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SMALL COMMUNICATIONS SYSTEMS INSTALLATION PRIMER

IBM 4331 - ACF/VTAM VERSION 2

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Raleigh International Systems Center

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Bulletin

Small Communications Systems Installation Primer
IBM 4331 - ACF/VTAM Version 2

Authors:
Jorge Castillo, IBM Venezuela
Robert Kenyon, IBM Australia
Manfred Moos, IBM Germany

Project Advisor:
Wilhelm Gardt
Raleigh International Systems Center

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LIST OF ILLUSTRATIONS

1.0 INTRODUCTION

1.1 ABBREVIATIONS AND TERMS USED IN THIS MANUAL

ACF/NCP/VS	Advanced Communications Function for Network Control Program/Virtual Storage
ACF/VTAM, VTAM	Advanced Communications Function for Virtual Telecommunications Access Method, Version 2 for DOS/VSE (unless otherwise specified)
ACF/VTAME	Advanced Communications Function for Virtual Telecommunications Access Method Entry
BSC	Binary Synchronous Control
BTAM	Basic Telecommunication Access Method
CA	Communications Adapter
CICS/VS	Customer Information Control System/Virtual Storage
ICCF	Interactive Computing and Control Facility
LU	Logical Unit
NCCF	Network Communications Control Facility
NPDA	Network Problem Determination Application
PU	Physical Unit
SDLC	Synchronous Data Link Control
SIPO/E	System Installation Productivity Option/Extended
SNA	Systems Network Architecture
VSE	Virtual Systems Extended

1.2 WHO THIS PRIMER IS FOR

1.2.1 The User

This publication is primarily for persons responsible for installing ACF/VTAM including the appropriate IBM 3270, IBM 364x and CICS/VS support as well as the integration of the IBM 4331 in a multi domain environment. It assumes that the reader is familiar with VSE SIPO/E 3.1 and has a working knowledge of VSE system operation, job control statements and data management. He is also able to define and operate the CICS/VS environment and has a basic knowledge of SNA and ACF/VTAM.

Different types of users are considered in this primer :

1. The First Time Users

   Installations which are starting the first time on an IBM 4331 with the SIPO/E. Tables or definitions are not currently available to describe the environment.

2. The former BTAM-ES Users

   The SIPO/E 3.1 is installed. The production system is still running with CICS/VS - BTAM.

3. The former ACF/VTAME Users

   The production system is running in a SIPO/E 3.1 environment. CICS/VS is using ACF/VTAME as the TP access method.

1.2.2 Purpose and Scope of this Document

This document is intended to assist the user in the installation of ACF/VTAM in a VSE SIPO/E Version 3 Release 1 environment on a IBM 4331 and in the operation and management of the network.

The document outlines the installation and definition steps and discusses migration aspects for the former BTAM-ES and ACF/VTAME user.

Basic operation and problem determination procedures are discussed for single and multi-system networks.

This publication is specifically directed towards the installation of IBM 3270, IBM 364X, ACF/VTAM and CICS/VS systems, and updates and expands the Small Communication Systems Installation Primer IBM 4331/ACF/VTAME in the following areas:

- Loop Adapter devices (e.g. IBM 364X)
- Set-up of physical devices
- Device tests
- CICS-ACF/VTAM dependencies
- Migration from BTAM-ES and ACF/VTAME
- CNM products
- Switched lines

The primer is also valuable for those users who still will be running with ACF/VTAME but have a need to install products of the above mentioned areas.

This primer does not cover the installation of IBM 3705 communications controllers. Information of this topic can be found in the Small Communication Systems Installation Primer VSE System IPO/E & IBM 3705-80

Also this primer does not cover the SIPO/E 3.1 Basic Installation but hints are provided in Chapter 4, section 'System Initialization'.

1.2.3 The Environment

The IBM 4331 Processor

The IBM 4331 Processor is an intermediate-scale, general purpose processor. It offers System/360 and System/370 compatible architecture, as well as advanced functions provided by System/370, such as support of virtual storage, and uses large-scale integrated technology.

The IBM 4331 Processor can be installed as a stand-alone system to handle all traditional application areas. It can also be incorporated in the communication networks of large installations and multiple-system installations.

The IBM 3270 Information Display System

The IBM 3270 System offers the user a wide selection of components and configurations that can be tailored to meet the needs of alphameric and graphic (programmed symbols)applications in both monochrome and color. Terminals from the IBM 3270 System can be attached to the:

- IBM 4331 Display/Printer Adapter,

- IBM 4331 LOOP Adapter (local/remote),
- IBM 4331 Communications Adapter (local/remote),
- IBM 4331 channels.
- IBM 3705 (not discussed in this primer).

The IBM 3178 is a functional alternative to an IBM 3278 model 2 display. Definitions shown in this document that apply to the 3278 model 2 also apply to the 3178.

The IBM 364X Devices

The IBM 364X devices are industry terminals which cover the needs of a typical manufacturing environment. These devices are locally attached to the IBM 4331 Loop Adapter without a control unit. If they are attached remotely, an IBM 3843 control unit is necessary.

Figure 1 on page 5 shows the networking capabilities of the IBM 4331 processor.

VSE SIPO/E 3.1

The IBM 4331 processor is supported by VSE SIPO/E 3.1. The DB/DC or DC Version needs to be installed.

ACF/VTAM Version 2 (VSE)

The ACF/VTAM Version 2 is an IBM program product for users of Disk Operating System/Virtual Storage Extended (DOS/VSE) with the VSE/Advanced Function program product. ACF/VTAM provides support for terminals on the

- Display/Printer Adapter (DPA),
- LOOP Adapter,
- Communications Adapter (CA)

of the IBM 4331 processor and also provides support for various channel attached terminals.
A channel attached 3705 with ACF/NCP is also supported with ACF/VTAM, and this may be used concurrently with CAs. The 3705 is not covered in this primer.

The communication part of an ACF/VTAM application program (e.g. CICS/VS) uses ACF/VTAM macro instructions to communicate with terminals and logical units, i.e. with devices or programs by which an end user (application program, a terminal operator, or a input/output mechanism) gains access to the data communication network, which is also being controlled by ACF/VTAM.

ACF/VTAM can be used in a single system environment, as well as in a multi system environment using the multi-system networking functions. In a mul-

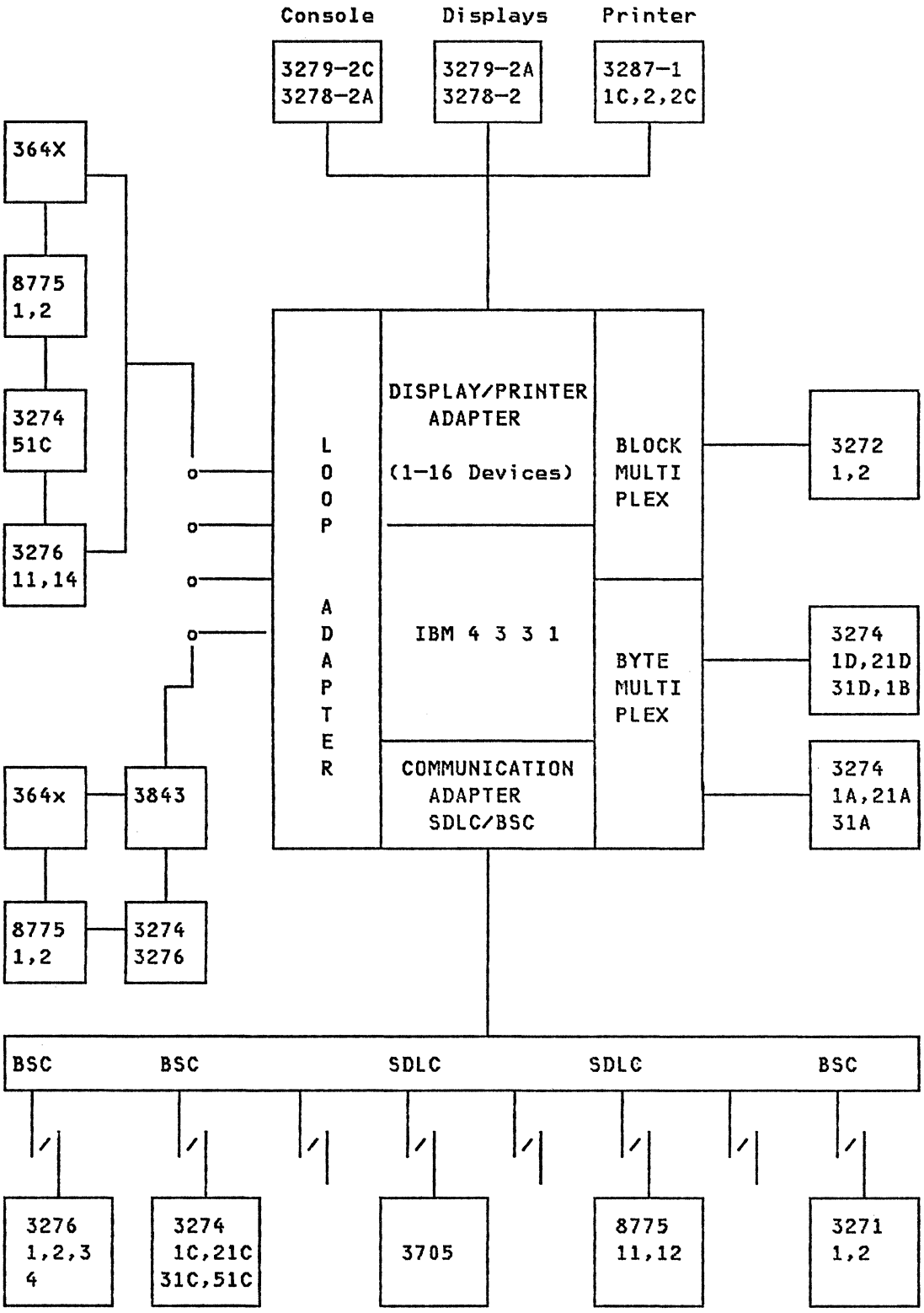


Figure 1. Network Capabilities of the IBM 4331

tiple systems environment, ACF/VTAM may be connected through an SDLC cross-domain link to other processors.

This allows application programs and terminals that are controlled by ACF/VTAM to communicate with application programs in another domain, i.e. in an area controlled by another host processor, of the multiple system network. It also allows terminals controlled by another domain in the network to communicate with ACF/VTAM application programs.

CICS/VS

The IBM Customer Information Control System/Virtual Storage (CICS/VS) is a general purpose data base/data communication system. It runs under control of VSE and uses standard access methods. It is treated as an application program in an ACF/VTAM environment.

1.3 HOW THIS PRIMER IS ORGANIZED

This primer contains twelve chapters, dealing with steps for planning, defining, installing, executing and testing the communications system, or parts of it, and a number of appendices, containing detailed information, such as configurations and other examples. As stated before, this publication contains information needed to get the ACF/VTAM system started. Further information covers the customization of ACF/VTAM applications as CICS/VS, NCCF, NPDA in an IBM 4331 SIPO/E 3.1 environment.

Chapter 2 contains a brief review of SNA terms used in this publication and describes the overall ACF/VTAM functions.

Chapter 3 describes the preparation of local, remote devices and the CPU for the implementation of a communication system.

Chapter 4 describes the installation of ACF/VTAM in a SIPO/E 3.1 environment.
Also, hints are provided for customization in a SIPO 3.1 environment.

Chapter 5 describes the customization process and the tests for a single system environment.

Chapter 6 describes the customization process and the tests for a multi system environment.

Chapter 7 discusses the definition and operation of switched lines.

Chapter 8 discusses storage requirements, performance and tuning of ACF/VTAM.

Chapter 9 discusses methods for problem determination in an ACF/VTAM network. It also shows examples of some common problems.

Chapter 10 covers the migration of an existing ACF/VTAME network to an ACF/VTAM network.

Chapter 11 covers the migration of an existing BTAM-ES installation to an ACF/VTAM communication system.

Chapter 12 leads the user in the customization process of the CNM products available with SIPO/E 3.1. system.

Appendix A contains a configuration example of a running multi-system environment.

Appendix B contains suggested naming conventions.

Appendix C contains a documentation summary.

Appendix D contains the Configuration Documentation Worksheets.

1.4 RELATED PUBLICATIONS

The titles and form numbers of associated publications, to which the reader can refer for detailed information, are summarized in Appendix C.

1.5 HOW TO READ THIS PRIMER

The **step-by-step** approach of this document makes it easy for the reader to follow and implement the outlined procedures. Only the chapters containing the required information need be read.

The **First Time Users** should read

- Chapter 1 to 4,
- Chapter 5 or 6,
- Chapter 8 and 9.

The **former BTAM-ES users** should read

- Chapter 1 to 4,
- Chapter 11,
- Chapter 5 or 6,

- Chapter 8 and 9.

The former ACF/VTAME users should read

- Chapter 4,
- Chapter 8, 9, 10.

Users of CNM products (NCCF,NPDA,OCCF) should read

- Chapter 12.

Users with installations having Switched Lines should read

- Chapter 7.

2.0 SNA AND ACF/VTAM V2 OVERVIEW

This chapter describes the components of an ACF/VTAM network and the way the elements of the networks are controlled and shared through ACF/VTAM.

2.1 SNA OVERVIEW AND ACF/VTAM'S RELATIONSHIP TO SNA

Data communication is the process of transmitting and receiving data over communication facilities such as telephone lines. Systems Network Architecture (SNA) defines the structure and protocols (request/response rules) for such a network.

ACF/VTAM provides, amongst other things, one of the SNA-defined network components, the **System Services Control Point (SSCP)**, which is used to control the network. Additionally, ACF/VTAM allows application programs (e.g. CICS, POWER) to use the network to communicate with other network users, such as terminals attached to the network, or with other ACF/VTAM application programs.

A network may contain more than one SSCP (e.g. another ACF/VTAM in another host). The network user of one **domain** can communicate with the network users associated with other SSCPs. This communication is called **cross-domain**.

A network user gains access to the network facilities through a **logical unit (LU)**. For example, an ACF/VTAM application program using ACF/VTAM macro instructions is identified with an LU and uses it to access the network. SNA terminals also implement LUs; e.g. each IBM 3270 display terminal is associated with an LU.

In order for two LUs (e.g. an application program and a display terminal) to communicate with each other, a logical connection called a **session** must be established between these two LUs. The SSCP assists the LUs in establishing this session. The session concept is described below in more detail.

In any given session, one LU is the **primary LU (PLU)** and the other is the **secondary LU (SLU)**. The PLU has more responsibility in establishing the session.

Generally, ACF/VTAM application program LUs are PLUs and terminal LUs are SLUs. However, if two application programs communicate with each other, one LU will act as the PLU and one as the SLU.

Before two LUs set up a session, they both must agree on a set of protocols that will be used for the duration of the session. This set of protocols is determined by **session parameters**, which may be user defined in a **logon**

mode table. Generally, the PLU suggests the session parameters and the SLU either agrees to them or rejects them.

Every LU in the network is associated with a **physical unit (PU)** . The PU works with the SSCP to manage the network configuration, e.g. to determine which network elements are currently usable. There is a PU supplied by ACF/VTAM in each host processor containing ACF/VTAM. There is also a PU in each cluster controller and each communications controller. ACF/VTAM also contains an internal PU that controls host logical units such as application programs.

The elements of an ACF/VTAM network are organized into groups of **major** and **minor** nodes. Major and minor nodes are the controllable elements of the network. A major node is a set of minor nodes. Each major node can be controlled (activated or deactivated, displayed, etc.) as a whole or portions of it can be controlled through its minor nodes. For example, application program major nodes consist of one or more application program LU definitions, which are the minor nodes. Local SNA major nodes consist of one or more SNA PUs attached via a channel to the host computer. The minor nodes are the physical units (controllers) and their associated logical units (terminals).

Major nodes are defined differently from minor nodes. Minor nodes are defined by ACF/VTAM definition statements; the name of each minor node is the label coded in the corresponding statement. Major nodes are defined by combining the definition statements for the minor nodes into sets and by cataloging these sets in the source statement library. The name of each major node is the book name assigned to the set.

In a multi-domain network, information about other domains must be provided to enable communication between the two domains. The other domains are identified by defining a **Cross Domain Resource Manager (CDRM)** for each domain. A CDRM, which is part of the System Services Control Point (SSCP), is a program which controls the resources in its domain and that has the ability to communicate with other domains. Any resource in a domain that may be used in another domain is called **Cross Domain Resource (CDRSC)**. CDRSCs, like CDRMs, are defined in major and minor nodes.

There are two important characteristics of ACF/VTAM's use of SNA. First, ACF/VTAM uses the processing capabilities of communication controllers and terminal products to move part of the communication control from the host processor to the network. Second, ACF/VTAM allows its application programs to use lines, controllers and LUs as shareable resources.

2.2 SNA SESSION CONCEPT

Before two LUs (e.g. an application and a terminal) can communicate with each other, they must be bound together in a **session**.

In an ACF/VTAM network, several types of sessions exist:

- SSCP-PU sessions,
- SSCP-LU sessions,
- LU-LU sessions,
- and SSCP-SSCP sessions (only in a multi domain network).

The first three session types are hierarchical, i.e. the higher session must have been established before the lower session can be started.

After ACF/VTAM is started, the SSCP establishes (within its domain) an **SSCP-PU session** with each physical unit which is defined with ISTATUS=ACTIVE in a major node listed in the configuration list (ATCCONxx).

For other PUs this session can also be established by a 'V NET,ACT,ID=puname' operator command.

The successful establishment of the SSCP-PU session is indicated by the ACF/VTAM message: puname ACTIVE. This also means that the physical path to the PU is available.

Once the SSCP-PU session is started, the SSCP can establish an **SSCP-LU session** for each logical unit with ISTATUS=ACTIVE associated with the PU. The same rules apply for the LU as for the PU.

This session can also be established by a 'V NET,ACT,ID=luname' operator command.

Finally, when a pair of LUs are to communicate with each other, the SSCP must establish an **LU-LU session** between them. Usually between any two LUs only a single LU-LU session can exist; however, some logical units (CICS/VS as a ACF/VTAM application program) can have multiple concurrent sessions (called parallel sessions) between the same two LUs.
After the LU-LU session establishment, ACF/VTAM is ready to handle the data transfer between these LUs (e.g. application-terminal).

For cross-domain communication, ACF/VTAM must first establish a session between its SSCP and the SSCP of another SNA access method in the associated domain. This session, called an **SSCP-SSCP session**, must exist before any logical units can communicate cross-domain. It is started by the activation of the two participating CDRMs in each host.

2.3 FUNCTIONAL OVERVIEW OF ACF/VTAM (VSE)

To support the communication within a single or multi-domain network ACF/VTAM performs the following functions:

- controls the allocation of network resources (e.g. lines, controllers, terminals)
- permits application programs to share network resources
- permits use of resources without specific knowledge of their location
- establishes, controls, and terminates sessions between LUs in the network
- facilitates the transfer of data between points in the network
- permits the operation of the network to be monitored and altered by the ACF/VTAM operator
- permits the network configuration to be changed while the network is being used
- initiates detection and correction of problems in the operation of the network

In addition, ACF/VTAM provides an integrated multi-system networking facility. As part of a multiple-domain network, ACF/VTAM:

- permits an application program in one domain to communicate with applications or terminals in other domains
- permits a terminal of one host processor to communicate with applications in another host's domain
- establishes, controls, and terminates sessions with application programs and terminals in other parts of the multiple-domain network
- permits the ACF/VTAM operator to obtain information about resources in parts of the network not controlled by the ACF/VTAM domain
- allows control of a communication controller of one host to be transferred to another host
- permits control of the terminals of a communication controller to be divided among multiple host processors

In a VSE environment ACF/VTAM services the Communication Adapter, which is an optional feature of the IBM 4331 and 4321 processors. It allows the use of link-attached terminals without requiring a communication controller (and NCP). Together, ACF/VTAM and the Communication Adapter provide the following functions:

- terminal addressing
- terminal dialing
- terminal polling
- terminal answering
- management of SDLC and BSC line controls
- control of multi-point lines
- exchange of identification sequences for terminals on switched lines
- management of modem/line interface
- pacing
- detection, recovery and recording of temporary line errors

The communication adapter also provides the service functions of the host, which are line-testing, line-tracing and configuration-updating functions.

3.0 PREPARING THE NETWORK HARDWARE

It is assumed that you already have determined and ordered the products for the physical configuration required to meet your normal operating needs.
You should now check or arrange your physical as well as VSE SIPO/E 3.1 and ACF/VTAM installation as described in this and the next chapter.

3.1 DOCUMENTATION OF THE CONFIGURATION

During the arrangement of your physical configuration you should document the status of your installation.

After this chapter have following information available:

- the Customer Set Up (CSU) configuration sheets for each control unit
- the modem specifications
- the hard-copies of the Service Processor configuration screens

Use the Configuration Documentation Sheet (see appendix D) to describe each network component.

3.2 THE IBM 4331 SERVICE PROCESSOR

The IBM 4331 has a Service Processor, which is used by IBM Customer Engineering for

- maintenance activities
- testing
- tracing

The Service Processor is also involved in configuration and reconfiguration of the

- Display/Printer Adapter
- LOOP adapter
- Communication Adapter

You can do this in the following way:
Press the MODE SEL key, which will display the following screen:

```
                    *MODE SELECTION*

        P PROGRAM RESET              D DISPLAY/ALTER
        C CLEAR RESET                L PROGRAM LOAD
        S MACHINE SAVE               A ADDRESS COMPARE
        R RESTART                    K CHECK CONTROL
        I INSTR STEP                 J INTERVAL TIMER
        N RESET I-STEP               M NATIVE DISPLAYS AND PRINTERS
        Y TOD ENABLE                 E COMMUNICATION LINES
        F LOOP ADAPTER

                SELECTION:
```

Figure 2. The Mode Selection Screen

Entering 'E' or 'F' or 'M' will display screens for configuration and reconfiguration of your network.

Use this facility also for documentation of your network by pressing the copy key of your system console after each display.

Details will be shown in the following sections.

3.3 LOCAL DEVICES

Terminals connected to a host processor through a channel are called local terminals. These devices can be attached to the IBM 4331 processor via a channel and control unit or directly via an I/O adapter that functionally replaces a channel and control unit. The latter approach provides low-cost attachment of I/O devices and reduces physical space requirements.

Local terminals can be either SNA or non-SNA terminals.

For example, ACF/VTAM supports the following locally attached control units:

- NON-SNA (These control units appear to ACF/VTAM as PU TYPE 1)
  - IBM 3272-1,2
  - IBM 3274-1B,21B,1D,21D,31D (supported as 3272-1,2)

- IBM 4331 Display/Printer Adapter (supported as 3272-2)

- SNA (These control units appear to ACF/VTAM as PU TYPE 2)
  - IBM 3274-1A,21A,31A
  - IBM 3791
  - IBM 3730/3791
  - IBM 4331 Loop Adapter

Display/Printer Adapter-attached Devices

The Display/Printer Adapter is an I/O adapter to which 1 to 8 devices can be attached (or 16 with the extension feature). Port 0 must be used for the IBM 3278-2A or 3279-2C console.

The devices that can be attached are :

- IBM 3278-2A or 3279-2c Display Console (required)
- IBM 3278/3279 Model 2
- IBM 3178
- IBM 3287 Model 1 and 2
- IBM 3262 Models 1 and 11 line printer (not supported by ACF/VTAM)
- IBM 3289 Model 4 line printer (not supported by ACF/VTAM)

These devices may be installed in any combination except that the IBM 3278-2A or 3279-2C console is required and no more than 2 line printers (IBM 3262-1,-11 or IBM 3289-4) may be installed.
The Display/Printer Adapter support includes most of the standard functions of the IBM 3274-1B with the IBM 3278 Model 2 attached.

Note:
The Display/Printer Adapter appears to ACF/VTAM as a non-SNA IBM 3272-2 and the devices attached to it as IBM 3277 and IBM 3286.

Physical Installation of Devices on the Display/Printer Adapter

Physical installation of teleprocessing devices on the Display/Printer Adapter is simply done by connecting a coaxial cable to one of the eight or sixteen ports on the IBM 4331 Processor (user responsibility). Only the system console will be installed by the IBM Customer Engineer.

The support for the DPA is given on channel 0 of the IBM 4331. On this channel 0 addresses '09'-'1F' are available for assignment by the user to devices attached via the DPA.
The addresses of these devices are not hard wired.

Assigning Addresses of Devices on the Display/Printer Adapter

The assignment of the device addresses is done at installation time using the Service Processor and can be easily examined and changed.

Press the MODE SEL key on the system console. The MODE SELECTION screen will be displayed: (see Figure 2 on page 16)

Entering 'M' (NATIVE DISPLAYS AND PRINTERS) will display the following screen: [1]

```
                *NATIVE DISPLAYS AND PRINTERS*
            (DEVICE ADDRESS RANGE: X'009' - x'01F')

 ATTACH DEVICES: 3278-2, 3287, 3289-4   DETACH DEVICES: KEY IN 'X'
            TRANSLATE TABLES(T): TYPEWRITER (UNITED STATES) =1
                                 DATA ENTRY I   (EBCDIC)    =2

       PORT DEVICE  ADR T     PORT DEVICE  ADR T
       00   3278-2A 01F 1     01   3289-4. 01E X
                    ... .           ....... ... .
       02   3278-2. 010 1     03   3278-2. 009 1
            ....... ... .           ....... ... .
       04   3278-2. 011 1     05   3278-2. 012 1
            ....... ... .           ....... ... .
       06   3287... 014 1     07   3278-2. 013 1
            ....... ... .           ....... ... .
```

Figure 3. The Native Displays and Printers Screen

- Supply for each port the device type, model number, the address (must be between 009 and 01F) and the appropriate translate table (T) for the keyboard.
- After the last modification, press ENTER.
- After the system answers: PRESS IML AFTER UPDATE, press the IML key and re-IPL.

---

[1] The actual screen layout may be different, depending on the EC level.

Test of Devices attached on the DPA

If you have completed the steps above, you can check the physical arrangement of your devices. This facility is only available with certain IBM 3270 terminals (type A).

There is a test function, which is invoked by holding down the **ALT key** and pressing the **ALT key**. Now the terminal is in the TEST mode and after entering '/' the position of the device on the control unit as well as the type of the control unit ('I' for the DPA) and active features are displayed.
To leave the TEST mode, again hold down the ALT key and press the TEST key.
Use this function also to get the values for your Configuration Documentation Sheet.

Loop Adapter-attached Devices

The Loop Adapter is an I/O adapter with a maximum of 2 directly attached and 2 data link loops to which 1 to 80 devices can be attached. Each directly attached loop can consist of 2 lobes.
At least one 3843 control unit is necessary for each data link loop.

The devices that can be attached are :

- IBM 3641 Model 1 and 2
- IBM 3642 Model 1 and 2
- IBM 3643 Model 3 and 4
- IBM 3644
- IBM 3645
- IBM 3646
- IBM 3647
- IBM 3287 Model 11 and 12

The control units that can be attached are :

- IBM 3274 Model 51C
- IBM 3276 Model 11,12,13,14
- IBM 8775 Model 1 and 2

These devices may be installed in any combination except that one loop may not have more than 64 attached devices.

Note:
All IBM 3641/42/43/46/47s (locally or remotely attached) appear to ACF/VTAM as one local SNA PU TYPE 2.

Each IBM 3644/45, IBM 3274/76, IBM 3287, IBM 8775 (locally or remotely attached) is a local SNA PU TYPE 2.

Devices on a remote loop are considered as locally attached devices.

Physical Installation of Devices on the Loop Adapter

Physical installation of teleprocessing devices on the Loop Adapter is done by connecting the device cables to the Loop Station Connectors. The installation of the loops is user responsibility. This is discussed in detail in the

- Communication Loop Planning Guide and
- Multiuse Communication Loop Installation Guide.

Each device/control unit must be set up by the user. For details refer to the Component and Operator Description available for each device.
During the set up process each device is given a **station address** , which is set in the jumper box or on the screen. This address must agree with the station address given at the Terminal Update and Display Screen (see below).

Note:
Every time you change either this address or other configuration details, power off/on the device.

Assigning Addresses of Devices on the Loop Adapter

The support for the Loop Adapter is provided on channel 0 of the IBM 4331. On this channel, addresses X'40' - X'7E' are available for assignment by the user to devices attached via the Loop Adapter.

The addresses of these devices are not hard wired.

The assignment of the device address is done at installation time using the Service Processor and can be easily examined and changed.

Press the MODE SEL key on the system console.
The MODE SELECTION screen will be displayed (see Figure 2 on page 16).

Entering 'F' (LOOP ADAPTER) will display the LOOP ADAPTER CONFIGURATOR SELECTION MENU:

```
LOOP ADAPTER CONFIGURATOR    SELECTION MENU

             A   TERMINAL PARAMETER DISPLAY AND UPDATE

             B   LOOP     PARAMETER DISPLAY AND UPDATE

             C   INLINE TESTS


             SELECTION : .
```

Figure 4. Loop Adapter Configurator: Selection Menu

Entering 'A' will show the Terminal Display and Update Screen:

```
LOOP ADAPTER CONFIGURATOR    TERMINAL DISPLAY AND UPDATE  PAGE 0001

DIRECTLY ATTACHED LOOP 1 PORT ADDR: 08  CHARACTER SET:

STAT TERMINAL   SUB  LU   TERM      STAT TERMINAL   SUB  LU   TERM
ADDR            CHNL ADDR PARA      ADDR            CHNL ADDR PARA

01   3641       40   01   10        F1   3642-2     40   02   00
..   ........   ..   ..   ..        ..   ........   ..   ..   ..

03   8775       42                  XX   XXXXXXXX   XX   XX   XX
..   ........   ..   ..   ..        ..   ........   ..   ..   ..

XX   XXXXXXXX   XX   XX   XX        XX   XXXXXXXX   XX   XX   XX
..   ........   ..   ..   ..        ..   ........   ..   ..   ..

XX   XXXXXXXX   XX   XX   XX        XX   XXXXXXXX   XX   XX   XX
..   ........   ..   ..   ..        ..   ........   ..   ..   ..

                                        DEC 143 BUFFERS AVAILABLE
  PRESS PF1 FOR BUFFER STATISTICS
```

Figure 5. LA Configurator: Terminal Display and Update Screen

Supply and check for each device:

- Station address
  X'01' - X'FE'
  This address must agree with the address given to the device during the set up process. This address has to be unique.

- Terminal type

- Subchannel address

  This is the address used in the ACF/VTAM PU-Macro, parameter CUADDR=0xx, and in the VSE ADD-command.

  X'40' for all IBM 3641/42/43/46/47
  X'41' - X'7E' for IBM 3274, IBM 3276, IBM 3287, IBM 3644, IBM 3645, and IBM 8775.

- LU address

  This is the address used in the ACF/VTAM LU-Macro, parameter LOCADDR=xx (here in decimal).

  X'01' for IBM 3287, IBM 3644, IBM 3645
  X'02' for IBM 3274, IBM 3276, IBM 8775
  X'01' - X'7E' for IBM 3641/42/43/46/47

  An IBM 3646 occupies 4 consecutive addresses

- Terminal parameter

  Character set for IBM 3641, etc.

For details refer to

- IBM 4331 LOOP ADAPTER Functional Characteristics

- IBM 4331 LOOP ADAPTER Operating Procedures

After the last modification, press PF3.

You also have to check and maintain the loop specifications which are displayed in the Loop Adapter Configurator Loop Display and Update Screen. Invoke this panel in the following way:

Press the MODE SEL key on the system console.
The MODE SELECTION screen will be displayed (see Figure 2 on page 16).

Entering 'F' (LOOP ADAPTER) will display the LOOP ADAPTER CONFIGURATOR SELECTION MENU (see Figure 4 on page 21).

Entering 'B' will display the Loop Display and Update Screen:

```
LOOP ADAPTER CONFIGURATOR    LOOP DISPLAY AND UPDATE

PASSWORD : ________ *                NUMBER LOOP MESSAGES : 0050

         LOBE 1  LOBE 2  PACING  NRZI  HALF  MODEM  PERM  POLL
         ACTIVE  ACTIVE  T/O           SPEED WRAP   REQ   T/O
                                                    TO    MASK
LOOP 1     Y       Y     X 01                       SEND
           .       .       ..

LINK 1                   X 10     N     N     N      Y   X 03
                         X ..     .     .     .      .   X ..
```

Figure 6. Loop Adapter Configurator: Loop Display and Update Screen

Supply and check:

- PASSWORD

  Identification for an operator on a 3643 invoking the test function

- NUMBER OF LOOP MESSAGES

  Wraparound value between 50 and 400

- LOBE 1/2 ACTIVE

  Local loop split in lobes indicating which one is active

- PACING T/O

  Pacing timeout value
  X'01' (6.25 ms) for direct attached loops
  X'10' (100 ms) and higher for data link loops (depending on the modem turn around time and line speed)

- NRZI

  Non-return-to zero-inverted method (depending on modem and device set up)

- HALF SPEED

  Modems, IBM 3843 and the data link loop attached devices must agree

- MODEM WRAP

  Specify only 'Y' if you are using IBM 387X modems

- PERM REQ TO SEND

  'Y' for 4 wire lines, unless the modem supplier specifies otherwise

- POLL T/O MASK

  Should be three times the Pacing Timeout value
  i.e X'03' (300ms)

For more details refer to

- IBM 4331 LOOP ADAPTER Functional Characteristics

- IBM 4331 LOOP ADAPTER Operating Procedures

After the last modification, press PF3.
After the system answers: PRESS IML AFTER UPDATE, press the IML key and re-IPL.

Test of devices on the Loop Adapter

After the application of the steps above, you may verify the physical installation and address assignment of devices attached to the Loop Adapter.

Before you start, make sure that the

- devices are connected with the loop,

- devices are powered on,

- IML is performed after the last configuration changes,

- unused loop/lobe cables are terminated with a terminator.

Now invoke the LA INLINE TEST screen in the following way:

Press the MODE SEL key on the system console.
The MODE SELECTION screen will be displayed (see Figure 2 on page 16).

Entering 'F' (LOOP ADAPTER) will display the LOOP ADAPTER CONFIGURATOR SELECTION MENU (see Figure 4 on page 21).

Entering 'C' will display the INLINE TEST screen:

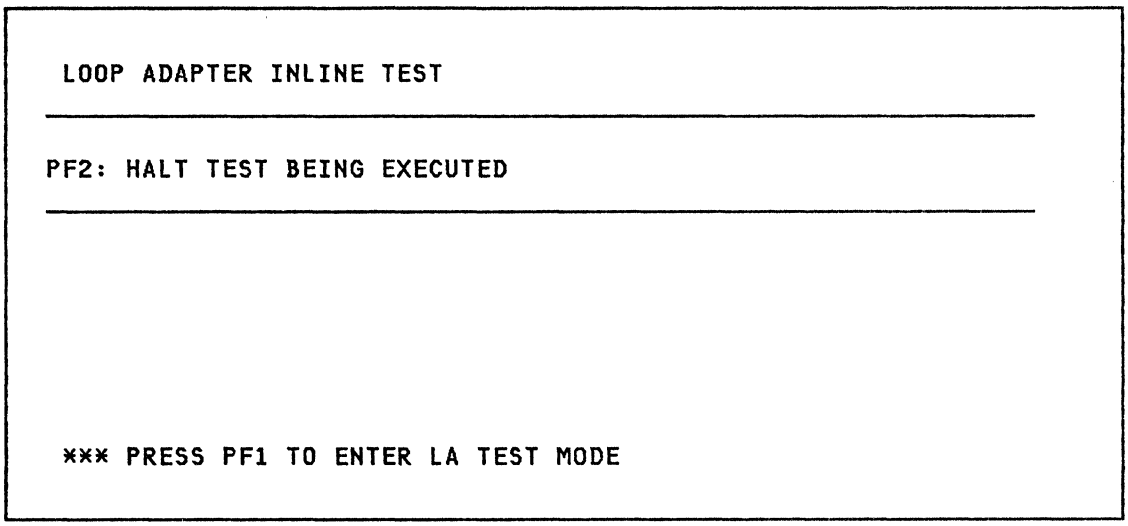


Figure 7. LA Inline Test Screen

Press the PF1 key and after the normal system console layout is displayed, the CHG DPLY key.
The Inline Test Screen will be displayed again and now you can enter the following commands, which are described in IBM 4331 Loop Adapter Operating Procedures:

- 001 display loop messages. The loop(s) should be open, otherwise issue the start command.
- 007 SAx assign test device (SA = station address)
- 550 xx xx xx send test data

Check the response after each command.
For each device special test commands (e.g.A0x) are available.

If the data transmission was successful continue with the next device

- 007 SAx assign test device (SA = station address)
- 550 xx xx xx send test data

Do not forget to terminate the tests with the '000' command.
These tests should complete successfully, otherwise your physical connection or address assignment is wrong.

IBM 3270s attached via control units on the Loop Adapter may also be tested as described earlier in this chapter.

Make a detailed drawing of your loop/lobe configuration (which device is in which position etc.).

During one production day a lot of information will be collected in the LA counters.

The '010' command displays this information, which can used for problem determination.

Channel-Attached Devices

In addition to the DPA attachments, terminals and other I/O devices can be attached by a control unit to the byte multiplex channel or the block multiplex channel(s).

One or more IBM 3272-1,2 or IBM 3274-1B,1D,21B,21D,31D non-SNA control units can be attached to the IBM 4331 Processor via a channel.
The devices attached to these non-SNA control units have physical addresses which must be specified in the VSE IPL ADD statement and in the ACF/VTAM LOCAL macro.

One or more IBM 3274-1A,21A,31A SNA cluster controllers can be attached to the IBM 4331 Processor via a channel.
Each SNA control unit with its attached devices has only one physical address which must be specified in the VSE IPL ADD statement and in the ACF/VTAM PU macro.

Physical connection of channel attached devices is done by an IBM Customer Engineer, who will assign the relevant channel addresses.

Customizing of Channel-Attached 3270 Devices

A 3274 must be customized by the customer before it can be used. This is done offline by responding to a series of questions presented on a screen attached to port 0 of the control unit. The final result is a customized 'system' diskette which is left in the 3274. When the 3274 is powered on, or IML is pressed, the customized microcode is loaded from this diskette. Full details on customizing the 3274 can be found in the 3274 Control Unit Planning, Setup, and Customizing Guide.

If you have a 3274 model 1A,1B or 1D you need know which, if any, Extended Function Store features are installed before you start customizing. These can be found on the literature accompanying the 3274.

When customizing, select only the features that you have or require.

When you have finished customizing the diskette, it is recommended that you create a second, backup diskette on the spare system diskette supplied with the 3274.

Assignment of Addresses of Channel attached Devices

The determination of addresses is done by the IBM Customer Engineer. He will make the addresses available which are needed for the ACF/VTAM and VSE definitions.

On channel 0 the addresses X'24' to X'3D' and X'3F' on nonshared subchannels and X'80' to X'BF' on shared subchannels can be used. A nonshared subchannel is designed for the use with a control unit that has only one I/O device attached or that has multiple I/O devices attached and is capa-

ble of using the block multiplexing facility. A shared subchannel can be used by a set of devices, but only one of these devices can be in operation at a time. There are some more restrictions on using these addresses on specific configurations.

The following contain detailed information on this subject:

- The Guide to the IBM 4331 Processor
- IBM 4331 Processor Functional Characteristics and Processor Complex Configuration

The block multiplex channel can operate in selector mode, equivalent to the selector channels on IBM /360 and IBM /370 systems, or in block multiplex mode equivalent to IBM /370 block multiplex channel. The operating mode of the channels depends on the address specification of the attached devices.

Test of Channel attached Devices

If you have finished with the steps above, you can check the physical connection (control unit - terminal) as described with the DPA-attached devices.

3.4 REMOTE DEVICES

Terminals connected to a host processor through communications lines are called remote devices. In the case of an IBM 4331 processor, the communication lines can be attached to the Communications Adapter (CA), a special feature integrated in the host processor and described later in this chapter.

ACF/VTAM supports only the SDLC and BSC line control disciplines of the CA. There is no support for start/stop lines.

For example, ACF/VTAM supports the following remotely attached display control units:

- SDLC (These control units appear to ACF/VTAM as PU TYPE 2)
  - IBM 3271-11,12
  - IBM 3274-1C,21C,31C,51C
  - IBM 3275-11,12
  - IBM 3276-11,12,13,14
  - IBM 8775-11,12

- BSC (These control units appear to ACF/VTAM as PU TYPE 1)
  - IBM 3271-1,2
  - IBM 3274-1C,21C,31C,51C (supported as 3271-1,-2)
  - IBM 3275-1,2
  - IBM 3276-1,2,3,4

Note:
Some control units can work either in SDLC or BSC mode. This depends on the CSU (Customer Set Up) of these units.

Communication Adapter-Attached Devices

The Communications Adapter with ACF/VTAM supports most of the functions provided by the IBM 3704/3705 Communications Controllers and the Network Control Program (NCP). As long as the network of remote devices is within the capabilities of the Communications Adapter, there is no need for a Communications Controller.

A set of 8 addresses, from X'030' to X'037', is reserved in channel 0 of the IBM 4331 for the use of the CA. These addresses must be used to specify to DOS/VSE and ACF/VTAM the lines attached to the CA. Only one CA can be installed in an IBM 4331 processor.

The line control disciplines supported by the CA are:

- SDLC
- BSC
- Start/stop (not supported by ACF/VTAM)

The CA can be provided with one or two Autocall interfaces, which permit the attachment of Autocall units, optional devices that enable ACF/VTAM to dial a switched cluster/terminal without operator intervention.

The CA supports only half-duplex data transmission, however, 2-wire and 4-wire communications lines can be attached to the CA.
Data rates of 600 to 9600 bps are supported for BSC and SDLC lines.

One high-speed BSC or SDLC line, with a rate up to 56,000 bps, can be attached to the CA. This line can operate concurrently with other lines attached to the CA as long as the aggregate data rate does not exceed 64,000 bps.
The maximum aggregate data rate that can be handled by the CA is 64,000 bps, if permitted by the interference from other operating channels. In order to achieve the maximum rate, lines should be installed in order of decreasing speed, with the highest speed in position 1, etc.

Each line also requires a modem feature for a stand-alone or an integrated modem (1200 bps only). Clocking can be provided by the CA or by the stand-alone modem.

The Local Attachment Interface provides for the local attachment of one BSC or SDLC terminal without the use of a modem.

Certain specifications must be included with the order. These may be obtained from the Sales Manual.

In certain IBM 4331's (depending on model, EC-level), the line control discipline can be changed only by ordering the necessary microcode changes through the MES process.
In addition, a cable must be ordered for each adapter position. A change of an address may require a different cable to be ordered with MES. Cables are not automatically supplied.
Refer to: IBM 4300 Installation - Physical Planning

Physical Installation of Devices on the Communication Adapter

Point-to-Point

A point-to-point configuration using an analog (telephone) line is setup similarly to Figure 8. Note that the PU address of 'C1' is arbitrary, but the same address must be used on the PU itself.

In this setup, the PU may have permanent Request To Send (RTS), which will cause permanent carrier to be generated on the line. This eliminates modem turn-around time at the secondary (remote) end. Alternatively, the secondary modem could be strapped or switched for permanent carrier. Similarly, the Communications Adapter, or the modem on the host end, can have permanent RTS selected.

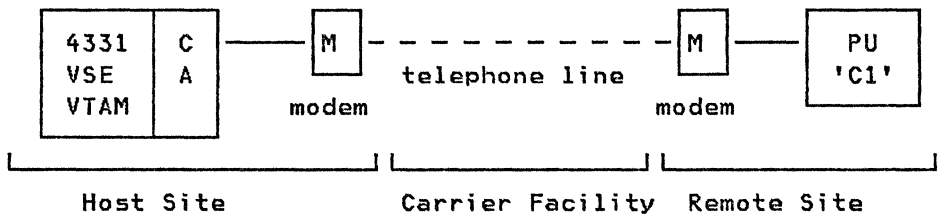


Figure 8. Devices attached to the CA: Point to Point

Multipoint

In the case of multidropped PU's on a line, the signals on a line are sent to all PUs by the use of an analog splitter (see Figure 9 on page 30), a digital splitter - also known as a modem, or port, sharing unit - (see Figure 10 on page 30), or a combination of the two (see Figure 11 on page 30). The SDLC frame contains an address which determines which PU is to act upon which frame. The address is set in the ACF/VTAM PU macro and in the PU itself.

None of these multidropped PUs may have permanent RTS: it must be controlled RTS in each case.

There are various combinations of ways of configuring the line, but the definitions to ACF/VTAM are exactly the same. See Chapter 5, section: 'Remote Devices' for details on coding.

