

PRINT MASTER

A SCREEN DUMP UTILITY FOR THE 32/64K
TANDY COLOR COMPUTER

PROGRAM BY **SCOTT DUDDS**

MANUAL NOTES BY GEOFF WELLS

DISTRIBUTED BY **DATAMAN INTERNATIONAL**

PRINTED IN CANADA

Copyright

This manual and the software (computer programs) described in it are copyrighted by Dataman International, with all rights reserved. Under the copyright laws, this manual or the programs may not be copied, in whole or part, without written consent of Dataman International except in the normal use of the software or to make a backup copy. This exception does not allow copies to be made for others, whether or not sold, but all of the material purchased (with all backup copies) may be sold or given to another person. Under the law, copying includes translating into another language or format.

You may use the software on any computer owned by you but extra copies cannot be made for this purpose. A multi-use license may be purchased to allow the software to be used on more than one computer owned by the purchaser, including a shared-disk system. (Contact Dataman International for information on multi-use licenses.)

©1985 Dataman International Corp.
125 South Fifth Street
Lewiston, New York 14092
USA

©1985 Dataman International
420 Ferguson Avenue North
Hamilton, Ontario L8L 4Y9
Canada

Limitation on Warranties and Liability

The program is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to, warranties of merchantability and fitness for a particular purpose. The entire risk as to the quality and performance of the program is with you. Should the program prove defective, you (and not Dataman International or an authorized dealer of Dataman International) assume the entire cost of all necessary servicing, repair or correction.

Dataman International does not warrant that the functions provided by this program will meet your requirements or that the operations of this program will be uninterrupted or error free.

In no event will Dataman International be liable for direct, indirect, special, incidental, or consequential damages resulting from any defect in the software or manual, even if they have been advised of the possibility of such damages. In par, they shall have no liability for any programs or data stored in or used with Dataman International products, including the costs of recovering or reproducing these programs or data.

The warranty and remedies set forth above are exclusive and in lieu of all others, oral or written, expressed or implied. No Dataman International dealer, agent, or employee is authorized to make any modification, extension, or addition to this warranty.

CONTENTS

Introduction	2
How to use this manual	4
Picture files & Coco graphics	5
Loading & running	6
Print Master	7
The Customizer	24
Glossary	38
Miscellaneous notes	Appendix A
Gray scale patterns	Appendix B
String samples	Appendix C
Working with Text & Graphic Master	Appendix D
	Index

<<< INTRODUCTION >>>

In the computer printer business there is only one standard, the American Standard Code for Information Interchange and the only standards in the ASCII code are the 96 numbers (32 - 128) that are used to represent upper and lower case letters, numbers and symbols. The numbers 0 - 31 are generally used as control codes and most, but not all, manufacturers abide by the ASCII standard. From 129 - 255 it's anybody's guess what a particular number will represent, sometimes they are graphic characters and sometimes special symbols or international characters like '£ ¶ Σ æ Ω √ ß ® '. Given a chart with the characters listed by the numbers used to represent them it is straight forward and easy to understand. Now we come to the special world of 'dot addressable graphics' where not only is there no agreement among manufacturers but often different models from the same company will use totally different codes and procedures. The challenge of writing a screen dump program that will work with any dot addressable printer was to incorporate every possible means of encoding the data and yet be able to use only the features required by a particular printer. The result is Print Master, a common kernel program that uses the output of The Customizer to configure itself for a particular printer and the operators custom requirements. Unfortunately most printer manuals are poorly written and difficult to understand. It may take considerable

<<< INTRODUCTION >>>

effort on your part to find the answers required by The Customizer. To save you this trouble we have included drivers for some of the more popular printers and we will add more as we discover them. If your printer is not listed we suggest you try each of the supplied drivers in turn as it is quite possible that one of them will work. If you have produced a driver for a printer that is not listed and you would like to share it with others please send us a copy and we will include it in future versions. Print Master is a very flexible program, capable of using all the special features of your printer. The only limitations are your imagination and the versatility of your printer.

The following instructions, particularly those covering The Customizer, are very complex and you may find it difficult to understand some of the unfamiliar concepts. We have tried to keep things as straightforward as possible but if you are having trouble please don't hesitate to call. Our customer support line is available to REGISTERED OWNERS ONLY from 9am - 5pm EST. Have your printer manual available if you call.

Thank you for purchasing our Print Master program. If you have any comments or suggestions on how we can improve it, or this manual, we would like to hear from you.

Geoff Wells

April 1985

HOW TO USE THIS MANUAL

This manual contains instructions for two programs; Print Master and The Customizer. If a driver for your printer is listed in Appendix A you can use Print Master right away and postpone reading The Customizer section. If you are creating your own driver please read the whole manual before you begin. There is a lot of material to cover but don't let it intimidate you. Go slowly and follow the program on the screen as you read the manual. Once you have found the variable values to use with your printer, write them down for future reference. They will not change unless you change printers.

The choices you make in Print Master are all selected from menus by pushing the button on your mouse or joystick. Print Master is a machine language program that is embedded in a basic driver. If you want to change the wording on the menus to something more meaningful to you you may do so by editing the Basic program.

PICTURE FILES

We supply a picture file called "TESTPIC", but you will need your own pictures to get full benefit from the program. If you use COCO MAX or GRAPHICOM their files will load directly into PRINT MASTER.

SAVING COCO GRAPHIC SCREENS

Tape users can save pictures produced by their own Basic or M/L programs by using the values from the chart in Fig. 1. When a disk controller is plugged in the graphic area is moved higher up

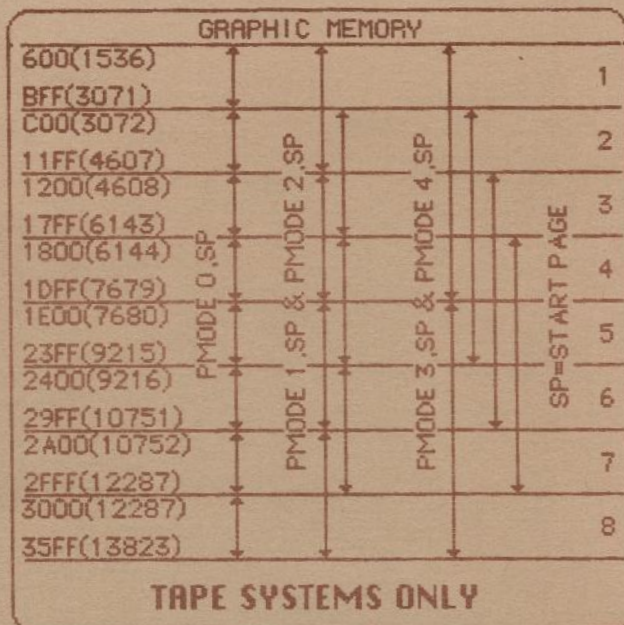


Fig. 1

in memory. The FILES command can also move the graphic area, therefore it is best to use the formula in Fig. 2 to find the start and end addresses. Pictures are saved as a machine language program with the command

(C)SAVEM"PICNAME",START,END,42768.

The execute address (42768) will produce an FC ERROR if you try to EXEC the picture by mistake.

START=PEEK(186)*256+PEEK(187)
END=PEEK(183)*256+PEEK(184)-1

Fig. 2

MOUSE OR JOYSTICK

A mouse or joystick is required to select the functions of this program. You may use either one but we will only refer to the **mouse** throughout this manual.

'CLICK'

When the instructions tell you to **'point and click'** it means position the pointer and press the button on the mouse or joystick.

LOADING

If you are using the disk version of PRINT MASTER type `RUN"PMAST"`. If you have the tape version type `CLOAD"PMAST"` and after the program loads type `RUN`. Disk users can load The Customizer from Print Master; tape users will type `CLOAD"CUSTOM"`. To **START** either program just 'click'.



