

# PCCAD Operating Instructions

**PCCAD** version 1.3 for Windows 95 and later.

The intention with this software package is to give you an easy-to-use tool to select suitable pulse capacitors for your applications.

You have the following main options with **PCCAD**:

- to get general technical information about Pulse capacitors
- to get complete data sheets of all EVOX RIFA pulse capacitors
- to select a Part Number and then get diagrams of ESR, DF, maximum I<sub>rms</sub> and U<sub>rms</sub> vs frequency and ambient temperature.

This means that it is easy to check if a certain capacitor is suitable for your application!

- to make Fourier analysis of an arbitrary waveform.
- to make print-outs of data files and diagrams from your simulations.
- to get information about EVOX RIFA and addresses of all EVOX RIFA offices and representatives worldwide.

## How to install the software:

- If you have received the program from Evox Rifa on a floppy disk unzip the file to your hard drive and run the program. **Note:** If you have a previous copy of PCCAD installed, uninstall it first by deleting the existing PCCAD subdirectory.
- If you download the program from [www.evox-rifa.com](http://www.evox-rifa.com), follow the instructions for downloading and extracting the program.

The software will be installed on your hard disk, by default on **C:\program files\EvovRifa PCCAD**. This can be changed.

A group "Evov Rifa PCCAD" is created with icons for the following programs:

- 1) *pccad1\_3.exe* The CAD program.
- 2) *fourier.exe* Fourier analysis of an arbitrary waveform.

Please completely fill out and return the registration card included in this package. (Not applicable to the on-line version.) **This information will not be sold or distributed beyond Evov Rifa or associated companies.**

We would also appreciate any comments you might have.



## Legal notice

The EVOX RIFA Pulse Capacitor CAD (PCCAD) is freeware. It is a non-commercial product. All documents, software and archives that are attached or included are protected by applicable copyright laws. PCCAD is provided "as is", without warranty of any kind or guarantees for fitness for a particular purpose, either expressed or implied, which is hereby explicitly disclaimed.

You may freely copy and distribute PCCAD as long as no fee is charged and the PCCAD archive contains unmodified copies of the original files as produced by EVOX RIFA. No part of PCCAD may be modified, altered or reverse engineered.

In no event shall EVOX RIFA be liable for any damages, costs or other incidental or consequential damages arising out of the use of PCCAD.

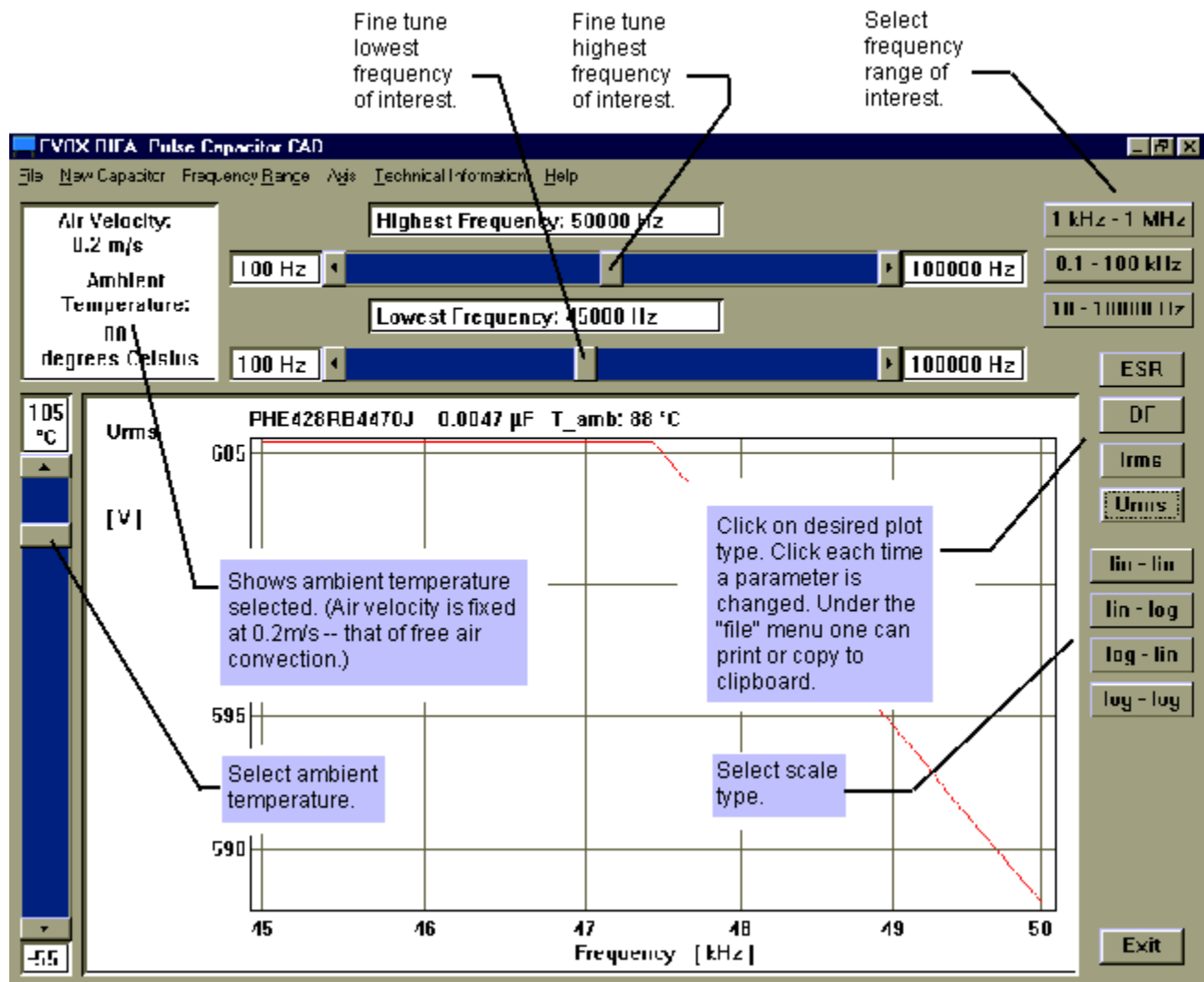
The specifications of the capacitors in PCCAD are subject to change without notice.

