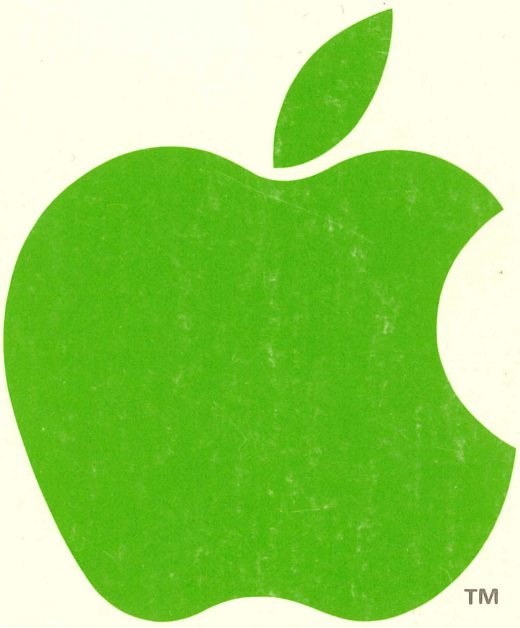
# AUTOSTART ROM

## INSTALLATION AND OPERATION MANUAL



Apple Intelligent Subsystems

# AUTOSTART ROM

## Installation and Operation Manual

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# 1 Introduction to the Easy-Editing Autostart ROM

# Introduction to the Easy-Editing Autostart ROM

When you plug this small black device (called a ROM in the trade) into your Apple II, a lot of little things become even nicer. Editing becomes easier, using BASIC becomes easier, and using Disk II becomes easier. There are special features for non-disk systems as well.

## The AUTOSTART Features

"It comes up running..."

First of all, this ROM helps get the Apple started. Once the ROM is installed, you only have to turn on the computer, and immediately it is in BASIC. If you have an Applesoft ROM card with the switch in the upward position, the Apple will come up in Applesoft. Otherwise, it will come up in Integer BASIC.

If you have a Disk II, then the AUTOSTART ROM does even more for you. With a disk in Drive 1, the Disk Operating System (DOS, pronounced "doss") will be booted automatically, and the Apple will execute the greeting program (commonly named "HELLO") on the disk, loading whichever BASIC the greeting program is written in. The fact that the Apple automatically executes the greeting program when it is turned on allows the Apple to act as a "turnkey" system. Say that the Apple has been programmed to keep an appointment schedule for a large office. When the receptionist starts the day's work, he or she turns on the switch to the front desk--the lights go on, the electric typewriter starts humming, and the computer automatically, without the receptionist's touching even so much as a single key on the Apple, prints the daily schedule on the screen.

A "turnkey" computer system is one that starts executing a particular program the instant it is turned on. It needs no special effort or knowledge on the part of its user to do this particular job. (Of course, the computer can also run other programs, and these may require special knowledge to use.) The word "turnkey" is used because so many systems have a lock that must be turned with a key to make them start.

The DOS 3.2 Manual has a section called "Creating a Turnkey System". That method is now even easier to use because of the AUTOSTART ROM.

(NOTE: The AUTOSTART ROM is designed to use the latest versions of DOS--Version 3.2 and higher-numbered versions--and will not work properly with earlier versions. Disks containing earlier versions of DOS should be updated via the UPDATE 3.2 program. The DOS 3.2 Manual explains how to do this.)

# The Easy-Editing Features

It is very easy to move the cursor around on the screen. Look at the I, J, K, and M keys on the keyboard. They look like this:


Imagine four arrows drawn on them (or make little labels and actually stick them on).


To move the cursor in the direction of the arrows, press the key on the left of the keyboard marked "ESC" (which stands for "ESCape") only once. As soon as you do that, the four keys (I, J, K, and M) will, when pressed, move the cursor in the indicated direction. You can use them to move the cursor as many times as you wish. For faster cursor motion, you can hold one of these keys and then hold down the key marked "REPT" (for "REPeaT"). The cursor will glide up, down, right, or left.

To make the keyboard work normally again, press the space bar once.

# Summary

The AUTOSTART ROM makes editing easier by allowing the cursor to be quickly moved around on the screen. It makes the Apple II easier to use, especially for beginners, since no special knowledge is required to get it started in BASIC. The rest of this manual explains how to install the ROM and gives more specific details about using it.

# 7 How to Install the Autostart ROM

# How to Install the Autostart ROM

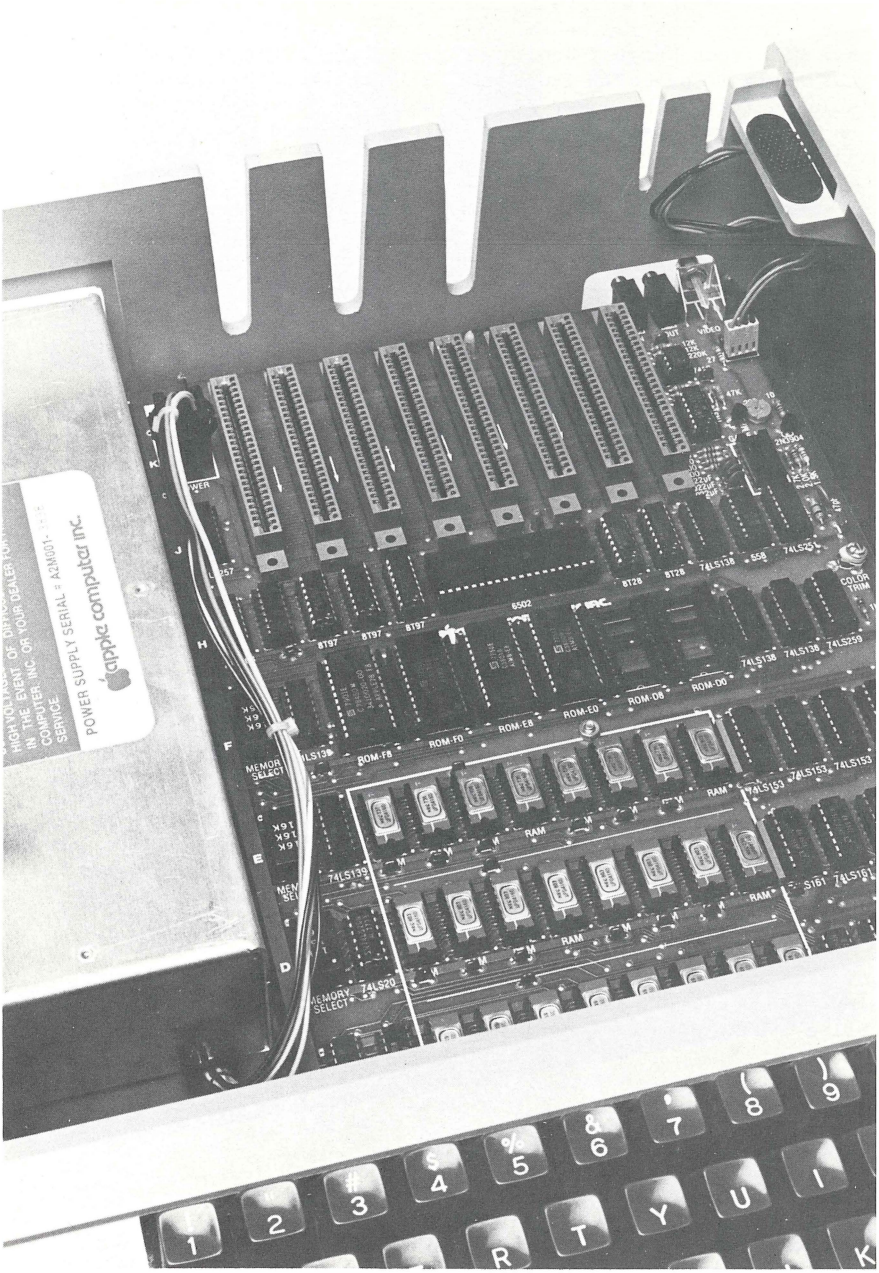
The Autostart ROM is an IC (integrated circuit, also called a "chip") that replaces a similar IC in a socket on the main circuit board of the Apple II computer. You can install the new ROM yourself if you like. Read these instructions first. If you feel uneasy working on your Apple yourself, ask your dealer to install the ROM for you. It will only take a few minutes.

1. Before doing anything else, turn off the power switch on the back of the Apple, and make sure the POWER light is off. This will prevent damage to the computer.

2. Remove the Apple's cover by pulling up on its rear edge until the two corner fasteners pop apart. Without lifting it any further, slide the cover backward (away from the keyboard).

3. Look into the open Apple, with the keyboard facing you. On the main printed-circuit board you will see many rows of small ICs. Two of these rows contain larger ICs. The nearer of these two rows (labelled "F" at its left end) has six large sockets, and the ROM you will replace is in the leftmost of these. It is labelled "ROM-F8" on the board, below the socket.

4. As you look at the old ROM, notice the small semicircular notch on the end facing the keyboard. (On some ROMs, the notch will have a different shape, but in all cases there will be a distinct mark on the end that should face the keyboard.) The ROMs should all be facing the same way.


POWER SUPPLY SERIAL # A2M001-
apple computer inc.
6502
ROM-F8
ROM-F0
ROM-E8
ROM-E0
ROM-D8
ROM-D0
RAM
74LS139
74LS20
74LS138
74LS153
74LS259

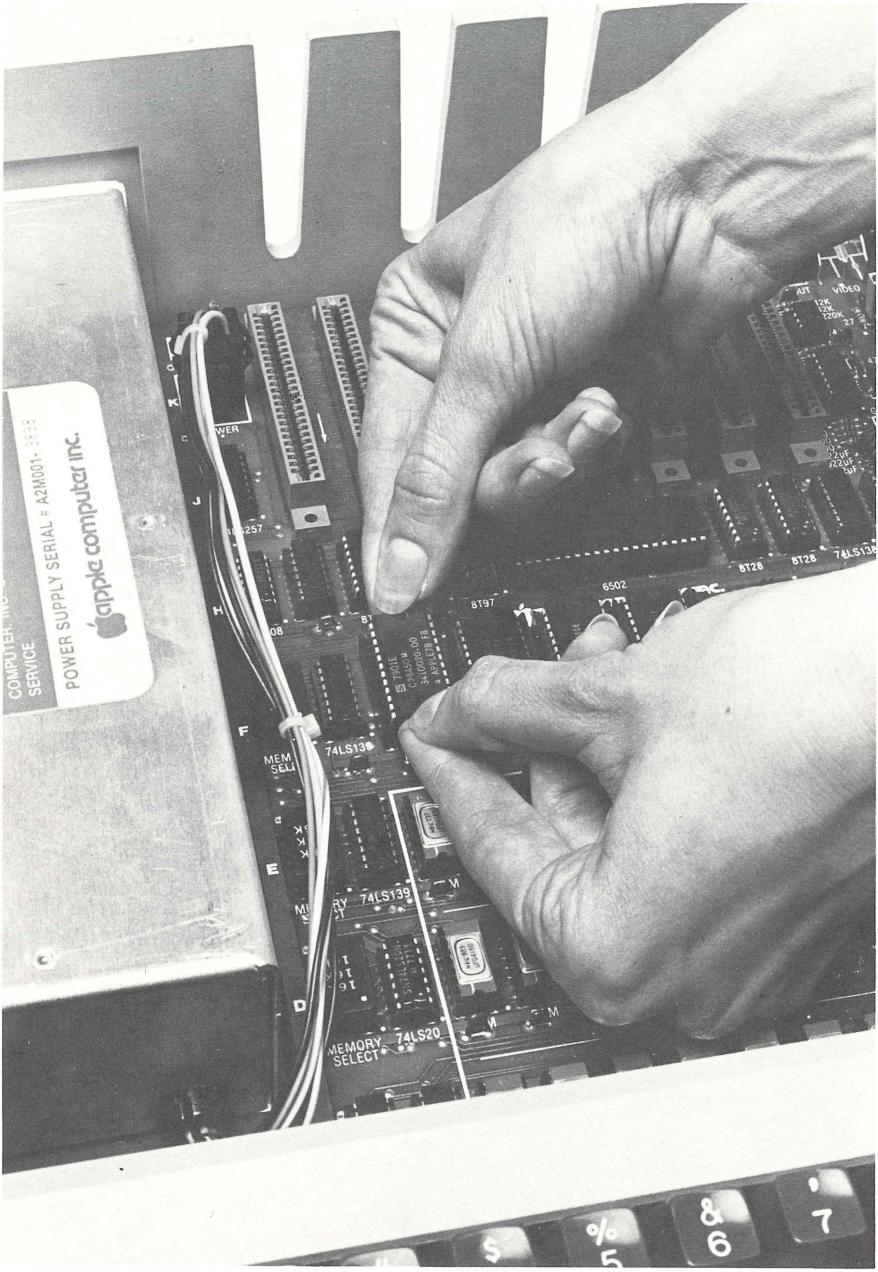
5. Before touching anything inside the Apple, discharge any static charge you may be carrying, by touching the power-supply case with your hand. (Don't worry--you won't get a shock if your Apple is properly grounded. All dangerous voltages are isolated inside the power supply, which is carefully insulated and grounded. Besides, you have already turned the Apple off, haven't you?)

6. Carefully remove the old ROM IC from its socket, using an IC puller if possible. If you can't get such a tool, there is another way to remove it, with a little care. Stand facing one side of the Apple. Place the tips of your index fingers under each end of the IC. The first knuckle of each index finger should be resting on the ICs in an adjacent row. Place your thumbs on top of the IC. By pushing down on adjacent rows, lever both fingertips up gently, turning the wrists. Control your motion with your thumbs. By pressing down with your thumb as you pry up with your finger, you can keep one end, or one side, from coming up too far. This will keep the IC fairly level as it wiggles out, so that no pins get bent. Do not try to simply yank the IC from the board--you will probably damage something. Make sure you are not trying to pull the socket from the board.

