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3770 RJE SNA Installation Guide

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1 INTRODUCTION ... *PLEASE READ*

PURPOSE

The purpose of this guide is to assist you in installing a 3770 and one of the RJE subsystems in an SNA environment. It is intended to supplement existing documentation (see Section 1.2); it is not intended to replace existing documentation. This document includes the combined knowledge and experience from the Palo Alto Systems Center (Product Support and Intermediate Systems), the Washington Systems Center, SCD, and most importantly from Systems Engineers.

PRODUCTS COVERED

The RJE Subsystems covered are MVS/JES2, VS1/RES/RTAM and DOS/VS/POWER.

Although the prime emphasis was placed on the "RJE" 3770 terminals (i.e., 3776 and 3777), an attempt was made to include the general purpose non-programmable 3770's (i.e., 3771, 3773, 3774, 3775, and the 3774P/3775P with the emulator feature) where possible. In other words, an effort was made to identify any differences between the "RJE" and "General Purpose" 3770's from an installation point of view. All testing was done with a 3774P, 3776-1,4 and a 3777-1. There are also some references to the 3774P/3775P included.

Although this is an SNA installation guide, there are some references to BSC operation; these identify the major differences or migration hurdles which have been encountered.

HOW TO USE

Since there is no index, the Table of Contents was constructed with as much descriptive detail as possible.

For most 3770 topics, there is a related RJE subsystem topic; be sure to reference all related topics for a given subject.

After reading the introduction, take thirty minutes and become familiar with the contents of this guide. Read the Table of Contents two or three times, then scan the entire document to become familiar with the information included and where it is located. *****Be sure not to overlook the appendices.

1.1 3770 FUNCTIONAL OVERVIEW

This section is provided as an overview of 3770 product functions. It must be supplemented by reading the relevant 3770 publications.

The 3770 terminals can be placed into five categories:

1. 3771, 3774P/3775P (with the emulator feature) - BSC/SDLC multifunction terminals.
2. 3776-1, 3776-2, and 3777-1 - BSC/SDLC RJE terminals
3. 3774P and 3775P - Programmable multifunction BSC/SDLC terminals.
4. 3777-2 - BSC Multileaving RJE terminal.
5. 3776-3, 3776-4 and 3777-3 - SNA Multiple Logical Unit RJE terminals.

CATEGORY DESCRIPTIONS

CATEGORY 1

3771:
- Usable with RJE as a card input/printer or card output terminal
- Usable as a batch terminal
- Usable as an interactive keyboard/printer terminal with DB/DC, TSO or VSPC

3774P/3775P (EMULATOR):
- Usable with RJE as card input/card or printer output terminal
- Usable as a batch terminal
- Usable as an interactive keyboard/printer to DB/DC
- Diskette input/output for batch or RJE usage
- Limited keyboard data entry function

CATEGORY 2

3776-1, 3776-2, and 3777-1:
- Designed for RJE usage
- No keyboard data entry capability
- Dual data path operation
- Compaction on 3777-1
- Dual 256 or 512 byte transmission buffers; switch selected
- SNA data compression inbound to host

The following SDLC, BSC and terminal characteristics are common to both CATEGORY #1 and CATEGORY #2 terminals.

SDLC Operation:
- Single logical unit support (one I/O device uses the line at a ti
- Batch communications to DB/DC capability
- Blank and data compression outbound

BSC Operation:
- 2770 or 3780 compatible line control
- Single on-line device active at a time
- Blank truncation and compression inbound/outbound

Terminal Operation:
- Terminal "jobs" started by simple console key entry including "communicate mode"
- Operator keyed RJE commands must be in card format
- Limited RJE console support
- Diskettes usable for input or output spooling (except 3771)
- 4800 bps maximum line speed
- 5 forms definitions available (1 on 3771)

CATEGORY 3

3774P/3775P:
- Single station distributed data processing terminals
- Designed for program controlled key entry, editing and I/O; BSC interactive (PC); SNA interactive (PC) announced
- SNA batch DB/DC functions available now
- RJE functions done using utilities and communicate mode options
- SNA RJE and SNA interactive from a program
- SNA/BSC RJE functions include: card/diskette input, printer/card/diskette output, and limited console capability
- Supervisor capability can assist in RJE operations
- Diskettes (up to 3) usable for I/O spooling
- Display or console printer usage is switch controlled
- Operator keyed RJE commands must be in card format
- Seven forms definitions optionally available
- Line speed up to 4800 bps

CATEGORY 4

3777-2:
- BSC Multileaving RJE capability only
- Full console support through display console, usable at all times
- Multiple I/O devices active with the line at one time
- Exchange is only diskette input
- No SNA support or non-RJE BSC support
- No keyboard entry capability
- Blank and data compression inbound/outbound
- All terminal operations controlled by a host generated workstation program
- 5 to 936 forms definitions available
- Line speeds to 19.2 KB

CATEGORY 5

3776-3, 3776-4, and 3777-3:
- SDLC Multiple Logical Unit terminal
- Multiple I/O devices active in multiple sessions with the SNA host RJE support (no DB/DC usage)
- Full console support through display console, usable at all times
- Can do SNA Single Logical Unit terminal operations allowing

SLU RJE usage
- Terminal operations controlled by operator defined procedures
- No keyboard entry capability
- Card, diskette, or tape input/output
- Multi-media input capability (for example: JCL on cards and data on tape or diskette)
- Line speed to 19.2 KB
- Blank and data compression inbound/outbound
- Basic Exchange output diskette usable on a 3740 type device (records aligned on sector boundaries)
- Compaction is supported outbound to the printer

RJE SUBSYSTEM SUPPORT (Some components not yet shipped)

Subsystem	3770 Category Support
POWER/VS SDLC	1, 2, 3, , 5
POWER/VS BSC	1, 2, 3,
RES SDLC	1, 2, 3, , 5
RES BSC	1, 2, 3, 4,
JES2 SDLC	1, 2, 3, , 5
JES2 (NJE) SDLC	1, 2, 3, , 5
JES2 BSC	1, 2, 3, 4,
JES3 SNA RJP	1, 2, 3, , 5
JES3 BSC	1, 2, 3, 4,

