



**Program Directory for
Advanced Communication Function (ACF)
Network Control Program (NCP)**

Version 7 Release 7

Program Number 5648-063

for Use with
VM/ESA

Document Date: October 1998

GI10-0987-00

Note!

Before using this information and the product it supports, be sure to read the general information under "Notices" on page vii.

This program directory, dated October 1998, applies to Network Control Program V7R7 for VM (NCP V7R7 VM), Program Number 5648-063 for the following:

COMP IDs	REL	Feature Numbers	System Names
564806300	772	5831/5832/6488	VM/ESA

and to all subsequent releases and modifications until otherwise indicated in new editions.

A form for reader's comments appears at the back of this publication. When you send information to IBM, you grant IBM a nonexclusive right to use or distribute the information in any way it believes appropriate without incurring any obligation to you.

© **Copyright International Business Machines Corporation 1984, 1998. All rights reserved.**

Note to U.S. Government Users — Documentation related to restricted rights — Use, duplication or disclosure is subject to restrictions set forth in GSA ADP Schedule Contract with IBM Corp.

Contents

Notices	vii
Notice to Users of Online Versions of This Book	viii
Trademarks	viii
1.0 Introduction	1
2.0 Program Materials	3
2.1 Basic Machine-Readable Material	3
2.1.1 NCP Base Product	3
2.2 Optional Machine-Readable Material	4
2.3 Program Publications	4
2.3.1 Basic Program Publications	4
2.3.2 Optional Basic Program Publications	5
2.3.3 Optional Program Publications	5
2.3.4 Softcopy Publications	5
2.3.5 Publications Associated with NCP V7R7 VM	5
2.4 Microfiche Support	6
2.5 Publications Useful During Installation	6
3.0 Program Support	9
3.1 Preventive Service Planning	9
3.2 Statement of Support Procedures	9
4.0 Program and Service Level Information	11
4.1 Program Level Information	11
4.2 Service Level Information	11
4.3 Cumulative Service Tape	11
5.0 Installation Requirements and Considerations	13
5.1 Program Considerations	13
5.1.1 Operating System Requirements	13
5.1.2 Other Program Product Requirements	13
5.1.2.1 Programming Requirements	13
5.1.2.2 Machine Requirements	13
5.1.2.3 Minimum Requisites	16
5.1.2.4 Functional Requisites	17
5.1.2.5 Compatibility Requisites	17
5.1.2.5.1 NCP	18
5.1.2.5.2 VTAM	18
5.1.2.5.3 NPM	22
5.1.2.5.4 TPF	24
5.1.2.5.5 NetView	24

5.1.2.5.6 TCAM	25
5.1.2.5.7 TCP/IP	25
5.2 Program Installation and Service Considerations	27
5.3 DASD Storage and User ID Requirements	27
6.0 Installation Instructions	29
6.1 VMSES/E Installation Process Overview	29
6.2 Plan Your Installation For NCP V7R7 VM	30
6.3 Allocate Resources for Installing NCP V7R7 VM	32
6.3.1 Installing NCP V7R7 VM on Minidisk	33
6.3.2 Installing NCP V7R7 VM in SFS Directories	33
6.4 Install NCP V7R7 VM	35
6.4.1 Update Build Status Table for NCP V7R7 VM	38
6.5 Place NCP V7R7 VM Into Production	38
6.5.1 Copy NCP V7R7 VM Files Into Production	38
7.0 Service Instructions	41
7.1 VMSES/E Service Process Overview	41
7.2 Servicing NCP V7R7 VM	42
7.2.1 Prepare to Receive Service	42
7.2.2 Receive the Service	44
7.2.3 Apply the Service	44
7.2.4 Update the Build Status Table	45
7.2.5 Build Serviced Objects	48
7.3 Place the New NCP V7R7 VM Service Into Production	48
7.3.1 Copy the New NCP V7R7 VM Serviced Files Into Production	48
Appendix A. APARs Incorporated into This Program	51
Reader's Comments	53

Figures

1. Basic Material: Program Tape	3
2. Program Tape: File Content	3
3. Basic Material: Unlicensed Publications	4
4. Optional Basic Program Publications	5
5. Optional Material: Licensed Program Publications	5
6. Softcopy Publications	5
7. Publications Associated with NCP V7R7 VM	6
8. Publications Useful During Installation / Service on VM/ESA Version 2.2.0	6
9. Publications Useful During Installation / Service on VM/ESA Version 2.3.0	7

10.	PSP Upgrade and Subset ID	9
11.	Component IDs	9
12.	Minimum Microcode Levels for the 3745	15
13.	NCP APAR Required for NCP V7R1 Compatibility with NCP V7R7	18
14.	VTAM APARs Required for IP Support Over 3745 Frame-Relay Switched Physical Lines	18
15.	VTAM APAR Required for Frame Relay Switched Dial Backup Support	18
16.	VTAM APAR Required for APPN Logical Resource Depletion Notification	18
17.	VTAM APAR Required for PU and LU Name Association between Host and Downstream Device Support	18
18.	VTAM APARs Required for NCP Frame Relay Over Token Ring	19
19.	VTAM APARs Required for NCP V7R7	19
20.	VTAM APAR Required for Compatibility with NCP Spare SDLC Lines	19
21.	VTAM APAR Required for Compatibility with NCP IP over FR Dynamic Reconfiguration	19
22.	Casual Connection and/or NNNC	20
23.	VTAM APARs Required for Selective NNNA Support	20
24.	VTAM APARs Required to Delay Activating Logical Links	20
25.	VTAM APARs Required for Compatibility with NCP Frame Relay	21
26.	VTAM APAR Required to Support NCP ESCON	21
27.	VTAM APAR Required to Perform Route INOP Reduction	21
28.	VTAM APARs Required for Coding MAXDATA for PU4s	22
29.	VTAM APAR Required for NetView and STATMON	22
30.	VTAM APAR Required for NCP Frame Relay Peripheral Node Support	22
31.	NPM APAR Required for NCP V7R7 VM and NCP IP Over Token Ring	22
32.	NPM APAR Required for ODLC LAN HPR Data Collection	22
33.	NPM APARs Required for 3746 Model 900 TIC3	23
34.	NPM APARs Required for 3746 Model 900 Processor	23
35.	NPM APARs Required for 3746 Model 900 X.25 NPSI	23
36.	NPM APARs Required for NCP Dynamic Control Blocks	23
37.	NPM APAR Required for NCP	23
38.	NPM APARs Required for Compatibility with NCP Frame Relay	24
39.	NPM APAR Required for 3746 Model 900 ISDN Function	24
40.	NPM APARs Required for 3746 Model 900 X.25 ODLC Function	24
41.	TPF APARs and PTF Required for NCP V7R7	24
42.	NetView APARs	24
43.	NetView APARs	25
44.	TCAM APAR	25
45.	TCP/IP APAR Required for Variable Length Subnet Mask	25
46.	TCP/IP APAR Required for RIP V2 Support	25
47.	TCP/IP APARs Required for Dynamic Routing Over Frame Relay	26
48.	TCP/IP APARs	26
49.	TCP/IP APAR Required for NCP Dynamic Internet Routing Function	26
50.	TCP/IP APARs Required for Direct IP Channel Communication	26
51.	TCP/IP APARs Required for IP NCPROUTE Direct over Channel	26
52.	DASD Storage Requirements for Target Minidisks	28

Notices

References in this publication to IBM products, programs, or services do not imply that IBM intends to make them available in all countries in which IBM operates. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any of IBM's intellectual property rights may be used instead of the IBM product, program, or service. Evaluation and verification of operation in conjunction with other products, except those expressly designated by IBM, are the user's responsibility.

APAR numbers are provided in this document to assist in locating PTFs that may be required. Ongoing problem reporting may result in additional APARs being created. Therefore, the APAR lists in this document may not be complete. To obtain current service recommendations and to identify current product service requirements, always contact the IBM Customer Support Center.

IBM may have patents or pending patent applications covering subject matter in this document. The furnishing of this document does not give you any license to these patents. You can send license inquiries, in writing, to the

International Business Machines Corporation
IBM Director of Licensing
500 Columbus Avenue
Thornwood, NY 10594
USA

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

Site Counsel
IBM Corporation
P.O. Box 12195
3039 Cornwallis
Research Triangle Park, NC 27709 2195
USA

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

The licensed program described in this document and all licensed material available for it are provided by IBM under terms of the IBM Customer Agreement.

This document is not intended for production use and is furnished as is without any warranty of any kind, and all warranties are hereby disclaimed including the warranties of merchantability and fitness for a particular purpose.

Notice to Users of Online Versions of This Book

For online versions of this book, you are authorized to:

- Copy, modify, and print the documentation contained on the media, for use within your enterprise, provided you reproduce the copyright notice, all warning statements, and other required statements on each copy or partial copy.
- Transfer the original unaltered copy of the documentation when you transfer the related IBM product (which may be either machines you own, or programs, if the program's license terms permit a transfer). You must, at the same time, destroy all other copies of the documentation.

You are responsible for payment of any taxes, including personal property taxes, resulting from this authorization.

THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, INCLUDING THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Some jurisdictions do not allow the exclusion of implied warranties, so the above exclusion may not apply to you.

Your failure to comply with the terms above terminates this authorization. Upon termination, you must destroy your machine-readable documentation.

