

ACE --- TRACKER

A New Beat production in 2002-2014
for the ATARI Falcon030

ACE Tracker is a New Beat production in 2002-2014.

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1 Getting started

1.1 Start the program

Unzip the ACE Tracker archive. Start the program by clicking on the .PRG file.

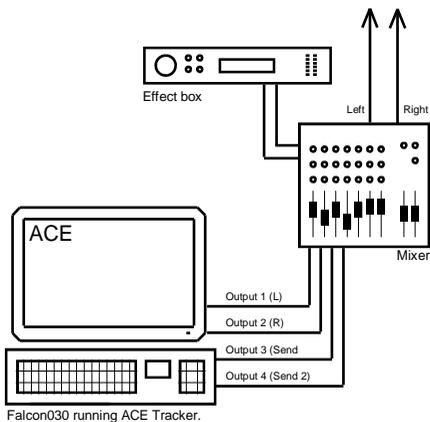
1.2 Requirements

The requirements for running ACE are:

- At least 4 MB ST-ram.
- A colour display. ACE does not work with monochrome monitors such as the ATARI sm124.
- An ATARI compatible mouse.
- Highly recommended: A IDE or SCSI hard drive.

1.3 Connecting

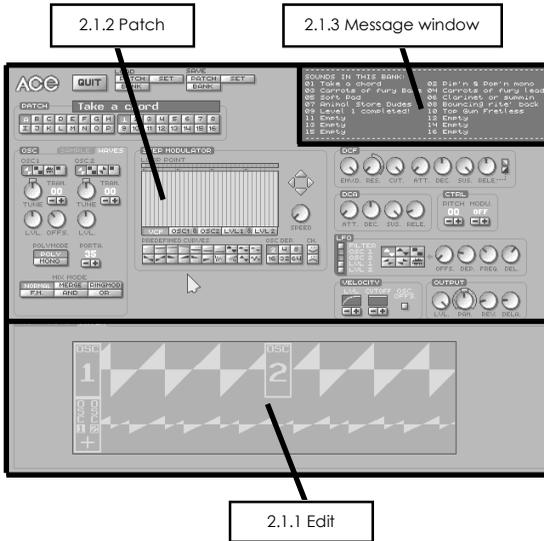
The figure below shows an example how you can connect the Falcon running ACE Tracker.



2 Interface

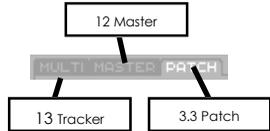
ACE has 3 main sections; patch edit, message window and edit section. The edit section has 3 different editors; tracker, patch overview and master.

2.1 Program overview



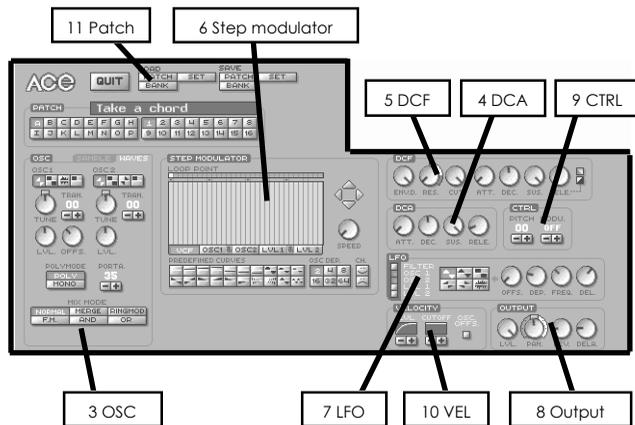
2.1.1 Edit

The lower part of the program is the workspace for a number of editors. The three buttons to the left, are the selectors for which editor you want to enter.



2.1.2 Patch

In this section of the program, all the patch editing is done. All patch parameters is found in this section of the program. The sections are divided into several subsections for each controller. Read more about the controllers in their respective chapter.



2.1.3 Message window

The message window in ACE is there to give help and important information. You should always read what is written in the message window. It also displays patches when you click on one of the BANK buttons, this makes it a lot easier to find the patch you're looking for.

```
-----
SOUNDS IN THIS BANK:
01 Reso Velocity Space 02 Synosium
03 Deep Nebulae       04 Duistort
05 Brass in the Ass   06 Star Pad
07 Shimmer Beautiful 08 Dark Star
09 Floating Cloud    10 BassaNova
11 Meateor           12 Dream Nebula
13 Deep Pulsar       14 Droid
15 SquareWavers      16 Sphere Pad
-----
```

The message window, currently displaying the patches in one of the banks. A "-" character in front of the patch name indicates that the patch is using sample as oscillator source.

2.2 Mouse

Most functions in ACE are only possible to edit by using the mouse. There are functions that behave differently depending if you use the left or the right mouse button. For example, sometimes it's necessary to have the fine-tune knobs of oscillator 1 and 2 exactly the same (see 3.2.2 Mix mode). Turn the fine tune knob by using the right button and both oscillators fine-tune will be set to the same value.

2.3 Keyboard

A note can be triggered from most of the alphabetic keys on your computers keyboard. It is always the active patch in the top on the screen that is triggered.

2.4 Knobs

Some of the patch parameters in ACE is set by knobs. To turn these, click and hold the knob and move the mouse up/down OR left/right to increase/decrease the parameter value.



2.5 Plus/Minus buttons

The plus/minus buttons in ACE sometimes behaves differently depending on if you use the left or right mouse button when you click on it. For example, the transpose parameters in the OSC section will increase/decrease by 1 if you use the left button and by 12 (one octave) if you use the right button.

3 Oscillators

ACE has two oscillator modes; wave and sample. The wave mode has 6 different waveforms and the sample mode let you use a sample as oscillator.



3.1 Sample

Enable the sample mode by clicking on the SAMPLE button in the OSC section. You can load samples by clicking on the floppy disc icon beneath (see 3.1.2 Load). To choose from the samples loaded in memory you can click on the buttons marked with "+" and "-", or select from the sample file name list box.

