YAMAHA

Programming Fractional Scalings

DX7 II·FD/D

DIGITAL PROGRAMMABLE ALGORITHM SYNTHESIZER

SUPPLEMENTAL BOOKLET

Welcome

In the first fractional scaling booklet, "Understanding Fractional Scalings," you learned the basic rules for creating fractional scalings. In this second booklet, you will use the concepts you've learned to examine a fractional scaling from the DX7 II ROM voices and to create your own fractional scaling.

Section 1 examines the multiple split effect created by using fractional scalings on the MultiPerc ROM voice.

Section 2 explains how fractional scalings are stored and recalled.

Section 3 shows you how to create a new fractional scaling

Section 4 describes the procedure for storing fractional scalings to disk on the DX7 II FD.

For continuing information concerning the DX7 II FD/D, consult AfterTouch, the official publication of the Yamaha Users Group. Many advanced functions will be discussed in its pages in the coming months. There will also be information concerning the availability of other materials concerning more advanced applications. To receive a free copy of AfterTouch every month, send your request to AfterTouch, P.O. Box 2338, Northridge, CA 91323-2338. On your letter or postcard, be sure to indicate that you are the owner of a DX7 II FD/D.

Contents

1 A Fractional Scaling Multiple Keyboard Split

The MultiPerc ROM voice demonstrates a split keyboard effect that can be created using fractional level scaling. For this example and the others in this booklet, you'll need a DX7 II FD/D, the DX7 II FD/D ROM cartridge (the cartridge that came with your DX) and a RAM 4 cartridge. If you're using a DX7 II FD, you will also need a formatted disk.

The MultiPerc ROM Voice

Loading the Rom

Split keyboard effects are useful if you need to play more than one sound at a time. On the DX7 II it's a very simple task to split the keyboard and play two different voices. It's also possible, though, to create keyboard split effects using only one voice. Fractional scaling makes this fairly easy to accomplish. You can see an excellent example of this technique by loading the DX7 II ROM voices.

Note:

You will be loading all of the voice and performance information from the DX7 II FD/D ROM cartridge bank 1 into the DX. This is necessary so that you can save work that you will be doing later. Before you load the cartridge be aware that you will be erasing everything that is in the DX memory. If there is anything presently in the machine that you would like to keep, either save it to a RAM 4 cartridge or a disk.

Turning Off the Memory Protection

1 COMPARE / EDIT — Press Edit to enter the edit mode.

2 TUNE (14 / 46)

```
Master tuning  Memory protect >INT >CRT
  + 0                           on   on
```

Press Tune until you see this display.

3 PAN (▷)

```
>Master tuning  Memory protect INT >CRT
  + 0                           on   on
```

Press the right cursor button to move the cursor to INT.

4 NO / -1/OFF

```
>Master tuning  Memory protect INT >CRT
  + 0                           off  on
```

Press OFF to turn off the internal memory protect.

5 PAN (▷)

```
>Master tuning  Memory protect >INT CRT
  + 0                           off  on
```

Press the right cursor button to move the cursor to CRT.

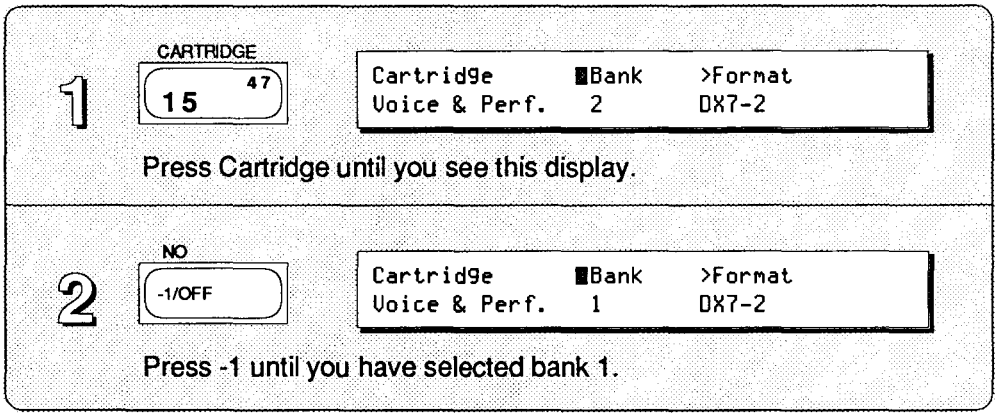
6 NO / -1/OFF

```
>Master tuning  Memory protect >INT CRT
  + 0                           off  off
```

Press OFF to turn off the cartridge memory protect.

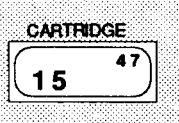
Inserting the DX ROM and Selecting Bank 1

Insert the DX7 II fd/d cartridge into the cartridge slot. Then...



Loading Bank 1

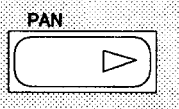
1




```
Cartridge      Save    >Load
Bank   1
```

Press Cartridge once to see this display.

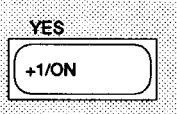
2




```
Cartridge      >Save    Load
Bank   1
```

Press the right cursor button to move the cursor to Load.

3




```
Cartridge      >Save    Load
                    Load without system ?
```

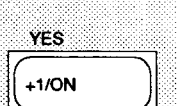
Press YES. You will see this display.

4


```
Cartridge      >Save    Load
** Are you sure?
```

Since you will want to also load the system, press NO. The cartridge is now ready to load with the system.

5



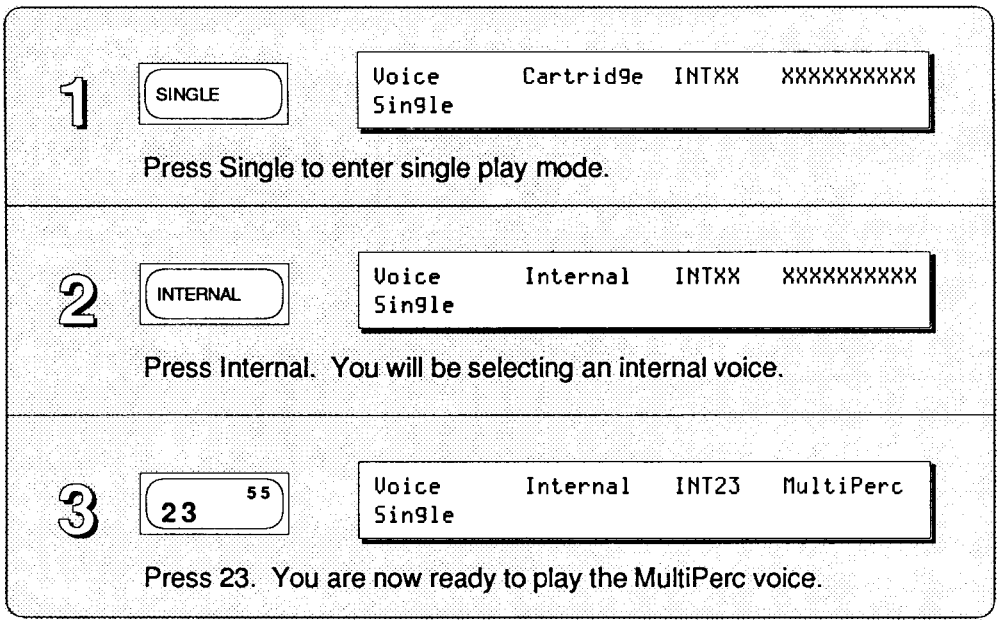

```
Cartridge      >Save    Load
     **BUSY** Now executing!
```

Press YES. You will see this display while the cartridge is loading.

```
Cartridge      >Save    Load
** Completed!
```

You will see this display when the cartridge is finished loading.

