

G 320-6023-1

IBM

**Palo Alto
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**Technical
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**SNA
3274/3276
Installation Guide**

by C.R. Boelkes, D.M. Craycraft,
V.E. Hensley, R.D. Lapp
Palo Alto Systems Center

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Preface.

This installation guide is intended to supplement existing product documentation by providing examples of the various parameters and options that must be specified to accomplish the installation process. The parameters and options in this guide are not optimum for any specific environment and should only be used as guidelines. Each installation must be evaluated individually. These examples are, generally, extracted from an operational system, but have not been submitted to any formal test.

The guide is organized in three parts:

Part 1 contains general installation planning information.

Part 2 shows examples of an installation consisting of ACF level access methods, IMS/VS Version 1 Release 1.5 and CICS/VS Release 1.4.

Part 3 shows examples of an installation consisting of a VTAM-II environment with IMS/VS Version 1 Release 1.4 and CICS/VS Release 1.3.

Summary of Amendments.

This manual is a major revision of G320-6023-0. The previous release was based primarily on lab experience. This release has been updated based on current field experiences. The format of this release of the guide is similar to the previous release, but a large number of seemingly minor changes have been made. Initial readers need not be concerned, but readers that have been using the previous release of this guide are cautioned to be alert for these changes. While minor in appearance, the effect of these changes may be far reaching. A simple change of a mode table name or entry name, for example, may require corresponding changes to the network definition and DB/DC product generations. Or a USSTAB change may alter the operating procedures.

In addition, two new chapters have been added; Problem Determination Aids and CICS/VS Considerations.

1-1. Installation Planning.

A. Installation Preparation.

As early as possible, on-order equipment specifications should be verified as appropriate for the current environment. This should be done on a continuing basis whenever major changes in plans or environment occur.

At least 16 weeks prior to scheduled shipment of a 3274 or 3276 sub-system, the appropriate Planning and Setup Guide (see Chapter 1-2) should be studied thoroughly. The 3276 Planning and Setup Guide or the 3274 Planning, Setup, and Customizing Guide will be the basic installation planning document. Each Planning and Setup Guide contains a 16-week checklist that can be used as a guide to this phase of the installation. Special consideration should be given to:

1. Developing specially tailored setup instructions for the personnel at the remote sites that will be responsible for setup. The IBM supplied instructions should be used as a basis, adding installation dependent information as required. The individual machine setup instructions should also be tied together with a "Sub-system Setup Guide" that simply describes the remote environment and covers such items as where to locate the equipment, which machines to setup first, help desk or network control operator phone numbers, etc.
2. Developing the customizing information packet required for remote 3274 installations.
3. Evaluating operator training requirements and developing an appropriate training program.
4. Ensuring that the applicable host programming (VTAM, TCAM, TSO, IMS, CICS, etc.) will have current maintenance applied.

As soon as possible after the installation of a sub-system accessible to the host network control personnel, problem determination procedures should be developed. Network control personnel should use that sub-system to become familiar with the problem determination aids available. Chapter 1-10 and the various Problem Determination Guides should be used as a starting point. Procedures should be in place and tested for using the trace facilities of VTAM, TCAM, NCP, IMS and CICS as appropriate. The SNA System Problem Determination Guide, G320-6016 should be helpful.

B. Miscellaneous Installation Considerations.

1. Incompatible Jacks - Warning.

In conjunction with it's registration program for direct attachment of non-Telco equipment to the Public Switched Telephone Network, the FCC has specified a new design of plugs and jacks. The standard interface for non-switched lines continues to be the four-prong plug type 283B connecting to a four-hole socket (jack), type 404B, 549A or 493A. A four-prong plug is shown in Appendix F of the 3270 Physical Planning manual. IBM modems for non-switched line operations, whether external or integrated, come equipped with this line interface.

In some cases, local telephone operating companies have installed the new jack as the interface for a non-switched line. Apparently, this is the outgrowth of an attempt by the local telephone company to reduce the number of different parts in inventory. While the telephone operating company has been cooperative in replacing the new jack with the four-hole socket in every such case, the installation process was delayed.

Note that the potential problem exists only for the case where:
a) IBM modems (including integrated modems) are involved, and
b) the communication facility is a non-switched line.

In all installations meeting these two criteria, site preparation should include making sure that the local telephone company knows to install specifically sockets (jacks) type 404B or 549A (surface mounted) or 493A (wall mounted). Installation reviews should likewise include a check on this point. See also a related article in this section "3276 Integrated Modem Features".

2. 3276 Integrated Modem Features.

All accounts having on-order 3276 configurations using FC 5501, 5502, 5507 or 5508 for switched network access should assure that the required data access arrangement will be available from the local common carrier when the 3276 is installed.

Note that FC 5502 and 5507 are shipped with the four prong 283B plug to fit the carrier supplied 404B (or equivalent) jack. This interfaces the CDT type data access arrangement. FC5501 and 5508 are shipped with the eight wire spade lug termination for the CBS type attachment.

Illustrations of the above interfaces may be found in the 3276 Planning and Setup Guide (GA18-2041).

When the integrated modem is to be attached to leased facilities, an interface hardware problem may exist. See article in this section "Incompatible Jacks - Warning".

In any case, interface arrangements for connecting IBM products to switched networks should be covered in detail with the common carrier representative and well in advance (at least 16 weeks) of installation.

3. Limitations of 3277, 3284, 3286 and 3288 attachment to the 3274

When a 3277 is attached to a 3274, the operator initiated local copy facility is not provided.

The 3287 and 3289 printers can be attached as either LU Type 1 or LU Type 3. The 3284, 3286 and 3288 printers are supported by the 3274-1A and 3274-1C (SDLC) as LU Type 3 only. These two types of support require different host programming. The host programming support that is provided is shown in the Introduction to 3270, GA27-2739. In the tables in that manual, LU Type 1 attachment is shown as SCS Printer and LU Type 3 attachment is shown as 3270 DSC Printer. Note that IMS/VS and NOSF do not support the LU Type 3 attachment (DSC printer). This means that the 3284, 3286 and 3288

printers attached to SNA mode 3274 controllers are not supported by IMS/VS or NOSP.

4. Equivalency Comparisons

When installing the new display and printer devices, the 3274, 3276, 3278, 3287 & 3289, there are important considerations to understand, especially if they are replacement devices. The following chart shows the nearest equivalency for replacement devices.

INSTALLED	REPLACEMENT	CONSIDERATIONS
3271-1,2	3276-1,2,3,4	Supported as 3271. Smaller number of displays on 3276.
3271-1,2	3274-1C	Total of 32 devices; limit of 16 "old" devices.
3271-11,12	3274-1C 3276-11,12, 13,14	Different SNA support; PU type 2 versus type 1. Copy operations are different.
3272	3274-1B,1D	Plug compatible; limit of 16 "old" devices.
3272	3274-1A	3274-1A has single address like 3791. Must use VTAM, EXTM or ACF/TCAM V2. See Component Description "3274-1A Local Operations".
3275-1,2	3276-1,2,3,4	BSC operation not equivalent to 3275; a 3276 functions as a 3271 in BSC.
3277	3278	New keyboard with different operator interaction.
3284/86	3287	3287 is a table top unit. 3284/86 Vertical Format RPQ not identical to the 3287 Page Length Control. IMS and NOSP require SCS when operating in SNA mode.
3288	3289	

5. 3274-1A or 1B waterproof plug

The waterproof power plug FC 8801 on the 3274-1A or 1B is not the same as that supplied with the 3272 previously, and will not fit the old receptacle (R-S 3743). The new plug (R-S 3720 U-2) and receptacle (R-S 3743 U-2) are described in the 3270 Installation Manual - Physical Planning, GA27-2787.

When a 3274 is to be installed replacing a 3272, and the waterproof plug is required, the new power receptacle should be installed prior to receipt of the 3274. This new receptacle has been in short supply. Check with your electrical contractor for current availability and order lead times.

6. SNA TOLTEP support

Some ACF/VTAM and 3270 manuals indicate that the SNA 3274 / 3276 are supported by TOLTEP. These manuals are in error and will be changed to delete reference to TOLTEP operation.

7. 3278 screen cleaning

The improved anti-glare screen on the 3278 is susceptible to finger printing. With power off, the screen should be cleaned with an ammonia based glass cleaner.

8. 3276 attachment to 3705 via 1F line set.

This connection utilizes FC3701 (EIA interface) on the 3276. No modem or modem eliminator is required. FC6301, Communications Feature with Business Machine Clock is also required on the 3276, limiting the speed to 1200 bps. When this feature is installed, the 3276 automatically defaults to NRZI operation. The NCP or EP generation for this line must specify NRZI=YES and DATARATE=HIGH.

9. 3274/3276 Digital Data Service Adapter.

The DDSA features (FC5650 & FC5651) use a special common carrier facility called Dataphone Digital Service. This service does not utilize the normal (telephone) channels and may be provided with either of two kinds of interface units. The first is a "Data Service Unit" which has an EIA interface and would be compatible with FC3701. The second is called a "Channel Service Unit" and uses FC5650/5651. Note that the 3705 does not feature a DDSA so that the type 1D or 1H line set with a "Data Service Unit" must be utilized. See also GA18-2038 for 3276 DDSA.

10. Size considerations.

Be aware that the dimensions of the 3274 Control Unit are physically larger than the 3271/3272 Control Unit. It should also be noted that additional clearance space is required surrounding the 3274.

11. ACF/VTAM non-SNA 3270 Considerations.

With ACF/VTAM using the PU=YES support for remote BISYNC controllers or for any large screen, non-SNA local attachment (3274-1B or 3274-1D) a mode table entry is required. The basic requirement is to supply VTAM with the appropriate protocols. In addition, if large screen support is required with ACF TSO/VTAM or NOSIP, then a PSERVIC parameter specifying the screen size must be used. See Chapter 2-4 for an example of a mode table for use with non-SNA terminals.

Local non-SNA terminals are defined to VTAM by using the LBUILD and LOCAL statements. The FEATUR2 parameter should specify the machine default screen size (i.e. MODEL=1 for 3278-1, MODEL=2 for 3278-2, 3278-3, 3278-4). Alternate screen size is defined in a mode table. Following is an example of a 3274-1B or 1D installation with a configuration similar to the other controllers used in this guide.

This definition has not been verified by actual operation.

```
LBUILD SUBAREA=6
LOCAL CUADDR=480,TERM=3277,FEATUR2=(MODEL2,ANKEY,PFK), X
      LOGTAB=MYINTAB,MODETAB=MT3274B,DLOGMOD=T3278M4
LOCAL CUADDR=481,TERM=3277,FEATUR2=(MODEL2,ANKEY,PFK), X
      LOGTAB=MYINTAB,MODETAB=MT3274B,DLOGMOD=T3278M4
LOCAL CUADDR=482,TERM=3277,FEATUR2=(MODEL2,ANKEY,PFK), X
      LOGTAB=MYINTAB,MODETAB=MT3274B,DLOGMOD=T3278M3
LOCAL CUADDR=483,TERM=3277,FEATUR2=(MODEL2,ANKEY,PFK), X
      LOGTAB=MYINTAB,MODETAB=MT3274B,DLOGMOD=T3278M3
LOCAL CUADDR=484,TERM=3277,FEATUR2=(MODEL2,ANKEY,PFK), X
      LOGTAB=MYINTAB,MODETAB=MT3274B,DLOGMOD=T3278M2
LOCAL CUADDR=485,TERM=3277,FEATUR2=(MODEL2,ANKEY,PFK), X
      LOGTAB=MYINTAB,MODETAB=MT3274B,DLOGMOD=T3278M4
LOCAL CUADDR=486,TERM=3286,FEATUR2=(MODEL2), X
      MODETAB=MT3274B,DLOGMOD=T3278M4
LOCAL CUADDR=487,TERM=3286,FEATUR2=(MODEL2), X
      MODETAB=MT3274B,DLOGMOD=T3278M4
```

For the printers, the DLOGMOD entry specified here is for a 3440 byte buffer (Specify code 9524). This is dependent on the Specify Code used when the machine was ordered. Use of 2560 or 3440 buffer specification also requires the Extended Print Buffer feature (FC3880) on the 3287. See Chapter 2-4 for an example of a mode table for use with non-SNA terminals.

C. Common Installation Problems.

This section consists of a series of commonly encountered installation problems. Special attention should be given to these items during the installation process.

1. NRZ/NRZI

To determine whether an SDLC line should use NRZ or NRZI encoding, consult your modem supplier. In either case, this must be specified during the NCP generation and during Customer Setup (3276) or Customization (3274). Both specifications must be the same or communications between the 3274/3276 and the NCP will not be established.

2. SCS Printer RU Size and Pacing Values

The relationship between the buffer size (3289=4K, 3287=2K or 4K), RU size and pacing values is not well understood, but can cause a Bind command to be rejected or degraded performance. Major changes have been made to this guide to provide examples that are applicable regardless of buffer size.

3. MVS TSO/VTAM Level 2 (SU58) Mode Tables

The PSERVIC parameter in the mode table specification is often specified incorrectly. A special mode table entry "TSOSU58" has been added to illustrate the correct PSERVIC specification.

4. IMS/VS and CICS/VS Effect on Mode Table Entries

When comparing the session parameters that are found in the Bind command in a trace to those specified in the mode table it may be confusing to find that they are not the same. This often leads to the erroneous conclusion that this difference is the source of the problem currently being investigated. Any VTAM application program can modify or completely ignore the session parameter specifications in the mode table and IMS/VS and CICS/VS are among those that do so. For example:

- a. CICS/VS 1.3 constructs the session parameters completely based on CICS generation parameters. Mode table values are ignored entirely.
- b. CICS/VS 1.4 will either construct the session parameters based on CICS generation parameters, ignoring the mode table, or will use mode table specified values exclusively if the LOGMODE parameter on the DFHTCT TYPE=TERMINAL macro is used.
- c. IMS/VS will always use the mode table values as a basis and modify them based on IMS generation parameters. For both SLUTYPE2 and SLUTYPE1 devies, IMS will set or alter FMPROF, TSPROF, PRIPROT, SECPROT, COMPROT. The maximum inbound RU size will be set to a value determined by the size of the IMS Receive Any (RECANY) buffer size. The maximum outbound RU size is set to a value determined by the OUTBUF specification on the TERMINAL macro. The screen size values and the screen size control byte are set to values determined by the SIZE parameter on the TERMINAL macro.

In this guide, wherever possible, the mode table values and the IMS and CICS specifications are the same. In cases where this is not possible (e.g. CICS 1.3) it must be understood that the application provided values always take precedence over the mode table values.

5. Various Logon Failure Symptoms

Many host programs have experienced problems during the logon process due to their inability to correctly handle the 082D sense data and the 082B LUSTAT data that may be encountered during logon. To avoid these problems as much as possible, ensure that vendor supplied programs are at current maintenance levels and that your VTAM programs or TCAM programs/message handlers are appropriately coded.

6. 3274 Device Port Addressing

There has been some confusion over the relationship between 3274 device ports and the BSC, SDLC or channel address associated with each port. The concept that seems to be most misunderstood is that port A0 is the first address in a sequence and that port B0 is the next sequential address following the last installed A port. If additional A ports are installed, then all of the B port addresses will be incremented by the number of A ports added. If A ports are removed from a machine, then all of the B port addresses will be decremented by the number of A ports removed. The increment or decrement is always in multiples of 8 (the number of ports in an A type adapter) except when more than 32 ports are installed on a

3274. Only 32 ports can be used and special rules apply to this situation to allow a 3274 to be fully configured to 32 ports, but without requiring A ports to be used in multiples of 8 and B ports to be used in multiples of 4. This special circumstance is described in the 3274 Planning, Setup and Customizing Guide. An example is also shown in Chapter 1-4 of this guide.

1-2. 3270 Publications.

A. Publication list

Installation Planning Information

GA27-2827 3274 Planning, Setup and Customizing Guide
GA18-2041 3276 Planning and Setup Guide
GA27-2849 3270 Display System Configurator
GA27-2787 Installation Manual - Physical Planning
GA27-2749 3270 Component Description
GA27-3153 3287 Component Description
GA27-3176 3289 Component Description
GA27-2739 Introduction to the 3270 Display System
GA27-2837 3270 Character Set Reference
GX27-2951 3270 Layout Sheet (pad)
GX27-2990 3270 Physical planning template (English)
GX27-2999 3270 Physical planning template (Metric)
GA27-2759 Human Factors Study
GA24-3488 Forms Design Reference Guide for Printers
GA27-2805 Assembly of Coax for Attachment to IBM Products
GC27-6999 Introduction to Programming the IBM 3270
G229-7031 Facility Error Recognition System
GC34-2003 OS/VS Display Exception Monitoring Facility
GA18-2018 3287 Site Planning Guide
SY27-2544 7460 Card Reader RPQ
GA23-0011 Description, Configuration and Physical Planning: 3274 DDSA
GA18-2038 Description, Configuration and Physical Planning: 3276 DDSA
GA23-0012 Description, Configuration and Physical Planning:
Extended Function Store and APL/Text Features
GA23-0013 Description, Configuration and Physical Planning:
Encrypt/Decrypt Feature 3274-1C
GA23-0014 Description, Configuration and Physical Planning: 3274-1D
GA27-2788 An Introduction to the IBM 3270 APL and Text Facilities
SR23-4691 3270 Enhancements (FE Education)
G320-6023 SNA 3274 / 3276 Installation Guide
SR20-7211 ISP: SNA Environment - Logical Data Flow Module 9
SNA 3270 (3274/3276) Device Considerations

Setup Instructions.

GA27-2855 3274-1C
GA18-2017 3276
GA27-2838 3278
GA27-3171 3287
GA27-3140 3289
GA27-2872 3278 Control Unit Switch
GA27-2873 3276/3278 Magnetic Stripe Reader
GA27-2895 3276/3278 Keyboard Replacement

Problem Determination Guides

GA27-2850 3274
GA18-2014 3276
GA27-2839 3278
GA27-3151 3287
GA27-3141 3289
GA27-2871 3274 Sub-System
GA18-2042 3276 Sub-System
G320-6016 SNA System Problem Determination Guide
SX23-0207 3274 CE Reference Summary
SX23-0206 3276 CE Reference Summary

Problem Reporting Forms

GX23-0203 3274
GX23-0201 3276/3278
GX27-2923 3287
GX27-2922 3289

Operator Guides

GA27-2742 Operators Guide for 3275/77/84/86/88
GA23-0023 Operators Guide for 3274
GA18-2040 Operators Guide for 3276
GA27-2890 Operators Guide for 3278
GA27-3150 Operators Guide for 3287
GA27-3147 Operators Guide for 3289
GA27-3148 Operator Reference Card for 3289
SR20-7247 3278 Operators ISP

Maintenance Information

SY27-2512 3274 Maintenance Concepts
SY27-2511 3274 Maintenance Information
SY18-2018 3276 Maintenance Concepts
SY18-2004 3276 Maintenance Information
SY27-2510 3278 Maintenance Information
SY27-0171 3287 Maintenance Information
SY27-0169 3289 Maintenance Information

B. SLSS Profile.

To ensure that an SLSS subscription provides all 3270 manuals without specifying each individual manual number, the following codes must be specified on the SLSS subscription form:

Section B: Specify a 360 or 370 CPU number

Section C: Yes

Section D: Specify -

00	General systems information
01 to 08	Processor, Storage Devices, Channels and I/O
09	Communications devices
13	Special features information
14	Custom features and supporting programs
15	Physical planning
30	Access methods, Data management, I/O control programs
37	RAS, Testing, Service aids, Problem determination

Section F: Specify the machine types for which manuals are needed (i.e. 3274, 3278, 3287, etc.). Do not specify 3270 as a machine or system type.

Items defined as installation forms or supplies are not distributed through SLSS and must be ordered separately. This applies to:

Trouble Report Forms	GX23-0203, GX23-0201, GX27-2923 and GX27-2922
3270 Display Layout Sheets	GX27-2951

Maintenance Concepts and Maintenance Information Manuals are not shipped to subscribers on a profile basis. These manuals are shipped with each machine. If extra copies are required they must be specified by form number on the SLSS subscription form. These manuals are billable and require that Section A specify PUBS and that non-IBM Billable also be specified, if applicable.

Subscribing based on profile has the advantage of automatically receiving new manuals (with new form numbers) as soon as they are available. However, if the SLSS profile is not complete then the subscription will also be incomplete. If more than one copy of a manual is required, then additional copies must be requested on the SLSS subscription by form number.

1-3. Software Support Matrices.

It is most important to understand that the SNA 3274/3276 machines are NOT host software compatible with the 3271-11, 3271-12, 3275-11, and 3275-12! The SNA 3274/3276 are generally compatible with host software designed to support the 3790 DSC feature, but these machines are NOT plug compatible. The 3270 and 3790 Component Description manuals should be reviewed in the areas of SNA bind parameters, Pⁿ sizes and sense/status for differences.

For additional information refer the Introduction to 3270 Display System (GA27-2739) .

Notes applicable to the following tables:

SNA printer support applies only when in SNA mode. PA and CANCEL keys are only operative when in SCS mode (LU Type 1). The heading DSC applies to 3270 print data streams in SNA mode only (LU Type 3). The 3287 requires feature 9660 for SCS operation. No BTAM changes are required for support of large screen remote displays. No attempt has been made to define non-SNA printer support.

PTFs are required for BTAM support of new screen sizes attached to the 3274-1B or 3274-1D. The appropriate APAR numbers are:

MVS OZ25924	SVS OY20293	VS1 OX20773	DOS/VS DY13042
OZ25921	OY20294	OX20763	

LEGEND:

- Y Support is announced.
- Not supported.
- (x) Refer to note "x" at the bottom of the appropriate table.

Note: Where access is indicated in the matrices as via NCP, both BSC and SDLC line protocols are supported for specified screen sizes unless otherwise stated. This includes 3274-1C and 3276 controllers.

ACCESS METHOD	SCREEN SIZES				PF KEYS		SNA PRINTERS		
	1920	960	2560	3440	1-12	1-24	SCS	PA	DSC
VTAM-2									
NCP	Y	-	-	-	Y	Y	Y	Y	Y
3274-1B, 1D	Y	-	-	-	Y	Y	-	-	-
3274-1A	Y	-	-	-	Y	Y	Y	Y	Y
ACF/VTAM									
NCP	Y	Y	Y	Y	Y	Y	Y	Y	Y
3274-1B, 1D	Y	Y	Y	Y	Y	Y	-	-	-
3274-1A	Y	Y	Y	Y	Y	Y	Y	Y	Y
TCAM 10									
EP	Y	(a)	(a)	(a)	Y	Y	-	-	-
NCP	Y	(a)	(a)	(a)	Y	Y	Y	Y	Y
3274-1B, 1D	Y	-	-	-	Y	Y	-	-	-
3274-1A	-	-	-	-	-	-	-	-	-
ACF/TCAM V1									
EP	Y	Y	Y	Y	Y	Y	-	-	-
NCP	Y	Y	Y	Y	Y	Y	Y	Y	Y
3274-1B, 1D	Y	Y	Y	Y	Y	Y	-	-	-
3274-1A	-	-	-	-	-	-	-	-	-
ACF/TCAM V2									
EP	Y	Y	Y	Y	Y	Y	-	-	-
NCP	Y	Y	Y	Y	Y	Y	Y	Y	Y
3274-1B, 1D	Y	Y	Y	Y	Y	Y	-	-	-
3274-1A	Y	Y	Y	Y	Y	Y	Y	Y	Y
BTAM									
EP	Y	Y	Y	Y	Y	Y	-	-	-
3274-1B, 1D	Y	Y	Y	Y	Y	Y	-	-	-
EXTM (see CICS table)									

NOTE: a. I/O device macro support available with ACF/TCAM, will not be available for TCAM/NCP Direct.