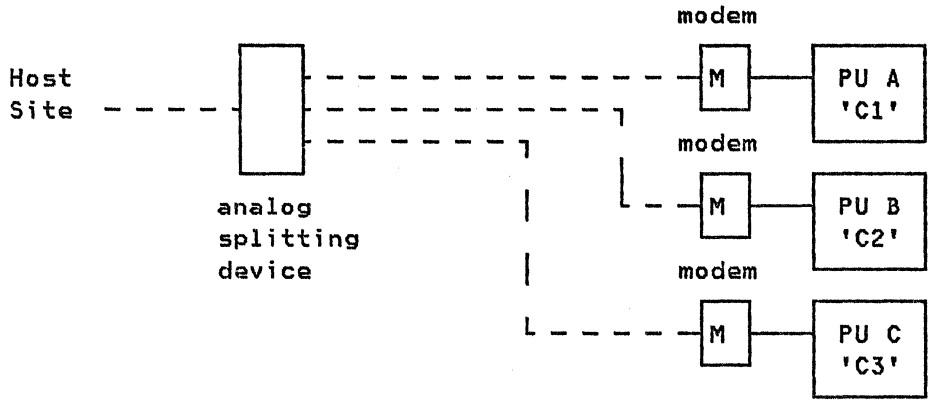


Figure 9. Multipoint Using an Analog Splitting Device

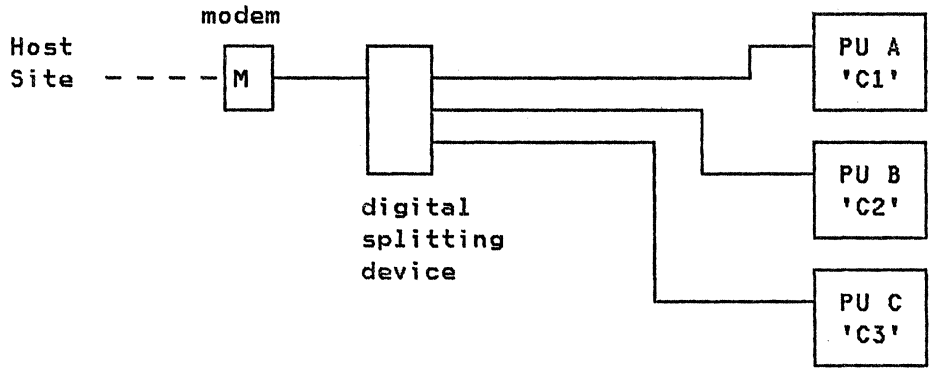


Figure 10. Multipoint Using a Digital Splitting Device

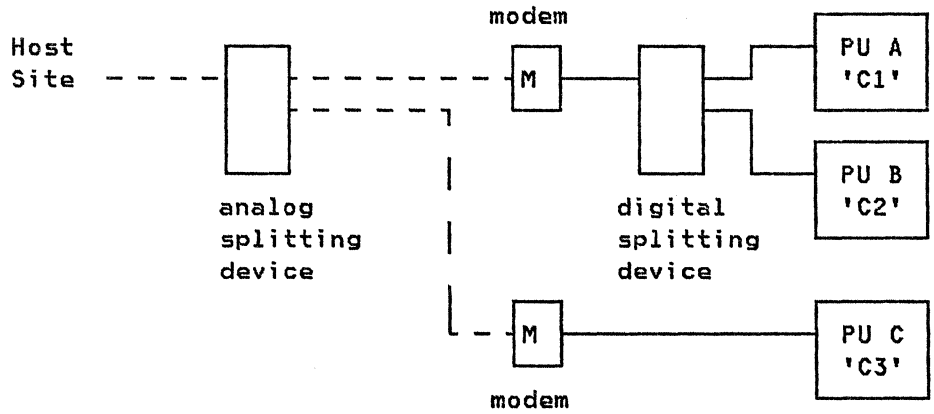


Figure 11. Multipoint Using Analog and Digital Splitting Devices

Customizing of CA-Attached 3270 Devices

Physical connection of CA-attached devices is done by the customer. The address of each PU is selected by the customer and is generally 'C1' for a single PU on a point-to-point line, or 'C1', 'C2', 'C3', etc. for PUs on a multipoint line.

IBM 3274

A remote 3274 must be customized by the customer before it can be used. This is done in the same way as for channel-attached devices.

If you have a 3274 model 1C you need know which, if any, Extended Function Store features are installed before you start customizing. These can be found on the literature accompanying the 3274.

When customizing, select only the features that you have or require.

When you have finished customizing the diskette, it is recommended that you create a second, backup diskette on the spare system diskette supplied.

When customizing a remote 3274, there are some responses which must correspond with set up parameters in the definitions in the host.

Question	Response
211	SCS support for 3287 printer. Enter 1 if it is used.
215	PIUD. Enter 00000 (unless the PU is on a switched link).
302	SDLC addr. '40', 'C1', etc. as described above. This must correspond to the ADDR parameter on the PU definition.
313	NRZI encoding. Corresponds to NRZI selection on the CA>
314	Enter 0 if you have defined more than 1 PU on the line.
331	Select 1 if the line is SDLC (VTAM GROUP macro and CA).
342	Permanent RTS will only be provided if 1 is selected and 1 (point-to-point) in Q.314

IBM 3274

With the 3276, options are selected through a switch panel on the unit. Refer to the 3276 Description and Programmer's Guide for details on selecting options.

With the 8775, options are selected from the keyboard. Refer to the 8775 Terminal User's Guide for details on selecting options.

Setting/changing Communication Adapter Line Characteristics

When the CA is installed in an IBM 4331, a configuration table is included on the system diskette. It contains one entry for each installed line that describes the characteristics and features of the line. Certain line parameters, described below, can be set or changed either temporarily (by the operator) or permanently (by the IBM Customer Engineer).

The IBM Customer Engineer can initially set or later change the following parameters for

- start/stop, BSC, and SDLC lines:
  - Select a switched line instead of a non-switched line (for external modems only)
  - Permanent request to send (4-wire communications line) [2]
  - EIA/V35 interface card disabled (external modem wrap)
  - Select standby for Switched Network Backup
  - Integrated modem answer tone select (2100 or 2150 Hz)
- BSC and SDLC lines only:
  - New Sync
  - Data signal rate select
  - Select high speed operation for one line only (enables an extra transmission buffer for the line)
  - DTR (data terminal ready) or CDSTL (connect dataset to line)
  - NRZI setting (only for SDLC lines) [3]
  - Error index byte and EBCDIC or ASCII transmission code (BSC only)

---

[2] For 2-wire lines PERM REQUEST TO SEND must be set to 'NO'

[3] The NRZI option must be matched between the different components of the network as:
line - front end modem - controller modem - controller
They all must be set to NRZI or no-NRZI for SDLC lines. In the CA this is done through the Service Processor facility, in the IBM 3276 by setting a switch during the customer set-up process. The characteristics of the modem must be checked to see if it requires NRZI, and how it can be jumpered to NRZI or no-NRZI.

Permanent Changes

For permanent changes the IBM Customer Engineer must use the IBM 4331 Maintenance and Service Program Selection function which is invoked by holding down the ALT key and pressing the MODE SEL key on the system console.

The IBM 4331 Maintenance and Service Program Screen will be displayed. The user may use this procedure to make inquiries on what is specified in the microcode.

The screen displayed has the following format:

```
        IBM 4331 MAINTENANCE AND SERVICE PROGRAM SELECTION

        LOG                    TEST                  TOOL

  0=LOG MODE              5=POWER              B=MANUAL OPERATIONS
  1=REFERENCE CODE LOG    6=CENTRAL COMPLEX    C=UTILITIES/REMOTE
  2=DETAILED LOG DISPLAY  7=5424               D=COMMUNICATION ADAPTER
  3=LAST DETAILED LOG     8=DISK/TAPE          -=FRIEND
  -=OTHERS                9=CA INLINE          F=OTHERS
                          -=TEST CHAINING


  SELECTION:                    - = NOT AVAILABLE
```

Figure 12. The Maintenance/Selection Program Screen

Entering 'D' (COMMUNICATION ADAPTER) will display the following screen:

```
                  *** CA TOOLS ***


                 A  UPDATE CONFIGURATION TABLE
                 B  UCW  DISPLAY
                 C  DISPLAY TRACE DATA

                                *** ENTER SELECTION ***


    SELECTION:
```

Figure 13. The CA Tools Screen

Entering 'A' will display the CA CONFIGURATION DATA Screen.

The CA Configuration Data Screen will display a description of the features of each line:

```
                *** CA CONFIGURATION DATA ***

      PF1-ADVANCE LINE POINTER  PF4-SELECT NEXT CA LINE ADR
      PF2-SELECT NEXT OPTION    ENTER-UPDATE AND EXIT
      PF3-EXIT WITHOUT UPDATE

      LINE ADDRESS 30  BSC  MOD CLOCK  EIA I/F

      ===>SWITCHED NETWORK            YES     =>NO
          PERM REQUEST TO SEND        YES     =>NO
          WRAP TEST SELECTION         MODEM   =>CA I/F
          SELECT STANDBY              YES     =>NO
          MODEM ANSWER TONE (HZ)      2025      2100
          NEW SYNC                    YES     =>NO
          EIB MODE                    YES     =>NO
          DATA SIGNAL RATE SEL        LOW     =>HIGH
          HIGH SPEED OPERATION        YES       NO
          MODEM PROCEDURE             CDSTL   =>DTR
          DATA CODE                   ASCII   =>EBCDIC
```

Figure 14. The CA Configuration Data Screen BSC Lines

This screen displays the configuration table of line 030 which is a BSC line with modem clocking and EIA I/F adapter type. With a certain EC-level of the IBM 4331 the line control can be changed in the corresponding field.

The features can be changed as described after the next screen.

To display the configuration data of the next CA line, press PF4.

```
            *** CA CONFIGURATION DATA ***

      PF1-ADVANCE LINE POINTER  PF4-SELECT NEXT CA LINE ADR
      PF2-SELECT NEXT OPTION    ENTER-UPDATE AND EXIT
      PF3-EXIT WITHOUT UPDATE

      LINE ADDRESS 31 SDLC  MOD CLOCK  EIA I/F

      ===>SWITCHED NETWORK            YES     =>NO
          PERM REQUEST TO SEND      =>YES       NO
          WRAP TEST SELECTION         MODEM   =>CA I/F
          SELECT STANDBY              YES     =>NO
          MODEM ANSWER TONE (HZ)      2025      2100
          NEW SYNC                    YES     =>NO
          NRZI                      =>YES       NO
          DATA SIGNAL RATE SEL        LOW     =>HIGH
          HIGH SPEED OPERATION        YES       NO
          MODEM PROCEDURE             CDSTL   =>DTR
```

Figure 15. The CA Configuration Data Screen SDLC Lines

This line (031) is a SDLC line with modem clocking and EIA I/F adapter type.

The user can update a given parameter using the following procedure:

- Use the PF1 key to put the large arrow in front of parameter to be updated.
- Use the PF2 key to put the small arrow in front of the desired value.

If you want to update the diskette with a new configuration table hit ENTER, and a warning message will appear. Hit ENTER again, and the diskette will be updated. If you do not want to update the diskette exit with PF3.

Normally, updating of the configuration table will be done by the IBM Customer Engineer. After the IBM Customer Engineer has made changes in the configuration table, an IML will have to be performed for the changes to take effect.

Where connection problems occur, check the values for PERM REQUEST TO SEND, NEW SYNC, NRZI, and DATA SIGNAL RATE SEL and compare them with the modem specifications, the modem strapping, and the ACF/VTAM line definition.

Temporary Changes

The following configuration parameters for an individual line can be specified by the operator:

- Select standby for Start/stop, BSC, or SDLC lines
- Data signal rate select
- NRZI mode for SDLC lines
- Half-speed operation for BSC lines
- ASCII or EBCDIC for BSC lines

Where connection errors occur, the operator can change certain parameters for each individual line before transmission occurs or during transmission. Such changes override the parameters specified for the line in the configuration table but are effective only until a system reset, IPL, or IML is performed.

The user may want to change temporarily, i.e. between two IPLs, one or more parameters of a specific line. To do this,

press the MODE SEL key on the system console (see Figure 2 on page 16).

The MODE SELECTION screen will be displayed:

Enter 'E' (COMMUNICATION LINES).

The following screen will be displayed:

```
                *** CA-CUSTOMER MANUAL OP'S ***

          A  TEMPORARY CONFIGURATION CHANGE FACILITY
          B  TRIBUTARY STATION ADDRESS(ES) FOR BSC LINES

                                  *** ENTER SELECTION ***



    SELECTION:
```

Figure 16. The CA-Customer Manual Op's Screen

Enter 'A'. The following screen will be displayed for a BSC line:

```
      *** TEMPORARY CONFIGURATION CHANGE FACILITY ***

PF1-ADVANCE SELECTION POINTER  PF4-SELECT NEXT CA LINE
PF2-SELECT ALTERNATE OPTION    ENTER - UPDATE AND EXIT
PF3-EXIT WITHOUT UPDATE

LINE ADDRESS 30  BSC  MOD CLOCK  EIA I/F

===> SELECT STANDBY              YES    => NO
     DATA SIGNAL RATE SEL        LOW    => HIGH
     DATA CODE                   ASCII  => EBCDIC
     EIB MODE                    YES    => NO
```

Figure 17. The Configuration Change Facility Screen for BSC Lines

The following screen will be displayed for an SDLC line:

```
      *** TEMPORARY CONFIGURATION CHANGE FACILITY ***

PF1-ADVANCE SELECTION POINTER  PF4-SELECT NEXT CA LINE
PF2-SELECT ALTERNATE OPTION    ENTER - UPDATE AND EXIT
PF3-EXIT WITHOUT UPDATE

LINE ADDRESS 31 SDLC  MOD CLOCK  EIA I/F

===> SELECT STANDBY              YES    => NO
     DATA SIGNAL RATE SEL        LOW    => HIGH
     NRZI                      =>YES       NO
```

Figure 18. The Configuration Change Facility Screen for SDLC Lines

Change the desired values as described in Figure 15 on page 35

Figure 19 on page 38 shows where certain matching network options have to be defined or set. The PU 3274 column shows question numbers of the customization process.

	ACF/VTAM	Communic. Adapter	Local Modem	Remote Modem	PU 3274	PU 3276
Perm RTS		yes	yes	yes	Q.314 Q.342	switch
NRZI (SDLC)		yes			Q.313	switch
SDLC PU address	PU macro ADDR=				Q.302	switch
BSC poll address	CLUSTER mac GPOLL=				Q.301	switch
Protocol SDLC/BSC	GROUP macro LNCTL=	yes			Q.331	select
Clocking		yes	yes	yes	Q.313	switch
Switched Line Address	PU macro IDNUM=id IDBLK=puid				Q.215	from serial number
Switched Line Defns.	yes	select switched	switched modem required	switched modem required	Q.343 Q.345	

Figure 19. Network Option Selection

Note:
NRZI must be yes or no for both ends. Some modems are sensitive to NRZI bit streams - check with the manufacturer of the modem.
To select permanent RTS, a 4-wire connection is required. RTS can be selected by either the DTE (host or controller) or by the DCE (modems), but should not be selected by both. It can be selected for one end, both ends or neither end.

Test of Remote Devices

If you have finished with the steps above, you can check the physical connection (control unit - terminal) as described with the DPA-attached devices.

4.0 INSTALLATION OF ACF/VTAM V2

It is assumed that the reader is familiar with SIPO/E 3.1 and has the SIPO/E 3.1 manuals available.

This chapter describes preparation and the installation of ACF/VTAM.

- during System Initialization of SIPO/E 3.1 (for First Time Users)
- on top of a running SIPO/E 3.1 system as a non-SIPO/E Program Product

4.1 INSTALLATION DURING SIPO/E 3.1 SYSTEM INITIALIZATION

Have the SIPO/E 3.1 Program Directory and Reference Manual available. Check following ACF/VTAM related **System Initialization** steps in the Program Directory and note the changes and hints mentioned below before you start with the real System Initialization.

Step 1: Select IPL Procedure

Select the IPL and JCL procedures depending on the environment. Make sure that the selected IPL procedure has an **ADD xxx,3277** statement for a non-SNA terminal which is physically available.
If not, you have to ADD this device during IPL as described below.

If an IBM 3274-1A is the only local control unit, you have to add this SNA control unit with an **ADD xxx,3791L** statement during IPL.

This address is also used in step 19, System Initialization.

If you have to add a device IPL·VSE as follows:

IPL=$IPLxxx,JCL=$$JCLxxx,STOP=ADD

When the system enters the WAIT state, you can add those devices which are not contained in the selected IPL procedure with:

ADD xxx,3277 for a non-SNA terminal (e.g. DPA-attached)

ADD xxx,3791L for an SNA control unit (e.g. IBM 3274-1A)

Steps 12/13: Restore the Previous/Current Release IPF Tapes

With these steps the SAMPLIB will be loaded. Use these SIPO/E provided jobs to customize your ACF/VTAM and CICS/VS environment as recommended in the following chapters.

The names of these ACF/VTAM related jobs are shown in the SIPO/E 3.1 Reference Manual on page 162 as well as at the end of this chapter.

Step 17: Create User Libraries

With job 'nSETUP' (corresponding to your DASD type) the User Library One Set is created, and the following ACF/VTAM B.books will be catalogued:

ATCSTR00 (start options)

ATCSTR33 (start options)

ATCCON33 (configuration list)

APPCON33 (application major node)

PATH1 (path table)

This job is listed in the SIPO/E Reference Manual Chapter: 'SIPO/E Supplied VSE/POWER Job Streams'.
These definitions are also used during the first ACF/VTAM start.

Step 19: Install your Telecommunications Access Method Starter System

During the System Initialization you release one of the 'nVTMINST' jobs in the reader queue (corresponding to your DASD type) and mount the ACF/VTAM tape to install the product in USRCL1.

This job installs a skeleton ACF/VTAM in order to use the initial CICS/VS system. This skeleton provides support for the **'one local screen'** version of CICS/VS. ACF/VTAM must be re-installed later as an non-SIPO/E 3.1 program product to provide full configuration support. This will be done via the Interactive Productivity Facility (IPF) and is shown in the next section of this chapter.

To define this single local screen to ACF/VTAM the user must catalog the definitions of the screen in a USRSL1 as a B.book.

The job ISTARTUP performs the creation and catalog function. Release this job as mentioned in step 19. Then you will be prompted to define this screen.

Valid responses for 'CU (Control Unit) TYPE AND MODEL' are:

327202 for an IBM 3272-2 local non-SNA control unit
4300DA for the Display Printer Adapter
32741B for an IBM 3274-1B local non-SNA control unit
32741D for an IBM 3274-1D local non-SNA control unit
32741A for an IBM 3274-1A local SNA control unit

Valid responses for 'CONTROL UNIT / TERMINAL ADDRESS' are:

e.g. '010' for an IBM 3277 attached to the DPA

Beware that this address is added at IPL time (refer to step 1) and that you have entered the corresponding control unit type (in this case '4300DA') in the previous response.
After this job has finished a major node named 'ICCF3270' is cataloged and will be used during ACF/VTAM start.

Step 20: Starting ACF/VTAM

You can use the job 'VTAMSTRT' to start ACF/VTAM.
After releasing this job during System Initialization the following message will appear on the console:

```
ENTER VTAM START PARAMETERS

Type in:  xx LIST=33
```

When the following messages appear on the console, the local screen defined on the IPL Procedure will be controlled by ACF/VTAM:

```
5E48I BUFFER POOL START OPTION INPUT FOR AN UNUSED POOL - IGNORED[4]
5A17I UNABLE TO LOAD PHASE ISTEXCVR[5]
5A17I UNABLE TO LOAD PHASE ISTSDCOS[5]
5F00I NO TRFILE AVAILABLE - WRAP MODE-TRACE ONLY
5D15I VTAM INTERNAL TRACE ACTIVE - MODE = INT, SIZE = 002, OPTIONS = API
PIU MSG
5A93I APPCON33 ACTIVE[6]
5A93I ICCF3270 ACTIVE[6]
5D42I SLU D72L301 TYPE = LOGICAL UNIT   , ACTIV   ,CUA=010[7]
5A20I VTAM INITIALIZATION COMPLETE
```

The user should now display the active nodes with following ACF/VTAM commands:

```
D NET,MAJNODES     (display major nodes)

5D50I VTAM DISPLAY - DOMAIN TYPE = MAJOR NODES
5A89I APPCON33 TYPE = APPL SEGMENT     , ACTIV
5A89I ICCF3270 TYPE = LCL 3270 MAJ NODE, ACTIV
5D14I END
```

The user may now display the minor nodes with following ACF/VTAM commands:

```
D NET,APPLS        (display application major nodes)
```

---

[4] This message shows that the SIPO/E default start options for ACF/VTAME (ATCSTR33) contain buffer pool definitions which are not used any longer in ACF/VTAM. The start options will be changed later to reflect the ACF/VTAM buffers.

[5] This message names a missing load phase, which is not necessary in your current environment.

[6] The named ACF/VTAM major nodes (SIPO/E defaults) became active, and their minor nodes should be displayed by ACF/VTAM commands.

```
5D50I VTAM DISPLAY - DOMAIN TYPE = APPL MAJ NODES/NAMES
5A89I APPCON33 TYPE = APPL SEGMENT     , ACTIV
5A80I DBDCCICS CONCT
5D14I END

D NET,ID=ICCF3270,E
      or

D NET,TERMS,E      (display local non-SNA minor nodes)

5D50I VTAM DISPLAY - DOMAIN TYPE = LOGICAL UNITS/TERMS
5D54I PU T4/5 MAJOR NODE = ISTPUS
5D51I LOCAL 3270 MAJOR NODE = ICCF3270
5A89I D72L301  TYPE = LOGICAL UNIT     , ACTIV     ,CUA=010[7]
5D14I END
```

The user may display the status of the ACF/VTAM buffers with the following command, but there should not be a buffer problem.

```
D NET,BFRUSE      (display ACF/VTAM buffers)

5D50I VTAM DISPLAY - DOMAIN TYPE = BUFFER POOL DATA
5G32I BUFF   BUFF  CURR   CURR   MAX    MAX  TIMES    EXP/CONT   EXP
5G33I  ID    SIZE TOTAL  AVAIL  TOTAL  USED   EXP    THRESHOLD  INCR
5D56I VF    02048 00005P 00001P  N/A  00004P  N/A       N/A     N/A
5D56I VP    02048 00170P 00138P  N/A  00038P  N/A       N/A     N/A
5D56I SF    00356 00153  00150  00153 00003  00000  00021/---- 00005
5D56I LF    00183 00138  00138  00138 00006  00000  00019/---- 00010
5D56I SP    00112 00210  00210  00210 00000  00000  00021/---- 00017
5D56I LP    01016 00054  00050  00054 00006  00000  00007/---- 00002
5D56I WP    00160 00100  00098  00100 00002  00000  00011/---- 00012
5F95I IRNLIMIT = NOLIMIT, CURRENT = 000000K, MAXIMUN = 000000k
5D14I END
```

Step 20: Starting VSE/ICCF with CICS/VS

During the System Initialization you release one of the 'nICFCVEC' or 'nICFCVEF' jobs in the reader queue (corresponding to your DASD type and MODE) to start CICS/VS.
When the message

```
DFH1500  CONTROL IS BEING GIVEN TO CICS
```

appears on the console, the local screen will be controlled by CICS/VS.

Step 26: LOGON to VSE/ICCF and the IPF

To logon to ICCF, this step should be carried out at the terminal which was defined in step 1 and 19.

Pressing the CLEAR key will erase the CICS/VS Good Morning Message.

---

[7] The actual CUA address is configuration dependent.

After the LOGON sequence you are ready to work with ICCF/IPF to tailor and customize your system as described in the SIPO/E 3.1 manuals.

4.2 ADDITIONAL HINTS

LOGOFF from VSE/ICCF and CICS/VS

If the terminal is in the Command Mode of ICCF, the user can leave the ICCF environment with the **/LOGOFF** command. The terminal is then logged off from ICCF but still connected to CICS/VS.

To log off from CICS/VS the command CSSF LOGOFF must be used. After this command is entered and accepted a message is received from CICS/VS indicating that the session is terminated.
Hitting the SYSREQ key will display the CICS/VS Good Morning message. The terminal will again be connected to CICS/VS.

Shut Down CICS/VS

To shut down CICS/VS enter from console:

/TC

and the following message will appear on the console:

K103I ENTER TERMINAL CONTROL (CICS) OPERATOR COMMAND

Enter: CSMT SHUT,NO

Then the following messages are displayed on the system console:

DFH1701 C.I.C.S. IS BEING TERMINATED
DFH1799 TERMINATION OF CICS/VS IS COMPLETE

Shut Down ACF/VTAM

To shut down ACF/VTAM enter:

Z NET,QUICK

QUICK specifies that you want the network to be closed down immediately. Application programs not currently using ACF/VTAM are denied access to ACF/VTAM.

Recommendations

When you start your System Initialization have the SIPO/E 3.1 Program Directory **and** this document at the system console.

During IPF's FIRST TIME USE allocate library set 'G', as it is recommended that you install ACF/VTAM in library set 'G'.

4.3 SIPO/E 3.1 ASSISTANCE FOR NETWORK DEFINITIONS

After the System Initialization steps of the SIPO/E 3.1 (see above) you will find several ACF/VTAM related jobs in ICCF-Lib 59 (SAMPLIB).

Member **VTAMBOOK** contains definitions for a:

Start list	ATCSTR00/ATCSTR33
Configuration list	ATCCON33
Path definition	PATH1
Local non-SNA major node	ICCF3270

Member **VTMSTRT** contains an ACF/VTAM start job.

Member **USSTAB** contains a job which catalogs an Unformatted System Services table.

If you are a First Time User or a former BTAM-ES user, you may:

- copy these jobs to your ADMINISTRATOR-Lib,
- rename these jobs according to your naming conventions,
- print these jobs, and
- modify these jobs as mentioned in the following chapters.

Divide member VTAMBOOK into several members. Each B.book should be represented in a separate CATAL job and member.

There are also **CICS/VS** related jobs in this library.

Member **DFHSIT** contains a SIT catalog job.
Member **DFHPPT** contains a PPT catalog job which includes the necessary ACF/VTAM entries.
Member **DFHPCT** contains a PCT catalog job which includes the necessary ACF/VTAM entries.
Member **DFHTCT$O** contains a TCT catalog job for a CICS/VS with ACF/VTAM.

You may use these jobs and modify them as mentioned in Chapter 5,6 or 9 of this Primer.

Another possibility is to punch (with SSERV) from PRDSLB sublib 'G' following CICS/VS tables:

DFHSIT$O, DFHPCTA$, DFHPPTA$ and DFHTCT$O,

which reflect ACF/VTAM prerequisites. After job execution include these tables by the ICCF command

/GETP jobname MEM=tablename (e.g. SITxxCAT)

into your ADMINISTRATOR Lib.
Choose the member name as SITSVCAT and the table suffix as 'SV' in a single system environment.
In a multi system environment substitute 'SV' by the subarea number.

You may use these tables as mentioned in Chapter 5/6 or Chapter 9 of this primer.

First Time Users may select from the VSE/POWER-SYSIN tape the CICS/VS-VTAM start job with following jobstream:

```
* $$ JOB SELECT
// JOB SELECT
* $$ PUN DISP=K,CLASS=Q
// ASSGN SYS004,tapeunit
// ASSGN SYS005,SYSPCH
// EXEC OBJMAINT
./SELECT xICFCVEF
./COPY
/*
/&
* $$ EOJ
```

Include the output of this job into your ADMINISTRATOR Lib with the /GETP command.

There are also **NCCF/NPDA** related jobs in this library.

Member **DSICMD** defines the NCCF commands.
Member **DSIDMN** defines the NCCF domain.
Member **DSIOPF** defines NCCF operators.
Member **LOGREF** defines the NCCF log task.
Member **NCCFCLU** creates the NCCF log data sets.
Member **NCCFLTAB** contains the catalog job for the NCCF Logon mode table.
Member **NCCFVLST** defines NCCF to ACF/VTAM.
Member **NCCFVSP** defines the VSAM space for NCCF.
Member **PROFSYS** defines NCCF operator profiles

Member **NPDABNH** defines NPDA.
Member **NPDACLU** creates the NPDA data bases.
Member **NPDAIST** creates the ACF/VTAM CNM interface table.
Member **NPDAVSP** creates the VSAM space for NPDA
Member **NPDAVSP** creates the VSAM space for NPDA

You may:

- copy these jobs to your ADMINISTRATOR-Lib,
- rename these jobs according to your naming conventions,

- print these jobs, and
- modify these jobs as mentioned in the Chapter 11.

There is also SIPO/E 3.1 assistance in defining your **OCCF** environment. Use the IPF VERIFY dialog for this component as mentioned in Chapter 11 of this primer.

4.4 INSTALLATION AS A NON-SIPO/E 3.1 PROGRAM PRODUCT

After the application of the steps described below, ACF/VTAM is installed and can be maintained via the IPF Service Dialogs.

Decide on Library Set to contain ACF/VTAM

To allow an easy testing of the new ACF/VTAM the component should be installed in the SIPO/E library set 'G'. This library set normally contains 'Non-SIPO/E Program Products'.

Check for Service required

At this time (March 83) no fixes need be applied before installation of ACF/VTAM Version 2.

The following fixes are required after installation of ACF/VTAM Version 2:

PREREQUISITE		PRODUCT	DESCRIPTION	USERS AFFECT.
PTF	APAR	INVOLVED		
	DY29804	VSE/AF R3	DY29804 is a required VSE/AF APAR which is a corequisite of an ACF/VTAM APAR which is fixed in this Release. A ZAP for this APAR is available in RETAIN	VSE/AF R3
N/A	N/A	DSLU R1.2	Downstream Load Utility users must run on Rel. 1 maintenance level 2 of the DSLU	DSLU USERS

Figure 20. APARs, Fixes required after Installation of ACF/VTAM

Note:
Use the IPF Service Dialogs to install the necessary APARs. Also refer to: VSE/AF Maintain System History Program (MSHP) User's Guide if necessary.

Prepare Installation Jobs via IPF

To follow the SIPO/E installation procedures the IPF dialogs for installation of 'non-SIPO/E Program Products' should be used to create the installation job-streams.

The following sequence of dialogs describes the generation of the installation job-stream via VSE/ICCF or VM/CMS.

Step 1:

Enter '@IPF'
Enter '=SYM$', if this panel is not already displayed

Step 2: Panel SYM$: Select '4' (INSTALLATION GUIDE)

Step 3: Panel SYM$I1: Select '1' (NON SYSTEM IPO/E PRODUCT)

Step 4: Panel SYM$I2: Select '1' (ADD SOFTWARE PRODUCT)

Step 5: Panel ADM$SFN1:

COMPONENT NUMBER: ==> 5666 ==> 28 ==> 001
COMPONENT LEVEL CODE: E27
FEATURE: NO
DELETE: blank
CONTINUE: YES

Step 6: Panel ADM$SFN2:

NAME: ==> ACF/VTAM ==> VERSION ==> 2
PRODUCT NUMBER: ==> 5666 ==> 280
MULTIPLE COMPONENTS: NO
LIBRARY SET: G
UNIQUE STRING: VT2
RELEASE NUMBER: 1.0

Step 7: Panel ADM$SFN3:

INSTALLED: NO
VSE/ICCF members: NO
NUMBER OF FILES: 5
COPYR STATEMENTS: NO
COPYS STATEMENTS: YES

Step 8: Panel ADM$SFN4

BLOCK TYPE: FBA (or User DASD Type)[8]
CORE IMAGE LIBRARY: 3800
RELOCATABLE LIBRARY: 8600
SOURCE STMT LIBRARY: 2600

The library allocation requirements in cylinders (CKD) or blocks (FBA) and the directory sizes in tracks (CKD) or blocks (FBA) are given below by device type:

DISK	Lib/Dir core im	Lib/Dir relocat	Lib/Dir source	Lib. Aux. Hist. File
3330	12/4	24/4	8/2	2
3340	26/5	56/5	17/2	8
3350	7/4	12/4	4/2	1
3375	10/4	20/4	6/2	2
FBA	3800/25	8600/45	2600/11	900

Figure 21. Library Space Requirements for ACF/VTAM

Step 9: Panel ADM$SFN1: CONTINUE: NO

Step 10: Panel ADM$SFT5: Hit ENTER key

Step 11: Panel SYM$I2: Select '2' (CONTINUE)

Step 12: Panel SYM$I3: Select '1' (CREATE COPY FILES)

Note:
For installation of non-SIPO/E Program Products, IPF assists in generating the necessary job control to merge members from the service to the production library.

The next three steps assist in creation of the necessary table containing the member names to be merged. The table is stored under the name INS$VT2S (unique product string plus 'S' for SL) in non-compressed format in the user's primary library (in most cases library 1).

---

[8] for other device types see Figure 21

Step 13: Panel ADM$CPY1:

PRODUCT STRING: VT2
RELOCATABLE: NO
SOURCE STATEMENT: YES
EXIT: NO

Step 14: Panel ADM$CPY4:

SUBLIBRARY: E
CONTINUE: YES
==> COS ==> COSEND ==> COSTAB ==> ISTRH
==> ISTBLENT ==> ISTGLBAL ==> ==>

Step 15: Panel ADM$CPY4:

SUBLIBRARY: Z
CONTINUE: NO
==> ISTINCNO ==> ==> ==>

Step 16: Panel SYM$I3: select '2'

Step 17: Panel SYM$I5:

To add or update Library set definitions: Select '2' (IBM PRODUCTION LIBRARIES)

To continue with step number 18 (Panel SYM$I6): Select '5'

Step 18: Panel SYM$I6:

Select '2' (CONTINUE) if no ASI tailoring is required

otherwise, if library set 'G' has been just added or moved to a different volume:

Select '1' (ASI Tailoring)

Leave after panel TAS$MAS2 with generation of jobstream

Select '2' (CONTINUE) on panel SYM$I6

Step 19: Panel SYM$I7: Select 'ICCF' by pressing PFK 4.

Now create the IPF COPYS file for the ACF/VTAM installation job stream. Decompress the existing IPF COPYS table INS$VTMS (ACF/VTAM R. 3.0) and include it into the new COPYS table INS$VT2S (ACF/VTAM V2) by entering:

'IPFDCMP INS$VTMS'

'@ED INS$VT2S'

'GET INS$VTMS'

'FILE'

'@IPF'

Note:
For a detailed description of the SIPO/E procedures for decompressing and compressing refer to the IPF User's Guide.

The new table INS$VT2S will be automatically picked up during generation of the installation job stream and the necessary COPYS statements will be included.

STEP 20: (back on Panel SYM$I7): Select '1' (CONTINUE)

Users with IBM 3641/42/44/46/47 may continue with the installation of the CICS/VS PRPQ (5799-BEH).

Users with IBM 3644 may install GEN3644 (5668-998) now.

Users with IBM 3644 and/or IBM 8775 (with feature 3624/26, 5110) may continue with the installation of DSLU (5668-006).

The dialogs for installing these non-SIPO/E Program Products into the Production Library Set G are nearly the same as described for the ACF/VTAM installation.

After this dialog check the generated VSE/POWER job via ICCF.
You may remove the job sequence which copies the $$RASTxx phases into VSE System Core Image Library. This is not necessary with ACF/VTAM.

Notes for former ACF/VTAME or ACF/VTAM Release 3.0 users:
Users with a running ACF/VTAME or ACF/VTAM Release 3.0 **must delete** this job sequence, otherwise the existing ACF/VTAM will fail.

Submit the generated and modified installation job stream. ACF/VTAM will be installed in the library set 'G' and can be maintained by the IPF dialogs. PTFs and APARs are only effective if ACF/VTAM is deleted from the USRCL1.

Remember to check the LIBDEF definitions of your ACF/VTAM partition and the CICS/VS partition as well as other partitions containing ACF/VTAM application programs. This is of special importance if ACF/VTAME is still installed in library set 'C'.

Note that **PRDxLG has to be in front of PRDxLC!**
Also check all ACF/VTAM related jobs in your environment.

5.0 SINGLE SYSTEM ENVIRONMENT

It is assumed that the user has an IBM 4331 with locally and remotely attached IBM 3270s and IBM 364Xs. CICS/VS is the ACF/VTAM application.

This chapter contains information about:

- the definition of terminals attached to
  - the Display/Printer Adapter (DPA),
  - the LOOP Adapter,
  - the channels,
  - the Communication Adapter (CA)

  in DOS/VSE, ACF/VTAM and CICS/VS;
- the ACF/VTAM start options,
- the session establishment between ACF/VTAM and these terminals,
- the definition of CICS/VS as an ACF/VTAM application,
- and the verification of the installation.

5.1 PREREQUISITES TO THIS CHAPTER

5.1.1 Hardware

It is recommended that the set up for the CPU, the attached terminals, control units and modems be completed. The hardware tests should have been performed.
Have the Configuration Documentation Sheet available as described in Chapter 3.

5.1.2 Software

The installation of SIPO/E 3.1 and ACF/VTAM is completed as described in Chapter 4. It is assumed that:

Users of IBM 3641/42/44/46/47's have installed the CICS/VS PRPQ (5799-BEH).

Users of IBM 3644's have installed GEN3644 (5668-998).

Users of IBM 3644's and/or IBM 8775 (with feature 3624/26 5110) have installed DSLU (5668-006).

First Time Users have copied all ACF/VTAM definitions from the SIPO/E 3.1 SAMPLIB to the ADMINISTRATOR-LIB.
Also the CICS/VS-VTAM tables have been copied either from PRDSLB or from the SAMPLIB to this ICCF-LIB.

5.1.3 Network Addressing Considerations

A network address is a sixteen bit field consisting of a subarea field and an element field. The number of bits allocated to each is determined by the ACF/VTAM MAXSUBA start option. This specifies the maximum address of a subarea in the network, a subarea being a host processor or a communication controller.

The default is 15; the minimum is 3 and the maximum is 255.

In a single systems environment, it is reasonable to allow MAXSUBA to default to 15, as this allows for enough subareas in one domain. In addition, when an ACF/VTAM trace is done, the four bits allocated to the subarea will form a hex digit, and the remaining twelve bits allocated to the element will form three hex digits for easy identification.

5.1.4 Naming Conventions

Before you start with any ACF/VTAM or CICS/VS definitions you should choose your naming convention. There are several conventions to choose from and some examples are provided in Appendix B of this manual.

5.1.5 Session Initialization

A session is started with a request by a logical unit to be put in session with an application program. Alternatively, the application program may issue the request on behalf of the LU. This request is called a logon.

Four types of logon are possible, and you should choose which type(s) you will use in your environment:

- **Secondary logical unit (SLU) initiated,**
  where the secondary logical unit (terminal) issues a request that causes it to be logged on to the selected application program. This is done by, for example, entering:

  LOGON APPLID(DBDCCICS)

  at a terminal which is in the SSCP-LU session (i.e. which has been activated by ACF/VTAM.

- **Application program initiated,**
  where an application program (CICS/VS,for example) simulates a logon, as if it were coming from a secondary logical unit. For example if CONNECT=AUTO is coded in a TCT TYPE=TERMINAL macro in CICS/VS a simulated logon will be issued by CICS/VS for the logical unit related to the terminal defined in the TCT. In this case the secondary logical unit must be powered on, otherwise CICS/VS sets this terminal OUT OF SERVICE.

  Do not use CONNECT=AUTO and LOGAPPL=DBDCCICS together (see below).

- **Automatic logon,**
  where ACF/VTAM automatically logs a secondary logical unit on to an application program, indicated by coding, for example, LOGAPPL=DBDCCICS in the ACF/VTAM LU definition statement.

  Operator logon,
  where the operator can cause a specified logical unit to be logged on to a specified application program. This is done by, for example, entering :

  V NET,ACT,ID=lu-name,LOGON=DBDCCICS

  at the system console.

Recommendations for LU-LU Session Initialization

If you have one CICS/VS system use the **automatic logon** technique.

If you intend to have more than one CICS/VS running at the same time with the capability to access either DBDCCICS or TESTCICS from a terminal use the **SLU initiated** technique.

If you supply an USSTAB (Unformatted System Service Table), it will allow the user to enter a single word to LOGON to a desired application (e.g. DBDCCICS, CICS, TEST, etc.). This is useful if more than one application is accessed from one terminal and you are not using an automatic logon (LOGAPPL statement).

To create this table refer to Chapter 6, section 'User Defined ACF/VTAM Tables'.

5.1.6 Session Parameters

In order to establish an LU-LU session ACF/VTAM needs to have access to a set of session parameters which will govern the session.
In a CICS/VS environment these parameters are derived from parameters (e.g. RUSIZE,etc. ..) in the CICS TCT macro TYPE=TERMINAL. Therefore, there is no need to use or code a VTAM LOGMODE table entry.

Recommendations for the Usage of a MODETAB

Exceptional cases, however, might require the use of a LOGMODE table entry for CICS sessions. The same applies for the use of other ACF/VTAM application programs, such as NCCF.

This is described in Chapter 6, section: Session Parameters and section: VTAM Tables.

5.1.7 Session Termination

When one session partner decides to terminate the communication, it can request a session termination. The method by which this is done varies according to which end of the session wants to terminate it.

Three types of session termination are possible, depending on the source of the termination request. Decide which type(s) you will use in your environment.

- **SLU requested session termination,**
  where the secondary logical unit (terminal) issues a termination request that causes it to be logged off from the application program. Session termination is requested from SLUs if it sends the **LOGOFF command**. To be able to enter a character-coded LOGOFF command, this terminal has to be in the SSCP-LU session. This is achieved by hitting the SYSREQ key on an SNA terminal (not possible on a non-SNA terminal).

The LOGOFF command can have parameters to indicate to ACF/VTAM whether the request is for conditional or unconditional termination of the session.

If conditional termination is requested, ACF/VTAM notifies the application program that the secondary logical unit has requested that the session be terminated. The application program can ignore the request or issue a CLSDST macro instruction to terminate the session.

If unconditional session termination is specified, ACF/VTAM terminates the session and then notifies the application program that the session has been terminated and that it is to issue a CLSDST macro instruction.

The format of the LOGOFF command is:

```
LOGOFF <APPLID(applname)> <TYPE(COND|UNCOND|FORCE)> <HOLD(YES|NO)>
```

The parameters included between < > are optional.

```
APPLID(applname) ==> Specifies the name of the application program with
                     which a session is to be terminated (optional)

TYPE(COND|UNCOND|FORCE)
                 ==> Specifies the type of LOGOFF as conditional or
                     unconditional or forced.
                     The default value is unconditional.

HOLD(YES|NO)     ==> Specifies wether or not the LU expects ACF/VTAM
                     to maintain the SSCP-PU session.
                     The default value is yes.
```

- **Application program requested session termination,**
  where an application program (e.g. CICS/VS) requests session termination with a secondary logical unit.

  In case of CICS/VS this kind of request can also be initiated by the connected terminal or the master terminal operator as shown below. For example, the terminal operator enters the CICS/VS command **CSSF LOGOFF** at a terminal in session with CICS/VS; or, the master terminal operator enters one of the following commands:

```
CSMT CLOSE,VTAM      (for all connected terminals)
CSMT SHUT,NO         (for all connected terminals)
CSMT TER,SIN,...     (for a specific terminal).
```

After these commands the terminal(s) are again in the SSCP-LU session and VTAM LOGON commands can be entered at the terminal.

- **Operator requested session termination,**
  where the VTAM operator can cause a specified logical unit to be logged off from a specified application program.
  This is done by entering **V NET,TERM,ID=lu-name** from the system console.

  Also **V NET,INACT,ID=lu-name** has the same effect, as it will terminate the SSCP-LU session and therefore also the hierarchically lower LU-LU session.

Recommendations for Session Termination

Usually the **application program requested session termination** is used. This is where applications like CICS/VS, NCCF, etc. allow the terminal user or master terminal operator to request session termination via operator commands.

In special situations the other types of session terminations may be used.

CICS/VS will honor any of these methods of logging off.

5.2 IPL DEFINITIONS

To identify the attached devices to DOS/VSE 'ADD commands' must be specified in the IPL procedure. Take your Configuration Documentation Sheet and update your IPL procedure as follows:

5.2.1 Local Devices

- non-SNA
  - DISPLAY/PRINTER ADAPTER

    Each terminal must be added with device type 3277.

    e.g. ADD 009,3277

    Each terminal printer must be added with device type 3277 and mode 01.

    e.g. ADD 012,3277,01

  - IBM 3272-1,2 IBM 3274-1B,1D,21B,31D

Each terminal attached to one of these controllers must be added with device type 3277.

e.g. ADD 080,3277

Each terminal printer attached to one of these controllers must be added with device type and mode 01.

e.g. ADD 087,3277,01

- SNA

  - LOOP ADAPTER(LA)

    All IBM 3641/42/43/46/47's (local or remote) on the IBM 4331 LA must be added with address X'040' (common PU) and device type 3791L.

    ADD 040,3791L

    Each IBM 3274/3276, IBM 3287, IBM 3644, IBM 3645, IBM 8775 (local or remote) on the IBM 4331 LA must be added with device type 3791L.

    e.g. ADD 041,3791L

  - IBM 3274-1A/-21A/-31A, IBM 3791

    Each control unit must be added with device type 3791L.

    e.g. ADD 080,3791L

5.2.2 Remote Devices

A set of eight addresses, from X'030' to X'037', is reserved in channel 0 of the IBM 4331 for the use of the CA. These addresses must be used to specify to DOS/VSE the lines attached to the CA.

For each line attached to the CA, an ADD statement must be included in the IPL procedure.

ACF/VTAM supports only the BSC and SDLC line control disciplines of the CA. There is no support for start/stop lines.
BSC lines under control of ACF/VTAM can only work with IBM 3270 BSC control units.

- Each SDLC line must be added with device type 3705 and mode 10.

  e.g. ADD 030,3705,10

- Each BSC line must be added with device type 2703.

  e.g. ADD 031,2703

Note:
All these ADD commands should be created via the IPF - ASI Tailoring Dialog.

5.3 STARTUP DEFINITIONS

The partition containing ACF/VTAM should have higher priority than partitions containing ACF/VTAM application programs; otherwise, the application programs may be unable to communicate with ACF/VTAM.

- If CICS/VS (F2 partition) is the only ACF/VTAM application program create a following PRTY statement:

  PRTY BG,FB,FA,F9,F8,F7,F6,F5,F4,F2,F3,F1 (F3 VTAM partition)

- The size of the VTAM partition (F3) in the ALLOC and ALLOCR commands can be defined as:

  1844K for the virtual storage (ALLOC), and
  200K for the real storage (ALLOCR).

If you want to use a more exact storage allocation use the storage estimates in Appendix F of ACF/VTAM V2 Planning and Installation Reference.

The ACF/VTAM partition can also run exclusive of VSE/POWER control and can start automatically during VSE system initialization.
This is arranged in the following way:

- Include the ACF/VTAM start job (without POWER JECL statements) into procedure $3JCLxx

- Add the 'START F3' command in procedure $0JCLxx

- Existing VSE/POWER start commands for F3 need to be removed from procedure $1JCLxx.

The ACF/VTAM start job considerations are discussed later in this chapter.

Note:
As far as possible use the IPF - ASI Tailoring Dialog.

5.4 ACF/VTAM DEFINITIONS

Now define the ACF/VTAM major and minor nodes.
First Time Users may use the members created from the SIPO/E 3.1 SAMPLIB member 'VTAMBOOK' and modify them according to the following rules.

5.4.1 Local Devices

Non-SNA Devices

Define your local non-SNA devices in one or several major nodes.

The LBUILD definition statement for a non-SNA major node is the header, followed by the appropriate LOCAL statements for the minor nodes.

- DISPLAY/PRINTER ADAPTER

  The Display/Printer Adapter appears to ACF/VTAM as an IBM 3272, so its definition to ACF/VTAM is similar to an IBM 3272 definition.
  The following job stream catalogs the definition book for a local non-SNA major node:

```
// JOB LOC1CT                          CATAL  DPA  Major node
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.LOC1
          BKEND B.LOC1
LOC1      LBUILD
D82L009   LOCAL CUADDR=009,                                    *
                TERM=3277,                3278 DISPLAY         *
                FEATUR2=MODEL2,                                *
                LOGAPPL=DBDCCICS
D92L010   LOCAL CUADDR=010,               3279 DISPLAY         *
                TERM=3277,                                     *
                FEATUR2=MODEL2,                                *
                LOGAPPL=DBDCCICS
D82L011   LOCAL CUADDR=011,                                    *
                TERM=3277,                3278 DISPLAY         *
                FEATUR2=MODEL2,                                *
                LOGAPPL=DBDCCICS
P72L012   LOCAL CUADDR=012,                                    *
                TERM=3286,                3287 PRINTER         *
                FEATUR2=MODEL2,                                *
                LOGAPPL=DBDCCICS
          BKEND
/*
/&
```

- IBM 3272-1,2 and IBM 3274-1B,1D,21B,21D,31D (channel attached)

  The terminals/terminal printers on these non-SNA control units are defined as in the example above.