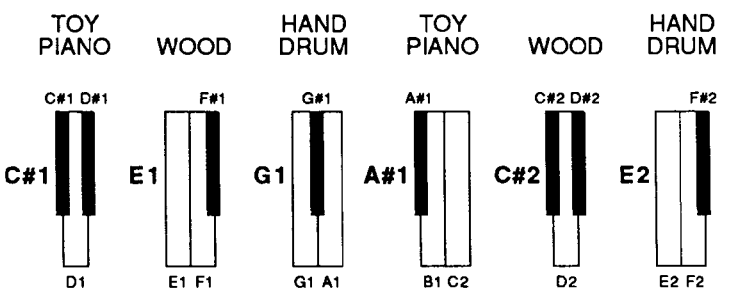
Selecting the MultiPerc Voice



Multiple Split Effect

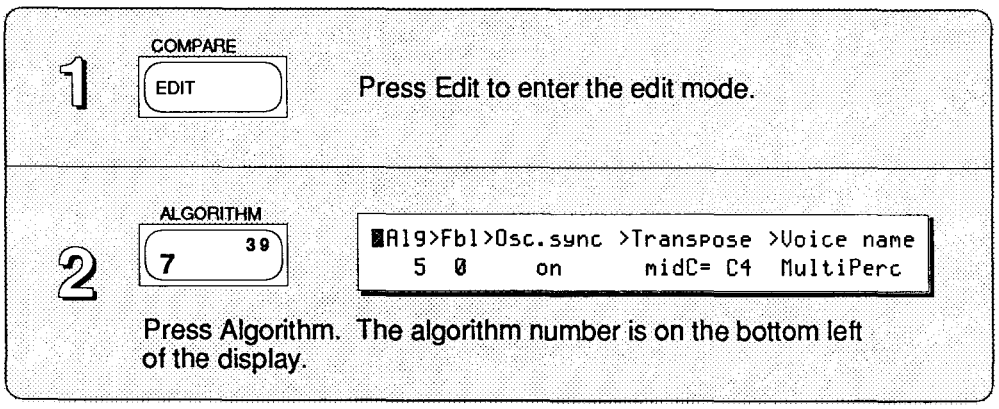
Slowly play a chromatic scale up the keyboard, starting at C#1 (the lowest C# on the DX). The sound changes with every three keys that you play. You will probably notice that there are really only three different sounds that are alternating with one another. The toy piano sound that plays at C#1 is the same as the sound that plays at A#1. The wood sound at E1 is repeated at C#2, and the hand drum sound that begins at G1 starts again at E2.

The Bottom Octaves of MultiPerc



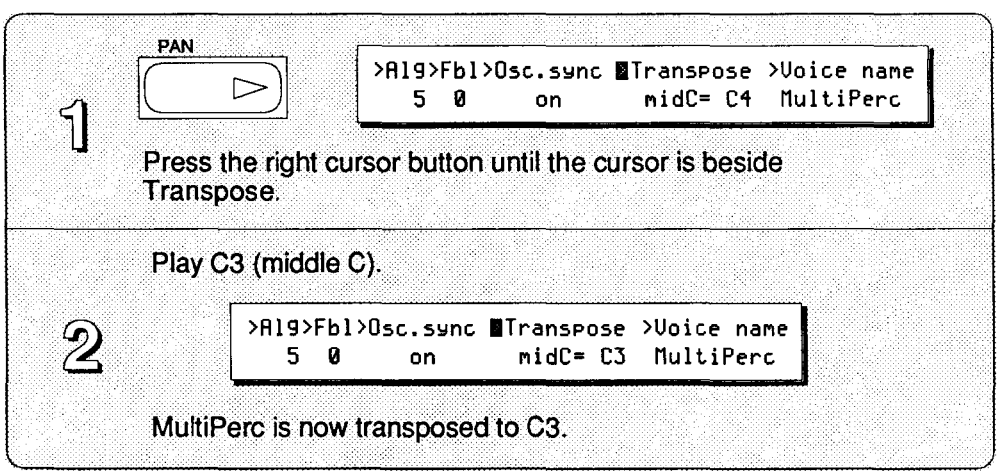
Viewing the Algorithm Display

You can begin to get an idea of how this works by checking the algorithm.



As you can see, MultiPerc is made with algorithm 5. If you check the algorithm diagrams on the front panel of the DX, you will see that algorithm 5 has three simple FM pairs. The fact that there are three FM pairs and three different sounds on the keyboard should be making you suspicious. In fact, each pair is responsible for each of the different sounds.

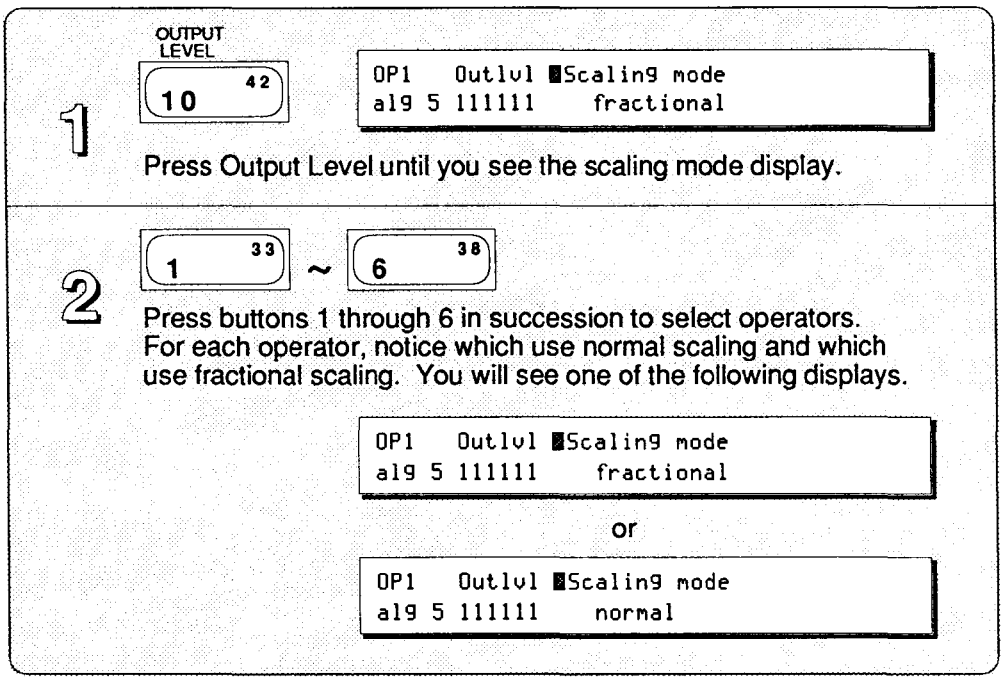
Transposing the Voice to C3



This is to avoid the problems that are a result of Rule 2 (see section three of the first fractional booklet, "Understanding Fractional Scaling"). Whenever you can get away with it, transpose the voice to C3 so that you can see the keygroups in their proper relation to the keyboard. This won't be possible, though, when you need to scale pitches that fall outside the normal DX keyboard range.

The next step is to check which operators use fractional scaling.

