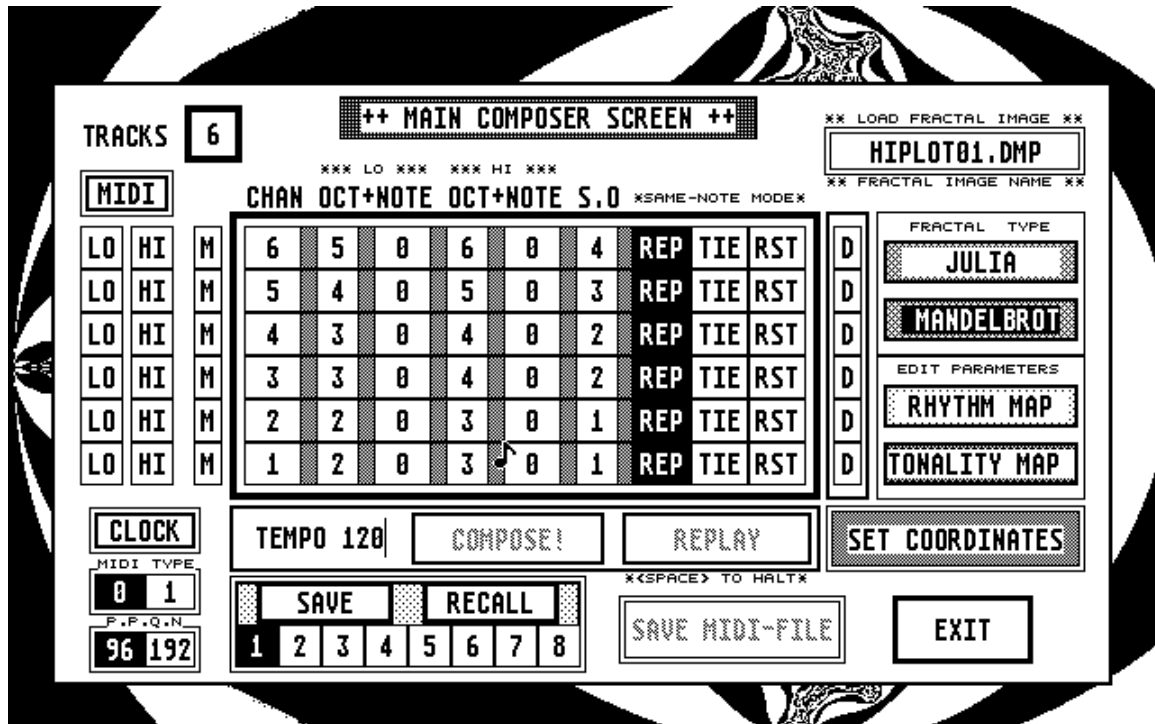


Fractal Music Composer II



Hugh McDowell

FRACTAL MUSIC COMPOSER

Version 2

By Hugh McDowell (c)1994

Programmed in HI-SOFT Lattice C5 and Devpac2 assembler.

Manual compiled by Tim Conrardy

SYSTEM REQUIRMENTS

FRACTAL MUSIC COMPOSER will work on all Atari computers: 520St, 1040St, Ste, TT030 as well as on a Falcon. ST medium Res and ST HI Res. It is most impressive in St medium because of the color involved in the mandelbrot Images. However you will need to set your preferred colors in the CONTROL.ACC (supplied in the ZIP) It looks best in "reversed" display: that is black background with white or "yellow" highlight. However the display on a monochrome is still excellent. (St Hi). FMC can also be run on PC using the Atari emulator called Steem Engine. (<http://tamw.atari-users.net/steem.htm>) FMC can be downloaded at Tims Atari MIDI World at the FMC page: <http://tamw.atari-users.net/fmc.htm>

Note on using FMC in Steem: In order to save MIDI files you must run FMC in Steems A-Drive and save to the A-Drive. You can then copy the MIDI files over to a folder on the virtual C-Drive and have access to them after quitting Steem.

FRACTAL MUSIC COMPOSER II has three main parts:

** MANDELBROT ZOOM PROGRAM is for exploring the Mandelbrot set, and, in the full version of the program, allows fractal plots to be saved, output to a printer, and used to create music with FRACTAL MUSIC COMPOSER.*

** FRACTAL MUSIC COMPOSER generates music for up to six instruments playing together. The software translates the visual patterns of the Mandelbrot or Julia Sets into sound patterns according to rules set by the user. Every composition is entirely unique, and may be influenced by various options of pitch, duration and tonality provided in the program. In the full version of the program all the music created can be saved to disk in standard MIDI-FILE 0 or 1 formats, allowing the results to be used with other music software. The lengths of compositions are only limited by available memory (The DEMO version is limited to about 2000 notes.)*

** MIDI FILE PLAYER/CONVERTER will play standard format 0 or 1 MIDI-FILES. Data can be muted or filtered out and files can be converted between the two formats. In the full version the files can then be saved to disk.*

What is Fractal Music?

"All music may be thought of as consisting of patterns. In nature, music and fractals there is a happy blend of form and irregularity, structure and surprise, or, if you prefer, theme and variation. FRACTAL MUSIC COMPOSER (2) is a program, which allows the infinitely varied patterns of fractals to be translated into sound. This infinite variety contains no randomness - just endless patterns with no copyright attached!"

-Hugh McDowell

" Fractals are infinite squiggles. Imagine zooming in on a coastline from outer space: the closer you get, the more detail you see, the longer the coastline becomes. Eventually you start measuring around the pebbles on the beach. Fractals are rigorously self-similar (generated by a grammar which dictates how each piece of detail unfolds from the previous one) semi-random or random self similar (where there are alternate unfoldings of detail at each level) and other which unfold from a formula, or boundary of stability, which are harder to summarize, but are constructed non-linearly. To understand the Mandelbrot set mathematically you need to understand complex numbers. The Madelbrot and Julia sets are boundaries, such that the boundary gets longer the more you magnify it. Computer graphic zooms can magnify the sets to a greater degree than you would need to see the atoms in your hand and the detail, indeed infinite (infinitely squiggly) continues on and on..... Music is fractal in many senses, one of which is that there are patterns occurring at different time scales. Music which has these same patterns is called self-similar since levels of basic skeletal structures within it are similar to its surface patterns."

-Lawrence Ball

There are several sets on screens on Fractal Music Composer.

After selecting FRACTAL MUSIC COMPOSER from the main menu you are presented with the MAIN COMPOSER SCREEN. This is where you choose your midi parameters such as midi channels, patch changes, octaves, high and low notes as well as auditioning them. You can also load Fractal Images, choose your Fractal Types (mandalbro, Julian sets) and your edit parameter screens (rhythm and tonality)

THE RHYTHM MAP SCREEN

This is where you can map out rhythms the composer will use in generating the music. Once you have created a rhythm, you can save it for later recall in another piece.

THE TONALITY MAP SCREEN

This is where you choose the scale tonalities the Composer will use in generating the music. Scales such as MAJOR, MINOR, DOMinant 7, DIMINISHED, WHOLE TONE and CHROMATIC are provided with the ability to Edit and Save your own scales! Transposing is also available meaning you can change to different Root "chords". (for example from the root of "C" to the root of "F".)

After you have completed your settings, you can select the SET COORDINATES field in the MAIN COMPOSER SCREEN where you are taken to the actual Mandelbrot Image to place your coordinates for pitches and durations (by dragging the mouse into the image itself). Then you are brought back to the MAIN COMPOSER SCREEN where you can select COMPOSE and you will hear the beautiful permutations of Fractal Music being generated in real time.