Trademarks

The following terms are trademarks of the IBM Corporation in the United States or other countries or both:

APPN	NTuneMON
BookManager	NTuneNCP
ESCON	OS/2
FunctionPac	OS/390
Hardware Configuration Definition	RETAIN
IBM	SystemPac
IBMLink	VM/ESA
MVS/ESA	VSE/ESA
MVS/XA	VTAM
NetView	

Other company, product, and service names may be trademarks or service marks of others.

1.0 Introduction

This program directory is intended for the system programmer responsible for program installation and maintenance. It contains information concerning the material and procedures associated with the installation of NCP V7R7 VM. You should read all of this program directory before installing the program and then keep it for future reference.

The program directory contains the following sections:

- Section 2.0, "Program Materials" on page 3 identifies the basic program materials and documentation for NCP V7R7 VM.
- Section 3.0, "Program Support" on page 9 describes the IBM support available for NCP V7R7 VM.
- Section 4.0, "Program and Service Level Information" on page 11 lists the program and service level information incorporated into NCP V7R7 VM.
- Section 5.0, "Installation Requirements and Considerations" on page 13 identifies the resources and considerations for installing and using NCP V7R7 VM.
- Section 6.0, "Installation Instructions" on page 29 provides detailed installation instructions for NCP V7R7 VM.
- Section 7.0, "Service Instructions" on page 41 provides detailed servicing instructions for NCP V7R7 VM.
- Appendix A, "APARs Incorporated into This Program" on page 51 lists the APARs incorporated into NCP V7R7 VM.

Before installing NCP V7R7 VM, read section 3.1, "Preventive Service Planning" on page 9. This section tells you how to find any updates to the information and procedures in this program directory.

The 3746 Model 900 CSS feature is a licensed offering that allows the operation of an IBM 3746 Model 900 attached to a 3745 Communication Controller. Prior to NCP V7R6, you were required to license, order, and install separate software media. Starting with NCP V7R6 the media containing the 3746 Model 900 CSS feature code has been incorporated into the base code of NCP. You are no longer required to install separate 3746 Model 900 CSS software media when attaching the IBM 3746 Model 900 to a 3745 Communication Controller. Please note that you **must** still obtain a license for the 3746 Model 900 CSS feature. Refer to the NCP V7R6 announcement letter dated September 9, 1997 for additional licensing instructions."

Starting with EP R14, users of EP Standalone must install NCP. A single EP installation can now be used in environments requiring both PEP and EP Standalone.

A good place to start any task regarding this program is *NCP V7R7, SSP V4R7, and EP Release 14 Library Directory* (SC30-3971). It introduces the enhancements for the current release and shows where these enhancements are described in the NCP library. It gives you an overview of NCP, SSP, and EP and directs you to a variety of tasks related to these programs.

At the end of this program directory you will find a Reader's Comment Form. Please take time to complete this form and return it to the address shown on the form. Your comments and suggestions help improve this program directory and make installation easier.

2.0 Program Materials

An IBM program is identified by a program number and a feature number. The program number for NCP V7R7 VM is 5648-063. Feature numbers associated with this release are provided in the following sections.

The program announcement material describes the features supported by NCP V7R7 VM. Ask your IBM marketing representative for this information if you have not already received a copy.

The following sections identify:

- Basic and optional program materials available with this program
- Basic, optional, and associated publications available for this program
- Publications useful during installation

2.1 Basic Machine-Readable Material

This section describes the basic machine-readable material for NCP V7R7 VM.

The distribution medium for this program is a 9-track magnetic tape (written at 6250 bpi), a 3480 tape cartridge, or a 4 mm cartridge. The tape or cartridge contains all the programs and data needed for installation. NCP V7R7 VM is installed using VMSES/E. See section 6.0, "Installation Instructions" on page 29 for more information about how to install the program.

2.1.1 NCP Base Product

Figure 1 describes the program tape or cartridge for the NCP V7R7 VM program.

Figure 1. Basic Material: Program Tape

Medium	Feature Number	Physical Volume	Tape Content	External Tape Label
6250 tape	5831	1	NCP V7R7 VM	V7R7 VM
3480 cart.	5832	1	NCP V7R7 VM	V7R7 VM
4 mm cart.	6488	1	NCP V7R7 VM	V7R7 VM

Figure 2 describes the file content of the program tape or cartridge for the NCP V7R7 VM program.

Figure 2 (Page 1 of 2). Program Tape: File Content

Tape File	Content
1	Tape Header

Figure 2 (Page 2 of 2). Program Tape: File Content

Tape File	Content
2	Tape Header
3	Product Header
4	Product Memo
5	Service Apply Lists
6	PTFPARTs
7	NCP V7R7 VM Service
8	NCP V7R7 VM Service
9	NCP V7R7 VM Base Code
10	NCP V7R7 VM Executable Code

2.2 Optional Machine-Readable Material

There are no optional machine-readable materials for this program. The IBM 3746 Model 900 Feature had been optional machine-readable material, but has recently been incorporated in the base code of NCP. Please see Section 1.0 for more information.

2.3 Program Publications

The following sections identify the basic, optional, and associated publications for NCP V7R7 VM.

2.3.1 Basic Program Publications

One copy of each of these publications is included when you order the basic materials for NCP V7R7 VM. For additional copies, contact your IBM representative.

Figure 3. Basic Material: Unlicensed Publications

Publication Title	Form Number
Licensed Program Specifications: Network Control Program Version 7 Release 7	GC31-6226
Network Control Program Version 7 Release 7 Migration Guide	SC30-3889
Network Control Program, System Support Programs, and Emulation Program Resource Definition Guide	SC31-6223
Network Control Program, System Support Programs, and Emulation Program Resource Definition Reference	SC31-6224
Planning for NetView, NCP, and VTAM	SC31-8063
Planning for Integrated Networks	SC31-8062

2.3.2 Optional Basic Program Publications

Figure 4. Optional Basic Program Publications

Publication Title	Form Number
Network Control Program (NCP) X.25 Planning and Installation	SC30-3470

2.3.3 Optional Program Publications

Figure 5 identifies the optional licensed program publications for NCP V7R7 VM. The first copy is available at no charge to licensees of the basic material by ordering the 7xxx feature number. Order additional copies using the 8xxx feature number. A fee is charged for additional copies.

Figure 5. Optional Material: Licensed Program Publications

Publication Title	Form Number	Feature Number First Copy	Feature Number Additional Copy
Network Control Program and Emulation Program Reference Summary and Data Areas	LY43-0030#	7100	8100
Network Control Program and Emulation Program Reference	LY43-0029#	7101	8101
Network Control Program (NCP) X.25 Diagnosis, Customization, and Tuning	LY30-5610#	7105	8103
ALCI Diagnosis Reference	LY33-7027#	7102	8102

Note: A pound symbol (#) beside the Form Number indicates that it contains "Restricted Materials of IBM."

2.3.4 Softcopy Publications

All NCP V7R7 VM manuals, licensed and unlicensed, except for *NCP Licensed Program Specifications*, are offered in displayable softcopy form on the media listed in Figure 6.

Figure 6. Softcopy Publications

Title	Form Number	Feature Number First Copy	Feature Number Additional Copy
ACF/NCP, ACF/SSP, EP, NPSI, and NTuneMON Softcopy Collection Kit (CD-ROM)	LK2T-0414#	7110	8110

Note: A pound symbol (#) beside the Form Number indicates that it contains "Restricted Materials of IBM."

2.3.5 Publications Associated with NCP V7R7 VM

Figure 7 identifies publications that may be helpful when you use NCP V7R7 VM. To order copies, contact your IBM representative. A fee is charged for each copy of these publications.

Figure 7. Publications Associated with NCP V7R7 VM

Publication Title	Order/Form Number
Network Control Program, System Support Programs, and Emulation Program Diagnosis Guide	LY43-0033#
Network Control Program, System Support Programs, and Emulation Program Messages and Codes	SC31-6222
Network Control Program, System Support Programs, and Emulation Program Generation and Loading Guide	SC31-6221
Network Control Program Version 7 Release 7, System Support Programs Version 4 Release 7, and Emulation Program Release 14 Library Directory	SC30-3971
Network Control Program and System Support Programs Customization Guide	LY43-0031#
Network Control Program and System Support Programs Customization Reference	LY43-0032#
Network Control Program and System Support Programs Emulation Program Trace Analysis Handbook	LY43-0037#

Note: A pound symbol (#) beside the Form Number indicates that the publication is available only to licensed customers.

2.4 Microfiche Support

Microfiche program listings are not provided with NCP V7R7 VM. Customers with access to View Program Listings (VPL), such as through SoftwareXcel Extended, can access program listings formerly provided through microfiche.

Those customers without access to VPL can contact their IBM representative.

The VPL facility provides online viewing of program listings that are available to customers.

2.5 Publications Useful During Installation

The publications listed in Figure 8 or Figure 9 on page 7, depending on your VM/ESA release, may be useful during the installation of NCP V7R7 VM. To order copies, contact your IBM representative.

