1541 FLASH! ™

DISK SPEEDUP

for

SX-64

Skyles Electric Works

SX-64 FLASH!

INSTRUCTION MANUAL

by

BOB SKYLES

BRYCE NESBITT

SKYLES ELECTRIC WORKS, INC.
231-E South Whisman Road
Mountain View, CA 94041 U.S.A.

i

TABLE OF CONTENTS
for
SX-64 FLASH! Instruction Manual

Introduction

Congratulations on purchasing SX-64 FLASH! Assembly, the fastest add on assembly for disk loading programs and files from the Commodore SX-64 disk drive. In addition to being the fastest disk drive enhancement available for the Commodore SX-64, over 50 added commands are included. These commands will make using your Commodore SX-64 much faster and easier. It is not necessary that you learn or use these commands. Install the SX-64 FLASH! Assembly and enjoy a whole new world of speed.

WHAT SX-64 FLASH! WILL NOT DO

SX-64 FLASH! will not, repeat, not fix or improve the loading of a marginal or non functioning disk drive. SX-64 FLASH will not speed up a program load or file transfer that involves lots of blinking of the red error light on the Commodore SX-64 disk drive. If you are having trouble (lots of error light blinking) with just one or two disks, and the rest work okay, replace your faulty disks. If you are having trouble loading all your diskettes, your disk drive usually needs cleaning, lubricating, aligning, or electronic repair. See your dealer for the appropriate fix before you attempt to install SX-64 FLASH!. If you do not have a local dealer capable of these repairs, you may send your Commodore SX-64 Disk Drive to:

Commodore Business Machines
1200 Wilson Drive
West Chester, PA 19380

Send it prepaid and include a check or money order for US$95.00. Commodore will send you a replacement SX-64.

Introduction

Skyles Electric Works warrants the SX-64 FLASH! Assembly parts and labor for 4 months from date of purchase. Please take a moment now to fill out and return the postpaid warranty card.

Installation instructions start on page 17. They are at the end of the manual because they are used only once and then hopefully forgotten. Please turn to page 40 and start enjoying your SX-64 Flash!.

Starting on the next page is a quick reference card covering the extra commands added by the SX-64 FLASH!. Most of these commands are described in detail in the accompanying manual "1541 FLASH!". This manual describes the commands that are added to the SX-64 FLASH!.

ENJOY

QUICK REFERENCE

Description of Symbology
Capital letters refer to keys struck in sequence.
<Control> refers to a single key struck
<Shift><Run/Stop> strike two keys simultaneously
<Ret> strike "Return" key

Easy Everyday Commands 1541 FLASH! Manual

	Command		Performs
1:	<Shift><Run/Stop> . . .		LOAD"*",8,1 <Ret>
2:	LOAD "PRG <Ret> . . .		LOAD"PRG",8 <Ret>
3:	POKE 148,64 <Ret> . .		SX-64 slow load
4:	Manual Switches Front .		Switches fast/slow
5:	OPEN1,8,15,"Z8S" <Ret>		Disk to slow load
6:	POKE 148,0 <Ret> . .		SX-64 to FLASH! load
7:	OPEN1,8,15,"Z8F" <Ret>		Disk to FLASH! load
8:	OPEN 1,8,15,"UJ" <Ret>		Disk reset
9:	SYS 64738 <Ret> . . .		SX-64 reset
10:	POKE 650,0 <Ret> . . .		Key repeat off
11:	SYS 61665 <Ret> . . .		White on grey screen

DOS Commands 1541 FLASH! Manual

	Command		Performs
1:	<Control><Restore> . .		Turn on DOS Commands
2:	SYS 65526 <Ret> . . .		Turn on DOS Commands
3:	@IO <Ret>		Initialize Drive 0
4:	@$ <Ret>		Read Directory
5:	@$:???* <Ret>		Dir. with pattern
6:	@ <Ret>		Read Error Channel
7:	@UJ <Ret>		Reset Disk
8:	@#x <Ret>		Change drive number
9:	%PRG NAME <Ret> . . .		Load program without relocation/end links
10:	@RO:NEW=OLD <Ret> . .		Rename a file
11:	@CO:NEW=OLD <Ret> . .		Copy a program
12:	@SO:NAME <Ret>		Scratch a File
13:	@NO:NAME,ID <Ret> . .		New a Disk
14:	@VO <Ret>		Validate a diskette

SX-64 FLASH!

QUICK REFERENCE

Editing Commands   1541 FLASH! Manual

Command	Performs
1: `<Control><←→>`	Cursor to bottom of screen
2: `<C=><←→>`	16 Character tab
3: `<C=><↑>`	Escape Quote or insert mode
4: `<C=><Inst/Del>`	Delete Line
5: `<C=><Clear/Home>`	Clear Screen from Cursor downward
6: `<C=><=>`	CHR$(27) printer "Escape" code in strings
7: `<Control><L>`	CHR$(13) in strings
8: `<Control>`	Slows Listing speed
9: `<Lock>`	Pauses listings
10: `<Shift><Return>`	Return without line execution

NOTEPAD Commands   SX-64 FLASH! Manual

Command	Performs
1: `<C=><Restore>`	Go to NOTEPAD
2: SYS 61662 `<Ret>`	Go to NOTEPAD
3: `<F1>`	Exit NOTEPAD
4: `<F3>`	NOTEPAD to Printer
5: SYS 61659 `<Ret>`	NOTEPAD to Printer
6: `<F5>`	Scroll up 1st screen
7: `<F7>`	Scroll dwn 1st screen
8: `<Control><< >,<F7>,<Ret>`	Copy 1st screen

QUICK REFERENCE

FLASHMON! Commands   SX-64 FLASH! Manual

	Command	Performs
1:	`<C=><OFF ON>`	Enter FLASHMON!
2:	SYS 61656 `<Ret>`	Enter FLASHMON!
3:	`<X>` `<Ret>`	Exit FLASHMON!
4:	`<X>,<C>` `<Ret>`	Exit FLASHMON!
5:	SYS 8 `<Ret>`	Re-enter FLASHMON!
6:	m xxxx yyyy `<Ret>` . . .	List memory/code
7:	g xxxx `<Ret>`	Execute Program
8:	G xxxx `<Ret>`	Execute Program
9:	l "ABC" `<Ret>`	Load ABC
10:	l "ABC",08 xxxx `<Ret>` .	Load ABC at xxxx
11:	s "DEF",08 xxxx yyyy `<Ret>`	Save DEF
12:	v "DEF",09 `<Ret>`. . . .	Verify DEF

Advanced Programming Commands   1541 FLASH! Man.

	Command	Performs
1:	Z1b+CHR$(t)+CHR$(s) . . .	"U1" replacement
2:	Z2b+CHR$(t)+CHR$(s) . . .	"U2" replacement
3:	Z3b	High Speed Transfer data from buffer to SX-64
4:	Z5b+CHR$(t)+CHR$(s) . . .	Execute Z1 then Z3
5:	Z6b+CHR$(t)+CHR$(s) . . .	Linked loader
6:	Z7s	Speed set
5:	NMI Debugger	Run time debugger

Symbology

We have adopted the following symbology for all the commands used in this manual.

First you should note that all the single letter keys on the SX-64 have upper case letters on their top surface. Therefore we refer to all the letter keys with upper case (capital) letters. If we wish you to strike a series of keys in sequence like normal typing we present the the sequence as follows:

If you should type "load" we show LOAD without any quotes or brackets.

