SUPER GRAPHIC SCRATCH PAD

Version 2 — For the Sorcerer (32K)

PROGRAM BY:

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1. Loading Procedures

(A) LOADING THE MAIN PROGRAM:
Type 'BYE' and enter the monitor, then type 'LO' (CR). The program will load from address 0000H to 3D00H. Type 'PP' and 'RUN'.
NOTE: Program length is approximately 16K.

(B) In case of experiencing any loading problems, please return the defective cassette for replacement.
If the user notices any type of problems or if he has any suggestion to improving the program — by all means, contact the writer.

(C) The loading of previously saved video pages or keyboards on cassette is covered under section #7.

2. General Description

This program is intended to aid the programmer in the creation of graphic images, which may be stored, in memory or cassette, for later use in programs of his own design. It will allow you to create your own characters or retrieve almost all of the characters that reside normally in the Sorcerer, with the exception of some of the control characters.

This program provides for storage of up to five complete keyboards consisting of 127 characters each, plus the one keyboard in present use. In addition, you can store up to seven video pages, consisting of up to 1280 characters each, which represent the top twenty lines of your video display, plus the use of the present display, if no display is recalled.

The position of the video page on the screen will allow one to display various pieces of information just below these created images. A total of ten lines are provided for that purpose.

This program is set up in such a way, that one can, at any time, retrieve either video page or keyboard from memory as the need arises. The program is split into two parts — first, the character generator and second, the video page generator. It is possible, to instantly switch back and forth between them as to allow you to change, perhaps a character that is'nt just right, or to create more new characters.

In the Video Page Mode, the program will let you save either keyboard or video pages on cassette at any time.

Only one keyboard can be in effect at any one given video image.

3. Guidelines For The User

Please find enclosed Scratch Pad Display Sheet that shows you the video screen perimeters. This should be copied by you for future use in other programs that you will be making. It is intended to keep your notes and various pieces of information pertaining to the program you are working on. ***Make multiple copies.***

Always plan your programs in logical order.

In the Video Page Mode you will notice that the current cursor position is always shown. This is there, so that you can make notes of the position of certain graphics. You may want to manipulate them during the course of the program that you will be using them in. So therefore, remember to keep a record of the access co-ordinate.

Try to plan your programs so, that you allow room for video pages in memory later. Above all else, remember, that the video pages should be added to your program as the last item to be done.

If you load the video page(s) first then BASIC may just shift your video page(s) slightly during re-writing of your BASIC program. Get into the habit of memory mapping your programs first. The same holds true for additional keyboards that you wish to use.

4. Commands

(A) CHARACTER GENERATION MODE

CURSOR MOVEMENTS: ***4*** = *Left,* ***6*** = *Right,* ***2*** = *Down,* ***8*** = *Up and* ***1, 3, 7, 9*** = *Diagonal* moves.

I = INVERT. Inverts the character 180 degrees in a horizontal direction.

F = FLIP. Flips the character 180 degrees in the vertical direction.

5 = SET/RESET DOT means that if the cursor moves over a dot and the 5 is depressed then the dot will disappear; inversely if there is no dot present then the dot will appear.

R = REVERSE FIELD means that whatever is present will be reversed.

(SP) = HITTING THE SPACE BAR will erase the current character.

(CR) = HITTING THE RETURN KEY is interpreted as that you're finished making the character and you wish to have a HEX and DEC printout of that character; also gets it ready for saving.

^ = DENOTES, that any key must be depressed at the same time as the Control Key *(Control Key must be pressed first.)*

^G = GET CHARACTER lets you retrieve any of the characters from the keyboard or lets you input the proper ASCII value under the additional ***^A*** sub command.

^S = SAVE CHARACTER lets you save the character under the two programmable sections of the keyboard, with the exception of the last key (CHR$(255)).

^N = SAVE KEYBOARD will save the keyboards, both sections as #'s 1 through 5 as you designate.