Figure 8 (Page 1 of 2). Publications Useful During Installation / Service on VM/ESA Version 2.2.0

Publication Title	Form Number
VM/ESA: VMSES/E Introduction and Reference	SC24-5747
VM/ESA: Service Guide	SC24-5749
VM/ESA: Planning and Administration	SC24-5750
VM/ESA: CMS Command Reference	SC24-5776
VM/ESA: CMS File Pool Planning, Administration, and Operation	SC24-5751

Figure 8 (Page 2 of 2). Publications Useful During Installation / Service on VM/ESA Version 2.2.0

Publication Title	Form Number
<i>VM/ESA: System Messages and Codes</i>	SC24-5784

Figure 9. Publications Useful During Installation / Service on VM/ESA Version 2.3.0

Publication Title	Form Number
<i>VM/ESA: VMSES/E Introduction and Reference</i>	GC24-5837
<i>VM/ESA: Service Guide</i>	GC24-5838
<i>VM/ESA: Planning and Administration</i>	SC24-5750
<i>VM/ESA: CMS Command Reference</i>	SC24-5776
<i>VM/ESA: CMS File Pool Planning, Administration, and Operation</i>	SC24-5751
<i>VM/ESA: System Messages and Codes</i>	GC24-5841

3.0 Program Support

This section describes the IBM support available for NCP V7R7 VM.

3.1 Preventive Service Planning

Before installing NCP V7R7 VM, check with your IBM Support Center or use IBMLink (Service Link) to determine if there is additional Preventive Service Planning (PSP) information. To obtain this information, specify the following UPGRADE and SUBSET values:

Figure 10. PSP Upgrade and Subset ID

Retain			
COMPID	Release	Upgrade	Subset
564806300	772	NCP770	772

3.2 Statement of Support Procedures

Report any difficulties you have using this program to your IBM Support Center. If an APAR is required, the Support Center will provide the address to which any needed documentation can be sent.

Figure 11 identifies the component ID (COMPID), RETAIN Release, and Field Engineering Service Number (FESN) for NCP V7R7 VM.

Figure 11. Component IDs

Retain			
COMPID	Release	Component Name	FESN
564806300	772	NCP V7R7 VM	0466620

4.0 Program and Service Level Information

This section identifies the program and any relevant service levels of NCP V7R7 VM. The program level refers to the APAR fixes incorporated into the program. The service level refers to the PTFs shipped with this program. Information about the cumulative service tape is also provided.

4.1 Program Level Information

The program level refers to the APAR fixes incorporated into NCP V7R7 VM. See Appendix A, "APARs Incorporated into This Program" on page 51, for a complete listing of the APARs incorporated into this program.

4.2 Service Level Information

The service level refers to the PTFs shipped with NCP V7R7 VM.

Check the NCP770 PSP bucket for any additional PTFs that should be installed or any additional install information.

4.3 Cumulative Service Tape

Cumulative service for NCP V7R7 VM is available through a monthly corrective service tape, Expanded Service Option (ESO).

5.0 Installation Requirements and Considerations

The following sections identify the system requirements for installing NCP V7R7 VM.

5.1 Program Considerations

The following sections list the programming considerations for installing NCP V7R7 VM.

5.1.1 Operating System Requirements

The operating system requirements for NCP V7R7 VM are defined by SSP V4R7 VM/ESA, licensed program number 5654-009.

5.1.2 Other Program Product Requirements

5.1.2.1 Programming Requirements:

A platform-dependent BookManager product is required to display softcopy publications on CD-ROM. Limited function DOS, Windows, and OS/2 versions of these products are available on your CD-ROM. For more information or to order full-function releases of these products, or VM or MVS versions, refer to the IBM BookManager home page at <http://booksrv2.raleigh.ibm.com>.

5.1.2.2 Machine Requirements:

This program operates on any IBM 3745 Communication Controller. The Controller Load and Dump Program (CLDP) is used to load and dump the 3745 when attached to the host via an OEMI channel, ESCON channel, or remotely via a 3745 base frame SDLC link through another controller. For other connections, loads and dumps require an active NCP and an owning VTAM. The MODIFY DUMP and MODIFY LOAD transfer facility commands of the owning VTAM are then used to load and dump the IBM 3745. For more information, refer to *IBM 3720/3745 Communication Controllers Remote Loading/Activation Guide (SA33-0161)*.

The IBM 3745 Communication Controller must have the appropriate features and microcode level installed when the IBM 3745 expansion frame, the IBM 3746 Model 900, is installed. The IBM 3746 Model 900 provides ESCON attachment capability for the IBM 3745, as well as additional higher performance token-ring adapters, communication line adapters, and frame relay capability on the communication line adapters for the IBM 3745. The communication line adapters support SDLC, frame relay, X.25 NPSI with NPSI V3R8 or later, and X.25 ODLC.

When the 3746 Model 900 is attached, the NCP V7R7 3746 Model 900 feature license is required at the appropriate usage tier level.

For 3746 Model 900 IP internal coupling with NCP, the 3746 Model 900 Network Node Processor Feature 5022 or 5122, the IP Routing Feature 5033, and Feature 5800 are required.

For 3746 Model 900 Frame Relay and ISDN DYNWIND Keyword expanded options, Feature 5800 is required.

For the higher performance frame relay capability on the communication line adapters in the 3746 Model 900, Feature 5800 or ECA number 134 is required.

For Automatic Network Routing (ANR) over ESCON, Feature 5800 or ECA number 137 is required.

For High Performance Routing (HPR) using frame-relay on the communication line adapters in the 3746 Model 900, Feature 5800 or ECA number 137 is required.

For 3746 Model 900 processor performance and storage utilization NPM information, Feature 5800 or ECA number 137 is required.

For 3746 Model 900 TIC3 utilization NPM information, Feature 5800 or ECA number 137 is required.

For 3746 Model 900 communication line adapter X.25 NPSI support, Feature 5800 or ECA number 137 is required.

For 3746 Model 900 frame-relay Boundary Access Node (BAN) support, Feature 5800 or ECA number 138 is required.

For 3746 Model 900 frame-relay SAP multiplexing support, Feature 5800 or ECA number 138 is required.

For 3746 Model 900 frame-relay HPR NPM information, Feature 5800 or ECA number 138 is required.

For 3746 Model 900 Network Node tier C level support, Feature 5800 or ECA number 146 (EC # D22560D) is required.

For 3746 Model 900 X.25 support, Feature 5800 or ECA number 146 (EC # D22560D) is required.

For 3746 Model 900 frame-relay frame handler switching, Feature 5800 or ECA number 146 (EC # D22560D) is required.

For 3746 Model 900 native IP over ESCON support, Feature 5800 or ECA number 142 (EC # D22510) is required.

For 3746 Model 900 ESCON reporting of an offline sequence as an INOP01, microcode fix MCF MD22414.418 is required.

For 3746 Model 900 HPR non-ERP over TIC3 support, Feature 5800 or ECA number 146 (EC # D22560D) is required.

For 3746 Model 900 ISDN primary rate, Feature 5800 or ECA number 159 (EC # D22570D) is required.

For 3746 Model 900 duplicate TIC addressing, Feature 5800 or ECA number 157 (EC # D22570C) is required.

For 3746 Model 900 frame-relay Boundary Access Node (BAN) for subarea links, Feature 5800 or ECA number 157 (EC # D22570C) is required.

For 3746 Model 900 TIC3 and ESCON port sharing between the network node processor (NNP) and NCP, Feature 5800 or ECA number 155 is required.

For 3746 Model 900 frame-relay port sharing between the network node processor (NNP) and NCP, Feature 5800 or ECA number 157 is required.

For 3746 Model 900 X.25 port sharing between the network node processor (NNP) and NCP, Feature 5800 or ECA number 167 is required.

For 3746 Model 900 Automatic Network Routing (ANR) over frame-relay Boundary Access Node (BAN), Feature 5800 or ECA number 155 is required.

For 3746 Model 900 NPM support for ISDN, Feature 5800 or ECA number 167 is required.

For 3746 Model 900 HPR over X.25 ODLC, Feature 5800 or ECA number 146 (EC # D22560D) is required.

For 3746 Model 900 Frame Relay automatic backup over ISDN, Feature 5800 or ECA number 167 is required.

For 3746 Model 900 ESCON retrying of the activation if the host is powered off, microcode fix MCF MD22714.403 is required.

For 3746 Model 900 duplicate TIC addressing for subarea connections, EC # D46130 is required.

For 3746 Model 900 support for RIP V2 multicasting, ESS microcode patch EGAL2 is required.

A microcode EC for the 3745 is required for the Dynamic Internet Protocol routing function of this program when using the Ethernet Subsystem (ESS). Following are the minimum 3745 microcode EC levels to support this function:

Figure 12. Minimum Microcode Levels for the 3745

EC Number	Model
C37967	210, 310, 410, 610
C38006	130, 150, 160, 170
D39894	21A, 31A, 41A, 61A
D40002	17A

For 3746 Model 900 support for

- Committed Information Rate (CIR) on frame-relay lines controlled by NCP
- frame-relay switched support for frame-relay switched lines controlled by NCP
- routing information change (RIF) notification to NTuneMON after a non-disruptive route switch for connections on a TIC3

Feature Number 5800 and ECA 185 are required with one of the following:

- Service Processor Type 2 (feature number 5052)
- Service Processor Part Number 55H7630 (feature number 5021 - type 3172 with Pentium 90 processor) equipped with
 - CD-ROM drive (feature number 5051)
 - Service Processor memory expansion (feature number 5028)

The NCP V7R7 minimum size load module may exceed 1 megabyte. This is supported in base microcode levels for the x1A and 17A models. Patches exist for x10 and 1x0 models. Please see Technical Data Recording (TDR) H124890 for more information.

5.1.2.3 Minimum Requisites:

A minimum requisite is defined as one of the following:

- *Installation Requisite:* A product that is required at installation time. i.e. this product **will not install** successfully unless this requisite is met.
- *Run Time Requisite:* A product that is **not** required for the successful installation of this product, but **is** needed at run time in order for this product to work.

TCAM or VTAM can reside in the host depending upon the specific requirements of the customer installation.

