

CIF20P INSTRUCTION MANUAL

by

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CIF20P is a command driven application program located in <SSPLIB>. It takes your typed input and if it is one of its commands it executes it, else it complains. The valid commands can be listed during execution by typing HELP or ?. Something like the following will be displayed on the screen.

COMMANDS:

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CIF <filename>           ! plots cif from file;
USE <filename>          ! takes commands from file;
END                      ! ends command file;
DEVICE <device name>    ! selects a new output device;
CALL nn                 ! same as 'CIF sysin, C nn, E';
MCALL nn                ! same as 'MBSSET nn, CALL nn';
SPLIT r c nn           ! same as 'MCALL nn' plots R x C
                        ! sheets;
OPEN <filename> ; CLOSE ! open or close a file for
                        ! LPT or CHARLES;
WIPE                    ! clear the entire screen;
CELLS                   ! output defined cells and their
                        ! mbb's;
ALLLAYERS ; LAYER <layer> ! plot all layers or only a
                        ! specific layer;
LAYERS                  ! lists all defined layers;
LEVEL nn                ! plot all cells until nn calls
                        ! deep;
MBSSET nn               ! sets window to mbb of cell nn;
USER|VIRT|CUSER|CVIRT  ! sets window coordinates;
OUTLINE <layer>        ! outline the window in a
                        ! layer's color;
CLEAR <layer>          ! clear the screen in a layer's
                        ! color;
NCIRCLE nn              ! set the number of points used
                        ! to plot circles;
HPARCS ON ; OFF        ! turn HP arc and circle hardware
                        ! on or off;
TEXT ON ; OFF           ! turn text plotting on or off;
DISK                    ! setup disk buffering
                        ! of symbols;
                        ! --- useful on CHARLES only ---;
TURNON <layer> ; ALL   ! reinstate a specific layer or
                        ! all layers;
TURNOFF <layer> ; ALL  ! erase a specific layer or all
                        ! layers;
REMAP ; MAP <4 integers> ! set the colormap;
CURSOR                  ! display cursor coordinates;

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HINTS: If a filename doesn't include an extension then it assumes ".CIF". SYSIN is valid and very useful for plotting after the file has been parsed.

CIF20P commands may be entered in either upper or lower case. Anything on a line after a command is thrown away. Also note that this is true when CIF'ing SYSIN and the HP plotter is turned on during that command.

Upon starting CIF20P the initial values for certain variables (like level) are shown on the screen. It is up to you to change these - no prompts are given. Following is an explanation of each command:

CIF <filename> reads and parses CIF2.0 from the file using the CIF2.0 parser in <SSPLIB>CIF20.SIM. The file specification can include '<>' and an extension. If no extension is given .CIF is assumed. SYSIN is a valid file specification and will then take CIF2.0 commands from the terminal. This can be used to plot the various cells already defined. The 'E' command returns you to CIF20P. Errors and warnings will be displayed on the screen. Any command not inside a definition will be executed. Everything after the 'E' command is ignored and no check is performed to see that nothing follows it. No user extensions are supported and comments are ignored.

USE <filename> takes CIF20P commands from the file. The file specification rules are the same as for the CIF command. This file can terminate with either an END or end-of-file.

END will terminate the current command level. If contained in a file that is USED, then it will terminate execution of commands from that file. If entered in at the terminal, it will terminate CIF20P.

DEVICE <device name> will select a new device if the device name is a valid device. Valid devices are TEK, HP, CHARLES, and LPT. Whenever a new device is selected, a new set of layers is created. Thus any that you may have created disappear.

CALL nn will plot cell nn on the currently selected device. It is the same as issuing the commands 'CIF sysin' , 'C nn;E'.

MCALL nn will set the user limits to the mbb of cell nn and then plot cell nn on the currently selected device. It is the same as issuing the commands 'MBBSET nn' , 'CALL nn'.

SPLIT r c nn will plot cell nn on r*c sheets or screens. It initially sets the user coordinates to be the mbb of cell nn. Then it divides that area up into 'r' rows and 'c' columns. For each of these sub areas it sets the user coordinates to its sides and plots the cell. Before each plot it asks whether you want to plot that sheet or not.

OPEN <filename> for the LPT will designate an output file. Nothing is output until the CLOSE is performed and after that close, the current image is cleared. Sysout is not a valid file name. For the CHARLES, OPEN will open a file and subsequent plotting characters will be output to it. This file will be closed by the CLOSE command. A CLOSE is done on exit from the program if forgotten, or when a new device is selected.

WIPE will clear the screen of the current device. The CHARLES and TEK will clear itself, the HP will ask for a new piece of paper, and the LPT will clear the current image it has stored.

CELLS will list all defined cells, tell whether their mbb is on/off, and also display the coordinates of its mbb (minimum bounding box).

LAYER <layer> will cause CIF2OP to plot only the specified layer from now on. Whenever a layer is specified in any command, if it doesn't exist it will be created, added to the current layer list, and you will be asked for its color number. The current layer list is the list of layers plotted. Each executable command gets executed once for each layer in the list. Thus a call really gets executed fully many times and adding layers can really slow down the plotting. Note that all layer names are truncated to four characters.

ALLLAYERS will return CIF2OP to plotting on all layers in the current layer list.

LAYERS will list the current layer list and the color numbers for each layer.

