONG key indicator is lit). Now press the ACCENT/MIDI key to enter the MIDI mode. The display shows that MIDI is set for INT or EXT. Use the UP/DOWN keys to select the MIDI mode to INT. Now press the ACCENT/MIDI key again and the display shows which MIDI channel (1-16) is selected to send note information on. Use the UP/DOWN keys to change the MIDI channel. After you have selected the MIDI channel, press the ACCENT/MIDI key again to exit the MIDI mode.

Now you will need to set up the MIDI sound module to play the sound you want on the same MIDI channel that the 777 is sending note information on. Once this is done select the pattern or song in the 777 that you want to play the sound module with. By pressing RUN on the 777, the MIDI sound module should play the notes programmed into the 777's sequencer.

When accents or glides are programmed in the sequencer they may have a totally different affect on the MIDI sound module's sound depending on how the sound module's sound is programmed to respond to velocity changes, or two keys being play at the same time. When a note in the 777 is programmed with an accent a full-on velocity value is sent for that note. When a glide is programmed into the 777, the sound module will see this as, the first note overlapping the second for a short period of time. Notes with no accent or glide programmed will play one note at a time.

Remember that you can select different patterns as well as edit patterns while controlling an external sound module. You can also play an external MIDI sound module with the 777, while the 777 syncs it's playback to an external clock. For more information on syncing the 777 to an external clock see P.23.



SYSTEM EXCLUSIVE

Using system exclusive to save patterns and songs

The 777 does support MIDI system exclusive messages (SYSEX), for saving and loading your songs and patterns to other MIDI sequencers or computer programs. Songs and patterns created in the 777 can also be directly dumped to or from the Future Retro Mobius sequencer.

To do a SYSEX dump, you will need to connect the MIDI OUT of the 777 to the MIDI IN of the computer you are using, and the MIDI IN of the 777 to the MIDI OUT of the computer.
NOTE: Only one MIDI cable is needed to load or save information, as the 777 does not require a hand shake with the other device. By using two MIDI cables as mentioned, loading or saving operations can be done from either machine.

Make sure the 777 is stopped, enter the song mode, and press the SYSEX key. The SYSEX key indicator will light to show you are in the SYSEX mode. The display will show either SAVE or LOAD. Using the UP/DOWN keys, you can specify whether the 777 will save or load SYSEX data. Once you have made your selection, press the SY-SEX key again. The display will show either "bank" or "song". Use the UP/DOWN keys to select whether the type of transfer will be banks of patterns, or entire songs. Press the SYSEX key again and the display will show which bank or song will be transferred. Use the UP/DOWN keys to select 1-16 or "ALL". When 1-16 is selected that song or bank of patterns will be transferred. If all is selected, you can transfer all the patterns or songs in one process.

You are now ready to load or save SYSEX data with the other machine. If you are saving the SYSEX data from the 777 to another device, you will first need to set that other device to a ready-to-receive mode. Once this has been done, press the RUN/STOP key on the 777 to start the SYSEX dump. The RUN/STOP key indicator will turn on and the display will show the packet number being saved, during the SYSEX transfer. When the transfer is com-plete, the RUN/STOP key indicator will turn off. Consecutive saves may be made without entering and exiting the SYSEX mode, by simply selecting the song or patterns and pressing the RUN/STOP key. The receiving device must always be setup and armed before the transfer is started.

If you are loading SYSEX data into the 777, press the RUN/STOP key to initiate the ready-to-receive mode. The 777 will then be armed and waiting for the SYSEX information to be sent. You may now start sending SYSEX in-formation from the other device. The RUN/STOP key indicator will be on during the transfer, and the display will show the packet number it is receiving. The RUN/STOP key indicator will turn off when the transfer is complete. If a check sum error is encountered during the transfer, the SYSEX key indicator will blink. If an error does occur, repeat the load again or exit the SYSEX mode to clear the error.

When banks or songs are loaded using SYSEX, they are normally placed in the location they were saved. You may change a bank or song's location by editing the sixth byte of the general header, remembering that 0=1, 4=5, 15=16 etc.. The song or bank can then be loaded to the new location in the 777.

To exit the SYSEX mode, press the SYSEX key until it's indicator turns off, returning you to the SONG mode.

SYSTEM EXCLUSIVE

SYSEX INFORMATION

MFG. ID=07
CHANNEL#=01
MODEL#=77
RAW DATA TRANSFER/PACKET=512 BYTES
PACKET SIZE ENCODED=604 BYTES

PACKET SIZE INFORMATION

1 BANK	1 PACKET	604 BYTES
ALL BANKS	16 PACKETS	9,499 BYTES
1 SONG	14 PACKETS	8,313 BYTES
ALL SONGS	224 PACKETS	132,843 BYTES

When transferring SYSEX data to another device, make sure the receiving device has the available buffer size before attempting downloading or saving of the files.

GENERAL HEADER INFORMATION

SIZE=11 BYTES
General header is sent once to identify packets to follow.

CONTENTS
F0=SYSEX START
07=MFG. ID
01=CHANNEL #
77=MODEL ID
XX=BANK/SONG, 0=BANK, 1=SONG
XX=BANK/SONG #, 0-15, 16=ALL
XX=LSB
XX= ***not used***
XX=MSB
F7=SYSEX STOP

PACKET INFORMATION

SIZE=604 BYTES
Packet is sent for every 512 bytes of raw data.