Note:
The IBM 3278/3279 display has to be specified as a 3277 and the IBM 3287 printer as a 3286.

By specifying LOGAPPL=DBDCCICS the device is automatically connected to DBDCCICS.

If you are using a USS table (see the section 'Recommendations for LU-LU Session Initialization' in this chapter) replace this parameter with **USSTAB=phasename**.
In this case the LU-LU session has to be established from the terminal.

SNA Devices

Define your SNA devices in one or more major nodes.

The VBUILD TYPE=LOCAL definition statement for an SNA major node is the header, followed by the appropriate PU and LU statements for the minor nodes.

- IBM 3274-1A,21A,31A

  These SNA control units with their attached devices have only one physical address which must be specified in the PU statement. The following job stream illustrates an IBM 3274-1A definition book for a control unit with 2 attached terminals:

```
// JOB LOC2CT                          CATAL LOCAL SNA Major Node
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.LOC2
          BKEND B.LOC2
LOC2      VBUILD TYPE=LOCAL
PU13F     PU     CUADDR=13F,                                      *
                 PUTYPE=2,                                        *
                 MAXBFRU=5,                                       *
                 SSCPFM=USSSCS
D82L13F1  LU     LOCADDR=2,                                       *
                 LOGAPPL=DBDCCICS
D82L13F2  LU     LOCADDR=3,                                       *
                 LOGAPPL=DBDCCICS
          BKEND
/*
/&
```

- The LOOP ADAPTER

  At first, define the devices IBM 3641,3642,3643,3646,3647 locally or remotely attached, in the 'common PU' at address X'40'.

All other LOOP-attachable devices are represented by a separate PU macro definition, or you build several major nodes.

The following job stream illustrates a LOCAL SNA major node with several IBM 364X devices:

```
// JOB LOC3CT                          CATAL LOOP SNA Major Node
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.LOC3
          BKEND B.LOC3
LOC3      VBUILD TYPE=LOCAL
PU040     PU     CUADDR=040,                                      *
                 PUTYPE=2,                                        *
                 MAXBFRU=5,                                       *
                 SSCPFM=FSS,                                      *
                 LOGAPPL=DBDCCICS
I1L0401   LU     LOCADDR=2           IBM 3641
I2L0402   LU     LOCADDR=3           IBM 3642
I3L0403   LU     LOCADDR=4           IBM 3643
I6L0404   LU     LOCADDR=5           IBM 3646 Scanner one
I6L0405   LU     LOCADDR=6           IBM 3646 Scanner two
I7L0408   LU     LOCADDR=8           IBM 3647
PU041     PU     CUADDR=041,                                      *
                 PUTYPE=2,                                        *
                 MAXBFRU=5,                                       *
                 SSCPFM=FSS,                                      *
                 LOGAPPL=DBDCCICS
I4L0411   LU     LOCADDR=1           IBM 3644
PU042     PU     CUADDR=042,                                      *
                 PUTYPE=2,                                        *
                 MAXBFRU=5,                                       *
                 SSCPFM=FSS,                                      *
                 LOGAPPL=DBDCCICS
I5L0421   LU     LOCADDR=1           IBM 3645
          BKEND
/*
/&
```

The following job stream illustrates a LOCAL SNA major node with an IBM 8775-1:

```
// JOB LOC4CT                          CATAL LOOP SNA Major Node
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
```

```
   CATALS B.LOC4
          BKEND B.LOC4
PU043     PU     CUADDR=043,                                    *
                 PUTYPE=2,                                      *
                 MAXBFRU=5,                                     *
                 SSCPFM=USSCS,                                  *
                 LOGAPPL=DBDCCICS
D62L0431  LU     LOCADDR=2
          BKEND
/*
/&
```

Note:
MAXBFRU specifies the number of buffers that will be allocated for READ operations from the PU. If the specified number of buffers is not available, then the READ is postponed until the buffers are available.

Specify a value large enough to hold the maximum RU size. That means:

MAXBFRU x LFBUF-size >= maximum RU size.

By specifying LOGAPPL=DBDCCICS the device is automatically connected to DBDCCICS.

If a second CICS/VS is running at the same time and the devices should be able to access also the second CICS/VS, replace this parameter with **USSTAB=tabname**. In this case the LU-LU session has to be established from the terminal. This is not possible with IBM 3641/42/43/44/46/47 devices. On these device definitions delete LOGAPPL=DBDCCICS. Establish the LU-LU session via operator command at the system console:

V NET,ACT,ID=lu-name,LOGON=DBDCCICS or TESTCICS

5.4.2 Remote Devices

Communications adapter major node(s) consist of one or more lines attached to the CA and the physical configuration defined for those lines. This configuration can include SDLC links (switched or non-switched), BSC lines (non-switched only), and the terminals attached to them. The minor nodes of the CA major node are lines, SNA physical units with their associated logical units, and the IBM 3270 BSC cluster control units with their associated terminals.

The VBUILD TYPE=CA definition statement for a major node is the header, followed by the appropriate GROUP, LINE, PU, LU, CLUSTER, and TERMINAL statements for the minor nodes.

The GROUP definition statement is required to indicate the beginning of a sequence of:

- LINE, PU, and LU statements for SDLC non-switched lines
- LINE, CLUSTER, and TERMINAL statements for BSC non-switched lines
- LINE, PU statements for switched lines (as described in Chapter 7).

Point-to-Point Definitions

The following JCL stream and ACF/VTAM definition statements are used to catalog a CA major node with a non-switched IBM 3276 SDLC.

```
// JOB REM1CT                    CATAL CA Major Node SDLC
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
 CATALS B.REM1
        BKEND  B.REM1
REM1    VBUILD TYPE=CA
GROUP1   GROUP LNCTL=SDLC,                              *
               DIAL=NO
LINE031  LINE  ADDRESS=031,[9]                          *
               MAXBFRU=(1,2),                           *
               RETRIES=7[10]
PU031    PU    ADDR=C1,[11]                             *
               PUTYPE=2,                                *
               MAXDATA=262,[12]                         *
               SSCPFM=USSSCS,                           *
               LOGAPPL=DBDCCICS
D62R0311 LU    LOCADDR=2,[13]                           *
               ISTATUS=ACTIVE
D62R0312 LU    LOCADDR=3,[13]                           *
               ISTATUS=ACTIVE
         BKEND
/*
/&
```

The following sample shows definition statements and JCL stream for the IBM 3276 (non-switched) attached to the BSC link.

---

[9] The channel unit address for the line.

[10] Number of PIU transmission retries; decrease this number with bad line quality.

[11] The SDLC station address assigned to this physical unit that will be used for polling and addressing.
This address is defined during the control unit set up.

[12] An IBM 3276 or IBM 3274 attached to the Communications Adapter requires MAXDATA=262 or less.

[13] The local address of the logical unit starting with 2 (port 0 = 2,etc.). Each logical unit associated must be described by separate LU macro.

```
// JOB REM2CT                        CATAL CA Major Node BSC
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
 CATALS  B.REM2
         BKEND B.REM2
REM2     VBUILD TYPE=CA
GROUP1   GROUP LNCTL=BSC
LINE030  LINE ADDRESS=030[14]
CL030    CLUSTER GPOLL=40,[15]                              *
               CUTYPE=3271,                                 *
               ISTATUS=INACTIVE,                            *
               LOGAPPL=DBDCCICS
D62R0301 TERMINAL ADDR=40,[16]                              *
               TERM=3277,                                   *
               FEATUR2=MODEL2,                              *
               ISTATUS=ACTIVE
D62R0302 TERMINAL ADDR=C1,[16]                              *
               TERM=3277,                                   *
               FEATUR2=MODEL2,                              *
               ISTATUS=ACTIVE
         BKEND
/*
/&
```

Refer to Figure 19 on page 38 where certain options in the network have to match.

Multipoint Definitions

To define a multipoint line, that is, a line with more than one PU, simply add your subsequent PU and LU statements after the first set of PU and LU statements. Make sure that the ADDR parameters for the PUs on the same line are all different, and that they are consistant with the addresses defined in the PUs themselves. The physical arrangement of the multipoint line (e.g. analog, digital splitting) does not affect the ACF/VTAM definitions of the line.

---

[14] The channel unit address for the line

[15] The general polling character assigned to the station during set up process.

X'40' for the first control unit
X'C1' for the second control unit
X'C2' for the third control unit ..... etc.

One CLUSTER definition statement must be coded for each IBM 3270 BSC cluster control unit on the line.

[16] Device address by which ACF/VTAM will select the terminal.

X'40' for port 0
X'C1' for port 1 ..... etc.

5.4.3 ACF/VTAM Application Programs

All application programs in an ACF/VTAM domain must be defined to ACF/VTAM. A single application or a logical group of applications defined to ACF/VTAM is called an application major node.

To identify an application major node, a VBUILD TYPE=APPL statement has to be filed. For each single application a following APPL statement must be coded.

The following job stream catalogs CICS/VS in an application major node:

```
// JOB APPL1CT                          CATAL APPLICATION Major Node
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.APPL1
   BKEND  B.APPL1
   APPL1    VBUILD TYPE=APPL
* ******
   DBDCCICS APPL   AUTH=ACQ,EAS=20
* ******
   BKEND
/*
/&
```

Note:
DBDCCICS is the ACB-name of CICS/VS. This name must agree with the APPLID=name defined in the DFHTCT macr o TYPE=ENTRY or in the DFHSITxx. DBDCCICS is the default APPLID-name in a CICS/VS TCT generation and is also used in the SIPO/E 3.1 supplied DFHTCT$O.

EAS=20 specifies the maximum number of concurrent sessions this program will have with logical units. The recommendation is to specify 10 to 20 percent more than the planned number of sessions.

5.4.4 Selecting ACF/VTAM Start Options

The Start List

ACF/VTAM needs a set of start options to provide information about the conditions under which it is to run.
In the absence of user-supplied values, ACF/VTAM will assume start option values. These values are described as the default start option formats in Chapter 17 and 12 of ACF/VTAM V2 Planning and Installation Reference. However, no default value for the required SSCPID parameter is provided. Therefore, the user has to code a book ATCSTR00, which is required and which must contain at least the option SSCPID=n. For a single system environment 'n' should be set to 01.

During SIPO/E 3.1 System Initialization, an ATCSTR00 is cataloged by the job 'nSETUP'. However, the supplied start options are designed for ACF/VTAME and not for ACF/VTAM.

Therefore catalog ATCSTR00 as follows:

```
// JOB STR00CAT                                CATAL ATCSTR00
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.ATCSTR00
   BKEND B.ATCSTR00
SSCPID=01
   BKEND
/*
/&
```

This start option is merged with the ACF/VTAM supplied default values.

To modify or extend the IBM-supplied values one or more of the following techniques can be used:

- Options can be modified by defining them in the B.ATCSTR00 List.
- The operator can enter options at the console during ACF/VTAM start procedure when he is prompted.
- The operator may enter a LIST=xx command during the ACF/VTAM start which will read an alternative cataloged start list B.ATCSTRxx.

It is recommended that the additional start options be coded in the book B.ATCSTR01.

The following example shows these start options designed for ACF/VTAM:

```
// JOB STR01CAT                                CATAL ATCSTR01
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.ATCSTR01
   BKEND B.ATCSTR01
CONFIG=01,[17]                                                  X
MAXSUBA=15,                                                     X
HOSTSA=01,                                                      X
VFBUF=20480,                                                    X
NOTRACE,TYPE=VTAM[18]
   BKEND
/*
/&
```

In this case the operator has to type in LIST=01 during the ACF/VTAM start.

The Configuration List

The configuration list defines the major nodes to be activated when ACF/VTAM is started. ACF/VTAM will search the Source Statement Library for a configuration list filed under the name B.ATCCON00 or B.ATCCONxx depending on the CONFIG=xx parameter coded in the used ATCSTRxx. ACF/VTAM will use this list, and will activate the major nodes in the sequence the nodes are coded and cataloged.

Note the following rules:

If you use LOGAPPL=DBDCCICS in your terminal definitions to provide automatic logon to CICS, then you should put the application major node before the local and CA major nodes in the configuration list. This will activate the application prior to the terminals.

The following job stream is an example of how to code and catalog a configuration list.

```
// JOB CON01CAT                                CATAL ATCCON01
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.ATCCON01
   BKEND B.ATCCON01
   APPL1,LOC1,REM1
   BKEND
/*
/&
```

- APPL1 is the name of an application program major node
- LOC1 is the name of a local non-SNA major node
- REM1 is the name of a CA major node

The book name B.ATCCON01 was selected because the CONFIG option in the B.ATCSTR01 start list is 01.

If the operator wants to override the usual configuration list, he can do this by entering LIST=01,CONFIG=xx at the system console, where xx points to a list ATCCONxx, which contains different major node names.

Reasons for this change could be:

- specific applications are started only on specific days
- a specific network definition is used for a specific situation (backup)

---

[17] This parameter indicates that ACF/VTAM will use the configuration list ATCCON01 to activate the defined major nodes at ACF/VTAM start time (see next paragraph).

[18] No ACF/VTAM traces are started. In case of problems activate the traces as described in Chapter 9: Problem Determination.

5.4.5 The ACF/VTAM Start Job

Take the SIPO/E 3.1 supplied VTAM start job (member VTMSTRT) and modify it as follows:

```
* $$ JOB VT2STRT,DISP=H,CLASS=3
// JOB VT2STRT
// LIBDEF CL,SEARCH=(PRDCLG,USRCL1)
// LIBDEF SL,SEARCH=(USRSL1)
// DLBL TRFILE,'VSEIPOE.SNA.VTAM.TRACE.FILE'                TRACE FILE
// EXTENT SYS001,SYSWK1,1,0,111770,500                       3310 DASD
// ASSGN SYS001,240
* ***************************************************************
*       ACF/VTAM    START UP                      SINGLE DOMAIN
* ENTER: xx LIST=33 SIPO/E START LIST  or  xx LIST=xx YOUR START LIST
* ***************************************************************
// EXEC ISTINCVT,SIZE=1130K
/&
* $$ EOJ
```

Note:

- The partition running ACF/VTAM should have higher priority than partitions containing ACF/VTAM application programs.
- Check the size of the ACF/VTAM partition defined during ASI Tailoring.
- The ACF/VTAM partition can run exclusive of VSE/POWER control and start automatically during VSE system initialization.
- Do not use SIZE=AUTO on the EXEC statement. See Chapter 8: Performance and Storage, for details.

Refer to section: 'Startup Definitions' discussed earlier in this chapter.

If ACF/VTAM runs exclusive of VSE/POWER control and is invoked by a procedure, you have to reinitiate ACF/VTAM after a Z NET,QUICK by entering :

```
 3 /&                (EOJ)
 3 // EXEC $3JCLxx
```

at the system console.

5.5 TEST OF YOUR CUSTOMIZED ACF/VTAM DEFINITIONS

Now you are ready to test your network definitions.

Make sure that:

- the ASI procedure reflects your network,
- the ACF/VTAM B.books are cataloged defining your environment,
- the USSTAB is assembled and cataloged (if necessary in your environment),
- the ACF/VTAM start job is submitted,
- the devices and lines that you want to test are not assigned to other partitions.

Users with IBM 3644 and IBM 8775 (enhanced/extended features) must consider additional prerequisites:

- The ACF/VTAM CNM routing table (ISTMGC00) must have entries for the NSRU (non sequenced RU) of these devices and the DLUPULP (DSLU physical unit load program).
  See DSLU Installation and Reference Guide.
- The micro code of these devices must be loaded via the DLULDPP (DSLU load data preparation program) into a VSE Core Image Library.
- IBM 3644 users must have generated user PTLs via the GEN3644 program product and must have loaded these user PTLs via the DLULDPP (DSLU load data preparation program) into a VSE Core Image Library.
- DLUPULP is started in a separate partition or is be activated after the ACF/VTAM start via **F NET,ATTACH,ID=DLUPULP**.

If your CICS/VS is stopped, continue with step 2, otherwise:

1. Stop CICS/VS

   If you have ACF/VTAM running, close the CICS-ACB by entering at the system console:

   /TC
   xx CSMT CLOSE,VTAM

   and then stop ACF/VTAM by

   Z NET,QUICK

   If you have ACF/VTAME running, shutdown CICS/VS by entering at the system console:

/TC
xx CSMT SHUT,NO
and then stop ACF/VTAME by

Z NET,QUICK

If you are running with BTAM-ES, shutdown CICS/VS by entering at the system console:

/TC
xx CSMT SHUT,NO

2. Release VT2STRT from the reader queue;
the following F3 message will appear:

xx 5A51A ENTER VTAM START PARAMETERS

ENTER: xx LIST=01

to start with the values in the appropriate start option list ATCSTR01.
Following F3 messages will appear, which you can ignore:

xx 5A17I UNABLE TO LOAD PHASE ISTEXCVR
xx 5A17I UNABLE TO LOAD PHASE ISTSDCOS

ACF/VTAM is now activating the major nodes you have defined in ATCCON01.
This is the first time syntax checking of your definitions is performed by ACF/VTAM.

If there are no error messages, go to step 3,

otherwise:

- Make a hardcopy of the screens or print the VSE hardcopy file by:

  R RDR,PAUSEBG
  0 // EXEC PRINTLOG
  0 F3

- Have ACF/VTAM V2 Messages and Codes and ACF/VTAM V2 Planning and Installation Reference available,

- Stop ACF/VTAM by

  Z NET,QUICK

- Start your CICS/VS environment as usual.
  First time users (with ACF/VTAM) do this by:

  R RDR,VTAMSTRT and
  xx CSMT OPEN,ACB

- correct the errors via ICCF, and submit the updated jobs.
- go to 1.

3. DISPLAY the status of your network by entering following ACF/VTAM commands:
   - D NET,TERMS or
   - D NET,ID=LOC1,E

If all LUs are ACTIVE, check the SSCP-LU session at each keyboard terminal with the IBMTEST command (see next section).
Otherwise proceed to Chapter 9: Problem Determination.

On an IBM 3641/42/44/45/46/47 you can not use the IBMTEST command.

5.5.1 Initial Test with the IBMTEST Command

Once the network has been activated by ACF/VTAM (see above), the keyboard terminal user can test the physical path between ACF/VTAM and his terminal. Using the IBMTEST command enables the user to find out if all his initial definitions are working correctly or not, independent of his application program.

The command IBMTEST causes test data to be returned a specified number of times to the terminal. The terminal user may specify the test data characters, or if no data is given, a predefined sequence will be supplied by ACF/VTAM. After the logical unit has been activated (USS-message 10 received) the terminal operator may enter:

```
IBMTEST  <n|10><,userdata>
```

n|10 ==> Number of times the test data should be returned. The maximum value of n is 255. The default value is 10.

userdata ==> Test data to be sent back to the terminal. The default data are the characters A-Z and 0-9.

Note:
During the execution of the IBMTEST, e.g. until the requested test message has been sent n times, no data entry is possible from the terminal tested.

If an error occurs during IBMTEST ACF/VTAM will issue an error message on the operator console. The following error message is an example of an I/O error during the test phase:

5E73I CONNECTIVITY TEST TO NNNNNNNN TERMINATED AFTER X ECHOES DUE TO I/O ERROR, SENSE: 08060000

If the IBMTEST command is working correctly, the user can start with the implementation of his application programs (in this case CICS/VS).

Otherwise proceed to Chapter 9: Problem Determination.

5.6 CICS/VS DEFINITIONS

CICS/VS is installed during SIPO/E 3.1 Base Install. The SIPO/E 3.1 System provides at least one version of all CICS/VS system programs. Some of them are provided in three or four different versions to cover a wide variety of configurations and options. The program versions provided have been chosen to meet the needs of the majority of installations; they include the most frequently used options.

The required version of each system control program can be selected. To indicate to CICS/VS which versions, if any, of the different system programs are needed, a System Initialization Table (SIT) must be specified to CICS/VS. How this is done is described later in this chapter.

Define CICS/VS tables

Only tables that are related to specific installation or application requirements (for example network configuration, transactions, etc.) need to be generated, such as:

- PPT - Application programs
- PCT - Transactions
- TCT - Terminals
- FCT - Files
- DCT - Queued data
- TST - Recoverable temporary storage
- JCT - System and user journals
- SIT - Execution and startup options
- SNT - Sign-on password security

At least the following CICS/VS tables will need customization because of ACF/VTAM:

- DFHSIT System initialization table.
- DFHTCT Terminal control table.

- DFHPCT Program control table.

- DFHPPT Program processing table.

Depending on the applications to be run under CICS/VS, other tables and programs may be needed. For example, if journaling is required a DFHJCT will be needed to describe the journal data sets and their characteristics for journal management.

You have also to create the CICS/VS initialization JCL.

5.6.1 Terminal Control Table Generation

The Terminal Control Table macro instructions (DFHTCT) are used to specify the terminal environment to CICS/VS. In an SNA communications system, CICS/VS does not control the network. Instead a description of the ACF/VTAM controlled terminals associated with logical units that are going to communicate with CICS/VS is required.

There are several types of DFHTCT macro instructions, which are used to specify terminals and communications lines to CICS/VS, which are controlled by ACF/VTAM or another access method such as BTAM/ES.

If you have asynchronous or BSC devices (other than BSC 3270) which are to communicate with CICS/VS, you will need to have BTAM/ES to control them, as ACF/VTAM does not support these terminals. Define these devices and their lines in front of all ACF/VTAM controlled devices. CICS/VS then runs with different TELEPROCESSING ACCESS METHODS.
Here only the ACF/VTAM controlled devices are discussed.

The following DFHTCT macro instructions are needed to describe to CICS/VS the ACF/VTAM terminals that will be allowed to establish sessions with CICS/VS:

DFHTCT TYPE=INITIAL
This macro instruction must precede all other DFHTCT macro instructions in a terminal control table assembly. This macro establishes the area of storage into which CICS/VS will assemble the terminal control table. Keyword entries in this macro give to CICS/VS information that will be needed to interface with ACF/VTAM.

DFHTCT TYPE=TERMINAL
Each terminal that is to communicate with CICS/VS requires one macro of this type. Keyword entries in this macro provide to CICS/VS the characteristics specific to each type of terminal supported and the name that identifies this terminal in the ACF/VTAM network. Also a name is defined by which the terminal will be known to CICS/VS.

CICS/VS allows only four characters for the name of the terminal. Use the recommended naming convention and a compromise will have to be devised. The last macro of this type must have the parameter 'LASTTRM=VTAM'.

DFHTCT TYPE=FINAL
This must be specified on the last control card for the terminal control table assembly before the assembler END statement.

Edit the SIPO/E 3.1 supplied DFHTCT$0 as mentioned in Chapter 3 and define your terminals as shown below.

```
* $$ JOB JNM=TCTSVCT,CLASS=0
// JOB TCTSVCT
*  ASSEMBLE AND LINK-EDIT CICS/VS TCT    DFHTCTSV
// LIBDEF CL,TO=USRCL1
// LIBDEF SL,SEARCH=(PRDSLG,PRDSLB)
// OPTION CATAL,NOXREF
// EXEC ASSEMBLY,SIZE=128K
TCT$     TITLE 'DFHTCTSV SING. DOMAIN'
* ********************************************************************** *
* ************          BASED  ON  DFHTCT$0   SIPO/E  TCT     ************ *
* ********************************************************************** *
         PRINT NOGEN
TCTSV    DFHTCT TYPE=INITIAL,STARTER=YES,SUFFIX=SV,                      X
               ACCMETH=(NONVTAM,VTAM),                                   X
               APPLID=DBDCCICS,        APPLICATION ID                    X
               GMTEXT='DBDCCICS',      GOOD MORNING MESSAGE TEXT         X
               RAMAX=4096,             RECV ANY I/O AREA, BYTES          X
               RAMIN=80,               DATA LEN TO XFER TO NEW TIOA      X
               RATIMES=4,              MAX NO TIOAS PER MSG              X
               RAPOOL=6,               RECV ANY'S                        X
               RESP=FME                RESPONSE REQUESTED BY CICS
* ********************************************************************** *
CNSL     DFHTCT TYPE=SDSCI,             BSAM CPU CONSOLE                 X
               DEVICE=CONSOLE,                                           X
               DEVADDR=SYSLOG,                                           X
               BLKSIZE=80
         DFHTCT TYPE=LINE,                                               X
               TRMTYPE=CONSOLE,                                          X
               ACCMETH=SAM,                                              X
               INAREAL=80
         DFHTCT TYPE=TERMINAL,                                           X
               TRMIDNT=CNSL,                                             X
               TRMSTAT=RECEIVE
* ********************************************************************** *
*        IBM 3278              IBM 4331 DPA ATTACHED
* ********************************************************************** *
L1T0     DFHTCT TYPE=TERMINAL,                                           X
               TCTUAL=255,                                               X
               TRMIDNT=L1T0,                                             X
               NETNAME=D82L009,       DESCRIBED IN VTAM B.BOOK           X
               ACCMETH=VTAM,                                             X
               GMMSG=YES,                                                X
```

```
                TRMTYPE=L3277,                                          X
                TRMMODL=2,                                              X
                TIOAL=160,                                              X
                TRMSTAT=TRANSCEIVE,                                     X
                RELREQ=(NO,YES),                                        X
                FEATURE=(COPY,DCKYBD,SELCTPEN,UCTRAN,AUDALARM),         X
                PGESIZE=(24,80),                                        X
                PGESTAT=PAGE,                                           X
                PRINTTO=(L1P1)
* ********************************************************************** *
*       IBM 3286              IBM 4331 DPA ATTACHED
* ********************************************************************** *
L1P1    DFHTCT TYPE=TERMINAL,                                           X
                TCTUAL=255,                                             X
                TRMIDNT=L1P1,                                           X
                NETNAME=P72L012,        DESCRIBED IN VTAM B.BOOK        X
                ACCMETH=VTAM,                                           X
                GMMSG=YES,                                              X
                TRMTYPE=L3284,                                          X
                TRMMODL=2,                                              X
                TIOAL=2200,                                             X
                TRMSTAT=RECEIVE,                                        X
                RELREQ=(NO,YES),                                        X
                FEATURE=(PRINT),                                        X
                PGESIZE=(24,80),                                        X
                PGESTAT=AUTOPAGE
* ********************************************************************** *
*       IBM 3278              IBM 4331 / IBM 3274-1A CHANNEL ATTACHED
* ********************************************************************** *
L2T1    DFHTCT TYPE=TERMINAL,                                           X
                TCTUAL=255,                                             X
                TRMIDNT=L2T1,                                           X
                NETNAME=D82L13F1,       DESCRIBED IN VTAM B.BOOK        X
                ACCMETH=VTAM,                                           X
                GMMSG=YES,                                              X
                TRMTYPE=LUTYPE2,                                        X
                BRACKET=YES,                                            X
                CHNASSY=YES,                                            X
                RUSIZE=1024,                                            X
                BUFFER=1536,                                            X
                TRMMODL=2,                                              X
                TIOAL=(1024,4096),                                      X
                TRMSTAT=TRANSCEIVE,                                     X
                RELREQ=(NO,YES),                                        X
                FEATURE=(DCKYBD,SELCTPEN,UCTRAN,AUDALARM),              X
                PGESIZE=(24,80),                                        X
                PGESTAT=PAGE,                                           X
                PRINTTO=(L1P1)
* ********************************************************************** *
*       IBM 3641              IBM 4331 LA  ATTACHED
* ********************************************************************** *
L3T0    DFHTCT TYPE=TERMINAL,                                           X
                TRMIDNT=L3T0,                                           X
                NETNAME=I1L0401,        DESCRIBED IN VTAM B.BOOK        X
```

```
                TCTUAL=32,                                              X
                ACCMETH=VTAM,                                           X
                GMMSG=YES,                                              X
                TRMTYPE=INTLU,                                          X
                BRACKET=YES,                                            X
                CHNASSY=YES,                                            X
                RUSIZE=256,                                             X
                BUFFER=256,                                             X
                TIOAL=(256,500),                                        X
                TRMSTAT=TRANSCEIVE,                                     X
                RELREQ=(NO,YES),                                        X
                BMSFEAT=NOROUTEALL
* ********************************************************************** *
*         IBM 3642                IBM 4331 LA  ATTACHED
* ********************************************************************** *
L3T1      DFHTCT TYPE=TERMINAL,                                         X
                TRMIDNT=L3T1,                                           X
                NETNAME=I2L0402,          DESCRIBED IN VTAM B.BOOK      X
                TCTUAL=32,                                              X
                ACCMETH=VTAM,                                           X
                GMMSG=YES,                                              X
                TRMTYPE=SCSPRT,                                         X
                BRACKET=YES,                                            X
                CHNASSY=YES,                                            X
                RUSIZE=256,                                             X
                BUFFER=1024,                                            X
                TIOAL=1536,                                             X
                TRMSTAT=RECEIVE,                                        X
                RELREQ=(NO,YES)
* ********************************************************************** *
*         IBM 3643                IBM 4331 LA  ATTACHED
* ********************************************************************** *
L3T2      DFHTCT TYPE=TERMINAL,                                         X
                TRMIDNT=L3T2,                                           X
                NETNAME=I3L0403,          DESCRIBED IN VTAM B.BOOK      X
                TCTUAL=32,                                              X
                ACCMETH=VTAM,                                           X
                GMMSG=YES,                                              X
                TRMTYPE=LUTYPE2,                                        X
                TRMMODL=1,                                              X
                BRACKET=YES,                                            X
                CHNASSY=YES,                                            X
                RUSIZE=256,                                             X
                BUFFER=600,                                             X
                TIOAL=(600,1500),                                       X
                TRMSTAT=TRANSCEIVE,                                     X
                RELREQ=(NO,YES),                                        X
                ALTSCRN=(12,40),                                        X
                ALTPGEN=(12,40),                                        X
                DEFSCRN=(12,40)
* ********************************************************************** *
*         IBM 8775                IBM 4331 LA  ATTACHED
* ********************************************************************** *
L4T0      DFHTCT TYPE=TERMINAL,                                         X
```

```
                TCTUAL=255,                                            X
                TRMIDNT=L4T0,                                          X
                NETNAME=D62L0431,        DESCRIBED IN VTAM B.BOOK      X
                ACCMETH=VTAM,                                          X
                GMMSG=YES,                                             X
                TRMTYPE=LUTYPE2,                                       X
                BRACKET=YES,                                           X
                CHNASSY=YES,                                           X
                RUSIZE=1536,                                           X
                BUFFER=1536,                                           X
                TRMMODL=2,                                             X
                TIOAL=(256,4096),                                      X
                TRMSTAT=TRANSCEIVE,                                    X
                RELREQ=(NO,YES),                                       X
                FEATURE=(DCKYBD,SELCTPEN,UCTRAN,AUDALARM),             X
                ALTSCRN=(24,80),                                       X
                ALTPGEN=(24,80),                                       X
                DEFSCRN=(24,80),                                       X
                PGESIZE=(24,80),                                       X
                PGESTAT=PAGE,                                          X
                PRINTTO=(L1P1)
* ********************************************************************* *
*        IBM 3278              IBM 4331 CA / IBM 3276 SDLC ATTACHED
* ********************************************************************* *
R1T0     DFHTCT TYPE=TERMINAL,                                         X
                TCTUAL=255,                                            X
                TRMIDNT=R2T0,                                          X
                NETNAME=D62R0311,        DESCRIBED IN VTAM B.BOOK      X
                ACCMETH=VTAM,                                          X
                GMMSG=YES,                                             X
                TRMTYPE=LUTYPE2,                                       X
                BRACKET=YES,                                           X
                CHNASSY=YES,                                           X
                RUSIZE=1024,                                           X
                BUFFER=1536,                                           X
                TRMMODL=2,                                             X
                TIOAL=(1024,4096),                                     X
                TRMSTAT=TRANSCEIVE,                                    X
                RELREQ=(NO,YES),                                       X
                FEATURE=(DCKYBD,SELCTPEN,UCTRAN,AUDALARM),             X
                PGESIZE=(24,80),                                       X
                PGESTAT=PAGE,                                          X
                PRINTTO=(L1P1)
* ********************************************************************* *
*        IBM 3278              IBM 4331 CA / IBM 3276 BSC  ATTACHED
* ********************************************************************* *
R2T0     DFHTCT TYPE=TERMINAL,                                         X
                TCTUAL=255,                                            X
                TRMIDNT=R2T0,                                          X
                NETNAME=D62R0301,        DESCRIBED IN VTAM B.BOOK      X
                ACCMETH=VTAM,                                          X
                GMMSG=YES,                                             X
                TRMTYPE=L3277,                                         X
                TRMMODL=2,                                             X
```

```
                TIOAL=160,                                              X
                TRMSTAT=TRANSCEIVE,                                     X
                RELREQ=(NO,YES),                                        X
                FEATURE=(COPY,DCKYBD,SELCTPEN,UCTRAN,AUDALARM),         X
                PGESIZE=(24,80),                                        X
                PGESTAT=PAGE,                                           X
                PRINTTO=(L1P1),                                         X
                LASTTRM=VTAM
* ********************************************************************** *
          DFHTCT TYPE=FINAL
          END
/*
// EXEC LNKEDT
/&
* $$ EOJ
```

Note:
Match the NETNAME with your ACF/VTAM minor node name.
All screens are defined with a screen size of 24 x 80. For details refer to CICS/VS System Programmer's Reference

Users of IBM 3641/42/44/46/47s need to obtain the definitions for these devices by generating an 'AASTTT' (Terminal Transaction Table). Include these definitions with the ICCF Editor. For details see: Loop Adapter CICS/VS PRPQ Programmer's Guide.

A PRPQ (5799-BEH) is prerequisite to work with these devices (INTLU).

5.6.2 Program Control Table Generation

Edit the SIPO/E 3.1 supplied DFHPCTA$ as mentioned in Chapter 3 and add your entries.

```
* $$ JOB JNM=PCTSVCAT,CLASS=0
// JOB PCTSVCAT
*  ASSEMBLE AND LINK-EDIT A CICS/VS PROGRAM CONTROL TABLE
// LIBDEF CL,TO=USRCL1
// OPTION CATAL,NOXREF
// EXEC ASSEMBLY,SIZE=128K
PCT$     TITLE 'DFHPCTSV SING. DOMAIN'
* ********************************************************************** *
* ************          BASED  ON  DFHPCTA$   SIPO/E  PCT     ************ *
* ********************************************************************** *
         PRINT NOGEN
PCTSV    DFHPCT TYPE=INITIAL,SUFFIX=SV
 ....    ...... ....
* ********************************************************************** *
* THE FOLLOWING ENTRIES ARE FOR USER TRANSACTIONS                         *
* ********************************************************************** *
 ....    ......
* ********************************************************************** *
* THE FOLLOWING ENTRIES ARE FOR CICS/VS                                   *
* ********************************************************************** *
 ....    ......
* ********************************************************************** *
* THE FOLLOWING ENTRIES ARE CICS/VS SYSTEM ENTRIES FOR VTAM               *
* ********************************************************************** *
 ....    ......
RESEND   DFHPCT TYPE=GROUP,                                              X
               FN=RESEND               VTAM RESEND PROGRAM
RESPLOG  DFHPCT TYPE=GROUP,                                              X
               FN=RESPLOG              VTAM RESPONSE LOGGING
VTAM     DFHPCT TYPE=GROUP,                                              X
               FN=VTAM                 VTAM ABNORMAL & SIGN-ON PROG
VTAMPRT  DFHPCT TYPE=GROUP,                                              X
               FN=VTAMPRT              VTAM 3270 PRINT FUNCTION
 ......  ......
* ********************************************************************** *
         DFHPCT TYPE=FINAL
         END
/*
// EXEC LNKEDT,SIZE=64K
/*
/&
* $$ EOJ
```

Note:
These four group entries are mandatory for ACF/VTAM.
For details refer to: CICS/VS System Programmer's Reference Manual.

5.6.3 Program Processing Table Generation

Pick up the SIPO/E 3.1 supplied DFHPPTA$ as mentioned in Chapter 3 and add your entries.

```
* $$ JOB JNM=PPTSVCAT
// JOB PPTSVCAT
*  ASSEMBLE AND LINK-EDIT A CICS/VS PROCESSING PROGRAM TABLE
// LIBDEF CL,TO=USRCL1
// LIBDEF SL,SEARCH=(PRDSLG,PRDSLB)
// OPTION CATAL,NOXREF
// EXEC ASSEMBLY,SIZE=128K
PPT$     TITLE 'DFHPPTSV SING. DOMAIN'
* ********************************************************************** *
* ***********      BASED  ON  DFHPPTA$   SIPO/E  PPT    *********** *
* ********************************************************************** *
         PRINT NOGEN
PPTSV    DFHPPT TYPE=INITIAL,SUFFIX=SV
 ....... ..........
* ********************************************************************** *
* INSERT YOUR ENTRIES AT THE BEGINNING.                                  *
* ********************************************************************** *
 ....    ..........
* ********************************************************************** *
* THE FOLLOWING ENTRIES ARE FOR CICS/VS  VTAM SYSTEMS                    *
* ********************************************************************** *
 ....    ...... ..........
RESEND   DFHPPT TYPE=GROUP,                                              X
               FN=RESEND                VTAM RESEND PGM
RESPLOG  DFHPPT TYPE=GROUP,                                              X
               FN=RESPLOG               VTAM RESPONSE LOGGING PGM
VTAM     DFHPPT TYPE=GROUP,                                              X
               FN=VTAM                  ABNORMAL COND & SIGN-ON PGM
VTAMPRT  DFHPPT TYPE=GROUP,                                              X
               FN=VTAMPRT               VTAM TERM CONT PRINT KEY PGM
 ....    ......
* ********************************************************************** *
         DFHPPT TYPE=FINAL
         END
/*
// EXEC LNKEDT,SIZE=64K
/*
/&
* $$ EOJ
```

Note:
These four group entries are mandatory for VTAM.
For details refer to: CICS/VS System Programmer's' Reference Manual.

Users with IBM 3641/42/44/46/47s have to include also the CICS/VS PRPQ programs.
For details refer to: Loop Adapter CICS/VS PRPQ Programmer's Guide

5.6.4 Program List Table Generation

Users with IBM 3641/42/44/46/47's have to create a DFHPLTxx.
This is done in the following way:

```
* $$ JOB JNM=PLTSVCAT
// JOB PLTSVCAT
*  ASSEMBLE AND LINK-EDIT A CICS/VS PROCESSING PROGRAM TABLE
// LIBDEF CL,TO=USRCL1
// LIBDEF SL,SEARCH=(PRDSLG,PRDSLB)
// OPTION CATAL,NOXREF
// EXEC ASSEMBLY,SIZE=128K
PLT$      TITLE 'DFHPLTSV SING. DOMAIN'
          PRINT NOGEN
PLTSV     DFHPLT TYPE=INITIAL,STARTER=YES,SUFFIX=SV
AASMIPI   DFHPLT TYPE=ENTRY,PROGRAM=AASMIPI
          DFHPLT TYPE=FINAL
          END
/*
// EXEC LNKEDT,SIZE=64K
/*
/&
* $$ EOJ
```

Note:
For details refer to CICS/VS System Programmer's Reference and to Loop Adapter CICS/VS PRPQ Programmer's Guide.

5.6.5 System Initialization Table Generation

The initialization of CICS/VS is both flexible and dynamic. The flexibility is provided by the system initialization table (DFHSIT). The contents of the DFHSIT macro instruction, which is assembled as a table, supplies the system initialization program with the information to initialize the system to suit the user's unique environment. During the initialization process the user is given the opportunity to change some of the parameters dynamically, if required.

The information contained in DFHSIT may be grouped into the following three categories:

- Information used to initialize and control system functions,for example: storage cushion size, partition exit time interval, etc.
- Module suffixes used to load the user-specified CICS/VS control modules and tables, for example: DFHPCTxx, DFHTCTxx, etc.
- Special information used to control the initialization process.

The user has also the flexibility of generating several system initialization tables and selecting the appropriate one at the time of initialization of CICS/VS.

Edit the SIPO/E 3.1 supplied DFHSIT$O as mentioned in Chapter 3 and modify:

```
// JOB SITSVCT
*  ASSEMBLE AND LINK-EDIT A CICS/VS-SIT   DFHSITSV
// LIBDEF CL,TO=USRCL1
// LIBDEF SL,SEARCH=(PRDSLG,PRDSLB)
// OPTION CATAL,NOXREF
// EXEC ASSEMBLY,SIZE=128K
SIT$     TITLE 'DFHSITSV SING. DOMAIN'
* ********************************************************************** *
* ************          BASED  ON  DFHSIT$O   SIPO/E  SIT    ************ *
* ********************************************************************** *
         PRINT NOGEN
SITSV    DFHSIT TYPE=CSECT,STARTER=YES,SUFFIX=SV,                        X
               .......
               AMXT=..,                 MAX ACTIVE TASKS                X
               .......
               CMXT=(..),               MAX CLASS TASKS                 X
               .......                  DOS/VS DL/I                     X
               DCT=(SV,COLD),           VTAM EXTRA + INTRA              X
               EXITS=YES,               USER EXIT INTERFACE             X
               FCT=..,                  FILE CONTROL TABLE              X
               MXT=..,                  SPECIFY NO TERMNLS+1            X
               .......
               PCT=(SV,COLD),           VTAM SINGLE DOMAIN PCT          X
               PLTPI=SV,                SYS INITIAL PLT                 X
               PPT=(SV,COLD),           VTAM SINGLE DOMAIN PPT          X
               SRP=1$,                  SYSTEM RECOVERY PROGRAM         X
               SRT=1$,                  SYSTEM RECOVERY TABLE           X
               START=COLD,              SYSTEM COLD START               X
               TCP=E$,                  CONS + VTAM 3270/3600/3790/PA1  X
               TCT=(SV,COLD),           VTAM SINGLE DOMAIN TCT          X
               .......
               ZCP=E$,                  CONS + VTAM 3270/3600/3790/PA1  X
               DUMMY=DUMMY              TO END MACRO
         END
/*
// EXEC LNKEDT
/&
* $$ EOJ
```

Note:
Only the mandatory entries for a CICS/VS running with ACF/VTAM are shown above.
Insert your installation depended values where appropriated.

For details refer to the CICS/VS System Programmer's Reference Manual.

Users with IBM 3641/42/44/46/47 have to include following parameters:

- EXITS=YES (that activates the User Exit Interface)
- PLTPI=xx refers to a Program List Table as described earlier.
- DCT=xx refers to a Destination Control Table in which the needs for a IBM 3642 transaction are covered.

For details refer to the Loop Adapter CICS/VS PRPQ Programmer's Guide

5.6.6 CICS/VS Execution

Take the SIPO/E 3.1 supplied job stream (xICFCVEM) and modify it as shown below. This start job is valid for an IBM 3310 DASD layout.

```
* $$ JOB JNM=ICFCVSV,DISP=L,CLASS=2
// JOB ICFCVSV  VSE/ICCF STARTUP WITH CICS/VS 3310 AND VTAM.
// UPSI 00011000 RECONFIG FROM SYSRDR. UPSI BITS D & E ARE ON.
// LIBDEF CL,SEARCH=(USRCL1,PRDCLB,PRDCLG,PRDCLC),FROM=IJSYSRS,TEMP
// LIBDEF RL,FROM=PRDRLA,TEMP
// LIBDEF SL,FROM=PRDSLA,TO=USRSL1,TEMP
// ASSGN SYS010,DISK,TEMP,VOL=DOSRES,SHR     ASSGN FOR DTSFILE
 .......
// ASSGN SYS041,DISK,TEMP,VOL=SYSWK4,SHR     ASSGN FOR CICS/VS FILES
 .......
// ASSGN SYS009,SYSLOG
// ASSGN SYS031,SYSPCH
// EXEC IDCAMS,SIZE=AUTO
   VERIFY FILE (DFHTEMP)                     CICS FILES
   VERIFY FILE (DFHNTRA)
   ......                                    USER FILES
/*
// EXEC DTSINIT,SIZE=3840K
10000000                        TERMINAL CONTROL UPSI SETTINGS
768                             NEW DEFAULT PARTITION SIZE
YES                             CHANGE PARTITION SIZE AND CLASS
00,1.5,0,T                      NEW DEFAULT PARTN SIZES AND CLASSES
01,768,0,BCA                    NEW DEFAULT PARTN SIZES AND CLASSES
 . .
                                END PARTITION SIZE DEFINITION
YES                             PFIX I/O AREA
NO                              CHANGE CONFIGURATION
SIT=SV,                         SYSTEM INITIALIZATION TABLE
DCP=F$,                         DUMP CONTROL FOR 3310
TRP=(F$,ON),                    TRACE CONTROL - MAIN STOR + AUX ON 3310
DCT=A$,                         DESTINATION CONTROL FOR 3310
$END
/*
```

```
/&
* $$ EOJ
```

Note:
SIT=SV specifies DFHSITSV as the system initialization table to be used for this execution of CICS/VS.
Take care, that the CL-SEARCH sequence fits to your installation needs.

Submit this job into the VSE/POWER queue and release it always after ACF/VTAM is started.
During CICS/VS start, the user may get different messages from the ones shown here, depending on the options defined.

```
-------------------------------------------------------------------------
F2 00 DFH1500 - LOADING CICS NUCLEUS
F2 00 DFH1596 - PL/I MODULE WILL BE INCLUDED
F2 00 DFH1500 - TRANSIENT DATA SETS ARE BEING OPENED
F2 00 DFH1500 - TERMINAL DATA ARE BEING OPENED
F2 00 DFH1500 - DUMP DATA SET IS BEING OPENED
F2 00 DFH1500 - INITIALIZING TEMPORARY STORAGE
F2 00 DFH1500 - LOADING RESIDENT APPLICATION MODULES
F2 00 DFH1500 - SUBPOOL SIZE FOR THIS START-UP IS   724K
F2 00 DFH1500 - CPU TERMINAL SUPPORT AVAILABLE
F2 00 DFH1500 - STXIT PC MACRO IS BEING ISSUED
F2 00 DFH1500 - STXIT AB MACRO IS BEING ISSUED
F2 00 DFH1500 - CONTROL IS BEING GIVEN TO CICS

-------------------------------------------------------------------------
```

At this point CICS/VS is ready to contact all terminals defined by LOGAPPL=DBDCCICS (LU-LU session establishment) or to accept logon messages from the defined terminals in the network.