^K = GET KEYBOARD # will retrieve 1 through 5 keyboards that were previously saved.

^E = RUB KEYBOARD # allows you to erase any present section of the keyboard, or both sections, as you wish.

^I = EXCHANGE THE STANDARD GRAPHIC character section with the programmable section.

^P = VIDEO PAGE MODE instantly switches to Mode 2 operation, so that you can put those graphic characters together into a larger overall picture. Just remember, that you should save any graphic keyboards prior to switching to Video Page Mode. ***(THEY COULD BE LOST if you are not careful and can never be retrieved, because they are just erased.)***

4. Commands (Continued)

(B) VIDEO PAGE MODE

CURSOR MOVEMENTS: ***4*** = *Left,* ***6*** = *Right,* ***2*** = *Down,* ***8*** = *Up and* ***1, 3, 7, 9*** = *Diagonal* moves.

^ = ***DENOTES,*** that any key must be depressed at the same time as the Control Key *(Control Key must be pressed first.)*

^I = ***EXCHANGE THE STANDARD GRAPHIC*** character section with the programmable section.

^F(n) = ***FLIP THROUGH VIDEO PAGES 2 to 8*** at the given speed of (n) (0 to 9). Zero being the fastest and nine the slowest.

^Q(n) = ***GET KEYBOARD #(1 to 5)*** will retrieve any keyboard that was previously stored in memory.

^W(n) = ***GET VIDEO PAGE #(2 to 8)*** will retrieve any video page that was previously stored in memory.

^S(n) = ***SAVE VIDEO PAGE*** as number (2 to 8).

^T = ***WRITE VIDEO TO CASSETTE*** (Drive #1). This will do a monitor save from F080 to F57F.

^R = ***KEYBOARD TO CASSETTE*** (Drive #1). This will do a monitor save from FC00 to FFFF.

^P = ***PRINT PAPER TIGER.*** Calls a machine language routine that will print out the video page via the PARALLEL PORT on your Paper Tiger printer. Paper Tiger MUST BE connected to your parallel port and also have the GRAPHICS OPTION installed.

CAUTION: Do not use this command if the printer is not hooked up.

(CR) = ***CARRIAGE RETURN*** will let you instantly return to the character generation mode. The video page that is being worked on will be saved in a holding buffer. When you return to the video page mode it will be displayed again.

5. Program Memory Map

0010 — 001F	Get character and store in 00FF
0020 — 002F	Save keyboard routine
0030 — 003F	Get keyboard routine
0040 — 004F	Video page mode buffer call routine
0050 — 005F	Video page buffer save routine
0060 — 006F	Get character video image
0070 — 007F	Save video page routine
0080 — 008F	Get video page routine
0090 — 009F	Erase FC00 to FDFF (Standard graphics)
00A0 — 00AF	Erase FE00 to FFFF (Programmable graphics)
00B0 — 00BF	Save on cassette routine
00C0 — 00EF	Exchange graphics keyboard sections
01D5 — 2700	BASIC program area
2880 — 2FFF	Video page image
3000 — 31FF	Paper Tiger printer routine
3200 — 33FF	Blank keyboard overlay
3480 — 3BFF	Scratch pad image
4300 — 47FF	Video page #2 storage area
4800 — 4CFF	Video page #3 storage area
4D00 — 52FF	Video page #4 storage area
5300 — 57FF	Video page #5 storage area
5800 — 5CFF	Video page #6 storage area
5D00 — 62FF	Video page #7 storage area
6300 — 67FF	Video page #8 storage area
6800 — 6BFF	Keyboard #1 storage area
6C00 — 6FFF	Keyboard #2 storage area
7000 — 73FF	Keyboard #3 storage area
7400 — 77FF	Keyboard #4 storage area
7800 — 7BFF	Keyboard #5 storage area

6. Machine Language Interface

SUPER GRAPHIC SCRATCH PAD utilizes one of the most powerful commands of the Z80, the Block Move Command. With this program you can implement this same technique into your BASIC programs. Being able to move video pages into and/or out of the video mapped memory area (directly to or from the screen).