## Getting Started with PCCAD

After following the installation instructions PCCAD may be run from the start menu.

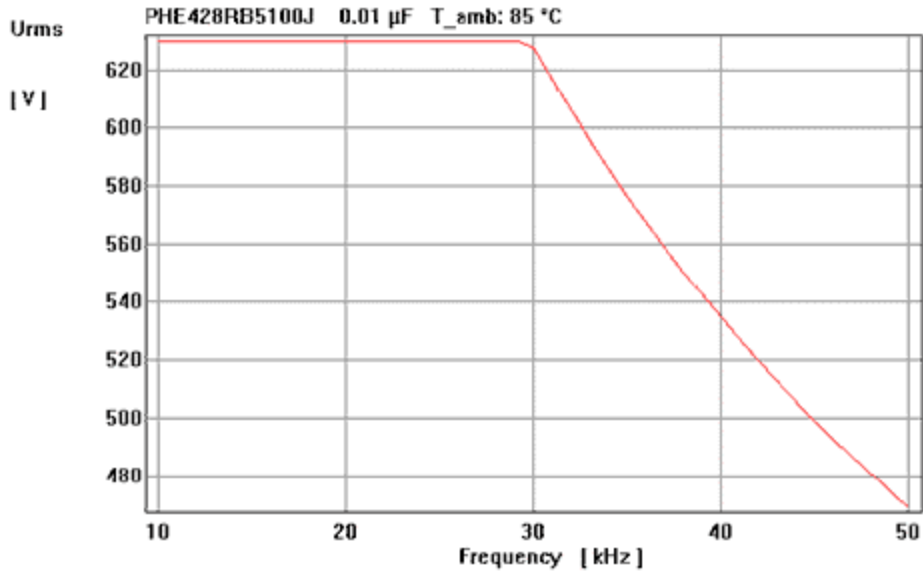
An initial menu will require the selection of a proposed capacitor type. Pick the series with a range of capacitance and voltage suitable for the application. Please note that there is a crossover in values amongst the three types. In cases where more than one type is available it is recommended that they be tried in reverse order of performance (and cost). That is, try PHE426 first, then PHE450 and PHE448.

Once a capacitor is selected the main window will appear. One selects the applicable parameters and then clicks on a plot type. The diagram below serves as a guideline. Additional help and technical information is available within the program. We recommend reading the help files to learn of other useful features.



**Example printout of PCCAD showing the maximum voltage vs. frequency:**

(Note: If the voltage waveform is not sinusoidal then use the RMS current rather than voltage as the basis for evaluation.)