This program is generated using SSP V4R7 for VM. In addition to providing the generation function for this release, SSP provides utilities for loading, dumping, and trace formatting for NCP.

NCP V7R7 VM is supported in conjunction with the following licensed programs at the function level of the version and release for as long as program services are available for the particular version and release. The following are host-resident programs:

- SSP V4R7
- Telecommunication Access Method (TCAM) V2R4
- OS/390 Release 4 or later
- OS/390 Releases 1, 2, or 3
- VTAM V4R1 or later
- VTAM V3R3 or later

5.1.2.4 Functional Requisites:

The following are host-resident programs:

- NTuneMON V2R5 (with NTuneNCP Tuning feature)
- TME 10 NetView for OS/390 V1R1 or higher
- NetView V2R1 or later
- NetView V1R3

Alert processing related to parallel transmission groups for channel links is provided by NetView V1R3, or later, releases.

- NetView Performance Monitor V1R6 or higher
- Transaction Processing Facility (TPF) V3 or V4

Either Type 5 or Type 2.1 attachment capability is provided. Type 5 attachment requires SNA Network Interconnection (SNI) support in the channel-attached NCP.

- TCP/IP with OS/390 V2R5 (CS/390 IP V2R5)
- TCP/IP V2R2 or later

The following are controller-resident programs:

- Emulation Program (EP) R14
- Network Terminal Option (NTO) R11
- Network Routing Facility (NRF) R9
- X.25 NCP Packet Switching Interface (NPSI) V3R9
- X.21 Short Hold Mode/Multiple Port Sharing (X.21 SH/MPS) V2 R3.1
- X.25 SNA Interconnection (XI) Program Product V2R4.2

The following levels of NCP are supported as communicating with NCP V7R7 VM as long as program services are available for the particular level of NCP.

- NCP V7R3 or higher
- NCP V6R2 or higher
- NCP V5R4
- NCP V4R3.1

5.1.2.5 Compatibility Requisites:

The following sections describe cross product service considerations for NCP, VTAM, NPM, TPF, NetView, TCAM, and TCP/IP.

5.1.2.5.1 NCP:

The NCP APAR listed in Figure 13 on page 18 is required for NCP V7R1 NTRI Subarea Links to be compatible with NCP V7R7.

Figure 13. NCP APAR Required for NCP V7R1 Compatibility with NCP V7R7

Product Name	APAR
NCP V7R1	IR32286

5.1.2.5.2 VTAM:

The VTAM APARs shown in Figure 14 is required for IP support over 3745 frame-relay switched physical lines.

Figure 14. VTAM APARs Required for IP Support Over 3745 Frame-Relay Switched Physical Lines

Product Name	APAR
VTAM V4R4	OW34198
OS/390 R5	OW34198
OS/390 R6	OW34198

The VTAM APAR shown in Figure 15 is required for 3745 and 3746 Model 900 Frame Relay Switched Dial Backup support.

Figure 15. VTAM APAR Required for Frame Relay Switched Dial Backup Support

Product Name	APAR
VTAM V4R4	OW27985

The VTAM APAR shown in Figure 16 is required for APPN Logical Resource Depletion Notification.

Figure 16. VTAM APAR Required for APPN Logical Resource Depletion Notification

Product Name	APAR
VTAM V4R4	OW25754

The VTAM APAR shown in Figure 17 is required for PU and LU Name Association between Host and Downstream device support.

Figure 17. VTAM APAR Required for PU and LU Name Association between Host and Downstream Device Support

Product Name	APAR
VTAM V4R4	OW25501

The VTAM APARs listed in Figure 18 is required for the NCP Frame Relay over Token Ring function.

Figure 18. VTAM APARs Required for NCP Frame Relay Over Token Ring

Product Name	APAR
VTAM V4R2 MVS/ESA	OW09797
VTAM V4R2 VSE/ESA	DY44000

The VTAM APARs listed in Figure 19 are required for the VTAM levels shown in Figure 19 to communicate with NCP V7R7 VM.

Figure 19. VTAM APARs Required for NCP V7R7

Product Name	APAR
VTAM V3R2 MVS/XA	OY22547
VTAM V3R2 MVS/370	OY23877
VTAM V3R2 VM	VM37705
VTAM V3R1.2 VSE	DY38541

The VTAM APAR listed in Figure 20 is required for compatibility with NCP Spare SDLC lines support.

Figure 20. VTAM APAR Required for Compatibility with NCP Spare SDLC Lines

Product Name	APAR
VTAM V4R2 MVS/ESA	OW06708

The VTAM APAR listed in Figure 21 is required for compatibility with NCP Internet Protocol over Frame Relay Dynamic Reconfiguration function.

Figure 21. VTAM APAR Required for Compatibility with NCP IP over FR Dynamic Reconfiguration

Product Name	APAR
VTAM V4R3 MVS/ESA	OW15600

The VTAM APARs listed in Figure 22 are required for casual connection and/or NNNC.

Figure 22. Casual Connection and/or NNNC

Product Name	APAR
VTAM V3R3 MVS/ESA	OY30487
VTAM V3R3 MVS/ESA	OY30488
VTAM V3R2.1 VM	VM40123
VTAM V3R2.1 VSE	DY39165
VTAM V3R2 MVS/XA	OY26312
VTAM V3R2 MVS/XA	OY26327
VTAM V3R2 MVS/370	OY29600

The VTAM APARs listed in Figure 23 are required for selective NNNA support.

Figure 23. VTAM APARs Required for Selective NNNA Support

Product Name	APAR
VTAM V3R3 MVS/ESA	OY52318
VTAM V3R4 MVS/ESA	OY52318
VTAM V3R4.1 MVS/ESA	OY52318
VTAM V3R3 MVS/XA	OY52319

The VTAM APARs listed in Figure 24 are required to delay activating logical links until the associated physical resources are active.

Figure 24. VTAM APARs Required to Delay Activating Logical Links

Product Name	APAR
VTAM V3R4.1 MVS/ESA	OY55462
VTAM V3R4.1 MVS/ESA	OY55304

The VTAM APARs listed in Figure 25 are required for compatibility with NCP Frame Relay support.

Figure 25. VTAM APARs Required for Compatibility with NCP Frame Relay

Product Name	APAR
VTAM V4R1 MVS/ESA	OW04338
VTAM V4R2 MVS/ESA	OW04338
VTAM V4R1 MVS/ESA	OW04575
VTAM V4R2 MVS/ESA	OW04575
VTAM V4R1 MVS/ESA	OW05013
VTAM V4R2 MVS/ESA	OW05013
VTAM V4R2 MVS/ESA	OW06065

The VTAM APARs listed in Figure 26 are required to support the NCP ESCON function.

Figure 26. VTAM APAR Required to Support NCP ESCON

Product Name	APAR
VTAM V3R3 MVS/ESA	OY58783
VTAM V3R3 MVS/ESA	OY29256
VTAM V3R3 MVS/ESA	OY35599
VTAM V3R3 VM/ESA	OY54982
VTAM V3R4 MVS/ESA	OY58783
VTAM V3R4.1 MVS/ESA	OY58783
VTAM V3R4.1 MVS/ESA	OY52595
VTAM V3R4.1 MVS/ESA	OY52888
VTAM V3R4.1 MVS/ESA	OY57157
VTAM V3R3 VM/ESA	VM54982

The VTAM APARs listed in Figure 27 are required to reduce the number of messages generated when a ROUTE INOP occurs.

Figure 27. VTAM APAR Required to Perform Route INOP Reduction

Product Name	APAR
VTAM V3R4 MVS/ESA	OY48223
VTAM V3R4.1 MVS/ESA	OY48223

The VTAM APARs listed in Figure 28 are required to avoid VTAM error messages when coding the MAXDATA keyword for PU4s in the NCP definition.

Figure 28. VTAM APARs Required for Coding MAXDATA for PU4s

Product Name	APAR
VTAM V3R3 MVS/ESA	OY58078
VTAM V3R3 MVS/XA	OY58281
VTAM V3R4 MVS/ESA	OY58078
VTAM V3R4.1 MVS/ESA	OY58078
VTAM V3R3 VM/SP	VM54590
VTAM V3R3 VM/ESA	VM54591
VTAM V3R4.1 VM/SP	VM54903
VTAM V3R4.1 VM/ESA	VM54904

The VTAM APAR listed in Figure 29 is required for users of NetView and STATMON.

Figure 29. VTAM APAR Required for NetView and STATMON

Product Name	APAR
VTAM V3R4.1 MVS/ESA	OY55988

The VTAM APAR shown in Figure 30 is required for compatibility with NCP Frame Relay Peripheral Node support.

Figure 30. VTAM APAR Required for NCP Frame Relay Peripheral Node Support

Product Name	APAR
VTAM V4R1	OW00206

5.1.2.5.3 NPM:

The NPM APAR listed in Figure 31 is required for compatibility with NCP V7R7 VM. This APAR is also required for the NCP Internet Protocol over Token Ring function.

Figure 31. NPM APAR Required for NCP V7R7 VM and NCP IP Over Token Ring

Product Name	APAR
NPM V2R2 MVS/ESA	OW12520

The NPM APAR listed in Figure 32 is required for ODLC LAN HPR data collection.

Figure 32. NPM APAR Required for ODLC LAN HPR Data Collection

Product Name	APAR
NPM V2R2 MVS/ESA	OW17876

The NPM APARs listed in Figure 33 on page 23 are required for the 3746 Model 900 TIC3 utilization NPM information function.

