What is OF-LINK?
================

OF-LINK is an OS-9 module that acts as an interface between the FLEX and OS-9
Level II operating systems on the CoCo 3. It permits FLEX to run underneath
and simultaneously with OS-9, in a similar fashion to other systems that let
MS-DOS run as a "guest" operating system under UNIX.

(Note -- throughout this brochure, most references to FLEX also apply to
 equally to SK*DOS/STAR-DOS)

Who Needs OF-LINK?
==================

Do you often switch back and forth between FLEX and OS-9, but the tedium of
rebooting the system every time is getting to you? Wouldn't you rather just
press the CLEAR key to switch to the other operating system in another
window in the blink of an eye? With OF-LINK you can!

Are you tired of the wimpy 51 column screen that FLEX gives you on the CoCo?
Do you wish that FLEX could use the same 80 column text screen and high
resolution multi-color graphics displays that OS-9 Level II supports on the
CoCo 3? With OF-LINK it can!

Perhaps your CoCo 3 has a RAM-Disk, disk caching, or even a hard drive.
Isn't it frustrating to have to give them all up for floppy-only operation
under FLEX? OF-LINK lets FLEX use these other devices. You can even boot
FLEX from a hard drive!

Do you ever need to copy files from a FLEX disk to an OS-9 disk, or vice
versa? Why spend money on software that can only transfer files, but do
nothing else, when OF-LINK also provides a special XCOPY utility to transfer
files both ways!

Have you ever been in the middle of using a FLEX text editor when you
need to read in part of another file, but can't remember how the file
name is spelled, or the line numbers of the desired data in that file?
Wouldn't you rather just flick to another window and immediately get the
information you need and return to where you left off in the editor, instead
of having to quit the editor, get the desired information, then restart the
editor from the beginning? OF-Link lets you run 2 or more copies of FLEX
simultaneously in different windows -- just press the CLEAR key to switch
between them.

Have you ever noticed that some software packages are only available for
FLEX, and not for OS-9? Three examples are: the powerful chess program
called Rapier, the PL/9 compiler from Windrush, and an excellent public
domain FORTH interpreter called FF9. On the other hand, you can get a
COBOL compiler for either FLEX or OS-9, but with Microware's COBOL for OS-9
costing $400, and Crunch COBOL for FLEX selling for only $99, you have a lot
of incentives to continue using FLEX.

Do you need OF-LINK? If you already own one or more FLEX software packages,
OF-LINK can protect and enhance that investment. And for those of you who
haven't run FLEX before, OF-LINK opens the window on a new computing
adventure.

Other Features of OF-LINK
==========================

- A very powerful benefit of OF-LINK is that programs running under FLEX in
  an OF-LINK environment have "dual citizenship" -- ie., within the same
  user program you can use not only the regular FLEX system calls, but also
  OS-9 system calls. For example, imagine using OS-9's high-level graphics
  commands from within a FORTH or BASIC program running under FLEX!

- Multiple users are possible under FLEX by running 2 or more copies of FLEX
  simultaneously, and connecting external terminals.

- Includes OF-MON, a mini-monitor program that takes the place of the ROM
  based monitors often present on other FLEX systems.

- FLEX and OS-9 can easily share your hard drive, RAM-Disk, and floppy
  drives -- no complicated or inflexible partitioning schemes are used.

- Includes a utility to format physical FLEX disks.

- FLEX printer spooling is not supported in this version.

What You Need To Run OF-LINK
============================

1) Tandy Color Computer 3 (CoCo 3) with 512K memory.

2) OS-9 Level II Version 2.00.01, or later, for the CoCo 3.

3) SDISK3 disk driver module, either the standard version from D.P. Johnson,
   or the modified version provided with the Sardis Technologies' DMC
   controller.

4) A copy of the FLEX or SK*DOS (STAR-DOS) operating system (which is not
   included with OF-LINK). While many versions (including those for non-CoCo
   systems) are compatible with the OF-LINK package, a few are not. Contact
   us to confirm whether your version is compatible, or not.

