CROSS C COMPILER
INSTALLATION MANUAL

ACKNOWLEDGEMENTS

I would like to thank Steve Guntly and Jana Hibbs for their assistance in completing this manual.

COPYRIGHT AND REVISION HISTORY

This manual reflects Version 2.4 of the OS-9 Operating System, Version 3.2 of the OS-9 Cross Compiler, Version 1.2 of the OS-9000 Operating System, and Version 1.2 of the OS-9000 Cross Compiler.

Publication Editor: Eileen Beck
Revision: B
Publication date: April, 1991
Product Number: XCC 68NA 68IM

DISCLAIMER

The information contained herein is believed to be accurate as of the date of publication. However, Microware will not be liable for any damages, including indirect or consequential, from use of the OS-9 operating system, Microware-provided software or reliance on the accuracy of this documentation. The information contained herein is subject to change without notice.

REPRODUCTION NOTICE

The software described in this document is intended to be used on a single computer system. Microware expressly prohibits any reproduction of the software on tape, disk or any other medium except for back-up purposes. Distribution of this software, in part or whole, to any other party or on any other system may constitute copyright infringements and misappropriation of trade secrets and confidential processes which are the property of Microware and/or other parties. Unauthorized distribution of software may cause damages far in excess of the value of the copies involved.

For additional copies of this software and/or documentation, or if you have questions concerning the above notice, the documentation and/or software, please contact your OS-9 supplier.

TRADEMARKS

OS-9 and OS-9000 are registered trademarks of Microware Systems Corporation.

Microware Systems Corporation • 1900 N.W. 114th Street
Des Moines, Iowa 50325-7077 • Phone: 515/224-1929

Preface

Microware supports numerous versions of its C compiler running on various platforms. The following table indicates which chapter of this manual is pertinent for your cross compiler.

Platform	*Chapter*
Sun 3	1 - BSD
Sun 4	1 - BSD
HP	2 - HP
Apollo	1 - BSD
VAX/UNIX	1 - BSD
VAX/VMS	3 - VMS
MV68	4 - System V

OS-9® cross compilers are currently available for all of the platforms listed above. OS-9000® cross compilers are currently available for the Sun 3, Sun 4, and HP platforms.

The following table provides information about the hardware and software used to build each cross compiler.

Cross Compiler	*Hardware Platform*	*OS Release*
Sun 3	Sun 3/180	SunOS 4.0.1
Sun 4	Sun 4/60	SunOS4.0.3C
HP	HP-9000/330	HP-UX 6.5
Apollo	Domain 3500	Domain SR10.1
VAX/UNIX	VAX 11/730	BSD 4.3
VAX/VMS	VAX 11/750	VAX/VMS 5.0-2
MV68	Motorola Delta/3300	System V/68 Release 3

Notes

Table of Contents

Notes

1

Installing the BSD Version

Distribution Files

The X-C compiler is distributed on one tape. Six directories are on the tape:

bin	Executable programs for host machine
cmds	OS-9 or OS-9000 commands
defs	C header files
etc	UniBridge help file
lib	Library files
source	Source files

NOTES: If you are installing other products along with the X-C compiler, more files and/or directories may exist on the distribution media.

The source files are provided for your information only. You do not need to move or alter them to install the X-C compiler.

The installation process consists of executing a Bourne shell script which copies the distribution files to the hard disk. It also symbolically links the directory containing the compiler files with the /dd directory. If you do not want the symbolic link, you can use the compiler without the symbolic link.

Before installing the software, you must have a minimum of 1500K of free space on the hard disk.

The prompts shown in the installation scripts reflect the OS-9 operating system. The prompts for the OS-9000 operating system use the OS-9000 designation.

Installing the X-C Compiler

To install the X-C compiler:

1. Login as root.
2. Change your directory to /tmp:

   ```
   cd /tmp
   ```

3. Copy the Bourne shell script from the distribution tape:

   ```
   tar xvf /dev/rmt8 INSTALL
   ```

   NOTE: This command assumes the tape is mounted and the /dev/rmt8 device is being used.

4. Execute the Bourne shell script:

   ```
   sh INSTALL
   ```

   NOTE: All text within angle brackets (<>) in the script prompts are default choices. Choose them by pressing the return key.

5. Specify the directory in which to keep the X-C compiler files:

   ```
   Directory to install into </usr/local/os9>
   ```

   Type in a directory pathlist at the prompt. If the specified directory does not exist, a directory of that name is created:

   Creating directory *directory*

   NOTE: In the example prompts, the italicized *directory* is replaced by the name of the directory previously specified.