Fig. 3

In order to keep PRINT MASTER flexible enough to work with any printer it was necessary to omit any checks on parameter values. This means you can easily enter values that will not work with your printer. It is important, therefore, that you follow these instructions carefully, particularly those concerning THE CUSTOMIZER.

PRINT MASTER



PARAMETER SETTINGS 8-21
PRINTING 22-23

THE MAIN MENU

Select the command you desire by pointing to it with the your mouse. To activate the highlighted command you just 'click'.

FILE I/O

This menu is used to save and load files from tape or disk. If you have 64K, then screens can be moved into high memory for storage. By clicking on the **NOW DISK I/O** line you change it to access tape or GRAPHICOM files.

```
*****  
***  MAIN MENU  ***  
*****
```

```
DUMP A PICTURE  
  FILE I/O  
SELECT COLOR SET  
  SELECT PMODE  
DEFINE MULTI TABLE  
CLEAR WORKING PAGE  
VIEW WORKING PAGE
```

END AND RETURN TO BASIC

Fig. 4

```
<<<<<<>>>>>>>>  
<<  FILE I/O  >>  
<<<<<<>>>>>>>>
```

```
LOAD A SCREEN  
SAVE  WORKING SCREEN  
>> COPY FROM WORKING SCREEN <<  
>> COPY TO WORKING SCREEN <<  
  NOW DISK I/O  
LOAD CUSTOM FILE  
SAVE CUSTOM FILE  
  DIRECTORY  
CURRENT DRIVE 0  
GOTO DUMP MENU
```

RETURN TO LAST MENU

Fig. 5

LOADING PICTURES

After selecting disk, tape or Graphicom input, click on **LOAD A SCREEN**. Tape or disk users will be asked to enter a filename. Graphicom input will load the Graphicom menu into the working screen (over-writing whatever is there). Select your file with the mouse.

DRIVE SELECT

Clicking **CURRENT DRIVE** will cycle through drives 0, 1 & 2. Drive 3 is not available in order to maintain compatibility with JDOS.

```
<<<<<<>>>>>>>>>>
<< FILE I/O >>
<<<<<<>>>>>>>>>>
```

LOAD A SCREEN

```
SAVE WORKING SCREEN
>> COPY FROM WORKING SCREEN <<
>> COPY TO WORKING SCREEN <<
NOW GRAPHICOM INPUT
LOAD CUSTOM FILE
SAVE CUSTOM FILE
  DIRECTORY
CURRENT DRIVE 0
GOTO DUMP MENU

RETURN TO LAST MENU
```

Fig. 6

```
<<<<<<>>>>>>>>>>
<< FILE I/O >>
<<<<<<>>>>>>>>>>
```

LOAD A SCREEN

```
SAVE WORKING SCREEN
>> COPY FROM WORKING SCREEN <<
>> COPY TO WORKING SCREEN <<
NOW DISK I/O
LOAD CUSTOM FILE
SAVE CUSTOM FILE
  DIRECTORY
CURRENT DRIVE 2
GOTO DUMP MENU

RETURN TO LAST MENU
```

Fig. 7

DUMP MENU

The **IMAGE DUMP** menu is available from both the **MAIN MENU** and the **FILE I/O** menu. If the listed parameters are correct you may click on the **menu title** (**IMAGE DUMP**) and proceed to the next level.

DUMP PARAMETERS

Selection is made in the usual way. Some instructions will toggle their states and others will ask for a value. The values are selected by moving the mouse **left to right** and clicking when the display is correct.

```
//////////////////
/  IMAGE DUMP  /
//////////////////
```

FUNCTION	STATUS
SET PIXEL SIZE	W 1 H 1
INVERT OUTPUT	OFF
SET TAB VAL	OFF
SET MOD OUTPUT	OFF
ROTATE IMAGE	OFF
SELECT OPTION	1
MULTI SCREEN	OFF
WITH TEXT	NOT USED
EXPAND HEIGHT	1

RETURN TO MAIN MENU

Fig. 8

```
//////////////////
/  IMAGE DUMP  /
//////////////////
```

FUNCTION	STATUS
SET PIXEL SIZE	W 1 H 1
INVERT OUTPUT	OFF
SET TAB VAL	OFF
SET MOD OUTPUT	OFF
ROTATE IMAGE	OFF
SELECT OPTION	1
MULTI SCREEN	OFF
WITH TEXT	NOT USED
EXPAND HEIGHT	1

WHAT OPTION NUMBER
2

RETURN TO MAIN MENU

Fig. 9

PIXEL SIZE

The width and height can be set from 1-8. Each screen pixel will be represented on paper by a pattern of dots taken from the color set table using these parameters. (See pages 12 and 30) Manipulating this control will stretch or zoom the printed image. Setting either value to 0 will cancel the input without updating any values.

INVERT ON/OFF

When turned ON each cell in the color set patterns will be reversed. The printed image will therefore appear as a negative; black will become white and white, black.

SET TAB VAL

(This feature is not available with all printers)

Shifts the printed image across the page to the right. See the tab string instructions in THE CUSTOMIZER section for further information.

SET MOD

(Short for modulus- see the following page for more details)

When ON this function ensures that the bit patterns used to represent colors will be a full 8 x 8 square, regardless of the expansion factor set by the PIXEL SIZE option.

ROTATE

When ON this function will rotate the printed image 90 degrees counter clockwise.

MOD MODE-OFF

64 different sizes of pictures can be printed by varying the **PIXEL SIZE** settings. A single screen pixel is printed according to the pattern definition table for its particular color. (Page 30) The portion of the table it uses starts at the top left corner and spreads **right** and **down** according to the **pixel size** setting. You can see from Fig. 10 that if both **width** and **height** are set to '1' only the top left block is used, therefore your pictures will be printed in solid black and white without shading.