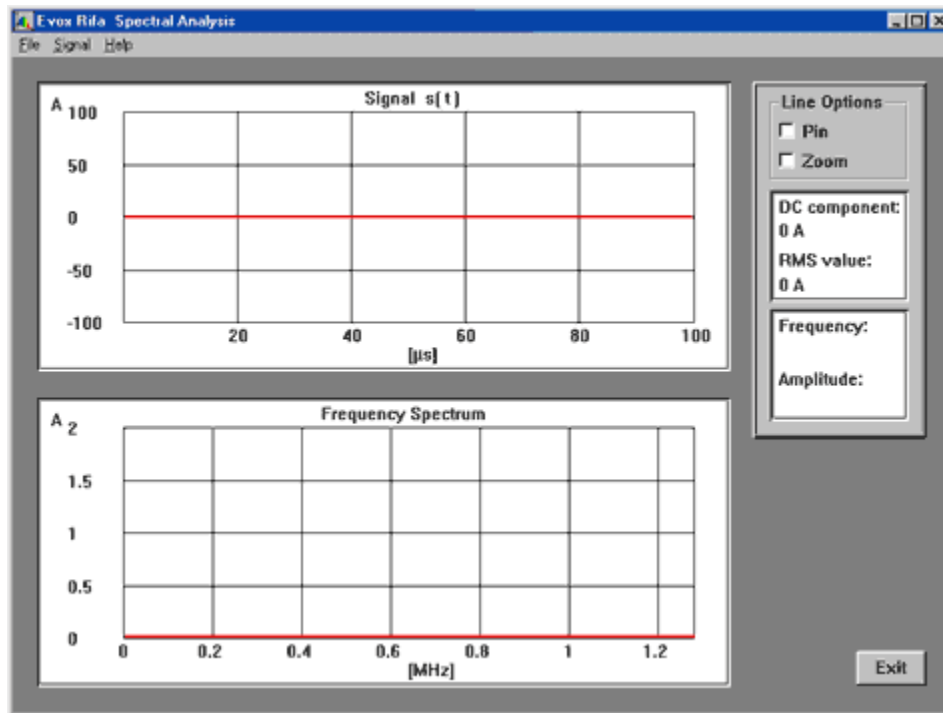
Max  $U_{rms}$  frequency at 85 °C, typical values.

Air velocity: 0.2 m/s (=natural convection).

Specifications			
Part No:	PHE428RB5100J		
Capacitance:	0.01 $\mu$ F		
Rated voltage:	1600 VDC / 630 VAC		
Max dimensions in mm:	B	H	L
	8.5	16	18
Pitch:	15 mm		
Max dU/dt:	2500 V/ $\mu$ s		

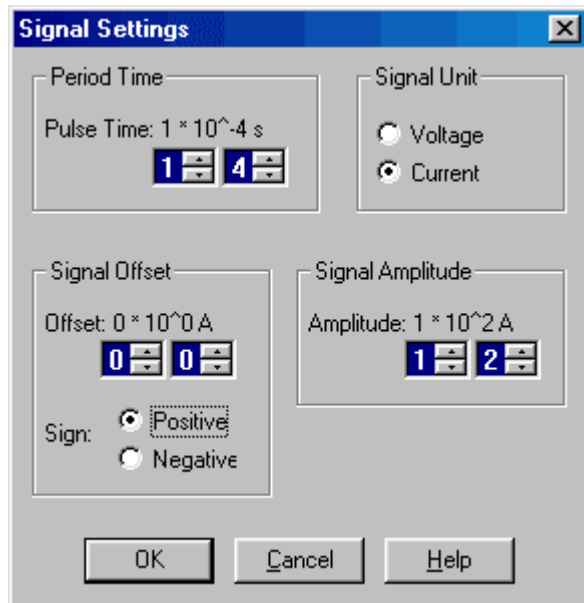
## The Fourier Utility

A utility called FFT1\_1.EXE is provided in the PCCAD subdirectory. The utility allows one to perform a Fourier analysis of any periodic waveform. After drawing the waveform on the screen one may read the RMS value and view the harmonic content on a frequency-domain display much like a spectrum analyzer. The main use of the Fourier utility is to obtain the RMS value of a current waveform in conjunction with the PCCAD program. Of course the program has many general applications as well.



After running the program the user will see the main screen. The waveform is drawn in the top window. The frequency spectrum is dynamically displayed in the bottom window and the waveform data is displayed to the right.

Before drawing a waveform, select the menu item FILE – CHANGE SETTINGS:



Adjust the period of the waveform graph, signal offset (DC offset), units of measure and signal amplitude (max. amplitude of the Y-axis).