6. Once you specify a destination directory, the system prompts you to ensure you have chosen the correct directory :

   BSD 4.2 Binaries for the cross compiler to be installed in: *directory*/bin
   C header files for OS-9/68000 to be installed in: *directory*/defs
   Library files for OS-9/68000 to be installed in: *directory*/lib

   ```
   NOTE: There are a few files that the cross C compiler and UniBridge must find
   in a specific place. These will be placed in /usr/local/os9/etc. They
   must stay there in order for these utilities to function properly.

   Is this correct <y>:
   ```

   If this is the correct configuration, type y or press <return>. If you wish to change the directory, type n. You will return to the first prompt.

7. Before the distribution files are copied to your hard disk, specify the device on which the distribution tape is mounted:

```
Installation device </dev/rmt8>:
```

Type the device name at the prompt.

After you specify the device, a list of the products contained on the tape is displayed and the files are copied to the hard disk:

```
This tape contains the following products:
product list

Extracting files from tape
file list
Press <RETURN> to continue
```

8. Indicate if you want this directory to symbolically link with /dd. This is necessary in order for the C executive to find the library and definition files it needs.

```
In order for xcc to properly locate the library and definition
files it needs, you must either symbolically link the directory
name /dd to directory or set environment variables to tell xcc where
to look.
Would you like to have /dd symbolically linked to directory (y/n) <y>:
```

You may use either the symbolic link or the environment method. However, if you do not use a symbolic link, you need to modify your .login or .profile file.

If you want a symbolic link, type y or press <return>. The script creates the symbolic link:

```
Linked the symbolic name /dd to directory
```

If you do not want to use a symbolic link, type n. The script prompts you with the following:

```
You must then set the environment variable CDEF to directory/defs
and CLIB to directory/lib. This can be done in your .login if you
use csh or .profile if you use sh as your shell.
```

9. Assign a user ID to the files. The following message is displayed:

```
Changing modes of files.

Enter the desired user id for the owner of these files <bin>:
```

If the ID you enter is located in the /etc/passwd file, the following message is displayed:

```
Changing user id of files to owner
```

If the ID is not located in the /etc/passwd file and the machine is not equipped with a Yellow Pages facility, the following message is displayed:

```
Invalid user id specified (owner not in /etc/passwd).
Owner of files NOT changed.
```

If the ID is not located in the /etc/passwd file and the machine is equipped with a Yellow Pages facility, the following message is displayed:

```
WARNING:  User id owner not in /etc/passwd file.

Checking Yellow Pages
```

If the ID is located in the Yellow Pages, the files' user ID's are changed and the corresponding message is displayed.

If the ID is not located in the Yellow Pages, the following message is displayed:

```
Invalid user id specified (owner not in Yellow Pages).
Owner of files NOT changed.
```

10. Assign a group ID to the files. The following message is displayed:

```
Enter the desired group id for these files <bin>:
```

If the ID is located in the /etc/group file, the following message is displayed:

```
Changing group id of files to group
```

If the ID is not located in the /etc/group file and the machine is not equipped with a Yellow Pages facility, the following message is displayed:

```
Invalid group id specified (group not in /etc/group).
Group id of files NOT changed.
```

If the ID is not located in the /etc/group file and the machine is equipped with a Yellow Pages facility, the following message is displayed:

```
WARNING:  Group id group not in /etc/group file.

Checking Yellow Pages
```

If the ID is located in the Yellow Pages, the group ID's of the files are changed and the corresponding message is displayed.

If the ID is not located in the Yellow Pages, the following message is displayed:

```
Invalid group id specified (group not in Yellow Pages).
Group id of files NOT changed.
```

11. You must specify whether the software is going to be used on the machine where the installation is being done. If this is the case, answer "yes" to the prompt:

```
This software can only be used on a single CPU. If you do not wish to
use this software on this machine, answer 'no' to the following question.

Do you wish to install this software on this machine <yes>:
```

If you answered "yes", continue with step 12.

If you answered "no", the following message is displayed:

```
After installing the software for the machine where you intend to use
it, run the command directory/bin/install to obtain the information
needed to obtain a key value.
```

12. To access the C compiler, you need to obtain a software key value from the Microware Software Support Line. The following prompt provides the necessary information for the Support Line:

```
Please contact your authorized Microware representative
and provide them with this value:  0x20024454.  They will
provide you with the key value needed for access to the compiler.
```

13. The installation script is finished at this point and issues a final message:

```
Installation complete
```

14. To complete the installation, call Microware and obtain the access key for your software. The Software Support Team will request the serial number of your software. This is found in the file *directory*/SER_NUM. List the contents of this file to find the serial number:

```
cat directory/SER_NUM
```

