FASTFINGERS

NEW FOR 2011

Back in 1984, before large fast hard disks, there was no way to save a whole song in real time. MIDI was just breaking in, so what I did was set up Fastfingers to record up to 5 minutes of high resolution recording time wise, several samples per second. This took up memory AND DISK SPACE. So when you hit SAVE back then, the entire recording, updated sounds, arpeggios, and transpose bank were all saved to 160 "blocks" on the 1541 disk drive. This took 2-3 minutes and was also just as slow to LOAD. Because most of you now have access to hard disk recording, in 2011, I have released 2 versions of Fastfingers, of which you now have BOTH. First the original, 160 block version and now a 31 block version SAVE which just saves your SOUNDS and ARPEGGIOS. 20 seconds is better than 3 minutes.....right !!! So for 2011 there is the LONG SAVE and SHORT SAVE versions on 2 different diskettes.

Tuning was tricky back then. We never had the cheap electronic tuners that we have today. Recently I discovered that 10% of the time you may hit a C and be playing a G or E. Most of the time this is due to RING modulation which modulates the main key with a part of the chord. Because of this, for 2011, I have gone through the entire 256 STANDARD sound bank and tweaked most of the sounds to fix this problem. If the sounds changed too much, I didn't modify them. There may be 4 or 5 sounds still in a different key, but I left them that way because the SOUND would have changed horribly. You also have another slight upgrade of Fastfingers on the Flip side of the "Short Save" diskette. The program has a new pitch table. The difference isn't very noticeable but some tuners may pick it up. The original version may have been out of tune less than 1 CENT for U.S. and Canadian C64 computers. The North American table in the Commodore 64 Programmers Reference Manual was based on a 1 mhz clock and the clock isn't really EXACTLY 1 mhz. I punched in the new NTSC frequency table for North America. If you are in the UK or Europe, you also have a new table.

Now ,up above, I was talking about the STANDARD sound bank, but there is also a DBX sound bank which I created way back. I tweaked all of the 256 sounds while monitoring through a DBX box. This was because I wanted to remove the noise from the SID chip and raise the S/N ratio to better than 70db. The DBX box handled noise reduction in 2 ways. During recording it would COMPRESS the sound making the quieter parts louder and making the louder parts quieter. During recording it also kicked up the high frequencies or treble. I did the same with the the Fastfinger sounds. The DBX version of sounds have longer DECAY and RELEASE times and filtering is more BAND PASS and HIGH PASS and less LOW PASS. I no longer have a DBX to play these sounds through though, but this could be re-created today by turning the tone down and using a 2-1 or 3-1 EXPANDER PLUGIN while recording in Cubase, Sonar, Pro Tools etc.. The DBX sounds are on the FLIP sides of the 2 diskettes.

Also the SPEED indicator was not based on BPM. It was just "FASTER" and "SLOWER". Here are a few suggestions for speeds. When you record in "ARPEGGIO" MODE, and hit a keystroke (play a note) between each click of the Metronome , these would play back as 16th notes after you adjust the speed to the Table below.

These are approximate BPM values. I used these when recording to the Korg Kaossilator.

225 FASTFINGER   = 120 BPM
230 FASTFINGER   = 140 BPM
232-233 FASTFINGER   = 150 BPM
235 FASTFINGER   = 160 BPM
Have Fun ! !
Dan Laskowski

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HOW TO USE THIS MANUAL

This manual is written in logical order and the way to get the most out of FASTFINGERS is to go through the entire manual from beginning to end, IN ORDER. If you see a strange bit of jargon it has already been explained in previous pages.

As you are reading through this manual, you will see things like "HIT THE [SAVE] BUTTON" or "HIT THE [LOAD] BUTTON". I know that your keys are not labelled this way, but please don't go out and buy a new keyboard.

This program is entirely MENU DRIVEN and at any given time, you will be able to look at the video display, to see what all of the keys will do. You will see that the F5 key is in fact, the FASTER button and that F7 is the SLOWER button. (When no CONTROL keys are pressed). This general rule applys to the whole manual and the whole program. There are 4 menus.........

1) NO CONTROL KEYS (Play mode)
2) SHIFT KEY   (Sound Shaper and Effects)
3) CTRL KEY   (Sound Banks)
4) CTRL/ SHIFT   (Sound Shaper)

FORMAT OF THE MANUAL WILL BE AS FOLLOWS:

COMPUTER OUTPUT WILL BE "LIKE THIS"

USER INPUT WILL BE [LIKE THIS]

"PIANO KEYS" REFER TO KEYS ON EXTERNAL KEYBOARD.

"PIANO BUTTONS" REFER TO KEYS USED WHEN AN EXTERNAL KEYBOARD IS NOT AVAILABLE.

YOU MAY NOT NEED A VIDEO DISPLAY

Once that people learn how to use FASTFINGERS, they might be able to work the program, without a display. This is because the program works with ONE KEY COMMANDS. This will give greater portability.

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PLEASE USE THE WORDS "FASTFINGER" AND "SUPPORT" IN YOUR LETTER. OTHERWISE
YOUR LETTER MAY GET THROWN OUT BY MISTAKE. I GET 100'S OF EMAIL EVERY DAY.
WATCH FOR UPDATES AT https://www.musicinit.com/fastfingers.php

C HAP T E R 1   STARTING UP

SETTING UP THE EXTERNAL KEYBOARD

If you will be using the Mattel keyboard, then read these instructions carefully and DO THE STEPS IN ORDER.

a) Carefully remove the keyboard from the carton and you will notice a cable with 2 plugs at one end.

b) Take out the KEYBOARD ADAPTER and mate it to these plugs.(You can't make a mistake because the adapter will only fit one way.)

c) Then, WITH THE COMPUTER TURNED OFF, orient the other end of the adapter and plug it into the joystick ports #1 and #2 of your COMMODORE 64. Now you can turn the power on and begin.

LOADING THE PROGRAM

Start by typing in [LOAD "MUSIC",8,1] [RETURN]. The program will now load in and start running.

LOADING SOUNDS AND SEQUENCES

After loading the program, you should be looking at a display with the word FASTFINGERS in the upper left hand area. Notice near the upper right hand corner the words "LOAD" and "SAVE". While pressing [CTRL/COMMODORE] ,HIT [LOAD]. WHEN THE PROGRAM IS FINISHED LOADING, MAKE A SPOT CHECK, TO SEE THAT EVERYTHING LOADED OK, BEFORE GOING ON.

USING FAST PRE-SETS

In the upper left hand area of the display, you will find "FAST PRE-SETS". After loading the sounds from diskette, simply hit one of the 8 [FAST PRE-SET] keys and then play.

The FAST PRE-SETS are just a subset of the 256 sounds in the bank. They can be used where you want to quickly switch back and forth from one sound to another, DURING A LIVE PERFORMANCE. You can use the sounds which are already in the FAST PRE-SETS or put your own in there. You could also transfer any of the 256 sounds to this area.

PLAYING SOUNDS

After GETTING the sound that you want, you can play it by either hitting the keys listed on your video display, (Z,X,C,V,B,N,M,<)],?,S,D,G,H,J,L,[) or using the EXTERNAL KEYBOARD.

"CHORDS" IMPLEMENTATION

There is also a bank of easy to use chords. With these, you will be able to play chords with a single finger. There are 3 MAJOR chords and 3 MINOR chords included in the bank. The other 6 CHORDS keys have other chords. The [C]ANCEL button is found to the far right of the "CHORDS". The [C]ANCEL button is used to cancel chords and all 3 voices will be playing the same note in unison when

[C]ANCEL is used. Orchestral like chords can also be played by using the HARMONICS function in conjunction with a chord.(See section on HARMONICS).

