386/ix® Multi-user

SW95705I
Release 1.2 (incl. 386/ix Rel. 1.2 Update 3)
RC International

Package Contents

- 1 Diskette 'Boot Diskette'
- 5 Diskettes 'Core Base'
- 1 Diskette 'File Management/Help Utilities'
- 3 Diskettes 'Kernel Configuration'
- 1 Diskette 'RC900 Kernel Configuration Addon'
- 1 Diskette 'High Performance Disk Driver'
- 5 Diskettes 'Software Development'
- 1 Diskette 'Spell Utilities'
- 2 Diskettes 'Terminal Utilities'
- 2 Diskettes 'Basic Networking'
- 1 Diskette 'RC Utilities and Addons'
- 1 Diskette 'RC Adapter/MUX Environment'
- 1 Diskette '386/ix Rel. 1.2 Update 3'
- 1 Package Description (this Document)
- 1 '386/ix Installation Instructions'
- 1 '386/ix Primer'
- 1 '386/ix System Administrator's Guide'

Requirements

SW95705I requires:
- RC900 386 based system equipped with minimum 4 Mb of main memory and a hard disk with a capacity of minimum 60 Mb.

Installation

Installation of 386/ix is described in "386/ix Installation Instructions". Note that the number of diskettes and the disk size required for the various packages may be slightly different from those figures mentioned in the documentation.

It is important to note the following additional instructions:

Intelligent adapters
If you intend to do a non-destructive installa-

tion, disable all currently active intelligent adapters (using cardconf) before starting the installation procedure.

Keyboard Nationality
The installation procedure starts asking the user which nationality his terminal supports. This question should be answered according to the type of keyboard attached to the main console. If the keyboard is a Danish keyboard featuring the special Danish Characters, the choice should be Danish and accordingly for the other supported nationalities.

Cleaning Your File Systems
If you try to make a non destructive installation on an RC900 UNIX System that has not been shutdown properly, the installation script may abort, telling you that one of the file systems could not be mounted. In that case execute the following command:

    fsck /dev/dsk/0s3

When the file system has been checked, press CTRL and D simultanously. This will restart the installation script.

Hard Disk Formatting
If you chose to format your fixed disk, the installation procedure asks if your fixed disk controller supports interleave 1:1. The answer should be 'y' unless your RC900 is equipped with the MF330 hard disk controller, in which case this question should be answered with 'n'.

The installation procedure suggests an alternate sector table size. The suggested size is normally adequate. Answer the question with 'y'.

The installation procedure asks which forms of representation for defects are available. Answer the question with 'O', meaning

Cylinder, Head and Byte offset from index is used.

Installation of Additional Software
If any of the packages 'Kernel Configuration', 'Terminal Utilities' or 'Basic Networking' are installed the corresponding RC900 Addon (contained on the diskette labelled *RC Utilities and Addons*) package must be installed afterwards. If the 'Kernel Configuration' package is installed the 'High Performance Disk Driver' shall be installed, too.

The '386/ix Rel. 1.2 Update 3' diskette must be installed as the last diskette.

Please note that the diskettes must be installed in the same sequence as listed under 'Package Contents' on the previous page.

Machine Specific Configurations
When installing a new release of 386/ix (upgrading to a newer release), it is important to backup some of the machine specific system files, therefore, when the installation is complete, these files must be reinstalled. The installation procedure overwrites a number of system files; therfore you will have to back up any file or directory that you wish to preserve. You will want to preserve files that you have customized for your system, such as the password file, /etc/passwd, so that users will not have to establish new passwords. You will restore these files after you have installed the new version, so that you do not have to recreate all these changes by hand on the updated system.

If you have customized any of the device driver or kernel configuration files in your system, you will want to print out these files so that changes can be recreated by hand in the updated versions of these files. You cannot replace these new files with the old ones, as you can replace the system files, because the new files may have changed significantly in the new release.

If you have a printer spool system running on your machine you need to reinstall your printer definitions after the new system has been installed.

The list of files that you may want to back up includes:
/etc/TIMEZONE
/etc/advtab
/etc/bupsched
/etc/checklist
/etc/fstab
/etc/gettydefs
/etc/group
/etc/rchosts
/etc/hosts
/etc/motd
/etc/passwd
/etc/passwd.SA
/etc/profile
/usr/filt/filtcap
/etc/termcap
/etc/lphconf
/etc/default/termdesc

Copy any file that needs to be saved and any other system file you want to save into a safe directory (one that will not be overwritten by the new release) or back them up onto a diskette. For example login as root and create a directory called bkup. Use the cp command to copy the files you want to save to the new directory:

    mkdir /bkup
    cp /etc/passwd /bkup
    cp /etc/rchosts /bkup

If you have customized the /etc/inittab file, you must recreate this customization using the new default /etc/inittab file, because the default file has changed.