5.7 TEST OF YOUR CUSTOMIZED CICS/VS DEFINITIONS

CICS/VS commands provided for management of the resources under control of CICS/VS can be used to test your definitions.

The CSMT and/or the CEMT commands can be used to display the status of your defined terminals.

At first create an open reply to CICS/VS with

```
/TC
```

entered at the system console.
After this, enter:

```
CSMT TERMNL,SIN,INQ,TERMID=xxxx to display a single terminal or
```

CEMT INQ TER or
CEMT INQ NETNAME to display all terminals.

All powered-on devices, defined with LOGGAPPL=DBDCCICS and ISTATUS=ACTIVE, should be **IN SERVICE (INS)** and **CONNECTED TO VTAM (ACQ)**.

The CICS/VS Good Morning Message appears on these devices.

On IBM 3641/44/45/46/47 devices you have a status, which is defined in your initialization program of the device. The initialization programs are activted by the CICS/VS PRPQ supplied Good Morning Message exit program.

Check keyboard terminals with the command:

CEMT INQ TAS or
CSMT TAS
using the TRMIDNT of the terminal.

It is suggested that you attach a label containing the TRMIDNT at the terminal, so that the user is able to refer to it should problems occur.

Now type in a valid transaction code to check the input/output function of these devices.

Logging off from CICS/VS

To logoff from CICS/VS the command

CSSF LOGOFF

can be used at the terminal. After the command is entered and accepted, a CICS/VS message is displayed indicating that the session is terminated; the terminal will again be in the SSCP-LU session.

The LU-LU session is terminated and can be reinstated by hitting the SYS-REQ key (if LOGAPPL=DBDCCICS is used), which will establish the LU-LU session (the CICS/VS Good Morning Message appears) again.

After each defined terminal is running with CICS/VS, you should delete ACF/VTAME or ACF/VTAM R3 from USRxL1 with the job DELVTAM from ICCF Lib 59.
Having done this the SIPO/E 3.1 supplied VTAM start job will not run any more.

6.0 MULTI SYSTEM ENVIRONMENT

It is assumed that the user has an IBM 4331 with locally and remotely attached 3270's and 364x's in a multi system environment. Terminals and applications are able to have sessions with resources located in others domains. The IBM 4331 is connected to another IBM 4331 via the CA link or to another host via a link attached ACF/NCP.

This chapter contains information about:

- the definition of terminals/terminal printers in VSE, ACF/VTAM and CICS/VS,
- the session establishment between ACF/VTAM and these terminals,
- the ACF/VTAM Tables,
- the definition of CICS/VS as an ACF/VTAM application,
- the definition of a PEER to PEER link in ACF/VTAM,
- the definition of a upstream link to a 3705 in ACF/VTAM,
- the cross-domain definitions in ACF/VTAM,
- the ACF/VTAM start options,
- the session establishment in a cross-domain environment,
- the CICS/VS tailoring,
- and the verification of the installation.

6.1 PREREQUISITES TO THIS CHAPTER

6.1.1 Hardware

It is recommended that set up of the CPU, the attached terminals, control units and modems is completed in each domain. The hardware tests should have been performed.
Have the Configuration Documentation Sheet available as described in Chapter 3.

6.1.2 Software

It is assumed that:

The installation of SIPO/E 3.1 and ACF/VTAM is completed as described in Chapter 4.
First Time Users or former BTAM-ES users have copied all ACF/VTAM definition books from the SAMPLIB to the ADMINISTATOR Lib as described in Chapter 4.
The CICS/VS-VTAM tables may be also prepared as mentioned there.

6.1.3 Networking Considerations

MAXSUBA

A network address is a sixteen bit field consisting of a subarea field and an element field. The number of bits allocated to each is determined by the ACF/VTAM start option MAXSUBA. This specifies the maximum address of a subarea in the network, a subarea being a host processor or a communication controller.

MAXSUBA must be defined the same in every ACF/VTAM start deck in the network (and in each NCP generation), and no subarea address may exceed MAXSUBA.

The default is 15; the minimum is 3 and the maximum is 255.

When selecting a MAXSUBA value, keep in mind the number of subareas which the network will eventually have, not just the current number.

In a multi-systems environment with a small number of subareas, it is reasonable to allow the MAXSUBA to default to 15, as this provides for some growth in the network. In addition, when an ACF/VTAM trace is done, the

four bits allocated to the subarea will form a hex digit, and the remaining twelve bits allocated to the element will form three hex digits for easy identification. However, other considerations might require another selection for MAXSUBA (e.g. 31, 63), for example, reservation of spare subarea addresses.

SSCPID

The SSCPID of each ACF/VTAM in a multi-domain network must be unique.

MAXBFRU, LFBUF SIZE

On INN (CA) links, both sides must provide for the biggest RU in the network. The values on both sides have not to be the same, but they have to be selected in a way that both sides can accommodate the biggest RU.

SUBAREA

The address of each subarea in a multi-domain network must be unique.

6.1.4 Naming Conventions

Before you start with any ACF/VTAM or CICS/VS definitions you should choose your naming conventions. Some possible conventions can be found in Appendix B of this document.

6.1.5 Session Initialization

After an LU (application or terminal) has been activated (i.e. the SSCP-LU session exists) it can attempt to initiate a session with another LU by using an Initiate request ('logon').

Four types of logon are possible, depending on the source of the logon:

- **Secondary logical unit (SLU) initiated,**
  where the secondary logical unit (terminal) issues a request that causes it to be logged on to the selected application program.
  This is done by the LOGON command send from the terminal.

  ACF/VTAM can receive logon commands in

  - field-formatted or
  - unformatted (character coded) form.

  Field-formatted Initiate requests can be sent by some programmable SNA terminals (IBM 8100, IBM 3600, etc.).

Most of the terminals described in this primer use the unformatted logon request which is formatted by USS (Unformatted System Services), a component of the SSCP.

The unformatted (character coded) logon command entered by the terminal operator has the following format:

```
LOGON APPLID(applname) <LOGMODE(name)>< DATA(userdata)>
```

The parameters included between < > are optional.

APPLID(applname) ==> Specifies the name of the application program with which a session is to be established

LOGMODE(name) ==> Selects a set of session parameters (optional)

DATA(userdata) ==> Data to be made available to the application program's LOGON exit routine (optional)

- **Application program initiated,**
  where an application program (CICS/VS) requests a session with a secondary logical unit.
  For example, if CONNECT=AUTO is coded in the CICS/VS TCT TYPE=TERMINAL macro a logon request will be issued by CICS/VS for the logical unit related to the terminal defined in this macro.
  The secondary logical unit must be powered on, otherwise CICS/VS sets this terminal OUT OF SERVICE.

  Do not use CONNECT=AUTO and LOGAPPL=applname (see below) together.

- **Automatic logon,**
  where ACF/VTAM automatically logs on a secondary logical unit to an application program, indicated by coding LOGAPPL=applid in the ACF/VTAM LU definition statement.

- **Operator logon,**
  where the operator can cause a specified logical unit to be logged on to a specified application program.
  This is done by a :

  ```
  V NET,ID=lu-name,LOGON=applname
  ```

  entered at the system console.

Recommendations for LU-LU Session Initialization

In a multi system environment use the SLU initiated technique for keyboard terminals. The terminal operator chooses the corresponding application in the Logon command. To assist the terminal operator you should provide an USSTAB which should contain entries for all applications he can logon to.
See section: 'User Defined ACF/VTAM Tables' for more details.

For terminal printers or terminals without keyboard (e.g. IBM 3646)

use the operator logon technique or the application program initiated technique.

6.1.6 Session Parameters

When an LU requests a session with an application program, ACF/VTAM needs to know a set of session parameters (session protocol), which govern the session. These parameters, also called 'logon modes', specify the SNA protocol that will be used during the session as well as certain characteristics of the terminal, such as RU size.

Usually ACF/VTAM gets these session parameters from a logon mode table. However, if CICS/VS is the PLU, it delivers these session parameters to ACF/VTAM from own parameters (e.g. RUSIZE, etc.) in the CICS TCT macro TYPE=TERMINAL.

ACF/VTAM contains an IBM-supplied default LOGMODE table (ISTINCLM). This table contains several entries of generally accepted session parameters for a basic list of IBM device types.

As only the most common terminals are reflected in this table, the user may have to provide another LOGMODE table containing the session parameters for additional terminals.

In order to select a specific logon mode entry for a specific terminal, the names of the table and of the entry must be specified in the terminal ACF/VTAM definition for the terminal.

The LOGMODE table is specified in the MODETAB parameter and the entry of this table in the DLOGMOD parameter. These parameters can be coded in the LU, TERMINAL or LOCAL macro or in a higher node.

If MODETAB is not specified, the default LOGMODE table ISTINCLM will be searched for the specified entry.

If DLOGMOD is not specified, the first entry of the selected mode table (user or default) is used for the session initialization.

To create a user LOGMODE table refer to section 'User Defined ACF/VTAM Tables'.

For more details refer to ACF/VTAM V2 Planning and Installation Reference, Chapter 18.

Recommendations for the Usage of a MODETAB

CICS/VS

If CICS/VS is the only application that a terminal will log on to, generally there is no need to reference an entry (DLOGMOD) in an ACF/VTAM logon

mode table (MODETAB), as CICS/VS provides the session parameters to ACF/VTAM from its own definitions.
Exceptional cases, however, might require a reference to a user logon mode table entry (e.g. IBM 3645 attended/unattended mode).

To override the CICS/VS provided session parameters, you have to

- specify LOGMODE=entry name in the CICS/VS TCT TYPE=TERMINAL macro,
- code your own logon mode table as shown in section: 'User Defined ACF/VTAM Tables'.
- specify the logon mode table name in the MODETAB parameter of the ACF/VTAM terminal definition.
- code DLOGMOD=entry name in the ACF/VTAM terminal definition (optional, for documentation purposes only).

NCCF

If the terminal can also be connected to NCCF you have to provide a LOGMODE table entry with the name DSILGMOD for this terminal.
Prepare a user logon mode table for this terminal as shown in section 'User Defined ACF/VTAM Tables'.

If the terminal is working only with CICS/VS and NCCF, the LOGMODE table has to contain only the entry DSILGMOD and only MODETAB='user table name' has to be specified in the terminal's definition.

Other Applications

In a multi system environment with several ACF/VTAM applications such as IMS/VS, TSO, the session parameters have to be supplied via a logon mode table entry.

In this case, it is recommended that the necessary table entry name for each session be provided in the LOGON command:

Prepare a USSTAB with specific LOGON commands for each application and define the LOGMODE table entry name in the LOGMODE parameter of the USS command (USSPARM PARM=LOGMODE,DEFAULT=entryname).

Check the default table ISTINCLM to see if the session parameters for terminal are specified or not. If the terminal has an entry in ISTINCLM, you just need to specify this entry name in the DLOGMOD parameter. If not, you need to prepare your own logon mode table.

6.1.7 Session Termination

When one session partner decides to terminate the communication, it can request a session termination. The method by which this is done varies according to which end of the session wants to terminate it.

Three types of session termination are possible, depending on the source of the termination request:

SLU requested session termination,
where the secondary logical unit (terminal) issues a termination request that causes it to be logged off from the application program. Session termination is requested from SLUs if it sends the **LOGOFF command**. To be able to enter a character-coded LOGOFF command, this terminal has to be in the SSCP-LU session. This is achieved by hitting the SYSREQ key on an SNA terminal (this is not possible on a non-SNA terminal).

The LOGOFF command can have parameters to indicate to ACF/VTAM whether the request is for conditional or unconditional termination of the session.

If conditional termination is requested ACF/VTAM notifies the application program that the secondary logical unit has requested that the session be terminated. The application program can ignore the request or issue a CLSDST macro instruction to terminate the session.

If unconditional session termination is specified, ACF/VTAM terminates the session and then notifies the application program that the session has been terminated and that it is to issue a CLSDST macro instruction.

The format of the LOGOFF command is:

LOGOFF <APPLID(applname)> <TYPE(COND|UNCOND|FORCE)> <HOLD(YES|NO)>

The parameters included between < > are optional.

APPLID(applname) ==> Specifies the name of the application program with which a session is to be terminated

TYPE(COND|UNCOND|FORCE)
==> Specifies the type of LOGOFF as conditional or unconditional or forced.
The default value is unconditional.

HOLD(YES|NO) ==> Specifies wether or not the LU expects ACF/VTAM to maintain the SSCP-PU session.
The default value is yes.

Application program requested session termination,
where an application program (e.g. CICS/VS) requests session termination with a secondary logical unit.

In case of CICS/VS this kind of request can be also initiated by the connected terminal or the master terminal operator as shown below.

For example, the terminal operator enters the CICS/VS command **CSSF LOGOFF** at a terminal in session with CICS/VS; or the master terminal operator enters one of the following commands:

```
CSMT CLOSE,VTAM        (for all connected terminals)
CSMT SHUT,NO           (for all connected terminals)
CSMT TER,SIN,...       (for a specific terminal).
```

After these commands the terminal(s) are again in the SSCP-LU session and ACF/VTAM LOGON commands can be entered at the terminal.

Operator requested session termination,
where the ACF/VTAM operator can cause a specified logical unit to be logged off from a specified application program. This is done by entering **V NET,TERM,ID=luname** at the system console.

Also **V NET,INACT,ID=luname** has the same effect, as it will terminate the SSCP-LU session and therefore also the hierarchically lower LU-LU session.

Recommendations for Session Termination

Usually the **application program requested session termination** is used. That means, many applications like CICS/VS, NCCF, etc. allow the terminal user or master terminal operator to request session termination via operator commands.

In special situations the other types of session terminations may be used.

Conclusion

At this point you should have determined which

- subarea number in your domain,
- MAXSUBA in your network
- naming conventions,
- LOGON/LOGOFF procedures,
- session parameters,

are used.

Now you are ready to make your VSE, ACF/VTAM and CICS/VS definitions for your domain.

During the customization use your Configuration Documentation Sheet and fill in the missing values.

6.2 IPL/JCL DEFINITIONS

Go to Chapter 5 and make the definitions as shown there.
Return and continue with the next steps.

6.3 ACF/VTAM DEFINITIONS

6.3.1 User Defined ACF/VTAM Tables

In addition to cataloging books to define an ACF/VTAM network, tables related to the LU-LU session establishment may need to be cataloged, such as logon mode tables and USS tables since the defaults provided are not always adequate.

User Logon Mode Tables

Logon mode entries are defined in logon mode tables, which are assembled and link-edited into phases. A table is defined with a MODETAB macro, and entries follow, each one defined with a MODEENT macro. The table ends with a MODEEND macro.

The entries are selected by:

1. a MODETAB parameter on the LU or TERMINAL macro for the terminal concerned, which points to the logon mode table in which the entry is contained.

2. a DLOGMOD parameter on the LU or TERMINAL macro for the terminal concerned, which identifies the entry in the logon mode table. The entry can alternatively be specified in the USS logon command. If both are specified, the USS command will override the DLOGMOD parameter.

Note:
The MODETAB and DLOGMOD parameters may be specified on a higher macro (e.g. PU, CLUSTER, LINE, GROUP) and this will 'sift' down to LU and TERMINAL macros. A sifted macro can then be overridden by a specific macro on any particular LU or TERMINAL.

Recommendations

If you are only using CICS/VS ACF/VTAM applications, then it will not normally be necessary to code logon mode tables as CICS generates its own session parameters from the TCT definitions. If you are using other ACF/VTAM applications it may be necessary; it is required by NCCF.

Examples of how to code tables for NCCF are given below. Where NCCF is used, it is necessary to code a table for each class of device with an

entry (MODEENT) of 'DSILGMOD' in each table (this name is required by NCCF). The tables may, of course, contain other entries not used by NCCF. It is suggested that three tables be coded as follows:

Name	Use
MODLU0	Non-SNA displays and printers
MODLU1	SNA printers
MODLU2	SNA displays

The jobs to generate these tables are as follows:

1. Table MODLU0 [19] -

```
// JOB MODGEN0                ASSEMBLY AND CATALOG A MODETAB
// LIBDEF CL,TO=USRCL1
// LIBDEF SL,SEARCH=PRDSLG
// OPTION CATAL
   PHASE MODLU0,*
// EXEC  ASSEMBLY
MODLU0   MODETAB
DSILGMOD MODEENT LOGMODE=DSILGMOD,                                    *
               FMPROF=X'02',TSPROF=X'02',PRIPROT=X'71',               *
               SECPROT=X'40',COMPROT=X'2000',RUSIZES=X'0000',         *
               PSERVIC=X'000000000000000000000200'
         MODEEND
         END
/*
//       EXEC  LNKEDT
/&
```

2. Table MODLU1 [19] -

```
// JOB MODGEN1                ASSEMBLY AND CATALOG A MODETAB
// LIBDEF CL,TO=USRCL1
// LIBDEF SL,SEARCH=PRDSLG
// OPTION CATAL
   PHASE MODLU1,*
// EXEC  ASSEMBLY
MODLU1   MODETAB
DSILGMOD MODEENT LOGMODE=DSILGMOD,                                    *
               FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1',               *
               SECPROT=X'A0',COMPROT=X'3080',RUSIZES=X'8587',         *
               PSERVIC=X'01000000E100000000000000'
         MODEEND
         END
/*
//       EXEC  LNKEDT
/&
```

3. Table MODLU2 [19] -

```
// JOB MODGEN2                ASSEMBLY AND CATALOG A MODETAB
// LIBDEF CL,TO=USRCL1
// LIBDEF SL,SEARCH=PRDSLG
// OPTION CATAL
```

```
   PHASE MODLU2,*
// EXEC  ASSEMBLY
MODLU2   MODETAB
DSILGMOD MODEENT LOGMODE=DSILGMOD,                                    *
               FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1',               *
               SECPROT=X'A0',COMPROT=X'3080',RUSIZES=X'8787',         *
               PSERVIC=X'020000000000000000000200'
         MODEEND
         END
/*
//       EXEC  LNKEDT
/&
```

User USSTAB

When the terminal operator initiates the LU-LU session (as on a 3270 screen), a USSTAB (Unformatted System Services Table) is used by Unformatted System Services.
One is provided with ACF/VTAM and others can be defined by the user. USS, a component of the SSCP, converts character-coded commands coming from a terminal operator or the domain operator to a field-formatted form. This enables the logon procedure to be simplified to allow, for example, the entry of a single word from a terminal to perform the logon to an application.

The IBM-supplied USS table (ISTINCDT) is used if no other is identified in the ACF/VTAM definitions.

The USS table allows you to modify the USS messages that are sent to the terminal. This could be used to provide information to the terminal operator about logon procedures, for example.

The table is identified by the USSTAB parameter on the LU, LOCAL or TERMINAL macros. It can also be 'sifted' from a higher level macro as for the macros describing the logon mode table (see previous section).
The table contains definitions for:

- LOGON command format and defaults
- IBMTEST command format and defaults
- LOGOFF command format and defaults
- USS messages definitions for messages 1 to 9 and 12, 13.
  These messages are sent when error conditions are detected by ACF/VTAM during the LOGON process.

---

[19] The definitions supplied here are for printers and single size screens attached to 3274s. For multiple size screens and devices attached to a 3276, see the session parameter table in the NCCF Installation manual.

- A character translation table definition that will accept EBCDIC characters and convert lowercase letters from 'a' to 'z' to uppercase, horizontal tab characters to blanks, leaving all other characters unchanged

The default USSTAB does not include entries for message 0 and message 10 which could be used to indicate to the terminal operator the status of the SSCP-LU or LU-LU session.
A detailed description of the USS table provided by ACF/VTAM can be found in the ACF/VTAM V2 Planning and Installation Reference Manual, Chapter 18.

A user USS table for terminal users is supplied with SIPO/E 3.1 in the SAMPLIB (member USSTAB). This table has entries defined for all of the USS messages to provide the terminal operator with information on the state of the session.

The first USSCMD entry in the table is a group of macros which modifies the USS LOGON command. It is recommended that you remove these and allow the LOGON command to default.

The tables are assembled, link-edited and cataloged into a VSE Core Image Library, so that they are available to ACF/VTAM.

Shortened LOGON Commands

You may expand this USSTAB with shortened LOGON commands to allow the user to enter a single word to access the desired application (e.g. CICS1 or NCCF60, etc.).

The following JCL stream and ACF/VTAM definition statements generate such a USSTAB for IBM 3270s.

```
// JOB USSTAB                          CATAL USSTAB
// LIBDEF CL,TO=USRCL1
// LIBDEF SL,SEARCH=PRDSLG
// OPTION CATAL
   PHASE USSTAB,*
// EXEC ASSEMBLY
*********************************************************************
* *   REF. TO SIPO/E 3.1 SAMPLIB     MEMBER USSTAB
*********************************************************************
         EJECT
USSTAB   USSTAB
 .....   ......
*********************************************************************
*        REMOVE THE MODIFIED LOGON COMMAND FROM HERE                *
*********************************************************************
 .....   ......
*********************************************************************
*        SAMPLE FOR SHORTENED LOGON COMMANDS                        *
*        FOR CICS (A60CICS1) and NCCF (A60N1)                       *
*********************************************************************
CICS1    USSCMD  CMD=CICS1,FORMAT=BAL,REP=LOGON
         USSPARM PARM=APPLID,DEFAULT=A60CICS1
```

```
         USSPARM PARM=LOGMODE
         USSPARM PARM=DATA
NCCF60   USSCMD  CMD=NCCF60,FORMAT=BAL,REP=LOGON
         USSPARM PARM=APPLID,DEFAULT=A60N1
         USSPARM PARM=LOGMODE
         USSPARM PARM=DATA
 .....   .......
MSG0     USSMSG  MSG=0,TEXT='USS COMMAND SUCCESSFULLY COMPLETED'
MSG1     USSMSG  MSG=1,......
 ....    ......  .....
MSG10    USSMSG  MSG=10,TEXT='CONNECTED TO SA 60 ENTER LOGON COMMAND'
END      USSEND
         END
/*
// EXEC LNKEDT
/*
/&
* $$ EOJ
```

Note:
It is suggested that you provide in the text of MSG10 the system identification or subarea number.
After MSG10 is displayed on the screen, the terminal user types in 'CICS1', then ACF/VTAM will send MSG0 and establishes the LU-LU session with the application A60CICS1 which sends the Good Morning Message.

This table is valid for SNA and non-SNA 3270s. It provides only one-line messages on the screen.

Expanded USS Messages

You may want to supply more information to the terminal operator. Particularly, MSG10 could have more terminal operator guidance than the SIPO/E 3.1 sample. MSG10 corresponds to a message that is automatically sent to a logical unit whenever it is available for use, such as when it is activated or a user issues a LOGOFF command or hits the SYSREQ key.

Ensure that the message length is less than or equal to the buffer size of the SNA device. For remote 3274s, 3276s and 8775s (i.e. remote SNA devices), this is 256 bytes of RU. For local SNA devices and remote non-SNA devices, this is the full screen size.

If you want to exploit the maximum message length, you should code three different USS tables for the different device types.

A specific table is selected by specifying USSTAB=phasename in the minor node.

If a USSTAB is specified that can not be found by ACF/VTAM (e.g. not cataloged or wrong CL SEARCH sequence in F3), the ACF/VTAM default USSTAB (ISTINCDT) is used.

If you change an existing USSTAB in the CL, ACF/VTAM has to be stopped and restarted before the new table can be used.

The sample below shows how a MSG10 is expanded for a **Non-SNA IBM 3270.** These definitions are valid for a model 2 (24 x 80)screen.

Modify the SIPO/E 3.1 sample in the following manner:

Change

- the phase name in PHASE card to USSNSNA
- the label in the USSTAB macro to USSNSNA
- the MSG10 definition into : MSG10 USSMSG MSG=10,BUFFER=M10

Insert between the USSEND macro and the END macro:

```
M10      DC     AL2(M10END-M10-2)
         DC     X'F5'                ERASE WRITE
         DC     X'C7'                WCC   ALARM
         DC     X'114040'            BUFFER ADDRESS
         DC     CL80' '
         DC     CL80'                          SA    61'
         DC     CL80'                            SYS6'
         DC     CL80'                          RALYDPD6'
         DC     CL80' '
         DC     CL80'                  TYPE IN REQUIRED APPLICATION'
         DC     CL80' '
         DC     CL80' '
         DC     CL80' '
         DC     CL80'                         AND PRESS ENTER'
         DC     CL80' '
         DC     CL80' '
         DC     CL80'               FOLLOWING APPLICATIONS ARE AVAILABLE'
         DC     CL80' '
         DC     CL80' '
         DC     CL80'            APPLICATION      APPLID         TYPE IN'
         DC     CL80' '
         DC     CL80'            CICS RALEIGH     A60CICS1         CICS1'
         DC     CL80'            CICS MUNICH      A61CICS1         CICS2'
         DC     CL80'            CICS MELBOURNE   A62CICS1         CICS3'
         DC     CL80'            IMS  CARACAS     A11IMS1          IMS'
         DC     CL80'            TSO  CARACAS     A11TSO1          TSO'
         DC     CL80' '
         DC     X'1D4013'
         DC     CL78' '
         DC     X'1DF0'
M10END   EQU *
```

The second sample shows how a MSG10 is expanded for an **local SNA IBM 3270.** These definitions are valid for a model 2 (24 x 80)screen.

Modify the SIPO/E 3.1 sample in the following manner:

Change

- the phase name in PHASE card to USSLSNA,
- the label in the USSTAB macro to USSLSNA,
- the MSG10 definition into :
  MSG10 USSMSG MSG=10,BUFFER=M10.

Insert between the USSEND macro and the END macro:

```
M10      DC     AL2(M10END-M10-2)
         DC     X'4015'
         DC     X'4015'
         DC     CL80'                              SA    61'
         DC     CL80'                                SYS6'
         DC     CL80'                               RALYDPD6'
         DC     X'4015'
         DC     CL80'                    TYPE IN REQUIRED APPLICATION'
         DC     X'4015'
         DC     X'4015'
         DC     X'4015'
         DC     CL80'                           AND PRESS ENTER'
         DC     X'4015'
         DC     X'4015'
         DC     CL80'                 FOLLOWING APPLICATIONS ARE AVAILABLE'
         DC     X'4015'
         DC     CL80'                 APPLICATION      APPLID      TYPE IN'
         DC     X'4015'
         DC     CL80'                 CICS RALEIGH     A60CICS1      CICS1'
         DC     CL80'                 CICS MUNICH      A61CICS1      CICS2'
         DC     CL80'                 CICS MELBOURNE   A62CICS1      CICS3'
         DC     CL80'                 IMS  CARACAS     A11IMS1       IMS'
         DC     CL80'                 TSO  CARACAS     A11TSO1       TSO'
         DC     X'4015'
M10END   EQU *
          END
```

The third sample shows how a MSG10 is expanded for an **remote SNA IBM 3270.** These definitions are valid for a model 2 (24 x 80)screen.

Modify the SIPO/E 3.1 sample in the following manner:

Change

- the phase name in PHASE card to USSSNA,
- the label in the USSTAB macro to USSSNA,
- the MSG10 definition into :
  MSG10 USSMSG MSG=10,BUFFER=M10.

Insert between the USSEND macro and the END macro:

```
M10      DC      AL2(M10END-M10-2)
         DC      X'4015'
         DC      X'4015'
         DC      CL80' Enter IBMTEST or logon command :'
         DC      CL80' CICS1 CICS2 CICS3 IMS TSO'
M10END   EQU *
          END
```

Note:
Each skip new line command (X'4015') represents a separate line. After this panel is displayed, the cursor is located in line 24 for the first two examples, and line 4 for the the third example.

6.3.2 Local and Remote Devices

Now define the ACF/VTAM major and minor nodes in your subarea.

Go to Chapter 5, section 'Local and Remote Devices' and use the same definitions.

The only changes to make are:

- use the selected naming conventions,
- remove LOGAPPL=DBDCCICS for devices which will require access to multiple applications,
- add USSTAB=phasename (if desired, see 'User Defined ACF/VTAM Tables')
- add MODETAB=phasename and DLOGMOD=entryname (if neccessary, see 'User Defined ACF/VTAM Tables')

6.3.3 ACF/VTAM Application Programs

Use the same definitions for the applications running in your subarea as shown in the Chapter 5.

The only changes are:

- the naming conventions selected,
- addition of special application to application session parameters, for example if CICS/VS-ISC or NCCF-NCCF sessions are planned.

Return and continue with the next steps.

6.3.4 PEER to PEER Link

A line from an IBM 4331 CA to another IBM 4331 CA is called a PEER to PEER link. This line must be a non-switched (leased) SDLC line. However, it is possible to use modems with the SNBU feature to provide a switched line which appears to each end as leased line. See Chapter 7 for details.

Define a separate CA major node for this line or expand your existing CA major node.

The following JCL stream and ACF/VTAM definition statements may be used to catalog a separate CA major node for a PEER to PEER link.

```
// JOB N6021CAT                    CATAL CA Major Node N6021
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
 CATALS B.N6021
        BKEND  B.N6021
N6021   VBUILD TYPE=CA
G601     GROUP LNCTL=SDLC,                                  *
               DIAL=NO [23]
L60032   LINE  ADDRESS=032,[20]                             *
               RETRIES=7
P60032   PU    PUTYPE=5,[21]                                *
               SUBAREA=61[22]
         BKEND
/*
/&
```

6.3.5 Defining an Upstream Link to an IBM 3705

A line from an IBM 4331 CA to an IBM 3705 is called an upstream link. This line must be a non-switched (leased) SDLC line. As for the PEER to PEER link, modems with the SNBU feature may be used to provide a switched line which appears as a leased line.

Define a separate CA major node for this line or expand your existing CA major node.

The following JCL stream and ACF/VTAM definition statements are used to catalog a separate CA major node for this type of link.

---

[20] The channel unit address for the line.
[21] PUTYPE 5 must be specified for another IBM 4331
[22] The destination subarea address of VTAM in the other IBM 4331

```
// JOB N6031CT                    CATAL CA Major Node N6031
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
 CATALS B.N6031
        BKEND  B.N6031
N6031   VBUILD TYPE=CA
G601     GROUP LNCTL=SDLC,                                  *
               DIAL=NO [23]
L60032   LINE  ADDRESS=032,[24]                             *
               RETRIES=7
P60032   PU    PUTYPE=4,[25]                                *
               SUBAREA=14[26]
         BKEND
/*
/&
```

6.3.6 PATH Tables

A path table is necessary to define the path between various domains. Routing information must be provided to ACF/VTAM when a session is established between logical units in different subareas. This routing information is provided to ACF/VTAM through the **PATH macro** which the user must define and catalog in a VSE source statement library.

The following is an example of how to define and catalog a PATH table for routes over a PEER to PEER link:

```
// JOB V601CT                     CATAL PATH TABLE
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
 CATALS B.V601
        BKEND  B.V601
V6061    PATH  DESTSA=61,                                   *
               ER0=(61,1),[27]                              *
               VR0=0[28]
         BKEND
/*
/&
```

The following is an example of how to define a PATH macro for an upstream Link to an IBM 3705 attached to an IBM 4341 or IBM 30XX processor.

---

23 DIAL=NO must be specified or defaulted for a PEER to PEER link.

24 The channel unit address for the line.

25 PUTYPE 4 must be specified for an IBM 3705

26 The subarea number of the NCP

27 The first subparameter of ERx defines the adjacent subarea number, the second the transmission group.
In the case of a connected IBM 4331 the adjacent subarea number is

```
V6011    PATH  DESTSA=(11,14),[29]                    *
               ER0=(14,1),[30]                        *
               VR0=0[31]
```

6.3.7 Cross-Domain Definitions

The Cross-Domain Resource Manager Definition

A cross-domain resource manager (CDRM) is a portion of the System Services Control Point (SSCP) that controls cross-domain sessions. A CDRM Major Node is defined with a **VBUILD TYPE=CDRM** definition statement, and each minor node is defined with a CDRM definition statement. For each domain one CDRM has to be defined.

The CDRM major node

The following example shows the definitions in subarea 60 of the own CDRM and the two CDRMs in subarea 11 and 61.

```
// JOB M601CAT                CATAL CDRM MAJOR NODE
// EXEC MAINT
   CATALS B.M601
          BKEND  B.M601
M601      VBUILD TYPE=CDRM
M6060     CDRM    SUBAREA=60,CDRDYN=YES,CDRSC=OPT
M6061     CDRM    SUBAREA=61,CDRDYN=YES,CDRSC=OPT
M6011     CDRM    SUBAREA=11,CDRDYN=YES,CDRSC=OPT
          BKEND
/*
/&
```

---

equal to the destination subarea number. The transmission group is always 1 for a link on a CA.
If the connected subarea is a migration node (IBM 4331 with ACF/VTAME), ER0 must be specified.
There is no PATH macro definition necessary in the migration node.

[28] If the connected subarea is a migration node (IBM 4331 with ACF/VTAME), VR0 must be specified.

[29] Indicates the subarea number(s) of the destination subarea(s). More than one destination subarea can be specified for each adjacent subarea. The destinations are an NCP (subarea 14) and a host (subarea 11).

[30] The adjacent subarea number is the NCP's subarea number.
If the connected subarea is a migration node (ACF/NCP R. 2.1, and earlier releases), ER0 must be specified and the transmission group is always 1 for a link on a CA.

[31] If the connected subarea is a migration node (ACF/NCP R. 2.1, and earlier releases), VR0 must be specified as shown above.

SUBAREA=nn represents the subarea number of the host in which the CDRM represented by this statement resides.

CDRDYN=YES (on M6060) authorizes the CDRM to dynamically define a cross-domain resource. E.g., a terminal in subarea 11 or 61 can log on to an application in subarea 60 without being defined as a cross-domain resource in subarea 60. The application, however, has to be defined as a cross-domain resource in subareas 11 and 61.

CDRSC=YES (on M6061 and M6011) authorizes the CDRMs in the other subareas to dynamically define cross-domain resources. The application in subarea 61 or 11 has to be defined as a cross-domain resource in subarea 60.

The Cross-Domain Resource Definition

A Cross-Domain Resource (CDRSC) is an application program or logical unit in another domain that is available for use by resources in this ACF/VTAM domain. Each CDRSC major node is defined with a **VBUILD TYPE=CDRSC** definition statement, and each minor node is defined with a CDRSC definition statement.

The CDRSC Major Node

The following example shows the definitions in subarea 60 of the applications TSO and IMS which reside in subarea 11 and to which resources from subarea 60 can log on.

```
// JOB R6011A11                    CATAL CDRSC MAJOR NODE
// EXEC MAINT
   CATALS B.R6011A11
          BKEND  B.R6011A11
R6011A11 VBUILD TYPE=CDRSC
A11TSO1  CDRSC CDRM=M6011[32]
A11IMS1  CDRSC CDRM=M6011
          BKEND
/*
/&
```

[32] The label A11TSO1 must be the same as the name specified in the APPL statement in the other domain.
M6011 specifies the name of the CDRM that controls this resource.

6.3.8 Definitions at the ACF/NCP Site

The following example shows the ACF/NCP (subarea 14) definitions for a downstream link to an IBM 4331:

```
NCPBUILD BUILD ABEND=YES,           ABEND FACILITY INCLUDED              *
               BFRS=128,            NCP BUFFER SIZE                      *
               CA=(TYPE4,TYPE4-1), INSTALLED CHANNEL ADAPTER TYPE       *
               ..........,                                              *
               MAXSUBA=127,         ALLOW FOR UP TO 127 SUBAREAS        *
               ...........,                                             *
               MODEL=3705-2,        CYCLTIME=900 FOR 3705 J             *
               SUBAREA=14,          SUBAREA ADDRESS = 14                *
               TYPGEN=NCP,          NCP ONLY                            *
               .........
M11      HOST  INBFRS=10,  NCP BUFFERS  ALLOCATION                       *
               UNITSZ=152,          VTAM IO BUFFERS SIZE                *
               SUBAREA=(11),        CHANNEL ATTACHED HOSTSA   REL 3     *
               TYPE=TYPE3           TYPE 3 COMM SCANNER
         PATH  DESTSA=11,                                               *
               ER0=(11,1)
         PATH  DESTSA=60,                                               *
               ER0=(60,1),ER1=(61,1)
L140A2   LINE  ADDRESS=0A2,         TRANSMIT AND RECEIVE ADDRESSES      *
               CLOCKNG=EXT,         MODEM PROVIDES CLOCKING             *
               DUPLEX=FULL,         MODEM STRAPPING IS FULL             *
               INTPRI=2,            INTERRUPT PRIORITY                  *
               MONLINK=YES,         MONITOR LINK FOR ACTPU              *
               NEWSYNC=NO,                                              *
               NRZI=YES,                                                *
               PAUSE=0.1,                                               *
               SDLCST=(SDL14PRI,SDL14SEC),                              *
               SERVLIM=254,                                             *
               SPEED=4800,          LINE SPEED IS 4800  BPS             *
               SRT=(,64),                                               *
               ISTATUS=ACTIVE       INITIAL STATUS
*************************************************************************
*       PU MACRO SPECIFICATION FOR THE ADJACENT 4331  SA=60             *
*************************************************************************
P140A2   PU    MAXOUT=7,            MAX PIU'S SENT BEFORE RESP REQ      *
               PUTYPE=4,            PHYSICAL UNIT TYPE 'LOCAL 3705'     *
               ISTATUS=ACTIVE,      INITIAL STATUS                      *
               TGN=1,               TRANSMISSION GROUP 1 (4331-ICA)     *
               ANS=CONTINUE         DON'T BREAK THE X-DOMAIN SESSIONS
```

Note:
The PU macro describes the IBM 4331.
The transmission group number (TGN=1) has to match the TGN specified in the PATH macro of subarea 60 which points to the NCP (subarea 14).

6.3.9 Selecting ACF/VTAM Start Options

The Start List

All recommendations given in Chapter 5 about this subject are also valid in a multi-system environment.
However, your start list ATCSTR00 should contain the following parameters:

SSCPID=xx,
HOSTSA=xx,
MAXSUBA=yy,

Note:
SSCPID and HOSTSA should be equal and represent your subarea number.
MAXSUBA must be the same in all domains.
(see: Prerequisites in this chapter)

Additional start options may be specified in a book B.ATCSTRxx, where xx could be the subarea number of your domain.

The Configuration List

Go to Chapter 5 and refer to this subject.
There are following additional hints:

The suffix of your ATCCONxx reflects the subarea number.

The order of the major nodes coded for this B.book should be:

Local and remote major nodes, the application major node and then the path table, the cross-domain manager and cross-domain resource major nodes.

6.3.10 The ACF/VTAM Start Job

There is no difference; continue as described in Chapter 5.

6.4 TEST OF YOUR CUSTOMIZED ACF/VTAM DEFINITIONS

Make sure that the

- ASI procedure reflects your network,
- ACF/VTAM B.books defining your environment are cataloged,

- USSTAB(s) / MODETAB(s) are assembled and cataloged (if necessary in your environment),
- ACF/VTAM startup is submitted,
- devices and lines you want to test are not assigned to other partitions.

The sequence of starting your network is shown in Chapter 5.

In addition, if all local and remote devices can be connected to ACF/VTAM, test your PEER to PEER Link and/or upstream link.

Test each link separately, subarea after subarea, check

- the physical connection in the concerned domains,
- the PATHTABs,
- the CDRMs and CDRSCs.

The following is an example of a console log showing the initiation of a link to another domain.

The host system has a subarea address of 61, while the destination has a subarea address of 60. The line linking the two subareas is known from the host as L61032, and its associated link-station is C61032.

The line, linkstation, CDRMs and CDRSCs are all inactive initially.

```
* First, vary the line active
v net,act,id=l61032
=>
F3 017 5A97I VARY ACCEPTED
F3 017 5A93I L61032 ACTIVE

* Display link stations; note that the line is ACTIV
* but the linkstation is not, yet.
d net,stations
=>
F3 017 5A97I STATIONS ACCEPTED
F3 017 5D50I VTAM DISPLAY - DOMAIN TYPE = STATIONS
F3 017 5D93I PU T4/5 MAJOR NODE: NAME = ISTPUS, SUBAREA = 061
F3 017 5B72I NO LINK STATIONS EXIST
F3 017 5F84I CA MAJOR NODE: NAME = N611
F3 017 5D96I LINENAME STATUS     LNKSTA   STATUS     CTG GTG ADJNODE  ADJSA
F3 017 5D97I L61032   ACTIV----E C61032   INACT        1   1           000
F3 017 5D14I END

* Activate the linkstation. The link station's status is already
* pending contacted from the other domain.
v net,act,id=c61032
=>
F3 017 5A97I VARY ACCEPTED
```

```
F3 017 5E64I LINK STATION C61032 IS IN CONTACT WITH SUBAREA 60
F3 017 5A93I C61032 ACTIVE

* Display CDRMs - none is active.
d net,cdrms
=>
F3 017 5A97I DISPLAY ACCEPTED
F3 017 5D50I VTAM DISPLAY - DOMAIN TYPE = CROSS-DOM. RSRC MGR
F3 017 5B72I NO CDRMS EXIST
F3 017 5D14I END

* Activate CDRM M611
v net,act,id=m611
=>
F3 017 5A97I VARY ACCEPTED
F3 017 5A93I M611 ACTIVE
F3 017 5A93I M6161 ACTIVE
F3 017 5A93I ISTCDRDY ACTIVE
F3 017 5A93I M6160 ACTIVE

* Now display CDRMs
d net,cdrms
=>
F3 017 5A97I DISPLAY ACCEPTED
F3 017 5D50I VTAM DISPLAY - DOMAIN TYPE = CROSS-DOM. RSRC MGR
F3 017 5A89I M611      TYPE = CDRM SEGMENT      , ACTIV
F3 017 5E82I M6161     ACTIV, SUBAREA = 061
F3 017 5E82I M6160     ACTIV, SUBAREA = 060
F3 017 5D14I END

* Now display CDRMs. Note that one is defined for this host - M6161.
d net,e,id=m611
=>
F3 017 5A97I DISPLAY ACCEPTED
F3 017 5A75I VTAM DISPLAY - NODE TYPE = CDRM SEGMENT
F3 017 5E86I NAME= M611, STATUS= ACTIV, DESIRED STATE= ACTIV
F3 017 5E77I CDRMS:
F3 017 5E82I M6161     ACTIV, SUBAREA = 061
F3 017 5E82I M6160     ACTIV, SUBAREA = 060
F3 017 5D14I END

* Display CDRSCs - none is active yet.
d net,cdrscs
=>
F3 017 5A97I DISPLAY ACCEPTED
F3 017 5D50I VTAM DISPLAY - DOMAIN TYPE = CROSS-DOM. RESOURCES
F3 017 5A89I R61601    TYPE = CDRSC SEGMENT     , ACTIV
F3 017 5E83I A60CICS1 INACT      , CDRM = M6160
F3 017 5D14I END

* Activate the CDRSC. A60CICS1 is the CDRSC for CICS/VS in subarea 60
v net,act,id=a60cics1
=>
```

```
F3 017 5A97I VARY ACCEPTED
F3 017 5A93I A60CICS1 ACTIVE

* Display route to subarea 60
d net,route,destsub=60
=>
F3 017 5A97I ROUTE ACCEPTED
F3 017 5F35I ROUTE DISPLAY 2 TO SA = 60
F3 017 5F36I VR TP   STATUS   ER   ADJSUB   STATUS
F3 017 5F37I  0  0   ACTIV     0      60    ACTIV3
F3 017 5D14I END

* At this stage, authorized terminals in subarea 61 are able
* to log on to CICS/VS in subarea 60, i.e. cross-domain logons
* can take place.
d net,terms,act
=>
F3 017 5A97I DISPLAY ACCEPTED
F3 017 5D50I VTAM DISPLAY - DOMAIN TYPE = LOGICAL UNITS/TERMS
F3 017 5D54I PU T4/5 MAJOR NODE = ISTPUS
F3 017 5D51I LOCAL 3270 MAJOR NODE = H61L11
F3 017 5A89I T61012   TYPE = LOGICAL UNIT     , ACTIV      ,CUA=012
F3 017 5A89I T61013   TYPE = LOGICAL UNIT     , ACT/S      ,CUA=013
F3 017 5D52I LOCAL SNA MAJOR NODE = H61L21
F3 017 5C31I CA MAJOR NODE = N611
F3 017 5D14I END

* Display PATHTAB
d net,pathtab
=>
F3 017 5A97I PATHTAB ACCEPTED
F3 017 5D50I VTAM DISPLAY - DOMAIN TYPE = PATH TABLE CONTENTS
F3 017 5F16I DESTSUB  ADJSUB  ER  ER STATUS  VR(S)
F3 017 5F17I   060     060     0   ACTIV3     0
F3 017 5F17I   061     061     0   ACTIV3     0
F3 017 5D14I END
```

6.5 CICS/VS DEFINITIONS

The steps to tailor the CICS/VS tables according to your needs are similar to those as mentioned in Chapter 5.
The table suffix may reflect your subarea number.

The DFHTCTxx has to be expanded with terminals/terminal printers located in other domains. Define these resources as if they were physically located in your subarea.

For example, an IBM 3278 on an IBM 3274 local SNA control unit in subarea 11 is defined as attached to your IBM 4331.

The CICS/VS start job is the same as described in Chapter 5.

Use your selected naming conventions and proceed to Chapter 5, section: 'CICS/VS Definitions'.

6.6 TEST OF YOUR CUSTOMIZED CICS/VS DEFINITIONS

First, test your host attached environment as described in Chapter 5 before you start to work with the cross-domain terminals.

Make sure that all ACF/VTAM majornodes which reflect the cross-domain environment in the concerned subareas are ACTIV. Test each link separately, subarea after subarea.

When this has been done, run through the test procedure again from the other domain. Make sure that you use a terminal which is defined to CICS.

7.0 SWITCHED LINES

This chapter is intended to assist the user in defining and using switched lines.

It contains information about:

- ACF/VTAM definitions for a switched line
- ACF/VTAM definitions for a switched major node
- the remote hardware setup
- determination of terminal identification
- the operation of a switched line
- session establishment on a switched line

One or more lines on a Communications Adapter can be defined as switched. This is done by selecting options on the CA configuration table and providing definitions to ACF/VTAM to support switched lines.

