AlgoRhythms

COLLABORATORS

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Chapter 1

AlgoRhythms

1.1 AlgoRhythms Guide

```
                AlgoRhythms 3.1 Copyright (c) 1984 Thomas E. Janzen All Rights ↩
                   Reserved.
Welcome to AlgoRhythms(TM) 3.0 by Thomas E. Janzen!  This updates the
earlier versions on Freely Redistributable Amiga Library disks 356
(AlgoRhythms 1) and 606 (AlgoRhythms 2).  AlgoRhythms is a freeware
(NOT PUBLIC DOMAIN!!!) program.  DO NOT REDISTRIBUTE THIS SOFTWARE IN
ANY WAY EXCEPT THE WAY YOU RECEIVED IT.  DO NOT CHANGE AND REDISTRIBUTE
THE SOFTWARE.  AlgoRhythms is provided without warranty.  Thomas E. Janzen
assumes no responsibility for the use or reliability of this softare.
It improvises music on a Commodore Amiga (TM).  For more information,
read the following:


                 Basic Principles

                 Menus

                 FORM PARAMETER window

                 VOICES window

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                 Arexx

                 Known Bugs
                **    Thomas E. Janzen
**    208A Olde Derby Road
**    Norwood, MA  02062-1761
**    (617)769-7733
**    tej@world.std.com
**
```

1.2 bugs

1. The few Arexx commands that are not implemented are marked in the AmigaGuide under Arexx .

2. Audio will not work from a second simultaneous AlgoRhythms process, because the audio code doesn’t share at this time. The MIDI device is shared. Also, running other programs that use the audio device may or will crash the computer or stall AlgoRhythms. Only one copy of AlgoRhythms may use the audio device.

3. AlgoRhythms grabs your serial device even if you have no MIDI gear. Don’t try to run other users of the serial device while running AlgoRhythms, unless you discover a MIDI program that shares the MIDI device nicely the way AlgoRhythms does.

1.3 menus

Projects

Music

1.4 music

The Music menu has only one item: ReDraw (Amiga-D). Selecting this item will re-draw the main display window, reflecting any changes in the form.

The reason that the screen is not re-drawn automatically after form changes is to avoid stalling the music. The only automatic redraw is after a Load Form A-L operation.

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Duration

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Pace

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hira joshi

kumoi joshi

kokin joshi

whole tone

Quintal

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Hungarian Minor

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Mode 6

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Chromatic

1.8 play

Play A-P

If you select the Play function with the mouse or by hitting the Right Amiga key and the "P" key, the music will start playing via the serial port from the beginning (the left side of the form display). In addition, a vertical cursor will show time passing by moving left to right.

Before starting to play, AlgoRhythms sends a MIDI Start command. This is useful for recording AlgoRhythms with a MIDI sequencer. Notes are played with the MIDI Note On command. Before a new note is sent out to an AlgoRhythms voice, a Note Off command is sent to stop the previous note. MIDI clock commands are sent about 25 times a second regardless of the setting of Pulse, unless it is zero. If Pulse is set to zero, no MIDI clock commands are sent.

1.9 stop

Stop A-S

If you select the Stop function with the mouse or by hitting the Right Amiga key and the "S" key, the music will stop playing if it had been playing. MIDI Note Off commands are sent to notes that were on when you activated the Stop function. After all notes are stopped, a MIDI Stop command is sent.

1.10 continue

Continue A-C

If you activate the Continue function with the mouse or by hitting the Right Amiga key and the "C" key, the music will continue in the graph where it left off when you hit "Stop." A MIDI Continue command will be sent.

1.11 loadform

Load Form A-L

If you select the Load function with the mouse or by hitting the Right Amiga key and the "L" key, a file requester will appear. You can select the form file to load. After you select a form file, the form display window will be re-drawn.

AlgoRhythms form files are summaries of the form or shape of the piece selected in the Form and Scales menu strips. Because form files are text files, you can edit them in a text editor and load them, but they must be in an exact form.