VSPC	SCREEN SIZES				PF KEYS		SNA PRINTERS		
	1920	960	2560	3440	1-12	1-24	SCS	PA	DSC
1.0 VTAM-2									
NCP	Y	-	-	-	Y	-	-	-	-
3274-1B,1D	Y	-	-	-	Y	-	-	-	-
3274-1A	-	-	-	-	-	-	-	-	-
2.0 VTAM-2									
NCP	Y	-	-	-	Y	Y	-	-	Y
3274-1B,1D	Y	-	-	-	Y	Y	-	-	-
3274-1A	Y	-	-	-	Y	Y	-	-	Y
2.0 ACF/VTAM									
NCP	Y	-	-	-	Y	Y	-	-	Y
3274-1B,1D	Y	-	-	-	Y	Y	-	-	-
3274-1A	Y	-	-	-	Y	Y	-	-	Y

TSO	SCREEN SIZES				PF KEYS (b)		SNA PRINTERS (d)		
	1920	960	2560	3440	1-12	1-24	SCS	PA	DSC
SU13 VTAM-2									
NCP (a)	Y	-	-	-	Y	(c)	-	-	-
3274-1B, 1D	Y	-	-	-	Y	(c)	-	-	-
3274-1A	-	-	-	-	-	-	-	-	-
SU58 VTAM-2									
NCP	Y	-	-	-	Y	(c)	-	-	-
3274-1B, 1D	Y	-	-	-	Y	(c)	-	-	-
3274-1A	Y	-	-	-	Y	(c)	-	-	-
ACF/VTAM									
NCP	Y	(e)	Y	Y	Y	(c)	-	-	-
3274-1B, 1D	Y	(e)	Y	Y	Y	(c)	-	-	-
3274-1A	Y	(e)	Y	Y	Y	(c)	-	-	-
TCAM 10									
EP	Y	-	-	-	Y	(c)	-	-	-
NCP	Y	-	-	-	Y	(c)	-	-	-
3274-1B, 1D	Y	-	-	-	Y	(c)	-	-	-
3274-1A	-	-	-	-	-	-	-	-	-
ACF/TCAM V1									
EP	Y	(e)	Y	Y	Y	(c)	-	-	-
NCP	Y	(e)	Y	Y	Y	(c)	-	-	-
3274-1B, 1D	Y	(e)	Y	Y	Y	(c)	-	-	-
3274-1A	-	-	-	-	-	-	-	-	-
ACF/TCAM V2									
EP	Y	(e)	Y	Y	Y	(c)	-	-	-
NCP	Y	(e)	Y	Y	Y	(c)	-	-	-
3274-1B, 1D	Y	(e)	Y	Y	Y	(c)	-	-	-
3274-1A	Y	(e)	Y	Y	Y	(c)	-	-	-

NOTE: a. BSC support only.
b. Support provided by SPF.
c. Support provided by SPF 2.2 only
d. TSO does not support printers, however printer support may be obtained through use of the FDP DSPRINT/VTAM.
e. Supported by TSO, but not by SPF

CICS/BMS	SCREEN SIZES				PF KEYS		SNA PRINTERS		
	1920	960	2560	3440	1-12	1-24	SCS	PA	DSC
1.3 VTAM-2 or ACF/VTAM									
NCP	Y	-	-	-	Y	-	Y	-	Y
3274-1B, 1D	Y	-	-	-	Y	-	-	-	-
3274-1A	Y	-	-	-	Y	-	Y	-	Y
1.3 BTAM									
EP	Y	-	-	-	Y	-	-	-	-
3274-1B, 1D	Y	-	-	-	Y	-	-	-	-
1.3 EXTM									
NCP	Y	-	-	-	Y	-	Y	-	Y
3274-1A	Y	-	-	-	Y	-	Y	-	Y
1.3 TCAM10 or ACF/TCAM									
EP	Y	-	-	-	Y	-	-	-	-
NCP	Y	-	-	-	Y	-	Y	-	Y
3274-1B, 1D	Y	-	-	-	Y	-	-	-	-
3274-1A	-	-	-	-	-	-	-	-	-
1.4 ACF/VTAM (a)									
NCP	Y	Y	Y	Y	Y	Y	Y	Y	Y
3274-1B, 1D	Y	Y	Y	Y	Y	Y	-	-	-
3274-1A	Y	Y	Y	Y	Y	Y	Y	Y	Y
1.4 BTAM									
EP	Y	Y	Y	Y	Y	Y	-	-	-
3274-1B, 1D	Y	Y	Y	Y	Y	Y	-	-	-
1.4 EXTM									
NCP	Y	Y	Y	Y	Y	Y	Y	Y	Y
3274-1A	Y	Y	Y	Y	Y	Y	Y	Y	Y
1.4 TCAM10									
EP	Y	(b)	(b)	(b)	Y	-	-	-	-
NCP	Y	(b)	(b)	(b)	Y	-	Y	-	Y
3274-1B, 1D	Y	-	-	-	Y	-	-	-	-
3274-1A	-	-	-	-	-	-	-	-	-
1.4 ACF/TCAM V1									
EP	Y	Y	Y	Y	Y	Y	-	-	-
NCP	Y	Y	Y	Y	Y	Y	Y	-	Y
3274-1B, 1D	Y	Y	Y	Y	Y	Y	-	-	-
3274-1A	-	-	-	-	-	-	-	-	-
1.4 ACF/TCAM V2									
EP	Y	Y	Y	Y	Y	Y	-	-	-
NCP	Y	Y	Y	Y	Y	Y	Y	-	Y
3274-1B, 1D	Y	Y	Y	Y	Y	Y	-	-	-
3274-1A	Y	Y	Y	Y	Y	Y	Y	-	Y

NOTE: a. ACF/VTAM is mandatory for CICS 1.4/VTAM.

b. I/O device macro support available with ACF/TCAM, will not be available for TCAM/NCP Direct.

IMS/MFS	SCREEN SIZES				PF KEYS		SNA PRINTERS		
	1920	960	2560	3440	1-12	1-24	SCS	PA	DSC
1.1.4 VTAM2 or ACF/VTAM									
NCP	Y	-	-	-	Y	-	Y	Y	-
3274-1B,1D	Y	-	-	-	Y	-	-	-	-
3274-1A	Y	-	-	-	Y	-	Y	Y	-
1.1.4 BTAM									
EP	Y	-	-	-	Y	-	-	-	-
3274-1B,1D	Y	-	-	-	Y	-	-	-	-
1.1.5 BTAM									
EP	Y	Y	Y	Y	Y	Y	-	-	-
3274-1B,1D	Y	Y	Y	Y	Y	Y	-	-	-
1.1.5 VTAM2									
NCP	Y	-	-	-	Y	Y	Y	Y	-
3274-1B,1D	Y	-	-	-	Y	Y	-	-	-
3274-1A	Y	-	-	-	Y	Y	Y	Y	-
1.1.5 ACF/VTAM(a)									
NCP	Y	Y	Y	Y	Y	Y	Y	Y	-
3274-1B,1D	Y	Y	Y	Y	Y	Y	-	-	-
3274-1A	Y	Y	Y	Y	Y	Y	Y	Y	-

NOTE: a. For IMS 1.1.5, ACF/VTAM is mandatory for support of new screen sizes (960, 2560, 3440).

1-4. Customization and Setup.

A. 3274 Customization

The following customization hints should help clarify the customization process.

1. The customizing procedures forms are sensitive to microcode release level. Diskettes and customizing procedures forms are both labeled "VALIDATION NUMBER nn". This nn level must match. Customization cannot be performed successfully with mismatched procedures and microcode.

NOTE: This "VALIDATION NUMBER" was previously called "DOCUMENTATION LEVEL". This terminology was changed to avoid confusion with publication dash-levels which are unrelated.

2. For sequence number 318 always specify 0. Modems that have half-speed capability should have a switch on the modem itself to control this function. Specifying this as 1 during customization does not specify that your modem has this capability, it specifies that, for this customization, your controller is to operate in this mode AT ALL TIMES.
3. For an initial installation, sequence number 311 should be specified as 0 until proper operation has been confirmed. Then, if your modem has wrap capability which you wish to take advantage, of you may recustomize and specify 311 as 1. This is to avoid confusion during the initial installation. Various modems have some type of wrap capability, however not all were designed to utilize the automatic activation interface used by the 3274. Any modem wrap failure will prevent the power-up or IML sequences from completing successfully.

The wrap function utilizes lead 18 (test) in the EIA interface (only known to be implemented in IBM modems, e.g. 3872 and 3874 with the required strapping options). Many modems supplied by other vendors have the terminal to modem wrap function implemented with a switch on the modem. This function may be used with the 3274, but requires that the switch be set before each IML and reset after each IML if you specify 311 as 1.

4. For Sequence number 313 specify 0 unless the host system (NCP) has specified NRZI for this line. NRZI is used to aid in bit-sync recovery for some modems which may be sensitive to certain characteristics of the data stream. If you think this sensitivity may exist, contact FE and the modem supplier to determine whether NRZI transmission might benefit your installation. This specification must match the NCP specification or communications cannot be established.

5. Device Port Addresses. Answers to sequence numbers 111 and 112 must be the number of "ports" installed in the configuration rather than the number of devices presently attached. If any B ports are installed, you must specify the exact number of A ports that are installed. You cannot specify A ports not actually installed and you cannot skip A ports that are installed. An exception is where more than 32 ports are installed (see configuration C below). Some examples follow:

a) 8 "A" ports and 4 "B" ports

111 = 4 and 112 = 8

addresses are -

Port	BSC	SNA	non-SNA channel
A0	x'40'	LU 2	C00
A1	x'C1'	LU 3	C01
A2	x'C2'	LU 4	C02
A3	x'C3'	LU 5	C03
A4	x'C4'	LU 6	C04
A5	x'C5'	LU 7	C05
A6	x'C6'	LU 8	C06
A7	x'C7'	LU 9	C07
B0	x'C8'	LU 10	C08
B1	x'C9'	LU 11	C09
B2	x'4A'	LU 12	C0A
B3	x'4B'	LU 13	C0B

b) 16 "A" ports and 8 "B" ports

111 = 8 and 112 = 16

addresses are-

Port	BSC	SNA	non-SNA channel
A0	x'40'	LU 2	C00
...
A7	x'C7'	LU 9	C07
A8	x'C8'	LU 10	C08
...
A15	x'4F'	LU 17	C0F
B0	x'50'	LU 18	C10
...
B7	x'D7'	LU 25	C17

c) 24 "A" ports and 12 "B" ports

To attach 22 "A" devices and 10 "B" devices-

111 = 10 and 112 = 22

addresses are-

Port	BSC	SNA	non-SNA channel
A0	x'40'	LU 2	C00
...
A21	x'D5'	LU 23	C15
B0	x'D6'	LU 24	C16
...
B9	x'5F'	LU 33	C1F

d) See 3270 Component Description manual, GA27-2749 for the table of device numbers vs. addresses to fill in the unspecified BSC addresses. For SNA addresses just add two to the device number. For non-SNA channel attachment, the channel address for a port consists of the channel number (C) and the control unit/device address. For valid control unit/device address combinations, refer to the 3270 Component Description manual "Local Operations (3272, 3274-1B/1D)".

6. Always clearly identify Systems diskettes. Indicate:

- a. Date customized
- b. Person performing customization
- c. Key parameter specifications that may differ from other diskettes (i.e. BSC/SDLC, modem wrap/no-wrap, etc.)

B. 3276 Setup

1. For BSC point-to-point or multi-point lines the Half-Duplex / Full-Duplex switch should normally be set to Full-Duplex. If NEWSYNC is used for the host modem (3271's on the same line) or if the host transmission control unit is sensitive to fast turn-arounds, set the switch to Half-Duplex. When the switch is set to Full-Duplex, in BSC mode, the controller will keep request-to-send up from recognition of "select" to the next EOT and respond to the text in about 6 ms. When the switch is set to Half-Duplex, the operation will be the same as with a 3271.

For SDLC point-to-point, set the switch to Full-Duplex (continuous request-to-send), and for SDLC multi-point set the switch to Half-Duplex (switched request-to-send).

2. The NRZI (SNA only) switch should normally be set off. NRZI is used to aid in bit-sync recovery for some modems which may be sensitive to certain characteristics of the data stream. If you think this sensitivity may exist, contact FE and the modem supplier to determine whether NRZI transmission might benefit your installation. This specification must match the NCP specification or communications cannot be established.
3. Set the Primary / Secondary line speed switch to Primary. This switch controls a line in the EIA interface which is used to switch speed on modems which implement this feature. Modems which have this half speed capability will have a switch on the panel to control this feature and the modem switch may be used with host site coordination.
4. Set the SNBU switch off (down) unless otherwise instructed by the host site network control operator. SNBU operation requires manual intervention at both ends with VTAM-II. Consult ACP/VTAM documentation (VARY RELEASE) for SNBU operations at that level.
5. BSC - SDLC address switches. For BSC, the control unit number should be used. See 3270 Component Description or the 3276 Planning and Setup Guide for the table of control unit numbers vs. addresses. For example, control unit 0 is address X'40', etc. Set the first five switches to the binary value of the control unit number.

For SDLC, set the switches to the hex value of the control unit address (e.g. X'C1', etc.). The hex address referred to above is the address used in the NCP generation on the CLUSTER or PU macros.

6. Consult FE and the local common carrier representative for the proper transmit level switch settings. Note: these switches apply only to a machine with the integrated switched modem.

1-5. Copy Operations.

Provisions for the 3274/3276 copy operations are complex and the 3270 Components Description manual (GA27-2749) should be studied carefully. Differences and restrictions are related to several factors:

1. BSC or SDLC mode of operation
2. 3276 or 3274 controller
3. 3274-1A, 3274-1B, 3274-1C or 3274-1D
4. Device attachment (3274 device adapter type A or B)
Type A = 3278, 3287, 3289
Type B = 3277, 3284, 3286, 3288, 3287 (with 3271/3272 attach feat.)
5. Host initiated copy or operator initiated copy via the PRINT key
6. The Print Authorization Matrix

Some general rules are:

1. No copy operation is possible if "Copy Lock" has been used. Copy Lock is specified by defining an attribute byte at screen position (1,1) that is protected alphameric (attribute byte bits 2,3 = B'10').
2. Host copy is not supported on the 3274-1B or 1D, but the PRINT key can be used to copy from a 3278 to a printer attached to a type A adapter (except for rule 3).
3. No copy is possible from a large buffer device to a small buffer device (e.g. 3278-3, -4 to a 3287 without the Extended Buffer feature).
4. In BSC mode, host copy utilizes the Copy Control Character with a "from" address. NL, EM, CR, and FF orders will be recognized. FF requires an RPQ on the 3284/86 and FC9550 or FC9660 on the 3287. Note that the above orders display as blanks on the 3278.
5. In SNA mode, host copy is accomplished by addressing the display using the Write Control Character (WCC) with the Start Print bit set on. However, the NL, EM, and CR orders will not be recognized and the printer format will default to the line size of the display. Note that bits 0-3 of the WCC are reserved when used in a LU type 2 operation. The FF order will be recognized if it is the first character of a print line.
6. On the 3274-1A or 3274-1C in SNA mode, no copy operation of any type is possible from a device attached to a type A adapter to a device attached to type B adapter or vice versa. On any model 3274, a PRINT key initiated copy can only be performed from a 3278 to a printer on an A port. Operator initiated copy is not available using a 3277 because it does not have a PRINT key.
7. On the 3274-1C, in BSC mode, host initiated copy is possible between any devices, but PRINT key initiated copy is only possible to a printer attached to a type A adapter.
8. In BSC mode, if a printer is busy performing a local copy operation when the host attempts to select it for output the control unit will respond with Intervention Required (IR).

9. In SNA mode, all copy operations are controlled by the Print Authorization Matrix (PAM).
10. On the 3276, the Print Authorization Matrix is internally generated at power-on time. The user cannot generate the PAM in any way. The default printer mode is "shared".

In SNA mode, copy is normally done to the next higher address port that has a printer attached. There is no address wrap in the PAM, therefore, there can be no copy from a display attached to port 7. (This default operation can be overridden using the PRINT IDENT function.)

11. On the 3274, the PAM can be generated and sent from the host, defined during customization or a default PAM will be generated at IML time. The PAM defines printers by address (port), mode (system, shared or local), class and authorized displays. The default PAM is similar to that described for the 3276 except that printers are set to system mode. This precludes PRINT key initiated copy in any mode and host initiated copy in SNA mode.
12. PRINT IDENT key operation allows rerouting of PRINT key initiated copy and, in SNA mode, host initiated copy output. When attached to a 3274, this key can be used to specify a class (70 - 85) or an address (01 - 31). The 3276 does not support classes of printers and only an address (01 - 07) can be entered.
13. When a printer is "shared", it may be used for PRINT key copy, host initiated copy or direct host output. PRINT key or host copy can be initiated whenever the printer is not in session with the host or, if in session with the host and in a between bracket state. If copy is attempted when the printer is busy with the host as defined above, the "very busy" indicator (two clocks) will be displayed. The request will be queued and the keyboard locked until the request can be satisfied or until the operator cancels the request via the DEVICE CANCEL key.

NOTE: On a 3274 with microcode Release 8 or greater, printer sharing may be accomplished on a bracket basis or on a session basis selectable during customization.

14. When a valid copy operation is requested, the wait indicator (clock) is displayed and the keyboard locks until the buffer transfer is complete. For PRINT key initiated copy, the keyboard then unlocks and the "printer printing" indicator appears until the print operation is complete. For host initiated copy the keyboard remains locked until the print operation is complete.
15. In SNA mode, the sense and status codes for display and printer busy/available are new. See the 3270 Component Description manual for sense codes and LUSTAT usage.

Because of these variations in implementation, it is important to carefully evaluate the copy requirements for each application, particularly when replacing one type of display system with another. These differences may also have a significant impact on conversions between BSC or local environments and an SNA environment.

1-6. 3274 Print Authorization Matrix Definition.

A. Concepts.

A Print Authorization Matrix (PAM) may be created at customization time and/or dynamically loaded into the controller by transmitting it from the host. For initial installations, it is recommended that the appropriate PAM be generated during customization. Generally, there is no requirement to host load the PAM. If it is to be loaded dynamically from the host, it must first be transmitted to the 3278 attached to port A0 and then loaded into the controller by the operator at that terminal. Loading of a print authorization matrix (other than the supplied default) is required before local copy operations can be performed (either PRINT key or host initiated SNA copy).

Three methods of defining a Print Authorization Matrix are shown here; transmitting from the host by IMS/VS, transmitting from the host by CICS/VS and defining the PAM during customization. For purposes of comparison, the same configuration is used for all three examples.

These PAM examples were designed to satisfy the following objectives:

1. 3278's attached to ports A0-A5 will be authorized to copy onto the printers attached to ports A6 and A7.
2. The printer attached to port A6 will be assigned to class 70.
3. The printer attached to port A7 will be assigned to class 80.
4. The default class for all 3278's will be class 70.
5. To perform copy operations to the printer on port A7, the operator must use the PRINT IDENT key and specify a class of 80 or a port address of 07.
6. The 3277's attached to ports B0-B2 will be authorized to copy (host initiated only) onto the printer attached to port B3.
7. The printer attached to port B3 will be assigned to class 85.
8. All printers will operate in shared mode.

Printer class assignments are, basically, arbitrary. The printer class concept is very similar to the implementation of printer SYSOUT classes in OS. It allows printed output to be directed to a class number without the operator having to be concerned about port numbers. This can be useful where the environment is dynamic. Where either the configuration is changed frequently or where the operator may use different displays attached to different control units that are not configured identically. Where a high volume of copying is done, multiple printers may be assigned to a common class. When a copy operation is requested, all printers in the assigned class will be scanned in search of an available one. This can provide increased printer availability to the operators.

On the other hand, if an operator's environment is fairly constant, multiple printers are not involved in load balancing and there is no inherent need for a class structure, the use of classes can be eliminated. If a class is not specified in the PAM, then the printer port address will appear in the operator information area of the 3278 instead of the class number. In many cases this may be simpler and easier for the operator to understand than the class number.

B. Transmitting the matrix using IMS/VS.

This technique can be utilized by IMS/VS users to perform the matrix definition and loading function. To cause the matrix to be transmitted, the operator at the 3278 attached to port A0 must enter:

/FORMAT PMATRIX (or /FOR PMATRIX)

When the matrix appears on the screen, the operator must then press the ALT and EOF keys simultaneously. This action will cause the matrix to be loaded into the 3274 controller. After the matrix has been loaded, the printer assignment symbol and the default print class will appear in the operator information area of each 3278 display that has been authorized to copy.

In this format definition, the NOT symbols (~) shown represent 3270 Start Field characters which are not printable. The actual format definitions contain a x'1D' where the ~ appear in this example.

```
PMATRIX MSG TYPE=OUTPUT,SOR=(MATRIX,IGNORE)
        MFLD (TITLE,'3274 PRINT AUTHORIZATION MATRIX')
        MSGEND
MATRIX  FMT
        DEV TYPE=3270-A4,FEAT=IGNORE,DSCA=X'0020'
        DIV TYPE=OUTPUT
TITLE   DFLD POS=(1,25),LTH=31,ATTR=(PROT,HI)
        DFLD 'PPM|----CLASS-----|01234567890123456789012345678901', X
        POS=(2,2)
        DFLD '~A~M~',POS=(3,2),ATTR=(PROT,ALPHA)
        DFLD '06J1 111111 ', X
        ATTR=(PROT,ALPHA),POS=(4,2)
        DFLD '07J 1 111111 ', X
        ATTR=(PROT,ALPHA),POS=(5,2)
        DFLD '11J 1 111 ', X
        ATTR=(PROT,ALPHA),POS=(6,2)
        DFLD '~E~N~D',POS=(7,2),ATTR=(PROT,ALPHA)
        FMTEND
        END
```

C. Transmitting the matrix using CICS/VS.

This is an example of how a CICS transaction could be used to generate and load a 3274 Print Authorization Matrix.

```

MAPLOAD CSECT          =====> See note 1.
TRTLOOP DS      0H
TRT      STARTRT (256) ,TR TABLE
BZ       WRITEIT
CLI     0 (1) ,C'#'
BE      WRITEIT
STC     2,0(1)
B       TRTLOOP
WRITEIT DFHBMS TYPE=(OUT,ERASE, LAST) ,           X
        CURSOR= 1, DATA=NO, MAP=MATRIX1, MSETADR=MATRIXS
        DFHPC TYPE=RETURN
        EJECT
TRTABLE DC      256X'0'
        ORG     TRTABLE+C'~'
        DC      X'1D'
        ORG     TRTABLE+C'#'
        DC      C'#'
        ORG
MATRIXS DFHMSD TYPE=MAP, MODE=OUT, CTRL=( FREEKB, ALARM, FRSET) ,           X
        DATA=FIELD, LANG=ASM, TERM=3270
MATRIX1 DFHMDF SIZE=(7,80) ,LINE=1, COLUMN=1
STARTRT DFHMDF POS=(1,25) ,LENGTH=31, ATTRB=(BRT,PROT) ,           X
        INITIAL='3274 PRINT AUTHORIZATION MATRIX'
        DFHMDF POS=(2,1) ,ATTRB=(BRT,PROT) ,LENGTH=50,           X
        INITIAL='PPM|----CLASS-----|0123456789012345678901234567X
        8901'
        DFHMDF POS=(3,1) ,ATTRB=(PROT) ,INITIAL='~A~M~- ' ,LENGTH=6
        DFHMDF POS=(4,1) ,ATTRB=(PROT) ,INITIAL='06J1           1111X
        11      ' ,LENGTH=30
        DFHMDF POS=(5,1) ,ATTRB=(PROT) ,INITIAL='07J           1      1111X
        11      ' ,LENGTH=30
        DFHMDF POS=(6,1) ,ATTRB=(PROT) ,INITIAL='11J           1      X
        111' ,LENGTH=30
        DFHMDF POS=(7,1) ,ATTRB=(PROT) ,INITIAL='~E~N~D' ,LENGTH=6
        DFHMSD TYPE=FINAL
        DC      C'#'
    
```

NOTE 1: This is not a complete CICS transaction program. Only the portion necessary to illustrate the technique has been shown. It may be desirable to include logic to dynamically build or alter the PAM based on changing network conditions.

D. Defining a Print Authorization Matrix during customization.

Specification of the Print Authorization Matrix during customization is well defined, including examples, in the 3274 Planning, Setup, and Customizing Guide, GA27-2827. To define a matrix during customization to satisfy the objectives set forth in this chapter, the following information would be entered in response to Sequence number 022:

AA	M	XXXX	YYYY	YYYY
06	2	8000	FC00	0000
07	2	0020	FC00	0000
11	2	0001	00E0	0000

The primary difference in this definition is that the information is bit-encoded instead of character-encoded as was done with the host transmitted matrix. Instead of defining the printer class and source device list as a positional character string of ones and blanks, a positional bit string of ones and zeroes is used. This results in having to convert the bit string into the above hex digits that will be entered by the operator performing customization.

To define a Print Authorization Matrix that does not use a class structure, specify all XXXX values in the above definition as zeroes. This will cause the assigned printer port (default 06) to be displayed in the 3278 operator information area instead of the class number.

1-7. IMS/VS Considerations.

A. IMS/VS Device and Feature Support.

The new 3270 devices offer new function and improved price/performance. These new devices come in many flavors and can attach to the host in many ways. Several different flavors of IMS/VS support may be used. This article is an attempt to clarify the relationship of the new devices to IMS support -- What is supported; when and how.

The article begins with overall comments and then discusses the new devices based on the method of attachment to the host:

1. BSC attachment
2. Local (3272 compatible) attachment
3. SNA attachment (local or remote)

The majority of the IMS/VS software support for these devices was available in 1.1.4. The additional support that is in 1.1.5 is identified in the article.

PEPPER EFFECT: The 3276/3278 displays are updated as information is received, without interruption of screen regeneration. This should eliminate the "blink" problem that occurred with some software. This capability has been referred to as the "WINDOWSHADE EFFECT", implying that data will smoothly appear beginning at the top of the screen and progressing down. IMS/VS does not transmit data in screen position sequence -- it is generally more efficient for MFS to edit data into a buffer as it is processed and avoid the extra cycles necessary to put data into screen position sequence. Because of this, 3276/3278 displays will exhibit a "PEPPER EFFECT" when operated with IMS -- data will appear in apparently random screen locations as it is received by the device. The actual transmission sequence is primarily a function of the sequence in which MFLD's are defined in the message output description (MOD). This does not create a data security exposure since non-display attribute bytes (all attribute bytes) will either be sent before the data or will already be in the buffer as a result of previous operations.

EXPANDED SELECT (3276/3278 displays) provides an efficient method for an application to use the selector pen for all operations. Without this capability, if a screen was designed for the operator to select from multiple groups of options on the screen and then cause entry by selecting a special "enter" field, IMS had to issue another read to get the data from the selected fields (mixed mode selector pen operation). The new select function will eliminate this extra read when the new designator character is placed in the "enter" field.

Attachment: BSC (3271 compatibility, remote)
 Access Methods: BTAM; VTAM (IMS/VS 1.1 on)
 Control Units: 3274-1C; 3276-1,2,3,4

Table 1a.