Typical machine language routine is shown below:

21	00 00	11	00 00	01	00 00	ED B0	C9
	Move from address		Move to address		How many to move		Return

The first address is the beginning address where information is to start from. This information will be transposed to the Move To Address. The second address is where the information is to be moved to.
The third is the number of pieces of information that is to be moved.

As shown in lower memory you will find, that there are nine (12) sub-routines between 0010H and 00FFH. These routines move various pages in memory to video or back to memory.

The second last machine language routine is the one, that allows you to save it on your cassette tape. The actual command is written in BASIC and poked into the monitor command buffer area and is then called via the save routine in the monitor.

Examine the routines located in the first two hundred and fifty six memory locations. 0 — 00FFH to get a full picture of the amount of machine language that is used.

7. Saving or Retrieving Pages from Cassette

When in the Video Page Mode you can save any keyboard or video page that is shown on the screen at any time.

The Save Keyboard Command does not let you just save one portion of the keyboard only, it is not written that way. If a partial keyboard save is required then exit the program by typing Control 'C', then type BYE. This will get you into the monitor state, then you may save on tape whatever you wish.

The pages are labeled: VIDE(n); the 'n' denotes which page number was saved — if any.

The keyboards are labeled: KEY(n) the 'n' denotes which keyboard was saved — if any. By 'any', means, that if a keyboard was retrieved it will have a number but if no keyboards were retrieved then no number would appear in this location.

The way in which you retrieve video pages from cassette is very important. The first thing to remember is that all video pages are saved from F080 to F5FF for a total of 1280 characters. Now then, if one just normally did a load using the monitor LO command, it would start to load directly into the video memory area. Do a couple of Video Saves and also do a machine language LO (load). The video page or keyboard will be loaded back to the same area of memory from where it came, ie: video space or under the keyboard. Note please, that any keyboard loaded into the program before it is run will be erased when the program is run, so therefore use the memory map to load in keyboards.

If you wish to load some previously saved video pages or keyboards back into the mapped memory area then you would consult the memory map and select the beginning address where you would like to put the information and enter the monitor again.

Type LO VIDE(n) 1 nnnn

This will load the program at address (nnnn) which will be your selected memory slot. Remember that nothing will get changed if you then return to BASIC and type RUN. You can resume where you left off. Using this method, you can reload either video pages or keyboards up to the number that can be saved in memory.

8. Theoretical Implementation

There are a number of things you should remember. First of all is that the video images that you have/can create can be moved from place to place in memory almost instantly. Also that if you were to move keyboards into the graphic section those video images would reflect the change of the programmable characters.

The video pages do not have to contain programmable characters only, they could contain anything you like.

There is one limitation in the Video Page Mode, and that is, that you can't just type a number from 0 — 9. If you wish to use numbers, then they would first have to be retrieved and one or more of the programmable characters used for its storage. In this way, you can then display numbers. The numbers are used for cursor control commands.

The Block Move Machine Language Routine can be used in any program, whether it be a machine language or BASIC program. It's always the same set-up. Under the heading Machine Language Interface the routines are shown and described.

By using the same type of memory map as is used in this program or one similar of your own choice it will be possible to recall certain video pages into your own progams.

After having them called in, you use the cursor routine as shown in the listing in this program to place additional information into the video area. The program has been kept as simple as possible in order that you will be able to follow it more easily.

Now the other way to manipulate the graphics is by poking additional info into the video memory space, or by changing what was called in previously. You may wish to flip through video pages as is accomplished in this program.

In any event, we trust that this program will make it far easier for you to write your own programs. Your imagination will do the rest. Have fun — and the best of luck with your programming.