Spaces between typing letters are for clarity only. SYS 65526 is exactly the same as SYS65526 to the SX-64.

The function keys are shown as they are designated on the key cap enclosed with angle brackets. If you should strike a function key such as "Run/Stop" we show <Run/Stop> with brackets. We have abbreviated "return" to <Ret>. The Commodore key located on the bottom left corner of the keyboard is shown as <C=>.

If you should strike two function keys together we show <Shift><Run/Stop> with no space or comma between them.

If you should strike two function keys one after the other we show <C=>,<Control> with a comma between the keys.

Added Easy Everyday Commands

The 1541 FLASH! manual that accompanies this manual contains 9 Easy Everyday Commands that also apply to the SX-64 FLASH!. Please go to page 6 of the 1541 FLASH! manual and read about these commands. There are three additional commands listed below.

Command   Manual Switches Front Panel

Mounted in the upper right corner of the storage slot above the disk drive are two small switches. The left one switches the disk drive between the original disk ROM (left position) and the new FLASH! ROM (right position). The right switch switches the computer between the original "kernal" ROM (left position) and the new FLASH! ROM (right position). These switches generally are positioned to the right (FLASH! position). It is possible to switch them without turning off the power. The results will be mixed. It is recommended that they only be switched with the power off.

Command   POKE 650,0   <Ret>

SX-64 FLASH! adds the auto-repeat command to all the keyboard keys. If for any reason you wish to turn off this feature, type POKE 650,0. <Ret>. The all key auto-repeat may be turned on by typing POKE 650,235 <Ret>. These commands also have the same effect on the C-64.

Command   SYS 61665   <Ret>

Many users find that white on dark grey is a preferred color combination for most serious work. To get this combination type SYS 61665   <Ret>.

Preface

The "DOS", or as they are sometimes called, "wedge" commands are a set of minimum keystroke commands for controlling the disk drive. Commodore furnishes a DOS program on the SX-64 Test/Demo disk that accompanies the Commodore SX-64. This program occupies a small part of your computer memory and sometimes interferes with programs. SX-64 FLASH! has a DOS program built in. This means that there are no programs to load or fill up memory. These DOS commands work with any Commodore disk drive.

The major keystroke saving that DOS offers is that the sequence of keystrokes; OPEN 1,8,15," is replaced by a single keystroke; <@> or < > >.

There are 11 classical DOS commands and 3 new DOS commands added by SX-64 FLASH!. They are described starting on page 9 of the 1541 FLASH! manual. The following corrections should be made:

Page	Wrong	Correct
11	@0:UJ	@UJ
13	@0:Z8S	@Z8S
13	@0:z8F	@Z8F

An additional easy DOS turn on command is listed below.

Command   <Control><Restore>   <RET>

This command starts the DOS. DOS is not automatically started when the SX-64 with SX-64 FLASH! is turned on. To start the DOS type, <Control><Restore> <Ret>. There is no on screen message given when DOS is turned by this command.

Preface

Why NOTEPAD? Have you ever been using your computer and desired to jot something down? Or maybe been in BASIC and desired to print out a small hardcopy note? Or desired to record some information before you started to use your computer? Maybe note down names and locations of programs and files? A quick easy solution to all these situations is available with NOTEPAD.

NOTEPAD gives you a whole screen to write whatever you wish. NOTEPAD does not use any of the normal program memory. For the technically oriented NOTEPAD stores whatever you write starting at memory address hexadecimal $b000. Additional commands allow you to print the NOTEPAD out to any printer connected to the IEEE serial bus.

Command   <C=><Restore>

To go to the NOTEPAD screen type; <C=><Restore>. This may be done from almost all modes of computer operation. You will be presented with a screen full of miscellaneous characters the first time you enter NOTEPAD after starting the computer. To clear the screen use the normal <Shift><Clear/Home> command.

Command   SYS 61662   <Ret>

An alternative method of starting the NOTEPAD screen is to type; SYS 61662 <Ret>. The previous command is recommend for the immediate (keyboard) mode of operation. This command is recommended for going to the notepad from a program.

Command   <F1>

Striking the function key F1, located on the left side of the keyboard, while in the NOTEPAD will immediately return you to wherever you were prior to entering the NOTEPAD. The notes that you have written will not be erased by this command. Technical note; if after leaving NOTEPAD, you overwrite the memory located underneath the BASIC ROM, you will at that time overwrite your NOTEPAD notes. In most situations this will not occur.

Command   <F5>

Striking the function key F5 while in NOTEPAD will cause the line immediately above the cursor on the original screen to appear on the bottom of the NOTEPAD screen. Repeated striking of this function key will move the cursor up on the original screen displaying each line in turn. If you place your cursor at the bottom of your NOTEPAD screen, and you strike the return key after each striking of the F5 key, you can copy the original screen onto the NOTEPAD screen. The line order will be reversed from what it was on the original screen.

Command   <F7>

Striking the function key F7 while in NOTEPAD will cause to appear on the bottom of the NOTEPAD screen, the line immediately below the cursor on the original screen. Repeated striking of this function key will move the cursor down on the original screen displaying each line in turn.

Command   <Control><< >,<F7>,<Ret>

This sequence of command keystrokes will place your cursor at the bottom of your NOTEPAD screen, and repeated striking of the F7 and return keys will copy the original screen onto the NOTEPAD screen. The line order will be the same as it was on the original screen. Placing the cursor at the top of the original screen prior to entering NOTEPAD and this command sequence allows you to copy all of the original screen to the NOTEPAD.

Command   <F3>

Striking the function key F3 while in NOTEPAD will cause the NOTEPAD screen to print out on any printer attached to the IEEE serial port of the SX-64. If the printer is turned off or attached somewhere else, this command is ignored.

Command   SYS 61659 <Ret>

Typing, SYS 61659 <Ret> will print the NOTEPAD on any printer attached to the SX-64 serial IEEE bus. This is an easier command to insert in programs (without the <Ret>) than the previous command.

Preface

One of the most frustrating features of
the Commodore 64 and the SX-64 for the
serious programmer is the lack of a built in
machine language monitor. No more!! SX-64
FLASH! adds a small machine monitor to your
computer. If you are not familiar with
machine language and M.L. monitors, please
see your local computer dealer or Skyles
Electric Works for some excellent books
written about M.L. programming. If you have
no interest in M.L. programming do not bother
to read this section of the SX-64 manual.
Some of the author's best friends use
computers and don't care the least bit about
machine language programming.

Command   SYS 61656   <Ret>

Typing; SYS 61656 <Ret> will turn on
FLASHMON!. At turn on you will be presented
the monitor message:

    .yr xr ac sr brk+2 s
    .00 00 08 30 f768 f7

The numbers are the y register, the x
register, the accumulator, the status
register, the break address plus two and the
stack pointer, respectively. The RAM test is
not performed upon entering FLASHMON!.

Command   <C=><OFF ON>

The truly hardcore M.L. may go directly
to the monitor by holding down the <C=> key
(Commodore key) as you turn on your SX-64.
The added advantage of this command is that
it will circumvent any autostart cartridge
installed.

Command   <X>   <Ret>

Example: x   <Ret>

Typing; <X> <Ret> will exit
FLASHMON! without affecting the BASIC
programs in the computer. This is the
recommend method of exiting FLASHMON! if it
was entered from the SYS 61656 command.
this command will not exit FLASHMON if the
commodore key was held down on turn on of
the computer. The next command should be
used in these situations.