Ordering Information
====================

 * OF-LINK (limited time introductory price) . . .   only $49
 * add $5 for shipping/handling ($10 overseas)
 * prices quoted in $US
 * payment by check, money order, or VISA

Sardis Technologies
2261 East 11th Ave.
Vancouver, B.C.
Canada V5N 1Z7   Phone (604) 255-4485 (Pacific time)

(preliminary information -- prices and specifications subject to change
   without notice)

oflinkbroch.DW097.880726.1429   dp/p66/t2/b3/l7 rm#77 12 cpi

August 6, 1988

Well, on August 3rd we finally shipped the first few copies of OF-LINK. In
our rush to avoid delaying shipping your copy any more, we managed to over-
look a few details.

NOTE - if you are using the Sardis Technologies' DMC "no halt" version of
SDISK3, and have a FLEX.COR version 3.01 file, these details don't affect
you, and you are probably already successfully running FLEX under OS-9 with
OF-LINK. Enjoy!

If your version of FLEX does not supply a FLEX.COR file, or it is a version
other than V3.01, or you are using STAR-DOS or SK*DOS instead of FLEX, refer
to the enclosed applications note entitled "Compatibility of OF-LINK with
Various Versions of FLEX".

If you are using the D.P. Johnson version of SDISK3, which you would be if
your controller is not a Sardis Technologies' DMC controller, read on.

1) If you are using the "SDISK3.SLOW" version of D.P. Johnson's SDISK3
   driver, you may notice that screen updates seem to run awfully slowly,
   even on other OS-9 windows. There appears to be a bug in the code that
   temporarily slows the CPU clock speed when accessing the disk controller
   that sometimes forgets to return the CPU clock back to the fast speed.
   We are looking into this bug. The DMC version of SDISK3 never slows the
   clock speed, so doesn't have this problem.

2) The D.P. Johnson SDISK3 driver returns different error codes than the
   DMC version of SDISK3 for certain errors such as "drive door left open",
   or "media density different than expected" (single vs double density).
   The OF-LINK module as provided on disk was set up for the DMC version. To
   be able to read single density FLEX disks with the D.P. Johnson SDISK3,
   you must make the following patches to OF-LINK, using the DPOKE and NEWCRC
   utilities provided with the OF-LINK disk:

```
CHD /D0/CMDS      [or in whichever drive your OF-LINK disk is]
DPOKE of_link 0002 10 BD
DPOKE of_link 0B94 16 04 F7
DPOKE of_link 0BBC 16 04 E5
DPOKE of_link 108E C1 F1 27 0C C1 F9 27 08 C1 F4 25 07 C1 F7 22 03 16
  FA FB 16 FB 04
DPOKE of_link 10A4 C1 F1 27 0C C1 F9 27 08 C1 F4 25 07 C1 F7 22 03 16
  FB 0D 16 FB 16 00 00 00
NEWCRC of_link
```

   Future revisions of OF-LINK will provide separate DMC and D.P.J. versions
   of the OF-LINK module so you won't have to make these patches.

3) On pages 6 and 28 of the OF-LINK Users Manual are references to patching
   OF-LINK to change offset $0015 from $80 to $00, because of the different
   ways that the D.P.J. and DMC versions of SDISK3 handle retries for errors.
   This patch might not be needed for some newer versions of SDISK3 from
   D.P.J. To verify this, try running OF-LINK without making this patch. If
   OF-LINK aborts with error #244 or #249 without even accessing the disk
   drive, you DO need to make this patch; otherwise you don't.

Introduction:

Most of our testing of OF-LINK to date has been with the General Version of
FLEX version 3.01 from Technical Systems Consultants (TSC). This package
provides a FLEX.COR operating system core file which is a generic copy of
the system independent portion of the FLEX operating system.

FLEX running under OF-LINK/OS-9 is merely a "guest" operating system, with
OS-9 as the "host" and "boss". As such, FLEX must behave properly and gen-
erally not access any CoCo 3 hardware directly. Functions such as keyboard
scanning, screen updates, and disk accesses, are done by OS-9 at the request
of FLEX.

Since FLEX.COR does not access any hardware directly, but makes all requests
through separate machine-specific device drivers (in this case provided by
OF-LINK), it works perfectly with OF-LINK.

The June '85 version of STAR-DOS Level I from STAR-K Software Systems Corp.
that we've tested also works well with OF-LINK, as it provides a STAR-DOS.COR
file that, like FLEX.COR, does not access any hardware directly, but makes
all such accesses through OF-LINK.