3.1.1 Load

To load a sample into memory, find a sample index that does not have a sample loaded, or remove (see section 3.1.3 Remove) the sample you have selected. Then click on the "LOAD" button and choose the sample you want to load in the file selector. ACE supports WAV and AVR file formats. Note that samples larger than the currently available memory will not be loaded. It is not possible to load samples larger than 20000000 bytes.

3.1.2 Remove

The trash can icon will remove a sample from memory. All patches using this sample will be set in WAVES mode. When a sample is removed it will give the memory it was using back to the system for another sample to be loaded. Select the sample to remove by clicking on the +/- buttons or by selecting one of the slots in the file name list box.

3.1.3 Sample points

There are 3 sample points to set. The first one is SAMPLE START, which defines the location of where you want the sample to start playing. The other two are loop points, LOOP START and LOOP END. When the sample reaches the loop end point, it will jump to the loop start point and continue playing from there. If you don't want any loop, just set the loop start and loop end to the same position. It is also possible to set these points graphically (see 3.3 Patch edit).

3.1.4 Transpose

The transpose parameter let you set the key for the wave in half note steps, 4 octaves up or down. The left mouse button increases or decreases the transpose by 1, and the right by 12, one octave.

3.1.5 Fine tune

In addition to the transpose parameter, it's also possible to change the tuning in finer steps by using the fine tune knob. Simply move the knob until you get the tuning you want.

3.1.6 Level

The level knob sets the volume for the sample patch.

3.1.7 Poly mode

These two switches sets the polyphony mode to either "poly" or "mono". The poly mode is the "normal" mode where you can play several voices at once while the mono mode turns the patch into

single voice, where only one key can be played at once. This can be very use full for lead and base sounds, especially in combination with portamento.

3.1.8 Portamento

Portamento is an auto frequency slide function which is very use full for lead sounds. It automatically tunes itself between the keys you play. Portamento can be set in range 0-63 where 1 is very fast and 63 is very slow. 0 disables the portamento.

3.2 Waves

Enable the waves mode by clicking on the WAVES tab in the OSC section.

3.2.1 Oscillators

The wave mode has two sources, oscillator 1 and oscillator 2, both periodic waveforms. The waveforms for the oscillators respectively are:

Oscillator 1	Oscillator 2
<ul style="list-style-type: none">• Sawtooth ramp up• Square• Noise• Square positive• Triangle• Trisaw	<ul style="list-style-type: none">• Sawtooth ramp up• Square• Sawtooth ramp down• Square positive• Triangle• Trisaw

Each of the two master oscillators also has the option to enable a sub oscillator. The sub oscillator is always sawtooth and can only be enabled in normal mix mode. Note that all the parameters of the sub oscillator is relative to the parent oscillator, see 3.2.9 for more information.

3.2.2 Mix mode

The mix modes let you choose between 7 methods of mixing the two oscillators together. NORMAL is what the name suggest, normal mixing. It adds oscillator 1 and 2 together. Here, you can also set the waveforms volume individually by turning the LEVEL knobs. MERGE mixes the oscillators by using Exclusive OR. RINGMOD multiplies oscillator 1 and 2. F.M is a very simple frequency modulator, it does however not sound like the F.M you perhaps heard in some of the synthesisers on the market. AND and OR uses logical 'and' and 'or' operations to mix the two oscillators together. In Hard sync mix mode, oscillator 2 is reset every time oscillator 1 passes through zero (going from negative to positive or v.v.).

To give even more mixing possibilities there is a knob called OFFSET to let you choose the starting phase of the OSC 1 waveform.

3.2.3 Transpose

The transpose parameter let you set the key for the waves in half note steps, 4 octaves up or down.

The right mouse button increases or decreases the transpose by 12, one octave, the left one by 1.

3.2.4 Level

The level knobs sets the volume for the oscillators. If you use AND, OR, MERGE, RINGMOD or HARD SYNC there is only one level knob for the mixed oscillator. In F.M. mode, the level knob for Oscillator 1 defines how much Oscillator 1 will modulate Oscillator 2.

3.2.5 Fine tune

In addition to the transpose parameters, it's also possible to change the tuning in finer steps, by using the fine-tune knobs. Simply move the knob until you get the tunings you want. Sometimes it's necessary to have both oscillators fine-tune exactly the same. To achieve this, turn the knob with the right mouse button. This way, if you change the first oscillators fine-tune, the second oscillator will be updated to the same value as the first oscillator, and v.v.

3.2.6 Poly mode

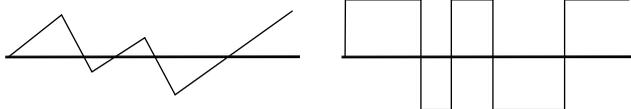
These two switches sets the polyphony mode to either "poly" or "mono". The poly mode is the "normal" mode where you can play several voices at once while the mono mode turns the patch into single voice, where only one key can be played at once. This can be very use full for lead and base sounds, especially in combination with portamento.

3.2.7 Portamento

Portamento is an auto frequency slide function which can be very usefull for lead sounds, etc. It automatically tunes itself between the keys you play. Portamento can be set in range 0-63 where 1 is very fast and 63 is very slow. A value of 0 disables the portamento.

3.2.8 Square transformator

The square transformator located just below oscillator 1 LEVEL knob will transform any shape of oscillator 1 into square wave. This can result in some alternative sounds when combined with the sub oscillator.



Before and after square transformator.

3.2.9 Sub oscillators

Normally every patch have 2 oscillators where you can choose from 6 different types of periodic waveforms. Below these oscillators you will find the sub oscillators. These are always saw tooth waveform and can only be enabled in normal mix mode. When enabled you will have 4 oscillators generated per voice.



Note however that the parameters (tune, transpose and level) is relative to it's master oscillator. For example, if the master oscillator tune is set to 3 o'clock the sub oscillator tune is also set to 3 o'clock even if it's pointing to 12 o'clock. This behaviour is best shown when changing the transpose of the master oscillator, in that case the sub oscillators transpose is updated the same amount as the master oscillator.