1.2 MANUALS YOU SHOULD HAVE

3770

Component Description for the IBM 3776 and 3777 Communication Terminals	GA27-3145
Component Description for the IBM 3771, 3773, 3774, and 3775 Communication Terminals	GA27-3146
3770 Customer Site Preparation Guide	GA27-3103

3771/3773 Operators Guide	GA27-3100
3774/3775 Operators Guide	GA27-3094
3776 Operators Guide	GA27-3107
3777-1 Operators Guide	GA27-3124
3776-3,4/3777-3 Operators Guide	GA27-3165

Other Publications You May Find Helpful

Installation -	Physical Planning	GA27-3006
3770	Physical Planning Template	GX27-2917
3770P	Programmer's Guide	GC30-3028
3770P	Operator's Guide	GA27-3114
3770P	Operator's Reference Summary	GA27-3113
3771/3773	Operator's Reference Summary	GA27-3101
3774/3775	Operator's Reference Summary	GA27-3095
3776	Operator's Reference Summary	GA27-3108
3777-1	Operator's Reference Summary	GA27-3125
3777-2	Operator's Guide	GA27-3129
3777-2	Operator's Reference Summary	GA27-3130
3771/3773/3774	Operator Tips	GA27-3131
3775/3776/3784	Operator Tips	GA27-3132
3203	Component Description and Operators Guide	GA33-1515

OS/VS2 - JES2

OS/VS2 SPL: System Generation Reference	GC26-3792
OS/VS2 SPL: JES2 4.0	GC23-0002
4.1 add supplement	GC23-0053
OS/VS2 SPL: NJE	SC23-0003
OS/VS2 SPL: VTAM	GC28-0688

OS/VS1

OS/VS1 System Generation Reference	GC26-3791
OS/VS1 RES System Programmer's Guide	GC28-6878
OS/VS1 RES RTAM and Workstation Support Logic	SY28-6849
OS/VS1 RES Workstation User's Guide	GC28-6879
OS/VS1 Message Library: VS1 RES RTAM and Accounting Messages	GC38-1010
OS/VS1 VTAM System Programmer's Guide	GC27-6996

DOS/VS

DOS/VS	System Generation	GC33-5377
POWER/VS	Installation Guide & Reference	GC33-6048
POWER/VS	Workstation User's Guide	GC33-6049
DOS/VS	VTAM System Programmer's Guide	GC27-6957

NCP/PEP/EP

3704/3705	Control Program Generation & Utilities	GC30-3008
3704/3705	Preinstallation Guide	GC30-3020
VTAM/NCP	Installation Student Text (Hal Liberty's Installation Guide)	SR20-4567
Advanced Function NCP and	Related Host Traces Student Text	SR20-4510

SNA

SNA General Information Handbook	G226-3543
SNA Maintenance Aids Handbook	G226-3544
SNA Reference Summary	GA27-3136
SNA Format And Protocol Reference Manual: Architecture Logic (FAP Manual)	SC30-3112

2 HOST SUBSYSTEM GENERATION/INITIALIZATION

2.1 NCP PARAMETERS (INCLUDING VTAM ONLY PARAMETERS)

PARAMETERS WHICH AFFECT 3770 INSTALLATION AND PERFORMANCE

NOTE: For a quick reference to all NCP parameters, where they can be coded (on which macros), under which macro it is explained, and whether it is a VTAM-only parameter, see Figure 5-9 (Page 5-69) in the 3704/3705 Control Program Generation and Utilities Manual (GC30-3008). Macros in this guide are referenced in the same order as in the 3704/3705 Control Program Generation & Utilities Guide; the parameters for each macro are in alphabetical order.

2.1.1 HOST Macro

2.1.1.1 UNITSZ

UNITSZ defines the size of VTAM's data buffers. If you will have both interactive and batch transactions, then UNITSZ becomes a compromise between specifying buffers larger than are required for interactive input and the overhead of chaining buffers together to hold batch input. If you have only batch, you may consider making UNITSZ larger, remembering though, that responses (definite, exception, and pacing) also use these buffers. The sample NCP has mixed interactive and batch, specifying UNITSZ=156.

UNITSZ is equal to the BSZ value of IOBUF. In the discussion of VTAM storage pools in the VTAM SPL, there is a table which shows the relation between the value selected and the number of elements per virtual storage page.

2.1.2 LUPOOL

Specifies the number of entries in a pool of logical units. One will be associated with every LU connected through the NCP over a switched line.

2.1.3 LINE Macro

2.1.3.1 NRZI

The most important thing about NRZI is that it agree on the 3770 and in your NCP. Most modems are not sensitive to NRZI, so unless your supplier dictates, code NRZI=NO and tell your CE to be sure the 3770 is jumpered to agree. For MLU 3770s, NRZI is specified in the Terminal Initialization Program (TIP) by the customer. NRZI should be used for IBM 3872 modems and for IBM integrated 1200 bps modems.

2.1.3.2 PAUSE

The PAUSE parameter on the line macro has major performance implications. Please read section 9.7 on NCP Pause Parameter.

2.1.3.3 REPLYTO

The default for REPLYTO on SDLC lines is 1.0 seconds. Unless this is a satellite link, allow it to default. If this is a satellite link you should increase it to the 1.5-2.0 second range. If the REPLYTO specified time is exhausted without a response then the operation (poll) may be retried, based on the values specified for RETRIES.

2.1.3.4 RETRIES=(m,t,n)

RETRIES on either the line or PU macro can negatively affect performance, especially on multipoint lines, unless some thought is put into its specification. Do not specify a very large value for m on multi-point lines because no one else will be serviced while NCP tries to retransmit. For multipoint lines, code m low (ie. m=1), allow a pause of 1 or 2 seconds (ie. t=1), and cycle a few times (ie. n=5); RETRIES=(1,1,5). This will work adequately on point-to-point lines also, since if the line errors are due to line noise, there should be a pause between retries to allow the line to become "quiet". If the error wasn't caused by line noise, one retry will probably be sufficient.

