WINCHESTER PERIPHERAL CHASSIS

ISIS-II(W) SUPPLEMENT

Order Number: 121899-001

REV	REVISION HISTORY	DATE
-001	Original issue. Use ISIS-II(W) V4.2 operating system software.	3/82

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This supplement describes the operation of a Winchester Periperal Chassis on an Intellec Series II or Series III Microcomputer Development System, and provides operating instructions unique to the ISIS-II(W).

This supplement assumes that you:

*   Understand how to use an Intellec Microcomputer Development System

*   Have read either the Intellec Series III Microcomputer Development System Console Operating Instructions, 121609, (for a Series III development system), or the ISIS-II User's Guide, 9800306 (for a Series II development system).

Winchester Peripheral Chassis operation requires Version 4.2 or later of the ISIS-II(W) operating system software.

This supplement contains three chapters and three appendices:

*   Chapter 1 "Overview," provides an overview of the use of a Winchester Peripheral Chassis on a Series II or Series III Microcomputer Development System. It also lists the configurations supported by the ISIS-II(W) operating system and discusses the use of this supplement.

*   Chapter 2 "Initialization and Startup," describes the initialization, subsequent startup, and power off procedures involved in using the Winchester Peripheral Chassis.

*   Chapter 3 "Functionality," describes the ISIS-II(W) operating system commands and system calls that differ from the ISIS-II commands and calls.

*   Appendix A "ISIS-II(W) Error Messages," lists error codes and messages unique to ISIS-II(W).

*   Appendix B "ISIS-II(W) Confidence Test," describes the customer diagnostic test for the Winchester Peripheral Chassis.

*   Appendix C "Moving the Winchester Peripheral Chassis," describes the steps to follow when moving the Winchester Peripheral Chassis.

Related Publications

For more information on the Intellec Series III development system, refer to:

*   Intellec Series III Microcomputer Development System Console Operating Instructions, 121609

*   Intellec Series III Microcomputer Development System Programmer's Reference Manual, 121618

For more information on the Intellec Series II development system, refer to:

*   ISIS-II User's Guide, 9800306

Notational Conventions

The following conventions are used to show syntax in this supplement:

UPPERCASE	Information in uppercase must be entered as shown. It can be entered in uppercase or lowercase.
<lowercase>	Fields in lowercase indicate variable information. They are enclosed in angle brackets (< >) to show field limitation because some formats do not need a delimiting space or punctuation. The angle brackets should not be entered.
[ ]	Brackets indicate optional fields.
...	Ellipses indicate that a field may be repeated.
{ }	Braces indicate a choice. One of the items within the braces must be picked unless the field is also surrounded by brackets, in which case it is optional.
|	A vertical bar indicates choice of syntactic elements.
punctuation	Punctuation other than ellipses, braces, and brackets must be entered as shown.

```
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INTRODUCTION

The primary function of the ISIS-II operating system is to coordinate the hardware and software elements essential to development of your programs. The ISIS-II(W) operating system is the version of ISIS designed to enable you to use a Winchester Peripheral Chassis as a mass storage device for your development system.

The Winchester Peripheral Chassis consists of a 35 megabyte disk drive and a power supply enclosed in a freestanding chassis. The Winchester disk drive is designed for use with Intellec Series II Microcomputer Development Systems equipped with an IPC-85 computer board or any Intellec Series III Microcomputer Development System.

CONFIGURATIONS

The ISIS-II(W) operating system resides on a flexible disk or a Winchester disk and can support up to six flexible disk drives and one Winchester disk drive. Table 1.1 describes the ISIS-II(W) supported configurations of disk drives.

Table 1-1.
ISIS-II(W) Supported Configurations

Configuration	Drive Numbers									
	0	1	2	3	4	5	6	7	8	9
W + D	W	W	W	W	D	D	(D)	(D)		
W + S	W	W	W	W	S	S	(S)	(S)		
W + IS	W	W	W	W	IS	*				
W + D + S	W	W	W	W	D	D	(D)	(D)	S	S
W + D + IS	W	W	W	W	D	D	(D)	(D)	IS	*
W + S + IS	W	W	W	W	S	S	(S)	(S)	IS	*
D	D	D	(D)	(D)						
S	S	S	(S)	(S)						
IS	IS	*								
D + S	D	D	(D)	(D)	S	S				
D + IS	D	D	(D)	(D)	IS	*				
S + IS	S	S	(S)	(S)	IS	*				