However, many FLEX and STAR-DOS/SK*DOS packages that were sold to run on
specific hardware, such as for the CoCo 2, do not include a FLEX.COR or
STAR-DOS.COR file. Instead, they only provide a FLEX.SYS or STAR-DOS.SYS
file that also includes all the code to access the hardware such as disk
drives, printers, keyboard, screen, and even memory bank switching. How this
hardware specific code was added to the core of the operating system varies
from supplier to supplier.

For example, Data Comp's FLEX CoCo Jr. (or Sr.) package has a FLEX.SYS file
that was created by taking a pure TSC V3.01 FLEX.COR file and appending the
CoCo specific hardware drivers to the end of it. The hardware drivers occupy
only those standard areas documented by TSC as reserved for drivers, and are
accessed only through the proper operating system "hooks". This has two
benefits. First of all, when this FLEX.SYS file is loaded by OF-LINK, even
though some hardware specific code that is not allowed in an OF-LINK
environment gets loaded, it is never executed because OF-LINK can point the
operating system "hooks" to look at only the OF-LINK drivers. Secondly, it
is very easy to write a program to strip off the hardware specific code from
the end of the file to re-create the original FLEX.COR file.

Unfortunately, other versions of FLEX, such as FHL Color FLEX from Frank Hogg
Labs, added instructions to initialize hardware, into the middle of the
standard instructions to initialize pointers and variables within FLEX
itself. This requires a lot of detective work on our part to find these
undesirable code areas, and more work to enhance OF-LINK to perform different
patches to different versions of FLEX at boot time to disable these code
areas. We've done this work for some versions, but not yet for all. OF-LINK
will be upgraded in the near future, and early purchasers will receive the
upgrade at no charge.

If you have a version of FLEX or STAR-DOS or SK*DOS that is not mentioned below, and you can successfully use it with OF-LINK, please let us know so we can update this list. If despite following these instructions you still have some problems, call or write us, and we will try to help. However, our profit on each sale of OF-LINK isn't sufficient to let us afford giving hours and hours of help to each customer for every version of FLEX or SK*DOS that was ever sold! With that in mind, note that each version listed below mentions the level of support we will provide. Any version not listed below, or listed but not guaranteed, will only be supported at our discretion.

Specific Compatibility:
----

1) General Version of FLEX, version 3.01, from TSC:
   a) This is the easiest version to use with OF-LINK, as it comes with
      a generic FLEX.COR file.
   b) No hardware specific commands are included (except NEWDISK), so you
      don't have to guess which commands you may or may not use with
      OF-LINK.
   c) No STARTUP.TXT file is included, so you don't have to use any tricks
      to disable its execution when booting OF-LINK for the first time.
   d) All features of present or future versions of OF-LINK are guaranteed
      to work with this version of FLEX.

2) FLEX CoCo Jr. / FLEX CoCo Sr., from Data Comp:
   a) A good buy, since the Jr. version only costs US$ 49.95
   b) Although no FLEX.COR file is supplied, the FLEX.SYS file is compatible
      with OF-LINK (as described above), with no patches needed.
   c) The supplied STARTUP.TXT file executes a program that writes directly
      to the hardware, so needs to be disabled. After you have answered
      OF-LINK's prompt for the name of the operating system file (FLEX.SYS),
      wait for the "FMATE FLEX V2.2" banner to be displayed, then immediate-
      ly open the door of the disk drive holding the FLEX CoCo Jr./Sr.
      system disk. After several attempts to read the now inaccessable
      disk, FLEX will give up and report "DISK ERROR #9", which you can
      ignore. If you don't open the disk drive door soon enough, the
      STARTUP.TXT file will execute the V51.CMD program which will crash the
      system.
   d) Several programs are supplied that access the hardware directly, and
      should not be run under OF-LINK.
   e) All features of present or future versions of OF-LINK are guaranteed
      to work with this version of FLEX, as long as the method of generating
      the FLEX.SYS file, as described earlier in this document, is maintain-
      ed.