15. When you have the key, run the program, final, to complete the installation:

```
cd directory
bin/final key -d bin
```

If the symbolic link to /dd was not used, set the environment variables CDEF and CLIB. If you use the C-shell, place the following command lines in your .login file:

```
setenv CDEF /usr/os9c/defs
setenv CLIB /usr/os9c/lib
```

If you use the Bourne shell, place the following command lines in your .profile file:

```
CDEF = /usr/os9c/defs
CLIB = /usr/os9c/lib
export CDEF CLIB
```

End of Chapter 1

2

Installing the HP-UX Version

Distribution Files

The OS-9 X-C compiler is distributed on one tape. Six directories are on the tape:

bin	Executable programs for HP machine
cmds	OS-9 or OS-9000 commands
defs	C header files
etc	UniBridge help file
lib	Library files
source	Source files

NOTES: If you are installing other products along with the X-C compiler, more files and/or directories may exist on the distribution media.

The source files are provided for your information only. You do not need to move or alter them to install the X-C compiler.

The installation process consists of executing a Bourne shell script which copies the distribution files to the hard disk.

Before installing the software, you must have a minimum of 1500K of free space on the hard disk.

The prompts shown in the installation scripts reflect the OS-9 operating system. The prompts for the OS-9000 operating system use the OS-9000 designation.

Installing the X-C Compiler

To install the X-C compiler:

1. Login as root.
2. Change your directory to /tmp:

   ```
   cd /tmp
   ```

3. Copy the Bourne shell script from the distribution tape.

   ```
   lifcp /dev/update.src:INSTALL INSTALL
   ```

   NOTE: This command assumes the tape is mounted and the /dev/update.src device is being used.

4. Execute the Bourne shell script:

   ```
   sh INSTALL
   ```

   NOTE: All text within angle brackets (<>) in the script prompts are default choices. Choose them by pressing the return key.

5. Specify the directory in which to keep the X-C compiler files:

   ```
   Directory to install into </usr/local/os9>:
   ```

   Type in a directory pathlist at the prompt. If the specified directory does not exist, a directory of that name is created:

   ```
   Creating directory directory
   ```

   NOTE: In the example prompts, the italicized *directory* is replaced by the name of the directory previously specified.

6. Once you specify a destination directory, the system prompts you to ensure you have chosen the correct directory :

   ```
   HP-UX Binaries for the cross compiler to be installed in:  directory/bin
   C header files for OS-9/68000 to be installed in:  directory/defs
   Library files for OS-9/68000 to be installed in:  directory/lib

   NOTE: There are a few files that the cross C compiler and UniBridge must find
   in a specific place.  These will be placed in /usr/local/os9/etc. They
   must stay there in order for these utilities to function properly.

   Is this correct <y>:
   ```

If this is the correct configuration, type y or press <return>. If you wish to change the directory, type n. You will return to the first prompt.

7. Before the distribution files are copied to your hard disk, specify the device on which the distribution tape is mounted:

```
Installation device </dev/update.src>:
```

Type the device name at the prompt.

After you specify the device, a list of the products contained on the tape is displayed and the files are copied to the hard disk:

```
This tape contains the following products:
product list

Extracting files from tape
file list
Press <RETURN> to continue
```

8. You must set two environment variables: CDEF and CLIB. The C executive uses these variables to locate the library and definition files it needs. Each X-C compiler user has to set these variables in their individual .login or .profile file.

When all of the files are copied to the hard disk, you will receive the following reminder:

```
You will need to set the environment variable CDEF to directory/defs
and CLIB to directory/lib so that xcc can find all the files it needs.
This can be done in your .login if you use csh or .profile if you
use sh as your shell.
```

9. Assign a user ID to the files. The following message is displayed:

```
Changing modes of files.

Enter the desired user id for the owner of these files <bin>:
```

If the ID you enter is located in the /etc/passwd file, the following message is displayed:

```
Changing user id of files to owner
```

If the ID is not located in the /etc/passwd file and the machine is not equipped with a Yellow Pages facility, the following message is displayed:

```
Invalid user id specified (owner not in /etc/passwd).
Owner of files NOT changed.
```

If the ID is not located in the /etc/passwd file and the machine is equipped with a Yellow Pages facility, the following message is displayed:

```
WARNING:  User id owner not in /etc/passwd file.

Checking Yellow Pages
```

If the ID is located in the Yellow Pages, the files' user ID's are changed and the corresponding message is displayed.