See also

Load File Format

1.12 loadfileformat

Form files may not have comments. The comments below are tutorial.

```
600.00 -- duration of the piece, in seconds
0.0    -- minimum duration for any note
2.0    -- maximum duration for any note
13     -- number of notes in the scale
48     -- the MIDI note numbers of the scale pitches
50
53
55
58
60
62
65
67
70
72
74
77
16      -- maximum number of voices playing at once
10      -- pulses per second
200.00  Pitch form -- Mean period in seconds
-1.57   -- starting phase of mean in radians
200.00  -- Spread period in seconds
```

```
-1.57   -- Spread starting phase in radians
200.00  Rhythm form -- Mean period in seconds
1.57    -- starting phase of mean in radians
200.00  -- Spread period in seconds
-1.57   -- spread starting phase in radians
200.00  Dynamics form -- Mean period in seconds
-1.57   -- starting phase of mean in radian
200.00  -- Spread period in seconds
-1.57   -- spread starting phase in radians
200.00  Texture form -- Spread period in seconds
-1.57   -- starting phase of spread in radians
24  96  0  1 0 Low and High Pitch, MIDI Channel, Walking, Audio
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
24  96  0  1 0
```

The last 20 lines give the lowest pitch, highest pitch, MIDI channel (of 0 to 15) walking (walking=1; not walking=0), and MIDI/Audio (0 = MIDI, 1 = Audio) for each of the AlgoRhythms voices. These can be changed while the program is running. The lowest pitch is the lowest pitch allowed in the voice. This helps you avoid having AlgoRhythms play pitches that are not appealing for a particular sample, for example. If the voice is walking up and down the scale, it will turn around at the lowest pitch and highest pitch and head back towards the middle of the range of the instrument. If the voice is playing random notes, It will simply not play notes that are out of range, defined by the lowest note and highest note. The voice will rest for the duration of the out-of-range note. A voice with a random melody and a narrow range may not play very much, but be silent instead.

Loading edited files affords the opportunity of loading scales other than the scales in the scales menu. Transposition works on imported scales using
Transpose
gadget.

1.13 saveform

Save Form A-F

If you select the Save function with the mouse or by hitting the Right Amiga key and the "F" key, a file requester will appear into which you may type a file name for saving the form file. A name similar to "file.form" is recommended. A form file will be saved, and loaded again later if desired. This file is a text file can be (carefully) edited.

See also
Load File Format

1.14 record

Record A-R

If you select the Record function with the mouse or by hitting the Right Amiga key and the "R" key, AlgoRhythms will make an internal recording of the note events of everything it plays from then on. It dynamically allocates memory until it runs out of memory, at which point it disables further recording. The only use for this is to save this recording as a MIDI file.

1.15 erase

Erase A-E

Erase clears out the recording memory activated by the Record function, above. It frees up memory in your Amiga for other applications or for more recording.

1.16 savemidi

Save MIDI A-M

If you select the Save MIDI function with the mouse or by hitting the Right Amiga key and the "M" key, you can save a standard MIDI file of the recording made by AlgoRhythms of its own output. This MIDI file can then be loaded into commercial MIDI software packages, such as sequencers, editors, and score printers. If you have a score printing program, you could print an AlgoRhythms-created MIDI file, so that human performers could play the music composed by AlgoRhythms. You will probably find, however, that in order to make a human-playable score with AlgoRhythms, you should use AlgoRhythms voice parameters to carefully limit the pitch range for each channel, separate the players by MIDI channel, and use a commercial sequencing program to quantize rhythms and line them up with measure bars.

The MIDI files created by AlgoRhythms always use 240 ticks per quarter

note, and a metronome marking of 60 quarters per minute. This usually will not line up with the Pulse setting, so a good sequencer program is needed to expand/compress the note values to match a tempo marking before a neat score can be printed. The file is a type 1 (multitrack) file with one track. The track name is, roughly, "AlgoRhythms by Tom Janzen."
If you wish to print a score with separate staffs, you will have to assign a different MIDI channel to voices in AlgoRhythms, and separate the channels into different tracks in the MIDI sequencer.