Command   <X>,<C>   <Ret>

Example: xc   <Ret>

Typing; <X>,<C> <Ret> will exit
FLASHMON! and reset the Computer. This is
the command to use to exit FLASHMON! if it
was entered by holding down the <C=> when
the power was turned on.

Command   SYS 8   <Ret>

Example: sys8   <Ret>

Typing; SYS 8 <Ret> will enter
FLASHMON! after it has been exited by the
<X> command. The full command SYS 61656
must be used if a reset exit (<X>,<C>
<Ret>) was previously used.

Command   <M> xxxx yyyy <Ret>

Example: m 0800 0900   <Ret>
Example: m b000   <Ret>
        This command will list 8 bytes per line
and the poke code interpretation at the
right. The listing will be in hexadecimal
and will start at hexadecimal address xxxx
and continue to hexadecimal address yyyy.
The listing can be stopped using the
Run/Stop key. If the ending address yyyy is
not specified the listing will continue
until the Run/Stop key is struck.

Command   <G>   xxxx   <Ret>

Example: g 1000   <Ret>
        This will start executing a code
located at hexadecimal address xxxx.
Normally a BRK command ends the code.

Command   <Shift><G>   xxxx   <Ret>

Example: G 2000   <Ret>
        This will start executing code located
at hexadecimal address xxxx. Additionally
the brk+2 address is placed on the stack.
This enables the code to end with a RTS
command and return to the BASIC interpreter.

Command   <S>   "DEF" 08 xxxx yyyy <Ret>

Example: s "super" 08 8000 9000   <Ret>
        This command will save the code
starting at hexadecimal address xxxx and
ending at hexadecimal address yyyy to the
disk drive device $08. The program name
assigned will be DEF.

Command   <L>   "ABC"   <Ret>

Example: l "mikroman"   <Ret>
Example: l "zoom",09   <Ret>

This will load a program from the disk
drive device hexadecimal 08. The code will
load into the memory area that it was saved
from. If another disk drive with a device
number other than hexadecimal 08 then the
command should be;   <L>   "ABC" zz <Ret>
where zz is the device number in hexadecimal

Command   <L>   "ABC" 08 xxxx   <Ret>

Example: l "zoom" 08 5000   <Ret>
This will load a program from disk drive
device hexadecimal 08. The code will be
loaded into the memory starting at
hexadecimal address xxxx regardless of the
memory location that was saved from.

Command   <V> "DEF" zz   <Ret>

Example: v "zoom" 08   <Ret>
This command will verify that program
DEF has been saved correctly to disk drive
device hexadecimal zz . If the device number
is not specified it is assumed to $08.

Command   <@> uuu   <Ret>

This is the general form of the DOS
commands described in the 1541 FLASH! manual.
FLASHMON! supports all of these commands.
For more information on these commands please
see pages 3 and 8 of this manual and pages 9
through 14 of the 1541 FLASH! Manual. If
FLASHMON! is entered by holding down the <C=>
key on power up, the DOS commands will not
work. The DOS requires the present of the
BASIC interpreter.

General Notes

FLASHMON! allows commas, spaces, or dashes, for separators. For example; <S> "ABC",zz,xxxx-yyyy <Ret> works as well as the command given on page 14.

Memory Usage:

Loc	Usage	Loc	Usage
$9b	scratch	$0200	filename strt addr.
$9c	scratch	$02a7	y reg. save
$b0	scratch	$02a8	x reg. save
$b1	scratch	$02a9	accumulator save
		$02aa	status reg. save
		$02ab	stack pointer save

FLASHMON! saves the above named registers upon turn on. FLASHMON! restores the registers when a <G> or <Shift><G> command.

SX-64 FLASH! INSTALLATION

Installation of your SX-64 FLASH! will take about 40 minutes. The following installation instructions are detailed and lengthy so that hopefully every question and concern that might come up is answered. For most SX-64's anybody familiar with the use of a phillips screwdriver can easily install the SX-64 FLASH!.

If you are concerned about "getting your fingers into" your Commodore SX-64 Computer, please have your local dealer install the SX-64 FLASH!. If your SX-64 Computer is under it's original 90 day Commodore warranty, remember that if you carefully follow the installation instructions, you can always return the SX-64 Computer to it's original condition without Commodore or the local dealer being upset. We don't recommend that you wait 90 days of old slow disk programming loading before you take advantage of the SX-64 FLASH!'s fantastic loading speeds. You would also miss out on the other very useful added commands that you get with SX-64 FLASH!.

Installation of the SX-64 FLASH! requires:

A Phillips (Crosshead) screwdriver
A thin blade knife or screwdriver, (a grapefruit segment knife is ideal).

LET US TURN THE PAGE AND BEGIN

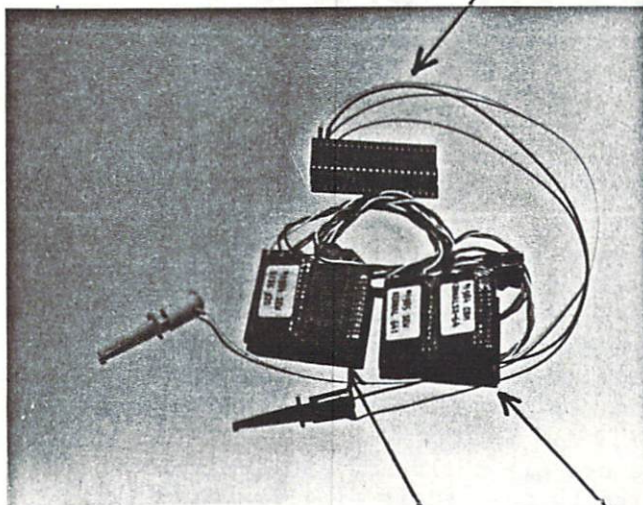## PARTS IDENTIFICATION

Like Gaul the SX-64 FLASH! is divided into 3 parts:

1: Kernal ROM Assy. and Switch
2: Disk ROM Assy. and Switch
3: SX-64 FLASH! IntraCable

They are pictured below.

3-SX-64 FLASH! IntraCable

2-Disk ROM Assy. and Switch

1-Kernal ROM Assy. and Switch

Parts SX-64 FLASH!

SX-64 FLASH! INSTALLATION

We will first prepare the SX-64 Computer for the installation of the SX-64 FLASH!.

1) Unplug all keyboards, cables, cartridges, and peripheral assembles from your SX-64.

2) Place the carrying handle in the normal carrying position in front of the SX-64.

3) Place the SX-64 rightside up on a clean well lighted surface. The rear of the computer should be facing you.

4) Using the Phillips screwdriver remove the two small black screws, on each side of the rear heatsink, that fasten the side strips of the SX-64. Place screws in a small dry cup for safe keeping. Refer to the picture on the next page for location.

5) Slide the side strips toward the rear of the SX-64 and remove them to a safe spot.

6) Unscrew the 8 screws holding the top cover of the SX-64. Two screws are located on the upper corners of the rear heatsink, and three screws are located along each side of the computer. See the picture on the next page for the location of screws.

7) Remove all children, and any adults that like to poke their fingers into electronics boards, from the immediate area. Now remove the top cover of the SX-64 to a safe place.

