REALISTIC® SYNTHESIZER

by Moog Music

Catalog Number 42-4000

Introduction

You have at your fingertips the ability to create music in a totally new and unique manner. The Realistic Synthesizer can duplicate the voices of an entire orchestra or create sounds that have never before existed.

One very important rule to remember about using synthesizers:

THERE ARE NO RULES

No matter what knobs you turn or switches you flip or sliders you move, **YOU CAN'T HURT IT!** Feel free to experiment. If you find a sound you like, remember to write it down (otherwise you'll never, ever find it again).

To fully appreciate the potential of your synthesizer, we suggest that you use this instruction manual as a guide to understanding how the controls work. The manual is designed to build your skills upon what you've previously learned, so be sure to follow it **exactly**—don't skip any sections.

For those of you who want to put the synthesizer through its paces right now, there are "patch" diagrams (in the back of this manual) for many popular sounds. Simply adjust the controls as shown for the desired sound.

For those of you who are still with us, come along and let's explore the world of sound and synthesizers (and make some music as we go)!

Note Characteristics

A note has pitch, volume, timbre and duration. Most instruments produce notes with only one timbre—a piano does not sound like a french horn, for instance. The timbre of the note is usually dependent upon the instrument.

The musician usually has control over the pitch, volume, and duration of a note. To a small degree, some of the timbre can also be controlled by the musician.

The Realistic Synthesizer gives you complete control over **each** characteristic of **each** note you play. We are going to build up a single note, one part at a time, to show you how each part contributes to the final sound. But first, you need to make sure that the synthesizer is in tune with any other instruments which might be playing along, and with itself (it has three different tone generators).

Setting Up

To get your synthesizer ready to use, follow these steps:

- Connect the AC power cord to a 120 GROUNDED (three prong) AC wall outlet.

- If you want to listen to your synthesizer through headphones, plug a pair into the PHONES jack on the front of your synthesizer.

- If you're going to listen to your synthesizer through your stereo system, connect patch cords (such as Radio Shack Cat. No.42-2368) from the **L** and **R OUTPUT** jacks on the back of your synthesizer to the left and right **AUX** inputs of your receiver/amplifier.

  Note: You'll hear the same sound from both the left and right speakers of your stereo system.

- If you're going to listen to your synthesizer through a musical instrument amplifier, connect a patch cord from either the **L** or **R OUTPUT** jack on your synthesizer to one of the inputs on your musical amplifier. (The type of patch cord you'll need will depend on whether your musical instrument amplifier has phone plug or phono plug inputs.)

- Now set the **POWER ON/OFF** switch on the back panel of your synthesizer to **ON**. You'll notice a red LED beside the **RATE** slider in the **MODULATION** section start to blink. Adjust the **MASTER VOLUME** knob for the loudness you want.

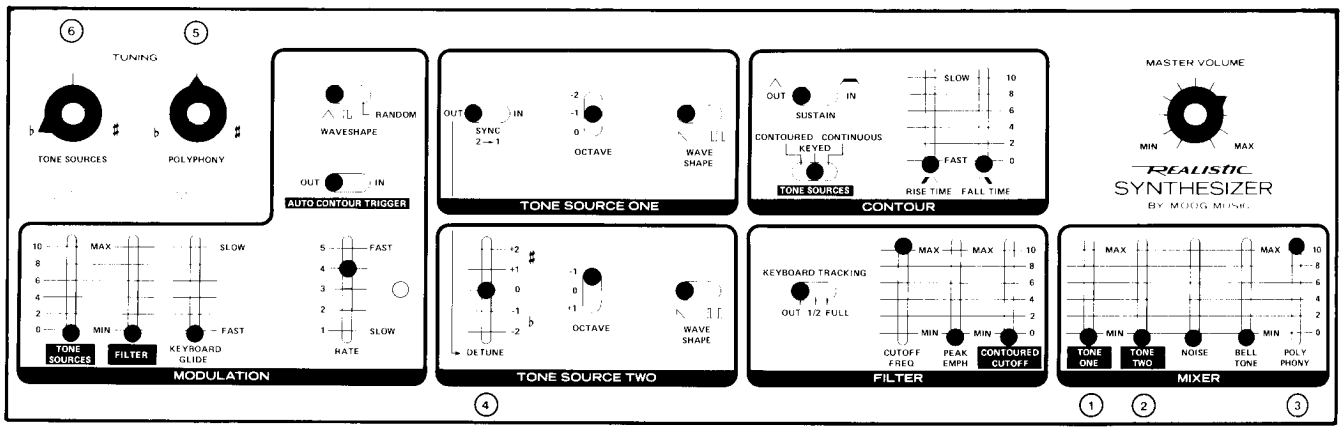
Note: Your synthesizer has four other jacks on its rear panel. The **AUX IN** jacks let you play along with your stereo tapes! Connect the left and right channels of your tape deck to the **AUX IN** jacks of your synthesizer, using patch cords such as Radio Shack Cat. No. 42-2368. Connect the **L** and **R OUTPUT** jacks of your synthesizer to your receiver/amplifier. You are now able to add the sounds of your synthesizer to your stereo system.

The **INTERFACE PORTS** can be connected to digital to analog and analog to digital converters, so your synthesizer can be controlled by a computer. The **PITCH** input jack requires 1 volt per octave (5 volts maximum). When the **PITCH** jack is connected, the keyboard is disabled. A modifier is necessary to temper the input voltage to achieve perfect pitch.

The **TRIGGER** input is simply a switching input—when the hot lead is shorted to ground, it will trigger the synthesizer.

Getting Started

Here are the starting control positions for building any note structure:



Adjust the controls on your synthesizer to exactly match the diagram. **MASTER VOLUME** should be adjusted to a comfortable sound level. Notice that there are six controls specially marked on the diagram. Controls **4**, **5**, and **6** are **extremely** sensitive and will only require slight adjustment.

1 . Slider **3** (**POLYPHONY**, in the **MIXER** section) should be up full.

2 . Hold down a key on the keyboard and use Control **5** (**POLYPHONY**, in the **TUNING** section) to tune the note to a known pitch (or just set it straight up if there are no other instruments around).

3 . Still holding down the key, slide Control **1** (**TONE ONE**, in the **MIXER** section) up to about 6.

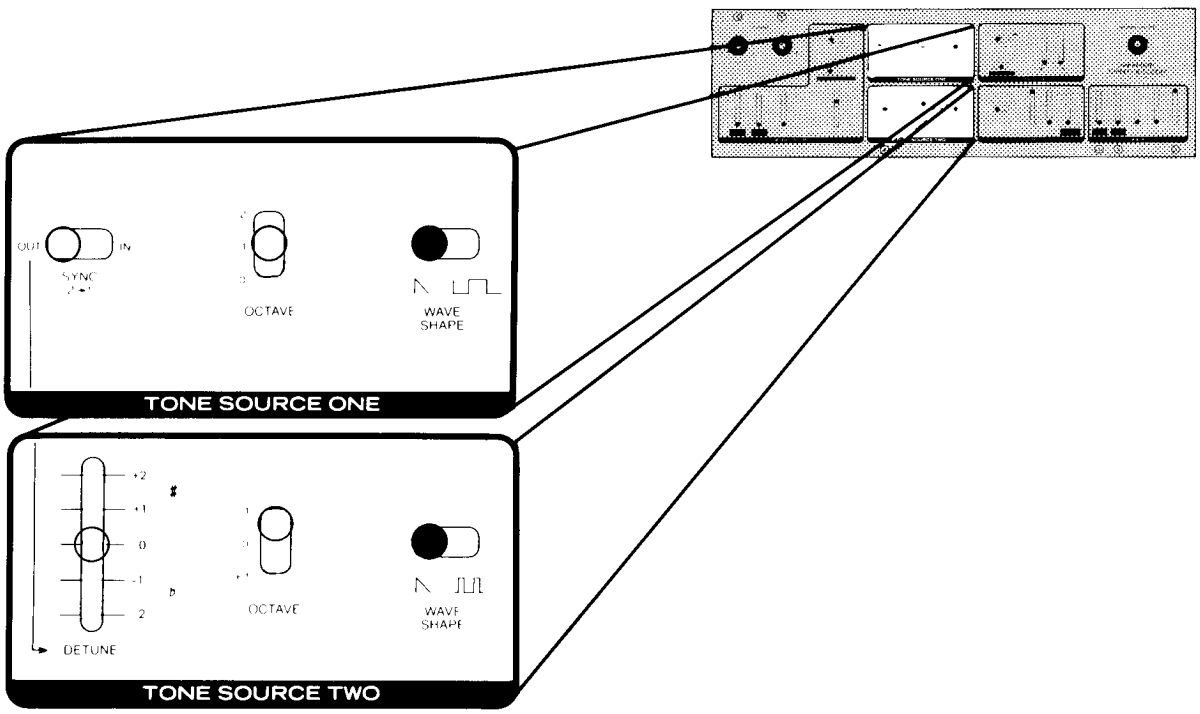
4 . Now, press the highest key on the keyboard, and adjust Control **6** (**TONE SOURCES**, in the **TUNING** section) to match the Poly mode note (should be near the straight up position). You will hear the sound change from two notes to a vibrating single note as you get close to a match. Adjust for the slowest (or zero) vibration.

5 . Slide Control **2** (**TONE TWO**, in the **MIXER** section) up to about 6.

6 . Press the lowest note on the keyboard and use Control **4** (**DETUNE**, in the **TONE SOURCE TWO** section) to adjust Tone Source Two until it matches the other notes (near the **0** position). The synthesizer is now internally tuned to itself.

7 . Finally, pull down Control **2** (**TONE TWO**, in the **MIXER** section) and Control **3** (**POLYPHONY**, in the **MIXER** section) to **MIN**. You're ready to construct a note.

The TONE SOURCE ONE and TWO Sections



The **TONE SOURCE**s (the red control sections above the center of the keyboard) determine the pitch and timbre of any music you play. You have two tone sources which can be used separately to play different types of sounds or combined to play with more versatility.

The two **WAVE SHAPE** switches determine the basic structure of the tones (to be modified later, in the **FILTER** section of the synthesizer). The three settings from which you may choose are:

—Sawtooth (Found in **TONE SOURCE**s **ONE** and **TWO**). A sawtooth waveshape gives you a bright, full, brassy sound.

—Square (Found in **TONE SOURCE ONE**). A square waveshape produces a bright but hollow sound.

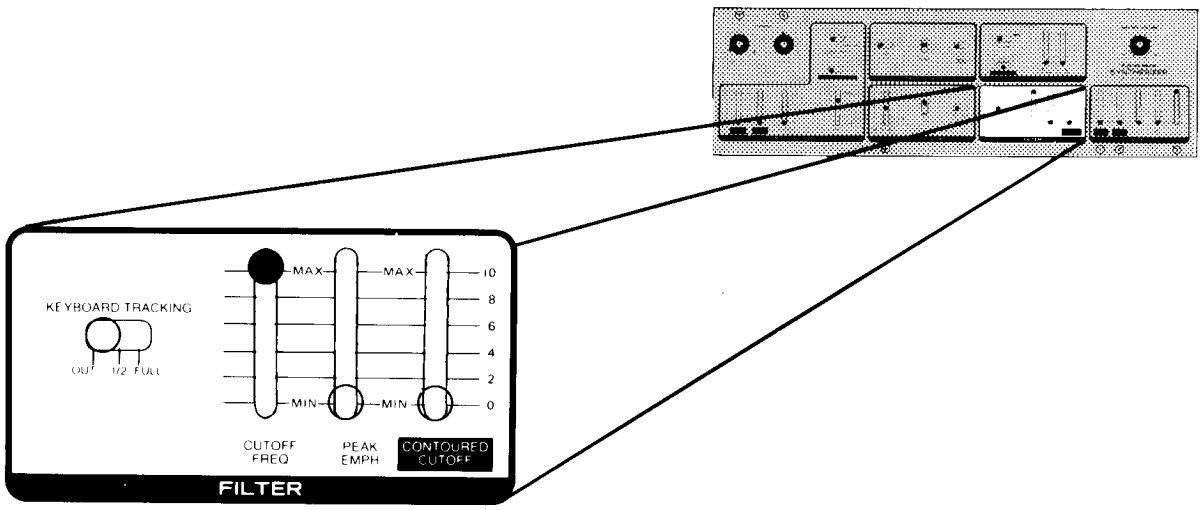
—Pulse (Found in **TONE SOURCE TWO**). A pulse waveshape will give you a nasal, reedy sound.

Constructing a Note

You've already constructed three elements of the tone—the keys you play determine the pitch, the length of time you hold down a key determines the duration, and you have the wave shape switch set to (giving you the timbre of the tone).

Try playing a few notes. Is the sound rather bland? Let's make it a bit more exciting. Right now, the notes have a lot of high harmonic overtones. We'll remove some of the highest ones.

The FILTER Section



CUTOFF FREQ

The **CUTOFF FREQ** control attenuates sound above a predetermined frequency. Hold down any key. In the blue rectangular area (marked **FILTER**), slide the **CUTOFF FREQ** control down to about **5**. Notice how the sound mellows as you lower the control.

The **CUTOFF FREQ** control cuts off all frequencies above the chosen frequency. You can move this cutoff frequency higher or lower by adjusting the slider. Near the **MAX** setting, it will cut off only the highest overtones. As you approach the **MIN** position, it can eliminate the entire note.

PEAK EMPH

The **PEAK EMPH** control attenuates sound below a predetermined frequency. The **PEAK EMPH** control works together with the **CUTOFF FREQ** control. It is **very** important to understand the relationship between these two controls.

