

Wildcard Plus

It copies!

For-

Apple][or //e
Disk Drive

Elite Software Company

WILDCARD PLUS REGISTRATION FORM

WILDCARD PLUS

USER MANUAL

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Dear Customer,

Thank you for purchasing Wildcard Plus, we hope that you will find it a useful device. We would be extremely grateful if you could take the time to complete this registration form and return it to:

Elite Software Company
30 Guildford Street
Chertsey
Surrey KT16 9PQ.

By doing so you give us the opportunity to inform you of upgrades and, where necessary, corrections to the package. Also if you encounter problems it makes our job of helping you considerably easier.

Thank you for your help.

Type of computer : _____

Interface cards

Slot #0 : _____
Slot #1 : _____
Slot #2 : _____
Slot #3 : _____
Slot #4 : _____
Slot #5 : _____
Slot #6 : _____
Slot #7 : _____

Wildcard Plus no. : _____

Date of purchase : _____

Name of supplier : _____

Your name and address : _____

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Thank you for purchasing THE WILDCARD PLUS SYSTEM, the finest product of its kind on the market today. The WILDCARD PLUS SYSTEM provides the ultimate in convenience and capability for backing up protected software products for the Apple computers. This system offers a wide variety of powerful utility functions, including printouts of both text and high resolution screens and BRUN file maker. It is primarily intended for making backup copies of 'total load' or 'memory resident' programs, as contrasted to 'multiple load'. Total load programs load all at once and can therefore be backed up by saving the entire contents of the computer memory to disk. Multiple load programs, since they do not load all at one time, may not be copyable. However, a technique for duplicating this type of program is discussed in Section 5.

THE WILDCARD PLUS SYSTEM contains a sophisticated interface card that plugs into your computer. With this card you can make a copy of many programs which run on your computer. The copy (or backup) created by THE WILDCARD PLUS SYSTEM contains an exact image of the program as it existed when you interrupted its execution. The program backup will start running at the point where you pushed THE WILDCARD PLUS button to make your copy.

THE WILDCARD PLUS SYSTEM contains a UTILITY DISK which is used to initialise blank disks for making copies. In addition, it will create BINARY (BRUN) files which can be placed on a hard disk. When using BRUN files it should be noted that more than one program may be placed on a disk. Also included is an Applesoft Recover and a program to view, print and 'wipe' text and graphics screens.

THE WILDCARD PLUS SYSTEM contains all the copy software on a 2732 EPROM. This makes copying fast and easy. There is no need to boot a of system disk to create a copy. The majority of copies will be made in under 30 seconds. The copies created are 'autobooting' which means that when they are booted, the program loads up and starts running automatically. WILDCARD PLUS does not need to be in the system to run the copies.

THE WILDCARD PLUS SYSTEM will back up any total-load program that will run on an Apple. This includes programs which use the additional memory provided on a RAM or Language card. On an Apple //e WILDCARD PLUS will also copy those programs which use the additional 64K of memory which is available in the extended 80-column card. In fact, WILDCARD PLUS and its sister card WILDCARD 2 are the only cards on the market which are capable of creating copies which use the full 128K on an Apple//e. These two cards are also the fastest cards on the market today.

ABOUT WILDCARD PLUS

WILDCARD PLUS is unique in its design. The union of a sophisticated micro-processor design together with a clever combination of a 2732 EPROM and hi-density static RAM has created a powerful card with many unique features.

The large EPROM contains a sophisticated yet easy to use copy program. There is no need to use a system disk to create the copy or to load copy software into the card. A copy can be made with only three keystrokes. Copying onto one of our pre-initialised disks takes approximately 10 seconds for each 64K written. Our menu driven software is straightforward and all commands are activated with a single key press. When making a copy you will be warned if you are going to write over a previously used disk or if you are not using a proper disk. This protects you from erasing an important copy. The majority of functions are available from a single menu.

From this menu you may select a powerful feature called 'ALTER OPTIONS'. This allows you to control many important parameters associated with the Apple and WILDCARD PLUS. For example, you can select which screen to display when the copy is restarted or the amount of memory to copy.

Our RAM section lets us up-load modules into the card which can then be activated from THE WILDCARD PLUS menu. This means that new features may easily be added to the card and thus the card will not become obsolete.

SYSTEM REQUIREMENTS

You will need the following computer configurations to use THE WILDCARD PLUS SYSTEM:

Apple II or Apple II Plus with up to 64K of RAM

Apple //e with up to 128K of RAM

You will also need a DOS 3.3 (16 Sector) disk drive in any slot.

If you are going to do text screen dumps then you will need any printer and a printer card in slot 1. If you are going to do graphics screen dumps you will need a printer capable of graphics such as the EPSON MX-80 with GRAFTRAX and a printer card which will properly control the printer such as an Orange Micro GRAPPLER. This card should be installed in slot 1.

If you have any questions about whether you can use THE WILDCARD PLUS SYSTEM with your computer, please ask your dealer for assistance or call Elite Software Company during normal business hours.

THE WILDCARD PLUS PACKAGE

Contained in the package should be the following items:

1. A WILDCARD PLUS peripheral card.
2. A WILDCARD PLUS UTILITY DISK.
3. A REGISTRATION FORM and this MANUAL.

If anything is missing please contact your dealer or Elite Software Company. Please do not return any package without contacting Elite Software Company.

HOW TO USE THIS MANUAL

THE WILDCARD PLUS SYSTEM is very easy to use. However, it is a sophisticated product that must be properly installed. A few minutes spent with our setup instructions will save you many problems later.

1. Follow the steps listed under INSTALLATION, starting on page 6. Although you may have done this a million times before, a few minutes spent here could save hours of frustration.
2. After you have installed your WILDCARD PLUS SYSTEM, try A FIRST EXAMPLE, which you will find on page 9. Mastering this simple, step-by-step introduction to the WILDCARD PLUS SYSTEM is a vital step in getting the most of this powerful tool.

Most of your backup needs can be met with A FIRST EXAMPLE. The concepts learned here will serve 90% of your copying needs.

3. Don't be afraid to experiment with different options. As long as you are diligent in removing the original program disk from your computer you can do no harm. Because WILDCARD PLUS is so fast, you can make changes and test them quickly.
4. Work your way through the book step-by-step. If something is not working correctly, go back and try a previous section and then try again.

NOTATION USED IN THIS MANUAL

Throughout this manual you will be asked to press various keys on your computer. When we want you to press a key it will be marked off in brackets. For example, <C> means press the "C" KEY. THE WILDCARD PLUS SYSTEM uses a series of menus to guide the user. A menu is just a list of options available to the user at that point.

In the WILDCARD PLUS SYSTEM the first letter of the options is highlighted by showing it in inverse (white on black). Throughout this text we will show the highlighted character surrounded by brackets, i.e., <Q>UIT. To choose that option press the key on the computer which corresponds to the highlighted character. For example, if <Q>UIT is the choice, the "Q" key.

There are also occasions when you will be asked to press a "CONTROL" key. You will see notation like this: <CTRL-C>. This requires that you press the key marked "CTRL" ("CONTROL" on an Apple //e) and at the same time press the appropriate letter key. It is similar to shifting to upper case on a typewriter or word-processor.