8) There are three main electronics boards inside the SX-64. their locations are shown in the picture on the next page.

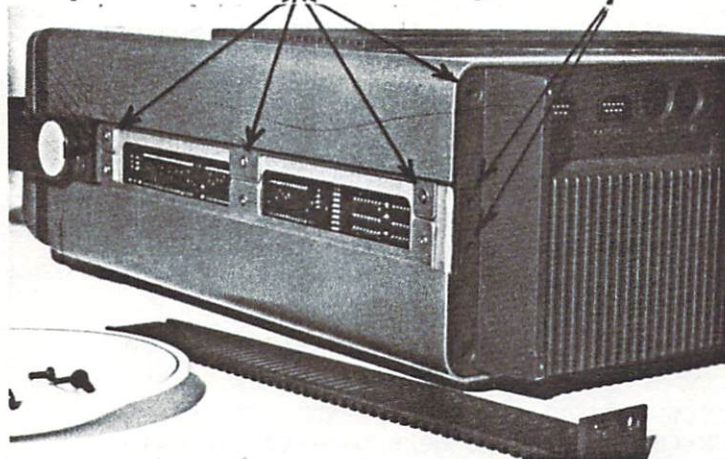CPU board located along the side.
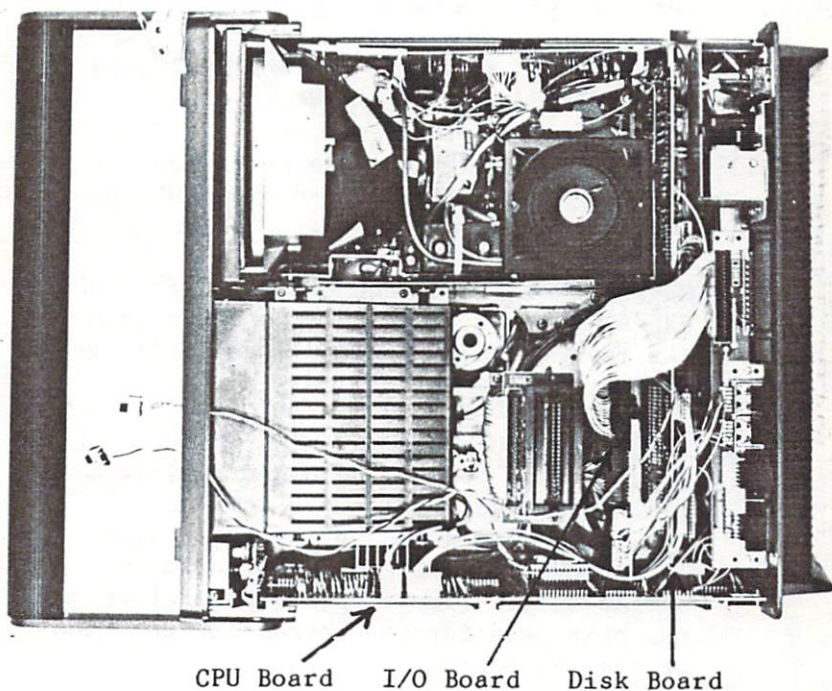Disk board located along the rear.
I/O board located in front of Disk board.

SX-64 FLASH! INSTALLATION

Top Cover Screws Side Strip Screws

Rear Corner View SX-64, screw locations


CPU Board   I/O Board   Disk Board

Top View SX-64, Electronic board locations

SX-64 FLASH! INSTALLATION

We will first remove the CPU board
located along the left side of the SX-64 as
viewed from the rear.

9) Unplug the 6 pin and 8 pin connectors
   from the top front of the CPU board.
   Lift up the flat plastic "catches" that
   hold these connectors in place. Refer to
   picture next page for location.

10) Remove the three plastic "rivets" from
    the top of the CPU board. The "rivets
    are removed by removing the center pin.
    Refer to picture next page for location.

11) Remove the one plastic rivet from the
    upper right corner (as viewed from the
    rear of the SX-64) of the I/O board.
    Refer to picture next page for location.

12) Unplug the I/O board from the CPU board
    by sliding it to the right.

13) Unscrew the two bottom corner screws of
    the rear heatsink and move it about one
    inch away from the SX-64.

14) Carefully lift out the CPU board from the
    SX-64. Unplug the power connector from
    the rear of the CPU board when it is easy
    to reach.

15) Place the CPU board in front of you with
    the previous top of the board away from
    you. Note that, all the electronic
    "chips" have notches on the right side.
    The printing on the "chips" should be
    upside down. Please check the picture on
    the next page for the correct orientation
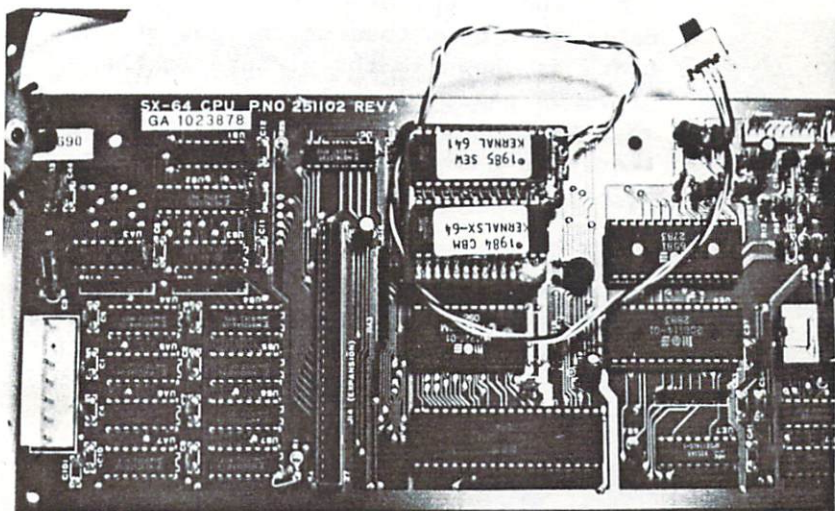   of the CPU board.