Another thing to mention is that CHORDS function will not produce a predictable result when used with RING MODULATION or SYNCRONIZATION. The CHORDS produce different types of bells and gongs when used with RING MODULATION but will not produce 3 note chords. Sometimes the results will be pleasant, but they won't always be predictable.

HOW TO USE "CHORDS"

To use CHORDS ,first you hit one of the CHORD keys. (QWERTYUIOP@*) Then, you play the sounds on your keyboard and you will notice a difference. There will be an apparent difference with MOST sounds. With some sounds,though, there will be very little difference because 1 of the 3 voices may be so much louder than the other 2 voices. This is only a "ONE FINGER CHORD". In other words, to play a CHORD you only hit one key.

USING THE EXTERNAL KEYBOARD

a) If you have the sound that you want and you have a **Mattel Intellivision piano keyboard** connected as instructed in step #1), then all you have to do is hit [EXT KEY ON]. Now you can play your music on the external keyboard.

b) TRANSPOSING THE EXT KEYBOARD UP AND DOWN. If you are a professional, or an amateur, and have ever had someone ask you to play in the key of C# or G flat you will appreciate this function. Every time that you hit [EXT KEY ON], your keyboard will play true. In other words, the first key will be a C the second C# etc. If you want the first key to play C# instead of C, then hit the [S] piano button and you will have raised the whole keyboard up one semi-tone. Before using the external keyboard, this button was used to play the note C# and so this approach is logical. You will be able to do the same thing with all of the piano buttons. In this way, you will be able to transpose the external keyboard to any key signature.

c) CANCELLING CHORDS WITH THE EXTERNAL KEYBOARD ON can be accomplished 2 ways. Either hit [SPACE BAR] or [C]ANCEL key. Using the space bar, while playing live, will make it easy to control CHORDS with one hand while playing the music with the other. (Thumb on space bar)THE SPACE BAR WILL NOT WORK FOR [C]ANCEL WHEN THE HANDS OFF SEQUENCER IS ON.

GETTING SOUNDS FROM BANK

After loading the sounds from the diskette, you will then want to select one from the bank to play. Depress [CTRL]. In front of you will be a MENU OF SOUNDS. You will first select which one of the banks that you want, then the specific sound from that bank. For example, hit [BELLS + PRCSSN] . Then depress [LEFT ARROW], because the top 16 keys select the individual sound and we are selecting the first sound from the percussion bank. Take note of the "POINTER" number and while the [CTRL] key is still depressed, hit [GET]. Now you can release the [CTRL] key and PLAY the sound.

STORING SOUNDS IN MEMORY

Before making any new sounds, you should first check to find a place where you can put the new sound, so that you are not erasing a sound that you like. See section on GETTING SOUNDS FROM BANK. Write down the "POINTER" and BANK NAME, once

you've found the empty spot. Do this immediately after [GET]. Then make the new sound. Then store it, as instructed below.

After you already have the sound that you like, whether it is from the BANK, or whether you made it yourself, you may want to move it in the sound bank, for permanent or temporary storage.

While holding down [CTRL], hit the bank where you want to place it. EXAMPLE: If you want to place the sound in the FAST PRE-SETS bank, you will want to set the pointer for the first bank. Hit [VARIED]. At the top of the screen, you will see 16 vertical pointer numbers. In this example, they will be from 000-015 inclusive. ("FAST PRE-SETS" are located from 000-007 inclusive.) Then hit, for example, [003]. Now the pointer shows "003". Now, while still holding down [CTRL], hit [PUT] and the sound will be in the bank. Then you can save it to disk, or just use it for today.

OCTAVES FUNCTION

OCTAVES will select which octave range your keyboard will play in. While holding [CTRL/SHIFT], press one of the OCTAVES buttons. (There are 8 OCTAVE RANGES when using the internal keyboard and 4 OCTAVE RANGES for this when using the external keyboard. The lower octaves are on the left and the higher octaves are on the right. If you see a solid blue box in the lower right hand area, when you play, it means that you are trying to play a note which is too high. Either play on lower keys, or set the keyboard to a lower octave.

"OCTAVES" FUNCTION MADE EASY

For those of you who would like more range with the smaller keyboard built into the computer, then let me say a few things. I originally had the OCTAVES function where the FAST PRE-SETS now sit, (in the menu) but I thought the FAST PRE-SETS would be more powerful in this location, for live performance. With FAST PRE-SETS here, you could get any one of 8 sounds without holding down a control key. You COULD also get the same sound with 8 OCTAVES (or 2 different sounds with 4 OCTAVES each etc.) To implement this type of OCTAVES function here, simply assign the same sound to each of the FAST PRE-SETS with a different OCTAVE for each sound.

CHAPTER 2
RECORDING + PLAYBACK
TERMS YOU SHOULD KNOW
ARPEGGIO is a fast run of notes. (usually 16th and 32nd notes)
HEXADECIMAL is a number system using 16 digits. 0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F
EVENT is whatever happens in one STEP of time. Example: 1 note or 1 rest.
LOOP is a repetitious function where the music will play over and over.
SEQUENCER is a device which will store and play back 1 EVENT at a time, at a variety of speeds.

INTRODUCTION
Here is where you will be able to do the real powerful things with this system., even if you never played a keyboard instrument before. Just imagine recording a song at your own pace and playing it back 3 times faster! You will also be able to pre-record shorter ARPEGGIOS and be able to call these up at the press of a button. Have fun!

RECORDING MELODIES
If you will take a look at your display, you will see some familiar looking symbols and words. That is, if you ever worked with a tape recorder before. PLAY, RECORD, FAST FORWARD, REWIND AND STOP are among the functions, that you will use to record and playback your songs, or other sequences.
TO RECORD what you want, simply hit [RCORD] and the METRONOME will count 4. Then begin playing. The METRONOME will continue to click and you will be recorded until you hit [STOP]. This metronome will keep your playing in time. You can change the metronome speed by holding down the [MET] button until the metronome is at the right speed. (The higher the number, the slower the speed) If the metronome is set to 8, for example, you will hear a click every 8th time that the memory increments "WHERE". If you don't want the metronome, while recording, set it to 0. If you want the MET speed to change faster, then hold down [COMMODORE KEY] while holding down the [MET] key.

PLAYING BACK YOUR MELODIES
Hit [PLAY]. It's that simple. If the timing isn't right refer to FASTER AND SLOWER.
[RWIND] will run your music backwards at high speed, until you find the spot that you want.
[FFWRD] is opposite of REWIND.
[BEGIN] will rewind to the beginning, in a flash. [STOP] will STOP all playback.

FASTER AND SLOWER FOR RECORDING AND PLAYBACK

The F5 and F7 keys are used for [FASTER] [SLOWER]. The fastest speed is 252 and the slowest speed is 0. If when playing back your song, the timing doesn't sound the same, you may need a faster speed to record with. Usually 240 can be used for straight 8th notes, but for 16th note triplets and dotted 8th notes a higher RESOLUTION (recording speed) will be necessary. The highest speed is always safe to record ,even the fastest keyboard player. (252) At this speed the computer will be storing your notes in memory at the rate of 60 notes per second. This very high speed is also good when used to play back music which was recorded at a much slower speed. At this speed, you will have approximately 10 minutes of recording and playback time.