1.17 about

About A-A

If you select the About function with the mouse or by hitting the Right Amiga key and the "A" key, you will see a copyright notice for AlgoRhythms.

1.18 quit

Quit A-Q

If you select the Quit function with the mouse or by hitting the Right Amiga key and the "Q" key, or hit the window close gadget, the music will stop and AlgoRhythms will exit.

1.19 maxvoices

The Max Voices gadget displays the maximum number of voices playing, when the waveform for Texture is at its peak. Voice 0 always plays. The low-numbered AlgoRhythms voices have precedence. If you specify three voices, voices 0, 1, and 2 play, for example. you may set any number from 1 to 20, inclusive. Just click on the gadget to cycle it from 1 to 20 and back to 1 again.

1.20 pulse

The Pulse gadget displays the pulses per second in the music. After clicking on the gadget, you can edit the number. Values from 5 to 12 make a real difference. Numbers over 20 have little effect. Numbers over 25 would have no effect at all. Entering a zero would eliminate quantization, and the rhythm would be very fluid (also AlgoRhythms takes much more of the CPU resource from the operating system). The actual tempo lags behind the pulse setting somewhat, but this has not been characterized. Casual measurements give 6 pulses per second when 8 is chosen, and higher values seem to lag to an even greater extent. MIDI Timing Clocks are sent about 25 times a second regardless of tempo unless Pulse is set to zero, in which case no Timing Clocks are sent.

Setting the pulse gives the music a rhythmic feeling. AlgoRhythms does not model musical meter or measures, but pulse gives the music a metric feeling in spite of this.

1.21 duration

The Duration gadgets allow you to change the minimum and maximum duration of note events. The Min gadget allows you to edit the minimum note length, typically equal to 0, and the Max gadget allows you to edit the Maximum duration of a value. The random lengths of notes are selected from within the resulting range. The purpose of these gadgets is to allow synthesizer voices with long attacks to speak fully before ending, even if the rhythm form specified short notes. Setting the minimum note length to a few seconds and the maximum note length to something longer allows you to make slow music with long gentle attacks, decays, and releases.

1.22 pitch

The mean curve tracks the center of the tessitura (range of pitches in the scale) of the voice. The range curve determines how wide a range of pitches will be played. If a voice's melody is "walking", the pitch curves do not affect it at all. Walking tends to sound more natural.

Mean Period

Mean Phase

Range Period

Range Phase

Randomize

1.23 pace

Set up the rhythm form curve. The mean determines the (rough) average duration of note events. The range determines the difference between the shortest and longest durations used.

Mean Period

Mean Phase

Range Period

Range Phase

Randomize

1.24 dynamics

Set up the dynamics form curve. The mean curve tracks the average loudness. The range curve determines the range of loudness.
A wider range sounds more accented and human.

Mean Period

Mean Phase

Range Period

Range Phase

Randomize

1.25 texture

Set up the texture form curve. The range determines how many voices play.
When the range is narrowest, at least one voice plays. When widest,
the number of voices set by Max Voices plays.

Range Period

Range Phase

Randomize

1.26 notelength

The minimum and maximum note length determine the widest range of note
durations from which note lengths will be chosen, using the pace curves.

Minimum

Maximum

1.27 transpose

The Transpose gadget permits you to enter the number of half-steps to transpose the scale. This takes effect immediately. For example, if AlgoRhythms is playing in the diatonic scale, and you use Tranposition to tranpose the scale by +3 steps, the new scale will correspond to E-flat major instead of C-major.

The value you enter will be "modulus" 12. If you enter 13, the transposition will be by 1 half-step. You may enter negative numbers from -1 to -11 to effect a downward transposition.

Note that since AlgoRhythms does not model triadic harmony, or emphasize scale tones differently, the feeling of key is weak, and transposition tends to have an effect only right after the change.

1.28 pentatonic

Pentatonic

This long scale consists of C, D, F, G, B-flat.

1.29 shortpentatonic

Short Pentatonic

This short scale is a pentatonic scale from the C below middle-C to the F an eleventh above middle-C, including C, D, F, G, B-flat.