The other special keys you should be aware of are the <ESC> and <RESET> buttons. <ESC> stands for ESCape. Although it has lost its meaning in modern computer keyboards, we use it to allow you to backout of escape from a particular function. It is particularly important when you are about to do an irreversible action, i.e. erasing a disk.

<RESET> is an all powerful key and it must be used with care. <RESET> will stop your machine dead and then leave it to try and recover. Some programs are very good at dealing with <RESET>; others just "crash" or cause the disk to reboot.

To prevent you from accidentally pressing the <RESET> button, Apple wisely provided a switch on the Apple II Plus which forces you to press <CTRL> and <RESET> together. As these keys are far apart it is almost impossible to do it accidentally. On the Apple //e you must press <CTRL> and <RESET> together.

In this manual when we want you to press <RESET> we will show it as such: <CTRL-RESET>. Take whatever action is appropriate to your particular machine.

The <RETURN> key is generally needed to confirm some action which cannot be stopped once started, i.e. before copying to a disk. It is also used when you are asked to enter a program name.

Throughout this manual you will be asked to enter text via the keyboard. The text you should enter will be surrounded by single quote marks - for example 'RUN RADIATION'. All you need enter is the text surrounded by the quotes; do not enter the quote marks.

If you have an Apple //e, the menu choices and any text produced by THE WILDCARD PLUS SYSTEM will be displayed in upper and lower case. We hope you find this more pleasing to the eye. On all other machines the text will be in upper case only.

SECTION 1 : INSTALLATION

This section describes how to install your WILDCARD PLUS SYSTEM. This procedure is the same for all types of Apple computers. Although you may have installed peripheral cards before, please follow the directions carefully. Before we begin, we must emphasize how important it is to turn off the power to your computer before trying to remove or replace a peripheral card like THE WILDCARD PLUS. Violation of this rule can result in serious physical damage to your computer, as well as other peripheral cards. Elite Software Co. cannot assume any responsibility for any damage you may cause by incorrectly installing your WPS.

1. Turn off the computer with the power switch, but for the moment leave the power cord plugged in. Remove the cover from the computer. On an Apple, this is done by pulling up, firmly but lightly, on the rear edge and then lifting up and back. Touch the metal surface of the power supply which occupies most of the back left. This procedure will discharge any static electricity you may have accumulated.
2. As an added precaution, remove the power cord from the back of the computer.
3. Select an empty slot for your WILDCARD PLUS. Slots #0, #1, #2, #3 and #6 are usually dedicated to other purposes, so slots #4, #5 or #7 are better choices. However, WILDCARD PLUS does not depend on a specific slot assignment.
4. Insert the card in the slot and press it firmly into place. If you encounter considerable resistance when you try to push the card into the slot, try placing just the back edge in and then roll the card forward while pressing down firmly. DO NOT ROCK THE CARD FROM SIDE TO SIDE AS YOU MAY DAMAGE THE SLOT.
5. Run the cable connected to the WILDCARD PLUS out through one of the slots at the rear of the computer case. On an Apple //e, you may have to remove one of the 'plugs' in the rear. Route the cable and pushbutton along the side of the case to the front. DO NOT PULL ON THE CABLE AS THIS MAY UNSEAT WILDCARD PLUS AND CAUSE DAMAGE. If you want to be safe, secure the cable and button to the side of the case with tape.

6. Replace the lid of your computer and reconnect the power cord.

This completes the hardware installation of your WILDCARD PLUS. What follows is a test to make sure that all is working correctly.

HARDWARE TEST

Remove any disks from your drive(s). Turn your Apple and monitor on. You should hear the computer beep but the disk drive should not come on. About one second later the Apple should beep again and the disk drive should come to life. If your monitor has warmed up you should see a screen full of garbage between the first and second beeps. This is normal. If you have an old Apple II without an 'AUTOSTART' monitor ROM, press <CTRL-Y> at the '*' prompt to start the system.

If you don't get the second beep or the disk drive comes on immediately after the first beep or if there are no beeps please recheck your installation (WITH POWER OFF!). If this fails please follow the instructions in Section 6.

If you do get the double beep, press <CTRL-RESET>. This should stop everything and give you some sort of prompt (usually ']', '>' or '!') and a flashing cursor. At this point press the WILDCARD PLUS button. The WILDCARD PLUS MENU should appear.

If it doesn't please recheck your installation (WITH POWER OFF!) and try again. If it still fails please follow the instructions in Section 6.

If you do get the menu, please don't panic. It all may seem confusing now but we are only interested in pressing <R>ESUME PROGRAM IN MEMORY. This should place you back at the flashing cursor.

If it doesn't please recheck your installation (WITH POWER OFF!) and try again. If it still fails please follow the instructions in Section 6.

PLEASE NOTE : EVERY TIME YOU SWITCH YOUR COMPUTER ON AND OFF, WITH WILDCARD PLUS INSTALLED, YOU WILL GET THE DOUBLE BEEPS. THIS IS NORMAL. IT WILL TAKE A LITTLE TIME TO GET USED TO BUT IT IS REASSURING TO KNOW THAT YOUR WILDCARD PLUS IS SITTING THERE READY TO GO.

This completes the installation and test of your WILDCARD PLUS hardware. In the next section we will install the disk that comes with your WILDCARD PLUS SYSTEM.

SOFTWARE INSTALLATION

The only installation needed on the disk is to make backup copies. As THE WPS DISK is unprotected you may use a standard copy program, such as COPYA. Make 2 or 3 copies and place the original in a safe place. There is no excuse for damaging your master disk and at 10.00 a piece to replace them, make the copies now.

If you are not familiar with COPYA please review pages 38-40 in the Apple DOS Manual.

SECTION 2 : A FIRST EXAMPLE

This section will teach you how to make a backup of protected programs using WILDCARD PLUS. This simple technique will serve most of your copying needs.

The first step is to get out your copy of the WILDCARD PLUS UTILITY DISK and to get a few blank or otherwise unneeded disks. Henceforth we will refer to the WILDCARD PLUS UTILITY DISK as the WILDCARD DISK.

Boot your WILDCARD DISK and wait for the menu to appear. On the menu will be several options. The one we are interested in is '<I>NITIALISE A BOOTSTRAP DISK'. All menu choices in THE WILDCARD PLUS SYSTEM are activated by pressing the key which corresponds to the highlighted letter of that menu choice. In this case you press <I>.

After pressing <I> the screen will clear and a description of the chosen option will be displayed. In this case, it tells us that we are going to create a 'bootstrap' disk. A bootstrap disk is a disk which will load and execute a program automatically when you boot it.

In the WPS we initialise the disk first and then place a special program on it which will load and restart the program which we are backing up. When you are ready to copy a program with WILDCARD PLUS you will use one of these disks to store the program.

Although this may seem awkward, it really helps to keep things simple. It also makes the actual copying procedure very fast. We have incorporated a unique feature which prevents you from using a non-WILDCARD formatted disk as well as preventing you from accidentally copying over a previous copy.

If you haven't already pressed <I> from the menu, do so now. Remove the WILDCARD DISK and place it back in its sleeve. Place a blank or otherwise erasable disk in the disk drive. THE WPS always uses drive 1 for any disk operations. Close the drive door and press <RETURN>.

If your disk is not blank you will be told that the disk is about to be erased. If you do not want to erase this disk, press <ESC> which will place you back in the WILDCARD DISK menu. Get another disk and press <I> to continue.