DISPLAYS	SCREEN	IMSGEN			MFS	
	SIZE	UNIT=	MODEL=	(1.1.5) or TYPE=	TYPE=	(1.1.5) or TYPE=
3278-1	480 960	3277	1	3270-A1	3270,1	3270-A1
3278-2	1920	3277	2	3270-A2	3270,2	3270-A2
3278-3	1920 2560	3277	2	3270-A3	3270,2	3270-A3
3278-4	1920 3440	3277	2	3270-A4	3270,2	3270-A4

Table 1b.

PRINTERS	FC	SUPPORT		IMSGEN		MFS
		COPY	DIRECT PRINT OUTPUT	UNIT=	MODEL=	TYPE=
3287-1, 2	9520 (5) (480)	YES	YES	3284	1	3270P, 1
	9521 (960)	(4)	YES (2)	3284	1	3270P, 1
	9522 (1920)	YES	YES	3284	2	3270P, 2
	9523 (2560)	(4)	YES (3)	3284	2	3270P, 2
	9524 (3440)	(4)	YES (3)	3284	2	3270P, 2
	9550	NO (6)	NO (1)	--	-	--
	9025 ALARM	NO	NO	--	-	--
3289-1, 2	9521 (960)	(4)	YES (2)	3284	1	3270P, 1
	9522 (1920)	YES	YES	3284	2	3270P, 2
	9523 (2560)	(4)	YES (3)	3284	2	3270P, 2
	9524 (3440)	(4)	YES (3)	3284	2	3270P, 2
	1090 ALARM	NO	NO	--	-	--

Table 1 notes:

1. IMS does not support vertical forms control on a TYPE=3270P device, but a multi-punched DFLD literal (X'0C') can cause a forms eject:

```
      12  
      9  
DFLD '8',POS=(n,1)  
      4
```

2. A maximum of 480 buffer positions will be used.
3. A maximum of 1920 buffer positions will be used.
4. The size defined by this feature must be equal to or greater than the screen size that you are copying from.
5. This feature does not apply to a 3276 control unit.
6. RPQ MK3988 is available to provide a forms feed after a copy.

COMMENTS:

- If you are using BTAM and replace existing 3275's with 3276 terminals, you must perform a control blocks generation defining the 3276 as a 3271 control unit with a 3277 terminal. The BSC 3276 is compatible with a 3271, not a 3275. There are 14 unique checks for 3275 or 3271 in the 3270 BTAM device dependent module.

If you are using VTAM and replace existing 3275's with 3276 terminals, you must perform an IMS control blocks gen (there are five modules that check for 3275 or 3271 in the 3270 VTAM DDM) and re-gen the NCP.

- Copy capability is available as with current IMS/VS remote 3270 support. In addition, 3276/3278 displays may obtain a copy without host involvement by using the PRINT key.

This "NO-HOST" copy eliminates 20-30K host instructions and some line traffic for each copy. There is no synchronization of "NO-HOST" copy with host programming (IMS), so care must be used if a printer is used for both copy and direct IMS output. This copy operation is asynchronous -- the display keyboard is unlocked as soon as the display buffer is copied to the printer buffer.

Host-involved copy with IMS/VS VTAM support is synchronous (the fix for APAR 71235 may change this) -- the display keyboard is locked until the printing is complete since VTAM/NCP do not notify IMS that buffer copy is complete (IMS is notified when the printing is complete). Host-involved copy with IMS BTAM support is asynchronous -- the display keyboard is unlocked as soon as the display buffer is copied to the printer buffer.

Attachment: Local (3272 compatible)
Access Methods: BTAM; VTAM (IMS/VS 1.1 on)
Control Units: 3274-1B; 3274-1D

Refer to Table 1.

Comments:

- Local copy capability is available through the PRINT key, without host involvement. This copy capability is not synchronized with the host programming (IMS) in any way. For this reason, great care must be used if a given printer is to be used for copy and direct IMS output. This copy is asynchronous -- the display keyboard is unlocked as soon as the display buffer is copied to the printer buffer.

There is no IMS/VS support for copy -- it must be performed using the hardware function or FDP 5798-CLZ.

Attachment: SNA (local or remote)
 Access Methods: VTAM (IMS/VIS 1.1.4 on)
 Control Units: 3274-1A; 3274-1C; 3276-11,12,13,14 (1,2,3,4 with FC6315)

Table 2.

DISPLAYS	IMSGEN			MFS	
	SCREEN SIZE	UNITYPE=	MODEL= or TYPE= (1.1.5)	TYPE=	or TYPE= (1.1.5)
3278-1	480 960	SLUTYPE2	1 3270-A1	3270,1	3270-A1
3278-2	1920	SLUTYPE2	2 3270-A2	3270,2	3270-A2
3278-3	1920 2560	SLUTYPE2	2 3270-A3	3270,2	3270-A3
3278-4	1920 3440	SLUTYPE2	2 3270-A4	3270,2	3270-A4

PRINTERS	FC	SUPPORT	IMSGEN	MFS
		COPY (1)	UNITYPE=	COMPT1=
3287-1,2	9660 (REQUIRED)	IMPLEMENTED IN CONTROL UNIT	SLUTYPE1	CONSOLE SCS1
3289-1,2		"	SLUTYPE1	CONSOLE SCS1

Table 2 Notes:

1. The copy function is performed by the control unit. On these machines this is referred to as "local copy". The term local copy should not be confused with PRINT key or PF12 key operation. Local copy means that the copy operation is controlled by the control unit. Printer selection is performed by the control unit alone. There are no IMS candidate printers. The printer that is the target of the copy operation does not even have to be defined to IMS. Local copy can be invoked either through the use of the PRINT key or the PF12 key. If the PRINT key is used, the host is not involved at all. This is called operator-initiated local copy. If the PF12 key is used, IMS will send a two byte message back to the display. This two byte message consists of a write command and a Write Control Character (WCC) that has the Start Print bit turned on. This is called host-initiated local copy.

COMMENTS:

- SLUTYPE2 support is available in IMS/VS 1.1.4.
- SLUTYPE2 support, when operated in terminal response mode, will use fewer host instructions than normal IMS 3270 support (BTAM or VTAM) if the output data is less than 1536 bytes for a 3274-1A.
- Based on current implementations, when operated in terminal response mode, SLUTYPE2 should produce a lower line utilization than 3270 VTAM (either BSC or SDLC). This should show up as better response time.
- MFS SCS1 formatting can be more efficient than 3270P formatting since it can completely fill all non-last buffers before transmission. Refer to Palo Alto Systems Center Newsletter 77-03, page H9 for information on 3270P formatting.
- Copy capability comes in two flavors: NO-HOST and HOST.

NO-HOST copy is available to 3276/3278 displays via a special key. This copy function is provided by the control unit without host involvement. Copy may be to a printer which is in session with IMS/VS -- the copy will be synchronized so that it does not print in the middle of a message from IMS. This copy operation is asynchronous -- the display keyboard is unlocked as soon as the display buffer is copied to the printer buffer. The use of this capability saves 20-30K host instructions per copy operation (compared to BTAM/VTAM attached UNIT=3277 host copy support) or 6-10K host instructions per copy operation (compared to VTAM attached UNITYPE=SLUTYPE2 host copy support).

HOST copy is invoked by using the PA3 or PF12 keys. HOST copy can be invoked "automatically" from the host using the MFS SCA and DSCA functions. IMS/VS merely tells the terminal to print -- candidate printer selection, buffer copy and printing are all performed by the control unit. This form of copy is synchronous -- the display keyboard is locked until the print operation is complete.
- The 3287 and 3289 printers have CANCEL, PA1 and PA2 keys that can be used when the device is operating in SCS mode and is attached to a 3274-1A, 3274-1C or 3276. Operation of the CANCEL key while IMS/VS is outputting a message causes IMS/VS to stop and discard the current output message. The PA keys cause a string of characters to be sent to IMS/VS (APAK 01 for PA1 and APAK 02 for PA2). This string of characters can be defined as a transaction code to IMS/VS or can be modified to a different string (command or message switch) by a user written IMS exit routine.
- The alarm feature on the 3287 and 3289 is not supported by MFS. The alarm can be sounded by sending a 'BEL' character via a multi-punched DFLD literal or by including it in a message which does not use MFS.
- The 3276 provides switched line capability. As with all VTAM terminals, the switched connection is transparent to IMS (IMS has no special support such as /IAM, is not aware that the connection is leased or switched, and does not support disconnect requests in the Z2 field of messages).

B. IMS/VS Forms Control for SCS Printers.

This section illustrates a technique for using MFS to transmit the SNA Set Vertical Format command that is required by the 3287 and 3289 to perform certain functions when operating in SCS mode. To perform vertical tabbing operations on either printer, or to perform a forms feed operation on the 3287 it is necessary to first transmit the SVF command to the printer. This SVF command can be sent by an application program that does not use MFS or it can be included in a format. When using MFS, the SVF can be sent as a stand-alone function as shown in this example or it could be included in format(s) that were designed for normal message output. In either case much thought should be given to systems design considerations, the impact on operators, and the affect of error recovery.

```
SETSVF  MSG  TYPE=OUTPUT,SOR=(SVF,IGNORE)
        MFLD (TITLE,'VERTICAL FORMAT HAS BEEN SET')
        MSGEND
SVF     FMT
        DEV  TYPE=SCS1,PAGE=(51)
        DIV  TYPE=OUTPUT
SVF     DFLD ' B          ',POS=(1,1)
TITLE  DFLD POS=(1,50),LTH=28
        FMTEND
        END
```

In the above example, the DFLD named SVF contains the SVF command in hex. The format of the SVF command is:
SSCMTB12345

Where:

SS = 2BC2	SVF command
C = 09	count field
M = 33	page size (51 decimal for 8 1/2 paper at 6 LPI)
T = 01	relative line number for top of form
B = 33	relative line number for bottom of form (51)
1 = 0A	relative line number for the first tab stop (10 decimal)
2 = 14	relative line number for the second tab stop (20)
3 = 1E	relative line number for the third tab stop (30)
4 = 28	relative line number for the fourth tab stop (40)
5 = 32	relative line number for the fifth tab stop (50)

This example specified 5 tab stops. From 0 to 11 tab stops may be specified. The count field must reflect the length of the command operand including the count field itself. If tab stops are provided and MFS is informed of them via the VT parameter on the DEV statement, MFS will use TAB commands instead of multiple NL commands where possible for vertical forms positioning.

To cause the format to be sent to the printer an operator at a display must enter the IMS/VS command:
/FORMAT SETSVF LTERM LHAPA08 (use appropriate LTERM name)

The intent of the previous example was to illustrate technically how to specify the SVF command using an MFS format. There are many installation dependent factors that must be considered when implementing a scheme to control printer formats throughout a network. One such possible solution is the following one that addresses the complex problem of controlling multiple form types on many remote printers.

This example is based on these printer and transaction definitions:

```
LHAPA08  TERMINAL NAME=LHAPA08,                                X
          COMPT1=(CONSOLE...),                                X
          OPTIONS=TRANRESP
          NAME LHAPA08
          NAME LSVFPA08

          TRANSACT CODE=APAK,MSGTYPE=(SNGLSEG,RESPONSE)
          TRANSACT CODE=FORMSET,MSGTYPE=(SNGLSEG)
```

Display stations that will be controlling printers must have security authorization to issue /PSTOP, /START and /OPNDST commands or have these requests relayed through the MTO. In IMS/VIS 1.1.5 an Automatic Operator Interface (AOI) application can be used. To minimize the security authorization level prior to IMS/VIS 1.1.5, use of MFS Segment Edit should be considered. This edit exit could take, for example, operator input of "STOP LHAPA08" and convert it to "/PSTOP LTERM LHAPA08". In this example, all printed output is directed to LTERM LHAPA08. Only the SVF (and optionally, the Set Line Density SLD) are sent to the terminal using the LTERM LSVFPA08. Two LTERMs are required because one LTERM must be available to handle the SVF while the LTERM controlling the normal printed output is stopped.

Normal Set-up Procedures:

1. Display operator enters the transaction code FORMSET, the name of the associated printer (e.g. LHAPA08) and the name of the form to be used.
2. The application invoked by the FORMSET transaction has a database containing appropriate set-up data for each form used in the installation. This could include horizontal tabs, vertical tabs, line density and sample output to assist the operator in forms alignment. This application also has a database record for each output unit that will be controlled by these procedures. This database record contains the name of the form last set-up and default set-up information for a stock form.
3. The application program sends a message (with set-up data) to the printer LTERM LSVFPA08 via an alternate IO-PCB.

Recovery Set-up Procedures:

1. The operator determines that the set-up message must be resent to the printer because of some error condition. The most common reason is that an error occurred resulting in the loss of the session between IMS/VIS and the printer.
2. The operator enters: /PSTOP LTERM LHAPA08
/OPNDST NODE LHAPA08
3. The operator depresses the HOLD PRINT and PA1 keys on the printer. This will result in a message consisting of the character string "APAK 01" being sent to the host and invoking the APAK transaction processing program.
4. The transaction processing program responds by resending the set-up message to LTERM LSVFPA08 as indicated by the database record for this printer. An alternative action might be to have the program also respond to PA2 key by sending a default set-up message.
5. The operator then enters: /START LTERM LHAPA08

NOTE: If the session has not terminated, but has stopped for some reason, such as intervention required, then Step 3 above would also include the procedure to clear the intervention required condition.

1-8. CICS/VS Considerations.

A. Terminology.

Throughout the CICS/VS documentation constant reference is made to the terms "VTAM-supported 3270" and "3270 Compatibility Mode" Logical Units (LU). It is important that the difference between these two LU descriptions be understood before installing the 3276 and 3274 SNA Control Units. The quickest method of determining which LU is which is by the control unit the LU is attached to. All devices attached to a 3271 (BSC or SDLC), 3275, 3272, 3274-1C (BSC), 3274-1B, 3274-1D, or a 3276 (BSC) Control Unit are "VTAM-supported 3270" LU's. This description indicates that SNA support for these devices is located in VTAM and to some extent NCP. The important thing to note here is that none of the control units listed above are SNA devices even though they are communicating through VTAM or, in the case of the 3271, using SDLC line protocol. On the other hand, all devices attached to a 3274-1C (SDLC), 3274-1A, or a 3276 (SDLC) Control Unit are "3270 Compatibility Mode" LU's with the exception of the SCS printers. This category of devices also includes 3277 displays and 3284/86/88 printers attached to the 'B' ports on the 3274-1C and 3274-1A Control Units. The difference is that SNA support is now located in the control unit's microcode and only SDLC line protocol is used by the remote control units. The following installation considerations will only apply to "3270 Compatibility Mode" (SNA 3270) LU's with emphasis on CICS/VS 1.4 and ACF/VTAM.

B. SYSGEN Considerations.

```
DFHSG TYPE=INITIAL  
VTAM=YES
```

```
DFHSG TYPE=TCP  
ACCMETH=VTAM  
CHNASSY=YES  
UCTRAN=EBCDIC  
VTAMDEV=3790 or  
VTAMDEV=(LUTYPE2,LUTYPE3,SCSPRT)
```

The TYPE=TCP in a VTAM environment generates 6 different modules: DFHZCA, DFHZCB, DFHZCP, DFHZCX, DFHZCY, and DFHZCZ. The parameters listed above generate in these modules the necessary support for the 3274/3276 SNA devices. TYPE2 LU's are 3276/3277/3278's; TYPE3 LU's are 3284/3286/3287/3288/3289's; and SCSPRT (LU1) refers to 3287 or 3289 printers with the SCS feature.

Note: All of the ZCP code necessary to support the new devices may be included in the CICS/VS system by using the 1\$ or 2\$ pre-generated modules.

C. DFHTCT TYPE=INITIAL Considerations.

```
RAMAX=
```

This value determines the size of the Receive Any Input Area's (RAIA) into which CICS/VS reads initial data from VTAM. Data from this area is always moved to a Terminal I/O Area (TIOA) before being

passed to a user application. This value will normally reflect the average input message size the user expects to receive. This value multiplied by RATIMES will be the largest chain element CICS/VS will accept from any SNA device.

RAPOOL=

The quantity of RAIAs, Receive Any Control Elements (RACE), Request Parameter Lists (RPL), and outstanding RECEIVE ANY's is controlled by this parameter. The RACE contains the RECEIVE ANY ECB's which are posted by VTAM when initial inbound data is received. This value is normally set initially at twice the average inbound message rate and then adjusted from the RAPOOL statistics created during CICS/VS shutdown so that neither the RACE scan is excessively long nor does a RECEIVE ANY shortage occur. The latter will cause VTAM to move the data into the CICS/VS address space until a RECEIVE ANY is issued.

D. DFHTCT TYPE=TERMINAL Considerations.

BRACKET=YES

Bracket protocol is enforced by CICS/VS. A bracket (a CICS/VS task) may be started by either CICS/VS or by the LU. CICS/VS will, however, always request permission to start a bracket by sending an SNA BID command to the LU before attaching the task. This sequence is always initiated by Automatic Task Initiation (ATI). Only CICS/VS will ever send an End Bracket (EB) which normally indicates end of task.

CHNASSY=YES

Chain assembly is also enforced by CICS/VS. This allows CICS/VS to assemble an entire inbound message into a single TIOA before presenting the message to the application message. The largest message that CICS/VS will assemble, however, is equal to the second parameter in the TIOAL parameter (see below).

BUFFER=

If the user wishes to have CICS/VS perform the outbound chaining of a message then CICS/VS will breakup the outbound message into chain elements of BUFFER size. Each chain element will require a SEND to be issued until the last element of the chain is transmitted. A value of zero will cause CICS/VS to SEND the entire message to VTAM which will in turn pass it to NCP which will segment the message. The trade-off here, obviously, is host versus NCP cycles and storage. For remote LUTYPE2 and LUTYPE3 outbound segmentation will normally provide the best performance and eliminate the "blinking" effect on LUTYPE2. For local attached devices, the hardware restricts the chain element size to 1536 bytes. For SCS printers, a value should be chosen that will, through the use of pacing, provide an overlap between printing and the receipt of data into an unused buffer (see Chapters 2-4 and 3-4 for additional information).

RUSIZE=

This parameter controls the size of inbound chain elements, each of which requires a RECEIVE to be issued by CICS/VS to retrieve them from VTAM. If the inbound chain element from a remote LU is larger than the 256 bytes, then the chain element is segmented. In the case

of a local LU, the chain element is segmented if it is larger than the VTAM IOBUF size. In either case, VTAM will re-assemble the chain element before passing it to CICS/VS to satisfy a RECEIVE. This assembly is performed in the CICS/VS address space through the use of GETMAINS. The maximum inbound chain element that may be sent by a 3276 attached LUTYPE2 is 2048 and by a 3274 attached LUTYPE2 is 1024. The best performance should normally be realized using these values as they will eliminate numerous RECEIVE's for small chain elements.

TIOAL=(parm1,parm2)

The size specified for the "parm1" will be the minimum size TIOA that a user application will be passed by CICS/VS. The size specified for "parm2" will control the largest chained message that CICS/VS will accept from the LU for which it is specified. Anything larger will be discarded by CICS/VS.

TRMMODL=

TRMMODL=1 is required for 3278-1 and TRMMODL=2 is required for all other models of the 3278.

FEATURE=UCTRAN

This parameter allows all inbound data to be translated to upper case EBCDIC characters.

E. SNA Sense Codes.

The most common SNA sense codes sent to CICS/VS from 3274/3276 Control Units, their normal cause, and the action taken by CICS/VS are as follows:

- 0801 The most probable cause for this is CICS/VS attempting a write to a printer that has been defined in the Printer Authorization Matrix as local only.
- 080A This sense code will never be seen by CICS/VS, but will be intercepted by VTAM. It is used by the 3274/3276 Control Units to reject a BIND to a LU that is powered off or not attached. VTAM will drive the CICS/VS SYNAD exit with a return code of X'10' and a feedback code of X'01' which indicates a BIND failure. CICS/VS will place the device out-of-service, thus, operator intervention is required before a LOGON is possible.
- 081B This will be sent as a BID reject whenever a key has been pressed by an operator but the enter key has not yet been pressed. CICS/VS will not retry the BID until after the task to be initiated has terminated. If the enter key has been pressed the BID will be rejected with an 0813 sense code and the BID retried.
- 0821 Invalid BIND's received by the 3274/3276 Control Units will be rejected with this sense code. Normally, this would be a CICS/VS error, but may be caused by improper parameter values in the TCT (i.e. invalid screen size or RUSIZE)
- 082B Normally this sense code will accompany an SNA LUSTATUS (LUS) from the 3274/3276 Control Units. It is always sent when

returning from SSCP-LU session to LU-LU session via the ALT SYS-REQ keys and after returning from TEST mode. It is also sent when a device is powered on if power off was during a session. Normally, any task would be abended and the read or write aborted. However, if received after a negative response of 082D or 0831, will serve as a component now available indicator.

- 082D If the LU is in either TEST mode or in a SSCP-LU session, all data will be rejected with this sense code. CICS/VS will await the subsequent LUS with 082B sense code before retrying the write.
- 0831 If the device is powered off during a session this sense code will be sent to CICS/VS along with an LUS. CICS/VS will await the subsequent LUS and 082B before proceeding.

F. Application Coding.

When issuing WRITES to SNA devices from application programs, two parameters on the DFHTC macro may have significant affect on terminal response time and system performance. Whenever possible, terminal related application programs should be designed in such a manner to take advantage of the DFHTC macro parameters explained below:

DFHTC TYPE=(WRITE, WAIT, LAST)

In a CICS/SNA environment each CICS/VS terminal related task represents a "bracket" and is initiated by a transaction sent from an SNA device. Each transactions will carry with it, in the SNA header, a "begin bracket" indicator. Only CICS/VS may send an "end bracket" indicator which signifies end of bracket or, normally, end of CICS/VS task. CICS/VS will always send the "end bracket" indicator to the terminal at task detach time unless specifically instructed by the application program, through the use of the LAST parameter on the DFHTC macro, to send it with the last data write.

If the application is specifically designed to know when the last WRITE will be issued, then both the data and the "end bracket" can sent with one I/O rather than two. There are at least two ramifications associated with this approach. First, system performance may be improved by saving one I/O to a terminal. And second, the SNA terminal will remain unavailable to the user (because of bracket state) until "end bracket" is received. With the standalone "end bracket", there may be a noticeable delay between keyboard availability and terminal availability (pressing enter key will give an X-f error on the terminal).

DFHTC TYPE=(CONVERSE)

In an CICS/SNA environment, conversations between CICS/VS and a SNA device is controlled by a protocol called "Half-Duplex Flip-Flop". This allows only one LU at a time to be transmitting data. This protocol is implemented through the use of an indicator in the SNA header called the "Change Direction" (CD) indicator. Whenever one of the LUs (CICS/VS or the SNA device) has completed transmission of data, the CD indicator is set to indicate to the other LU that it is its turn to transmit. In a conversational

task, this CD is sent each time a DFHTC TYPE=READ is issued for more data from the terminal. Therefore, if an application issues a WRITE to the terminal and then issues a subsequent READ, it forces a second transmission of a standalone CD to the terminal. By using the CONVERSE parameter, CICS/VS is aware at the time of the WRITE that the application wants to issue a READ, and thus, sends the CD indicator to the terminal with the outbound data. This design consideration has the same ramifications as those described above for the "end bracket" transmission.

G. CICS Copy Considerations.

The Print Request Matrix illustrates the printer modes supported by the various control units. Also shown are the methods by which the copy function may be invoked.

PRINT REQUEST MATRIX

PRINTER MODE (PAM)	3274	3276	3277/3790 DSC	COPY INVOCATION
System	Yes 1	No 2	Yes 1	PA Key
Local	Yes 3	No 4	Yes 5	Print Key Test-Req Key
Shared	Yes 3 6	Yes 7 6	Yes 6 5	Print Key PA Key Test-Req Key

NOTES:

1. Controlled by TCTTE PRINTTO/ALTPRT operand
2. May be simulated by plugging printers in the last two ports on the 3276 Control Unit. No local copies would then be possible on the last printer unless the next to last printer was powered off when the Control Unit was powered on or by specific printer addressing via the PRINT IDENT key.
3. Controlled by the Print Authorization Matrix defined by CICS/VS or during customization.
4. May be simulated by not defining the printer to CICS/VS, thus only local copies would be possible.
5. Controlled by the LU/LA Print Group Table.
6. Controlled by TCTTE PRINTTO/ALTPRT operand.
7. Controlled by the printer(s) placement on the 3276 Control Unit. Local copy will take place on the first printer found on a port above the 3278 where the PRINT key was pressed unless a specific printer is addressed via the PRINT IDENT key.

1-9. TCAM Considerations.

Alternate Screen Support.

A. Local Attach (3274-1B,1D)

Only ACF/TCAM with changes to the SCREEN macro has support for the alternate screen sizes. A 3278-3 or a 3278-4 may be used with TCAM 10 but it will only function in 1920 character mode.

B. Remote Attach

1. BSC and SDLC

To use the alternate screen sizes for remotely attached devices an ERASE/WRITE ALTERNATE command must be sent to the device to set the device in alternate screen size mode. This may be done either in an application program or in a Message Handler. The user should do it wherever he normally inserts the write command for the 3270. Even though the ERASE/WRITE ALTERNATE command is only required once per session it is recommended that it be sent with each write because there are some functions (such as clearing the screen) that can reset the display to the primary screen size.

SPF support of large screen sizes is only provided by SPF 2.2.