7.1 CA CONFIGURATION

To define a switched line on the CA configuration table, refer to Chapter 3, section 'Permanent Changes' for details. Select 'YES' for the 'SWITCHED NETWORK' option and 'NO' for 'PERM REQUEST TO SEND'. You must not have permanent request-to-send (RTS) as switched lines are two-wire and controlled carrier is necessary for communication. The other options depend mainly on the modems you are using.

7.2 THE ACF/VTAM DEFINITIONS

The ACF/VTAM definitions for switched lines are provided differently to those for leased (non-switched) lines. The LINE definition is included under a GROUP statement with the parameter 'DIAL=YES'; all lines grouped by this GROUP statement must be switched lines.

Following each LINE macro is an entry for each PU that is able to make a dialled connection on the line. The PUs listed under the LINE macro are defined in a separate switched major node, with their associated LUs. The switched major node is created with a 'VBUILD TYPE=SWNET' statement at the beginning.

PUs on a switched line cannot be multidropped: only one at a time can be dialled on the line.

Dial-In Definitions

An example of a dial-in switched line definition follows:

```
N0631    VBUILD TYPE=CA
G603     GROUP LNCTL=SDLC,                                          X
               DIAL=YES
L60033   LINE  ADDRESS=033,                                         X
               CALL=IN,                                            X
               RETRIES=7,                                          X
               MAXBFRU=(1,2),                                      X
               REPLYTO=5
P60033A PU
P60033B PU
```

This defines a switched line which allows two PUs to dial in on that line (CALL=IN).

The PUs listed under the LINE macro (P60033A and B in the example above) are defined in a switched major node, along with the associated LUs for each PU.

A unique identifier is provided in the PU definition through the IDNUM parameter; the device type is given in the IDBLK parameter on the PU macro (for more information see the section 'Determining Terminal Identification' in this chapter.)

An example of definitions for a dial-in switched major node follows:

```
S6031    VBUILD TYPE=SWNET
P60033A  PU    ADDR=C1,                                             X
               PUTYPE=2,                                           X
               IDBLK=018,                                          X
               IDNUM=0DC4A,                                        X
               MAXDATA=262,                                        X
               USSTAB=USSSNA61,                                    X
               SSCPFM=USSSCS
L60033A1 LU    LOCADDR=2
L60033A2 LU    LOCADDR=3
L60033A3 LU    LOCADDR=4
P60033B  PU    ADDR=C1,                                             X
               PUTYPE=2,                                           X
               IDBLK=017,                                          X
               IDNUM=00001,                                        X
               MAXDATA=262,                                        X
               USSTAB=USSSNA61,                                    X
               SSCPFM=USSSCS
L60033B1 LU    LOCADDR=2
L60033B2 LU    LOCADDR=2
L60033B3 LU    LOCADDR=2
```

The first PU, P60033A, is a definition for a switched 3276 with three screens; the second is for a 3274.

Dial-Out Definitions

Alternatively, a node may be defined as as dial-out (CALL=OUT) or both dial-in and dial-out (CALL=INOUT). The dial-out operation can be accomplished manually or automatically.

For dial-out operation, a PATH macro immediately follows the macro defining each PU that can be dialled, which contains the dialling number for the PU (DIALNO). An example of the PATH macro follows:

```
P60034C  PU      ......
VS601    PATH    DIALNO=5435970,GRPNM=G6034
L60034C1 LU      ......
 ....    LU      ......
```

There may be multiple PATH statements for a PU, up to 256.

The PATH macro can contain other information, such as the line group name associated with the macro. See ACF/VTAM Planning and Installation Reference for details on the coding of this macro.

Automatic Dial-Out

An 'autocall unit' can be used to automatically dial a peripheral node from the host. Where this is used, an AUTO parameter must appear on the line macro which has the unit, which specifies the address of the unit; up to two units can be used on the Communications Adapter. When an application program requests a session with the PU, ACF/VTAM uses the dialling information contained in the PATH statement to cause the autocall unit to dial the required number.

Manual Dial-Out

If CALL=OUT or CALL=INOUT is specified but no AUTO parameter is provided, manual dial-out operation will take place. When an application program requests a session with the PU, ACF/VTAM sends the information contained in the PATH statement to the ACF/VTAM operator, requesting that the number be manually dialled.

7.3 DETERMINING THE TERMINAL IDENTIFICATION

The way this is done depends on the hardware being used. Some devices, such as a 3276 and an 8775 have this unique identification hard-coded at time of manufacture, while others, such as 3274s, have the identification provided by the user. The identification is provided to ACF/VTAM on the 'IDNUM=' parameter on the PU macro. The device type is provided on the 'IDBLK=' parameter, and this is unique to the device type being used.

Information on terminal identification can be found in the Programmer's Guide for the device concerned.

3274

The IDBLK is fixed as 017.

The IDNUM is set in the customization process by replying to question 215 (PUID) with five digits. This could be derived, for example, from the serial number of the 3274. During customization, make sure that you specify '1' to question 314 (point-to-point) and '0' to question 342 (request-to-send).

3276

The IDBLK is fixed as 018.

The IDNUM is determined by the serial number of the device. The actual method for deriving the IDNUM depends on which of three ranges the serial number falls into. The three methods for calculating it can be found in the 3276 Control Unit Display Station Description and Programmer's Guide on page 4-45. The 'Terminal ID' corresponds to the IDNUM.

8775

The IDBLK is fixed as 019.

The IDNUM is fixed at time of manufacture. It can be found in the first five hex digits of the terminal setup label which should be attached at the rear of the terminal. It can also be obtained by going into terminal setup mode (see the 8775 Terminal User's Guide) and checking the terminal setup line. Example:

<>015E*E483*0FC0*8000*1020*0000*0000*0005*

The IDNUM for this 8775 terminal is 015EE : the first five digits, disregarding the <> and the * .

This number can also be determined by converting the last five digits of the 8775 serial number to hex.

Alternative Method of Finding IDNUM

An alternative way of finding the terminal ID is to define a switched line with PUs and a dummy entry (e.g. use IDNUM=99999) for the device in question. Dial-up the device to the host. When ACF/VTAM cannot find a PU defined with the ID of the device, it will generate an error message, e.g.:

5G90I CONNECTION REQUEST DENIED - INVALID STATION ID = 02000180DC4A

The last five digits of the message give the terminal ID that the device has responded with, in this case '0DC4A'. This should be used in the IDNUM

parameter on the PU macro. The three digits before that give the terminal's IDBLK. Here, it is '018' - a 3276.

7.4 OPERATION OF A SWITCHED LINE

For dial operations to take place, the relevant line(s) and switched major node(s) must be active. This can be accomplished by the ACF/VTAM operator entering a VARY ACTIVE command for the line and node concerned, or by providing an ISTATUS=ACTIVE parameter (this is the default) on the LINE macro and including the switched major node name in the configuration list. The lines' and PUs' status should display as ACTIV and the LUs' status as CONCT before the dial operation takes place.

For a dial-in operation with IBM 3864-2 modems, the remote modems at both ends should be in 'data' mode and the PU should be powered on (and IMLed, if necessary). The remote terminal operator dials the host, and when the answer tone is heard, hangs up. A session is then established by ACF/VTAM and the PU.

If for some reason the peripheral PU does not respond in time, the CA line will time out and generate a message similar to the following:

```
5E46I I/O ERROR 033,TIMEOUT     ,27,0E00,402E
```

If this happens you may need to vary the line inactive and re-activate it to make the dialled connection.

For a manual dial-out connection, dial is performed as for a dial-in but the dial is made from the host end.

For an automatic dial-out connection, the dial-out is performed automatically by ACF/VTAM and the autocall unit and operator intervention is not required.

7.5 SWITCHED SESSION ESTABLISHMENT

When a dial operation has taken place, an XID (exchange ID) command is first sent to the PU attempting the connection. The PU responds with information identifying itself to ACF/VTAM. This information is used by ACF/VTAM to determine which PU is making the call. If ACF/VTAM has been provided with the correct definitions for the PU, activation of the PU and its associated LUs can then take place.

When the last LU-LU session terminates, that is, when the last terminal on the controller logs off the application, the dial connection may be dropped (i.e. the telephone is hung up) or the dial connection may remain. This is determined by coding the DISCNT parameter in the PU macro - for details see ACF/VTAM Planning and Installation Reference.

7.6 SWITCHED NETWORK BACK-UP (SNBU) FACILITY ON MODEMS

The switched network back-up facility provided on modems such as the IBM 3864 and 3865 allows a switched line to be directly substituted for a leased line in the event of failure of the leased line.

With SNBU it is not necessary to have the facilities in the DTE equipment, that is, the host or the peripheral node, to be able to use a switched line. So, although ACF/VTAM does not support a switched line for an CA to CA link, it is still possible to use a switched line for backup of the leased line or even as a regular connection.

The SNBU facility can, of course, be used also for peripheral nodes.

Consider the example shown in Figure 22:

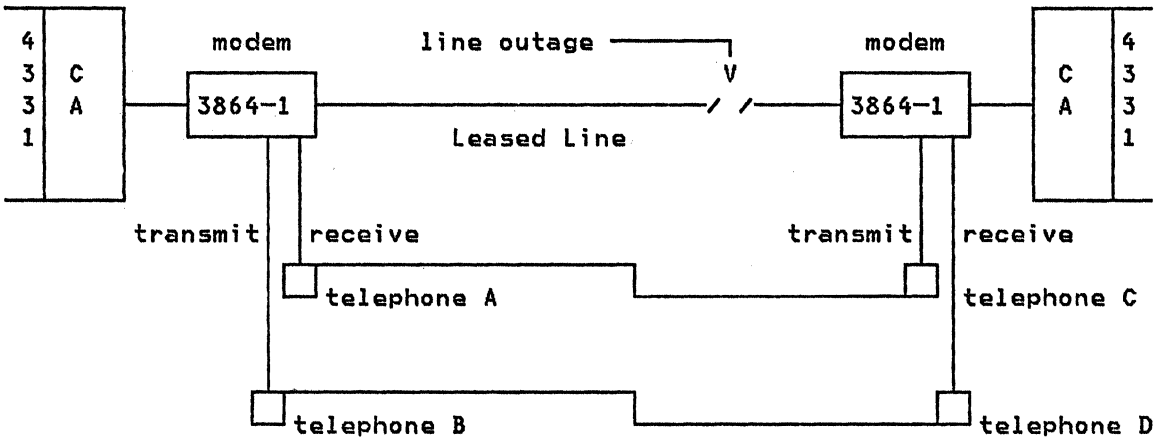


Figure 22. Using SNBU Modems for Leased Line Backup

In this example, two IBM 4331s are connected via a 4-wire leased line using IBM 3864-1 modems with the SNBU feature. Attached to each modem are two switching telephones, one for the receive function (telephones A and D) and one for the transmit function (telephones B and C). ACF/VTAM is running at both sites.

In the event of a line failure, the operator at one of the sites can dial the other site and establish a switched connection.

Here is an example of the series of events:

1. When the leased line fails, ACF/VTAM will generate error messages on the system consoles notifying the operators of the failure. The lines will remain ACTIV, as Data Set Ready is still present at each line, and at both sites the link station PUs will go into pending contacted status.

2. The operator at one of the sites sets the modem to 'talk'.

3. She then picks up the handset of the 'receive' phone (A) and dials the 'transmit' phone at the other site (C), after lifting the exclusion button.

4. When the tone is emitted, she does not hang up the phone. Next, she lifts the handset of the 'transmit' phone (B), lifts the exclusion button and dials the 'receive' phone (D) at the other site. The actual order of dialling the phones ('receive' or 'transmit') does not matter.

5. When the tone is received for the second dialling, she switches the modem to 'data' and hangs both phones up.

6. The modems establish a connection and synchronize. The interface provided to each end is as for a leased line.

7. ACF/VTAM then performs recovery automatically and sessions are re-established. Messages are generated by ACF/VTAM and displayed on the consoles, informing the operators of the successful recovery.

Note that the telephones only need to be supplied at the site making the calls; in the example the connections may be initiated from either end.

The definitions at either end need not to be altered from those of the e normal, leased line. The CA configuration is not altered to 'switched'.

In case of a peripheral link, the control unit need not to be set to switched mode.

From both sites the SNBU dialled lines appear as a four-wire leased line.

Note:

1. This SNBU facility can, of course, be used not only for backup purposes, but for regular connections, thus providing a cost-efficient solution for a connection of two IBM 4331s, if a leased line is not needed permanently and therefore is too expensive to be considered.

2. The modem SNBU feature is distinct from a switched line back-up, where both ends (CA and control unit) will operate in switched mode.

8.0 PERFORMANCE AND STORAGE REQUIREMENTS

This chapter investigates some of the facilities available to control the performance of ACF/VTAM and its network. The chapter looks at things such as ACF/VTAM buffer pools, CA parameters affecting performance, and estimation of storage sizes for ACF/VTAM.

8.1 BUFFER POOLS

ACF/VTAM buffer pools are mainly used to control the passing of data between ACF/VTAM and the nodes in the network, and for internal control blocks. Requirements for these pools vary considerably, such as at start-up time, during peak traffic periods and at shutdown. In order to make most efficient use of the available space, ACF/VTAM uses a technique known as **dynamic allocation** for many of its buffers. This allows the buffers to be dynamically expanded whenever necessary to cater for existing requirements.

Through parameters in the ACF/VTAM start list, the **basic allocation** and dynamic allocation can be controlled to a considerable degree. IBM default values are supplied and these are used where values are not provided in the start list. The IBM supplied values are not necessarily the most efficient values for a particular system, so it is recommended that the tuning exercises in this chapter be carried out.

The general format of the specification for a buffer pool is:

```
poolname = (baseno,bufsize,slowpt,xpanno,xpanpt)
```

8.1.1 Basic Allocation

The basic allocation is the amount of space reserved for the buffer pool when ACF/VTAM is started. The first 3 suboptions for each pool specify the initial basic allocation.

- **baseno** indicates the initial number of buffers provided in the buffer pool.
- **bufsize** indicates the size in bytes of each buffer in the pool. Only the bufsize for LFBUF can be changed.
- **slowpt** indicates the point at which the buffer pool is to enter slowdown processing. When the number of buffers remaining in pool reaches this point, the buffers are allocated only for priority requests. Non-

priority requests are queued, or rejected with a return code. Slowdown processing ends as soon as the number of available buffers becomes equal to or greater than slowpt and there are no queued requests for storage.

8.1.2 Dynamic Allocation

The two additional buffer pool suboptions are provided to allow ACF/VTAM temporary changes in allocation.

- **xpanno** indicates the number of buffers to be added to the buffer pool whenever a dynamic expansion is needed. ACF/VTAM will allocate whole pages for dynamic expansion.

- **xpanpt** indicates the point at which dynamic expansion of this buffer pool will occur. When this point is reached ACF/VTAM will expand the number of buffers in the pool by the number specified by xpanno. The buffer pool will be contracted as soon as the number of available buffers in the pool reaches an internally calculated value.

Dynamic allocation of buffer pools is the default for ACF/VTAM. Unless overridden, a default expansion as later shown in this chapter will be used. Dynamic allocation allows the user to reduce the amount of storage that must be permanently allocated for ACF/VTAM buffer pools. It also enables the user to provide for temporary peak demands or for unexpectedly high demands for buffers, a feature that is useful when initializing a system. Although it is possible to override the ability for buffers to dynamically expand, it is strongly recommended that this is not done.

8.2 TUNING OF BUFFER ALLOCATIONS

The best way to select values for buffers is to provide initial values which will enable you to get the system up and running, then collect statistics on the use of those buffers and modify the start list where necessary.

8.2.1 IBM Supplied Defaults

Not providing any values for buffers in the ACF/VTAM start list results in the buffer specifications as in Figure 23 on page 123.

POOL	BASENO	BUFSIZE[33]	SLOWPT	XPANNO	XPANPT
VFBUF[34]	-	10240	0	-	-
VPBUF[34]	-	262144	0	-	-
SFBUF	10	356	0	1	3
LFBUF	17	288	2	1	3
SPBUF	36	100	0	1	3
LPBUF	16	1016	0	1	1
WPBUF	24	144	0	1	3

Figure 23. Default Buffer Values for ACF/VTAM V2(VSE)

8.2.2 Choosing Initial Values

If you need to provide one or more values for a buffer, it is not necessary to include all the values. For example, if you want to change the value of xpanno only of the SFBUF from the IBM default of 3 to 4, use the following:

```
SFBUF=(,,,4,)
```

The IBM default values will remain for values that have not been provided to give the equivalent of:

```
SFBUF=(10,356,1,4,1)
```

VPBUF

When initializing ACF/VTAM for the first time, specify VPBUF=1048576. This value is large enough to start ACF/VTAM and to use the buffer trace facilities.

If the value for VPBUF is not large enough and an activation of a node is in progress, the following error message will be issued by ACF/VTAM:

```
5D80I  ERROR FOR ID = NNNNNN   - REQUEST: ACTLINK , SENSE:08120000
```

---

[33] When using D NET,BFRUSE the resulting display will show some buffers as being larger than defined: ACF/VTAM adds internal fields to the defined size.

[34] **Important.**
These buffers are not dynamically expandable, so it is important to provide sufficient storage for these buffers to cater for all circumstances.

The meaning of the sense code as explained in the ACF/VTAM 'Messages and Codes' is: 'Insufficient resources. The receiver cannot act upon a request because of a temporary lack of resources.'

VPBUF is used to obtain storage for expansion requests on behalf of buffer pools that use virtual storage.

VFBUF

It is recommended that the initial start value for VFBUF be overridden as follows:

VFBUF=20480

as the default is not sufficient in some cases.

VFBUF is used to obtain storage for expansion requests on behalf of buffer pools that use real storage.

LFBUF

BUFSIZE is not specifiable on the buffers except for LFBUF. However, if a channel-attached NCP is not being used, it is recommended that this BUFSIZE be allowed to default to its value of 288. This value is calculated for an optimization of internal buffering based on the DOS/VSE 2K byte pagesize.

Most of the default values, an exception being VFBUF, should be large enough to meet the network configuration requirements and workload of many users.

The initial values provided here should be sufficient to get the VTAM system running.

The next step is to use the ACF/VTAM display 'D NET,BFRUSE' and the ACF/VTAM BUFFER (SMS) trace to calculate more efficient values.

8.2.3 DISPLAY NET,BFRUSE

The 'DISPLAY NET,BFRUSE' command should be used to tell whether temporary performance problems are a result of existing buffer pool values. This command can be used to find out which buffer pool is exhausted when ACF/VTAM error messages point to those problems.

You can investigate the ACF/VTAM buffer requirements by keying in the command at regular intervals, or by using the NCCF 'EVERY' command which can automatically execute the command at regular intervals. Example:

EVERY 15 D NET,BFRUSE

This will cause the command to be executed every 15 minutes.

The most efficient way for the system to run is if dynamic expansion is not invoked until a peak is encountered. To achieve this, reduce the initial allocation (baseno) values until the D NET,BFRUSE command shows that dynamic allocation is starting to take place under normal, non-peak conditions. Now, use a value slightly larger than this for your initial allocation value and allow dynamic expansion to take care of the peak periods. Remember that a large basic allocation is more processing efficient, but more storage is tied up for the pool and this may be the limiting factor in your system.

Figure 24 shows an example of the output of the DISPLAY NET,BFRUSE command.

```
**************************************************************************
*                  DISPLAY NET,BFRUSE                                    *
**************************************************************************
=>D NET,BFRUSE
5A97I  DISPLAY  ACCEPTED
5D50I  VTAM DISPLAY - DOMAIN TYPE= BUFFER POOL DATA
5G32I  BUFF   BUFF  CURR   CURR   MAX    MAX  TIMES   EXP/CONT  EXP
5G33I   ID    SIZE TOTAL  AVAIL  TOTAL  USED   EXP   THRESHOLD  INCR
5D56I  VF    02048 00010P 00003P  N/A  00007P  N/A      N/A      N/A
5D56I  VP    02048 00128P 00071P  N/A  00063P  N/A      N/A      N/A
5D56I  SF    00356 00015  00008   00015 00009  00001 00003/00013 00005
5D56I  LF    00343 00017  00014   00057 00049  00008 00003/-----  00005
5D56I  SP    00112 00036  00036   00036 00000  00000 00003/-----  00017
5D56I  LP    01016 00016  00012   00016 00008  00000 00001/-----  00002
5D56I  WP    00160 00024  00017   00024 00010  00000 00003/-----  00012
5F95I  IRNLIMIT = NOLIMIT, CURRENT = 000000K, MAXIMUM = 000000K
5D14I  END
```

Figure 24. ACF/VTAM BFRUSE Display

- BUFF ID

  The buffer pool ID

- Flags

  Q = queued request for this pool

  F = dynamic buffering failed for this pool

- BUFF SIZE

  The size of each buffer in this pool. Note that some buffers do not display as they are defined in the start list, as ACF/VTAM will add internal control blocks to the buffer size.

- CURR TOTAL

  The current total number of buffers in this pool. The 'P' indicates that the storage is measured in pages

- CURR AVAIL

  The current count of buffers that are available. The 'P' indicates that the storage is measured in pages

- MAX TOTAL

  The largest number of buffers that this pool has expanded to at any time

- MAX USED

  The largest number of buffers in use at any time

- TIMES EXP

  Cumulative count of the number of times each buffer pool has expanded

- EXP/CONT THRESHOLD

  Expansion and contraction thresholds

- EXP INCR

  The expansion increment which gives the number of buffers to be added to a buffer pool during dynamic expansion

- IRNLIMIT

  This describes the pageable storage use for Intermediate Routing Node traffic that cannot be routed to adjacent subarea nodes because those subarea are in slowdown mode.

For tuning purposes the values of 'MAX USED', 'TIMES EXP', and 'EXP/CONT THRESHOLD' are very important. If the value of 'MAX USED' matches the value of 'MAX TOTAL' or comes close to it, the 'TIMES EXP' value should be analyzed. If there is a high value, that means that there has been a lot of expansions, the BASENO of this buffer pool should be increased.

8.2.4 ACF/VTAM Buffer (SMS) Trace

Statistics may be collected on the use of ACF/VTAM buffers by running the SMS trace. These statistics, with the exception of the wait value, contains the same values as results from the D NET,BFRUSE command. There are a couple of differences: firstly, the collection is not timer initiated but occurs after 1000 requests to the buffer pools; secondly the counters are reset at each collection. The trigger of 1000 requests can be changed to another value, but this is not normally necessary. For details on how to do this, see ACF/VTAM V2 Diagnosis Guide.

An example of initiating the ACF/VTAM buffer usage trace in combination with the trace facility of SDAID is shown in the chapter 'Problem Determination' under the section SDAID. The statistics are written to tape; this can then be printed with DOSVSDMP as shown in the same chapter under 'DOSVSDMP'- again, an example is given.

The details are explained as follows:

- IN USE

  Indicates the number of buffers that were in use at the time the snapshot dump was taken. For the variable pageable pool (VP) and the variable fixed pool (VF), INUSE indicates the number of pages that were in use at the time the snapshot dump was taken.

- MAX ALLOC

  Indicates the maximum number of buffers in the pool that were in use at any one time during the time covered by the snapshot dump. For (VP) and (VF) MAX ALLOC indicates the maximum number of pages that were in use at any one time during the time covered by the snapshot dump.

- MAX WAIT

  Indicates the maximum number of requests for buffers that were queued waiting for storage at any one time during the time covered by the snapshot dump. This field has no meaning for VFBUF or VPBUF.

- EXPAND

  Indicates the number of times the buffer pool was expanded during the time covered by the snapshot dump. This field has no meaning for VFBUF or VPBUF.

- MAX AVAIL

  Indicates the maximum number of buffers that were in the pool at any time during the time covered by the snapshot dump. This field has no meaning for VFBUF or VPBUF.

- CUR AVAIL

  Indicates the number of buffers that were in the pool at the time the snapshot dump was taken. This field has no meaning for VFBUF or VPBUF.

8.3 CA PARAMETERS AFFECTING PERFORMANCE

This section discusses definition parameters for devices on CA lines that can affect the performance of those devices.

Figure 25 shows a CA configuration example, followed by the definitions for the SDLC and the BSC lines.

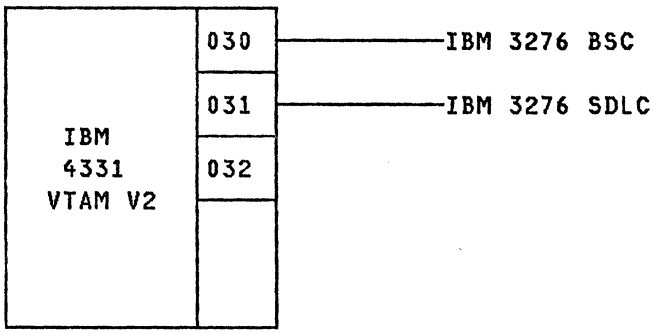


Figure 25. CA Configuration example

Definition statements for an IBM 3276 on an SDLC link:

```
REM1     VBUILD TYPE=CA
GROUP1    GROUP LNCTL=SDLC,                          *
                DIAL=NO
LINE031   LINE  ADDRESS=031,                         *
                MAXBFRU=(1,2),                       *
                PAUSE=0.1,                           *
                REPLYTO=1,                           *
                RETRIES=7,                           *
                SERVLIM=4
PU031     PU    ADDR=C1,                             *
                PUTYPE=2,                            *
                MAXDATA=262,                         *
                MAXOUT=7,                            *
                SSCPFM=USSSCS,                       *
                LOGAPPL=DBDCCICS
D62R0311 LU     LOCADDR=2,                           *
                ISTATUS=ACTIVE
D62R0312 LU     LOCADDR=3,                           *
                ISTATUS=ACTIVE
```

Definition statements for an IBM 3276 on an BSC link:

```
REM2      VBUILD TYPE=CA
GROUP1    GROUP LNCTL=BSC
LINE030   LINE ADDRESS=030,SERVLIM=4
CL030     CLUSTER GPOLL=40,                           *
                CUTYPE=3271,                          *
                ISTATUS=INACTIVE,                     *
```

```
                LOGAPPL=DBDCCICS
D62R0301 TERMINAL ADDR=40,                                    *
                TERM=3277,                                    *
                FEATUR2=MODEL2,                               *
                ISTATUS=ACTIVE
D62R0302 TERMINAL ADDR=C1,                                    *
                TERM=3277,                                    *
                FEATUR2=MODEL2,                               *
                ISTATUS=ACTIVE
```

LINE-Related Parameters

MAXBFRU (SDLC only)

MAXBFRU specifies the number of buffers (LFBUF) to be used to read data from this line.

Specify two values:

- norm: This number indicates the number of LFBUFs ACF/VTAM will use whenever it reads data from a line.

- max: This number indicates the maximum number of LFBUFs to be used to read data from this line. This must be enough to hold the largest PIU that can be received over this line.

In the START option list the length of the LFBUF is specified Multiplying this length with the values of MAXBFRU gives the normal and the maximum I/O area length ACF/VTAM will allocate to read from this line. Specify a max value at least large enough to read the maximum PIU length from the line.

The default values are:

For PU type 1 or PU type 2 connected to the line: (1,2).

For PU type 4 or PU type 5 connected to the line: (2,8).

For BSC IBM 3270 this parameter is invalid as only one buffer is used of at least 256 bytes.

PAUSE (SDLC only)

The PAUSE operand specifies the time the communication adapter will wait after a normal data poll cycle of all PUs on this line, when all PUs on the line answer by negative response (no data to send).

Polling on other lines may continue but this line will not be polled until the time specified by the PAUSE operand has elapsed.

Wasteful operations on the link and Communications Adapter usage overhead can be avoided by selecting an adequate value for this parameter.

The default value is 0.1 seconds, and this is considered reasonable for most interactive situations. Non-interactive devices can be defined with a higher value.

REPLYTO (SDLC only)

This operand applies when ACF/VTAM is operating as primary side: i.e. in a configuration where a CA line connects two 4300s, it applies only to the ACF/VTAM in the higher subarea.

Unless the CA receives a response to polling (frame with poll bit=ON) within the specified time the CA will judge it as an Idle Detect Timeout.

The Idle Detect Timeout should take into account:

- Propagation time to the secondary station.
- Processing time at secondary station.
- Clear to send delay at secondary station.
- Propagation time from secondary station.

At the detection of a Idle Detect Timeout ACF/VTAM will attempt to recover according to the RETRIES operand. It will make unlimited retries for the SNRM command. The default is one second.

RETRIES

Specifies the number of retries ACF/VTAM (as primary station) will perform.

The specification should be large enough to permit the recovery of temporary errors, but small enough to cut down the delay of notification of unrecoverable errors.

This retry counter is applicable to the following errors:

- Timeout (for SNRM the retry is repeated continuously regardless of this specification)
- Negative acknowledgement
- Data check (excluding I frame)
- Invalid address
- Buffer overflow
- Overrun

The default value is RETRIES=7.

SERVLIM (SDLC)

This parameter specifies the number of normal data scans which the CA will repeat on the PUs of this line before it starts special service on PUs on this line.

Normal service is the service for exchanging PIU's with a PU. PIUs can be I (information) or S (supervisory) SDLC frames.

Special service is used for sending non-sequenced SDLC frames (e.g. SNRM) to PUs.

Supposing one or more PUs on a multipoint line are powered off, then they need special service (transmission of SNRM) from time to time to detect when they power on. The CA will poll for normal service all other PUs on the line as many times as the value specified in the SERVLIM operand, then it will check if any PU requires special service, if yes it will execute the special service to one PU alone and then go back to normal service.

EXAMPLE:

A multi point line has 4 PUs A,B,C,D connected to it.

- PU A and C are active requesting normal service
- PU B and D are inactive requesting special service

SERVLIM=2

The sequence of service will be as in Figure 26

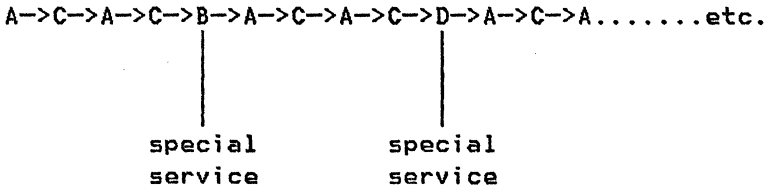


Figure 26. Service Order Example

The default is 4 seconds.

SERVLIM (BSC)

The SERVLIM parameter on the Line macro instruction is used differently by ACF/VTAM for BSC support.

ACF/VTAM uses this as the maximum number of output operations (WRITEs) performed per line before a polling operation is started. In this respect SERVLIM on a line basis acts somewhat similar to a SDLC PUs MAXOUT parameter.

The default is 4 seconds.

PU and LU-Related Parameters

MAXDATA

This parameter specifies the maximum length of data the PU can accept in one data transfer: that is, the length of either an entire PIU or one PIU segment. This in turn depends upon the physical size of the buffer of the PU or cluster controller (e.g. 3274), which can be found in the relevant component description guide.

This maximum data length includes the transmission header (TH) and the request/response header (RH). The transmission header (TH) length is 2 bytes for a PU type 1 and 6 bytes for a PU type 2. For traffic between subareas (PU types 4 and 5) the TH may be 10 (non-SNA devices or nodes that do not support explicit and virtual route protocols e.g. ACF/VTAME) or 26 (where the nodes do support ER and VR protocols e.g. ACF/VTAM V2).

The request/response header (RH) is always 3 bytes long.

The RU contains the user data and varies in length.

If TH+RH+RU is larger than MAXDATA then ACF/VTAM will automatically segment it.

MAXOUT

This parameter specifies the maximum number of path information units (PIU) or path information segments ACF/VTAM can send to this PU without receiving a acknowledgement from the PU.

ACF/VTAM will perform the following operations on SDLC links according to the value of MAXOUT:

1. ACF/VTAM will send PIU or PIU segments as SDLC I frames to the PU until the MAXOUT value is reached.

2. When MAXOUT is reached ACF/VTAM will poll the destination station (PU) to make sure that all I frames have been correctly received.

3. The destination station will set a receive count in the response frame to acknowledge correctly received frames.

4. ACF/VTAM will examine the receive count in the response frame. If the receive count acknowledges all the I frames that have been sent then ACF/VTAM will repeat steps 1, 2 and 3 to send the next PIU or PIU segments.

   If a negative response is given to some or all of the I frames ACF/VTAM will resend the I frame containing the error and all subsequent I frames.

5. When ACF/VTAM has completed the transmission of all the PIUs it will immediately poll the destination station (PU) to obtain confirmation even although MAXOUT has not been reached.

SDLC limits the value of MAXOUT to 7 or less.

Generally a large value should be specified for applications that handle a large amount of outbound batch data, although such an application can monopolise the line.

If the line has a low quality, a low value (such as 2) should be specified to avoid retransmission of many PIUs after a line error.

On high quality lines specifying a high value (such as 7) will improve line utilization.

Also check the characteristics of the PU for the MAXOUT value.

The default value is MAXOUT=1.

PASSLIM (multipoint lines only)

PASSLIM specifies the maximum number of I frames (PIUs or PIU segments) which ACF/VTAM will send to a PU in one service.

ACF/VTAM will move to the next PU on the line when as many I frames as the PASSLIM value have been send to one PU or when all I frames in the queue are completely sent.

The service of a specific PU on a multi-point line can be improved by specifying a high value as PASSLIM parameter for the PU.

If the value of PASSLIM is too high for a specific PU, this PU will occupy the line exclusively for a long period of time and other PU will be waiting too long for service. Therefore this parameter must be handled with care when batch PUs and inquiry PUs are mixed on one multi-point line. Conclusion of some studies has indicated that PASSLIM should be 1, 2 or 3 on multipoint lines; if full-duplex, no batch then use PASSLIM=1 and MAXOUT=7.

The PASSLIM parameter is effective on outbound data only, it has no direct effect on inbound data.

Indirectly it will affect the time between polls.

The default is the MAXOUT value.

Relationship Between PASSLIM and MAXOUT

The way ACF/VTAM will operate depends on a combination of PASSLIM and MAXOUT and is illustrated by the following examples:

1. PASSLIM < MAXOUT

   ACF/VTAM will send as many I frames as PASSLIM, then it will move to the next PU on the line. It will poll the first PU, requesting a response, when the number of I frames sent reaches MAXOUT during a subsequent service.

2. PASSLIM = MAXOUT

   ACF/VTAM will send as many SDLC I frames to the PU as specified in PASSLIM, poll the PU and receive the response and will then move to the next PU on the line.

3. PASSLIM > MAXOUT

   ACF/VTAM will send as many SDLC I frames to the PU as MAXOUT allows, poll the PU and receive the response. Then it will continue to send I frames to the same PU until PASSLIM is reached in which case it will move to the next PU on the line.

It is recommended that MAXOUT=PASSLIM be specified. This will cause an acknowledgement after each service.

The determination of the values for MAXOUT and PASSLIM depend heavily upon the type of application for each PU on the link.

Basically, the LUs connected to a PU can be divided into three different classes.

1. Inquiry LU

   LU that receives one output message from the host for each input message - a typical interactive 3270 application.

2. Inbound batch LU

   LU that sends mainly consecutive input records to the host, such as a data-entry application.

3. Outbound batch LU

   LU that receives mainly consecutive output from the host, such as a remote printing facility.

The following tables give a guideline for the specifications for PASSLIM and MAXOUT for point-to-point and multi-point lines.

Application of PU	MAXOUT	PASSLIM
PU with INQ. LU only	SMALL	N.A [35]
PU with inbound batch only	N.A [36]	N.A
PU with outbound batch LU only	LARGE	N.A
PU with Inq.LU and Inbound batch LU	SMALL	N.A
PU with Inq.LU and outbound batch LU	SMALL	N.A

Figure 27. MAXOUT and PASSLIM Values for a Point to Point Line

Application of PU	Applicable PU	MAXOUT	PASSLIM
PU with Inq.LUs only	ALL	SMALL	ANY
PU with Inbound Batch LUs only	ALL	N.A	N.A
PU with Outbound Batch LUs only	ALL	LARGE	LARGE
PU with Inbound BATCH LUs only plus PU with INbound batch LUs	IN BATCH	N.A	N.A
	OUT BATCH	LARGE	LARGE
PU with Inq.Lus only plus PU with Inbound Batch only	INQUIRY	SMALL	ANY
	IN BATCH	N.A	SMALL
PU with Inq. LUs only plus PU with Outbound Batch LUs only	INQUIRY	SMALL	ANY
	OUT BATCH	LARGE	SMALL

Figure 28. MAXOUT and PASSLIM Values for a Multipoint Line

[35] PASSLIM is meaningless for point to point lines.
[36] MAXOUT is only applicable for outbound data.

8.4 STORAGE REQUIREMENTS

The actual storage required to run ACF/VTAM depends upon several things, most of these dependent upon the size and activity of the network:

- VPBUF storage
- VFBUF storage
- ALLOC, ALLOCR and EXEC statements
- zero paging storage
- storage for activation of channel-attached devices

Note:
The EXEC statement should be coded as follows:

```
// EXEC ISTINCVT,SIZE=1130K
```

If SIZE=AUTO is specified, ACF/VTAM will try to load all of its control programs in storage and will not leave enough room for its other storage areas. Thus when ACF/VTAM is required to load any of its special handlers there won't enough space left to load them and ACF/VTAM may abort, depending on what was requested.

The size of the ACF/VTAM partition can be defined by the ALLOC and ALLOCR commands as:

1844K for the virtual storage (ALLOC), and
200K for the real storage (ALLOCR).

This is sufficient for a small to medium size network without an NCP, but for most efficient use of your system's storage, it is recommended that you use the tables in Appendix F-15 of ACF/VTAM V2 Planning and Installation Reference to calculate ALLOC, ALLOCR and other storage.

9.0 PROBLEM DETERMINATION

This chapter provides information for basic problem determination techniques, and briefly investigates some of the tools and products that are available for your use. In problem determination in an SNA environment, a good basic understanding of SNA fundamentals is necessary. This chapter is not intended to provide this, rather, to point the problem resolver in the right direction, to show some of the tools that are available for P.D. and to give some examples of typical problems that might be encountered.

The chapter is divided into the following sections:

- approaching a problem in an SNA environment
- use of ACF/VTAM displays, status and sense codes, 3270 codes
- hardware tests
- software checks
- traces, ACF/VTAM and VSE
- use of dumps and how to produce them
- where to go to get more information

9.1 APPROACHING A PROBLEM

SNA is a layered architecture and problem determination should be approached in a manner which takes advantage of this. For example, if a problem occurs which involves the application-to-terminal session (LU-LU session) it means that the other sessions have already been established successfully - i.e. SSCP-PU, SSCP-LU. This in turn means that the link hardware (modems,lines) and the control unit must be functioning correctly. Conversely, if there is a problem in activating a line, we know that the application program is not the cause.

9.1.1 ACF/VTAM Displays

The first step, then, in determining the cause of a problem should be to identify the layer that the problem is in.

ACF/VTAM displays are always a good starting point. They can display such things as PUs, LUs, lines, major nodes, application programs, cross domain resources, and many others. The ACF/VTAM display of a node gives general information about it and if requested, information about other nodes associated with it. One technique is to display the ACF/VTAM components down through the levels to find the first level at which the problem appears. The general format for this command is:

D NET,ID=nodename<,E>

..where nodename is the ACF/VTAM name of the node. The ',E' appended to the end of the command requests the display of all its subordinate resources.

The display:

D NET,PENDING

is also useful for quickly identifying problems. This shows which nodes are in a PENDING state, that is, in a transient state to or from the fully active state, or with a BIND or UNBIND outstanding.

9.1.2 ACF/VTAM Status Codes

An ACF/VTAM display shows two status codes - the current state and the desired state. The desired state is the condition that ACF/VTAM is trying to establish. This can be as a result of operator commands or ACF/VTAM recovery procedures (or ACF/VTAM POI programming[37]). When the

command/procedure has completed successfully, the two states will be the same.

A comprehensive list of status codes and their meanings can be found in ACF/VTAM V2 Messages and Codes, appendix E, the Diagnosis Guide, appendix B or the Reference Summary.

9.1.3 SNA Sense Codes

A sense code is sometimes generated by ACF/VTAM when a component fails or a command cannot be completed, and this may appear on the screen or in a trace. This 4-byte field provides information on why a request was rejected. The format is shown in figure 1.

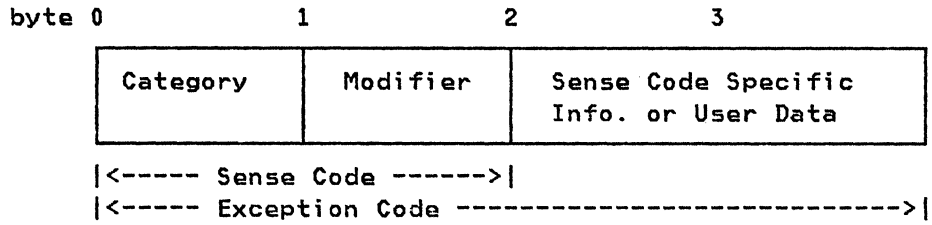


Figure 29. Structure of Sense Code Information

A complete description of SNA sense codes and their meanings can be found in ACF/VTAM V2 Messages and Codes, appendix G.

9.1.4 3270 Displays

Displays attached to 3274/6 warrant a special mention as the intelligent controllers are able to detect, log and display errors in communication hardware, programs and protocols. These are shown with symbols and numbers under the operator line of a screen attached to the controller. The meanings of the numbers generated can be found in the 3274 Control Unit Description and Programmer's Guide, or the IBM 3270 System Problem Determination Guide for the 3274 or 3276.

---

[37] POI is the Programmed Operator Interface, which allows an authorized ACF/VTAM application program to issue ACF/VTAM commands. A guide to this can be found in ACF/VTAM V2 Programming.

Generally speaking, with a 3274 the error codes are as follows:

2nn	-	hardware problem
4nn	-	program/protocol error
5nn	-	communications error

Common errors for a 3274 controller are:

401/402	3274 addressing problem. Check MODEL number.
407	As for 401/2, or screen does not have extended attributes.
450-456	Bind reject. Check ACF/VTAM definitions, LOGMODE entry, or CICS TCTs.
501	Secondary modem problem.
510	PU needs activating.
521	Problem on line, or host down.

Codes are generated for 3276s in a similar fashion but are different to those generated by a 3274. Each code generated is accompanied by an error symbol indicating the classification of the error code (i.e. program, communication, hardware) for the benefit of the operator.

9.1.5 8775 Display Terminal

8775 displays are also able to diagnose errors and record them, in a similar manner to the 3270's. The error log displays on the 8775 are mainly for the use of IBM service personnel. To display them:

1. put the terminal in TEST mode by holding down the ALT key and pressing the TEST key.

2. key a 9 and press enter.

Any failures that have occurred on the terminal since the last error log reset will be displayed. To reset the log, enter an A instead of 9 and press enter.

9.2 HARDWARE TESTS

9.2.1 Loop Adapter Attached Devices

Various tests and displays can be made of loop adapter attached devices from the console of the 4331. To execute these:

- Invoke the LA INLINE TEST screen by pressing MODE SEL and selecting the option:

  F LOOP ADAPTER

  The next screen that is shown is the LOOP ADAPTER CONFIGURATOR screen. Select:

  C INLINE TESTS.

- Press PF1 to commence execution of the tests. This will place the screen back in program mode. To control the test from the console, press the CHG DPLY key.

- Commands can now be entered from the console such as:

  - 001 to display loop messages
  - 007 to assign a device and 550 to test it
  - 010 to display statistical counters
  - A00-A04 to execute loop wrap tests
  - 000 to end tests

Full details of these tests and displays can be found in the IBM 4331 Loop Adapter Operating Procedures. This manual should be used in conjunction with the IBM 4331 Loop Adapter Problem Determination Guide to isolate hardware problems on the loop. The console operator can display the group/device counters daily to help predict certain hardware problems. Hard copies may be made of the displays.

9.2.2 3270 Devices

There are various tests and error log checking procedures that can be run on a 3270 display, if it is suspected of causing an error. TEST mode is entered by holding down the ALT key on a 3178 or 3278/9 and pressing the TEST key. You can then use the test/error log display facilities. One of these is the Status Summary Display. This can be used to check a problem

display or screen, or could be used in daily operation to check for potential problems. To invoke it, enter /3 from TEST mode on any screen and a display similar to Figure 30 on page 142 will be shown.

```
   01234567890123456789012345678901
   00011101011101100100111 01000-01
   dddddd_p_dddd_dd__d_dpdd ddddddddd  TYP
   ..........:.......|..*..  .........  COAX
   ..............:.....:..  .........  DEV
      +++ +  ++  ++  +  +      +     +  LU

   0000 0000 0013 0013 0013
```

Figure 30. 3274 TEST /3 Display

The example provided shows the display from a screen attached to a 3274; a 3276 shows a similar display but some of the lines are not present. The actual content of the display is dependent upon the E.C. or microcode level of the controller.

Line 1 indicates the port of the terminal. Blanks separate type A and type B terminals (24 type A and 8 type B shown here).

Line 2 shows whether the terminal is powered ON (1), OFF (0) or has been disabled by the control unit due to errors (-).

Line 3 indicates the device type - display (d) printer (p) or that the port has not had a powered-on device attached to it since the control unit was IML'd (-).

Lines 4 and 5 show the number of coax and device errors logged for that terminal as follows:

```
.  =  no errors
:  =  1 to 9 errors
|  =  10 to 19 errors
*  =  20 or more errors
```

Line 6 shows a (+) if there is a session bound.

The bottom line is formatted as follows:

```
MMMM CCCC PPPP RRRR XXXX

   MMMM = summary count of control unit machine checks
   CCCC = summary count of communications checks
   PPPP = summary count of program checks
   RRRR = summary count of SDLC Test commands received
```

XXXX = summary count of SDLC Test commands
successfully transmitted

Other tests can be found in the problem determination guide which is attached to the keyboard of any 3278/9. The tests include sequences which can check out the screen and the controller adapter and identify the features attached to the screen (such as Programmed Symbols, Extended Attributes). In addition, the guide provides explanations of the operator symbols generated. For more detailed information, refer to the IBM 3274 Control Unit Description and Programmer's Guide.

Several other tests/error log displays are available mainly for use by the IBM Customer Engineer.

9.2.3 8775 Display Terminal

The 8775 has the ability to run diagnostic tests on itself. The tests are:

- Test 0 - Basic Assurance Tests
- Test 1 - Terminal Read/Write Storage Test
- Test 2 - Highlighting and APL Test
- Test 3 - Programmed Symbols Test
- Test 4 - CRT Alignment Pattern
- Test 5 - (mod 11 and 12) Data-Link-Adapter Wrap Test
- Test 6 - (mod 1 and 2) Loop-Station-Adapter Wrap Test
- Test 6 - (mod 11 and 12) Data-Link Basic Assurance Test
- Test 7 - Selector Light Pen Test
- Test 8 - Magnetic Stripe Reader Test
- Test 9 - Error Log Display
- Test A - Error Log Reset
- Test B - (mod 11 and 12, Japan only) Communication Line Driver Test

Full details on the running of these tests can be found in the manual IBM 8775 Display Terminal Terminal User's Guide under the section 'Problem Determination Test Procedures'.