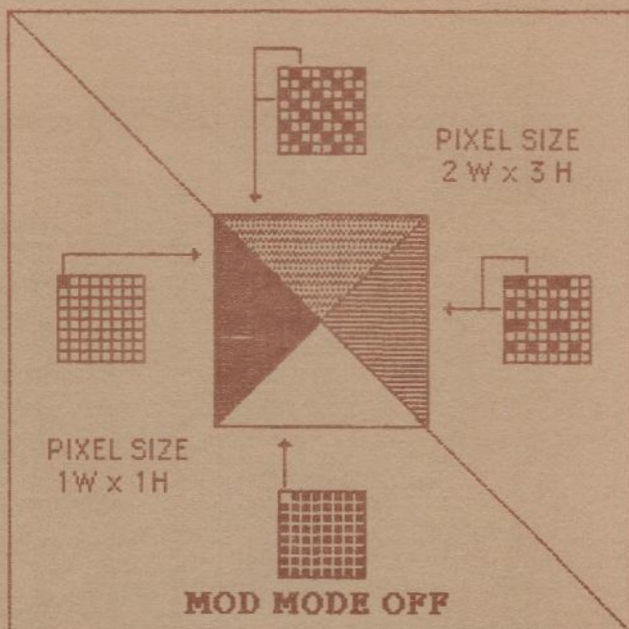


Fig. 10

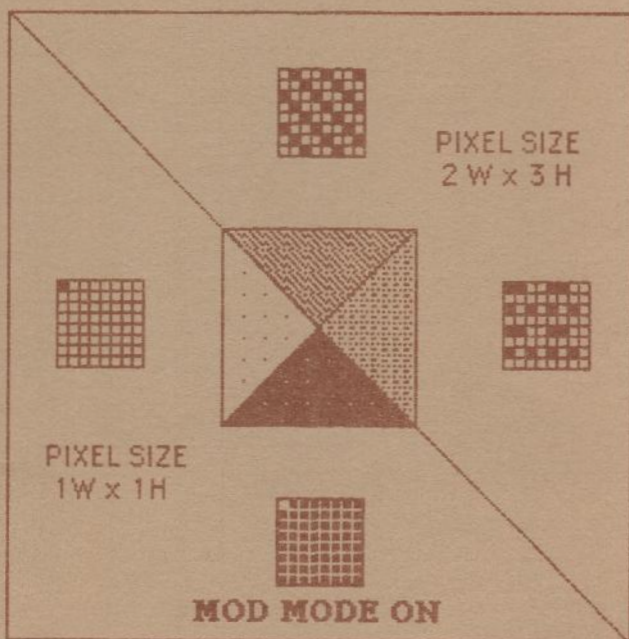


Fig. 11

MOD MODE-ON

With the MODulas mode turned ON large areas are properly shaded using the full 8 x 8 pattern layout. For artistic work this will most likely be your normal operating mode, providing you choose appropriate gray scales. For text or line drawings, however, you will find the definition better with mod mode OFF. For two color work, solid black and solid white patterns will produce the same result irrespective of the mod mode setting.

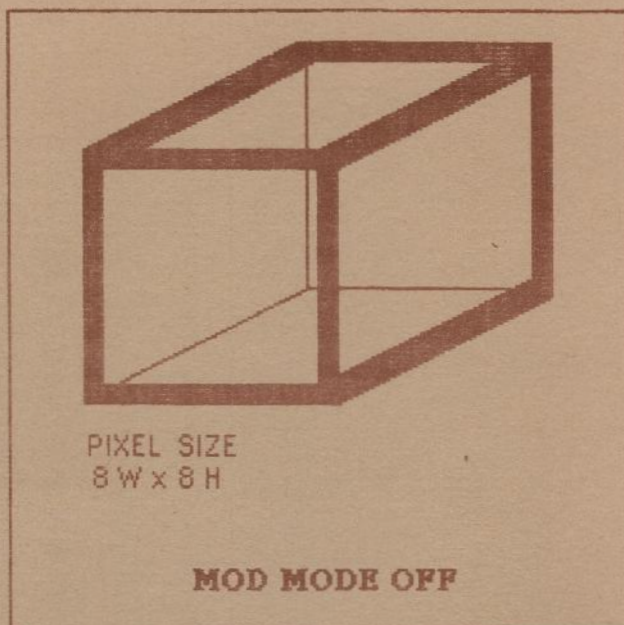


Fig. 12

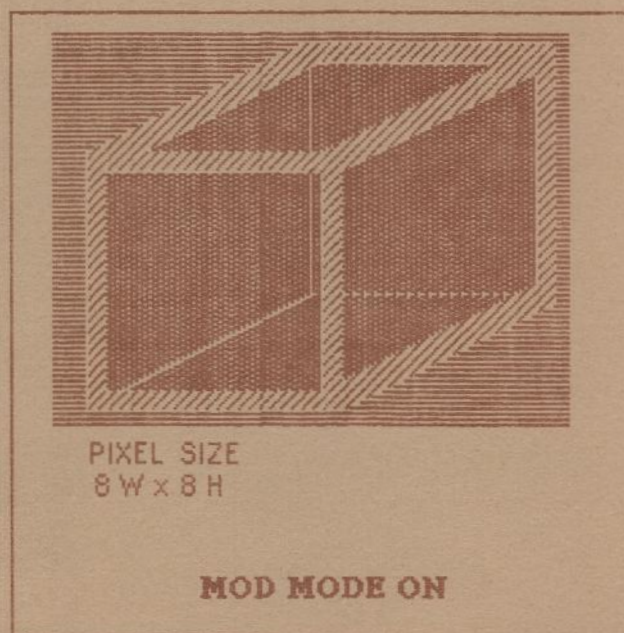


Fig. 13

SELECT OPTION

****** You decide what each option does.

MULTI SCREEN

(Short for multiple image-See page 21 for more details)

WITH TEXT

(This feature is not available with all printers)

**** TEXT SIZE**

(Page 20) must also be set when using this option.

EXPAND HEIGHT

****** To print a full COCO MAX screen use a value of 2.

After you click on this line move the mouse from **left to right** to select print options 1-4. For more details see THE CUSTOMIZER.

If ON this function will cause more than one screen to be printed across the page. The number and order of printing is defined from the command in the MAIN MENU. If the ROTATE function is ON then the selected screens will be rotated and joined top to bottom.

Use this option if you wish to add text to your pictures. The printer will pause at the **start, end, or start and end** of each line to allow you to input the required text. Text mode line feeds may cause blank lines to appear in the graphics, if so try to reprogram the **line feed size** using a custom string.

This option allows you to print out up to four physically concurrent screens down the page. If you are printing a portion of the screen then the bottom of the portion will be moved down appropriately.

DUMP A SCREEN

After all parameters are set you click on **IMAGE DUMP** to move to the **DUMP A SCREEN** menu. Here you decide if you wish to print the whole screen or just a part of it and whether to dump the working screen or a stored screen.

DUMP PART OF SCREEN

If you click on the **DUMP ALL OF SCREEN** line it will toggle to **DUMP PART OF SCREEN**. Now when you give the command to dump you will be given the opportunity to select the area to be printed. (See page 23)

```
=====
=== DUMP A SCREEN ===
=====
```

```
DUMP WORKING SCREEN
DUMP STORED SCREENS
DUMP ALL OF SCREEN
VIEW WORKING SCREEN
    LINE FEED
    SELECT PMODE
    GOTO FILE I/O
    SELECT TEXT SIZE
```

RETURN TO DUMP MENU

Fig. 14

```
=====
=== DUMP A SCREEN ===
=====
```

```
DUMP WORKING SCREEN
DUMP STORED SCREENS
DUMP PART OF SCREEN
VIEW WORKING SCREEN
    LINE FEED
    SELECT PMODE
    GOTO FILE I/O
    SELECT TEXT SIZE
```

RETURN TO DUMP MENU

Fig. 15

WORKING SCREEN

The working screen is the regular Coco graphic screen area available when you PCLEAR 8. There are room for, 8 PMODE 0 or 4 PMODE 1 / 2 or 2 PMODE 3 / 4 regular Coco screens or 1 COCO MAX screen.

STORAGE SCREENS

If your system has working 64K chips you will be able to move your working screens up into high memory for storage. You will also be able to print them out as a concatenated image.
(See page 21)