2. SDLC

- a. ACF/TCAM has full support for alternate screens through use of the:
 - SCRSIZE operand of the TERMINAL macro,
 - ALTSCR operand of the LISTTA macro,
 - SCREEN operand of the LINEGRP macro,and the IEDLSCR macro. The example in Chapter 2-6 illustrates the use of these macros.
- b. TCAM 10 users must perform the functions provided by these macros for themselves. This may be done by coding a bind image for each model of the 3278 that the user wants to support. An example of these bind images is shown in the 'VTAM Mode Tables' section of this document. Bytes 20-24 of the bind image contain the screen size information and the PRESERC operand of the IEDBENT macro can be used for coding the screen sizes. The user, when he logs on, must select the correct bind image name based on which model of 3278 he is using (this may be simplified by coding your own USS TABLE).
- c. For both TCAM 10 and ACF/TCAM if the display is always to be used in alternate screen mode then a simpler approach exists. The primary screen size in the bind may be set to the same as the alternate screen size and byte 24 of the bind may be changed from x'7F' to x'7E' which says that if an ERASE/WRITE ALTERNATE command is received then accept it, treat it as a regular ERASE/WRITE and continue to use the primary screen size.

1-10. Problem Determination Aids.

A. Problem Determination Guides.

There are, basically, three levels of problem determination guides:

1. System level.

At the overall system level the SNA System Problem Determination Guide (G320-6016) should be used. The purpose of this document is to assist in isolating the problem to a sub-system or, if possible, to a component.

2. Sub-System level.

There are two sub-systems that this manual is concerned with; System Problem Determination for the 3276 (GA18-2042) and System Problem Determination for the 3274 (GA27-2871). The purpose of these documents is to assist in isolating the problem to a machine.

3. Machine level.

Each machine type has a problem determination guide that is to be used to locate the source of a problem down to a component level or, at least, definitely isolate it to a particular machine.

B. Hardware Facilities.

The new 3270 sub-systems have several built-in features that can be used to improve the availability of these machines as well as reduce the installation time through enhanced problem determination capabilities. There are many new status indicators, error logs and E.C./microcode level displays that can be used very effectively by a knowledgeable operator or network control technician to quickly locate problems. Most of these were intended for normal customer use and are documented in the appropriate problem determination guide. There are some additional capabilities that were intended primarily for the service representative, but can be beneficial to network control personnel. These hardware facilities will be presented by machine type.

1. 3276/3278 Displays.

The main aid to problem determination for the displays is the operator information area on the bottom of the screen. Besides the obvious operator oriented items (upshift, insert, keying error, etc.), the information displayed here is almost equivalent to that found in a VTAM or TCAM I/O trace. The readiness and connection indicators will show whether an Activate Physical Unit (ACTPU) and Activate Logical Unit (ACTLU) commands have completed successfully. A careful observer can actually see the Bind and Start Data Traffic (SDT) commands being received. The system connection indicator will also change to indicate that the Bind has been accepted. If a Bind was sent and rejected, then a PROGnnn indicator will appear to indicate that a Bind was rejected and why. During normal operation, depressing an AID generating key (ENTER, PA, PF, CLEAR) will cause the input

inhibited and time symbols to appear. This situation means that the operator has initiated a transmission. These symbols will disappear when the host accepts the input and responds with output that unlocks the keyboard. This output will also normally contain Change Direction (CD) or End Bracket (EB) SNA indicators. This input inhibited condition cannot be reset by the operator.

If output is received and the operation is terminated with a CD or EB, but the host program did not unlock the keyboard, then the time symbol will change to the word SYSTEM. This condition can be reset by the operator. If, during normal operation, depressing an AID generating key causes the input inhibited -function (X-f) to appear, this is generally indicative of a host programming problem. This indicates that the host has responded to the previous transmission and unlocked the keyboard, but did not properly terminate the interchange with a CD or EB. The terminal is still in receive mode and cannot send data to the host until the host turns it around with either a CD or an EB. The indicator can be reset by the operator, but the condition cannot. This condition indicates that a host application protocol error has occurred. The host Help Desk or application programmer should be notified. Various other host protocol errors are clearly indicated via the PROGnnn indicators. Communications problems are also fairly clearly shown by the communications check indicator (-+/_nnn). The program and communication check indicator numbers are explained in the appropriate (3274 or 3276) Sub-System level problem determination guide as well as in the 3270 Component Description manual.

A good working knowledge of these indicators will allow much more rapid problem determination than getting this same information from a trace. It is even more beneficial with intermittent problems where you must be able to recreate the problem to trace it. In any case, a thorough understanding of SNA protocol is required to understand either the significance of these indicators or the information presented in a trace.

2. 3276 Control Unit.

There are some facilities useful to network control personnel that can be invoked via the TEST key on the 3276 or a 3278 attached to the 3276. One such facility is described in Section 4 of either the 3276 or 3278 Problem Determination Guide (located in the keyboard). This is called Test L0 and is used to verify correct operation of several display and control unit functions. Test facility routines other than L0 are described in the 3276 Maintenance Information manual (located under the keyboard). These Test facility routines are described in Table 2-3 in the 3276 MI manual.

Test L1 is probably the most useful of these routines for network control purposes. Test L1 will display the machine error log as an easily readable matrix of error counters. Operation and interpretation is easy enough for experienced operators to understand or for a network control technician to remotely talk an inexperienced operator through.

Test L3 will display the status of each terminal adapter. One of three conditions will be indicated for each port; device is powered on and operational, device is powered off or not installed, adapter has been disabled due to errors or adapter not installed.

Test L4 will erase the error log displayed in Test L1. This can be used to help isolate current errors from previous ones.

Test L5 displays 3276 machine registers and RAM storage. Practical use of this facility requires a professional technician. This routine will display all the logs including the communication adapter log and the stacking log. Machine check codes and the number of installed PROM modules are also displayed. Interpretation of this information requires more knowledge of the machine than a customer would normally be expected to have.

The information displayed by any of these Test facilities can be printed by using the local copy function.

3. 3274 Control Unit.

The 3274 control unit also has some facilities useful to network control personnel that can be invoked via the TEST key on a 3278 attached to the 3274. The Test 0 routine is the same as the 3276 Test L0 and is described in the 3278 Problem Determination Guide (located in the keyboard). The additional Test facilities are described in the 3274 Maintenance Concepts manual (SY27-2512), chapter 3. In general, the information displayed by the 3274 is not as easily interpreted as that displayed by the 3276. There is a larger volume of information to display and, due to the various model and features, more different types of information to display. Detailed information on interpreting these displays can be found in the 3274 Maintenance Concepts manual.

Test 1 is similar to the 3276 Test L1. This Test routine displays device error logs. Counters which record the number of times each of five different error types have occurred are displayed. The most current error in each error series (2nn, 3nn, 4nn, 5nn) is also displayed. These error series are the numbers that appear in the 3278 operator information area in conjunction with an error type (e.g. program check, machine check, or communication check). Test 1 can also be used to display the error logs for the Common Communications Adapter (BSC or SDLC), High Performance Communications Adapter (SDLC only), Local Host Attachment (3274-1B), Local Channel Attachment (3274-1A), Type A Terminal Adapter, and Type B Terminal Adapter.

Test 2 is used to display configuration information. The primary purpose of this Test routine is to determine what microcode level was used for customization and exactly what parameters were specified during customization, if there is any doubt.

Test 3 is similar to the 3276 Test L3. The primary purpose of this display is to determine the status of each controller port; powered on and operational, powered off or not installed, or disabled due to errors.

Test 4 is similar to 3276 Test L4 and is used to reset the error logs.

Test 6 will display the Device Control Block for each device. Much detailed information is displayed, but it is of little use in normal network control operations or problem determination.

The information displayed by any of these Test routines can be printed by using the local copy function.

4. 3287 Printer.

On the 3287 the two digit status indicator is the primary problem determination aid. The recommended operator action for each of these status codes may be found in the 3287 Problem Determination Guide. A more detailed description of the cause of each of these status codes may be found in the 3287 Maintenance Information manual (locate under the printer at the rear).

One capability that may be of use for some unique or difficult problems is the Register and Communication Buffer printout. This printout can be obtained by pressing the Hold Print switch and then pressing the Test switch. To interpret this printout refer to the 3287 Maintenance Information manual, section 2. The Register Printout Analysis Chart describes the contents of the register printout in detail.

Some of the information contained in the Register Printout is:

- a. To verify that the appropriate specify and feature codes are installed check location X'052' and X'0C7'.

ADDRESS	BIT(S)	VALUE	FC/SC	DESCRIPTION
052	2	1	FC3880	Extended print buffer (4K)
	3	1	SC9550	Page length control
	4,5,6	000	SC9520	480 Character print
		001	SC9521	960 Character print
		010	SC9521	1920 Character print
		011	SC9521	2560 Character print
		111	SC9521	3440 Character print
	7	1	SC9488	X print
0C7	1	1	SC9660	SCS support

- b. SCS Print Control Parameters

ADDRESS	DESCRIPTION
0A4	Maximum print position
0A5	Left margin
0A6	Right margin
0A7	Maximum page length
0A8	Top margin
0A9	Bottom margin
100-110	SCS horizontal tab values
112-11D	SCS vertical tab values

c. Statistical Error Log 170-1AF

A section titled "Communication Buffer Printout Analysis" describes the format of the communications buffer and how to interpret it. The communication buffer is divided into two parts in the printout. The first part (address 0000 - 004F) is the Printer Control Interface Area (PCIA). The PCIA format is described in the PCIA Analysis Chart. The second part of the Communications Buffer printout is the data part of the buffer. The data in the buffer is in internal code structure not EBCDIC. Appendix D contains charts to interpret the internal buffer code.

5. 3289 Printer.

For the 3289, the two-digit status indicator is again the primary problem determination aid. There are several additional aids described in the 3289 Component Description manual. Some facilities available are:

- Single Cycle Print
- Error Log Print
- Buffer Print
- Register Print
- Adapter Storage Print
- System Card Jumper Setting Print
- Activate 3289 Internal Traces
- Print 3289 Internal Trace

2-1. Installation environment for Part 2.

MVS 3.7F at PTF level 78-05

ACF/VTAM & TSO/ACF/VTAM (SU34, SU35 & SU40)

ACF/TCAM & TSO/ACF/TCAM (SU44, SU46 & SU59)

ACF/NCP

NOSP (SU 45)

SPF 2.2

IMS/VS Version 1, Release 1.5

CICS/VS 1.4

3276-12 (at E.C. level 850568) 9600 BPS

3274-1A (Release 9.0 microcode)

1 type A adapter (8 displays, 2 printers)

1 type B adapter (4 displays)

3274-1C (Release 7.0 microcode, E.C. 0746798E) 9600 BPS

1 type A adapter (8 displays, 2 printers)

1 type B adapter (4 displays)

3278-1

3278-2

3278-3

3278-4

3287-2 (with SCS FC9660)

3289-2

3277-2

2-2. NCP Definition.

The NCP definition example shown below is not a complete NCP definition. Only items pertinent to this document are shown.

```

*****
NCPACF  PCCU  CUADDR=418,          3705 CONTROL UNIT ADDRESS      X
          MAXDATA=4000,    MAX OUTBOUND PIU      =====> See Note 1 X
          AUTOSYN=YES,     PROMT IF ALREADY LOADED          X
          AUTODMP=NO,      PROMPT BEFORE DUMPING NCP          X
          AUTOIPL=YES,     AUTOIPL AND RESTART NOT AUTO      X
          DUMPDS=NCPDUMP,  AUTODUMP REQUESTED          X
          SUBAREA=13,      VTAM REQUIREMENT                X
          INITEST=NO      NCP INITIALIZATION TEST
*****
*          BUILD MACRO SPECIFICATIONS          *
*****
HONEDV  BUILD  TYPGEN=NCP,          X
          MAXSUBA=31,          X
          CATRACE=(YES,255),    X
          MAXSSCP=2,          BOTH HOSTS ACTIVE          X
          MEMSIZE=256,          X
          MODEL=3705-2,        X
          CA=(TYPE4,TYPE4-0),  X
          NCPCA=(ACTIVE,ACTIVE), X
          LTRACE=2,            X
          ABEND=YES,          ABEND FACILITY INCLUDED      X
          ANS=YES,            AUTOMATIC NETWORK SHUTDOWN    X
*****
          BFRS=64,            NCP BUFFER SIZE      =====> See Note 2 X
*****
          ERASE=NO,           DO NOT ERASE BUFFERS          X
          OLT=YES,            ONLINE TEST AVAILABLE          X
          SLOWDOWN=12,        SLOWDOWN WHEN 12% OF BUFFERS AVAIL X
          SUBAREA=21,          X
          TIME=,              NO TIME ON STAGE 2 EXEC CARDS  X
          TRACE=(YES,64),     64 ADDRESS-TRACE ENTRIES    X
          XITB=NO             NO ITB SUPPORTED BSC UNITS
*****
*          SYSCNTRL OPTIONS          *
*****
NCPSYSC SYSCNTRL OPTIONS=(MODE,DVSINIT,LNSTAT,SESINIT,          X
          RCNTRL,RCOND,RECMD,RIMM,ENDCALL,SSPAUSE,              X
          BHSASSC,NAKLIM,SESSION,XMTLMT)

```

NOTES:

1. The large RU sizes used with the new larger screen displays require a MAXDATA value on the PCCU macro that is equal to or greater than the maximum size outbound RU. If this MAXDATA value is exceeded, VTAM will internally generate a -RSP with a sense code of 8007 (segmenting error).
2. An NCP buffer size of 64 is recommended for an NCP supporting devices that utilize segmentation (i.e. 3271-11/12, 3600, 3790 DSC, or SDLC 3274 / 3276).

```

*****
*      HOST MACRO SPECIFICATIONS OS ACF/TCAM      *
*****
NCPHOST3 HOST  INBFRS=8,          INITIAL 3705 ALLOCATION      X
                MAXBFRU=20,        TCAM BUFFER UNIT ALLOCATION  X
                SUBAREA=14,         X
                UNITSZ=156,         MUST MATCH MCP UNITSZ    X
                BFRPAD=17,          X
                DELAY=.1,           .1 SECOND ATTENTION DELAY  X
                STATMOD=YES,        X
                TIMEOUT=(180)       AUTO SHUT DOWN IF NO RESP IN 180SEC X
*****
*      HOST MACRO SPECIFICATIONS OS ACF/VTAM      *
*****
NCPHOST4 HOST  INBFRS=8,          INITIAL 3705 ALLOCATION      X
                MAXBFRU=20,        VTAM BUFFER UNIT ALLOCATION  X
                SUBAREA=13,         X
                UNITSZ=152,         X
                BFRPAD=0,           X
                DELAY=.1,           .1 SECOND ATTENTION DELAY -OS X
                STATMOD=YES,        X
                TIMEOUT=(180)       AUTO SHUT DOWN IF NO RESP IN 180SEC X
*****
*      HOST MACRO SPECIFICATIONS DOS ACF/VTAM     *
*****
NCPHOST5 HOST  INBFRS=8,          INITIAL 3705 ALLOCATION      X
                MAXBFRU=20,        VTAM BUFFER UNIT ALLOCATION  X
                SUBAREA=12,         X
                UNITSZ=136,         X
                BFRPAD=0,           X
                DELAY=.1,           .1 SECOND ATTENTION DELAY -OS X
                STATMOD=YES,        X
                TIMEOUT=(180)       AUTO SHUT DOWN IF NO RESP IN 180SEC X
*****
*      CSB MACRO SPECIFICATIONS                   *
*****
FRAME1  CSB    SPEED=(134),        X
                MOD=0,              X
                TYPE=TYPE2
*****
*      LUPOOL MACRO SPECIFICATION                 *
*****
POOL1   LUPOOL  NUMBER=120         ALLOW FOR LARGE CLUSTER
*****
*      GROUP MACRO SPECIFICATION FOR SDLC LEASED LINES *
*****
SDLCGV1I GROUP LNCTL=SDLC,        SYNCHRONOUS DATA LINK      X
                DIAL=NO,           REQUIRED FOR LEASED LINE     X
                REPLYTO=1.0,       USE DEFAULT                X
                TYPE=NCP           NCP ONLY

```

```

*****
* LINE MACRO SPECIFICATION FULL DUPLEX *
*****
SDLCI22 LINE ADDRESS=(022), XMIT/RECEIVE ADDRESS ===> See Note 3 X
          DUPLEX=FULL, MODEM STRAPPING IS FULL-DUPLEX X
          SPEED=9600, LINE SPEED IS 9600 BPS X
          PAUSE=.2, X
          NEWSYNC=NO, DEPENDS ON MODEM USED X
          CLOCKNG=EXT, MODEM PROVIDES CLOCKING X
          NRZI=NO, DEPENDS ON MODEM USED X
          POLLED=YES, X
          RETRIES=(5) 5 RETRIES PER SEQUENCE X
*****
* SERVICE ORDER FOR FULL-DUPLEX LINE (022) *
*****
SERVICE ORDER=(SDLC3274)
*****
* PU MACRO SPECIFICATION FOR 3274 *
*****
SDLC3274 PU ADDR=C1, X
          PUTYPE=2, X
          ISTATUS=ACTIVE, X
          MODETAB=MTSDLC, X
          USSTAB=USST3270, X
          SSCPFM=USSCS, =====> See Note 4 X
          MAXOUT=7, MAX PATH INFO UNITS BEFORE RESPONSE X
          MAXDATA=265, MAXIMUM AMOUNT OF DATA X
          PASSLIM=7, X
          PACING=0, FOR DISPLAYS AND DSC PRINTERS ==> See Note 6 X
          VPACING=0, FOR DISPLAYS AND DSC PRINTERS ==> See Note 6 X
          DISCNT=(NO), X
          RETRIES=(,1,4) 4 RETRIES, 1 SECOND BETWEEN X
*****
* LOGICAL UNIT SPECIFICATIONS *
*****
SDLCPA01 LU LOCADDR=2,DLOGMOD=T3278M4 =====> See Note 5
SDLCPA02 LU LOCADDR=3,DLOGMOD=T3278M4
SDLCPA03 LU LOCADDR=4,DLOGMOD=T3278M3
SDLCPA04 LU LOCADDR=5,DLOGMOD=T3278M3
SDLCPA05 LU LOCADDR=6,DLOGMOD=T3278M2
SDLCPA06 LU LOCADDR=7,DLOGMOD=T3278M4
SDLCPA07 LU LOCADDR=8,DLOGMOD=DSC4K,MODETAB=MTNDSPTR
SDLCPA08 LU LOCADDR=9,DLOGMOD=SCS,MODETAB=MTNDSPTR
SDLCPB01 LU LOCADDR=10,DLOGMOD=T3277M2
SDLCPB02 LU LOCADDR=11,DLOGMOD=T3277M2
SDLCPB03 LU LOCADDR=12,DLOGMOD=T3277M2
SDLCPB04 LU LOCADDR=13,DLOGMOD=T3277M2

```

NOTES:

3. A 1D line set was used here because there is only one control unit per line. If more than one control unit is multi-dropped on a line, then a 1H line set could be used to provide increased throughput on the line. If a 1H line set is used, then the format of the ADDRESS parameter would be: ADDRESS=(022,023). See Chapter 3-2 for an example of an NCP gen for multi-dropped 3270 using a 1H line set.

```

*****
*           LINE MACRO SPECIFICATION   FULL DUPLEX           *
*****
SDLCI23  LINE  ADDRESS=(023),      TRANSMIT AND RECEIVE ADDRESSES      X
          DUPLEX=FULL,             MODEM STRAPPING IS FULL-DUPLEX      X
          SPEED=9600,              LINE SPEED IS 9600 BPS              X
          PAUSE=.2,                X
          NEWSYNC=NO,              DEPENDS ON MODEM USED              X
          CLOCKNG=EXT,            MODEM PROVIDES CLOCKING            X
          NRZI=NO,                DEPENDS ON MODEM USED              X
          POLLED=YES,              X
          RETRIES=(5)              5 RETRIES PER SEQUENCE            X
*****
*           SERVICE ORDER FOR FULL-DUPLEX LINE (023)         *
*****
          SERVICE ORDER=(SDLC3276)
*****
*           PU MACRO SPECIFICATION FOR 3276                   *
*****
SDLC3276 PU  ADDR=01,                X
            PUTYPE=2,                X
            ISTATUS=ACTIVE,          X
            MODETAB=MTSDLC,         X
            USSTAB=USST3270,        X
            SSCPFM=USSSCS, ==> See Note 4 X
            MAXOUT=7,                MAX PATH INFO UNITS BEFORE RESPONSE X
            MAXDATA=265,             MAXIMUM AMOUNT OF DATA              X
            PASSLIM=7,                X
            PACING=0, FOR DISPLAYS AND DSC PRINTERS ==> See Note 6 X
            VPACING=0, FOR DISPLAYS AND DSC PRINTERS ==> See Note 6 X
            DISCNT=(NO),              X
            RETRIES=(,1,4)           4 RETRIES, 1 SECOND BETWEEN        X
*****
*           LOGICAL UNIT SPECIFICATIONS                       *
*****
SDLC76P1 LU  LOCADDR=2,DLOGMOD=T3278M2 ==> See Note 5
SDLC76P2 LU  LOCADDR=3,DLOGMOD=T3278M2
SDLC76P3 LU  LOCADDR=4,DLOGMOD=T3278M2
SDLC76P4 LU  LOCADDR=5,DLOGMOD=T3278M2
SDLC76P5 LU  LOCADDR=6,DLOGMOD=T3278M2
SDLC76P6 LU  LOCADDR=7,DLOGMOD=T3278M2
SDLC76P7 LU  LOCADDR=8,DLOGMOD=DSC4K,MODETAB=MTNDSPTR
SDLC76P8 LU  LOCADDR=9,DLOGMOD=SCS,MODETAB=MTNDSPTR

```

NOTES:

4. The correct value for the SSCPFM operand is USSSCS.
5. The first port on the 3274 or 3276 is LOCADDR 2.
6. Due to the inherent logical pacing in 3270 data stream operations, explicit pacing is not generally required. For display output, an application usually will not send subsequent output until receiving acknowledgement from the operator that the current display has been received and can be overwritten. For DSC printers, the application must request a definite response which will, in effect, pace the output. See Chapter 2-4 for the SCS pacing requirements and implementation.

2-3. 3274-1A Definition.

A. VTAM local SNA major node definition for the 3274-1A

```
LHA3274A VBUILD SUBAREA=7,TYPE=LOCAL      =====> See Note 4
LHA3274  PU      CUADDR=4E0,                =====> See Note 3
                DISCNT=NO,
                ISTATUS=ACTIVE,
                USSTAB=USST3270,
                MAXBFRU=10,
                MODETAB=MT3274A,
                PUTYPE=2,
                SSCPFM=USSSCS,              =====> See Note 1
                VPACING=0                   =====> See Note 5
LHAPAO 1  LU      LOCADDR=2,DLOGMOD=T3278M1  =====> See Note 2
LHAPAO 2  LU      LOCADDR=3,DLOGMOD=T3278M4
LHAPAO 3  LU      LOCADDR=4,DLOGMOD=T3278M3
LHAPAO 4  LU      LOCADDR=5,DLOGMOD=T3278M3
LHAPAO 5  LU      LOCADDR=6,DLOGMOD=T3278M2
LHAPAO 6  LU      LOCADDR=7,DLOGMOD=T3278M4
LHAPAO 7  LU      LOCADDR=8,DLOGMOD=DSC4K,MODETAB=MTNDSPTR
LHAPAO 8  LU      LOCADDR=9,DLOGMOD=SCS,MODETAB=MTNDSPTR
LHAPB0 1  LU      LOCADDR=10,DLOGMOD=T3277M2
LHAPB0 2  LU      LOCADDR=11,DLOGMOD=T3277M2
LHAPB0 3  LU      LOCADDR=12,DLOGMOD=T3277M2
LHAPB0 4  LU      LOCADDR=13,DLOGMOD=T3277M2
```

X
X
X
X
X
X
X

NOTES:

1. The correct value for the SSCPFM operand is USSSCS.
2. The first port on the 3274 is LOCADDR 2.
3. The 3274-1A is defined to the operating system as a local 3791.
4. The 3274-1A requires that the VTAM IOBUF size must be an even number. There is also a minimum allowable IOBUF size. Refer to the 3270 Component Description manual for further details.
5. Due to the inherent logical pacing in 3270 data stream operations, explicit pacing is not generally required. For display output, an application usually will not send subsequent output until receiving acknowledgement from the operator that the current display has been received and can be overwritten. For DSC printers, the application must request a definite response which will, in effect, pace the output. See Chapter 2-4 for the SCS pacing requirements and implementation.

B. OS System Generation.

IODEVICE UNIT=3791L,ADDRESS=4E0

C. DOS System Generation.

DVCGEN CHUN=X'4E0',DVCTYP=3791L

D. VM/370 System Generation.

VM/370 does not support the 3274-1A directly, but the 3274-1A may be attached to a virtual machine that is running an SCP that does support it. To cause VM/370 to correctly perform the CCW translation, the 3274-1A must be defined to VM/370 as a 3705. The 3705 is the only VM/370 supported device with similar channel program characteristics.

Due to problems encountered with the SIOF instruction simulation, it was necessary to define a channel-to-channel adapter on the same channel as the 3274-1A. This will cause VM/370 to bypass SIOF simulation and treat it as a SIO instruction. NOTE: This same bypass was required for the 3705 NCP machines.

The generation macros used were:

3274-1A

```
RDEVICE ADDRESS=4E0,DEVTYPE=3705,ADAPTER=TYPE4,MODEL=F6,      X
      CUTYPE=NCP
RCTLUNIT ADDRESS=4E0,CUTYPE=3705
```

C-T-C Adapter

```
RDEVICE ADDRESS=401,DEVTYPE=CTCA
RCTLUNIT ADDRESS=400,CUTYPE=3811
```

E. EXTM Definition.

```
LOC1  ETMCFG TYPE=CNTRL,ALTBFR=1600,DEVADDR=SYS007,DEVICE=3790,  X
      ISTATUS=ACTIVE,NETNAME=LOC1,MAXBFRU=10,NEWNAME=LHA3274, X
      OBFRNO=20,OBFRSZ=32,UNITSZ=136
```

2-4. VTAM Mode Tables.