Figure 33. NPM APARs Required for 3746 Model 900 TIC3

Product Name	APAR
NPM V2R1 MVS/ESA	OW10584
NPM V2R2 MVS/ESA	OW10584

The NPM APARs listed in Figure 34 are required for the 3746 Model 900 processor utilization NPM information function.

Figure 34. NPM APARs Required for 3746 Model 900 Processor

Product Name	APAR
NPM V2R1 MVS/ESA	OW08565
NPM V2R2 MVS/ESA	OW08565

The NPM APARs listed in Figure 35 are required for the 3746 Model 900 X.25 NPSI function.

Figure 35. NPM APARs Required for 3746 Model 900 X.25 NPSI

Product Name	APAR
NPM V2R1 MVS/ESA	OW10583
NPM V2R2 MVS/ESA	OW10583

The NPM APARs listed in Figure 36 are required for the NCP Dynamic Control Blocks function.

Figure 36. NPM APARs Required for NCP Dynamic Control Blocks

Product Name	APAR
NPM V2R1 MVS/ESA	OW09271
NPM V2R2 MVS/ESA	OW09271

The NPM APAR listed in Figure 37 is required for compatibility with NCP.

Figure 37. NPM APAR Required for NCP

Product Name	APAR
NPM V1R6 MVS	OY66928

The NPM APARs listed in Figure 38 are required for compatibility with NCP Frame Relay on 3746 Model 900 support.

Figure 38. NPM APARs Required for Compatibility with NCP Frame Relay

Product Name	APAR
NPM V2R1 MVS/ESA, MVS/XA, VM/ESA	OW07715
NPM V2R2 MVS/ESA, VM/ESA	OW07715

The NPM APAR listed in Figure 39 is required for the 3746 Model 900 ISDN function.

Figure 39. NPM APAR Required for 3746 Model 900 ISDN Function

Product Name	APAR
NPM V2R2	OW18882

The NPM APARs listed in Figure 40 are required for the 3746 Model 900 X.25 ODLC function.

Figure 40. NPM APARs Required for 3746 Model 900 X.25 ODLC Function

Product Name	APAR
NPM V2R1	OW19297
NPM V2R2	OW19297

5.1.2.5.4 TPF:

The TPF APARs and PTF level shown in Figure 41 are required for compatibility with NCP V7R7 if you use TPF.

Figure 41. TPF APARs and PTF Required for NCP V7R7

Product Name	APAR or PTF
TPF V3R1	WP12070
TPF V3R1	WP11843
TPF V3R1	PTF Level 16

5.1.2.5.5 NetView:

The NetView APARs listed in Figure 42 are required for enhanced LPDA2 support for 786x modems.

Figure 42. NetView APARs

Product Name	APAR
NetView V1R3 MVS	OY21453
NetView V1R3 VM	VM37606

The NetView APARs listed in Figure 43 are required for compatibility with NCP V7R7 VM.

Figure 43. NetView APARs

Product Name	APAR
NetView V2R1 MVS/ESA	OY53410
NetView V2R2 MVS/ESA	OY53410
NetView V2R1 MVS/XA	OY53578
NetView V2R2 MVS/XA	OY53578
NetView V1R3 MVS/ESA	OY53579
NetView V1R3 MVS/XA	OY53580

5.1.2.5.6 TCAM:

The TCAM APAR listed in Figure 44 is required if your NCP is channel-attached to TCAM.

Figure 44. TCAM APAR

Product Name	APAR
TCAM V2R4 MVS	OY25731

5.1.2.5.7 TCP/IP:

The TCP/IP APAR listed in Figure 45 is required for Variable Length Subnet Mask support.

Figure 45. TCP/IP APAR Required for Variable Length Subnet Mask

Product Name	APAR
TCP/IP V3R2	PQ02781

The TCP/IP APAR listed in Figure 46 is required for RIP V2 support.

Figure 46. TCP/IP APAR Required for RIP V2 Support

Product Name	APAR
TCP/IP V3R2	PQ02781

The TCP/IP APARs listed in Figure 47 are required for the Dynamic Internet Routing over Frame Relay function.

Figure 47. TCP/IP APARs Required for Dynamic Routing Over Frame Relay

Product Name	APAR
TCP/IP V3R1 MVS	PN66582
TCP/IP V3R1 MVS	PN68188
TCP/IP V3R1 MVS	PN69619
TCP/IP V3R1 MVS	PN69951
TCP/IP V3R1 MVS	PN72929

The TCP/IP APARs listed in Figure 48 are required for compatibility with NCP.

Figure 48. TCP/IP APARs

Product Name	APAR
TCP/IP V2R2 VM	PN20654
TCP/IP V2R1 MVS	PN17950

The TCP/IP APAR listed in Figure 49 is required for compatibility with NCP Dynamic Internet Routing function.

Figure 49. TCP/IP APAR Required for NCP Dynamic Internet Routing Function

Product Name	APAR
TCP/IP V2R2.1 MVS	PN48473

The TCP/IP APARs listed in Figure 50 are required for Direct IP Channel Communication.

Figure 50. TCP/IP APARs Required for Direct IP Channel Communication

Product Name	APAR
TCP/IP V3R1 MVS	PN75734

The TCP/IP APAR listed in Figure 51 is required for the IP NCPROUTE Direct over Channel function.

Figure 51. TCP/IP APARs Required for IP NCPROUTE Direct over Channel

Product Name	APAR
TCP/IP V3R1 MVS	PN80904

5.2 Program Installation and Service Considerations

This section describes items that should be considered before you install or service NCP V7R7 VM.

- VMSES/E is required to install and service this product.
- If multiple users install and maintain licensed products on your system, there may be a problem getting the necessary access to MAINT's 51D disk. If you find that there is contention for write access to the 51D disk, you can eliminate it by converting the Software Inventory from minidisk to Shared File System (SFS). Refer to the *VMSES/E Introduction and Reference* manual, section 'Changing the Software Inventory to an SFS Directory', for information on how to make this change.
- Customers will no longer install and service NCP V7R7 VM strictly using the MAINT user ID, but will use a new user ID--P648063H. This is the IBM suggested user ID name. You are free to change this to any user ID name you wish; however, a PPF override must be created.

Note: It may be easier to make the above change during the installation procedure 6.2, "Plan Your Installation For NCP V7R7 VM" step 6 on page 31, rather than after you have installed this product.

5.3 DASD Storage and User ID Requirements

Figure 52 lists the user IDs, minidisks and default SFS directory names that are used to install and service NCP V7R7 VM.

Important Installation Notes:

- User ID(s) and minidisks or SFS directories will be defined in 6.2, "Plan Your Installation For NCP V7R7 VM" on page 30 and are listed here so that you can get an idea of the resources that you will need prior to allocating them.
- P648063H is a default user ID and can be changed. If you choose to change the name of the installation user ID you need to create a Product Parameter Override (PPF) to reflect this change. This can be done in 6.2, "Plan Your Installation For NCP V7R7 VM" step 6 on page 31.
- If you choose to install NCP V7R7 VM on a common user ID the default minidisk addresses for NCP V7R7 VM may already be defined. If any of the default minidisks required by NCP V7R7 VM are already in use you will have to create an override to change the default minidisks for NCP V7R7 VM so they are unique.

Figure 52. DASD Storage Requirements for Target Minidisks

Minidisk owner (user ID)	Default Address	Storage in Cylinders		FB-512 Blocks	SFS 4-K Blocks	Usage
		DASD	CYLS			Default SFS Directory Name
P648063H	2B2	3390 3380 9345	50 60 60	72000	9000	Contains all the base code shipped with NCP V7R7 VM VMSYS:P648063H.NCP.OBJECT
P648063H	2C2	3390 3380 9345	4 5 5	6000	750	Contains customization files. This disk may also be used for local modifications. VMSYS:P648063H.NCP.SAMPLE
P648063H	2D2	3390 3380 9345	16 20 20	24000	3000	Contains serviced files VMSYS:P648063H.NCP.DELTA
P648063H	2A6	3390 3380 9345	16 20 20	24000	3000	Contains AUX files and software inventory tables that represent the test service level of NCP V7R7 VM VMSYS:P648063H.NCP.APPLYALT
P648063H	2A2	3390 3380 9345	16 20 20	24000	3000	Contains AUX files and software inventory tables that represent the service level of NCP V7R7 VM that is currently in production. VMSYS:P648063H.NCP.APPLYPRD
P648063H	400	3390 3380 9345	90 115 115	138000	17250	Test BUILD disk. This code will be copied to a production disk. VMSYS:P648063H.NCP.TRUN
P648063H	401	3390 3380 9345	90 115 115	138000	17250	Production BUILD disk. Files from the test BUILD disk are copied here for application use. VMSYS:P648063H.NCP.RUN
P648063H	191	3390 3380 9345	90 115 115	138000	17250	P648063H user ID's 191 minidisk VMSYS:P648063H.

Note: Cylinder values defined in this table are based on a 4-K block size. FB-512 block and SFS values are derived from the 3380 cylinder values in this table. The FBA blocks are listed as 1/2-K but should be CMS formatted at 1K size. 70 500 4-K blocks are needed for SFS install.

6.0 Installation Instructions

This section describes the installation methods and the step-by-step procedures to install NCP V7R7 VM.

The step-by-step procedures are in two column format. The steps to be performed are in bold large numbers. Commands for these steps are on the left hand side of the page in bold print. Additional information for a command may exist to the right of the command. For more information about the two column format, refer to “Understanding Dialogs with the System” in *VM/ESA Installation Guide*.