If you do want to continue, press <RETURN>. The disk is now being prepared and you will get a message on the screen telling you this. When the process is done you will be returned to the WILDCARD DISK menu.

If the program runs into difficulty preparing the disk, you will hear a two-tone beep and an error message will appear on the screen. This means that the program could not format or write upon the disk. This may be caused by the following:

1. Check that there is no write protect tab on the edge of the disk. If there is, remove it.
2. The disk was not properly inserted in the disk drive. Try replacing it and opening and closing the drive door a few times to get it properly seated.
3. The disk is defective. It happens once in a while; try another.
4. The disk drive itself is broken or out of alignment. Your dealer can check this.

If everything worked correctly (it almost always does), you will be returned to the WILDCARD DISK menu. Initialise 3 or 4 more disks now, so that you don't have to keep booting up the WILDCARD DISK.

Mark the disk labels with 'WILDCARD BOOTSTRAP DISK' and place them on the disks. Replace the disks back into their sleeves and put them in a safe but convenient place.

RUNNING RADIATION

Now we are going to make a copy with the WILDCARD PLUS. However, we need something to copy. We have provided a little demonstration program called 'RADIATION' on your WILDCARD DISK. Although it is not protected for the purposes of this example we will pretend it is.

To run RADIATION, exit from the WILDCARD DISK menu by pressing <Q>UIT TO APPLESOFT. This will clear the screen and give you a 'I' and a flashing cursor in the upper left hand corner of the screen. Place the WILDCARD DISK back in drive 1. Enter the following commands. DO NOT TYPE THE QUOTE MARKS; they are there to mark the actual words you should type.

```
I 'I' <RETURN>
I 'RUN RADIATION' <RETURN>
```

The disk drive light will come on and in a few seconds the program will start running. If this doesn't happen, make sure you place the WILDCARD PLUS UTILITY DISK in drive 1, and try again.

RADIATION is a little program in BASIC which will print a pretty pattern on the Apple's Graphics screens. When the program first runs, a little explanation of the program is shown and you are asked to press <RETURN> to start. The program cycles through various different screens and then returns you to the first screen. If you're curious press <RETURN> and watch RADIATION do its thing. It's really quite nice. When you have returned to the beginning of RADIATION continue with this example.

RADIATION should be at its first screen and waiting for you to press <RETURN>. This is a great place to push the WILDCARD PLUS pushbutton. So... press the button. Instantly, the screen should change to :-

```
WILDCARD PLUS
-----
<R>ESUME PROGRAM IN MEMORY
<A>LTER OPTIONS
<C>OPY PROGRAM TO DISK
<L>OAD PROGRAM FROM DISK
<B>OOT A DISK (CLEARS MEMORY)
<U>TILITIES

SELECT :
```

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(If you don't get this please recheck your installation and Section 6.)

WOW! There is sure a lot of stuff! Don't panic - this will all make sense soon enough. For now we are interested in just three commands : <R>ESUME PROGRAM IN MEMORY, <C>OPY PROGRAM TO DISK, and OOT A DISK (CLEARS MEMORY). Here is a brief outline of these three commands.

<R>ESUME PROGRAM IN MEMORY will return you to the program which was running when you pressed the WILDCARD PLUS button. In fact, the program will never know it was stopped. It is safe to press the WILDCARD PLUS button and press <R> at any point in a program except when the program is accessing a disk drive.

On an Apple //e WILDCARD PLUS will return you with the proper text or graphics screen showing and any extra memory, such as the extended 80-column card properly set up. This is because such information can be read from an Apple //e. On the Apple II and Apple II Plus the WILDCARD PLUS will return you to the regular text screen and try to figure out if you have a RAM card and if it was in use. By using <A>LTER OPTIONS you can tell WILDCARD PLUS how to resume correctly. We will cover this shortly.

If you want to try <R>ESUME PROGRAM IN MEMORY, go right ahead. Check that the program still runs. When RADIATION has returned to the first menu press the WILDCARD PLUS button again.

<C>OPY PROGRAM TO DISK is what we use to create a copy of the program in memory. The 'DISK' is one of the disks we have already initialised.

OOT A DISK (CLEARS MEMORY). This feature lets you boot up a new program to copy or to quickly boot a copy. This will also completely clear the Apple's memory. This feature is important when you want to create a compressed 'BRUN' file. By completely clearing the Apple's memory we can easily spot those places which are not used by the program you wish to back-up. This helps make a disk file as small as possible.

Now, back to making a back-up of RADIATION. Remove the WILDCARD DISK from drive 1 and insert one of the WILDCARD BOOTSTRAP DISKS that we created a short while ago. Press <C>.

The screen will clear and the following will appear:

```
COPY FILE: PROGRAM
```

You can now enter a name to identify what you are copying. This name will be displayed on the screen when you boot the copy. If you don't want to enter a name just press <R>ETURN and WILDCARD PLUS will enter 'PROGRAM' for the name. You may enter up to 20 characters, including numbers and punctuation. If you mistype a letter the < <- > (back arrow) key will move you back a character.

For now, enter 'RADIATION'. When you are all set, press <RETURN>. You can also press <ESC> right up to the point that you finally press <RETURN>. <ESC> will return you to the WILDCARD PLUS menu. If you have pressed <RETURN> the disk drive light will come on and WILDCARD PLUS will create a copy. How long this takes depends on how much memory you have in your computer and to a degree, how well 'in tune' your disk drive is.

In an Apple II Plus with a 16K RAM card it should take about 10 seconds to create a copy. In an Apple //e with an extended 80-column card it should take about 25 seconds. These times will vary if your disk drives are turning a little too fast or too slow. Your dealer can adjust your drives back to their optimal speed.

When the copy is complete you will be returned to the WILDCARD PLUS menu. If during this process you hear a two-tone beep, the following message will appear on the screen:

```
DISK ERROR! PRESS <RETURN>
```

This means that WILDCARD PLUS ran into a problem with your disk or disk drive. Pressing <RETURN> (actually any key will do) will return you to the WILDCARD PLUS menu. Try putting the disk in again or try another disk.

OK - we have now created a copy of RADIATION. Let's try it. Turn your computer off and then on again. The WILDCARD PLUS BOOTSTRAP DISK will boot up and the following screen message will appear:

```
LOADING COPY : RADIATION
```

```
TRACK
```

```
0000000001111111 1122222222223333  
1234567890123456 8901234567890123
```

```
*
```

```
48K 64K 8 EXT  
0
```

```
COPYRIGHT 1983
```

```
ELITE SOFTWARE COMPANY
```

Don't worry what all the writing means for now, just watch as the little stars move to the right. When they reach the end the whole system will pause for a second and then BINGO, RADIATION reappears! Wasn't that easy? Play with RADIATION for a little while to prove to yourself that it really is all there.