The same procedure goes for the level. The level of the sub oscillator is always relative to it's master oscillator.

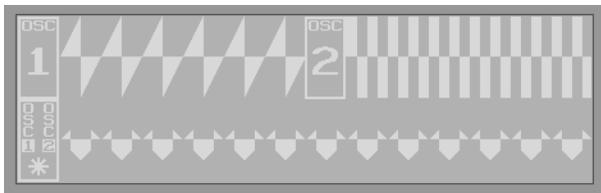
3.3 Patch edit overview

MULTI MASTER PATCH

Sometimes you may want to see what your patch looks like graphically, then click on the PATCH button to the left at bottom of the screen.

3.3.1 Wave overview

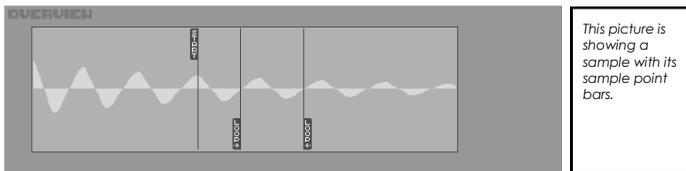
The OVERVIEW window let you see your patch graphically. For patches using WAVES mode as oscillator source, the window will display both oscillators plus the resulting wave, coming from the mix of the two oscillators.



This figure is showing a sawtooth waveform for OSC 1 and a square waveform for OSC 2. This sound uses the "RINGMOD." mix mode.

3.3.2 Sample overview

The sample overview let you see what the sample you are currently using looks like. It is also possible to change the sample points by moving the bars around the window. To do this, click and hold the bar you want to change and move it to the location you want. To zoom in the sample, left click on the lower half of the window. To zoom out, click on the right button. You can also scroll the sample by clicking in the upper half of the window. Just click and hold the left mouse button and move the mouse to the direction you want the window to scroll. The sample will now automatically scroll until you release the mouse button. If you do the same with the right mouse button, the window will only scroll as far as you move the mouse.



This picture is showing a sample with its sample point bars.

4 DCA

DCA is short for Digital Controlled Amplifier. Basically, it is a volume controller that changes over time based on how the parameters of the DCA envelope is set. The DCA sections also includes an amplifier to amplify patches with low amplitude.



4.1 Attack

The attack parameter defines how fast the patch will fade in. A low value makes the DCA fade in quickly and a high value will give a slow fade in. The attack parameter is useful to give a sound the characteristics of a "hard" or "soft" sound.

4.2 Decay

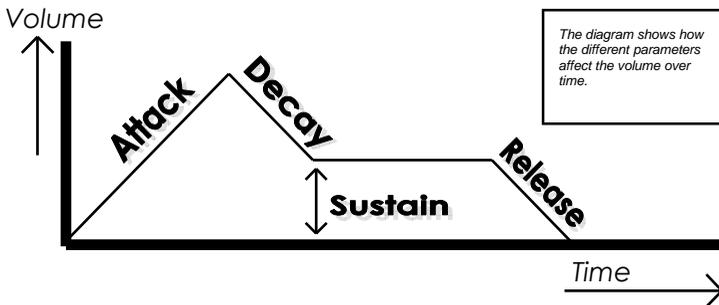
While the attack sets how fast the sound will fade in, the decay parameter defines how fast the sound should fade out. The sound will not fade out to silence though. It will fade out to the value defined by the sustain (see 4.3 Sustain).

4.3 Sustain

The sustain level is the value which will be "hold" as long as the sound is playing, e.g., while you hold a key on your keyboard or synthesiser. If the sustain is set to zero, the sound will automatically be "killed" as soon as the decay has reached zero.

4.4 Release

When the "REL" command is triggered, the release parameter decides how fast the sound will fade out. (The "REL" command will simulate a key being released on a synthesizer keyboard. See chapter 13 Tracker for more info on the "REL" command.)

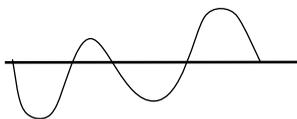


4.5 Amplifier

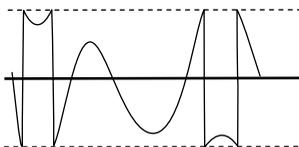
When enabled, the amplifier can amplify the patch 4 or 8 times. This can be used on patches that give a low amplitude output, for example when using a very narrow band pass filter.

4.6 Limit

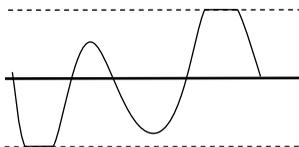
When the amplifier is enabled, the amplitude of the patch may be higher than the max amplitude range. This will result in audio cracks and uncontrollable distortion. By enabling the LIMIT function, the amplitude will never exceed this range and the result is a distortion effect. The LIMIT function has some penalty and should only be used when you want distortion. The amplifier has no penalty when LIMIT is disabled.



Original wave, not amplified.



Amplified wave with LIMIT disabled, signal wraps around and causes audio cracks.



Amplified wave with LIMIT enabled which results in a distortion effect.

5 DCF

DCF is short for Digital Controlled Filter. There are 4 types of filters in ACE. The different parameters defines how the filters should open and close over time.



5.1 Filter type

There are four types of filters in ACE: Low Pass, High Pass, Band Pass and Band Stop. Each filter has its own characteristic and is useful in different situations. For example, the low pass filter is suitable for bases and other sounds with high energy in the low frequency domain, while the high pass filter has the opposite characteristic and works great for sounds up in the high frequency domain, like hi hats and lead sounds. The Band Pass and Band Stop filters works somewhere in between. It is also possible to disable the filter and let the oscillators pass without any filtering at all.

5.2 Envelope depth

The envelope depth defines how deep the envelope can go. If you set this parameter to the minimum value, the ADSR (Attack, Decay, Sustain and Release) parameters won't affect the envelope at all. If you set it to maximum, the envelope will have full depth and the filter will open and close according to the ADSR parameters.