Once the **CUTOFF FREQ** has been set, the **PEAK EMPH** can be used to emphasize the frequency of the cutoff point (frequency where the sound begins to roll off). Emphasis is achieved by attenuating most of the frequencies below the cutoff frequency, until you are finally left with only a small range of frequencies on either side of the chosen frequency.

At that point (above an **8** setting), this narrow filtered band can be made to oscillate, creating another tone source. There are other controls that interact with the **CUTOFF FREQ** and **PEAK EMPH** controls (to be discussed later). For now, set the **CUTOFF FREQ** to **5** and the **PEAK EMPH** to about **7**, and play a few notes to see how the sound has changed.

KEYBOARD TRACKING

Notice the three-position switch to the left of the **CUTOFF FREQ** filter. This is the **KEYBOARD TRACKING** switch. **KEYBOARD TRACKING** lets you vary the effect of the filter action, depending upon the keyboard note you're playing.

Try holding down the lowest note on the keyboard and move the switch from **OUT** to ½ to **FULL**, then back to **OUT**. Nothing happens. Try the same thing while holding down the highest note on the keyboard. Notice that the high note becomes much brighter as you go to ½ or **FULL**.

The **KEYBOARD TRACKING** control lets the filter follow the note played. If you set the filter one octave above the lowest note (about **4** on the **CUTOFF FREQ** control), the filter would eliminate the higher notes to a point where you couldn't even hear them.

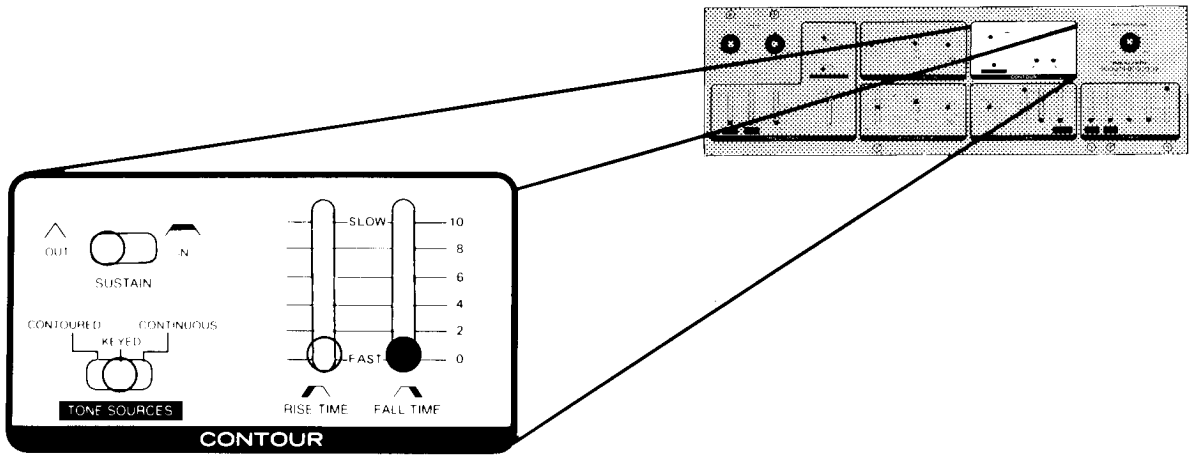
The **KEYBOARD TRACKING** control (set to ½ or **FULL**) will maintain that octave of headroom, regardless of the note played. After you try some notes at different settings of the switch, return it to the **OUT** position.

CONTOURED CUTOFF

The **CONTOURED CUTOFF** control (to the right of the **PEAK EMPH** slider) lets you automatically alter the **CUTOFF FREQ** and **PEAK EMPH**, using the **CONTOUR** controls in the section above the filter. Try this: set the **CONTOURED CUTOFF** to **MAX** (**10**) and play a few notes. Notice a "chomping" sound has been added whenever you press a key.

The **CONTOURED CUTOFF** is sliding the **CUTOFF FREQ** and **PEAK EMPH** filters from their startup settings to their current positions. The only problem is that it is happening so fast, you only hear a fragment of the effect. Let's slow down the action.

The CONTOUR Section



FALL TIME

Look at the **CONTOUR** section. There is a control marked **FALL TIME**. **FALL TIME** determines the length of time that the volume or filter effect of a note will take to decay when a key is pressed.

Slide it up to about **1** (between the **0** line and the **2** line) and press a key. Notice how the original startup sound comes on first, then quickly slides into the new filtered sound. To make this slide happen slower, simply increase the **FALL TIME**.

RISE TIME

But what if you want the effect to go from your filtered sound to the original startup sound? Simple. **RISE TIME** determines the time a note or filter requires to reach peak effect. Pull down the **FALL TIME** and bring up the **RISE TIME** (next to **FALL TIME**) to about **7**.

Hold down a key and listen. Notice that the **RISE TIME** cannot sustain the startup sound indefinitely. After it completes the slide, the **RISE TIME** function drops back to the new filtered sound.

SUSTAIN

The **SUSTAIN** switch (to the left of the **RISE TIME** control) will sustain the startup sound in the **IN** position. **SUSTAIN** will hold a note or filter setting as long as the key remains pressed. Try it by moving the switch to the right and holding a key. (Turn it off when you finish.)

You can combine the **RISE TIME** and **FALL TIME** to make the sound go from filtered to startup and back to filtered. Set the **RISE TIME** to **5** and the **FALL TIME** to **2** and hold down a key. Try varying the effect by switching in the **SUSTAIN** to go from filtered sound to a held startup sound. Leave **SUSTAIN IN**. Set the **RISE TIME**, **FALL TIME**, and **CONTOURED CUTOFF** controls to **0**.

TONE SOURCES Switch

Below the **SUSTAIN** control is a three-position switch, marked **TONE SOURCES**. The **TONE SOURCES** switch has three positions: **KEYED**, **CONTOURED**, and **CONTINUOUS**. This switch determines how the note (coming from the tone sources) will be played.

KEYED

The **TONE SOURCES** switch is currently (or should be) set to the **KEYED** position. The note plays as soon as you press the key and stops when you release the key. Hold down a key and switch back and forth between **KEYED** and **CONTOURED**. Nothing happens. The **CONTOURED** setting (with only **SUSTAIN IN**) is identical to **KEYED** (with **SUSTAIN OUT**).

CONTOURED

Why have **CONTOURED**? Because you have two very important controls that are controlled by **CONTOURED**—**RISE TIME** and **FALL TIME**. Try this: leave the switch in the **CONTOURED** position. Make sure **SUSTAIN** is **IN**. Set **RISE TIME** and **FALL TIME** both to about **5** and just tap a key (don't hold it down).

What happened? The note swelled in volume and then faded away. The effect was similar to the previous example for filters, but with volume rather than frequency. The filtered sound swept from low to high and back again, and now, the volume is sweeping from low to high and back again.

Does the **SUSTAIN** still hold the high sound as long as the key is held down? Yes. When you press a key, the volume swells, remains loud as long as you hold the key, then dies away when you release the key. Try it.

Try setting **RISE TIME** to **MIN** and **SUSTAIN** to **OUT**. Press a key and you'll hear the beginnings of what could be adjusted into a close approximation of a piano. Lower the **FALL TIME** control to about **2** and you have the basis for banjo, mandolin, guitar, or harpsichord.

Raise **FALL TIME** to **5**, **RISE TIME** to a shade above **1**, and **SUSTAIN IN** to get the starting settings for an oboe or bassoon. Try some different combinations in your own, adjusting the controls you've learned so far. Don't be afraid to experiment.

You can also combine the filtered sweep by simply bringing up the **CONTOURED CUTOFF** control. Press a key, and the volume and filter will both swell together, hold, then die away when the key is released.

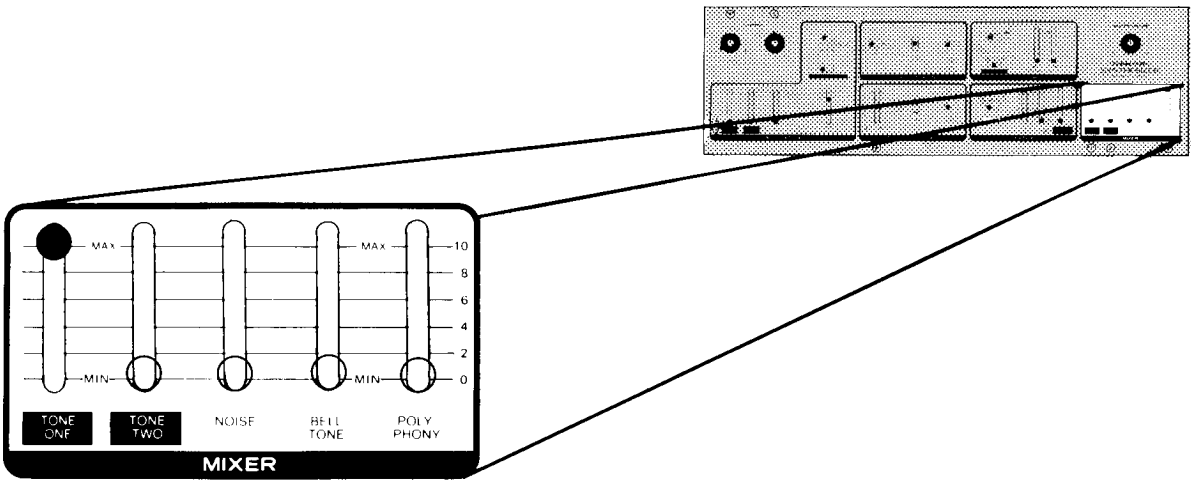
CONTINUOUS

Slide the **CONTOURED CUTOFF** control back down to **MIN**. Set the **TONE SOURCES** switch to **CONTINUOUS**. You'll hear the last note you played. The synthesizer will continue to play the last note (until a new note is selected). This position is very useful for duplicating bowed instruments. Notice that **SUSTAIN**, **RISE TIME**, and **FALL TIME** have no effect in **CONTINUOUS** mode. But is that really true?

Set **RISE TIME** to **5** and **FALL TIME** to about **2** and bring up the **CONTOURED CUTOFF** control to **MAX**. (You'll hear one of the background overtones raise about a fifth—depending on the **CUTOFF FREQ** position). Set the **SUSTAIN** switch to **IN**.

Now hold any key. We're back to our old friend, the filtered sweep. Release the key. You'll hear the filter sweep back to preset. If the **SUSTAIN** is set to **OUT**, the filter will simply sweep up and then down, determined only by the first press of the key, not by how long the key was held. Set the **TONE SOURCES** switch to **CONTOURED**.

The MIXER Section



The **MIXER** is to the right of the **FILTER** section. It blends all the different possible sources of sound. So far, you've only used a single source (**TONE ONE**) to create the sounds. We are going to broaden a few horizons right now.

In the **CONTOUR** section, set **SUSTAIN** to **IN**, **TONE SOURCES** to **CONTOURED**, and set the **RISE TIME** and **FALL TIME** to **5**.

In the **FILTER** section, set **CUTOFF FREQ** to **4**, **PEAK EMPH** to **7**, **CONTOURED CUTOFF** to **3**, and switch **KEYBOARD TRACKING** to **½**.

In the **MIXER** section, leave **TONE ONE** up full, and slide **POLYPHONY** up to about **6**.

POLYPHONY

With **POLYPHONY** raised, you can now play more than one note at a time (whole 10-finger chords if you like). Try it. Notice that the **FILTER** section still works perfectly with chords.

The **CONTOUR** section also works, except that **FALL TIME** has no effect on the **POLYPHONY** (when **SUSTAIN** is **IN**), and you cannot hold chords in the **CONTINUOUS** mode. The synthesizer will hold only the last note to be released.

TONE TWO

TONE TWO is another tone generator. Hold down a three note chord around the middle of the keyboard, while you move **TONE TWO** (**MIXER** section) up to about **6**. The chord should sound much fuller, since it's being played using more than one tone source. Soon we'll be experimenting with the various possibilities this additional tone source can provide.

NOISE

The noise generator (controlled by the **NOISE** slider in the **MIXER** section) simply generates white noise (like static on a radio). It becomes very useful when trying to duplicate the sound of motors, gunshots, rain, wind, drums, and other non-pitched sound sources. (Snare drums and many percussive instruments do not have a discernable pitch—basically, they are controlled-noise sources.)

Noise can be contoured, filtered, and played from the keyboard. You already have a setting that will produce a fine wind sound. Lower all the sliders in the **MIXER** section to **MIN**. Bring up the **NOISE** slider to about **6** and tap a key around the middle of the keyboard.

You can hold the key to sustain the breeze, then release it to let the wind die away. Patches (at the back of the manual) will show some typical applications for noise. For now, bring **NOISE** down to **MIN**.

BELL TONE

The **BELL TONE** slider (**MIXER** section) takes the **TONE ONE** and **TONE TWO** tone generators and creates a unique tone source, based on the other two sources. It can be used for bells, woodblocks, and steel drums. **BELL TONE** is a very distinctive tone source. Try this for some possible uses:

Slide **BELL TONE** up full. Set **RISE TIME** to **FAST**. Set **CONTOURED CUTOFF** to **MIN**. Set **SUSTAIN** to the **OUT** position. Play the highest note on the keyboard. It produces a chime-like sound.

To get a sound more like a large clocktower bell, look at the **TONE SOURCE TWO** section (above the middle of the keyboard). Find the **DETUNE** slider, and center it between the **0** and **-1** lines. If you hit the high key again, it will sound similar to a belltower chime. (You may want to lower the **CUTOFF FREQ** control a bit to soften the higher part of the tone.)