7. Line up all the pins of the new Autostart ROM IC with the holes in socket ROM-F8, making sure that there are no pins or holes left over on either end, and gently press the IC into place. If a pin bends, remove the IC from its socket. Straighten any bent pins with needlenose pliers, and press the IC into its socket again, even more carefully. Check that the IC is firmly seated and facing the same way (notch toward keyboard) as the other ROMs. If the IC is inserted backwards, it will be destroyed when you turn the Apple on.

8. Put the cover back on the Apple by first sliding the front edge of the cover into position, then pressing down on the two rear corners until they pop into place.

9. Your Autostart ROM is installed; you may now turn on your improved Apple. (If you have one or more Disk IIs, make sure Drive 1 has an initialized disk inserted and the door closed.)


POWER SUPPLY SERIAL # A2M001-
apple computer inc.
SERVICE
74LS139
MEMORY SELECT
74LS20
6502
74LS138

# 13 How to Use the Autostart ROM

## The AUTOSTART Features in Detail

When you turn on the Apple with the new ROM in place, it will display "APPLE ][" and the prompt for whatever language you have installed in the machine: either Integer BASIC ( > ) or Applesoft ( ] ). On some older Apples, you will get a display of vertical bars and then bars of characters, and a star prompt ( * ) will appear on the screen, followed by the blinking cursor. On these Apples, you must press RESET to continue the start-up procedure. After you do this, they will behave like the newer Apples. If you have an Applesoft ROM card, the Apple will look at the position of the switch on the back of the card. If the switch is up, the Apple will choose Applesoft. If it is down, the Apple will choose Integer BASIC. If you have no Applesoft card, The Apple will come up in Integer BASIC.

If you have one or more disk drives, the Autostart ROM does even more for you. When you turn the Apple on, it will look for a disk controller card in the slots at the back of the main circuit board, starting with Slot 7 and moving toward Slot 1. (The first controller is normally placed in Slot 6, as many programs expect it there.) If it finds a controller, it stops searching. If the controller has no Drive 1, the Apple just sits there until you press RESET. If Drive 1 exists but has no disk in it, or has an open door, the Apple will spin the drive until the end of time, or until you press RESET, whichever comes first. If the Apple tries to boot a disk that is not initialized, it will keep spinning the disk, and will try to boot it each time you press RESET. You can stop it by pressing RESET several times in rapid succession, or by turning the Apple off. If the Apple finds no controller, or if it tries unsuccessfully to boot and you press RESET, the Apple will go into BASIC, as explained above, but will not have DOS and will act as if it had no disk drive. If the Apple successfully boots a disk, it will then try to run the greeting program on the disk booted, entering the BASIC that program is written in. If the Apple does not have the right BASIC, either in memory or on disk, it will display "LANGUAGE NOT AVAILABLE" and a prompt for the BASIC it does have, without executing the greeting program.

If you turn the Apple off and then on, it will start up as described above. Any program in memory will be lost whenever the Apple is turned off. (Turning the Apple off and on very quickly will have odd results, as the contents of memory will be only partially cleared.) If you press RESET, the Apple will stop whatever program it may be running, and display the prompt for whatever BASIC you were in, without losing your program or DOS. RESET has a function similar to CTRL-C. (CTRL-C is typed by typing C while holding down CTRL.) Both stop the program running and allow you to run it again. In addition, RESET restores the computer to the state it was in before the program was first run. CTRL-C does not restore all numbers in memory to their starting values, so when you reRUN the program it may not do the same things it did when it was first run.

(WARNING: If you have a Disk II, do not leave the Apple unattended without an initialized disk in Drive 1 of the highest numbered disk controller. If someone should inadvertantly turn the Apple off and then on, or if a power failure should occur, the Apple will attempt to recover by booting the disk in this drive. If this drive has no disk or has the door open, both the drive and the Apple's power supply will get warm, but will probably suffer no damage. If the door is closed and a defective or uninitialized disk is in the drive, both the disk and the drive may be damaged.)

## The Easy-Editing Features in Detail

The new Autostart ROM makes it easy to move the cursor. First you put the Apple in edit mode by pressing and releasing the ESC key, then use I to move the cursor up, M to move it down, J to move it left, and K to move it right. To move the cursor repeatedly, hold down one of the cursor direction keys (I, J, K, or M) and then hold down the REPT key at the same time. The cursor will zip along while both keys are held down. If the cursor reaches the top of the screen, it will stop. If the cursor reaches the bottom of the screen, it will stop, and the lines will start to move upward. If it reaches the right edge, the cursor will disappear and reappear at the left edge, but on the next line. If it reaches the left edge, it will reappear on the right, one line up. To leave edit mode, press the space bar. The Apple will now be in what we call "normal mode", the mode it was in before you pressed ESC. (Actually, you can press any key except A, B, C, D, I, J, K, M, E, F, @, CTRL, SHIFT or RESET, but the space bar is most convenient.)

It is also possible to move the cursor one space and then leave edit mode, by pressing ESC and then A, B, C, or D. This is to insure feature compatibility with the previous ROM.

How to clear one or more characters from a line on the screen. In edit mode, move the cursor onto the first character. The character is now blinking. Then press the space bar to get the Apple out of edit mode, and press the space bar once again for each character you wish to clear. Each of these characters will be replaced by a blank.

How to clear to the end of a line on the screen. In edit mode, move the cursor onto the first character you wish to get rid of, then press E. The blinking character and all the characters after it on the line will disappear, and the Apple will return to normal mode.

How to clear to the end of the screen. In edit mode, move the cursor onto the first character you wish to clear, then press F. The blinking character and all the characters after it on the screen will disappear, and the Apple will return to normal mode.

How to clear the whole screen. If you are in edit mode, press @. All the characters on the screen will disappear, the cursor will return to the top left corner ("home"), and the Apple will return to normal mode. To get a BASIC prompt ( > or ] ), press RETURN. If you are not in edit mode and wish to clear the screen, press ESC, then @.

When you press I, J, K, or M, the Apple remains in edit mode (because you may want to continue moving the cursor); but if you press A, B, C, D, E, F, or @, the Apple leaves the edit mode immediately after carrying out that command. If you press the space bar, the Apple will also return to normal mode.

All these features affect only what is displayed on the screen, not what is stored in memory. Two other keys allow you to change what is in memory, and are very useful in editing programs. These are the left- and right-pointing arrows, which can also be called the Delete and Retype keys.

These keys affect only the line currently being typed. When you press the Delete (left-pointing arrow) key, the cursor moves back (left) one space, erasing the character last entered. If the last character you typed appeared on the screen, it will be deleted. If you last typed a non-printing control character, the Apple will behave as if it had never been typed, but will not change the display. If the last character typed was a pure cursor move (I, J, K, or M in edit mode), it would not be the last character entered, and would never have been part of the current line.

When you press the Retype (right-pointing arrow) key, the cursor moves forward (right), copying the character it just passed over. If you copy a line with the Retype key, then press the RETURN key, the Apple behaves exactly as if you had retyped the line by hand.

You can "fast-retype" by holding down the Retype key, then the REPT key. The Apple will retype characters until one of the two keys is released. Any time you use the REPT key, remember that it repeats the last key typed, not the next key typed. For example, if you press the space bar to leave edit mode, press and hold the REPT key, and then press the Retype key, the Apple will delete the blinking character (as if you had pressed the space bar again). It will not retype the blinking character as you may have intended. This can be disconcerting if you do not understand what is happening.

You can use these features to replace, insert, or delete lines or parts of lines in your program. For example, let's look at a simple program in Applesoft:

```
10  PRINT "JABBERWOCK"
```

To replace 'JABBER' with 'JIBBER', you can do as follows:

1. LIST the program on the screen.

```
]LIST
10  PRINT "JABBERWOCK"
]
```

2. Press ESC, then move the cursor onto the very first character (the digit '1') of line 1Ø, using the J and I keys.

```
10  PRINT "JABBERWOCK"
```

3. Press the space bar to leave edit mode, then fast-retype the line up through the 'J' of 'JABBERWOCK', using the Retype and REPeaT keys. The blinking cursor should cover the 'A'.

```
10  PRINT "JABBERWOCK"
```

3a. If the '1' disappeared when you tried to fast-retype, you pressed the REPT key before the Retype key. To restore it, back up the cursor to the beginning of the line with the Delete key, type in a '1', then fast-retype through "J".

4. Type 'I', then fast-retype the rest of the line.

```
10  PRINT "JIBBERWOCK"
```

5. Press RETURN, to tell the machine to replace the line in memory.

```
10  PRINT "JIBBERWOCK"
]
```

6. LIST the program to see what you have done:

```
]LIST
10  PRINT "JIBBERWOCK"
]
```

To insert 'JABBER' after 'JIBBER', do this:

1. List the program:

```
]LIST
10  PRINT "JIBBERWOCK"
]
```

2. Fast-retype it through 'JIBBER'.

```
10  PRINT "JIBBERWOCK"
```

3. Press ESC, then move the cursor back to 'J', using the edit-mode keys.

```
10  PRINT "JIBBERWOCK"
```

4. Leave edit mode by pressing the space bar, then type 'JABBER' where 'JIBBER' was, using fast-retype if desired. This will delete 'JIBBER' from the screen, but not from the current line.

```
10  PRINT "JABBERWOCK"
```

5. Fast-retype the rest of the line and press RETURN.

```
10  PRINT "JABBERWOCK"
]
```

6. LIST the program to see what you have done:

```
]LIST
10  PRINT "JIBBERJABBERWOCK"
]
```

To delete 'JABBER' from the current line, do this:

1. LIST the program:

```
]LIST
10  PRINT "JIBBERJABBERWOCK"
]
```

2. Fast-retype it through 'JIBBER'.

```
10  PRINT "JIBBERJABBERWOCK"
```

3. Press ESC, then pass the cursor over 'JABBER'. This will delete 'JABBER' from the current line, but not from the screen.

```
10  PRINT "JIBBERJABBERWOCK"
```

4. Press the space bar to leave edit mode, then fast-retype the rest of the line and press RETURN.

```
10  PRINT "JIBBERJABBERWOCK"
]
```

5. LIST the program to see what you have done:

```
]LIST
10  PRINT "JIBBERWOCK"
]
```

Experiment with these methods, watching carefully what happens on the screen, then listing the line to see what happened to it in memory. After some practice you will become more familiar the relationship between these two processes.

Here is a trick that may be helpful in editing programs. If you have tried using the fast-retype feature on statements that took up more than one line on the screen, you may have noticed that unwanted blanks crept in. To avoid picking them up, do this:

1. Clear the screen by pressing ESC, then @.

2. Type

```
]POKE 33, 33
```

3. Press RETURN.

4. LIST the program.

This makes the text window on the screen 3Ø characters wide and ensures that a statement longer than 3Ø characters will "wrap around" to the very beginning of the next screen line, without indentation. Consequently, if you fast-retype the statement, the cursor will go the end of one screen line and immediately jump to the beginning of the next, without picking up any extra blanks.

When you have done all the fast-retyping you need to do, type

```
]TEXT
```

and then press RETURN to restore the text window to normal. (Do not POKE a number larger than 4Ø into location 33 or you will clobber BASIC and your program. The Applesoft Reference Manual explains this in detail.)

## The Stop-List Feature

The new Autostart ROM has another useful feature: it lets you stop and start a program listing at will. You do this by typing CTRL-S when you wish to interrupt a listing, and typing CTRL-S again to continue. (CTRL-S is typed by pressing S while holding down CTRL.) Let's try it.

1. LOAD a program of twenty lines or more from disk or cassette, or type one in at the keyboard.

2. Type 'LIST', but don't press RETURN yet.

3. Press the CTRL key and hold it down. Place one finger on the S key, ready to press it.

4. Press RETURN. The program will begin listing on the screen.

5. Press the S key, still holding CTRL down. The listing will stop.

6. Type CTRL-S to resume listing.

7. Press RESET to quit listing entirely.

This procedure takes a little practice to get down, as the Apple lists a program quickly, making it easy to go past the line you want. This is why it's a good idea to hold the CTRL key down while you are waiting for the right line.

This feature will also suspend execution of any program that outputs text to the screen. Let's try it on a simple program:

```
10 PRINT "JABBERWOCK"
20 GOTO 10
```

1. RUN the program.

2. Type CTRL-S. When the program sends a carriage return to the screen, to start a new line, it looks at the keyboard, and if it sees CTRL-S, it suspends execution of the program and waits for further instructions.

3. Type CTRL-S again. The program will resume execution.

4. To stop the program and get back to BASIC, type CTRL-C.

For some programs, this will not work: for example,

```
10 PRINT "JABBERWOCK";
20 GOTO 10
```

If you try to suspend this program by typing CTRL-S, The Apple will not respond. This is because this program sends a continuous stream of characters to the screen, rather than separate lines. It does not send any carriage returns to the screen, so the Apple never looks at the keyboard.

# Summary of Features (reference chart)

# Summary of Features (reference chart)

| | |
|---|---|
| Start, enter BASIC, boot DOS | Turn on power |
| Restart, keeping program | Press RESET |
| Enter edit mode | Press ESC |
| Enter normal mode | Press space bar |
| Move cursor | Press I, J, K, or M |
| Delete a character | Press left arrow |
| Retype a character | Press right arrow |
| Clear line from cursor on | Press ESC, then E |
| Clear screen from cursor on | Press ESC, then F |
| Clear entire screen | Press ESC, then @ |
| Stop listing | Type CTRL-S |
| Resume listing | Type CTRL-S |

# Appendices

Appendix A: Subroutines Added to the Autostart ROM
Appendix B: Subroutines Deleted or Changed
Appendix C: Limitations of the Autostart ROM
Appendix D: Source Listing of the Autostart ROM

# APPENDIX A: Subroutines Added to the Autostart ROM

NAME: APPLE II ($FB6Ø) CALL -1184

PURPOSE: This routine clears the screen and POKEs the string 'APPLE ][' into line 1 of the text buffer, so that the screen will display 'APPLE ][' on RESET.