5.3 Resonance

The resonance sets the peak level of the filters cut-off frequency. In general, a high resonance value will have a greater impact on the sound. However, when using the Band Stop filter a very low resonance value will give the greatest impact on the sound.

5.4 Cut-off

This parameter is the main level of the whole DCF envelope and it controls how much the filter can open in total. You could say it's the filter's volume.

5.5 Attack

The attack parameter defines how fast the filter sound open. A low value makes the filter open quickly and a high value will make the filter open slowly.

5.6 Decay

The decay parameter defines how fast the filter sound close, going from the fully open filter down to the sustain level (see 5.7 Sustain).

5.7 Sustain

The sustain level is the filter value which will be "hold" as long as the sound is playing, e.g., while you hold a key on your keyboard/synthesiser.

5.8 Release

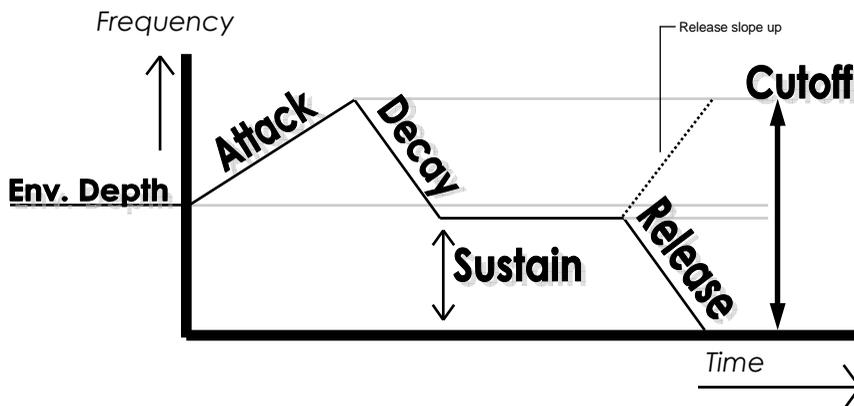
When a key on the synthesiser is released, the release parameter decides how fast the filter should open or close (see 5.9 Release slope).

5.9 Release slope

The two buttons to the right of the release knob let you decide if you want the release envelope to have a positive (open filter) or negative (close filter) direction.

5.10 Diagram

The diagram shows how the different parameters affect the filter over time.



6 Step modulator

The Step modulator in Ace could be described as a LFO (see 7 LFO), an envelope (see 4 DCA and 5 DCF), portamento or even a sequencer. It has 32 steps that can be set individually for filter, frequency and volume. You can draw your own curves with the mouse or use one of the 20 predefined curves.



6.1 Edit a curve

The 7 buttons under the bar window let you decide which one of the parameters to edit. There are 5 parameters to edit (Filter, Oscillator 1 frequency, Oscillator 2 frequency, Oscillator 1 volume and Oscillator 2 volume). Click on the button of which parameter you wish to edit. The "&" buttons can be used to edit frequency and level curves by pairs.

Each bar in the curve represents a value between 0 and 63. There are two ways to edit these values; absolute and relative. By using the left mouse button and drag a bar, the bar will increase or decrease relatively to the mouse movement. The right mouse button sets the bar value to the current position of the mouse. The latter makes it possible to "draw" a curve. A max bar value (value 63) opens the filter as much as possible, and a value of 0 represents a closed filter. The same procedure applies to the volume curves. The oscillator curves has a zero point in the middle of the curve. Values lower than this zero point will tune down the oscillator and a value higher than the zero point will tune up the oscillator.

6.2 Speed

This knob defines the how long time should go between every step in the step modulator.

6.3 OSC Depth

OSC DEPTH is the value each bar will represent to control the oscillator frequency. Ace have 64 fine steps between every half note. By setting the OSC Depth to "64" each bar will represent a note. This can be used to make sequences with arpeggio characteristics. If you want to make a vibrato effect to your patch, you probably don't want each bar to represent a full half-note key, then, set the OSC DEPTH to a lower value.

6.4 Predefined curves

To edit bar by bar may be quite difficult when you want a perfect triangle or sinus shape. The predefined curves do this for you by a simple click on one of the buttons.

6.5 Loop

Above the bars window there is a row of small switches, all grey except one that is yellow. The yellow one is the bar the Step modulator will jump to when it has reached the end of the Step modulator sequence.

6.6 Chords

There are two "chord" buttons. One has a happy face and one with a sad face. The happy face symbolises "major" and the sad "minor". With these buttons it's easy to make minor and major chord "arpeggio" sequences. Just set the bars to whatever you feel like and click on either of the two buttons. ACE will now set the bars to a value in the correct minor/major scale. Observe that the OSC Depth (see 6.3 OSC Depth) must be set to 64 manually.

6.7 Move

The move arrows makes it possible to move around the bars in the sequence. This is very handy if you want to tune a chord to a certain key, or if you want to open a filter sequence a bit. The left/right arrows move the bars one step to the left/right and the up/down arrows move the bars one value up/down.

7 LFO

A LFO is a Low Frequency Oscillator. The word oscillator may fool you to think that the LFO makes a sound. It doesn't. The LFO's job is to modulate the oscillators (see 3 OSC) in different ways. You can make vibratos, tremolos, filter wah-wah's, etc.



7.1 Switches

The switches make it possible to turn on/off LFO functions. There are 5 switches; Filter, OSC 1, OSC 2, Level 1 and Level 2. To modulate the filter, simply activate the filter by clicking on the filter switch, etc. At least one of these switches must be activated for the LFO to modulate.

7.2 Depth

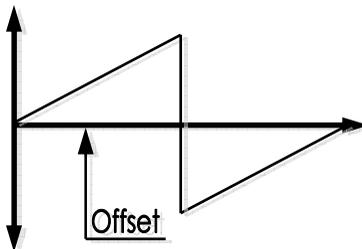
The strength of the LFO is defined by this parameter. A low value won't affect the sound much at all while a high value will make very strong influence on the sound.