Play a note about halfway between the lowest note and the middle of the keyboard to produce a gong sound (raise the **CONTOURED CUTOFF** to about **1** to increase the effect). Notice that you can adjust the **DETUNE** slider (**TONE SOURCE TWO**) to achieve a wide variety of tones.

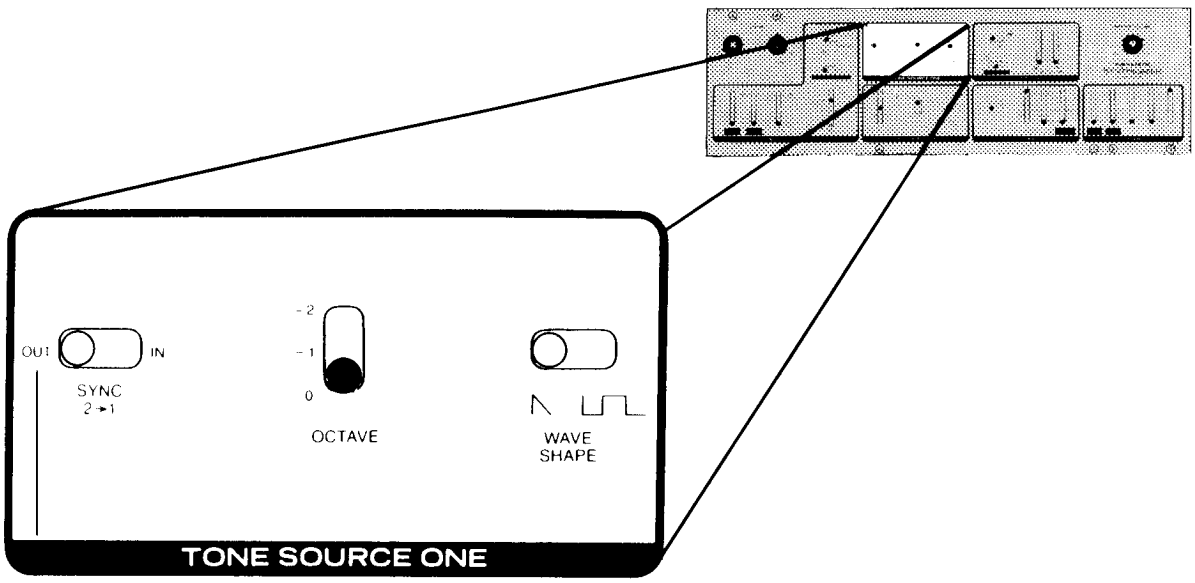
Let's leave the **MIXER** section with a rousing finish. Here's an interesting effect that combines most of the controls you've just learned:

Don't play any note just yet. Leave the **DETUNE** set to **-1**. Raise all the sliders in the **MIXER** section up full. Bring **NOISE** back down to about **6**. (A little noise goes a long way.) Set the **CUTOFF FREQ** to **4**, set **RISE TIME** to **5**, and switch **SUSTAIN** to **IN**.

Press the lowest note and slowly raise the **DETUNE** slider up towards **0**. When you reach **0**, it should sound like a bomber squadron out of an old war movie. If you go past **0**, they'll start their bombing run.

After you finish this sound, bring **NOISE, BELL TONE**, and **POLYPHONY** back down to **MIN**. Press the highest keyboard note and get the two tone sources back in tune by adjusting the **DETUNE** control (as during the setup).

The TONE SOURCE ONE and TWO Sections (Revisited)



OCTAVES

The **TONE SOURCE** sections each contain a three-position switch, labeled OCTAVE. The OCTAVE switch (**TONE SOURCE ONE**) lets you drop the pitch of a note down one (or two) octaves from standard pitch (labeled **0** on the OCTAVE switch). The OCTAVE switch (**TONE SOURCE TWO**) lets you raise or lower the pitch one octave.

Let's use these switches (and our filtered setup) to create some musical instruments.

Move the **TONE SOURCE ONE** OCTAVE switch to **-2**. Set the WAVE SHAPE (**TONE SOURCE ONE**) to the ⊔⊓⊔ setting. Set the **RISE TIME** and **FALL TIME** to **2**. Try playing some notes in the lower range of the keyboard for a deep bassoon effect.

To change the bassoon to an oboe, drop the **TONE ONE** slider (**MIXER** section) to **MIN**. Raise the **CUTOFF FREQ** to **5** and move the other **WAVE SHAPE** switch (**TONE SOURCE TWO** section) to the ⎍⎍ setting. Try playing in the middle and lower part of the keyboard for instant oboe.

Without changing very much, we can get a good electric bass sound.

Set the **SUSTAIN** switch to **OUT**. Drop the **CUTOFF FREQ** to about **3**. Raise **TONE ONE** up full. Set **RISE TIME** a hair below **1**, and set **FALL TIME** to about **3**. Set **CONTOURED CUTOFF** to **1** and tap some of the lower keys. (You might want to trim **FALL TIME** to get a less sustained sound.)

SYNC 2-1 and DETUNE

You've used **DETUNE** several times now to tune **TONE SOURCE TWO** to the other tone sources (and for bells and planes). Whenever you use **TONE SOURCE TWO** with **TONE SOURCE ONE**, it is usually important that the two sources be in perfect tune.

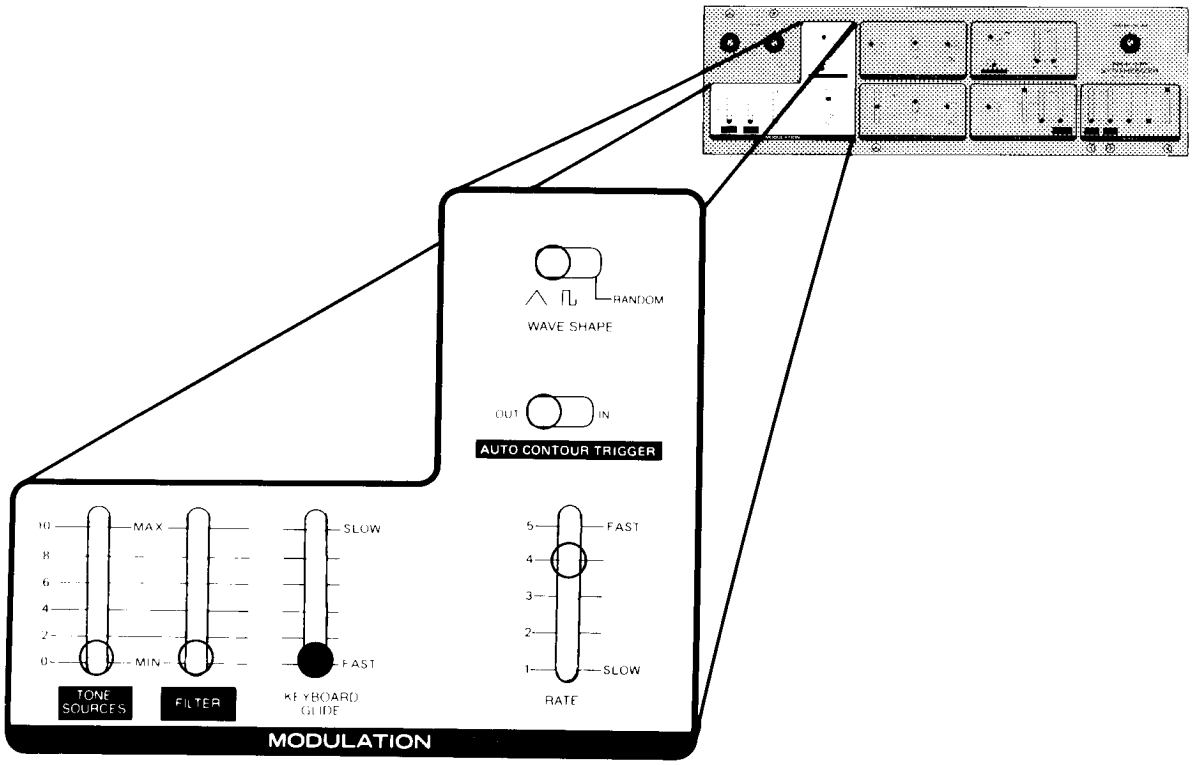
The **DETUNE** control is used to manually trim the second tone source. **SYNC 2-1** will automatically lock **TONE SOURCE TWO** to **TONE SOURCE ONE** (if **DETUNE** is set anywhere near **0**).

Since the two sources are locked together, the **DETUNE** now has a limited range—to the point of only changing the phase angle of the second source in relation to the first source, upon which it is now dependent. The spread between the two **OCTAVE** switches will determine the degree of phasing. A true change in phase angle between two identical sound sources is known as "flanging."

Let's listen to the flanging effect. Flip **SYNC 2-1** to **IN**, **CONTOURED** to **KEYED**, and set the **CUTOFF FREQ** to **5**. Set the **OCTAVE** switches in both **TONE SOURCE**s to **-1**. Hold down a low key and raise the **DETUNE** control slowly up toward **+2**.

The effect you're hearing is flanging. Take the **SYNC OUT** and retune (using the **TONE ONE**, **TONE TWO**, and **DETUNE** controls—you should know the rest of the process by now). Leave **TONE ONE** and **TWO** up full when you're finished.

The MODULATION Section



The **MODULATION** section contains the tricky things—things that add the little finishing touches to the sound. Let's look at the different effects.

KEYBOARD GLIDE

This control lets you slide from one note to another, through all the notes in between. A piano cannot slide notes—it simply plays one note and then the next. A violin, trombone, and human voice can hold a tone and change pitch at the same time.

Move **KEYBOARD GLIDE** up to about **4**. While holding a middle key down, press a key one octave higher. After the note slides up to the higher sound, release the high key and the note will slide back. Release the lower key and the sound fades away (thanks to the **CONTOUR** section). Leave the **KEYBOARD GLIDE** set to **4**.

RATE

RATE (**MODULATION** section) lets you change a sound at a predetermined rate of speed. The **RATE** control (next to the flashing red light) determines how many times per second the change will occur. This control is the basis for duplicating many special musical effects, such as vibrato, tremolo, and wah. The **RATE** control should already be set to **4**.

TONE SOURCES

TONE SOURCES (**MODULATION** section) lets you change the pitch of the note. Hold down a high note. Slowly bring the TONE SOURCES control (**MODULATION** section) up to just below **2**. Press a key, and listen for the slight change in pitch. (That's too much. Bring it down a little - you want just enough to hear a very light quavering in pitch.)

Now, let's reproduce a very unique instrument. Don't play anything just yet.

Move the OCTAVE switch (**TONE SOURCE ONE** section) to the **0** position. Move the OCTAVE switch (**TONE SOURCE TWO** section) to the **+ 1** position. To avoid the possibility of tuning problems, flip the SYNC switch (**TONE SOURCE ONE** section) to **IN**. Set RISE TIME and FALL TIME (**CONTOUR** section) to **5** for a slow attack and decay of the notes. Set CUTOFF FREQ (**FILTER** section) to **4** to cut off some of the highs.

Starting with the highest key on the keyboard, play the next seven white keys slowly, in descending order. Although it's not Beverly Sills, you've created a sound very much like the human voice!

FILTER

The FILTER (**MODULATION** section) can open and close the filters (**FILTER** section) at a speed set by the RATE control. This creates a "wah" sound. Try this:

Drop the two OCTAVE switches back to their lowest positions (**-2** and **-1**). Bring the FILTER control (**MODULATION** section) up to about **6**. Play a middle note.

To slow down the wah, lower the RATE control to about **3** and try it. With the RATE all the way down to **1**, you can hear the filter sliding slowly through the frequency range. Remember, you can usually combine effects to create new effects.

WAVE SHAPE

The WAVE SHAPE switch (**MODULATION** section) affects the RATE control. A demonstration, rather than an explanation, will probably help you understand how WAVE SHAPE works right now.

Set the RATE control to **2**. Bring the FILTER (**MODULATION** section) down to MIN. Raise the TONE SOURCES (**MODULATION** section) up to about **6**. Take KEYBOARD GLIDE down to FAST.

Press a middle key. Notice how the note moves, sliding up, then back down to the original pitch. Watch the flashing red light. When the light is off, the pitch goes up. When the light comes on, the pitch drops. The sound literally follows the triangle drawing, going steadily up, then reversing and dropping in pitch.

The **RATE** control determines how long the pitch will take to reach its peak and return to start over. Slowly raise the **RATE** control to about **4** to hear the increase in the "rate" of change. The sound will still go just as high and low—it simply does it quicker. Bring the **RATE** control back down to **3**.

Switch the **WAVE SHAPE** (**MODULATION** section) from ⩘ to ⎍ , and press a key. It follows the picture, too—instant change from low pitch to high pitch and back again. But where are the two notes coming from?

The low note is the fixed note you are playing on the keyboard. The higher pitched note is adjustable, using the **TONE SOURCES** slider (**MODULATION** section).

Try adjusting the **TONE SOURCES** slider. The lower note will remain constant, but the upper note's pitch will vary—up to 1½ octaves higher than the fundamental note. Near **6** on the slider, you'll find the octave note. As you play different keyboard notes, you'll find the high note tracking the low note, maintaining its distance.

With all settings left just as they are, flip the **WAVE SHAPE** switch (**MODULATION** section) to the **RANDOM** position. Hold down a key. The synthesizer is now randomly selecting notes (between the limits of the **TONE SOURCES** slider and the key pressed) and playing them at the speed determined by the **RATE** control. Try raising the **TONE SOURCES** (**MODULATION** section) to **MAX**. Set the **RATE** a little above **4** and press a high key. Computer music!

The **RANDOM** switch can also drive the filter. Set the **FILTER** slider (**MODLUATION** section) to **MAX** and press the highest key. Since **CONTOURED CUTOFF** can be used with the filters, it is also operating. Slide **CONTOURED CUTOFF** to about **3**. Press the key. Can you hear the changes in the sound made by the filters?