FRACTAL MUSIC COMPOSER II - TUTORIAL

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This program has the filename FMC2.PRG and can be found in the FMC2 folder. The program uses MIDI, so be sure to connect a MIDI cable from the Atari's MIDI OUT to the MIDI IN of your instrument(s).

*** Throughout the program, values can be changed with the mouse (default : left button-- ,right button++) ***

[1] Load the program. The different parts of the program can be selected from the "STARTUP SCREEN". You can also reverse the +,- functions of the mouse buttons in the box lower-right. Select the "FRACTAL MUSIC COMPOSER" button. You will see the "MAIN COMPOSER SCREEN". Select "RECALL" (lower screen-left). (set on slot |1|) The 1st. pre-defined "Set-Up" will be loaded. The large box near centre-screen shows the basic parameters for EACH track as rows of numbers.

lo *hi*
CHAN OCT+NOTE OCT+NOTE S.O

CHAN = midi-channel

lo
OCT+NOTE = the low limit of the note-range (NOTE=semitone)

hi
OCT+NOTE = the high limit of the note-range

S.O = Scale-base Octave (more on this later)

[2] Set the midi-channels to numbers which correspond to the midi- channels of your keyboard/sound module. You can check these by clicking on the |LO| and |HI| buttons on the left. You should hear the low and high limits of each track's note-range.(You can adjust these limits with the mouse of course). < For some pleasing results from the 1st pre-defined Set-Up from the '| SAVE | RECALL |' box, Tracks 1 to 3 could be piano or tuned percussion sounds, Track 4 bass, Tracks 5 & 6 for drum kit. Set the midi-channels (and your midi-instrument) accordingly .Test with the |HI| & |LO| buttons. >

** If you can't wait to move on, go to [3]. Read on if you want to know more about the MAIN COMPOSER SCREEN functions **

MAIN COMPOSER SCREEN

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The box at top-left (TRACKS) sets the number of tracks to be used. Below this is a button called 'MIDI'. Click on this to go to the Timbre/Patch change Screen. You can send 'TIMBRE'(or 'TONE') change commands to your synth or 'PATCH' change commands if 'CHAN' is set to the 'Control' channel of your synth. < 'SEND' transmits two bytes of information:- 1st= 192+chan.(0 to 15); 2nd= patch/timbre no.(0 to 127).You should check the instrument manual to see how these commands are used. Note: the Patch Changes are not saved when saving a MIDI File to disc.

The column of 'M's to the left of the main box will Mute individual tracks. These Tracks won't write to the MIDI-FILE. The three columns of buttons |REP|TIE|RST| determine how repeated (same) notes are treated - played ,tied ,or a rest(gap) The column of 'D's to the right of the main box will disable the TONALITY (scale-pattern and transposition) functions for individual tracks. (Useful for drum tracks) The 'CLOCK' button enables midi-clock pulses to sync. to other midi equipment such as drum machines. The 'Midi Type' buttons set the format of the MIDI-FILE to be produced. (0= One multi-channel track, 1= separate tracks) The 'PPQN' buttons set the (midi) Pulses Per Quarter Note. (this will affect the apparent tempo (see [3] RHYTHM EDITOR))

The 'TEMPO' (quarter notes per minute) setting can be typed in or changed with the mouse.

By clicking on the 'Fractal Image Name' box (top-right) you will be presented with the file-selector to load a different Plot.

Below that are two buttons to set the TYPE of Fractal used to compose the music ('JULIA', or 'MANDELBROT').

At bottom left is the SAVE/RECALL box. Up to 8 Set-Ups (of all the settings on this screen) can be saved/recalled. (I've provided a few to get you started). Click on one of the 8 slots then RECALL (or SAVE). (start with record (slot) |1|) < Because each track's "Box" coordinates are recalled (or saved) as well as the name of the relevant Plot, if the Plot on screen doesn't match the record, you will be asked if you want to load the correct one or use the current one.

[3] Click on |RHYTHM MAP| in the "Edit Parameters" Box. This will take you to the "RHYTHM EDITOR" screen. Click on |RECALL| to load a RHYTHM "Set-Up". (slot |1|)

** If you can't wait to move on, click on "EXIT" to return to the MAIN COMPOSER SCREEN screen. Read from [4].
Read on if you want to know more about the RHYTHM EDITOR **

RHYTHM EDITOR

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The rows of numbers to the right of the screen are the note-lengths that the program will choose from for each track when generating the music. These numbers are multiplied by the value selected in the small box at screen top-left. The note-lengths in a MIDI-FILE are represented as the number of 'Pulses' per quarter-note (ppqn) between 'Midi Events' >

If |8| is selected (and |96| ppqn in the MAIN COMPOSER SCREEN) work on the basis that:

96 = 2 X Whole-note (or Breve)

48 = Whole-note (or Semibreve)

24 = Half-note (or Minim)

12 = Quarter-note (or Crochet) (12 times 8 = 96 ppqn)

8 = Triplet crochet

6 = Eighth-note (or Quaver)

4 = Triplet Quaver

3 = Sixteenth-note (or Semiquaver)

2 = Triplet Semi-quaver

1 = Triplet Demi-semi-quaver

(of course intermediate values can be used i.e. 36 for a dotted Minim, 18 = dotted Crochet etc. Other values might create interesting cross-rhythmical effects)

The 1st value in each 'Note-Lengths' box (between the two "REP" columns) sets the number of note-lengths each track can use.

The first note-length in each row (headed "REP" in small type has a special function - it will be repeated the number of times set in the column headed "N.REPS", creating a run of notes of equal length.

The two columns of buttons on the left determine whether the set durations are to be chosen between by the program |DUR|, or to be treated as a repeated rhythmical sequence |SEQ|. (which will ignore the "REP" function). Note that you can (should?) SAVE/RECALL 'RHYTHM MAP' Set-Ups.

< The Set-Up I've provided in slot |1| has a feel of 3 time to it because the bass rhythm (track 4) will play either 3 Quarter-notes in a row, or a Dotted minim (3 X Q-note) note.>

Click on |EXIT| to return to the "MAIN COMPOSER SCREEN".

TONALITY EDITOR

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[4] Click on |TONALITY MAP| in the "Edit Parameters" Box. This will take you to the "TONALITY EDITOR" screen.

Click on |RECALL| to load a TONALITY "Set-Up". (slot |1| ?)

**** If you can't wait to move on, click on "EXIT" to return to the MAIN COMPOSER SCREEN . Read from [5].
Read on if you want to know more about the TONALITY EDITOR ****

If you want to inspect or edit the scale patterns, Click on [EDIT SCALES]. You will see the "SCALE EDITOR".

SCALE EDITOR

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To edit or inspect a scale pattern, click on one of the 12 slots at lower screen-left, then on [EDIT]. This will display the scale pattern stored in that location. The line of note names above the central box shows which notes would be played if no scale pattern was imposed. In each octave (row) the notes can be shifted individually (with the mouse buttons) to create (or change) the scale pattern. Strictly speaking, these patterns aren't like normal scales, but rather a series of offsets which determine which notes of the scale are available for the program to choose between. Notice that in most of the 12 scale patterns I've provided, the lowest Scale-Octave has only the main notes of a chord whereas higher octaves have a greater variety of the scale's notes. (Most music tends to have wider intervals and less notes in the lower (bass) parts than higher up). In fact you could create a completely different scale in the upper 3 Scale-Octaves (say) than in the lower 3.