If the ID is not located in the Yellow Pages, the following message is displayed:

```
Invalid user id specified (owner not in Yellow Pages).
Owner of files NOT changed.
```

10. Assign a group ID to the files. The following message is displayed:

```
Enter the desired group id for these files <bin>:
```

If the ID is located in the /etc/group file, the following message is displayed:

```
Changing group id of files to group
```

If the ID is not located in the /etc/group file and the machine is not equipped with a Yellow Pages facility, the following message is displayed:

```
Invalid group id specified (group not in /etc/group).
Group id of files NOT changed.
```

If the ID is not located in the /etc/group file and the machine is equipped with a Yellow Pages facility, the following message is displayed:

```
WARNING:  Group id group not in /etc/group file.

Checking Yellow Pages
```

If the ID is located in the Yellow Pages, the files' group ID's are changed and the corresponding message is displayed.

If the ID is not located in the Yellow Pages, the following message is displayed:

```
Invalid group id specified (group not in Yellow Pages).
Group id of files NOT changed.
```

11. To access the C compiler, you need to obtain a software key value from the Microware Software Support Line. The following prompt provides the necessary information for the Support Line:

```
Please contact your authorized Microware representative
and provide them with this value:  0x20024454.  They will
provide you with the key value needed for access to the compiler.
```

The installation script is finished at this point and issues a final message:

```
Installation complete
```

12. To complete the installation, call Microware and obtain the access key for your software. The Software Support Team will request the serial number of your software. This is found in the file *directory*/SER_NUM. List the contents of this file to find the serial number:

```
cat directory/SER_NUM
```

13. When you have the key, run the program, final, to complete the installation:

```
cd directory
bin/final key -d bin
```

Set the environment variables CDEF and CLIB. If you use the C-shell, place the following command lines in your .login file:

```
setenv CDEF /usr/os9c/defs
setenv CLIB /usr/os9c/lib
```

If you use the Bourne shell, place the following command lines in your .profile file:

```
CDEF = /usr/os9c/defs
CLIB = /usr/os9c/lib
export CDEF CLIB
```

End of Chapter 2

3

Installing the VAX/VMS Version

Distribution Files

The X-C compiler is distributed on one tape. The files for the X-C compiler are all in the [OSK] directory. [OSK] also contains a sample LOGIN.COM file used to establish the user's environment for the X-C compiler. Included in the [OSK] directory are the following sub-directories:

[C.SOURCE]	Sample source files for the cross compiler
[CMDS]	OS-9 utilities to facilitate development
[DEFS]	C header files for the cross compiler
[EXEC]	VAX / VMS Binaries for the cross compiler
[LIB]	Library files for the cross compiler

NOTES: If you are installing other products along with the X-C compiler, more files and/or directories may exist on the distribution media.

The source files are provided for your information only. You do not need to move or alter them to install the X-C compiler.

Installation Procedure

The installation process consists of using the VMSINSTAL.COM command procedure to install the software from your distribution tape. To install the compiler, you must obtain a key value from Microware Software Support. This key ties the compiler to the specific machine on which it is installed.

The installation process has two phases. The first provides the necessary information to obtain the key value from Microware. The second uses the key value to install the compiler system.

Check the following items prior to running VMSINSTAL:

1. Before mounting the tape in your tape drive, check the label on the tape. If more than one product is listed on the label, use the product name OSK024 to install the tape; otherwise use the product name OSKC032.

2. This package requires version 5.0 or later of VAX/VMS to execute correctly. The VMSINSTAL script validates that an appropriate version of VMS is installed on your machine before allowing you to install the software.

3. The X-C compiler requires at least 3500 free blocks of disk space on the device where the software will be installed. The installation procedure will fail if the space is not available.

4. Determine where you wish the software to reside. This includes the node on which it will run, as well as the device and directory on that node. Please note that the compiler is protected. You can only install it on a single machine. Therefore, the selection of the machine on which to install the software is important.

Installation: Phase 1

1. Mount the tape on the tape drive, and place the drive on-line.

2. Login as SYSTEM on an appropriate terminal.

3. Change to the SYS$UPDATE directory:

```
SET DEFAULT SYS$UPDATE
```

4. Execute the VMSINSTAL.COM command procedure. This command uses two parameters: the name of the product you are installing, and the device where the distribution tape is loaded.

   Because the X-C Compiler comes in two different configurations, you can execute one of two possible commands:

```
@VMSINSTAL OSKC032 MTA0:        (The tape contains only the X-C compiler)
@VMSINSTAL OSK024 MTA0:         (The tape contains other products)
```

   NOTE: In the above examples, MTA0 is the device with the mounted tape.

   The VMSINSTAL procedure reports whether DECnet is currently running on your system. You do not need to shut down DECnet prior to running VMSINSTAL.