ENTRY: Before CALLing this routine, make sure the scrolling window parameters have been set for maximum screen limits, by using the TEXT command or

```
1Ø POKE 32, Ø
2Ø POKE 33, 4Ø
3Ø POKE 34, Ø
4Ø POKE 35, 24
```

EXIT: A=$C1; Y=Ø; X=entry

STATUS: N=Ø, Z=1, C=X; V=X

NAME: SETPWRC ($FB6F)

PURPOSE: This routine lets the user make the Apple go into monitor mode when RESET is pressed. It sets location $3F4 to the exclusive OR of the contents of location $3F3 with $A5.

ENTRY: No conditions; location $3F3 (POKE 1Ø11) should be set with the high-order address of the RESET vector for this call to be meaningful.

EXIT: A=EOR#$A5, $3F3; Y=entry; X=entry
STATUS: N=X, Z=X, V=entry, C=entry

COMMENTS: To get the Apple to go into monitor mode upon RESET, do a CALL -155. This will get you into monitor mode. After the monitor prompt ( * ), type

```
3F2:69 FF 5A
```

and press RETURN.

After you have done this, the Apple will go into monitor mode whenever you press RESET.

Monitor mode is described in the Apple II Reference Manual.

# APPENDIX B: Subroutines Deleted or Changed

| | |
|---|---|
| STEP | $FA4Ø-$FA85<br>$FAA5-$FAD6<br>$FAFD-$FB18 |
| MULPM, DIVPM | $FB6Ø-$FBCØ |

The following routines have been moved:

IRQ/BREAK was at $FA86, is now at $FA4Ø

PAGE 3 MEMORY USAGE:

| LOCATION | USAGE | DEFAULT VALUE |
|---|---|---|
| $3FØ, $3F1 | BREAK VECTOR | $59, $FA |
| $3F2 | RESET VECTOR LOW | $Ø3* |
| $3F3 | RESET VECTOR HIGH | $EØ* |
| $3F4 | POWERED-UP MASK | $45* |

*For non-disk systems after power-up reset.

# APPENDIX C: Limitations of the Autostart ROM

1. Any programs using the 16-bit integer multiply/divide routines of the old monitor will fail, as these are not in the Autostart ROM.

2. Any programs using any part of the single-step simulator code will fail for the same reason.

# APPENDIX D: Source Listing of the Autostart ROM

```
0000:                1          PAGE
0000:                2 ********************************
0000:                3 *
0000:                4 * APPLE II
0000:                5 * MONITOR II
0000:                6 *
0000:                7 * COPYRIGHT 1978 BY
0000:                8 * APPLE COMPUTER, INC.
0000:                9 *
0000:               10 * ALL RIGHTS RESERVED
0000:               11 *
0000:               12 * STEVE WOZNIAK
0000:               13 *
0000:               14 ********************************
0000:               15 *
0000:               16 * MODIFIED NOV 1978
0000:               17 * BY JOHN A
0000:               18 *
0000:               19 ********************************
F800:               20          ORG $F800
F800:               21          OBJ $2000
F800:               22 ********************************
F800:               23 LOCO     EQU $00
F800:               24 LOC1     EQU $01
F800:               25 WNDLFT   EQU $20
F800:               26 WNDWDTH  EQU $21
F800:               27 WNDTOP   EQU $22
F800:               28 WNDBTM   EQU $23
F800:               29 CH       EQU $24
F800:               30 CV       EQU $25
F800:               31 GBASL    EQU $26
F800:               32 GBASH    EQU $27
F800:               33 BASL     EQU $28
F800:               34 BASH     EQU $29
F800:               35 BAS2L    EQU $2A
F800:               36 BAS2H    EQU $2B
F800:               37 H2       EQU $2C
F800:               38 LMNEM    EQU $2C
F800:               39 V2       EQU $2D
F800:               40 RMNEM    EQU $2D
F800:               41 MASK     EQU $2E
F800:               42 CHKSUM   EQU $2E
F800:               43 FORMAT   EQU $2E
F800:               44 LASTIN   EQU $2F
F800:               45 LENGTH   EQU $2F
F800:               46 SIGN     EQU $2F
F800:               47 COLOR    EQU $30
F800:               48 MODE     EQU $31
F800:               49 INVFLG   EQU $32
F800:               50 PROMPT   EQU $33
F800:               51 YSAV     EQU $34
F800:               52 YSAV1    EQU $35
F800:               53 CSWL     EQU $36
F800:               54 CSWH     EQU $37
F800:               55 KSWL     EQU $38
F800:               56 KSWH     EQU $39
F800:               57 PCL      EQU $3A
F800:               58 PCH      EQU $3B
F800:               59 A1L      EQU $3C
F800:               60 A1H      EQU $3D
F800:               61 A2L      EQU $3E
F800:               62 A2H      EQU $3F
F800:               63 A3L      EQU $40
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F800:                64 A3H      EQU $41
F800:                65 A4L      EQU $42
F800:                66 A4H      EQU $43
F800:                67 A5L      EQU $44
F800:                68 A5H      EQU $45
F800:                69 ACC      EQU $45          ; NOTE OVERLAP WITH A5H!
F800:                70 XREG     EQU $46
F800:                71 YREG     EQU $47
F800:                72 STATUS   EQU $48
F800:                73 SPNT     EQU $49
F800:                74 RNDL     EQU $4E
F800:                75 RNDH     EQU $4F
F800:                76 PICK     EQU $95
F800:                77 IN       EQU $0200
F800:                78 BRKV     EQU $3F0         ; NEW VECTOR FOR BRK
F800:                79 SOFTEV   EQU $3F2         ; VECTOR FOR WARM START
F800:                80 PWREDUP  EQU $3F4         ; THIS MUST = EOR #$A5 OF SOFTEV+1
F800:                81 AMPERV   EQU $3F5         ; APPLESOFT & EXIT VECTOR
F800:                82 USRADR   EQU $03F8
F800:                83 NMI      EQU $03FB
F800:                84 IRQLOC   EQU $3FE
F800:                85 LINE1    EQU $400
F800:                86 MSLOT    EQU $07F8
F800:                87 IOADR    EQU $C000
F800:                88 KBD      EQU $C000
F800:                89 KBDSTRB  EQU $C010
F800:                90 TAPEOUT  EQU $C020
F800:                91 SPKR     EQU $C030
F800:                92 TXTCLR   EQU $C050
F800:                93 TXTSET   EQU $C051
F800:                94 MIXCLR   EQU $C052
F800:                95 MIXSET   EQU $C053
F800:                96 LOWSCR   EQU $C054
F800:                97 HISCR    EQU $C055
F800:                98 LORES    EQU $C056
F800:                99 HIRES    EQU $C057
F800:               100 SETANO   EQU $C058
F800:               101 CLRANO   EQU $C059
F800:               102 SETAN1   EQU $C05A
F800:               103 CLRAN1   EQU $C05B
F800:               104 SETAN2   EQU $C05C
F800:               105 CLRAN2   EQU $C05D
F800:               106 SETAN3   EQU $C05E
F800:               107 CLRAN3   EQU $C05F
F800:               108 TAPEIN   EQU $C060
F800:               109 PADDL0   EQU $C064
F800:               110 PTRIG    EQU $C070
F800:               111 CLRROM   EQU $CFFF
F800:               112 BASIC    EQU $E000
F800:               113 BASIC2   EQU $E003
```

```
F800:                 114          PAGE
F800: 4A              115 PLOT     LSR A
F801: 08              116          PHP
F802: 20 47 F8        117          JSR GBASCALC
F805: 28              118          PLP
F806: A9 0F           119          LDA #$0F
F808: 90 02           120          BCC RTMASK
F80A: 69 E0           121          ADC #$E0
F80C: 85 2E           122 RTMASK   STA MASK
F80E: B1 26           123 PLOT1    LDA (GBASL),Y
F810: 45 30           124          EOR COLOR
F812: 25 2E           125          AND MASK
F814: 51 26           126          EOR (GBASL),Y
F816: 91 26           127          STA (GBASL),Y
F818: 60              128          RTS
F819: 20 00 F8        129 HLINE    JSR PLOT
F81C: C4 2C           130 HLINE1   CPY H2
F81E: B0 11           131          BCS RTS1
F820: C8              132          INY
F821: 20 0E F8        133          JSR PLOT1
F824: 90 F6           134          BCC HLINE1
F826: 69 01           135 VLINEZ   ADC #$01
F828: 48              136 VLINE    PHA
F829: 20 00 F8        137          JSR PLOT
F82C: 68              138          PLA
F82D: C5 2D           139          CMP V2
F82F: 90 F5           140          BCC VLINEZ
F831: 60              141 RTS1     RTS
F832: A0 2F           142 CLRSCR   LDY #$2F
F834: D0 02           143          BNE CLRSC2
F836: A0 27           144 CLRTOP   LDY #$27
F838: 84 2D           145 CLRSC2   STY V2
F83A: A0 27           146          LDY #$27
F83C: A9 00           147 CLRSC3   LDA #$00
F83E: 85 30           148          STA COLOR
F840: 20 28 F8        149          JSR VLINE
F843: 88              150          DEY
F844: 10 F6           151          BPL CLRSC3
F846: 60              152          RTS
```

```
F847:                   153           PAGE
F847: 48                154 GBASCALC  PHA
F848: 4A                155           LSR A
F849: 29 03             156           AND #$03
F84B: 09 04             157           ORA #$04
F84D: 85 27             158           STA GBASH
F84F: 68                159           PLA
F850: 29 18             160           AND #$18
F852: 90 02             161           BCC GBCALC
F854: 69 7F             162           ADC #$7F
F856: 85 26             163 GBCALC    STA GBASL
F858: 0A                164           ASL A
F859: 0A                165           ASL A
F85A: 05 26             166           ORA GBASL
F85C: 85 26             167           STA GBASL
F85E: 60                168           RTS
F85F: A5 30             169           LDA COLOR
F861: 18                170           CLC
F862: 69 03             171           ADC #$03
F864: 29 0F             172 SETCOL    AND #$0F
F866: 85 30             173           STA COLOR
F868: 0A                174           ASL A
F869: 0A                175           ASL A
F86A: 0A                176           ASL A
F86B: 0A                177           ASL A
F86C: 05 30             178           ORA COLOR
F86E: 85 30             179           STA COLOR
F870: 60                180           RTS
F871: 4A                181 SCRN      LSR A
F872: 08                182           PHP
F873: 20 47 F8          183           JSR GBASCALC
F876: B1 26             184           LDA (GBASL),Y
F878: 28                185           PLP
F879: 90 04             186 SCRN2     BCC RTMSKZ
F87B: 4A                187           LSR A
F87C: 4A                188           LSR A
F87D: 4A                189           LSR A
F87E: 4A                190           LSR A
F87F: 29 0F             191 RTMSKZ    AND #$0F
F881: 60                192           RTS
```

```
F882:                  193           PAGE
F882: A6 3A            194 INSDS1    LDX PCL
F884: A4 3B            195           LDY PCH
F886: 20 96 FD         196           JSR PRYX2
F889: 20 48 F9         197           JSR PRBLNK
F88C: A1 3A            198 INSDS2    LDA (PCL,X)
F88E: A8               199           TAY
F88F: 4A               200           LSR A
F890: 90 09            201           BCC IEVEN
F892: 6A               202           ROR A
F893: B0 10            203           BCS ERR
F895: C9 A2            204           CMP #$A2
F897: F0 0C            205           BEQ ERR
F899: 29 87            206           AND #$87
F89B: 4A               207 IEVEN     LSR A
F89C: AA               208           TAX
F89D: BD 62 F9         209           LDA FMT1,X
F8A0: 20 79 F8         210           JSR SCRN2
F8A3: D0 04            211           BNE GETFMT
F8A5: A0 80            212 ERR       LDY #$80
F8A7: A9 00            213           LDA #$00
F8A9: AA               214 GETFMT    TAX
F8AA: BD A6 F9         215           LDA FMT2,X
F8AD: 85 2E            216           STA FORMAT
F8AF: 29 03            217           AND #$03
F8B1: 85 2F            218           STA LENGTH
F8B3: 98               219           TYA
F8B4: 29 8F            220           AND #$8F
F8B6: AA               221           TAX
F8B7: 98               222           TYA
F8B8: A0 03            223           LDY #$03
F8BA: E0 8A            224           CPX #$8A
F8BC: F0 0B            225           BEQ MNNDX3
F8BE: 4A               226 MNNDX1    LSR A
F8BF: 90 08            227           BCC MNNDX3
F8C1: 4A               228           LSR A
F8C2: 4A               229 MNNDX2    LSR A
F8C3: 09 20            230           ORA #$20
F8C5: 88               231           DEY
F8C6: D0 FA            232           BNE MNNDX2
F8C8: C8               233           INY
F8C9: 88               234 MNNDX3    DEY
F8CA: D0 F2            235           BNE MNNDX1
F8CC: 60               236           RTS
F8CD: FF FF FF         237           DFB $FF,$FF,$FF
```