T.M. northamerican software

INSTRUCTIONS FOR RUNNING THE TWO SAMPLE VIDEO GRAPHIC SCRATCH PAD PROGRAMS

The following two sample programs are just a demonstration of the routine of flipping thru the seven Video Pages. This is not the whole intention of this program. The program's intention is to be able to create a 20 line graphic display of your choice to insert in any program you select, or what have you.

1. (a) First load "SUPER GRAPHIC SCRATCH PAD" Program.
BYE (C.R.) *(C.R.) Denotes Carriage Return
>LO SUPAD (C.R.)

2. (a) Now load the first sample program which is located about 4 to 5 seconds after the Scratch Pad Program. (Do not erase the "SUPAD" Program during the operation of both sample programs.)
>LO NAS1(C.R.)

   (b) When loaded
>PP (C.R.)
RUN (C.R.)

   (c) You are now in the Character Generator Mode. Press Control Key(CTRL) & P simultaneously. This passes you to the Video Screen Mode.

3. (a) Press Control Key(CTRL) & Q simultaneously, then press 1. (This places Keyboard #1 in Video Screen Mode.)

   (b) To Flip thru the seven Video Pages, utilizing the Block Move Routine, press CTRL Key & F simultaneously, then press Ø -- instantly you flash thru the seven Video Pages.

   (c) To slow the illusion down repeat 3(b) but press any number between 1 and 9. Nine being the slowest.

4. (a) As you can detect the bottom row of characters on the screen of the Video Page Mode are in reverse field - by utilizing the Control Key (CTRL) & I simultaneously, you place the bottom row of programmed characters to the top row. Now press CTRL Key & W simultaneously, then 2 (you are now displaying Video Page 2 - the first page). What you see is the Northamerican Software's Logo, almost a replica!

   (b) Just for the fun of it Flip thru the Pages and see how easy it is - by using the routine at Item 3(b).

5. (a) Now to look at the second sample program. Press CTRL Key & I simultaneously to return to normal Video Page Mode, then hit Return - this returns you to the Character Generator Mode - Press CTRL Key & C simultaneously, to return you to Basic.

   (b) Then type in BYE (C.R.)
>LO NAS2 (C.R.)
When loaded type
>PP (C.R.)
RUN (C.R.)
After loading follow the instructions as per Item #2(c).

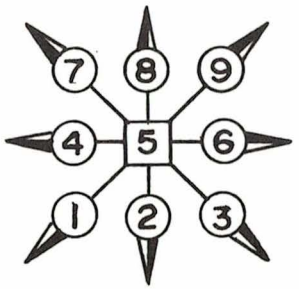
Let's hear from you with any new creations you might develop with this Program as there is no limit to it's potential ---

NOTE When you start to write your own graphics program, prior to locating graphic characters into the Video Page Mode, and avoiding having to erase all the O's on Video Pages 2 thru 8, do the following as soon as you enter the Video Page Mode on start up. Hit CTRL & 'S' Key simultaneously then hit 2. Repeat this for pages 3,4,5,6,7 & 8. This will ensure you have a clear screen on all seven Video Pages when you wish to add graphics.
THIS PROGRAM COMES RECORDED TWICE ON ONE SIDE AT 1200 BAUD.
Finally anyone wishing to market any new software thru Northamerican Software, for the benefit of all Sorcerer owners, at a return of between 20-40% depending on popularity, submit us a copy for evaluation.