WHY THE OTHER SPEEDS?

Well if we slow right down to 20 or 30 and set the metronome to 1, we can record 1 EVENT at a time, then speed up for playback. This is very accurate, memory efficient, and is easier than typing in the notes. At the 240 speed, you will have 40 minutes of playback. The numbers displayed at "WHERE" are the memory locations where the music is being stored . (Hexadecimal is used here to conserve space. These numbers are only for appearance and all recording and playback can be done "by ear".) Every memory location gets the same duration and this makes things easy for CUTTING and SPLICING. It is also easier to PUNCH IN.

PUNCHING IN

PUNCHING IN is when you want to correct a mistake in a musical piece without re-recording the entire composition. To PUNCH IN ,simply start playing your music back and when you think that you have reached the mistake, hit [RCORD] and redo the part. Soon as you have made the correction, then switch back to [PLAY].

Since the [RCORD] and [PLAY] buttons are side by side, this process can be done simply with 2 fingers. If the composition is very complex, then it might be better to slow it down before attempting to punch in.

RECORDING ARPEGGIOS

Here's where the fun begins!

First hit the [ARP] button and note a few changes to the video monitor. Instead of "MELODY" at the top, it now says "ARPEGGIO". Also the speed has slowed down to 020 and the metronome is now set to 001. Things were set up this way for convenience ,for EVENT programming, but you could set up any way that you want to. For the example below, I will stick with the pre-set.

Hit [RCORD]. A count of 4 beats will be heard and then start playing in 1 note at a time, not right on the count/click but just after it. If you hit a note ANYWHERE between 2 clicks, it will be registered , when working with the recorder. When you have finished your ARPEGGIO of 8,12,16 EVENTS ETC., then hit [STOP] and this will put an end on your arpeggio. This is like recording some music on tape and then cutting the tape at both ends. Then , if we tape both ends together, and play this back, it will run in an endless LOOP, over and over. This is the way our ARPEGGIOS will work.

PLAYING BACK ARPEGGIOS

If you have just finished recording an ARPEGGIO, you can leave everything as it is and hit [PLAY]. The arpeggio will play back endlessly. This is not the

intended use of this feature, but it will work this way if you want.

The most powerful way to implement the arpeggios, is to use the arpeggio when you are playing live or recording. When you want a quick fill or riff at the ends of you fingers, but you are too slow to play it, hold the [COMMODORE] key down while you are playing the note. The arpeggio will play, at the speed that you set in the key that you are holding down REMEMBER: If you have just finished recording the arpeggio, the speed is probably set very low so either adjust the speed or hit [MEL] and the speed will be adjusted automatically and you will be ready to record the MELODY. (SEE °; N 0 T E below)

USING THE "HANDS OFF SEQUENCER"

You will also have the use of the "HANDS OFF SEQUENCER". To turn this function ON, simply hit [COMMODORE/SHIFT] simultaneosly. Now you need to only hit the PIANO buttons or PIANO keys to start the arpeggio off and the arpeggio will play back until it is finished or until you hit another key. You can TRIGGER up to 255 note arpeggios, take your hands off of the keyboard and play another instrument at the same time with this function. Another way to actuate the "HANDS OFF SEQUENCER", is to hit the SPACE BAR instead of the piano keys. The arpeggio will always play back in the key of C, this way. The SPACE BAR is an easy target to hit and could easily be hit with a DRUMSTICK, FIST etc.

N 0 T E......ADJUSTING SUSTAIN TIME MAY BE NECESSARY FOR DESIRED RESULTS. SOME SOUNDS MAY NOT BE SUITABLE FOR FASTER ARPEGGIOS, ESPECIALLY THOSE WITH GLIDE.

To shut off the "HANDS OFF SEQUENCER"

Hit [COMMODORE/SHIFT] simultaneously.

RECORDING OF TRANSPOSER

Hit the [TRN] key and now the word "TRANSPSR" will appear at the top of the screen. The transposer will usually be used if you want to create "walking bass" lines. Recording with the transposer is same as recording with MELODY or ARPEGGIO, except you will not be able to use rests.

Hit [RCORD] and then play the keyboard, one note at a time. Hit [STOP], when you are done.

PLAYBACK OF TRANSPOSER

Switch over to [ARP] and hit [PLAY]. If you already have a transposer and arpeggio recorded, the arpeggio will play over and over, transposing up and down according to the information in the transposer and arpeggio MEMORY.

SHORTENING OR LENGTHENING ARPEGGIOS

If, by mistake, you should happen to make a 17 note arpeggio, when you want a 16 note arpeggio, or a 9 note arpeggio when you want an 8 note arpeggio then CLIP can fix these problems. Hit [ARP] and then hit [PLAY]. Then hit [CLIP] to remove the last note. Let it continue to play back and listen. Repeat hitting [CLIP] until you get the required results

If you took away too many notes, with CLIP, then you can put them back, one at a time, with [SPLICE]. Start to [PLAY] the arpeggio back and hit [SPLICE] until you get the arpeggio the way you want it.

CLIP and SPLICE are especially useful if you didn't hit [STOP] soon enough, while recording the arpeggio.

SAVING ON DISKETTE

After you have the sound, melody, transposer,arpeggio and sound bank the way you want them, you can save the whole thing onto disk in one simple step. BE SURE THAT YOU USE A 1541 FORMATTED DISKETTE WHICH DOESN'T CONTAIN "SOUNDS", THAT YOU WILL WANT TO KEEP. THIS IS BECAUSE [SAVE] AUTOMATICALLY REPLACES THE OLD "SOUNDS" WITH THE NEW. WHEN YOU SAVE TO DISKETTE, MAKE AT LEAST 3 COPIES. THIS IS BECAUSE DISKETTE STORAGE IS SOMETIMES UNRELIABLE. (The name of the file is "SOUNDS") YOU CAN ONLY SAVE ONE MUSIC FILE PER DISKETTE. There are a few good reasons for this.

1) SIMPLICITY. There is only ONE [SAVE] and ONE [LOAD] button.

2) Since 160 blocks are used for each music file, you could have information saved on the outer tracks. With long disk loads and saves, it is easy to get BAD BITS, if you try to store more than one music file per diskette.

3) You never need to remember a file name, only the disk where it is stored.

4) You will still be able to save that space game or other program on the diskette, but I recommend that your diskettes be dedicated for the music file only. This is because the SAVE @ command has trouble keeping track of files. (If you must save other things to diskette, then VALIDATE before the session and make several backup copies.) To validate type [OPEN 1,8,15,"V":CLOSET]

To S A V E simply hold the [COMMODORE/CTRL] keys while hitting [SAVE].

Remember, when you SAVE with FASTFINGERS, you will be saving ALL the DATA with one hit of the SAVE button. In other words, you will be saving the SONG/MELODY which you recorded along with the sound that you recorded it with, along with the "HANDS OFF"/ARPEGGIO sequencer and the TRANSPOSER sequencer. These will be written over top of any similar information you may have on the diskette.

C HAP T E R 3 USING   EFFECTS

After you get done this chapter, you will have a better idea of what went into making some of the 256 sounds and you will be able to customize and save your own sounds to memory and diskette.

EFFECTS OVERVIEW

These EFFECTS are software effects to simulate or replace hardware effects and "stomp boxes", such as phase shifters and tremelo. These effects have been incorporated into many of the 256 sounds which are already in the sound bank.