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F8D0:                   238           PAGE
F8D0: 20 82 F8          239 INSTDSP   JSR INSDS1
F8D3: 48                240           PHA
F8D4: B1 3A             241 PRNTOP    LDA (PCL),Y
F8D6: 20 DA FD          242           JSR PRBYTE
F8D9: A2 01             243           LDX #$01
F8DB: 20 4A F9          244 PRNTBL    JSR PRBL2
F8DE: C4 2F             245           CPY LENGTH
F8E0: C8                246           INY
F8E1: 90 F1             247           BCC PRNTOP
F8E3: A2 03             248           LDX #$03
F8E5: C0 04             249           CPY #$04
F8E7: 90 F2             250           BCC PRNTBL
F8E9: 68                251           PLA
F8EA: A8                252           TAY
F8EB: B9 C0 F9          253           LDA MNEML,Y
F8EE: 85 2C             254           STA LMNEM
F8F0: B9 00 FA          255           LDA MNEMR,Y
F8F3: 85 2D             256           STA RMNEM
F8F5: A9 00             257 NXTCOL    LDA #$00
F8F7: A0 05             258           LDY #$05
F8F9: 06 2D             259 PRMN2     ASL RMNEM
F8FB: 26 2C             260           ROL LMNEM
F8FD: 2A                261           ROL A
F8FE: 88                262           DEY
F8FF: D0 F8             263           BNE PRMN2
F901: 69 BF             264           ADC #$BF
F903: 20 ED FD          265           JSR COUT
F906: CA                266           DEX
F907: D0 EC             267           BNE NXTCOL
F909: 20 48 F9          268           JSR PRBLNK
F90C: A4 2F             269           LDY LENGTH
F90E: A2 06             270           LDX #$06
F910: E0 03             271 PRADR1    CPX #$03
F912: F0 1C             272           BEQ PRADR5
F914: 06 2E             273 PRADR2    ASL FORMAT
F916: 90 0E             274           BCC PRADR3
F918: BD B3 F9          275           LDA CHAR1-1,X
F91B: 20 ED FD          276           JSR COUT
F91E: BD B9 F9          277           LDA CHAR2-1,X
F921: F0 03             278           BEQ PRADR3
F923: 20 ED FD          279           JSR COUT
F926: CA                280 PRADR3    DEX
F927: D0 E7             281           BNE PRADR1
F929: 60                282           RTS
F92A: 88                283 PRADR4    DEY
F92B: 30 E7             284           BMI PRADR2
F92D: 20 DA FD          285           JSR PRBYTE
F930: A5 2E             286 PRADR5    LDA FORMAT
F932: C9 E8             287           CMP #$E8
F934: B1 3A             288           LDA (PCL),Y
F936: 90 F2             289           BCC PRADR4
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F938:                   290           PAGE
F938: 20 56 F9          291 RELADR    JSR PCADJ3
F93B: AA                292           TAX
F93C: E8                293           INX
F93D: D0 01             294           BNE PRNTYX
F93F: C8                295           INY
F940: 98                296 PRNTYX    TYA
F941: 20 DA FD          297 PRNTAX    JSR PRBYTE
F944: 8A                298 PRNTX     TXA
F945: 4C DA FD          299           JMP PRBYTE
F948: A2 03             300 PRBLNK    LDX #$03
F94A: A9 A0             301 PRBL2     LDA #$A0
F94C: 20 ED FD          302 PRBL3     JSR COUT
F94F: CA                303           DEX
F950: D0 F8             304           BNE PRBL2
F952: 60                305           RTS
F953: 38                306 PCADJ     SEC
F954: A5 2F             307 PCADJ2    LDA LENGTH
F956: A4 3B             308 PCADJ3    LDY PCH
F958: AA                309           TAX
F959: 10 01             310           BPL PCADJ4
F95B: 88                311           DEY
F95C: 65 3A             312 PCADJ4    ADC PCL
F95E: 90 01             313           BCC RTS2
F960: C8                314           INY
F961: 60                315 RTS2      RTS
F962: 04                316 FMT1      DFB $04
F963: 20                317           DFB $20
F964: 54                318           DFB $54
F965: 30                319           DFB $30
F966: 0D                320           DFB $0D
F967: 80                321           DFB $80
F968: 04                322           DFB $04
F969: 90                323           DFB $90
F96A: 03                324           DFB $03
F96B: 22                325           DFB $22
F96C: 54                326           DFB $54
F96D: 33                327           DFB $33
F96E: 0D                328           DFB $0D
F96F: 80                329           DFB $80
F970: 04                330           DFB $04
F971: 90                331           DFB $90
F972: 04                332           DFB $04
F973: 20                333           DFB $20
F974: 54                334           DFB $54
F975: 33                335           DFB $33
F976: 0D                336           DFB $0D
F977: 80                337           DFB $80
F978: 04                338           DFB $04
F979: 90                339           DFB $90
F97A: 04                340           DFB $04
F97B: 20                341           DFB $20
F97C: 54                342           DFB $54
F97D: 3B                343           DFB $3B
F97E: 0D                344           DFB $0D
F97F: 80                345           DFB $80
F980: 04                346           DFB $04
F981: 90                347           DFB $90
F982: 00                348           DFB $00
F983: 22                349           DFB $22
F984: 44                350           DFB $44
F985: 33                351           DFB $33
F986: 0D                352           DFB $0D
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F987: C8          353          DFB $C8
F988: 44          354          DFB $44
F989: 00          355          DFB $00
F98A: 11          356          DFB $11
F98B: 22          357          DFB $22
F98C: 44          358          DFB $44
F98D: 33          359          DFB $33
F98E: 0D          360          DFB $0D
F98F: C8          361          DFB $C8
F990: 44          362          DFB $44
F991: A9          363          DFB $A9
F992: 01          364          DFB $01
F993: 22          365          DFB $22
F994: 44          366          DFB $44
F995: 33          367          DFB $33
F996: 0D          368          DFB $0D
F997: 80          369          DFB $80
F998: 04          370          DFB $04
F999: 90          371          DFB $90
F99A: 01          372          DFB $01
F99B: 22          373          DFB $22
F99C: 44          374          DFB $44
F99D: 33          375          DFB $33
F99E: 0D          376          DFB $0D
F99F: 80          377          DFB $80
F9A0: 04          378          DFB $04
F9A1: 90          379          DFB $90
F9A2: 26          380          DFB $26
F9A3: 31          381          DFB $31
F9A4: 87          382          DFB $87
F9A5: 9A          383          DFB $9A
F9A6: 00          384 FMT2     DFB $00
F9A7: 21          385          DFB $21
F9A8: 81          386          DFB $81
F9A9: 82          387          DFB $82
F9AA: 00          388          DFB $00
F9AB: 00          389          DFB $00
F9AC: 59          390          DFB $59
F9AD: 4D          391          DFB $4D
F9AE: 91          392          DFB $91
F9AF: 92          393          DFB $92
F9B0: 86          394          DFB $86
F9B1: 4A          395          DFB $4A
F9B2: 85          396          DFB $85
F9B3: 9D          397          DFB $9D
F9B4: AC          398 CHAR1    DFB $AC
F9B5: A9          399          DFB $A9
F9B6: AC          400          DFB $AC
F9B7: A3          401          DFB $A3
F9B8: A8          402          DFB $A8
F9B9: A4          403          DFB $A4
F9BA: D9          404 CHAR2    DFB $D9
F9BB: 00          405          DFB $00
F9BC: D8          406          DFB $D8
F9BD: A4          407          DFB $A4
F9BE: A4          408          DFB $A4
F9BF: 00          409          DFB $00
F9C0: 1C          410 MNEML    DFB $1C
F9C1: 8A          411          DFB $8A
F9C2: 1C          412          DFB $1C
F9C3: 23          413          DFB $23
F9C4: 5D          414          DFB $5D
F9C5: 8B          415          DFB $8B
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F9C6: 1B          416          DFB $1B
F9C7: A1          417          DFB $A1
F9C8: 9D          418          DFB $9D
F9C9: 8A          419          DFB $8A
F9CA: 1D          420          DFB $1D
F9CB: 23          421          DFB $23
F9CC: 9D          422          DFB $9D
F9CD: 8B          423          DFB $8B
F9CE: 1D          424          DFB $1D
F9CF: A1          425          DFB $A1
F9D0: 00          426          DFB $00
F9D1: 29          427          DFB $29
F9D2: 19          428          DFB $19
F9D3: AE          429          DFB $AE
F9D4: 69          430          DFB $69
F9D5: A8          431          DFB $A8
F9D6: 19          432          DFB $19
F9D7: 23          433          DFB $23
F9D8: 24          434          DFB $24
F9D9: 53          435          DFB $53
F9DA: 1B          436          DFB $1B
F9DB: 23          437          DFB $23
F9DC: 24          438          DFB $24
F9DD: 53          439          DFB $53
F9DE: 19          440          DFB $19
F9DF: A1          441          DFB $A1
F9E0: 00          442          DFB $00
F9E1: 1A          443          DFB $1A
F9E2: 5B          444          DFB $5B
F9E3: 5B          445          DFB $5B
F9E4: A5          446          DFB $A5
F9E5: 69          447          DFB $69
F9E6: 24          448          DFB $24
F9E7: 24          449          DFB $24
F9E8: AE          450          DFB $AE
F9E9: AE          451          DFB $AE
F9EA: A8          452          DFB $A8
F9EB: AD          453          DFB $AD
F9EC: 29          454          DFB $29
F9ED: 00          455          DFB $00
F9EE: 7C          456          DFB $7C
F9EF: 00          457          DFB $00
F9F0: 15          458          DFB $15
F9F1: 9C          459          DFB $9C
F9F2: 6D          460          DFB $6D
F9F3: 9C          461          DFB $9C
F9F4: A5          462          DFB $A5
F9F5: 69          463          DFB $69
F9F6: 29          464          DFB $29
F9F7: 53          465          DFB $53
F9F8: 84          466          DFB $84
F9F9: 13          467          DFB $13
F9FA: 34          468          DFB $34
F9FB: 11          469          DFB $11
F9FC: A5          470          DFB $A5
F9FD: 69          471          DFB $69
F9FE: 23          472          DFB $23
F9FF: A0          473          DFB $A0
FA00: D8          474 MNEMR    DFB $D8
FA01: 62          475          DFB $62
FA02: 5A          476          DFB $5A
FA03: 48          477          DFB $48
FA04: 26          478          DFB $26
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FA05: 62          479         DFB $62
FA06: 94          480         DFB $94
FA07: 88          481         DFB $88
FA08: 54          482         DFB $54
FA09: 44          483         DFB $44
FA0A: C8          484         DFB $C8
FA0B: 54          485         DFB $54
FA0C: 68          486         DFB $68
FA0D: 44          487         DFB $44
FA0E: E8          488         DFB $E8
FA0F: 94          489         DFB $94
FA10: 00          490         DFB $00
FA11: B4          491         DFB $B4
FA12: 08          492         DFB $08
FA13: 84          493         DFB $84
FA14: 74          494         DFB $74
FA15: B4          495         DFB $B4
FA16: 28          496         DFB $28
FA17: 6E          497         DFB $6E
FA18: 74          498         DFB $74
FA19: F4          499         DFB $F4
FA1A: CC          500         DFB $CC
FA1B: 4A          501         DFB $4A
FA1C: 72          502         DFB $72
FA1D: F2          503         DFB $F2
FA1E: A4          504         DFB $A4
FA1F: 8A          505         DFB $8A
FA20: 00          506         DFB $00
FA21: AA          507         DFB $AA
FA22: A2          508         DFB $A2
FA23: A2          509         DFB $A2
FA24: 74          510         DFB $74
FA25: 74          511         DFB $74
FA26: 74          512         DFB $74
FA27: 72          513         DFB $72
FA28: 44          514         DFB $44
FA29: 68          515         DFB $68
FA2A: B2          516         DFB $B2
FA2B: 32          517         DFB $32
FA2C: B2          518         DFB $B2
FA2D: 00          519         DFB $00
FA2E: 22          520         DFB $22
FA2F: 00          521         DFB $00
FA30: 1A          522         DFB $1A
FA31: 1A          523         DFB $1A
FA32: 26          524         DFB $26
FA33: 26          525         DFB $26
FA34: 72          526         DFB $72
FA35: 72          527         DFB $72
FA36: 88          528         DFB $88
FA37: C8          529         DFB $C8
FA38: C4          530         DFB $C4
FA39: CA          531         DFB $CA
FA3A: 26          532         DFB $26
FA3B: 48          533         DFB $48
FA3C: 44          534         DFB $44
FA3D: 44          535         DFB $44
FA3E: A2          536         DFB $A2
FA3F: C8          537         DFB $C8
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FA40:                  538          PAGE
FA40: 85 45            539 IRQ      STA ACC
FA42: 68               540          PLA
FA43: 48               541          PHA
FA44: 0A               542          ASL A
FA45: 0A               543          ASL A
FA46: 0A               544          ASL A
FA47: 30 03            545          BMI BREAK
FA49: 6C FE 03         546          JMP (IRQLOC)
FA4C: 28               547 BREAK    PLP
FA4D: 20 4C FF         548          JSR SAV1
FA50: 68               549          PLA
FA51: 85 3A            550          STA PCL
FA53: 68               551          PLA
FA54: 85 3B            552          STA PCH
FA56: 6C F0 03         553          JMP (BRKV)       ;BRKV WRITTEN OVER BY DISK BOOT
FA59: 20 82 F8         554 OLDBRK   JSR INSDS1
FA5C: 20 DA FA         555          JSR RGDSP1
FA5F: 4C 65 FF         556          JMP MON
FA62: D8               557 RESET    CLD              ; DO THIS FIRST THIS TIME
FA63: 20 84 FE         558          JSR SETNORM
FA66: 20 2F FB         559          JSR INIT
FA69: 20 93 FE         560          JSR SETVID
FA6C: 20 89 FE         561          JSR SETKBD
FA6F: AD 58 C0         562 INITAN   LDA SETANO       ; ANO = TTL HI
FA72: AD 5A C0         563          LDA SETAN1       ; AN1 = TTL HI
FA75: AD 5D C0         564          LDA CLRAN2       ; AN2 = TTL LO
FA78: AD 5F C0         565          LDA CLRAN3       ; AN3 = TTL LO
FA7B: AD FF CF         566          LDA CLRROM       ; TURN OFF EXTNSN ROM
FA7E: 2C 10 C0         567          BIT KBDSTRB      ; CLEAR KEYBOARD
FA81: D8               568 NEWMON   CLD
FA82: 20 3A FF         569          JSR BELL         ; CAUSES DELAY IF KEY BOUNCES
FA85: AD F3 03         570          LDA SOFTEV+1     ;IS RESET HI
FA88: 49 A5            571          EOR #$A5         ;A FUNNY COMPLEMENT OF THE
FA8A: CD F4 03         572          CMP PWREDUP      ; PWR UP BYTE ???
FA8D: D0 17            573          BNE PWRUP        ; NO SO PWRUP
FA8F: AD F2 03         574          LDA SOFTEV       ; YES SEE IF COLD START
FA92: D0 0F            575          BNE NOFIX        ; HAS BEEN DONE YET?
FA94: A9 E0            576          LDA #$E0         ; ??
FA96: CD F3 03         577          CMP SOFTEV+1     ; ??
FA99: D0 08            578          BNE NOFIX        ; YES SO REENTER SYSTEM
FA9B: A0 03            579 FIXSEV   LDY #3           ; NO SO POINT AT WARM START
FA9D: 8C F2 03         580          STY SOFTEV       ; FOR NEXT RESET
FAA0: 4C 00 E0         581          JMP BASIC        ; AND DO THE COLD START
FAA3: 6C F2 03         582 NOFIX    JMP (SOFTEV)     ; SOFT ENTRY VECTOR
FAA6:                  583 ********************************
FAA6: 20 60 FB         584 PWRUP    JSR APPLEII
FAA9:                  585 SETPG3   EQU *            ; SET PAGE 3 VECTORS
FAA9: A2 05            586          LDX #5
FAAB: BD FC FA         587 SETPLP   LDA PWRCON-1,X   ; WITH CNTRL B ADRS
FAAE: 9D EF 03         588          STA BRKV-1,X     ; OF CURRENT BASIC
FAB1: CA               589          DEX
FAB2: D0 F7            590          BNE SETPLP
FAB4: A9 C8            591          LDA #$C8         ; LOAD HI SLOT +1
FAB6: 86 00            592          STX LOC0         ; SETPG3 MUST RETURN X=0
FAB8: 85 01            593          STA LOC1         ; SET PTR H
FABA: A0 07            594 SLOOP    LDY #7           ; Y IS BYTE PTR
FABC: C6 01            595          DEC LOC1
FABE: A5 01            596          LDA LOC1
FAC0: C9 C0            597          CMP #$C0         ; AT LAST SLOT YET?
FAC2: F0 D7            598          BEQ FIXSEV       ; YES AND IT CANT BE A DISK
FAC4: 8D F8 07         599          STA MSLOT
FAC7: B1 00            600 NXTBYT   LDA (LOC0),Y     ; FETCH A SLOT BYTE
```