RANDOM can be used for filtering alone for interesting rhythm patterns. Bring **TONE SOURCES** (**MODULATION** section) down to **MIN**. Press a key.

You can still use the polyphony functions to play whole chords, since filtering affects the **POLYPHONY** tone generator. In the **MIXER** section, raise **POLYPHONY** to **MAX** and lower **TONE ONE** and **TONE TWO** to about **6**. Play a few chords.

AUTO CONTOUR TRIGGER

The **CONTOUR** functions can also be controlled by the **RATE** slider. Simply set the **AUTO CONTOUR TRIGGER** to the **IN** position. All the **CONTOUR** section controls are now being triggered by the **RATE** and **WAVE SHAPE** controls (**MODULATION** section). Try setting **CONTOURED CUTOFF** (**FILTER** section) to **MAX**. Experiment with every control in the **CONTOUR** section.

In Closing

This concludes the explanations of the synthesizer's controls. The rest of the manual contains "patches" for some of the more popular sounds, as well as blank diagrams for you to save your own creations. Remember that each synthesizer is slightly different, so try varying the controls slightly if a patch doesn't sound like what it's supposed to.

Remember also that these patches represent what **we** think the instrument sounds like—you may not agree. That's what creativity is all about. Feel free to improve on any patch you like, and use ours as starting points. (As the old saying goes, "One man's bassoon is another man's harpsichord.")

A Small Note of Caution:

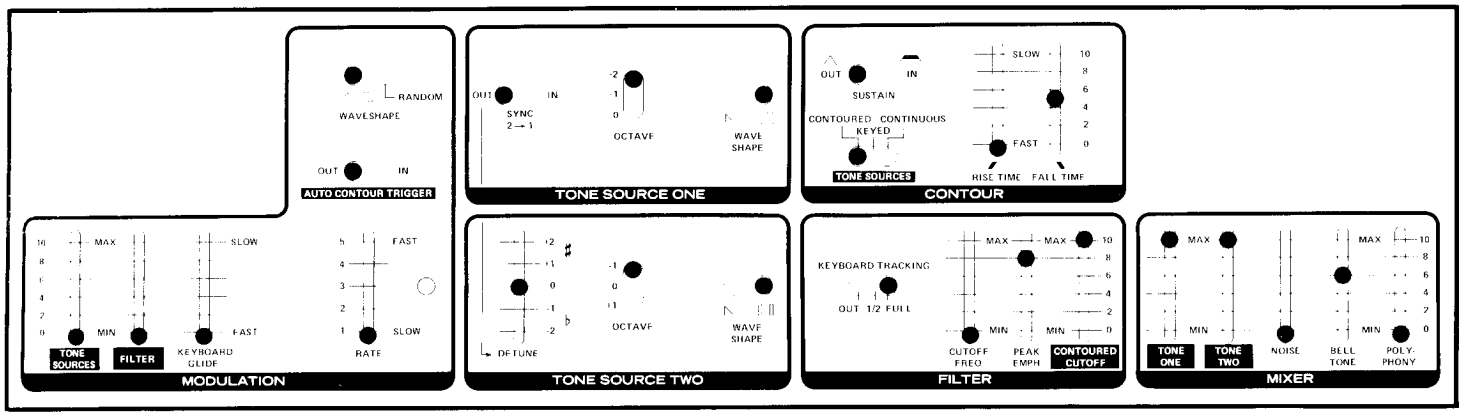
At the start of this manual, we said you can't hurt the synthesizer, regardless of the control combinations you choose. That is very true, but remember, it's not a piano. As long as you press a key on a piano, you will hear something.

This is not necessarily true with a synthesizer. Just as there are an infinite number of ways to produce unique sounds, there are an equal number of ways to produce **NO SOUND WHATSOEVER** (known as "What happened?" or "Wait, Wait!!"). When this occurs (and it will), check the last thing you did in the **FILTER**, **CONTOUR**, or **MIXER** sections.

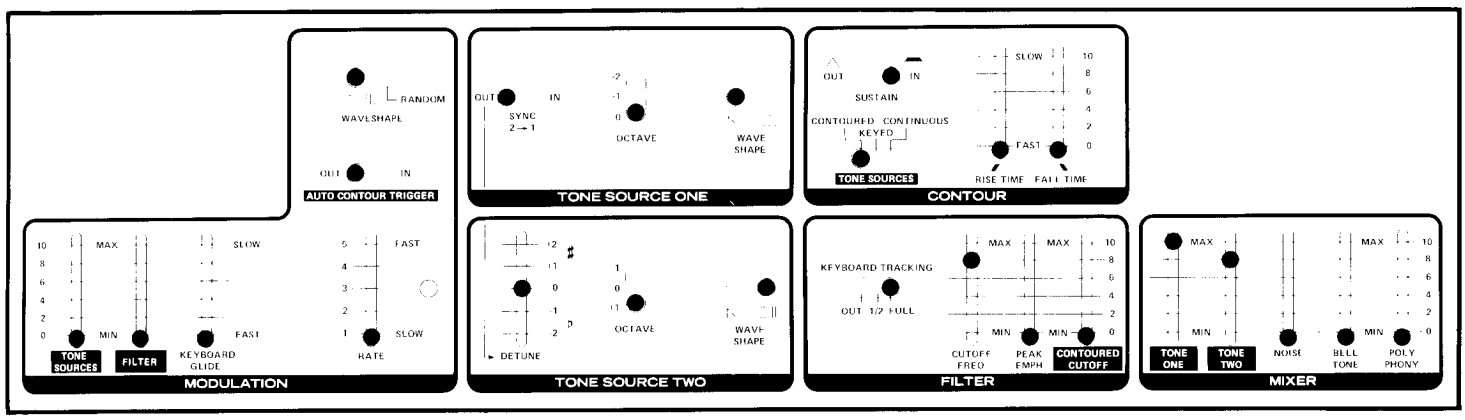
Please understand that you have only been exposed to a small fraction of the potential of the Realistic Synthesizer. We have shown you the tip of the ieberg—it's now up to you to explore the bulk. Good hunting.