*The S.O (Scale-Octave) setting for each track in the MAIN COMPOSER SCREEN determines which S.O octave of the scale pattern corresponds to that track's lower note limit. < e.g. in M.C.S. Set-Up 1: Track 1 which has a 2 octave range set and "S.O" set to 3, will use notes from S.O octaves 3 & 4. Track 4 (bass line) with 1 octave range and "S.O" set to 1, will use just the notes from S.O octave 1. Geddüt!??? If a track's note-range is (say) 4 octaves and the S.O is set to (say) 5, the scale pattern in S.O octave 6 will be continued upwards through the rest of the track's range. * The S.O setting ONLY decides where each track starts looking at the scale-pattern -- so there !*

The notes in each Scale-Octave can be set between 'C' and 'C+' (octave above) and also 'T' (Tie) which causes an earlier note to be held over, and 'R*' (Rest) or silent. You can type in a new name (if you wish) for the scale-pattern in the *SCALE NAME* box and either save it to its old memory location by clicking on [WRITE], or select another location (slots |1| to |12|) and then click on [WRITE]. Changes will be ignored unless you WRITE them to memory. The "NUMBER" box (top right) shows the original scale number.*

Click on [EXIT] to return to the TONALITY EDITOR.

TONALITY EDITOR (part 2)

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You may save your modified set of scale patterns to disk by clicking on [SAVE SCALES]. Name the new file with the file selector. (I suggest you create a new file with a different name than "SCALESET.SCA" just in case you want the old one!) Sets of scale patterns can be loaded from disk with the file-selector. (The default scales are the same as "SCALESET.SCA") Notice that there are three rows of numbers in the central white area of the screen: The top row of numbers set which scale pattern to use (corresponding to the 12 scales listed at the top of the screen). The second row is the transposition value. This shifts all the tracks (with the scale pattern) up or down a maximum of 24 semi-tones. The bottom row is the length of time, expressed in Quarter-notes, that the music will use the chosen scale pattern and trans position value, before moving to the next 'Tonality' set of 3 values :(Scale no.; Transposition; Time). (The whole "MAP" will recycle as long as the music plays). The box at screen top-left sets the number of 'Tonalties' for the whole "MAP" to cycle through. The box just below sets a global transpose + or - 12 semitones for all the tonalties.

**** The 'D'(Disable) buttons on the MAIN COMPOSER SCREEN will cause a track to ignore scale patterns and transpositions so that just the notes within the track's set note range will be used ****

Note that you can (should ?)"SAVE or RECALL" TONALITY MAP Set-Ups. The Set-Up I've provided in slot |1| will work well with the 1st RHYTHM Set-Up (feel of 3 time) because the 'Tonality' change every 6 beats (2 bars of 3 Quarter-notes). You can achieve a strong rhythmic and tonal correlation to the music this way. 'EXIT' takes you back to the MAIN COMPOSER SCREEN.

[5] Click on | SET COORDINATES |. A dialog box will appear asking "Use Existing Coords ?"

*** If you can't wait to move on, click on | YES | to return to the MAIN COMPOSER SCREEN . Read from [6]. Read on if you want to know more about setting the note and rhythm boxes. ***

A set of coordinates will have been loaded with the rest of the MAIN COMPOSER Set-Up ('RECALLED') but you can set new ones by clicking on | NO |. If you have 'RECALLED' a MAIN COMPOSER Set-Up and the Plot name doesn't match the one on screen, you won't be given this option and you'll have to set new coordinates. These will be stored (but not saved to disk yet) . (Read 'DRAWING BOXES')

DRAWING BOXES

You use the mouse to select the areas of the screen which will be used to generate the music. This is done by "clicking and dragging" with the LEFT mouse button a box shape around the area in which you are interested. ("busy" areas seem best) You will be prompted (top left) to draw two boxes for each track:

The First box will choose between the notes (itches); The Second box will choose between the durations (note-lengths). The 'prompt' also reminds you which 'Function button' will hold (and repeat) that track's note or duration coordinates

Before you draw each box you can examine the area by pressing the RIGHT mouse button and moving the mouse around the screen. You will see which note (or duration) will be produced at each point on the screen in the display top-left. (these simply reflect the note-ranges or durations set for each track and ignore the tonality, transpose and scale-pattern settings). It is usually best to choose fairly "busy/chaotic" parts of the image, so that the music contains sufficient variety. Note that the central black 'pool' will always produce the lowest note of each track's range or the 1st duration setting

The 'UNDO' KEY will step you backwards progressively deleting boxes if you aren't happy with any of them.

The coordinates of each box can be repeated for other tracks by using the function buttons (F1 - F10). It works like this:- Say you've already "dragged" the boxes for 2 tracks, then the coordinates of track 1 will be held in <F1> (notes) and <F2> (durations), and in <F3>(notes) & <F4> (durations) for track 2. If you want the note and duration coordinates of track 1 (say), for track 3, then instead of using the mouse, you press <F1> then <F2> . (<F5> and <F6> will now also hold those coords.) (track 3 will still use its own note-range or durations set as well as it's other track parameters.) Its worth noting the "prompt" at top left to avoid confusion. You could use the 'F' buttons to use the note coordinates of one track as the duration coordinates of another too! Having set the boxes you are returned to the MAIN COMPOSER SCREEN.

[6] The 'COMPOSE!' button will now be enabled. Either click on it or press <RETURN> to go into the compose function. Press <RETURN> or click on 'START' and the music will begin. 'COMPOSE!' will over-write any MIDI-FILE in memory Notice that the pixels in the boxes are being recalculated to produce the values used for notes and durations. Press <SPACE> (space-bar) to stop composing. You can replay the music by clicking on 'REPLAY'. Perhaps you might want to adjust some of the parameters:- Try changing the |REP|TIE|RST| , or the S.O. settings, or adjust the note-ranges, or TEMPO - then repeat from [6]. You might try setting different box coordinates (see [5]).

If you are happy with the settings you could '|SAVE|' them:- (select a slot in the 'SAVE RECALL' box then 'SAVE'.) this will save all the parameters on the MAIN COMPOSER SCREEN as well as the 'Box'

coordinates, the name of the PLOT used and which of the 'SAVE RECALL' slots are selected in the 'RHYTHM MAP' and 'TONALITY MAP' screens.

**** If you 'RECALL' a Main set-up, load a different Plot, or change the 'Fractal Type' setting, the 'COMPOSE!' button will be disabled and you will have to click 'RHYTHM MAP' (see [3]) and 'SET COORDINATES' (see [5]) again. This is to ensure suitable Rhythm and coordinate settings are used. You might want to check the 'TONALTY MAP' settings too! The slot numbers set in the R.MAP and T.MAP are reset (or recorded) when you |RECALL| (or |SAVE|) a MAIN Set-Up, so after 'RECALL'ing a MAIN Set-Up, you could also 'RECALL' the correct Set-Ups for the TONE and RHYTHM EDITOR screens. In the full version of the program you can save the music as a standard MIDI-FILE. Click on 'SAVE MIDI' to name it.**

JULIA SETS

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[7] Now select slot |5| in the 'SAVE RECALL' box and then 'RECALL'. You may have to reset the 'CHAN' settings as before (see [2]) This will load another pre-defined set-up which will use the "JULIA" type fractal. (The 'JULIA' button will be selected.) **** If you have created a new Plot with the 'ZOOM' part of the program, or loaded a Plot other than the one that loaded up at the start, you will be asked if you wish to load the Plot that goes with the SAVED settings in slot |5|. You can stay with your new Plot (and not loose it) by selecting 'USE' from the dialog box. (DEMO users can't save Plots to disk) However, the Julia sets really only correspond to points on the 'HILOT01' or 'MIDPLOT01' images. ****