```
D  = Double density flexible disk
IS = Integrated single density flexible disk
S  = Single density flexible disk
W  = Winchester disk
*  = Not available
() = Optional drive with particular configuration
```

NOTE

When using ISIS-II(W) on a development system with the Winchester
Peripheral Chassis turned off:

1.   The ISIS-II(W) operating system delays approximately 1 1/2
minutes before displaying the ISIS prompt after RESET is pressed.
This delay occures because the ISIS-II(W) operating system is
waiting for the Winchester Peripheral Chassis to respond to the
drive initialization sequence.

2.   The Winchester Peripheral Chassis retains the device numbers
:F0: through :F3:. The drive containing the ISIS-II(W) operating
system remains :F4:.   Because the ISIS-II(W) operating system
retains the :F0: default all commands must include the device
number (:F4: through :F9:). Failure to include the device number
in the command will result in an error message and necessitate
resetting the system.

ABOUT THIS SUPPLEMENT

This supplement is designed for use with the ISIS-II User's
Guide, (for Series II user's), and the Intellec Series III
Microcomputer Development System Console Operating Instructions
and the Intellec Series III Programmer's Reference Manual (for
Series III users).

Only the initialization and startup procedures, system commands
and calls, and error messages that have changed are discussed in
this supplement. For information on ISIS-II material that has not
changed, refer to the manuals listed in the preface under Related
Publications.

This chapter describes the initialization and subsequent startup procedures required when using the Winchester Peripheral Chassis on a Series II or Series III development system.

CAUTION

Do not turn the Winchester Peripheral Chassis on or off unless the development system is on. Failure to follow this precaution may result is damage to the disk drive recording head or surface.

INITIALIZATION- WINCHESTER NON-SYSTEM DISK

When the Winchester disk has not yet been formatted as a system disk, the procedure that follows should be used. (This procedure initializes and builds a system disk on the Winchester disk drive (F0) before booting from the Winchester disk drive.)

NOTE

When using the Winchester Peripheral Chassis, the Winchester disk drives are identified as :F0:, :F1:, :F2:, and :F3:; the flexible disk drives become :F4: through :F9:.

1. Power on the Series II or Series III development system.

2. Power on the Winchester Peripheral Chassis and the flexible disk device that corresponds to drive 4.

3. Insert the ISIS-II(W) Operating Software flexible disk into drive 4.

4. Press RESET, then type F.

5. Type:

    :F4:FORMAT :F0:SYSTEM.DSK S FROM 4

    The following message will appear:

    FORMATTING WILL DESTROY ALL FILES AND DATA ON DEVICE :F0:
    DO YOU WANT TO CONTINUE?

6.   Type:

     YES <CR> or Y <CR> to continue formatting. Type NO <CR> or N
     <CR> to abort the format command.

     If YES <CR> or Y <CR> is typed the following display message
     will appear:

      FORMATTING . . .
      CHECK READ . . .
     COPY SYSTEM FILES
     ISIS.TO
     ISIS.BIN
     ISIS.CLI
       .
       .
       .
     SYSTEM.LIB
     LINK
     LINK.OVL

     Note: This step requires approximately 10 minutes.

7.   Press RESET or Interrupt 1 when formatting is completed.

The system will now boot from drive 0 and the following message
display will appear:

ISIS-II(W) Vn.m
-

where

 Vn.m is the version number of the ISIS-II(W) software and the
 dash indicates the system is ready to accept commands.

Drive 0 is now the system disk.   The system will reboot from the
Winchester disk drive whenever the Interrupt 1 button is pushed
or whenever an ISIS abort occurs. The system will reboot from the
flexible disk drive whenever the ISIS-II(W) operating system disk
is in place and RESET is pressed.

SUBSEQUENT STARTUP- WINCHESTER SYSTEM DISK

Use the following procedure for the subsequent startup of any
Series II or Series III development system with a   formatted
Winchester disk drive.

1.   Power on the Intellec Series II or Series III.

2.   Power on the Winchester Peripheral Chassis and the flexible
     disk device that corresponds to drive 4.

3. Insert the ISIS-II(W) Operating Software flexible disk into drive 4.

4. Press RESET.

The system will now boot from drive 4 and the following display will appear:

ISIS-II(W) Vn.m
-

where

Vn.m is the version number of the ISIS-II(W) software and the dash indicates the system is now ready to accept commands.

POWER OFF SEQUENCE

Use the following sequence when turning off a development system with an attached Winchester Peripheral Chassis:

1. Type SPINDN and wait for the Winchester drive to spin down.

2. Turn off the power to the Winchester Peripheral Chassis.

3. Turn off the power to the development system.

This chapter discusses the following system commands and calls that have changed under the ISIS-II(W) version of ISIS:

System Commands
    DIR
    FIXMAP
    FORMAT
    HDCOPY
    IDISK
    SPINDN
    VERS

System Calls
    SPATH

DIR- Disk Directory Listing

The DIR command lists one or more directory entries of the disk
in a specific drive and sends the list to the console output
device or to a list file.

COMMAND SYNTAX

The syntax of the DIR command is:

     DIR [FOR<file>][TO<listfile>][<switch>]

The positions of these fields are not fixed.

where

<file> is the file or group of files (specified with the wild
card construction) whose directory entry is to be listed. If
FOR<file> is omitted, the entire directory is listed. If <file>
is not a wild card name (that is, does not contain * or ?) it is
listed even if it has the invisible attribute.

<listfile> is the name of the file to contain the directory
listing. If TO<listfile> is omitted, the listing is sent to the
console output device.

<switch> can be one or more of the following:

     0-9   Lists the directory of the disk in drives :F0: through
           :F9:. If this parameter is omitted, the directory of
           the disk in :F0: is listed. More than one drive number
           can be specified but only the directory for the
           rightmost drive is displayed. The drive number also
           overrides any device specification in FOR<file>.

     I   Lists all files, including files with the invisible
           attribute set. If this parameter is omitted, only
           files with the invisible attribute not set are listed.

     F   Gives fast output, listing only name.ext of files.

     O   Prints directory in a single column format. The
           default is double column format.

     Z   Prints the number of sectors presently used on the
           specified disk as a fraction of the number of available
           sectors.

     P   Pauses after loading the command. The system displays
           the message:

           LOAD SOURCE DISK, TYPE (CR)

After the disk is loaded and CR is pressed, the requested directory is output to the console output device. The system will then request that the system disk be replaced.

LOAD SYSTEM DISK, TYPE (CR)

DISCUSSION

The DIR default is the directory output in two columns with the following headings:

DIRECTORY of name.ext
NAME   .EXT BLKS LENGTH ATTR   NAME .EXT BLKS LENGTH ATTR

XXX/XXXX

 BLOCKS USED

where

   name.ext is the label of the disk volume that is assigned by the FORMAT or IDISK command. It has the same syntax as a filename.

   XXX/XXXX shows the number of blocks in use and the total number of blocks within the disk . A total of 44,520 blocks per logical device are available on the Winchester Peripheral Chassis and a total of 4,004 blocks are available on a double-density flexible disk. On a single-density flexible disk a total of 2,002 blocks are available.

EXAMPLES

Example 1.

The following example lists three files on a Winchester disk drive. The system files, which have the invisible attribute set, are not listed.

```
-DIR
DIRECTORY OF :F0:SYSTEM.DSK
NAME  .EXT  BLKS  LENGTH  ATTR      NAME  .EXT  BLKS  LENGTH  ATTR
PROGA .HEX    75  9263    W          SUMS         51  6357
SYSTEM.LIB    26  3128    WS
                                152
1691/44520 BLOCKS USED
```

Example 2.

This is the same as example 1 except a fast listing is requested.

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```
-DIR F
DIRECTORY OF :F0:SYSTEM.DSK
PROGA .HEX        SUMS
SYSTEM.LIB
1691/44520 BLOCKS USED
```

Example 3.

This example requests a directory listing of all format files be
sent to the line printer. The format files have the invisible
attribute and ISIS.* is a wild card filename, so the I switch
must be specified.

```
-DIR I FOR ISIS.* TO :LP:
```

Example 4.