SUMMARY : HOW TO CREATE A COPY USING WILDCARD PLUS

1. Boot the program you want to back-up. To aid our various compression routines it is best to boot up as follows:
 - a) Turn your computer on and press <CTRL-RESET>
 - b) Push the WILDCARD PLUS button
 - c) Press OOT A DISK (CLEARS MEMORY)
 - d) Press <R>ETURN when all is ready. The Apple will beep, the screen will fill up with characters and then the Apple will beep again and start booting.
2. When the program has finished loading and the disk drive has stopped for the last time, remove the program disk from the drive and press the WILDCARD PLUS button. It is best to press the button when the program is in a stable place; for example, when it is waiting for some sort of keyboard input.
3. Place an initialised WILDCARD BOOTSTRAP DISK in drive 1 and press <C>OPY PROGRAM TO DISK. The disk will whirl for a moment and you will be asked for a file name. Enter a name or press <RETURN> to accept the default, 'PROGRAM'.
4. When the copy is finished press <R>ESUME PROGRAM IN MEMORY to continue running the program or press OOT A DISK (CLEARS MEMORY) to run the copy.

That's how simple it all is. If you are using WILDCARD PLUS on an Apple //e, you may never need to do anything more to create back-ups of your total-load programs. On an Apple II or Apple II Plus you will need to use the <A>LTER OPTIONS to tell WILDCARD PLUS certain information when copying programs which use graphics or programs which use the 16K RAM card. This feature is covered next. If you own an Apple //e follow along too, as this information will be useful as you get more involved with WILDCARD PLUS.

SECTION 3 : TUNING YOUR COMPUTER - USING 'ALTER OPTIONS'

When you pressed the WILDCARD PLUS button you may remember seeing a menu choice called 'ALTER OPTIONS'. This is a unique and powerful option of WILDCARD PLUS. It lets you 'get inside' your Apple and do things you never thought possible! Specifically, it lets you play with the Apple 'soft switches'.

Deep inside your Apple, unseen, are tiny electronic switches which turn various options on and off. Unlike the switch which turns your Apple on and off, these electronic switches do not have handles or even any physical ('hard') moving parts. Hence, the name 'soft switch'. There are quite a few of these switches in the Apple and they live between locations 4916 (\$C000) and 49407 (\$C0FF) in the Apple's memory map. A switch may be turned on and off ('toggled' in computerese) by accessing that switch's location in memory.

The options that these switches control include switching the Apple's screen between TEXT and GRAPHICS, selecting HI-RES or LO-RES GRAPHICS, making the speaker click, and switching peripheral cards in and out.

One problem with these switches is that, for most of them, there is no way the computer can tell whether they are on or off. There is no way that a program can tell if, for example, the screen is set for GRAPHICS or for TEXT. This can be a problem when WILDCARD PLUS tries to determine what state your Apple was in when you pushed the button. If you pushed it when a graphic image was being displayed the WILDCARD will flip the screen to TEXT mode to be able to display the menu. When you press <R>ESUME PROGRAM in memory or boot a copy the WILDCARD will assume the TEXT screen and you won't see your picture. This is where ALTER OPTIONS comes in.

When Apple designed the //e, they included the ability to find out what position a soft switch is in. WILDCARD PLUS can read this and dutifully record it so that they will be properly restored when you resume or boot a copy. This makes the whole copy procedure very simple. Thank you, Apple.

The //e can also contain an extra 64K of memory in the 'AUXILIARY SLOT'. This memory can be switched on and off as needed. Some programs will store information in this memory and then switch it off. WILDCARD PLUS can tell if there is this extra memory but it cannot tell if it contains anything useful. WILDCARD PLUS will copy this extra automatically. However, if this extra is not being used, then why copy it? With ALTER OPTIONS you can easily switch it off.

Load up your copy of the WILDCARD DISK and <Q>UIT TO BASIC. Now, run RADIATION (ENTER 'RUN RADIATION'<RETURN>). Pick a nice screen and press the WILDCARD PLUS button. From the menu select <A>LTER OPTIONS. The screen will change and display:

```
-> Memory- 64K:Y 80Col:Y Ext:Y
Screen   T A I L
LC read  0
LC write 7
Disk slot 6
Slot 1   N
Slot 2   N
Slot 3   N
Slot 4   N
Slot 5   N
Slot 6   N
Slot 7   N
Aux mem  N
//e ROM  N
Alt ZP   N
C300 ROM Y
80 column N
STOREAUX N
Alt chars N
```

Depending on your machine various combinations of 'Y' and 'N' will be displayed. There is also a little arrow. This selects the option you wish to change. This pointer is moved up and down with the arrow keys. On an Apple //e the up and down arrow keys also move the pointer. Try moving the pointer around. Notice that when you try to go over the top it wraps around to the bottom and when you go beyond the bottom, it wraps around to the top. When you are done, return the pointer to the MEMORY option. Make a mental note of the 'Y' and 'N' at this option.

To change an option once selected by the pointer, press the <SPACE> bar. Notice how the 'Y' and 'N' change. As you continue to press <SPACE> the 'Y' and 'N' will cycle through every valid combination. In case you haven't guessed, 'Y' means Yes (option selected) and 'N' means No (option not selected). Press the <SPACE> bar until you have reselected the same combination of 'Y' and 'N' as you had before.

MEMORY-64K:Y 80COL:Y EXT:Y

This option shows how much memory is available on your Apple and if you have a //e, whether or not you have an extended 80-column card.

On an Apple II or II Plus only the 64K Indicator will be valid. If it says 'Y' it means that WILDCARD PLUS found a 16K RAM CARD in slot 0 and that the contents of this memory will be copied to the disk.

On an Apple //e the 64K will always be 'Y' as the //e has the extra 16K of RAM built in. If you have a standard 80-column card, then the 80COL will show 'Y' and if you have an extended 80-column card (the one that gives you an extra 64K) then the EXT will also show 'Y'. When 80COL and/or EXT is 'Y' then the contents of the 80-column card will be copied to the disk.

The MEMORY option does not tell you if there is valid data in the extra memory; it only lets you select how much memory you want to copy to a disk. If you are using a program which only uses 64K on an Apple //e but you have the extended 80-column card in your machine there is no reason to copy the extra memory. Just press <SPACE> until you get 64K:Y 80COL:N EXT:N. Similarly on an Apple II or II Plus you may choose not to copy the contents of the RAM CARD. Just press <SPACE> until you see 64K:N 80COL:N EXT:N.

SCREEN TAIL

This is a fun option! This lets you select which screen will be displayed upon resuming or booting a copy. On an Apple //e, because we can read the appropriate soft switches this option will always be selected properly. On other machines, you have to tell WILDCARD PLUS what to display. For example, if you were playing 'SPACE INVADERS' just prior to pushing the WILDCARD PLUS button the Apple would be on a high resolution (HI-RES) graphics display. The moment you press the button, WILDCARD PLUS switches the proper soft switches to display text and the WILDCARD PLUS menu.

Since we were not on an Apple //e, WILDCARD PLUS could not tell that you were shooting aliens on the graphics screen. If you were to press <R>ESUME PROGRAM IN MEMORY you would get a screen full of garbage. The program would still be running but you are looking at the wrong screen!

The Apple has an interesting variety of screens. You can show TEXT, LOW RESOLUTION (LO-RES or block graphics) and HIGH RESOLUTION (HI-RES or dot graphics). You can also have a full screen of either graphics (ALL) or mixed with four lines of regular Apple TEXT on the bottom four lines of the screen (MIXED). But that's not all! There are also two 'pages' for each screen. This means that you can have two pictures in memory and switch between the two. These two pages are known as PRIMARY or PAGE 1 and SECONDARY or PAGE 2.