The '386/ix Rel. 1.2 Update 3' Diskette

The following list describes the enhancements and corrections in updates 1, 2 and 3.

New Facilities in Update 1

- System/driver support for the MF338 SCSI Host Adapter. The adapter is used in conjunction with the tape streamer. If your system unit is equipped with the MF338 (in which case a MF338 label is affixed to the rear of the system unit), you must enable the corresponding software driver before building new kernels. See step 7 below.
- 4 Mb system support. If you have a system with 4 Mb RAM, it is strongly recommended to build a new UNIX kernel which is tailored to maximum performance on such a system. See step 6 below.

Corrections in Update 1

- The /usr/bin/csp program permission is corrected.
- Old release 1.1 programs that survived the release 1.2 installation in the /usr/cards directories have been removed. The presence of these programs could cause the LAN controller software to fail.
- Problems when using CSP to login on a non RC900 system (e.g. RC8000) have been corrected.

New Facilities in Update 2

- It is now possible to run the TCP/ip telnet utility on a CSP terminal.
- Some programs in the Basic Networking Package have been enhanced to support detection of lost carrier on a modem.

Corrections in Update 2

- An error, which caused a terminal line on the MF321 Terminal Multiplexor Adapter to be disabled when the neighbour terminal was shut off, has been corrected.
- An error, which caused a LAN terminal to be disabled after it had failed to connect to another host on the LAN, has been corrected.
- An error, which disabled the conversion from VT200 character set to DOS character set on the RC911 LANMUX and the MF321 Terminal Multiplexor Adapter, has been corrected.

- An error, which caused an RC8000 host to disconnect a terminal connected to an RC911 LANMUX or an MF321 Terminal Multiplexor Adapter, has been corrected.
- An error, which could cause the MF310/MF311 LAN adapter to fail with error code 2, has been corrected.
- An error, which caused printers connected via RcLAN to be disabled, has been corrected.
- A streamer tape device node was not created when an MF338 SCSI Host Adapter was used. This has been corrected.
- CSP terminal connections via the /dev/csp devices now use XON/XOFF protocol to eliminate loss of characters.
- In the previous release an ansi cursor addressing and reset sequence was sent to a terminal connected to the RC911 LANMUX or MF321 Terminal Multiplexor Adapter, when the terminal was disconnected caused by network failure. This was done to ensure that the terminal was in a state where it was possible to reconnect to the host. The sequences sent was only usable for satellites, vt100 or vt200 terminals. The sequence sent is now two bell characters. If you is disconnected caused by network, it may thus be necessary to reset your terminal by turning it off and on again.

New Facilities in Update 3
- None.

Corrections in Update 3

- An error that could cause the MF321 Multiplexor or the MF310/MF311 LAN Adapter to hang has been corrected.
- An error that caused line statistics to be displayed incorrectly in SW95902I (3770RJE) has been corrected.
- An error causing the message "Timeout when sending" has been corrected.
- The "mux" and "lph" printer drivers have been changed to support non-buffered printing from HCR/Pascal applications.

Installation of update 3

This package must be installed as the last one. It contains corrections to the following packages. If you later on need to install one of these packages you must reinstall the update 3 package afterwards:

> Core Base
> Kernel Configuration
> Basic Networking
> Adapter Environment
> MUX Adapter Environment

The update 3 package is installed with the command:

sysadm installpkg

When the installation is complete you have to build a new kernel to include the updated modules into your kernel. This is done in the following way:

1. Login as superuser on the console and invoke the 'kconfig' program.

2. Answer the questions
   configuration directory(/etc/atconf):
   System File Name (system.std):
   by pressing < Return >

3. Choose: 1) CONFIGURE KERNEL in the MAIN MENU.

4. Choose: REMOVE DRIVER first to see which drivers are included. The list presented must contain the following drivers:
   Serial I/O Driver
   Floppy Disk Driver
   Line Printer Driver
   RC Streamer Tape Driver
   LAN Printer Host

   The following drivers should be removed if present:
   AT Hard Disk Driver
   Shell Layers Driver

   Choose "m" to get the CONFIGURA-TION MENU.

If the Driver list was not complete use the ADD DRIVER entry to include the missing drivers. Choose "m" to get the CON-FIGURATION MENU.