A single-column fast directory listing of all files (including
the invisible files) on the Winchester drive :F0: is requested by
the following command:

```
-DIR O F I
DIRECTORY OF DISK :F0:SYSTEM.DSK
ISIS   .DIR
ISIS   .MAP
ISIS   .TO
ISIS   .LAB
ISIS   .BAD
ISIS   .BIN
ISIS   .CLI
ISIS   .OV0
HEXOBJ
ATTRIB
COPY
IDISK
SUBMIT
DIR
LIB
FIXMAP
RENAME
SPINDN
VERS
DELETE
FORMAT
LOCATE
EDIT
SYSTEM.LIB
PROGA .HEX
SUMS
OBJEX
LINK   .OVL
LINK
1691/44520 BLOCKS USED
```

FIXMAP- Map Bad Sectors on Winchester Disk

The FIXMAP command records the presence of bad sectors on a
Winchester disk. Flexible disks do not have a corresponding
command.

COMMAND SYNTAX

The syntax of the FIXMAP command is:

    FIXMAP<drive>

where

  <drive> is the number of the Winchester disk on which the command
  is to operate. Unlike IDISK or FORMAT, FIXMAP requires a drive
  number, not a drive name, for <drive>.

DISCUSSION

Various hardware and software problems can cause a sector on a
disk to become bad, or unreliable. The FORMAT and IDISK commands
in ISIS recognize some bad sectors and record the numbers of
those sectors to prevent their allocation to files. The following
message reports that on drive 1, track 137, sector 106, is bad:

    BAD SPOT AT LOGICAL ADDRESS (137,106), STATUS = 0040

When the FIXMAP command is entered, the console displays the
message:

    ISIS-II MAP FIXER Vx.y

where

  x.y is the version number of the FIXMAP program.

FIXMAP commands

The operation of FIXMAP is directed by entering commands from the
following list. FIXMAP prompts with an asterisk whenever it is
ready to accept a command.

      Mark<disk address>   Change the known state of a sector from
                           good to bad.

      Free<disk address>   Change the known state of a sector from
                           bad to good.

      List[<filename>]   List all known bad sectors.

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Count   List the number of known bad sectors.

Record   Record   changes specified by Mark and
                                Free.

Quit   Exit   to ISIS without recording
                                changes.

Exit   Record changes and exit to ISIS.

A   command   may   be   truncated   at   any   point   after   its   first
character.   For example, M, MA, or MAR may be used to stand for
Mark.

When a command calls for a disk address, that address should have
the form:

    <track><sector>[T]

where

  <track>   is   a number from 0 to 211 that specifies the track on
  which the bad sector exists.

  <sector> is a number from 1 to 210 that specifies the number of
  the bad sector within the track.

  [T] is an optional switch that indicates a group of 70 sectors
  should be processed.

The   T switch is appropriate if the STATUS reported in the error
message was 0001,000A, or 000E.   (See ISIS-II(W) Error Messages
in Appendix A.)

If the T switch is present, the <sector> number specifies a group
of 70 sectors on <track>.

If <sector> is in the range 1-70, that group of sectors is
processed.

If <sector> is in the range 71-140, that group of sectors is
processed.

If <sector> is in the range 141-210, that group of sectors is
processed.

After   all   of   the sectors have been processed, the console
displays the message: TRACK PROCESSED.

Track and sector numbers, and the T switch, if present, should be
separated   by   spaces.   The track and sector numbers should be
those reported in the error message that identified the bad
sector.

Mark Command. The Mark command changes the known state of a sector from good to bad.

The syntax of the Mark command is:

    MARK<disk address>

where

<disk address> is the track-and-sector to be marked as bad.

If the T switch is present, a group of 70 sectors is marked as bad. A sector known to be bad is not allocated to any file.

If the sector specified in the Mark command is not associated with an existing file, the sector is marked as bad. If the T switch is not present, the system displays

    SECTOR MARKED

If the T switch is present, no message appears when a single sector is marked; instead, when all 70 sectors have been processed, the system displays the message:

    TRACK PROCESSED

If the sector belongs to an existing file, it cannot be marked as bad. Under any of the following conditions, the sector is not marked:

If the sector belongs to one of the required ISIS format files, the system displays:

    (track,sector)REQUIRED BY ISIS-II

The system will be unreliable when the questionable disk is being used. Reformat the Winchester disk and copy the program and data files onto it.

If the sector is already known to be bad, it is redundant to mark the sector. The system displays:

    (track,sector)ALREADY MARKED

If the sector belongs to a file other than a required format file, the system displays:

    (track,sector)IN USE

If the name of the file is known, exit to ISIS and delete the file; then use FIXMAP to mark the bad sector. If the name of the file is not known, follow this procedure:

1.   Exit to ISIS, using either the Quit or the Exit command (described below).

2. Give the command

        COPY :Fm:*.* TO :Fn: Q C

where

   Fm is the device name of the disk being fixed, and Fn is the name
   of another disk. Because of the Q switch, a list of copied files
   will be generated.   (See the COPY description in the ISIS-II
   User's Guide or the Series III Console Operating Instructions.)

3a.   If the copy is successful, disk :Fn: contains a usable copy
of disk :Fm:.   Use FIXMAP to get a list of bad sectors on :Fm:;
then use IDISK or FORMAT to reformat :Fm:,   and use FIXMAP to
mark any bad sectors missed by the formatting command.

3b.   If an error occurs while the disk is being copied, note the
last filename displayed by COPY and the track and sector numbers
that appear in the error message. Use the DELETE command to
delete the bad file from :Fm:; then use FIXMAP to mark the bad
sector. (See the DELETE description in the ISIS-II User's Guide
or the Series III Console Operating Instructions.) If an error
occurs and prevents you from deleting the file, repeat step 2.
The file you attempted to delete will not be copied to the new
disk. Then repeat step 3a.

EXAMPLES

Example 1.

The following example illustrates the use of the Mark command.

        *MARK 27 83
         SECTOR MARKED
        *MARK 27 83
         (27,83) ALREADY MARKED

Free Command.   The Free command changes the known state of a
sector from bad to good.

The syntax of the Free command is:

        FREE<disk address>

where

   <disk address> is the track-and-sector address of the sector
   to be freed for allocation.

If the T switch is present, a group of 70 sectors is freed. Use
this command if a sector has been marked by mistake.