One mode table is shown for displays attached to remote controllers (3274-1C and 3276), one for displays attached to the 3274-1A and one for use with ACF TSO non-SNA large screen displays. The non-SNA mode table was included here because the method of informing TSO of the screen size needed clarification. The screen size is specified in the PSERVIC parameter just as it is for the SNA terminals. The remainder of the mode table parameters are identical to the S3270 entry in the IBM-supplied default mode table. The rest of this chapter applies only to the SNA machines.

The 3276 will support a 2K inbound RU size and the 3274 only 1K although any inbound RU size equal to or greater than the device maximum may be specified. The controller does not consider this an error and will cause the controller to default to the maximum inbound RU size that it supports (1K for 3274, 2K for 3276). Therefore, even though the 3274 and 3276 have some different characteristics, one mode table will suffice. For the sake of simplicity, this guide will illustrate that approach. Because the outbound RU size on the 3274-1A is restricted (1536 bytes) and the SDLC controllers are not, a separate mode table is used for the 3274-1A. If restricting outbound RU size to 1536 is acceptable for remote controllers as well, the 3274-1A mode table could be used as the only mode table for displays on all controllers. In any case, many host programs (e.g. IMS/VS and CICS/VS) alter the values specified in the mode table by overlaying all or part of the session parameters including RU sizes. Mode table entry names are the same in each table to allow the use of one USSTAB for all of these terminals.

The RU sizes supported by controller type are:

controller	MAX RU size	MAX RU size
	inbound to host	outbound from host
3276	2048	unlimited
3274-1C	1024	unlimited
3274-1A	1024	1536

One mode table is included for all printers regardless of controller attachment. This was done for two reasons:

1. NOSP requires all mode table entry names to be DSILGMOD. This precludes having both the NOSP display and NOSP printer entries in the same table.
2. Since it was decided to use the same printer RU sizes with all controllers, the printer entries in each table would have been identical if they were included in each controller table.

For this installation it was decided to set pacing and vpacing values in the terminal definitions (NCP and VBUILD) to zero and override those values when desired by utilizing the mode table parameters PSNDPAC and SRCVPAC. Inbound pacing (SSNDPAC) has not been used in any of these examples. Displays and DSC printers normally run with pacing set to zero. SCS printers, however, require a non-zero pacing count. Since a 3287 or 3289 printer can operate in either DSC or SCS mode it is not possible to have different pacing counts for the same printer if the pacing is determined by the terminal definition. In this installation, for example, a 3289 printer could be used with IMS/VS by specifying the mode table entry SCS. It could also be used in DSC mode by another application by specifying the mode table entry DSC4K.

There are some special considerations for printers operating in SCS mode. For 3287 printers the pacing count, RUSIZE and PSERVIC values depend on the buffer size in the printer. The 3287 printer has a 2K buffer as a standard feature and a 4K buffer as an optional feature. The 3289 printer has a 4K buffer as a standard feature. In all cases a determination must be made regarding the pacing count and RU size to be used. Many factors may enter into the decision, but the most important performance objective is to achieve overlap of printing with data transmission. In these examples, the rationale used for the trade-off between pacing count and RU size was to set the pacing count to one and set the RU size to the highest value that would still allow printing and transmission to overlap regardless of printer buffer size. The actual maximum RU size that is allowed depends on the controller type and model and can be determined by using the formulae described in the 3270 Component Description manual (GA27-2749) in the section "RU Lengths". It appears that there is little, if any, performance advantage in using an RUSIZE greater than 768. If an application program limits RU lengths to something significantly less than 768, it may be advantageous to use a pacing count greater than one. Pacing counts greater than 3 would not generally be recommended.

 * MODE TABLE FOR REMOTE DISPLAYS ==> See Note 1

```

MTSDLC  MODETAB
MODEENT LOGMODE=T3278M2, X
        FMPROF=X'03',TS PROF=X'03',PRIPROT=X'B1', X
        SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8', X
        PSERVIC=X'020000000000185018507F00'
MODEENT LOGMODE=T3278M3, X
        FMPROF=X'03',TS PROF=X'03',PRIPROT=X'B1', X
        SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8', X
        PSERVIC=X'020000000000185020507F00'
MODEENT LOGMODE=T3278M4, X
        FMPROF=X'03',TS PROF=X'03',PRIPROT=X'B1', X
        SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8', X
        PSERVIC=X'02000000000018502B507F00'
MODEENT LOGMODE=T3278M1, X
        FMPROF=X'03',TS PROF=X'03',PRIPROT=X'B1', X
        SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8', X
        PSERVIC=X'0200000000000C280C507F00'
MODEENT LOGMODE=DSILGMOD, X
        FMPROF=X'03',TS PROF=X'03',PRIPROT=X'B1', X
        SECPROT=X'A0',COMPROT=X'3080',RUSIZES=X'88F8', X
        PSERVIC=X'02000000000018502B507F00'
MODEENT LOGMODE=T3277M2, X
        FMPROF=X'03',TS PROF=X'03',PRIPROT=X'B1', X
        SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8', X
        PSERVIC=X'020000000000000000000200'
MODEENT LOGMODE=T3277M1, X
        FMPROF=X'03',TS PROF=X'03',PRIPROT=X'B1', X
        SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8', X
        PSERVIC=X'02000000000000000000100'
MODEEND
END
  
```

Notes: 1. For proper operation with this mode table, the 3276 must have E.C. level 850568 installed.

* MODE TABLE FOR 3274-1A DISPLAYS

MT3274A MODETAB

```

MODEENT LOGMODE=T3278M2, X
      FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1', X
      SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88C7', X
      PSERVIC=X'020000000000185018507F00'
MODEENT LOGMODE=T3278M3, X
      FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1', X
      SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88C7', X
      PSERVIC=X'020000000000185020507F00'
MODEENT LOGMODE=T3278M4, X
      FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1', X
      SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88C7', X
      PSERVIC=X'02000000000018502B507F00'
MODEENT LOGMODE=T3278M1, X
      FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1', X
      SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88C7', X
      PSERVIC=X'0200000000000C280C507F00'
MODEENT LOGMODE=DSILGMOD, X
      FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1', X
      SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88C7', X
      PSERVIC=X'02000000000018502B507F00'
MODEENT LOGMODE=T3277M2, X
      FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1', X
      SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88C7', X
      PSERVIC=X'0200000000000000000000200'
MODEENT LOGMODE=T3277M1, X
      FMPROF=X'03',TSPROF=X'03',PRIPROT=X'B1', X
      SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88C7', X
      PSERVIC=X'0200000000000000000000100'
MODEEND
END

```

* MODE TABLE FOR NON-SNA DISPLAYS USED WITH ACF TSO/VTAM OR NOSP

MT3274B MODETAB

```

MODEENT LOGMODE=T3278M2, X
      FMPROF=X'02',TSPROF=X'02',PRIPROT=X'71', X
      SECPROT=X'40',COMPROT=X'2000', X
      PSERVIC=X'000000000000185018507F00' =====> See Note 2
MODEENT LOGMODE=T3278M3, X
      FMPROF=X'02',TSPROF=X'02',PRIPROT=X'71', X
      SECPROT=X'40',COMPROT=X'2000', X
      PSERVIC=X'000000000000185020507F00' =====> See Note 2
MODEENT LOGMODE=T3278M4, X
      FMPROF=X'02',TSPROF=X'02',PRIPROT=X'71', X
      SECPROT=X'40',COMPROT=X'2000', X
      PSERVIC=X'00000000000018502B507F00' =====> See Note 2

```

Notes: 2. Bind command byte 24 must be X'7F', not X'7E', for non-SNA terminals and the alternate (large) screen size must be in bytes 22 & 23 (2050 for Model 3 or 2B50 for Model 4).

* MODE TABLE FOR 3287 & 3289 PRINTERS

MTNDSPTR MODETAB

```

MODEENT LOGMODE=SCS,
    FMPROF=X'03',TS PROF=X'03',PRIPROT=X'B1',
    SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C6',
    PSERVIC=X'01000000E100000000000000',
    PSNDPAC=X'01',SRCVPAC=X'01'          =====> See Note 3
MODEENT LOGMODE=DSC4K,
    FMPROF=X'03',TS PROF=X'03',PRIPROT=X'B1',
    SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'8787',
    PSERVIC=X'03000000000018502B507F00'
MODEENT LOGMODE=DSC2K,
    FMPROF=X'03',TS PROF=X'03',PRIPROT=X'B1',
    SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'8787',
    PSERVIC=X'030000000000185018507F00'
MODEENT LOGMODE=DSILGMOD,
    FMPROF=X'03',TS PROF=X'03',PRIPROT=X'B1',
    SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C6',
    PSERVIC=X'01000000E100000000000000',
    PSNDPAC=X'01',SRCVPAC=X'01'          =====> See Note 3
MODEEND
END

```

NOTES: 3. All SCS (LU Type 1) printers require pacing. The PSNDPAC and SRCVPAC parameters must specify a non-zero value or the pacing must be specified in the network definition as non-zero. See text above for details.

2-5. VTAM USS Table.

The following USSTAB illustrates the use of expanded output messages from the SSCP. The technique used allows easy entry of hex data. Also note that these devices operate in SCS mode when communicating on the SSCP-LU session. The display does not send 3270 data streams to the host and does not recognize 3270 data streams sent to it when communicating with SSCP. The only control character used here is the NL character (X'15'). Since 3270 data streams are not used, field attributes such as high intensity and protect are not available.

The use of message 10 can greatly simplify operations. The 3274/3276 control unit is designed to set screen ownership to the SSCP-SLU session upon receipt of an SSCP message when there is no PLU-SLU session. This will eliminate the requirement to press the SYSREQ and ALT keys before entering a logon command. Message 10 in conjunction with the simplified logon microcode (3276 EC 850573, 3274 microcode release 9) will eliminate the need for using the SYSREQ and ALT keys during logon. This will provide logon procedures that are compatible with 3271 SDLC, 3271 BSC (PU=YES) and generally compatible with NEFSOL attached 3270 displays.

With the installation of the simplified SNA logon, message 0 was eliminated from these installation examples. The previously used message 0 (instruction to the operator to press ALT & SYS REQ) is no longer applicable. Message 0 could still be used to display the text "LOGON in progress", although this could be confusing if the VTAM (SSCP) LOGOFF command is used (message 0 is displayed after either the VTAM LOGON or LOGOFF commands are successfully entered).

```
*****
*      USSTAB FOR SNA 3274/3276
*****
USST3270  USSTAB
LOG      USSCMD CMD=LOG,REP=LOGON,FORMAT=BAL
        USSPARM PARM=P1,REP=APPLID
        USSPARM PARM=P2,REP=LOGMODE,
        USSPARM PARM=P3,REP=DATA
IMS     USSCMD CMD=IMS,REP=LOGON,FORMAT=BAL
        USSPARM PARM=APPLID,DEFAULT=IMS
        USSPARM PARM=P1,REP=LOGMODE
CICS    USSCMD CMD=CICS,REP=LOGON,FORMAT=BAL
        USSPARM PARM=APPLID,DEFAULT=CICS
        USSPARM PARM=P1,REP=LOGMODE
NOSP    USSCMD CMD=NOSP,REP=LOGON,FORMAT=BAL
        USSPARM PARM=APPLID,DEFAULT=NOSP1
        USSPARM PARM=LOGMODE,DEFAULT=DSILGMOD
TSO     USSCMD CMD=TSO,REP=LOGON,FORMAT=BAL
        USSPARM PARM=APPLID,DEFAULT=TSO
        USSPARM PARM=LOGMODE
        USSPARM PARM=P1,REP=DATA
LOGOFF  USSCMD CMD=LOGOFF,FORMAT=BAL
        USSPARM PARM=APPLID
        USSPARM PARM=TYPE,DEFAULT=UNCOND
        USSPARM PARM=HOLD,DEFAULT=YES
EOD     USSCMD CMD=EOD,REP=LOGOFF,FORMAT=BAL
        USSPARM PARM=APPLID
        USSPARM PARM=TYPE,DEFAULT=UNCOND
        USSPARM PARM=HOLD,DEFAULT=NO
```

* THE FOLLOWING CODE IS POSITIONALLY DEPENDENT.....DO NOT CHANGE
MESSAGES USSMSG MSG=1,TEXT='MAXIMUM MESSAGE

X
X
X
X

X
X
X
X

X
X
X
X

X
X
X
X

X
X
X
X

X
X
X
X

X
X
X
X

X
X
X
X

USSMSG MSG=2,TEXT='MAXIMUM MESSAGE

USSMSG MSG=3,TEXT='MAXIMUM MESSAGE

USSMSG MSG=4,TEXT='MAXIMUM MESSAGE

USSMSG MSG=5,TEXT='MAXIMUM MESSAGE

USSMSG MSG=6,TEXT='MAXIMUM MESSAGE

USSMSG MSG=7,TEXT='MAXIMUM MESSAGE

USSMSG MSG=10,TEXT='MAXIMUM MESSAGE

PATCHBK EQU *
ORG ISTD0001+1 ORG BACK TO OVERLAY MESSAGE
MSG1S EQU *
DC X'4015' SKIP TO LINE 2
DC C'INVALID COMMAND SYNTAX, ENTER AS SHOWN BELOW:',X'15'
DC X'4015'
DC C'LOG applid logmode data',X'15'
DC C'IMS',X'15'
DC C'CICS',X'15'
DC C'TSO tsoid/password',X'15'
DC C'NOSP'
MSG1E EQU *

```

MSG2S  ORG  ISTD0002+1  ORG BACK TO OVERLAY MESSAGE
      EQU  *
      DC  X'4015'          SKIP TO LINE 2
      DC  C'% COMMAND NOT RECOGNIZED, ENTER ONE OF THE FOLLOWING:'
      DC  X'154015'
      DC  C'LOG applid logmode data',X'15'
      DC  C'IMS',X'15'
      DC  C'CICS',X'15'
      DC  C'TSO tsoid/password',X'15'
      DC  C'NOSP'
MSG2E  EQU  *
MSG3S  ORG  ISTD0003+1  ORG BACK TO OVERLAY MESSAGE
      EQU  *
      DC  X'4015'          SKIP TO LINE 2
      DC  C'% PARAMETER NOT RECOGNIZED, ENTER:',X'15'
      DC  X'4015'
      DC  C'LOG applid logmode data',X'15'
      DC  C'IMS',X'15'
      DC  C'CICS',X'15'
      DC  C'TSO tsoid/password',X'15'
      DC  C'NOSP'
MSG3E  EQU  *
MSG4S  ORG  ISTD0004+1  ORG BACK TO OVERLAY MESSAGE
      EQU  *
      DC  X'4015'          SKIP TO LINE 2
      DC  C'% PARAMETER IS NOT VALID, ENTER:'
      DC  X'154015'
      DC  C'LOG applid logmode data',X'15'
      DC  C'IMS',X'15'
      DC  C'CICS',X'15'
      DC  C'TSO tsoid/password',X'15'
      DC  C'NOSP'
      DC  X'154015'
      DC  C'NOTE: The application may not be active'
MSG4E  EQU  *
MSG5S  ORG  ISTD0005+1  ORG BACK TO OVERLAY MESSAGE
      EQU  *
      DC  X'4015'          SKIP TO LINE 2
      DC  C'TO LOGON, ENTER:',X'15'
      DC  X'4015'
      DC  C'LOG applid logmode data',X'15'
      DC  C'IMS',X'15'
      DC  C'CICS',X'15'
      DC  C'TSO tsoid/password',X'15'
      DC  C'NOSP'
MSG5E  EQU  *

```



```

MSG6S  ORG  ISTD0006+1  ORG BACK TO OVERLAY MESSAGE
      EQU  *
      DC  X'4015'          SKIP TO LINE 2
      DC  C'SEQUENCE ERROR:',X'15'
      DC  X'40154015'
      DC  C'1. You are attempting to logoff from a terminal '
      DC  C'that is not in session'
      DC  X'4015'
      DC  C'2. You are attempting to logon from a terminal that '
      DC  C'is already in session'
MSG6E  EQU  *
      ORG  ISTD0007+1  ORG BACK TO OVERLAY MESSAGE
MSG7S  EQU  *
      DC  X'40154015'          SKIP TO LINE 3
      DC  C'YOUR LOGON REQUEST HAS BEEN REJECTED FOR ONE OF THE'
      DC  C' FOLLOWING REASONS:'
      DC  X'1540154015'
      DC  C'1. This terminal is already in session'
      DC  X'154015'
      DC  C'2. The host application rejected the logon request'
      DC  X'154015'
      DC  C'3. The terminal rejected the bind'
MSG7E  EQU  *
      ORG  ISTD0008+1  ORG BACK TO OVERLAY MESSAGE
MSG10S EQU  *
      DC  X'40154015'          SKIP TO LINE 3
      DC  C'          PALO ALTO SYSTEMS CENTER, ACF/VTAM SYSTEM'
      DC  X'40154015'
      DC  C'          SIMPLIFIED LOGON'
      DC  X'401540154015'
      DC  C'For logon command syntax, press enter'
MSG10E EQU  *
      ORG  PATCHBK
* MAKE SURE EACH MESSAGE DOES NOT EXCEED 249 BYTES
MSG1L  EQU  (MSG1E-MSG1S)
MSG2L  EQU  (MSG2E-MSG2S)
MSG3L  EQU  (MSG3E-MSG3S)
MSG4L  EQU  (MSG4E-MSG4S)
MSG5L  EQU  (MSG5E-MSG5S)
MSG6L  EQU  (MSG6E-MSG6S)
MSG7L  EQU  (MSG7E-MSG7S)
MSG10L EQU  (MSG10E-MSG10S)
END    USS END

```

Following is an example illustrating the use of message 0 to display a "LOGON in progress" message to the operator after the LOGON request has been entered. This message will stay on the screen until the BIND has been received and accepted by the 3274 or 3276 at which time the screen will be erased and ownership will switch to the PLU-SLU session.

```

MSG10S  ORG  ISTD0008+1    ORG BACK TO OVERLAY MESSAGE
        EQU  *
        DC  X'40154015'          SKIP TO LINE 3
        DC  C'                PALO ALTO SYSTEMS CENTER, ACF/VTAM SYSTEM'
        DC  X'40154015'
        DC  C'                SIMPLIFIED LOGON'
        DC  X'401540154015'
        DC  C'For logon command syntax, press enter'
MSG10E  EQU  *
MSG0S   ORG  ISTD0009+1    ORG BACK TO OVERLAY MESSAGE
        EQU  *
        DC  X'40154015401540154015'
        DC  C'LOGON in progress'
MSG0E   EQU  *

```

Shown below is the original message 0 which is still applicable for use with a 3274 or 3276 that has not yet had the SNA simplified logon microcode installed.

```

MSG10S  ORG  ISTD0008+1    ORG BACK TO OVERLAY MESSAGE
        EQU  *
        DC  X'40154015'          SKIP TO LINE 3
        DC  C'                PALO ALTO SYSTEMS CENTER, ACF/VTAM SYSTEM'
        DC  X'40154015'
        DC  X'401540154015'
        DC  C'For logon command syntax, press enter'
MSG10E  EQU  *
MSG0S   ORG  ISTD0009+1    ORG BACK TO OVERLAY MESSAGE
        EQU  *
        DC  X'40154015'          SKIP TO LINE 3
        DC  C'COMMAND COMPLETED OK:'
        DC  X'4015401540154015'
        DC  C'If LOGON, press ALT/SYS REQ'
        DC  X'401540154015'
        DC  C'If LOGOFF, enter next command or press enter for '
        DC  C'logon command syntax'
MSG0E   EQU  *

```

In both of these examples using message 0, the following macro must be added following the one defining message 10. Note that this positioning is critical. The sequence of the USSMSG macros determines the ORG statement parameter.

```
USSMSG MSG=0,TEXT='MAXIMUM MESSAGE
```

```
X
X
X
X
```

2-6. TCAM Definitions.

This section consists of a sample terminal network definition and changes to the sample programs found in the ACF/TCAM Installation and Migration Guide (SC20-3121) required to support the SNA 3274/3276.

```
*****
* TERMINAL TABLE FOR 3274 AND 3276
*****
*
*          TERMINAL TABLE
*
*
* TERMTYPE  X'80'  3270 TERMINAL
*           X'40'  2770/3770 TERMINAL
*           X'20'  2741/3767 TERMINAL
*           X'10'  NDS 3270 TERMINAL
*           X'08'  S/S , BSC LINE CONTROL EP MODE
*           X'04'  S/S , BSC LINE CONTROL NCP MODE
*           X'02'  LOCAL SUPPORT
*           X'01'  SDLC LINE CONTROL
*
*
* TERM MODE X'80'  BATCH
*           X'40'  INQUIRY
*           X'20'  MESSAGE SWITCH
*           X'10'  GOOD MORNING MESSAGES REQUIRED
*           X'08'  NO IDLES NEEDED
*           X'04'  SCREEN DEVICE
*           X'02'  IDLES NEEDED
*           X'01'  PRINTER
*
*
* SNADFC   X'80'  CHANGE OF DIRECTION BIT
*           X'40'  ISSUE BID DFC
*           X'10'  CANCEL THE MESSAGE
*           X'08'  IN RECEIVE DATASET STATE
*           X'04'  IN SEND DATASET STATE
*           X'02'  CHANGE DIRECTION HAS BEEN SENT
*           X'01'  REMEMBER TO SET CHANGE DIRECTION
*****
```

```
TTABLE LAST=SSCP,MAXLEN=8
TERMTYPE OPTION CL8      1  TERMINAL NAME FIELD
PATHSW   OPTION XL1     2  OPTION FIELD FOR PATH SWITCH
TERMTYPE OPTION XL1     3  TERMINAL TYPE & LINE CONTROL
TERMMODE OPTION XL1     4  TERMINAL AND APPL CHARACTERISTICS
ERRCT    OPTION XL1     5  TRANS ERROR COUNTER (IEDPSTOP)
SNADFC   OPTION XL1     6  DATA FLOW CONTROL BYTE
SNA SENSE OPTION XL5     7  STORAGE FOR SNA SENSE BYTES
IEDBN DPM OPTION CL40   8  BIND IMAGE USED
IEDL MODE OPTION CL8    9  BIND NAME FOR HOST INITIATED SESSION
PRNT3270 OPTION CL8   10  NAME OF 328X FOR 3277 TO PRINT
IEDLUNAM OPTION CL8   11  DMH FOR HOST INITIATED SESSION
IEDQFSCR OPTION XL1   12  TSO FULL SCREEN SUPPORT
```

```

*****
GSNA      GROUP MH=HMEMU90,TRANS=EBCF,BUFMAX=7,OPACING=5,BUFSIZE=2028
SDLCI22  TERMINAL TERM=LINE,GROUP=GSNA,RLN=1,ACTIVE=NO
*****
*        3274 LEASED LINE SDLC      *
*****
SDLC3274 TERMINAL TERM=PUNT
SDLCPA01 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
          TCMSASN=LUNIT,ALTDEST=SDLCPA01,SECTERM=YES, X
          SCRSIZE=(24,80,43,80),FEATURE=(NOBREAK,NOATTN), X
          BUFSIZE=3588, X
          OPDATA=(SDLCPA01,0,11,64,0,0,0,Y,,SDLCPA07,,0)
SDLCPA02 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
          TCMSASN=LUNIT,ALTDEST=SDLCPA02, X
          SCRSIZE=(24,80,43,80),FEATURE=(NOBREAK,NOATTN), X
          BUFSIZE=3588, X
          OPDATA=(SDLCPA02,0,11,64,0,0,0,Y,,SDLCPA08,,0)
SDLCPA03 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
          TCMSASN=LUNIT,ALTDEST=SDLCPA03,SECTERM=YES, X
          SCRSIZE=(24,80,32,80),FEATURE=(NOBREAK,NOATTN), X
          BUFSIZE=2562, X
          OPDATA=(SDLCPA03,0,11,64,0,0,0,Y,,SDLCPA07,,0)
SDLCPA04 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
          TCMSASN=LUNIT,ALTDEST=SDLCPA04,SECTERM=YES, X
          SCRSIZE=(24,80,32,80),FEATURE=(NOBREAK,NOATTN), X
          BUFSIZE=2562, X
          OPDATA=(SDLCPA04,0,11,64,0,0,0,Y,,SDLCPA07,,0)
SDLCPA05 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
          TCMSASN=LUNIT,ALTDEST=SDLCPA05,SECTERM=YES, X
          SCRSIZE=(24,80,24,80),FEATURE=(NOBREAK,NOATTN), X
          OPDATA=(SDLCPA05,0,11,64,0,0,0,Y,,SDLCPA07,,0)
SDLCPA06 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
          TCMSASN=LUNIT,ALTDEST=SDLCPA06,SECTERM=YES, X
          SCRSIZE=(24,80,43,80),FEATURE=(NOBREAK,NOATTN), X
          BUFSIZE=3588, X
          OPDATA=(SDLCPA06,0,11,64,0,0,0,Y,,SDLCPA07,,0)
SDLCPA07 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=DR,USS=SCS, X
          ALTDEST=SDLCPA07, X
          OPDATA=(SDLCPA07,0,11,61,0,0,0,0,NDS87,,NDSMH)
SDLCPA08 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=DR,USS=SCS, X
          ALTDEST=SDLCPA08, X
          OPDATA=(SDLCPA08,0,11,61,0,0,0,0,NDS87,,NDSMH)