To get into EFFECTS MODE, hold down [SHIFT] and you will see the words "EFFECTS" with the words "FLANG", "PKICK" etc. If an effect is already on, you will see a "1" or "2" below the effect. To turn an effect on, hit the corresponding key, for the effect and then "play away". If the effect doesn't fit with a particular sound, then hit the same effect key again and you will shut the effect off. (Some effects have 2 modes of operation and you may have to hit the effect key ONCE OR TWICE to shut the effect off)

EFFECTS WORK ON ALL THREE VOICES. Of course, if a voice uses a triangle wave, a pulse width effect will have no effect, on that voice, nor will a filter effect have any effect on a voice which is not routed through the filter.

THE   EFFECTS

FLANG Flanger effect actually plays all three oscillators slightly out of tune, in respect to each other, to produce the flanging effect. You can only turn this effect on or off. The PHASE **SHIFTER** will not work as long as the flanger is on. The flanger will be less noticable with **CHORDS** and more or less noticable with various HARMONICS.

PKICK Pulse Width Kick #1 will give your pulse wave sound extra KICK. #2 PKICK is an oscillation of pulse width at the same speed as TREMELO or VIBRATO and can be used to accentuate TREMELO or VIBRATO.

GLIDE is when one note GLIDES, SLEWS or CHANGES to the next note and this change of one note to the other is not sudden. This effect can be used to simulate anything from the rubbing of a bow on a violin string, to a police siren.

THICK will thicken the sound and make it slightly raspy. This is a very good effect to use with horns.

WEOW #1 will make an upward pitch slew as you release the piano key and #2 will make a downward slew as you release the key. WEOW #2 is especially useful for drum sounds, such as tom toms and electronic drum sounds.

SWIRL is like having one hand on the TONE control going up and down slowly while playing the keyboard with the other hand. It's nice to sit back with your finger on the keyboard and listen to this effect through a good amplifier.

WAH1 is EXPONENTIAL which means that it will have a little more punch than WAH2.

WAH2 #1 is a linear wah wah which means that it will be a little gentler than WAH1. Both WAH1 and WAH2 can be combined to make an even larger variety of sounds. WAH2 #2 is the invert of WAH2 #1. In other words, this note will get more

TREBLEY when decaying.

TREMELO is like SWIRL but only it's like twisting the TONE control faster. TREMELO and SWIRL can be added together.

PSWIRL is like SWIRL but pulse width is effected here instead of filtering. (See next chapter for more info)

VBRTO VIBRATO is a gentle changing of the pitch up and down from the true pitch. (only about 1%) This effect will help to synthesize many violins.

SHFTR PHASE SHIFTER is similar to the FLANGER, but with this effect, only one VOICE is slightly out of tune. The FLANGER will cancel this EFFECT.

DIGIT DIGITAL DISTORTION will add some random distortion to "fill up" sounds. It is not always appropriate with some chord and harmonic combinations and should be used with discretion.

C HAP T E R 4 SHAPING SOUNDS

In chapter 3, you started to modify sounds using effects. In this chapter, you will learn how to build up your own sounds from scratch.

TERMS THAT YOU SHOULD KNOW

SID CHIP is the Sound Interface Device. It is just the part of the computer which generates the sounds that you hear.

PARAMETER. If you were baking a cake, you would need the ingredients and the recipe, a little bit of sugar, a.few eggs etc. If you are building a sound you need ingredients also, a little bit of triangle wave,a dash of distortion etc. The components which make up the sound as well as the amount of each component are the PARAMETERS. If you know ALL the PARAMETERS for a flute, you should have little trouble to synthesize a flute.

A "HANDS ON" INTRODUCTION TO SYNTHESIS

OSCILLATORS

OSCILLATORS generate the TONES for each sound. Each oscillator can only make 1 tone at a time. Sounds in real life are made of many tones or HARMONICS and many different WAVE FORMS. So in an attempt to synthesize a realistic sound, we will use ALL 3 of the oscillators built into the SID CHIP.

With FASTFINGERS, you will be able to adjust each oscillator, up and down, in semi-tone increments and also bend the pitch out of tune using the EFFECTS. (chapter 3) You will also be able to set the three oscillators in a pre-set nature using CHORDS and HARMONICS. You will also be able to select various WAVEFORMS.

USING HARMONICS

1) Call up the SOUND BANK by holding down [CTRL] and pull up an ORGAN sound. (chapter 1). The specific characteristics of organ sounds will illustrate OSCILLATOR effects better.

PLAY the sound and listen to it. Now [C]ANCEL out all the HARMONICS and CHORDS and listen to the sound. It sounds different, right? Now hit different [CHORDS] then play them and notice how different each chord sounds. Now, while holding down [CTRL/SHIFT], hit the various [HARMONICS] buttons and then play these sounds. Did you hear the dramatic difference in sounds? Though you heard a great variety of sounds, toy organs, church organs, etc., you were only playing with 1 PARAMETER, the PITCH of the oscillators. There are about 30 more PARAMETERS to play with, so this should give you some idea of the vast variety of sounds, which can be created with this system. NOTE: CHORDS will override HARMONICS but HARMONICS will not override CHORDS.

The oscillators are capable of playing many different WAVEFORMS as well. I'm not going into the physics of how each waveform varies in frequency content and energy content though. Simply play with each waveform and listen for yourself. Here's how.

SELECTING A VOICE (01, #2, OR 03)

First you must select which one of the 3 voices you want to change. Hold down the [SHIFT] key and you will see 1, 2 and 3 displayed in the upper right

hand area of the display. Hit one of these VOICE keys to select the VOICE that you want to modify. At the bottom of the screen, you will see a long horizontal cursor which will indicate which voice/channel that you are working on.

While still holding [SHIFT], press [TRGL] or [SAWT] or [SQRE] or [HISS]. Play each of these waveforms and listen to the way they sound. Also notice how the indicators, under the long cursor changed. After you have a square or sawtooth wave on, hit the [T BLEND] button to experience 2 new waveforms, the ANDED waves which are somewhat weaker, but have their uses when used in conjunction with other waves. THERE WILL BE NO CHANGE, IN THE DISPLAY, to indicate that ANDED waves are there, but when, you play them, their distinctive, sharp sound should give you an idea of their presence.

GENERAL APPLICATIONS OF VARIOUS WAVES

TRIANGLE waves are very smooth and are good for flute like sounds.
SAWTOOTH waves are a little coarse and are good for trumpets and other horn instruments.
HISS OR NOISE is best used for cymbals, snare drums and wind sounds.
PULSE AND SQUARE waves are very coarse and will be best used with FILTERING, because natural sounds seldom occur with pulse waves.

ADJUSTING OSCILLATORS UP 1 SEMI-TONE
This adjustment is meant to adjust the #2 and #3 oscillators, relative to the #1 oscillator. There are already many pre-set chords for you to select, but if you want more chords or special tuning for RING MODULATION, this adjustment will be helpful.
While holding down the [SHIFT KEY], tap either the [0 2] or [0 3] button repeatedly, to get the desired result.

PHASE LOCKED OSCILLATORS
Maybe you have already noticed, that sometimes, when you play a sound, it will be louder than other times. This is due to cancellation and is more predominant, when all 3 oscillators are playing the same note. In order to fix this problem, we have the [PHL] button. When this switch is on, all 3 voices will RESET, each time that you hit a new key and will all start IN PHASE, with each other. Now, when you hit a key, it will always be the same volume. The only trouble with [PHL], is that with certain sounds, it will make a "click" noise, so use with discretion. While holding down [CTRL/SHIFT], hit [PHL] to turn on and off.
FILTERING
Filtering is what happens when a waveform passes through a FILTER and the unwanted parts of the waveform are REMOVED. In the SID CHIP all of the voices pass through the same filtering system and because of this, your 3 voices are basically tied together, as far as filtering is concerned. The only way for each voice to have independence, as far as filtering is concerned, is to have some voices BYPASS the filters. Here's how.