2.1.3.5 SERVICE

A service macro is required for every nonswitched SDLC line.

2.1.3.6 SERVLIM

SERVLIM (service limit) only has an effect on multi-point lines. It is the number of scans of the service order table that the NCP will make before it makes a special scan to contact terminals which have not yet responded to an SDLC SNRM (set normal response mode) command. The default for SERVLIM on SDLC links is 4. On a multi-point line you should probably raise SERVLIM but only after reading the caution on the SERVLIM parameter on the line macro in the IBM 3704 AND 3705 CONTROL PROGRAM GENERATION AND UTILITIES GUIDE (GC 30-3008).

2.1.4 PU PARAMETERS

2.1.4.1 ADDR

ADDR on the PU macro specifies the hexadecimal representation of the 8-bit address of the terminal (SDLC only). On SLU 3770s, decide on an address and tell the CE the address to plug on the 3770. (See XID, Section 11.1). For MLU 3770 terminals, the customer may specify the address, the block number and the ID number in the Terminal Initialization Program (TIP).

2.1.4.2 DISCNT, HOLD

These two parameters (DISCNT on the GROUP,LINE, or PU macro and HOLD on the character coded logoff) determine whether or not a switched line will be held after a PU has no more of its LUs in session. If DISCNT=YES and HOLD=NO, a disconnect will be sent when the last LU logs off. On a switched line, the terminal powers off (if feature 9501 remote power off is installed) and the line disconnects. On a dedicated line, the terminal also powers off. DISCNT defaults to NO and HOLD defaults to NO. This will result in the disconnect. HOLD can be changed on the logoff or by USSTAB entries. You should consider having one USSTAB entry for HOLD=YES and one for HOLD=NO. HOLD will override DISCNT.

The 3770 if configured with remote power off, will power off when it receives a Disconnect command preceeded by a DACTPU with the final bit on. Remote power off is standard on the 3777-1 and 3777-3.

2.1.4.3 MAXDATA=nnn

265 IF USING 256 BYTE BUFFER
521 IF USING 512 BYTE BUFFER
521 IF YOU WILL USE 256 AND 512 ALTERNATELY

Determines the maximum amount of data that NCP will transmit to the terminal including 9 bytes for the Transmission Header and Request/Response Header.

2.1.4.4 MAXLU=n (CODE FOR SWITCHED LINE ONLY)

Specifies the maximum number of concurrent sessions NCP will establish with LUs on this physical unit.

Specify MAXLU=1 for single logical terminals. You may specify a value from 1 to 6 for multiple logical 3770s, depending upon number of concurrent active sessions desired.

2.1.4.5 MAXOUT=n

Specifies the maximum number of data blocks (PIUs) that NCP can transmit to the physical unit before requesting an SDLC data link acknowledgement.

For single logical unit 3770s, specify a value of 1; A larger value can be specified, but will be ignored.

For multiple logical unit 3770s, a value of 7 is recommended.

2.1.4.6 PASSLIM=n

Specifies the maximum number of data blocks (PIUs) that NCP will send at one time to this PU.

For single logical unit 3770s, specify a value of 1; A larger value can be specified, but will be ignored.

For multiple logical unit 3770s, a value of 7 is recommended.

2.1.4.7 PUTYPE=2

Required for 3770.

2.1.5 LU PARAMETERS

2.1.5.1 BATCH=YES

Specifies to NCP that this is a BATCH LU (NCP gives priority to interactive LUs).

2.1.5.2 BUFLIM, BUFFACT

BUFLIM is specified on the PU or LU macro in an NCP. BUFFACT is specified on the APPL statement in an APPCONnn member of SYS1.VTAMLST. Their product determines how many PPBUF elements VTAM will receive from a logical unit until VTAM can transfer the data to the application. You should have values set high enough to ensure that VTAM buffers are always available to receive data.

Use BUFLIM as a multiplier by terminal (i.e., BUFLIM=1 for 256 byte buffer terminals and BUFLIM=2 for 512 byte buffer terminals). Use BUFFACT as a multiplier by application (i.e., For interactive applications use BUFFACT=4 and for batch applications use BUFFACT=10). For example with a 512 byte 3776 using JES2, if you specify BUFLIM=2 on the PU macro for the terminal and BUFFACT=10 on the APPL statement, then VTAM would accept up to 20 buffers of data from the terminal and hold them in pageable memory until JES2 can accept them.

JES will normally have a VTAM RECEIVE outstanding, in which case the data will be transferred directly from IOBUF buffers to JES and not to PPBUF buffers, unless JES cannot issue receives as quickly as the data is arriving.

The defaults are: BUFLIM = 2 and BUFFACT = 1.

It is recommended that you not use the defaults, the product of BUFLIM and BUFFACT should be large enough to provide for at least 10 to 20 RU's from the terminal. For example, if the PPBUF buffer size is 156 bytes and a 3776 with 512 byte buffers is being used, then each 512 byte RU would require 4 PPBUF buffers. The number of buffers required for 10 RU's would be 40; therefore, the product of BUFLIM and BUFFACT should be at least 40 for this example.

If too small a value is specified for the product or BUFLIM and BUFFACT then VTAM will issue an SNA CLEAR command and stop receiving from the terminal. When this occurs, NPR code 292 will be displayed at the 3770.

2.1.5.3 LOCADDR=1

Specifies the local address of this LU on the PU. LOCADDR should be 1 for all 3770s except the MLU terminals which can have up to 6 LU sessions.

2.1.5.4 MODETAB

The MODETAB (mode table) entry on the LU or PU macro supplies VTAM with the name of a logon mode table which contains the BIND image parameters to be used for this logical unit. The entry in the table which will be used is determined either by an entry in the logon message (LOGMODE(name)) or by the entry specified in the appropriate USSTAB member. Examples are included in APPENDIX A for both a 256 and 512 byte buffer (BUF256 and BUF512).