```

* 3276 LEASED LINE SDLC =====> See Note 1 *

SDLC3276 TERMINAL TERM=PUNT,ACTIVE=NO

SDLC76P1 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
TCMSESN=LUNIT,ALTDEST=SDLC76P1,SECTERM=YES, X
SCRSIZE=(24,80,24,80),FEATURE=(NOBREAK,NOATTN), X
OPDATA=(SDLC76P1,0,11,64,0,0,0,Y,,SDLC76P4,,0)

SDLC76P2 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
TCMSESN=LUNIT,ALTDEST=SDLC76P2, X
SCRSIZE=(24,80,24,80),FEATURE=(NOBREAK,NOATTN), X
OPDATA=(SDLC76P2,0,11,64,0,0,0,Y,,SDLC76P4,,0)

SDLC76P3 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
TCMSESN=LUNIT,ALTDEST=SDLC76P3,SECTERM=YES, X
SCRSIZE=(24,80,24,80),FEATURE=(NOBREAK,NOATTN), X
OPDATA=(SDLC76P3,0,11,64,0,0,0,Y,,SDLC76P4,,0)

SDLC7604 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
TCMSESN=LUNIT,ALTDEST=SDLCPA05,SECTERM=YES, X
SCRSIZE=(24,80,24,80),FEATURE=(NOBREAK,NOATTN), X
OPDATA=(SDLC7604,0,11,64,0,0,0,Y,,SDLC7607,,0)

SDLC7605 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
TCMSESN=LUNIT,ALTDEST=SDLCPA05,SECTERM=YES, X
SCRSIZE=(24,80,24,80),FEATURE=(NOBREAK,NOATTN), X
OPDATA=(SDLC7605,0,11,64,0,0,0,Y,,SDLC7607,,0)

SDLC7606 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=MRT,USS=SCS, X
TCMSESN=LUNIT,ALTDEST=SDLCPA06,SECTERM=YES, X
SCRSIZE=(24,80,24,80),FEATURE=(NOBREAK,NOATTN), X
OPDATA=(SDLC7606,0,11,64,0,0,0,Y,,SDLC7607,,0)

SDLC7607 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=DR,USS=SCS, X
ALTDEST=SDLC7607, X
OPDATA=(SDLC7607,0,11,61,0,0,0,0,NDS87,,NDSMH)

SDLC7608 TERMINAL TERM=LUNT,GROUP=GSNA,RLN=2,QBY=T,QUEUES=DR,USS=SCS, X
ALTDEST=SDLC7608, X
OPDATA=(SDLC7608,0,11,61,0,0,0,0,NDS87,,NDSMH)

```

*****
* BIND IMAGE TABLE FOR 3274 AND 3276      ==> See Note 1      *
*****
      IEDBTAB CBI=(BI3270NB,BI3767,EMU3790,BTCH3790,BI3770A,BI3601),X
      DEFBI=BI3270
* BIND FOR 3278
NDS3278  IEDBENT COMPROT=XL2'3080',PRIROT=X'B1',SECROT=X'90',      X
          LUPROF=X'02',PRESERC=XL11'000000000185018507F00',      X
          TSUSAGE=XL6'000088F80000'
* BIND FOR 3287 AND 3289
NDS87    IEDBENT COMPROT=XL2'3080',PRIROT=X'B1',SECROT=X'90',      X
          LUPROF=X'03',PRESERC=XL11'000000000185018507F00',      X
          TSUSAGE=XL6'000087C60000'
      ENTRY IEDTSOB0
IEDTSOB0 IEDBENT COMPROT=XL2'2000',PRIROT=X'21',SECROT=X'40',      X
          TSUSAGE=XL6'010000000100',FMPROF=X'02',TSPROF=X'02',      X
          LOGON=C' LOGON ',USRDATA=C'
      ENTRY IEDTSOB1
IEDTSOB1 IEDBENT COMPROT=XL2'3040',PRIROT=X'A1',SECROT=X'90',      X
          TSUSAGE=XL6'010085850100',LUPROF=X'01',                  X
          LOGON=C' LOGON ',USRDATA=C'
      ENTRY IEDTSOB2
IEDTSOB2 IEDBENT COMPROT=XL2'3080',PRIROT=X'B1',SECROT=X'B0',      X
          TSUSAGE=XL6'000085850000',LUPROF=X'02',                  X
          PRESERC=XL11'0200',                                       X
          LOGON=C' LOGON ',USRDATA=C'
      ENTRY IEDTSOB8
* TSO BIND FOR 3278
IEDTSOB8 IEDBENT COMPROT=XL2'3080',PRIROT=X'B1',SECROT=X'90',      X
          LUPROF=X'02',PRESERC=XL11'000000000185018507F00',      X
          TSUSAGE=XL6'000087F80000',                                  X
          LOGON=C' LOGON ',USRDATA=C'
      IEDBEND TSO=NO,TOTE=NO

```

Note 1: For proper operation with these terminal definitions, the 3276 must have E.C. level 850568 installed.

TCAM Message Handlers.

The message handler for the SNA 3274 and 3276 is the same as the HMEMU90 message handler found in the ACF/TCAM/TSO - shared MCP except for the STARTMH macro which should be changed to add the BIND exit:

```
NDSMH   STARTMH DFC=FULL,LU=YES,BEXIT=NDSBXIT
```

Statement 17056 should also be changed to use the erase/write alternate command to support the large screens:

```
MSGEDIT ((I,X'7E73114040',SCAN))  CMD,WCC,SBA,CA,CA
```

The TSO message handler for the 3274 and 3276 also uses the BIND exit and should appear as follows:

```
TSOMH   STARTMH TSOMH=YES,STOP=YES,CONV=YES,LC=IN,DFC=FULL,LU=YES,      X  
        BEXIT=NDSBXIT
```

It will be necessary to code a BIND exit similar to the following one to set the proper screen size in the BIND parameters:

```
NDSBXIT  CSECT  
        USING *,15  
        STM   0,15,SVE  
        LR    12,15  
        USING NDSBXIT,12  
        DROP  15  
        IEDLSCR          MOVE TTE SCREEN SIZE TO BIND  
EXT      LM    0,14,SVE  
        BR    14  
SVE      DS    16F  
        LTORG
```

2-7. IMS/VS Version 1 Release 1.5 Terminal Definitions.

```

*****
COMM   RECANY=(6,3842),APPLID=IMS,SECCNT=3,OPTIONS=(NOPSWD, *
      TERMINAL,PAGING,TIMESTAMP,4096,FMTMAST,NOUSMSG, *
      NOMSTEX,NOMSPEX,NOCIPH,VTAMAUTH,BLKREQD)
*****
      TYPE   UNITYPE=SLUTYPE1      ==> See Notes 1 & 3
*****
**      3274-1A SNA CHANNEL ATTACHED PRINTERS      *****
*****
LHAPA07 TERMINAL NAME=LHAPA07, *
      COMPT1=(CONSOLE,BASIC-SCS1), non-MFS example *
      MODETBL=SCS, *
      OUTBUF=768 *
      NAME   LHAPA07
LHAPA08 TERMINAL NAME=LHAPA08, *
      COMPT1=(CONSOLE,MFS-SCS1), MFS example *
      OUTBUF=768 *
      NAME   LHAPA08
*****
**      3274-1C SDLC ATTACHED PRINTERS      *****
*****
SDLCPA07 TERMINAL NAME=SDLCPA07, *
      COMPT1=(CONSOLE,BASIC-SCS1), non-MFS example *
      MODETBL=SCS, *
      OUTBUF=768 *
      NAME   SDLCPA07
SDLCPA08 TERMINAL NAME=SDLCPA08, *
      COMPT1=(CONSOLE,MFS-SCS1), MFS example *
      OUTBUF=768 *
      NAME   SDLCPA08
*****
**      3276 SDLC ATTACHED PRINTER      *****
*****
SDLC76P7 TERMINAL NAME=SDLC76P7, *
      COMPT1=(CONSOLE,BASIC-SCS1), non-MFS example *
      MODETBL=SCS, *
      OUTBUF=768 *
      NAME   SDLC76P7
SDLC76P8 TERMINAL NAME=SDLC76P8, *
      COMPT1=(CONSOLE,MFS-SCS1), MFS example *
      OUTBUF=768 *
      NAME   SDLC76P8

```

- NOTES: 1. The COMPT1 parameter of each of these printers has been specified as CONSOLE instead of PRINTER1 because these printers are capable of limited input via the PA keys.
2. The MODETBL parameter was required on all printers with node names ending in 7 because, in this particular network, the default mode table entry for these nodes is DSC4K which will not work with IMS/VS.
3. The OUTBUF parameter specification of 768 will work with either a 2K or 4K printer buffer.


```

*****
TYPE    UNITYPE=SLUTYPE2          ==> See Note 4
*****
*****
*****
*****
3274-1A SNA CHANNEL ATTACHED DISPLAYS
*****
LHAPAO1 TERMINAL NAME=LHAPAO1,          3278-1
      TYPE=3270-A1,SIZE=(12,80),
      FEAT=IGNORE,
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),
      OUTBUF=1536          =====> See Note 5
      NAME LHAPAO1
LHAPAO2 TERMINAL NAME=LHAPAO2,          3278-4
      TYPE=3270-A4,SIZE=(43,80),
      FEAT=IGNORE,
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),
      OUTBUF=1536
      NAME LHAPAO2
LHAPAO3 TERMINAL NAME=LHAPAO3,          3278-3
      TYPE=3270-A3,SIZE=(32,80),
      FEAT=IGNORE,
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),
      OUTBUF=1536
      NAME LHAPAO3
LHAPAO4 TERMINAL NAME=LHAPAO4,          3278-3
      TYPE=3270-A3,SIZE=(32,80),
      FEAT=IGNORE,
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),
      OUTBUF=1536
      NAME LHAPAO4
LHAPAO5 TERMINAL NAME=LHAPAO5,          3278-2
      TYPE=3270-A2,SIZE=(24,80),
      FEAT=IGNORE,
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),
      OUTBUF=1536
      NAME LHAPAO5
LHAPAO6 TERMINAL NAME=LHAPAO6,          3278-4
      TYPE=3270-A4,SIZE=(43,80),
      FEAT=IGNORE,
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),
      OUTBUF=1536
      NAME LHAPAO6

```

NOTES: 4.The TYPE parameter on the terminal macros in these examples use the actual machine model number as the device name suffix (3270-An). Although this is not required, it is recommended that an installation standard such as this be developed and used to avoid confusion.

5.An OUTBUF size of 1536 is the maximum that can be specified for the 3274-1A.

```

LHAPB01 TERMINAL NAME=LHAPB01,          3277-2          *
      TYPE=3270-A2,SIZE=(24,80),        *
      FEAT=IGNORE,                       *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=1536                         *
      NAME LHAPB01
LHAPB02 TERMINAL NAME=LHAPB02,          3277-2          *
      TYPE=3270-A2,SIZE=(24,80),        *
      FEAT=IGNORE,                       *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=1536                         *
      NAME LHAPB02
LHAPB03 TERMINAL NAME=LHAPB03,          3277-2          *
      TYPE=3270-A2,SIZE=(24,80),        *
      FEAT=IGNORE,                       *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=1536                         *
      NAME LHAPB03
LHAPB04 TERMINAL NAME=LHAPB04,          3277-2          *
      TYPE=3270-A2,SIZE=(24,80),        *
      FEAT=IGNORE,                       *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=1536                         *
      NAME LHAPB04

```

```

*****
*****          3274-1C SDLC ATTACHED DISPLAYS          *****
*****
SDLCPA01 TERMINAL NAME=SDLCPA01,          3278-4          *
      TYPE=3270-A4,SIZE=(43,80),          *
      FEAT=IGNORE,                          *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600                            =====> See Note 7
      NAME SDLCPA01
SDLCPA02 TERMINAL NAME=SDLCPA02,          3278-4          *
      TYPE=3270-A4,SIZE=(43,80),          *
      FEAT=IGNORE,                          *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600
      NAME SDLCPA02
SDLCPA03 TERMINAL NAME=SDLCPA03,          3278-3          *
      TYPE=3270-A3,SIZE=(32,80),          *
      FEAT=IGNORE,                          *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600
      NAME SDLCPA03
SDLCPA04 TERMINAL NAME=SDLCPA04,          3278-3          *
      TYPE=3270-A3,SIZE=(32,80),          *
      FEAT=IGNORE,                          *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600
      NAME SDLCPA04
SDLCPA05 TERMINAL NAME=SDLCPA05,          3278-2          *
      TYPE=3270-A2,SIZE=(24,80),          *
      FEAT=IGNORE,                          *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600
      NAME SDLCPA05
SDLCPA06 TERMINAL NAME=SDLCPA06,          3278-4          *
      TYPE=3270-A4,SIZE=(43,80),          *
      FEAT=IGNORE,                          *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600
      NAME SDLCPA06

```

```

SDLCPB01 TERMINAL NAME=SDLCPB01,          3277-2      *
        TYPE=3270-A2,SIZE=(24,80),      *
        FEAT=IGNORE,                      *
        OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
        OUTBUF=3600                       *
        NAME SDLCPB01
SDLCPB02 TERMINAL NAME=SDLCPB02,          3277-2      *
        TYPE=3270-A2,SIZE=(24,80),      *
        FEAT=IGNORE,                      *
        OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
        OUTBUF=3600                       *
        NAME SDLCPB02
SDLCPB03 TERMINAL NAME=SDLCPB03,          3277-2      *
        TYPE=3270-A2,SIZE=(24,80),      *
        FEAT=IGNORE,                      *
        OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
        OUTBUF=3600                       *
        NAME SDLCPB03
SDLCPB04 TERMINAL NAME=SDLCPB04,          3277-2      *
        TYPE=3270-A2,SIZE=(24,80),      *
        FEAT=IGNORE,                      *
        OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
        OUTBUF=3600                       *
        NAME SDLCPB04

```

```

*****
*****      3276 SDLC ATTACHED DISPLAYS      =====> See Note 6      *****
*****
SDLC76 P1  TERMINAL NAME=SDLC76P1,              3276-12                *
          TYPE=3270-A2,SIZE=(24,80),           *
          FEAT=IGNORE,                          *
          OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
          OUTBUF=3600                            =====> See Note 7
          NAME  SDLC76P1
SDLC76 P2  TERMINAL NAME=SDLC76P2,              3278-2                *
          TYPE=3270-A2,SIZE=(24,80),           *
          FEAT=IGNORE,                          *
          OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
          OUTBUF=3600
          NAME  SDLC76P2
SDLC76 P3  TERMINAL NAME=SDLC76P3,              3278-2                *
          TYPE=3270-A2,SIZE=(24,80),           *
          FEAT=IGNORE,                          *
          OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
          OUTBUF=3600
          NAME  SDLC76P3
SDLC76 P4  TERMINAL NAME=SDLC76P4,              3278-2                *
          TYPE=3270-A2,SIZE=(24,80),           *
          FEAT=IGNORE,                          *
          OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
          OUTBUF=3600
          NAME  SDLC76P4
SDLC76 P5  TERMINAL NAME=SDLC76P5,              3278-2                *
          TYPE=3270-A2,SIZE=(24,80),           *
          FEAT=IGNORE,                          *
          OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
          OUTBUF=3600
          NAME  SDLC76P5
SDLC76 P6  TERMINAL NAME=SDLC76P6,              3278-2                *
          TYPE=3270-A2,SIZE=(24,80),           *
          FEAT=IGNORE,                          *
          OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
          OUTBUF=3600
          NAME  SDLC76P6

```

Notes: 6.For proper operation with these terminal definitions, the 3276 must have E.C. level 850568 installed.

7.An OUTBUF value of 3600 has been specified to cause IMS/VIS to, generally, send the output message as one RU. Any message greater than 3600 bytes will be sent as two RUs. This is a relatively arbitrary number based on your message characteristics. Too large a number may waste CPU and NCP storage. Too small a number may increase the transaction path length. Values in the range of 1024 to 4096 should exhibit little performance differences.

2-8. CICS/VS 1.4 Terminal Definitions.

These definitions are applicable for either VTAM or EXTM.

 * LOCAL 3274-1A *

 *

LA01	DFHTCT TYPE=TERMINAL,TRMIDNT=LA01,TRMTYPE=LUTYPE2,TRMMODL=1, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPA01, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), RUSIZE=1024,BRACKET=YES,PAGESIZE=(12,40),BUFFER=1536, PRINTTO=LA07,ALTPRT=LA08,PGESTAT=PAGE,CHNASSY=YES, ALTPGE=(12,80),DEFSCRN=(12,40),ALTSCRN=(12,80)	X X X X X X
LA02	DFHTCT TYPE=TERMINAL,TRMIDNT=LA02,TRMTYPE=LUTYPE2,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPA02, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, PRINTTO=LA07,ALTPRT=LA08,PGESTAT=PAGE,CHNASSY=YES, ALTPGE=(43,80),DEFSCRN=(24,80),ALTSCRN=(43,80)	X X X X X X
LA03	DFHTCT TYPE=TERMINAL,TRMIDNT=LA03,TRMTYPE=LUTYPE2,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPA03, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, PRINTTO=LA07,ALTPRT=LA08,PGESTAT=PAGE,CHNASSY=YES, ALTPGE=(32,80),DEFSCRN=(24,80),ALTSCRN=(32,80)	X X X X X X
LA04	DFHTCT TYPE=TERMINAL,TRMIDNT=LA04,TRMTYPE=LUTYPE2,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPA04, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN,PRTADAPT), RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, ALTPGE=(32,80),DEFSCRN=(24,80),ALTSCRN=(32,80), PGESTAT=PAGE,CHNASSY=YES	X X X X X X X
LA05	DFHTCT TYPE=TERMINAL,TRMIDNT=LA05,TRMTYPE=LUTYPE2,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPA05, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, PRINTTO=LA07,ALTPRT=LA08,PGESTAT=PAGE,CHNASSY=YES, ALTPGE=(24,80),DEFSCRN=(24,80),ALTSCRN=(24,80)	X X X X X X X
LA06	DFHTCT TYPE=TERMINAL,TRMIDNT=LA06,TRMTYPE=LUTYPE2,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPA06, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, PRINTTO=LA07,ALTPRT=LA08,PGESTAT=PAGE,CHNASSY=YES, ALTPGE=(43,80),DEFSCRN=(24,80),ALTSCRN=(43,80)	X X X X X X X
LA07	DFHTCT TYPE=TERMINAL,TRMIDNT=LA07,TRMTYPE=LUTYPE3,TRMMODL=2, ACCMETH=VTAM,NETNAME=LHAPA07,BUFFER=1536,BRACKET=YES, TRMSTAT=TRANSCEIVE	X X
LA08	DFHTCT TYPE=TERMINAL,TRMIDNT=LA08,TRMTYPE=SCSPRT,TRMMODL=2, ACCMETH=VTAM,NETNAME=LHAPA08,BUFFER=768,BRACKET=YES, TRMSTAT=TRANSCEIVE,HF=YES,VF=YES	X X

LB01 DFHTCT TYPE=TERMINAL,TRMIDNT=LB01,TRMTYPE=LUTYPE2,TRMMODL=2, X
 ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPB01, X
 TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, X
 FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X
 RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, X
 PGESTAT=PAGE,CHNASSY=YES

LB02 DFHTCT TYPE=TERMINAL,TRMIDNT=LB02,TRMTYPE=LUTYPE2,TRMMODL=2, X
 ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPB02, X
 TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, X
 FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X
 RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, X
 PGESTAT=PAGE,CHNASSY=YES

LB03 DFHTCT TYPE=TERMINAL,TRMIDNT=LB03,TRMTYPE=LUTYPE2,TRMMODL=2, X
 ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPB03, X
 TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, X
 FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X
 RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, X
 PGESTAT=PAGE,CHNASSY=YES

LB04 DFHTCT TYPE=TERMINAL,TRMIDNT=LB04,TRMTYPE=LUTYPE2,TRMMODL=2, X
 ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPB04, X
 TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, X
 FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X
 RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, X
 PGESTAT=PAGE,CHNASSY=YES

* REMOTE 3274-1C *

*

PA01	DFHTCT TYPE=TERMINAL,TRMIDNT=PA01,TRMTYPE=LUTYPE2,TRMMODL=2, X ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPA01, X TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, X FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN,PRTADAPT), X BUFFER=0,RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80), X ALTPGE=(43,80),DEFSCRN=(24,80),ALTSCRN=(43,80), X PGESTAT=PAGE,CHNASSY=YES
PA02	DFHTCT TYPE=TERMINAL,TRMIDNT=PA02,TRMTYPE=LUTYPE2,TRMMODL=2, X ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPA02, X TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, X FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X BUFFER=0,RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80), X PRINTTO=PA07,ALTPRT=PA08,PGESTAT=PAGE,CHNASSY=YES, X ALTPGE=(43,80),DEFSCRN=(24,80),ALTSCRN=(43,80)
PA03	DFHTCT TYPE=TERMINAL,TRMIDNT=PA03,TRMTYPE=LUTYPE2,TRMMODL=2, X ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPA03, X TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, X FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X BUFFER=0,RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80), X PRINTTO=PA07,ALTPRT=PA08,PGESTAT=PAGE,CHNASSY=YES, X ALTPGE=(32,80),DEFSCRN=(24,80),ALTSCRN=(32,80)
PA04	DFHTCT TYPE=TERMINAL,TRMIDNT=PA04,TRMTYPE=LUTYPE2,TRMMODL=2, X ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPA04, X TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, X FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN,PRTADAPT), X BUFFER=0,RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80), X ALTPGE=(32,80),DEFSCRN=(24,80),ALTSCRN=(32,80), X PGESTAT=PAGE,CHNASSY=YES
PA05	DFHTCT TYPE=TERMINAL,TRMIDNT=PA05,TRMTYPE=LUTYPE2,TRMMODL=2, X ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPA05, X TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, X FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X BUFFER=0,RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80), X PRINTTO=PA07,ALTPRT=PA08,PGESTAT=PAGE,CHNASSY=YES, X ALTPGE=(24,80),DEFSCRN=(24,80),ALTSCRN=(24,80)
PA06	DFHTCT TYPE=TERMINAL,TRMIDNT=PA06,TRMTYPE=LUTYPE2,TRMMODL=2, X ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPA06, X TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, X FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X BUFFER=0,RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80), X PRINTTO=PA07,ALTPRT=PA08,PGESTAT=PAGE,CHNASSY=YES, X ALTPGE=(43,80),DEFSCRN=(24,80),ALTSCRN=(43,80)
PA07	DFHTCT TYPE=TERMINAL,TRMIDNT=PA07,TRMTYPE=LUTYPE3,TRMMODL=2, X ACCMETH=VTAM,NETNAME=SDLCPA07,BUFFER=0,BRACKET=YES, X TRMSTAT=TRANSCIVE
PA08	DFHTCT TYPE=TERMINAL,TRMIDNT=PA08,TRMTYPE=SCSPRT,TRMMODL=2, X ACCMETH=VTAM,NETNAME=SDLCPA08,BUFFER=768,BRACKET=YES, X TRMSTAT=TRANSCIVE,HF=YES,VF=YES

PB01	DFHTCT TYPE=TERMINAL,TRMIDNT=PB01,TRMTYPE=LUTYPE2,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPB01, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), BUFFER=0,RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80), PGESTAT=PAGE,CHNASSY=YES	X X X X X
PB02	DFHTCT TYPE=TERMINAL,TRMIDNT=PB02,TRMTYPE=LUTYPE2,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPB02, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), BUFFER=0,RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80), PGESTAT=PAGE,CHNASSY=YES	X X X X X
PB03	DFHTCT TYPE=TERMINAL,TRMIDNT=PB03,TRMTYPE=LUTYPE2,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPB03, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), BUFFER=0,RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80), PGESTAT=PAGE,CHNASSY=YES	X X X X X
PB04	DFHTCT TYPE=TERMINAL,TRMIDNT=PB04,TRMTYPE=LUTYPE2,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPB04, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), BUFFER=0,RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80), PGESTAT=PAGE,CHNASSY=YES	X X X X X

* REMOTE 3276 ==> See Note 1 *

*

```

P761 DFHTCT TYPE=TERMINAL,TRMIDNT=P761,TRMTYPE=LUTYPE2,TRMMODL=2, X
      ACCMETH=VTAM,TIOAL=(2048,4096),NETNAME=SDLC76P1, X
      TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, X
      FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN,PRTADAPT), X
      BUFFER=0,RUSIZE=2048,BRACKET=YES,PAGESIZE=(24,80), X
      ALTPGE=(24,80),DEFSCRN=(24,80),ALTSCRN=(24,80), X
      PGESTAT=PAGE,CHNASSY=YES
P762 DFHTCT TYPE=TERMINAL,TRMIDNT=P762,TRMTYPE=LUTYPE2,TRMMODL=2, X
      ACCMETH=VTAM,TIOAL=(2048,4096),NETNAME=SDLC76P2, X
      TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, X
      FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X
      BUFFER=0,RUSIZE=2048,BRACKET=YES,PAGESIZE=(24,80), X
      PRINTTO=P767,ALTPRT=P768,PGESTAT=PAGE,CHNASSY=YES, X
      ALTPGE=(24,80),DEFSCRN=(24,80),ALTSCRN=(24,80)
P763 DFHTCT TYPE=TERMINAL,TRMIDNT=P763,TRMTYPE=LUTYPE2,TRMMODL=2, X
      ACCMETH=VTAM,TIOAL=(2048,4096),NETNAME=SDLC76P3, X
      TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, X
      FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X
      BUFFER=0,RUSIZE=2048,BRACKET=YES,PAGESIZE=(24,80), X
      PRINTTO=P767,ALTPRT=P768,PGESTAT=PAGE,CHNASSY=YES, X
      ALTPGE=(24,80),DEFSCRN=(24,80),ALTSCRN=(24,80)
P764 DFHTCT TYPE=TERMINAL,TRMIDNT=P764,TRMTYPE=LUTYPE2,TRMMODL=2, X
      ACCMETH=VTAM,TIOAL=(2048,4096),NETNAME=SDLC76P4, X
      TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, X
      FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN,PRTADAPT), X
      BUFFER=0,RUSIZE=2048,BRACKET=YES,PAGESIZE=(24,80), X
      ALTPGE=(24,80),DEFSCRN=(24,80),ALTSCRN=(24,80), X
      PGESTAT=PAGE,CHNASSY=YES
P765 DFHTCT TYPE=TERMINAL,TRMIDNT=P765,TRMTYPE=LUTYPE2,TRMMODL=2, X
      ACCMETH=VTAM,TIOAL=(2048,4096),NETNAME=SDLC76P5, X
      TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, X
      FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X
      BUFFER=0,RUSIZE=2048,BRACKET=YES,PAGESIZE=(24,80), X
      PRINTTO=P767,ALTPRT=P768,PGESTAT=PAGE,CHNASSY=YES, X
      ALTPGE=(24,80),DEFSCRN=(24,80),ALTSCRN=(24,80)
P766 DFHTCT TYPE=TERMINAL,TRMIDNT=P766,TRMTYPE=LUTYPE2,TRMMODL=1, X
      ACCMETH=VTAM,TIOAL=(2048,4096),NETNAME=SDLC76P6, X
      TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, X
      FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), X
      BUFFER=0,RUSIZE=2048,BRACKET=YES,PAGESIZE=(24,80), X
      PRINTTO=P767,ALTPRT=P768,PGESTAT=PAGE,CHNASSY=YES, X
      ALTPGE=(24,80),DEFSCRN=(24,80),ALTSCRN=(24,80)
P767 DFHTCT TYPE=TERMINAL,TRMIDNT=P767,TRMTYPE=LUTYPE3,TRMMODL=2, X
      ACCMETH=VTAM,NETNAME=SDLC76P7,BUFFER=0,BRACKET=YES, X
      TRMSTAT=TRANSCEIVE
P768 DFHTCT TYPE=TERMINAL,TRMIDNT=P768,TRMTYPE=SCSPRT,TRMMODL=2, X
      ACCMETH=VTAM,NETNAME=SDLC76P8,BUFFER=768,BRACKET=YES, X
      TRMSTAT=TRANSCEIVE,HF=YES,VF=YES

```

Note 1: For proper operation with these terminal definitions, the 3276 must have E.C. level 850568 installed.