3) FHL Color FLEX, from Frank Hogg Labs (version V5.0:4):
   a) No FLEX.COR file is supplied, and the FLEX.SYS file needs to be
      patched before being used with OF-LINK. A future version of OF-LINK
      may do this patching for you, but for now you will need to be able
      to somehow boot FLEX without OF-LINK, so you can make these patches
      before running OF-LINK:

```
          i) Use an editor to create this FHLPATCH.TXT source file:
                   ORG   $CA54         coldstart routine
             NOP    EQU   $12           NOP opcode
                   FCB   NOP,NOP        (was LDA  #$34)
                   FCB   NOP,NOP,NOP    (was STA  $FF01)
                   FCB   NOP,NOP,NOP    (was STA  $FF03)
                   FCB   NOP,NOP,NOP    (was STA  $FF21)
                   FCB   NOP,NOP,NOP    (was STA  $FF23)
                   END
         ii) Assemble the code:
                   ASMB 1.FHLPATCH.TXT,1.FHLPATCH.OVR
        iii) Append the patches to the end of the boot file so they will
             overlay the original code:
                   APPEND 1.FLEX.SYS,1.FHLPATCH.OVR,1.FLEXPAT.SYS
         iv) When OF-LINK asks for the name of the operating system file,
             reply with "FLEXPAT.SYS".
```

   b) The instructions in item 2c above also apply here, except that the
      banner to wait for is ",.FHL Color FLEX V5.0:4". On, the other hand,
      since you needed to make some changes to the disk in the previous
      step anyways, just rename or delete the STARTUP.TXT file and you won't
      need to open the drive door at that point.
   c) Several programs are supplied that access the hardware directly, and
      should not be run under OF-LINK.
   d) Unfortunately the "MON" command has been disabled in this version, so
      OF-MON can't be used. This also means that there is no clean way of
      exitting FHL FLEX under OF-LINK. For now you will either have to
      do a hardware reset of the machine, or use KILL to kill the OF-LINK
      process from another OS-9 window..
   e) Although FHL FLEX appears to work with OF-LINK (except for "MON"), it
      is not currently guaranteed to work with OF-LINK.

4) FLEX+, from Spectral Associates (release 2.0, 2/1/83):
   a) We have not yet managed to get this version running with OF-LINK,
      and cannot guarantee if or when we will.

5) FLEX 9.0, for the Southwest Technical Products Corp. (SWTPc) DC-2
   controller, from Technical Systems Consultants:
   a) This is one of the oldest versions of 6809 FLEX around. A generic
      FLEX.COR file is included, providing compatibility with OF-LINK.
      However, OF-LINK itself needs to be patched before booting this
      version of FLEX:
```
           LOAD OF_LINK
           MODPATCH
           L OF_LINK
           C 04FA B7 12
           C 04FB CA 12
           C 04FC 02 12
           V
```
   b) No hardware specific commands are included (except NEWDISK), so you
      don't have to guess which commands you may or may not use with
      OF-LINK.
   c) No STARTUP.TXT file is included, so you don't have to use any tricks
      to disable its execution when booting OF-LINK for the first time.
   d) The WARMSTART routine in the disk drivers (jump table entry at $DE18)
      is never called by this version of FLEX, which can cause some problems

when using OF-LINK's virtual disk feature. As a result this version
of FLEX is not recommended, nor fully guaranteed.

6) FLEX - Version 2.8:1 - K, from Southwest Technical Products Corp. (SWTPc):
   a) This version, as well as earlier and later versions from SWTPc have
      not yet successfully been run with OF-LINK. However, STWPc's versions
      of FLEX were so common several years ago, that hopefully we can
      discover the necessary patches. Can any of you give us some hints?

7) STAR-DOS Level I, June '85 version, from STAR-K Software Systems Corp.:
   a) This version is also easy to use with OF-LINK, as it comes with a
      generic STAR-DOS.COR file.
   b) Few hardware specific commands are included (only FORMAT, CACHE,
      RAMDISK), so you don't have to guess which commands you may or may not
      use with OF-LINK.
   c) No STARTUP.TXT file is included, so you don't have to use any tricks
      to disable its execution when booting OF-LINK for the first time.
   d) There are a few slight incompatibilities with FLEX, such as no user
      memory resident commands allowed, but most of these features are not
      used by any commercial software anyways.
   e) Guaranteed to work with most functions of OF-LINK, but future versions
      of OF-LINK may include certain optional features that might not work
      with STAR-DOS/SK*DOS.