Patch Diagrams

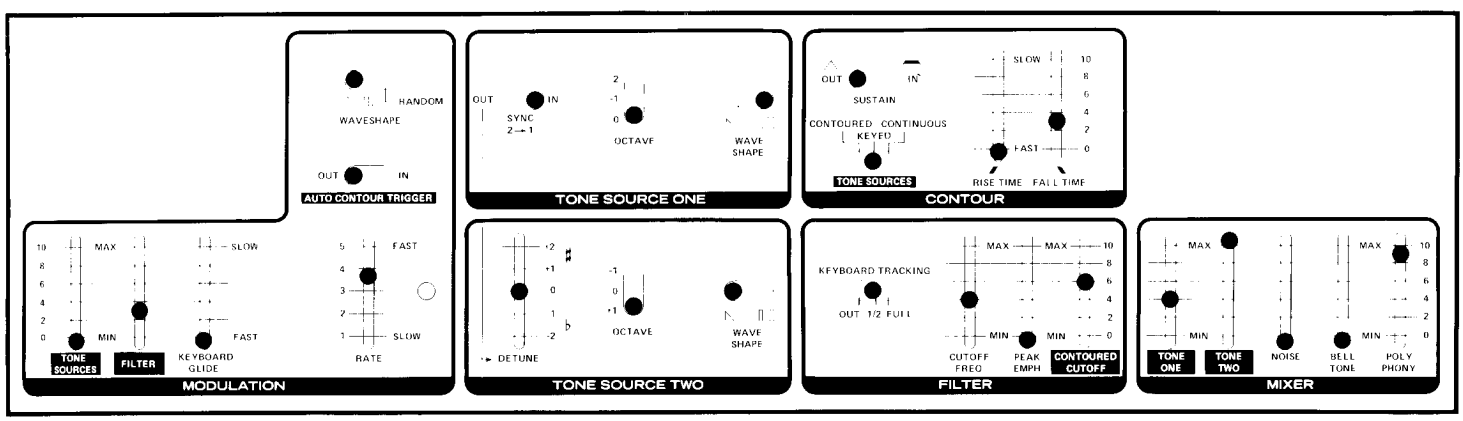
Lead Synthesizer



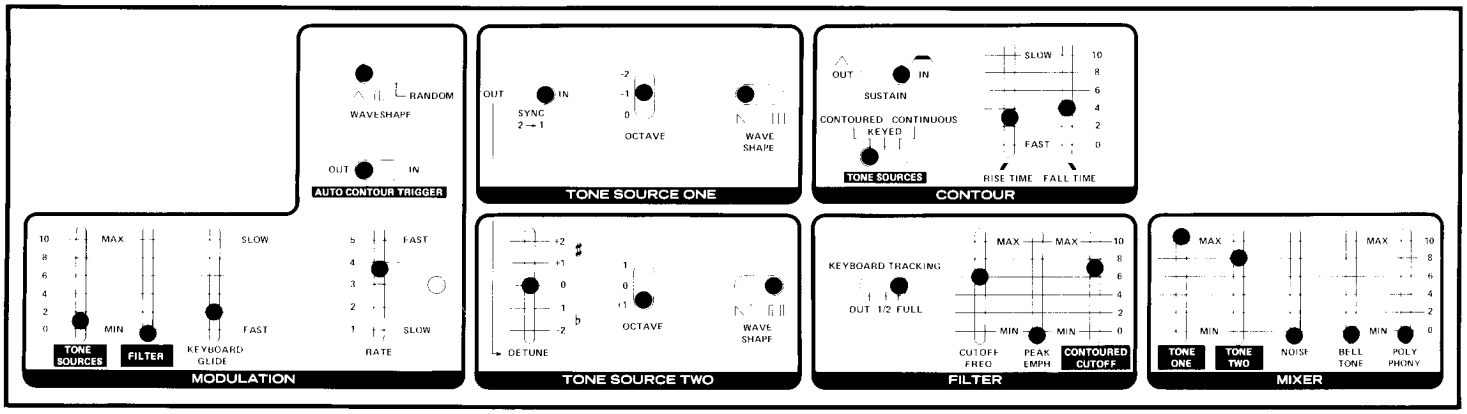
Alternate Lead Synthesizer



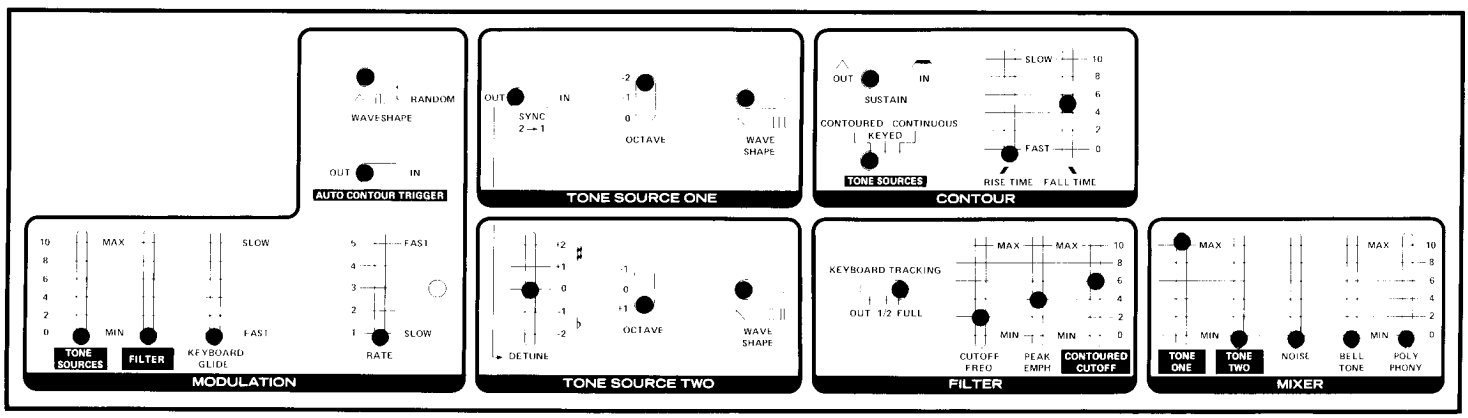
Electric Organ



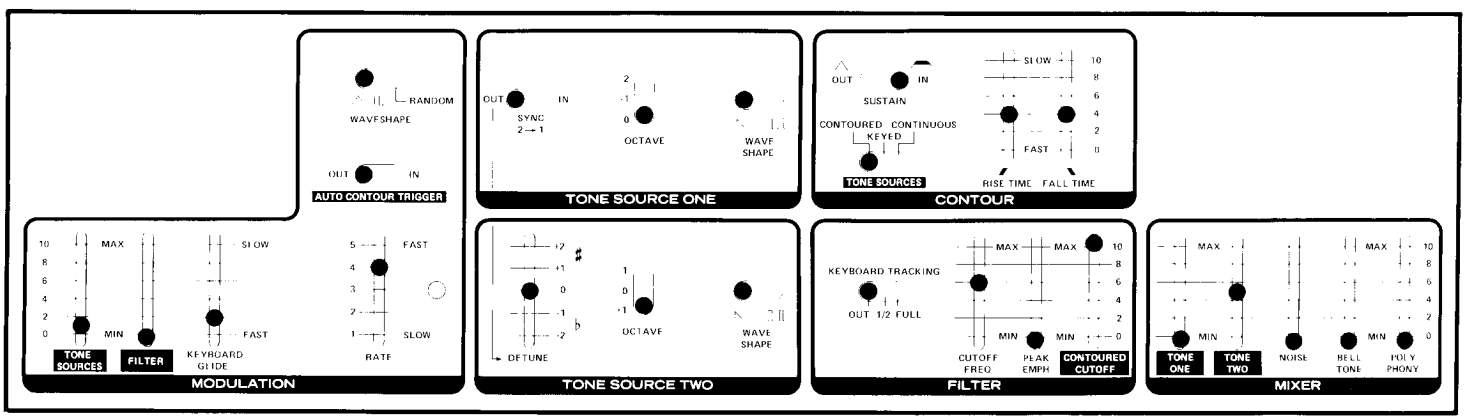
Electric Guitar



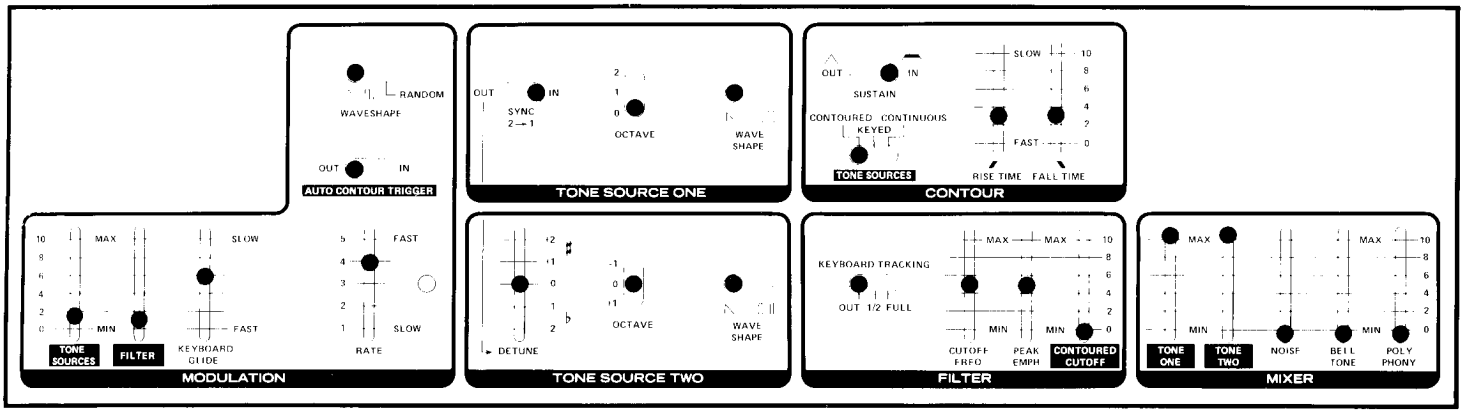
Electric Bass Guitar



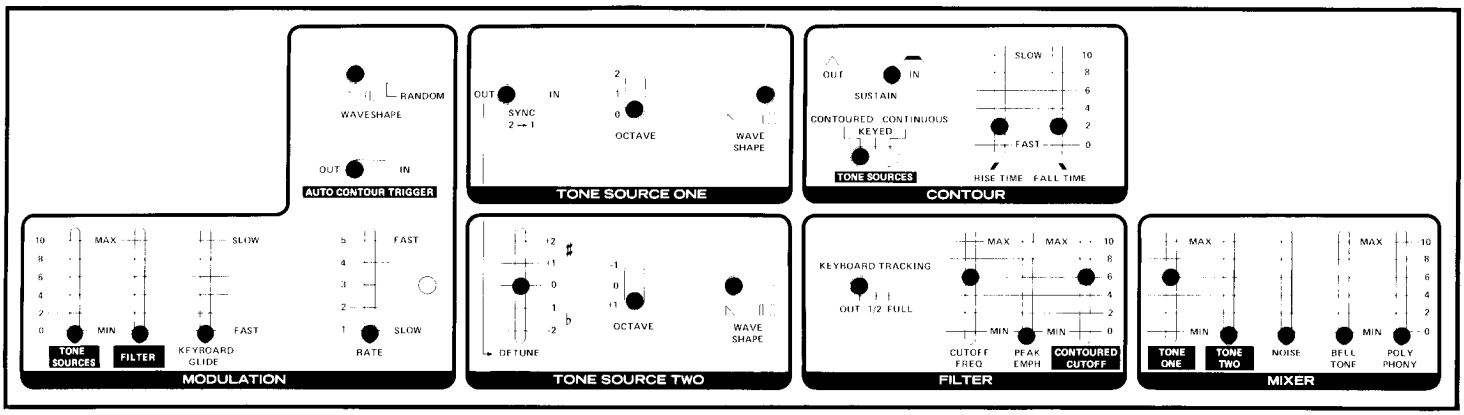
Violin



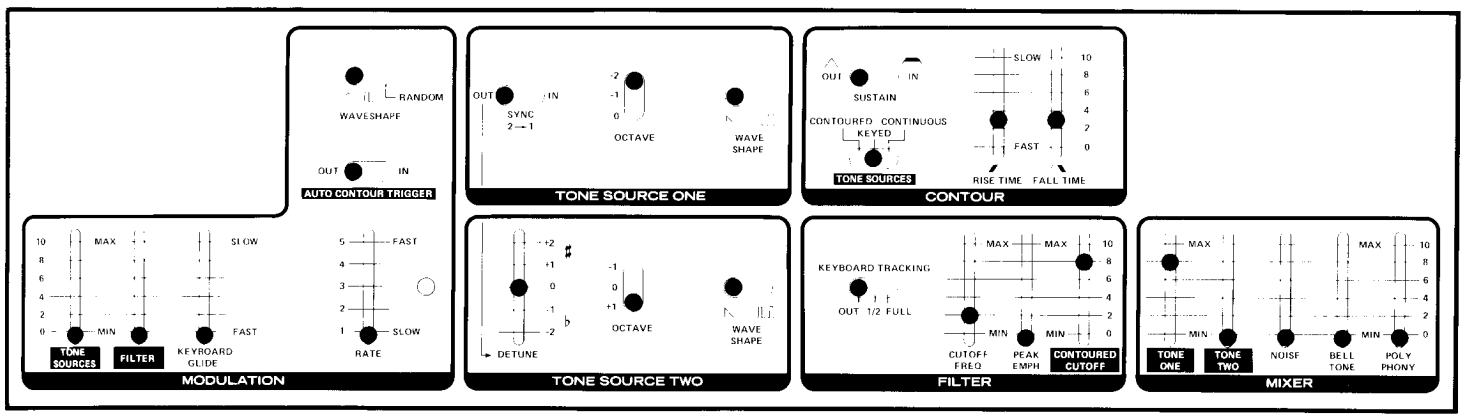
Voice



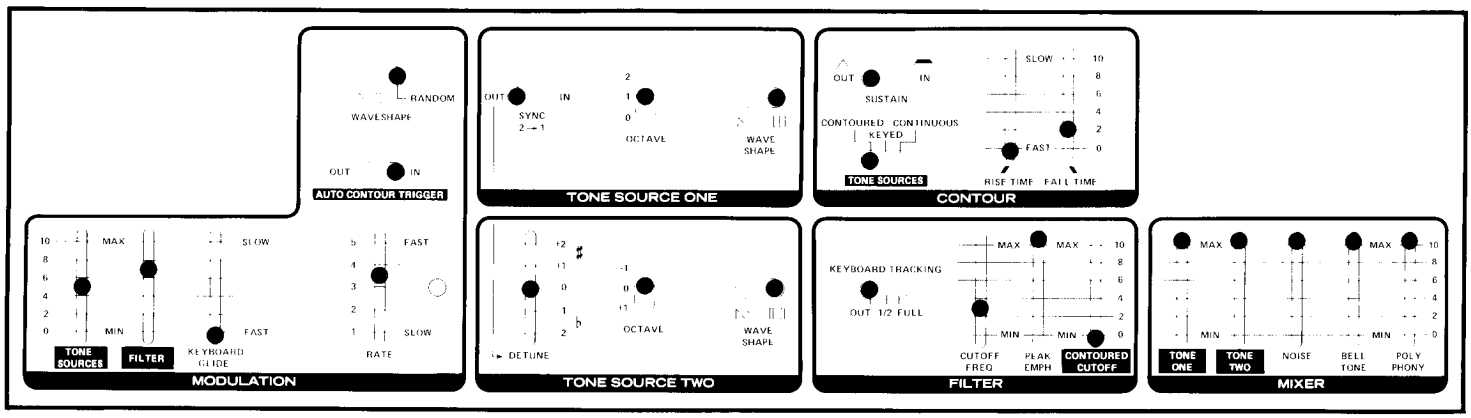
Clarinet



