

## **Micro-Cap 11**

### **Installation:**

To install Micro-Cap 11 run the setup.exe from the CD and follow the instructions. Do not install on a write-protected area like Program Files. Micro-Cap writes to its installation folder so the folder needs to be writable. No security key is required.

## **New Features in Micro-Cap 11**

### **64 Bit Version**

Micro-Cap 11 comes in two varieties, a 32 bit version which can access 2G of RAM and a 64 bit version which can access as much as 192G of RAM. With 32G of RAM, the 64 bit MC11 easily handles circuits with 2,000,000 nodes.

### **Analysis**

Stability analysis: This is new type of AC analysis that breaks the loop at a user selected site and measures open loop gain, phase margin, and gain margin using the Tian or Middlebrook method.

Worst Case analysis: Using RSS, Monte Carlo, and extreme value analysis, this routine computes the worst case value of critical design parameters. It works in AC, DC transfer, transient, or DC operating point.

### **Schematic Editor**

Encryption: Password-protected encryption can now be used on circuit, macro and library files.

Title Block editor: A Title Block editor was added that allows multiple fonts, adjustable size, and title block template save and recall for greater ease of use.

Rich Text Format: An option for RTF text format was added, enabling super and sub-scripting, and font, style, size and color control of individual words within a text block.

Text angle: An option was added to allow arbitrary text angles.

Command statement builder: A command statement builder was added to help construct .measure, .warning, .help, and .define statements.

Background: Background images, including watermarks, can be added to a schematic.

Graph Paper Option : A Graph Paper option was added to the Grid options

Auto Scale (F6) : An auto scale option was added.

Unconnected pin markers: Pins and wires that have no connections can be marked with a special symbol (yellow triangle) that shows possible faulty wiring.

Bill of Materials: An Excel file can be created from the BOM contents.

BOM optional expand: The .define values can optionally be expanded in the BOM, so that .DEFINE RX 3K shows up as 3K and not RX.

Copy circuit name to clipboard : Right click on the circuit window tab has an option to copy the window name to the clipboard. The name includes the entire path to the circuit file.

Expandable Component Find : An expandable component find dialog box makes it easier to read the sometimes lengthy component memo text fields.

Attribute Dialog box disable: The automatic display of the Attribute Dialog box that occurs when you place a component can be eliminated. This is convenient when drawing a general schematic without values.

Expandable Attribute Dialog box: This dialog box can now be expanded by dragging the Size grow icon, making viewing large subcircuits easier.

Dialog box location save: The location of major dialog boxes can be saved, even if they are on different monitors.

Text grid snap: A feature was added to disable or enable grid snap for text.

Find / Replace: This command was improved to include whole word search and to show the schematic location of the found item behind the dialog box.

Enable region box: An on/off check box was added to the enable region to make it easy to disable/enable the region expression checking.

Find in Files command: An All option was added to this command.

Push-pin text: Push-pin text can be enabled in the Text dialog box. Placing a mouse over the text displays the text. Otherwise just push pin is shown.

Embedded Images: Image files in a circuit can now be localized (embedded or saved in the circuit file) making the circuit file more portable.

Pictures: Images can be dragged from an application and dropped into a schematic or analysis plot. Images can also be copied and pasted into the schematic. They can now be embedded in the circuit file or linked. They can be created automatically from an analysis.

Info page options: Info page content can be chosen from the circuit Properties dialog box (F10).

Properties dialog box : The color of each schematic object is displayed beside the item for greater clarity.

Change dialog box : The Change dialog box now shows selected components.

### **Measurement, and Plotting**

Performance functions: An integration operator that integrates a waveform between two X values and a Peak-to-peak operator that measures the peak to peak of a waveform over the simulation run were added.

.Measure command: The HSPICE .Measure command was added.

Measurements window: A measurements window shows the results of .measure and performance functions.

Measure library: Common measurement functions using the basic .measure command set. Includes pulse width, frequency, period, overshoot, delay, and power factor.

FFT windowing functions: Extensive set of FFT windowing functions (Rectangular, Cosine, Tukey, Barlett-Hann, Blackman, and many more)

FFT window reference frequency: For HARMN, db(HARMN), THD and IHD

Fourier Integral: An option for computing Fourier spectra using the Fourier integral rather than the FFT was added.