9.3 LINK LEVEL 2 TEST

This is a test which can be run to determine problems on a non-switched SDLC link. This can be a CA to peripheral PU link, a CA to CA link or a CA to NCP link.

To run the test to a peripheral station, the link must be active and the PU at the secondary end, inactive.

With the CA to CA link, the test must be conducted from the primary end, the one with the higher subarea address. The test will fail if run from the secondary end.

Between a CA and an NCP, the host controlling the NCP must initiate the test as the NCP is always considered the primary node.

In both the CA-CA and the CA-NCP case, the link must be active, the primary end must see the secondary as inactive or inoperative and the secondary must see the primary as pending contacted. This can be set up in one of two ways:

- If both the primary and the secondary ends are inactive, vary the primary-end PU active from the secondary end with the ACF/VTAM command:

  VARY NET,ACT,ID=linkstationname[38]

- If both ends are active, vary the secondary end inactive from the primary end with the ACF/VTAM command:

  VARY NET,INACT,ID=linkstationname[38]

The test can now be initiated; the following ACF/VTAM command is entered from the console:

```
 F NET,LL2,ID=name
<,DATA=data>
<,NFRAMES=n>
<,NTRANS=m>
<,OPT=CANCEL|CONT>
```

DATA (optional) is user data

NFRAMES (optional, default=1) is the number of test messages to be sent to the PU each time its station is selected (multipoint line)

---

[38] linkstationname is the PU name of a peripheral PU or a link-station name. If a CA-CA or CA-NCP link is being tested, the link-station is a representation of the PU at the remote end of the link. Its name can be determined by using the 'D NET,ID=line,E' command and looking at the field LNKSTA. The command 'D NET,STATIONS' also displays all link stations.

NTRANS (optional, default=10) is the number of test messages to be sent

OPT=CANCEL (optional) cancels the current test while OPT=CONT runs the test continuously.

The test data is sent to the link station and returned. ACF/VTAM then displays information regarding the data sent and the data returned. This indicates:

- the number of test messages sent
- the total number of test messages returned
- the number of test messages returned without error

9.4 LU CONNECTION TEST

This test can be initiated on the SSCP-LU session by a terminal operator to quickly check that communication with the host is possible. Using the IBMTEST command enables the user to find out if all his initial definitions are working correctly or not, independent of his application program.

The command IBMTEST causes test data to be returned a specified number of times to the terminal. The terminal user may specify the test data characters, or if no data is given, a predefined sequence will be supplied by ACF/VTAM.

SSCP-LU Session for a non-SNA Terminal

The terminal is in the SSCP-LU session when it has been activated and USS MSG10 - the logon message - has appeared. If the terminal is automatically logged on to CICS at this point (as a result of the LOGAPPL parameter) then you will need to use a CICS command from the CICS master terminal to release it first: CSMT TERMNL,SIN,REL,TERMID=xxxx
...where xxxx is the CICS terminal name.

Then, instead of entering a logon command, follow the instructions 'Running the IBMTEST' below.

SSCP-LU Session for an SNA Terminal

On a 3178 or 3278/9 look for a human stick-figure in a box under the operator line to the left of the screen. If it is not there, hold down the ALT key and press the SYS REQ key. It should now appear.

Running the IBMTEST

The following command executes the test:

IBMTEST <n|10><,userdata>

n|10 ==> Number of times the test data should be returned. The maximum value of n is 255. The default value is 10.

userdata ==> Test data to be sent back to the terminal. The default data are the characters A-Z and 0-9.

Note:
During the execution of the IBMTEST, i.e. until the requested test message has been sent 'n' times, no data entry is possible from the terminal being tested.

If an error occurs during IBMTEST ACF/VTAM will issue an error message on the operator console. The following error message is an example of an I/O error during the test phase:

5E73I CONNECTIVITY TEST TO NNNNNNNN TERMINATED AFTER X ECHOES DUE TO I/O ERROR, SENSE: 08060000

If the test completes without error, the message 'IBMTEST' followed by the data will remain on the screen and no error message will be generated.

9.5 ACF/VTAM TRACES

If a problem cannot be resolved by investigating ACF/VTAM displays and messages, you may need to trace the data flowing between the various components. ACF/VTAM provides several trace facilities for use in the CA environment:

- Buffer Contents Trace.
  It is recommended that you use this option for tracing activity on PUs, LUs, the SSCP, cross domain resources etc. as it provides up to 256 bytes of the PIU. Use this option to inspect a BIND which is causing problems, or when the user data needs to be inspected.

  To start the trace: F NET,TRACE,TYPE=BUF,ID=nodename

  To stop the trace: F NET,NOTRACE,TYPE=BUF,ID=nodename

- I/O Trace.

  This is useful for investigating activity between ACF/VTAM and network nodes, similarly to the Buffer Contents Trace. However, it only records the first 36 bytes so little user data is displayed. This saves trace file space, and it is useful where user data need not be inspected.

  To start the trace: F NET,TRACE,TYPE=IO,ID=nodename

  To stop the trace: F NET,NOTRACE,TYPE=IO,ID=nodename

- Buffer Pool Usage (SMS) Trace.
  Takes a snapshot of information on buffer pool usage every 1000 requests. Use this for evaluating buffer pool requirements. It must be used in conjunction with the SDAID facility (see below).

  To start the trace: F NET,TRACE,TYPE=SMS,ID=VTAMBUF

  To stop the trace: F NET,NOTRACE,TYPE=SMS,ID=VTAMBUF

  See the chapter 'Performance and Storage Requirements' in this manual for further details on its use.

- VTAM Internal Trace.

  This trace provides a record of events within ACF/VTAM itself such as scheduling of resources, storage management, and the flow of PIU's internally. This trace should be used if ACF/VTAM internal problems are suspected.

  To start the trace: F NET,TRACE,TYPE=VTAM,MODE=EXT,OPTION=ALL

  To stop the trace: F NET,NOTRACE,TYPE=VTAM,OPTION=ALL

  Note that 'OPTION=' can select particular components for tracing.

9.5.1 Trace Collection

Trace collection can be started through operator commands from the console, or by specifying options at ACF/VTAM startup. The trace information is written sequentially to disk or tape file. On disk, the newest trace records overlay the oldest when the file is filled. The ACF/VTAM startup JCL in this manual provides the necessary statements for a trace data collection file on disk.

Trace data collection can be initiated from the console by use of the MODIFY TRACE command. Here is an example of its use to trace data on the LU 'L020B01' :

```
F NET,TRACE,TYPE=BUF,ID=L020B01
```

This will start collection of data.

After sufficient data has been collected, the following command will stop collection:

```
F NET,NOTRACE,TYPE=BUF,ID=L020B01
```

Note that the command must be entered in full.

Another option on the BUF and IO trace is 'SCOPE=ALL'; this will cause all subordinate resources to the specified node to be traced. For example, all the LU's associated with a PU.

Note: SDAID must be used in conjunction with the ACF/VTAM MODIFY command to collect SMS data.

For a full description of the MODIFY TRACE command, see the ACF/VTAM V2 Operation manual. Use of trace parameters in ACF/VTAM start options is described in the 'Planning and Installation Reference' manual.

The BUF, I/O, and VTAM Internal Trace data can then be printed using the TPRINT utility. This can run as a subtask under ACF/VTAM or as a job step under VSE, however it is recommended that it be run as a separate job step to avoid possible ACF/VTAM performance degradation. If the ACF/VTAM startup JCL provided in this manual is used, then the following statements can be used to invoke TPRINT:

```
// JOB TRPRINT
// DLBL TRFILE,'VSEIPOE.SNA.VTAM.TRACE.FILE'
// EXTENT SYS004,SYSWK1,1,0,111770,500
// ASSGN SYS004,241
// ASSGN SYSLST,00E
// EXEC  TPRINT
```

SYSLST can be assigned to a printer, tape or disk with IJSYSLS.

When the job is run, you will be prompted for options. The options can select type of data, source of data, a time interval, and whether or not to continue tracing afterwards. Example:

```
PRINT BUF=ALL,CLEAR=YES,INTERVAL=(18:00:00,18:05:00)
```

This will print all BUF records recorded between the times shown and start recording from the beginning of the file afterwards. A full description of trace options can be found in ACF/VTAM V2 Operation under the section 'Trace Print Options'.

Note: For printing out SMS data use DOSVSDMP (see below).

Actual analysis of ACF/VTAM trace data is beyond the scope of this manual, however examples can be found in ACF/VTAM V2 Diagnosis Guide and ACF/SNA System Problem Determination Guide (volumes 1 and 2).

9.6 VSE TRACING AND DUMPING FACILITIES

There are also a number of tracing and dumping facilities provided by VSE that can be used for problem determination in ACF/VTAM. These are:

- SDAID
- DOSVSDMP
- 4331 Communications Adapter Dynamic Trace
- VSE DUMP Command
- VSE CANCEL Command
- Program Initiated.

9.6.1 SDAID

This program is invoked through the console by entering 'SDAID'. It can be used as a useful hands-on debugging tool to obtain information about the conditions prevailing at the time of a malfunction. Most of the tracing facilities for VSE are provided by this program. The resulting event records can be written into a wrap-around buffer, a onto a magnetic tape or straight to printer. Data written to a tape can be formatted and sent to a printer through the use of DOSVSDMP. SDAID can be requested to trace VSE/VTAM I/O related events (not to be confused with the ACF/VTAM I/O trace). These include occurences of SVCs, SIO/SIOF instructions and I/O interrupts.

SDAID must also be used in conjunction with the ACF/VTAM MODIFY command to enable collection of SMS data.

Here is an example of SDAID being used to collect SMS data. ACF/VTAM is started in F3 and the trace tape is mounted on unit 300.

Enter from the console:

```
sdaid
AR 015 4C05I PROCESSING OF 'SDAID' COMMAND SUCCESSFUL.
area
AR 015 4C08D SPECIFY TRACE AREA.
15 f3
AR 015 4C08D SPECIFY TYPE OF LIMITS.
15 (blank)
AR 015 4C08D SPECIFY ADDITIONAL TRACE AREA.
15 (blank)
AR 015 4C05I PROCESSING OF 'AREA' COMMAND SUCCESSFUL.
outdev
AR 015 4C08D SPECIFY OUTPUT DEVICE.
```

```
15 tape
AR 015 4C08D SPECIFY PHYSICAL ADDRESS OF PRINTER/TAPE.
15 300
AR 015 4C05I PROCESSING OF 'OUTDEV' COMMAND SUCCESSFUL.
trace
AR 015 4C08D SPECIFY TRACE TYPE.
15 vtambu
AR 015 4C08D SPECIFY OUTPUT.
15 (blank)
AR 015 4C08D SPECIFY OPTIONS.
15 (blank)
AR 015 4C05I PROCESSING OF 'TRACE' COMMAND SUCCESSFUL.
ready
AR 015 4C05I PROCESSING OF 'READY' COMMAND SUCCESSFUL.
strtsd
AR 015 4C05I PROCESSING OF 'STRTSD' COMMAND SUCCESSFUL.
       ----- SDAID IS STARTED AT THIS POINT -----
f net,trace,type=sms,id=vtambuf
F3 017 5A97I TRACE ACCEPTED
F3 017 5F13I TRACE INITIATED FOR NODE = VTAMBUF
F3 017 5F04I VTAM TRACE SUBTASK STARTED
       ----- SMS TRACE IS NOW STARTED       -----
       ----- COLLECTION TAKES PLACE.        -----
       ----- TO STOP THE TRACE :            -----
f net,notrace,type=sms,id=vtambuf
F3 017 5A97I NOTRACE ACCEPTED
F3 017 5F12I TRACE TERMINATED FOR NODE = VTAMBUF
       ----- TO STOP     SDAID :            -----
stopsd
AR 015 4C05I PROCESSING OF 'STOPSD' COMMAND SUCCESSFUL.
       ----- TO END      SDAID :            -----
endsd
AR 015 4C05I PROCESSING OF 'ENDSD' COMMAND SUCCESSFUL.
       -----  SDAID IS NOW ENDED            -----
```

9.6.2 DOSVSDMP

The DOSVSDMP printing facility can be used to print the output of a stand-alone dump, a dump as the result of a DUMP command (tape or disk), or output from SDAID written to tape. Here is an example of its use in printing off the tape created in the SDAID section. A job with a PAUSE statement is released and Job Control is entered from the console.

```
r rdr,pausebg
BG 000 // JOB PAUSEBG
BG 000 // PAUSE
0 // assgn sys006,300
BG-000 0D16D READY
0 // exec dosvsdmp
BG 000 4C50D ENTER: OPTION #, ? FOR HELP, R FOR RETURN
```

```
 ..................................................
1 CREATE DOSDMPF 2 PRT SA DUMP  3 PRT SDAIDTAPE
4 PRT SYS DUMP OR SDAID BUFFER WRITTEN BY AR COMMAND
5 CREATE DOSDMPG 6 CLR DOSDMPF  7 CLR DOSDMPG
     (ENTER 1 OPTION ONLY)
BG-000
0 3
BG 000 1I00D  READY FOR COMMUNICATIONS.
0 /&
BG 000 EOJ PAUSEBG
```

The DOSVSDMP stand-alone facility can be used whenever the severity of a malfunction (e.g. hard wait) prevents the use of other dump facilities. It can create a stand-alone dump on cards, tape, diskette, or disk. The program needs to be generated under VSE before it can be used stand-alone. It is written to a device such as a tape or disk, and this is IPL'd for execution.

9.6.3 4331 CA Dynamic Trace

This facility can be used to activate a trace on a 4331 Communications Adapter, collect the data on tape, and deactivate the trace while the the attached teleprocessing line is still running. This trace records entries which provide information on the functioning of the CA hardware and microcode, CCW commands, sense information and user data. The data is mainly for use by IBM personnel.

The facility is invoked by first invoking the In Line Test from the 4331 Maintenance Selection facility. The options can then be supplied through the MS facility or preferably through an OPTION control statement invoked by a jobstream. Here the JCL of a trace jobstream:

```
// JOB   XX
// ASSGN SYSLST,cuu        cuu=output
// ASSGN SYS010,cuu        cuu=tape work file
// ASSGN SYS011,03B        03B=required
// EXEC  IDUSVEP
   PAUSE
---- enter from console --------
OPTION 410nn              >nn= subchannel to
                               be traced[39]
DYNADMP DYNAMIC           >to trace dynamically

OPTION 411nn              >to stop the trace
SYSIN                     >continue input from card reader
 ------------------------------------
   PRINT
   END
/*
/&
```

A full description of the options available can be found in the VSE SADP manual in Chapter 2.

9.6.4 DUMP Command

The DUMP command can be used to dump an area of storage. The format is:

DUMP dumparea,cuu

There are several options for 'dumparea', the default being a dump of general, control and floating point registers, and all active partitions. Others, such as the supervisor, SVAs, and selective addresses may be selected.

To dump the ACF/VTAM partition to tape, 'dumparea' is the partition (e.g. F3) that ACF/VTAM is running in and 'cuu' is the address of the tape unit.

The dump can be printed by using DOSVSDMP as described before, by selecting opition 4.

For more information on the DUMP options, see p.18 of the VSE SADP manual.

9.6.5 CANCEL Command

A dump can be specified by the operator when the VSE CANCEL command is used: it is processed as for the VSE DUMP command.
Example:

CANCEL F3,DUMP

---

[39] E.g. if you want to trace the CA for the line address 031, the subchannel address to put here is 31.

9.7 COMMON PROBLEMS

9.7.1 ACF/VTAM Problems

One of the most common problems with ACF/VTAM operation relates to inadequate buffers. This can result in such things as:

- inability to start or terminate ACF/VTAM
- ACF/VTAM abending or waiting
- ACF/VTAM appearing to not accept commands
- local devices not activating or communicating
- inability to activate or deactivate a PU or LU
- LU 'hanging'
- poor response time
- message 5D80I being generated with sense 0812

It is therefore essential to provide adequate buffers for ACF/VTAM operation in both normal and peak periods.

In addition, it is essential to provide sufficient virtual storage area for these buffers in the ACF/VTAM partition. This should be calculated as shown in ACF/VTAM Planning and Installation Reference, appendix F-11. ACF/VTAM needs sufficient space to operate within that partition as well, but do not use SIZE=AUTO on the EXEC statement; a SIZE of 1130K is recommended. More information on these topics can be found in the chapter 'Storage and Performance' in this manual.

9.7.2 Link Related Problems

Successful activation of a link (line) does not imply that the telecommunications facility is functioning correctly. Provided that the host-site modem is able to present Data Set Ready, link activation may take place. When a link cannot be activated, it is frequently due to the modem being powered off, being faulty, or that the link to the modem is incomplete.

Where VSE is running under VM make sure that the CA line is ATTACHed to VSE and DVCUP'd before attempting to activate the line from ACF/VTAM. Also check that the characteristics defined in the CA hardware, VSE and ACF/VTAM are consistent.

9.7.3 PU Related Problems

PU related problems on installation frequently relate to inconsistencies between the definitions in ACF/VTAM and those in the PU. The sorts of things to look for are:

1. NRZI setting
2. PU addressing
3. XID identification (switched lines)
4. control unit powered off or not IML'd
5. faulty link(s) between modems or faulty modems
6. faulty link(s) between modem and PU

9.7.4 LU Related problems

These are generally either due to the LU not being in the correct status, or the LU being unable to establish a session with another (application) LU after the ACTIV status has been established.

Usual problem determination techniques should be used to determine problems with such things as LU hardware and software; e.g. through the use of ACF/VTAM displays and commands. Sometimes the LU may be shown as being inoperative (due to a fault or failure of some sort); the LU can sometimes be brought to ACTIV status by using the ACF/VTAM vary inactive command with the force option. This will change the status to INACT; a vary active command may then activate it:

```
V NET,INACT,ID=luname,F
 ...node will become inactive

V NET,ACT,ID=luname
 ...may restore the status to ACTIV
```

Attention should be paid to the use of the 'ISTATUS=' parameter on the LU definition, so that operators know which LUs should be automatically activated and which need to be activated through ACF/VTAM commands.

The default ACF/VTAM USS message 'SESSION NOT BOUND' (USS MSG 7) means that the LU has had session establishment rejected for some reason. This could be, for example:

- the application is not accepting logons
- the application has rejected the session parameters presented by ACF/VTAM

- the terminal has rejected the BIND with the session parameters
- a route is not available (for cross-domain connection)

In addition, the terminal itself may indicate that a BIND has been rejected. The 3274 may show a '45n' number under the operator line on the LU's screen, for instance; this also indicates why the BIND was rejected.

If a BIND rejection occurs, find out how the BIND is built - via a LOGMODE table, or via the application, or even via a combination of the two. Run an ACF/VTAM buffer trace to see the actual BIND flow and check to see if it differs from the expected BIND flow. Check the definitions for the terminal in the application, if present. In CICS this is the TCT, and the BIND image is usually built from this.

If you receive the USS message 'parameter PARAMETER INVALID' (USS MSG 4) it could mean that:

- the application has not been started
- the application has not been activated from ACF/VTAM
- the application has not (yet) opened its ACB
- the cross domain definitions have not yet been activated

A full description of USS messages and their meanings can be found in ACF/VTAM V2 Messages and Codes

Note:
With 3270s the screens have various model numbers, dependent upon the screen sizes. If a screen is plugged into a port which is defined for a model higher than itself, it can still be logged on but the number of lines/characters on the screen will remain the same. The overall image will be smaller. However, a smaller sized screen cannot be used in a port defined for a larger screen: an error message will appear on the display and logon will not complete.

9.8 FAILURE AND BACKUP

Planning for Failure, Backup and Recovery should be a part of the installation process for an SNA network. Consideration should be given to the sorts of failures that can occur and the impact that these failures would have on the end users. Questions need to be considered such as:

- What is the impact if a particular component (e.g. control unit) is down?
- What is the impact if there is a line outage - this may affect more than one component?
- What is the maximum downtime before the situation becomes critical?
- Does the potential impact on the organization justify the installation of backup hardware or switched/leased lines?
- Which terminals have critical access to which programs?

Various facilities are available in ACF/VTAM that assist backup planning and recovery.

9.8.1 Configuration Restart

Configuration restart is an ACF/VTAM facility that maintains certain status information about ACF/VTAM resources, on data sets. In general, this information includes active/inactive status and operator-specified values of activation and operating parameters. When restarting ACF/VTAM after a halt or failure, or when reactivating an individual major node after a deactivation or failure, ACF/VTAM can use this information to restore the resources to their status prior to the deactivation or failure.

The information is stored in one or two files - the NODELST file and the configuration restart file. The NODELST file contains information about the status of major nodes; the configuration restart file contains information about changes made within major nodes. As the ACF/VTAM operator makes changes to these nodes, the changes are recorded in these files so that they reflect the current state of the network.

When the operator restarts ACF/VTAM, he or she can specify that the start be :

1. COLD - which restarts ACF/VTAM to its initial status
2. WARM - which restarts ACF/VTAM using :
    - the information contained in the configuration restart file, identified on the CONFIG operand

- the information contained in the NODELST file, identified on the NODELST operand

Both operands are specified in the ACF/VTAM startup parameters.

Both the NODELST and the configuration restart files are VSAM files. Information on defining these can be found in the manual ACF/VTAM V2 Planning and Installation Reference, along with more detailed information on Configuration Restart.

9.8.2 Link Failure Backup

Where critical links exist, switched lines can often be used to provide backup to the primary, non-switched link. There are a few different ways to achieve this:

1. through the use of an alternative set of modems to provide a manual, switched connection. After having changed the CA hardware definition to switched via the CA configuration screen, the line is reactivated with the original ACF/VTAM definitions and operated as a non-switched line, as usual.

2. through the use of modems with the Switched Network BackUp (SNBU) feature, where the modems can provide a switched facility and be used in a similar manner to 1. In this case, the CA definitions do not have to be changed; once the modems have established the switched connection, the line is operated as a leased line. For details see Chapter 7, section 'Switched Network Back-Up'.

3. where an alternative CA port is available, it can be set up as having a switched line. Alternative sets of CA definitions can be provided for this port and in the event of a leased line failure, a switched connection can be made to the remote location by using this line. This is done by deactivating the original set of leased line definitions and activating the relevant set of switched definitions. The same LU definitions are used in the backup switched definitions as in the non-switched definitions.

   The control unit has to be set to switched mode.

4. if modems with the switched line backup feature are used (not to be confused with SNBU), an alternative, set of switched definitions can be provided for the line using the same LU names as for the non-switched line. In the event of non-switched line failure, the original definitions can be deactivated, the modems and the CA changed to provide switched connection, and the switched definitions activated.

   The control unit has to be set to switched mode. In case of an IBM 3276 flip the SNBU switch, which is a confusing name for it.

5. where multiple peripheral links run to a remote location from one 4300, it is possible to have an alternative set of definitions multidropping the PUs in various combinations. In the event of failure of a link, the definitions for that link and its PU(s) could be deactivated and definitions which include the PU(s) on another line could be activated. The site would need a hardware multidropping facility of some sort (e.g. splitter modems or a modem-sharing unit).

Pay attention as to whether the facilities are physical half-duplex or duplex. Some switched facilities only provide for half-duplex connection and switched duplex connection requires TWO connections through special modems. Some countries provide a switched, full-duplex connection.

Note:
All the methods above can be used to provide backup for peripheral links, but note that cross-subarea links, that is, links between two 4331/4321's or between a 4321/4331 and an IBM 3705, do not support switched definitions. However cross-subarea links can make use of a switched line by the use of modems with the SNBU feature (method 2). See Chapter 7, section 'Switched Network Back-Up' for details.

9.9 GENERAL GUIDELINES

It is recommended that the person who is responsible for problem determination in an SNA network receive at least some basic education in SNA, either through IBM Independent Study Programs or through scheduled classes. In addition there are manuals which are available to assist with problem determination, such as ACF/SNA System Problem Determination Guide volumes 1 and 2. These can be used in conjunction with ACF/VTAM V2 Diagnosis Guide and SNA reference manuals to provide a comprehensive means of dealing with SNA network problems.

The use of Communication Network Management Products can greatly simplify the operation of a network and assist with online problem determination. IBM's NPDA is the product which is used for problem determination, and this runs under NCCF. A description and guide to installation of NCCF and NPDA can be found in the 'CNM Customization' chapter in this manual. Further information on the use of CNM tools can be found in the document Communication Network Management: Using the CNM Tools.

10.0 ACF/VTAME TO ACF/VTAM V2 MIGRATION

This chapter provides information that you will need for migrating to ACF/VTAM V2 from ACF/VTAME.

The following topics are discussed:

- new functions
- changes from ACF/VTAME
- migration configurations
- coexistence

If you need more detailed information please refer to the ACF/VTAM Planning and Installation Reference manual, Chapter 13: Migration.

10.1 NEW FUNCTIONS

ACF/VTAM V2 has the following major new functions over ACF/VTAME:

10.1.1 New Routing Structure

In an ACF/VTAME multi domain environment the user had to define cross-domain PATH statements to provide for the routing of messages to different subareas. Only paths to subareas which were not adjacent to the originating subarea had to be defined.

ACF/VTAM V2 introduces a new way to define the routes in a single or multi domain environment.

The following terms are used to describe the new routing structure:

- Transmission Groups
- Parallel links
- Explicit Routes
- Virtual Routes
- Multiple (Alternate) Routes
- Transmission Priority Levels

- Class of Service

The user can define from one to eight logical communication paths between **adjacent** subareas in a network. These logical links are called **transmission groups (TGs)**.

There may be only **one** TG (TG number 1 or TG1) between the following subareas:

- a host processor and an ACF/NCP attached by a channel
- a host processor and an ACF/NCP attached by an SDLC link through a Communication Adapter
- two host processors attached by an SDLC link through Communication Adapters

Up to **eight** TGs can be defined between two ACF/NCPs which are connected by one or more SDLC links.

Each TG consists of one or more links called **parallel links** . If one or more of the links in a TG fail, session traffic continues over the remaining links in the group without loss of data.

Note:
In a 43X1 CA environment only **one** TG can be defined between two subareas. This single TG may only contain **one** link (no parallel links).

When a session is established, a network communication path called a **route** is used. This route may be considered at a **physical** and a **logical** level. Routes at the physical level are called **explicit routes (ERs)**. An ER is a sequence of physical network elements over which two subareas communicate. Physical elements include host processors, communication processors, and links which connect them. Therefore, an ER consists of the origin subarea, intermediate TG(s) (and subareas), and the destination subarea.

Up to **eight** ERs (ER0 - ER7) can be defined between any two subareas, therefore allowing the definition of **multiple** or **alternate** routes via different intermediate subareas. This provides for higher availability in the case of failure of some route elements.

Routes at the logical level are called **virtual routes (VRs)** .A VR is a logical connection between two subareas that participate in a session. Each VR is assigned to an ER (and is therefore defined as VR0 - VR7).

Each VR provides the user with a particular **transmission priority.** ACF/VTAM V2 provides 3 levels of transmission priority (TP0 - TP2), where 0 is the lowest priority. Data on VRs with higher priority can be sent ahead of data on VRs with lower priority.

Note:
These different priorities are not implemented over links connected through a CA.

The VR to be used for a session is selected through the **class of service (COS)**, which is specified in the LOGMODE table for this session. The COS is a list of VRs and associated TPs that have been defined between two subareas. The COS will be selected from a user defined COSTABLE or from a default COS algorithm.

10.1.2 Route Test

In ACF/VTAME the VTAM operator could display the defined paths with the D NET,PATHTAB command.

This is still true in ACF/VTAM V2. Additionally, the VTAM operator can use the D NET,ROUTE,... command to display the defined routes and to test if a route is operative. A test message is sent along the route resulting in a reply that indicates whether the route is available. If the test message cannot be sent along the entire route, the reply to the operator includes information to locate the inoperative part of the route.

10.1.3 Route and Session Failure Notification

If a VR or ER fails, the sessions assigned to that VR or those VRs which are associated with that ER are disrupted. In all ACF/VTAM host subareas the operator will be notified of that route failure, so that corrective action can be taken to make the route active again.

Also session failure notifications will be generated for both ends of the session (e.g. the application program). Reason codes will be supplied to be used in determining the cause of the failure as well as if the session should be restarted.

10.1.4 Dynamic CDRSC Definitions

In ACF/VTAME an LU (LUA) in domain A which could have a session with a resource (LUB) in domain B had to be defined as a CDRSC in domain B, and LUB had to be defined as a CDRSC in domain A.

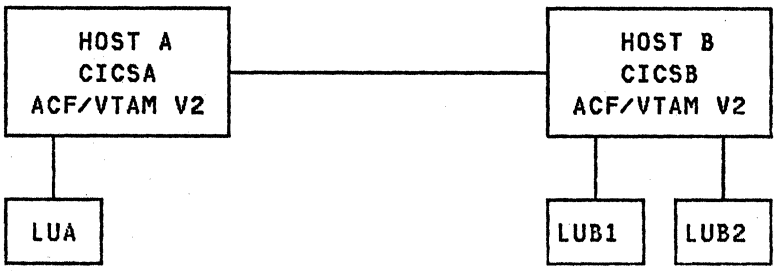
ACF/VTAM V2 allows a dynamic definition of one side of the session partners. During a session setup the LU which initiates the session request is the **requesting** LU, the other side is the **requested** LU.

Only the requested LU (the destination of the session request) has to be predefined in the host of the requesting LU. The requesting LU (the origin of the session request) does not need to be predefined in the host of the requested LU, as the necessary information about the requesting LU can be

found in the session request command, and the definition will be dynamically built.

This dynamic definition has to be authorized in the CDRM definition statement of both hosts. This implies that both hosts have to be at ACF/VTAM V2 level.

Figure 31 illustrates the necessary definitions.



1. LUA logs on to CICSB
2. CICSA acquires LUB1 (printer with LOGAPPL=CICSA)
3. LUB2 logs on to CICSA

Case	Requesting LU	Requested LU
1.	LUA	CICSB
2.	CICSA	LUB1
3.	LUB2	CICSA

CDRSC definitions in	
HOST A	HOST B
CICSB CDRSC LUB2 CDRSC (LUB1 CDRSC)	CICSA CDRSC (LUA CDRSC)

Figure 31. Example of Dynamic CDRSC Definition

Note:
Definitions in parentheses show additional definitions required **without** dynamic CDRSC definition.

10.1.5 Support of new functions of CICS/VS 1.6.

ACF/VTAM V2 is the base for enhanced sessions which CICS/VS 1.6 can set up with new terminals (office systems) and other CICSs.

10.1.6 Support of the IBM 3705 on an IBM 4331 Channel

In addition to devices attached via links on the CA, ACF/VTAM V2 now supports a channel-attached 3705 controller and all the devices connected to it.

Thereby, ACF/VTAM V2 combines the functions of ACF/VTAME and ACF/VTAM R2 or R3.

This allows to expand the network beyond the limits of the CA to the number of lines attachable to a 3705 without the need to migrate to another VTAM version.

It also allows better backup facilities for host failures. An IBM 4331 can now take over parts of a network whose host has failed, provided that both hosts share the NCP to which the network is attached.

10.1.7 Configuration Restart

Configuration restart is an ACF/VTAM facility that maintains information that an operator can use to reactivate a network to a pre-failure status.

The user can define VSAM datasets where minor and major node activation and deactivation are recorded.

The configuration restart is initiated by the operator after

- an ACF/VTAM failure,
- a host operating system or processor failure,
- a communication controller or an NCP failure from which VTAM did not immediately recover,
- deactivation of a domain in the network by the operator.

ACF/VTAM will then restart the network to its status (active or inactive) before the failure occurred.

10.2 CHANGES FROM ACF/VTAME

The following changes have to be made when migrating from ACF/VTAME to ACF/VTAM V2. Only those changes required to prevent definition errors and to allow proper operation are listed.

Optional changes which would invoke new functions are not listed. Please refer to the Planning and Installation Reference Manual, chapter 13: 'Migration' for a complete list of changes.

Do not change definitions which belong to the production system.
It is recommended that you copy the whole existing ACF/VTAM related procedures, jobs, etc. into a different ICCF library, then rename the ICCF members and change the job names. The names should have a reference to ACF/VTAM V2, e.g., the CATAL job for ACF/VTAM V2's ATCSTR00 is named V2STR00C.

Change in all these jobs the 'TO library' from USRxL1 to USRxL2.
ACF/VTAM related assembly/link jobs have LIBDEF SEARCH chains, which have PRDxLG in front of PRDxLC!

If not available, create the USRxL2 library set via the IPF Dialogs.
Now modify the definitions as mentioned below and submit the updated members to VSE.

Beware, that the ACF/VTAM V2 start job, the CICS/VS start job and other ACF/VTAM application start jobs have changed LIBDEF SEARCH chains, PRDxLG in front of the PRDxLC, USRxL2 in front of USRxL1.

When ACF/VTAM V2 is active, release only ACF/VTAM application start jobs, which have the changed LIBDEF SEARCH chain. Otherwise these applications will fail.

10.2.1 Operating System

ACF/VTAM V2 requires VSE/AF Release 3. If you migrate from ACF/VTAME and still are at a lower release level of VSE, you have to migrate to the required VSE release first.

10.2.2 CNM Applications

ACF/VTAM V2 only supports NCCF Rel.2. If you migrate from ACF/VTAME and still are at a lower release level of NCCF, you have to migrate to the required NCCF release. You can do that first under ACF/VTAME.

10.2.3 IPL Definitions

You can use the same IPL definitions as in the ACF/VTAME environment.

10.2.4 Startup Definitions

ACF/VTAM V2 requires more storage in the ALLOC and ALLOCR statements than for VTAM/E. If you used the storage estimates in the ACF/VTAME Installation manual to determine the space requirements precisely, repeat the estimates with the formulae from ACF/VTAM V2 Planning and Installation Reference.

Do not use SIZE=AUTO for the EXEC statement on the VTAM startup deck. The correct value is 1130K. See the Chapter 8 for details.

Otherwise use the values given in Chapter 5, section 'Startup Definitions'. These values should provide space for a medium to large size network.

10.2.5 USS Table (USSTAB)

ACF/VTAME was able to segment data which were sent over the SSCP-LU session (e.g. USS messages) to the terminal. This facility could be used to send full-screen messages (e.g. USSMSG 10) to terminals whose input buffer was smaller than the data size.

This is no longer true in ACF/VTAM V2. Now, the maximum RU size (data plus SNA headers) **may not** exceed the device buffer size. This implies that the former full-screen USS messages have to be shortened to maximum buffersize (e.g. 256 bytes for remote SNA devices).

Note:
This applies only for the SSCP-LU session (not for the LU-LU session) and for locally and remotely (via a CA line) attached devices (not for NCP attached devices, as the NCP will perform the segmentation).

10.2.6 ACF/VTAM Definitions

The following definition statements have changed from ACF/VTAME:

Local devices

Your existing LOCAL statements may need the following changes:

- The (NO)SELPEN parameter of the FEATURE2 operand is no longer valid.

- The (NO)EDATS parameter of the FEATURE2 operand has been added for devices with extended data stream (e.g. 8775 with graphics support).

Remote devices

The GROUP statement for CA attached devices may need to be changed:

- There is no default value for LNCTL (formerly SDLC). If you have an SDLC line you have to code LNCTL=SDLC.

The LINE or GROUP statement needs to be changed:

- The INBFRS operand has been replaced by MAXBFRU.

- The (NO)SELPEN parameter of the FEATURE2 operand is no longer valid.

Application programs

The (N)VPACE parameter of the AUTH operand in the APPL statement has been added.

PATH statements

PATH statements must be coded also for cross domain routes where the destination subarea is the adjacent subarea. Additionally, the format of the PATH statements has changed.

10.2.7 Start Options

- The UECB buffer pool is no longer used. Therefore, if you have defined it for VTAM/E, delete this buffer definition from your start list(s). The VPBUF may need to be increased by an amount similar to that of the old UECB buffer.

- The default base number and buffer size of the other buffers have changed. If you have user defined buffer values, change them or let them default to reflect the new buffer size and base number. See chapter eight of this manual.

10.2.8 ACF/VTAM Start Job

Pick up your production system ACF/VTAME start job (prepared as mentioned above) and change the LIBDEF SEARCH chains in this job.:
Replace PRDxLC by PRDxLG, USRxL1 by USRxL2!

10.2.9 Operator Commands and Messages

The syntax of the MODIFY and the DISPLAY STATIONS command has changed. Refer to the ACF/VTAM V2 Operation manual for details.

The differences, however, should cause no migration concern, because the old format of the commands will also be accepted.

10.2.10 Test of Your Customized ACF/VTAM V2 Definitions.

Go to the same section in Chapter 5 and return after completion of the described tests.

10.2.11 CICS/VS

You have to change only your CICS/VS start job. Pick up your production system CICS/VS start job (prepared as mentioned above) and change the LIBDEF SEARCH chains in this job:

PRDxLG in front of the PRDxLC!

Submit the job into the VSE/POWER queue and release after ACF/VTAM V2 is active.

10.2.12 Test of CICS/VS with ACF/VTAM V2 Definitions.

Go to the same section in Chapter 5 and return after completion of the described tests.

If the tests are correct, you may use ACF/VTAM V2 in production. After some production days you may delete your ACF/VTAME from the PRDxLC library set.

You also may replace (CORGZ) the ACF/VTAME definitions in USRxL1 by the ACF/VTAM V2 definitions of USRxL2.

If you do this, do not forget to correct the LIBDEF SEARCH chains.

10.3 MIGRATION CONFIGURATIONS

Configurations containing ACF/VTAME nodes that are providing an 'IRN' routing function must be migrated to ACF/VTAM V2 in a specific order. IRN (Intermediate Routing Node), formerly called INN (Intermediate Networking Node) means that this host is neither the origin nor the destination for data passing through this node.

The order of ACF/VTAME node migration must be as follows:

ACF/VTAME nodes that are **not** providing an IRN routing function may be migrated to ACF/VTAM V2 one at a time. If these ACF/VTAME nodes are upstream connected (via an NCP to a host), the adjacent ACF/NCP nodes may also be migrated to ACF/NCP R3 (or higher) one at a time.

All peer connected ACF/VTAME nodes that are providing an IRN routing function must be migrated to ACF/VTAM V2 simultaneously after all non-IRN ACF/VTAME nodes have been migrated. If these ACF/VTAME nodes are upstream connected, the adjacent ACF/NCP nodes must also have been migrated to ACF/NCP R3 (or up).

Examples of non-IRN Node Migration

Figure 32 shows a peer connected ACF/VTAME configuration where neither HOST1 nor HOST2 provides an IRN function. Both hosts can migrate to ACF/VTAM V2 one at a time.

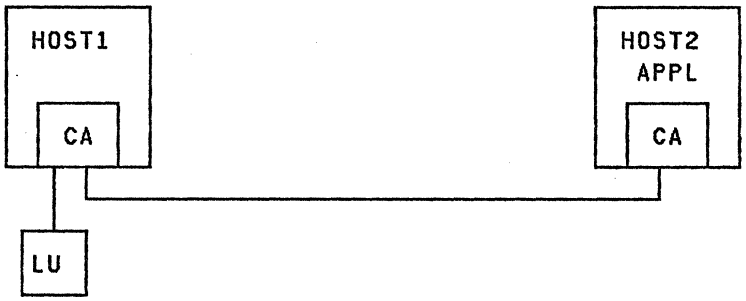


Figure 32. Peer Non-IRN Configuration

Figure 33 on page 173 shows a upstream connected ACF/VTAME configuration where HOST1 is not providing an IRN function. HOST1 can migrate to ACF/VTAM V2 and NCP2 can migrate to ACF/NCP R3 (or up) one at a time.

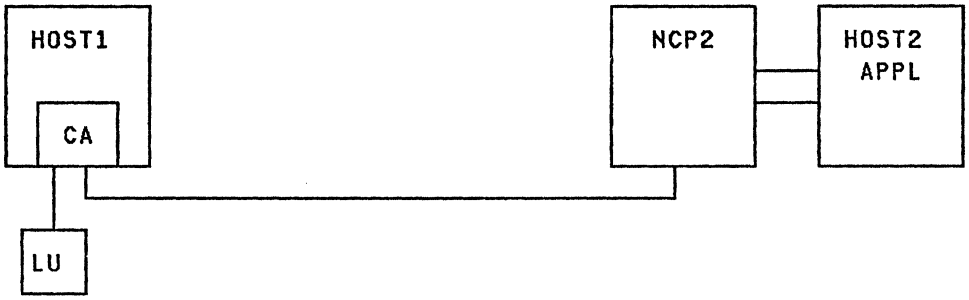


Figure 33. Upstream Non-IRN Configuration

Examples of IRN Node Migration

Figure 34 shows a peer connected ACF/VTAME configuration where HOST2 provides an IRN function. HOST2 cannot migrate to ACF/VTAM V2 unless HOST1 and HOST3 have been migrated to ACF/VTAM V2.

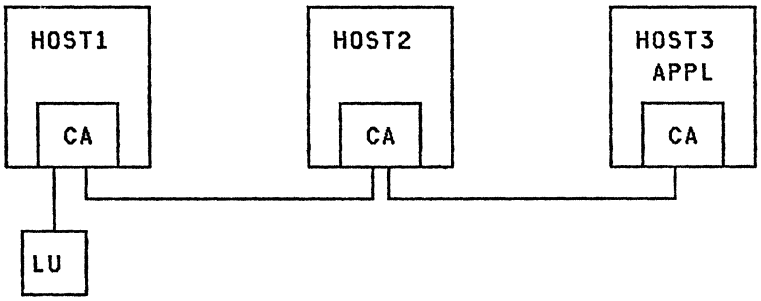


Figure 34. Peer IRN Configuration

Figure 35 shows a upstream connected ACF/VTAME configuration where HOST2 is providing an IRN function. HOST2 cannot migrate to ACF/VTAM V2 unless HOST1 has been migrated to ACF/VTAM V2 and NCP3 has been migrated to ACF/NCP R3 (or up).

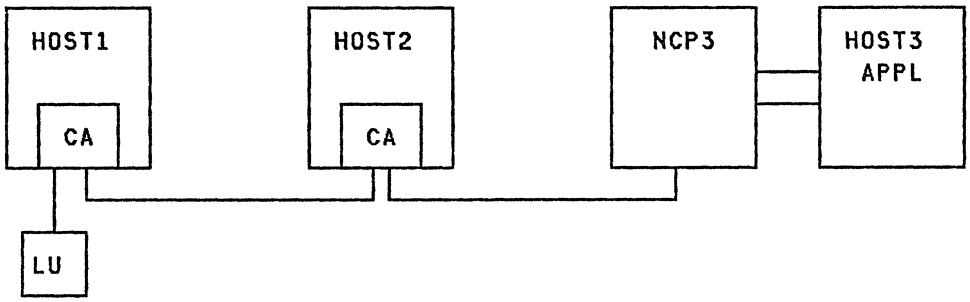


Figure 35. Upstream IRN Configuration

10.4 COEXISTENCE OF ACF/VTAME AND ACF/VTAM V2R1

In a multi-domain network ACF/VTAME and ACF/VTAM V2 nodes can coexist and can be connected peer-to-peer.

There are some items which have to be considered in such an environment. They will be described separately from the viewpoint of each side.

ACF/VTAME

Whether or not ACF/VTAME is connected to another ACF/VTAME or ACF/VTAM V2 is transparent to ACF/VTAME. There are no definition changes in ACF/VTAME if it is connected to an ACF/VTAM V2.

ACF/VTAM V2

For ACF/VTAM V2 an ACF/VTAME node is a migration node. This implies that certain restrictions apply:

As ACF/VTAME does not support the new routing structure, only ER0 and VR0 (the migration route) may be defined as routes between ACF/VTAM V2 and ACF/VTAME. This also implies that there are no alternate routes to a migration node.

As ACF/VTAME does not support the dynamic CDRSC definition, all CDRSCs in both ACF/VTAM V2 and ACF/VTAME have to be defined statically.

11.0 BTAM-ES TO ACF/VTAM V2 MIGRATION

It is assumed that the user has an IBM 4331 with locally and remotely attached IBM 3270s. CICS/VS is running with BTAM-ES or the terminals are driven by BTAM application programs.

This chapter contains information about the migration steps necessary to run the existing network with ACF/VTAM and CICS/VS.

11.1 PREREQUISITES TO THIS CHAPTER

There are many ways to migrate from BTAM-ES to ACF/VTAM.

1. You define all non-SNA IBM 3270s to ACF/VTAM and migrate your applications immediately.

2. To ease the transition from BTAM-ES to ACF/VTAM, you may want to do in two stages:
   Existing non-SNA IBM 3270 terminals continue to run with BTAM-ES.

   - Existing application programs that use BTAM macros directly need not be changed, but assigned terminals and lines can only be used by the partition in which the application is running. All new SNA terminals cannot work with these applications.

   - CICS/VS definitions must be expanded so that CICS/VS can run with BTAM-ES and ACF/VTAM.

     All new SNA terminals are defined as ACF/VTAM resources. The non-SNA terminals are defined as before but you have all the disadvantages of assigned BTAM devices.

   In a second stage all non-SNA IBM 3270 devices will be attached to ACF/VTAM.

   - Recode the BTAM application programs to CICS/VS application programs and make the CICS/VS tailoring.

   - Define the non-SNA devices to CICS/VS.

   With this method you will resume production faster but you have to do a lot of work twice.

11.1.1 Hardware

It is assumed that the environment is in production state. The attached terminals, control units and modems are operating.
You have prepared the Configuration Documentation Sheet as described in Chapter 3.

11.1.2 Software

The installation of ACF/VTAM is completed as described in Chapter 4.

You have copied all ACF/VTAM definition books from the SIPO/E 3.1 SAMPLIB to the ADMINISTRATOR-LIB. Following CICS/VS-production tables

- DFHPCTxx
- DFHPPTxx
- DFHSITxx
- DFHTCTxx

and the CICS/VS start job are reproduced and available with different member names in the ADMINISTRATOR-LIB. One example is PCTSVCAT in a single system environment.

Do not mix your migration definitions with your production definitions, but create a separate test environment.

11.1.3 Application Programs

Existing application programs that use BTAM macros directly must be rewritten with ACF/VTAM macros to operate with ACF/VTAM or you convert these BTAM application programs into CICS/VS application programs.