7.3 Frequency

This parameter sets the speed of the LFO. A low value makes the LFO go slow and a high value makes it go fast.

7.4 Offset

The waveforms (see 7.6 Shape) are all cyclic waveforms except for the random waveform. They all have a positive and a negative period half. When the LFO comes to the end of the period it wraps around and starts from the beginning again. The Offset parameter let you decide where on the period you want the LFO to start. For example, the triangle waveform has a zero crossing point in the middle of the period. If you want the LFO to start at this position you should set the Offset parameter to a middle value. A low value makes the LFO start at the beginning of the waveform period and a high value makes it start in the end of the period.



The Offset parameter on a sawtooth waveform. The LFO will start at the position of the arrow instead of starting at the beginning of the period as it would have if the Offset value was set to zero. A max value of the Offset parameter will make the LFO start at the end of the period.

7.5 Delay

For some patches you may want the LFO to start a little bit later than the sound starts playing. This parameter delays the LFO a while before it activates it.

7.6 Shape

There are 6 different waveforms to choose from. They are all cyclic waveforms and has the zero crossing point in the middle of the period. This applies to all waveforms except the random waveform which makes the LFO to pick out a random value and use this to modulate the sound.

8 Output

ACE has 2 output modes, "internal effects" and external. Depending on which mode currently selected, the output parameters in the sound section are changed. See section 12 Master for more information about this.



8.1 Dry

This parameter is used to set how much direct sound that should be send to the outputs. Direct sound means sound that is not affected by the reverb and delay units.

8.2 Pan

The Pan parameter let you decide the location of the sound in the stereo picture. The tiny button placed on top of the Pan knob sets the Pan to centre (equal in Left/Right channel).

8.3 Reverb

This function is only activated in "internal effects"-mode (see 12 Master). This parameter sets the level of the sound sent to the reverb unit.

8.4 Delay

This function is only activated in "internal effects"-mode (see 12 Master). This parameter sets the level of the sound sent to the delay unit.

8.5 Out 3-4

This function is only activated in external mode (see 12 Master). The two out knobs are only available in the external mode. They are used to set the levels of the 3rd and 4th output on the external DAC.

8.6 FX/Ex. Out

This small switch is used to enable/disable the reverb and delay processing for the patch. The result is the same as setting the reverb and delay levels to zero. The only difference is that disabling the fx output for the patch will free up some DSP resources.

10 Velocity

Velocity can be assigned to both DCA (amplifier) and DCF (filter). Both parameters can be set to one of 7 different curves. This will make the sounds in ACE respond differently on different velocity values.



10.1 Level

Use the plus/minus buttons to set the curve for the DCA. The first curve (straight line) turns the velocity OFF and when using the last curve you have to play real hard to make the DCA go up. The two curves in between are a mix of these two. The last three curves are "reversed" curves. If you use these curves you will have to play very soft on the keyboard to obtain high volume.

10.2 Cutoff

Use the plus/minus buttons to set the curve for the DCF. The first curve (straight line) turns the velocity OFF and in the last curve you have to play real hard to make the DCF open. The two curves in between are a mix of these two. The last three curves are "reversed" curves. If you use these curves you will have to play very soft on the keyboard to open the filter.

10.3 Oscillator offset

By enabling this switch, you can control the offset parameter of oscillator 1.

11 Patch

The patch operations consists of the patch select buttons and the disc operations for loading and saving patches. See also chapter 14 Sharing files for more information.



11.1 Bank

The 16 buttons marked A-P, selects the active bank. This will be the bank selected if you for example load a bank. Each bank holds 16 patches. A right click on one of these buttons will print the names of the patches in the message window.

11.2 Patch

The 16 buttons marked 1-16, selects an individual patch within the currently selected bank. There are 16 patches per bank. This gives you access to a total number of 256 patches.

11.3 Name

To name or rename a patch, click on the name display and type the name. Press return to exit the text mode.

11.4 Load

The LOAD operations load a number of patches into ACE. There are 3 different quantities; patch, bank and set. All 3 operations will always try to load all patches of the specified type. If there are samples used and the memory left is not enough, ACE will dismiss the sample and set the patch into WAVE mode. Also note that all LOAD operations will destroy the patch(es) previously in memory, at the destination locations.

11.4.1 Load patch

To load a patch, start by selecting the bank and patch slot you want your patch to be located at. Click on the load button and chose the patch (files with the APH extension) you want to load in the file selector and click on the OK button.

11.4.2 Load bank

To load a bank, select the bank (A to P) you want to load your bank into. Click on the load button and chose the bank (files with the ABK extension) you want to load in the file selector and click on the OK button.

11.4.3 Load set

Click on the load button and chose the set (files with the AST extension) you want to load in the appearing file selector and click on the OK button. ACE can also load a set by default. Place a file called "DEFAULT.AST" in the ACE directory and ACE will load this set when you start the program.

11.5 Save

There are 3 ways to save patches. You can save each individual patch as an individual file or group them by 16 (bank) or 256 (set). Note that sample data is not saved, only the path to the sample. When you are about to overwrite a file, ACE will ask you to confirm this operation. This will hopefully prevent you from overwriting important files by accident.

11.5.1 Save patch

To save a patch, start by selecting the patch you want to save with the select buttons. Click on the SAVE button and type the filename you want the patch to be saved as. Click on OK in the file selector.

11.5.2 Save bank

To save a bank start by selecting the bank you want to save with the select buttons. Click on the SAVE button and type the filename you want the bank to be saved as. Click on OK in the file selector.

11.5.3 Save set

Click on the save set button and type the filename you want your set to be saved as. Click on OK in the file selector.

12 Master

The master section of ACE has the parameters for the most basic operations and settings of ACE.



12.1 Volume

The volume knob sets the volume for the whole synthesiser.