Click on 'RHYTHM MAP'. Now click on 'RECALL' (which should be on slot |5| to load a suitable pre-defined 'RHYTHM MAP') Notice the |DUR|SEQ| buttons. For the 'JULIA' type, only sequential (|SEQ|) rhythms are used. The 'REP' settings are ignored. Click on 'EXIT' Click on 'TONALITY MAP'. Now click on 'RECALL' (which should be on slot |5| to load a different pre-defined 'TONALITY MAP' Click on 'EXIT' Now click on 'SET COORDINATES'. You will see the Mandelbrot set. The Mandelbrot set can be thought of as a catalogue of Julia sets, so six Julia sets (one for each track) may be selected with (up to) six single clicks around the screen. These coordinates really only relate to "HILOT01"

'COMPOSE!' will put you into compose mode (see [6]) but now the program will draw (up to) six Julia set patterns at the same time. The leftmost dot in each pattern corresponds to the lowest note of the track's note-range, and the rightmost the highest. The vertical position corresponds to the note's loudness. Use the spacebar to stop.

[8] 'REPLAY' will (not surprisingly) replay the track you just composed. You can set a different TEMPO.

The 'MIDI FILE PLAYER/CONVERTER' is another way of playing back your music.

Click on 'EXIT' to quit the MAIN COMPOSER SCREEN. All settings will still be there when (if) you return. You will be reminded to save Set-ups (if you wish). (THE SET-UPS CAN ONLY BE SAVED FROM THEIR OWN SCREENS!) Now select 'MIDI FILE PLAYER/CONVERTER'

MIDI FILE PLAYER/CONVERTER

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[9] Information about the MIDI-FILE of your music will be displayed. The screen shows the presence of various data contained in the file by "enabling" the relevent boxes. If the file is type 0, only one multi-channel track will show in the main central display. 'CONVERT' will convert the file to type 1, demixing the Midi-Channels into separate tracks. If you used the same channel for several tracks in the COMPOSE part of the program you won't see as many tracks If the file was type 1, separate tracks will

be displayed. 'CONVERT' will convert the file to type 0, mixing the tracks. If you "CONVERT" again, the file may appear different from its original state although no data is lost.

*'REPLAY' will play the file. (You can set the 'TEMPO')Data (if present) can be *MUTED* temporarily by clicking (selecting) the individual little boxes. Data can also be *FILTERED* from the file in the same way and then clicking 'FILTER'. ** 'FILTER' will *DELETE* data from the file in memory ***

'CLEAR FILTER' will deselect any (selected) boxes.

'LOAD MIDI' will load Standard 1 or 0 type Files from disk. The program can load Files of up to 32 tracks (subject to available memory. As only (up to) 8 tracks can be shown at one time, the display can be "scrolled" through by clicking on the upper "Trk No." box with left or right mouse buttons.

'SAVE MIDI' will save the file to disk

'Help!' will display an explanation of the various types of Midi data that the program can show if present. TO(tempo) and TX(text) are two of the many MT(meta) events. 'EXIT' takes you back to the STARTUP SCREEN. Click on 'MANDELBROT ZOOM PROGRAM'

MANDELBROT ZOOM PROGRAM

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[10] First you will be given the option to VIEW, ZOOM or QUIT.

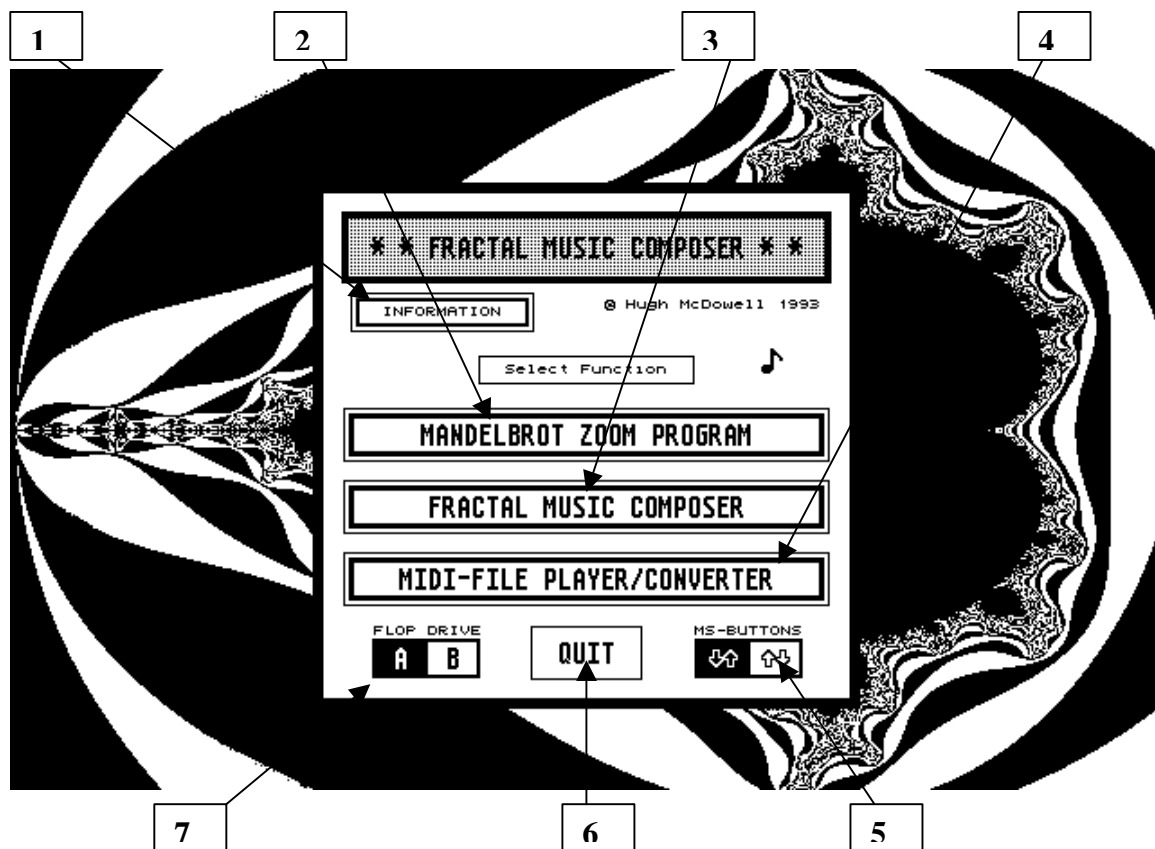
VIEW lets you load a Plot which you can then "Zoom". After using VIEW, press the spacebar to continue. ZOOM lets you zoom in on the Plot. Another alert box will ask you how many iterations you would like to use ... 72, 144 or 288. The higher this figure, the more detail you will see, but the longer the image will take to Plot.

'AUTOSAVE' allows you to pre-name the Plot which will save to disk automatically. You can name/save it when complete if you click 'NO'. Plots with high iterations may sound "unsteady" during 'COMPOSE!' due to the great number of calculations involved. However the MIDI-FILE won't be affected and will REPLAY o.k Now "click and drag" an interesting part of the image, making sure that your box is roughly screen-shaped. Most Plots take 10 to 30 minutes to complete at 72 iterations. When the Plot is complete, you may Zoom in on it again. The full version allows you to save Plots to disk. The new "Zoomed" Plot can be used if you return to the Composer part of the program . You will be asked if you wish to load the Plot that goes with the SAVED settings in the Main 'SAVE RECALL' box. You can stay with your new Plot (and not lose it) by selecting 'USE' from the dialog box.