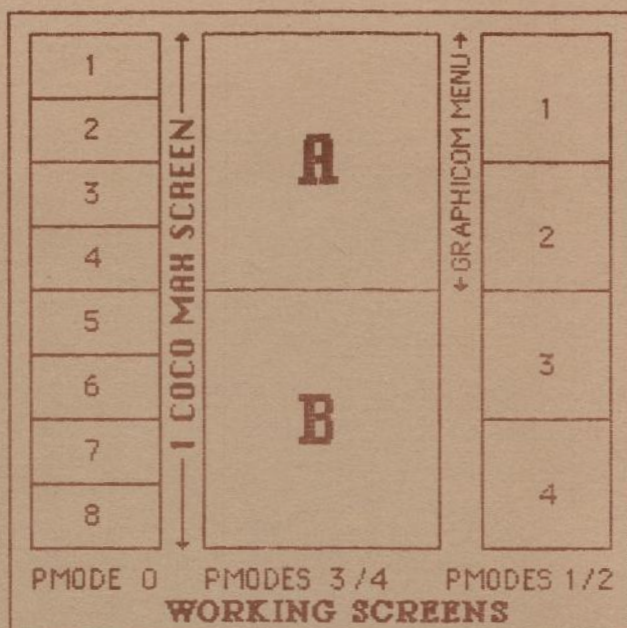


Fig. 16

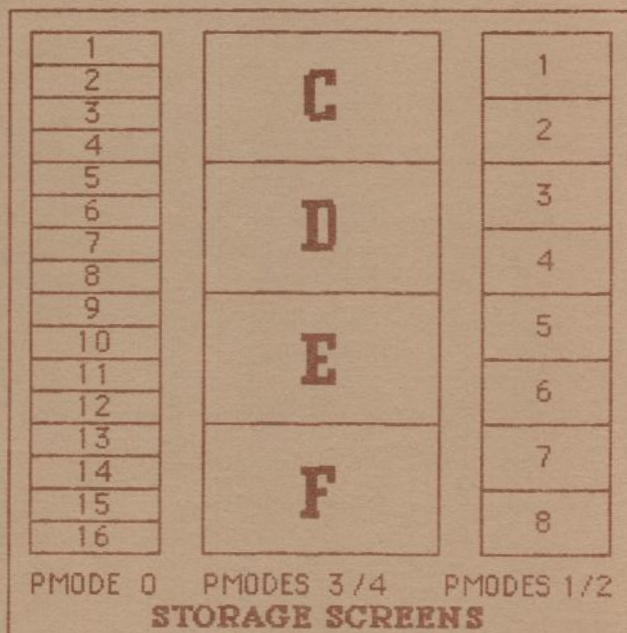


Fig. 17

VIEW WORKING PAGE

(Main Menu)

Click on **VIEW WORKING PAGE** and move the mouse **up** and **down** to position the screen you wish to operate on. Click again to record the setting and return to the **MAIN MENU**. You will scroll through the 8 graphic pages in 1 page jumps. If you are in PMODEs 1/2 or PMODEs 3/4 then the jumps will appear to be a half or quarter page respectively.

CLEAR WORKING PAGE

(Main Menu)

To clear the page you have just selected, point to **CLEAR WORKING PAGE** and **click-hold** until the image clears. Moving the mouse from **left** to **right**, while holding the button down, will change the clear color. When you release the button you will be returned to the **MAIN MENU**.

SAVE WORKING SCREEN

(File I/O menu)

You will find this option helpful when making backups of your pictures. It is particularly useful for transferring GRAPHICOM files to regular COCO DOS format. You can also split the eight page COCO MAX screen into two or more separate files.

COPY FROM WORKING SCREEN

(This feature only available on 64K)

****You may exit high memory at any time, without changing the contents of memory, by moving the mouse to the left or right.**

COPY TO WORKING SCREEN

(This feature only available on 64K)

****You may exit high memory at any time, without changing the contents of memory, by moving the mouse to the left or right.**

All pictures start loading into the working screen at the top of section 'A'. If you intend to print more than one screen you will have to move this image to avoid it being overwritten on the next load. Click on **COPY FROM WORKING SCREEN** and the page defined with **VIEW WORKING PAGE** will appear. Click to see high memory storage, move the mouse **up and down** to select the storage area and click to copy the working screen and return to the **FILE I/O** menu.

When you click on **COPY TO WORKING SCREEN** you are first shown the screen that will be replaced. This will be the one most recently defined with the **VIEW WORKING PAGE** option. Click again to view high memory storage, then move the mouse **up or down** to scroll through the stored screens. When the desired screen is in view, click again to copy it to the working screen and return to the **FILE I/O** menu.

LOAD CUSTOM FILE

****** A custom file containing appropriate control codes **must** be loaded before Print Master can communicate with your printer.

SAVE CUSTOM FILE

CREATING A CUSTOM PROGRAM

**** THIS IS NOT A MENU OPTION.**
Use a new tape or disk, not the original.

In order to control a printer the host computer issues a series of numbers called control codes. These codes will turn on and off the various features with which your printer is equipped. Because you need a new series of these codes to enter different print modes, Print Master can hold four SETS of codes in memory. (Accessed with the OPTION parameter) If you need additional sets they can be loaded from tape or disk-replacing the existing sets.

This command will save the current four sets of codes along with the current multiple screen table. (See page 21)

To create a version of Print Master that contains the default values you would like to have available on power up, start by loading the custom file containing these values. Press BREAK and then type (C)SAVE"PMAS". Next time you load the program it will contain your default strings plus the current MULTIPLE SCREEN TABLE.

SELECT COLOR SET

(Main Menu)

If you point and click at the **SELECT COLOR SET** option in the **MAIN MENU** the screen color will change to indicate that you have toggled between color set 0 and color set 1. Are you wondering why you would care about **COLOR SETS** for a black and white printout? Each of the 8 Coco colors has its own, user definable, dot pattern. For more information on color sets see **GETTING STARTED WITH COLOR BASIC**.

SELECT PMODE

(Main Menu and
Dump A Screen)

Click on **SELECT PMODE** and you will see a new screen with the available options listed. Point and click on the mode you desire and it will be set. Point and click on **RETURN TO LAST MENU** to return to the **MAIN MENU** or the **DUMP A SCREEN** menu.

SELECT TEXT SIZE

(Dump A Screen)

** Strings will be
printed **LEFT**
justified.

If you use the **WITH TEXT** option from **IMAGE DUMP** (Page 14) you have to enter the maximum size of the strings you will use. If you are not using one of the strings, enter a zero as the requested value.

DEFINE MULTI TABLE

(This feature only available on 64K)

**It is possible to define a maximum of 8 entries in the table. This may be more than can fit across the page of your printer. It is up to you to determine if this possibility exists.

VIEW MULTI TABLE

(This feature only available on 64K)

Accessed from the MAIN MENU is the DEFINE MULTI TABLE option. When the MULTI SCREEN option is turned on (IMAGE DUMP menu) the order in which the multiple screens are printed is defined by the multi table. To record the screen order, click on DEFINE NEW TABLE and move the mouse **up** and **down** to scroll through the images. Each time you click another entry is made in the table. Press the SPACE BAR to toggle between the storage screens and the working screens. Press ENTER to end the table definition and return to the menu.

After the table is defined you can check the order of the entries by using this option. Each time you click you will be advanced one entry until you are eventually returned to the menu.

PRINTING FULL SCREENS

After all variables have been selected and you have checked that your printer is **connected** and **switched on**, click on either DUMP WORKING SCREEN or DUMP STORAGE SCREENS.

WORKING SCREEN

Move the mouse **up** and **down** to position on the screen the picture you wish to print. When you are satisfied click to commence the dump.

STORAGE SCREENS

(This feature only available on 64K)

WITH TEXT

The STORAGE SCREENS are set up and printed in exactly the same way as the WORKING SCREEN.

If you selected one of the three 'with text' options the printer will stop at the appropriate times to allow for text entry.

MULTIPLE SCREENS

Click on either screen dump option to commence printing.

EXPAND HEIGHT

Large pictures can be created by using this option to combine several smaller images. For example, a setting of '2' will dump a complete COCO MAX screen.

COCO MAX

SELECTING PARTIAL SCREENS

** The joystick port is capable of only 64 x 64 resolution. In order to be able to select from 256 x 192 pixels the selection box is allowed to 'float' across the screen.

