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SYNTHER 7

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● WELCOME TO SYNTHER 7

Synther 7 is a real-time software synthesizer for the Dragon. The synthesizer reads the computer keyboard as a musical keyboard. The user can change notes and certain other variables while the music is sounding. Musical sound comes from both the speaker of the T.V. Monitor and from the AUX plug that connects to the cassette recorder. You may directly record your results simply by removing the remote plug (the smallest jack plug) from your cassete recorder, inserting a blank tape and pressing the PLAY and RECORD buttons.

● LOADING SYNTHER 7

1 Place the cassette in the cassette recorder, rewind the tape and press the PLAY button.

2 Type CLOADM and press ENTER.

● USING THE SYNTHESIZER

Your SYNTHER 7 program is in machine language and is loaded from the tape by the CLOADM command. It has been set up to automatically execute itself. Once running, you should see a screen with the SYNTHER 7 name at the top. The screen should also contain a picture of a set of black and white music keys, a block of text labelled 'STOPS', a set of six bar graphs on the lower center which identifies the control keys, and a horizontal bar indicator in the lower right which displays your current pitch ranges.

At the bottom of the keyboard picture is a row listing the letters on the computer keyboard which correspond to these musical notes. The 'QWERTY' row corresponds to the black. You may wish to mark with tape the number keys which sound notes. These are the 1, 2, 4, 5, 6, 8, 9, :, −, and BREAK keys. The following is a "hands-on" demonstration of SYNTHER 7. You should load the program before continuing.

Once the program is running, press the 'U' key several times while adjusting the volume on your TV. You should hear a note that lasts about a half second and sounds like a ukelele. This is the LUTE stop. You may need to adjust the tuning on your TV for the clearest sound. The pitch is middle C.

Press the 'UP-ARROW' key. This is the same note, C, but an octave lower. The pitch of this note is half of that of middle C and contains only half as many cycles per second. Now press the 'CLEAR' key. This

note is the C one octave higher than middle C. Its pitch is twice that of middle C and has twice as many cycles per second.

In the lower right corner of the screen is the RANGE indicator. Its upper coloured block shows the two octave range of the computer keyboard. The lower coloured bar shows the tuned musical range of the particular stop you have selected. Press the 'ENTER' key and watch what happens to the blocks. Where is middle C on the keyboard now?

Now press the 'DOWN-ARROW' key and you are back home again. Now press it a few more times until range indicator is as low as it will go. Congratulations!!! you now own the world's first 256 foot long Lute!. (You may need to turn the volume up to be able to hear the 4 cycle per second note . . .).

Press the 'K' key, (and turn the volume down). What happened to middle C? You have just shifted stops from the Lute to the KRUMPHORN. Notice that the stop range colour bar has shifted to the right and has become smaller. This is because the musical range of the Krumphorn is less than that of the Lute. The keyboard range indicator has moved to within this boundary.

The Krumphorn not only has a different timbre (pronounced like "CAMBER") — or tone — than does the Lute, but also has a different envelope. The coloured bars at the lower left of the screen indicate the envelope of the notes you are playing.

Press the 'B' key, then a new note. Can you hear the difference it makes? What happens when you do this several times? The 'B' controls the pitch BOING at the beginning of each note. At higher levels of 'S' (Sustain), you will hear more BOING.

The number below the 'B' colour stripe displays the value to which it is set. At a value between 6 and 9, the note descends into pitch. At a value between 1 and 4, it rises into pitch. At a value of 5, there is no BOING. At either extreme there is a little extra twist. The 'N' key lowers the BOING value and the 'B' key raises it. At low values of 'S' almost imperceptible amounts of onset BOING can be found which mimic the flattenning of a plucked string. This is useful to remember for those times when you may tire of Loch Ness Monster sounds . . .

Now set the BOING Indicator level and let's proceed with the tour. The composer Ussachevsky once specified for a composition some electronic notes which included attack, sustain, decay, and release parameters. These parameters defined the varying loudness of a note from start to

finish. Since then, this set of names have become a fairly standard way of describing the envelope or shape of a sound. Since the release process has become confused with decay, and particularly since the keyboard of the Dragon Computer is ready made for it, SYNTHER 7 uses a FELT rather than a Release generator. This will be explained in detail later.

The 'A' and 'Z' keys set the intensity of the ATTACK — 'A' increases it while 'Z' decreases it. Set the Attack to its lowest value and compare the sound as you increase it to its highest value. The Attack controls the volume rise at the beginning of each note. Set the Attack to some reasonable value and let's move on to the Sustain.

The 'S' and 'X' keys set the length of the SUSTAIN. Sustain is a pause between the attack and the decay during which the tone does not change in loudness. Usually, sustain is set to be longer than it needs to be. In SYNTHER 7 this function also affects the BOING rate, the Vibrato rate, and the Bend rate, which we shall discuss shortly. In a way, the 'S' key may be said to set the slowness of things.