SELECTING WHICH VOICES WILL BE ROUTED THROUGH THE FILTERS
While holding down [SHIFT], hit [FONOFF] repeatedly until the desired "F" combination is achieved. When an "F" is displayed, THAT voice is going through the filters. (The "F" is displayed in the lower left hand area of the display.)

LOWPASS, BANDPASS AND HIGHPASS FILTERS
When you have selected which voices will be routed through the filters, you will then have to decide whether you want HIGHPASS, LOWPASS, or BANDPASS filters.
The LOWPASS filter does just what the name implies. It passes low frequencies and rejects all others. It is like playing your stereo, without any treble and turning the bass up at the same time.
The BANDPASS filter passes medium or midrange frequencies and rejects highs and lows.
The HIGHPASS filter will allow or pass high frequencies. Sounds passing through this filter will sound "tinny".

SELECTING HIGHPASS, BANDPASS OR LOWPASS FILTERS
While holding down [CTRL/SHIFT], hit [BAND OFF], [HIGH OFF], AND [LOW ON]. In this way, you have just selected a lowpass filter and if all 3 voices are passing through this filter, the sound will be very "bassy". Select other filters in a similar manner. You can also try any combinations of all 3 filters.

SELECTING THE FILTER CUTOFF FREQUENCY
Another thing which will affect filter output, is the FILTER CUT control. While holding down the [CTRL/SHIFT] keys hold down [FILTER -] until the number on the display shows "000". Notice that the sound is more "muddy" now. Now while depressing [CTRL/SHIFT], hold down [FILTER +], until the number reads "255". Notice that the sound is much brighter now. There are 256 graduations of filter cut, with FASTFINGERS, and so we will be able to get quite a variety of TIMBRES. With a LOWPASS filter set to 080, we will get bass guitar and with a BANDPASS filter set to 120, we will get a horn sound. Adjusting filter cut, will make WAH WAH, TREMELO, and or SWIRL more or less pronounced.
FILTER RESONANCE
We also have a RESONANCE control, which will make the filtering more or less pronounced. While holding down [SHIFT], tap on [RES] repeatedly and notice the change in sound. RESONANCE will affect WAH WAH, TREMELO and or SWIRL because these are all FILTER effects.
THE ADSR
When you blow a trumpet, the volume of the sound rises slowly to a PEAK or ATTACKS slowly. Then the volume drops or DECAYS to a SUSTAIN level, which will be maintained as long as you are blowing and then quickly RELEASES to fade away. ATTACK, DECAY, SUSTAIN, RELEASE is where we get the term ADSR from. In the SID we have 3 such TRANSIENT or ADSR generators, 4 registers for each of the 3 voices, so that we can immitate the STRIKING of a piano key or the BLOWING of a bassoon.
We can put a number in each register, between 0 and 15. The smaller the number is, the shorter the time will be. This doesn't apply to SUSTAIN though.

The number, in the sustain register, will affect the VOLUME. To learn how the ADSR works, I would recommend that you pull some sounds out of the BANK, listen to them, and examine each of their ADSRs'. Then experiment yourself.

MODIFYING THE ADSR

While holding down the [SHIFT] key, depress 1,2 or 3, to select the channel that you want to modify. In the upper display, you will see "A D S R" . These ADSR keys are the ones which will be referred to in the following instructions.

1) If you want to adjust ATTACK, tap the [A] key repeatedly.
2) If you want to adjust DECAY, tap the [D] key repeatedly.
3) If you want to adjust SUSTAIN, tap the [S] key repeatedly.
4) If you want to adjust RELEASE, tap the [R] key.

ADJUSTING SUSTAIN TIME

While holding down [CTRL/SHIFT], tap on the [S] key. This will shorten or lengthen SUSTAIN TIME. It will make a slight difference, on some instrument sounds, but on other sounds, such as string bass, the longer sustain times, will make a more "solid" sound. It may also help with some ARPEGGIOS.

NOTE: If modifying the ADSR is new to you, you may want to listen to each sound as you are modifying it. Also, if you put a very long ATTACK time, don't expect to be able to play the keyboard very quickly. This is because the sound will never reach the PEAK, while you will already be hitting the next key.

TURNING RING MODULATION ON

RING MODULATION is used to produce GONGS, BELLS and XYLOPHONES. To turn it on, hold down [SHIFT] and tap the [RING ON] key, for the selected voice. Since the SID CHIP needs a triangle wave, for RING MODULATION, 2 things will happen. First the waveform will switch over automatically to "TRIANGLE" and then the RING MODULATION will be turned on. This is a good to know, especially if you had a PULSE wave with all kinds of PULSE EFFECTS.

TURNING RING MODULATION OFF

While holding down [SHIFT], hit the [RING OFF] button, for the selected channel. If ring modulation was on, only momentarily, the old waveform will be restored and RING MODULATION will be turned off. In this way, you will be able to see if you want RING MODULATION, and if you don't, change things back quickly, with a minimum of keystrokes.

vnrrP q nVV

Sometimes, when we are using RING MODULATION, it is desirable to shut off the sound, from VOICE 3. While holding down [CTRL/SHIFT], hit [VOIC3 OFF], to turn off voice 3.

UnTrp I nN

While holding down [CTRL/SHIFT], hit [VOIC3 ON].

TURNING SYNC ON
While holding down the [SHIFT] key, hit the [SYNC ON] button, for the selected voice.

TURNING SYNC OFF
While holding down the [SHIFT] key, hit the [SYNC OFF] key, for the selected channel.

ADJUSTING PULSE WIDTH
Adjusting PULSE WIDTH, will make the sound thinner, or richer. This adjustment will only work with a SQUARE/PULSE wave. First select the channel. Then, while holding down [SHIFT], hold down [PLSE +] or [PLSE -] to change the PULSE WIDTH. You will hear the sound change, as you do this, for the voice that you are adjusting.

VOLUME
VOLUME CONTROL is also available with FASTFINGERS. Though it is more important with MULTI-SID systems, for mixing, volume control does have a purpose with a single SID. If we try to set all of our sounds, to approximately the same volume, we won't have to worry about blowing speakers up, when we change from one sound to another.

ADJUSTING VOLUME
While holding down [CTRL/SHIFT], tap on [V], until you get the desired volume.

CHAPTER 5 ADVANCED USES

As long as you are using this system for live performance or just having fun with it you won't have to bother with this chapter. If you want to make professional recordings with this system, then read on.

NOISE REDUCTION AND DYNAMIC RANGE

If you are not satisfied with the signal to noise ratio for the SID (48db), then you can run the audio output through an EXPANDER. I have a DBX unit and I can safely say that the improved s/n ratio and dynamic range is worth the trouble. When feeding the sound through an expander, you should re-adjust your ADSR and your filter cut, though, to compensate for the effects of the expander.