Application programs that use an IBM application subsystem such as CICS/VS should require few changes, if any, to run on ACF/VTAM.

11.1.4 Naming Conventions

Before you start with any ACF/VTAM or CICS/VS definitions you should choose your naming conventions depending on your environment whether it be single or multi system.

Go to the chapter which matches your environment.
Read this chapter to the section 'Definitions' and return.

Fill the node names into your Configuration Documentation Sheets and continue with the next steps.

11.2 IPL DEFINITIONS

If you make a migration without adding new devices there is no need to change your IPL procedure. Otherwise go to Chapter 5, section 'IPL Definitions' and add the new devices/lines in a renamed copy (e.g. $IPLVT) of your existing ASI-IPL procedure.

11.3 ACF/VTAM JOB PRIORITY

The partition containing ACF/VTAM should have higher priority than the CICS/VS partitions, therefore go to Chapter 5 section 'Startup Definitions' and include the recommended changes in renamed copies (e.g. $xJCLVT) of your existing ASI-JCL procedures. Submit the job and return to continue with the next steps.

11.4 ACF/VTAM DEFINITIONS

Go to the chapter which matches your environment, section 'ACF/VTAM Definitions' and define your ACF/VTAM major and minor nodes.
Use the SIPO/E 3.1 supplied ACF/VTAM books and modify them as described in this section.

Beware, that on a switched line, the CA only supports SDLC IBM 3270's with ACF/VTAM.

Return and continue with the next steps.

11.4.1 Selecting ACF/VTAM Start Options

Go to the chapter which matches your environment, section 'Selecting ACF/VTAM Start Options' and return to the next steps.

11.5 TEST OF YOUR CUSTOMIZED ACF/VTAM DEFINITIONS

Now you are ready to test your definitions.
Be sure that the:

- procedures and B.books are cataloged in USRSL1 as recommended in the previous steps,
- USSTAB(s) are cataloged in the USRCL1 (if necessary in your environment),
- ACF/VTAM start job is submitted,
- devices and lines you want to test are not assigned to other partitions,
- active ASI-IPL/JCL procedures reflect the network and the ACF/VTAM requirements.

11.6 CICS/VS DEFINITIONS

The main task to be performed is the modification of the CICS/VS tables. The table which interfaces with ACF/VTAM in defining the communication environment of CICS/VS is the

DFHTCTxx

But also the following tables have to be modified:

DFHPCTxx
DFHPPTxx
DFHSITxx

Pick up the catal jobs of these tables (prepared as mentioned at the beginning of this chapter) and modify them as described below.

11.6.1 Terminal Control Table Generation

DFHTCT TYPE=INITIAL macro

Exchange the entire macro with the DFHTCT$O INITIAL macro.
If desired modify APPLID and GMTEXT.
APPLID has to reflect the name chosen in the APPL minor node.
SUFFIX has to be different to your production TCT suffix.

DFHTCT TYPE=SDSCI/LINE/TERMINAL macros describing the console:

There is no need to change the console describing macros.

DFHTCT TYPE=SDSCI/LINE macros preceding user terminals:

Delete these macros, they are not longer necessary.

DFTRMLST AUTOWLST/OPENLST

Delete these definitions, they are not longer necessary

DFHTCT TYPE=TERMINAL macros describing IBM 3270s:

Add

ACCMETH=VTAM
GMMSG=YES
NETNAME=minor node name (used in the LU, LOCAL, TERMINAL macro)
RELREQ=(NO,YES)

Change

LASTTRM=POOL/LINE to LASTTRM=VTAM in the last terminal defined in this TCT
TRMIDNT=xxxx corresponding to your naming conventions

Delete

COMPAT=NO
LASTTRM=POOL/LINE in the last terminal macro of a pool/line
LVUNIT=x
POLLPOS=x
TRMADDR=xxxx
TRMPRTY=0

Note:
As IBM 3270 terminals are the only non-SNA terminals supported by ACF/VTAM, the definitions of all other devices remain unchanged. These devices have to be defined prior to the first ACF/VTAM terminal definition. If these devices are attached to a CA line, this line must run under BTAM-ES control.

If you have a multipoint line with non-IBM 3270s and IBM 3270 terminals attached to it, all terminals must be defined as before. Beware that on a switched line, the CA only supports SDLC IBM 3270s with ACF/VTAM.

New SNA/SDLC devices have to be defined as described in Chapter 5, section 'CICS/VS Definitions'.

11.6.2 Program Control Table Generation

Beware, that the following GROUP entries are in your renamed table:

```
RESEND   DFHPCT TYPE=GROUP,                                    X
                  FN=RESEND
RESPLOG  DFHPCT TYPE=GROUP,                                    X
                  FN=RESPLOG
VTAM     DFHPCT TYPE=GROUP,                                    X
                  FN=VTAM
VTAMPRT  DFHPCT TYPE=GROUP,                                    X
                  FN=VTAMPRT
```

Otherwise you have to expand your prepared PCT catal job with these entries.

11.6.3 Program Processing Table Generation

Beware, that the following GROUP entries are in your renamed table:

```
RESEND   DFHPPT TYPE=GROUP,                                    X
                  FN=RESEND
RESPLOG  DFHPPT TYPE=GROUP,                                    X
                  FN=RESPLOG
VTAM     DFHPPT TYPE=GROUP,                                    X
                  FN=VTAM
VTAMPRT  DFHPPT TYPE=GROUP,                                    X
                  FN=VTAMPRT
```

Otherwise you have to expand your prepared PPT catal job with these entries.

Users with a generated **Terminal Error Program** refer to: CICS/VS System Programmer Reference Manual for how to generate the ACF/VTAM Node Error Program.

11.6.4 System Initialization Table Generation

Change your prepared SIT catal job as described below.

```
PCT=xx              VTAM PCT
PPT=(xx,COLD)       VTAM PPT
TCP=E$
TCT=(xx,COLD)       VTAM TCT
ZCP=E$
```

11.6.5 CICS/VS Execution

Take your reproduced and renamed CICS/VS production job, and change it as shown below:

```
* $$ JOB JNM=IVFCVxx,DISP=L,CLASS=2
// JOB ICVCVxx
 .......
// LIBDEF CL,SEARCH=(USRSL1,PRDCLB,PRDCLG,PRDCLC),FROM=IJSYSRS,TEMP
 .......
SIT=xx
 .......
/*
/&
* $$ EOJ
```

Note:

```
     xx = SV                in a Single System Environment
     xx = subarea number    in a Multi System Environment
```

Submit this job into the POWER/VS reader queue and release it after ACF/VTAM is started.

11.7 TEST OF YOUR CUSTOMIZED CICS/VS DEFINITIONS

Go to the same section in Chapter 5 and continue as described there.
If your CICS/VS is running only with ACF/VTAM you may delete your BTAM-ES from the SIPO/E 3.1 library sets after some production days. Thereafter, your CICS/VS BTAM-ES environment will not run any more.

If you have added only new SNA terminals to CICS/VS, you start with the definitions of your non-SNA 3270s in ACF/VTAM and CICS/VS now. Follow again the sequence described earlier.

12.0 CNM CUSTOMIZATION

This chapter is to aid in the implementation and tailoring of NCCF, NPDA and VSE/OCCF. Additional information can be found in the document Communication Network Management: Using the CNM Tools.

The following sections describe the customization sequence via definition jobs from the SIPO/E 3.1 SAMPLIB.
You should have copied these jobs to your ADMINISTRATOR Lib and prepared as mentioned in Chapter 4. You should review these job streams to determine how they are applicable to your needs.

The installation process is not described in this primer, as it is part of the SIPO/E 3.1 IPF Install Product Dialogs.

Refer to IPF VSE Feature User's Guide Rel. 4.1, page 85 (Install Products), for more information.

12.1 NETWORK COMMUNICATION CONTROL FACILITY (NCCF)

The SIPO/E 3.1 contains NCCF Release 2 (5735-XX6).

NCCF is a program product designed to let you control, record and automate various network operator tasks. It runs as an ACF/VTAM application program and provides a base for IBM's Communication Network Management program products.

NCCF allows the control of the network to be removed from the main system console and be placed on one or more other terminals in the network, either in the same or different domains. In addition, the optional feature 'Terminal Access Facility' allows you to use the NCCF terminal to communicate with CICS, HCF or a remote NCCF. TAF allows any combination of these subsystems to be controlled simultaneously from one NCCF terminal without requiring the operator to log off NCCF or to use separate, dedicated NCCF terminals for controlling each subsystem. Remote NCCF access can also be obtained by use of the NCCF-NCCF cross-domain ability, where one NCCF program establishes a session with another NCCF in another domain. In either way, control of a multi-systems network can be provided from a single screen logged on to one NCCF program.

The facilities provided by NCCF allow you to streamline the daily operation of your network by providing the ability to write your own command lists, command processors, exit routines and subtasks.

Command Lists

Command lists, or CLISTS, contain sequences of ACF/VTAM, NCCF and user-written commands stored in a file. These CLISTS can be invoked by the NCCF operator or by the solicited or unsolicited messages received from ACF/VTAM. Here is an example of a simple NCCF CLIST:

```
FORCE CLIST
NET,INACT,ID=&1,F
D NET,E,ID=&1
&EXIT
```

If the operator enters 'FORCE L020B01', L020B01 will replace the &1 in the CLIST and the two ACF/VTAM commands will be executed. Use of CLISTS can greatly shorten the number and length of commands that an operator needs to enter.

Command Processors

NCCF command processors can be user written or supplied by IBM. They allow the user to tailor, modify and extend the NCCF program. The command processors are written in assembler language, assembled, link edited into phases and the name is included in the NCCF definitions.

Various facilities are provided by NCCF for writing command processors and a complete guide can be found in the NCCF Customization manual.

One example of an IBM-supplied NCCF command processor is Network Problem Determination Application (NPDA) which is described later in this chapter.

Exit Routines

User-written exit routines can be called from various points in NCCF processing. These allow such facilities as PF key definition for CLISTS, console message manipulation and message logging to hard-copy.

Subtasks

User written subtasks may be written to further customize NCCF. For example, a subtask may be written to centralize a process that would be used by several different subtasks, such as access to a database.

Complete information on the above facilities can be found in the NCCF Customization manual.

Note:
The NCCF Installation manual should be used as a reference during the installation process.

12.1.1 Naming Conventions

Before you do your NCCF definitions you should decide on a naming convention for the NCCF definitions, particularly if you are working in a cross-domain environment. The following naming convention is suggested:

Type	Name
NCCF operators	OPss#N1
NCCF main task	AssN1
NCCF POI task	AssN1PPT
NCCF operator station tasks	AssN1000 ... AssN1nnn

Figure 36. NCCF Naming Convention

O = Operator
N = NCCF
ss = subarea number
# = sequence number
A = application
PPT = primary POI task(ACF/VTAM Program Operator Interface)
nnn = maximum number of operator station tasks

12.1.2 JCL Startup Statements

NCCF must run in a partition with a priority second to ACF/VTAM:

e.g. PRTY FB,FA,F9,F8,F7,F6,F5,BG,F2,F4,F3,F1

F3 = ACF/VTAM
F4 = NCCF
F1 = VSE/POWER
F2 = CICS/VS
etc.

Note:
If you are going to use OCCF, see the section on OCCF in this chapter.

The SAMPLIB member NCNPST is an example of a job stream that will start NCCF in F4.

```
* $$ JOB JNM=N1START,CLASS=4,DISP=L
// JOB N1START
* ********************************************************************
*          THIS JOB STARTS NCCF IN F4                                  *
* ********************************************************************
// DLBL DSILOGP,'NCCFPLOG',,VSAM,CAT=SIPOEUC
// EXTENT SYS022,SYSWK1
// DLBL DSILOGS,'NCCFSLOG',,VSAM,CAT=SIPOEUC
// EXTENT SYS023,SYSWK1
// LIBDEF CL,SEARCH=(USRCL1,PRDCLG,PRDCLC),FROM=USRCL1
// LIBDEF SL,SEARCH=(USRSL1,PRDSLG,PRDSLC),TEMP
// EXEC DSIDPR,SIZE=AUTO
/*
/&
* $$ EOJ
```

Note:
The DLBL 'file names' (in this case DSILOGP and DSILOGS) have to be consistent with those in the DSTINIT definition. The 'file ids' (NCCFPLOG and NCCFSLOG) have to be consistent with the VSAM Cluster name.

12.1.3 NCCF Definitions

Defining the NCCF Domain

NCCF allows you to have multiple network operators. These operators may be stationed at various locations in your network. Therefore, you need to specify the terminals to which your NCCF operators will log on. To define the NCCF terminals the POS or POSPOOL statements are used.

The POS statement defines these terminals by name, while the POSPOOL statement allows an operator to log on to a certain number of devices that have not been previously defined to NCCF. Coding one of these statements is required; both may be specified.

Pick up the SAMPLIB member DSIDMN from the ADMINISTRATOR Lib and modify according to your naming conventions. Use POSPOOL statements to replace or enhance the POS statements. In these samples the NCCF and the multi-system environment naming conventions are used.

Statements such as POS, POSPOOL, CDMNSESS and MAXSPAN allocates storage for these functions so they should not be used indiscriminately.

```
// JOB N1DMNCT                    CATAL DSIDMN
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
*  CATALS B.DSIDMN
   BKEND
*************************************************************************
*           DEFINES THE NCCF ENVIRONMENT                                *
*************************************************************************
         NCCFID   DOMAINID=A60N1,DMNPSW=PDM60N1  40
         OPTIONS  VERIFY=NORMAL
         POS      T60010,T60011                  41
         POS      T60012,T600301
         POSPOOL  2
         CDMNSESS 2                              42
         MAXSPAN  6                              43
         MAXABEND 2
         MAXLOGON 3
N1NPDA   TASK     MOD=DSIZDST,TSKID=BNHDSERV,INIT=Y,PRI=1,MEM=N1NPDA44
N1LOG    TASK     MOD=DSIZDST,TSKID=DSILOG,PRI=1,MEM=N1LOG,INIT=Y
         ACCESS   METHOD=V,LEVEL=2
         END
   BKEND
/*
/&
```

Defining the NCCF Data Services Task

Pick up the SAMPLIB member LOGREF, which defines the data services task of NCCF.

---

40 The DOMAINID parameter must match your ACF/VTAM application minor node name for the NCCF main task. The DMNPSW must match the PRTCT name in the NCCF application definition (APPL) statements.

41 The POS parameter must match your ACF/VTAM LU names.

42 This will allow 2 stations in other domains to log on.

43 This NCCF program can handle 6 SPANS of control.

44 These TASK statements are required for NPDA.

```
// JOB LOGREF                    CATAL LOGREF
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.N1LOG
   BKEND
*****************************************************************
*  INITIALIZATION PARAMETERS FOR THE DATA SERVICES TASK OF NCCF  *
*****************************************************************
 DSTINIT PDDNM=DSILOGP,SDDNM=DSILOGS,DSRBO=1,XITVN=DSIWLMED,FUNCT=VSAM
   BKEND
/*
/&
```

Note:
The B.book name must agree with the label given to the TASK definition statement for DSILOG (see DSIDMN).

Defining the Commands and Command Lists to NCCF

You need to define commands or verbs which NCCF can process. Pick up job DSICMD, and modify as follows:

```
// JOB N1CMDCT       CATAL DSICMD
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.DSICMD
   BKEND
* *****************************************************************
*     NCCF COMMANDS OR VERBS                                      *
* *****************************************************************
AGAIN     CMDMDL   MOD=DSIAGAIN
AT        CMDMDL   MOD=DSIATP,TYPE=R
AUTOWRAP  CMDMDL   MOD=DSIAWP,TYPE=I
CANCEL    CMDMDL   MOD=DSICAP,TYPE=I
CLEAR     CMDMDL   MOD=DSICKP,TYPE=I,CTL=S
 ....... etc...    ......
 ....... etc...    ......
ROUTE     CMDMDL   MOD=DSIRTP
START     CMDMDL   MOD=DSISRP
STOP      CMDMDL   MOD=DSISTP
SWITCH    CMDMDL   MOD=DSISWCP,TYPE=RD,CTL=N
* *****************************************************************
*     PF KEY SETTINGS for NCCF COMMANDS                           *
* *****************************************************************
2         CMDMDL   MOD=ICMNCMD,TYPE=R,CTL=S    PFK 2   OCCF
4         CMDMDL   MOD=DSICAP,TYPE=I,CTL=S     PFK 4   CANCEL
5         CMDMDL   MOD=DSIRSP,TYPE=I,CTL=S     PFK 5   RESET IMMEDIATE
:         CMDMDL   MOD=BNHPNPDA,CTL=S          PFK 10  NPDA
#         CMDMDL   MOD=DSIAWP,TYPE=I,CTL=S     PFK 11  AUTOWRAP
@         CMDMDL   MOD=DSIENP,TYPE=I,CTL=S     PFK 12  LOGOFF
B         CMDMDL   MOD=ICMNCMD,TYPE=R,CTL=S    PFK 14  OCCF
D         CMDMDL   MOD=DSICAP,TYPE=I,CTL=S     PFK 16  CANCEL
E         CMDMDL   MOD=DSIRSP,TYPE=I,CTL=S     PFK 17  RESET IMMEDIATE
```

```
¢         CMDMDL   MOD=BNHPNPDA,CTL=S          PFK 22  NPDA
.         CMDMDL   MOD=DSIAWP,TYPE=I,CTL=S     PFK 23  AUTOWRAP
<         CMDMDL   MOD=DSIENP,TYPE=I,CTL=S     PFK 24  LOGOFF
* ************************************************************************
*     CLEAR KEY, ENTER KEY and PA1, PA2 SETTINGS                         *
* ************************************************************************
_         CMDMDL   MOD=DSICKP,TYPE=I,CTL=S     CLEAR   CLEAR
'         CMDMDL   MOD=DSINDP,TYPE=I,CTL=S     PA1     ENTER
%         CMDMDL   MOD=DSIAGAIN,TYPE=I,CTL=S   PA2     AGAIN
* ************************************************************************
*     ACF/VTAM    COMMANDS                                               *
* ************************************************************************
D         CMDMDL   MOD=DSIVTP
DISPLAY   CMDMDL   MOD=DSIVTP
F         CMDMDL   MOD=DSIVTP
MODIFY    CMDMDL   MOD=DSIVTP
V         CMDMDL   MOD=DSIVTP
VARY      CMDMDL   MOD=DSIVTP
R         CMDMDL   MOD=DSIREP
REPLY     CMDMDL   MOD=DSIREP
* ************************************************************************
*     NPDA        COMMANDS, VERBS  PFK10 HAS BEEN SET FOR NPDA           *
* ************************************************************************
NPDA      CMDMDL   MOD=BNHPNPDA,TYPE=R         NPDA PSCP
BNHIBMPD CMDMDL   MOD=BNHPNPDA,TYPE=R         NPDA PSCP
BNHUNSOL CMDMDL   MOD=BNHDNPDA,TYPE=RD        UNSOL DPCP NAME
REQMS     CMDMDL   MOD=BNHQNPDA,TYPE=R         PSCP (FOR SOLICITATION)
BNHIBMRQ CMDMDL   MOD=BNHQNPDA,TYPE=R         PSCP (FOR SOLICITATION)
* ************************************************************************
*     OCCF        COMMANDS                                               *
* ************************************************************************
OCCF      CMDMDL   MOD=ICMNCMD
O         CMDMDL   MOD=ICMNCMD
   BKEND
/*
/&
```

Note:
This book contains ACF/VTAM and NCCF, as well as NPDA and OCCF commands.

Defining NCCF Operators

You should modify the SAMPLIB job DSIOPF according to your naming convention.

Include as many operators as you may need.

```
// JOB N1OPFCT          CATAL DSIOPF
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.DSIOPF
   BKEND
************************************************************************
```

```
*     DSIOPF DEFINES NCCF OPERATORS AND THEIR PASSWORDS.
*************************************************************************
OP601N1  OPERATOR PASSWORD=POP601N1
         PROFILEN PROFSYS
OP602N1  OPERATOR PASSWORD=POP602N1
         PROFILEN PROFSYS
         END
   BKEND
/*
/&
```

Defining Operator Profiles

The job PROFSYS from ICCF SAMPLIB (lib. 59) is a sample of how to define characteristics of various NCCF operators by defining their profiles.

```
// JOB PROFSCT          CATAL PROFSYS
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.PROFSYS
   BKEND
*************************************************************************
*    PROFSYS DEFINES NCCF OPERATOR PROFILE NAMED PROFSYS
*************************************************************************
PROFSYS  PROFILE
         AUTH   CTL=GLOBAL,MSGRECVR=YES
         END
   BKEND
/*
/&
```

The following sections show how to create optional CLISTS and user exits to improve the usability of NCCF.

Defining an NCCF Command List

A command list can be written to :

- simplify the issuing of a command or series of commands to the system; for example, deactivating a set of ICA definitions and reactivating another set.

- provide additional function or to give more information to the operator, such as a 'HELP' function. A CLIST can be provided to display available CLISTS on the system.

- automatically provide a response to an ACF/VTAM message, or to automatically clarify the message before it is displayed.

When creating a CLIST, make the first statement:

<label> CLIST

This will define the CLIST to NCCF. If you want to use SCOPE[45] checking, you need to add a CMDMDL statement to the DSICMD for each CLIST as follows:

```
clistname CMDMDL MOD=DSICCP
```

Here is an example of a CLIST used to simplify the VARY ACTIVATE command. It allows you to enter:

```
ACT nodename <scope>          instead of

V NET,ACT,ID=nodename<,SCOPE=scope>
```

```
// JOB CATCLIST
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
   CATALS B.ACT
  CLIST
&CONTROL ERR
* VARY NET,ACT,ID=nodename,SCOPE=(COMP,ONLY,ALL,U)
&IF .&1 EQ .  &THEN &GOTO -TELL1
&A = &1
&B = &2
-TELL4
&SCOPE = &B
&IF .&SCOPE EQ . &THEN &SCOPE = U
&IF &SCOPE EQ A    &THEN &SCOPE = ALL
&IF &SCOPE EQ ALL  &THEN &GOTO -GO
&IF &SCOPE EQ C    &THEN &SCOPE = COMP
&IF &SCOPE EQ COMP &THEN &GOTO -GO
&IF &SCOPE EQ O    &THEN &SCOPE = ONLY
&IF &SCOPE EQ ONLY &THEN &GOTO -GO
-GO
&WRITE VARY NET,ACT,ID=&A,SCOPE=&SCOPE
VARY NET,ACT,ID=&A,SCOPE=&SCOPE
&EXIT
-TELL1
&WRITE * INPUT REQUIRED, RE-ENTER.
&EXIT
   BKEND
/*
/&
```

Further examples, details and hints on writing CLISTs can be found in the manual NCCF Customization.

---

[45] When you define NCCF operators and commands, you can limit the use of commands to an operator or group of operators. For example, you may want to restrict the use of the CLOSE or STOP FORCE commands to a subset of NCCF operators. See the NCCF Installation manual for details.

Creating an NCCF Exit

The NCCF macros are held in production service library 'G', so this will need to be restored before creating any NCCF exits.

To enable you to use PF keys to initiate CLISTS as well as commands, it will be necessary for you to provide code for user exit DSIEX01. This must be included in the NCCF library during installation. The following is an example of an NCCF exit DSIEX01[46] :

```
// JOB NCCFEX1
// LIBDEF SL,SEARCH=(USRSL1,PRDSLG,PRDSLC),TEMP
//    OPTION CATAL
      PHASE DSIEX01,*
//    EXEC ASSEMBLY
* ****************************************
* NCCF USER EXIT DSIEX01                 *
* ****************************************
*   This exit intercepts input from an NCCF screen
*
* PURPOSE
* *******
*   The purpose of this exit is to change the command verb
*   that is submitted when a program function key is used
*   from an operator terminal. This enables PF keys to be
*   used to submit command lists. Some keys are not changed,
*   so that they may be used to submit immediate commands.
*
* METHOD
* ******
*   The command verb begins with a percent sign (%) followed
*   by a character identifying the key (AID). The hex value of
*   the identifying character is used to look up a value in a
*   translate table. If the table value is zero, no action is
*   taken; if non-zero then the character identifying the PF
*   key is replaced by the value found in the table and the '%'
*   is changed to '$'.
          EJECT
*
*
*
* INPUT
* *****
*   (NOTE: % = HEX '6C')
*       PFKEY  Input  Hex          PFKEY  Input  Hex
*       -----  -----  ----         -----  -----  ----
*          1     %1   6CF1           13     %A   6CC1
*          2     %2   6CF2           14     %B   6CC2
*          3     %3   6CF3           15     %C   6CC3
```

---

[46] Please note that this code has not been subjected to any test and may not work.

```
*          4     %4   6CF4          16     %D   6CC4
*          5     %5   6CF5          17     %E   6CC5
*          6     %6   6CF6          18     %F   6CC6
*          7     %7   6CF7          19     %G   6CC7
*          8     %8   6CF8          20     %H   6CC8
*          9     %9   6CF9          21     %I   6CC9
*         10     %:   6C7A          22     %¢   6C4A
*         11     %#   6C7B          23     %.   6C4B
*         12     %@   6C7C          24     %<   6C4C
*
*      CLEAR     %_   6C6D         PA1     %%   6C6C
*                                  PA2     %>   6C6E
*      ENTER     %'   6C7C         PA3     %,   6C6B
*
* OUTPUT
* ******
*   PFKEY NO.  VALUE     PFKEY NO.  VALUE
*   ---------  -----     ---------  -----
*          1     $1           13     $D
*          3     $3           15     $F
*          8     $8           20     $H
*          9     $9           21     $I
*   ALL OTHER KEYS ARE UNCHANGED.
*
*   If you want to change a PF key to specify a command instead of a
*   CLIST or vice-versa, you will need to update the translate table
*   at the end of the routine.
*
* REGISTERS USED
* **************
*   R1,R2 USED BY TRT INSTRUCTION
*   R3    ADDRESS OF 1ST ENTRY IN PARSE TABLE
*   R4    ADDRESS OF PDB
*   R5    ADDRESS OF COMMAND VERB IN BUFFER
*
*************************************************
* ADDRESS PDB & DATA IN INPUT BUFFER            *
*************************************************
         EJECT
DSIEX01  CSECT
         DSICBS DSITIB,DSIPDB,DSISWB,DSIUSE,DSIMVT,DSISVL,DSITVB        *
               DEFER=ALL                  INCLUDE CONTROL BLOCKS AT END
         STM   14,12,12(13)               SAVE REGISTERS
         LR    10,15                      SET BASE ADDRESS
         USING DSIEX01,10
         LR    7,1                        MOVE USER EXIT P. LIST ADDR
         USING DSIUSE,7
         L     11,USERSWB                 LOAD SWB REG WITH SWB ADDR
         USING DSISWB,11
         LA    2,SWBSAVEA                 GET ADDR OF SAVEAREA
         ST    2,8(13)
         ST    13,4(2)
         L     4,USERPDB                  PDB ADDRESS IN R4
         USING DSIPDB,4                   ADDRESS PDB
```

```
         CLI   PDBNOENT+1,X'00'            DATA IN INPUT BUFFER
         BE    RETURN                      IF NOT , RETURN
         LA    3,PDBTABLE                  GET PDB ENTRY FOR CMD VERB
         USING PDBENTRY,3
         CLI   PDBLENG,X'02'               LENGTH CMD VERB EQ 2
         BNE   RETURN                      IF NOT RETURN
         L     5,PDBBUFA                   ADDRESS OF CMD BUF
         LH    1,PDBDISP                   DISPLACEMENT
         LA    5,0(1,5)                    R5 ADDRESS OF CMD VERB
*************************************************
*  IF NOT PA, PF, CLEAR OR RETURN KEY, RETURN    *
*************************************************
         CLI   0(5),C'%'           CHECK IF COMMAND STARTS WITH %
         BNE   RETURN              RETURN IF NOT
         TRT   1(1,5),TRTABLE      CHECK 2ND BYTE OF COMMAND
         BC    8,RETURN            RETURN IF ZEROS
         STC   2,1(5)              OR REPLACE 2ND CHAR
         MVI   0(5),C'$'           CHANGE 1ST CHAR TO $
RETURN   EQU   *
         L     13,4(13)
         LM    14,12,12(13)
         SR    15,15
         BR    14
TRTABLE  DC    74X'00'
         DC    X'000000'              PFKEYS 22-24
         DC    45X'00'
         DC    X'000000'              PFKEYS 10-12
         DC    68X'00'
         DC    X'C400C60000C90000D3'  PFKEYS 13-21
         DC    39X'00'
         DC    X'F100F30000F60000F9'  PFKEYS 1-9
         DC    6X'00'
         END
/*
// LIBDEF CL,TO=USRCL1,TEMP
//    EXEC LNKEDT
/&
```

The PF keys will be set up so that depressing PFK 1 will cause the CLIST $1 to be executed, PFK 3 will cause CLIST $3 to be executed and so on. These CLISTS should be coded according to the needs of your installation.

12.1.4 ACF/VTAM Definitions

Defining NCCF as an ACF/VTAM Application

You need to define the NCCF applications to ACF/VTAM. Job NCCFVLST in the SAMPLIB is a sample ACF/VTAM definition which you should modify according to your naming conventions.

You can define a separate major node for NCCF or include the APPL statements into existing application major nodes.

```
// JOB A602CT        ACF/VTAM APPL MAJOR NODE
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
        CATALS   B.A602
        BKEND   B.A602
*************************************************************************
*             APPL. MAJOR NODE FOR NCCF
*************************************************************************
A602     VBUILD TYPE=APPL
A60N1    APPL  AUTH=(ACQ,PASS),PRTCT=PDM60N1,EAS=6     47
A60N1PPT APPL  AUTH=(PPO),PRTCT=PDM60N1,EAS=1          48
A60N1000 APPL  AUTH=(SPO,ACQ),PRTCT=PDM60N1,EAS=2      49
A60N1001 APPL  AUTH=(SPO,ACQ),PRTCT=PDM60N1,EAS=2
A60N1002 APPL  AUTH=(SPO,ACQ),PRTCT=PDM60N1,EAS=2
A60N1003 APPL  AUTH=(SPO,ACQ),PRTCT=PDM60N1,EAS=2
A60N1004 APPL  AUTH=(SPO,ACQ),PRTCT=PDM60N1,EAS=2
A60N1005 APPL  AUTH=(SPO,ACQ),PRTCT=PDM60N1,EAS=2
A60N1006 APPL  AUTH=(SPO,ACQ),PRTCT=PDM60N1,EAS=2
BNHDSERV APPL  AUTH=(CNM),EAS=1                        50
        BKEND
/*
/&
```

The EAS values for the NCCF Main Task, the Primary POI Task and NPDA application statements should be coded as shown. For the other subtasks, the value should equal the number of domains with which the the subtask can start a session, plus one for the subtask's terminal.

The PRTCT names must match that provided in the NCCFID statement in the DSIDMN definitions. These are optional, and you may prefer to leave them out for the sake of simplicity. If you do leave them out, you should also leave out the DMNPSW on the NCCFID statement of the DSIDMN book.

It may be necessary to increase the MAXAPPL value on the ACF/VTAM startup list to accommodate the new applications that have been defined.

Create the NCCF Terminal Session Parameters

For each terminal that can be used as an NCCF operator station an entry in a LOGMODE table must be exist for that terminal. The entry name must be DSILGMOD (LOGMODE=DSILGMOD): this is required by NCCF.

---

47 Application statement for the NCCF Main Task.

48 Application statement for the Primary POI task.

49 You have to define at least one APPL statement (A60N1nnn) for each operator and hardcopy printer.
You also need one APPL statement for each NCCF - NCCF session in a multi-system environment.

50 Application statement for NPDA

It is recommended that you code three tables, each with a DSILGMOD entry: one for LU type 0 (non-SNA 3270s), one for LU type 1 (SNA printers), and one for LU type 2 (SNA displays). Details on how to code these tables can be found in the section 'User Defined ACF/VTAM tables' in Chapter 6 of this document.

Create the NCCF-NCCF Session Parameters

If you will be using NCCF-NCCF cross-domain sessions, as distinct from simple cross-domain logon to NCCF, you will need to:

1. Create an additional modetable with an entry for the application to application session (NCCF-NCCF), as follows-

```
// JOB  MODETAB
// LIBDEF CL,TO=USRCL1
// LIBDEF SL,SEARCH=PRDSLG
// OPTION CATAL
  PHASE DSIXDOM,*
// EXEC ASSEMBLY
DSIXDOM  MODETAB
DSILGMOD MODEENT LOGMODE=DSILGMOD,FMPROF=X'03',TSPROF=X'03',          X
               PRIPROT=X'20',SECPROT=X'20',COMPROT=X'4000',           X
               RUSIZES=X'0000',PSERVIC='000000000000000000000000'
         MODEEND
         END
/*
// EXEC LNKEDT
/*
/&
```

2. Modify the NCCF 'APPL' statements for the operator tasks in the application node B.book (A602 in the sample supplied) as follows:

```
A60N1000 APPL  AUTH=(SPO,ACQ),PRTCT=PDM60N1,EAS=2,MODETAB=DSIXDOM
   ...  ...   .... etc.
```

Updating the USS Table

To enable ease of logon to NCCF you should update the USS Table which is used by the terminal(s). The example provided in Chapter 6, section 'User Defined ACF/VTAM Tables', shows a USS table with an entry for logging on to NCCF.

This entry consists of the following statements, which, if added to your existing table will allow you to logon to NCCF by entering 'NCCF60' from the ACF/VTAM logon screen:

```
NCCF60  USSCMD CMD=NCCF60,REP=LOGON,FORMAT=BAL
        USSPARM PARM=APPLID,DEFAULT=A60N1[51]
        USSPARM PARM=LOGMODE
        USSPARM PARM=DATA
```

If you update a USS table, ACF/VTAM must be restarted before the change comes into effect.

12.1.5 Preparing NCCF

Creating the NCCF VSAM Space and Log Datasets

You need to define log files to NCCF. These files are used to record messages or commands sent to or from operator terminals.

Two log files are defined: a primary and a secondary one.

The SAMPLIB members NCCFVSP and NCCFCLU are samples of how to create VSAM space and the log files for NCCF.

Note:
You should refer to the system IPO/E dasd layout charts to choose unused space for the log files and evaluate where you want to place the log files on one of your disk packs. Modify and rename the jobs in the ADMINISTRATOR Lib before you submit them.

12.1.6 Starting NCCF

When you run the NCCF start up job stream, you will receive several messages. The messages that are normal if you are using the System IPO/E sample definitions are:

```
DSI086I  NCCF DSISPN NOT FOUND ON DISPARM
DSI090I  LOAD FAILED FOR NCCF MODULE DSIEX01
       ...etc. for each exit that is not coded
DSI090I  LOAD FAILED FOR NCCF MODULE DSIEX14
DSI112I  NCCF READY FOR LOGONS AND SYSTEM OPERATORS COMMANDS
DSI802A  REPLY WITH VALID NCCF SYSTEM OPERATOR COMMAND
DSI530I  DSILOG : DST IS READY AND WAITING FOR WORK
```

You should ignore messages DSI086I and DSI090I. A DSI090I message will occur for each exit that has not been coded. If you want to suppress these messages, code dummy routines for any unused exits as shown in the NCCF Customization manual, section 5-13.

---

[51] The default must be the name of the NCCF main task defined in the NCCF application major node; A60N1 shown here is consistent with that used in the application major node definition statements provided in this chapter.

Messages DSI112I and DSI802A indicate that NCCF is ready for system operator commands as well as terminal operators' logon commands.

Message DSI530I indicates that the NCCF log file is ready to be used.

12.1.7 Test of Your Customized NCCF Definitions

Testing of the installed NCCF system should consist of logging on to NCCF, testing out the use of ACF/VTAM commands and displays and NCCF CLISTs and logging off.

Logon

After starting up NCCF from the system console, log on to NCCF from a designated NCCF console by using the appropriate USS command. If you have used the USS table provided in this document, it will be 'NCCF60'.

You will then be presented with the NCCF logon screen. Enter the operator id and password in the identified fields and press enter. You should now have signed on to NCCF.

Operation

To permit automatic scrolling, enter 'AUTOWRAP'. Display various nodes in the network through the ACF/VTAM DISPLAY command and check that results are similar to those produced by executing the same commands from the system console (unless, of course, you have used the various NCCF facilities to change the messages).

Now check any CLISTS that you may have included.

Cross-Domain Sessions

If you have another NCCF program running in a different domain and both the NCCF programs are set up to establish NCCF-NCCF sessions, you can test the facility at this point. This is done by the use of the NCCF 'START' command:

START DOMAIN=domainid

..where domainid is the name of the other NCCF domain.

The cross-domain session can then be tested as for the primary domain, using the NCCF command:

ROUTE domainid,command

The command:

STOP DOMAIN=domainid terminates the session.

Logoff

To logoff from NCCF simply enter LOGOFF from the NCCF console.

Terminal Access Facility

If this feature is included in your system, test it by logging on to CICS (or another ACF/VTAM application program) by using the NCCF 'BGNSESS' command, the syntax of which can be found in the NCCF Terminal Use manual.

ENDSESS should be used to terminate the session.

To sign off from NCCF simply enter 'LOGOFF'.

NCCF Shutdown

To shutdown NCCF, enter:

MSG nn

.. where nn is the number of the NCCF partition.

When you receive a reply from VSE, enter:

n CLOSE

.. and NCCF will be shut down.

12.2 OPERATOR COMMUNICATION CONTROL FACILITY (OCCF)

The SIPO/E 3.1 contains VSE/OCCF Release 1 (5746-XC5).

The function of VSE/OCCF is to suppress messages, translate messages, automatically reply to messages or route messages to an NCCF console.

While NCCF works on ACF/VTAM messages only, OCCF can be used to handle all messages destined for the system console. OCCF can be used directly from the system console, from NCCF running on the same processor, or from a remote site. In this way, it is possible to control one or more remote VSE systems from a central site. This can be done in one of three ways.

1. Through an ACF/VTAM cross-domain logon to a remote NCCF application where its host also has OCCF. See Figure 37. This can be achieved from a host that does not have NCCF.

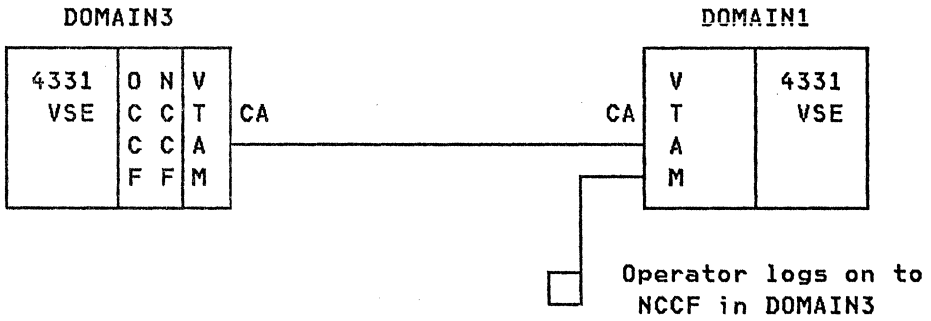


Figure 37. Cross Domain Logon to Remote NCCF

2. By the central NCCF application establishing a cross-domain NCCF-NCCF session with the remote site. A central NCCF operator can then receive and send messages to and from the remote NCCF, which in turn passes the these messages to and from OCCF on the same host. This requires that NCCF be implemented in both domains; it allows multiple remote sites to be controlled from one screen at a central site, without the necessity of the operator constantly logging on and off from the sites. See Figure 38.

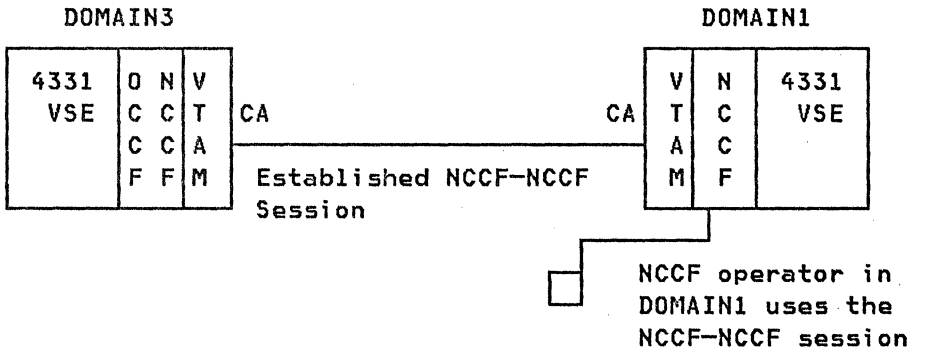


Figure 38. Use of the NCCF-NCCF Session

3. By using the NCCF feature TAF to allow an NCCF operator in the central site to log on to the remote NCCF. Again NCCF needs to be implemented in both sites, with TAF in the central site. This also allows multiple remote sites to be controlled from one screen at a central site, without the necessity of the operator constantly logging on and off from the sites. In addition, the screen can be used concurrently access other ACF/VTAM applications such as CICS/VS and TSO. See Figure 39.

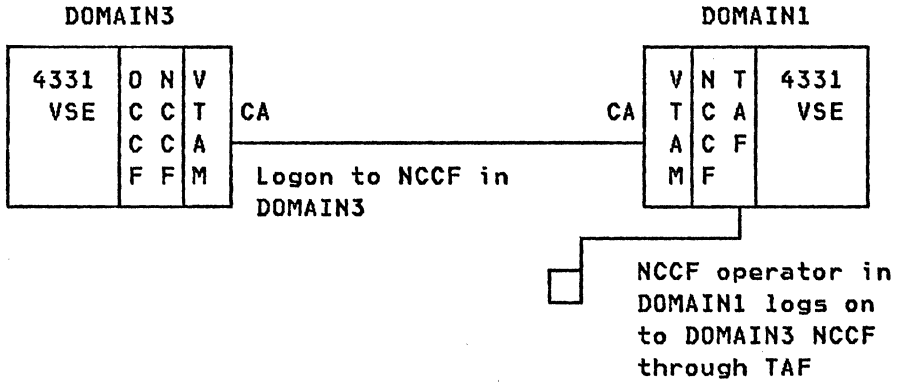


Figure 39. Use of TAF to log on to a Remote NCCF

OCCF allows you to tailor your OCCF system so that each message can be acted upon according to the needs of your installation.

With this in mind evaluate your installation message traffic and determine the action VSE/OCCF should take on each message or group of messages.

OCCF Verification

To verify the installation of VSE/OCCF, the IPF Verification Dialog creates a job stream, which will generate a VSE/OCCF action table, a message translation table, a VSE/OCCF start-up job stream, and a job stream to test the generated VSE/OCCF functions.

In the SERVICE.SYSSLB.A are three sample VSE/OCCF generation decks. They are catalogued in the A.sublib as OCCFS1, OCCFS2 and OCCFS3. Any of these may be modified to route messages to the NCCF operator to allow you to verify the installation of VSE/OCCF and NCCF.

Note:
Refer to VSE System IPO/E User's Guide Release 3.1 page 43 for more information.

12.2.1 JCL Startup Statements

VSE/OCCF with NCCF must run in a partition of higher priority than any for which it will handle messages. However, ACF/VTAM must be in a higher priority partition than VSE/OCCF:

e.g. PRTY FB,FA,F9,F8,F7,F6,F5,BG,F2,F1,F4,F3

F3 = ACF/VTAM
F4 = VSE/OCCF AND NCCF
F1 = VSE/POWER
F2 = CICS/VS

12.2.2 The OCCF/NCCF Start Job

The following job stream will start up VSE/OCCF and NCCF in F4 controlled by VSE/POWER:

```
* $$ JOB JNM=N1OCCFST,CLASS=4,DISP=L
// JOB N1OCCFST
* ***************************************************************************
*      THIS JOB STARTS UP VSE/OCCF WITH NCCF IN F4                            *
* ***************************************************************************
// DLBL DSILOGP,'NCCFPLOG',,VSAM
*       NCCF PRIMARY LOG
// DLBL DSILOGS,'NCCFSLOG',,VSAM
*       NCCF SECONDARY LOG
// LIBDEF CL,SEARCH=(USRCL1,PRDCLG,PRDCLC),FROM=USRCL1
// LIBDEF SL,SEARCH=(USRSL1,PRDSLC),TEMP
// LIBDEF RL,SEARCH=PRDRLC,TEMP
// EXEC OCCF3,SIZE=512K [52]
/*
/&
* $$ EOJ
```

With this jobstream, the OCCF program is started and NCCF is run as a subtask in the same partition, F4.

12.2.3 OCCF Definitions

A sample of a MESSAGE ACTION TABLE is provided in SERVICE.SYSSLB.A (OCCFS3). This is the primary VSE/OCCF control table in which messages are designated for routing, automatic reply, suppression, or messages translation. This sample contains entries that route all messages related to operator actions to the system console and all others messages to the default target.

---

[52] OCCF3 is the phasename for the Message Action Table and must be used in the EXEC statement of the VSE/OCCF start job.

VSE/OCCF Macros

OCCF macros are used for specifying the OCCF options and for defining control tables to tailor the OCCF environment.

- The OCFOPT macro

  This is used to specify various OCCF functions, such as if the alarm is to be sounded upon receipt of each message and if NCCF is to be started along with OCCF. The macro supplied in the example is:

  ```
  OCFOPT   PHASE=OCCF3,NCCF=YES,ALARM=YES
  ```

  The PHASE name is the name specified in the startup JCL.

- The OCFMAR macro

  This specifies the entries for an MATAB. It identifies the messages for which action will be taken and what type of action, such as routing and automatic reply. If message translation is done, the macro:

  ```
  OCFMAR   TYPE=TRANSL
  ```

  must be the first OCFOPT macro in the table. Macros identifying messages to be translated immediately follow this macro. The verification sample supplied provides the macro:

  ```
  OCFMAR MID=1I00D,TRANSL=MSG1I
  ```

  where MID is the number of the message to be translated and MSG1I points to the table with the message translation, which has the phase name 'MSG1I'.

  If message routing is used, the macro:

  ```
  OCFMAR   TYPE=ROUTE
  ```

  must be the first OCFMAR macro in the table, if message translation is not used. The message routing macros follow this macro. The MATAB provided with the SIPO (OCCF3) contains the following macro:

  ```
  OCFMAR MID=1Q55D,ROUTE=SYSCONS
  ```

  which will route message number 1Q55D to the system console. Messages can also be grouped together, so that it is not necessary to specify a macro for each individual macro. OCCF3 also contains a macro:

  ```
  OCFMAR MID=8V96D,REPLY=YES
  ```

  which is an example of how automatic replies can be issued. In this case, the message 8V96D will automatically cause the generation of the reply defined in the OCFTEXT macro with the label 'YES' (see below).