Each step of the installation instructions must be followed. Do not skip any step unless directed otherwise.

Throughout these instructions, the use of IBM-supplied default minidisk addresses and user IDs is assumed. If you use different user IDs, minidisk addresses, or SFS directories to install NCP V7R7 VM, adapt these instructions as needed for your environment.

Note!

The sample console output presented throughout these instructions was produced on a VM/ESA 2.2.0 system. If you are installing NCP V7R7 VM on a different VM/ESA system, the results obtained for some commands may differ from those depicted here.

6.1 VMSES/E Installation Process Overview

The following is a brief description of the main steps in installing NCP V7R7 VM using VMSES/E.

- Plan Your Installation

Use the VMFINS command to load several VMSES/E files from the product tape and to obtain NCP V7R7 VM resource requirements.

- Allocate Resources

The information obtained from the previous step is used to allocate the appropriate minidisks (or SFS directories) and user IDs needed to install and use NCP V7R7 VM.

- Install the NCP V7R7 VM Product

Use the VMFINS command to load the NCP V7R7 VM product files from tape to the test BUILD and BASE minidisks/directories. VMFINS is used to update the VM SYSBLDS file used by VMSES/E for software inventory management.

- Place NCP V7R7 VM Files into Production

Once the product files have been installed and the operation of NCP V7R7 VM is satisfactory, the product files are copied from the test BUILD disk to the production BUILD disk.

For a complete description of all VMSES/E installation options, refer to *VMSES/E Introduction and Reference*.

6.2 Plan Your Installation For NCP V7R7 VM

The VMFINS command will be used to plan the installation. This section has 2 main steps that will:

- load the first tape file, containing installation files
- generate a “PLANINFO” file listing
 - all user ID and minidisk/SFS directory requirements
 - required products

To obtain planning information for your environment:

1 Log on as NCP V7R7 VM installation planner.

This user ID can be any ID that has read access to MAINT's 5E5 minidisk and write access to the MAINT 51D minidisk.

2 Mount the NCP V7R7 VM installation tape and attach it to NCP V7R7 VM installation planner at virtual address 181. The VMFINS EXEC requires the tape drive to be at virtual address 181.

3 Establish read access to the VMSES/E code.

**link MAINT 5e5 5e5 rr
access 5e5 b**

The MAINT 5E5 disk contains the VMSES/E code.

4 Establish write access to the Software Inventory disk.

**link MAINT 51d 51d mr
access 51d d**

The MAINT 51D disk is where the VMSES/E system-level Software Inventory and other dependent files reside.

Note: If another user already has the MAINT 51D minidisk linked in write mode (R/W), you only obtain read access (R/O) to this minidisk. If this occurs, you need to have that user re-link the 51D in read-only mode (RR), and re-issue the above LINK and ACCESS commands. Do not continue with these procedures until a R/W link is established to the 51D minidisk.

5 Load the NCP V7R7 VM product control files to the 51D minidisk.

vmfins install info (nomemo)

The NOMEMO option will load the memos from the tape but will not issue a prompt to send them to the system printer. Specify the MEMO option if you want to be prompted for printing the memo.

This command will perform the following:

- load Memo-to-Users
- load various product control files, including the Product Parameter File (PPF) and the PRODPART files
- create VMFINS PRODLIST on your A-disk. The VMFINS PRODLIST contains a list of products on the installation tape.

```
VMFINS2760I VMFINS processing started
VMFINS1909I VMFINS PRODLIST created on your A-disk
VMFINS2760I VMFINS processing completed successfully
Ready;
```

6 Obtain resource planning information for NCP V7R7 VM.

Note: The product will **not** be loaded by the VMFINS command at this time.

vmfins install ppf 5648063H {NCP | NCPSFS} (plan nomemo)

Use **NCP** for installing on minidisks or **NCPSFS** for installing in Shared File System directories.

The PLAN option indicates that VMFINS will perform requisite checking, plan system resources, and provide an opportunity to override the defaults in the product parameter file.

You can override any of the following:

- the name of the product parameter file
- the default user IDs
- minidisk/directory definitions

Notes:

- a. If you change the PPF name, a default user ID, or other parameters via a PPF override, you need to use your changed values instead of those indicated (when appropriate), throughout the rest of the installation instructions, as well as the instructions for servicing NCP V7R7 VM. For example, you need to specify your PPF override file name instead of 5648063H for certain VMSES/E commands.
- b. If you are not familiar with creating PPF overrides using VMFINS, you should review the “Using the Make Override Panel” section in the *VMSES/E Introduction and Reference* before you continue.
- c. For more information about changing the VMSYS file pool name, refer to *VMSES/E Introduction and Reference*.

```
VMFINS2760I VMFINS processing started
VMFREQ2805I Product 5648063H component NCP passed requisite checking
Do you want to create an override for 5648063H NCP (prodid 5648063H)?
Enter 0 (No), 1 (Yes) or 2 (Exit)
0
VMFRMT2760I VMFRMT processing started
VMFRMT2760I VMFRMT processing completed successfully
VMFPLA1909I 5648063H PLANINFO created on your A-disk
VMFINS2760I VMFINS processing completed successfully
```

- 7** Review the install message log (\$VMFINS \$MSGLOG). If necessary, correct any problems before proceeding. For information about handling specific error messages, refer to *VM/ESA: System Messages and Codes*, or use on-line HELP.

vmfview install

6.3 Allocate Resources for Installing NCP V7R7 VM

Use the planning information in the 5648063H PLANINFO file, created in the **PLAN** step, to:

- Create the P648063H user directory for minidisk install

OR

- Create the P648063H user directory for SFS install

6.3.1 Installing NCP V7R7 VM on Minidisk

- 1 Obtain the user directory from the 5648063H PLANINFO file.

Note: The user directory entry is located at the bottom of the PLANINFO file of the resource section; these entries will contain all of the links and privilege classes necessary for the P648063H user ID. Use the directory entry found in PLANINFO as a model for input to your system directory.

- 2 Add the MDISK statements to the directory entry for P648063H. Use Figure 52 on page 27 to obtain the minidisk requirements.

- 3 If you are installing NCP V7R7 VM on a VM/ESA 370 system, the following directory entry change must be made:

- For the P648063H directory entry:
 - Change the user ID storage from 24M to 16M.
 - Comment out or remove the MACHINE XA statement from the directory entry.

- 4 Add the P648063H directory to the system directory. Change the password for P648063H from xxxxx to a valid password, in accordance with your security guidelines.

- 5 Place the new directories on-line using VM/Directory Maintenance (DIRMAINT) or an equivalent CP directory maintenance method.

Note

All minidisks for the P648063H user ID must be formatted before installing NCP V7R7 VM.

6.3.2 Installing NCP V7R7 VM in SFS Directories

- 1 Obtain the user directory from the 5648063H PLANINFO file.

Note: The user directory entry is located at the bottom of the PLANINFO file of the resource section; these entries contain all of the links and privilege classes necessary for the P648063H user ID. Use the directory entry found in PLANINFO as a model for input to your system directory.

- 2 If you are installing NCP V7R7 VM on a VM/ESA 370 Feature system, the following directory entry change must be made:

- For the P648063H directory entry:
 - Change the user ID storage from 24M to 16M.

- Comment out or remove the MACHINE XA statement from the directory entry.
- 3** Add the P648063H directory to the system directory. Change the password for P648063H from xxxxx to a valid password, in accordance with your security guidelines.
- 4** Place the new directories on-line using VM/Directory Maintenance (DIRMAINT) or an equivalent CP directory maintenance method.
- 5** An SFS install also requires the following steps:
 - a** Determine the number of 4K blocks that are required for SFS directories by adding up the 4K blocks required for each SFS directory you plan to use.

If you intend to use all of the default NCP V7R7 VM SFS directories, the 4K block requirements for each NCP V7R7 VM are summarized in Figure 52 on page 27

This information is used when enrolling the P648063H to the VMSYS filepool.
 - b** Enroll user P648063H in the VMSYS filepool using the ENROLL USER command:

```
ENROLL USER P648063H VMSYS: (BLOCKS blocks
```

where *blocks* is the number of 4K blocks that you calculated in the previous step.

Note: This must be done from a user ID that is an administrator for VMSYS: filepool.
 - c** Determine if there are enough blocks available in the filepool to install NCP V7R7 VM. This information can be obtained from the QUERY FILEPOOL STATUS command. Near the end of the output from this command is a list of minidisks in the filepool and the number of blocks free. If the number of blocks free is smaller than the total 4K blocks needed to install NCP V7R7 VM, you need to add space to the filepool. See *VM/ESA SFS/CRR Planning, Administration, and Operation* for information about adding space to a filepool.
 - d** Create the necessary subdirectories listed in the 5648063H PLANINFO file using the CREATE DIRECTORY command.

set filepool vmsys:
create directory *dirid*

dirid is the name of the SFS directory you're creating, such as:

```
create directory vmsys:P648063H.NCP
create directory vmsys:P648063H.NCP.object
:
```

If necessary, refer to *VM/ESA CMS Command Reference* for more information about the CREATE DIRECTORY command.

A complete list of default NCP SFS directories is provided in Figure 52 on page 27.

- e** If you intend to use an SFS directory as the work space for the P648063H user ID, include the following IPL control statement in the P648063H directory entry:

```
IPL CMS PARM FILEPOOL VMSYS
```

This will cause CMS to automatically access the P648063H's top directory as file mode A.