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If the sector specified in the Free command is known to be bad, it is freed for allocation. If the T switch is not present, the system displays:

SECTOR FREED

If the T switch is present, no message appears when a single sector is freed; instead, when all 70 sectors have been processed, the system displays the message:

TRACK PROCESSED

Under either of the following conditions, the sector is not freed:

If a sector is already free for allocation, it is redundant to free the sector. The system displays:

(track,sector) ALREADY FREE

If the sector is not free because it is being used by a file, the system displays:

(track,sector) NOT A BAD SECTOR

A good sector that is part of an existing file should not be freed.

Example 2.

The following example illustrates the use of the Free command. Note that 8 5 T and 8 10 T identify the same group of 70 sectors, i.e., sectors 1-70 on track 8.

```
*FREE 180 51
 SECTOR FREED
*MARK 8 5 T
 TRACK PROCESSED
*FREE 8 10
 SECTOR FREED
*FREE 8 10 T
 (8,10) ALREADY FREE
 TRACK PROCESSED
```

List Command. The List command writes a list of all known bad sectors on the named file.

The syntax of the List command is:

LIST[<filename>]

where

[<filename>] is an optional parameter that specifies the listing file.

The listing file may be either an output device or a disk file. It may not reside on the disk being fixed. If no filename is given, the list is printed on the console.

The format of the output is one sector per line, with track and sector number separated by a comma. The list includes all sectors marked by FIXMAP, and bad sectors found by IDISK and FORMAT.

If there are no known bad sectors, the system displays:

    NO BAD SECTORS

If output is directed to a device other than the console, the following message is displayed after the list is written to the device:

    LIST WRITTEN

If the named file resides on the disk being fixed, the system displays:

    CANNOT LIST TO TARGET DRIVE

Example 3.

The following example illustrates the use of the List command. The list is written first to the console, then to a disk file.

    *LIST
     180,63
     182,115
     182,116
     182,117
    *LIST DISK.FIL
     LIST WRITTEN

Count Command. The Count command reports the number of known bad sectors on the disk.

The syntax of the Count command is:

    COUNT

The command displays the following message on the console:

    xxxxx BAD SECTORS

where

xxxxx is a decimal number, the number of known bad sectors on the disk. A sector that has not been marked, or a sector that has been marked and then freed, is not a known bad sector.

Example 4.

The following example illustrates the use of the Count command.

```
*LIST
 180,63
 182,115
 182,116
 182,117
*COUNT
 4 BAD SECTORS
```

Record Command. The Record command records the changes specified by Mark and Free.

The syntax of the Record command is:

    RECORD

When this command is entered, the changes specified by Mark and Free are recorded on the disk.

When the Exit command is used to leave the FIXMAP program, the Record command is unnecessary. (Exit is described below.) When using the Quit command, the Record command is required; otherwise; none of the marking and freeing specified during the work session- or since the last Record command- will actually take effect.

When the recording is complete, the system displays:

    CHANGES RECORDED

If no sector has been marked or freed during the work session- or since the last Record command- the system displays:

    NO CHANGES

Example 5.

The following example illustrates the use of the Record command.

```
*RECORD
 CHANGES RECORDED
*RECORD
 NO CHANGES
```

Quit Command. The Quit command stops the operation of FIXMAP and returns control to ISIS.

The syntax of the Quit command is:

    QUIT

If the Record command has not been given, changes specified by Mark and Free are not recorded on the disk.

Example 6.

The following example illustrates the use of the Quit command. Note that the freeing of sector 12,86 is not recorded on the disk; therefore, upon reentry to FIXMAP, that sector is still known as bad.

    *FREE 12 86
    SECTOR FREED
    *QUIT
    -FIXMAP 1
    ISIS-II MAP FIXER Vx.y
    *LIST
     12,86

Exit Command. The Exit command records changes and returns command to ISIS.

The syntax of the Exit command is:

    EXIT

The Exit command is equivalent to the Record command followed by the Quit command: changes specified by Mark and Free are recorded on the disk, and control returns to ISIS.

Example 7.

The following example illustrates the use of the Exit command. (Compare this example with example 6, above.)

    *FREE 12 86
     SECTOR FREED
    *EXIT
     CHANGES RECORDED
    -FIXMAP 1
    ISIS-II MAP FIXER Vx.y
    *LIST
     NO BAD SECTORS

FIXMAP Errors

The following errors cause immediate termination of FIXMAP and returns control to ISIS. If execution terminates because of one of the errors, work done since the last Record command is not recorded on the disk.

If no Winchester disk drive is present, the system displays:

    USE ON WINCHESTER SYSTEM ONLY

If no drive number is given in the FIXMAP command, or if an illegal switch is present, the system displays:

    INVALID SYNTAX

If this message appears in response to a command within FIXMAP, the command was typed incorrectly. However, the incorrectly typed command will not terminate the session.

If the specified drive number is greater than 3, the system displays:

    DRIVE NUMBER OUT OF RANGE

(In the maximum configuration of the system, the Winchester system disk drive is number 0.)

If the disk does not exist in the system, is not on-line, or is not properly connected, the system displays:

    ERROR 30 USER PCXXXX

where

 xxxx is a hexadecimal number.

Example 8.

The following example illustrates a typical work session with FIXMAP. Invoke the command and begin by getting a list of all bad sectors on the target drive (drive 1, as indicated in the FIXMAP command). The Count command reports eight bad sectors, and the Record command shows that no sectors have been marked or freed during this work session. Free the last 36 sectors on the track that contains track 170, sector 113; all sectors except the eight known bad sectors are reported already to be free. Mark track 170, sector 113 as a bad sector, and again list and count the number of bad sectors. This time, the record command reports that changes have been made. Free the remaining bad sector, list again, and return to the ISIS operating system.