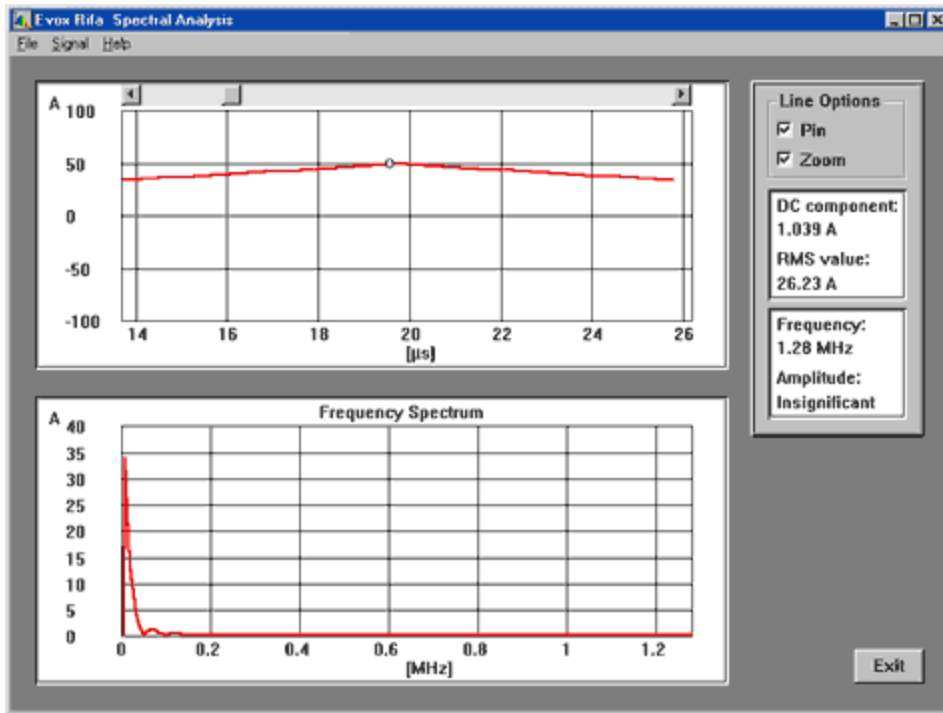
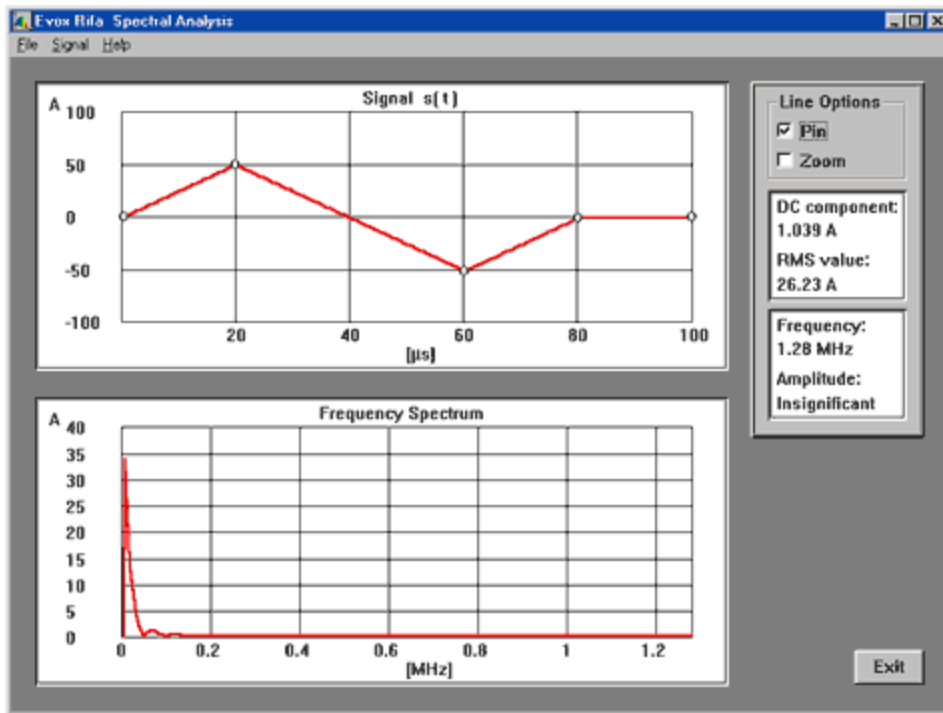
### Entering a waveform manually

Waveforms consisting of straight lines can be manually drawn. To draw a waveform one simply moves the cursor into the top window. As the cursor is positioned over the red line it changes to a hand. (Note that the index finger is the locating point.) Click-and-hold to grab the line and drag it up or down to the desired value. Release to reposition the line at the new point.

By selecting the “pin” option in the window to the right, one can see the adjustment points. This allows for easier repositioning of the waveform peaks.