LEVEL nn will set the level to the integer nn. Level regulates the depth of symbol calls. Once the depth of calls equals level, the symbols just show their mbb and nothing else. Initially, level is 0 so that upon reading most files in only the top symbol's mbb is shown. Thus you needn't worry about the window's size before reading in the file.

MBBON;MBBOFF ALL!nn will set the mbb for one or all symbols on or off. If the mbb is off, the symbol shows itself normally. If the mbb is on, then it shows its mbb and nothing else. An mbb shows itself by drawing a white line around itself. Note that NMBB is a valid layer and can be used in the LAYER command to only show mbb's.

MBBSET nn will set the window's boundaries to the mbb of cell nn plus one per cent. It is the same as the USER command with cell nn's mbb numbers.

USER followed by 4 reals will set the user coordinates of the window. The first two reals are the lower left x and y, the next two the upper right x and y. The user coordinates are the coordinates that the cells are defined in (microns) and determine what is shown in the window. For more information about user and virtual coordinates, windows, and clipping see <SSPLIB>VIEWS.SIM and SSP Memo #1929.

VIRT followed by 4 reals will set the virtual coordinates of the window. The reals are the same as for USER. The virtual coordinates of a window specify where on the device the window is shown and how big it is. The maximum size is -1.0 $-aspectratio$ 1.0 $aspectratio$ where $aspectratio$ is the y size of the device divided by the x size of the device. By using the virt command, the same user coordinates will always be shown inside the window.

CUSER followed by 3 reals sets the user coordinates of the window also. The first two are the window's center x and y, the third is the magnification. The magnification is user/virtual coordinates. By changing the magnification to a smaller number, the picture can be enlarged.

CVIRT followed by 4 reals sets the virtual coordinates of the window just like VIRT except that the magnification stays the same (changing the user coordinates contained inside the window).

OUTLINE <layer> will outline the window with four boxes that are 3 pixels thick in the specified layer's color.

CLEAR <layer> will clear the entire device's screen in the specified layer's color. This may be useful before plotting only contact cuts on the CHARLES, as they are black and normally wouldn't show by themselves.

NCIRCLE nn will set the number of points used in converting a full circle to a vector of points to nn. An arc has a proportionate number of points in it, but no less than 4.

HPARCS ON!OFF will enable the HP plotter hardware for circles and arcs. When this is on, arcs and circles are not clipped or rotated properly.

TEXT ON!OFF will turn the plotting of mbb names on or off. The names are the cell's number and will be displayed in the center of the cell.

TURNON!TURNOFF <layer>!ALL will turn on or turn off a layer or all layers on the CHARLES terminal. This changes only the color map and not the frame buffer.

DISK will setup the disk buffering of whole symbols such that designs that are too large for the address space can be plotted. CIF20P will ask for a resident symbol limit which is used to regulate the number of symbols permitted in memory. The DISK command can be used at any time. If CIF symbols have already been defined they will be written to disk in preparation for symbol "paging". After the DISK command is executed all subsequent CIF symbols read will be copied to a random access disk file in the same manner. The DISK command may be issued at any later time if the user wants to change the resident symbol limit. Once Disk buffering is turned on with the DISK command, it cannot be turned off without exiting and restarting CIF20P. The creation of the random access disk file adds significant overhead to the reading of CIF files, thus the DISK command should not be used unless you really need it.

MAP followed by 4 integers will set the RED, BLUE, and GREEN values of a color for the CHARLES. The first integer is the color number, the next three are the RED, BLUE, and GREEN values. All four integers should be from 0 to 15. This can be useful for viewing only transistors (whose color is the logical OR of poly's color and diffusion's color), or other intersections. Remember that these commands may be placed in a file and USED.

REMAP resets the color map for the CHARLES to its original setting.

CURSOR will stay in a loop and display the user coordinates of the cursor until the third mouse button is pressed. The MP can also digitize points using the ENTER button. The pens serve as buttons, that is if pen 3 is being held, it will have the same effect as mouse button three.

A very useful extension has been added to CIF20P if used in conjunction with a CIF file that has been produced with LAP or GAP. LAP outputs the cell's name in the comment preceding the DS statement. CIF20P reads this comment field and picks the cell name out from it and saves the UPCASE version of it. For any command that uses a cell number (CALL, MCALL, MBBSET, MBBON, MBBOFF), you can use the name instead of the number. CIF20P will look for the name in the cell dictionary. If you read in a non-LAP CIF file, the names that CIF20P assigns to the cells will not be what you expect, so that it probably won't find the name you enter. This feature along with the new CALL and MCALL commands makes it easy to write a command file and 'USE' it.

CIF20P occasionally uses SIMULA's inint and inreal procedures, so if you enter an illegal integer or real, SIMDDT will be entered and you will be asked to enter a new line. If at any time, CIF20P enters SIMDDT besides for invalid integer or real input, please let me know exactly how it happened. Thanks.

The communication between CIF20P and the HP plotter has been changed to make the asking of the HP plotter for its buffer size more reliable. In the past, if the request for buffer size got garbled on its way to the plotter, the plotter would not respond and CIF20P would wait indefinitely for an integer that would never arrive. If the user was aware of the situation he/she/it could type in an integer and the program would proceed. Now, CIF20P will make the request and wait for a period of time (30 seconds), if no response occurs it sends the request again. This will repeat six times before CIF20P gives up. Also, the program checks the response to insure that an integer is received and not garbage, thus preventing SIMDDT from being entered. If hangups still occur please let me know so I can do something about it.