Color Printer Drivers

for COCOMAX3

NX1000,CGP220 OKI20

COLORWARE

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Color Printer Driver Instructions

Okimate 20 Driver for CoCo Max

From BASIC, type RUN"BOOT" and follow the screen prompts.

The program "BOOT" is not necessary to do the printing but it makes things easier. A "CM3" picture can be loaded and printed just by running "TRANSMOD". Any picture in HSCREEN2 memory can be printed by running "OKI". Alternately, the following line will do the same:
PCLEAR1:CLEAR 200,&H3A52:LOADM"OKI":EXEC. If you use this line, note that the defaults are RGB colors and a baud rate of 9600. These can be changed as noted in the "OKI" basic loader or one can LOADM"OKI" and then POKE &H3A52,1 for CMP colors and/or POKE &H3C3C,X where X is the number normally poked to &H96 to set the baud rate. Then SAVEM"OKI.BIN", &H3A52,&H3FBC,&H3C38 will make the changes permanent.

If you are running the printer with the PCjr serial interface, notice that the instructions do not document 9600 baud but it can be used. On the interface DIP switches of panel #1 (the one to the left if you're facing the slot the interface is plugged into) set switches 1 and 2 both ON. The Auto LF DIP switch, switch #3 on panel #2 (on the right) must be switched OFF for color graphics. You could add a little toggle switch outside of the printer to allow switching without pulling out the interface each time.

For advanced users, you may to change the colors printed. This is useful to match CMP monitor colors, or just for fun. The codes for the color tables are:
0: Blank (no print)
1: Solid – 100% of the color being printed
2: Halftone – 50% screen
3: 33% Screen
4: 66% Screen

The tables are located as follows:

RGB Yellow	&H3A6A to &H3AA9	CMP Yellow	&H3B2A–&H3B69
RGB Magenta	&H3AAA to &H3AE9	CMP Magenta	&H3B6A–&H3BA9
RGB Cyan	&H3AEA to &H3B29	CMP Cyan	&H3BAA–&H3BE9

For example, since color 0 is black in both CMP and RGB, loading the driver and peeking the first location for each color in the above table should yield 1. If all these were changed to 0 and the program saved, it would print white in place of black. If only the cyan locations were changed to 0 it would print deep red orange for black. These are drastic changes but if one wanted a color to be slightly bluer and found the appropriate location of the cyan contained a 2 it could be changed to 4 or 1 for more blue.

This driver was written by Greg Dow. He can be reached at (613) 741-1912.

Ultra-Color CGP220 Printer Driver Kit

Introduction
The Ultra-Color graphics printer driver for the CGP220 color printer is designed for use on the Color Computer 3 with CoCo Max III or other HSCREEN2 pictures. (A HSCREEN 2 picture is 320x192 pixels, in 16 colors.) The driver can be installed on your CoCo Max III program disk, or pictures can be loaded and printed with the PRINTIT program supplied. Pictures in memory, or drawn by BASIC, can also be printed.

The driver program is capable of reproducing up to 125 separate colors on a CGP220 printer. 64 of these can be selected as a "palette", each equivalent to one of the CoCo 3's own built-in colors. A predefined palette is supplied for use with an RGB monitor, and another for a color TV or composite monitor (since these displays show a different color for each color number, compared to an RGB monitor). Alternatively, you can customize your own palette.

Once these 64 colors are installed into the printer driver, the output from the CGP220 will be a very close copy of what you see on your screen. For example, if you change the color number in slot 9, the output from the CGP220 will change to match the new color on the screen. Since not all colors will be a perfect match between screen and printer (some printers or monitors could be a bit nonstandard in their colors), software support for setting up your own palette is included.

Installing the Driver on a CoCo Max III Disk
To install the driver on your CoCo Max III program disk (use a copy, not the original disk), do the following:
  - Insert the color printer driver disk in drive 0
  - Type LOAD"CONFIG"
  - Insert the CoCo Max program disk in drive 0.

- Type SAVE"CONFIG"
- Now we'll copy the driver onto your CoCo Max disk. You may need to create some space on the disk for the driver. Kill one of the unneeded printer drivers if necessary.