Note:
If your computer is equipped with the MF338 SCSI Host Adapter (Look for MF338 label on the rear of the system unit) the RC Streamer Driver must be excluded.

5. Choose the ADD FACILITY entry. Choose all available facilities (i.e. no facilities should be left in this list). Choose "m" to return to the CONFIGURATION MENU.

6. If you have a computer with 4 Mb of main memory, choose the ADD DEFAULT PARAMETERS FOR MEMORY SIZE entry, then choose the 4Mb option. Choose "m" to return to the CON-FIGURATION MENU.

7. Choose the CONFIGURE THE HIGH PERFORMANCE DEVICE DRIVER entry in the CONFIGURATION MENU.

8. Answer the following questions:
   Standard AT disk controller: yes
   1 or 2 disks: 2
   Secondary AT disk controller: no

   If you have an MF338 SCSI Host Adapter (see label on system unit):

   SCSI Host controller: yes
   Future Domain or Adaptec: adaptec
   Interrupt Vector: 15
   1,2,3 or 4 disks: 1
   SCSI Tape Drive: yes
   RAM disk: no

   otherwise:

   SCSI Host controller: no
   RAM disk: no

9. Choose "m" for menu. Save the modified systemfile. You get the MAIN MENU back.

10.Choose the BUILD A KERNEL entry.
After the kernel has been built you must
follow the instructions given by the
program in order to install the new kernel
and shut down the system. (Read the
prompts carefully!).

Answer the question:
This procedure will execute a shutdown
to reboot the new kernel unix.std.1
Enter y to continue, n to terminate: y

and later:
Do you want to continue ? (y or n): y

Changes since last release

SW95705I Release 1.2 introduces several
new features. The following describes these
features.

Terminal Connections
Terminals may be connected to an RC900
UNIX host in 4 different ways:

1. Main Console connected to adapter on
   CPU board.
2. Terminals connected to COM1 or COM2
   on CPU board.
3. Terminals connected to MF321/MF322
   Terminal Multiplexor Adapter.
4. Terminals connected to RcLAN Terminal
   Control Unit (RC911, RC890-30, another
   RC900, RC39, RC8000, RC9000)

The system administrator customizes the way
terminal sessions are initiated by means of
editing a few text files.

Note:
This only applies to terminals connected as 3)
or 4). Some features described in the follow-
ing require that the terminal control unit
used supports CSP version 4. This is true for
the following Terminal Control Units:

HW	SW	Release
RC900	SW95704/5I	1.2
RC911	SW95702I	2.0
RC890-30	SW8934	2.1
ADP	SW8740	6.0
RC9310	SW9310	1.0

The Terminal Type and Application Index is
configurered for each individual terminal.
The documentation following the Terminal
Control Units describes how to do this.

The following Terminal Control Units still
use CSP Protocol Version 3:

SW1553	Partner CSP/FTS Release 3.0
SW95604	DOS CSP/FTS Release 1.2
SW3910	XENIX TIMESHARING SYSTEM, Release 4.2.

Automatic Recognition of Terminal Type
Release 1.2 supports two different methods
to automate the setting of the UNIX TERM
environment variable.

Method 1:
This method is preferred, because it can be
used with all kinds of terminals. If the Ter-
minal Control Unit is able to supply the host
with information about the Terminal Type,
this information is used to setup the TERM
variable. Only Terminal Control Units that
supports CSP Protocol Version 4 can supply
this information.

Method 2:
The Terminal Type set based on the
/etc/default/termdesc file. This text file can be
customized by changing the value of certain
keywords in the file. The Terminal Type is
found by sending a ENQ character to the Ter-
minal. Response from the Terminal is
awaited for up to 3 ("TIMEOUT = 3")
seconds. The first ten characters of the
response ("CHKNUM = 10") is compared
with known response strings in the
/etc/default/termdesc file. If found, the Ter-
minal Type associated with the response
string, is used to setup the TERM variable.

If there is no response or the response cannot
be recognized two options exists:

If ASK = NO the standard Terminal Type is
used ("DEFAULT = at386").
If ASK = YES the question defined in
ASKSTRING ("Terminal?:") is written on
the Terminal and the answer is used to setup
the TERM variable.

Automatic Application Selection

Release 1.2 supports Automatic Application Selection from Terminals connected via Terminal Control Units supporting CSP Protocol Version 4 with the reconnect capability (see above).

The Application Selection is controlled by the file /etc/appltab. This text file contains one line for each terminal that should be connected to a predefined application automatically.