    -FIXMAP 1
     ISIS-II MAP FIXER V1.0
    *LIST
     170,113
     170,114
     170,115
     170,116
     170,117
     170,118

```
 170,119
 170,120
*COUNT
 8 BAD SECTORS
*RECORD
 NO CHANGES
*FREE 170 113 T
 (170,109) ALREADY FREE
 (170,110) ALREADY FREE
 (170,111) ALREADY FREE
 (170,112) ALREADY FREE
 (170,121) ALREADY FREE
 (170,122) ALREADY FREE
 (170,123) ALREADY FREE
 (170,124) ALREADY FREE
 (170,125) ALREADY FREE
 (170,126) ALREADY FREE
 (170,127) ALREADY FREE
 (170,128) ALREADY FREE
 (170,129) ALREADY FREE
 (170,130) ALREADY FREE
 (170,131) ALREADY FREE
 (170,132) ALREADY FREE
 (170,133) ALREADY FREE
 (170,134) ALREADY FREE
 (170,135) ALREADY FREE
 (170,136) ALREADY FREE
 (170,137) ALREADY FREE
 (170,138) ALREADY FREE
 (170,139) ALREADY FREE
 (170,140) ALREADY FREE
 (170,141) ALREADY FREE
 (170,142) ALREADY FREE
 (170,143) ALREADY FREE
 (170,144) ALREADY FREE
 TRACK PROCESSED
*MARK 170,113
 SECTOR MARKED
*LIST
 170,113
*COUNT
 1 BAD SECTOR
*RECORD
 CHANGES RECORDED
*FREE 170,113
 SECTOR FREE
*LIST
 NO BAD SECTORS
*EXIT
 CHANGES RECORDED
```

FORMAT- Disk Formatting Command

The FORMAT command formats a new disk for use with ISIS.

COMMAND SYNTAX

The syntax of the FORMAT command is:

        FORMAT <device><label>[<switches>]

where

   <device> is the name of the drive that contains the disk to be
   formatted. If :F0: is specified without a FROM switch, or if
   :F0: and FROM 0 are specified, then an error will result.

   is the name to be given to the disk. The syntax of
   is the same as for filename, with up to six characters
   for name and three characters for extension.

   <device><label> must be entered with no intervening space or
   comma, as in :F1:MYDISK. At least one space must be entered
   before and after <device><label>.

   <switches> are one or more of the following:

   A copies all files to the specified drive. The new disk contains
   all the files that were on the source disk. If the source disk
   is a system disk, the new disk becomes a system disk. (The S
   switch functions differently under FORMAT than it does under
   IDISK.)

   FROM n specifies the disk drive that contains the disk files
   needed for formatting. n is an integer 0-9, specifying drives
   :F0: through :F9:. If the FROM n switch is not specified the
   default is to :F0:. If n is not a valid integer 0-9, the
   following error message appears on the :CO: device:

        XX,UNRECOGNIZED SWITCH

where

   XX is the invalid integer.

DISCUSSION

        ISIS disks are of two types: system and non-system. A disk
   is formatted as a system or non-system disk depending on the type
   of source disk used and on the switches specified in the FORMAT
   command.

   When a system disk is formatted, FORMAT copies other files in

addition to the basic format files. When a non-system disk is formatted, however, FORMAT copies only the basic format files: ISIS.DIR, ISIS.MAP, ISIS.T0, ISIS.LAB, and ISIS.BAD. Any other files that are to be on the new disk must be copied with the COPY command. (See the COPY description in the ISIS-II User's Guide or the Series III Console Operating Instructions.)

Before formatting a Winchester disk, FORMAT will print the following message:

    FORMATTING WILL DESTROY ALL FILES AND DATA ON DISK DRIVE :F0:
    DO YOU WANT TO CONTINUE? (Y/N)

If an error occurs during the formatting of the Winchester disk, the following message will be displayed:

    FORMAT ERROR: XX

where

    XX is a Winchester disk drive error number. (See ISIS-II(W) Error Messages in Appendix A.)

If <device> is :F0: and :F0: is a Winchester disk drive and the S switch is not specified, the following error message appears on the :CO: device:

    NON-SYSTEM WINCHESTER DRIVE 0 NOT ALLOWED

:F0: must be formatted as a system disk.

When the FORMAT Command is used to format a Winchester disk it reads defective track information supplied and stored on the disk. If FORMAT cannot read this information, the following error message appears:

    CANNOT READ DEFECTIVE TRACK INFORMATION

When this message appears contact an Intel Customer Engineer.

When FORMAT is used with a Winchester disk, it verifies each sector. If FORMAT cannot read a sector reserved for an ISIS file, the message

    FATAL BAD SPOT AT LOGICAL ADDRESS (ttt,sss),STATUS=nnnn

appears on the console, and ISIS.CLI is reloaded. ttt is the logical track address (in decimal); sss is the sector track address (in decimal); and nnnn is the Winchester disk error status (in hexadecimal). If the unreadable sector does not correspond to an ISIS file, then the message

    BAD SPOT AT LOGICAL ADDRESS (ttt,sss),STATUS=nnnn

is displayed. ISIS allocates Winchester disk sectors serially,

thus if no mechanism existed to "skip over" bad hard disk
sectors, the remaining sectors would remain unallocated.
Instead, ISIS checks Winchester disk sectors for irregularities
during FORMAT and IDISK operations. If a bad sector is
encountered, it is allocated to ISIS.BAD and disk formatting
continues.

EXAMPLES

Example 1.

This example shows the creation of a duplicate system disk in
:F4:. This example does not copy any non-system files on that
disk.

```
-FORMAT :F4:IS00AS.SYS S
COPYING SYSTEM FILES
ISIS.TO
ISIS.BIN
ISIS.CLI
ISIS.OV0
HEXOBJ
ATTRIB
COPY
IDISK
SUBMIT
DIR
LIB
FIXMAP
VERS
RENAME
SPINDN
FORMAT
DELETE
EDIT
LOCATE
OBJHEX
SYSTEM.LIB
LINK
LINK.OVL
-
```


Example 2.

This example formats a basic non-system disk on drive :F1:,
giving it the name LIB.V1. System files are not copied.

```
-FORMAT :F1:LIB.V1
NON-SYSTEM DISK
-
```

Example 3.

This example formats a Winchester disk in drive :F0: as a system disk; the files with the system or format attribute set are copied from a system disk in :F4:.

```
-:F4:FORMAT :F0:SYSTEM.DSK S FROM 4
FORMATTING WILL DESTROY ALL FILES AND DATA ON DRIVE :F0:
 DO YOU WANT TO CONTINUE?  (Y/N)
 FORMATTING . . .
 CHECK READ . . .
COPYING SYSTEM FILES
ISIS.TO
ISIS.BIN
ISIS.CLI
 .
 .
 .
SYSTEM.LIB
LINK
LINK.OVL
-
```

HDCOPY

ISIS-II(W) does not support the command HDCOPY. This command is not applicable since the Winchester Peripheral Chassis does not contain removable platters.