  If you have more than one drive and an RGB monitor, Copy the file CGP220R.BIN from the CGP220 disk to the CoCo Max disk. For example, if the program disk is in drive 0 and the CGP220 driver disk is in drive 1, type COPY "CGP220R.BIN:1" TO "CGP220R.BIN:0"

  If you have more than one drive and a composite monitor, Copy the file CGP220C.BIN from the CGP220 disk to the CoCo Max disk. For example, if the program disk is in drive 0 and the CGP220 driver disk is in drive 1, type COPY "CGP220C.BIN:1" TO "CGP220C.BIN:0"

  If you have only one drive and an RGB monitor, insert the CGP220 disk in the drive and type RUN"PINSTRGB". Select "Install driver", and insert the CoCo Max program disk when prompted.

  If you have only one drive and a composite monitor, insert the CGP220 disk in the drive and type RUN"PINSTCMP". Select "Install driver", and insert the CoCo Max program disk when prompted.

- Put the CoCo Max program disk in drive 0 and type RUN"CONFIG"
- Select the driver you want from the menu.

When you run CoCo Max III, try out the new printer dump. Notice how closely anything on the screen is matched to the printout. (By the way, adjust the controls on a composite monitor or color TV to get the best match: the second slot color should be as near to pure yellow as possible.)

Printing Pictures Without CoCo Max III
The PRINTIT program is supplied to allow printing of color pictures even without CoCo Max III. To use it, you must already have run PINSTRGB (if you have an RGB monitor) or PINSTCMP (if you have a color TV or composite monitor) and selected Install Palette. Press Enter to write the driver right to your printer driver disk.

Now, run PRINTIT. You are first asked for your printer's baud rate: pressing Enter will select 2400 baud – this is a good speed. All of the other programs are set up to use 2400 baud, usually in line 110.
You will then be asked for the palette that you wish to use. If you want the colors to match an RGB display, select R. If you want the printout to match a composite picture, select C.

If you want to print a CoCo Max III picture, answer "Y" to the next question, and supply the picture's file name (the file extension of "CM3" is automatically added). The picture is displayed as it is loaded, and the colors are saved for the printer driver to use.

If you want to use a picture already in memory, or one drawn by BASIC (in HSCREEN 2 mode), answer "N" or just press Enter. In this case, there are two ways to supply colors to the printer driver. If a DATA line containing the 16 slot colors is supplied at the end of the PRINTIT program, these will be used. Otherwise, the colors that were set up before the program was run will be used.
Now you have the choice of printing the picture in either single or double size. Single size prints faster, but may miss fine detail or be "striped". Double size fills the entire width of the paper, but takes about 10 minutes to do a printout at 2400 baud.

Customizing the Color Palette
Several programs are supplied to help you set colors to your preferences.
The first of these is called PAL220. It prints out the entire set of 125 colors that the driver can produce on the CGP220. The printout consists of 25 lines of color "chips", five chips in each row. Each chip is supplied with a color number from 0 to 124, and the amount of each "color": red, green and blue. For example, the label "45   R1G4B0" means that the chip is color 45, which reflects 1/4 of the red light, 4/4 of the green light, and 0/4 of the blue light that illuminates it. (Another way to interpert this is to subtract the color from 4 to get the amount of its "complementary" color that the printer applies to the paper. The complement of red is cyan, green is magenta, and blue is yellow.) You may wish to cut the printout into strips for easier matching of colors. Trim each strip even with the top of the color chips, punch a hole in one end, and insert a pin to get a professional "paint chip" set.

The second program displays all 64 colors that your display device (color TV, composite monitor or RGB monitor) is capable of displaying with the CoCo 3. Run SHOW64 to get an 8x8 display of these colors. Color 0 is in the top left corner, and the numbering proceeds right and down to 63 in the bottom right. This 8x8 layout is the same as the DATA statements in the PINSTRGB and PINSTCMP programs, and the 64 color menu display in the Set Colors.. dialog box in CoCo Max III. It is also used in the palette printouts from the PINSTxxx programs.

The PINSTRGB and PINSTCMP programs can also print out the entire 64 selected palette colors in an 8x8 grid, labelled with color numbers.

This makes it easy (with the SHOW64 program) to verify the color matching of your adjusted palette. To get this printout, run the selected PINSTxxx program and select Print Palette. The palette is printed out (normally, at 2400 baud, unless you change line 110).

Once you've decided what changes you want to make, load one of the PINSTxxx programs and modify the DATA statements beginning at line 1000. There are 8 DATA lines, each holding 8 entries. This matches the palette printout and display layouts. Then save the program under a name like CUSTOMP, and run it to print out the new palette, or to ma⠐⠄ ⠄⠠ ⠄⠄ CoCo Max III printer driver incorporating your new palette.