EXPAND HEIGHT

COLOR PRINTING

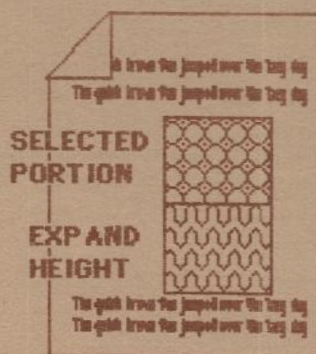


Fig. 18

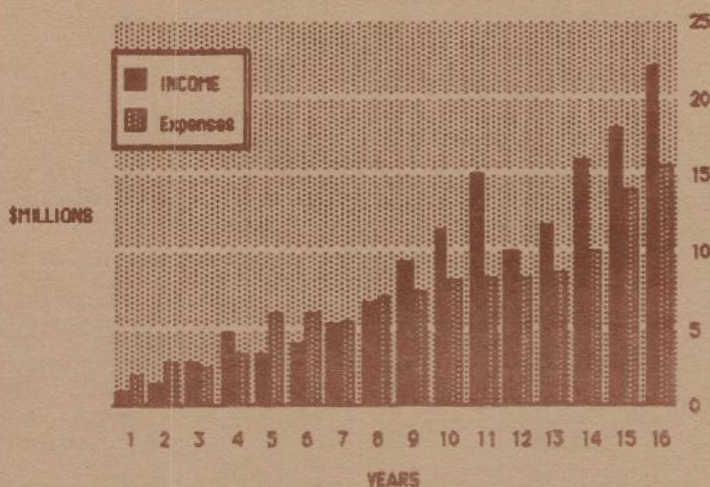
If you have selected DUMP PART OF SCREEN you will move the mouse **up** and **down** until you see the area you wish to print. Click to lock the picture and display the **'floating box'** cursor. Move the mouse to position the first corner then click to lock it and free the second corner. Move the mouse once again until the print area is framed by the box. Click once more to lock the corner and commence the dump.

If EXPAND HEIGHT has a value of more than 1 the height of the selected portion will be multiplied accordingly. (See Fig. 18)

If paper position can be accurately maintained over successive dumps and colored ribbons are available you can easily produce colored printouts. Print one color at a time by changing gray scale patterns. For each of the four custom string sets define only one color as 'black', the rest should be 'white'. By printing four times, once with each option, you can build the colored image.

THE CUSTOMIZER

ABC COMPANY PROFITS



SET AND FORGET OPTIONS 25 - 29
COLOR SETS AND STRINGS 30 - 34

CUSTOMIZE MENU

Before you use **THE CUSTOMIZER** program you should have a thorough understanding of how your printer works in graphic (dot addressable) mode. Pay particular attention to how it enters and exits graphic mode and which characters, if any, must be avoided or treated as special. You will also need to know how many pins in the print head can be fired at the same time and whether bits must be sent in normal or reversed order (see Fig. 20).

CUSTOMIZE MENU

SET BAUD RATE
SET # OF WIRES IN PRINT HEAD
REMAP THE PRINT HEAD
SET BYTE TO ADD TO OUTPUT
SET BITS TO REMAIN ON IN OUTPUT
RESET GRAPHIC MODE IN MULTISCRN
DEFINE COLOR SET

DEFINE TAB STRING
DEFINE CUSTOM STRINGS
ISOLATE AND REPLACE BAD OUTPUT

TEST OR SAVE CUSTOM FILE

Fig. 19

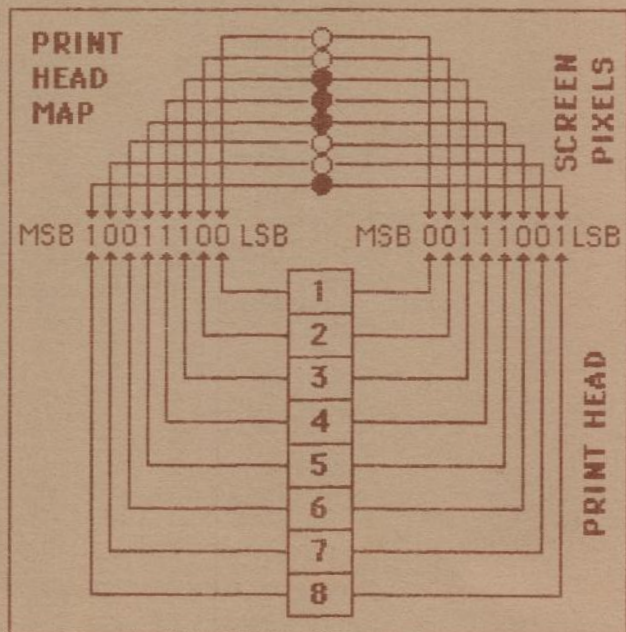


Fig. 20

SET BAUD RATE

The TANDY COLOR COMPUTER sends data out the RS232 port at **600 BAUD**. This can be changed under software control to any of the displayed values. Simply point and click to select the speed that matches your printer. Rates over 3600 baud may produce erratic results due to timing errors that occur with software RS232 implementations like that used on the Coco.

SET # OF WIRES IN PRINT HEAD

**** Print Master only** supports printers that have their print head wires/pins arranged vertically.

Your printer manual will tell you how many pins or wires in the print head are fired at once. To enter this number into THE CUSTOMIZER just click on the option and move the mouse left and right until the correct number appears. Click again to record the value and return to the menu.

RE-MAP THE PRINT HEAD

There are several ways in which data is mapped onto the print head but the great majority of printers use one of the two methods shown opposite in Fig. 21 (b & d). If a '1' represents pixels that are **on** and '0' represents pixels that are **off** you will see from Fig. 21 (a), that two different binary numbers will be generated depending on whether you read the column from the **top down** or the **bottom up**, 00111001 or 10011100 respectively. This is why you must inform Print Master which system your printer uses.

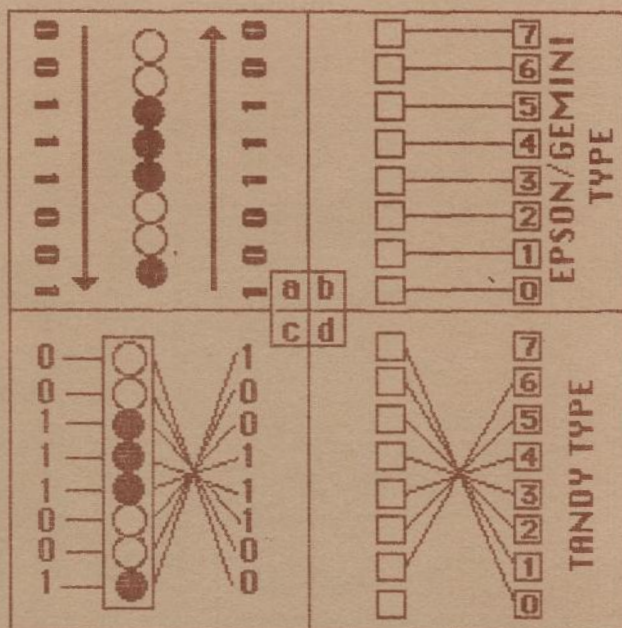


Fig. 21

When you enter this option the current map is displayed on the left and the work area is on the right. The right most column represents the print head. Click on any box to map the data bits from each succeeding box in the column to the left. To avoid mapping a bit (always off) press the **spacebar**. When complete, click again to exit.

**** Tandy printers require bit 7 to be unmapped as this is used to indicate that the byte contains graphic data.**

SET BYTE TO ADD TO OUTPUT

** Only to be used if you require 7 or less print head pins/wires.

SET BIT TO REMAIN ON IN OUTPUT (EOR)

** Only to be used if you require 7 or less print head pins/wires.

BIT	VALUE
7 (MSB)	128
6	64
5	32
4	16
3	8
2	4
1	2
0 (LSB)	1

Fig. 22

Some printers require this operation to distinguish graphic characters from control codes. Great care must be exercised if you decide to use this option. An erroneous bit could cause your print outs to become distorted. You cannot do any damage, but we do not advise its use unless your printer manual requests it. The following 'EOR-bit mask' option is the preferred method.