The default is the IBM supplied table, ISTINCLM. User generated logon mode tables must be assembled and link edited into SYS1.LPALIB for MVS systems and SYS1.VTAMLIB for VS1 systems.

2.1.5.5 PACING=(n,m)

Specifies that a PACING response from the terminal will be required for every n blocks of data (PIUs). The pacing request indicator will be turned on in block m. The pacing response informs NCP that adequate buffers are available in the terminal in which it can receive another n blocks of data.

For SLU 3770s a value of 1,1 is required.

For MLU 3770s, a value from 1,1 to 7,1 may be specified. However, the pacing values may be restricted to lower values depending upon the number of concurrent sessions active and the RU size being used (i.e. 256 or 512). See the discussion on pacing in the 'SDLC Performance on Point-to-Point Lines' section.

2.1.5.6 SSCPFM=USSSCS

The 3770 RJE logon will be a character coded logon.

2.1.5.7 USSTAB

The USSTAB (Unformatted System Services Table) parameter on the LU macro designates the name of a user provided table which is used by VTAM to interpret user logons. This enables a user to enter a logon in a simplified or more meaningful format; the VTAM USS function replaces that with a logon that is acceptable to VTAM and the application from a correspondence set forth in USSTAB entries. The USSTAB entries must be assembled and link edited into SYS1.VTAMLIB using the same module name as specified on the USSTAB parameter.

If the user enters the following logon:

SIGNON USER=RMT1

Then using the sample USSTAB in Section A.6, this is translated to:

LOGON APPLID(JES2) LOGMODE(BUF512) DATA(RMT1)

2.1.5.8 VPACING=(n,n)

VPACING controls the flow of data from VTAM to the NCP. PACING controls the flow of data from the NCP to the terminal. Therefore, the VPACING value specified is dependent upon the PACING value. VPACING allows VTAM to keep NCP ready with data for the terminal by buffering ahead. The recommendation for VPACING for 3770's using a pacing value of (1,1) is (2,1) or (3,1). For pacing values greater than (1,1), it is generally recommended that the vpacing value be two times the pacing value. For example, a PACING=(3,1) should have a corresponding VPACING=(6,1) specification. See discussion of VPACING in section 9.3.

2.2 JES2 INITIALIZATION PARAMETERS FOR THE SNA 3770

This section describes those JES2 RJE initialization parameters which are used for SNA RJE. The following information is meant to supplement the JES2 manuals by providing device specific information and should be used together with the parameter descriptions in the JES2 manual. Also included is information on some JES2 features such as automatic logon.

2.2.1 SAMPLE INITIALIZATION PARAMETERS

```
3770
RMTn     LUTYPE1,BUFSIZE=256,COMP,NUMPR=1,LUNAME=NCPLU1
Rn.PR1   CLASS=A2S,PRWIDTH=132,CHAINSIZ=0,FCBLOAD
Rn.PU1   CLASS=A2S,CHAINSIZ=0

3777-1 or 3770 MLU (with compaction)
RMTn     LUTYPE=1,BUFSIZE=512,COMP,CMPCT,NUMPR=1,LUNAME=NCPLU1
Rn.PR1   CLASS=A2S,PRWIDTH=132,CHAINSIZ=0,COMPACT=3,FCBLOAD
Rn.PU1   CLASS=A2S,CHAINSIZ=0
```

2.2.2 COMPACT (Compaction Table Definition)

This is where a user specified compaction table is defined. The first character is the compaction table number used in JCL to reference this compaction table. In addition to alphameric characters JES2 compaction tables should include the following SNA Character String functions: new line x'15', record separator x'1E', select x'04', form feed x'0C', and carriage return x'0D'. See the example compaction tables below (compaction table #3 and #4). Also see APPENDIX D for more detail on compaction tables. There are no compaction tables supplied with JES2.

SAMPLE COMPACTION TABLE FOR ALPHABETIC DATA:

```
COMPACT=3,13,40,A,D,E,G,I,L,N,O,R,S,T,U,
15,.,4C,(,+,4F,&,1E,$,*,),5E,0C,-,/,
,,6C,6D,6E,6F,0D,7A,7B,7C,',7E,7F,B,C,F,
H,J,K,M,P,Q,04,V,W,X,Y,Z,0,1,2,
3,4,5,6,7,8,9,81,82,83,84,85,86,87,88,89,
92,93,94,95,96,97,99,A2,A3,A4,A5,A6,A8
```

SAMPLE COMPACTION TABLE FOR NUMERIC DATA:

```
COMPACT=4,13,0,1,2,3,4,5,6,7,8,9, ,,,.,
15,4C,(,+,4F,&,1E,$,*,),5E,0C,-,/,
6C,6D,6E,6F,0D,7A,=,7C,',7E,7F,B,C,F,
H,J,K,M,P,Q,04,V,W,X,Y,Z,
A,D,E,G,I,L,N.O,R,S,T,U,
81,82,83,84,85,86,87,88,89,
92,93,94,95,96,97,99,A2,A3,A4,A5,A6,A8
```

2.2.3 LINEnnn (RJE Lines)

One line should be defined for each 3770 that will be active at any one time. All lines, BSC and SNA must be numbered sequentially. The line referred to is not a physical communication line but rather a logical connection between JES2 and the terminal. A single SDLC communication link might have several terminals multi-dropped. Each terminal would have a separate logical path to VTAM and would require a separate LINE parameter. Thus one physical communication link would appear as multiple LINEs to JES2.

2.2.3.1 PASSWORD=cccccccc

PASSWORD is a subparameter on the LINEnnn parameter entry. Passwords are an optional security feature. This password is the line password. A line password may not be specified if automatic logon is to be used. When the operator logs on, the user data portion of the logon is:

RMTnnn,PASSWORD1,PASSWORD2,LUNAME

RMTnnn	is the remote name. Leading zeroes are not used. Remote 1 would be RMT1 NOT RMT001. It could also be specified as REMOTEnn but only for remotes 1 to 99.
PASSWORD1	is the LINE password.
PASSWORD2	is the remote password from the RMTnnn parameter.
LUNAME	is the symbolic name assigned to the terminal in the VTAM terminal definition. The symbolic name of the terminal is specified to VTAM on the LU statement as part of a switched terminal definition or on the NCP LU macro. See LUNAME on the RMT parameter below. LUNAME would usually be specified only for a 3770 using multiple logical units.