This driver was written by Dave Stampe and is copyright 1987 Colorware

Star NX-1000 Rainbow Printer Driver

The Ultra–Color graphics printer driver for the NX–1000 Rainbow color printer is designed to print out CoCo Max III or other HSCREEN 2 pictures. (An HSCREEN 2 picture is 320x192 pixels, in 16 colors.) The driver can be installed on your CoCo Max III program disk, or can be used with the **LOADLINK** program supplied to print out pictures in memory or drawn by BASIC. The driver is also completely independent of the DIP switches on your NX–1000 printer

The driver program is capable of reproducing up to 125 separate colors on an NX–1000 printer. Sixty–four of these can be selected as a "palette", equivalent to the CoCo III's 64 built in colors. A predefined palette is supplied for use with an RGB monitor, and another for a color TV or composite monitor. Also, you can customize your own palette.

Once these 64 colors are installed into the printer driver, the output from the NX–1000 will be an exact copy of what you see on your screen, with no need to set new colors. Since not all colors will be a perfect match between screen and printer, software support for setting up your own palette is included.

Installing the driver on a CoCo Max III disk
To install the driver on your CoCo Max III program disk (it's best to use a copy of the original disk), type **RUN"MAKE"**. The program will customize a driver to match your needs, based on a series of questions it asks you to answer.

Then NX-1000 driver can produce a picture that is either upright on the page (like most CoCo Max III printouts), or that lies sideways on the page, for larger "poster" sizes. However, the sideways driver will not print out double-height pages as one picture: it will produce two pictures that must be fastened together.

The next option chooses the correct set of 64 display colors out of the 125 colors that the NX-1000 driver can produce. The set you need depends on whether you have an RGB monitor or a color TV or composite monitor (CMP color set). Select the correct set and it will be installed into the driver. Alternatively, you might want to adjust some of the colors in the set -- see the instructions later in this manual.

The next option selects the number of lines in the picture to be printed. Then NX-1000 driver will support 192 lines (for CoCo Max III or standard HSCREEN 2 pictures) or 200 lines for larger pictures. For most uses, just press ENTER at the prompt (this will give you the default at this and all prompts).

Most NX-1000 color printer dumps produce black (and grey) by using the red, blue and yellow ribbons together. While this is OK if there is only a little black in your picture, it degrades the ribbon faster and can produce a multicolored "black" if the ribbon is old. The Ultra-Color NX-1000 driver allows you to choose this method, or lets you choose to use the black ribbon for black areas. This can extend your ribbon life, and is much faster for pictures with only a little color in them. (It might be a bit slower on a few pictures as four passes of the print head may be needed instead of three). Press the ENTER key to select the default of the black ribbon.

Once all this is done, the **MAKE** program loads the correct driver from the disk and installs the customizing data. Then the program asks for permission to write the new driver. If you are creating a driver for a CoCo Max III program, insert the CoCo Max III program disk into the drive and press the ENTER key. The new driver will be saved as **CUSTOM.** Run the **CONFIG** program and select the CUSTOM printer driver. If you want a driver to use with the **LOADLINK** program (to print non-CoCo Max III pictures), leave the disk in the drive and press ENTER.

Now type **RUN"CM3"** to run CoCo Max III and try out the new printer dump. Notice how closely anything on the screen is matched to the printout. (The color and tint controls on a composite monitor or color TV should be set so the second slot color should be as near to pure

yellow as possible). You can use Double Strike and Double Size with the NX–1000 driver and print out both single and double page pictures.
If you get stripes of color at the left side of the page, back off the head spacing adjustment by half to free up the ribbon.

Printing pictures without CoCo Max III
The LOADLINK program is supplied to allow printing of color pictures even without CoCo Max III. To use it, you must already have run MAKE to create a customized NX–1000 driver, and installed it on the disk.
Now type **RUN"LOADLINK"**. You will first be asked for your printer's baud rate – pressing ENTER will select the default of 9600 baud. (Most serial to parallel converters will support this speed and anything slower can double the time it takes to print a picture)

Next, you have the option of loading a CoCo Max III picture (/CM3). One picture (SCREEN01) is supplied on the disk for you: it has an RGB color set. To load a CM3 picture, enter the picture's file name (the "/CM3" extension is automatically added). The picture is displayed as it is loaded, and the colors are saved for the printer driver to use.

If you want to print a picture from a different source, it should already be loaded or drawn, and there are two ways to supply the slot colors to the printer driver. If a DATA line containing the 16–slot colors is supplied at the end of the **LOADLINK** program, these will be used. Otherwise, the colors that were set up before the program was run will be used.