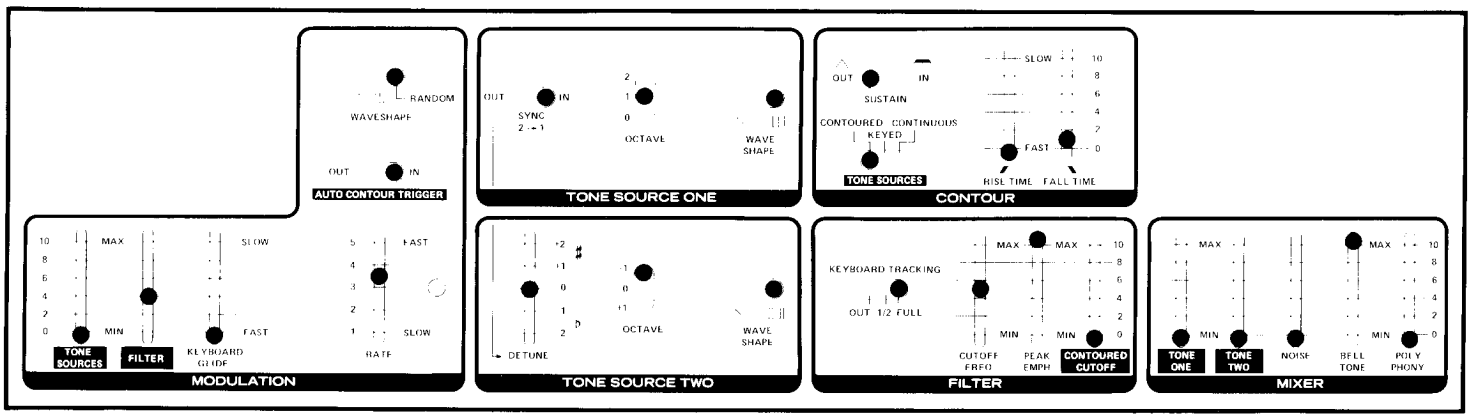
Tuba



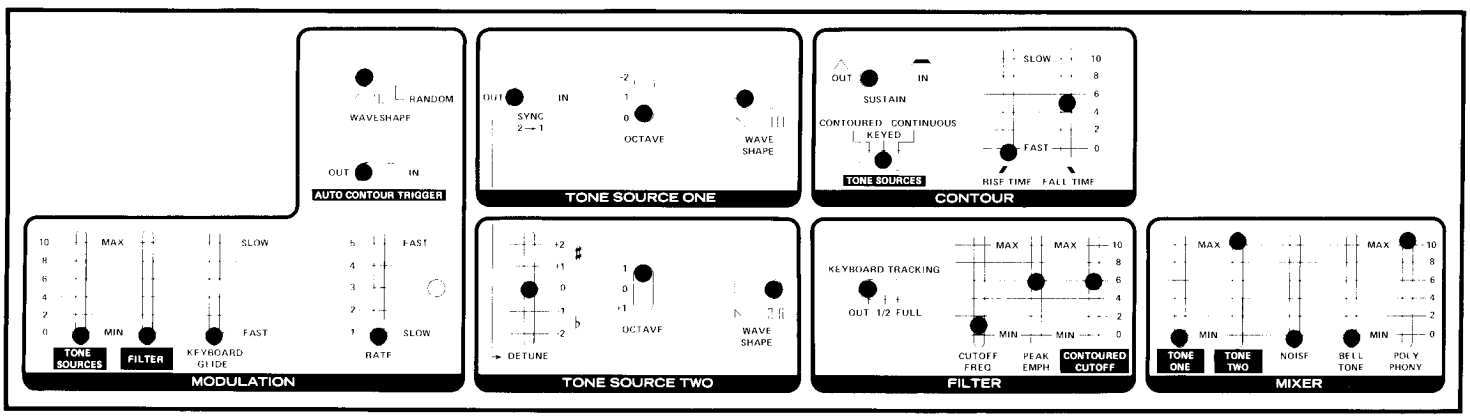
Drums



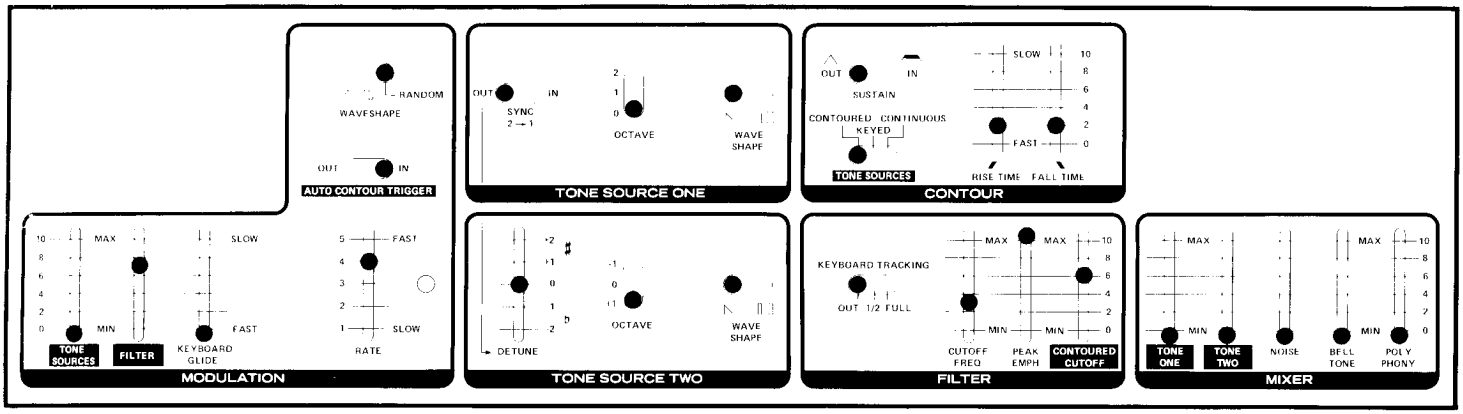
Woodblocks



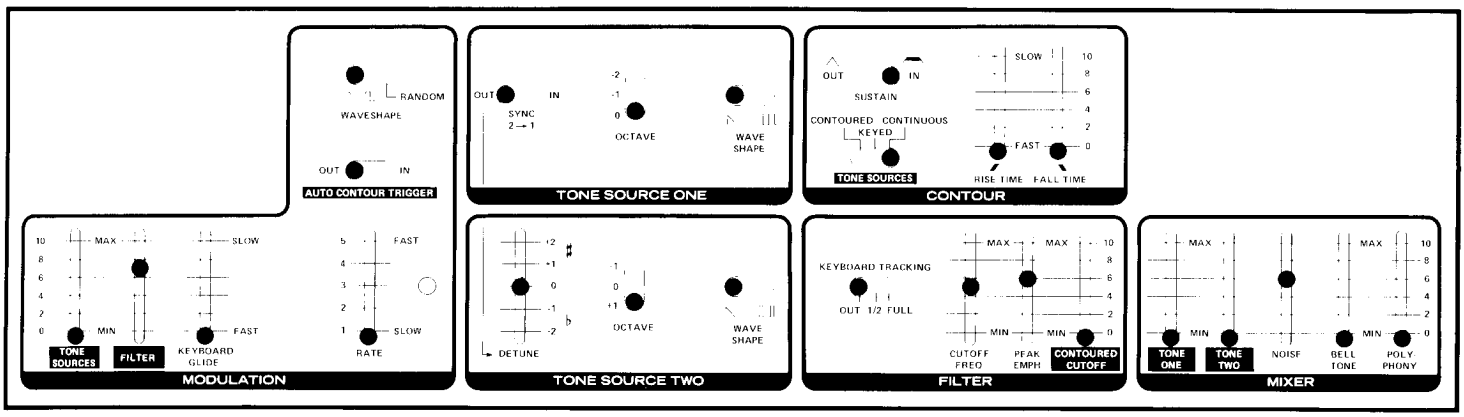
Steel Drums



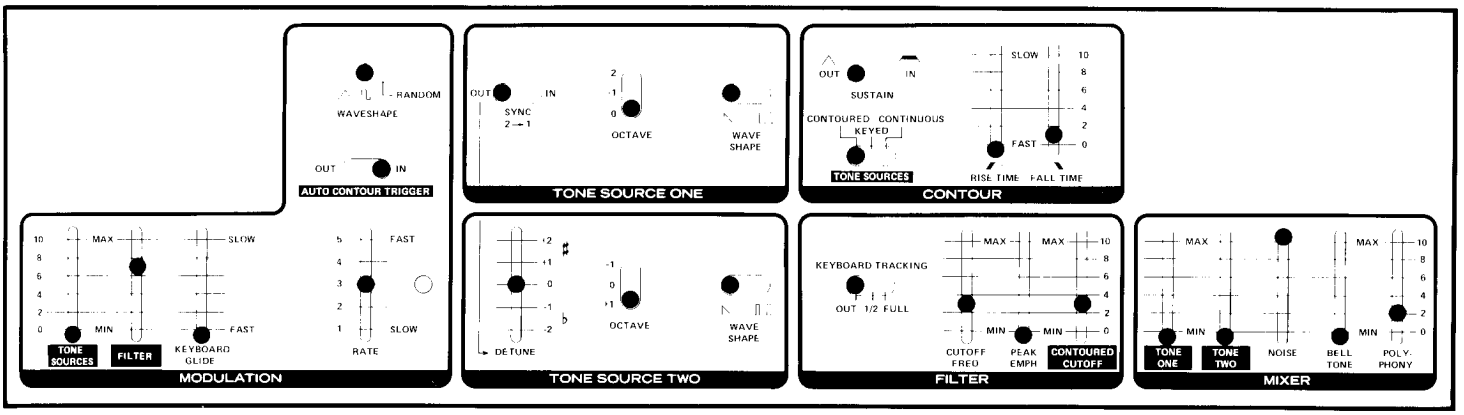
Birds



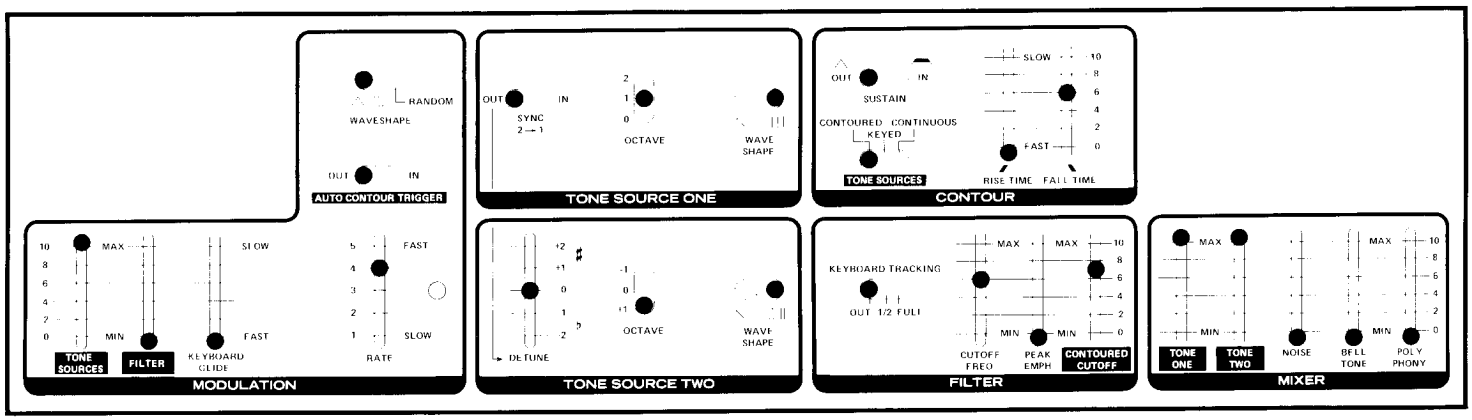
Storm



Footsteps



Laser



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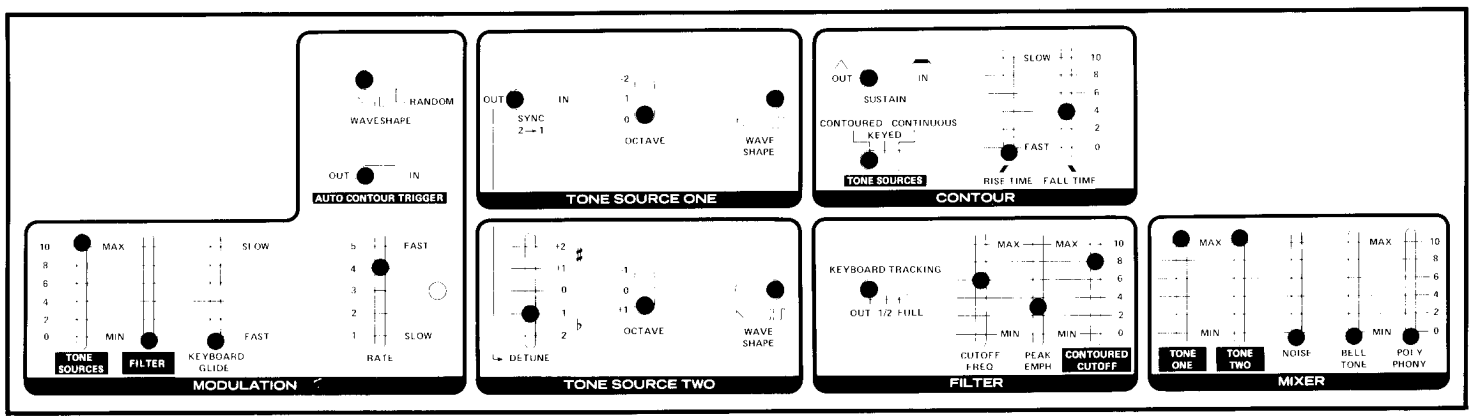
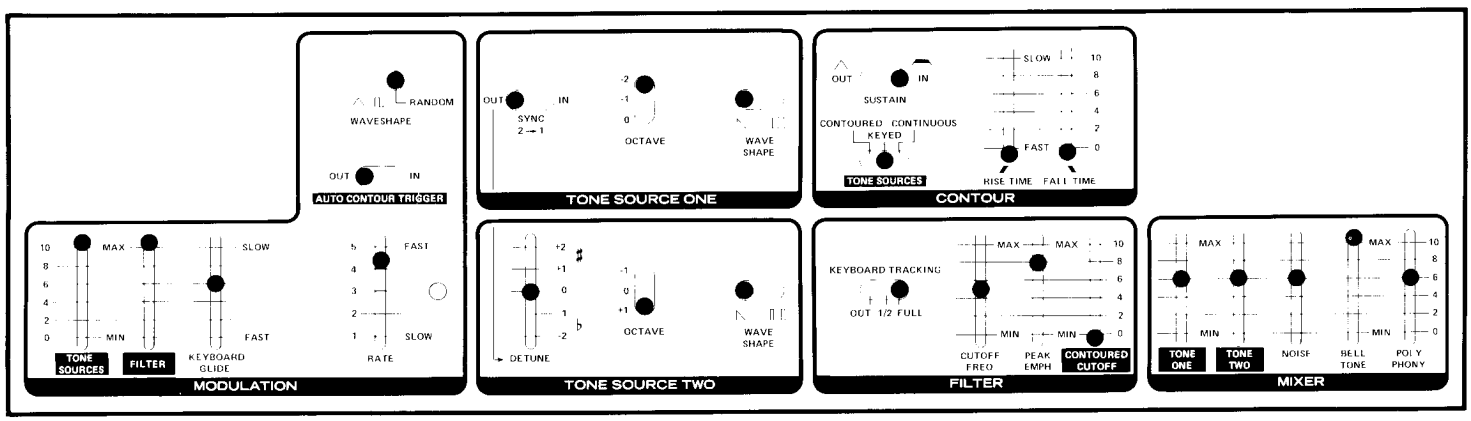
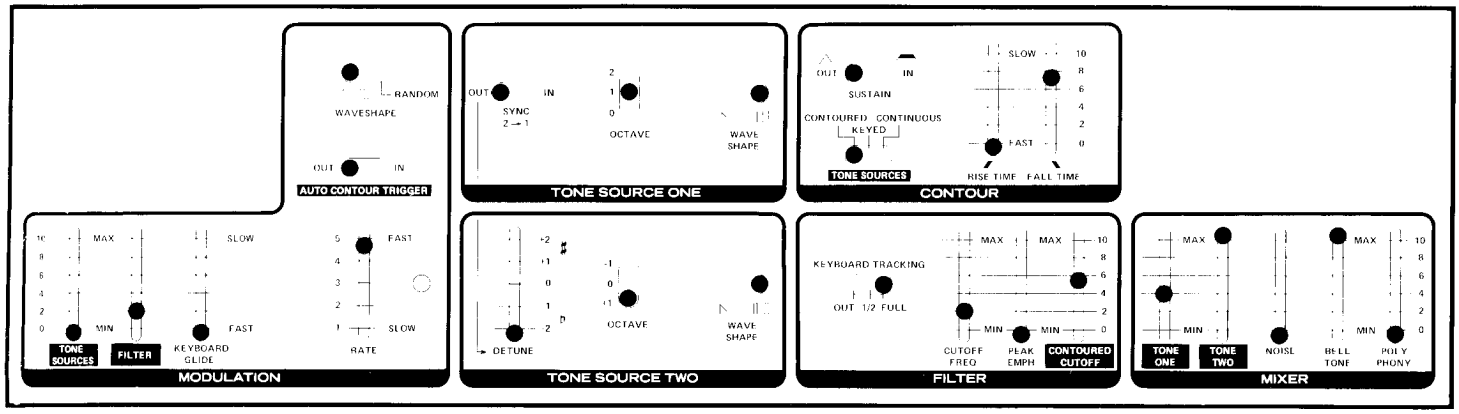