2-9. Operating Procedures.

The operating procedures described in this chapter are unique to an ACF/VTAM environment using USSTAB messages as illustrated in the USSTAB chapter of this guide. Use of message 10, in particular, can greatly simplify the logon process by returning ownership of the display screen to the SSCP-SLU when a PLU-SLU session does not exist (subsequent operator action may alter this). In normal operation a display screen will be owned by either the PLU-SLU session or the SSCP-SLU session. This effectively eliminates the unowned state (box/?). A display screen will normally have either the SSCP message 10 or host application information displayed on the screen. This is particularly important for 3277's attached to a 3274 controller since there is no operator information area as there is on a 3278.

NOTE: These procedures assume that the Simplified SNA Logon capability is installed (3276 EC 850573, 3274 microcode Release 9).

A. LOGON using a 3276 or 3278.

1. Check the operator information display area for the connection symbols. From left to right should appear a box with a 4 or 6 in it. This indicates that the display is connected to an operational control unit (3274 or 3276). Next there should appear a small underlined B. This indicates that the controller is operating in SNA mode. In the next position to the right will appear another box in one of the three following forms:

- a. Box contains a question mark: No PLU - SLU session exists (will not occur under normal operation). Press the ALT and SYS REQ keys and proceed to Step 2a.
- b. Box is filled in solid: A PLU - SLU session already exists. A logon cannot be performed until the session is terminated.
- c. Box contains a stick-person: Display is owned by the SSCP - SLU session. USSTAB message 10 should be displayed on the screen. You may proceed to Step 2.

If you wish to determine if a PLU - SLU session exists, press the ALT and SYS REQ keys. Condition 1a or 1b should then exist. Follow directions for 1a or 1b as appropriate.

2. Enter logon command as follows:

- a. Determine that the display is owned by the SSCP-SLU session. (box/stick-person)
- b. Enter the logon sequence that is valid for your installation.
- c. Press ENTER.
- d. If either the host application or the terminal rejected the logon request, then the appropriate SSCP error message will appear.
- e. If the logon request completed successfully, the box/stick-person should change to a solid box. Logon is now complete.

B. LOGOFF using the 3276/3278.

1. The recommended logoff method is to enter a character sequence recognized by the host application as a disconnect request. For example in TSO that is "LOGOFF", in IMS/VS it is "/RCL".
2. You can also request that the SSCP terminate the session. This is done by pressing the ALT and SYS REQ keys. When the box/stick-person appears, enter the logoff command (installation dependent).

C. LOGON using the 3277.

1. The 3277 when connected to the 3274 controller must attempt to emulate 3278 operations. Since the 3277 does not have the operator information display area or equivalent keyboard keys this is somewhat difficult and may lead to operator confusion. Before attempting to use the 3277, you must thoroughly understand the 3278 operation. The ALT and SYS REQ keys are simulated by the sequential (not simultaneous) operation of the TEST REQ and CLEAR keys. The SYSTEM AVAILABLE and INPUT INHIBITED indicators are all that is available to provide the information described in the 3278 procedures. Obviously all that information cannot be represented by these two indicators. Therefore, a limited number of exception conditions can be handled by the operator. Some assumptions must also be made when attempting to logon from a 3277:
 - a. The operator must know the control unit type and connection method for the control unit to which this display is attached. (i.e. SNA 3274 vs. 3271, 3272 or non-SNA 3274).
 - b. The operator must assume that the control unit and display are operational and active.
2. If the SYSTEM AVAILABLE indicator is on and the USSTAB message 10 is displayed on the screen, the display is owned by the SSCP-SLU session. You may proceed to Step 3.

If you wish to determine if a PLU-SLU session already exists, press the TEST REQ and CLEAR keys. One of the following conditions should then exist:

- a. The SYSTEM AVAILABLE indicator is off and the INPUT INHIBITED indicator is on. No PLU-SLU session exists. Press TEST REQ and CLEAR keys and proceed to Step 3.
- b. The SYSTEM AVAILABLE indicator is still on. A PLU-SLU session already exists. A logon cannot be performed until this session is terminated.

3. Enter logon command as follows:

- a. Enter the logon sequence that is valid for your installation.
- b. Press the ENTER key.
- c. If either the host application or the terminal reject the logon request then the appropriate SSCP error message will appear.
- d. If the logon request completed successfully, the screen should be clear (or contain a host application generated message). The PLU - SLU session. The SYSTEM AVAILABLE indicator should still be on. Logon is complete.

D. LOGOFF using the 3277.

1. The recommended logoff method is to enter a character sequence recognized by the host application as a disconnect request. For example in TSO that is "LOGOFF", in IMS/VS it is "/RCL".
2. You can also request that the SSCP terminate the session. This is done by pressing the TEST REQ and CLEAR keys and entering the logoff command (installation dependent).

E. ATTN key operation.

Simulation of the ATTN key operation on a 3277 is accomplished through a two key sequence like that for simulating the SYS REQ key operation. To cause an SNA SIGNAL command to be transmitted to the host, press the TEST REQ and PA1 keys in sequence.

3-1. Installation Environment for Part 3.

MVS IPO release 2.0 with no additional SUs or PTFs
(this includes VTAM-2 and TSO/VTAM level 1)
IMS/VS Version 1 Release 1.4 PID level + PP73002
CICS/VS 1.3 PTF 502
ACF/NCP
TCAM 10
3874 modem at 4800 BPS
3274-1A system diskette release 3
 1 type A adapter (8 displays, 2 printers)
 1 type B adapter (4 displays)
3274-1C system diskette release 3
 1 type A adapter (8 displays, 2 printers)
 1 type B adapter (4 displays)
3278-2
3287-2 (without SCS)
3277-2

NOTE: SU58 (TSO/VTAM level 2) is required to provide TSO support for these devices.

Many changes have been made to Part 3 of this guide that reflect experience gained since the original publication of this information. The authors have attempted to ensure the accuracy of this information, but this environment is no longer available for verification by actual operation.

3-2. NCP Definition.

```

SDLC136  LINE  ADDRESS=(136,137), XMIT/RCV ADDRESSES  ==> See Note 3  X
          DUPLEX=FULL,           MODEM STRAPPING IS FULL-DUPLEX  X
          SPEED=4800,            LINE SPEED IS 4800 BPS          X
          NEWSYNC=YES,          NORMAL                          X
          CLOCKNG=EXT,          MODEM PROVIDES CLOCKING    X
          NRZI=YES,             ** DEPENDS ON MODEM USED **  X
          POLLED=YES,
          RETRIES=(5)           5 RETRIES PER SEQUENCE          X
    
```

```

*
*      SERVICE ORDER FOR FULL-DUPLEX LINE (136)
*
    
```

```

          SERVICE ORDER=(SDLC3274,SDLC3276)
    
```

```

*      PU MACRO SPECIFICATION FOR 3274
*
    
```

```

SDLC3274 PU  ADDR=C1,
          PUTYPE=2,
          ISTATUS=ACTIVE,
          MODETAB=MTSDLC,
          USSTAB=USST3270,
          SSCPFM=USSCS,           ==> See Note 1
          MAXOUT=7,              MAX PATH INFO UNITS BEFORE RESPONSE X
          MAXDATA=265,          MAXIMUM AMOUNT OF DATA          X
          PASSLIM=7,
          RETRIES=(,1,4)        4 RETRIES, 1 SECOND BETWEEN          X
    
```

```

*      LOGICAL UNIT SPECIFICATIONS      ==> See Notes 2 & 4
*
    
```

```

SDLCPA01 LU  LOCADDR=2,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLCPA02 LU  LOCADDR=3,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLCPA03 LU  LOCADDR=4,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLCPA04 LU  LOCADDR=5,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLCPA05 LU  LOCADDR=6,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLCPA06 LU  LOCADDR=7,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLCPA07 LU  LOCADDR=8,PACING=(1,1),VPACING=(2,1),ISTATUS=ACTIVE
SDLCPA08 LU  LOCADDR=9,PACING=(1,1),VPACING=(2,1),ISTATUS=ACTIVE
SDLCPB01 LU  LOCADDR=10,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLCPB02 LU  LOCADDR=11,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLCPB03 LU  LOCADDR=12,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLCPB04 LU  LOCADDR=13,PACING=0,VPACING=0,ISTATUS=ACTIVE
    
```

```

*****
*
*      PU MACRO SPECIFICATION FOR 3276
*
*****
SDLC3276 PU      ADDR=C2,
                 PUTYPE=2,
                 ISTATUS=ACTIVE,
                 MODETAB=MTSDLC,
                 USSTAB=USST3270,
                 SSCPFM=USSSCS,          =====> See Note 1
                 MAXOUT=7,              MAX PATH INFO UNITS BEFORE RESPONSE X
                 MAXDATA=265,          MAXIMUM AMOUNT OF DATA
                 PASSLIM=7,
                 RETRIES=(,1,4)        4 RETRIES, 1 SECOND BETWEEN
*****
*
*      LOGICAL UNIT SPECIFICATIONS          =====> See Notes 2 & 4
*
*****
SDLC76P1 LU      LOCADDR=2,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLC76P2 LU      LOCADDR=3,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLC76P3 LU      LOCADDR=4,PACING=0,VPACING=0,ISTATUS=ACTIVE
SDLC76P4 LU      LOCADDR=5,PACING=(1,1),VPACING=(2,1),ISTATUS=ACTIVE

```

NOTES:

1. The correct value for the SSCPFM parameter is USSSCS.
2. The first port on the 3274 or 3276 is LOCADDR 2.
3. A 1H line set was used here to increase throughput on this line. This was possible because the 3274 and 3276 are multi-dropped on one line. The 1H line set can be used to advantage whenever there is more than one control unit per line. A iD line set could also have been used, but performance may have been degraded. A 1D line set can be used with no performance degradation if there is only one control unit per line. See Chapter 2-2 for an example of an NCP gen using 1D line sets.
4. Due to the inherent logical pacing in 3270 data stream operations, explicit pacing is not generally required. For display output, an application usually will not send subsequent output until receiving acknowledgement from the operator that the current display has been received and can be overwritten. For DSC printers, the application must request a definite response which will, in effect, pace the output. Since only one set of pacing values can be specified for any LU, the printer LUs have the SCS pacing requirements specified. If only DSC operation of the printers is planned, the printer pacing may be specified as 0. See Chapter 3-4 for more information on SCS printer pacing considerations.
5. An NCP buffer size of 64 is recommended for an NCP supporting devices that utilize segmentation (i.e. 3271-11/12, 3600, 3790 DSC, or SDLC

3-3. 3274-1A Definition.

A. VTAM local SNA major node definition for the 3274-1A.

LHA3274A	VBUILD	SUBAREA=7,TYPE=LOCAL	=====> See Note 4	
LHA3274	PU	BUFLIM=10,		X
		CUADDR=4E0,	=====> See Note 3	X
		DISCNT=NO,		X
		ISTATUS=ACTIVE,		X
		USSTAB=USST3270,		X
		MAXBFRU=10,		X
		MODETAB=MT3274A,		X
		PUTYPE=2,		X
		SSCPFM=USSSCS,	=====> See Note 1	X
		VPACING=0	=====> See Note 5	
LHAPA01	LU	LOCADDR=2,ISTATUS=ACTIVE	=====> See Note 2	
LHAPA02	LU	LOCADDR=3,ISTATUS=ACTIVE		
LHAPA03	LU	LOCADDR=4,ISTATUS=ACTIVE		
LHAPA04	LU	LOCADDR=5,ISTATUS=ACTIVE		
LHAPA05	LU	LOCADDR=6,ISTATUS=ACTIVE		
LHAPA06	LU	LOCADDR=7,ISTATUS=ACTIVE		
LHAPA07	LU	LOCADDR=8,ISTATUS=ACTIVE,VPACING=(1,1)		
LHAPA08	LU	LOCADDR=9,ISTATUS=ACTIVE,VPACING=(1,1)		
LHAPB01	LU	LOCADDR=10,ISTATUS=ACTIVE		
LHAPB02	LU	LOCADDR=11,ISTATUS=ACTIVE		
LHAPB03	LU	LOCADDR=12,ISTATUS=ACTIVE		
LHAPB04	LU	LOCADDR=13,ISTATUS=ACTIVE		

NOTES:

1. The correct value for the SSCPFM operand is USSSCS.
2. The first port on the 3274 is LOCADDR 2.
3. The 3274-1A is defined to the operating system as a local 3791.
4. The 3274-1A requires that the VTAM IOBUF size must be an even number. There is also a minimum allowable IOBUF size. Refer to the 3270 Component Description manual for further details.
5. Due to the inherent logical pacing in 3270 data stream operations, explicit pacing is not generally required. For display output, an application usually will not send subsequent output until receiving acknowledgement from the operator that the current display has been received and can be overwritten. For DSC printers, the application must request a definite response which will, in effect, pace the output. Since only one set of pacing values can be specified for any LU, the printer LUs have the SCS pacing requirements specified. If only DSC operation of the printers is planned, the printer pacing may be specified as 0. See Chapter 3-4 for more information on SCS printer pacing considerations.

B. OS System Generation.

IODEVICE UNIT=3791L,ADDRESS=4E0

C. DOS System Generation.

DVCGEN CHUN=X'4E0',DVCTYP=3791L

D. VM/370 System Generation.

VM/370 does not support the 3274-1A directly, but the 3274-1A may be attached to a virtual machine that is running an SCP that does support it. To cause VM/370 to correctly perform the CCW translation, the 3274-1A must be defined to VM/370 as a 3705. The 3705 is the only VM/370 supported device with similar channel program characteristics. Due to problems encountered with the SIOF instruction simulation, it was necessary to define a channel-to-channel adapter on the same channel as the 3274-1A. This will cause VM/370 to bypass SIOF simulation and treat it as a SIO instruction. NOTE: This same bypass was required for the 3705 NCP machines.

The generation macros used were:

3274-1A

```
RDEVICE ADDRESS=4E0,DEVTYPE=3705,ADAPTER=TYPE4,MODEL=F6,      X
      CUTYPE=NCP
RCTLUNIT ADDRESS=4E0,CUTYPE=3705
```

C-T-C Adapter

```
RDEVICE ADDRESS=401,DEVTYPE=CTCA
RCTLUNIT ADDRESS=400,CUTYPE=3811
```

3-4. VTAM Mode Tables.

One mode table is shown for remote controllers (3274-1C and 3276) and one the 3274-1A. The 3276 will support a 2K inbound RU size and the 3274 only 1K although any inbound RU size equal to or greater than the device maximum may be specified. The controller does not consider this an error and will cause the controller to default to the maximum inbound RU size that it supports (1K for 3274, 2K for 3276). Therefore, even though the 3274 and 3276 have some different characteristics, one mode table will suffice. For the sake of simplicity, this guide will illustrate that approach. Because the outbound RU size on the 3274-1A is restricted (1536 bytes) and the SDLC controllers are not, a separate mode table is used for the 3274-1A. If restricting outbound RU size to 1536 is acceptable for remote controllers as well, the 3274-1A mode table could be used as the only mode table for all controllers. In any case, many host programs (e.g. IMS/VS and CICS/VS) alter the values specified in the mode table by overlaying all or part of the session parameters, including RU sizes.

The RU sizes supported by controller type are:

controller	MAX RU size	MAX RU size
	inbound to host	outbound from host
3276	2048	unlimited
3274-1C	1024	unlimited
3274-1A	1024	1536

The entries labled T3278M2, T3278M3, T3278M4 and T3278M1 have been specified using the presentation services bind format (PSERVIC parameter) that defines the display screen size in terms of default and alternate row/column sizes. These definitions may be used instead of the format used in the T3277M1 and T3277M2 entries provided the application does not attempt to determine the screen size characteristics by examining the presentation services data for a model number. TSO/VTAM SU58 requires the format that contains the model number as shown in the TSOSU58 example.

There are some special considerations for printers operating in SCS mode. For 3287 printers the pacing count, RUSIZE and PSERVIC values depend on the buffer size in the printer. The 3287 printer has a 2K buffer as a standard feature and a 4K buffer as an optional feature. The 3289 printer has a 4K buffer as a standard feature. In all cases a determination must be made regarding the pacing count and RU size to be used. Many factors may enter into the decision, but the most important performance objective is to achieve overlap of printing with data transmission. In these examples, the rationale used for the trade-off between pacing count and RU size was to set the pacing count to one and set the RU size to the highest value that would still allow printing and transmission to overlap regardless of printer buffer size. The actual maximum RU size that is allowed depends on the controller type and model and can be determined by using the formulae described in the 3270 Component Description manual (GA27-2749) in the section "RU Lengths". It appears that there is little, if any, performance advantage in using an RUSIZE greater than 768. If an application program limits RU lengths to something significantly less than 768, it may be advantageous to use a pacing count greater than one. Pacing counts greater than 3 would not generally be recommended.

* MODE TABLE FOR REMOTES

```

MTSDLC  MODETAB
        MODEENT LOGMODE=T3278M2,                                     X
            FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',             X
            SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8',        X
            PSERVIC=X'020000000000185018507F00'
        MODEENT LOGMODE=T3278M3,                                     X
            FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',             X
            SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8',        X
            PSERVIC=X'020000000000185020507F00'
        MODEENT LOGMODE=T3278M4,                                     X
            FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',             X
            SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8',        X
            PSERVIC=X'02000000000018502B507F00'
        MODEENT LOGMODE=T3278M1,                                     X
            FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',             X
            SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8',        X
            PSERVIC=X'0200000000000C280C507F00'
        MODEENT LOGMODE=T3277M2,                                     X
            FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',             X
            SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8',        X
            PSERVIC=X'020000000000000000000200'
        MODEENT LOGMODE=T3277M1,                                     X
            FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',             X
            SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8',        X
            PSERVIC=X'020000000000000000000100'
        MODEENT LOGMODE=TSOSU58,                                     X
            FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',             X
            SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'88F8',        X
            PSERVIC=X'020000000000000000000200'
        MODEENT LOGMODE=SCS3287,                                     X
            FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',             X
            SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C6',        X
            PSERVIC=X'01000000E100000000000000'
        MODEENT LOGMODE=DSC3287,                                     X
            FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',             X
            SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'8787',        X
            PSERVIC=X'030000000000185018507F00'
        MODEEND
        END

```

Note 1: For proper operation with this mode table, the 3276 must have E.C. level 850568 installed.

* MODE TABLE FOR 3274-1A

MT3274 A MODETAB

MODEENT LOGMODE=T3278M2,	X
FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',	X
SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C7',	X
PSERVIC=X'020000000000185018507F00'	
MODEENT LOGMODE=T3278M3,	X
FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',	X
SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C7',	X
PSERVIC=X'020000000000185020507F00'	
MODEENT LOGMODE=T3278M4,	X
FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',	X
SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C7',	X
PSERVIC=X'02000000000018502B507F00'	
MODEENT LOGMODE=T3278M1,	X
FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',	X
SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C7',	X
PSERVIC=X'0200000000000C280C507F00'	
MODEENT LOGMODE=T3277M2,	X
FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',	X
SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C7',	X
PSERVIC=X'02000000000000000000200'	
MODEENT LOGMODE=T3277M1,	X
FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',	X
SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C7',	X
PSERVIC=X'02000000000000000000100'	
MODEENT LOGMODE=TSOSU58,	X
FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',	X
SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C7',	X
PSERVIC=X'02000000000000000000200'	
MODEENT LOGMODE=S CS3287,	X
FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',	X
SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'87C6',	X
PSERVIC=X'01000000E100000000000000'	
MODEENT LOGMODE=DSC3287,	X
FMPROF=X'03',TS PROF=X'03',PRI PROT=X'B1',	X
SECPROT=X'90',COMPROT=X'3080',RUSIZES=X'8787',	X
PSERVIC=X'030000000000185018507F00'	
MODEEND	
END	

3-5. VTAM USS Tables.

The following USSTAB illustrates the use of expanded output messages from the SSCP. The technique used allows easy entry of hex data. Also note that these devices operate in SCS mode when communicating on the SSCP-LU session. The display does not send 3270 data streams to the host and does not recognize 3270 data streams sent to it when communicating with SSCP. The only control character used here is the NL character (X'15'). Since 3270 data streams are not used, field attributes such as high intensity and protect are not available.