Now you have the choice of printing the picture in either single or double size. Single size prints faster, but may miss fine detail or be "striped". Double size will fill the entire width of the paper or length if the sideways driver is used.

Creating a Customized Color Palette
The NX–1000 Ultra Color Printer Driver can print up to 125 colors, but the Color Computer 3 can only use 64. The 64 colors used in each set were carefully selected to match the display colors as closely as possible, but there is no reason why you can't use different colors to match your display or improve your printouts. In fact, there are several tools supplied on your disk to help you do just that.

The first of these is called **PAL1000** – it prints out the entire set of 125

colors that the dirver can produce on the NX–1000. The printout consists of 25 lines of color "chips", five chips in each row. Each chip is supplied with a color number from 0 to 124 and a code which states how much of each primary color of light it reflects.

These numbers are the same as the ones in the palette color DATA statements at the end of the **MAKE** program and encode the color levels on a scale from 0 (none) to 4 (full). The color number is calculated as (RED)*25+(GREEN)*5+(BLUE). For example, the color labeled 45 R1G4B0 would be specifed with 45 in the DATA statement. This reflects 1/4 of the red light, 4/4 of the green light, and 0/4 of the blue light that illuminates it. Another way to interpret this is to subtract the color from 4 to get the amount of its "complementary" color that the printer applies to the paper. The complement of red is cyan, green is magenta, and blue is yellow. These are the true ribbon colors used.

You may wish to cut the **PAL125** printout into strips for easier matching of colors. Trim each strip even with the top of the color chips, punch a hole in one end, and insert a fastening pin to get a professional "paint chip" set. Now you can match up the colors against the screen, or any other color reference.

The **MAKE** program can also be used to print out the installed 64 color palettes that are in the DATA statements at the end of the program. To do this, load the program and **RUN 20**. You may need to reset the baud rate number in line 30 if you aren't using 9600 baud. The printout will be in an 8x8 grid like the DATA statements or palette displays and are labelled with their color numbers.

The color number lists are in the DATA statements at the end of the program. They are in a 8x8 grid, going from colors 0 to 7 in the top row, etc. This matches the **Set Colors** display in CoCo Max III, as well as in the **SHOW64** program.

A Color Computer 3 palette display program is also supplied that can show all 64 colors that your display device is capable of at one time. Run **SHOW64** to get an 8x8 display of these colors. COlor 0 is in the top left corner and the numbering proceeds right and down to 63 in the bottom right. This 8x8 layout is the same as the DATA statements in the **MAKE** program and the 64 color menu display in the **Set Colors...** dialog box in CoCo Max III. It is also used in the palette printouts from the **MAKE** program.

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March 25, 1988

COCO ←

PRINTER ↑

25
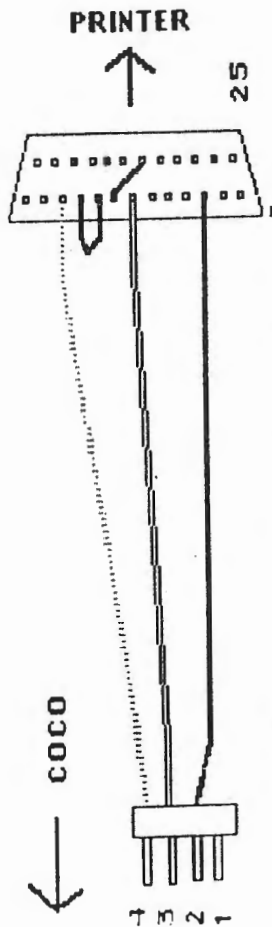
OKIMATE-20 TO COCO CABLE

What it boils down to is chopping off the plug provided for
the computer and attaching the four pin CoCo plug (Radio Shack
catalog #274-007) as follows:

line from pin 3 (red*) of printer connector to pin 4 of CoCo
plug.
line from pin 7 (white*) of printer connector to pin 3 of
CoCo plug.
line from pin 11 (black*) of printer connector to pin 2 of
CoCo plug.
pin 1 on CoCo plug not used.

pins 4 and 5 on the printer connector are wired together.
pins 6 and 20 on the printer connector are wired together.

*It was a long time ago that I did this but I think the pins
4,5,6, and 20 were already shorted together because there are
only three wires in the cable. Assuming the colors of the wires
are the same as mine one would only have to chop off the 'ld
plug and connect the four pin plug. To be sure though the
printer connector can be opened to check the colors coming from
the pins there.

Yours truly,

Greg Dow