Passwords and LUNAME are optional, except the same LUNAME must be specified in all logons for multiple sessions on a 3770 MLU terminal. JES uses this to associate all LU's for a given PU.

2.2.3.2 UNIT=SNA

This subparameter on the LINEnnn parameter entry must be specified for SNA lines.

2.2.6 LOGON1 (Identification of JES2 to VTAM)

The LOGON1 parameter gives JES2 a name as an application program and an optional password. JES2 uses this to build and open a VTAM ACB.

2.2.6.1 APPLID=cccccccc

APPLID is a subparameter on the LOGON1 parameter entry. The default is JES2. This is the name that will be used by VTAM for JES2. The name is used in logons and in the VTAM configuration list.

2.2.6.2 PASSWORD=cccccccc

PASSWORD is a subparameter on the LOGON1 parameter entry. This operand may be specified to provide a VTAM password for JES2. If specified, it must correspond with the PRTCT value specified in the APPL definition statement for JES2.

2.2.8 &MAXSESS=nnn (Maximum Number of VTAM Sessions)

MAXSESS is the total number of active sessions at any point in time. For each single LU terminal, i.e. 3770, 1 session can be active. For each multiple LU terminal (i.e. 3770 MLU: 3776-3, 3776-4, 3777-3), SEVERAL SESSIONS CAN BE active. The default is the number of lines with UNIT=SNA which may be insufficient if multiple LU terminals are installed.

2.2.9 &NUMBUF=nnn (JES2 I/O Buffer Count)

When SNA terminals are added to a JES2 system or when SLU terminals are being replaced with MLU terminals, &NUMBUF should be increased to take into account the increased system activity caused by the additional remote readers, printers, and punches. The number of buffers needed for the SNA terminals is heavily dependent on the number of SNA sessions that will be active at one time. A good rule of thumb is: 4 times the number of sessions plus 6 times the number of logon DCTs. The number of logon DCTs is currently 1.

2.2.10 &NUMCMBS=nnn (Number of JES2 Console Buffers)

The use of RJE increases the number of console message buffers required particularly if there is a large amount of message activity. Broadcast messages in particular can increase the requirement for buffers. Specifying too few buffers will result in system degradation and loss of messages. Too many buffers specified wastes CSA. If messages are lost, increase the number of buffers. See the JES2 System Programming Library (SPL) manual chapter 7 for a discussion of &NUMCMBS.

2.2.11 &NUMJOES=nnn (Number of Job Output Elements)

This parameter should be increased to take into account the additional requirement caused by the remote terminals on the system. The total number of JOEs is equal to the number of characteristic JOEs plus the number of work JOEs plus the number of interrupt JOEs. One characteristic JOE is used for each unique combination of characteristics (CLASS, FORMS, UCS, DEST, etc.) for SYSOUT data sets on a system wide basis. A work JOE is the same but on a job basis. A check point JOE is required for each active device (printer or punch) plus 1 for each device that is warm started plus 1 for each time a device is interrupted with a $I command.

To illustrate, take a JES2 system that has only 2 jobs. The JCL for the jobs is:

NOTE	CHAR JOE	WORK JOE			
A	1	1	//ONE	JOB	
B	1	1	//A	DD	SYSOUT=A
C	2	2	//B	DD	SYSOUT=B
D	3	3	//C	DD	SYSOUT=(A,FRM1),DEST=3
E		4	//TWO	JOB	
F		4	//X	DD	SYSOUT=A

G 4 5 //Y DD SYSOUT=(A,FRM2)

A MSGCLASS=A is the default. One characteristic JOE is required for the JCL images, system messages and HASP log which all use the default FORMS, UCS, etc. One work JOE is also required.

B This SYSOUT data set has the same characteristic as the first so another JOE is not required.

C This SYSOUT data set has a different class so both another work JOE and another characteristic JOE are required.

D A change in characteristics (FORM and DEST) requiring a new work JOE and a new characteristic JOE.

E A characteristic JOE is already available for a SYSOUT data set with these characteristics so another is not required. A work JOE is required because a work JOE is on a job basis.

F No additional JOEs required.

G This data set has new characteristics both on a job and system wide basis so both characteristic and work JOEs are required.

A total of 4 characteristic JOEs and 5 work JOEs are required for these two jobs.

In addition to the characteristic and work JOE, checkpoint JOEs for each remote printer and punch should be included in the calculation of the number of JOEs. Allow 1 checkpoint JOE for each local or remote printer or punch that is active plus a couple for each device that has been interrupted with a $I command. The default for NUMJOEs, which is 10 times the number of local and remote printers and card punches, is often inadequate. If insufficient JOEs are allocated, JES2 will wait for JOES to become available which can create significant performance degradation in an MVS system.

2.2.12 &NUMLNES=nnn (Number of Teleprocessing Lines)

&NUMLNES should equal the largest teleprocessing line identification number (from a LINEnnn parameter).

2.2.13 &NUMRJE=nnn (Number of Remote Terminal Definitions)

&NUMRJE defaults to the value specified for &NUMLNES. This may be insufficient. &NUMRJE should be made equal to the largest terminal identification number (from a RMTnnn parameter).

2.2.14 &NUMTPBF=nnn (Number of JES2 TP Buffers)

Specify a large value for &NUMTPBF. A large value uses extra virtual storage and may cause some extra paging. A small value can degrade performance. Each active session can have up to 6 buffers for inbound data and up to 3 buffers for outbound data.

An SLU 3770 may have 1 active session requiring a maximum of 6 buffers. An MLU 3770 may have up to 6 active sessions. Based on your knowledge of what might be operational during peak periods a value for &NUMTPBF for SNA devices should be calculated and added to the number for the rest of the system.