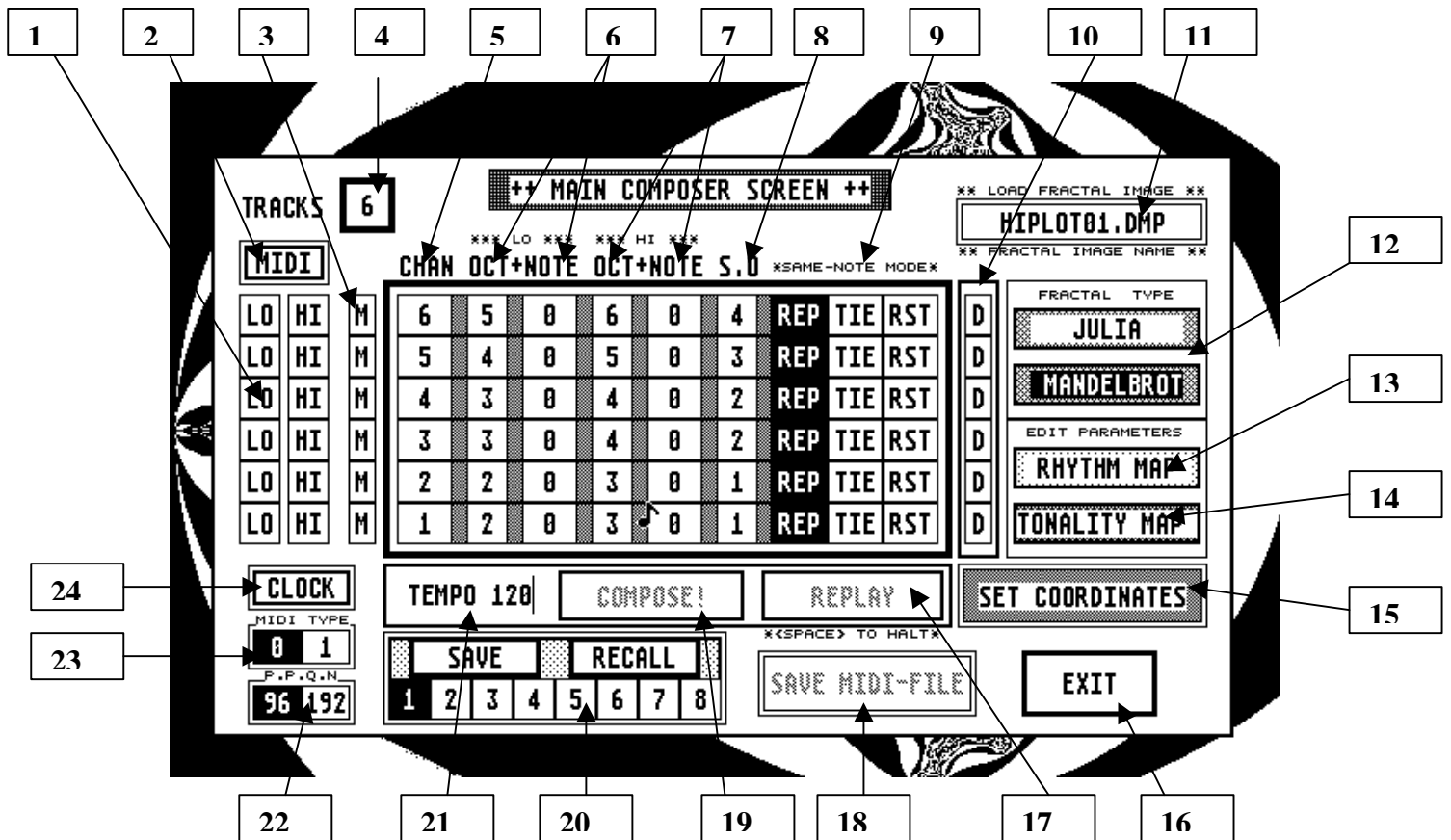
THATS IT (I think)

Have Fun !

Hugh McDowell



- (1) Click for information*
- (2) Select ZOOM part of program*
- (3) Select COMPOSER part of program*
- (4) Select MIDI FILE PLAYER/CONVERTER/FILTER part of program*
- (5) Set Increase/Decrease function of Left/Right Mouse –Buttons.
Throughout the program, values may be changed with the Left/Right Mouse buttons (default Left=minus: Right=plus)*
- (6) Quite Fractal Music Composer program to desktop*
- (7) Set Disc-Drive to use*