One can also obtain a 10:1 zoom for fine tuning by selecting the “zoom” option. The time scale will be expanded and a horizontal scroll bar will appear above the waveform.

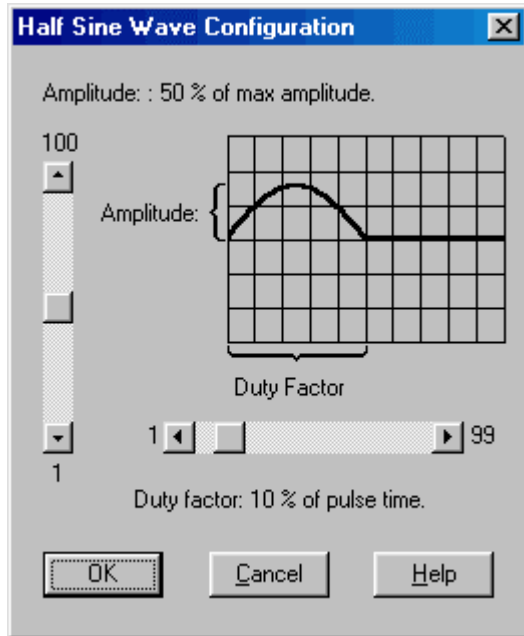
To start over with a fresh straight line, see the instructions on entering a predefined waveform. Two examples using the pin option are shown below, with and without the zoom option selected.



## Entering a predefined waveform

Select the menu item SIGNAL and choose one of the predefined waveforms. To select a straight line, choose "DC offset."

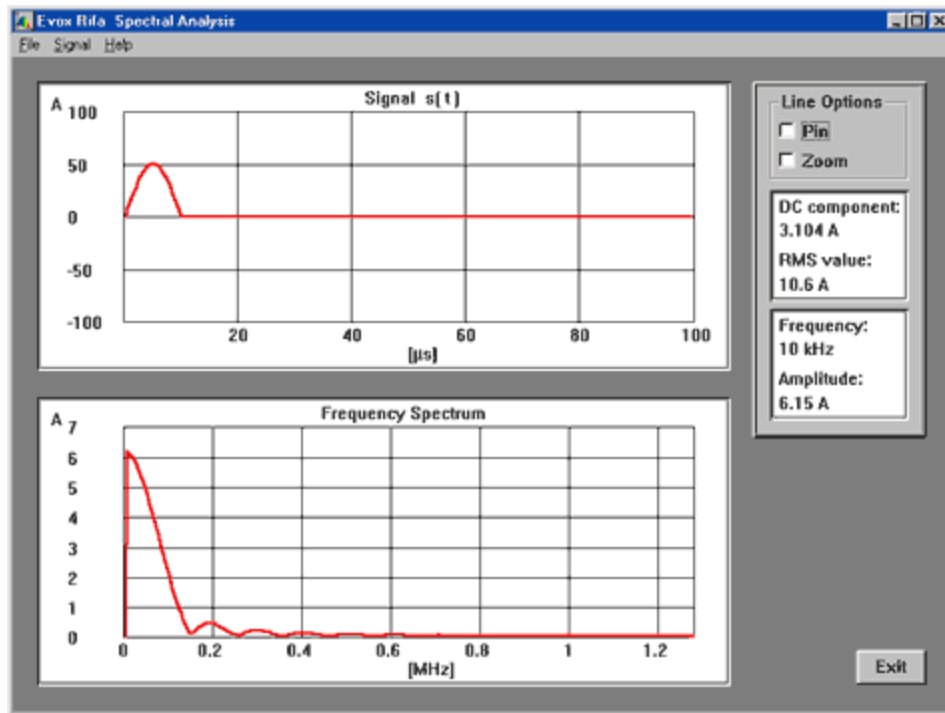
In the example below the waveform "half sine" was chosen.



Adjust the duty factor and max. amplitude. In this example the time axis spans 100uS, so a 10% setting will provide a half sine with a 10uS period. Similarly, the Y axis max. amplitude is 100A, so this half sine will have a peak of 50A. The result is shown in the next example.

## Reading amplitudes for specific frequencies in the lower window

When the cursor is moved to the lower window it changes to a tuning fork. Position the tuning fork at the desired frequency to read the amplitude in the window to the right. In the following example the tuning fork was placed at the peak of the display in the frequency domain.



## Obtaining assistance

Assistance about this software or about capacitors in general may be obtained by contacting your local Evox Rifa office. In North America contact Evox Rifa at the address shown on the first page of these instructions. For locations elsewhere visit the Evox Rifa Web site [www.evov-rifa.com](http://www.evov-rifa.com) or select "Who is Evox Rifa?" in the help menu.