When you select the SCREEN option and press <SPACE> you will be taken through every valid combination of screens. These are what the letters mean: T = TEXT, G = GRAPHICS, A = ALL (all graphics), M = MIXED (text and graphics displayed together), 1 = PAGE 1 or PRIMARY and 2 = PAGE 2 or SECONDARY.

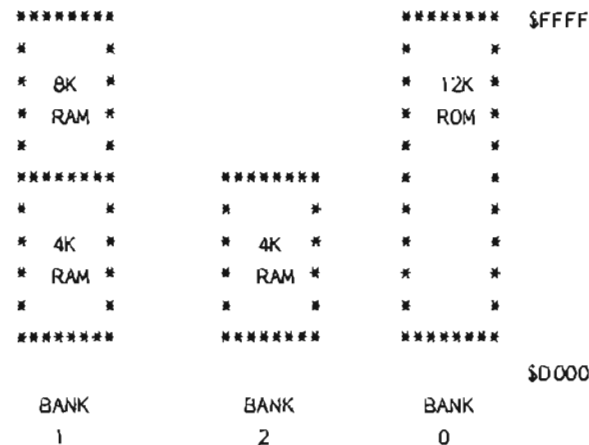
But how are you supposed to figure all this out and select the right combination? This is where the fun comes in and our genius shines. With the pointer selecting SCREEN, press <V> (for VIEW). PRESTO, the currently selected screen combination is shown on your monitor. Press <SPACE> to scan through the combinations. When you see the same screen that was up when you pressed the WILDCARD PLUS button, press <V> again or press <ESC>. You are returned to the ALTER OPTIONS menu and the correct combination is selected. Wasn't that easy?

LC READ and LC WRITE

These two options show how the extra 16K of RAM on a RAM card (or on the motherboard of a //e) was set up. This extra RAM is special (even on a //e). This RAM is not always 'connected' to the Apple. This is because it occupies the same space as the ROMS that contain the Apple's monitor and BASIC! No, it wasn't an error to have it this way but a limitation of the 6502 microprocessor in the Apple. The 6502 can only address a total of 64K of memory. With 48K of RAM on the motherboard, 12K of ROM and 4K for soft switches and peripheral (slot) card expansion there was just no space for the extra RAM.

The solution is called 'BANK' switching. This is a technique which takes advantage of the fact that you are never really accessing the entire memory of the Apple at the same time. What you can do is turn off the portion of memory which you are not using and swap in a section of special memory set aside for this purpose. On the Apple, they switch off the 12K of ROMS and swap in the RAM on the RAM card. This means, of course, that you cannot use BASIC or the Apple's MONITOR when the RAM is switched on. However, these are not always needed and programmers work around this limitation.

But wait, the Apple's ROMS are only 12K long and the RAM card is 16K. Where do you put that additional 4K of RAM? Well, they bank switch that with the bottom 4K of the RAM card. A diagram is shown on the next page.



BANK 1 and 2 are each 4K long and can be switched in and out as needed. For some reason BANK 0 is generally used before BANK 1. BANK 0 is not an official term but has come to mean that the ROMS are selected.

On top of all this you can have the RAM write protected which means that you can store some information in the RAM and then lock it in so that it cannot accidentally be erased but you can still read it when you want to. You can also set it so that you can read the ROMS but when you want to store the RAM it switches in automatically. It goes on and on.

Anyway, LC read and LC write show the state of the RAM card when you pushed the button. WILDCARD PLUS tries its best to figure out the correct combination. If it can't you will see a '?' as the entry.

LC READ is the read state of this 12K area. 0 = ROM read, 1 = BANK 1, 2 = BANK 2. LC WRITE is the write state of the 12K area. 0 = ROM write (RAM card write protected), 1 = BANK 1 write, 2 = BANK 2 write, ? = couldn't tell.

For most procedures you will never need to touch these options but feel free to experiment. By the way the 'LC' of LC WRITE and LC READ stands for Language Card, which was Apple Computers name for a 16K RAM card. Language Card now refers to any 16K RAM card.

DISK SLOT

This lets you choose which slot to use for the disk drive when you make a copy. Whatever slot you choose MUST have an Apple or Apple-compatible controller card. WILDCARD PLUS will NOT write to a hard disk or disk emulator.

This option is handy if you have a hard disk in slot 6 and your floppy drives in another slot.

SLOT 1 SLOT 7

This lets you reactivate any peripheral cards that may have been switched in when you pushed the WILDCARD PLUS button. For example, a program which uses an 80-column card must have that card switched back on when you boot the copy.

Don't forget that we are copying programs AFTER they have booted and turned on any peripheral cards. When you boot a WILDCARD PLUS copy the program is placed back in memory exactly the way it was when you pressed the button. So, if it was using a peripheral card, it must come back up with that card on.

Do not select any slot which has a disk controller card in it, as this will cause that card to try and boot a disk and turn off the disk from which you are booting the copy!

A DIGRESSION - 80 COLUMN PROGRAMS

More and more programs are using 80-column screens as the number of users with 80-column cards increases. With the //e many programs require 80-column cards as they are very inexpensive for this machine.

Since the Apple //e was designed to have an 80-column card and there is a standard way of implementing the card WILDCARD PLUS will automatically switch the card on and off to restore its memory when necessary on resume or boot. You should not set a slot with the //e and the 80-column card in the 'AUXILIARY SLOT'.

Unfortunately, it is quite a different story on an Apple II or II Plus. There is no standard for 80-column cards, there isn't even a standard way for them to switch between 80 and 40 columns. WILDCARD PLUS cannot read the memory of an 80-column card so it cannot restore it on resume or boot. Nor can it switch the 80-column card to 40 columns when you press the button. There is one exception - see below.

When you want to copy an 80-column program, the first step is to find a convenient way to get 40 columns back. If you don't WILDCARD PLUS will still work; you just won't see the menus! WILDCARD PLUS will only write to the 40-column screen.

All is not lost, however. All you need to do is switch the Apple back to 40 columns. Some 80-column cards have a switch to flip, but the sure proof way is to unplug your monitor's cable from the 80-column card and plug it into the 'VIDEO OUT' jack in the rear of the Apple. When you are done you can reconnect it to the 80-column card. Make sure you select the same slot the 80-column card is in using the SLOT option in ALTER OPTIONS.

The exception. There is always one. When we designed the card we put in the ability to switch off a VIDEX VIDEOTERM card with the SOFTSWITCH. You will not have to move cables. You will still be required to select the proper slot.

When you boot a WILDCARD copy of an 80-column program, the 80-column card will come on and then the rest of the program will load. You won't see a thing as we cannot put back the 80-column card's screen memory. When the disk drive's light has gone out, press some key which will cause the program to start displaying something on the screen. Sometimes <ESC> or <CTRL-RESET> may do the trick.

You lucky //e owners don't have to worry about any of this!

THE LAST SEVEN OPTIONS

The last seven options in ALTER OPTIONS (AUX MEM, //e ROM, ALT ZP, C300 ROM, 80 COLUMN, STOREAUX and ALT CHAR50 are very special and far beyond the scope of this manual. They control some interesting soft switches that only exist on an Apple//e. They will have no effect on any other machine. On a //e they will be automatically set by WILDCARD PLUS.

What these switches do is covered in the APPLE //e TECHNICAL REFERENCE MANUAL and I refer you to that if you want to know more.

Feel free to play with various settings, if you must. At worst you will lock up the program in memory and will have to reboot.