Press the 'L' key to set the Lute to stop again. This resets the 'S' to a low value. How does the sound change as you increase the 'S' to its maximum? Now return 'S' to zero and put a bit of BOING on the note. See what happens now as you increase the 'S' to a maximum. The BOING effect should become longer and deeper.

The next part of the envelope to be explored is the decay function. The 'D' and 'C' keys set the decay rate. A high value lets the note fade away slowly while the lower value makes it fade away faster. Reset the Lute and see what happens at various Decay rates. At the lowest value it should sound like a plucked rubber band. At the highest value — where there is no decay at all — it becomes like an organ.

Leave the decay at the high value — in the organ position — and let's explore the final element of the envelope process, the release. When you lift your finger from the key of a piano, the internal mechanism drops a block of felt on the vibrating wire, damping the sound. Depending on the size of the felt, the sound may die away quickly or last a while longer after the key has been released. The 'F' key sets the amount of FELT — the greater the Felt value, the more rapidly the damping occurs. Notice that this damping occurs only AFTER the note key has been released. The Felt adjustment has six levels. By pressing 'F' when the Felt value is six, you can return it to one.

You will also notice that when the 'F' value is set to one, the Decay is

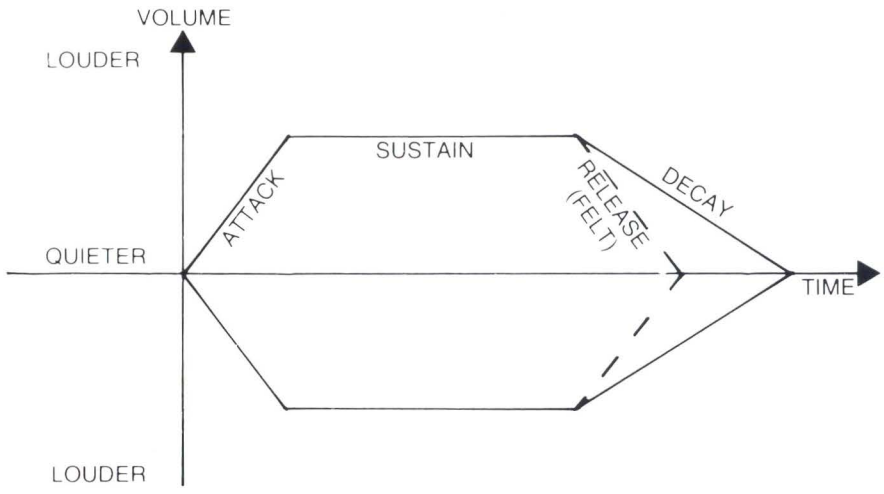
set to the organ mode, and when the sustain is set to zero the tone lasts forever. This allows the use of the low frequency oscillations as vibrato source voltages. This continuous signal may then be set by the keys to various rates and wave shapes. To escape this configuration, simply press the ';' key. This restores you to the CONTROL mode. It is labelled on the screen as the BREAK key.

Each stop key (G,H,J,K,L,) may be seen as a "RESET" key which returns you to a stable, known sound. There is also a general reset key, the '/', which provides you with a uniform envelope from stop to stop. It adjusts the range variable to provide a more complex timbre with some stops.

To the right of the envelope stripes is an individual stripe labelled 'V'. The 'V' key sets the vibrato depth. Remember that the 'S' key sets the vibrato rate, which is the number of cycles per second. Press the Lute stop, set the decay to organ mode, and try different vibrato depths while varying the sustain. You will find that vibrato appears at the start of a note and dwindles away. There are four rates available from the sustain, spread over its nine segment range. The more useful middle rate covers most of the middle to allow more useful combinations of BOING and Bend. The extremes are at the ends. To force a note to have more vibrato, just press the space bar while playing a note.

Also with the vibrato you get the BENDER. Try pressing the '<' or '>' keys during a note. Phasing lasers! It's Pinball Alley!!! play several notes while holding one of the bend keys down. Now while holding the other down. You can see the destructive potential.

To the right of the vibrato indicator is another indicator labelled 'M'. This is the control for MORE VOLUME. It steals from the volume available to the vibrato and with some stops produces vibrato with peaky tops, but it does produce interesting effects. It is very easy to lock the program into continuous play with this control set too high but remember that the ';' key will stop the note at any time.



If you were to look at the output of SYNTHER 7 on an oscilloscope, it would look something like this.

SUMMARY

To change the sound to a preset stop:

Press	To Get
G	GAMBA
H	HOGFIFE
J	JNINNI
K	KRUMPHORN
L	LUTE

For an alternate sound, press the "/" key.

To change the shape of a note:

	Increases	Decreased
Attack	A	Z
Sustain	S	X
Decay	D	C
Felt (Release)	F	
To make a note louder:	M	
To change the range:	<ENTER>	Down-Arrow
To make vibrato deeper:	V—and press the space bar during the note.	
To add twang at the beginning of a note:	B	N
To bend a note:	>	<
Reset Program:	; — and then press a stop key.	

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