Checking Which Operators Use Fractional Scaling

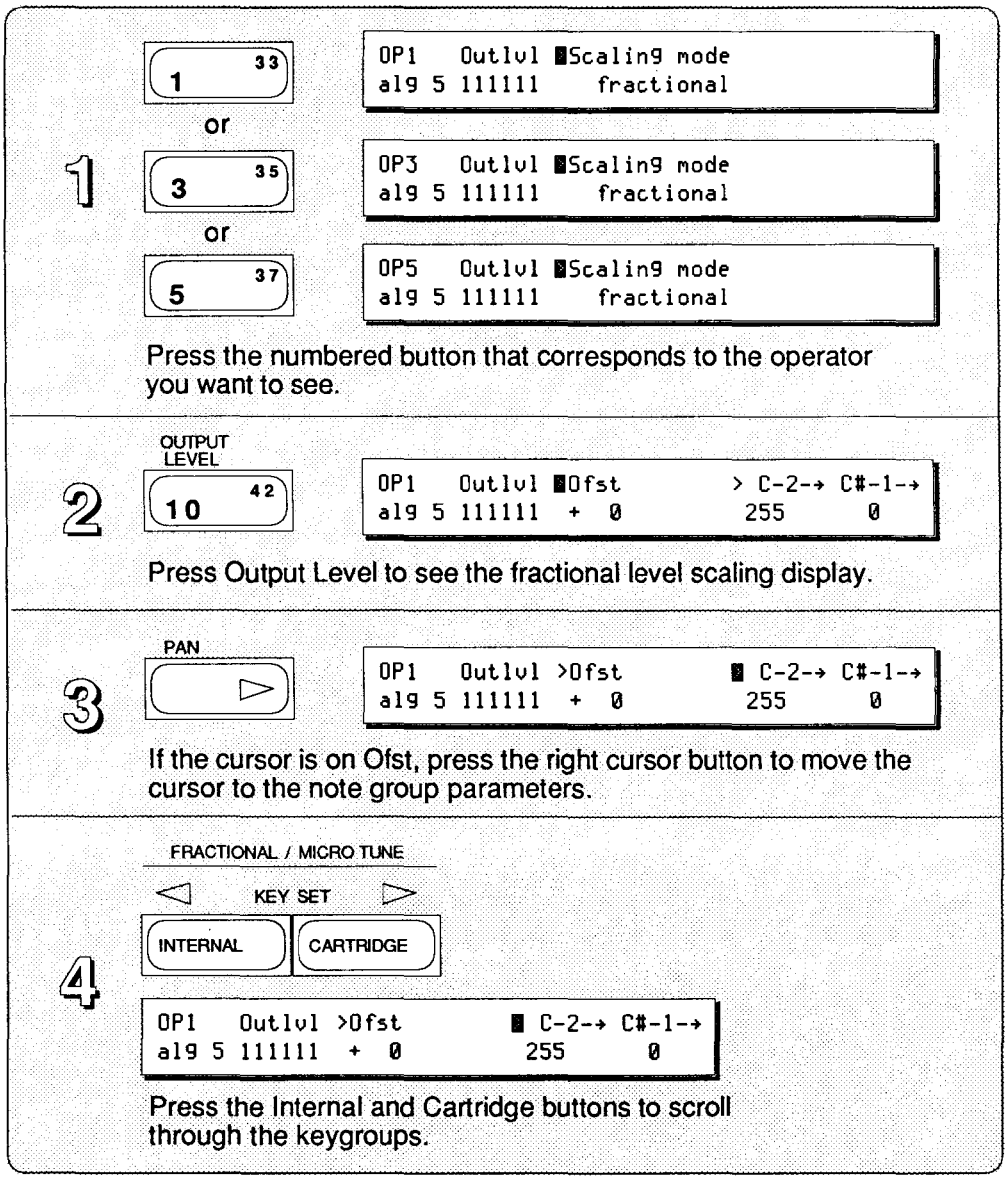


As you cycle through the operators you will see that operators 1, 3 and 5 use fractional scaling and operators 2, 4 and 6 use normal scaling. Operators 1, 3 and 5 are the carriers in algorithm 5. When you look at the fractional scaling data, remember that scaling changes made to a carrier affect the volume of the carrier and all of its modulators.

Also, up to this point you have seen some operators that have used normal scaling and some that have used fractional scaling. But you may not have been aware that both kinds of scaling can be used in the same voice. In other words, just because you choose fractional scaling for one operator in a voice doesn't mean that you have to use fractional scaling for all of the operators in the voice. This system gives you more flexibility and can save you a lot of extra work.

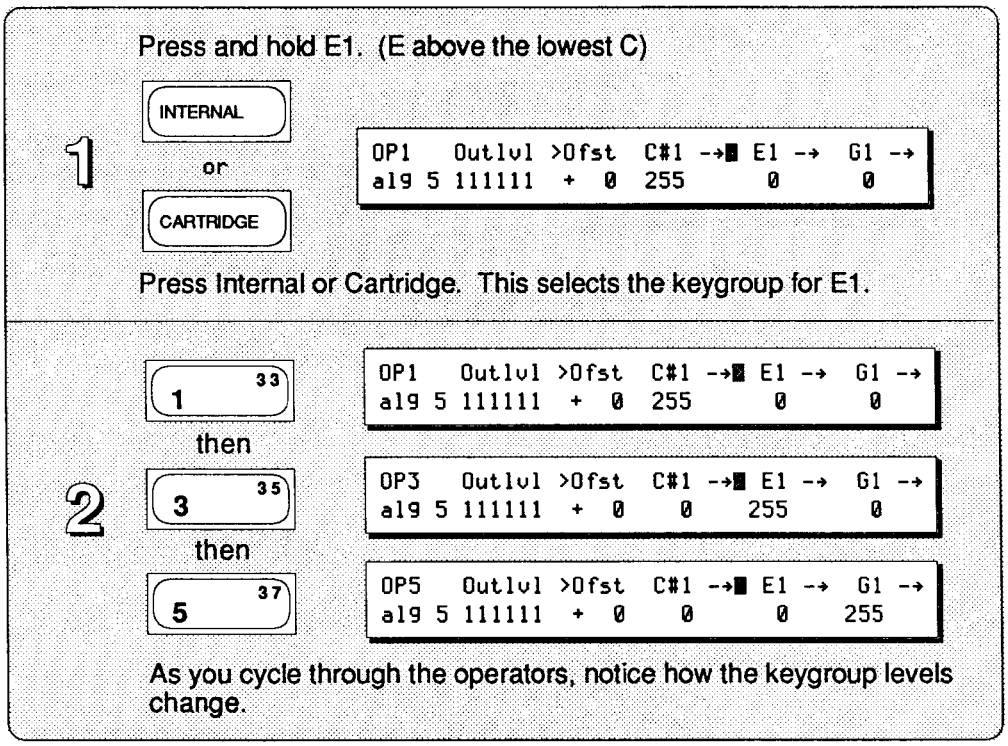
Looking at the Fractional Scaling Data for Operators 1, 3, & 5

Now, look at the fractional scaling data for operators 1, 3 and 5.



All three operators have the same type of scaling. One out of every three keygroups is at full level. This is always followed by two keygroups that are set to 0. To get a clearer idea of what is going on, look at the next example.

Showing the Fractional Scaling Alternate Mode



As you go between the three operators, you can see that the keygroup with the full level moves across the screen. Fractional scaling has been used to create a sort of alternating split. Every third keygroup on each operator is set to full level, but the full level keygroups are staggered so that when two of the operators are turned off the third operator is turned all the way up. Since the carriers are affected, this has the effect of alternately turning the volume of each FM pair on and then off.

The MultiPerc voice demonstrates a rather drastic use of fractional scaling, but it gives you some idea of what you can do. The ability to create multiple key split effects can be very useful and there is no way to reproduce this effect in the normal scaling mode.

2 Fractional Scaling Memory

Before you create a fractional scaling, you'll need to know how to store it. This section describes how fractional scaling data is handled in the DX and shows you how to format a RAM 4 cartridge so that you can store fractional scalings.

Fractional Scaling Memory Management

The way fractional scalings are stored and recalled is different from the way all other data on the DX7 II is managed. You can store voice data, performance data and microtune data to locations inside the DX itself. Fractional scaling data, however, must always be saved to a specially formatted RAM 4 cartridge. This is an important point, so always keep it in mind. **Fractional scaling data can't be saved or recalled without a cartridge.**

The Fractional RAM Buffer

When you first begin working on a fractional scaling, the data is stored in a temporary RAM (Random Access Memory) buffer that resides in the DX. This sounds fancy, but it only means that the DX's internal computer allocates a small area of its memory to storing fractional data you are working on or fractional scalings when they are being used. If you accidently turn off the DX at any time before you save your fractional to a cartridge, it could be completely lost. This is the same sort of thing that occurs when you use any high quality computer, so it's nothing to get worried about. But, as with all computers, you should save your work often to avoid putting yourself through a lot of unnecessary grief.