DOING MULTI-TRACK RECORDING WITHOUT MULT-TRACK $

Since the FASTFINGERS system uses a real time clock, it is entirely possible to SYNCRONIZE several C64 computers, together for playback. I expect this approach to be more feasible, as the price of the C64 comes down.
First, each computer should be at the same SPEED. Then record each PART of the composition, one CHANNEL at a time, on each C64, layering CHANNEL on top of CHANNEL, as described below.
After recording the first "track", set the metronome to 0. After this, you won't have a metronome to follow, but you will use the first "track" for timing. Recording will begin as soon as you hit [RCORD], so hit [PLAY], on the first machine, at the same time as you hit [RCORD] on the second C64. To play the whole thing back, you will have to hit [PLAY] on each of the computers, at the same time. If you save these "tracks", on diskette, it would be better to mark each diskette, so that you know which computer, the music was recorded on. This way you will always playback the same parts, on the same computers.

FASTFINGERS COMMAND SUMMARY

MENU 1 (Play Mode)
1) MET: Sets the speed for the metronome.
2) FAST PRE-SETS Up to 8 different pre-sets can be called up quickly from the bank.
3) RWIND: Rewind or review music back to beginning.
4) RCORD: Record music. (Be careful with this because it erases the old music.)
5) PLAY: Playback music.
6) FFWRD: Fast forward or cue.
7) STOP: Will stop music playback.
8) BEGIN: Same as stop, but now will rewind to beginning automatically.
9a) EXT KEY ON-OFF: If you are using the 4 octave external keyboard this should be "ON".
9b) When using the EXT KEYBOARD, the PIANO BUTTONS now become transposing or key signature keys.
10) LOAD + SAVE: Load and save sounds and sequences from and to disk. You must also depress the [CTRL/COMMODORE] keys at the same time.
11) FASTER-SLOWER: Speed up or slow down recording and playback speed.
12) CHORDS: Select 3 major and 3 minor chords here or 6 other chords
13) C: CANCELS out CHORDS. (All three voices play the same note or tone.
14 Z,X,C,V,B,N,M,(,),?,S,D,G,H,J,L ,, [....These are the buttoms that you strike to make music but not when using the external keyboard. When using the external keyboard these keys become transposing or key signature keys.
15a) COMMODORE/SHIFT (simultaneosly): Depress once to turn "HANDS OFF SEQUENCER" and depress again to turn off "HANDS OFF SEQUENCER".
15b) To use the "HANDS OFF SEQUENCER", just hit any key and the sequence will play in the key which was struck until the sequence is over. You could also hit the space bar to trigger this.
15c) To use "HANDS ON SEQUENCER" hold down COMMODORE while playing on the piano keys.
16) MEL: Select melody sequencer.
17) ARP: Select arpeggio sequencer.
18) TRN: Select transposer sequencer.
(The above three sequencers have different places in memory but all utilize FASTER/SLOWER , RECORD, REWIND, PLAY, STOP, BEGIN etc.)
19) CLIP: Will shorten sequence or clip off last note and make loop shorter.

20) SPLICE: Splice will undo a [CLIP] or even a series of [CLIP]s (Note CLIP and SPLICE are best used when PLAY is running.)

21) The SPACE BAR will also cancel chords when not using the sequencer and while using the external keyboard.

MENU 2 (SHIFT KEY)
SOUND SHAPER AND EFFECTS

1) 0 2 : Oscillator #2 up one semi-tone.

2) 0 3 : Oscillator #3 up one semi-tone.

3) RES: Resonance control for filters.

4) A : ATTACK up.

5) D : DECAY   up.

6) S : SUSTAIN up.

7) R : RELEASE up.

8) TRGL : Select TRIANGLE wave.

9) SAWT : Select SAWTOOTH wave.

10) SQRE : Select SQUARE or PULSE wave.

11) HISS : Select NOISE wave.

12) PLSE + - : Pulse width up or down.

13) RING ON-OFF : Turn on or off RING MODULATION.

14) SYNC ON-OFF : Turn on or off SYNC

15) 1, 2, 3, Select the voice that you will shape.

16) F ONOFF : Hit this key repeatedly to select which voices will be routed through the filters.

17) T BLEND : Will blend the TRIANGLE wave with a SAWTOOTH or SQUARE/PULSE wave, in the voice selected, to create new timbres and sounds.

18) E F F E C T S : Designated effects are OFF when 0 is displayed.

A) FLANG : Flanger effect.

B) PKICK : #1 Pulse width controlled by ADSR. #2 Pulse width quickly oscillating up and down.

C) GLIDE : Notes will slide or glide into each other.

D) THICK : Thick will add a little roughness to the sound. (good for horn sounds)

E) WHEOW : Will cause a pitch slew either up, (#l),or down, (#2), directly proportional to the ADSR #3 output.

F) SWIRL: Or SWEEP will slowly oscillate the filter cutoff frequency.

G) WAH1 : The popular wah-wah effect.

H) WAH2 : Like WAH1#1 but not as punchy. #2 is inverted wah.

I) TRMLO: This tremelo is similar to sweep but has faster oscillation.

J) PSWRL: Pulse width SWIRL, slowly oscillating up and down pulse width.

K) VBRTO: Vibrato

L) SHFTR: Similar to the FLANGER but not as pronounced.

M) DIGIT: Digital Distortion

MENU 3 CTRL KEY
BANK MODE

1) GET : Get a sound from bank.

2) PUT : Put a sound into bank.

NOTE: To get a sound or put a sound you must set the "POINTER" to set up the location.

There are locations for 256 different sounds and the "FAST PRE-SETS" are a subset of these 256.

3a) First select one the 16 banks varied, bass, wind, drum, bells, string, wah wah, assort, piano, space, etc.

3b) Then hit one of the 16 keys in the top row to set the pointer

3c) Then either hit "PUT" or "GET"

MENU 4 (CTRL-SHIFT)
SOUND SHAPER MODE

1) "S" SUSTAIN TIME: unlike the sustain register already in the SID, this register will effect the DURATION of sustain not the amplitude.

2) HARMONICS 112, 122, 123, 113, 114, 124, 134, and 133, these are octaves that will play...
EXAMPLE: 1,2,3 means that the sound will play a low octave on voice 1, one higher octave on voice 2, and two higher octaves on voice 3

3) LOW ON-OFF: Low pass filter on or off.

4) BAND ON-OFF: Band pass filter on or off

5) HIGH ON-OFF: High pass filter on or off

6) VOIC3 ON-OFF: Voice 3 on or off

7) FILTER + OR -: Filter cut off frequency up or down

8) OCTAVES: select octave that keyboard will play.

9) V   : VOLUME up

10) PHL: PHASE LOCK:will lock oscillators in phase with each other upon initial triggering.

SUPPLEMENTAL INFORMATION FOR FASTFINGERS

The following information is supplied to answer questions from FASTFINGER users.

EPYX FASTLOAD

First of all, I failed to mention, in the instruction manual, that you can use the EPYX FAST LOAD cartridge with FASTFINGERS. This will speed up using the "LOAD" function greatly and if you are a serious user of FASTFINGERS, the investment in a FAST LOAD will be well worth it. The FAST LOAD retails from $40 to $50.

MYSTERIOUS YELLOW FASHING BOXES?

To those of you who are wondering about the mysterious yellow flashing boxes above the word "LOAD", they represent the note you are playing in BINARY. They are just there for appearance. I used to have a similar setup on my old synthesizer made up of 6 LEDs. I thought they looked nice, so I incorporated the idea into FASTFINGERS.

BIG BLUE BOX BUT NO SOUND?

The blue box indicates that you just hit a note outside of the range of the SID chip. Just move the keyboard down 1 OCTAVE with the OCTAVES function. If you get another blue box, then move down again. Remember, you could force a note to go too high just by the CHORDS and HARMONICS that you select. So when you make a sound, the proper procedure is to completly sculpture the sound ,including CHORDS and HARMONICS, then adjust the volume and then select the OCTAVES range last.