2.2.15 &PRTRANS=YES (Print Line Translation Option)

Before data is sent to an SNA terminal JES2 checks for any characters with a value less than X'40'. If there are any, the print line will be sent in transparent mode. Transparency prevents the printer from interpreting invalid data as SNA Character String Control Characters, instead they will print as dashes.

When &PRTRANS=YES is specified, all print data for local 1403s and remote printers is translated to characters that are valid on a PN print train. &PRTRANS=YES may be specified if SNA terminals print dashes for invalid characters. The translate table in the JES2 HASPPRPU module may be modified to provide for different character sets, however, there is only one translate table for all the local 1403s and remote printers.

2.2.16 RMTnnn (SNA Remote Terminal)

The RMTnnn parameter is used to specify the characteristics of each remote terminal. The following subparameters of the RMTnnn parameter are applicable to 3770 SNA RJE.

Terminal type must be LUTYPE1 for SNA terminals.

2.2.16.0 BUFSIZE=nnn

In general, the 3770 BUFSIZE must be 256 bytes, except for the 3776 and 3777 which may use a BUFSIZE of 256 or 512. 512 byte buffers improve performance by reducing overhead on the communication line. In addition when 512 byte buffers are used, the number of requests to VTAM to send or receive data is cut approximately in half. Other members of the 3770 family have 256 byte buffers. On the SLU 3776/3777, the specification of BUFSIZE must match the setting of the extend buffer switch on the terminal or the bind will fail. On the MLU 3776/3777, there is no buffer extend switch. The 3770 MLU allocates buffers based on the RU size specified in the BIND. JES will specify the RU size in the BIND to be the same as the BUFSIZE specification.

Caution should be used when specifying BUFSIZE=512 for an MLU terminal, since all sessions for the remote will use the same buffer size. A 512 byte RU requires two times more internal 3770 buffers than a 256 byte RU. The 3770 internal buffers are not unlimited. See the discussion for "PACING" in section 9 for the relationship between pacing, RU size, and the number of concurrent active sessions.

2.2.16.1 CMPCT/NOCMPCT

Specifies whether or not compaction may be used with this remote. CMPCT should be specified for the 3776-3,4 and 3777-1,3.

2.2.16.2 COMP/NOCOMP

Blank compression and multiple character compression are standard features of SNA terminals. The default for this operand is no compression, therefore, COMP should be explicitly specified or if compaction is specified, compression is forced.

2.2.16.3 CONDEST=nnn

CONDEST is used to specify that console responses are to be directed to another remote.

2.2.16.4 CONSOLE/NOCON

CONSOLE is used with SNA terminals to indicate that the terminal has a device separate from the printer that can be used for receiving console messages. CONSOLE should only be specified for devices with a separate CONSOLE device, otherwise, messages from the subsystem can print in the middle of normal output. A 3774 with a 3784 and the MLU terminals are the only 3770s for which CONSOLE is a valid option. No console (NOCON) is the default.

2.2.16.5 DISCINTV=nnn

JES2 provides an automatic disconnect facility that is designed primarily for terminals on dial lines but which is available on both leased and dial lines. If a terminal becomes idle for the number of seconds specified in DISCINTV, it will automatically be disconnected. Specify 0 or allow this parameter to default to 0 unless you have determined that automatic disconnection is required. The value specified will be rounded up to a multiple of 32 seconds.

Automatic reconnection to JES2 is possible thru use of the JES2 autologon facility. When output is ready for the terminal, JES2 will automatically initiate a session with the logical unit named in LUNAME. See the discussion of LUNAME below for information about the JES2 autologon capability.

2.2.16.6 FIXED/VARIABLE

This parameter is ignored for SNA terminals.

2.2.16.7 LINE=nnn

LINE should not be specified unless you have a good reason to dedicate a particular logical line to one terminal. Warning: If LINE is specified, then the line is considered dedicated to the terminal and JES2 will not check the user's password.

See the JES2 System Programming Library manual chapter 5 for a discussion of dedicated versus non-dedicated lines.

2.2.16.8 LUNAME=cccccccc

LUNAME provides support for automatic logon; if specified, it is the same name as that specified for the logical unit to VTAM/NCP. LUNAME can also be used to ensure that only a particular terminal logs on to a given remote. In this case it functions something like a password and only the named LU will be allowed to log on.

LUNAME is not required on the RMT for a 3770 but if it is used, it must be the name of the first LU to log on. When LU name is entered as the fourth field of the user data portion of the logon from a 3770 it provides support for multiple logical units sharing the same 3770. LUNAME is required as part of the logon data from a 3770 when multiple logical units are used.

2.2.16.8.1 AUTOMATIC LOGON

Connection to JES2 of the remote named in the LUNAME parameter can be done either thru a $SRMTn JES2 command or automatically when output is available for the remote. The $T command is used to set the remote terminal to automatic connect mode and to specify a disconnect interval. The host computer operator could type $TRMTn,A=Y,D=32. A=Y places the terminal in automatic connect mode. D=32 specifies a disconnect interval of 32 seconds. When there is no activity at the terminal for about 32 seconds, the session will be terminated automatically. JES2 will automatically reconnect to the terminal when output is available, read any input from the reader and send the output. A disconnect interval need not be specified. Too short a disconnect interval may cause auto logon to fail, particularly on a low speed line because the terminal will be logged off before JES2 can start sending data to it.

Automatic connection is accomplished using the facilities of VTAM. If autodial facilities are available, NCP will automatically dial the terminal. For automatic connection to occur with a 3770, it must be in communicate mode. If it is not, the CPU select light will come on at the 3770, a message will notify the host operator that autologon failed, and the terminal will be taken out of automatic connect mode. With the 3770 automatic connection and disconnection may occur without operator intervention. JES2 does not support unattended operation of any terminals.

2.2.16.9 NUMPR=n

NUMPR specifies the number of logical printers at this terminal. A logical printer may also be used for output destined to a tape drive or diskette on a 3770. The maximum value for NUMPR is 6 if CONSOLE is specified, 7 otherwise. The total number of printers and punches must not exceed 8. One is the default.