Fourier Plots: An option for clipping baseline db values and ignoring the phase computation for low db values was added.

Curve fitting utility: Linear and polynomial curve fitting utility

Ignore Illegal Plots: Option that ignores analysis plots that have a disabled or missing part or node, for cases where you want to switch between enabling and disabling circuitry and have the analysis limits plots still be legal.

More Plot Groups: Up to 19 plots within each plot page can be named and used.

Adjustable Plot Height: Analysis plots heights can be adjusted by dragging.

Dynamic AC: Temperature and frequency were added to the text display.

**Analysis Limits Copy / Paste:** The analysis limits can now be copied from one circuit and pasted into another.

**P key skips:** The Plot tab of the of the Plot Properties dialog box controls how many P keys to skip between values printed to the plot.

**Numeric output path:** The name and path can be set for numeric output files.

**Fast Numeric output:** The speed of the output routines was enhanced in anticipation of the need in larger circuits possible with the 64 bit version.

**Analysis Limits Plot Item Menu :** A new pop-up menu provides control (move, add, delete, copy, and paste) for each plot item in the analysis limits dialog box. Click and drag for plot items makes it easy to rearrange the plot order.

**Animation programmed wait:** A “Wait for Key Press After T=” which waits until T equals the specified time to start the key press wait was added.

## **Models**

**Parker-Skellern Gaasfet Model:** A fourth GAASFET model option was added.

**New BSIM4 Model:** The latest BSIM 4.7 model was added.

**Updated JFET model:** Added the ALPHA, VK, ISR, N, NR parameters.

**M multiplier:** The M multiplier command line parameter was added to diodes, BJTs, and JFETs.

## **Expressions**

**Floor and Ceil functions:** Floor and ceiling functions were added using standard C language notation.

**Internal Variables:** The internal structure variables for many complex models are now available for plotting. For example gm, gmbs, vdseff for BSIM3 models.

**Fourier Window Phase Operator Limit:** This lower limit below which the phase function is ignored, minimizes choppy plots when the real and imaginary parts are very small.

**Fourier Window Magnitude Operator Limit:** This is a lower limit below which the magnitude is clipped.

## **Monte Carlo**

**Run Limit:** The limit on the number of runs was increased to 100,000.

Simultaneous runs: Stepping and Monte Carlo can be run simultaneously. Formerly, only one or the other could be run at a time.

Histogram info: Hovering the mouse over a histogram bar shows the Y value and the X range in the Status bar.

Histogram bar count: The number of histogram bars can be set when using the Auto option.

Monte Carlo exception file: When creating an exception file, a text string is placed in the schematic to describe the case that was used such as Temperature= 27 Case=3

### **Component editor**

Shape not found: When a component can't find its assigned shape, a flag is set so that the part looks for its normally assigned shape each time the component file is loaded.

Component merge command: Partial merges can be done when merging two component library files.

Save As command: A Save As icon was added to the Component editor tool bar.

Read Only flag: If a component library is set to read-only the text "(Read Only)" is appended to the file name in the hierarchy display.

Size control: The size of the Component editor dialog box and its Move dialog box are now user-controllable using the Size grip icon.

### **Shape editor**

Size control: The size of the Shape editor dialog box is now user-controllable using the Size grow icon.

Uniform text direction: The text direction is now uniform.

### **Printing**

Print portion: Optionally, only the portion within a select box can be printed.

Print scale: Each page can have a different print scale.

Print disable: Disabled items can optionally be excluded from the print.

### **Miscellaneous improvements**

Excel import: Data from an Excel spreadsheet can be imported into a User model file using

Copy (on the Excel side) and Special Paste (on the MC11 side).

Batch file quiet command: Plotting can be eliminated with the new /quiet command.

Batch file image commands: Commands were added to facilitate capture of schematic and plot images.

Batch file Save V&I command: A batch file command (/SVI) was added to save voltage and current only.

Internal batch file execution : A batch file that normally is executed from DOS or a Micro-Cap command line can now be executed from within Micro-Cap.

Sliders default: A new button was added to set the default value to the current value.

Tag Branch Info: Cursor tags can have branch information added to the tag.

WMF files: WMF files can be created with transparent background.

3D graphs: Users can set the min and max colors and the graph color will scale in between.