Edit Recall

In fact, the DX7 II does protect your work in the event of a power failure or accident. You can use the Edit Recall feature to recall the last voice you were editing. When the voice is reloaded, the fractional scaling that you were working on will also be reloaded. Even with this little bit of insurance, though, you should still make a habit of periodically saving your work to cartridge.

The Fractional Cartridge

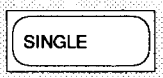
After you are done editing a fractional scaling, you must save the entire voice to one of the 64 internal memories. You must also have a cartridge formatted for fractional scalings inserted in the cartridge slot so that the fractional scalings will be saved. When you save a voice that uses fractional scalings to one of the 64 internal memories, the scalings will be stored in the corresponding memory in the cartridge. So, if you store the voice to internal memory 1, the fractional scalings will be saved to memory 1 on the cartridge.

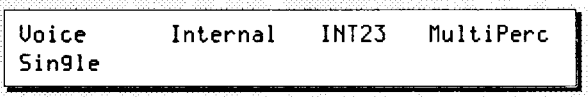
The system works in reverse when you are recalling a voice that uses fractional scalings. If the DX sees that the voice you selected uses fractional scalings, it will look for a cartridge formatted for fractional data. If it finds one, it will load the fractional data for the corresponding voice into the RAM buffer. If it doesn't find a fractional cartridge, it will substitute the scalings that were set up in the normal scaling mode for all of the operators. For instance, if you recall the same voice 1 that you stored in the previous paragraph, the DX will also load the fractional scalings from memory 1 of the cartridge. If there isn't any cartridge inserted or the cartridge isn't formatted for fractional scaling data, the DX will default to the normal level scaling settings for all of the operators. (This is a good reason to create normal scaling versions of a voice before you begin working on the fractional scalings.)

Fortunately, you can always find out if a voice is supposed to use a fractional cartridge as soon as you select it. A small f appears in inverted text in the top center of the LCD display to let you know that the voice has been loaded without the fractional scalings.

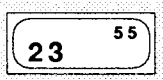
The Normal Scaling Version of the MultiPerc Voice

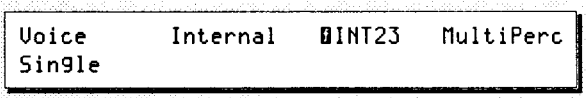
1 Pull the DX7 II fd/d cartridge out of the cartridge slot.

2 



Press Single to enter the single play mode.

3 



Press 23. Notice the small *f* in the center of the upper line of the display. This means that the DX can't find a fractional cartridge, so only normal level scaling is used. Play the keyboard to hear what MultiPerc sounds like without fractional level scaling.

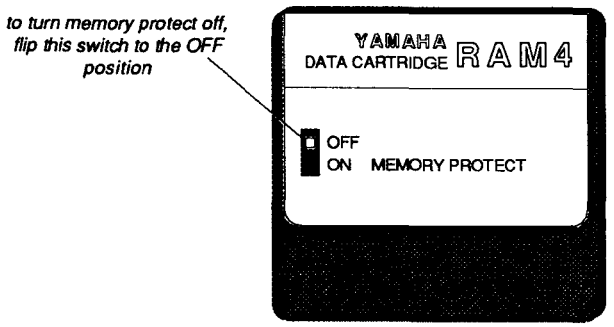
If some of the fractional scaling memory management seems a bit confusing, don't worry. You will be formatting a cartridge next and saving a fractional scaling soon, so it should all become a little clearer. The main thing to remember is that you will always need a properly formatted RAM 4 cartridge in the cartridge slot whenever you want to save or load a voice that uses fractional scaling.

Formatting a RAM 4 Cartridge for Fractional Scalings

Note:

Before you format the cartridge, be aware that you may erase data on it. If there is anything presently on the cartridge that you would like to keep, either save it to another RAM 4 cartridge or a disk.

Turning Off Cartridge Memory Protect



Formatting the Cartridge

1 Insert a RAM 4 cartridge into the DX7 II cartridge slot.

2 COMPARE / EDIT — Press Edit to enter the edit mode.

3 CARTRIDGE 15 47

```
Cartridge      Bank    >Format
Fractional SC.  1
```

Press Cartridge until you see this display.

4 PAN ▷

```
Cartridge      >Bank    Format
Voice & Perf.   1
```

Press the right cursor button to move the cursor to format.

5 YES / +1/ON

```
Cartridge      >Bank    Format
** Are you sure?
```

Press YES.

6 YES / +1/ON

```
Cartridge      >Bank    Format
** Completed!
```

Press YES again. The RAM 4 is now ready to receive fractional scaling data.

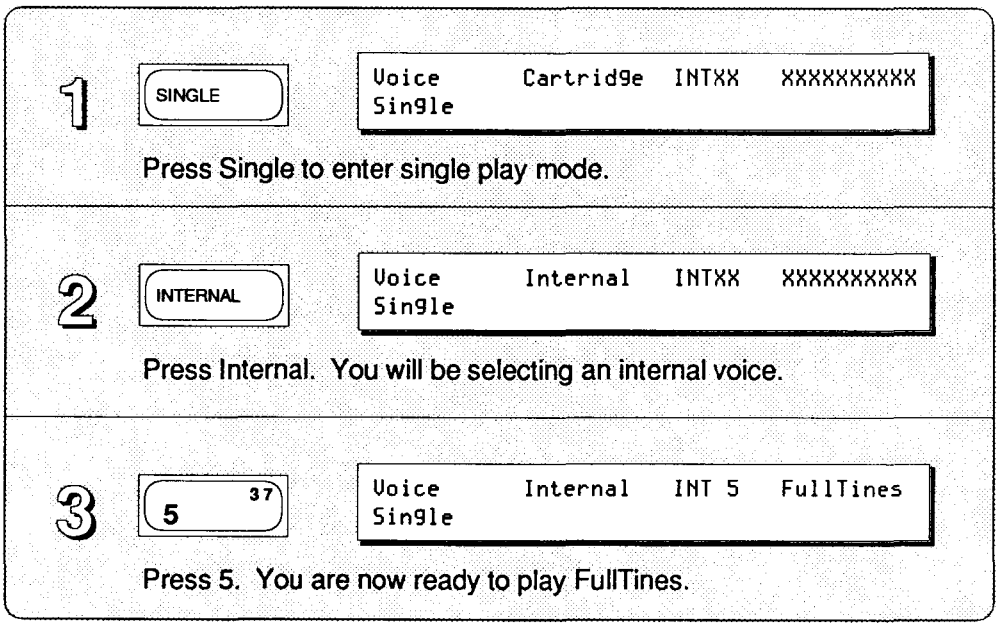
3 Creating a New Fractional Scaling

So far you have seen how fractional scalings work and what they can do. In this section, you will learn how to actually create and store a fractional scaling.

Creating a Fractional Scaling for FullTines

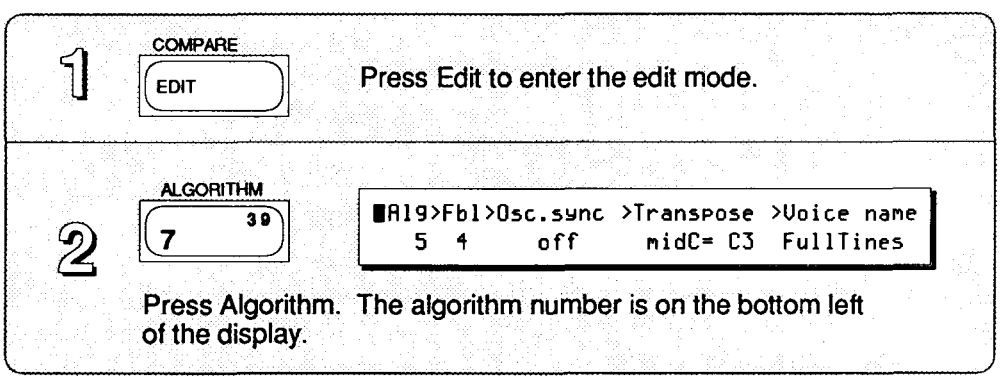
Selecting FullTines

To get started, it will be easiest to modify one of the ROM voices that you loaded into the internal DX memory. Because it's such a familiar sound and easy to edit, you'll be using fractional scalings to change the FullTines voice (INT 5).