8) STAR-DOS+, for the CoCo, from Data Comp:
   a) A good buy, since it only costs US$ 34.95
   b) Although no STAR-DOS.COR file is supplied, the STAR-DOS.SYS file seems
      to be compatible with OF-LINK in a similar manner to FLEX CoCo Jr. and
      Sr. (also from Data Comp), so no patches appear to be needed.
   c) The instructions in item 2c above also apply here, except that the
      banner to wait for is: WELCOME TO
                                 STAR-DOS+
                    (C) 1984, 1985 BY PETER A. STARK
                    STAR-KITS SOFTWARE SYSTEMS CORP.
      and the error message is "ERROR 14", after which it does some more
      retrying before giving you the "STAR-DOS: " prompt.
   d) Several programs are supplied that access the hardware directly, and
      should not be run under OF-LINK.
   e) STAR-DOS+ appears to work fine with OF-LINK, but we have not done
      enough testing to guarantee it. Again, future versions of OF-LINK may
      include certain optional features that might not work with STAR-DOS,
      although most functions of OF-LINK are expected to work.

Booting from a FLEX physical disk in an 80 track (96 tpi) drive
----

If your working copy of the FLEX system disk is recorded at 48 tpi, OF-LINK
should boot up as-is from your 96 tpi drive. But if your disk is recorded at
96 tpi, then you need to patch the OF_LINK module before booting from the 96
tpi drive. Change the value at offset $0AA1 from $00 to $40. After you have
successfully booted up, you must remember to use the DSKSET command with the
"TM" parameter every time you change from a 96 tpi disk to a 48 tpi disk in
that drive, or vice versa. This only applies to physical FLEX disks in that
drive. When the disk in that drive is an OS-9 disk containing a FLEX virtual
disk, OS-9 will automatically detect if the disk is recorded at 48 tpi or 96
tpi.

Using FHL Color FLEX

In our August 6/88 "Compatibility of OF-LINK with Various Versions of FLEX"
data sheet we mentioned that the "MON" command had been disabled in Frank
Hogg Labs' FHL Color FLEX. We subsequently discovered that it can be
resurrected with the following statements added to the FHLPATCH.TXT file:

```
              ORG   $CC99
              FCC   'MON'       change "ROM" to "MON"
              ORG   $CC12
              FDB   0           disable user command table
```

Adapting software packages to run under OF-LINK

The instructions in our manual for installing STYLOGRAPH, DYNACALC, and other
software packages in an OF-LINK environment were based on 5 to 8 year old
versions supplied for generic FLEX systems, and not for the special CoCo
versions. Many FLEX programs that were available in two versions, one for
the CoCo, and another for all other FLEX systems, used special tricks to
prevent the CoCo version from running on non-CoCo systems. These tricks
sometimes involved playing with the hardware directly, which is a no-no for
programs running under OS-9 such as in an OF-LINK environment. As a result,
many CoCo-specific FLEX programs are very difficult to get running under
OF-LINK, whereas most non-CoCo FLEX programs are very easy to install!

We will try to discover the patches needed for some of the more popular
CoCo-specific FLEX programs as these are the versions many of you already
own, but any help you can give will speed up the process. If you know of
someone who adapted any of these CoCo-specific programs to run on a non-CoCo
system, we would like to hear about it.

Running more than one copy of FLEX under OS-9 simultaneously:

Those of you who have tried running two or more copies of FLEX simultaneously
in different windows may have discovered that at times only one copy of FLEX
is able to run, while the other copies go into a state of suspended
animation. Then, when the first copy runs the CAT command, suddenly the
second copy springs to life, but then the first copy freezes up. There is
both an explanation and a fix for this behaviour.

OS-9 Level II implements record locking whenever more than one process
accesses the same file. OF-LINK accesses FLEX physical disks using OS-9's
raw I/O facility (drive name with "@" suffix such as /D0@) which disables
record locking, thus permitting two or more copies of OF-LINK to access the
same sector on the same physical disk simultaneously. FLEX virtual disks,
however, are implemented using normal OS-9 files, in which case record
locking is active. When sharing virtual disks, one copy of FLEX will often
lock out all other copies of FLEX from accessing part of that "disk". When
FLEX is locked out of a sector that it wants to read or write, it waits and
waits until the sector is unlocked, however long that takes, before
continuing to execute.