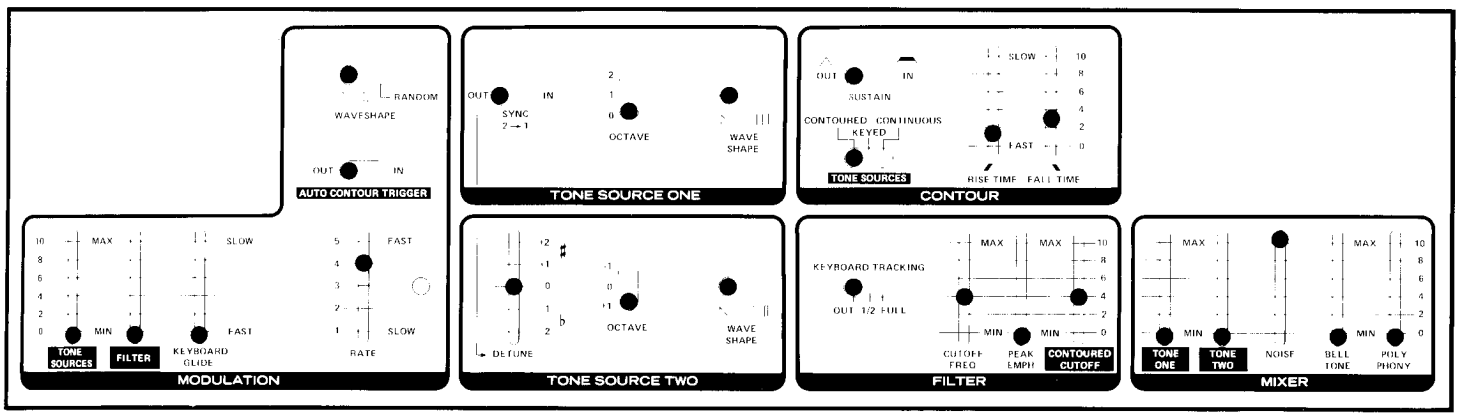
Talking Robots



Clocktower



Old Car



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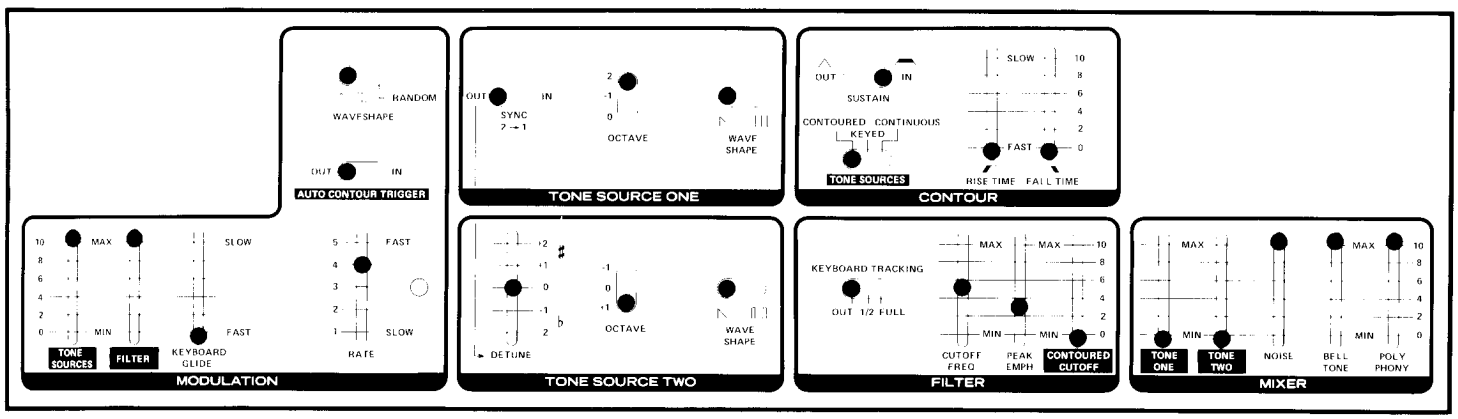