   The VMSINSTAL procedure checks for any users currently logged on the system. Users do not need to logoff prior to installing the software. However, if you are using an old version of the X-C compiler at the time of this installation and you are installing the new software in the same directory as the previous version, the files that are compiling could become corrupted. Microware suggests that you install the new software in a new directory. You can copy the files to another directory when you are sure no one is using the compiler.

```
        VAX/VMS Software Product Installation Procedure V5.0-2

It is 5-SEP-1989 at 14:00.
Enter a question mark (?) at any time for help.

%VMSINSTAL-W-ACTIVE, The following processes are still active:
        DEB
        KIM
        SHIP
        STEVE
* Do you want to continue anyway [NO]? yes
* Are you satisfied with the backup of your system disk [YES]? yes

Please mount the first volume of the set on MTA0:.
* Are you ready? yes
```

At this point, VMSINSTAL begins reading the tape. It progresses with the following messages.

NOTE: For the remainder of this example, it is assumed that the X-C compiler was the only product on the tape, and the command line shown above was used. If other products were on the tape and the second command line was used, the messages will be slightly different.

```
%MOUNT-I-MOUNTED, VMSBK mounted on _MTA0:.

The following products will be processed:

  OSKC V3.2

        Beginning installation of OSKC V3.2 at 14:01

%VMSINSTAL-I-RESTORE, Restoring product saveset A ...

%OSKC-I-BEGIN, Beginning installation of VAX/VMS to OS-9/680x0 Cross C
Compiler V3.2...
```

The system prompts:

```
Have you obtained a key value from Microware Software Support yet:
```

Answer no to this question. The following explains how to obtain a key from Microware:

```
Please contact your authorized Microware representative
and provide them with this value:  0x4020de18.  They will
provide you with the key value needed for access to the compiler.
Serial number is 1f318549.
```

You need to provide Microware Software Support with both the serial number and the value provided in the installation message. Mircoware will provide you with the access key to your software in order to finish phase two of the installation.

At this point, VMSINSTAL dismounts the tape and exits.

```
%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target
directories...

Installation of OSKC V3.2 completed at 14:03

VMSINSTAL procedure done at 14:04
```

Installation: Phase 2

1. Mount the tape on the tape drive, and place the drive on-line.

2. Login as SYSTEM on an appropriate terminal.

3. Change to the SYS$UPDATE directory, as in Phase 1.

4. Execute the VMSINSTAL.COM command procedure with the same command as in Phase 1. The system prompts:

   ```
   Have you obtained a key value from Microware Software Support yet:
   ```

   Answer yes to this question. Type the key value supplied by Microware.

   ```
   Enter the Microware supplied key value:
   ```

5. Specify the device and directory on which you are installing the X-C compiler:

   ```
   Enter destination device for OS-9/680x0 product(s): sys$user
   Enter destination directory for OS-9/680x0 product(s): [steve.oskc]
   ```

6. VMSINSTAL checks for sufficient disk space on the specified device. If not, an appropriate message is displayed, and VMSINSTAL exits:

   ```
   %OSKC-E-NOSPACE, Insufficient disk space to perform installation
   %VMSINSTAL-E-INSFAIL, The installation of OSKC V3.2 has failed
   ```

   If enough disk space exists on the device, VMSINSTAL checks whether the specified directory exists on the device. If the directory does not exist, it is created:

   ```
   %OSKC-I-CREDIR, Creating directory SYS$USER:[STEVE.OSKC]...
   ```

7. The installation procedure requires no further assistance. It provides a message to this effect and continues with the installation.

   ```
   %OSKC-I-NOOPER, The installation requires no further operator intervention.
   %OSKC-I-COMPTIME, It should complete within 15 minutes.
   ```

8. VMSINSTAL copies the files from the tape into the directory specified above.

   ```
   %OSKC-I-COPYFILES, OS-9/680x0 V3.2: copying files from tape
   %BACKUP-I-STARTVERIFY, starting verification pass
   ```

After the files are copied from the tape, VMSINSTAL patches several files with the key value that you provided. Depending upon the software you received, you will see some or all of these messages:

```
%PATCH-I-NOGBL, some or all global symbols not accessible
%PATCH-I-NOLCL, image does not contain local symbols
%PATCH-I-OVERLAY, SYS$USER:[STEVE.OSKC.EXEC]XCC.EXE;1 being overwritten
```

The software installation is complete. VMSINSTAL displays a message to this effect and exits.

```
%OSKC-I-PRODINST, VAX/VMS to OS-9/680x0 Cross C Compiler V3.2 installed in
SYS$USER:[STEVE.OSKC...].

%VMSINSTAL-I-MOVEFILES, Files will now be moved to their target directories...

Installation of OSKC V3.2 completed at 14:05

VMSINSTAL procedure done at 14:06
```