* USSTAB FOR SNA 3274/3276

USST3270 USSTAB

LOG USSCMD CMD=LOG,REP=LOGON,FORMAT=BAL
USSPARM PARM=P1,REP=APPLID
USSPARM PARM=P2,REP=LOGMODE,
USSPARM PARM=P3,REP=DATA

IMS USSCMD CMD=IMS,REP=LOGON,FORMAT=BAL
USSPARM PARM=APPLID,DEFAULT=IMS
USSPARM PARM=P1,REP=LOGMODE,DEFAULT=T3278M2

CICS USSCMD CMD=CICS,REP=LOGON,FORMAT=BAL
USSPARM PARM=APPLID,DEFAULT=CICS
USSPARM PARM=P1,REP=LOGMODE,DEFAULT=T3278M2

TSO USSCMD CMD=TSO,REP=LOGON,FORMAT=BAL
USSPARM PARM=APPLID,DEFAULT=TSO
USSPARM PARM=LOGMODE,DEFAULT=TSOSU58
USSPARM PARM=P1,REP=DATA

LOGOFF USSCMD CMD=LOGOFF,FORMAT=BAL
USSPARM PARM=APPLID
USSPARM PARM=TYPE,DEFAULT=COND
USSPARM PARM=HOLD,DEFAULT=YES

EOD USSCMD CMD=EOD,REP=LOGOFF,FORMAT=BAL
USSPARM PARM=APPLID
USSPARM PARM=TYPE,DEFAULT=UNCOND
USSPARM PARM=HOLD,DEFAULT=NO

* THE FOLLOWING CODE IS POSITIONALLY DEPENDENT.....DO NOT CHANGE
MESSAGES USSMSG MSG=1,TEXT='MAXIMUM MESSAGE

X
X
X
X

USSMSG MSG=2,TEXT='MAXIMUM MESSAGE

X
X
X
X

USSMSG MSG=3,TEXT='MAXIMUM MESSAGE

X
X
X
X

USSMSG MSG=4,TEXT='MAXIMUM MESSAGE

X
X
X
X

USSMSG MSG=5,TEXT='MAXIMUM MESSAGE

X
X
X
X

USSMSG MSG=6,TEXT='MAXIMUM MESSAGE

X
X
X
X

USSMSG MSG=7,TEXT='MAXIMUM MESSAGE

X
X
X
X

```

PATCHBK EQU *
          ORG ISTD0001+1   ORG BACK TO OVERLAY MESSAGE
MSG 1S   EQU *
          DC X'40154015'   SKIP TO LINE 3
          DC C'INVALID COMMAND SYNTAX, ENTER:',X'15'
          DC X'4015'
          DC C'LOG      applid logmode data',X'15'
          DC C'IMS      logmode',X'15'
          DC C'CICS     logmode',X'15'
          DC C'TSO      tsoid, LOGMODE=logmode',X'15'
MSG 1E   EQU *
          ORG ISTD0002+1   ORG BACK TO OVERLAY MESSAGE
MSG 2S   EQU *
          DC X'40154015'   SKIP TO LINE 3
          DC C'% COMMAND NOT RECOGNIZED, ENTER:',X'15'
          DC X'4015'
          DC C'LOG      applid logmode data',X'15'
          DC C'IMS      logmode',X'15'
          DC C'CICS     logmode',X'15'
          DC C'TSO      tsoid, LOGMODE=logmode',X'15'
MSG 2E   EQU *
          ORG ISTD0003+1   ORG BACK TO OVERLAY MESSAGE
MSG 3S   EQU *
          DC X'40154015'   SKIP TO LINE 3
          DC C'% PARAMETER NOT RECOGNIZED, ENTER:',X'15'
          DC X'4015'
          DC C'LOG      applid logmode data',X'15'
          DC C'IMS      logmode',X'15'
          DC C'CICS     logmode',X'15'
          DC C'TSO      tsoid, LOGMODE=logmode',X'15'
MSG 3E   EQU *

```

```

MSG4S  ORG  ISTD0004+1  ORG BACK TO OVERLAY MESSAGE
      EQU  *
      DC  X'40154015'  SKIP TO LINE 3
      DC  C'% PARAMETER INVALID, ENTER:',X'15'
      DC  X'4015'
      DC  C'LOG  applid logmode data',X'15'
      DC  C'IMS  logmode',X'15'
      DC  C'CICS  logmode',X'15'
      DC  C'TSO  tsoid,LOGMODE=logmode',X'15'
MSG4E  EQU  *
MSG5S  ORG  ISTD0005+1  ORG BACK TO OVERLAY MESSAGE
      EQU  *
      DC  X'40154015'  SKIP TO LINE 3
      DC  C'UNSUPPORTED FUNCTION, ENTER:',X'15'
      DC  X'4015'
      DC  C'LOG  applid logmode data',X'15'
      DC  C'IMS  logmode',X'15'
      DC  C'CICS  logmode',X'15'
      DC  C'TSO  tsoid,LOGMODE=logmode',X'15'
MSG5E  EQU  *
MSG6S  ORG  ISTD0006+1  ORG BACK TO OVERLAY MESSAGE
      EQU  *
      DC  X'40154015'  SKIP TO LINE 3
      DC  C'SEQUENCE ERROR:',X'15'
      DC  X'40154015'
      DC  C'You are attempting to logoff from a terminal '
      DC  C'that is not in session'
MSG6E  EQU  *
MSG7S  ORG  ISTD0007+1  ORG BACK TO OVERLAY MESSAGE
      EQU  *
      DC  X'40154015'  SKIP TO LINE 3
      DC  C'SESSION NOT BOUND BECAUSE:',X'15'
      DC  X'40154015'
      DC  C'1. This terminal is already in session',X'15'
      DC  X'4015'
      DC  C'2. The host application is not active',X'15'
      DC  X'4015'
      DC  C'3. The host application rejected the logon request'
      DC  X'154015'
      DC  C'4. The terminal rejected the bind',X'15'
MSG7E  EQU  *
      ORG  PATCHBK
* MAKE SURE EACH MESSAGE DOES NOT EXCEED 249 BYTES
MSG1L  EQU  (MSG1E-MSG1S)
MSG2L  EQU  (MSG2E-MSG2S)
MSG3L  EQU  (MSG3E-MSG3S)
MSG4L  EQU  (MSG4E-MSG4S)
MSG5L  EQU  (MSG5E-MSG5S)
MSG6L  EQU  (MSG6E-MSG6S)
MSG7L  EQU  (MSG7E-MSG7S)
END  USSEND
      END

```


This is an example of a USSTAB used when message substitution is not desired.

```
*****  
*      USSTAB FOR SNA 3274/3276  
*****  
USST3270  USSTAB  
LOG      USSCMD CMD=LOG,REP=LOGON,FORMAT=BAL  
         USSPARM PARM=P1,REP=APPLID  
         USSPARM PARM=P2,REP=LOGMODE,  
         USSPARM PARM=P3,REP=DATA  
IMS      USSCMD CMD=IMS,REP=LOGON,FORMAT=BAL  
         USSPARM PARM=APPLID,DEFAULT=IMS  
         USSPARM PARM=P1,REP=LOGMODE,DEFAULT=T3278M2  
CICS     USSCMD CMD=CICS,REP=LOGON,FORMAT=BAL  
         USSPARM PARM=APPLID,DEFAULT=CICS  
         USSPARM PARM=P1,REP=LOGMODE,DEFAULT=T3278M2  
TSO      USSCMD CMD=TSO,REP=LOGON,FORMAT=BAL  
         USSPARM PARM=APPLID,DEFAULT=TSO  
         USSPARM PARM=LOGMODE,DEFAULT=TSOSU58  
         USSPARM PARM=P1,REP=DATA  
LOGOFF   USSCMD CMD=LOGOFF,FORMAT=BAL  
         USSPARM PARM=APPLID  
         USSPARM PARM=TYPE,DEFAULT=UNCOND  
         USSPARM PARM=HOLD,DEFAULT=YES  
EOD      USSCMD CMD=EOD,REP=LOGOFF,FORMAT=BAL  
         USSPARM PARM=APPLID  
         USSPARM PARM=TYPE,DEFAULT=UNCOND  
         USSPARM PARM=HOLD,DEFAULT=NO  
END      USSEND  
         END
```

3-6. IMS/VS Version 1 Release 1.4 Terminal Definitions.

```

*****
      COMM  RECANY= (6,3842) ,APPLID=IMS,SECCNT=3,OPTIONS=(NOPSWD,
              TERMINAL,PAGING,TIMESTAMP,4096,FMTMAST,NOUSEMSG,
              NOMSTEX,NOMSPEX,NOICIPH,VTAMAUTH,BLKREQD)
*****
      TYPE  UNITYPE=SLUTYPE1           ====> See Notes 1 & 2
*****
*
*****
**          3274-1A SNA CHANNEL ATTCHED PRINTERS          *****
*****
LHAPA07 TERMINAL NAME=LHAPA07,
              COMPT1=(CONSOLE,MFS-SCS1),
              OUTBUF=768,
              MODETBL=SCS3287
      NAME  LHAPA07
LHAPA08 TERMINAL NAME=LHAPA08,
              COMPT1=(CONSOLE,MFS-SCS1),
              OUTBUF=768,
              MODETBL=SCS3287
      NAME  LHAPA08
*****
**          3274-1C SDLC ATTACHED PRINTERS          *****
*****
SDLCPA07 TERMINAL NAME=SDLCPA07,
              COMPT1=(CONSOLE,MFS-SCS1),
              OUTBUF=768,
              MODETBL=SCS3287
      NAME  SDLCPA07
SDLCPA08 TERMINAL NAME=SDLCPA08,
              COMPT1=(CONSOLE,MFS-SCS1),
              OUTBUF=768,
              MODETBL=SCS3287
      NAME  SDLCPA08
*****
**          3276 SDLC ATTACHED PRINTER          *****
*****
SDLC76P4 TERMINAL NAME=SDLC76P4,
              COMPT1=(CONSOLE,MFS-SCS1),
              OUTBUF=768,
              MODETBL=SCS3287
      NAME  SDLC76P4

```

- Notes:
1. The OUTBUF parameter specification of 768 will work with either a 2K or 4K printer buffer.
 2. The COMPT1 parameter of each of these printers has been specified as CONSOLE instead of PRINTER1 because these printers are capable of limited input via the PA keys.

```

*****
TYPE          UNITYPE=SLUTYPE2
*****
*
*****
*****          3274-1A SNA CHANNEL ATTACHED DISPLAYS          *****
*****
LHAPAO1 TERMINAL NAME=LHAPAO1,                                     *
      MODEL=2,                                                     *
      FEAT=(PFK,CARD,PEN),                                         *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),                       *
      OUTBUF=1536          =====> See Note 3
      NAME LHAPAO1
LHAPAO2 TERMINAL NAME=LHAPAO2,                                     *
      MODEL=2,                                                     *
      FEAT=(PFK,CARD,PEN),                                         *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),                       *
      OUTBUF=1536
      NAME LHAPAO2
LHAPAO3 TERMINAL NAME=LHAPAO3,                                     *
      MODEL=2,                                                     *
      FEAT=(PFK,CARD,PEN),                                         *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),                       *
      OUTBUF=1536
      NAME LHAPAO3
LHAPAO4 TERMINAL NAME=LHAPAO4,                                     *
      MODEL=2,                                                     *
      FEAT=(PFK,CARD,PEN),                                         *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),                       *
      OUTBUF=1536
      NAME LHAPAO4
LHAPAO5 TERMINAL NAME=LHAPAO5,                                     *
      MODEL=2,                                                     *
      FEAT=(PFK,CARD,PEN),                                         *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),                       *
      OUTBUF=1536
      NAME LHAPAO5
LHAPAO6 TERMINAL NAME=LHAPAO6,                                     *
      MODEL=1,          *** MODEL 1 (480) ***                       *
      FEAT=(PFK,CARD,PEN),                                         *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),                       *
      OUTBUF=1536
      NAME LHAPAO6

```

```

LHAPB01 TERMINAL NAME=LHAPB01, *
      MODEL=2, *
      FEAT=(PFK,CARD,PEN), *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=1536
      NAME LHAPB01
LHAPB02 TERMINAL NAME=LHAPB02, *
      MODEL=2, *
      FEAT=(PFK,CARD,PEN), *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=1536
      NAME LHAPB02
LHAPB03 TERMINAL NAME=LHAPB03, *
      MODEL=2, *
      FEAT=(PFK,CARD,PEN), *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=1536
      NAME LHAPB03
LHAPB04 TERMINAL NAME=LHAPB04, *
      MODEL=2, *
      FEAT=(PFK,CARD,PEN), *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=1536
      NAME LHAPB04

```

NOTES: 3. An OUTBUF size of 1536 is the maximum that can be specified for the 3274-1A.

```

*****
***** 3274-1C SDLC ATTACHED DISPLAYS ==> See Note 4 *****
*****
SDLCPA01 TERMINAL NAME=SDLCPA01,          3278          *
        MODEL=2,                                *
        FEAT=(PFK,CARD,PEN),                    *
        OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),  *
        OUTBUF=3600                               *
        NAME SDLCPA01
SDLCPA02 TERMINAL NAME=SDLCPA02,          3278          *
        MODEL=2,                                *
        FEAT=(PFK,CARD,PEN),                    *
        OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),  *
        OUTBUF=3600                               *
        NAME SDLCPA02
SDLCPA03 TERMINAL NAME=SDLCPA03,          3278          *
        MODEL=2,                                *
        FEAT=(PFK,CARD,PEN),                    *
        OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),  *
        OUTBUF=3600                               *
        NAME SDLCPA03
SDLCPA04 TERMINAL NAME=SDLCPA04,          3278          *
        MODEL=2,                                *
        FEAT=(PFK,CARD,PEN),                    *
        OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),  *
        OUTBUF=3600                               *
        NAME SDLCPA04
SDLCPA05 TERMINAL NAME=SDLCPA05,          3278          *
        MODEL=2,                                *
        FEAT=(PFK,CARD,PEN),                    *
        OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),  *
        OUTBUF=3600                               *
        NAME SDLCPA05
SDLCPA06 TERMINAL NAME=SDLCPA06,          3278          *
        MODEL=1,                                *** MODEL 1 (480) *** *
        FEAT=(PFK,CARD,PEN),                    *
        OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST),  *
        OUTBUF=3600                               *
        NAME SDLCPA06

```

```

SDLCPB01 TERMINAL NAME=SDLCPB01,          3277          *
      MODEL=2,                               *
      FEAT=(PFK,CARD,PEN),                   *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600                             *
      NAME SDLCPB01
SDLCPB02 TERMINAL NAME=SDLCPB02,          3277          *
      MODEL=2,                               *
      FEAT=(PFK,CARD,PEN),                   *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600                             *
      NAME SDLCPB02
SDLCPB03 TERMINAL NAME=SDLCPB03,          3277          *
      MODEL=2,                               *
      FEAT=(PFK,CARD,PEN),                   *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600                             *
      NAME SDLCPB03
SDLCPB04 TERMINAL NAME=SDLCPB04,          3277          *
      MODEL=2,                               *
      FEAT=(PFK,CARD,PEN),                   *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600                             *
      NAME SDLCPB04
*****
*****      3276 SDLC ATTACHED DISPLAYS  ==> See Note 4      *****
*****
SDLC76P1 TERMINAL NAME=SDLC76P1,          3278          *
      MODEL=2,                               *
      FEAT=(PFK,CARD,PEN),                   *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600                             *
      NAME SDLC76P1
SDLC76P2 TERMINAL NAME=SDLC76P2,          3278          *
      MODEL=2,                               *
      FEAT=(PFK,CARD,PEN),                   *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600                             *
      NAME SDLC76P2
SDLC76P3 TERMINAL NAME=SDLC76P3,          3278          *
      MODEL=2,                               *
      FEAT=(PFK,CARD,PEN),                   *
      OPTIONS=(TRANRESP,COPY,PAGDEL,OPNDST), *
      OUTBUF=3600                             *
      NAME SDLC76P3

```

Notes 4. An OUTBUF value of 3600 has been specified to cause IMS/VS to, generally, send the output message as one RU. Any message greater than 3600 bytes will be sent as two RUs. This is a relatively arbitrary number based on your message characteristics. Too large a number may waste CPU and NCP storage. Too small a number may increase the transaction path length. Values in the range of 1024 to 4096 should exhibit little performance differences.

3-7. CICS/VS 1.3 Terminal Definitions.

 * LOCAL 3274-1A *

 *

LA01	DFHTCT	TYPE=TERMINAL,TRMIDNT=LA01,TRMTYPE=3790,TRMMODL=1, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPAO1, TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), RUSIZE=256,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, PRINTTO=LA07,ALTPRT=LA08, PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X X
LA02	DFHTCT	TYPE=TERMINAL,TRMIDNT=LA02,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPAO2, TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), RUSIZE=256,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, PRINTTO=LA07,ALTPRT=LA08, PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X X
LA03	DFHTCT	TYPE=TERMINAL,TRMIDNT=LA03,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPAO3, TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), RUSIZE=256,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, PRINTTO=LA07,ALTPRT=LA08, PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X X
LA04	DFHTCT	TYPE=TERMINAL,TRMIDNT=LA04,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPAO4, TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN,PRTADAPT), RUSIZE=256,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X X
LA05	DFHTCT	TYPE=TERMINAL,TRMIDNT=LA05,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPAO5, TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), RUSIZE=256,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536, PRINTTO=LA07,ALTPRT=LA08, PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X X
LA06	DFHTCT	TYPE=TERMINAL,TRMIDNT=LA06,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPAO6, TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), RUSIZE=256,BRACKET=YES,PAGESIZE=(12,40),BUFFER=1536, PRINTTO=LA07,ALTPRT=LA08, PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X X
LA07	DFHTCT	TYPE=TERMINAL,TRMIDNT=LA07,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,NETNAME=LHAPAO7,BUFFER=256,BRACKET=YES, TRMSTAT=TRANSCIVE,SESTYPE=3286CM	X X
LA08	DFHTCT	TYPE=TERMINAL,TRMIDNT=LA08,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,NETNAME=LHAPAO8,BUFFER=256,BRACKET=YES, TRMSTAT=TRANSCIVE,SESTYPE=SCSPRT	X X

LB01	DFHTCT TYPE=TERMINAL,TRMIDNT=LB01,TRMTYPE=3790,TRMMODL=2,	X
	ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPB01,	X
	TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO,	X
	FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN),	X
	RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536,	X
	PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	
LB02	DFHTCT TYPE=TERMINAL,TRMIDNT=LB02,TRMTYPE=3790,TRMMODL=2,	X
	ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPB02,	X
	TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO,	X
	FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN),	X
	RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536,	X
	PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	
LB03	DFHTCT TYPE=TERMINAL,TRMIDNT=LB03,TRMTYPE=3790,TRMMODL=2,	X
	ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPB03,	X
	TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO,	X
	FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN),	X
	RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536,	X
	PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	
LB04	DFHTCT TYPE=TERMINAL,TRMIDNT=LB04,TRMTYPE=3790,TRMMODL=2,	X
	ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=LHAPB04,	X
	TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO,	X
	FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN),	X
	RUSIZE=1024,BRACKET=YES,PAGESIZE=(24,80),BUFFER=1536,	X
	PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	

* REMOTE 3274-1C *

*

PA01	DFHTCT TYPE=TERMINAL,TRMIDNT=PA01,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPA01, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN,PRTA DAPT), BUFFER=1536,RUSIZE=256,BRACKET=YES,PGESIZE=(24,80), PRINTTO=PA07,ALTPRT=PA08, PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X X X
PA02	DFHTCT TYPE=TERMINAL,TRMIDNT=PA02,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPA02, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), BUFFER=1536,RUSIZE=256,BRACKET=YES,PGESIZE=(24,80), PRINTTO=PA07,ALTPRT=PA08, PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X X X
PA03	DFHTCT TYPE=TERMINAL,TRMIDNT=PA03,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPA03, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), BUFFER=1536,RUSIZE=256,BRACKET=YES,PGESIZE=(24,80), PRINTTO=PA07,ALTPRT=PA08, PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X X X
PA04	DFHTCT TYPE=TERMINAL,TRMIDNT=PA04,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPA04, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN,PRTA DAPT), BUFFER=1536,RUSIZE=256,BRACKET=YES,PGESIZE=(24,80), PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X X X
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PA06	DFHTCT TYPE=TERMINAL,TRMIDNT=PA06,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPA06, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), BUFFER=1536,RUSIZE=256,BRACKET=YES,PGESIZE=(12,40), PRINTTO=PA07,ALTPRT=PA08, PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X X X
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PA08	DFHTCT TYPE=TERMINAL,TRMIDNT=PA08,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,NETNAME=SDLCPA08,BUFFER=256,BRACKET=YES, TRMSTAT=TRANSCEIVE,SESTYPE=SCSPRT	X X

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PB02	DFHTCT TYPE=TERMINAL,TRMIDNT=PB02,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPB02, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), BUFFER=1536,RUSIZE=256,BRACKET=YES,PAGESIZE=(24,80), PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X
PB03	DFHTCT TYPE=TERMINAL,TRMIDNT=PB03,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPB03, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), BUFFER=1536,RUSIZE=256,BRACKET=YES,PAGESIZE=(24,80), PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X
PB04	DFHTCT TYPE=TERMINAL,TRMIDNT=PB04,TRMTYPE=3790,TRMMODL=2, ACCMETH=VTAM,TIOAL=(1024,4096),NETNAME=SDLCPB04, TRMSTAT=TRANSCEIVE,RELREQ=(YES,YES),CONNECT=NO, FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN), BUFFER=1536,RUSIZE=256,BRACKET=YES,PAGESIZE=(24,80), PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM	X X X X X

* REMOTE 3276 *

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*
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          TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO,      X
          FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN,PRTA DAPT),      X
          BUFFER=1536,RUSIZE=256,BRACKET=YES,PGESIZE=(24,80),      X
          PRINTTO=P764,      X
          PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM
P762      DFHTCT TYPE=TERMINAL,TRMIDNT=P762,TRMTYPE=3790,TRMMODL=2,      X
          ACCMETH=VTAM,TIOAL=(2048,4096),NETNAME=SDLC76P2,      X
          TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO,      X
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          PRINTTO=P764,      X
          PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM
P763      DFHTCT TYPE=TERMINAL,TRMIDNT=P763,TRMTYPE=3790,TRMMODL=2,      X
          ACCMETH=VTAM,TIOAL=(2048,4096),NETNAME=SDLC76P3,      X
          TRMSTAT=TRANSCIVE,RELREQ=(YES,YES),CONNECT=NO,      X
          FEATURE=(DCKYBD,SELCTPEN,AUDALARM,UCTRAN),      X
          BUFFER=1536,RUSIZE=256,BRACKET=YES,PGESIZE=(24,80),      X
          PRINTTO=P764,      X
          PGESTAT=PAGE,CHNASSY=YES,SESTYPE=3277CM
P764      DFHTCT TYPE=TERMINAL,TRMIDNT=P767,TRMTYPE=3790,TRMMODL=2,      X
          ACCMETH=VTAM,NETNAME=SDLC76P4,BUFFER=256,BRACKET=YES,      X
          TRMSTAT=TRANSCIVE,SESTYPE=3286CM

```

3-8. Operating Procedures.

To clarify the operating procedures for logon/logoff with the 3276, 3277 and 3278 displays in SNA mode, they are explained here in the context of the operating environments and conditions that may exist.

A. LOGON using the 3276/3278.

1. Check the operator information display area for the connection symbols. From left to right should appear a box with a 4 or 6 in it. This indicates that the display is connected to an operational control unit (3274 or 3276). Next there should appear a small underlined B. This indicates that the controller is operating in SNA mode. In the next position to the right will appear another box in one of the three following forms:
 - a. Box contains a question mark: No PLU - SLU session exists. Proceed to Step 2.
 - b. Box is filled in solid: A PLU - SLU session already exists. A logon cannot be performed until the session is terminated.
 - c. Box contains a stick-person: Display is owned by the SSCP - SLU session. To determine if a PLU - SLU session exists, press the ALT and SYS REQ keys. Condition 1a. or 1b. should then exist. Follow directions for 1a or 1b as appropriate.
2. To successfully logon, the display must not already have an active PLU - SLU session. You must verify that the box/question mark state exists. From this state follow these steps:
 - a. Press ALT and SYS REQ keys simultaneously. This should result in the box/question mark changing to a box/stick-person.
 - b. Enter the logon sequence that is valid for your installation.
 - c. Press ENTER.
 - d. If either the host application or the terminal rejected the logon request, then the appropriate SSCP error message will appear.
 - e. If, after a second or two, no error message has been displayed, press the ALT and SYS REQ keys. The box/stick-person should change to a solid box. Logon is now complete.

B. LOGOFF using the 3276/3278.

1. The recommended logoff method is to enter a character sequence recognized by the host application as a disconnect request. For example in TSO that is "LOGOFF", in IMS/VS it is "/RCL".
2. You can also request that the SSCP terminate the session. This is done by pressing the ALT and SYS REQ keys. When the box/stick-person appears, enter the logoff command (installation dependent).

C. LOGON using the 3277.

1. The 3277 when connected to the 3274 controller must attempt to emulate 3278 operations. Since the 3277 does not have the operator information display area or equivalent keyboard keys this is somewhat difficult and may lead to operator confusion. Before attempting to use the 3277, you must thoroughly understand the 3278 operation. The ALT and SYS REQ keys are simulated by the sequential (not simultaneous) operation of the TEST REQ and CLEAR keys. The SYSTEM AVAILABLE and INPUT INHIBITED indicators are all that is available to provide the information described in the 3278 procedures. Obviously all that information cannot be represented by these two indicators. Therefore, a limited number of exception conditions can be handled by the operator. Some assumptions must also be made when attempting to logon from a 3277:
 - a. The operator must know the control unit type and connection method for the control unit this display is attached to (i.e. SNA 3274 vs. 3271, 3272 or non-SNA 3274).
 - b. The operator must assume that the control unit and display are operational and active.
2. The first step to logon with a 3277 is to determine the state of the display as in step 1 of the 3278 procedure. When first approaching the display, the information on the screen, including the indicators, is not necessarily meaningful. To determine the state of the display perform the following procedure:
 - a. Press the TEST REQ and CLEAR keys. If the SYSTEM AVAILABLE and INPUT INHIBITED indicators are then off, you must assume that no PLU - SLU session exists (the display is now in box/question mark state) and you may proceed directly to step 2d below. If the SYSTEM AVAILABLE indicator is on, the display state is still not determined. Press the TEST REQ and CLEAR keys again.
 - b. If the SYSTEM AVAILABLE indicator is still on, then a PLU - SLU session already exists. To determine whether the display is currently owned by the SSCP - SLU session or the PLU - SLU session, it is necessary to key in a character stream that is likely to produce an error message. The error message should allow the operator to determine which session currently owns the display. The operator can flip-flop between these sessions by using the TEST REQ and CLEAR key sequence. A logon cannot be performed until the session is terminated.
 - c. If the SYSTEM AVAILABLE and INPUT INHIBITED indicators are now off, there is no PLU - SLU session active.
 - d. Once it has been determined that no PLU - SLU session currently exists and assuming the SYSTEM AVAILABLE and INPUT INHIBITED indicators are off, press the TEST REQ and CLEAR keys.

- e. The SYSTEM AVAILABLE indicator should now be on. Enter the logon sequence that is valid for your installation.
- f. Press the ENTER key.
- g. If either the host application or the terminal rejected the logon request, the the appropriate SSCP error message will appear.
- h. If, after a second or two, no error message has been displayed, press the TEST REQ and CLEAR keys to transfer display ownership to the PLU - SLU session. The SYSTEM AVAILABLE indicator should now be on. Logon is complete.

D. LOGOFF using the 3277.

1. The recommended logoff method is to enter a character sequence recognized by the host application as a disconnect request. For example in TSO that is "LOGOFF", in IMS/VS it is "/RCL".
2. You can also request that the SSCP terminate the session. This is done by pressing the TEST REQ and CLEAR keys and entering the logoff command (installation dependent).

E. ATTN key operation.

Simulation of the ATTN key operation on a 3277 is accomplished through a two key sequence like that for simulating the SYS REQ key operation. To cause an SNA SIGNAL command to be transmitted to the host, press the TEST REQ and PA1 keys in sequence.



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