SUMMARY

Well, you have covered a lot of ground here. Don't worry if you didn't digest it all. Go back and try again if you get lost or confused. As long as you remove the original program disk from the drive before you experiment you cannot do any harm whatsoever.

To review: ALTER OPTIONS is used before you make a copy to tailor the machine's memory size and to set up the correct screen. Other options let you set the RAM card state, change the copy disk slot, reinitialise a peripheral card and change some funny sounding soft switches.

One of the nicest features of ALTER OPTIONS, besides the SCREEN option, is the ability to tailor the amount of memory that you copy. If you have a //e try making the copy with EXT: set to 'N'. This will let you make a copy in 10 seconds instead of 25 and the boot up will be faster.

If you have an Apple II or II Plus you might want to set 64K: to 'N', especially if you see that LC READ is set to 0 and LC WRITE is set to 0 or ? If this is successful, the copy will boot on a 48K Apple.

OTHER MENU ITEMS

LOAD PROGRAM FROM DISK

This option lets you load a copied program from a WILDCARD BOOTSTRAP DISK. This is useful for several reasons.

1. If you are using ALTER OPTIONS to try different combinations of options, this will save a lot of time in loading the copy each time.
2. There may be a program or two which cannot be compressed enough to autoboot and resume properly. In this event, just push THE WILDCARD PLUS button, insert the BOOTSTRAP DISK and press <L>OAD PROGRAM FROM DISK. When you are returned to the menu, press <R>ESUME PROGRAM IN MEMORY.

If, in loading a program, an error occurs, a two-tone bell will sound and the error message will be printed. Press <RETURN> and try again. The usual disk problems and solutions apply.

BOOT A DISK (CLEARS MEMORY)

As explained above, this option will clear the entire memory of the computer and then boot a disk. This option should be used to boot any program you wish to copy as it will help any compression that the WILDCARD PLUS may need to perform. When you select this option and confirm your choice by pressing <RETURN> the Apple will beep twice. These are the same two beeps as when you first turn your Apple on.

UTILITIES

This function is the key to what makes the WPS so powerful and unique. This option lets you upload new functions into the WILDCARD PLUS card and execute them.

UTILITIES is used in conjunction with your WILDCARD DISK. With the WILDCARD DISK you select the utility you wish to upload. Then you press the WILDCARD PLUS button and choose <U>UTILITIES. When you press <RETURN> to confirm, the utility is loaded into WILDCARD PLUS. The screen will clear and the following message will appear:

UTILITY LOADED IN SLOT 7

PRESS <RETURN>

Of course, the slot number shown depends on what slot your card is in. If you hear the two-tone bell and the message states that the card is in 'SLOT 0' it means that the utility could not be loaded correctly. Re-check your installation and try again.

Whenever you need to use the uploaded utility, press the WILDCARD PLUS button, then press <U>UTILITIES. Whatever utility you have selected will now start running and you will be prompted from that program on how to continue. When you have finished, you can generally just press <R>ESUME PROGRAM IN MEMORY to continue with whatever you were doing.

Please keep in mind that the uploaded utility disappears from the WILDCARD PLUS when you turn the power off and it must be uploaded again the next time.

If you press <U>UTILITIES without having anything loaded then you can lock up the WILDCARD PLUS and may have to turn the computer off and then on again. Sometimes <CTRL-RESET> will unstick you but don't count on it. If you accidentally hit <U>UTILITIES, just press <ESC> to get back to the menu.

SECTION 4: THE WILDCARD BOOTSTRAP DISK

When you boot a WILDCARD DISK one of two things will happen. If you have not saved a program on the disk then the process will terminate and you will be returned, neatly and quietly to BASIC.

If you have saved a program on the disk then the following screen will appear:

LOADING COPY : RADIATION

```
TRACK
0000000001111111 1122222222223333
123456789012>456 8901234567890123
                      *
                      48K 64K 8          EXT
                      0
```

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At the top is the name of the program you selected at the time you made the copy. Below that are the numbers 01 through 33 arranged in a vertical manner. These mark the 32 tracks on a disk. As the program loads an asterisk, '*', will appear under each track number as that track is loaded.

When the asterisk reaches the far left, under track 01, the system will pause for a moment as the copied program is properly replaced and then resumed.

Under the track numbers are markers to show where the memory is placed on the disk. A 48K program occupies tracks 01 to 12, while the additional 16K of a 64K program will take tracks 13 to 16.

One quick note: when booting a program which turns on a 80-column card the card will switch on before the rest of the program is loaded and so you will not see this screen as it loads.

SECTION 5: MULTI-ACCESS DISKS

Although WILDCARD PLUS is designed to back up only total-load programs, it is possible to make copies of some multi-access programs. This is done by making a two disk copy. The first disk is a WILDCARD PLUS copy of the program made right after the program has finished booting, perhaps at a menu. The second disk is a copy of the entire original program disk made with a good bit map copier.

What this technique does is to bypass the disk protection schemes which are generally heaviest on the 'boot' portion of a disk. When you try and make a copy of this disk with a bit map copier it generally copies everything but the boot up portion correctly.

Since WILDCARD PLUS makes a copy of the running program after it has booted we have bypassed the boot protection. However, all we have done is copied one part of the program. What we need is a way to get all the other parts. You might think that you could make WILDCARD PLUS copies of the individual parts and try to join them back again. This is not at all practical. Most protected programs do not store the various modules in normal DOS formats, so putting a whole mess of files on a disk wouldn't help. We also don't know what type of files they are looking for and the best we can do is to create BRUN files.

The solution is to use the copy made by the bit map copier. Once you have booted the copy made by WILDCARD PLUS remove the disk and replace it with the copy made with the bit map copier. Hopefully, we will fool the program and it will read the files off the copy.

With this technique you can often create copies that boot faster than the original! Although this technique will not work every time, we have had reasonable success making back-ups with this method even with complicated "adventure" type programs. Here is a summary of the technique:

- 1) Use WILDCARD PLUS to copy the part of the program that is first loaded into memory when the disk is booted.
- 2) Back up the entire disk with the bit map copier. If the program boots on one side or one disk and then requires you to flip the disk or insert a new disk, then copy the back side or the new disk with the bit map copier.
- 3) To restart the program, boot the copy made with WILDCARD PLUS and then insert the copy made with the bit map copier.

THE WILDCARD PLUS DISC

When you have created a copy of memory on a Wildcard Plus Bootstrap disc you can do much more than just boot the copy. These extra functions are accessed by using the Wildcard Plus Disc. Boot the disc and you will be presented with a menu of options:

WILDCARD PLUS DISK SOFTWARE

INITIALISE BOOTSTRAP DISK

CREATE A WILDCARD PLUS DISK

FREE SPACE ON A BOOTSTRAP DISK

SCREEN ERASE/PRINT/VIEW

BINARY FILE MAKER (COMPRESSED)

MAKE FILE (UNCOMPRESSED)

QUIT (APPLESOFT)

SELECT OPTION : _

These are described below. The Wildcard Plus Disc can be removed from the drive; all the functions are contained in the computer's memory.

QUIT TO APPLESOFT

This simply exits the Wildcard Plus functions and places you in Applesoft Basic.

INITIALISE BOOTSTRAP DISC

You should already be familiar with this option for creating discs which are then used to make copies with Wildcard Plus.