2.2.16.10 NUMPU=n

NUMPU specifies the number of logical card punches at the terminal. A logical punch may also be used for output destined to a tape drive or diskette on a 3770. The maximum value for NUMPU is 7. The total number of printers and punches must not exceed 8. Zero is the default.

2.2.16.11 NUMRD=n

Specifies the number (0 to 7) of logical card readers at this remote terminal. Up to 7 reader data streams can be supported. Specify the number of inbound data streams that may be active concurrently (i.e. tape, disk, and/or card reader on an MLU terminal; one on an SLU terminal. One is the default.

2.2.16.12 PASSWORD=cccccccc

See LINE=nnn above on the RMTnnn parameter for restrictions on the use of the LINE parameter and passwords. If a remote password is specified, it must be entered as the third parameter in the user data field of the remote logon. See 2.2.3.1.

2.2.16.13 ROUTECDE=nn

ROUTECDE is used to specify that input from this terminal will have the return destination specified. In addition any output routed to the ROUTECDE specified would be received by this terminal. For example, if this is remote 10 and a ROUTECDE of 11 is specified, then this terminal and remote 11 will receive output routed to remote 11 and any input from remote 10 will have a route code of 11. Data routed to remote 10 would not be sent to either remote.

2.2.16.14 SETUPHDR/SETUPMSG

SETUPHDR is not supported by the 3770s. The message referenced by SETUPMSG is a message to the operator telling him to mount special forms. See AUTO/OPERATOR below on the Rnnn.PRm parameter. The header referenced by SETUPHDR is a Function Management Header (FMH) type 2. Specify SETUPMSG for the 3770. SETUPHDR causes the PDIR bit (byte 16 bit 2) in the bind to be set on, which will result in the 3770 rejecting the bind with a sense of x'0821'.

2.2.16.15 SETUPINF/SETUPACT

When the printer or punch is operating in automatic forms mode (see AUTO/OPERATOR below on the Rnnn PRm parameter), the message to the operator telling him to mount special forms will be displayed on both the remote console, and at the console of the CPU. If SETUPACT is specified, then the host operator will have to delete the set up message. SETUPINF should usually be specified when operating in automatic forms mode. When operating in demand forms mode. (OPERATOR specified on the Rnnn.PRm), this parameter has no effect.

2.2.16.16 WAITIME=nn

The WAITIME parameter gives the operator additional time between output to submit commands and jobs. It specifies the interval in seconds that JES will wait at the completion of printing before initiating print of the next output data set. It is during this pause that an input operation can be started. If unsure, 01 will result in the least time the printer remains idle between print data sets. For MLU 3770s, 01 should always be specified.

2.2.17 Rnnn.PRm (SNA Remote Printer)

2.2.17.0 AUTO/OPERATOR

When AUTO is specified, JES2 will send a message to tell the operator that special forms should be mounted in the printer. When OPERATOR is specified, the remote terminal operator periodically uses a $DF JES2 command to check the forms queue and then uses a $TPRn,F=form,Q=classes command to set the printer for special forms. In most cases OPERATOR should be specified.

2.2.17.1 CTTL/NOCCTL

CCTL specifies that carriage control characters are to be placed in the output stream transmitted to this remote printer. This operand is for use with only SNA devices. NOCCTL is required when the SELECT=BASICn subparameter of the Rnnn.PRm initialization parameter is specified. When NOCCTL is specified, data will not be compressed or compacted.

Default: CCTL

2.2.17.2 CHAINSIZ=nnn

CHAINSIZ (chain size) specifies the number of RUs (1 to 254) that are sent as a chain to the remote printer. All elements in the chain except the last are sent requesting exception response. If CHAINSIZ is not specified then JES2 will send a page, as defined by a skip to channel 1, to the printer before requesting a definite response. In either case, the printer will pause, sometimes for more than a second, while the response is processed. If CHAINSIZ=0 is specified, an entire print data set is treated as one chain. For best terminal thruput, CHAINSIZ=0 should be specified.

CHAINSIZ also affects the operation of the attention key on the SLU 3770. When CHAINSIZ is not specified, a single depression of the attention key causes output to stop at the top of the next page so the operator can enter jobs or commands. When CHAINSIZ=0 is specified, a single attention interrupt may be used to stop output to the terminal so the operator may enter data. When CHAINSIZ is not equal to zero, one depression of the attention key is used to request stopping output at the end of the current chain. Two depressions of the attention key spaced a few seconds apart are used to request an "immediate" interrupt. When CHAINSIZ is equal to zero, one depression of the attention key is used to request an "immediate" interrupt. Even with an immediate interrupt, the operator must wait for the data queued in VTAM and the NCP to be processed. For MLU 3770s, it is assumed that another session would be available for input and an interruption would not be necessary.

When CHAINSIZ is allowed to default a new chain is started at the top of each page. Backspacing 2 pages will be enough to guarantee recovery of printed data after most errors. When CHAINSIZ is equal to zero, it is not as easy to guarantee printing of all data after an error occurs because of the large amount of data that may be queued in the system. In fact it may be necessary to backspace to the beginning of the data set and then forward space to the page before the error.

2.2.17.3 CLASS=C(1)....C(n)

Output classes can be used to group all output of a particular type. For example, if both 6 and 8 line per inch output is to be printed at the terminal then the 8 line per inch output could be put in a special class. The operator would drain the printer using a JES2 $P command, then on the 3770, a "code/K" function for SLU 3770s or the PRINT command for MLU 3770s could be used to switch to 8 lines per inch. To start the output again, the operator would use a JES2 $TPRn,Q=classes command to set the printer to the class which is used for 8 lines per inch output and would then use a $S command to start the printer. An alternative is to use host loaded FCB's in conjunction with the $T JES2 command (to get the FCB sent from JES2) and the 3770 lines per inch selection. On an MLU 3770, a HOSTOUT, OUTPUT, or PRINT command is used to set the printer line density rather than CODE/K and CODE/L.