1.30 harmonic

Harmonic

This short scale is an approximation of a harmonic series, using notes: C1, C2, G2, G2, C3, E3, G3, A#3, C4, D4, E4, F#4, G4, A4, B4, C2, C5. The doubled notes are intended to favor the fundamental.

1.31 diatonic

Diatonic

This long scale is the white keys of the piano, which corresponds to C-major.

1.32 hira

```
Hira

This short scale is a tuning of the classical Japanese
instruments, the koto.  The pitches are:

A3, B3, middle C4, E4, F4, A4, B4, C5, E5, F5, A5, B5
```

1.33 kumoi

```
Kumoi

This short scale is a tuning of the classical Japanese
instruments, the koto.  The pitches are:

A3, A#3, D4, E4, F4, A4, A#4, D5, E5, F5, A5, B5
```

1.34 kokin

```
Kokin

This short scale is a tuning of the classical Japanese
instruments, the koto.  The pitches are:

B3, D4, E4, F4, A4, B4, D5, E5, F5, A5, B5
```

1.35 wholetone

```
Wholetone

This long scale is a long scale including only C, D, E, F#,
G#, A#.
```

1.36 quintal

```
Quintal

This is a long scale of all perfect fifths, rising, and does
not repeat every octave, of course.
```

1.37 minor2major3

Minor2 Major3

This is a long scale from 24 to 96 that does not repeat each octave. As it rises from note number 24, it alternates minor third, major second, minor third, major second, minor third, major second, and so on.

1.38 harmonicminor

Harmonic Minor

This long scale, in C, consists of C, D, E-flat, F, G, A-flat, B.

1.39 hungarianminor

Hungarian Minor

This long scale, in C, consists of C, D, E-flat, F#, G, A-flat, B.

1.40 diminished

Diminished

This long scale consists of C, D, E-flat, F, F#, G#, A, B.

1.41 mode3

Mode 3

This long scale consists of C, D, E-flat, F, F#, G#, A, B.

1.42 mode4

Mode 4

This is another long scale from Olivier Messiean's book. Messiean designates it as mode number 4. The notes are C, Db, D, F, F#, G, Ab, B.

1.43 mode5

Mode 5

This is another long scale from Olivier Messiean’s book. Messiean designates it as mode number 5. The notes are C, Db, F, Gb, F, B.

1.44 mode6

Mode 6

This is another long scale from Olivier Messiean’s book. Messiean designates it as mode number 4. The notes are C, D, E, F F#, G#, A#, B.

1.45 mode7

Mode 7

This is another long scale from Olivier Messiean’s book. Messiean designates it as mode number 7. The notes are C, Db, D, Eb, F, F#, G, F#, A, B.

1.46 quartal

Quartal

This is a long scale of all perfect fourths, rising, and does not repeat every octave of course.

1.47 major3minor2

Major 3 Minor 2

This is a long scale from 24 to under 96 that does not repeat each octave. As it rises from note number 24, it alternates major third, minor second, major third, minor second, and so on.

1.48 chromatic

Chromatic

This long scale is a chromatic scale of over six octaves from MIDI 24 to 107.

1.49 meanperiod

The Mean Period is the period of the sine-wave oscillation of the rough mean value. For the Pitch menu-item, Mean Period is the length of the cycle through which the mean value for pitch moves. A sine-wave moves up and down gradually with time:

```
      **           **
    **   **
  *        **   *
**           **
```

The wave is shown with phase zero. Here is a sine-wave with different phases, in radians:

 pi radians (gadget will read 314):

```
        **
*     **  *
 *   *
  **
```

.5 * pi radians (gadget will read 1.57):

```
*          **
  *      **
   **   *
     **
```

-0.5 * pi radians (gadget will read -1.57):

```
    **
  **  *
 *     *
*       **
```

There are 2 * pi (6.28...) radians in a circle. 1 * pi (3.14159...) radians is a semi-circle. The proportional gadget for entering phase is a horizontal slider. Zero phase is in the center. Pi radians (half circle) is all the way to the right and minus Pi radians is all the way to the left.