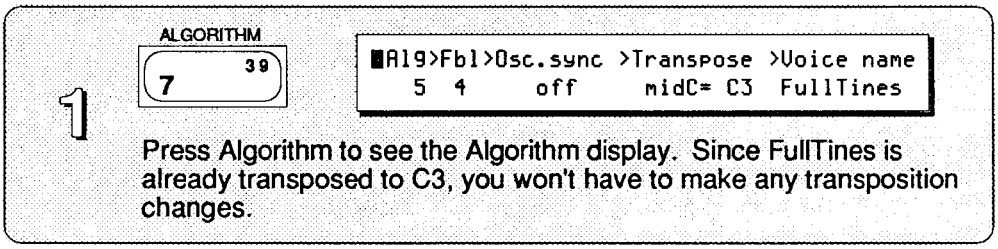


Before you begin editing, check the algorithm and transposition of the voice.

Viewing the Algorithm



Checking the Transposition



Like the MultiPerc voice, FullTines uses algorithm 5. The first FM pair (operators 1 & 2) is making the high tine sound. The second and third FM pairs (operators 3 & 4 and operators 5 & 6) are responsible for the body of the sound. Both of these pairs have a similar tone, and are detuned from one another to add a chorus effect to the voice.

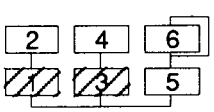
If you were to describe FullTines, you might say that it is an electric piano sound with a pronounced tine. The tone under the tine is fairly dark, but brightens slightly as you play harder.

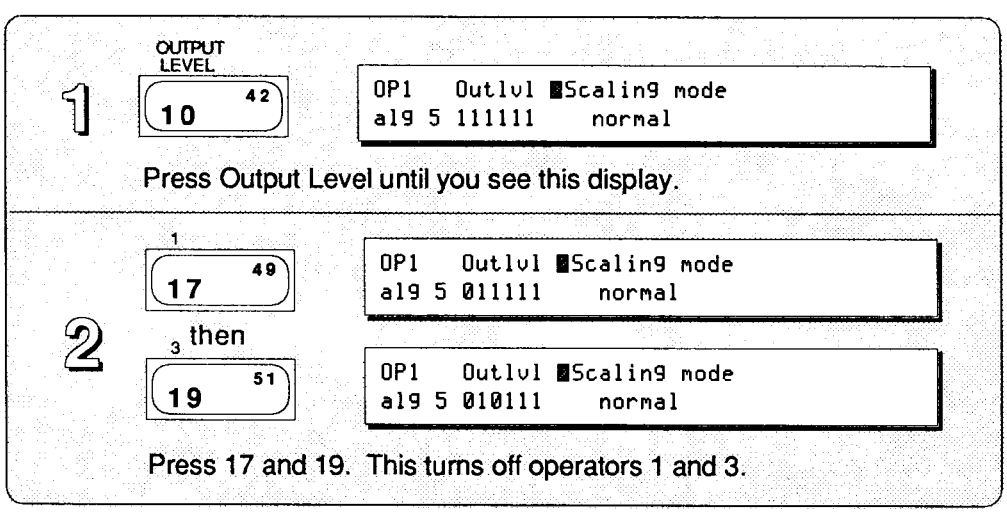
With fractional scaling you can make a very different sounding electric piano without changing any of the basic elements of the voice. You will be making the tone brighter in just the bottom and middle ranges of the keyboard (as they tend to be on real electric pianos). You will also be changing the relative volume and tone of the tine so it isn't quite as exaggerated as it is on the original voice.

Editing the Body of the Voice

In order to brighten the tone of FullTines, you will want to edit the scaling of operators 4 and 6. These are the modulators in the two FM pairs that make up the body of the sound. By increasing their output level in certain portions of the keyboard, you will brighten the tone under the tine. Start with operator 6 and scale only over the length of the DX keyboard. (Don't forget that you will need to do extra scaling later if you decide to transpose the voice.)

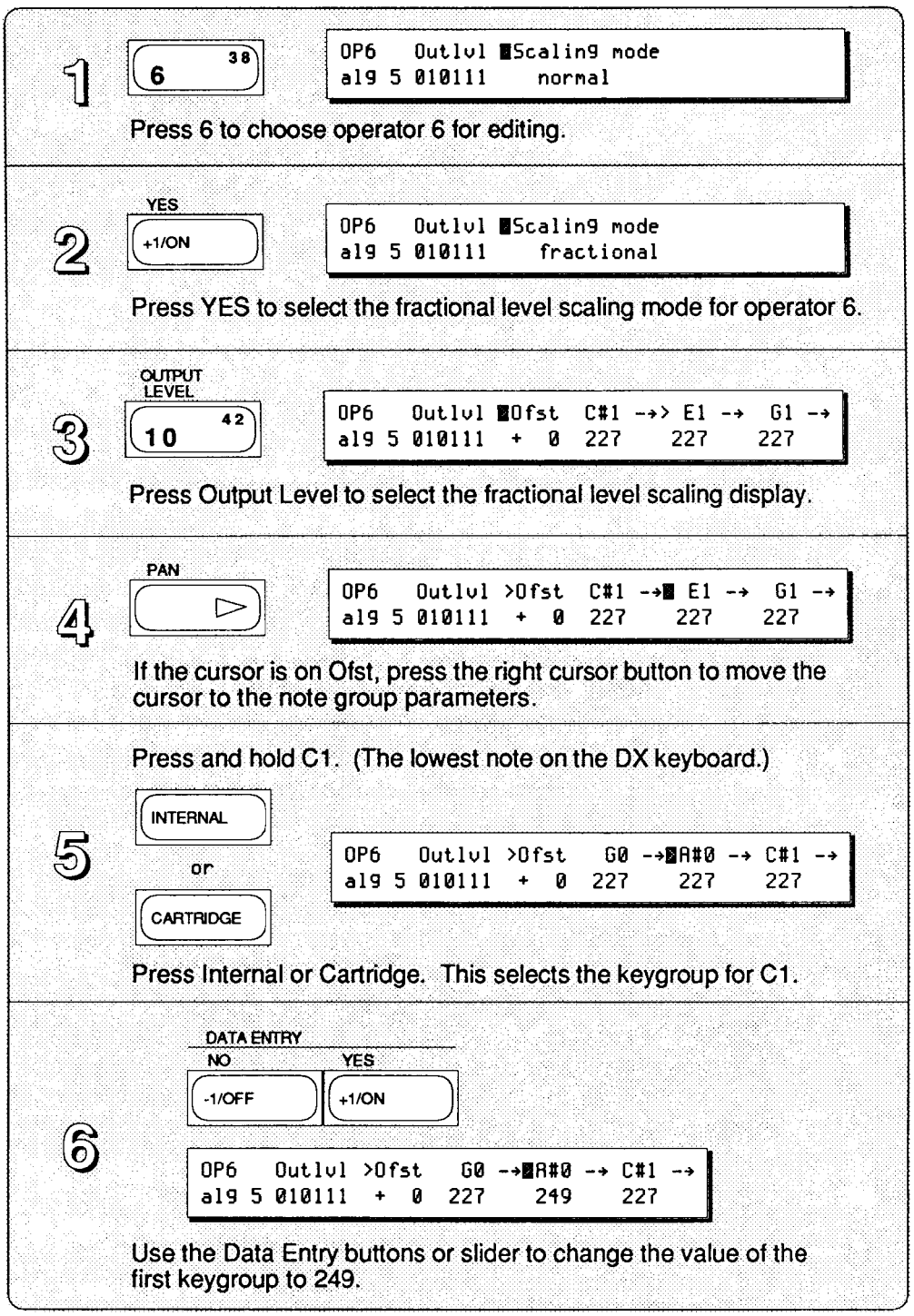
Turning Off Operators 1 & 3



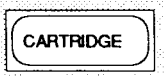


When you turn off these two operators, you isolate operators 5 and 6. Now you can listen to only the two operators that are being affected by the fractional scaling. This is a good habit to get into when you are editing a voice.