SOME OF THE SOUNDS PLAY VERY FAINT

If you notice that some of the sounds are very faint, when played with YOUR C64, this is mostly due because of the way that some SID chips use the FILTERS. First, you should try to adjust FILTER CUT (page 15). If you are still not satisfied with the sound, adjust the volume control (page 17). If the volume is still not loud enough and you are playing live, simply turn up your amplifier. If you are recording to tape, turn up that channel of your mixer. Remember, though a bass sound may not sound loud to your ears, it may already be too loud to record (look at your VU meters) or may already be overtaxing your speakers. (is the cone bouncing in and out) The reason that bass sounds are apparently quieter is because the low pass filters only pass the low frequency sounds. The more LOWS in a sound the louder a soumd will be. In other words, don't expect to play a bass guitar way up in a high OCTAVE. It will be inaudible (quiet) way up there. Don't expect to hear any real deep bass sounds out of your monitor because the speakers and amp in the monitor have poor low frequency response. Since a poor amp/speaker will also have few "highs", you should sculpture sounds with the amplifier and speaker that you will most often be using for playback or "live" play. The amp should have BASS,MID and TREBLE set to 12 o'clock or the midway position.

WHY NO TUNING CONTROL?

I went to a great deal of trouble to ensure that FASTFINGERS was IN TUNE. This is because I remembered how much trouble it was to tune my old analog synthesizer. I spent hours tuning it to find it out of tune the very next day. With FASTFINGERS, I didn't settle for the note tables which were printed in various publications. Instead the notes were calculated to 8 decimal places and poked into memory. Then I used a quartz tuner to check all of the notes. The notes ARE in tune and if anything, all the other instruments should be tuned to FASTFINGERS.
I also felt that with an already extensive list of functions, that tuning would just cause more confusion. For instance, are you talking about re-tuning for live performance or re-tuning which will be stored with the song? When you are done the song, will tuning return to normal automatically or will you have to remember to change it. Also , everytime new "TRACKS" (or channels) are recorded, you will have to re-tune them also. A simple thing like tuning could get very complex.

WHY HEXADECIMAL ANYWAY?

Originally, all of the numbers displayed were in hex. I later realized that most musicians would be alien to this numbering system, so I wrote an 8 bit decimal display routine (only displays numbers from 0-255). The decimal routine took care of everything except "PULSE WIDTH" and "WHERE". Both of these needed a 16 bit display routine. They had a display only as an aid. In other words the PULSE WIDTH will be adjusted by your hearing preference and you will also be operating RCORD by ear or PUNCHING IN by ear. The only place where a decimal display may make a real major difference, is with ARPEGGIO recording. Here you will want you ARPEGGIOS to be a standard length long such as 48 events (for 16th note triplets) ,96 ,32 ,64 ,128 etc. To help you below is a table.

HEXADECIMAL =	DECIMAL
10	16
20	32
30	48
40	64
50	80
60	96
70	112
80	128
90	144
AO = 10*16	160
BO = 11*16	176
CO = 12 *16	192
DO = 13*16	208
EO = 14-16	224
FO = 15-'16	240

WHAT IS DBX? HOW DO I USE IT?

When a sound is DECODED or EXPANDED with DBX, the louder sounds get twice as loud and the quieter sounds get twice as quiet. This effectively removes all low level noise. This is why DBX is called a 2:1 expander. DOLBY is also similar. (You might try to process the DBX sounds through DOLBY to see the effect.) The other effect of passing sounds through DBX is that the "HIGHS" get filtered out.

The way to sculpture the sounds is to pass the sounds through the DBX or other expander, while you are creating the sounds. This is the way that I created the COMPRESSED sounds on the flip side of the diskette. If you listen to these sounds without DBX, you will notice that they are very TINNY, they RING (release) much slower and ATTACK much faster, than sounds on the other side.

To use the DBX 21, for an example, set the front push buttons to IN and TAPE. Then feed the sound from the C64 audio output to the DBX PLAY INPUT # 1. You will then run a cord from the PLAY OUTPUT #1 to your amplifier. Since the model #21 is stereo, you could process 2 C64 computers at the same time. CAUTION.... Because the EXPANDER will make loud sounds louder make sure that you turn your volume down a bit before playing these sounds through your speakers!

For more information on EXPANDERS the FEBRUARY 1984 issue of POLYPHONY has an article titled "NE572 NOISE REDUCTION UNIT". This is a "Build it yourself" expander. Write for a back issue to

POLYPHONY MAGAZINE 1020 W.WILSHIRE BLVD. OKLAHOMA CITY, OK. 73116

POLYPHONY recently joined with another magazine and the new magazine is called "ELECTRONIC MUSICIAN". I strongly recommend it for the serious musician.

ELECTRONIC MUSICIAN 5615 W.CERMAK ROAD, CICERO, IL. 60650

FASTFINGERS
A QUICKSTART GUIDE

Introduction:

FastFingers is a complex program!

This short guide is designed simply to let you get the feel of its power quickly. Even if you're a veteran user of the C=64, and intimately familiar with the, "SID," chip, you will benefit from starting your journey with FastFingers by first using this quickstart guide. Later, the full manual will allow you to explore all the complexity FastFingers offers any devotee of sound from the C=64 computer.

Happy exploration!

What is FastFingers:

FastFingers allows you to make, shape, and save your own sounds.

FastFingers allows you to set up these sounds so that your Commodore 64 can become the lead synthesizer for live performances.

But this program does much more.

You can change note parameters on the fly, record using the built in sequencer, compose while your machine plays the baseline, and build up a library of songs.

And, FastFingers has a built-in metronome to help you get the timing just right.

The philosophy of FastFingers is to put total flexibility at your fingertips, giving you unprecedented access to the power of the SID chip.

Starting Out:

Always work from a backup.

Loading:

FastFingers is designed to load quickly, but it is such a large program, it can still take more a minute to fully load both the program, and pre-set sound modules into your Commodore 64, SX=64, or Commodore 128 in 64 mode. It will also work with the Epyx Fastload cartridge.

To load after inserting the disk, type Load "MUSIC",8,1

(SX owners.. .do not use the Commodore/runstop key combination.)

A copyright screen will appear immediately, but program loading will continue for approximately 30 secs.

Loading in sound modules:
The Fl key is the loading key for pre-set sound modules.
You must hold down both the Ctrl and the Commodore keys and then simply hit the F1 function key.
Once the drive light goes out (in about 25 secs) you should be able to get sound by depressing some of the keys on the bottom two rows of your keyboard.
Now comes the fun stuff! Turn up the volume.
Changing Instruments:
Hit any of the 1-through-8 number keys on the top of your keyboard and tap keys in the bottom two rows to hear the different sounds available in this one bank!
Want Chords?:
We got one-finger chords! To select a chord simply hit a key in the "QWERTY," row on the keyboard, and then "play," the keys on the bottom two rows of your keyboard.
Changing Sounds:
Out of the box FastFingers comes with a wealth of different sounds. ..256 to be exact. It is a little complex to explain.. .but stay with us. ..the results you will hear will be worth it! Let's try to change banks of sounds.
Depress and hold down the Cntrl key and a new screen will appear. This is the sound menu. Select a kind of sound like winds or organs. For example, the "Y," key represents organs while you are on this screen. Hit the "Y," key. You have now entered the organ bank which has 16 different sounds.
To select one of these organ sounds, first hit any of the keys in the top row of your keyboard. Next, hit the, "GET," key. This is the up-arrow on the right-hand side in the second row from the top of your keyboard.
Remember to keep the "Cntrl," key depressed during all of this.
Once the new sound is assigned you can release the "Cntrl," key.
Now, "play," the bottom two rows of your keyboard to hear your new sounds.
If you look at the sound menu, you will see that there are eight blue columns with words like "Bass, Varied, Winds." Half the columns are fat, and half are skinny. The skinny columns represent banks of 16 sounds, while the fat columns actually give you access to 32 sounds.
To access the additional sounds, hit the corresponding key at the top of the column (a Qwerty-row key) before selecting one of the keys at the top of your keyboard.
But, other sounds are also available. If you look at the right hand side of the Sound menu you will see that the F1, F3, F5, and F7 function keys have also been designated to access sound banks.
Try the F7 Key, it puts you in outer space!