If you enter a period of 180 seconds, it will take the mean pitch 180 seconds (three minutes) to move all the way up and down the range of the scale before returning to the beginning phase. If you enter 10000 seconds for the period, the mean pitch will virtually not change at all. Sometimes you will want a form parameter to remain at one value; this is the way to do it.

The equation for pitch with no range control is:

```
pitchpoint = sin( 2 * pi * time / period  + phase)

pitch_index= (pitchpoint + 1) * scale_range
```

```
pitch=scale(pitch_index)
```

1.50 meanphase

The phase (in radians) of the mean curve.
The slider reads in hundredths of radians
from -314 to +314, meaning from -pi to +pi
radians.

1.51 rangeperiod

Set the length, in seconds, of the period of a sinusoid
which controls the range of values used for the parameter.

1.52 rangephase

Set the phase, in radians, of the sinusoid the controls
the range of values for the parameters.

1.53 randomize

Select some pseudo-random values for the four values for the
parameter. The gadgets for the parameter will change to
reflect the random selections.

1.54 maximum

Set the maximum length of a note event in floating-point seconds.

1.55 minimum

Set the minimum length of a note event in floating-point second.

1.56 voices

VOICE

Channel

Melody

MIDI_Audio

High Note

Low Note

1.57 channelgadget

The channel gadget is a listview gadget that allows you to select ↩ the channel through which to send the voice. If the voice is set for MIDI, the channel is a midi channel, of MIDI channels 1 to 16. If the voice is set for Audio, the channel refers to a chair for an instrument (either default or loaded as an 8SVX file) (using the Orchestra window).

1.58 voicegadget

The VOICE gadget cycles from Voice 1 to voice 20 and to 1 again. The other parameters in the VOICE are the settings for the voice whose number appears in the Voice gadget.

1.59 melodygadget

The Melody Gadget allows you to determine whether the voice plays random pitches (Random)(evenly distributed throughout the scale) or randomly walks up and down by scale-steps (Walking). If pitches are calculated during the performance that fall outside the range of a voice (as determined by High Note and Low Note) with a Random melody, the pitch will not be played and the voice is silent. If a Walking voice walks to the High Note or Low Note, it turns back toward the center of the range. Therefore, walking voices are never silent, but random voices sometimes are.

A mathematical random walk allows a drunk to take any sized step in any direction. AlgoRhythms uses a walk that can do three things: it can go up a step, down a step, or not move.

1.60 midi_audio

The MIDI/Audio gadget allows you to select whether the voice plays out the serial device to MIDI, on the MIDI channel given in the Channel gadget, or plays out the audio port using the audio voice loaded into the "chair" given in the Channel gadget. When AlgoRhythms is started, there is a default sawtooth-like instrument.

1.61 highnote

"High Note" and "Low Note" define the range allowed in the voice. As explained before, a voice will not play out-of-range notes in random mode, and turns back from range boundaries in walk mode.

Note that, in random notes (non-walking) mode, if your current scale has a broader range than the AlgoRhythms voices (set with High Note and Low Note), AlgoRhythms may go silent because it is selecting notes that are out of range for the voices. This is likely to happen when the pitch curve is very thin and very high. In such an instance, wait a minute for the music to return. Otherwise, stop and re-arrange parameters and ranges to avoid this situation. Click the right mouse button over the String Gadget for High Note or Low Note, and type in the note and octave, for example:

C7, C#7, Db6, Ab5 are note names suitable for High Note.
c0, C#1, eb2, G#3, Fb3 are suitable for Low Note.

Note that C4 is middle C (ca. 261 Hz) and that the flat sign is just a ’b’ or ’B’ (bravo), and the sharp sign is a pound sign.

1.62 lownote

"High Note" and "Low Note" define the range allowed in the voice. As explained in notes for High Note a voice will not play out-of-range notes in random mode, and turns back from range boundaries in walk mode.