12.2 Tune

Here you can tune the whole synth. Min value gives one key down pitch and max value gives one key up pitch. The middle value is the normal pitch following the 440 Hz A-key standard.

12.3 Transpose

Here you can transpose the whole synth in semi tone steps. Min value (-12) gives one octave down pitch and max value (+12) gives one octave up pitch.

12.4 Clock

There are 4 master frequencies in ACE, 32780 Hz, 44100 Hz*, 48000 Hz* and 49170 Hz. Remember that a higher frequency lowers the number of tracker channels you will be able to play.

Note, if you want to connect a sp/dif interface to your Falcon and transfer sounds to another device, you should check what different frequencies the device supports. Some equipment only works with 44100* or 48000* Hz clock frequencies.

12.5 Voices - Currently in use

Here you can see how many channels (voices) that are currently playing. A tracker pattern in ACE can play up to 16 channels. If you get an OVERLOAD message in the message window, you should try to use less channels (voices).

12.6 Save settings

Click on the green disc icon to save your master settings.

12.7 Oscilloscope

The oscilloscope displays the output directly from the DSP. If you use 4-output mode instead of the internal effects (see section 9.7) the left channel represents channel 1 and the right channel 2.

* 44100 and 48000 Hz are only available if you have an external sample clock connected to the DSP port.

12.8 DAC

ACE has two different output modes. The first one is the standard stereo mode, with internal effects. The second one is the external mode, with 4 individual channels for external effects. Note that you need an output box such as the Line Audio FAD 8/2 or 8/8, Steinberg FA8 or Soundpool connected to the DSP port for the 4-channel mode to work properly.

12.8.1 Internal effects

The internal 2-channel mode has two post processing effects, reverb and delay. Reverb simulates the reflections in a room. By enabling reverb on your patches you can make them sound like they were played in a church or hall. Delay can be described as an echo. The delay in ACE is of ping-pong type, meaning the echo bounces between the left and the right speaker. Read more about the parameters in chapter 12.8 for delay, and 12.9 for reverb.

12.8.2 External effects

The 4-output mode was implemented for those who want to use external effects with Ace. This enables you to send patches to different external effect boxes. Output 1 and 2 on your external output box is left (1) and right (2) channel. Output 3 and 4 are effect send channels.

12.9 Delay

The delay effect is best described as an "echo". This can give your sounds very nice stereo picture and add some depth to the sounds. There are 4 parameters to change the characteristics of the delay. See the following 4 sections.

12.9.1 Spread

This parameter set the delays "width". A full value makes the echo jump from left to right channel, like a ping-pong effect. A min value makes the echo sound in the middle of the channels, like in mono.

12.9.2 Decay

The delay knob sets how fast the echo will fade out. A max value will make the delay echo for a long time and a min value will make it fade out quickly.

12.9.3 Time

This parameter defines how long time there will be between every bounce.

12.9.4 Level

This sets the volume of the delay

12.10 Reverb

The reverb is a simulation of a room, it can make your sounds sound like they were played in a large hall or a tiny chamber. It gives ambience and depth to the patches.

12.10.1 Decay

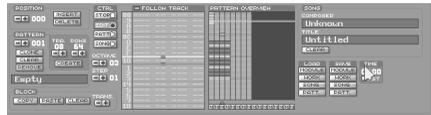
The decay parameter set the size of the room. A max value gives a large room, like a church or a hall, while a low value gives a small room.

12.10.2 Level

This sets the volume of the reverb for all sounds.

13 Tracker

The tracker in ACE Tracker is a 16 channel pattern based tracker. The normal edit window is backed up by the overview window which gives a good view over the pattern, great for editing and marking blocks and patterns.



13.1 Position

There are 255 pattern positions in ACE Tracker. Each position can point to a (separate) pattern. Position 1 may point to pattern 16, position 2 may point to pattern 1, etc. While the pattern defines how the notes and commands should execute, the song positions defines in which order the patterns should be played.

13.1.1 Insert

This functions inserts a new position at the currently selected position. In case you forgot a pattern or later, for some reason, realise that you must insert a pattern.

13.1.2 Delete

This function deletes a position. Please note that the pattern pointed to by this position is not deleted. This have to be done separately.

13.2 Pattern

As mentioned earlier, a pattern defines how the notes and commands should execute. In ACE, a pattern can use up to 16 tracks, or voices, at once. It may be 64 lines long, and a tempo command defines how much time should elapse before the next line is played.

13.2.2 Create

To create a pattern, click on the CREATE button. ACE Tracker does not have a fixed pattern size. You can choose from 1 to 16 tracks and 1 to 64 pattern lines.

13.2.3 Clone

The clone function creates a new pattern and copies the content of the pattern you are currently on to the new pattern. The number of the cloned pattern is displayed in the message window.

13.2.4 Remove

This function removes the pattern from the pattern list. Please be carefull as it is not possible to recover a pattern that you removed.

13.2.5 Clear

Unlike the REMOVE function, this function only clears the pattern data, not the pattern itself.

13.2.6 Name

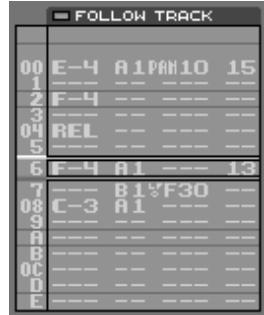
To name or rename a pattern, click on the name display and type the name. Press return to exit the text mode.

13.3 Edit pattern window

The edit pattern window is where the music is created. Combined with the Pattern Overview window (see 13.4) you get a very good picture of what the pattern looks like at the moment.

Press the space key to enter the edit mode, the yellow edit marker will now appear. Use the up/down arrow keys to move up and down in the pattern and the left/right arrow keys to choose which field to edit.

Please note that you can not use the arrow keys to jump to the next track as in most trackers. Use the [Tab] (or [Undo]) key to choose the track to the right of the current track and [Alternate/Shift]+[Tab] (or [Help]) to go to the track to the left. It is also possible to use the mouse to move the marker. Right click on the track and line in the Pattern Overview window.