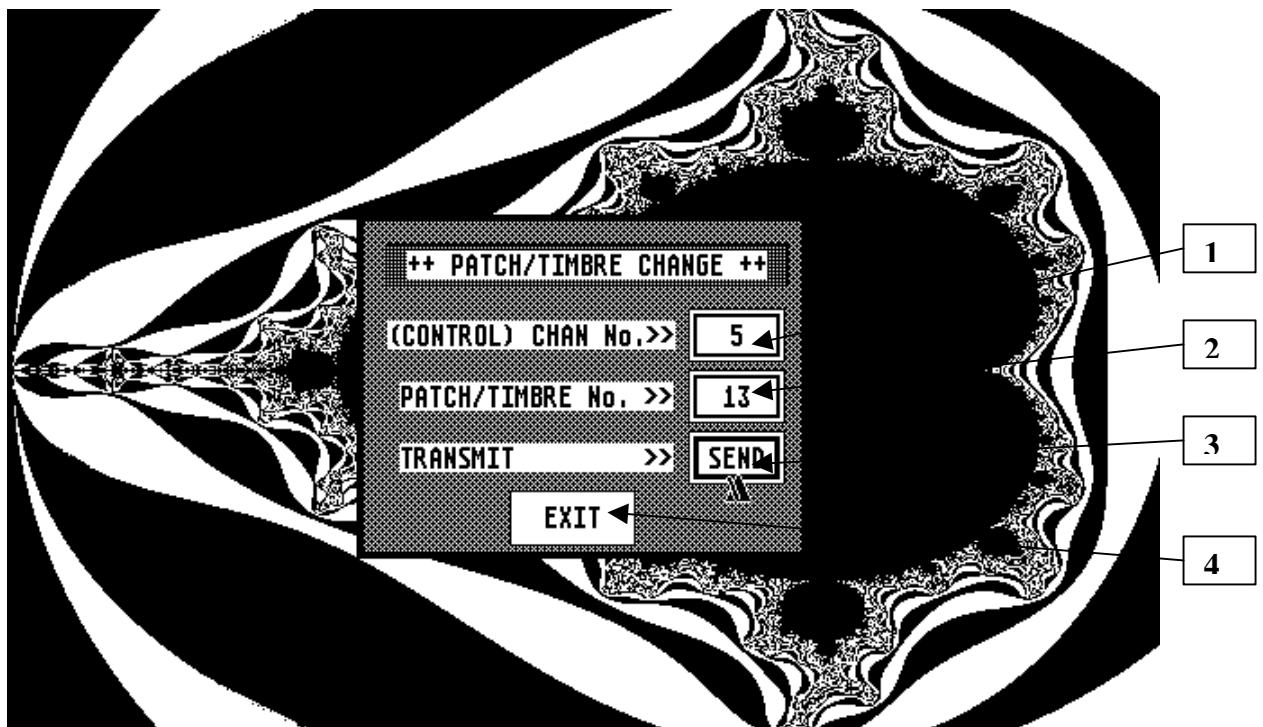


MAIN COMPOSER PARAMETERS

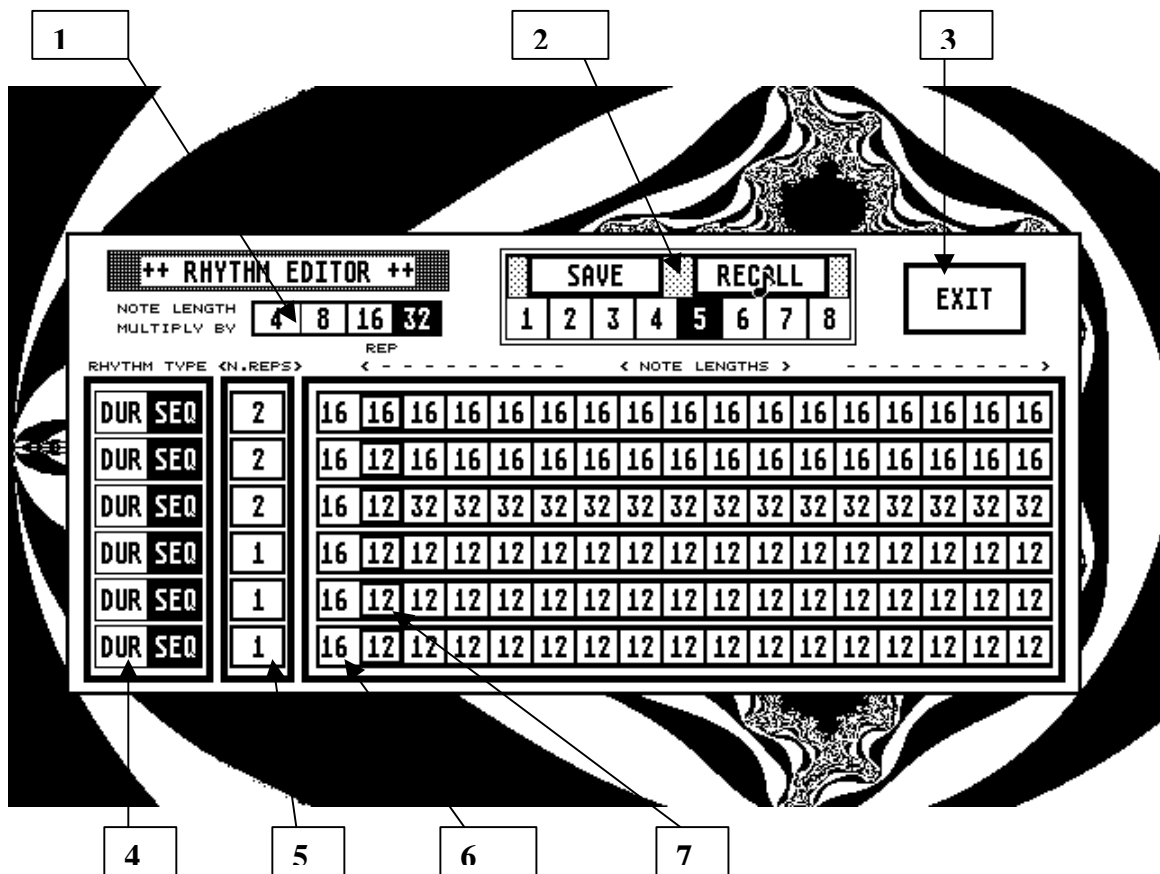
- (1) Lo/Hi buttons play the Low or High notes of the track's note range.
- (2) MIDI button calls up the PATCH/TIMBRE CHANGE screen
- (3) Mute buttons mute a track (the track will not be composed)
- (4) Set the number of tracks used (and displayed)
- (5) Set the tracks MIDI channel (1-16)
- (6) Set the tracks lowest note :Octave (1 to 8)+note (0 to 11) semitones
- (7) Set the tracks highest note (see (6) above)
- (8) Set which octave in the scale-patterns the track will start from.
- (9) Set the way the track will treat repeated (same) notes-REP=Repeated:
TIE=Previous note held: RST=rest (gap)
- (10)Disable all TONALITY-MAP functions for a track.

- (11) Load another Fractal Plot (will disable compose! Button) SET COORDINATES to enable Compose!)
- (12) Set the compose method: Julia or Mandalbrot.
- (13) Calls up the RHYTHM MAP screen
- (14) Calls up the TONALITY MAP screen
- (15) Set the Plot-Coordinates that each track will use.
- (16) Exit to the START UP screen.
- (17) Replay the MIDI file. (if a file is in memory. Press the computer keyboards SPACE bar to stop.
- (18) Save the MIDI file to disc (enabled if a file is in memory)
- (19) COMPOSE! Starts the composition. Press the computer keyboards SPACE bar to stop.
- (20) SAVE/RECALL all Main Composer parameters to/from disc.
- (21) Set the tempo in Beats (quarter notes) per minute for Compose/Replay.
- (22) Set the Pulses per quarter note for the MIDI file.
- (23) Set MIDI Type. (0=one multi-channel track; 1=separate tracks
- (24) Enables MIDI-Clock Pulses to be output (for MIDI Sync)