```
FAC9: D9 01 FB     601          CMP DISKID-1,Y  ; IS IT A DISK ??
FACC: D0 EC        602          BNE SLOOP       ; NO SO NEXT SLOT DOWN
FACE: 88           603          DEY
FACF: 88           604          DEY             ; YES SO CHECK NEXT BYTE
FAD0: 10 F5        605          BPL NXTBYT      ; UNTIL 4 CHECKED
FAD2: 6C 00 00     606          JMP (LOC0)
FAD5: EA           607          NOP
FAD6: EA           608          NOP
FAD7:              609 * REGDSP MUST ORG $FAD7
FAD7: 20 8E FD     610 REGDSP   JSR CROUT
FADA: A9 45        611 RGDSP1   LDA #$45
FADC: 85 40        612          STA A3L
FADE: A9 00        613          LDA #$00
FAE0: 85 41        614          STA A3H
FAE2: A2 FB        615          LDX #$FB
FAE4: A9 A0        616 RDSP1    LDA #$A0
FAE6: 20 ED FD     617          JSR COUT
FAE9: BD 1E FA     618          LDA RTBL-251,X
FAEC: 20 ED FD     619          JSR COUT
FAEF: A9 BD        620          LDA #$BD
FAF1: 20 ED FD     621          JSR COUT
FAF4:              622 * LDA ACC+5,X
FAF4: B5 4A        623          DFB $B5,$4A
FAF6: 20 DA FD     624          JSR PRBYTE
FAF9: E8           625          INX
FAFA: 30 E8        626          BMI RDSP1
FAFC: 60           627          RTS
FAFD: 59 FA        628 PWRCON   DW  OLDBRK
FAFF: 00 E0 45     629          DFB $00,$E0,$45
FB02: 20 FF 00
FB05: FF           630 DISKID   DFB $20,$FF,$00,$FF
FB06: 03 FF 3C     631          DFB $03,$FF,$3C
FB09: C1 D0 D0     632 TITLE    DFB $C1,$D0,$D0
FB0C: CC C5 A0     633          DFB $CC,$C5,$A0
FB0F: DD DB        634          DFB $DD,$DB
FB11:              635 XLTBL    EQU *
FB11: C4 C2 C1     636          DFB $C4,$C2,$C1
FB14: FF C3        637          DFB $FF,$C3
FB16: FF FF FF     638          DFB $FF,$FF,$FF
FB19:              639 *  MUST ORG $FB19
FB19: C1 D8 D9     640 RTBL     DFB $C1,$D8,$D9
FB1C: D0 D3        641          DFB $D0,$D3
FB1E: AD 70 C0     642 PREAD    LDA PTRIG
FB21:              643          LST ON
FB21: A0 00        644          LDY #$00
FB23: EA           645          NOP
FB24: EA           646          NOP
FB25: BD 64 C0     647 PREAD2   LDA PADDL0,X
FB28: 10 04        648          BPL RTS2D
FB2A: C8           649          INY
FB2B: D0 F8        650          BNE PREAD2
FB2D: 88           651          DEY
FB2E: 60           652 RTS2D    RTS

ASM2 &12
NEWMON.SRC2 PASS2
```

```
FB2F:                    1          PAGE
FB2F: A9 00              2 INIT     LDA #$00
FB31: 85 48              3          STA STATUS
FB33: AD 56 C0           4          LDA LORES
FB36: AD 54 C0           5          LDA LOWSCR
FB39: AD 51 C0           6 SETTXT   LDA TXTSET
FB3C: A9 00              7          LDA #$00
FB3E: F0 0B              8          BEQ SETWND
FB40: AD 50 C0           9 SETGR    LDA TXTCLR
FB43: AD 53 C0          10          LDA MIXSET
FB46: 20 36 FB          11          JSR CLRTOP
FB49: A9 14             12          LDA #$14
FB4B: 85 22             13 SETWND   STA WNDTOP
FB4D: A9 00             14          LDA #$00
FB4F: 85 20             15          STA WNDLFT
FB51: A9 28             16          LDA #$28
FB53: 85 21             17          STA WNDWDTH
FB55: A9 18             18          LDA #$18
FB57: 85 23             19          STA WNDBTM
FB59: A9 17             20          LDA #$17
FB5B: 85 25             21 TABV     STA CV
FB5D: 4C 22 FC          22          JMP VTAB
FB60: 20 58 FC          23 APPLEII  JSR HOME        ; CLEAR THE SCRN
FB63: A0 08             24          LDY #8
FB65: B9 08 FB          25 STITLE   LDA TITLE-1,Y   ; GET A CHAR
FB68: 99 0E 04          26          STA LINE1+14,Y
FB6B: 88                27          DEY
FB6C: D0 F7             28          BNE STITLE
FB6E: 60                29          RTS
FB6F: AD F3 03          30 SETPWRC  LDA SOFTEV+1
FB72: 49 A5             31          EOR #$A5
FB74: 8D F4 03          32          STA PWREDUP
FB77: 60                33          RTS
FB78:                   34 VIDWAIT  EQU *           ; CHECK FOR A PAUSE
FB78: C9 8D             35          CMP #$8D        ; ONLY WHEN I HAVE A CR
FB7A: D0 18             36          BNE NOWAIT      ; NOT SO, DO REGULAR
FB7C: AC 00 C0          37          LDY KBD         ; IS KEY PRESSED?
FB7F: 10 13             38          BPL NOWAIT      ; NO
FB81: C0 93             39          CPY #$93        ; IS IT CTL S ?
FB83: D0 0F             40          BNE NOWAIT      ; NO SO IGNORE
FB85: 2C 10 C0          41          BIT KBDSTRB     ; CLEAR STROBE
FB88: AC 00 C0          42 KBDWAIT  LDY KBD         ; WAIT TILL NEXT KEY TO RESUME
FB8B: 10 FB             43          BPL KBDWAIT     ; WAIT FOR KEYPRESS
FB8D: C0 83             44          CPY #$83        ; IS IT CONTROL C ?
FB8F: F0 03             45          BEQ NOWAIT      ; YES SO LEAVE IT
FB91: 2C 10 C0          46          BIT KBDSTRB     ; CLR STROBE
FB94: 4C FD FB          47 NOWAIT   JMP VIDOUT      ; DO AS BEFORE
```