To disable record locking for FLEX virtual disks you need to patch OF-LINK
using the DPOKE and NEWCRC utilities provided with the OF-LINK disk. (If you
are running the standard D.P. Johnson version of SDISK3, the patch mentioned
in item 2) of the August 6/88 letter should be applied first, before
installing the following patch.)

```
    CHD /D0/CMDS          ;* (or in whatever drive your OF-LINK disk is)
    DPOKE of_link 0002 10 D2
    DPOKE of_link 0CFF 17 03 B8
    DPOKE of_link 10BA 10 3F 89 25 0F A6 C4 84 3F C6 11 8E 00 00 1F 13
     10 3F 8E 5F 39 00 00 00
    NEWCRC of_link
```

There are also other considerations involved when running multiple copies of
FLEX on one system, and they are regarding the integrity of data on shared
disks:

1) The safest way is to use different disks (physical or virtual) for each
   copy of FLEX. In other words, don't share disks. Following this guide-
   line requires keeping duplicate copies of some programs and data. It also
   prevents you from achieving some of the expected benefits of being able to
   run multiple copies of FLEX on one system, such as switching from a window
   where a word processor is in the middle of editing a file, to a window
   where you display the directory listing of the same disk used by the word
   processor, in order to refresh your memory of the name of a file you want
   to merge in. But this is the safest way to run OF-LINK.

2) The next safest way, if two or more incarnations of FLEX need to share a
   physical or virtual FLEX disk, is to only read from the shared disk, but
   never to write to a shared disk. Unlike the previous guideline, this mode
   doesn't require you to keep multiple copies of programs, because loading
   them for execution involves only reading. The current version of OF-LINK
   doesn't prevent you from doing a write by mistake, but an upcoming
   enhancement to OF-LINK will be to allow DSKSET to "logically" write

protect a physical or virtual disk, even if the disk itself isn't "physically" write protected.

3) If you need the flexibility of being able to write to and update shared disks, the rules get more complicated, and the chances of making a mistake become greater. The reason is that each copy of FLEX wants to maintain the disk's directory, free chain, and file sector-to-sector links, all by itself, and assumes no-one else is also writing to the disk -- FLEX is, after all, a single user system. If two copies of FLEX write to the same disk, they will at times clobber each other's pointers and the directory, because some of the updated pointers are not immediately written back to disk. You can prevent your disks from getting clobbered, however, if you heed the following advice.

Only one copy of FLEX may have files open for writes on a shared (physical or virtual) disk -- the others should only access that disk for reads. But due to a design deficiency in FLEX, even if the files that were open for writes have been closed, if the program that closed the files still has other files open, even if those other files are open for reads only, or are on another "drive", the disk that was written to is generally not safe for a second copy of FLEX to write to, until that program has closed ALL its files.

Since it isn't always obvious when a particular program has or has not closed all its files, a safer guideline to follow is this: once a FLEX program opens a file for writes on a shared FLEX disk (physical or virtual), other copies of FLEX should not open any file for writes on that shared disk (reads are OK) until that program returns to the operating system prompt ("+++" or "STAR-DOS:"). Although STAR-DOS/SK*DOS may be slightly less restrictive than FLEX in this regard, we suggest you always follow this last guideline anyways.

Upcoming enhancements to OF-LINK

Here are the major new features planned for the next revision of OF-LINK:

1) Have OF-LINK extract the "physical" vs "virtual" drive indication from
   the drive assignments on the command line at boot time instead of
   requiring patching OF-LINK at $0018 as at present. It would assume that
   a device name ending in "@" is a physical drive, and a pathlist not ending
   in "@" is a virtual drive. This method is more flexible and is virtually
   error-free (ie. it doesn't require you to remember how OF-LINK is
   currently configured).
2) Specify FLEX drive assignments at boot time as <drive number>=<pathlist>
   to make the syntax more consistent and allow specifying non-consecutive
   drives. Eg.   OF_LINK 0=/D1@ 2=/H0/FLEX/disk4 P=/P
3) Allow respecifying drive assignments with DSKSET to avoid having to
   re-boot just for that. This would be especially useful to re-assign a
   different virtual disk to a FLEX drive.
4) Allow respecifying the printer path assignment to a device or an OS-9
   file with the PRTSET command to avoid having to re-boot just for that.
   This would be especially useful if using printer spooling under OS-9.
5) Enhance DSKSET/DSKSHOW to allow "logically" write protecting a physical
   or virtual FLEX disk.
6) Implement a memory resident "P" command to reduce disk accesses. However,
   this feature would not be available to SK*DOS/STAR-DOS users, only FLEX.
7) Allow setting a flag in OF-LINK to disable the STARTUP file so you don't
   have to have fast reaction times to open the drive door when you boot
   OF-LINK for the first time from certain versions of FLEX/SK*DOS/STAR-DOS.
8) Make it easier to boot FLEX from a physical FLEX disk on a 96 tpi drive
   by defaulting the media tpi setting to the same as the drive tpi setting,
   but allowing overriding this default on the OF-LINK command line at boot
   time, instead of having to patch OF-LINK.
9) We have also been experimenting with ways to speed up output to the FLEX
   console screen, and have achieved speed increases of up to 2.6 : 1 for
   certain benchmarks compared to version 0.5 of OF-LINK. As long as no
   undesirable side effects are uncovered by further testing, this
   improvement will also be incorporated into version 1.xx.