SX-64 FLASH! INSTALLATION

I/O Board Rivet—

CPU Bd. 6pin plug   8 pin plug   Rivets
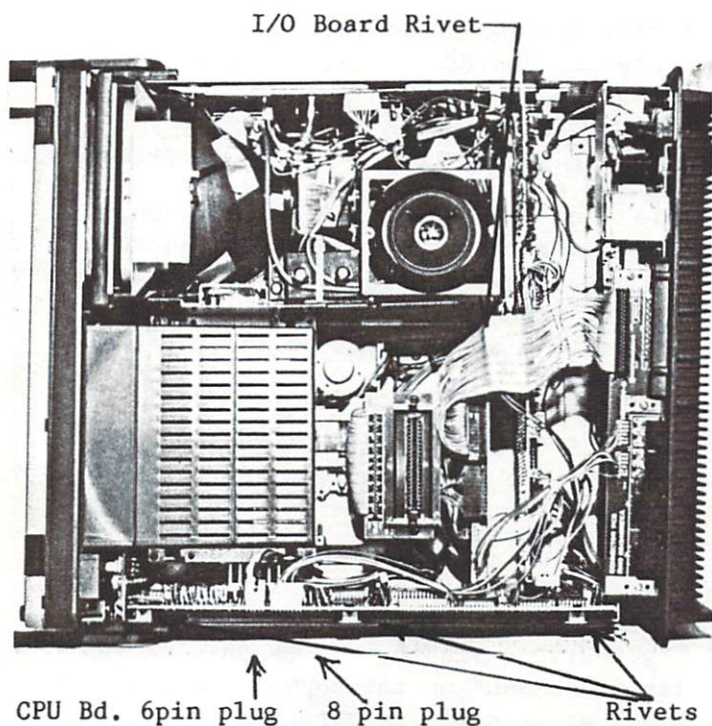
SX-64, CPU, I/O board Plugs, Rivets
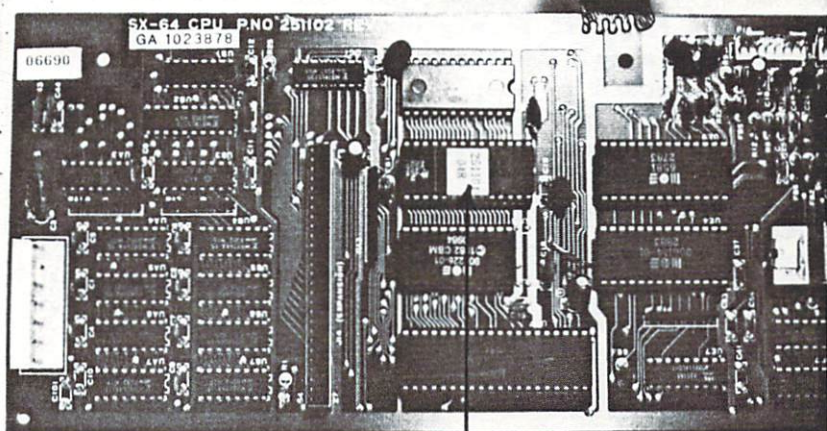
CPU Board, Kernal ROM, location UD3

16) Locate the ROM in position UD3 near the center of the CPU board. This is the Kernal ROM. Please see the picture on the previous page to locate the Kernal ROM. It should have the number 251104-04 printed on the top. There should be 12 pins (legs) on each side of this ROM. If you have a very early model of the SX-64 you might have 14 pins or legs on each side of the ROM. In either case there should be a small notch on the right end of the ROM.

17) Remove the Kernal ROM from position UD3 by carefully prying it up from both ends, a little bit at a time. Set it behind the CPU board.

18) Remove the SX-64 FLASH! Kernal ROM Assembly from the package. This Assembly may be recognized by the EPROM with the label "KERNAL" on the top. A yellow-black-white cable is attached to it.

19) Remove the Black foam from the plug of the SX-64 FLASH! Kernal ROM Assembly and place it firmly over the pins of the Kernal ROM that you removed from the CPU board in step 17 above. Place this original Kernal ROM in the package for return to Skyles Electric Works.

20) Remove the green backing paper from the small square of double sided tap on the bottom of the SX-64 FLASH! Kernal ROM Assembly

CPU Board, Kernal ROM Assy installed

21) Plug the SX-64 Flash! Kernal ROM Assy.and
switch into the left 24 holes of the
Kernal ROM socket (location UD3). The
new SX-64 Flash should be away from you
and the notch on the new Kernal ROM
should be to the right. The label on the
EPROM should upside down. The switch
cable should be towards the top of the
board as shown in the picture on the
previous page. The plug has 24 pins and
most SX-64 have a 28 pin socket,
therefore the right 4 socket holes should
be empty.

22) Holding both the CPU board and the switch
at the end of the yellow-black-white
cable, carefully place the CPU board back
into the SX-64. Note that the bottom of
the CPU board goes into a slot at the
bottom of the SX-64.

23) Holding the switch at the end of the
yellow-black-white in one hand press
gently,but firmly, on the top front
center of the storage box until you can
slip the switch through the opening. The
switch should stick out about 3 inches in
front of the SX-64.

24) Checking alignment, plug the I/O board
back into the CPU board. This is easiest
done if you place your left hand fingers
behind the connector on the CPU board and
slide the I/O board to the left with your
right hand. Place your fingers as far
down both boards as possible.

25) Reconnect the power cable at the rear of
the CPU board.

26) Reposition the rear heatsink and screw
back in the two bottom corner screws.

SX-64 FLASH! INSTALLATION

FLASH! Kernal Assy.   Yellow-Black-White
                            Cable   Switch
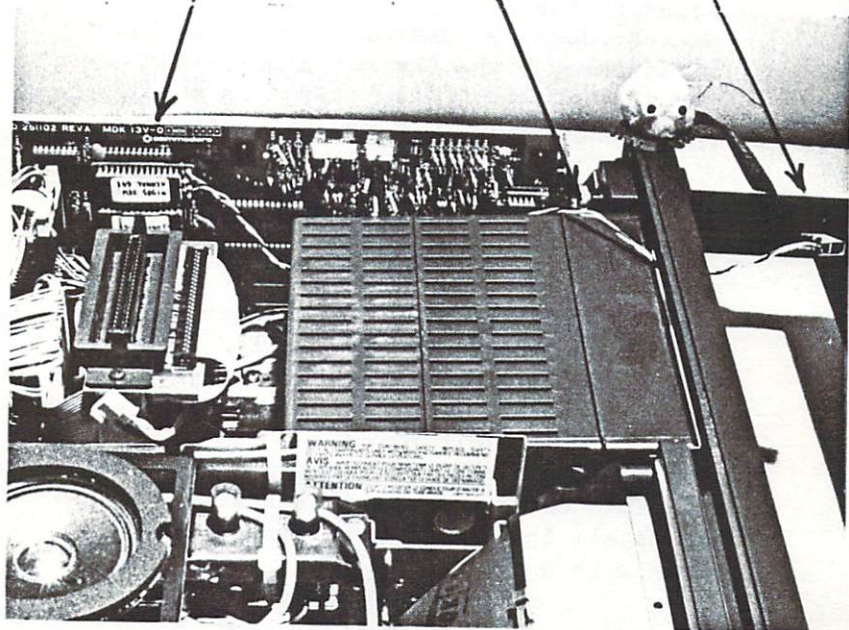
CPU board reinstalled in SX-64

27) Reconnect the 6 pin and 8 pin connectors at the top front of the CPU board.

28) Reinsert the 3 plastic rivets. This is easiest done by inserting the small body first through the CPU board hole and then the metal frame. The larger pin should then be inserted from the CPU board side.

29) Check that there no pins sticking outside of the rear of the Kernal ROM socket on the CPU board. Check that the ROM assembly is in the rear 24 holes of the 28 pin Kernal ROM socket and that the original Kernal Rom is installed in the rear 24 pins of the 28 pin socket on the new Kernal ROM assembly.

30) Reinstall the top cover and fasten it with the center screw on each side. Reinstall the two side strips and fasten them with one screw each.

31) Place your SX-64 into its normal operating position. Plug in the keyboard and the power cable.

32) Switch the new switch at the end yellow-black-white cable toward black end.

33) Turn on your SX-64.

34) Test your system by operating it. Everything should still work the same as before you began the installation. Load a program from the disk drive. If you do not get a normal load, recheck installation starting with item 10.

35) Turn off your SX-64 and then switch the new switch on toward the yellow end

36) Turn on your SX-64 and observe the SX-64 FLASH! copyright message. You should see:

   *** COMMODORE SX-64 V2.0+ ***

   W/1541 FLASH! 38911 BYTES FREE

   (C)1984 BRYCE NESBITT

37) Now Type: POKE 148,64 and strike the RETURN key.