CREATE A WILDCARD PLUS DISK

Before using the Wildcard Plus Disk you should make a copy. You can do this using any standard copy program, or you can use this option. Place a blank disc in drive 1 and press <C> for Create. You are given a warning message (any data on the disc will be destroyed if it is not blank). Press <RETURN> to make a copy or <ESC> to return to the menu. You do not need the Wildcard Plus disc in a disc drive in order to make a copy using this function.

FREE SPACE ON A BOOTSTRAP DISK

When the Wildcard Plus creates a copy onto a bootstrap disc the entire disc is marked as used so that no other files can be stored on it. There is, however, always some free space available, although how much depends on the size of the copy. The Free Space option marks this space as being available so that DOS can then use it. This is useful in applications such as copying a word processor. You can make a copy, Free Space on the disc, and then use the Wildcard Plus copy both to boot the word processor and to store text.

After pressing <F> place a bootstrap disc in drive 1. Press <RETURN> to free space on the disc, or <ESC> to go back to the menu.

SCREEN ERASE/VIEW/PRINT

Using the Screens option allow you to examine and erase text and high resolution screens on a bootstrap disc. Additionally you can print the contents of the text screens to a printer.

After pressing <S> you are asked to place a bootstrap disc in drive 1 and press <RETURN>. Then the name of the bootstrap disc is displayed and you can continue or return to the menu. If you continue you are asked:

<T>EXT OR <H>IRES : _

Select whether you wish to work with a Text or Hires screen by pressing <T> or <H>. The screen being used can be changed later. Then you are asked to select screen 1 or 2 in a similar manner. Finally you are asked to <V>iew or <E>rase the screen, and if you have selected a text screen <P>rint is also offered.

Viewing the screen causes that screen to be displayed. While viewing pressing <T> or <H> causes you to move to text or high resolution graphics screens, and you can move to primary or secondary screens by pressing <1> and <2>.

Erase replaces the area on disc corresponding to the screen with zeros. This is useful for later compression, but should only be used if the screen does not contain useful information.

Print outputs the contents of a text screen to a printer.

Remember that the graphics screens can be extracted as binary files using the Make Files option.

BINARY FILE MAKER (COMPRESSED)

Using this function allows a memory dump on a Wildcard Plus Bootstrap disc to be converted into a single, compressed binary file which you can BRUN. Thus several programs can be stored on one disc. The function will compress 48K or 64K memory dumps. Larger copies (from a //e) will still compress but the extra memory from the 80 column card will not be stored as part of the compressed file.

If the dump is 64K you will be asked if you wish to compress all 64K or if only 48K should be compressed. Usually you will select <Y> to convert the entire memory dump.

This function operates with 1 or 2 disc drives. You will be prompted to give the number of drives and to place the correct discs in the correct drives at the correct time. Have an initialised DOS disc available to store the compressed binary file.

The compression process takes a couple of minutes to complete, and while the compressed file is being transferred to the DOS disc a display of the current size is shown on the screen. This starts at the full memory size and becomes smaller as the memory dump is compressed. If the compressed file is larger than 32K you may experience problems in BRUNNING the file. Even if the file compresses below 32K this does mean that the compressed program will work. In most cases there are no problems, but for a few programs the compression destroys data that the program needs and it simply will not restart correctly. There is no solution; you can't compress these programs.

A compressed binary file can be transferred to and BRUN from a hard disc. When the program resumes, however, it will be exactly as it was when the Wildcard Plus button was pushed. Thus if it was a database program using a floppy drive it will only use a floppy disc for data storage even if you run it from a hard drive system. The only solution to this is do become involved in machine code programming.

Should you wish to transfer 128K to a hard drive you can compress the normal 64K using this option and then create the auxiliary 64K as uncompressed binary files using the Make File option. These can be loaded immediately prior to BRUNNING the compressed binary.

MAKE FILES (UNCOMPRESSED)

This function allows selected areas from the Wildcard Plus Bootstrap disc to be converted into uncompressed binary files. Areas of 16K from main or auxiliary memory can be selected, as can 12K and 4K banks from the RAM card. The graphics screens can be recovered as binary files.

After pressing <M> you are asked to place the bootstrap disc in drive 1 and press <RETURN>. After doing this the name of the bootstrap disc is displayed. If this is the correct disc press <RETURN>, and if it is not pressing <ESC> will take you back to the menu. Then you are presented with the following display:

	MAIN	AUX	MAIN	AUX
\$0000-3FFF	<0>	<5>	N	N
\$4000-7FFF	<1>	<6>	N	N
\$8000-BFFF	<2>	<7>	N	N
\$D000-FFFF	<4>	<9>	N	N
PRIMARY HIRES	<P>		N	-
SECOND HIRES	<S>	<N>	N	-
EIGHTY COLUMN		<E>	-	N
APPLESOFT	<A>		N	-

SELECT OPTIONS, FOLLOWED BY <RETURN>

MAIN refers to the standard 64K of memory found in the Apple // and //e. AUX refers to the extended 64K found in the //e only. The highlighted characters are legal keys and the corresponding N on the right hand side of the screen indicates that the option has not been selected. Suppose, for example, that you wished to turn the 16K containing DOS into a binary file. You would press <2> and the N would change to a Y. You can select as many options as you like and they will all be converted. Options <3> and <8> refer to the 12K of the RAM card including bank 2. Options <4> and <9> convert the 4K of bank 1 in the RAM card. <E> turns the contents of the auxiliary part of the //e 80 column card into a binary file (1K in length), and A recovers an Applesoft program if one were in memory when you made the copy.

When you have finished selecting the areas of memory to convert press <RETURN>. You are asked to insert a DOS disc in drive 2. If you have 2 drives press <RETURN>; if you have only 1 drive press 1. You will be prompted to insert the correct discs as needed.

In addition to the ROM on the Wildcard Plus there is 4K of RAM; into this RAM additional software can be loaded to provide additional functions. On the Wildcard Plus disk we have provided such a piece of software, a small monitor program. This monitor program allows you to inspect your Apple's memory, to alter its contents, disassemble machine code instructions, step through programs and so on. If you are not familiar with 6502 machine code you probably won't want to use this monitor and you can skip this section completely.

HOW TO LOAD UP THE UTILITY MONITOR

In order to use this monitor it must first be loaded from disk and transferred to the Wildcard Plus RAM:

Take a copy of the Wildcard Plus disk and boot it, when the menu appears select the <Q>ult option. This will return you to Applesoft - you should see a '!' followed by a flashing cursor.

Catalog the disk by typing: CATALOG followed by <RETURN>. A list of programs on the disk will appear on the disk, one of these is called 'UTILITY.MONITOR', now type BRUN UTILITY.MONITOR, followed by <RETURN>. A message will appear on the screen:

USE THE WILDCARD TO LOAD UTILITY OR HIT <ESC>

If you decide for some reason not to load the monitor you can hit the <ESC> key.

The monitor is now in the Apple's memory waiting to be transferred to the Wildcard Plus RAM. To do this push the the Wildcard Plus button. The, by now familiar, menu will appear. Press the <U>tilities key. A new message will appear:

Move utility to Wildcard

<ESC>ape to menu <RETURN> to continue

You should hit <RETURN>, the monitor will be loaded into the Wildcard Plus RAM and you will be returned to the Wildcard menu. You can now return to Applesoft by hitting the <R>esume key. You will not need to load the monitor again until you switch off your Apple.