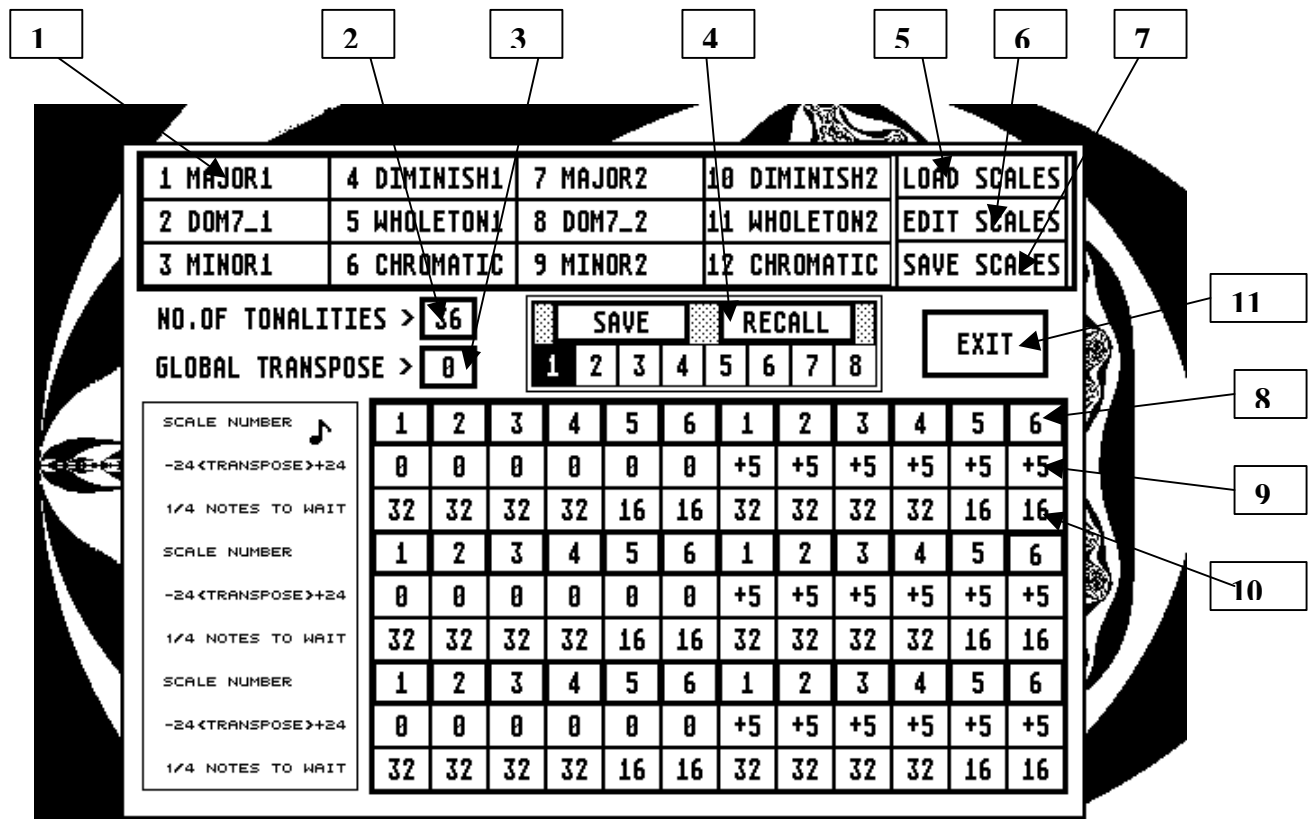
Patch/Timbre Change Screen



- (1) Set the Transmit Channel number (1-16)
- (2) Set the Patch/Timbre number to be sent (1-128)
- (3) Send the data through MIDI. Transmits two bytes of data, Channel no and patch/timbre change.
- (4) Exit to MAIN COMPOSER screen

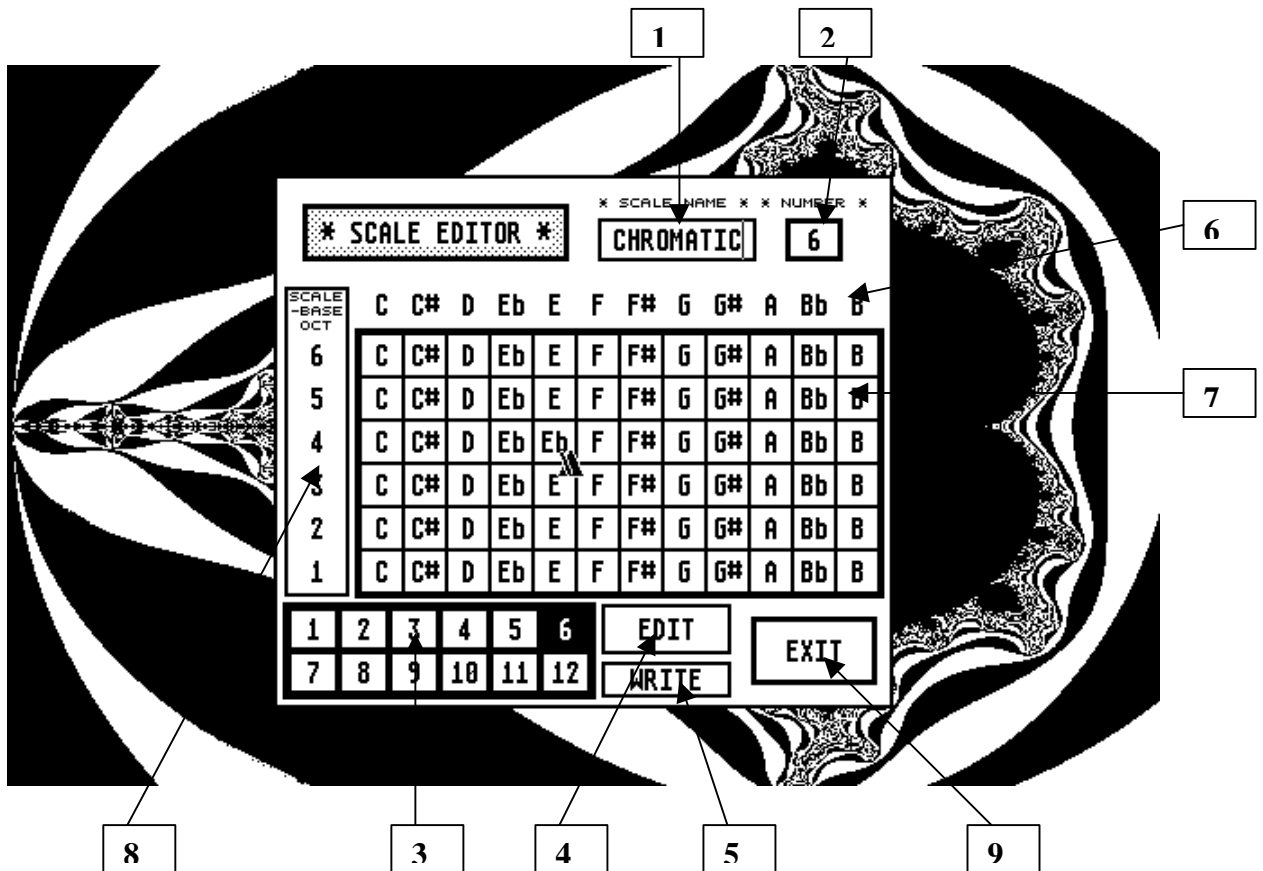


- (1) Set the value that the displayed durations are multiplied by.
- (2) Save/Recall 'RHYTHM MAP' Set-ups.
- (3) Exit to 'MAIN COMPOSER SCREEN'
- (4) Set how each track's durations are used: DUR=durations to be chosen between by the program or SEQ=durations treated as a repeated rhythmical sequence which will ignore the REP function. see (5) and (7) JULIA types can only use SEQ type rhythms.
- (5) Set repeats for the track's duration. (Run of equal durations)
- (6) Set the number of durations (note lengths) each track can use.
- (7) Row of durations for the track used. The first note-length in each row (in thicker box) has a special function. It will be repeated the number of times set in the N.REP column (see (5), creating a run of notes of equal length.