```
FB97:                    48          PAGE
FB97: 38                 49 ESCOLD   SEC               ; INSURE CARRY SET
FB98: 4C 2C FC           50          JMP ESC1
FB9B: A8                 51 ESCNOW   TAY               ; USE CHAR AS INDEX
FB9C: B9 48 FA           52          LDA XLTBL-$C9,Y   ; XLATE IJKM TO CBAD
FB9F: 20 97 FB           53          JSR ESCOLD        ; DO THIS CURSOR MOTION
FBA2: 20 0C FD           54          JSR RDKEY         ; AND GET NEXT
FBA5: C9 CE              55 ESCNEW   CMP #$CE          ;IS THIS AN N ?
FBA7: B0 EE              56          BCS ESCOLD        ; N OR GREATER DO IT
FBA9: C9 C9              57          CMP #$C9          ; LESS THAN I ?
FBAB: 90 EA              58          BCC ESCOLD        ; YES SO OLD WAY
FBAD: C9 CC              59          CMP #$CC          ; IS IT A L ?
FBAF: F0 E6              60          BEQ ESCOLD        ; DO NORMAL
FBB1: D0 E8              61          BNE ESCNOW        ; GO DO IT
FBB3: EA                 62          NOP
FBB4: EA                 63          NOP
FBB5: EA                 64          NOP
FBB6: EA                 65          NOP
FBB7: EA                 66          NOP
FBB8: EA                 67          NOP
FBB9: EA                 68          NOP
FBBA: EA                 69          NOP
FBBB: EA                 70          NOP
FBBC: EA                 71          NOP
FBBD: EA                 72          NOP
FBBE: EA                 73          NOP
FBBF: EA                 74          NOP
FBC0: EA                 75          NOP
FBC1:                    76 *     MUST ORG $FBC1
FBC1: 48                 77 BASCALC  PHA
FBC2: 4A                 78          LSR A
FBC3: 29 03              79          AND #$03
FBC5: 09 04              80          ORA #$04
FBC7: 85 29              81          STA BASH
FBC9: 68                 82          PLA
FBCA: 29 18              83          AND #$18
FBCC: 90 02              84          BCC BASCLC2
FBCE: 69 7F              85          ADC #$7F
FBD0: 85 28              86 BASCLC2  STA BASL
FBD2: 0A                 87          ASL A
FBD3: 0A                 88          ASL A
FBD4: 05 28              89          ORA BASL
FBD6: 85 28              90          STA BASL
FBD8: 60                 91          RTS
FBD9: C9 87              92 BELL1    CMP #$87
FBDB: D0 12              93          BNE RTS2B
FBDD: A9 40              94          LDA #$40
FBDF: 20 A8 FC           95          JSR WAIT
FBE2: A0 C0              96          LDY #$C0
FBE4: A9 0C              97 BELL2    LDA #$0C
FBE6: 20 A8 FC           98          JSR WAIT
FBE9: AD 30 C0           99          LDA SPKR
FBEC: 88                100          DEY
FBED: D0 F5             101          BNE BELL2
FBEF: 60                102 RTS2B    RTS
```

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FBF0:                  103           PAGE
FBF0: A4 24            104 STORADV   LDY CH
FBF2: 91 28            105           STA (BASL),Y
FBF4: E6 24            106 ADVANCE   INC CH
FBF6: A5 24            107           LDA CH
FBF8: C5 21            108           CMP WNDWDTH
FBFA: B0 66            109           BCS CR
FBFC: 60               110 RTS3      RTS
FBFD: C9 A0            111 VIDOUT    CMP #$A0
FBFF: B0 EF            112           BCS STORADV
FC01: A8               113           TAY
FC02: 10 EC            114           BPL STORADV
FC04: C9 8D            115           CMP #$8D
FC06: F0 5A            116           BEQ CR
FC08: C9 8A            117           CMP #$8A
FC0A: F0 5A            118           BEQ LF
FC0C: C9 88            119           CMP #$88
FC0E: D0 C9            120           BNE BELL1
FC10: C6 24            121 BS        DEC CH
FC12: 10 E8            122           BPL RTS3
FC14: A5 21            123           LDA WNDWDTH
FC16: 85 24            124           STA CH
FC18: C6 24            125           DEC CH
FC1A: A5 22            126 UP        LDA WNDTOP
FC1C: C5 25            127           CMP CV
FC1E: B0 0B            128           BCS RTS4
FC20: C6 25            129           DEC CV
FC22: A5 25            130 VTAB      LDA CV
FC24: 20 C1 FB         131 VTABZ     JSR BASCALC
FC27: 65 20            132           ADC WNDLFT
FC29: 85 28            133           STA BASL
FC2B: 60               134 RTS4      RTS
FC2C: 49 C0            135 ESC1      EOR #$C0        ; ESC @ ?
FC2E: F0 28            136           BEQ HOME        ; IF SO DO HOME AND CLEAR
FC30: 69 FD            137           ADC #$FD        ; ESC-A OR B CHECK
FC32: 90 C0            138           BCC ADVANCE     ; A, ADVANCE
FC34: F0 DA            139           BEQ BS          ; B, BACKSPACE
FC36: 69 FD            140           ADC #$FD        ; ESC-C OR D CHECK
FC38: 90 2C            141           BCC LF          ; C, DOWN
FC3A: F0 DE            142           BEQ UP          ; D, GO UP
FC3C: 69 FD            143           ADC #$FD        ; ESC-E OR F CKECK
FC3E: 90 5C            144           BCC CLREOL      ; E, CLEAR TO END OF LINE
FC40: D0 E9            145           BNE RTS4        ; ELSE NOT F,RETURN
FC42: A4 24            146 CLREOP    LDY CH          ; ESC F IS CLR TO END OF PAGE
FC44: A5 25            147           LDA CV
FC46: 48               148 CLEOP1    PHA
FC47: 20 24 FC         149           JSR VTABZ
FC4A: 20 9E FC         150           JSR CLEOLZ
FC4D: A0 00            151           LDY #$00
FC4F: 68               152           PLA
FC50: 69 00            153           ADC #$00
FC52: C5 23            154           CMP WNDBTM
FC54: 90 F0            155           BCC CLEOP1
FC56: B0 CA            156           BCS VTAB
FC58: A5 22            157 HOME      LDA WNDTOP
FC5A: 85 25            158           STA CV
FC5C: A0 00            159           LDY #$00
FC5E: 84 24            160           STY CH
FC60: F0 E4            161           BEQ CLEOP1
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FC62:                  162            PAGE
FC62: A9 00            163 CR         LDA #$00
FC64: 85 24            164            STA CH
FC66: E6 25            165 LF         INC CV
FC68: A5 25            166            LDA CV
FC6A: C5 23            167            CMP WNDBTM
FC6C: 90 B6            168            BCC VTABZ
FC6E: C6 25            169            DEC CV
FC70: A5 22            170 SCROLL     LDA WNDTOP
FC72: 48               171            PHA
FC73: 20 24 FC         172            JSR VTABZ
FC76: A5 28            173 SCRL1      LDA BASL
FC78: 85 2A            174            STA BAS2L
FC7A: A5 29            175            LDA BASH
FC7C: 85 2B            176            STA BAS2H
FC7E: A4 21            177            LDY WNDWDTH
FC80: 88               178            DEY
FC81: 68               179            PLA
FC82: 69 01            180            ADC #$01
FC84: C5 23            181            CMP WNDBTM
FC86: B0 0D            182            BCS SCRL3
FC88: 48               183            PHA
FC89: 20 24 FC         184            JSR VTABZ
FC8C: B1 28            185 SCRL2      LDA (BASL),Y
FC8E: 91 2A            186            STA (BAS2L),Y
FC90: 88               187            DEY
FC91: 10 F9            188            BPL SCRL2
FC93: 30 E1            189            BMI SCRL1
FC95: A0 00            190 SCRL3      LDY #$00
FC97: 20 9E FC         191            JSR CLEOLZ
FC9A: B0 86            192            BCS VTAB
FC9C: A4 24            193 CLREOL     LDY CH
FC9E: A9 A0            194 CLEOLZ     LDA #$A0
FCA0: 91 28            195 CLEOL2     STA (BASL),Y
FCA2: C8               196            INY
FCA3: C4 21            197            CPY WNDWDTH
FCA5: 90 F9            198            BCC CLEOL2
FCA7: 60               199            RTS
FCA8: 38               200 WAIT       SEC
FCA9: 48               201 WAIT2      PHA
FCAA: E9 01            202 WAIT3      SBC #$01
FCAC: D0 FC            203            BNE WAIT3
FCAE: 68               204            PLA
FCAF: E9 01            205            SBC #$01
FCB1: D0 F6            206            BNE WAIT2
FCB3: 60               207            RTS
FCB4: E6 42            208 NXTA4      INC A4L
FCB6: D0 02            209            BNE NXTA1
FCB8: E6 43            210            INC A4H
FCBA: A5 3C            211 NXTA1      LDA A1L
FCBC: C5 3E            212            CMP A2L
FCBE: A5 3D            213            LDA A1H
FCC0: E5 3F            214            SBC A2H
FCC2: E6 3C            215            INC A1L
FCC4: D0 02            216            BNE RTS4B
FCC6: E6 3D            217            INC A1H
FCC8: 60               218 RTS4B      RTS
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FCC9:                  219           PAGE
FCC9: A0 4B            220 HEADR     LDY #$4B
FCCB: 20 DB FC         221           JSR ZERDLY
FCCE: D0 F9            222           BNE HEADR
FCD0: 69 FE            223           ADC #$FE
FCD2: B0 F5            224           BCS HEADR
FCD4: A0 21            225           LDY #$21
FCD6: 20 DB FC         226 WRBIT     JSR ZERDLY
FCD9: C8               227           INY
FCDA: C8               228           INY
FCDB: 88               229 ZERDLY    DEY
FCDC: D0 FD            230           BNE ZERDLY
FCDE: 90 05            231           BCC WRTAPE
FCE0: A0 32            232           LDY #$32
FCE2: 88               233 ONEDLY    DEY
FCE3: D0 FD            234           BNE ONEDLY
FCE5: AC 20 C0         235 WRTAPE    LDY TAPEOUT
FCE8: A0 2C            236           LDY #$2C
FCEA: CA               237           DEX
FCEB: 60               238           RTS
FCEC: A2 08            239 RDBYTE    LDX #$08
FCEE: 48               240 RDBYT2    PHA
FCEF: 20 FA FC         241           JSR RD2BIT
FCF2: 68               242           PLA
FCF3: 2A               243           ROL A
FCF4: A0 3A            244           LDY #$3A
FCF6: CA               245           DEX
FCF7: D0 F5            246           BNE RDBYT2
FCF9: 60               247           RTS
FCFA: 20 FD FC         248 RD2BIT    JSR RDBIT
FCFD: 88               249 RDBIT     DEY
FCFE: AD 60 C0         250           LDA TAPEIN
FD01: 45 2F            251           EOR LASTIN
FD03: 10 F8            252           BPL RDBIT
FD05: 45 2F            253           EOR LASTIN
FD07: 85 2F            254           STA LASTIN
FD09: C0 80            255           CPY #$80
FD0B: 60               256           RTS
FD0C: A4 24            257 RDKEY     LDY CH
FD0E: B1 28            258           LDA (BASL),Y
FD10: 48               259           PHA
FD11: 29 3F            260           AND #$3F
FD13: 09 40            261           ORA #$40
FD15: 91 28            262           STA (BASL),Y
FD17: 68               263           PLA
FD18: 6C 38 00         264           JMP (KSWL)
FD1B: E6 4E            265 KEYIN     INC RNDL
FD1D: D0 02            266           BNE KEYIN2
FD1F: E6 4F            267           INC RNDH
FD21: 2C 00 C0         268 KEYIN2    BIT KBD          ; READ KEYBOARD
FD24: 10 F5            269           BPL KEYIN
FD26: 91 28            270           STA (BASL),Y
FD28: AD 00 C0         271           LDA KBD
FD2B: 2C 10 C0         272           BIT KBDSTRB
FD2E: 60               273           RTS
FD2F: 20 0C FD         274 ESC       JSR RDKEY
FD32: 20 A5 FB         275           JSR ESCNEW
FD35: 20 0C FD         276 RDCHAR    JSR RDKEY
FD38: C9 9B            277           CMP #$9B
FD3A: F0 F3            278           BEQ ESC
FD3C: 60               279           RTS
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FD3D:                   280           PAGE
FD3D: A5 32             281 NOTCR     LDA INVFLG
FD3F: 48                282           PHA
FD40: A9 FF             283           LDA #$FF
FD42: 85 32             284           STA INVFLG
FD44: BD 00 02          285           LDA IN,X
FD47: 20 ED FD          286           JSR COUT
FD4A: 68                287           PLA
FD4B: 85 32             288           STA INVFLG
FD4D: BD 00 02          289           LDA IN,X
FD50: C9 88             290           CMP #$88
FD52: F0 1D             291           BEQ BCKSPC
FD54: C9 98             292           CMP #$98
FD56: F0 0A             293           BEQ CANCEL
FD58: E0 F8             294           CPX #$F8
FD5A: 90 03             295           BCC NOTCR1
FD5C: 20 3A FF          296           JSR BELL
FD5F: E8                297 NOTCR1    INX
FD60: D0 13             298           BNE NXTCHAR
FD62: A9 DC             299 CANCEL    LDA #$DC
FD64: 20 ED FD          300           JSR COUT
FD67: 20 8E FD          301 GETLNZ    JSR CROUT
FD6A: A5 33             302 GETLN     LDA PROMPT
FD6C: 20 ED FD          303           JSR COUT
FD6F: A2 01             304           LDX #$01
FD71: 8A                305 BCKSPC    TXA
FD72: F0 F3             306           BEQ GETLNZ
FD74: CA                307           DEX
FD75: 20 35 FD          308 NXTCHAR   JSR RDCHAR
FD78: C9 95             309           CMP #$95
FD7A: D0 02             310           BNE CAPTST
FD7C: B1 28             311           LDA (BASL),Y
FD7E: C9 E0             312 CAPTST    CMP #$E0
FD80: 90 02             313           BCC ADDINP
FD82: 29 DF             314           AND #$DF        ; SHIFT TO UPPER CASE
FD84: 9D 00 02          315 ADDINP    STA IN,X
FD87: C9 8D             316           CMP #$8D
FD89: D0 B2             317           BNE NOTCR
FD8B: 20 9C FC          318           JSR CLREOL
FD8E: A9 8D             319 CROUT     LDA #$8D
FD90: D0 5B             320           BNE COUT
FD92: A4 3D             321 PRA1      LDY A1H
FD94: A6 3C             322           LDX A1L
FD96: 20 8E FD          323 PRYX2     JSR CROUT
FD99: 20 40 F9          324           JSR PRNTYX
FD9C: A0 00             325           LDY #$00
FD9E: A9 AD             326           LDA #$AD
FDA0: 4C ED FD          327           JMP COUT
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FDA3:                   328           PAGE
FDA3: A5 3C             329 XAM8      LDA A1L
FDA5: 09 07             330           ORA #$07
FDA7: 85 3E             331           STA A2L
FDA9: A5 3D             332           LDA A1H
FDAB: 85 3F             333           STA A2H
FDAD: A5 3C             334 MOD8CHK   LDA A1L
FDAF: 29 07             335           AND #$07
FDB1: D0 03             336           BNE DATAOUT
FDB3: 20 92 FD          337 XAM       JSR PRA1
FDB6: A9 A0             338 DATAOUT   LDA #$A0
FDB8: 20 ED FD          339           JSR COUT
FDBB: B1 3C             340           LDA (A1L),Y
FDBD: 20 DA FD          341           JSR PRBYTE
FDC0: 20 BA FC          342           JSR NXTA1
FDC3: 90 E8             343           BCC MOD8CHK
FDC5: 60                344 RTS4C     RTS
FDC6: 4A                345 XAMPM     LSR A
FDC7: 90 EA             346           BCC XAM
FDC9: 4A                347           LSR A
FDCA: 4A                348           LSR A
FDCB: A5 3E             349           LDA A2L
FDCD: 90 02             350           BCC ADD
FDCF: 49 FF             351           EOR #$FF
FDD1: 65 3C             352 ADD       ADC A1L
FDD3: 48                353           PHA
FDD4: A9 BD             354           LDA #$BD
FDD6: 20 ED FD          355           JSR COUT
FDD9: 68                356           PLA
FDDA: 48                357 PRBYTE    PHA
FDDB: 4A                358           LSR A
FDDC: 4A                359           LSR A
FDDD: 4A                360           LSR A
FDDE: 4A                361           LSR A
FDDF: 20 E5 FD          362           JSR PRHEXZ
FDE2: 68                363           PLA
FDE3: 29 0F             364 PRHEX     AND #$0F
FDE5: 09 B0             365 PRHEXZ    ORA #$B0
FDE7: C9 BA             366           CMP #$BA
FDE9: 90 02             367           BCC COUT
FDEB: 69 06             368           ADC #$06
FDED: 6C 36 00          369 COUT      JMP (CSWL)
FDF0: C9 A0             370 COUT1     CMP #$A0
FDF2: 90 02             371           BCC COUTZ
FDF4: 25 32             372           AND INVFLG
FDF6: 84 35             373 COUTZ     STY YSAV1
FDF8: 48                374           PHA
FDF9: 20 78 FB          375           JSR VIDWAIT      ; GO CHECK FOR PAUSE
FDFC: 68                376           PLA
FDFD: A4 35             377           LDY YSAV1
FDFF: 60                378           RTS
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FE00:                  379           PAGE
FE00: C6 34            380 BL1       DEC YSAV
FE02: F0 9F            381           BEQ XAM8
FE04: CA               382 BLANK     DEX
FE05: D0 16            383           BNE SETMDZ
FE07: C9 BA            384           CMP #$BA
FE09: D0 BB            385           BNE XAMPM
FE0B: 85 31            386 STOR      STA MODE
FE0D: A5 3E            387           LDA A2L
FE0F: 91 40            388           STA (A3L),Y
FE11: E6 40            389           INC A3L
FE13: D0 02            390           BNE RTS5
FE15: E6 41            391           INC A3H
FE17: 60               392 RTS5      RTS
FE18: A4 34            393 SETMODE   LDY YSAV
FE1A: B9 FF 01         394           LDA IN-1,Y
FE1D: 85 31            395 SETMDZ    STA MODE
FE1F: 60               396           RTS
FE20: A2 01            397 LT        LDX #$01
FE22: B5 3E            398 LT2       LDA A2L,X
FE24: 95 42            399           STA A4L,X
FE26: 95 44            400           STA A5L,X
FE28: CA               401           DEX
FE29: 10 F7            402           BPL LT2
FE2B: 60               403           RTS
FE2C: B1 3C            404 MOVE      LDA (A1L),Y
FE2E: 91 42            405           STA (A4L),Y
FE30: 20 B4 FC         406           JSR NXTA4
FE33: 90 F7            407           BCC MOVE
FE35: 60               408           RTS
FE36: B1 3C            409 VFY       LDA (A1L),Y
FE38: D1 42            410           CMP (A4L),Y
FE3A: F0 1C            411           BEQ VFYOK
FE3C: 20 92 FD         412           JSR PRA1
FE3F: B1 3C            413           LDA (A1L),Y
FE41: 20 DA FD         414           JSR PRBYTE
FE44: A9 A0            415           LDA #$A0
FE46: 20 ED FD         416           JSR COUT
FE49: A9 A8            417           LDA #$A8
FE4B: 20 ED FD         418           JSR COUT
FE4E: B1 42            419           LDA (A4L),Y
FE50: 20 DA FD         420           JSR PRBYTE
FE53: A9 A9            421           LDA #$A9
FE55: 20 ED FD         422           JSR COUT
FE58: 20 B4 FC         423 VFYOK     JSR NXTA4
FE5B: 90 D9            424           BCC VFY
FE5D: 60               425           RTS
FE5E: 20 75 FE         426 LIST      JSR A1PC
FE61: A9 14            427           LDA #$14
FE63: 48               428 LIST2     PHA
FE64: 20 D0 F8         429           JSR INSTDSP
FE67: 20 53 F9         430           JSR PCADJ
FE6A: 85 3A            431           STA PCL
FE6C: 84 3B            432           STY PCH
FE6E: 68               433           PLA
FE6F: 38               434           SEC
FE70: E9 01            435           SBC #$01
FE72: D0 EF            436           BNE LIST2
FE74: 60               437           RTS
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FE75:                   438           PAGE
FE75: 8A                439 A1PC      TXA
FE76: F0 07             440           BEQ A1PCRTS
FE78: B5 3C             441 A1PCLP    LDA A1L,X
FE7A: 95 3A             442           STA PCL,X
FE7C: CA                443           DEX
FE7D: 10 F9             444           BPL A1PCLP
FE7F: 60                445 A1PCRTS   RTS
FE80: A0 3F             446 SETINV    LDY #$3F
FE82: D0 02             447           BNE SETIFLG
FE84: A0 FF             448 SETNORM   LDY #$FF
FE86: 84 32             449 SETIFLG   STY INVFLG
FE88: 60                450           RTS
FE89: A9 00             451 SETKBD    LDA #$00
FE8B: 85 3E             452 INPORT    STA A2L
FE8D: A2 38             453 INPRT     LDX #KSWL
FE8F: A0 1B             454           LDY #KEYIN
FE91: D0 08             455           BNE IOPRT
FE93: A9 00             456 SETVID    LDA #$00
FE95: 85 3E             457 OUTPORT   STA A2L
FE97: A2 36             458 OUTPRT    LDX #CSWL
FE99: A0 F0             459           LDY #COUT1
FE9B: A5 3E             460 IOPRT     LDA A2L
FE9D: 29 0F             461           AND #$0F
FE9F: F0 06             462           BEQ IOPRT1
FEA1: 09 C0             463           ORA #IOADR/256
FEA3: A0 00             464           LDY #$00
FEA5: F0 02             465           BEQ IOPRT2
FEA7: A9 FD             466 IOPRT1    LDA #COUT1/256
FEA9:                   467 IOPRT2    EQU *
FEA9: 94 00             468           STY LOC0,X        ; $94,$00
FEAB: 95 01             469           STA LOC1,X        ; $95,$01
FEAD: 60                470           RTS
FEAE: EA                471           NOP
FEAF: EA                472           NOP
FEB0: 4C 00 E0          473 XBASIC    JMP BASIC
FEB3: 4C 03 E0          474 BASCONT   JMP BASIC2
FEB6: 20 75 FE          475 GO        JSR A1PC
FEB9: 20 3F FF          476           JSR RESTORE
FEBC: 6C 3A 00          477           JMP (PCL)
FEBF: 4C D7 FA          478 REGZ      JMP REGDSP
FEC2: 60                479 TRACE     RTS
FEC3:                   480 * TRACE IS GONE
FEC3: EA                481           NOP
FEC4: 60                482 STEPZ     RTS               ; STEP IS GONE
FEC5: EA                483           NOP
FEC6: EA                484           NOP
FEC7: EA                485           NOP
FEC8: EA                486           NOP
FEC9: EA                487           NOP
FECA: 4C F8 03          488 USR       JMP USRADR
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FECD:                   489           PAGE
FECD: A9 40             490 WRITE     LDA #$40
FECF: 20 C9 FC          491           JSR HEADR
FED2: A0 27             492           LDY #$27
FED4: A2 00             493 WR1       LDX #$00
FED6: 41 3C             494           EOR (A1L,X)
FED8: 48                495           PHA
FED9: A1 3C             496           LDA (A1L,X)
FEDB: 20 ED FE          497           JSR WRBYTE
FEDE: 20 BA FC          498           JSR NXTA1
FEE1: A0 1D             499           LDY #$1D
FEE3: 68                500           PLA
FEE4: 90 EE             501           BCC WR1
FEE6: A0 22             502           LDY #$22
FEE8: 20 ED FE          503           JSR WRBYTE
FEEB: F0 4D             504           BEQ BELL
FEED: A2 10             505 WRBYTE    LDX #$10
FEEF: 0A                506 WRBYT2    ASL A
FEF0: 20 D6 FC          507           JSR WRBIT
FEF3: D0 FA             508           BNE WRBYT2
FEF5: 60                509           RTS
FEF6: 20 00 FE          510 CRMON     JSR BL1
FEF9: 68                511           PLA
FEFA: 68                512           PLA
FEFB: D0 6C             513           BNE MONZ
FEFD: 20 FA FC          514 READ      JSR RD2BIT
FF00: A9 16             515           LDA #$16
FF02: 20 C9 FC          516           JSR HEADR
FF05: 85 2E             517           STA CHKSUM
FF07: 20 FA FC          518           JSR RD2BIT
FF0A: A0 24             519 RD2       LDY #$24
FF0C: 20 FD FC          520           JSR RDBIT
FF0F: B0 F9             521           BCS RD2
FF11: 20 FD FC          522           JSR RDBIT
FF14: A0 3B             523           LDY #$3B
FF16: 20 EC FC          524 RD3       JSR RDBYTE
FF19: 81 3C             525           STA (A1L,X)
FF1B: 45 2E             526           EOR CHKSUM
FF1D: 85 2E             527           STA CHKSUM
FF1F: 20 BA FC          528           JSR NXTA1
FF22: A0 35             529           LDY #$35
FF24: 90 F0             530           BCC RD3
FF26: 20 EC FC          531           JSR RDBYTE
FF29: C5 2E             532           CMP CHKSUM
FF2B: F0 0D             533           BEQ BELL
FF2D: A9 C5             534 PRERR     LDA #$C5
FF2F: 20 ED FD          535           JSR COUT
FF32: A9 D2             536           LDA #$D2
FF34: 20 ED FD          537           JSR COUT
FF37: 20 ED FD          538           JSR COUT
FF3A: A9 87             539 BELL      LDA #$87
FF3C: 4C ED FD          540           JMP COUT
```