HOW TO USE THE MONITOR

To use the monitor you must have previously loaded it - if you have not done so you should read the previous page.

If you have loaded the monitor you can gain access to it by pushing the Wildcard Plus button and then selecting the <U>tilities option. The menu will disappear to be replaced by a screen that will look like this:

```
A=00 X=23 Y=45 NV*BD1ZC
S=F7 PC=1229 P=81=10000001
```

1229>_

This tells you the contents of the Apple's 6502 registers. In this example the A register is 00, the X register 23, the Y register 45. The stack pointer is F7 and the program counter is at 1229. The flag register P is 81. The P register is also displayed in bit form to make it easier to see which flags are set or clear.

At the bottom of the screen is the current location or address, this is used as a starting point by the various monitor commands unless otherwise instructed by you.

When you first come to this screen from the main Wildcard Plus menu the contents of the registers will reflect the state of the Apple when you pushed the button.

THE MONITOR COMMANDS

The monitor has eight commands, they are described in more detail on the following pages, but briefly they are:

= set a register	. show one or more bytes
: store one or more bytes	? find a byte or character
L disassemble	R remove the monitor
S step	<ESC> return to the main menu

SET A REGISTER

You can alter any one of the 6502's registers, to do this simply type the name of the register, followed by an '=', followed by the value you wish to set the register to, followed by <RETURN>. For example:

```
A=11      sets the A register to 11 (hexadecimal)
PC=BF00   sets the program counter to BF00
```

There are six registers you can set, they are A, X, Y, S, PC and P. When you have altered a register, its revised contents will be displayed at the top of the screen.

Warning: when you alter a register and then leave the monitor to resume the program the Apple will use the altered value to resume. This can have disastrous consequences for the resumed program unless you are very careful. You have been warned.

ALTER THE MEMORY

You can alter the contents of memory. To do this you type ':' followed by the hexadecimal values you wish to store. For example:

```
:12      would store the value 12 at the current location
          and advance the current address by one,

:23 00 45 would store the values 23, 00 and 45 at the
          current location and the two subsequent locations
          and advance the current address by three.
```

Of course you may wish to alter the contents of memory at somewhere other than the current address. To do this type in the address where you wish to store, followed by a ':', followed by the value or values you wish to store. For example:

```
1000:00  would store 00 at 1000, and advance the current
          address to 1001.
```

As well as storing hexadecimal values you can store text, instead of using the colon you use either ' or ". Text preceded by the apostrophe is stored with the top bit clear. Text preceded by the quotation mark is stored with the top bit set. For example

```
2000"Hello would store the ASCII for Hello at location 2000,
          the current address would become 2005.
```

```
1000'NOT   would store the ASCII for NOT at 1000, note that
          the top bit would be clear. The current address
          would be advanced to 1003.
```

```
"*        would store the ASCII for * at the current
          address and advance the current address by one.
```

Note that you do not need a trailing quote or apostrophe!

Some characters are difficult to type in, for example CTRL-M (carriage return). If you want to type such a character and have it accepted as part of the input string precede it with CTRL-D. The next key you hit is accepted verbatim.

Displaying the contents of memory is very easy. Simply type the address from which you wish to start displaying, followed by a '.', followed by the address at which you wish to stop. For example:

2000.2FFF

would display the contents of memory between locations 2000 and 2FFF, after displaying the memory the current address would be 3000. The display of memory shows the contents of memory in hexadecimal and ASCII form. You can pause the display at any time by pressing the space bar, to continue hit the space bar again. If you want to stop completely hit the <ESC> key.

You can display the contents of a single byte by typing the address of just that byte, for example:

34FF

would display the contents of location 34FF and advance the current location to 3500.

if you hit just the <RETURN> key the content of the current address is displayed and the current address is advanced by one.

Below are some valid examples of the display memory command:

<RETURN>	Display content of current address, and advance the current address by one.
1234	Display the content of location 1234, the current address becomes 1235
1234.1234	This is equivalent to the previous example.
2000.3000	Displays the contents of locations 2000 to 3000 inclusive, the current address will be 3001 on completion.

Warning: You can access the Apple's soft switches with this command.

SEARCH FOR A BYTE

This is not an attempt to find a fast food joint! If you want to find a byte stored in memory you can use this command. For example if you wanted to find where the value 20 was stored in memory you could type:

2000.BFFF?20

This means start at location 2000 and carry on until BFFF, displaying the addresses where the number 20 is found. Notice that in this example we stopped at BFFF - there is a very good reason for this. The Apple's soft switches are located in the range C000 to C0FF, blithely scanning across them would cause unpredictable effects.

While the monitor is searching the location currently being accessed is displayed on the screen. You can halt the search by pressing the space bar, to resume simply hit the space bar a second time. If you want to halt the search, press the <ESC> key.

As well as being able to search for hexadecimal values you can search for ASCII characters. To find characters with the top bit set replace the colon with the quote, for example:

1000.1FFF?"a

would search the range 1000 to 1FFF for the letter 'a' with top bit set. If you wish to search for characters with the top bit clear, use the apostrophe, thus:

4000.4444?'a

would search from 4000 to 4444 for the character 'a' with the top bit clear.

You do not have to specify a range, you can just indicate a starting point, and the character to search for, e.g.:

5544?45

there is, however, a disadvantage to this. The search will start at 5544 and continue until all of memory has been scanned or you stop the search. This means that it is very easy for the search to access all of the soft switches in turn - this is not a good ideal

These two commands are so closely related that we have placed them together. If you type L, followed by <RETURN> of course, the Wildcard Plus monitor will disassemble the contents of memory. The disassembly will start at the current location and continue until you halt it. You can halt it by pressing the space bar at any time, pressing the space bar again will continue the disassembly, pressing the <ESC> key will allow you to enter another command.

You can instruct the monitor to start disassembling at a particular point by specifying a starting address, e.g.:

4000L

would start the disassembly at location 4000 (hexadecimal). You can also specify a range to be disassembled, thus:

1000.10FFL

would produce a disassembly between 1000 and 10FF, or you can specify the a certain number of instructions should be disassembled. A number of examples are given below:

L	Start disassembling at the current location and continue until stopped by the user.
1000L	Start disassembling at 1000.
1000L10	Start disassembling at 1000 and disassemble 10 instructions.
1000.10FFL	Start at 1000 and stop at 10FF.
1000.10FFL80	Start at 1000, stop at 10FF, or after 80 instructions whichever is the sooner.

Step works in a similar manner except that 'L' is replaced by 'S' and the instructions are executed! The various flags and registers are modified accordingly and when you resume from the main menu of the Wildcard Plus this will be reflected in the program. You can of course pause the step instruction by hitting the space bar at any time, just as with the 'L' instruction.

QUITTING THE MONITOR

To leave the monitor and to return to the Wildcard Plus menu hit the <ESC> key instead of typing in an instruction. You do not need to follow this by hitting the <RETURN> key. You can of course return to the monitor later by using the <U>tilles option.

Under some circumstance it may be desirable to load up another utility, at the time of writing there is only one utility but there may be others in the future. To do this type <R>, for remove, followed by <RETURN>. You will be returned to the Wildcard Plus menu and the monitor utility will have been removed. You can of course reload it.