13.3.1 Line number column

The first and leftmost column displays the lines of the pattern. When a song is playing the pattern will scroll down line by line and play the notes in the pattern. If "follow track" is not enabled, you can use the up/down arrow keys on the keyboard to move to the line you want to edit while the music is playing.

13.3.2 Note column

The second column is the Note column and this is where you enter the Notes when playing on the keyboard. If this column is empty, it can still be used to set a command for another patch than the one currently playing on this track.

Notes are inserted with keys on the computer keyboard. Just like on a synthesizer keyboard you can also simulate a key being released. Use [ESC] key when you are in edit mode to insert a release "REL" command.

Example 1:

```
00 C-3 A1 --- --
01 C-3 B1 --- --
```

Line 00 will play patch A1 with note C-3. In the next line, patch B1 will start playing a C-3 Note.

Example 2:

```
00 C-3 A1 --- --
01 --- B1 LD20 --
```

Line 00 will play patch A1 with note C-3. In the next line, LFO Depth will be updated for patch B1 while patch A1 still continues to play note C-3. If patch B1 is playing on another track, you will hear the change of the LFO Depth parameter even if the parameter is updated in a different track. By do-

ing this, you can update several patch parameters for a patch at once in different tracks.

Example 3:

```
00 C-3 A1 --- --
01 C-4 -- --- --
```

Line 00 will play patch A1 with note C-3. In the next line, the playing frequency of patch A1 will change from C-3 to C-4 without retriggering the patch. To remove the patch number, move the edit cursor to the patch number field and press [Backspace].

13.3.2 Patch column

The patch number is automatically inserted when playing a note on the keyboard but can easily be updated/changed afterwards. There are two fields within the patch number column. The left one is the bank number and the right one is the patch number within that bank. Alphabetical keys A-P is used to insert bank number and keys 0-9 and Q-Y to insert patch number.

13.3.2 Command column

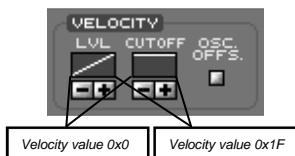
This field can be used for various things. For example, it can be used to change the tempo of the song, jump between patterns, update patch parameters, etc.

There are 3 fields within the command column. The first field is used to define command type. If you put the cursor at this position and for example press key [P] on the keyboard, the command icon "PAN" will show up in the command field. Pan is the balance between Left/Right speakers. For this command, legal value ranges from 0x0 to 0x3F (0 to 63 in decimal) where 0x20 is center position, 0x0 is left and 0x3F is right. For a full listing of available commands, see the Command Table page.

13.3.2 Velocity column

"Velocity" is an inheritance from the terms of synthesizers. Velocity is basically how hard (or fast) you play a key on a synthesizer keyboard. The harder you play, the louder the sound will get. In ACE Tracker, the velocity can be set in 32 steps. If no velocity is inserted, the note playing will have velocity 32 which is the hardest. Even if this value is the hardest, it will not necessary mean that it will generate the loudest sound. It all depends on how the velocity curves are set. To get even more complicated, the velocity value can not only generate high or low volume, it can also be used to open or close the filter.

Example:

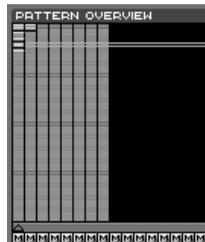


In this configuration, the level velocity curve is set to linear which will result in a high volume for a high velocity value. The filter cutoff velocity curve is set to a straight line which will not change the filter cutoff no matter of what the velocity value is set to.

13.4 Pattern Overview window

The pattern overview window located to the right of the pattern edit window displays the whole pattern. 16 tracks and 64 lines of pattern data can be shown to give a good overview of what the pattern "looks" like at the moment.

The two horizontal bars shows the play position and the small track cursor is the edit position. When entering edit mode, the bars and marker change colour from black to yellow.



13.4.1 Mute / Solo

Beneath the pattern overview, there are 16 buttons marked "M". These can be used to mute a track to make it silent. A right click on a "M" button, mutes all tracks except for the track the "M" button belongs to. You can also hear tracks one by one by hovering the mouse pointer over the overview window.

13.4.1 Block operation

In the overview window you can also mark blocks. Either by a left-click-and-hold mouse movement or by holding down [Alt] key while using arrow keys to move the track cursor.

When a block is marked, you can use the block as a source for a copy/paste operation. Copy and paste can be done by either clicking on the buttons in the "Block" section to the left in the tracker section, or by [Alt]+[C] (copy) and [Alt]+[V] (paste).

In the "Block" section you will also find buttons for clearing the block and transposing the notes in the block.

Voice table

Here is a table of how many voices you can expect on your Falcon.

Standard Falcon030 / 16MHz:

WAVE	33 KHz	44 KHz	48 KHz	50 KHz
Internal	N/A	N/A	N/A	N/A
External	N/A	N/A	N/A	N/A

SAMPLE	33 KHz	44 KHz	48 KHz	50 KHz
Internal	N/A	N/A	N/A	N/A
External	N/A	N/A	N/A	N/A

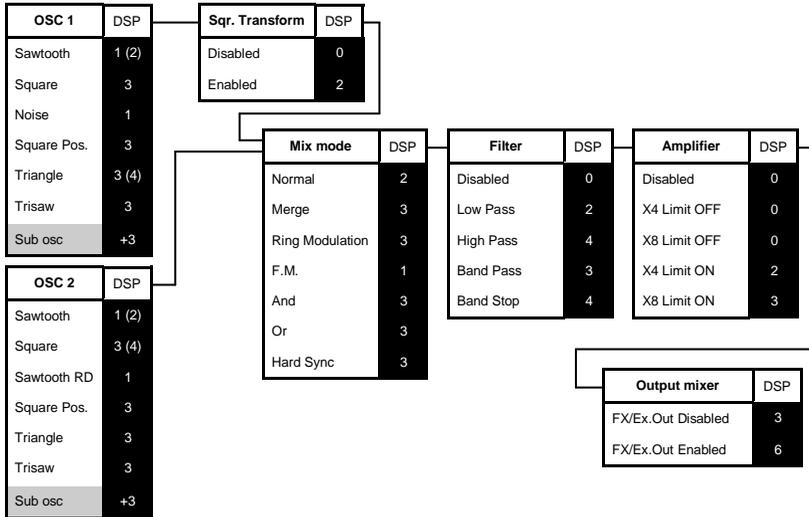
Accelerated Falcon CT60 / 66MHz CPU / 25MHz bus:

WAVE	33 KHz	44 KHz	48 KHz	50 KHz
Internal	N/A	N/A	N/A	N/A
External	N/A	N/A	N/A	N/A

SAMPLE	33 KHz	44 KHz	48 KHz	50 KHz
Internal	N/A	N/A	N/A	N/A
External	N/A	N/A	N/A	N/A

DSP Block diagram

Numbers in DSP column defines number of DSP instructions per sample output. Numbers within parenthesis are for F.M. mix mode.



Best case

Sawtooth + Sawtooth + Normal mix mode = 7 DSP instructions/sample.

Worst case

Square + Sub osc + Triangle + Sub osc + Square Transformator enabled + Normal mix mode + High Pass filter + Amplifier X8 Limit ON + FX/Ex.Out enabled = 29 DSP instructions/sample.

(In theory, the DSP can perform 16.000.000 instructions per second. When running ACE in 32780 Hz this would mean $32780 * 29$ (worst case) = 950620 instructions per second and voice. In theory.)

Short cuts

CTRL + ↑	.....	bank up
↓	.....	bank down
→	.....	patch up
←	.....	patch down
CTRL + C	.....	copy patch
CTRL + V	.....	paste patch
CTRL + S	.....	select the patch in the current pattern cell

In Tracker mode:

Most keys on the keyboard	.....	insert / play a note
[Esc ]	.....	insert release note REL
↑	.....	move marker up one pattern line
↓	.....	move marker down one pattern line
→	.....	move marker right
←	.....	move marker left
ALT + ↑	.....	mark pattern block up
↓	.....	mark pattern block down
→	.....	mark pattern block right
←	.....	mark pattern block left
ALT + [C ]	.....	copy pattern block
ALT + [V ]	.....	paste pattern block
ALT + [D ]	.....	delete (clear) pattern block
ALT + [+] (Num pad)	.....	transpose block 1 semi tone up
ALT + [-] (Num pad)	.....	transpose block 1 semi tone down
[Tab] (or Undo)	.....	move marker to next track
ALT + [Tab] (or Help)	.....	move marker to previous track
SHIFT + [Tab] (or Help)	.....	move marker to previous track
ALT + [1] thru [8 ]	.....	octave
[Return ]	.....	play pattern
ALT + [Return ]	.....	play song
[Space ]	.....	toggle stop / edit
Undo (or Tab)	.....	move marker to next track
Help (or ALT + Tab)	.....	move marker to previous track
((Num. Pad)	.....	position decrease
) (Num. Pad)	.....	position increase
/ (Num. Pad)	.....	pattern decrease
* (Num. Pad)	.....	pattern increase
. (Num Pad)	.....	set custom play position
Enter (Num Pad)	.....	play pattern from custom play position

...short cuts

- 0 (Num Pad) play pattern, start from 8 lines back
- F1 decrease a value in any pattern column
- F2 increase a value in any pattern column
- F3 start position for interpolation of column 3 or 4
- F4 end position for interpolation of column 3 or 4

Default.ast

Default set - banks by category:

Bank A	And Mix Mode
Bank B	Basses
Bank C	Chords
Bank D	Drums, Analog
Bank E	Electro Drums
Bank F	F.M. Mix Mode
Bank G	Guitars and strings
Bank H	Hard Sync Mix Mode
Bank I	Ringmodulation Mix Mode
Bank J	Juno
Bank K	Keyboards
Bank L	Lead Sounds
Bank M	Merge Mix Mode
Bank N	Nils Feske Classics
Bank O	Or Mix Mode
Bank P	Empty

Thanks...

Thanks goes to the following people for help and support while making this program. In random order:

Odd Skancke for help with file selector calls.

Tim Conrardy for support, beta testing, patch programming and for all the effort and hard work you gave

to the Atari MIDI scene.

Pieter Van Der Meer - Qasm simply rules!

Daniel Pettersson for optimizing some of the synth engine code.

Shiuming Lai for support and beta testing.

Nils Feske for beta testing and patch creation.

Fredrik Olsson for rendering the knobs.

Leon Stok for original ideas and formulas for filter design.

Anders Eriksson for support with IFF file format, APX converter, beta testing and much more.

Roger Andersson for help with Jam FAD.

The ATARI scene for inspiration and motivation.

The Hatari crew for making the great Hatari Falcon emulator.

Martin Knutsson for beta testing.

George Nakos for help with bits and pieces.

#atariswe & #atariscne- always helpful people.

I would also like to give an extra thank you to all the people who are using the programs to make music. There's no greater joy than to hear what you have accomplished with ACE.

Thank you!

Program history

Version 2.00

Released (2014-06-19)

- Triangle oscillator implemented.
- Trisaw oscillator implemented.
- High Pass, Band Pass and Band Stop filters implemented.
- Filter disable implemented.
- Square transformator added to oscillator 1.
- Sawtooth sub oscillators added to both osc. 1 and 2.
- Hard sync mix mode implemented.
- Possibility to disable reverb and delay (or output 3/4) per patch.
- Two new source oscillators in F.M. mix mode.
- Amplifier with or without limiting. Can be used for distortion effect.
- Improved .WAV support.
- Increased maximum number of samples to 256.

Version 0.998

Released (????-??-??)

No official release.

Version 0.997

Released (2005-09-05)

Version 0.996

Released (????-??-??)