- The OCFMSGTE macro

  This macro is used to define a message translation. The one indicated above and provided in the SIPO verification sample is:

```
OCFMSGTE MID=1I00D,TEXT='READY FOR  COMMUNICATIONS/
                      SYSTEM IST  EINGABEBEREIT'
OCFMSGTE END
```

  This table is link-edited and the phase name is used in the OCFMAR macro. The text can also be given in an OCFTEXT macro.

- The OCFREPTR macro

  This macro is used to translate a message from the operator into a message which can be used by the system. For example the macro:

```
OCFREPTR TEXT1=ENTFERNE,TEXT2=DELETE
```

  will translate an operator's reply of 'ENTFERNE' to 'DELETE' for use by the system.

- The OCFTEXT macro

  This can be used to provide text to an OCFMAR or an OCFMSGTE macro.

More complete information on the use of all these macros can be found in the manual VSE/OCCF Installation Guide and Reference.

Defining VSE/OCCF to NCCF

The VSE/OCCF command processor ICMNCMD must be defined to NCCF during NCCF generation with the NCCF 'CMDMDL' macro:

```
commandname CMDMDL MOD=ICMNCMD
```

..where commandname is the command to execute OCCF, usually simply 'OCCF' or 'O'. This is how it is specified in the NCCF DSICMD book in the earlier part of this chapter.

Operation with VSE/OCCF

Operating through OCCF from a system console is straightforward. Console commands are intercepted and processed by OCCF. This facility is useful if you want to simplify and streamline the operation of a VSE system.

Operation using OCCF can also be done from an NCCF operator's screen on the same host. This is done by establishing a link with OCCF through the use of the QLOGON command as described later in this chapter. Messages to OCCF from the NCCF screen are prefixed by the OCCF keyword which is usually 'OCCF' or 'O'. The NCCF operator's screen may be local, remote, or cross-domain.

Starting OCCF from an NCCF Console

Once OCCF and NCCF have been started by the jobstream, a data link between programs can be established by issuing a 'QLOGON' command from an NCCF console. Only one NCCF console can receive messages from OCCF at a time.

The method for using the QLOGON command depends on how your system is set up.

1. If you are using a local OCCF from a local NCCF the following applies:

   a. logon to the local NCCF

   b. enter the OCCF keyword followed by QLOGON to allow routing of messages to your station.

2. If you are accessing a remote OCCF:

   - by an ACF/VTAM cross-domain logon, that is, not through a central NCCF system
   - from a central NCCF system using TAF

   the following applies:

   a. logon to the remote NCCF by cross-domain logon or through TAF from the local NCCF

   b. enter the OCCF keyword followed by QLOGON to allow routing of messages to your station.

3. If you are using the NCCF-NCCF session to access a remote OCCF the following applies:

   a. logon to central NCCF

   b. establish the cross-domain session to the remote system using the 'START' command of NCCF (i.e. START DOMAIN=domainid)

   c. use the 'ROUTE' of NCCF to issue the QLOGON to allow routing of messages to your station

      (i.e. ROUTE domainid keyword QLOGON).

VSE/OCCF Commands

The VSE/OCCF commands are summarized below in Figure 40 on page 206.

COMMAND	ACTION
QLOGON QLOGOFF	Establishes data-link between the NCCF console and the VSE/OCCF program Terminates the data link established by QLOGON
QSTOP QSTART QEND	Suspends VSE/OCCF functions Reinstates suspended VSE/OCCF functions Terminates VSE/OCCF processing
QDISPL <ALL | END| NCCF | NEXT>	Displays messages from hardcopy file at the NCCF operator station. ALL— the most recent of any message routed NCCF— the most recent message routed to the NCCF operator station NEXT— the next 'older' message after ALL or NCCF option used END— end the display

Figure 40. VSE/OCCF Commands

Terminating VSE/OCCF

To terminate OCCF processing the command QEND is used. If NCCF is running in the OCCF partition, it remains active, otherwise the partition is freed.

12.3 NETWORK PROBLEM DETERMINATION APPLICATION (NPDA)

The SIPO 3.1 contains NPDA Release 2.1 (5735-XX8).

NPDA is a product which collects and processes hardware errors associated with various IBM devices in your communications network. Error data are collected on IBM 4331 under VSE for SNA and BSC/SDLC devices only. Error data on local devices are not processed by NPDA under VSE.

NPDA is run as a command processor under NCCF, so NCCF needs to be installed first. You will need to complete several steps to define NPDA to NCCF and ACF/VTAM.

The following sections describe the customization of jobs from the SIPO/E 3.1 SAMPLIB. You should review these job streams to determine if they are applicable to your system. The NPDA Installation manual should be used as a reference. After any necessary modifications have been made, run the jobs to catalog the definitions in USRSL1/USRCL1.

12.3.1 NPDA Definitions

The NCCF startup JCL supplied in the first section of this chapter includes NPDA, as does the JCL supplied in the section on OCCF.

You must catalog a B.book in the USRSL1 to define NPDA.

The name of this book is B.N1NPDA, and it is used partly to define NPDA to NCCF, and partly to specify parameters for the NPDA data bases and exit routines.

SAMPLIB member NPDABNH is an example of how to define and catalog the NPDA definitions. The NPDA Installation manual, page 27 will direct you if you want to change any of the default values specified in this job.

```
// JOB N1NPDA                          CATAL NPDA DEFINITONS
// LIBDEF SL,TO=USRSL1
// EXEC MAINT
        CATALS   B.N1NPDA
        BKEND    B.N1NPDA
*************************************************************************
*        NPDA DEFINITIONS
*************************************************************************
 DSTINIT PDDNM=BNHLGPR
 DSTINIT PPASS=USERPASS 53
 DSTINIT SDDNM=BNHLGSE
 DSTINIT SPASS=USERPASS 54
 DSTINIT DSRBU=1
 DSTINIT DSRBO=10       55
 DSTINIT UNSOL=BNHUNSOL
```

```
 DSTINIT FUNCT=BOTH
 DSTINIT XITVN=BNHAINTA
 DSTINIT XITDI=BNHAPAMA
 LINE 100
 NCP  10                [56]
 CTRL 150
 SNA01 2
 SNA02 50
 SNA04 2
 SNA05 2
        BKEND
/*
/&
```

The last seven statements shown (LINE through SNA05) are default wrap count parameters for the NCP data base for line errors, NCP errors, and controller errors for SNA and non-SNA controllers. See the NPDA Installation manual for details.

Defining NPDA to NCCF

You need to define NPDA to NCCF.

The B.book DSIDMN (see section NCCF) must contain the following definition statement for the NPDA data services task:

```
TASK     MOD=DSIZDST,TSKID=BNHDSERV,INIT=Y,PRI=1,MEM=N1NPDA
```

Defining NPDA Commands to NCCF

You need to define the NPDA commands to NCCF. This has been done in the example provided in the section on NCCF in this chapter. The NPDA keyword that has been used in the supplied NCCF definitions is 'NPDA' which is the most common and logical choice.

12.3.2 ACF/VTAM Definitions

Defining NPDA as an ACF/VTAM Application

You have to define NPDA as an ACF/VTAM application. The major node A602 described in section NCCF contains the application BNHDSERV, which is the

---

[53] Must correspond to the UPDPW parameter in the primary VSAM data base allocation.

[54] Must correspond to the UPDPW parameter in the secondary VSAM data base allocation.

[55] Number of users that can be logged on.

[56] Only if an NCP is used.

NPDA application. This is done to identify the NDPA data services task to the ACF/VTAM Communications Network Management (CNM) Interface.

Defining NPDA in the ACF/VTAM CNM Routing Table

NPDA uses the CNMI (Communication Network Management Interface) of ACF/VTAM. You have to define the SNA request units (RECMS, RECFMS) which ACF/VTAM will pass over the CNMI to NPDA. Member NPDAIST of the SIPO/E 3.1 SAMPLIB is an example of how to do this.

```
// JOB NPDAIST                          ASS/LINK ISTMGC00 FOR NPDA ENTRIES
*  ********************************************************************
*     ASSEMBLE AND LINK EDIT ISTMGC00                                  *
* ********************************************************************
// PAUSE
// LIBDEF CL,TO=USRCL1
// OPTION CATAL
   PHASE ISTMGC00,*
// EXEC ASSEMBLY,SIZE=64K
ISTMGC00 CSECT
         DS    0F
         DC    X'0002'              NUMBER OF ENTRIES
         DC    X'000C'              LENGTH OF EACH ENTRY
         DC    XL4'00000000'        RESERVED
         DC    XL4'00000000'        RESERVED
         DC    XL1'00'              FLAGS FOR NPDA A/VTAM R2 CNMI
         DC    XL3'010381'          RECMS
         DC    CL8'BNHDSERV'        MUST APPEAR IN APPL STMT FOR VTM
         DC    XL1'00'              FLAGS FOR NPDA A/VTAM R2 CNMI
         DC    XL3'410384'          RECFMS
         DC    CL8'BNHDSERV'        MUST APPEAR IN APPL STMT FOR VTM
         END   ISTMGC00
/*
// EXEC LNKEDT
/*
/&
```

Note:
The same table must be used and expanded if you use the DSLU program for IBM 3644 devices or IBM 8775 (with enhanced/extended features)

Define NPDA VSAM Space and Clusters

You need to allocate VSAM space for primary and secondary data bases into which NPDA can log network error data.

The SAMPLIB member NPDAVSP and NPDACLU are examples of how to define the NPDA VSAM space and data bases.

Note:
You should refer to the system IPO/E dasd layout charts to choose unused space for the log files and to the NPDA Installation manual, page 12 for an explanation of how to calculate the amount of VSAM space that you will need.

NPDA Start

NPDA is initialized when NCCF is started.

The following JCL can be used to start NCCF with NPDA in F4.

```
* $$ JOB JNM=N1START,CLASS=4,DISP=L
// JOB N1START
* ********************************************************************
*          THIS JOB STARTS NCCF IN F4                                  *
* ********************************************************************
// DLBL DSILOGP,'NCCFPLOG',,VSAM,CAT=SIPOEUC
// EXTENT SYS022,SYSWK1
// DLBL DSILOGS,'NCCFSLOG',,VSAM,CAT=SIPOEUC
// EXTENT SYS023,SYSWK1
// DLBL BNHLGPR,'BNHLGPRI',,VSAM,CAT=SIPOEUC
// EXTENT SYS020,SYSWK1
// DLBL BNHLGSE,'BNHLGSEC',,VSAM,CAT=SIPOEUC
// EXTENT SYS021,SYSWK1
// LIBDEF CL,SEARCH=(USRCL1,PRDCLG,PRDCLC),FROM=USRCL1
// LIBDEF SL,SEARCH=(USRSL1,PRDSLG,PRDSLC),TEMP
// EXEC DSIDPR,SIZE=AUTO
/*
/&
* $$ EOJ
```

12.3.3 Test of Your Customized NPDA Definitions

Logon to NPDA

To use NPDA, log on to NCCF and enter the NPDA keyword. If you have used the definitions provided in this manual it is 'NPDA'; alternatively press PFK 1. The first panel of NPDA will be displayed.

NPDA Operation

NPDA is driven through a series of panels displaying data collected from the various components in the network, starting with a panel showing NCP and ICA selection. From here a hierarchical path can be taken through the network displaying error statistics and panels recommending user actions.

NPDA has its own commands to allow the user to bypass panels, in addition to the selections provided on the panels themselves. The NPDA command word will remain in bottom left hand corner while NPDA is in use and this must prefix any NPDA command. Other, non-NPDA commands may be issued while NPDA is in use by overtyping the NPDA command word with the command and pressing enter. This will take the screen out of NPDA mode and put it back in NCCF mode. NPDA can be returned to at the same point that it was left by entering 'NPDA RESUME' from NCCF.

Exit from NPDA

The NPDA command 'END' causes the screen to exit to NCCF. NPDA however, continues to collect error data on the data bases. An alternative to using 'END' is to simply exit and resume as described above.

NPDA terminates when NCCF in ended.

12.3.4 Using OCCF, NCCF and NPDA Together

The following JCL can be used to start OCCF, NCCF and NPDA in the same VSE partition:

```
* $$ JOB JNM=N1OCCFST,CLASS=4,DISP=L
// JOB N1OCCFST
* ************************************************************************
*      THIS JOB STARTS UP VSE/OCCF WITH NCCF IN F4                       *
* ************************************************************************
// DLBL DSILOGP,'NCCFPLOG',,VSAM
*       NCCF PRIMARY LOG
// DLBL DSILOGS,'NCCFSLOG',,VSAM
*       NCCF SECONDARY LOG
// DLBL BNHLGPR,'BNHLGPRI',,VSAM,CAT=SIPOEUC
// EXTENT SYS020,SYSWK1
// DLBL BNHLGSE,'BNHLGSEC',,VSAM,CAT=SIPOEUC
// EXTENT SYS021,SYSWK1
// LIBDEF CL,SEARCH=(USRCL1,PRDCLG,PRDCLC),FROM=USRCL1
// LIBDEF SL,SEARCH=(USRSL1,PRDSLC),TEMP
// LIBDEF RL,SEARCH=PRDRLC,TEMP
// EXEC OCCF3,SIZE=512K [52]
/*
/&
* $$ EOJ
```

A.0 INSTALLATION EXAMPLES, MULTI-SYSTEM ENVIRONMENT

Figure 41 shows the hard- and software configuration used for this primer. The following definitions examples are based on this configuration.

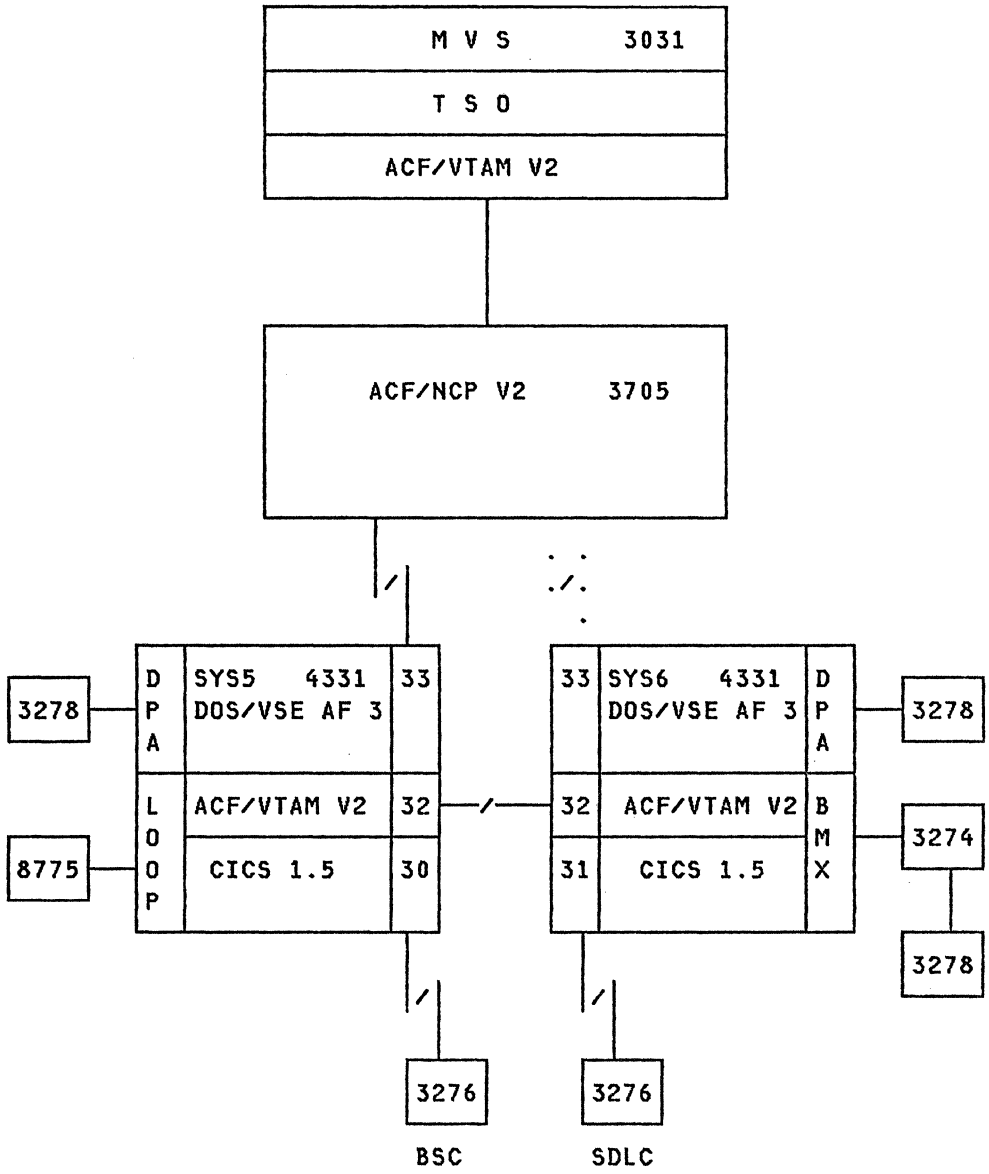


Figure 41. Multi System Configuration

Figure 42 shows the explicit routes defined in this environment. To allow SA 60 and 61 to communicate with migration nodes (ACF/VTAME or ACF/NCP R2) ER0 was selected as the primary route to all destination subareas. ER1 and ER2 were selected as back-up (or alternate) routes. The back-up routes had to be mapped on distinct ERs to avoid a routing conflict in SA 60 and 61.

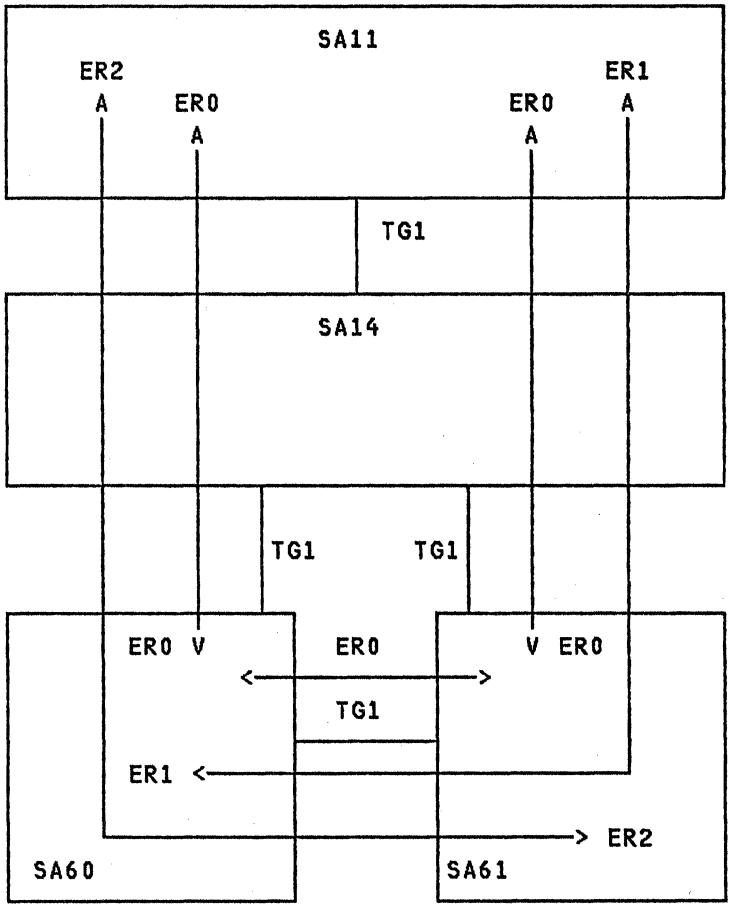


Figure 42. Multi System Environment Routing Concept

A.1 DEFINITIONS IN SA 60

```
************************************************************************
*                      ACF/VTAM START LIST 00                          *
************************************************************************

SSCPID=60,MAXSUBA=127,MAXAPPL=25,HOSTSA=60,PROMPT



************************************************************************
*                      ACF/VTAM START LIST 60                          *
************************************************************************

SSCPID=60,CONFIG=60,MAXSUBA=127,MAXAPPL=25,HOSTSA=60,VPBUF=20480



************************************************************************
*                      CONFIGURATION LIST 60                           *
************************************************************************

A601,H60L11,H60121,N601,V601,M601,R60611



************************************************************************
*                    APPLICATION MAJORNODE                             *
************************************************************************

A60CICS1 APPL  AUTH=(PASS,ACQ)
```

```
*************************************************************************
*              LOCAL NON-SNA MAJORNODE  -  DISPLAY PRINTER ADAPTER      *
*************************************************************************

H60L11   LBUILD

T60009   LOCAL CUADDR=009,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2,SELPEN),                                 X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS60

T60010   LOCAL CUADDR=010,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2,SELPEN),                                 X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS60

T60011   LOCAL CUADDR=011,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2,SELPEN),                                 X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS60

T60012   LOCAL CUADDR=012,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2,SELPEN),                                 X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS60

T60013   LOCAL CUADDR=013,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2,SELPEN),                                 X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS60

T60014   LOCAL CUADDR=014,                                              X
               TERM=3286,                                               X
               FEATUR2=(MODEL2),                                        X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS60

T60015   LOCAL CUADDR=015,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2),                                        X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS60
```

```
************************************************************************
*                      LOCAL SNA MAJORNODE                             *
************************************************************************

H60L21   VBUILD TYPE=LOCAL

C60041   PU     CUADDR=041,                                           X
                PUTYPE=2,                                             X
                SSCPFM=USSSCS,                                        X
                MAXBFRU=5,                                            X
                ISTATUS=ACTIVE

T60041   LU     LOCADDR=2,                                            X
                USSTAB=USSSNA60,                                      X
                ISTATUS=ACTIVE

C60043   PU     CUADDR=043,                                           X
                PUTYPE=2,                                             X
                SSCPFM=USSSCS,                                        X
                MAXBFRU=5,                                            X
                ISTATUS=INACTIVE

T60043   LU     LOCADDR=2,                                            X
                USSTAB=USSSNA60,                                      X
                ISTATUS=ACTIVE
```

```
*************************************************************************
*                    COMUNICATION ADAPTER MAJORNODE
*************************************************************************

N601     VBUILD TYPE=CA

G601     GROUP LNCTL=BSC

L60030   LINE  ADDRESS=030,                                            X
               SERVLIM=4

C60030   CLUSTER GPOLL=40,                                             X
               CUTYPE=3271,                                            X
               ISTATUS=INACTIVE

T600301  TERMINAL ADDR=40,                                             X
               TERM=3277,                                              X
               FEATUR2=MODEL2,                                         X
               ISTATUS=ACTIVE,                                         X
               USSTAB=USSNS60

G602     GROUP LNCTL=SDLC

L60032   LINE  ADDRESS=032,                                            X
               RETRIES=7,                                              X
               REPLYTO=1,                                              X
               PAUSE=0.1,                                              X
               SERVLIM=4

C60032   PU    PUTYPE=5,                                               X
               SUBAREA=61

L60033   LINE  ADDRESS=033,                                            X
               RETRIES=7,                                              X
               REPLYTO=1,                                              X
               PAUSE=0.1,                                              X
               SERVLIM=4

C60033   PU    PUTYPE=4,                                               X
               SUBAREA=14
```

```
************************************************************************
*                          PATH MAJORNODE                              *
************************************************************************

V601      PATH  DESTSA=(10,11,14),                                      x
                ER0=(14,1),ER1=(61,1),ER2=(14,1),                       x
                VR0=0,VR1=1,VR2=2
          PATH  DESTSA=(61),                                            x
                ER0=(61,1),ER1=(61,1),ER2=(61,1),                       x
                VR0=0,VR1=1,VR2=2


************************************************************************
*                          CDRM MAJORNODE                              *
************************************************************************

M601      VBUILD TYPE=CDRM

M6060     CDRM SUBAREA=60,CDRDYN=YES,CDRSC=OPT

M6061     CDRM SUBAREA=61,CDRDYN=YES,CDRSC=OPT

M6011     CDRM SUBAREA=11,CDRDYN=YES,CDRSC=OPT


************************************************************************
*                         CDRSC MAJORNODE
************************************************************************

R60611    VBUILD TYPE=CDRSC

A61CICS1 CDRSC CDRM=M6061,ISTATUS=ACTIVE

A11TSO1   CDRSC CDRM=M6011,ISTATUS=ACTIVE

A11IMS1   CDRSC CDRM=M6011,ISTATUS=ACTIVE
```

A.2 DEFINITIONS IN SA 61

```
**************************************************************************
*                      ACF/VTAM START LIST 00                            *
**************************************************************************

SSCPID=61,MAXSUBA=127,MAXAPPL=25,HOSTSA=61,PROMPT



**************************************************************************
*                      ACF/VTAM START LIST 61                            *
**************************************************************************

SSCPID=61,CONFIG=61,MAXSUBA=127,MAXAPPL=25,HOSTSA=61,VPBUF=20480



**************************************************************************
*                      CONFIGURATION LIST 61                             *
**************************************************************************

A611,H61111,H61121,N611,V611,M611,R61601



**************************************************************************
*                    APPLICATION MAJORNODE                               *
**************************************************************************

A61CICS1 APPL  AUTH=(PASS,ACQ)
```

```
*************************************************************************
*             LOCAL NON-SNA MAJORNODE  -  DISPLAY PRINTER ADAPTER       *
*************************************************************************

H61L11   LBUILD

T61009   LOCAL CUADDR=009,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2,SELPEN),                                 X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS61

T61010   LOCAL CUADDR=010,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2,SELPEN),                                 X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS61

T61011   LOCAL CUADDR=011,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2,SELPEN),                                 X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS61

T61012   LOCAL CUADDR=012,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2,SELPEN),                                 X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS61

T61013   LOCAL CUADDR=013,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2,SELPEN),                                 X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS61

T61014   LOCAL CUADDR=014,                                              X
               TERM=3286,                                               X
               FEATUR2=(MODEL2),                                        X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS61

T61015   LOCAL CUADDR=015,                                              X
               TERM=3277,                                               X
               FEATUR2=(MODEL2,SELPEN),                                 X
               ISTATUS=ACTIVE,                                          X
               USSTAB=USSNS61
```

```
************************************************************************
*                      LOCAL SNA MAJORNODE                             *
************************************************************************

H61L21   VBUILD TYPE=LOCAL

P6113F   PU     CUADDR=13F,                                           X
                PUTYPE=2,                                             X
                MAXBFRU=5,                                            X
                ISTATUS=INACTIVE

T6113F1  LU     LOCADDR=2,                                            X
                ISTATUS=INACTIVE,                                     X
                USSTAB=USSSNA61

T6113F2  LU     LOACCDR=3,                                            X
                ISTATUS=INACTIVE,                                     X
                USSTAB=USSSNA61

T6113F3  LU     LOACCDR=4,                                            X
                ISTATUS=INACTIVE,                                     X
                 SSTAB=USSSNA61
```

```
************************************************************************
*                    COMUNICATION ADAPTER MAJORNODE
************************************************************************

N611     VBUILD TYPE=CA

G612     GROUP LNCTL=SDLC

L61031   LINE  ADDRESS=031,                                          X
                RETRIES=7,                                           X
                REPLYTO=1,                                           X
                PAUSE=0.1,                                           X
                SERVLIM=4

C61031   PU    ADDR=C1,                                              X
                PUTYPE=2,                                            X
                SSCPFM=USSSCS,                                       X
                MAXDATA=262,                                         X
                MAXOUT=1,                                            X
                ISTATUS=INACTIVE

T610311  LU    LOCADDR=2,                                            X
                ISTATUS=ACTIVE,                                      X
                USSTAB=USSSNA61

T610312  LU    LOCADDR=3,                                            X
                ISTATUS=ACTIVE,                                      X
                USSTAB=USSSNA61

L61032   LINE  ADDRESS=032,                                          X
                RETRIES=7,                                           X
                REPLYTO=1,                                           X
                PAUSE=0.1,                                           X
                SERVLIM=4

C61032   PU    PUTYPE=5,                                             X
                SUBAREA=60
```

```
************************************************************************
*                        PATH MAJORNODE                                *
************************************************************************

V611     PATH  DESTSA=(10,11,14),                                      x
               ER0=(14,1),ER1=(14,1),ER2=(60,1),                       x
               VR0=0,VR1=1,VR2=2
         PATH  DESTSA=(60),                                            x
               ER0=(60,1),ER1=(60,1),ER2=(60,1),                       x
               VR0=0,VR1=1,VR2=2


************************************************************************
*                        CDRM MAJORNODE                                *
************************************************************************

M611     VBUILD TYPE=CDRM

M6161    CDRM SUBAREA=61,CDRDYN=YES,CDRSC=OPT

M6160    CDRM SUBAREA=60,CDRDYN=YES,CDRSC=OPT

M6111    CDRM SUBAREA=11,CDRDYN=YES,CDRSC=OPT


************************************************************************
*                        CDRSC MAJORNODE
************************************************************************

R61601   VBUILD TYPE=CDRSC

A60CICS1 CDRSC CDRM=M6160,ISTATUS=ACTIVE

A11TSO1  CDRSC CDRM=M6111,ISTATUS=ACTIVE

A11IMS1  CDRSC CDRM=M6111,ISTATUS=ACTIVE
```

B.0 NAMING CONVENTIONS

Names based on the format below are assigned to lines, physical units (PUs) and logical units (LUs). These names are identified to ACF/VTAM V2 through definition statements.

The names are also used by the network operator and should be known to the terminal end users for proper identification of failing components during problem determination and correction. Without a good naming convention, operation and maintenance of the network becomes difficult.

ACF/VTAM V2 - Single System

Names based on the format below are assigned to lines, physical units (PUs) and logical units (LUs). These names are identified to ACF/VTAM V2 through definition statements.

The names are also used by the network operator and should be known to the terminal end users for proper identification of failing components during problem determination and correction. Without a good naming convention, operation and maintenance of the network becomes difficult.

The following conventions for a single system environment are based on the SIPO 3.1 supplied samples.

However, it is not recommended that you use device dependent names (e.g. LU names of the form ttmLcuu). This is rather inflexible and does not allow for new devices.

Instead, a single system user might choose the multisystem naming conventions, disregarding definitions which do not apply, or possibly a combination of the two.

S I N G L E D O M A I N

TYPE	12345678
Application Major Node	APPL#v
Application Minor Node	DBDCCICS TESTCICS
Local non-SNA Major Node	LOC#v
Terminal (MN)	ttmLcuu
Local SNA Major Node	LOC#
PU (MN)	PUcuu
LU (MN)	ttmLcuu#
CA Majornode	REM#v
Group	GROUP#
Line	LINElia
Cluster/PU (MN)	CLlia
Terminal/LU (MN)	ttmRcuu#

Figure 43. VTAM Naming Conventions in a Single System Environment

tt = terminal type
m = model/screen
cuu = physical address for local devices, clusters
lia = physical address of the connection (line)
# = sequence number
v = variation number
may be used for variations in major node names
(e.g. lines originally ACTIVE or INACTIVE,
different hardware definition,...)

The following figure shows a list of possible devices types used as ttm in the naming conventions.

```
IX  = 364X X = 1 to 7
IN  = 3790/8100
FA  = 3600
FC  = 3614
E   = 3650
QD  = 3660
D52 = 3275 mod 2
D61 = 3276 mod 1 (12 x 80)
D62 = 3276 mod 2 (24 x 80)
D63 = 3276 mod 3 (32 x 80)
D64 = 3276 mod 4 (43 x 80)
D71 = 3277 mod 1 (12 x 40)
D72 = 3277 mod 2 (24 x 80)
D81 = 3278 mod 1 (12 x 80)
D82 = 3278 mod 2 (24 x 80)
D83 = 3278 mod 3 (32 x 80)
D84 = 3278 mod 4 (43 x 80)
D85 = 3278 mod 5 (27 x 132)
D92 = 3279 mod 2A and 2B
D93 = 3279 mod 3A and 3B
P41 = 3284 mod 1
P42 = 3284 mod 2
P43 = 3284 mod 3
P61 = 3286 mod 1
P62 = 3286 mod 2
P63 = 3286 mod 3
P71 = 3287 mod 1
```

```
P72 = 3287 mod 2
P81 = 3288 mod 1
P91 = 3289 mod 1
P92 = 3289 mod 2
P93 = 3289 mod 3

D61 = 8775 mod 1
D62 = 8775 mod 2
D6A = 8775 mod 11
D6B = 8775 mod 12
...   .... ... ..
```

Figure 44. Terminal Table for the Use in Naming Conventions

CICS/VS - Single System

Like the ACF/VTAM V2 major and minor node names the TRMIDNT (parameter in the TCT TYPE=TERMINAL macro) have to be unique.
In accordance with the SIPO/E 3.1 supplied VTAM TCT (DFHTCT$O), use following names:

TYPE	1234	MNEMONIC
TRMIDNT	L#Tn R#Tn	L = Local terminal R = Remote terminal

Figure 45. CICS/VS Naming Conventions - Single System

L#Tn/L#Pn for local terminals/printers
R#Tn/R#Pn for remote terminals/terminal printers

# = number of the ACF/VTAM V2 major node
n = position of this terminal/printer in the ACF/VTAM V2 major node (e.g. 0 to 9, A to ....)

ACF/VTAM V2 - Multi-System

This naming convention is based on a two digit subarea definition.

TYPE	12345678	MNEMONIC
Application Major Node	Assv	A = Application
Application Minor Node	AssCICSv AssPOWv AssNv	CICS/VS POWER RJE/PNET NCCF
Local non-SNA Major Node	HssL#v	H = Host attached L = Local
Terminal	Tsscuu	T = Terminal
Local SNA Major Node	HssL#v	H = Host attached L = Local
PU	Psscuu	P = Pysical Unit
LU	Tsscuu#	
CA/NCP Major Node	Nss#v	N = CA/NCP
Switched Major Node	Sss#v	S = Switched
Group	Gss#	G = Group
Line	Lsslia	L = Line
Cluster/PU	Psslia(#)	P = Cluster/PU
Terminal/LU	Tsslia(#)#	T = Terminal
Path Table	Vssv	V = Path
Path	Vssdd	
Path (Switched Defn.)	VSss#	

Figure 46. VTAM Naming Conventions in a Multi System Environment

```
  ss  =  subarea number (max. = MAXSUBA) of this domain
  dd  =  destination subarea number
 (#)  =  sequence number only used for devices
         on multipoint lines
   #  =  sequence number
 lia  =  CA/NCP line address
 cuu  =  physical address of the connection
         for local devices and clusters
   v  =  variation number used for variations within the
         same subarea
```

TYPE	12345678	MNEMONIC
CDRM Major Node	Mssv	M = Manager
CDRM Minor Node	Mssss Mssdd	CDRM in SA ss CDRM of SA dd
CDRSC Major Node	RssddA#v RssddT#v	Applications in SA = dd Terminals in SA = dd
CDRSC Minor Node	AddCICSv Tddcuu#	[57]

Figure 47. Naming Conventions for Cross Domain Definitions

```
  ss  =  this subarea number (max. = MAXSUBA)
  dd  =  subarea number of the participating cross domain
         (destination) host
         for applications and terminals
   #  =  sequence number
   v  =  variation number used for variations within the
         same subarea
         (e.g.  minor node originally ACTIVE or INACTIVE)
```

Note:
Users of SSX systems should take into consideration the naming convention used by SSX. This is shown in SSX/VSE Pregeneration Specifications, from page 66 on.

[57] All the minor nodes (LUs or APPLs) per CDRSC major node retain their original names.

CICS/VS - Multi-System

Like the ACF/VTAM major and minor node names the TRMIDNT parameter (in the TCT TYPE=TERMINAL macro) have to be unique.

Based on experiences in many installations the following naming convention is recommended:

TYPE	1234	MNEMONIC
TRMIDNT	a###	

Figure 48. CICS/VS Naming Conventions - Multi-System

a = alphabetic character for each CICS/VS system
(e.g. A for CICS/VS in SA=60,
B for CICS/VS in SA=61, etc. ...)

= position of the terminal in an ACF/VTAM V2 major node
(e.g. 0 to 31 for terminals in the first major node,
32 to 63 for terminals in the second major node,
etc. ...)

The suffix of the CICS/VS tables (TCT,PCT,PPT,SIT) may reflect the subarea number.

C.0 DOCUMENTATION SUMMARY

More detailed information on various subjects mentioned in this primer can be found in the IBM publications listed below.

C.1 ACF/VTAM V2 PUBLICATIONS SUMMARY

The following manual is the index of the ACF/VTAM V2 library.

- ACF/VTAM V2 Master Index GX27-0032

  This manual contains a listing of topics discussed in the ACF/VTAM V2 manuals.

The following manual deals with evaluation and education:

- ACF/VTAM V2 General Information GC27-0608

  This manual contains general information about the facilities and requirements of ACF/VTAM V2. It is intended primarily for use by installation managers and planners who are evaluating ACF/VTAM V2 for inclusion in their data communication system. This book is directed primarily to those whose who require an elementary introduction to the concepts that underlie ACF/VTAM V2.

The following publication discusses installing ACF/VTAM V2:

- ACF/VTAM V2 Planing and Installation Reference SC27-0439

  The purpose of this book is to enable management personnel and system programmers to understand planning requirements when preparing to install an ACF/VTAM V2 system. It describes how to define, tailor, and maintain an ACF/VTAM V2 system. It includes information on the choice and specification of installation options and information on definition of devices and programs.

The following manual discusses writing ACF/VTAM V2 application programs:

- ACF/VTAM V2 Programming SC27-0611

  This manual contains information about how to write application programs that contain ACF/VTAM V2 macro instructions and explains how to code those ACF/VTAM V2 macro instructions.

The following manuals discuss the ACF/VTAM V2 operation:

- ACF/VTAM V2 Operation SC27-0612

This publication contains detailed information about commands used to run an ACF/VTAM V2 domain. It may be used as reference manual for domain operators as well as a guide for system programmers who provide detailed information needed to run the domain.

- ACF/VTAM V2 Messages and Codes SC27-0612

  This is a reference manual for ACF/VTAM V2 messages and related codes. All information needed to interpret ACF/VTAM V2 messages (identified by the prefix 5) is contained in this manual. This publication contains also messages that can be displayed or printed at a terminal operated by the terminal user, or a network, e.g. domain operator, Teleprocessing Online Test (TOLTEP) messages and messages issued by the unformatted system Services (USS) portion of ACF/VTAM V2.

The following manuals help to detect, diagnose and fix possible problems:

- ACF/VTAM V2 Diagnosis Guide SC27-0630
- ACF/VTAM V2 Diagnosis Reference LY38-3058
- ACF/VTAM V2 Data Areas LY38-3059

  These shows the use of the diagnostic facilities available through ACF/VTAM V2. It provides a diagnostic approach to debugging ACF/VTAM V2, and contains guidelines and debugging aids to assist system and application programmers. The primary purposes of these manuals are to

  1. provide information that enables the reader to use ACF/VTAM V2 diagnostic aids to determine where the cause of a failure lies and

  2. to summarize serviceability aids described in other publications.

- ACF/VTAM V2 Reference Summary SX27-0027

  This shows the use of the diagnostic facilities available through ACF/VTAM V2.

C.2 SIPO/E PUBLICATIONS SUMMARY

- SIPO/E Release 3.1 Reference Manual
- SIPO/E Release 3.1 Program Directory
- GC20-1933 SIPO/E User's Guide Release 3.1
- SH20-2486 IPF VSE Feature Reference Manual Release 4.1
- SH20-5526 IPF VSE Feature User's Guide Release 4.1

C.3 OTHER INSTALLATION PRIMERS

- GG24-1519 Small Communications Systems Installation Primer, IBM 4331/ACF/VTAME
- GG24-1552 Small Communications Systems Installation Primer, VSE SYSTEM IPO/E & IBM 3705-80

C.4 NCCF PUBLICATIONS SUMMARY

- GC27-0429 NCCF General Information
- SC27-0430 NCCF Installation
- SC27-0431 NCCF Messages
- SC27-0432 NCCF Terminal Use
- SC27-0433 NCCF Customization
- GG24-1554 CNM Customizing NCCF

C.5 NPDA PUBLICATIONS SUMMARY

- GC34-2010 NPDA General Information
- SC34-2011 NPDA Installation
- SC34-2012 NPDA Messages and Codes
- SC34-2032 NPDA User Action Guide

C.6 OCCF PUBLICATIONS SUMMARY

- GC33-6113 General Information
- SC33-6115 Installation Guide and Reference
- SC33-6117 Diagnosis Guide

C.7 OTHER PUBLICATIONS

- GA24-3667 IBM 4300 Physical Planning
- GA33-1525 IBM 4331 Operating Procedures
- GA33-1526 IBM 4331 Functional Characteristics
- GA27-2749 IBM 3270 Component Description
- GA18-2081 IBM 3276 Control Unit Description and Programmer's Guide
- GA23-0061 IBM 3274 Control Unit Description and Programmer's Guide
- GA18-2042 IBM System Problem Determination for 3276 Display Stations
- GA27-2871 IBM System Problem Determination for 3274 Control Units
- GA27-2850 IBM 3274 Control Unit Problem Determination Guide
- GC20-1878 A Guide to IBM 4331 Processor
- GC33-6094 VSE/AF System Management Guide
- GC33-6097 VSE/AF Operating Procedures
- GC33-6111 VSE/AF MHSP User's Guide
- SC33-0069 CICS/VS System Programmer's Reference Manual
- SC33-0070 CICS/VS System Programmer's Guide
- ZZ20-2873 IBM 4300 Installation Planning Checklist
- G320-6023 SNA 3274/3278 Installation Guide
- G320-6028 SNA Product Installation Guide
- GG24-1514 SNA System Problem Determination Guide - Volume 1
- GG24-1523 SNA System Problem Determination Guide - Volume 2

For Loop Adapter and IBM 364X Users

- GA23-0038 Communication Loop Planning Guide
- GA23-0039 Multiuse Communication Loop Installation Guide
- GA23-1523 IBM 4300 Funct. Character. and Processor Complex Config.
- GA23-1534 IBM 4300 Loop Adapter Functional Characteristics
- GA23-1538 IBM 4300 Loop Adapter Operating Procedures

- GA23-1540 IBM 4300 Loop Adapter Problem Determination Guide
- SC31-0500 Loop Adapter CICS/VS PRPQ Programmers Guide
- GC31-0505 Loop Adapter CICS/VS PRPQ Specifications
- LC31-1500 Loop Adapter CICS/VS PRPQ Logic Overview
- GA24-3679 IBM 3641 Rep. Term. Component and Operator Description
- GA24-3680 IBM 3642 Enc. Prt. Component and Operator Description
- GA24-3681 IBM 3643 Key. Disp. Component and Operator Description
- GA24-3711 IBM 3645 Printer Component and Operator Description
- GA24-3683 IBM 3646 Scanner Contr. Unit Comp. and Oper. Description
- GC31-2011 IBM 3647 Time and Attendance Comp. and Oper. Description
- GA27-3253 IBM 3843 Loop Control Unit Introduction Guide
- GA33-3040 IBM 8775 Display Terminal Introduction
- GA33-3041 IBM 8775 Display Terminal Character Set Reference

For IBM 3644 Users

- GA24-3653 IBM 3644 Aut. Data Unit Component Description
- GC31-0009 Parameter Table Generation Facility

For IBM 3644 and IBM 8775 (enhanced/ext. functions) Users

- GC33-6125 Downstream Load Utility Programming Summary
- GC33-6126 Downstream Load Utility Specifications
- GC33-6127 Downstream Load Utility Installation and Reference Guide
- LY33-9099 Downstream Load Utility Diagnosis Guide

D.0 CONFIGURATION DOCUMENTATION WORKSHEETS

CLUSTER / CONTROL UNIT
TYPE _____ ___ FEATURES _______________ SERIAL NUMBER __________ SET UP DATE __/__/__ PERSON ______________________
MAJOR NODE NAME ________ incl. in ATCCON __

TERMINAL
PORT __ ADDRESS ___ TYPE _____ __ FEATURES _________________ SERIAL NUMBER __________
MINOR NODE NAME ________ ISTATUS ________ LOGAPPL ________ USSTAB ________ MODETAB ________ DLOGMOD ________ APPLICATIONS ________ ________ ________ ________ TRMIDNT ________

TERMINAL
PORT __ ADDRESS ___ TYPE _____ __ FEATURES _________________ SERIAL NUMBER __________
MINOR NODE NAME ________ ISTATUS ________ LOGAPPL ________ USSTAB ________ MODETAB ________ DLOGMOD ________ APPLICATIONS ________ ________ ________ ________ TRMIDNT ________

TERMINAL
PORT __ ADDRESS ___ TYPE _____ __ FEATURES _________________ SERIAL NUMBER __________
MINOR NODE NAME ________ ISTATUS ________ LOGAPPL ________ USSTAB ________ MODETAB ________ DLOGMOD ________ APPLICATIONS ________ ________ ________ ________ TRMIDNT ________

Figure 49. Configuration Documentation Worksheet: Control Unit

TERMINAL
PORT ___ ADDRESS ___ TYPE _____ ___ FEATURES _________________ SERIAL NUMBER __________
MINOR NODE NAME ________ ISTATUS ________ LOGAPPL ________ USSTAB ________ MODETAB ________ DLOGMOD ________ APPLICATIONS ________ ________ ________ ________ TRMIDNT ________

TERMINAL
PORT ___ ADDRESS ___ TYPE _____ ___ FEATURES _________________ SERIAL NUMBER __________
MINOR NODE NAME ________ ISTATUS ________ LOGAPPL ________ USSTAB ________ MODETAB ________ DLOGMOD ________ APPLICATIONS ________ ________ ________ ________ TRMIDNT ________

TERMINAL
PORT ___ ADDRESS ___ TYPE _____ ___ FEATURES _________________ SERIAL NUMBER __________
MINOR NODE NAME ________ ISTATUS ________ LOGAPPL ________ USSTAB ________ MODETAB ________ DLOGMOD ________ APPLICATIONS ________ ________ ________ ________ TRMIDNT ________

TERMINAL
PORT ___ ADDRESS ___ TYPE _____ ___ FEATURES _________________ SERIAL NUMBER __________
MINOR NODE NAME ________ ISTATUS ________ LOGAPPL ________ USSTAB ________ MODETAB ________ DLOGMOD ________ APPLICATIONS ________ ________ ________ ________ TRMIDNT ________

Figure 50. Configuration Documentation Worksheet : Terminals

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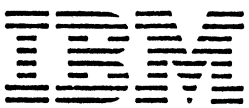

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