9. Remove the tape from the tape drive and store it in a safe place.

10. The software is now ready for use. The X-C compiler requires that you define three logical names to function correctly. These logical names are OSK$EXEC, OSK$DEFS, and OSK$LIB. You define these names using either the ASSIGN or DEFINE commands in VMS. For example, to define these logical names with the software installed in SYS$USER:[STEVE.OSKC], execute the following ASSIGN commands:

```
ASSIGN SYS$USER:[STEVE.OSKC.EXEC] OSK$EXEC:
ASSIGN SYS$USER:[STEVE.OSKC.DEFS] OSK$DEFS:
ASSIGN SYS$USER:[STEVE.OSKC.LIB] OSK$LIB:
```

You must define certain symbols for parts of the X-C compiler. Define each of the components of the compiler as a foreign command:

```
XCC == "$ OSK$EXEC:XCC"
CPP == "$ OSK$EXEC:CPP"
C68 == "$ OSK$EXEC:C68"
O68 == "$ OSK$EXEC:O68"
R68 == "$ OSK$EXEC:R68"
L68 == "$ OSK$EXEC:L68"
```

The LOGIN.COM command procedure defines the necessary logical names and foreign commands. Make the necessary changes to this command procedure by changing the directory names defined for the logical names OSK$EXEC, OSK$DEFS, and OSK$LIB. You can then invoke this command procedure during the login sequence by adding a line to the personal LOGIN.COM procedure of each user who will be using the X-C compiler. For example, you could add:

```
$ @SYS$USER:[STEVE.OSKC]LOGIN.COM
```

End of Chapter 3

Notes

4

Installing the System V Version

Distribution Files

The X-C Compiler is distributed on one tape. Six directories are on the tape:

bin	Executable programs for host machine
cmds	OS-9 or OS-9000 commands
defs	C header files
etc	UniBridge help file
lib	Library files
source	Source files

NOTES: If you are installing other products along with the X-C Compile, more files and/or directories may exist on the distribution media.

The source files are provided for your information only. You do not need to move or alter them to install the X-C compiler.

The installation process consists of executing a Bourne shell script which copies the distribution files to the hard disk.

Before installing the software, you must have a minimum of 1500K of free memory on the hard disk.

The prompts shown in the installation scripts reflect the OS-9 operating system. The prompts for the OS-9000 operating system use the OS-9000 designation.

Installing the X-C Compiler

To install the X-C compiler:

1. Login as root.
2. Change your directory to /tmp:

   ```
   cd /tmp
   ```

3. Copy the Bourne shell script from the distribution tape:

   ```
   tar xvf /dev/rmt8 INSTALL
   ```

   NOTE: This command assumes the tape is mounted and the /dev/rmt8 device is being used.

4. Execute the Bourne shell script:

   ```
   sh INSTALL
   ```

   NOTE: All text within angle brackets (<>) in the script prompts are default choices. Choose them by pressing the return key.

5. Specify the directory in which to keep the X-C Compiler files:

   ```
   Directory to install into </usr/local/os9>:
   ```

   Type in a directory pathlist at the prompt. If the specified directory does not exist, a directory of that name is created:

   ```
   Creating directory directory
   ```

   NOTE: In the example prompts, the italicized *directory* is replaced by the name of the directory previously specified.

6. Once you specify a destination directory, the system prompts you to ensure that you have chosen the correct directory:

   ```
   System V Binaries for the cross compiler to be installed in:  directory/bin
   C header files for OS-9/68000 to be installed in:  directory/defs
   Library files for OS-9/68000 to be installed in:  directory/lib

   NOTE:There are a few files that the cross C compiler and UniBridge must find
   in a specific place.  These will be placed in /usr/local/os9/etc. They
   must stay there in order for these utilities to function properly.

   Is this correct <y>:
   ```

If this is the correct configuration, type y or press <return>. If you wish to change the directory, type n. You will return to the first prompt.

7. Before the distribution files are copied to your hard disk, specify the device on which the distribution tape is mounted:

```
Installation device </dev/rmt8>:
```

Type the device name at the prompt.

After you specify the device, a list of the products contained on the tape is displayed and the files are copied to the hard disk:

```
This tape contains the following products:
product list

Extracting files from tape
file list
Press <RETURN> to continue
```

8. You must set two environment variables: CDEF and CLIB. The C executive uses these variables to locate the library and definition files it needs. Each X-C compiler user has to set these variables in their individual .login or .profile file.