6.4 Install NCP V7R7 VM

The *ppfname* used throughout these installation instructions is **5648063H**, which assumes you are using the PPF supplied by IBM for NCP V7R7 VM. If you have your own PPF override file for NCP V7R7 VM, you should use your file's *ppfname* instead of **5648063H**. The *ppfname* you use should be used **throughout** the rest of this procedure.

- 1** Log on to the installation user ID **P648063H**.
- 2** Create a PROFILE EXEC that will contain the ACCESS commands for MAINT 5E5 and 51D minidisks.

```
xedit profile exec a
====> input /**/
====> input 'access 5e5 b'
====> input 'access 51d d'
====> file
```

If either 5E5 or 51D is in a shared file system (SFS) then substitute your SFS directory name in the access command.

- 3** Execute the profile to access MAINT's minidisks.

profile

- 4 Establish write access to the Software Inventory disk, if it is not already linked R/W.

Note: If the MAINT 51D minidisk was accessed R/O, you need to have the user who has it linked R/W link it as R/O. You can then issue the following commands to obtain R/W access to it.

```
link MAINT 51d 51d mr  
access 51d d
```

- 5 Mount the NCP V7R7 VM installation tape and attach it to P648063H at virtual address 181. The VMFINS EXEC requires the tape drive to be at virtual address 181.
- 6 Install NCP V7R7 VM.

Notes:

If you have already created a PPF override file, you should specify your override file name after the **PPF** keyword for the following VMFINS command.

You may be prompted for additional information during VMFINS INSTALL processing depending on your installation environment. If you are unsure how to respond to a prompt, refer to "Installing Products with VMFINS" and "Install Scenarios" chapters in *VMSES/E Introduction and Reference* to decide how to proceed.

```
vmfins install ppf 5648063H {NCP | NCPSFS} (nomemo nolink
```

Use **NCP** for installing on minidisks or **NCPSFS** for installing in Shared File System directories.

The NOLINK option indicates that you don't want VMFINS to link to the appropriate minidisks, only access them if not accessed.

```

VMFINS2760I VMFINS processing started
VMFREQ2805I Product 5648063H component NCP passed requisite checking
Do you want to create an override for 5648063H NCP (prodid 5648063H)?
Enter 0 (No), 1 (Yes) or 2 (Exit)
0
VMFINT2760I VMFINST processing started
VMFSET2760I VMFSETUP processing started
VMFUTL2205I Minidisk|Directory Assignments:
          String      Mode  Stat  Vdev  Label/Directory
VMFUTL2205I LOCALSAM  E    R/W  2C2   SES2C2
VMFUTL2205I APPLY      F    R/W  2A6   SES2A6
VMFUTL2205I              G    R/W  2A2   SES2A2
VMFUTL2205I DELTA      H    R/W  2D2   SES2D2
VMFUTL2205I BUILD0     I    R/W  400   SES400
VMFUTL2205I BASE1      J    R/W  2B2   SES2B2
VMFUTL2205I -----  A    R/W  191   SES191
VMFUTL2205I -----  B    R/O  5E5   MNT5E5
VMFUTL2205I -----  D    R/W  51D   SES51D
VMFUTL2205I -----  S    R/O  190   MNT190
VMFUTL2205I -----  Y/S  R/O  19E   MNT19E
VMFSET2760I VMFSETUP processing completed successfully
VMFREC2760I VMFREC processing started
VMFREC1852I Volume 1 of 1 of INS TAPE 9800
VMFREC1851I (1 of 6) VMFRCAXL processing AXLIST
VMFRCX2159I Loading 0 part(s) to DELTA 2D2 (H)
VMFREC1851I (2 of 6) VMFRCPTF processing PARTLST
VMFRCP2159I Loading 0 part(s) to DELTA 2D2 (H)
VMFREC1851I (3 of 6) VMFRCCOM processing DELTA
VMFRCC2159I Loading 0 part(s) to DELTA 2D2 (H)
VMFREC1851I (4 of 6) VMFRCALL processing APPLY
VMFRCA2159I Loading part(s) to APPLY 2A6 (F)
VMFRCA2159I Loaded 1 part(s) to APPLY 2A6 (F)
VMFREC1851I (5 of 6) VMFRCALL processing BASE
VMFRCA2159I Loading part(s) to BASE1 2B2 (J)
VMFRCA2159I Loaded 2503 part(s) to BASE1 2B2 (J)
VMFREC1851I (6 of 6) VMFRCALL processing BUILD
VMFRCA2159I Loading part(s) to BUILD0 400 (I)
VMFRCA2159I Loaded 2 part(s) to BUILD0 400 (I)
VMFREC2760I VMFREC processing completed successfully
VMFINT2603I Product installed
VMFINS2760I VMFINS processing completed successfully

```

- 7 Review the install message log (\$VMFINS \$MSGLOG). If necessary, correct any problems before proceeding. For information about handling specific error messages, refer to *VM/ESA System Messages and Codes*, or use on-line HELP.

vmfview install

6.4.1 Update Build Status Table for NCP V7R7 VM

- 1 Update the VM SYSBLDS software inventory file for NCP V7R7 VM.

vmfins build ppf 5648063H {NCP | NCPSFS} (serviced nolink

Use **NCP** for installing on minidisks or **NCPSFS** for installing in Shared File System directories.

The SERVICED option will build any parts that were not built on the installation tape (if any) and update the Software Inventory build status table showing that the product 5648063H has been built.

- 2 Review the install message log (\$VMFINS \$MSGLOG). If necessary, correct any problems before going on. For information about handling specific error messages, refer to *VM/ESA: System Messages and Codes*, or use on-line HELP.

vmfview install

6.5 Place NCP V7R7 VM Into Production

This section describes the procedure to place the new NCP V7R7 VM into production.

6.5.1 Copy NCP V7R7 VM Files Into Production

- 1 Log on to P648063H user ID. This user ID owns the disk that will contain the “production” level of the NCP V7R7 VM code.

a If installing using minidisks

access 400 e
access 401 f
vmfcopy * * e = = f2 (prodid 5648063H%NCP olddate replace

The VMFCOPY command will update the VMSES
PARTCAT file on the 401 disk.

b If installing using Shared File System

access P648063H.NCP.trun e
access P648063H.NCP.run f
vmfcopy * * e = = f2 (prodid 5648063H%NCP olddate replace

The VMFCOPY command will update the VMSES
PARTCAT file on the 401 disk.

NCP V7R7 VM is now installed and built on your system.

7.0 Service Instructions

This section contains the procedure to install CORrective service to NCP V7R7 VM. VMSES/E is used to install service for NCP V7R7 VM.

To become more familiar with service using VMSES/E, you should read the introductory chapters in the *VMSES/E Introduction and Reference*. These manuals also contain the command syntax for the VMSES/E commands listed in the procedure.

Note: Each step of the servicing instructions must be followed. Do not skip any step unless otherwise directed. All instructions showing accessing of disks assume the use of default minidisk addresses. If different minidisk addresses are used, or if using a shared file system, change the instructions appropriately.

7.1 VMSES/E Service Process Overview

The following is a brief description of the main steps in servicing NCP V7R7 VM using VMSES/E.

- Setup Environment
Access the software inventory disk. Use VMFSETUP command to establish the correct minidisk access order.
- Merge Service
Use the VMFMRDSK command to clear the alternate apply disk before receiving new service. This allows you to easily remove the new service if a serious problem is found.
- Receive Service
The VMFREC command receives service from the delivery media and places it on the Delta disk.
- Apply Service
The VMFAPPLY command updates the version vector table (VVT), which identifies the service level of all the serviced parts. In addition, AUX files are generated from the VVT for parts that require them.
- Reapply Local Service (if applicable)
All local service (mods) must be entered into the software inventory to allow VMSES/E to track the changes and build them into the system. Refer to Chapter 7 in the *VM/ESA Service Guide* for this procedure.
- Build New Levels
The build task generates the serviced level of an object and places the new object on a test BUILD disk.
- Place the New Service into Production

Once the service is satisfactorily tested, it should be put into production by copying the new service to the production disk, re-saving the NSS (Named Saved System).

7.2 Servicing NCP V7R7 VM

This section describes the procedure to service NCP V7R7 VM.

7.2.1 Prepare to Receive Service

The *ppfname* used throughout these servicing instructions is **5648063H**, which assumes you are using the PPF supplied by IBM for NCP V7R7 VM. If you have your own PPF override file for NCP V7R7 VM, you should use your file's *ppfname* instead of **5648063H**. The *ppfname* you use should be used **throughout** the rest of this procedure, unless otherwise stated differently.

- 1 Log onto NCP V7R7 VM service user ID **P648063H**
- 2 Establish access to the software inventory disk.

Note: If the MAINT 51D minidisk was accessed R/O, you need to have the user that has it accessed R/W link it R/O. You can then issue the following commands to obtain R/W access to it.

**link MAINT 51d 51d mr
access 51d d**

The 51D minidisk is where the VMSES/E Software Inventory files and other product dependent files reside.

- 3 Have the NCP V7R7 VM CORrective service tape mounted and attached to **P648063H**.
- 4 Establish the correct minidisk access order.

vmfsetup 5648063H {NCP | NCPSFS}

5648063H is the PPF that was shipped with the product. If you have your own PPF override, you should substitute your PPF name for 5648063H.

Use **NCP** for installing on minidisks or **NCPSFS** for installing in Shared File System directories.