38) Reload the program from disk that you loaded in step 33. Everything should still occur in the old slow mode. Now proceed to step 41 at the bottom of this page for installation of SX-64 FLASH! into your I/O board.

39) If you have trouble with one of the tests described above carefully recheck the installation instructions starting at step 1.

40) If you are still having trouble replace your original Kernal ROM into its socket and test that this has returned the computer to it's original condition. Every SX-64 FLASH! is tested before leaving the factory, but mistakes can happen. Notify your local dealer for test and/or SX-64 FLASH! replacement.

41) Turn off your SX-64 disconnect the power and keyboard cables and place with the rear facing you on a well lighted surface.

42) Remove all children from the area of the SX-64. Remove the two side strips and then the top cover of the SX-64.

43) Unplug, starting from the left, a 6 pin, a 6 pin, a 24 pin, a 40 pin, and a 2 pin plug from the top of the I/O board.

44) Move all the connectors away from the I/O board. Place all but the 24 pin connector between the Disk board and the power supply. Move the 24 pin connector toward the front of the SX-64.

45) Slide the I/O board to the right until it is unplugged from the CPU board.

46) Carefully lift the I/O board out of the SX-64. Rotate it counter clockwise and lay it component side up on the cartridge port.

47) Locate UB2, a 40 pin chip labeled 6526, at the center left side of the I/O board. Please see the pictures on the next page for more details.

48) Remove the SX-64 FLASH! IntraCable from the box and connect the black microclip to pin 40 of the 6526 located at position UB2. The black microclip should lay to the right beneath the flat cable. Tape the black microclip down onto the electronics board. Please see the pictures on the next page for more details.

49) Holding the SX-64 IntraCable in your left hand, rotate the I/O board clockwise and carefully place it in the slot at the bottom of the SX-64. Place the IntraCable at the front of the SX-64.

50) Lining up the CPU board connector slide the I/O board to the left plugging it into the CPU board.

Location UB2   Notch
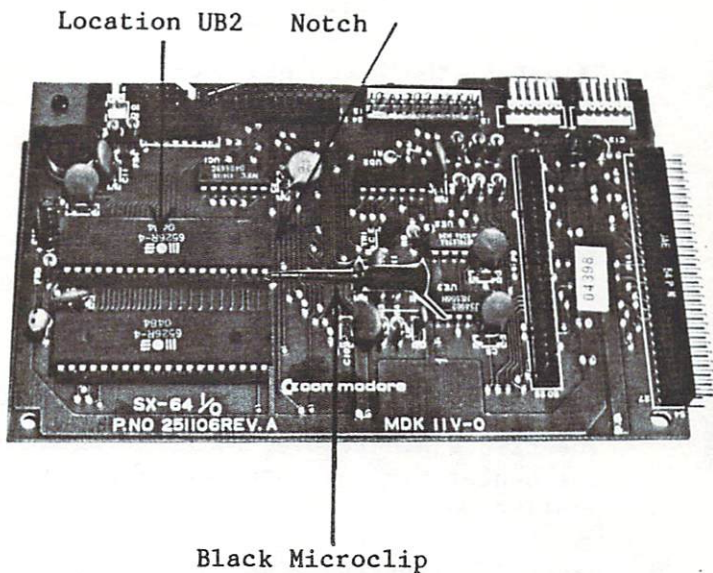
Black Microclip

SX-64 I/O Board
Location of UB2 and black microclip

8 7 6 5 4 3 2 1

32 34 36 38 40
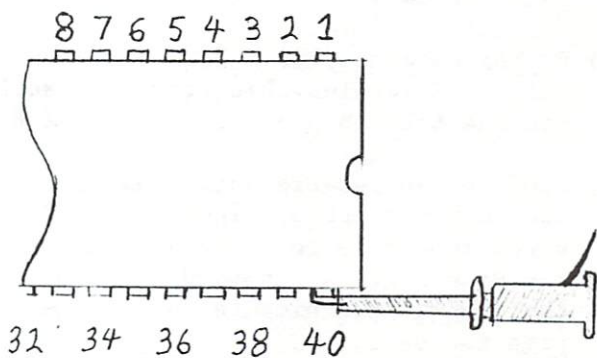
Detail of black microclip connection

51) Reinstall the black plastic rivet at the upper right corner of the I/O board.

52) Unplug the 8 pin plug that is second from the front on the CPU board.

53) Unplug the 2 pin, 6 pin, 15 pin, and 4 pin plugs from the Disk board. lay the cables behind the SX-64

54) Remove the black rivets from the left, center, and right top of the Disk board. The rivets are removed by first removing the center pin and then removing the smaller body.

55) Carefully lift the Disk board up and out of the SX-64. Unplug the power supply connector at the bottom of the board and lay the board component side up on top of the I/O board and the speaker.

56) Locate the 40 pin chip, labeled 6522, at location UBC3 at the left center of the Disk board. See pictures on the next page for details.

57) Prying up gently from both ends remove this 6522 labeled chip from its' socket. Set the 6522 chip alongside the SX-64.

58) Plug the IntraCable socket assembly into the socket at UBC3. The black and white wires should be going towards the top of the Disk board and toward the front of the SX-64. See pictures on the next page for details.

59) plug the 6522 into the 40 pin socket assembly at UBC3 with the small notch to the right. See pictures on the next page for details.