The system prompts you with the following reminder:

```
You will need to set the environment variable CDEF to directory/defs
and CLIB to directory/lib so that xcc can find all the files it needs.
This can be done in your .login if you use csh or .profile if you
use sh as your shell.
```

9. Assign a user ID to the files. The following message is displayed:

```
Changing modes of files.

Enter the desired user id for the owner of these files <bin>:
```

If the ID you enter at the prompt is found in the /etc/passwd file, the following message is displayed:

```
Changing user id of files to owner
```

If the ID is not located in the /etc/passwd file and the machine is not equipped with a Yellow Pages facility, the following message is displayed:

```
Invalid user id specified (owner not in /etc/passwd).
Owner of files NOT changed.
```

If the ID is not located in the /etc/passwd file and the machine is equipped with a Yellow Pages facility, the following message is displayed:

```
WARNING:  User id owner not in /etc/passwd file.

Checking Yellow Pages
```

If the ID is located in the Yellow Pages, the files' user ID's are changed and the corresponding message is displayed.

If the ID is not located in the Yellow Pages, the following message is displayed:

```
Invalid user id specified (owner not in Yellow Pages).
Owner of files NOT changed.
```

10. Assign a group ID to the files. The following message is displayed:

```
Enter the desired group id for these files <bin>:
```

If the ID is located in the /etc/group file, the following message is displayed:

```
Changing group id of files to group
```

If the ID is not located in the /etc/group file and the machine is not equipped with a Yellow Pages facility, the following message is displayed:

```
Invalid group id specified (group not in /etc/group).
Group id of files NOT changed.
```

If the ID is not located in the /etc/group file and the machine is equipped with a Yellow Pages facility, the following message is displayed:

```
WARNING:  Group id group not in /etc/group file.

Checking Yellow Pages
```

If the ID is located in the Yellow Pages, the files' group ID's are changed and the corresponding message is displayed.

If the ID is not located in the Yellow Pages, the following message is displayed:

```
Invalid group id specified (group not in Yellow Pages).
Group id of files NOT changed.
```

11. To access the C compiler, you need to obtain a software key value from the Microware Software Support Line. The following prompt provides the necessary information for the Support Line:

```
Please contact your authorized Microware representative
and provide them with this value:  0x20024454.  They will
provide you with the key value needed for access to the compiler.
```

The installation script is finished at this point and issues a final message:

```
Installation complete
```

12. To complete the installation, call Microware and obtain the access key for your software. The Software Support Team will request the serial number of your software. This is found in the file *directory*/SER_NUM. List the contents of this file to find the serial number:

```
cat directory/SER_NUM
```

13. When you have the key, run the program, final, to complete the installation:

```
cd directory
bin/final key -d bin
```

Use the setenv command to set the environment variables CDEF and CLIB. If you use the C-shell, place the following command lines in your .login file:

```
setenv CDEF /usr/os9c/defs
setenv CLIB /usr/os9c/lib
```

If you use the Bourne shell, place the following command lines in your .profile file:

```
CDEF = /usr/os9c/defs
CLIB = /usr/os9c/lib
export CDEF CLIB
```

End of Chapter 4

Notes

A

Distribution Directory Maps

Distribution Directory Maps

This appendix contains four directory maps. They include the following:

UNIX to OS-9 directory map

VAX/VMX to OS-9 directory map

UNIX to OS-9000/68020 directory map

UNIX to OS-9000/80386 directory map

UNIX to OS-9 Directory Map

./

bin/	cmds/	defs/	etc/	lib/	source/
Read_me	SER_NUM				

./bin/

binex	c68	c68020	cc68	cpp	exbin
final	fixmod	ident	install	l68	o68
os9cmp	os9dump	r68	r68020	rdump	unisrv
xcc					

./cmds/

clo	clo020

./defs/

ctype.h	dir.h	direct.h	errno.h	events.h	float.h
limits.h	Machine/	math.h	modes.h	module.h	oskdefs.d
path.h	procid.h	rbf.h	sbf.h	scf.h	setjmp.h
setsys.h	sgstat.h	sg_codes.h	signal.h	stdio.h	strings.h
sysio.h	termcap.h	time.h	types.h		

./defs/Machine/

reg.h

./etc/

UniBug.hlp

./lib/

clib.l	clibn.l	clib020.l	clib020h.l	clib020n.l	clo.l
cstart.r	math.l	math881.l	sys.l	termlib.l	usr.l

./source/

cstart.a	example.c	funcs.c	inittrap.a	Makefile	make.68k
mytraps.a	READ_ME	Rels/	trapdefs.a	trapmain.a	

NOTE: In previous releases of the compiler, the compiler executive was called cc68. In this release of the compiler, the executive is referred to as xcc. For compatibility, the files cc68 and xcc are both provided in this release. They are linked to the same file.