1.63 orchestra

The Orchestra window provides a means of loading audio voices. To load an audio voice, click on a chair button (such as "Chair 1"). A file requester will appear, through which you should select an 8SVX-format audio voice file created with other software. The name of the 8SVX file will appear in the label to the right of the chair button. To play the chair, select the chair number in the Voices window’s Channel gadget, and select "Audio" in the Voices window’s MIDI/Audio button.

AlgoRhythms does not play stereo voices in stereo, but it should play them in monaural. For the time being, AlgoRhythms can use only smaller 8SVX audio files (probably up to 64K). You should probably use only four voices.

If you do not load a new voice, AlgoRhythms uses a built-in saw-tooth-like voice.

1.64 basics

AlgoRhythms (TM) improvises music in real-time on a Commodore Amiga (TM).
AlgoRhythms decides which pitch to play at which loudness and for how long just before it plays the individual note.

AlgoRhythms (TM) can play music to MIDI using the serial port. It can also play over Amiga internal audio using audio.device.

When AlgoRhythms(TM) is started, it is ready to play over MIDI. It has a randomized form, which is displayed on the form screen.

To change the random form, you may use the Load Form menu item, or the Form window. To change the musical scale, you may use the Scales gadget in the VOICES window .

AlgoRhythms(TM) has 20 independent monophonic voices. It does not model melody however. Nor does it model harmony or meter. There is no way to tell the software to play a certain chord, or to use 4/4 or 3/4. Each line plays pseudo-random note events within the ranges set by the form curves. An exception is that pitch may move stepwise up and down a scale.

To make the most colorful music with AlgoRhythms you need to work with your MIDI synthesizers, load appealing 8SVX voices for internal audio, and use MIDI effects appropriately.

You can also start AlgoRhythms by clicking on a form file icon. Copy the example form file icons to your knew form files. AlgoRhythms does not currently generate the form file icon automatically. Use the AmigaDOS (TM) Info command to set the default tool as AlgoRhythms, in the path in which you put it on your disk.

See also:

Speed

1.65 midi

AlgoRhythms (TM) requires that a MIDI (RS-232C to current-loop) level shifter be connected to the Amiga (TM) serial port. AlgoRhythms (TM) sets up the serial.device at the MIDI baud rate of 31,250 bits per second. The serial device is used shareably so that other programs that use serial.device sharably may also send data over MIDI while AlgoRhythms is running and even while it is playing. Other MIDI utilities from Tom Janzen can use this feature.

Note that several copies of AlgoRhythms (TM) can run simultaneously using the serial device and MIDI, but only one can use the audio device even while other copies of the program are running MIDI. Running several copies of AlgoRhythms through MIDI makes it possible to layer textures.

1.66 speed

AlgoRhythms(TM) has been measured playing 408 notes per second under the following conditions:

```
                 Pulse
                 set to 0;
  16 Voices set to play MIDI;
  4 Voices set to play internal audio;

                 Max Voices
                 set to 20;
  The platform was an Amiga 3000 at 25MHz with a 68882.
```

Whether the Amiga and your MIDI synthesizers can actually play 408 notes per second is another problem. Chances are that the synthesizers will not play such high events rates.

1.67 arexx

Arexx

Using Arexx, multi-media programs can control AlgoRhythms, so that it can be synchronized with images being displayed on the screen. Arexx command scripts can be run only from outside AlgoRhythms, for example using the rx command in a shell window.

Address: ALGORHYTHMS_0, ALGORHYTHMS_1, ALGORHYTHMS_2 as successive simultaneous images are started.