IDISK- Disk Formatting Command

The IDISK Command formats a new disk for use with ISIS.

COMMAND SYNTAX

The syntax of the IDISK command is:

    IDISK<device><label>[<switch>]

where

<device> is the name of the drive that contains the disk to be
formatted. If :F0: is specified without a FROM switch, the
system assumes a single disk system and prompts for disk swaps as
needed. Disk swapping is not required if any drive other than
:F0: is specified. :F0: must be formatted as a system disk.

If <device> is :F0: and :F0: is a Winchester disk and the S
switch is not specified, the following error message appears on
the :CO: device:

    NON-SYSTEM WINCHESTER DRIVE 0 NOT ALLOWED

is the name to be given to the disk. The syntax of label
is the same as for filename, with up to six characters for name
and three for extension.

<device><label> must be entered with no intervening space or
comma, as in :F1:MYDISK. At least one space must be entered
before and after <device><label>.

<switches> are one or more of the following:

S specifies that the new disk is formatted as a basic system
disk. If S is not specified, the disk is formatted as a basic
non-system disk.

P specifies that IDISK operates in single drive mode, prompts for
output and system disks, and pauses to display the prompt
messages and to allow changes of disks.

FROM n specifies the disk drive that contains the disk files
needed for formatting. n is an integer 0-9, that specifies
drives :F0: through :F9:. If the FROM n switch is not specified,
the default is to :F0:. If n is not a valid integer 0-9, the
following error message appears on the :CO: device:

    XX,UNRECOGNIZED SWITCH

where

XX is the last digit or digits of the invalid integer.

DISCUSSION

A blank disk must be formatted before it can be used by ISIS. ISIS disks are of two types: system and non-system. The type of disk to be formatted is specified by the presence or absence of a switch with the command.

IDISK copies only the files needed for a basic disk (whether system or non-system). A basic disk contains only the files needed to format the disk: ISIS.DIR, ISIS.MAP, ISIS.T0, ISIS.LAB and ISIS.BAD. For a basic system disk, IDISK copies two additional files: ISIS.BIN and ISIS.CLI.

If any additional files such as command files are to be on the new disk, they must be copied with the COPY command. (See the COPY description in the ISIS-II User's Guide or the Series III Console Operating Instructions.)

Before formatting a Winchester disk, IDISK will print the following message:

    FORMATTING WILL DESTROY ALL FILES AND DATA ON DISK DRIVE :F0:
    DO YOU WANT TO CONTINUE (Y/N)

If an error occurs during the formatting of the Winchester disk, the following message will be displayed:

    FORMAT ERROR: XX

where

    XX is a Winchester disk error number. (See ISIS-II(W) Error Messages in Appendix A.)

IDISK can be used on single drive and multiple drive disk systems. On single drive systems, the user is prompted to remove the system disk and to insert the blank disk. When formatting is completed, the user is prompted to insert the original system disk. In systems with only 32K of RAM, two swaps of disks are required.

The IDISK Command reads defective track information supplied and stored on the Winchester disk. If IDISK cannot read this information, the following error message appears:

    CANNOT READ DEFECTIVE TRACK INFORMATION

When this message appears contact an Intel Customer Engineer.

When IDISK is used with a Winchester disk, IDISK verifies each sector. If IDISK cannot read a sector reserved for an ISIS file,

then the message

        FATAL BAD SPOT AT LOGICAL ADDRESS(ttt,sss),STATUS=nnnn

appears on the console, and ISIS.CLI is reloaded. ttt is the
logical track address (in decimal); sss is the logical sector
address (in decimal); and nnnn is the Winchester disk error
status (in hexadecimal). If the unreadable sector does not
correspond to an ISIS file, then the message

        BAD SPOT AT LOGICAL ADDRESS(ttt,sss),STATUS=nnnn

is displayed. ISIS allocates Winchester disk sectors serially;
thus, if no mechanism existed to "skip over" bad disk sectors,
the remaining sectors would remain unallocated and unusable.
Instead, ISIS checks Winchester disk sectors for irregularities
during FORMAT and IDISK operations. If a bad sector is
encountered, it is allocated to ISIS.BAD and hard disk formatting
continues.

EXAMPLES

Example 1.

This example formats a flexible disk in :F4: as a basic system
disk and gives the disk the name NSYS.V1. The COPY command
copies all other non-format files from the disk in drive :F0: to
the disk in drive :F4:.

        -IDISK :F4:NSYS.V1 S
        SYSTEM DISK
        -COPY *.* TO :F4: C B
        COPIED :F0:ASM80 TO :F4:ASM80
        COPIED :F0:ASM80.OV0 TO :F4:ASM80.OV0
        COPIED :F0:ASM80.OV1 TO :F4:ASM80.OV1
        .
        .
        .
        COPIED :F0:FPAL.LIB TO :F4:FPAL.LIB
        COPIED :F0:PLM80.LIB TO :F4:PLM80.LIB
        COPIED :F0:SYSTEM.LIB TO :F4:SYSTEM.LIB
        -

Example 2

This example formats a Winchester disk in drive :F0: as a basic
system disk; the basic files needed to format the disk are copied
from a system disk in drive :F4:. The COPY command should then
be used to copy other files onto the newly formatted disk, as in
the previous example.

VERS- Display Version Number

The VERS command lists the version number of the ISIS operating system commands.

COMMAND SYNTAX

The syntax of the VERS command is:

VERS <command>

where

 <command> is one of the ISIS command.

DISCUSSION

The VERS command identifies the version number of the different versions of the ISIS operating system command. Each version only works correctly with the corresponding version of ISIS.

ISIS-II(W) operates with any command that displays a version number followed by W.

EXAMPLE

Example 1.

The following example displays the version of the IDISK command:

    -VERS IDISK
    V4.2W

SPATH- Obtain File Information

The SPATH call allows your program to obtain information relating to a specified file. The information returned by this call includes the device number, file name and extension, device type, and if a disk file, the drive type.

COMMAND SYNTAX

A parameter list of three variables must be passed with the SPATH call:

1.   The address of an ASCII string that contains the name of the file for which information is requested. The string can contain leading spaces but cannot contain embedded spaces. The string must be terminated by a character other than a letter, digit, colon (:), or period (.). A space can be used.