A line in the file must adhere to the following syntax:

> < application index > : < login name >

< application index > is a number between 0 and 255. When a CSP Version 4 terminal connects to an RC900 UNIX host, the Terminal Control Unit supplies information about which application index the terminal has been assigned. This index is compared with the ones found in the file and the terminal is logged in according to the associated login name. The login name must be present in the /etc/passwd file.

Application Index 0 is reserved for normal login sequence, i.e. a terminal assigned Application Index 0 will present the user for the normal login prompt ("login:").

Application Index 1 is reserved for the CSP menu server which is described in the next chapter.

Example 1. /etc/appltab contains the following line:

> 1:csp

When a Terminal, assigned Application Index 1, connects to the RC900 UNIX host, the program described in the CSP account entry in the /etc/passwd file is started. /etc/passwd contains the following line:

> csp::91:1:Csp login:/tmp:/usr/bin/csp

I.e. the program /usr/bin/csp is started. This program connects the terminal to other RcLAN hosts as described in the next chapter.

Automatic Host Selection

When a CSP Version 4 terminal supporting the reconnect capability connects to an RC900 UNIX host, the login procedure depends on the terminals application index as described in the following:

Application index 0
The standard login procedure is invoked.

Application index 1
The /usr/bin/csp program is started. This program reconnects the terminal to another RcLAN host. This is done on basis of the file /etc/rcttymap which contains one line for each terminal that should be automatically reconnected to another RcLAN host. A line in this file has the following format:

> < device name > : < host name >
> CSP: < applikation index >

< device name > is a unique identification assigned to every CSP Version 4 terminal. On some Terminal Control Units this name may be customized. This is the case for RC890-30 and the ADP. On other Terminal Control Units it is predefined. This is the case for the RC911 LANMUX and the MF321/MF322 Terminal Multiplexor Adapter. Predefined LAN device names may be found in appendix A.

< host name > is the name of the RcLAN host the Terminal shall be connected to.

< application index > is used when the terminal is reconnected to the new host (the terminal itself is configured with application index 1, to invoke the /usr/bin/csp program).

If the device name cannot be found in the /etc/rcttymap file, the /usr/bin/csp program presents a menu with RcLAN hosts that is accessible at that moment. When the user has chosen a host, the terminal is reconnected to this host using application index 0 (normal login).

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Automatic Terminal Characterset Control

Automatic Control of Terminal Character sets is managed according to three keywords in the file /etc/default/termdesc. These keywords must be defined for each terminal type capable of changing between 7 and 8 bit character sets.

The value of the keyword "SELCS" (Y or N) indicates whether a terminal has the capability to switch character set. The keyword "CS7" is assigned the character string which switch the terminal into 7 bit mode.The keyword "CS8" is assigned the character string which switch the terminal into 8 bit mode.

The following example shows the definition of these keywords for a vt200 terminal:

```
; Dec vt220 terminal
vt200 = DEC VT220 V
; 'DEC VT220 V' in the line above is the
; terminal response to an ENQ character
SELCS = Y
CS8 = \E[62;0"p\E*<\E}\E(B\017\E[?7h
CS7 = \E[61"p\E[?42h\E(E\017\E[?7h
```

When a CSP terminal connects to an RC900 UNIX host, the CS8 string is sent to the terminal. When the terminal is logged out the CS7 string is sent to prepare the terminal to be connected to an 7 bit host not capable of controlling the terminal character set. RC900 terminals that is connected to another RcLAN host, are switched to 7 or 8 bit mode depending on the contents of the file /etc/rchosts.

Each line in this file describes an RcLAN host in the following format:

   < host name > : < comments > : < host type >

< host name > is the name of the host.
< comments > is a textstring used when presenting the menu of accessible hosts. This field may be empty.

< host type > must be "7bit" or "8bit" depending on the character set used by the host.

Known problems

The shl (shared layers) driver does not work. Do not use it, as it may cause system breakdown. Use virtual consoles instead.

Using the diskette station simultaneously with file transfers across LAN may cause the message 'data underrun' or 'data over-run' on the main console. If this situation occures you have to retry the diskette operation.

In rare cases you may encounter the message 'missing interrupt from host adapter' on the main console in connection with the tape streamer. If this situation occurs, you have to retry the streamer tape operation.

Appendix A. LAN Device names

RC900 CSP devices.