If you have any other ideas for changes or new features that would make
OF-LINK better, I would love to hear them. Write to, or call:

        Sardis Technologies   (604) 255-4485 (Pacific Time)
        2261 East 11th Ave.
        Vancouver, B.C. V5N 1Z7
        Canada

Introduction

The VSYS program on the disk included in today's parcel allows you to run
OF-LINK without SDISK3. However, as described below, if you don't have
SDISK3, you need some other means of copying files from a physical FLEX disk
to an OS-9 disk.

Booting up FLEX (or SK*DOS/STAR-DOS) for the first time
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1) Use VSYS to create a new FLEX virtual disk containing the operating
   system as a FLEX file. VSYS is a program running under OS-9, so can
   be run before FLEX is booted. You must, however, have already somehow
   copied the operating system file (FLEX.COR, STAR-DOS.SYS, etc.) from a
   physical FLEX disk onto an OS-9 disk, using some other program such as
   FHL's "XCOPY", South East Media's "OF", etc. A typical run of VSYS might
   look like this:

        VSYS /D0/FLEX.SYS /D1/TEMP

2) Patch OF_LINK on disk to flag all four FLEX drives as virtual drives
   (since you cannot read or write physical FLEX disks without SDISK3), and
   also to suppress the prompt asking you for the name of the operating
   system file (since VSYS has already linked to the file). For example:

        DPOKE /D1/CMDS/OF_LINK 0018 01 01 01 01 00
        NEWCRC /D1/CMDS/OF_LINK

3) Run OF_LINK, specifying the new virtual disk containing the FLEX (or
   SK*DOS/STAR-DOS) operating system as FLEX drive 0, and the FLEX virtual
   disk on the working copy of the OF-LINK disk as FLEX drive 1. For
   example:

        OF_LINK /D1/TEMP /D0/VIRTUAL P=/P

4) Use BINCPY to copy the operating system file to the main FLEX virtual
   disk, then link to it so you can boot from it next time. For example:

        BINCPY.1 0.VRTLBOOT.SYS 1.FLEX.SYS
        LINK.1 1.FLEX.SYS

VSYS Documentation

Converts an OS-9 file containing the FLEX or SK*DOS/STAR-DOS
 operating system into an OS-9 file formatted as a FLEX
 virtual disk so FLEX can boot from the virtual disk when
 first bringing up OF-LINK, instead of booting from a physical
 FLEX disk which would necessitate having SDISK3 installed.
 The new FLEX virtual disk file contains only the one FLEX
 file, with no free sectors. The OS-9 input file would
 typically be created by running one of the following programs
 to copy the file from a FLEX disk to the OS-9 disk:
   - XCOPY utility in FHL's O-Pak package
   - OF utility from South East Media
   - MS-DOS/FLEX File Transfer Utilities from Granite Computer Systems
   - communications (modem) program
The name of the FLEX virtual volume and the name of the file
 within it are both set to "VRTLBOOT.SYS".
Only the operating system file itself needs to be processed through
 VSYS. Once FLEX has been booted, you can use the XCOPY command
 supplied with the OF-LINK package to copy other files to a FLEX
 virtual disk from an OS-9 disk.

Inspired by a suggestion from Tom K.

Known bugs: appends an extra sector of all zeros data at the end of
 the file. You can use BINCPY to remove it, although this extra sector
 doesn't cause any problems.

Syntax: vsys <input file> <output file>

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