2.   The address of a 12-byte memory location in which the system will return the information. After the call is completed, the buffer will contain the following information:

      Byte 0- Device number

      Bytes 1 through 6- file name

      Bytes 7 through 9- file name extension

      Byte 10- Device type

      Byte 11- Device type

The possible values for device number are:

      0- disk drive 0
      1- disk drive 1
      2- disk drive 2
      3- disk drive 3
      4- disk drive 4
      5- disk drive 5
      6- teletype input
      7- teletype output
      8- CRT input
      9- CRT output
      10- user console input
      11- user console output
      12- teletype paper tape reader
      13- high speed paper tape reader
      14- user reader 1
      15- user reader 2

```
16- teletype paper tape punch (teletype)
17- high speed paper tape punch
18- user punch 1
19- user punch 2
20- line printer
21- user list 1
22- byte bucket (a pseudo input/output device)
23- console input
24- console output
25- disk drive 6
26- disk drive 7
27- disk drive 8
28- disk drive 9
```

The file name and extension are the ISIS file name.

The device type specifies the type of peripheral with which the file is associated. The possible values for this field are:

```
0- sequential input device
1- sequential output device
2- sequential input/output device
3- random access input/output device
```

The drive type field specifies the type of drive controller if the device type field is 3. If the device type is anything except 3, the drive type is undefined. The possible values for a device type of 3 are:

```
0- controller not present
1- two-board double density
2- two-board single density
3- integrated single density
9- Winchester disk device
```

3.   The address of a memory location for the return of a nonfatal error number. The nonfatal error numbers issued by the SPATH call are: 4, 5, 23, and 28.

EXAMPLES

1.   PL/M SPATH Call Example:

```
SPATH:
  PROCEDURE (FILE,BUFFER,STATUS)EXTERNAL;
    DECLARE(FILE,BUFFER,STATUS)ADDRESS;
  END SPATH;
  •
  •
  •
DECLARE FILENAM(15)BYTE;
DECLARE BUF$IN(12)BYTE;
DECLARE STATUS ADDRESS;
```

```
            .
            .
            .
CALL SPATH (.FILENAM,.BUF$IN,.STATUS);
IF STATUS < > 0 THEN...
            .
            .
            .
```

2. Assembly Language SPATH Call Example:

```
            EXTRN           ISIS        ;LINK TO ISIS ENTRY POINT
SPATH       EQU             14          ;SYSTEM CALL IDENTIFIER
;
            MVI             C,SPATH     ;LOAD IDENTIFIER
            LXI             D,SBLK      ;LOAD PARAM ADDR
            CALL            ISIS
            LDA             SSTAT       ;TEST ERROR STATUS
            ORA             A
            JNZ             EXCEPT      ;BRANCH TO EXCEPTION
                                       ;ROUTINE
            .
            .
            .
SBLK                                    ;PARAMETER BLOCK FOR
                                       ;SPATH
            DW              FILEN       ;POINTER TO FILE NAME
            DW              BUFIN       ;POINTER TO BUFFER
            DW              SSTAT       ;POINTER TO STATUS
;
FILEN:      DS              15          ;FILE NAME FIELD
BUFIN:      DS              12          ;BUFFER FOR DATA
SSTAT:      DS              2           ;STATUS (RETURNED)
;
```

ISIS-II(W) error messages are identical to ISIS-II error messages with the following exceptions:

When error number 24 occurs, the following message is output to the console:

```
STATUS = 00nn
D = x  T = yyy  S = zzz
```

where

x represents the drive number, yyy represents the track address, zzz represents the sector address, and where nn has the following meaning for the Winchester disk drive:

```
01 Cylinder address miscompare
02 Seek error
03 Controller RAM error
04 Controller ROM error
05 Seek in progress error
06 Illegal track format
07 End of media detected during transfer
08 Illegal sector size detected
09 Diagnostic fault
0A No index pulse detected
0B Invalid controller command issued
0C Sector not found
0D Invalid disk address issued
0E Drive not ready
0F Attempt to write to write protected unit
0F Seek error
20 Data field ECC error
40 ID field ECC error
80 Drive fault
```

The SERIES II/III CUSTOMER WINCHESTER DIAGNOSTIC flexible disk provides the Winchester disk drive user with a convenient user confidence test. This confidence test is designed to check a variety of hardware related functions on the Winchester disk drive.

This test should be performed whenever a disk malfunction is suspected or whenever the Winchester Peripheral Chassis has been physically relocated.

<div align="center">CAUTION</div>

Do not turn the Winchester Peripheral Chassis on or off unless the development system is on. Failure to follow this precaution may result in damage to the the disk drive recording head or surface.

To run the confidence test:

1. Power on the Intellec Series II or Series III development system.

2. Power on the Winchester Peripheral Chassis and the flexible disk drive that corresponds to drive 4.

3. Insert the SERIES II/III CUSTOMER WINCHESTER DIAGNOSTIC flexible disk into drive 4.

4. Press RESET, then type F.

The system will now boot from drive 4 and the following display will appear:

ISIS-II(W) Vn.m
-

where

Vn.m is the version number of the ISIS-II(W) software and the dash indicates the system is now ready to accept commands.

5. Type :F4:STFS <CR>

The following display will appear:

ISIS-II STFS, V1.1
*

6.   Type INI:F4:SIIWIN <CR>

The following display will appear:

WINCHESTER CONFIDENCE TEST
      FOR ISIS-II(W) PERIPHERAL CHASSIS V 1.0
PASS
MIO/VERSION 1.07
USER RETURN
*

7.   Type T to begin the test.

The following display will appear as each componet of the test is
run:

```
TEST 000BH                         ****IGNORED****
TEST 000EH                         ****IGNORED****
TEST 0010H                         ****IGNORED****
0000H RESET TEST                   "PASSED"
0001H TRANSFER STATUS              "PASSED"
0002H BUFFER I/O TEST              "PASSED"
0003H ROM CHECKSUM TEST            "PASSED"
0004H RAM WINDOW TEST              "PASSED"
0005H RAM ADDRESS TEST             "PASSED"
0006H FORMAT TEST                  "PASSED"
0007H MICRO-DIAGNOSTICS            "PASSED"
0008H SEEK/VERIFY TEST             "PASSED"
0009H WORST CASE SEEK TEST         "PASSED"
000AH WRITE/READ TEST              "PASSED"
000CH PLATTER/HEAD TEST            "PASSED"
000DH SECTOR SELECTION             "PASSED"
000FH TRACK VERIFY                 "PASSED"
0011H ALTERNATE TRACK TEST         "PASSED"
0012H ZERO FILL TEST               "PASSED"
0013H DATA OVERRUN TEST            "PASSED"
0014H AUTO-INCREMENT TEST          "PASSED"
*
```


After the confidence test is completed, the status of each test
should   read "PASSED" (except for for 000BH, 000EH, and 0010H,
all of which should read "****IGNORED****").