P.O. Box 1173, Station 'B', Downsview, Ont., Can. - M3H5V6

GRAPHIC SCRATCH PAD WORKSHEET

TRUE IMAGE RATIO



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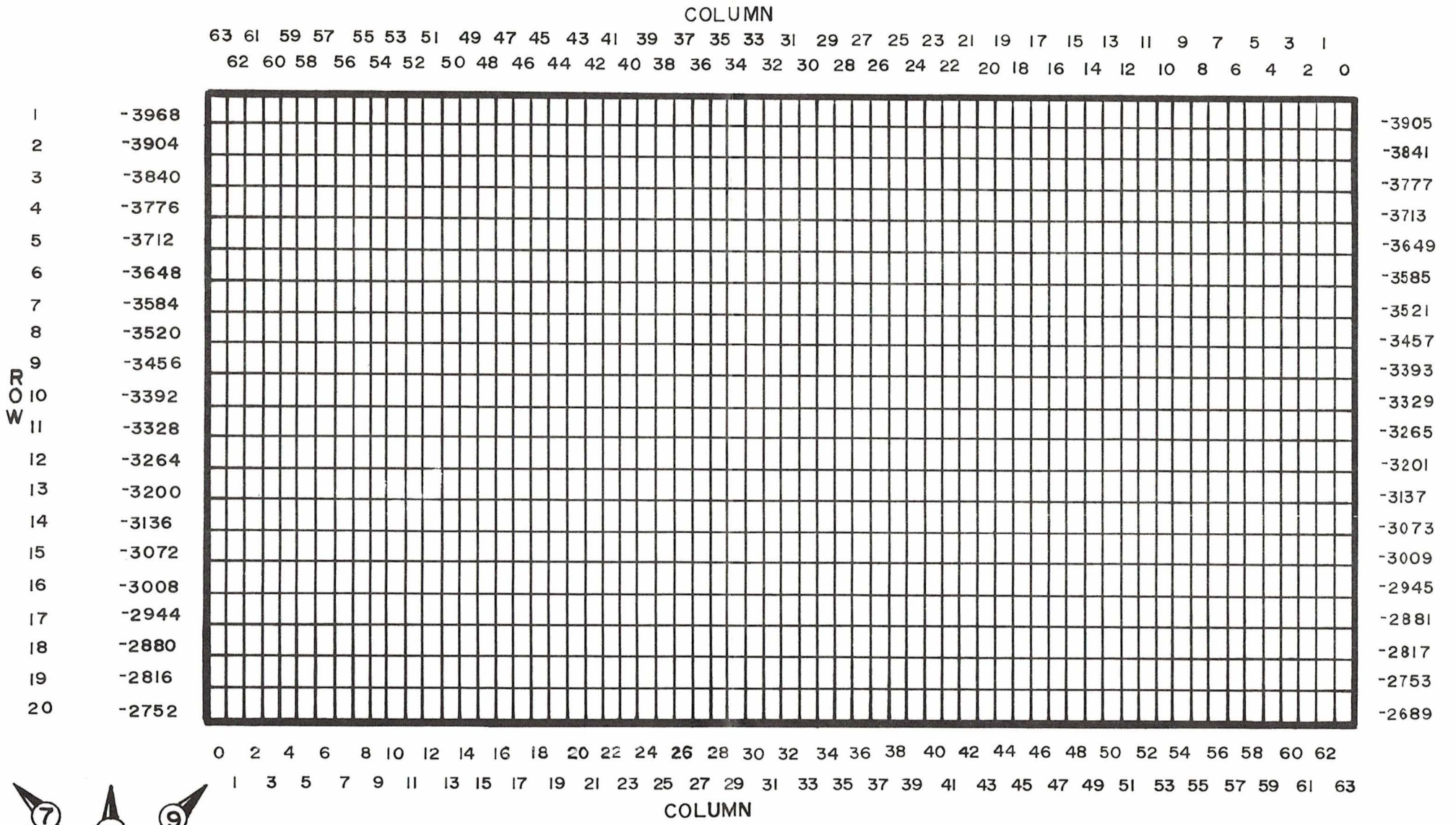
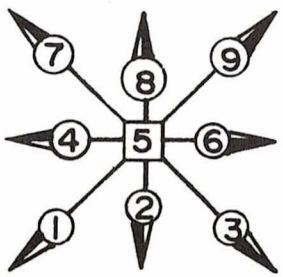
SORCERER SUPER GRAPHIC SCRATCH PAD





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