Creating a Fractional Scaling for Operator 6



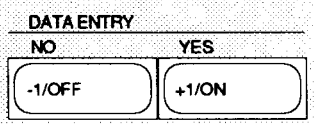
7




```
OP6   Outlvl >Ofst  A#0 ->■C#1 ->  E1 ->
alg 5 010111  +  0  249    227    227
```

Press Cartridge to move the cursor to the next keygroup.

8




```
OP6   Outlvl >Ofst  A#0 ->■C#1 ->  E1 ->
alg 5 010111  +  0  249    248    227
```

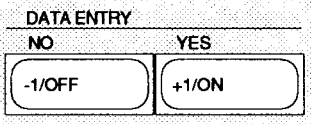
Use the Data Entry buttons or slider to change the value of the keygroup to 248.

9


```
OP6   Outlvl >Ofst  C#1 ->■ E1 ->  G1 ->
alg 5 010111  +  0  248    227    227
```

Press Cartridge to move the cursor to the next keygroup.

10




```
OP6   Outlvl >Ofst  C#1 ->■ E1 ->  G1 ->
alg 5 010111  +  0  248    244    227
```

Use the Data Entry buttons or slider to change the value of the keygroup to 244.

Continue up the keyboard following the same steps. Move the cursor to the next keygroup and change the keygroup value to the value shown on the following chart. Play the keyboard as you make the changes and listen to how the voice is affected. Press the EDIT button at any time to hear the original version. Press EDIT again to return to your edited version.

Operator 6 Data

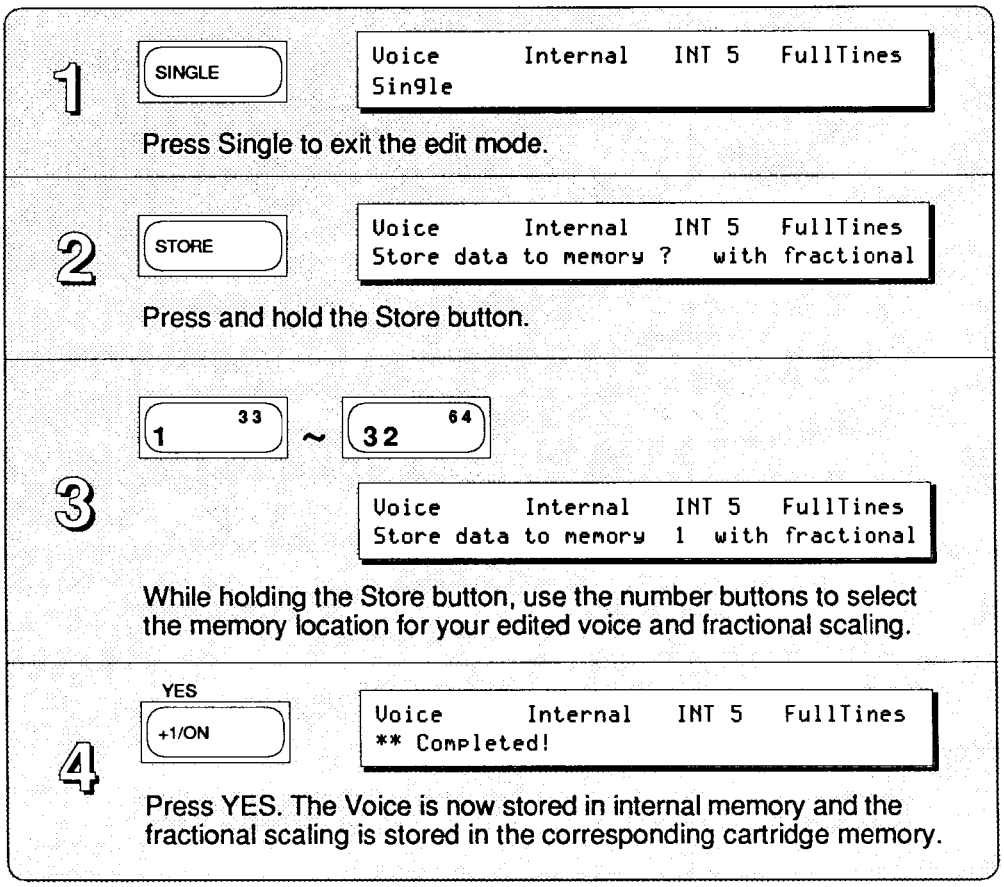
OPERATOR 6

Keygroup	Value	Keygroup	Value	Keygroup	Value
A#0	249	G2	242	E4	234
C#1	248	A#2	240	G4	229
E1	244	C#3	238	A#4	224
G1	244	E3	237	C#5	216
A#1	244	G3	233	E5	217
C#2	244	A#3	230	G5	207
E2	241	C#4	234	A#5	202

Listen to how much brighter the body of the sound is now, especially in the bottom and middle range. Feel free to modify this scaling in any way you like. Don't worry about the numbers in the display, use your ears to help you decide what kind of scaling you prefer. Even though there are more operators to scale, as soon as you are done with operator 6, it is a good idea to store the new version of the voice.

Saving Data

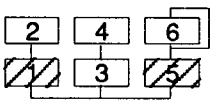
Insert a RAM 4 cartridge that is formatted for fractional scaling and...



When you have stored the voice, you are ready to scale operator 4. You will be more or less duplicating the kind of scaling you set up for operator 6. Again, feel free to make any modifications you want. Notice that there is an offset to be added to this operator.

Using Offset

Turning Off Operators 1 & 5



1 COMPARE / EDIT — Press Edit to enter the edit mode.

2 OUTPUT LEVEL / 10 (42)

```
OP6   Outlvl ▮Scalin9 mode
alg 5 111111     fractional
```

Press Output Level until you see the level scaling display.

3 1 / 17 (49)

```
OP6   Outlvl ▮Scalin9 mode
alg 5 011111     fractional
```

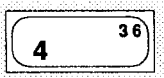
5 then / 21 (53)

```
OP6   Outlvl ▮Scalin9 mode
alg 5 011101     fractional
```

Press 17 and 21 to turn off operators 1 and 5.

Creating a Fractional Scaling for Operator 4

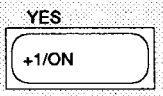
1




```
OP4   Outlvl ■Scalin9 mode
alg 5 011101    normal
```

Press 4 to choose operator 4 for editing.

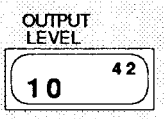
2




```
OP4   Outlvl ■Scalin9 mode
alg 5 011101    fractional
```

Press YES to select the fractional level scaling mode for operator 4.

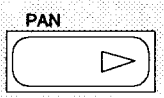
3




```
OP4   Outlvl ■Ofst  C#1 -→> E1 -→  G1 -→
alg 5 011101  +  0  227    227    227
```

Press Output Level to select the fractional level scaling display.

4

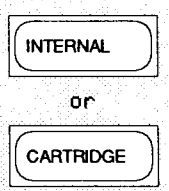



```
OP4   Outlvl >Ofst  C#1 -→■ E1 -→  G1 -→
alg 5 011101  +  0  227    227    227
```

If the cursor is on Ofst, press the right cursor button to move the cursor to the note group parameters.

5

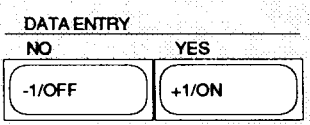
Press and hold C1. (The lowest note on the DX keyboard.)




```
OP4   Outlvl >Ofst   G0 -→■R#0 -→ C#1 -→
alg 5 011101  +  0  235    235    235
```

Press Internal or Cartridge. This selects the keygroup for C1.