This option is used if your printer requires one particular bit to be always set. If you use this feature be sure to leave the corresponding position of the print head map - **BLANK**. If you try to mask a bit that is mapped to the print head it will cause a black horizontal line to be printed across the page. Enter a value from the chart on the left to set the corresponding bit. To keep more than one bit on, enter the **sum** of the values for each individual bit that you wish to set. You would enter a value of 128 for a Tandy printer which uses bit 7 to indicate graphic data.

RESET GRAPHIC MODE IN MULTI SCREEN?

NO (Tandy type)
Your printer stays in graphic mode until it receives a specific 'end of graphic' code.

ISOLATE AND REPLACE BAD OUTPUT

** The trap table has room for eight entries.

In Multi screen mode a series of screens are printed horizontally across the page. To do this PRINT MASTER prints the top 8 or less lines from the first picture then the top lines from the second picture and so on. Therefore it needs to know if a 'turn on graphic mode code' has to be sent between pictures.

YES (Epson/Gemini type) Your printer automatically returns to text mode after a specific number of graphic characters have been printed.

Sometimes you will find a particular arrangement of dots either will not print or will produce some other undersirable result. PRINT MASTER allows you to trap these numbers and send either a different pattern or the bad number twice (which will often cure the problem). Specify the number to trap and then the replacement number. To send the same number twice the trap and replacement number should be the same for two entries.

DEFINE COLOR SET

****** Before you attempt to use this option be sure you understand the section on MOD MODE.

(Pages 12 & 13)

ENTER to save pattern and exit.

SPACEBAR to exit without saving.

STRINGS

****** Each custom string set contains a total of twenty- one strings; four sets of five, plus a common tab string.

****** Each set of five strings is accessed with the option parameter.

****** You decide the purpose of each option according to the ability of your printer.

This option defines the 'gray scale' patterns used to represent each color. Eight different patterns can be defined; four patterns for each Coco color set. After you click on the color set and color number to edit you will see a grid of 8 x 8 squares. Black squares will print black in non-inverted mode. Just click on any square to toggle it. (See appendix B for examples of gray scale designs).

Your printer manual will contain a list of functions and the control codes associated with them. You will be told to send these codes to the printer as a string. It may say CHR\$(?) or CONTROL ? or give a series of numbers in DECIMAL or HEXDECIMAL. These codes are used to enter and exit graphic mode, turn on condensed, emphasized, expanded, NLQ and draft printing modes plus a whole variety of other options depending on the model you have. As you learned in the LOAD CUSTOM FILE section Print Master holds 4 sets of custom strings in memory and additional sets can be loaded from tape or disk.

STRINGS cont.

Besides the basics of turning graphic modes on and off, string sets can be programmed to take advantage off whatever features your printer may have. A string set contains 5 micro interpreted strings (like DRAW or PLAY in Extended Basic) that are sent to the printer at different points during the dump. You will probably not need all the strings for a simple dump but it is possible to use them for many special effects. For example they can be programmed to draw frames, used for form feeds or to control which colors will print in multi ribbon printing.

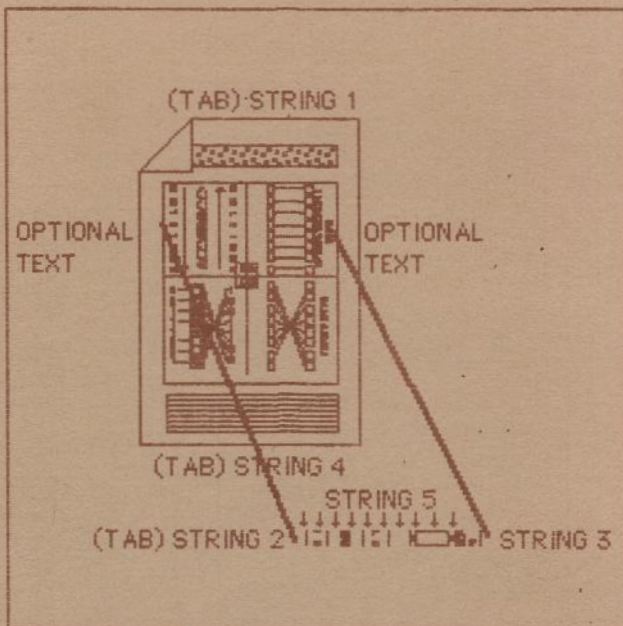


Fig. 23

The TAB STRING contains the codes that will move the print head a certain number of dot or character columns to the right AND the graphic or alphanumeric characters you may want printed in the tab area. Don't confuse these characters with the text string. These will be printed on every line and are suitable for drawing borders. The TAB STRING does **not** contain the actual distance to move; this value is specified in TAB VAL from the IMAGE DUMP screen. Tandy printers do not require the TAB STRING so it may be left blank.

STRING 1

(sent before dump)

Used to set parameters that are seldom changed during the dump such as graphic mode settings and line feed increments.

STRING 2

(sent before each line)

Selects and turns on graphic mode for each line in regular and MULTI MODE. May replace some tab functions.

STRING 3

(sent after each line)

Exits graphic mode and sends a carriage return and/or line feed. If you use the 'TEXT AT END' option do not program a carriage return as this will be done by the text string.

STRING 4

(sent after dump)

Resets mode parameters set by strings 1 and 2.

STRING 5

(sent before each character)

Seldom used and is included only to be sure we have all contingencies covered.

TAB STRING

(sent before strings 1, 2 and 4)

Because it is sent before strings 1, 2 and 4 it follows that it is sent before any part of the image is printed. It can therefore be defined as a tab function, if required.

DEFINE TAB or CUSTOM STRINGS

The procedure for programming all the strings is the same, except that the TAB STRING can hold 20 chars. and the others hold up to 40 characters.

An internal buffer is used to transfer data between the screen and the active string. (See Fig. 24) Click on CUSTOM OPTION IS 1 to select the string SET (1-4) that you wish to work with. Click on SUB-STRING IS 1 to select which of the five strings **within the set** to edit. Click on CLEAR BUFFER to initialise it. You must do this before you begin constructing the string.

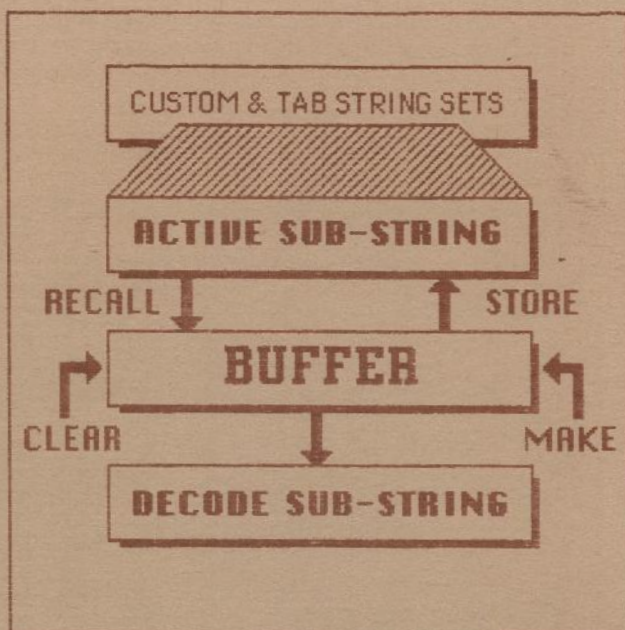


Fig. 24

RECALL SUB-STRING will load the selected sub-string into the buffer, the contents can then be checked and the results printed on the screen using the DECODE/LIST BUFFER option. Click to see each entry or click and HOLD to scroll through the listing. Release the button to return. STORE SUB-STRING will save the contents of the buffer in the currently selected sub-string. Later it can be saved as part of the custom string set. In the active string menu only clicking on YOU HAVE ? CHARACTERS LEFT will also clear the buffer.