If the status of any test is reported as "FAILED", contact an
Intel Customer Engineer.

8.   Type EXIT to return to the ISIS operating system.

Table B-1.
Summary of ISIS-II(W) Confidence Test

TEST NO.	TEST NAME	TEST DESCRIPTION
000H	RESET	Restarts the controller and initializes drive specified at initialization.
0001H	TRANSFER STATUS	Checks communication lines to and from the controller by enabling the transfer status function.
0002H	BUFFER I/O	Verifies the transfer of data to and from the controller.
0003H	ROM CHECKSUM	Checks the controller ROM by running the ROM on-board checksum test.
0004H	RAM WINDOW	Checks RAM data integrity by walking ones and then zeros through all memory locations.
0005H	RAM ADDRESS	Checks that all RAM address lines are working and that each bit of RAM can be turned on or off.
0006H	FORMAT	Formats and verifies diagnostic tracks on the drive specified at initialization.
0007H	MICRO-DIAGNOSTICS	Checks controller functions by executing the controller on-board micro-diagnostic.
0008H	SEEK/VERIFY	Checks seek and verify functions by verifying a sector on the last track and then verifying a sector on the first track.
0009H	WORST CASE SEEK	Checks seek and verify functions by seeking from track 0 to track 0+1, track 0 to track 0+2, etc., until seeking is performed from track 0 to all other tracks.
000AH	WRITE/READ	Checks the controller write and read functions by writing to and reading from diagnostic tracks.
000BH	DRIVE SELECTION	This test is reserved for future system use.

000CH	PLATTER/HEAD	Verifies that each platter and head can be accessed individually.
000DH	SECTOR SELECTION	Checks that each sector of a track can be addressed.
000EH	OVERLAP	This test is reserved for future system use.
00FH	TRACK VERIFY	Verifies that a predetermined number of tracks is available on the drive.
0010H	PLATTER VERIFY	This test is reserved for future system use.
0011H	ALTERNATE TRACK	Checks alternate track capability by using the first and last diagnostic tracks.
0012H	ZERO FILL	Checks the controller's zero fill capability by verifying that partial sectors are zero-filled.
0013H	DATA OVERRUN	Checks the area immediately following a partial sector read to determine if extra (overrun) data is being read.
0014H	AUTO-INCREMENT	Verifies the controller's ability to increment to the next sector, head, or cylinder.

CAUTION

Moving the Winchester Peripheral Chassis without locking the drive head into position may result in damage to the drive head or to the recording surface. Always lock the head before moving the Winchester Peripheral Chassis.

Before moving the Winchester Peripheral Chassis:

1. Type SPINDN.

2. Turn off the power to the Winchester Peripheral Chassis and wait for the drive to stop.

3. Loosen the front panel by pulling out the fasteners located in each corner, and then remove the panel. (See figure C-1.)

4. Move the locking lever to the right, then up and to the left, to lock the head into position. (See figure C-2.)

5. Move the Winchester Peripheral Chassis to the desired location.

6. Move the locking lever to the right, and then down, to unlock the drive head.

7. Replace the front panel and push in the four fasteners.

8. Turn on the power to the the Winchester Peripheral Chassis.
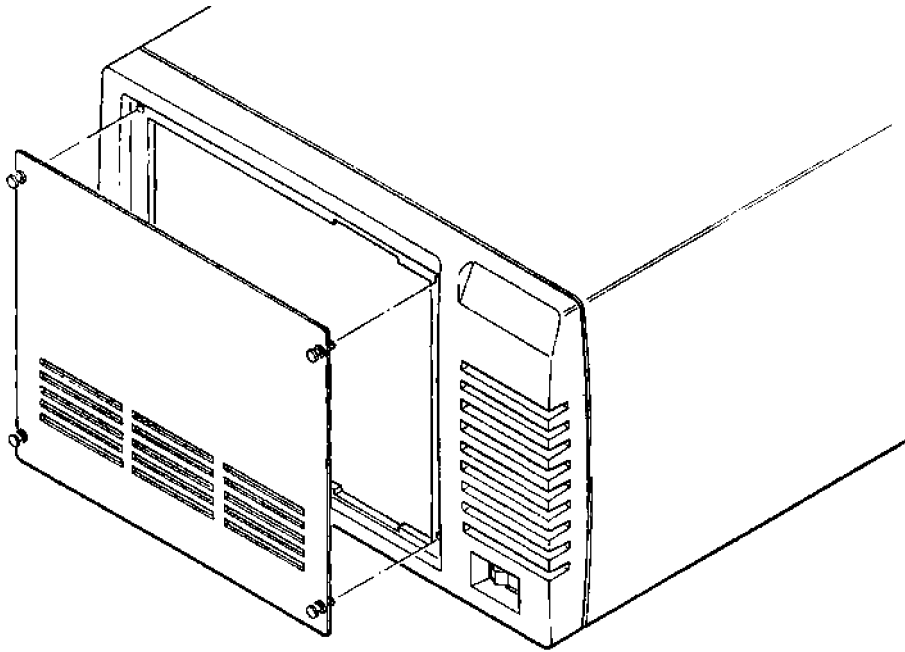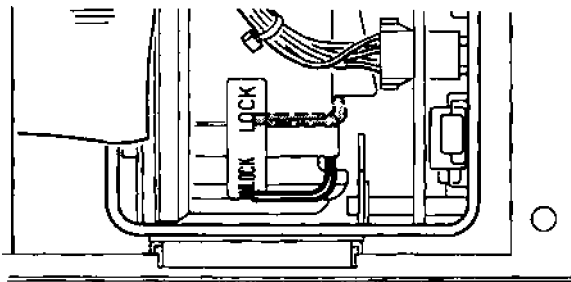
9. Run the ISIS-II(W) Confidence Test. (See Appendix B.)

Figure C-1.
Front Panel

Figure C-2.
Locking Lever