6




```
OP4   Outlvl >Ofst   G0 -→■R#0 -→ C#1 -→
alg 5 011101  +  0  235    250    235
```

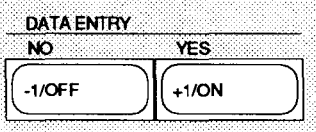
Use the Data Entry buttons or slider to change the value of the keygroup to 250.

7 CARTRIDGE

```
OP4   Outlvl >Ofst  A#0 ->■C#1 ->  E1 ->
al9 5 011101  +  0  250    235    235
```

Press Cartridge to move the cursor to the next keygroup.

8




```
OP4   Outlvl >Ofst  A#0 ->■C#1 ->  E1 ->
al9 5 011101  +  0  250    250    235
```

Use the Data Entry buttons or slider to change the value of the keygroup to 250.

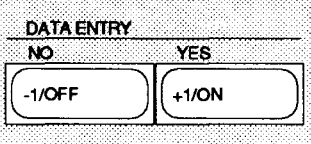
Continue up the keyboard following the same steps. Move the cursor to the next keygroup and change the keygroup value to the value shown on the following chart. Play the keyboard as you make the changes and listen to how the voice is affected. Press the EDIT button at any time to hear the original version. Press EDIT again to return to your edited version. When you are finished editing the keygroups...

9 ◁

```
OP4   Outlvl ■Ofst   G5 ->>A#5 -> C#6 ->
al9 5 011101  +  0  201    200    235
```

Press the left cursor button to move the cursor to Ofst.

10




```
OP4   Outlvl ■Ofst   G5 ->>A#5 -> C#6 ->
al9 5 011101  + 10  201    200    235
```

Use the Data Entry buttons or slider to change the offset value to +10.

Operator 4 Data

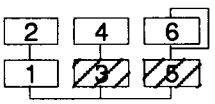
OPERATOR 4

Keygroup	Value	Keygroup	Value	Keygroup	Value
A#0	250	G2	245	E4	223
C#1	250	A#2	246	G4	212
E1	249	C#3	243	A#4	219
G1	249	E3	233	C#5	213
A#1	249	G3	233	E5	209
C#2	244	A#3	235	G5	201
E2	241	C#4	223	A#5	200

Use the offset to brighten or darken the overall scaling once you have set the curve. When a keygroup has reached its maximum level (255) a positive offset won't make any change. To check this, play C1 while you move the offset up with the data entry slider. There is no perceptible difference in the sound even though the offset value changes from +10 to +127. That is because the keygroup at C1 is set to a value of 250 and the offset of +10 already brings it up to its full level. Now try the same thing while you play C6. You will immediately hear a big difference in the brightness of C6 because you are changing the level of its keygroup from 200 to 255 as you increase the offset.

Before you go on, follow the instructions in the Saving Voices diagram to save FullTines.

Turning Off Operators 3 & 5



The next operator to be scaled is operator 1. Operators 1 and 2 are making the tine sound. Because operator 1 is the carrier, reducing its level will reduce the level of the tine portion of the voice.

1 COMPARE / EDIT — Press Edit to enter the edit mode.

2 OUTPUT LEVEL — 10 (42)

```
OP4   Outlvl ■Scaling mode
alg 5 111111     fractional
```

Press Output Level until you see the level scaling display.

3 3 — 19 (51)

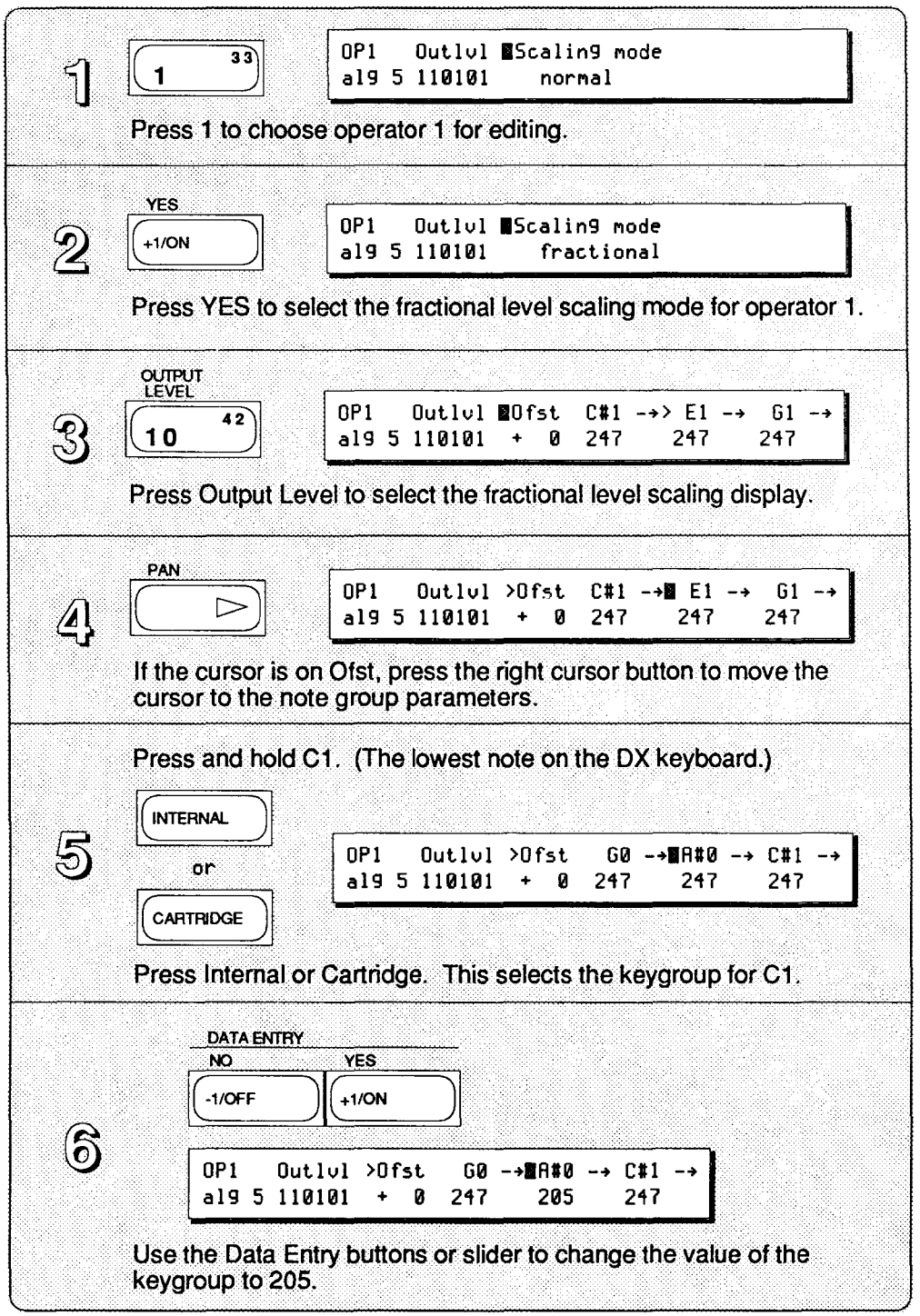
```
OP4   Outlvl ■Scaling mode
alg 5 110101     fractional
```

then 5 — 21 (53)

```
OP4   Outlvl ■Scaling mode
alg 5 110101     fractional
```

Press 19 and 21 to turn off operators 3 and 5.

Creating a Fractional Scaling for Operator 1

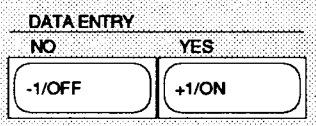


7 CARTRIDGE

```
OP1   Outlvl >Ofst  A#0 ->■C#1 ->  E1 ->
alg 5 110101  +  0  205    247    247
```

Press Cartridge to move the cursor to the next keygroup.

8




```
OP1   Outlvl >Ofst  A#0 ->■C#1 ->  E1 ->
alg 5 110101  +  0  205    215    247
```

Use the Data Entry buttons or slider to change the value of the keygroup to 215.