Arexx commands recognized by AlgoRhythms:

*NOT IMPLEMENTED

```
PROJECT PLAY
PROJECT STOP
PROJECT CONTINUE
PROJECT LOADFORM filepath
*PROJECT SAVEFORM filepath
*PROJECT RECORD {ON | OFF}
*PROJECT ERASE
*PROJECT LOAD8SVX filepath
*PROJECT SAVEMIDI filepath
*PROJECT QUIT
FORM MAXVOICES {1-20}
FORM REDRAW
FORM PULSE {1-25}
FORM DURATION {seconds}
FORM PITCH MEAN PERIOD {seconds}
FORM PITCH MEAN PHASE {radians}
FORM PITCH RANGE PERIOD {seconds}
FORM PITCH RANGE PHASE {radians}
FORM PITCH RANDOMIZE
FORM RHYTHM MEAN PERIOD {seconds}
FORM RHYTHM MEAN PHASE {radians}
FORM RHYTHM RANGE PERIOD {seconds}
FORM RHYTHM RANGE PHASE {radians}
FORM RHYTHM RANDOMIZE
FORM DYNAMIC MEAN PERIOD {seconds}
FORM DYNAMIC MEAN PHASE {radians}
FORM DYNAMIC RANGE PERIOD {seconds}
FORM DYNAMIC RANGE PHASE {radians}
FORM DYNAMIC RANDOMIZE
FORM TEXTURE RANGE PERIOD {seconds}
FORM TEXTURE RANGE PHASE {radians}
FORM TEXTURE RANDOMIZE {seconds}
FORM NOTELENGTH {MAXIMUM | MINIMUM} {num}

SCALE TRANSPOSE {num}
SCALE PENTATONIC
SCALE SHORTPENTATONIC
SCALE HARMONIC
SCALE DIATONIC
SCALE HIRAJOSHI
SCALE KUMOIJOSHI
SCALE KOKINJOSHI
SCALE WHOLETONE
SCALE QUINTAL
SCALE MIN3MAJ2
SCALE HARMONICMINOR
SCALE HUNGARIANMINOR
SCALE DIMINISHED
SCALE MODE3
SCALE MODE4
SCALE MODE5
SCALE MODE6
SCALE MODE7
SCALE QUARTAL
SCALE MAJ3MIN 2
SCALE CHROMATIC

VOICE {number 1-20} {CHANNEL {1-16} | LOWNOTE {note} |
HIGHNOTE {note} | {WALKING | RANDOM} | {MIDI | AUDIO}
```

```
See algo:
                Arexx Example
```

1.68 arexxexample

```
/*
 * ALGORHYTHMS.REXX FOR ALGORHYTHMS
*/

port_name = "ALGORHYTHMS_0"

if( arg() >= 1 )then
    port_name = arg(1)

if( ~show( 'p', port_name ) )then do
    say "Please start the host application first."
    exit
end

address value port_name

"PROJECT LOADFORM ALGO:/FORMS/LUCY.FORM"
"FORM MAXVOICES 7"
"FORM REDRAW"
"FORM PULSE 13"
"FORM DURATION 345"
"FORM PITCH MEAN PERIOD 123"
"FORM PITCH RANGE PERIOD 345"
"FORM PITCH MEAN PHASE 1.0"
"FORM PITCH RANGE PHASE 2.0"
/*
** "FORM PITCH RANDOMIZE"
*/
"FORM RHYTHM MEAN PERIOD 123"
"FORM RHYTHM RANGE PERIOD 345"
"FORM RHYTHM MEAN PHASE 1.0"
"FORM RHYTHM RANGE PHASE 2.0"
/*
** "FORM RHYTHM RANDOMIZE"
*/
"FORM DYNAMIC MEAN PERIOD 123"
"FORM DYNAMIC RANGE PERIOD 345"
"FORM DYNAMIC MEAN PHASE 1.0"
"FORM DYNAMIC RANGE PHASE 2.0"
/*
** "FORM DYNAMIC RANDOMIZE"
*/
"FORM TEXTURE RANGE PERIOD 345"
"FORM TEXTURE RANGE PHASE 2.0"
/*
** "FORM TEXTURE RANDOMIZE"
*/
"FORM NOTELENGTH MAXIMUM 3.4"
```

```
"FORM NOTELENGTH MINIMUM .12"
"VOICE 3 CHANNEL 13"
"VOICE 3 LOWNOTE A#1"
"VOICE 3 HIGHNOTE A#6"
"VOICE 3 WALKING"
"VOICE 4 RANDOM"
"VOICE 4 AUDIO"
"VOICE 5 MIDI"

exit
```