SX-64 INSTALLATION
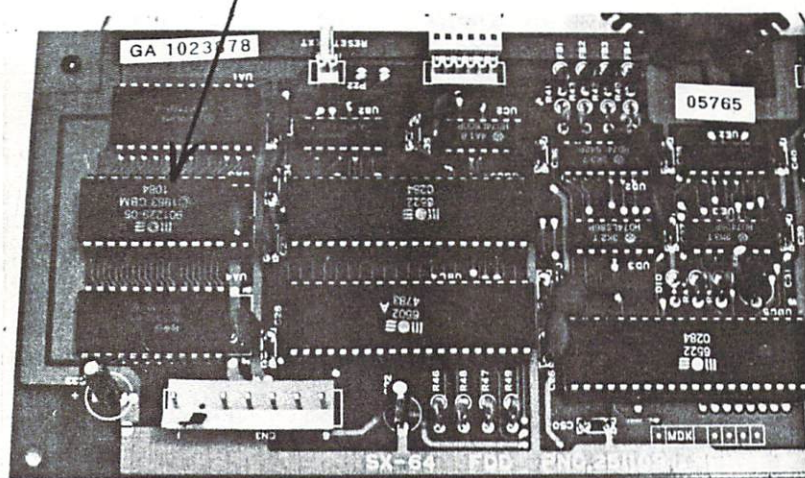
Location UCB3

Disk board SX-64
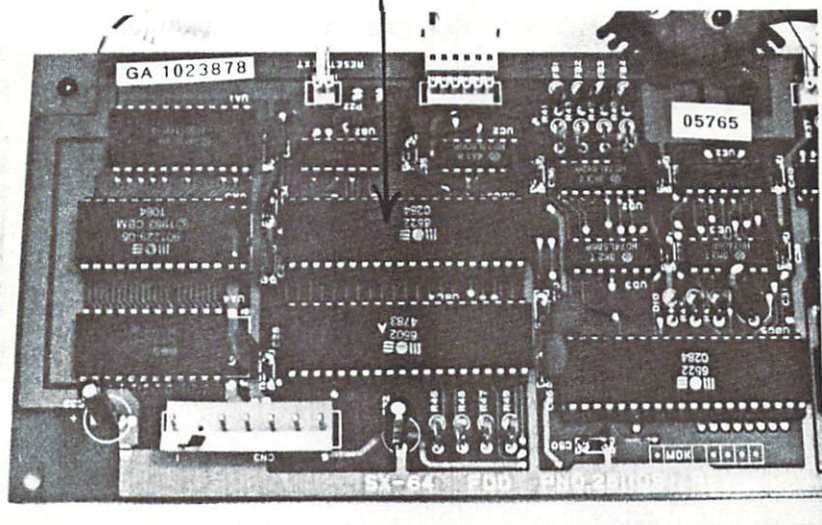
IntraCable   Socket   Notch End
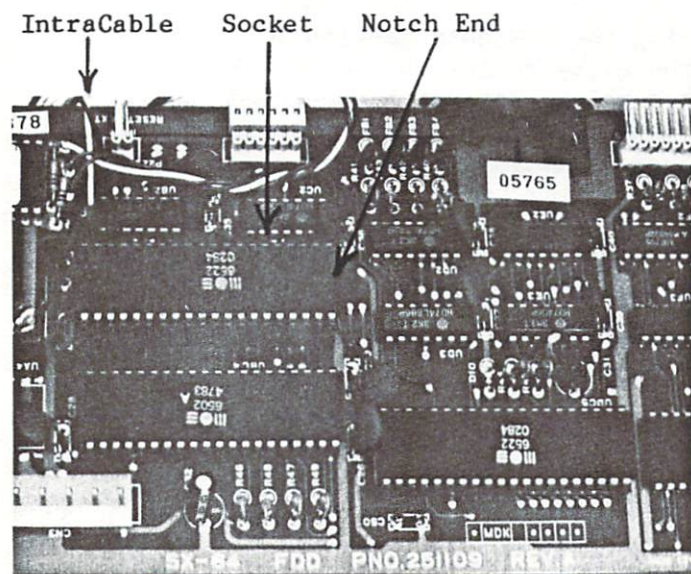
Details of IntraCable socket installation

60) Locate the 24 pin ROM chip, labeled 901229-03 (or-05), at location UA3 on the left edge of the Disk Board. See pictures on the next page for details.

61) Remove ROM chip labeled 901229-03 (or-05) from the socket located at location UA3. Set the ROM alongside the SX-64.

62) Remove the Disk ROM assembly and switch from the SX-64 FLASH! box and remove the green backing paper from the double sided tape on the bottom of the assembly.

63) Plug the ROM assembly into the socket at location UA3.the notch on the ROM on the assembly should be to the right. The Disk ROM Assembly has a 24 pin plug the goes into the left 24 pins of the socket.

64) Plug the ROM chip labeled 901229-03 onto the empty socket on the Disk ROM assembly. The notch should be to the right. See pictures on the next page for details.

65) Carefully tape the black-white and the red-white-blue cable to the disk board to the left of the 2 pin connector.

66) Plug the power plug into the lower left corner of the Disk board and place the Disk board into the SX-64. Be sure that all the various cables are clear of the area where Disk board is going to be installed.

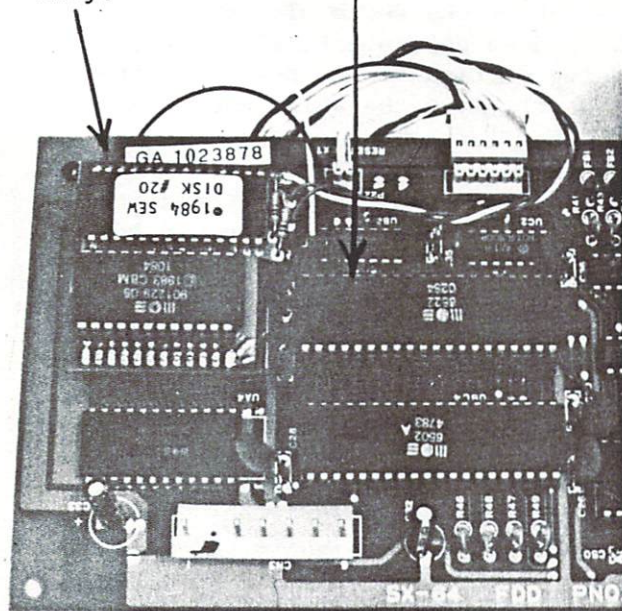67) Replace the small black plastic rivets into the three rivet holes along the top of the board.

Location UA3


SX-64 Disk board

Disk ROM Assy.   Intracable Assy.

Disk ROM Assy. Installation

68) Starting at the left end of the Disk
    board, plug the 2 pin, 6 pin, 15 pin,
    and 4 pin plugs into the connectors on
    the top of the Disk board. The 4 pin
    plug should have a key on the left side.
    The second from the left hole on the
    plug should be empty when it is properly
    oriented on the Disk board.

69) Starting at the left end of the I/O
    board, plug in the two 6 pin, the 24
    pin, and the 2 pin plug.

70) Connect the white microclip of the SX-64
    IntraCable to the sixth pin from the
    right in the top row of pins of 40 pin
    connector of the I/O board.

71) Holding the white microclip in your left
    hand plug the 40 pin plug onto the 40
    pin connector on the I/O board. Pull
    the shank of the white microclip up so
    that it does not interfere with the 40
    pin plug fitting firmly down onto the
    connector. Tape the white microclip
    toward the left.

72) Plug the 8 pin plug into the connector,
    second from the front, on the CPU board.

73) Holding the switch at the end of the red-
    white-blue cable in one hand press
    gently,but firmly, on the top front
    center of the storage box until you can
    slip the switch through the opening.
    The switch should stick out about 3
    inches in front of the SX-64.

74) Tape the yellow-black-white and red-
    white-blue cables two inches from the
    left side of the top of the storage box.

SX-64 INSTALLATION
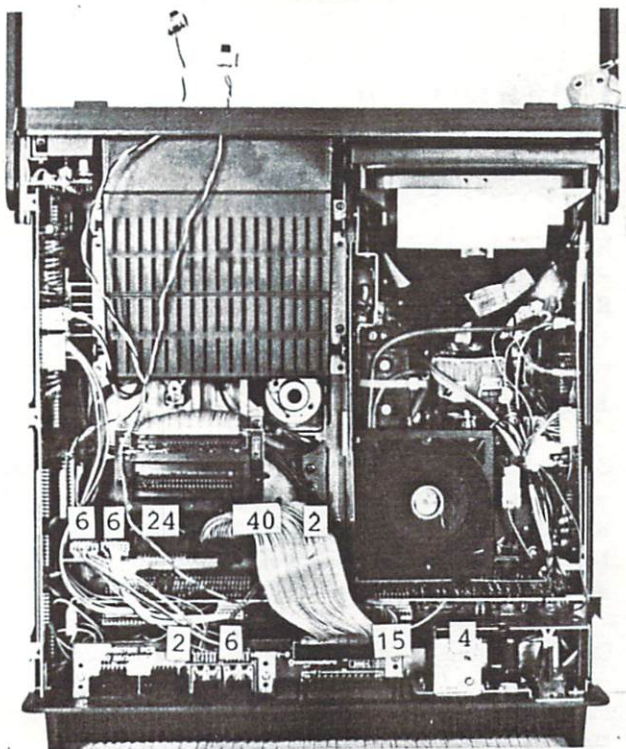
SX-64 Connector locations
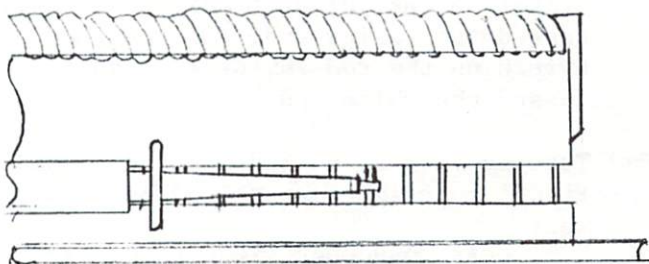
White microclip location

75) This completes the physical installation
of the SX-64 FLASH! inside the SX-64.
Check that all cables are plugged into
the proper connectors.