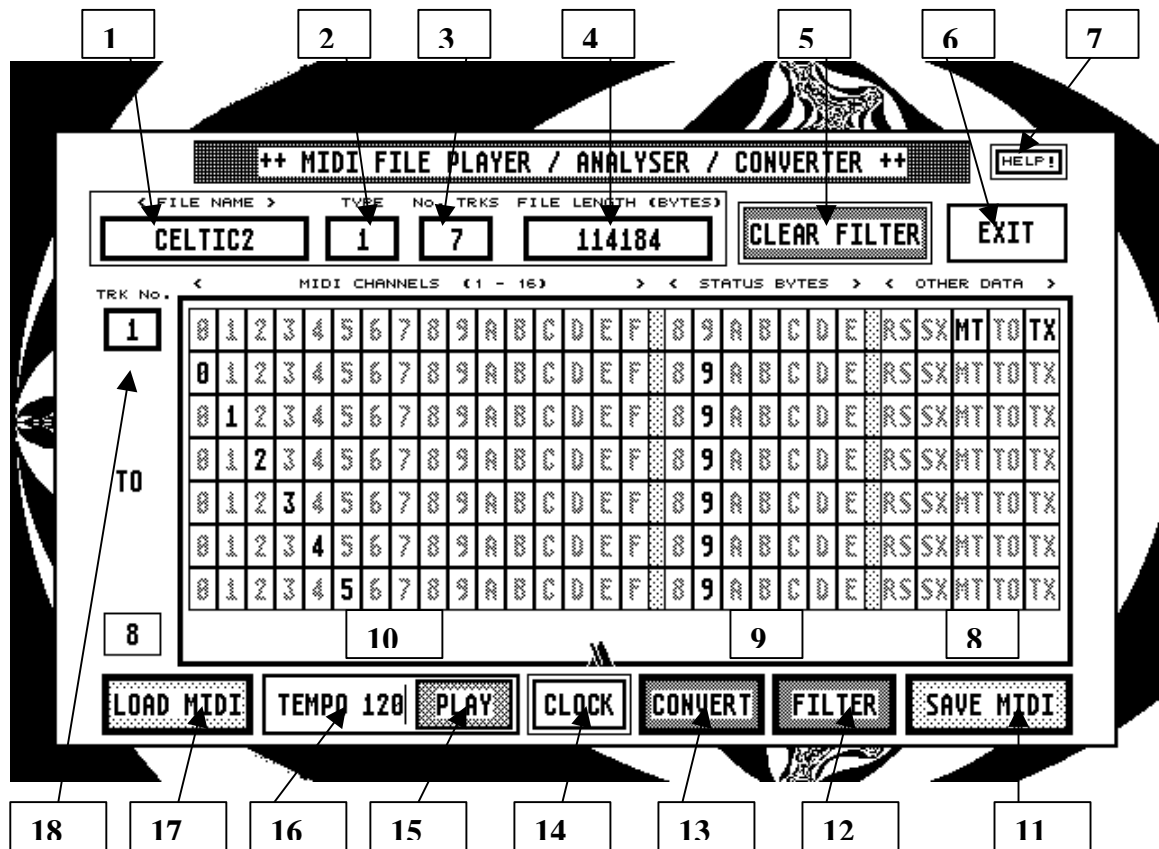


- (1) Displays names of scale-patterns held in memory-slots (1-12)
- (2) Set the number of 'Tonalities' for the whole 'MAP' to cycle through. A Tonality is a stack of 3 values: See (8),(9) and (10)
- (3) Set a global transpose + or - 12 semitones for the whole TONALITY-MAP.
- (4) Save/Recall TONALITY MAP setups to/from disc.
- (5) Load a set of 12 scale-patterns unto 12 memory slots.
- (6) Sets up SCALE EDITOR to inspect/edit individual scale patterns.
- (7) Save a set of 12 scale patterns to disc.
- (8) Set which scale pattern to use for the tonality.
- (9) Set the transpose value for the tonality (-24 to+ 24 semitones). The whole MAP of tonalities will be cycled through repeatedly.
- (10) Exit to the MAIN COMPOSER screen

All the TONALITY MAP functions are ignored by any track that has it's D (disable) button selected in the MAIN COMPOSER screen. Those tracks will simply use any of the notes between the upper and lower note range settings without modification.



- (1) Name of the scale pattern being displayed. You can type in a new name (if you wish) for the scale pattern.
- (2) Number of the scale pattern being displayed/edited (1-12)
- (3) Select 'Memory Slot' to call up/write scale pattern (1-12)
- (4) Call up scale pattern to be displayed/edited
- (5) Write scale pattern to 'Memory Slot' (else changes are ignored)
- (6) Displays notes that would be used if no scale pattern was imposed.
- (7) In each octave row, the notes can be shifted individually (with the mouse buttons) to create or change the scale pattern. The notes in each scale octave (row) can be set between C and C+ (octave above) and also T* (Tie) which causes the previous note to be held over, and R* (Rest) silent.
- (8) Shows the S.O. (Scale-Octave) for each row of the scale pattern. The S.O. setting for each track in the main composer screen determines which S.O. (row) of the scale pattern corresponds to that tracks lower note limit.
- (9) Exit to TONALITY EDITOR screen



- (1) MIDI file name display ('unsaved' if new composition not saved)
- (2) MIDI file type (1 or 0)
- (3) Number of tracks contained in the MIDI file (max 32)
- (4) MIDI file size (in bytes)
- (5) De-select all selected data boxes (if selected for mute/filter)
- (6) Exit to START-UP screen
- (7) Display HELP screen (reminder of data box meanings)
- (8) Data Boxes show presence of other data if displayed BOLD.
- (9) (10) Data Boxes show presence of status (type) and MIDI channel of the MIDI data in each track if displayed Bold. All data displayed bold can be selected/deselected with the mouse for filtering/muting (see (12) and (15))
- (11) Save (and name) the MIDI file with the file selector.
- (12) All selected MIDI data is filtered (lost) from the file in memory.
- (13) Convert the MIDI file between Type 0 and 1 (or visa versa)
- (14) Enables Clock Pulse output during play (for synchronization)
- (15) Play the MIDI file. (selected data is muted out)
- (16) Set the Tempo: in beats (quarter notes) per minute for Play.
- (17) Load a MIDI file (Type 0 or 1) from disc
- (18) Scroll back and forth through the display (if more then 8 tracks)

About Hugh McDowell



Hugh Mc Dowell was born on **July 31st, 1953** in Hampstead, London and was **ELO's** cellist from February 1972 to July 1972, then rejoined in December 1973 to September 1979. His only recorded album with **The Electric Light Orchestra** apart from the live LP, was "Eldorado", all the later albums featured him on the credits but apart from a few little cello solos, he didn't perform on them. At the age of four and a half Hugh started playing cello and by the age of 10 he won a scholarship to the Yehudi Menuhin School Of Music (from which he was expelled). Only one year later he made his first professional appearance in Benjamin Britten's "Turn Of The Screw", in hich he sang. Later on he went to Kingsway College Of Further Education, the Royal College Of Music and Guildhall School Of Music. He then played with the **London Youth Symphony Orchestra**, **The London Schools Symphony Orchestra**, **National Youth Orchestra** and **London Youth Chamber Orchestra**, until he was persuaded by **Wilf Gibson** to join **The Electric Light Orchestra** on cello. At that time Hugh was only 17 years old(!).

He left **ELO** after a few months of live performances in July 1972 to play with **Roy Wood's** own band **Wizzard**, for which he played cello and moog synthesizer. His decision to re-join **ELO** was made because he would have had to play more and more keyboards with **Wizzard** instead of cello and **Jeff Lynne** and the other **ELO** mates were once again hunting for a suitable cellist. So he joined the band again and was allowed to perform his own track "Hugh's Solo/Flight Of The Bumble Bee" live on stage which sometimes lasted up to eight minutes.

After the promotional video for "Discovery" in 1979 he wasn't used any more in **ELO**. He wasn't fired, just never booked to play in any more **ELO** projects. In 1980 Hugh Mc Dowell played on the album "Gift Wrapped" by his old **ELO** mate **Melvyn Gale**, who had founded the group **Wilson Gale & Co**. In the autumn of 1980, he started to teach part-time at a London music school. He conducted a children's orchestra and other orchestras at several London Schools.

Hugh later joined the 20th Century Chamber Groups **George W. Welch**, **Harmonie Band** and **Quorum** with whom he toured worldwide. Every now and then the quartet **Quorum** perform gigs of classical music.

In 1989 he re-joined **ELO** for the third time in **Bev Bevan's Electric Light Orchestra Part II** again as a live cello player for their first UK tour after which he was dropped. He then teamed up with Mik & Kelly's band [OrKestra](#) with whom he recorded as guest musician on their album and performed every now and then with them.

Hugh is also involved with computer programming and has published a computer program for music composing in 1992 which is called "Fractal Music Composer". He developed a suite for 4 programmes; Mandelbrot Set Composer, Julia Set Composer, Mandelbrot Zoom and Play Midi.

Information compiled by Marc Haines, Patrik Guttenbacher and Alexander von Petersdorff.
Shortened excerpt taken from their book ["Unexpected Messages"](#)