CONTENTS
F0=SYSEX START
07=MFG. ID
01=RECEIVE ID
77=MODEL ID
XX=PACKET COUNT (00-7F)
XX=597 BYTES OF ENCODED DATA
XX=CHECKSUM
F7=SYSEX STOP

SPECIFICATIONS

AUDIO SOURCES
Oscillator A: cv internal/external, range, waveform, level
Oscillator B: cv internal/external, range, waveform, level
External In/Sub A: level
Sub B: level
Noise: level
Filter: (when set to self oscillate)

FREQUENCY MODULATION
Glide: time
Wave B: sawtooth-square
Amount A: amount of oscillator B to modulate oscillator A
Wave A: sawtooth-square
Amount B: amount of oscillator A to modulate oscillator B
Envelope Decay: decay time
Envelope Amount: amount of affect the envelope decay has on oscillator B

FILTER
Gain: amount of prefilter gain
Slope: 3 pole or 7 pole lowpass filer type
Cutoff: frequency
Resonance: amount
Resonance Maximum: sets maximum resonance amount
Accent: amount
Highpass: frequency

FILTER MODULATION
CV Type: normal, warp
CV Amount: amount of CV type
Wave B: sawtooth-square
Mod Amount: amount of oscillator B to modulate the filter
Envelope Decay: decay time
Envelope Amount: amount of affect the envelope decay has on the filter

AMPLIFIER
Accent Decay: decay time for accented notes
Envelope Decay: decay time for non-accented notes
Shape: gate, envelope
Bass: normal, boost bass response
OD Type: normal, phase type
Overdrive: amount
Accent: amount
Volume: level of output

SPECIFICATIONS

NUMBER OF PATTERNS: 256 pattern (16 banks x 16 patterns)

RECORDED PATTERN CONTENT: note duration, pitch, accent, glide, loop point, time signature

NUMBER OF STEPS PER PATTERN: 3/4 time = 12 steps max, 4/4 time = 16 steps max

NOTE RANGE: C1-D#6

LOOP POINT: 1-16 notes per pattern

PATTERN TRANSPOSE: -36 to +36 half steps

OTHER PATTERN FEATURES: copy/paste patterns, pattern shifting, multiple pattern cueing, real-time editing of pattern information, sequencer automatically saves all changes made

NUMBER OF SONGS: 16

NUMBER OF STEPS PER SONG: 3580

RECORDED SONG CONTENT: tempo, bank/pattern per step, pattern transpose per step, song loop point

TEMPO RANGE: 20 - 250 B.P.M.

SONG PATTERN TRANSPOSE: -36 to +36 half steps per pattern

MIDI CONNECTIONS: in, out,

MIDI FUNCTIONS: internal, external, channels 1-16

MIDI SYNC: internal, external

NOTE DATA: transmit, receive

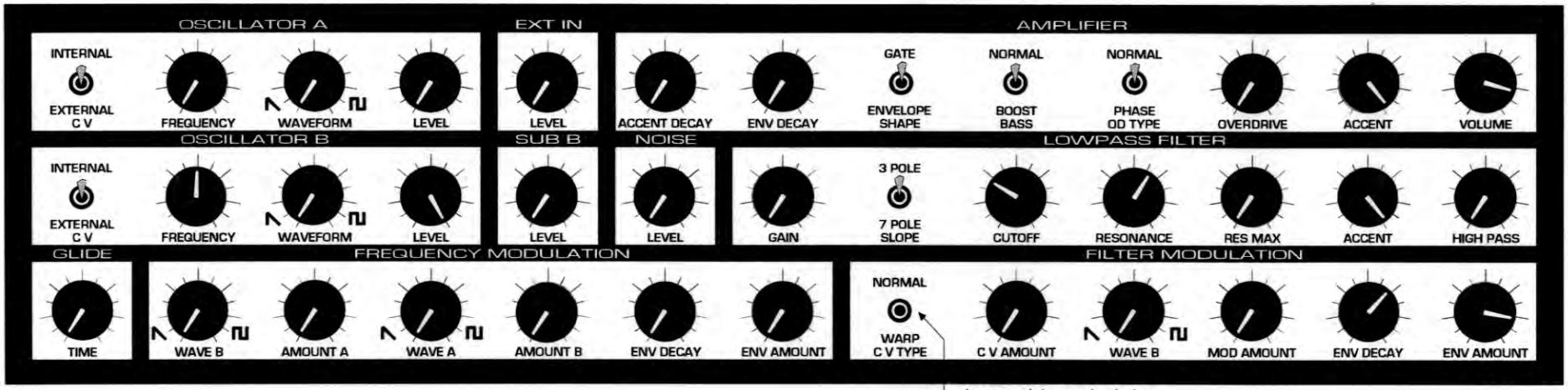
SYSEX: sysex transfer of patterns and songs

1/4" INPUTS:
CV, Gate, Accent, Filter (audio input)

1/4" OUTPUTS:
CV, Gate, Accent, Audio signal

POWER: 12v AC, 1 Amp

PATCH NAME | TB 303



DESCRIPTION

To set up the analog section to produce TB 303 sounds, set all the controls on your front panel to look like the panel above. The original TB 303 has only 7 controls. They are frequency, waveform, filter cutoff, filter resonance, filter envelope amount, envelope decay, and accent. In this setup we will use oscillator B as our signal source, leave the frequency control of osc. B in it's mid position for accurate tuning to the notes the sequencer will play. You may adjust the waveform knob from sawtooth to squarewave. Feel free to adjust the filter's cutoff and resonance knobs. In the filter modulation section you may adjust the envelope decay and envelope amount knobs. You may also adjust the accent knob in the filter section as well as in the amplifier section. (The accent feature in the original 303 had only 1 knob to adjust the accents.) Other than that leave all controls as set above.

After reading through the manual you will learn how to use the other controls to take the famous 303 sound to a whole new level of dimensions.