VAX/VMS to OS-9 Directory Map

[OSK]

[C.SOURCE]	[CMDS]	[DEFS]	[EXEC]	[LIB]
login.com	ser_num.			

[OSK.C.SOURCE]

[RELS]	cstart.a	example.c	funcs.c	inittrap.a
make.68k	make.com	makefile	make_020.com	mytraps.a
read_me.lis	trapdefs.a	trapmain.a		

[OSK.CMDS]

clo.	clo020.	com.	exbin.	

[OSK.DEFS]

[MACHINE]	ctype.h	dir.h	direct.h	errno.h
events.h	float.h	limits.h	math.h	modes.h
module.h	oskdefs.d	path.h	procid.h	rbf.h
sbf.h	scf.h	setjmp.h	setsys.h	sgstat.h
sg_codes.h	signal.h	stdio.h	strings.h	sysio.h
termcap.h	time.h	types.h		

[OSK.DEFS.MACHINE]

reg.h

[OSK.EXEC]

binex.exe	c68.exe	c68020.exe	cpp.exe	exbin.exe
fixmod.exe	ident.exe	l68.exe	o68.exe	os9cmp.exe
os9dump.exe	os9merge.exe	r68.exe	r68020.exe	rdump.exe
xcc.exe				

[OSK.LIB]

clo.l	clib.l	clibn.l	clib020.l	clib020h.l
clib020n.l	cstart.r	math.l	math881.l	sys.l
termlib.l	usr.l			

NOTE: In previous releases of the compiler, the C executive was called cc68.exe. Starting with release 3.2, the executive is called xcc.exe. For compatibility, symbol names for cc68 and xcc are provided in the login.com file. Please note that the cc68 symbol will be removed in a future release.

UNIX to OS-9000/68020 Directory Map

./

bin/	defs/	etc/	lib/

./bin/

a020	binex	c020	cprep	exbin	final
fixmod020	ident020	install	l020	o020	os9cmp
os9dump	rdump	unisrv	xcc		

./defs/

alloc.h	aton.h	cache.h	const.h	ctype.h	devdesc.h
dexec.h	dir.h	errno.h	events.h	evtbl.h	excpt.h
float.h	fork.h	funcs.a	funcs.h	init.h	io.h
ioedt.h	limits.h	lock.h	logic.h	math.h	memory.h
moddir.h	modes.h	module.h	msg.h	oskdefs.d	pcf.h
process.h	proctbl.h	rbf.h	reg68k.h	rom.h	rtcstat.h
sbf.h	scf.h	scfdesc.h	scfstat.h	setjmp.h	settrap.h
sg_codes.h	signal.h	srvcb.h	stddef.h	stdio.h	stdlib.h
string.h	strings.h	svctbl.h	sysglob.h	tapehead.h	termcap.h
time.h	tkstat.h	types.h			

./etc/

UniBug.hlp

./lib/

clo.l	clib.l	cpu.l	cstart.r	curses.l	descstart.r
drvstart.r	fmstart.r	initstart.r	lock.l	os_lib.l	scsistart.r
sys_clo.l	sys_clib.l	syscstart.r	systart.r	termlib.l	tkstart.r

UNIX to OS-9000/80386 Directory Map

./

bin/	defs/	etc/	lib/

./bin/

a386	binex	c386	cprep	exbin	final
fixmod386	ident386	install	l386	o386	os9cmp
os9dump	rdump	unisrv	xcc		

./defs/

alloc.h	aton.h	cache.h	const.h	ctype.h	devdesc.h
dexec.h	dir.h	errno.h	events.h	evtbl.h	excpt.h
float.h	fork.h	funcs.a	funcs.h	init.h	io.h
ioedt.h	limits.h	lock.h	logic.h	math.h	memory.h
moddir.h	modes.h	module.h	msg.h	oskdefs.d	pcf.h
process.h	proctbl.h	rbf.h	reg386.h	rom.h	rtcstat.h
sbf.h	scf.h	scfdesc.h	scfstat.h	setjmp.h	settrap.h
sg_codes.h	signal.h	srvcb.h	stddef.h	stdio.h	stdlib.h
string.h	strings.h	svctbl.h	sysglob.h	tapehead.h	termcap.h
time.h	tkstat.h	types.h			

./etc/

UniBug.hlp

./lib/

cio.l	clib.l	cpu.l	cstart.r	curses.l	descstart.r
drvstart.r	fmstart.r	initstart.r	lock.l	os_lib.l	scsistart.r
sys_cio.l	sys_clib.l	syscstart.r	systart.r	termlib.l	tkstart.r

End of Appendix A

Notes