76) Reinstall the top cover and fasten it
with the three screws on each side.
Reinstall the two side strips and fasten
them with two screws each. Fasten the
top of the rear heatsink with the top
two corner screws

77) Switch the new switch at the end of the
yellow-black-white cable toward black
end. Switch the switch on the end of
the white-red-blue cable toward the blue
end.

78) Connect the keyboard and power cord to
your SX-64. Turn on your SX-64.

79) Test your system by operating it.
Everything should still work the same as
before you began the installation. Load
a program from the disk drive. If you
do not get a normal load, recheck
installation starting with item 10.

80) Turn off your SX-64 and then switch the
switch on the yellow-black-white cable
toward the yellow end. Switch the
switch on the red-white-blue cable
toward the white end.

81) Turn on your SX-64 and observe the SX-64
FLASH! copyright message. You should
see:

        *** COMMODORE SX-64 V2.0+ ***

        W/1541 FLASH! 38911 BYTES FREE

        (C)1984 BRYCE NESBITT

82) Place a program diskette into the disk.

83) Type on the keyboard:

   SYS 65526   <RET>

   @I   <RET>

   @S   <RET>

84) Observe the initialization of the disk drive and the printout of the directory on the screen.

85) Reload the program from the disk that you loaded in step 33 (page 39) of the SX-64 installation instructions. Time the load cycle. The program should load three times faster than previously.

86) Type: POKE 148,64 :OPEN 1,8,15,"Z8S" and then strike the <RETURN> key.

87) Reload the program from step 85 above. Time the load. It should be 3 times slower than in step 85 above. It probably is already getting difficult to consider loading all your programs at this slow speed.

88) Type: POKE 148,0 :OPEN 1,8,15,"Z8F" and then strike the <RETURN> key.

89) Reload the program from the disk that you loaded in step 85 and 87 above. Time the load cycle. The program should load three times faster than the load in step 87.

90) Turn off your SX-64 and then switch the switch on the yellow-black-white cable toward the black end.

91) Turn on your SX-64 and observe the
original Commodore 64 turn-on message.
You should see:

        *****   SX-64 BASIC V2.0   *****

    64K RAM SYSTEM   38911 BASIC BYTES FREE

    READY

92) Now Type: OPEN1,8,15,"Z8S" and strike
the RETURN key.

93) Reload the program from step 85 on the
previous page.. Time the load. It
should be about 3 times slower than in
step 85 above. By this time it probably
is getting very tedious to load at the
slow speed.

94) Remove the diskette from the disk drive.
Turn off the SX-64. Switch the switch
on the red-white-blue cable toward the
blue wire.

95) Turn on the SX-64. Place a program disk
into the disk drive and type on the
keyboard:

    OPEN1,8,15,"IO"   <RET>

    LOAD "$",8   <RET>

    LIST   <RET>

96) Observe the initialization of the disk
drive and the printout of the directory
on the screen.

97) Once again, reload the program from step
85 above. Time the load. It should be
about 3 times slower than in step 85
above. By this time it most certainly
is getting very tedious to load at the
slow speed.

98) If one of these tests does not work
correctly, recheck the installation
starting at step 7.

99) If you are still having trouble, replace
your original Kernal ROM in the SX-64
CPU board and the original Operating ROM
in the Disk board. Test that this has
returned the computer and disk drive to
their original condition. Every SX-64
FLASH! is tested before leaving the
factory, but mistakes can happen.
Notify your local dealer for test and/or
possible replacement of the 1541 FLASH!.

100) In case of trouble you may also contact:

The following instructions describe
mounting the SX-64 FLASH! switches on the
front of the SX-64. Two pages forward is a
picture of an alternate rear mounting of the
FLASH! switches. Now is the time to decide
if you wish to use the alternate mounting.

101) Now remove the white cover paper from
the square of double sided tape.

102) Place the switch from the yellow-black-
white cable on the left front of this
tape with the yellow wire to the left.

103) Place the switch at the end of the red-
white-blue cable to the right side front
of the double sided tape, with the white
wire to the left. Reading from the left
you should have a yellow, white, black,
white, red, blue wires. Please see the
picture on the next page to check the
details of this mounting.

104) Press both switches firmly onto the
double sided tape.

105) Remove the green cover from the double
sided tape. Place this side of the
double sided tape in the upper right
corner of the storage hole.

106) Form the cable wire around the front
edge of the storage hole. Use a couple
of pieces of tape to tape the wire to
the top of the storage hole.

107) Both switches should now be to the right
which is the FLASH! mode of operation.
The disk switch is on the left and the
CPU switch is on the right.

108) This completes the installation of the
SX-64 FLASH!.

109 Please mail back to Skyles Electric
Works the CPU ROM/EPROM removed in step
19. Mail it to:

> Skyles Electric Works
> 231-E South Whisman Rd.
> Mountain View, CA 94041
> USA
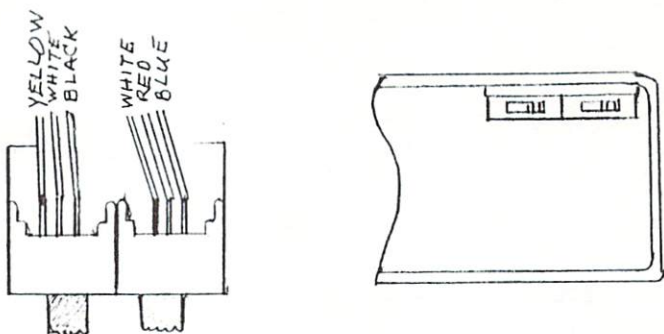
Details Switch Front Mounting
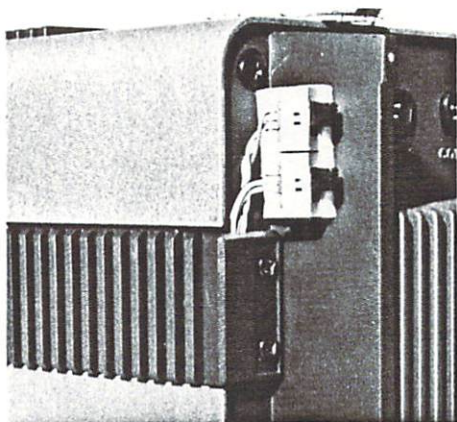
Details of Switches Rear Mounting

ROM/EPROM to be Returned to
Skyles Electric Works