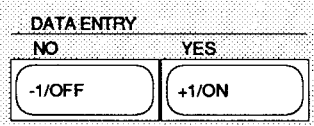
Continue up the keyboard following the same steps. Move the cursor to the next keygroup and change the keygroup value to the value shown on the following chart. Play the keyboard as you make the changes and listen to how the voice is affected. Press the EDIT button at any time to hear the original version. Press EDIT again to return to your edited version. When you are finished editing the keygroups...

9 ◁

```
OP1   Outlvl ■Ofst   G5 ->>A#5 -> C#6 ->
alg 5 110101  +  0  233    255    247
```

Press the left cursor button to move the cursor to Ofst.

10




```
OP1   Outlvl ■Ofst   G5 ->>A#5 -> C#6 ->
alg 5 110101  + 11  233    255    247
```

Use the Data Entry buttons or slider to change the offset value to +11.

Operator 1 Data

OPERATOR 1

Keygroup	Value	Keygroup	Value	Keygroup	Value
A#0	205	G2	203	E4	207
C#1	215	A#2	201	G4	205
E1	211	C#3	203	A#4	195
G1	217	E3	201	C#5	201
A#1	217	G3	206	E5	223
C#2	197	A#3	205	G5	233
E2	199	C#4	207	A#5	255

When you are finished, be sure to save the voice again.

There is only one more operator that should be edited. The overall level of operator 2 has to come down to take a little edge off the tine. Since operator 2 is a modulator, changes you make will affect the tone of the tine rather than the level.

Creating a Fractional Scaling for Operator 2

1 COMPARE / EDIT

Press Edit to enter the edit mode.

2 OUTPUT LEVEL / 10 42

```
OP1   Outlvl ▮Scaling mode
alg 5 111111    fractional
```

Press Output Level until you see the level scaling display.

3 2 34

```
OP2   Outlvl ▮Scaling mode
alg 5 111111    normal
```

Press 2 to choose operator 2 for editing.

4 YES / +1/ON

```
OP2   Outlvl ▮Scaling mode
alg 5 111111    fractional
```

Press YES to select the fractional level scaling mode for operator 2.

5 OUTPUT LEVEL / 10 42

```
OP2   Outlvl >Ofst  C#1 ->▮ E1 ->  G1 ->
alg 5 111111  +  0  217    217    217
```

Press Output Level to select the fractional level scaling display.

6 POLY / MONO / ◁

```
OP2   Outlvl ▮Ofst   G5 ->>A#5 -> C#6 ->
alg 5 111111  +  0  217    217    217
```

Press the left cursor button to move the cursor to Ofst.

7 DATA ENTRY — NO: -1/OFF — YES: +1/ON

```
OP2   Outlvl ▮Ofst   G5 ->>A#5 -> C#6 ->
alg 5 111111  - 12  217    217    217
```

Use the Data Entry buttons or slider to change the offset value to -12.

That's it for this operator and you're probably wondering why (or maybe you're just glad you didn't have to enter a bunch of numbers again). You could have left the normal scaling mode and adjusted the output level to achieve the same effect. There is a small advantage to the way you just changed operator 2, though.

If you don't want to use your fractional scaling cartridge with FullTines, the voice will be exactly the same as it was before you started editing. In other words, you now have two usable versions of FullTines: one if the fractional cartridge is inserted and one if the fractional cartridge isn't used. If you would have changed the output level of operator 2, both the fractional and normal versions of the voice would be different. Sometimes you will be able to get away with this sort of thing, so keep it in mind while you are editing.

Now that you're finished editing the voice, store it for the last time.

4 Storing Fractional Scalings to Disk (FD Only)

If you're using a DX7 II FD you can backup your fractional scalings on disk. You still need to use a cartridge when you are creating or recalling scalings, but the disk provides a great way to protect your work.

Moving Fractional Scalings Between Cartridge and Disk

Backing Up a Fractional Cartridge on Disk

Turn off the memory protect on the disk and insert it into the disk drive.

1 COMPARE / EDIT — Press Edit to enter the edit mode.

2 DISK / 16 48

```
Disk CRT  ▮Dir>Save>Load>Del>Rename>Bank
** Set disk and push [yes]            1
```

Press Disk until you see this display.

3 YES / +1/ON

```
Disk CRT  ▮Dir>Save>Load>Del>Rename>Bank
File  8   ........
```

Press YES until you find an empty file.

4 PAN / ▷

```
Disk CRT  >Dir▮Save>Load>Del>Rename>Bank
File  8   ........ input filename?
```

Press the right cursor button to move the cursor to Save.

5 COMPARE / EDIT / CHARACTER

```
Disk CRT  >Dir▮Save>Load>Del>Rename>Bank
File  8   NewFile  input filename?
```

Press and hold the Edit/Character button and type in a name for the file you wish to save to disk.

6 YES / +1/ON

```
Disk CRT  >Dir▮Save>Load>Del>Rename>Bank
File  8   NewFile  ** Are you sure?
```

Press YES.

7 YES / +1/ON

```
Disk CRT  >Dir▮Save>Load>Del>Rename>Bank
     **BUSY** Now executing!
```

Press YES. You will see this display while the cartridge is saving to disk.

```
Disk CRT  >Dir▮Save>Load>Del>Rename>Bank
File  8   NewFile  ** Completed
```

You will see this display when the save is completed.

Loading Fractional Scalings from Disk to Cartridge

Turn off the memory protect on the disk and insert it into the disk drive.

1 COMPARE / EDIT — Press Edit to enter the edit mode.

2 DISK (48) 16

```
Disk CRT  ▮Dir>Save>Load>Del>Rename>Bank
** Set disk and push [yes]          1
```

Press Disk until you see this display.

3 YES / +1/ON

```
Disk CRT  ▮Dir>Save>Load>Del>Rename>Bank
File  8   NewFile
```

Press YES until you find the desired file.

4 PAN / ▷

```
Disk CRT  >Dir>Save▮Load>Del>Rename>Bank
File  8   NewFile  to cartridge ?   1
```

Press the right cursor button to move the cursor to Load.

5 YES / +1/ON

```
Disk CRT  >Dir>Save▮Load>Del>Rename>Bank
File  8   NewFile  ** CRT=FKS-Y  ok?
```

Press YES. The display tells you what kind of information the inserted cartridge is formatted to receive.
The cartridge will automatically be formatted for fractional scaling data when you transfer the file.

6 YES / +1/ON

```
Disk CRT  >Dir>Save▮Load>Del>Rename>Bank
File  8   NewFile  ** Are you sure?
```

Press YES.

7 YES / +1/ON

```
Disk CRT  >Dir>Save▮Load>Del>Rename>Bank
     **BUSY** Now executing!
```

Press YES. You will see this display while the file is loading to the cartridge.

```
Disk CRT  >Dir>Save▮Load>Del>Rename>Bank
File  8   NewFile  ** Completed
```

You will see this display when the load is completed.

Fractional Scaling Data Chart

Voice Name _____ Operator - 1 2 3 4 5 6

C -2			
C# -1	E -1	G -1	A# -1
C# 0	E 0	G 0	A# 0
C# 1	E 1	G 1	A# 1
C# 2	E 2	G 2	A# 2
C# 3	E 3	G 3	A# 3
C# 4	E 4	G 4	A# 4
C# 5	E 5	G 5	A# 5
C# 6	E 6	G 6	A# 6
C# 7	E 7	G 7	A# 7
C# 8	E 8	G 8	Offset

Voice Name _____ Operator - 1 2 3 4 5 6

C -2			
C# -1	E -1	G -1	A# -1
C# 0	E 0	G 0	A# 0
C# 1	E 1	G 1	A# 1
C# 2	E 2	G 2	A# 2
C# 3	E 3	G 3	A# 3
C# 4	E 4	G 4	A# 4
C# 5	E 5	G 5	A# 5
C# 6	E 6	G 6	A# 6
C# 7	E 7	G 7	A# 7
C# 8	E 8	G 8	Offset