MAKE A SUB STRING

Before you begin programming a new string you must **CLEAR THE BUFFER** or the new string will be added to the old. Each of the PGM options (Fig. 25) will add coded instructions to the buffer. The codes are stored (and later output to the printer) in the same order in which you choose them.

The display, showing how many characters are still available, is updated as each PGM is selected.

PGM TAB VAL MSB **PGM TAB VAL LSB**

Like the options opposite, these two select the output order only.

YOU HAVE 40 CHARACTERS LEFT

PGM A SIMPLE STRING

PGM A LOOP
PGM #CHRS/LINE MSB
PGM #CHRS/LINE LSB
PGM TAB VAL MSB
PGM TAB VAL LSB
PGM #CHRS/LINE 3 BYTE ASCII
PGM #CHRS/LINE 4 BYTE ASCII
TOGGLE DOUBLE PRINT
END STRING

RETURN TO LAST MENU

Fig. 25

PGM # CHRS/LINE MSB **PGM # CHRS/LINE LSB** **PGM # CHRS/LINE 3 BYTE ASCII** **PGM # CHRS/LINE 4 BYTE ASCII**

The above options are used to tell Print Master whether to send the number of characters in a line as MSB/LSB, LSB/MSB, 3 byte ASCII, 4 byte ASCII or, as in the case of most Tandy printers, nothing at all. Because the actual values sent to the printer depend on variables, such as pixel width and screen portion size, they are calculated by Print Master at dump time.

PGM A SIMPLE STRING

****** While learning to use custom strings we suggest you use the DECODE/ LIST BUFFER option frequently. This will allow you to check on your progress and to see how each option adds to the rest.

PGM A LOOP

****** It is the total length that is specified NOT the number of times to repeat the string.

Of the total 40 characters (20 for TAB) that you are assembling, some may consist of a simple string. That is one character after another sent to the printer just as you have stored them. This could be, for example, the title of a picture. If you click on the option you will be asked to enter the number of characters in the string. You then enter each character by clicking on the appropriate line. Notice that you can program any value into the string (0-255) so they may be used to send, not only printable text characters but control codes and graphic dot patterns also.

There may be times when you wish to output the same character, or series of characters, over and over. With a programmed loop the characters to repeat are specified along with the total length of the final string. The length can be set to an absolute value (e.g. as a form feed in string 4) or allowed to vary with the width of the picture (e.g. for the top and bottom of a border).

TAB STRING LOOP

** The loop codes require a four character overhead.

TOGGLE DOUBLE PRINT

** This flag is reset at the start of each dump.
** Only graphic data is affected.

END STRING

** For the strings to function correctly this flag **must** be included.

The procedure for programming a **tab string loop** is the same as for a **simple string loop**. The only difference is if Print Master is to set the total length then it will be set to TAB YAL. (See page 11)

When encountered in a custom string a flag is set that causes each output byte to be sent twice. As this will effectively double the width of the picture it only works with printers that stay in graphic mode until they receive the code to enter text mode. (Tandy type)

When you have completed your entries, select END STRING which places an end of string flag in the buffer. Print Master sees this flag during a dump and doesn't waste a lot of time analyzing the balance of the string.

TEST OR SAVE CUSTOM FILE

** Before you test the active string be sure you have transfered it from the buffer. (STORE BUFFER)

** It is **not** necessary to save a string set to tape or disk between tests.

RUN PRINT MASTER

It would be very frustrating and time consuming if you had to return to Print Master each time you wanted to test some small change in a custom string. To save you this trouble and inconvenience all the features needed to check out your programming have been included in The Customizer. The STRING TEST AND I/O screen provides both a **resolution** and a **color** test. These options will draw a pattern on the screen and then dump it to the printer.

If you have the disk version, clicking on this line will load and run Print Master. If you have forgotten to save your files you will be given the opportunity to cancel the command.

<<< GLOSSARY >>>

BACKUP

An exact copy of tape or disk programs and data.

BAUD RATE

The speed at which data is transferred, expressed as bits per second.

BIT

Binary digit - a '1' or '0'

BIT PATTERN

The sequence of '1's and '0's in a binary number.

BYTE

8 bits - from 0 to 255 decimal.

COCO

An affectionate name for the Color Computer, now official Tandy name. Graphic development software from Colorware.

COCO MAX

DOS

Disk Operating System

DOT ADDRESSABLE

A printer operating mode that allows control of individual dots instead of ASCII characters.

DUMP

The process of transferring digital information to another medium.

EOR

Exclusive OR. A Boolean function that is true when both operators are different.

EXEC

EXECute - command to start a machine language program.

FC ERROR

Function Call - 42768 used as EXEC address when saving pictures.

FILE

Stored binary information used by a program. Not directly accessible.

<<< GLOSSARY >>>

GRAPHICOM

Graphic development software from Cheshire Cat Software.

GRAY SHADES

A pattern of dots used in black and white printing to represent colors.

HIGH MEMORY

Upper 32K bank of RAM memory - uses same addresses as BASIC ROM

IDOS

A DOS supplied by J & M Systems of Albuquerque NM.

LSB

Least Significant Bit (or Byte)

MOUSE

A small rodent that likes cheese.

MSB

Most Significant Bit (or Byte)

NLQ

Near Letter Quality

PIXEL

Picture Element - the smallest component of a picture.

POINT

A typesetting measurement - seventy-two points equal one inch.

PRINT HEAD

Part of the printer that houses the print vires/pins.

RESOLUTION

Expressed as dots per inch a measurement of the quality of image reproduction.

TOGGLE

To switch backwards and forwards between one of two states.

WIRES/PINS

A column of individually controlled mechanisms that push ribbon to paper.

APPENDIX A - MISCELLANEOUS NOTES

THE FOLLOWING PROGRAMS ARE SUPPLIED (VER 1.0)

PMAST.BAS

Filenames are shown with their disk extensions. For tape versions use only the characters before the period.

FILES WITH THE EXTENSION 'CST'
ARE FOR USE BY PRINT MASTER
ONLY - DO NOT ATTEMPT TO RUN
OR EXEC THEM.

Print Master Basic menu driver and embedded M/L kernal.

CUSTOM.BAS

The Customizer Basic menu driver with embedded M/L routines.

TESTPIC.BIN

A PMODE 4 graphic screen created with COCO MAX and then modified.

TANDY.CST

Generic custom string set suitable for most Tandy DMP printers.

GEMINI.CST

Custom string set for Gemini 10X and similar machines.

IMAGE.CST

Tested on the Apple ImageWriter and should work with C. ITOTH.