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FF3F:                   541           PAGE
FF3F: A5 48             542 RESTORE   LDA STATUS
FF41: 48                543           PHA
FF42: A5 45             544           LDA A5H
FF44: A6 46             545 RESTR1    LDX XREG
FF46: A4 47             546           LDY YREG
FF48: 28                547           PLP
FF49: 60                548           RTS
FF4A: 85 45             549 SAVE      STA A5H
FF4C: 86 46             550 SAV1      STX XREG
FF4E: 84 47             551           STY YREG
FF50: 08                552           PHP
FF51: 68                553           PLA
FF52: 85 48             554           STA STATUS
FF54: BA                555           TSX
FF55: 86 49             556           STX SPNT
FF57: D8                557           CLD
FF58: 60                558           RTS
FF59: 20 84 FE          559 OLDRST    JSR SETNORM
FF5C: 20 2F FB          560           JSR INIT
FF5F: 20 93 FE          561           JSR SETVID
FF62: 20 89 FE          562           JSR SETKBD
```

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FF65:                  563          PAGE
FF65: D8               564 MON      CLD
FF66: 20 3A FF         565          JSR BELL
FF69: A9 AA            566 MONZ     LDA #$AA
FF6B: 85 33            567          STA PROMPT
FF6D: 20 67 FD         568          JSR GETLNZ
FF70: 20 C7 FF         569          JSR ZMODE
FF73: 20 A7 FF         570 NXTITM   JSR GETNUM
FF76: 84 34            571          STY YSAV
FF78: A0 17            572          LDY #$17
FF7A: 88               573 CHRSRCH  DEY
FF7B: 30 E8            574          BMI MON
FF7D: D9 CC FF         575          CMP CHRTBL,Y
FF80: D0 F8            576          BNE CHRSRCH
FF82: 20 BE FF         577          JSR TOSUB
FF85: A4 34            578          LDY YSAV
FF87: 4C 73 FF         579          JMP NXTITM
FF8A: A2 03            580 DIG      LDX #$03
FF8C: 0A               581          ASL A
FF8D: 0A               582          ASL A
FF8E: 0A               583          ASL A
FF8F: 0A               584          ASL A
FF90: 0A               585 NXTBIT   ASL A
FF91: 26 3E            586          ROL A2L
FF93: 26 3F            587          ROL A2H
FF95: CA               588          DEX
FF96: 10 F8            589          BPL NXTBIT
FF98: A5 31            590 NXTBAS   LDA MODE
FF9A: D0 06            591          BNE NXTBS2
FF9C:                  592 *
FF9C: B5 3F            593          LDA A2H,X
FF9E:                  594 *
FF9E: 95 3D            595          STA A1H,X
FFA0:                  596 *
FFA0: 95 41            597          STA A3H,X
FFA2: E8               598 NXTBS2   INX
FFA3: F0 F3            599          BEQ NXTBAS
FFA5: D0 06            600          BNE NXTCHR
FFA7: A2 00            601 GETNUM   LDX #$00
FFA9: 86 3E            602          STX A2L
FFAB: 86 3F            603          STX A2H
FFAD: B9 00 02         604 NXTCHR   LDA IN,Y
FFB0: C8               605          INY
FFB1: 49 B0            606          EOR #$B0
FFB3: C9 0A            607          CMP #$0A
FFB5: 90 D3            608          BCC DIG
FFB7: 69 88            609          ADC #$88
FFB9: C9 FA            610          CMP #$FA
FFBB: B0 CD            611          BCS DIG
FFBD: 60               612          RTS
FFBE: A9 FE            613 TOSUB    LDA #GO/256
FFC0: 48               614          PHA
FFC1: B9 E3 FF         615          LDA SUBTBL,Y
FFC4: 48               616          PHA
FFC5: A5 31            617          LDA MODE
FFC7: A0 00            618 ZMODE    LDY #$00
FFC9: 84 31            619          STY MODE
FFCB: 60               620          RTS
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FFCC:                   621             PAGE
FFCC: BC                622 CHRTBL      DFB $BC
FFCD: B2                623             DFB $B2
FFCE: BE                624             DFB $BE
FFCF: B2                625             DFB $B2         ; T CMD NOW LIKE USR
FFD0: EF                626             DFB $EF
FFD1: C4                627             DFB $C4
FFD2: B2                628             DFB $B2         ; S CMD NOW LIKE USR
FFD3: A9                629             DFB $A9
FFD4: BB                630             DFB $BB
FFD5: A6                631             DFB $A6
FFD6: A4                632             DFB $A4
FFD7: 06                633             DFB $06
FFD8: 95                634             DFB $95
FFD9: 07                635             DFB $07
FFDA: 02                636             DFB $02
FFDB: 05                637             DFB $05
FFDC: F0                638             DFB $F0
FFDD: 00                639             DFB $00
FFDE: EB                640             DFB $EB
FFDF: 93                641             DFB $93
FFE0: A7                642             DFB $A7
FFE1: C6                643             DFB $C6
FFE2: 99                644             DFB $99
FFE3: B2                645 SUBTBL      DFB $B2
FFE4: C9                646             DFB $C9
FFE5: BE                647             DFB $BE
FFE6: C1                648             DFB $C1
FFE7: 35                649             DFB $35
FFE8: 8C                650             DFB $8C
FFE9: C4                651             DFB $C4
FFEA: 96                652             DFB $96
FFEB: AF                653             DFB $AF
FFEC: 17                654             DFB $17
FFED: 17                655             DFB $17
FFEE: 2B                656             DFB $2B
FFEF: 1F                657             DFB $1F
FFF0: 83                658             DFB $83
FFF1: 7F                659             DFB $7F
FFF2: 5D                660             DFB $5D
FFF3: CC                661             DFB $CC
FFF4: B5                662             DFB $B5
FFF5: FC                663             DFB $FC
FFF6: 17                664             DFB $17
FFF7: 17                665             DFB $17
FFF8: F5                666             DFB $F5
FFF9: 03                667             DFB $03
FFFA: FB 03             668             DW  NMI
FFFC: 62 FA             669             DW  RESET
FFFE: 40 FA             670             DW  IRQ

ENDASM

*** SUCCESSFUL ASSEMBLY: NO ERRORS
```

```
0000 LOC0       0001 LOC1       0020 WNDLFT     0021 WNDWDTH
0022 WNDTOP     0023 WNDBTM     0024 CH         0025 CV
0026 GBASL      0027 GBASH      0028 BASL       0029 BASH
002A BAS2L      002B BAS2H      002C H2         002C LMNEM
002D V2         002D RMNEM      002E MASK       002E CHKSUM
002E FORMAT     002F LASTIN     002F LENGTH     002F SIGN
0030 COLOR      0031 MODE       0032 INVFLG     0033 PROMPT
0034 YSAV       0035 YSAV1      0036 CSWL       0037 CSWH
0038 KSWL       0039 KSWH       003A PCL        003B PCH
003C A1L        003D A1H        003E A2L        003F A2H
0040 A3L        0041 A3H        0042 A4L        0043 A4H
0044 A5L        0045 A5H        0045 ACC        0046 XREG
0047 YREG       0048 STATUS     0049 SPNT       004E RNDL
004F RNDH       0095 PICK       0200 IN         03F0 BRKV
03F2 SOFTEV     03F4 PWREDUP    03F5 AMPERV     03F8 USRADR
03FB NMI        03FE IRQLOC     0400 LINE1      07F8 MSLOT
C000 IOADR      C000 KBD        C010 KBDSTRB    C020 TAPEOUT
C030 SPKR       C050 TXTCLR     C051 TXTSET     C052 MIXCLR
C053 MIXSET     C054 LOWSCR     C055 HISCR      C056 LORES
C057 HIRES      C058 SETANO     C059 CLRANO     C05A SETAN1
C05B CLRAN1     C05C SETAN2     C05D CLRAN2     C05E SETAN3
C05F CLRAN3     C060 TAPEIN     C064 PADDL0     C070 PTRIG
CFFF CLRROM     E000 BASIC      E003 BASIC2     F800 PLOT
F80C RTMASK     F80E PLOT1      F819 HLINE      F81C HLINE1
F826 VLINEZ     F828 VLINE      F831 RTS1       F832 CLRSCR
F836 CLRTOP     F838 CLRSC2     F83C CLRSC3     F847 GBASCALC
F856 GBCALC     F864 SETCOL     F871 SCRN       F879 SCRN2
F87F RTMSKZ     F882 INSDS1     F88C INSDS2     F89B IEVEN
F8A5 ERR        F8A9 GETFMT     F8BE MNNDX1     F8C2 MNNDX2
F8C9 MNNDX3     F8D0 INSTDSP    F8D4 PRNTOP     F8DB PRNTBL
F8F5 NXTCOL     F8F9 PRMN2      F910 PRADR1     F914 PRADR2
F926 PRADR3     F92A PRADR4     F930 PRADR5     F938 RELADR
F940 PRNTYX     F941 PRNTAX     F944 PRNTX      F948 PRBLNK
F94A PRBL2      F94C PRBL3      F953 PCADJ      F954 PCADJ2
F956 PCADJ3     F95C PCADJ4     F961 RTS2       F962 FMT1
F9A6 FMT2       F9B4 CHAR1      F9BA CHAR2      F9C0 MNEML
FA00 MNEMR      FA40 IRQ        FA4C BREAK      FA59 OLDBRK
FA62 RESET      FA6F INITAN     FA81 NEWMON     FA9B FIXSEV
FAA3 NOFIX      FAA6 PWRUP      FAA9 SETPG3     FAAB SETPLP
FABA SLOOP      FAC7 NXTBYT     FAD7 REGDSP     FADA RGDSP1
FAE4 RDSP1      FAFD PWRCON     FB02 DISKID     FB09 TITLE
FB11 XLTBL      FB19 RTBL       FB1E PREAD      FB25 PREAD2
FB2E RTS2D      FB2F INIT       FB39 SETTXT     FB40 SETGR
FB4B SETWND     FB5B TABV       FB60 APPLEII    FB65 STITLE
FB6F SETPWRC    FB78 VIDWAIT    FB88 KBDWAIT    FB94 NOWAIT
FB97 ESCOLD     FB9B ESCNOW     FBA5 ESCNEW     FBC1 BASCALC
FBDO BASCLC2    FBD9 BELL1      FBE4 BELL2      FBEF RTS2B
FBF0 STORADV    FBF4 ADVANCE    FBFC RTS3       FBFD VIDOUT
FC10 BS         FC1A UP         FC22 VTAB       FC24 VTABZ
FC2B RTS4       FC2C ESC1       FC42 CLREOP     FC46 CLEOP1
FC58 HOME       FC62 CR         FC66 LF         FC70 SCROLL
FC76 SCRL1      FC8C SCRL2      FC95 SCRL3      FC9C CLREOL
FC9E CLEOLZ     FCA0 CLEOL2     FCA8 WAIT       FCA9 WAIT2
FCAA WAIT3      FCB4 NXTA4      FCBA NXTA1      FCC8 RTS4B
FCC9 HEADR      FCD6 WRBIT      FCDB ZERDLY     FCE2 ONEDLY
FCE5 WRTAPE     FCEC RDBYTE     FCEE RDBYT2     FCFA RD2BIT
FCFD RDBIT      FD0C RDKEY      FD1B KEYIN      FD21 KEYIN2
FD2F ESC        FD35 RDCHAR     FD3D NOTCR      FD5F NOTCR1
FD62 CANCEL     FD67 GETLNZ     FD6A GETLN      FD71 BCKSPC
FD75 NXTCHAR    FD7E CAPTST     FD84 ADDINP     FD8E CROUT
FD92 PRA1       FD96 PRYX2      FDA3 XAM8       FDAD MOD8CHK
FDB3 XAM        FDB6 DATAOUT    FDC5 RTS4C      FDC6 XAMPM
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FDD1 ADD        FDDA PRBYTE     FDE3 PRHEX      FDE5 PRHEXZ
FDED COUT       FDF0 COUT1      FDF6 COUTZ      FE00 BL1
FE04 BLANK      FE0B STOR       FE17 RTS5       FE18 SETMODE
FE1D SETMDZ     FE20 LT         FE22 LT2        FE2C MOVE
FE36 VFY        FE58 VFYOK      FE5E LIST       FE63 LIST2
FE75 A1PC       FE78 A1PCLP     FE7F A1PCRTS    FE80 SETINV
FE84 SETNORM    FE86 SETIFLG    FE89 SETKBD     FE8B INPORT
FE8D INPRT      FE93 SETVID     FE95 OUTPORT    FE97 OUTPRT
FE9B IOPRT      FEA7 IOPRT1     FEA9 IOPRT2     FEB0 XBASIC
FEB3 BASCONT    FEB6 GO         FEBF REGZ       FEC2 TRACE
FEC4 STEPZ      FECA USR        FECD WRITE      FED4 WR1
FEED WRBYTE     FEEF WRBYT2     FEF6 CRMON      FEFD READ
FF0A RD2        FF16 RD3        FF2D PRERR      FF3A BELL
FF3F RESTORE    FF44 RESTR1     FF4A SAVE       FF4C SAV1
FF59 OLDRST     FF65 MON        FF69 MONZ       FF73 NXTITM
FF7A CHRSRCH    FF8A DIG        FF90 NXTBIT     FF98 NXTBAS
FFA2 NXTBS2     FFA7 GETNUM     FFAD NXTCHR     FFBE TOSUB
FFC7 ZMODE      FFCC CHRTBL     FFE3 SUBTBL

SYMBOL TABLE SIZE
2589   BYTES USED
2531   BYTES REMAINING


ERR: SYNTAX

:SLIST4
```