- 5 Receive the documentation. VMFREC, with the INFO option, loads the documentation and displays a list of all the products on the tape.

Electronic Service

If you are receiving service from Service Link (electronic service), refer to Appendix A, "Receiving Service for VMSES Envelopes", section "Receive Service Documentation", in the *VM/ESA Service Guide*. Remember to substitute the *ppfname* and *compname* used for servicing NCP V7R7 VM in the instructions shown in that Appendix. Then return back to this program directory and continue with step 7 on page 43 below.

vmfrec info

This command will load the service memo to the 191 disk.

- 6 Check the receive message log (\$VMFREC \$MSGLOG) for warning and error messages.

vmfview receive

Also make note of which products and components have service on the tape. To do this, use the PF5 key to show all status messages which identify the products on the tape.

- 7 Clear the alternate APPLY disk to ensure that you have a clean disk for new service.

vmfmrdsd 5648063H {NCP | NCPSFS} apply

Use **NCP** for installing on minidisks or **NCPSFS** for installing in Shared File System directories.

This command clears the alternate APPLY disk.

- 8 Review the merge message log (\$VMFMRD \$MSGLOG). If necessary, correct any problems before proceeding. For information about handling specific error messages, refer to *VM/ESA System Messages and Codes*, or use on-line HELP.

vmfview mrd

7.2.2 Receive the Service

Note: If you are installing multiple service tapes, you can receive all of the service for this proid before applying and building it.

Electronic Service

If you are receiving service from Service Link (electronic service), refer to Appendix A, "Receiving Service for VMSES Envelopes", section "Receive the Service", in the *VM/ESA Service Guide*. Remember to substitute the *ppfname* and *compname* used for servicing NCP V7R7 VM in the instructions shown in that Appendix. Then return back to this program directory and continue with section 7.2.3, "Apply the Service."

For **each** service tape you want to receive, do the following:

- 1 Receive the service.

vmfrec ppf 5648063H {NCP | NCPSFS}

Use **NCP** for installing on minidisks or **NCPSFS** for installing in Shared File System directories.

This command receives service from your service tape. All new service is loaded to the DELTA disk.

- 2 Review the receive message log (\$VMFREC \$MSGLOG). If necessary, correct any problems before going on. For information about handling specific error messages, refer to *VM/ESA System Messages and Codes*, or use on-line HELP.

vmfview receive

7.2.3 Apply the Service

- 1 Apply the new service.

vmfapply ppf 5648063H {NCP | NCPSFS}

Use **NCP** for installing on minidisks or **NCPSFS** for installing in Shared File System directories.

This command applies the service that you just received. The version vector table (VVT) is updated with all serviced parts and all necessary AUX files are generated on the alternate apply disk.

You must review the VMFAPPLY message log if you receive a return code (RC) of a 4, as this may indicate that you have local modifications that need to be reworked.

- 2** Review the apply message log (\$VMFAPP \$MSGLOG). If necessary, correct any problems before proceeding. For information about handling specific error messages, refer to *VM/ESA System Messages and Codes*, or use on-line HELP.

vmfview apply

Note

If you get message VMFAPP2120W, re-apply any local modifications before building the new NCP V7R7 VM. Refer to *VM/ESA Service Guide*. Follow the steps that are applicable to your local modification.

The following substitutions need to be made:

- **esalcl** should be **5648063H**
- **esa** should be **5648063H**
- *compname* should be **NCP** or **NCPSFS** (minidisk or SFS)
- *appid* should be **5648063H**
- *fm-local* should be the fm of 2C2
- *fm-applyalt* should be the fm of 2A6

If you have changed any of the installation parameters through a PPF override, you need to substitute your changed values where applicable.

Keep in mind when you get to the “Rebuilding Objects” step in *VM/ESA Service Guide*, you should return to this program directory at 7.2.4, “Update the Build Status Table.”

7.2.4 Update the Build Status Table

- 1** Update the Build Status Table with serviced parts.

vmfbld ppf 5648063H {NCP | NCPSFS} (status

Use **NCP** for installing on minidisks or **NCPSFS** for installing in Shared File System directories.

This command updates the Build Status Table.

Note

If the \$PPF files have been serviced, you get the following prompt:

```
VMFBLD2185R The following source product parameter files
             have been serviced:
VMFBLD2185R 5648063H $PPF
VMFBLD2185R When source product parameter files are serviced,
             all product parameter files built from them must
             be recompiled using VMFPPF before VMFBLD
             can be run.
VMFBLD2185R Enter zero (0) to have the serviced source
             product parameter files built to your A-disk
             and exit VMFBLD so you can recompile your
             product parameter files with VMFPPF.
VMFBLD2185R Enter one (1) to continue only if you have
             already recompiled your product parameter files
             with VMFPPF.
```

0

Enter a 0 and complete the following steps before you continue.

```
VMFBLD2188I Building 5648063H $PPF
             on 191 (A) from level $PFnnnnn
```

vmfppf 5648063H {NCP | NCPSFS}

Note: If you created your own PPF override, use your PPF name instead of 5648063H.

Use **NCP** for installing on minidisks or **NCPSFS** for installing in Shared File System directories.

**copyfile 5648063H \$PPF a = = d (olddate replace
erase 5648063H \$PPF a**

Note: **Do not** use your own PPF name in place of 5648063H for the COPYFILE and ERASE commands.

vmfblid ppf 5648063H {NCP | NCPSFS} (status

1

Re-issue VMFBLD to complete updating the build status table.

Use **NCP** for installing on minidisks or **NCPSFS** for installing in Shared File System directories. When you receive the prompt that was previously displayed, enter a 1 to continue.

- 2 Use VMFVIEW to review the build status messages, and see what objects need to be built.

vmfview build

7.2.5 Build Serviced Objects

- 1 Rebuild NCP V7R7 VM serviced parts.

vmfbld ppf 5648063H {NCP | NCPSFS} (serviced

Use **NCP** for installing on minidisks or **NCPSFS** for installing in Shared File System directories.

Note: If your software inventory disk (51D) is not owned by the MAINT user ID then make sure the VMSESE PROFILE reflects the correct owning user ID.

- 2 Review the build message log (\$VMFBLD \$MSGLOG). If necessary, correct any problems before proceeding. For information about handling specific error messages, refer to *VM/ESA System Messages and Codes*, or use on-line HELP.

vmfview build

7.3 Place the New NCP V7R7 VM Service Into Production

This section describes the procedure to place the new NCP V7R7 VM Service into production.

7.3.1 Copy the New NCP V7R7 VM Serviced Files Into Production

- 1 Log on to P648063H user ID. This user ID owns the disk that will contain the “production” level of the NCP V7R7 VM code.
 - a If installing using minidisks

access 400 e
access 401 f
vmfcopy * * e = = f2 (prodid 5648063H%NCP olddate replace

The VMFCOPY command will update the VMSES
PARTCAT file on the 401 disk.

b If installing using Shared File System

access P648063H.NCP.trun e
access P648063H.NCP.run f
vmfcopy * * e = = f2 (prodid 5648063H%NCP olddate replace

The VMFCOPY command will update the VMSES
PARTCAT file on the 401 disk.

You have finished servicing NCP V7R7 VM.

Appendix A. APARs Incorporated into This Program

The following NCP V7R6 APARs are incorporated into this program:

IR36479	IR36578	IR36483	IR37623
IR36484	IR36647	IR36969	IR37644
IR36543	IR36695	IR37280	IR37637
IR36544	IR36715	IR37893	IR37762
IR36557	IR36717	IR37879	IR37820
IR36442	IR36485	IR37903	IR37092
IR36472	IR36486	IR37990	IR36996
IR36726	IR36487	IR37998	IR37108
IR36785	IR36488	IR38035	IR37176
IR36851	IR36493	IR38068	IR37202
IR36884	IR36494	IR38072	IR37209
IR36886	IR36495	IR38071	IR37226
IR36889	IR36506	IR37297	IR37255
IR36907	IR36515	IR37271	IR37121
IR36956	IR36480	IR37390	IR38219
IR37026	IR36481	IR37517	IR38246
IR37055	IR36482		

Reader's Comments

Program Directory for Network Control Program V7R7 for VM

You may use this form to comment about this document, its organization, or subject matter with the understanding that IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

For each of the topics below, please indicate your satisfaction level by circling your choice from the rating scale. If a statement does not apply, please circle N.

RATING SCALE						
very satisfied	←—————→				very dissatisfied	not applicable
1	2	3	4	5	N	

	Satisfaction						
Ease of product installation	1	2	3	4	5	N	
Contents of program directory	1	2	3	4	5	N	
Installation Verification Programs	1	2	3	4	5	N	
Time to install the product	1	2	3	4	5	N	
Readability and organization of program directory tasks	1	2	3	4	5	N	
Necessity of all installation tasks	1	2	3	4	5	N	
Accuracy of the definition of the installation tasks	1	2	3	4	5	N	
Technical level of the installation tasks	1	2	3	4	5	N	
Ease of getting the system into production after installation	1	2	3	4	5	N	

Did you order this product as an independent product or as part of a package?

- Independent
- Package

If this product was ordered as part of a package, what type of package was ordered?

- CustomPac
 - FunctionPac
 - SystemPac
- System Delivery Offering (SDO)
- Other - Please specify type:

Design & Information Development
Dept. CGF/Bldg. 656
International Business Machines Corporation
PO Box 12195
RESEARCH TRIANGLE PARK NC 27709-9990



Program Number: 5648-063 5831
5832
6488

Printed in U.S.A.

G110-0987-00