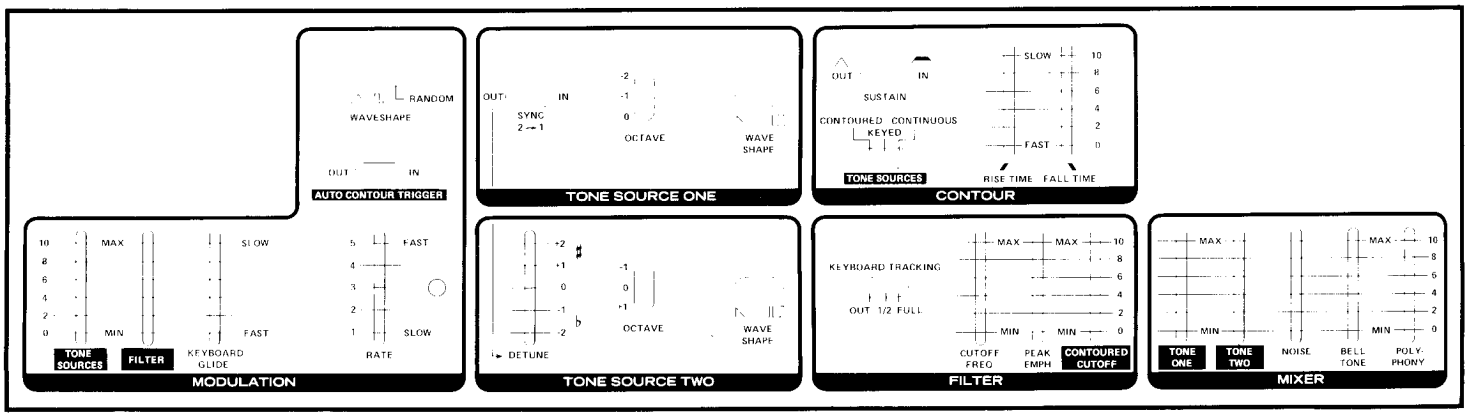
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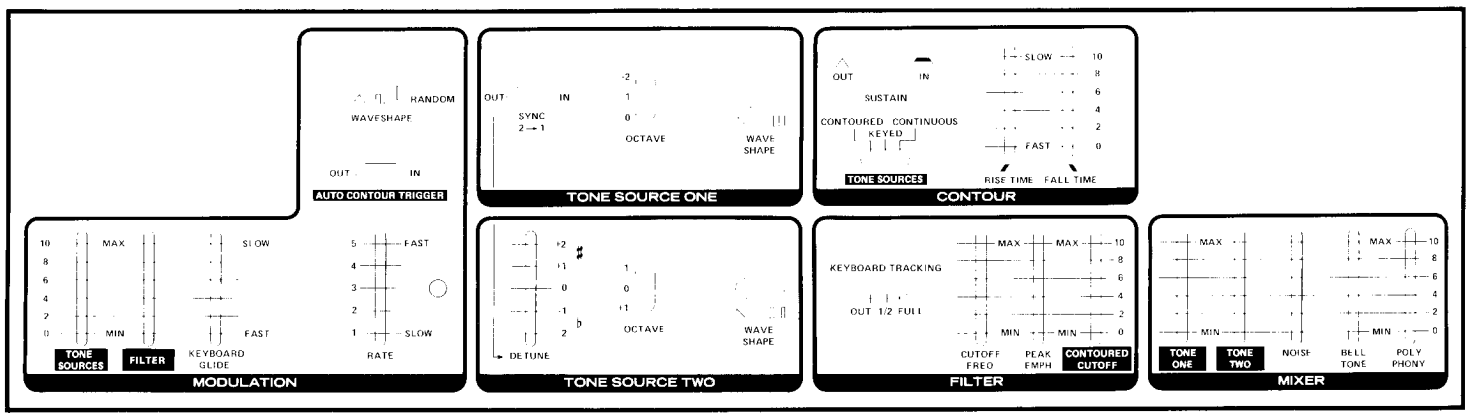
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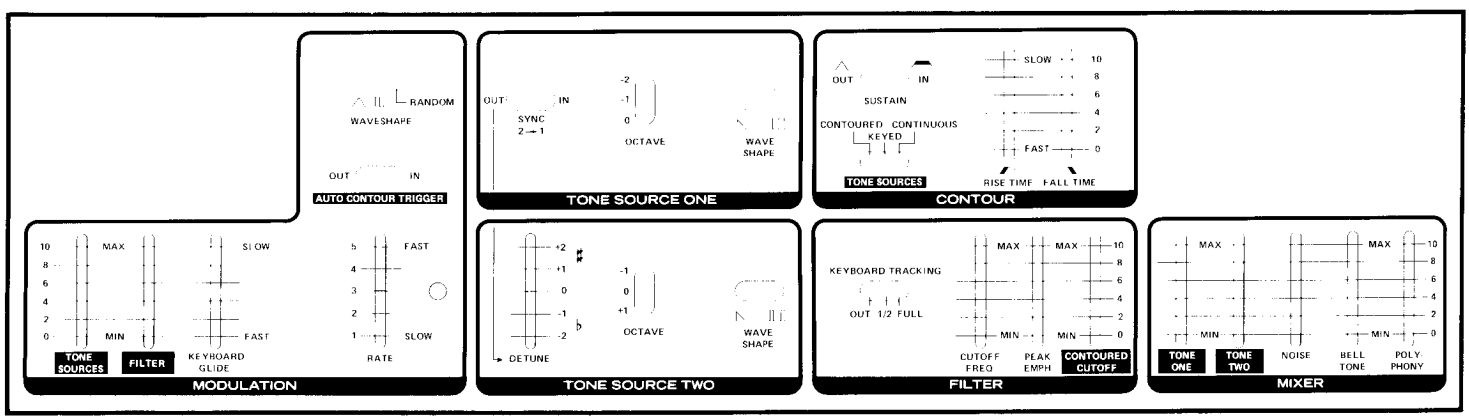
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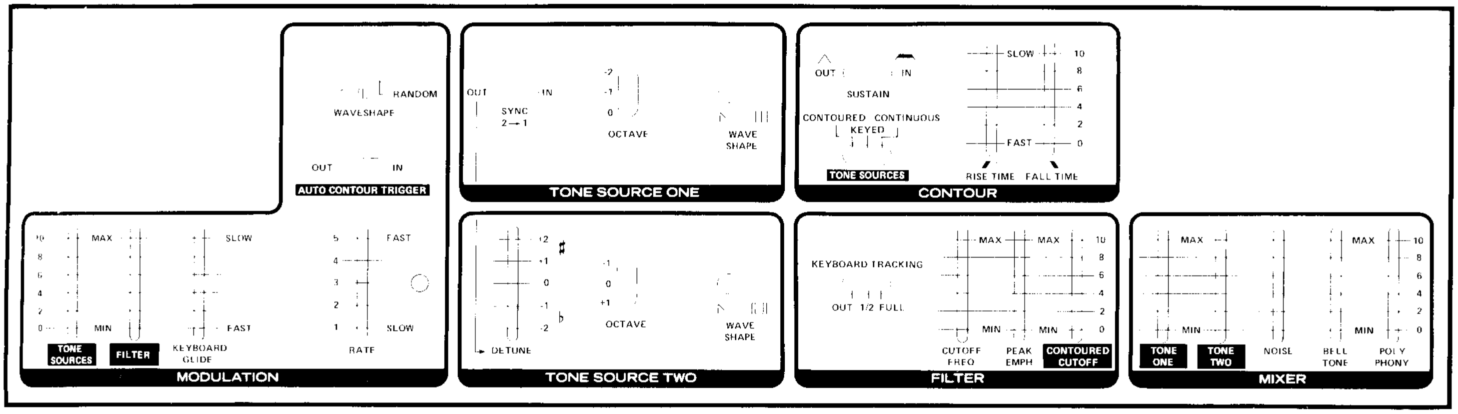
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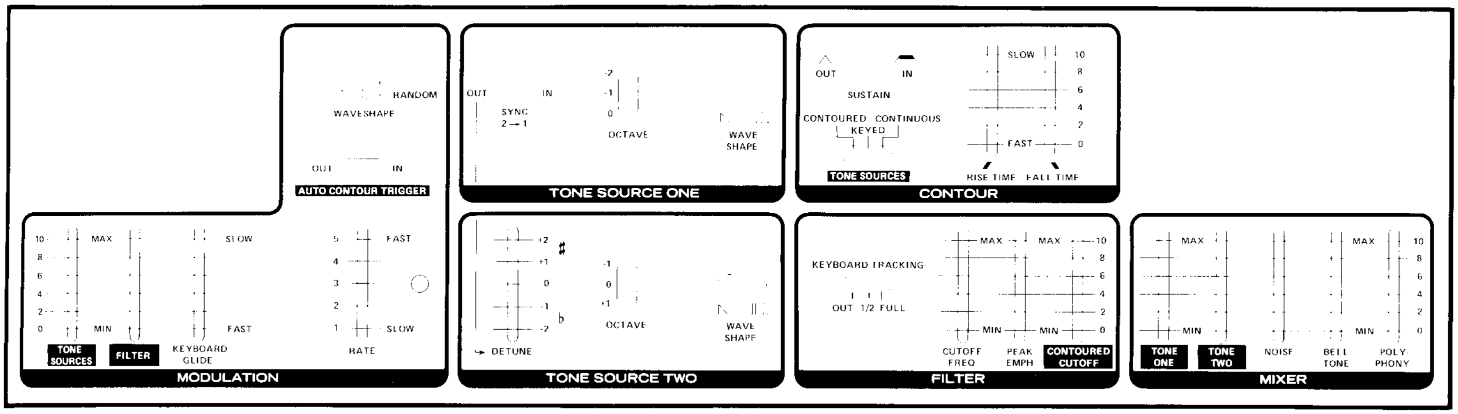
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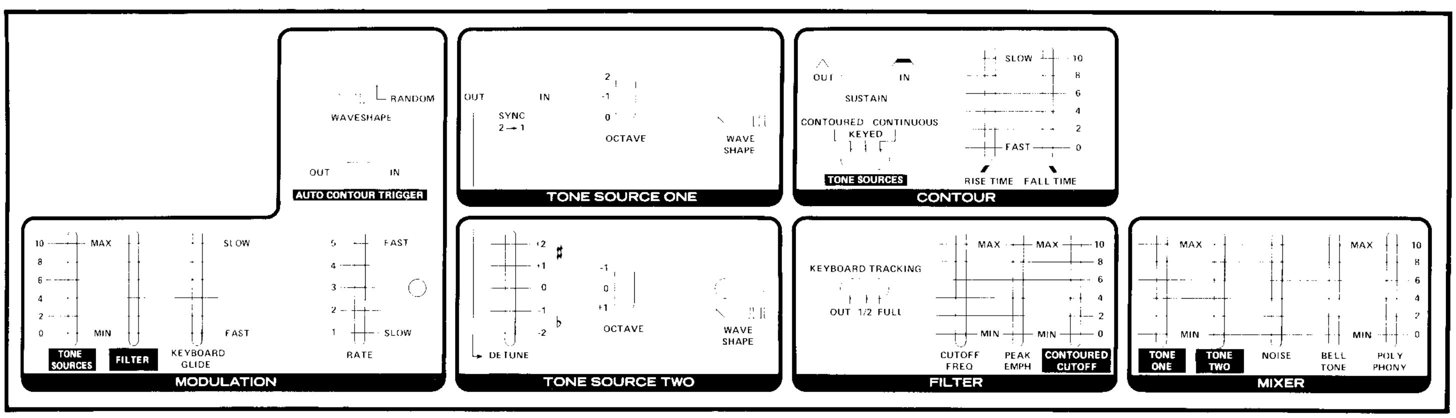
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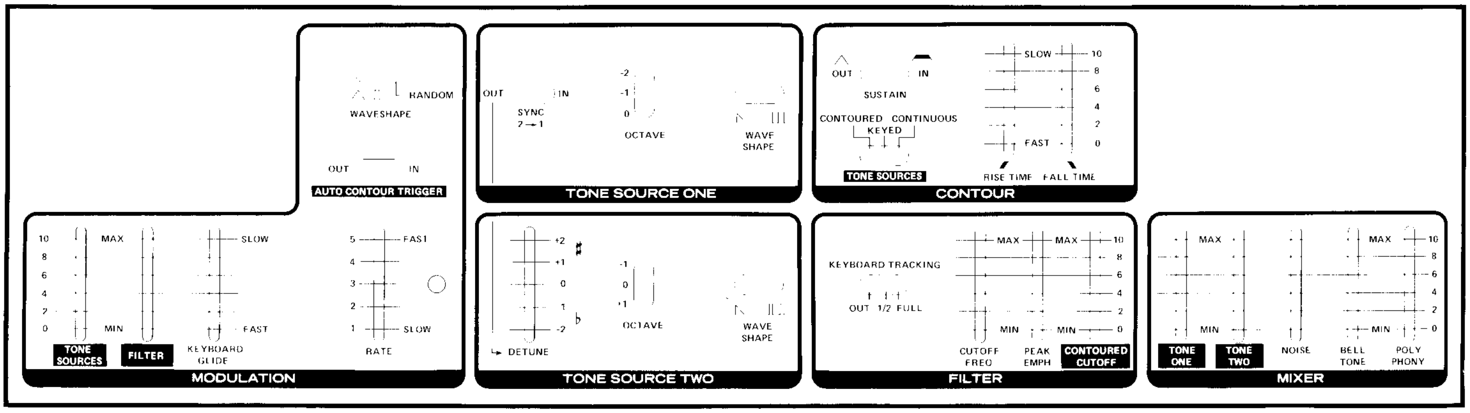
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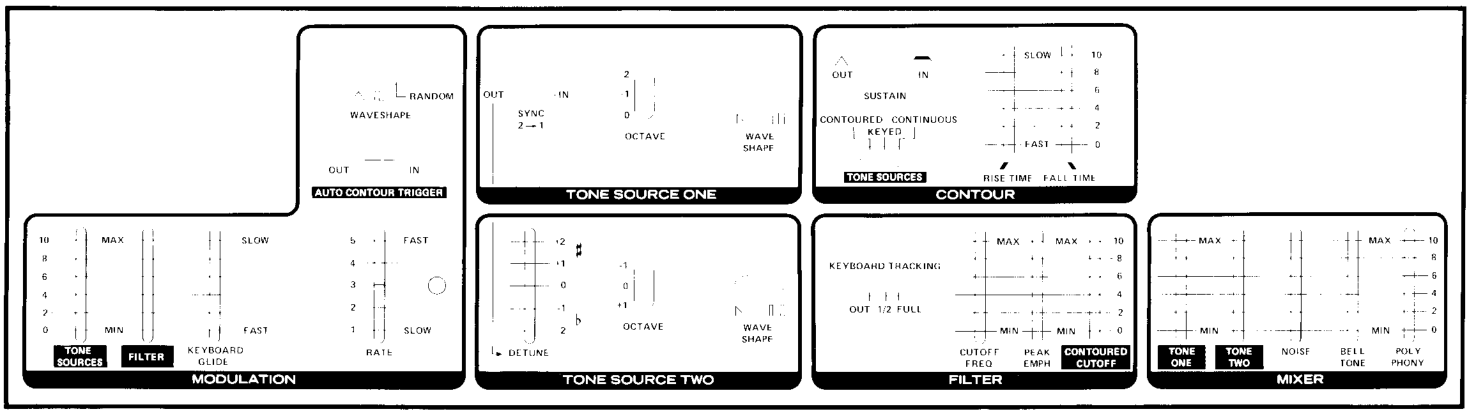
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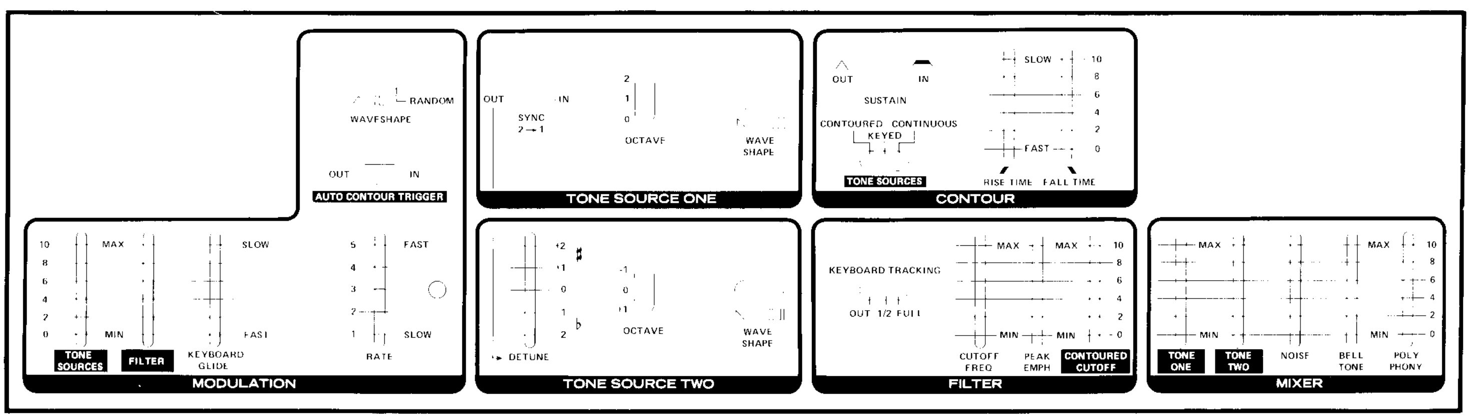
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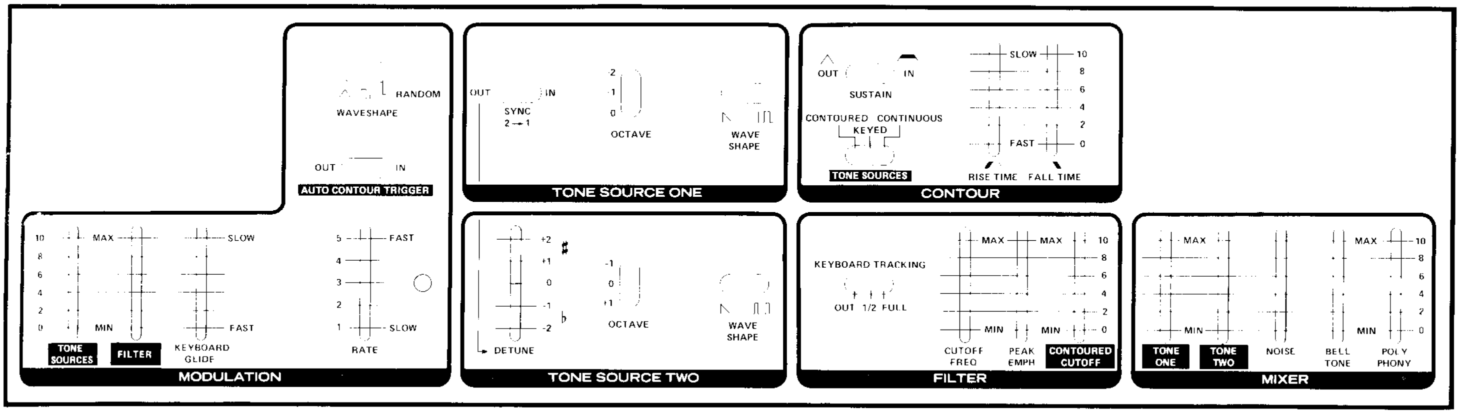
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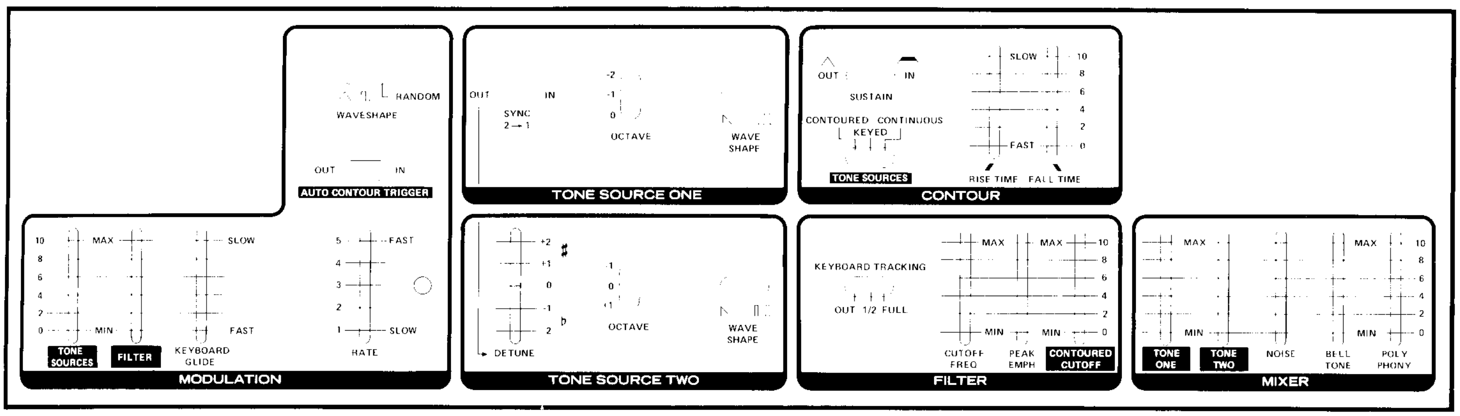
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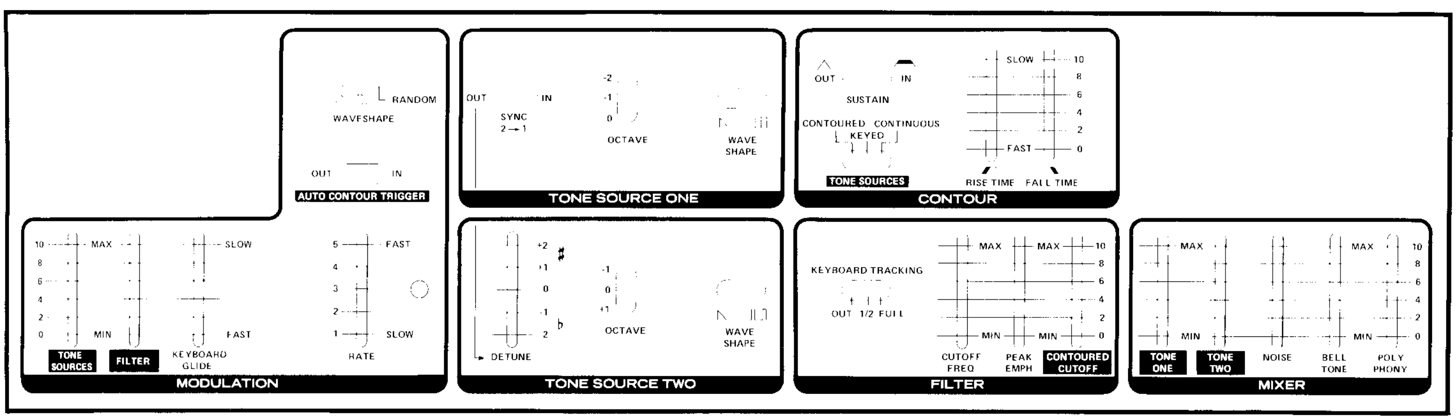
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MIXER

Suggested Reading and Listening

If you're interested in learning more about synthesized sound, the following books might prove helpful:

Synthesis: An Introduction to the History, Theory and Practice of Electronic Music by Herbert A. Deutsch

Electronic Music Synthesizers by Delton T. Horn

Principles and Practice of Electronic Music by Gilbert Trythall

For some interesting listening, try one or all of these:

Switched-on Bach by Walter Carlos

Sonic Seasonings by Walter Carlos

Firebird by Tomita

Mysterious Traveller by Weather Report

Romantic Warrior by Chick Corea

I Feel Love by Donna Summer

Vienna by Ultravox

Computer World by Kraftwerk

Pictures at an Exhibition by Emerson, Lake & Palmer

My Life in the Bush of Ghosts by Brian Eno and David Byrne

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