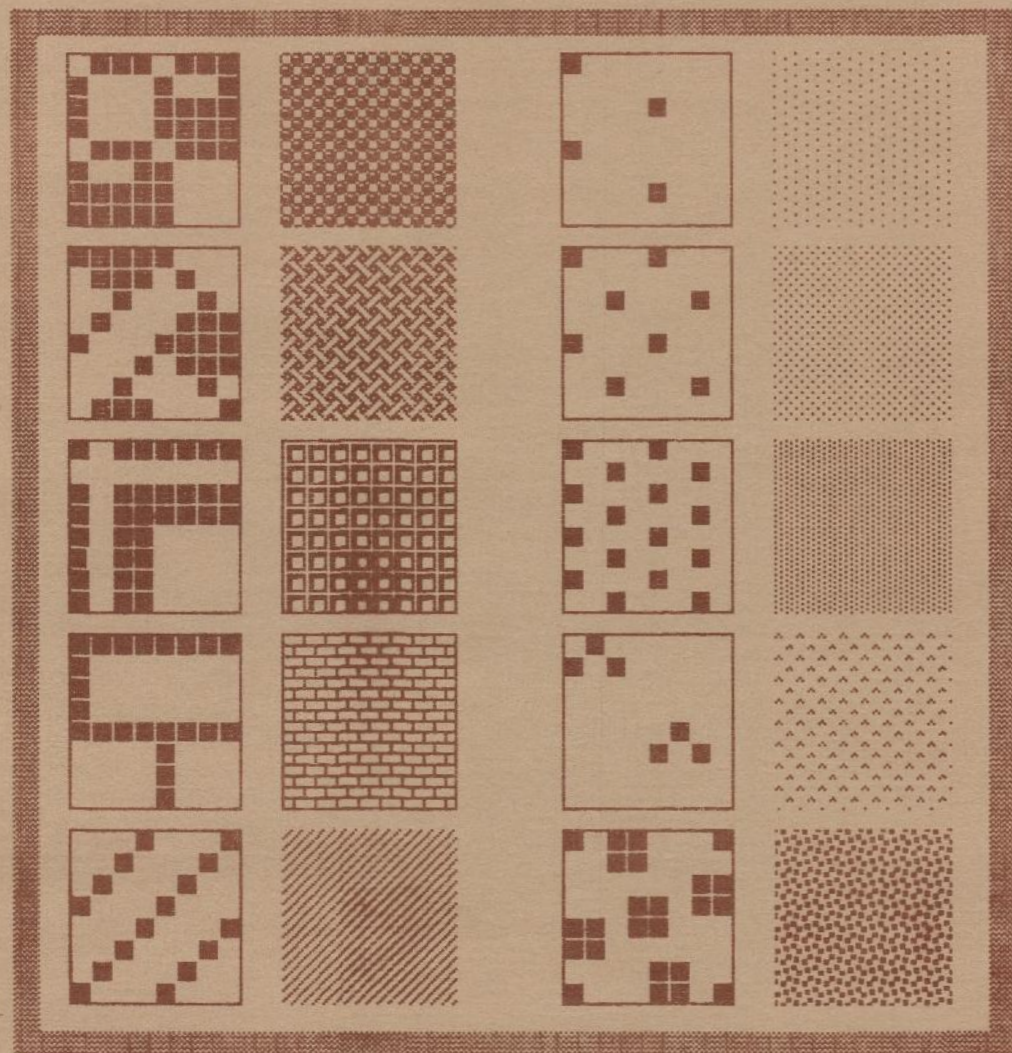
SPIRIT80.CST

Spirit 80 & Manisman Tally

CGP115

An example of Print Masters flexibility, extremely slow but it works.

APPENDIX B - COLOR SET PATTERN EXAMPLES



APPENDIX C - SAMPLE STRINGS

GEMINI

Programming the Gemini to perform a basic dump is very simple. It is a line oriented machine and only requires strings 2 and 3.

STRING 2

27₁₀ - "K" -
LSB - MSB - END.

We will use String 2 to enter graphic mode and inform the printer of the number of graphic characters per line. The code to enter Gemini graphic mode is Escape 'K' (27₁₀; "K"). We will allow Print Master to calculate the number of bytes per line, (expressed as a two byte number) but you must specify the order in which these numbers are sent. In this case it is LSB/MSB. Thus String 2 is built as a simple string plus control codes.

STRING 3

27₁₀ - 41₁₀ - 08₁₀ -
13₁₀ - END

String 3 is used to perform a line feed of the correct size by sending Escape - Line Feed - Size (27₁₀; 41₁₀; 08₁₀) and a Carriage Return (13₁₀). Therefore String 3 is a four character simple string.

APPENDIX C - SAMPLE STRINGS

TANDY

Tandy printers will remain in their current operating mode until told to change. We want to allow for possible text entry so a general routine, that will send the start and end graphic codes for each line, is our best choice. The TAB STRING is not required on this type of printer as we are required to send the specific dot column in which to start printing. This can all be done with just String 2 and String 3.

STRING 2

27₁₀ - 16₁₀ -
MSB(TAB VAL) -
LSB (TAB VAL) -
END

The code Escape 16₁₀ (27₁₀;16₁₀), sent as a two character simple string, will turn on graphic mode. The starting dot column could be sent as a fixed number or, as in this example, set to TAB VAL; which will allow it to be specified at dump time.

STRING 3

13₁₀ - 30₁₀ - END

The line feed/carriage return code (13₁₀), which will perform the correct size line feed regardless of mode, and the exit graphic mode code (30₁₀) are recognized as control characters because the specified number of graphic bytes have already been sent. Thus a two character simple string is all we require.

APPENDIX D - WORKING WITH TEXT & GRAPHIC MASTER

**** A great set of tools, working together to make you more productive.**

TEXT MASTER

The 'MASTER' series of programs are designed to be complimentary and compatible. Combining Print Master with Text and/or Graphic Master will give you unparalleled control of your printed output.

Text Master is particuallly well suited to applications requiring custom type fonts in either English or any other alphabet you may wish to use. Point sizes are easily changed and text in any combination of fonts or point sizes can be mixed on the screen.

GRAPHIC MASTER

Graphic Master is designed for high speed drawing and animation. Text and titles can be added to the screen graphics using Text Master and then Print Master is used to produce hard copy of your creation.

INDEX

A

ASCII 2,34

B

BAUD RATE 26,38
BUFFER 33
BYTE 28,38

C

CLEAR WORKING PAGE 8,17
CLICK 6
COCO MAX 5,16,17,22
COLOR PRINTING 23
COLOR SET 8,20,30,B1
COPY WORKING PAGE 18
CUSTOMIZER 2,24
CUSTOM FILE 37
CUSTOM PROGRAM 19

D

DEFINE MULTITABLE 8,21
DIRECTORY 8
DOUBLEPRINT 36
DRIVESELECT 9
DUMP 15

E

END 36
EOR 28,38
EPSON 27,29
EXPAND HEIGHT 10,14,23

F

FC ERROR 5
FILE I/O 8,10
FILES 5

INDEX

G

GEMINI 27,29,C1
GRAPHIC MASTER D1
GRAPHICOM 5,8,9,17,39

H

HEIGHT
EXPAND 14,22,23
PIXEL 11
HIGH MEMORY 16

I

IMAGE DUMP 10
INK JET PRINTERS A1
INVERT 11

J

JDOS 9

K

L

LASER PRINTERS A1
LOAD
CUSTOM FILE 19
PROGRAM 6
SCREEN 9
LOOP 35,36

M

MAIN MENU 8,10
MOD 11,12,13,30
MOUSE 6,39
MSB 25,34,39
MULTISCREEN 14,21,22,29,32

N

NLQ 30,39

O

OPTION 14,30,33

INDEX

P

PARTIAL SCREEN 15,23,34
 PEEK 5
 PGM 34,35
 PICTURE FILES 5
 PIXEL 11,12,39
 PLOTTERS A1
 POINT 39
 PMODE 5,8,15,16,17,20
 PRINTING 22
 PRINT HEAD 25,26,27,28

Q

R

READ ME A1
 REVERSE ORDER 25
 ROTATE 11

S

SAVE
 CUSTOM FILE 19
 GRAPHIC SCREEN 5
 SHADING 12,13
 SPACE BAR 21,27,30
 STORAGE SCREEN 15,16,18
 STRINGS 30,35
 SUPPORT LINE 3

T

TAB 10,11,31,32,33,34,35,36
 TAB VAL 8,11,34,36
 TANDY 27,29,C2
 TESTPIC 5
 TEXT 14,20,22,32
 TEXT MASTER D1
 TRAP TABLE 29

U

V

VALUE SELECTION 10
 VIEW PAGE 8,17

W

WORKING SCREEN 15,16,17,18
 WIDTH 34,11,36

XYZ