Local device name	LAN device name	
/dev/csp0	< local host name >	0
/dev/csp1	-	1
/dev/csp2	-	2
/dev/csp3	-	3
/dev/csp4	-	4
/dev/csp5	-	5
/dev/csp6	-	6
/dev/csp7	-	7
/dev/csp8	-	8
/dev/csp9	-	9
/dev/csp10	-	10
/dev/csp11	-	11
/dev/csp12	-	12
/dev/csp13	-	13
/dev/csp14	-	14
/dev/csp15	-	15

RC900 MF321/MF322 Number 1

Device-connected to:	local device name	LAN device name	
port 1, virtual console 0:	tty400	< local host name >	16
1:	tty401		17
2:	tty402		18
3:	tty403		19
hardcopy:	tty40h		20
printer:	tty40p		21
port 2, virtual console 0:	tty410		22
1:	tty411		23
2:	tty412		24
3:	tty413		25
hardcopy:	tty41h		26
printer:	tty41p		27
port 3, virtual console 0:	tty420		28
1:	tty421		29
2:	tty422		30
3:	tty423		31
hardcopy:	tty42h		32
printer:	tty42p		33
port 4, virtual console 0:	tty430		34
1:	tty431		35
2:	tty432		36
3:	tty433		37
hardcopy:	tty43h		38
printer:	tty43p		39
port 5, virtual console 0:	tty440		40
1:	tty441		41
2:	tty442		42
3:	tty443		43
hardcopy:	tty44h		44
printer:	tty44p		45
port 6, virtual console 0:	tty450		46
1:	tty451		47
2:	tty452		48
3:	tty453		49
hardcopy:	tty45h		50
printer:	tty45p		51
port 7, virtual console 0:	tty460		52
1:	tty461		53
2:	tty462		54
3:	tty463		55
hardcopy:	tty46h		56
printer:	tty46p		57
port 8, virtual console 0:	tty470		58
1:	tty471		59
2:	tty472		60
3:	tty473		61
hardcopy:	tty47h		62
printer:	tty47p		63

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RC900 MF321/MF322 Number 2

Device-connected to:	local device name	LAN device name	
port 1, virtual console 0:	tty500	< local host name >	64
1:	tty501		65
2:	tty502		66
3:	tty503		67
hardcopy:	tty50h		68
printer:	tty50p		69
port 2, virtual console 0:	tty510		70
1:	tty511		71
2:	tty512		72
3:	tty513		73
hardcopy:	tty51h		74
printer:	tty51p		75
port 3, virtual console 0:	tty520		76
1:	tty521		77
2:	tty522		78
3:	tty523		79
hardcopy:	tty52h		80
printer:	tty52p		81
port 4, virtual console 0:	tty530		82
1:	tty531		83
2:	tty532		84
3:	tty533		85
hardcopy:	tty53h		86
printer:	tty53p		87
port 5, virtual console 0:	tty540		88
1:	tty541		89
2:	tty542		90
3:	tty543		91
hardcopy:	tty54h		92
printer:	tty54p		93
port 6, virtual console 0:	tty550		94
1:	tty551		95
2:	tty552		96
3:	tty553		97
hardcopy:	tty55h		98
printer:	tty55p		99
port 7, virtual console 0:	tty560		A0
1:	tty561		A1
2:	tty562		A3
3:	tty563		A4
hardcopy:	tty56h		A5
printer:	tty56p		A6
port 8, virtual console 0:	tty570		A7
1:	tty571		A8
2:	tty572		A9
3:	tty573		B0
hardcopy:	tty57h		B1
printer:	tty57p		B2

RC911 LANMUX

Device connected to	LAN device name	
port 1, virtual console 0:	< unit id >	0
1:		1
2:		2
3:		3
hardcopy:		4
printer:		5
port 2, virtual console 0:		6
1:		7
2:		8
3:		9
hardcopy:		10
printer:		11
port 3, virtual console 0:		12
1:		13
2:		14
3:		15
hardcopy:		16
printer:		17
port 4, virtual console 0:		18
1:		19
2:		20
3:		21
hardcopy:		22
printer:		23
port 5, virtual console 0:		24
1:		25
2:		26
3:		27
hardcopy:		28
printer:		29
port 6, virtual console 0:		30
1:		31
2:		32
3:		33
hardcopy:		34
printer:		35
port 7, virtual console 0:		36
1:		37
2:		38
3:		39
hardcopy:		40
printer:		41
port 8, virtual console 0:		42
1:		43
2:		44
3:		45
hardcopy:		46
printer:		47

< unit id > is found on a label fixed to the RC911 Unit. The format of < unit id > is "lmxxxxxx" or "xxxxx" where xxxxxx is six characters.