003D A1H
003C A1L
FE78 A1PCLP
FE75 A1PC
FE7F A1PCRTS
003F A2H
003E A2L
0041 A3H
0040 A3L
0043 A4H
0042 A4L
0045 A5H
0044 A5L
0045 ACC
FD84 ADDINP
FDD1 ADD
FBF4 ADVANCE
03F5 AMPERV
FB60 APPLEII
002B BAS2H
002A BAS2L
FBC1 BASCALC
FBD0 BASCLC2
FEB3 BASCONT
0029 BASH
E000 BASIC
E003 BASIC2
0028 BASL
FD71 BCKSPC
FBD9 BELL1
FBE4 BELL2
FF3A BELL
FE00 BL1
FE04 BLANK
FA4C BREAK
03F0 BRKV
FC10 BS
FD62 CANCEL
FD7E CAPTST
F9B4 CHAR1
F9BA CHAR2
002E CHKSUM
FF7A CHRSRCH
FFCC CHRTBL
0024 CH
FCA0 CLEOL2
FC9E CLEOLZ
FC46 CLEOP1
C059 CLRAN0
C05B CLRAN1
C05D CLRAN2
C05F CLRAN3
FC9C CLREOL
FC42 CLREOP
CFFF CLRROM
F838 CLRSC2
F83C CLRSC3
F832 CLRSCR
F836 CLRTOP
0030 COLOR
FDED COUT
FDF0 COUT1
FDF6 COUTZ
FD8E CROUT
FC62 CR
FEF6 CRMON
0037 CSWH
0036 CSWL
0025 CV
FDB6 DATAOUT
FF8A DIG
FB02 DISKID
F8A5 ERR
FC2C ESC1
FBA5 ESCNEW
FB9B ESCNOW
FB97 ESCOLD
FD2F ESC
FA9B FIXSEV
F962 FMT1
F9A6 FMT2
002E FORMAT
F847 GBASCALC
0027 GBASH
0026 GBASL
F856 GBCALC
F8A9 GETFMT
FD67 GETLNZ
FD6A GETLN
FFA7 GETNUM
FEB6 GO
002C H2
FCC9 HEADR
C057 HIRES
C055 HISCR
F81C HLINE1
F819 HLINE
FC58 HOME
F89B IEVEN
FA6F INITAN
0200 IN
FB2F INIT
FE8B INPORT
FE8D INPRT
F882 INSDS1
F88C INSDS2
F8D0 INSTDSP
0032 INVFLG
C000 IOADR
FEA7 IOPRT1
FEA9 IOPRT2
FE9B IOPRT
03FE IRQLOC
FA40 IRQ
C010 KBDSTRB
FB88 KBDWAIT
C000 KBD
FD1B KEYIN
FD21 KEYIN2
0039 KSWH
0038 KSWL
002F LASTIN
002F LENGTH
FC66 LF
0400 LINE1
FE5E LIST
FE63 LIST2
002C LMNEM
0000 LOC0
0001 LOC1
C056 LORES
C054 LOWSCR
FE22 LT2
FE20 LT
002E MASK
C052 MIXCLR
C053 MIXSET
F9C0 MNEML
FA00 MNEMR
F8BE MNNDX1
F8C2 MNNDX2
F8C9 MNNDX3
FDAD MOD8CHK
0031 MODE
FF69 MONZ
FF65 MON
FE2C MOVE
07F8 MSLOT
FA81 NEWMON
03FB NMI
FAA3 NOFIX
FD3D NOTCR
FD5F NOTCR1
FB94 NOWAIT
FCBA NXTA1
FCB4 NXTA4
FF98 NXTBAS
FF90 NXTBIT
FFA2 NXTBS2
FAC7 NXTBYT
FD75 NXTCHAR
FFAD NXTCHR
F8F5 NXTCOL
FF73 NXTITM
FA59 OLDBRK
FF59 OLDRST
FCE2 ONEDLY
FE95 OUTPORT
FE97 OUTPRT
C064 PADDL0
F954 PCADJ2
F953 PCADJ
F956 PCADJ3
F95C PCADJ4
003B PCH
003A PCL
0095 PICK
F80E PLOT1
F800 PLOT
FD92 PRA1
F910 PRADR1
F914 PRADR2
F926 PRADR3
F92A PRADR4
F930 PRADR5
F94A PRBL2
F94C PRBL3
F948 PRBLNK
FDDA PRBYTE
FB1E PREAD
FB25 PREAD2
FF2D PRERR
FDE3 PRHEX
FDE5 PRHEXZ
F8F9 PRMN2
F941 PRNTAX
F8DB PRNTBL
F8D4 PRNTOP
F944 PRNTX
F940 PRNTYX
0033 PROMPT
FD96 PRYX2
C070 PTRIG
FAFD PWRCON
03F4 PWREDUP
FAA6 PWRUP
FCFA RD2BIT
FF0A RD2
FF16 RD3
FCFD RDBIT
FCEE RDBYT2
FCEC RDBYTE
FD35 RDCHAR
FD0C RDKEY
FAE4 RDSP1
FEFD READ
FAD7 REGDSP
FEBF REGZ
F938 RELADR
FA62 RESET
FF3F RESTORE
FF44 RESTR1
FADA RGDSP1
002D RMNEM
004F RNDH
004E RNDL
FB19 RTBL
F80C RTMASK
F87F RTMSKZ
F831 RTS1
FBEF RTS2B
FB2E RTS2D
F961 RTS2
FBFC RTS3
FCC8 RTS4B
FDC5 RTS4C
FC2B RTS4
FE17 RTS5
FF4C SAV1
FF4A SAVE
FC76 SCRL1
FC8C SCRL2
FC95 SCRL3
F871 SCRN
F879 SCRN2
FC70 SCROLL
C058 SETANO
C05A SETAN1

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C05C SETAN2      C05E SETAN3      F864 SETCOL      FB40 SETGR
FE86 SETIFLG     FE80 SETINV      FE89 SETKBD      FE1D SETMDZ
FE18 SETMODE     FE84 SETNORM     FAA9 SETPG3      FAAB SETPLP
FB6F SETPWRC     FB39 SETTXT      FE93 SETVID      FB4B SETWND
002F SIGN        FABA SLOOP       03F2 SOFTEV      C030 SPKR
0049 SPNT        0048 STATUS      FEC4 STEPZ       FB65 STITLE
FE0B STOR        FBF0 STORADV     FFE3 SUBTBL      FB5B TABV
C060 TAPEIN      C020 TAPEOUT     FB09 TITLE       FFBE TOSUB
FEC2 TRACE       C050 TXTCLR      C051 TXTSET      FC1A UP
FECA USR         03F8 USRADR      002D V2          FE36 VFY
FE58 VFYOK       FBFD VIDOUT      FB78 VIDWAIT     F826 VLINEZ
F828 VLINE       FC24 VTABZ       FC22 VTAB        FCA9 WAIT2
FCA8 WAIT        FCAA WAIT3       0023 WNDBTM      0020 WNDLFT
0022 WNDTOP      0021 WNDWDTH     FED4 WR1         FCD6 WRBIT
FEEF WRBYT2      FEED WRBYTE      FECD WRITE       FCE5 WRTAPE
FDA3 XAM8        FDC6 XAMPM       FDB3 XAM         FEB0 XBASIC
FB11 XLTBL       0046 XREG        0047 YREG        0035 YSAV1
0034 YSAV        FCDB ZERDLY      FFC7 ZMODE

SYMBOL TABLE SIZE
2589   BYTES USED
2531   BYTES REMAINING
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