Changing Octaves:
When you first boot FastFingers, the default sounds are in a variety of octaves.

To place a sound in a different octave, depress and hold down both the Shift and Cntrl keys. Then, to select an octave, simply hit any key from, "Q," to "I," with octaves rising from left to right.

Sometimes you may place a sound outside the range of the Sid chip. If you do that, when you return to the original menu and try to play that sound, you won't hear anything. But, if you look at your monitor, you will see a small blue box flashing on the right centre of your screen when you hit a key. Its telling you to go back and choose a lower octave for that sound.

Recording/Saving/Playback:

Let FastFingers do the work!

FastFingers is designed to work just like a tape-recorder.

If you hit the "0," key you will hear a paced click. This is the built-in metronome. The "0," is also the RECORD key. You are now in record mode. Wait for the fifth click of the metronome. Any sound key you depress after that will be recorded into memory. Here's where you can let loose with your favorite riff.

The metronome sound is NOT recorded.

To stop recording hit the stop key, which is the English Pound Sign on the top right hand side of the keyboard.

Now, to go immediately back to the start of your recording, simply hit the letter "A," key.

To hear what you have recorded, hit the play key, which is the plus "+," sign.

Your recording will be played back to you at the pace at which it was entered.

FastFingers also has a rewind button, "9," that can be used in conjunction with the stop key, (English Pound sign) to cue up to somewhere in the middle of your recording.

But, FastFingers (How do you think it got its name?) can speed up, or slow down your recordings as well. You will see on the main screen that faster is the F5 key, while slower is the F7 key.

The main screen also has a speedometer that shows you in numbers (0 to 252) the speed at which your recording is playing back.

Recording Arpeggios:

Arpeggios are a fast stream of quick notes...and fun!

FastFingers has an arpeggio built-in. Its a scale.

To hear it, hold down the Commodore key.

You should see the word, "sequencer," flashing red to blue.

Now, your bottom two rows of designated sound keys will play the arpeggio instead of regular notes as long as you keep the Commodore key depressed.

In FastFingers, you can set up your own arpeggios. To do so you need to access the Arpeggio screen.

Make sure the sequencer is off and not flashing. It toggles on/off with the Shift and Commodore keys.

Now, hit the "=," (equal sign) key, and you will see the word, Arpeggio, just below the copyright in the title.

Recording arpeggios is just like recording regular notes.

Notice however, that the clock is slowed down automatically.

This allows you to step-time record a single note, in between each click of the metronome.

Use the record, stop, and play back keys in the same way you did when recording regular notes. You also have the faster and slower options.

To leave the arpeggio screen simply hit the "return," key and you are back to the main screen.

To use your arpeggios in recording a song, simply begin recording as normal and then, when you want to insert your arpeggio, just hold the Commodore key down to change your keyboard into arpeggio mode. By holding down the sound key for just a little longer than normal, your arpeggio will play as long as both keys are depressed.

Special Effects:

Out of the box, FastFingers has some pretty wild and exotic special effects only weird rock stars will really appreciate. They include, "Wah-Wah," "Flang," and "Glide,"

To access these features, hold down the Shift key to see an entirely new screen. There are 13 effects listed in vertical columns. To get one into your sounds, just keep the Shift key depressed and hit that effect's corresponding key in the, "Qwerty," row.

You will notice numbers at the bottom of each column. 0 means the effect is off, while the number 1 means that the effect has been selected. Some columns have two levels of an effect so if you tap that column's key again you will see the number 2. Tap it a third time and it toggles back to 0, or off.

A sound can have more than one effect assigned to it... so experiment.

Release the shift key to go back to the main screen and then play your note keys to hear the effect(s) you've just selected.

Shaping your Sounds:

When you're playing or recording with FastFingers all three voices are being used.

But, FastFingers gets deeply into individual sounds for each voice. You have an almost unlimited ability to alter the sound each voice makes.

It has two different screens that can be used to alter the sounds of each voice.

To see one of these screens hold down the "Shift," key. To change the voice to be altered, hit the English Pound, Clear/Home, or Inst/del keys. You will notice the highlighted row on the bottom will change, indicating which voice you are modifying. Voice one is red, Voice two is purple, and Voice three is blue.

This screen has selection keys that allow you to change waves, deepen or shorten pulses, and change sound parameters. These are known as the Attack, Decay, Sustain, and Release. You can also fool with resonance, filters, and modulations.

FastFingers also takes advantage of a unique feature of the Sid chip. ..the ability to mix, or combine some kinds of waves for a particular voice.

It will combine triangle with square, or triangle with sawtooth waves. Simply hit the "s" key while you have the shift key depressed.

Using some of these keys will give you an immediate audio feedback, while others require you to return to the main screen to hear what you've created.

By now, you should be able, with a little experimenting, change existing sounds more to your liking.

Saving to Disk:

If you want to save the work from your session with FastFingers, you will need a formatted disk and a 1541 drive.

(Saving has not been tried with 1571/81 drives, but it should work).

FastFingers does an idiot, bulk save. ..meaning it saves all the blocks of the computer's memory where you have stored your songs, sounds, and arpeggios during the current session. It dosn't check to see if there is actually anything there.

FastFingers saves your work using one file name...and one file name only..."Sounds."

To begin your save, make sure your new, formatted disk and not a copy of FastFingers is in your drive. Then depress the Cntrl and Commodore keys. While these two keys are depressed hit the F3 function key. Your disk light should come on.

Saving can take more than a minute.

Next time you want to use FastFingers, boot with the FastFingers program disk. When see the second screen and the disk drive light goes out, put in the data disk you made from your last session.

Depress the Cntrl and Commodore keys and hit the Fl function key. Be patient, because this load will take a long time, even with a fastload cartridge. ..up to 90 secs.

Once the drive light is out, press the "+," key to hear what you saved from the previous session.

Remember if you resave to this disk, you will be erasing your original session with FastFingers, and replacing it completely. So if you are planning to save your latest session, but want to keep the original, make sure you have a formatted disk handy.

From you're experimenting you can hear just how flexible FastFingers is for getting at all of the sounds locked up in you Commodore 64.

A couple of caveats.

Chords may not sound right if you have ring modulation on any one of the three voices.

FastFingers was originally set up to also work with an external keyboard with a special adaptor. The Clear/Home key and the Inst/Del keys were designed to toggle an external keyboard on or off. When you are using your regular Commodore keyboard, but have the external keyboard selected, you will only hear sounds when you release keys.

We hope you are now well on your way to understadning and enjoying the power of FastFingers. Write us if we can help you in any way.