2.2.17.4 CMPCT/NOCMPCT

CMPCT specifies that this remote SNA printer has compaction capabilities. CMPCT forces this remote SNA printer to use compaction if the corresponding remote terminal initialization parameter (RMTnnn) specifies CMPCT. Specifying CMPCT also causes the data to be compressed. NOCMPCT turns off compaction even if compaction is specified on the RMTnnn initialization parameter. This parameter is ignored for BSC devices.

NOTE: If the RMTnnn initialization parameter specifies compaction and the Rnnn.PRm initialization parameter does not specify NOCMPCT, compression will be forced regardless of the COMP/NOCOMP specification.

Default: The CMPCT/NOCMPCT specification for the corresponding RMTnnn initialization parameter.

2.2.17.5 COMP/NOCOMP

COMP specifies this remote SNA printer has compression/expansion capabilities. COMP forces this remote SNA printer to use compression only if the corresponding remote terminal (RMTnnn) initialization parameter has COMP specified. NOCOMP turns off compression for this remote SNA printer even if the corresponding RMTnnn initialization parameter specifies COMP. This parameter is ignored for BSC devices.

Default: The COMP/NOCOMP specification for corresponding RMTnnn intialization parameter.

2.2.17.6 COMPACT=n

COMPACT specifies the default compaction table number to be used for this remote printer.

2.2.17.7 DRAIN/START

START would usually be specified.

2.2.17.8 FCB=cccccccc

This is the name of the Forms Control Buffer (FCB) that will be used initially for this printer. If a name is not specified here, the default name from &PRTFCB will be used.

2.2.17.9 FCBLOAD/NOFCBLD

The 3770 has the capability of receiving Forms Control Buffer (FCB) images from the host. The FCB image is the equivalent of an electronic carriage tape.

When FCBLOAD is specified, JES2 will build a Set Vertical Format (SVF) SNA command based on the FCB specified for the print data set and transmit it to the terminal. JES2 gets the information for the FCB from SYS1.IMAGELIB. Systems that have 3211s installed will usually have the FCBs already defined in SYS1.IMAGELIB. When the FCB is defined, only one stop per channel is permitted for SNA devices. FCBLOAD should be specified for the 3770 to save the operator from having to define FCBs at the 3770 and start 3770 jobs for each report that requires a special FCB. In addition, the SLU 3770s have only a limited number of FCBs (five) that may be defined. If NOFCBLD is specified and an FCB is required that is not already stored as part of an operator job in the 3770, the operator must disconnect from the host, read in more operator defined jobs, logon to JES2 and then request the output requiring a special FCB.

MLU 3770s provide for an adequate number of forms definitions (FCBs) to be defined. A new forms definition can be invoked via the PRINT command.

2.2.17.10 FORMS=cccccccc

This is the name of the form that JES2 will assume is initially loaded in the printer.

2.2.17.11 LRECL=nnn

Specifies the logical record length (nnn) of data transmitted to a remote printer. This value must not exceed the printer width specified during RMT generation (via the &PRTSIZE or &PRTFOTLW RMT generation parameters) for this terminal. LRECL may be used in place of PRWIDTH subparameter when specifying record size destined for remote devices. The maximum value of LRECL is 255.

Default: 120

2.2.17.12 NOSEP/SEP

NOSEP performs two functions for terminals without a separate console. It both eliminates page separators and suppresses printing of operator messages on the printer. To eliminate page separators without affecting console messages, the &TPIDCT parameter could be used.

2.2.17.13 NOSUSPND/SUSPEND

This is not used for SNA devices.

2.2.17.14 PRWIDTH=nnn

Specifies the maximum number of characters to be printed on one line.

NOTE: This value must not exceed the printer width you specified during RMT generation of this MULTI-LEAVING terminal with the &PRTSIZE parameter for Mod 20, S/360, and S/370 terminals and via the &PRFOTLW parameter for 1130 terminals). PRWIDTH is a BSC only parameter. Specify 132 for the 3770.

Default: 120

2.2.17.15 ROUTECDE=nnn

ROUTECDE specifies the route code for this printer. For example, if this is remote 10 and a route code of 11 is specified for the printer then only output for remote 11 would print on the printer. Route code specified on the printer differs from route code on the RMTnnn parameter in that when it is specified on the remote it affects input originating at the terminal as well as output directed to the printer.

2.2.17.16 SELECT =

```
               PRINTn
SELECT =       EXCHn
               BASICn
```

Specifies the device type (PRINT, EXCH, or BASIC) and device subaddress (n-1) to which output queued for this remote device will be sent. The SELECT options and their meanings are:

Option	Meaning
PRINTn	Output sent to printer
EXCHn	Output sent to exchange diskette device
BASICn	Output sent to basic exchange device diskette

The value n specifies the desired device number. The value of n may range from 1-15 (subaddress 0-14). If n is omitted then any available device of the specified type (PRINT, EXCH, or BASIC) will be used. When BASICn is specified, NOCCTL must be specified and LRECL must not exceed 128. Refer to the remote terminal publication for your device to determine valid device type subaddresses and their requirements.

Example: To cause all output queued to this remote routecode to be sent to an exchange diskette device with subaddress 0, specify:

SELECT=BASIC1

NOTE: This parameter is ignored for BSC devices.

Default: Standard device selection of print and subaddress selection based upon printer number.

2.2.17.17 UCS=cccccccc

This is not used for SNA terminals.

2.2.18 Rnnn.PUm (SNA Remote Punch)

The Rnnn.PUm parameter specifies the characteristics of a remote punch. See the JES2 System Programming Library manual and the discussion of Rnnn.PRm above. CCTL/NOCCTL, CMPCT/NOCMPCT, COMP/NOCOMP, LRECL= , and SELECT= are valid parameters for a remote punch also.

2.2.18.1 CHAINSIZ=nnn

The default for CHAINSIZ on a punch is 100.
Because the card punch is a slow device compared to the printer, the discussion of CHAINSIZ for the printer does not apply to the punch.

The following discussion is pertinent to SLU 3770s, since it is assumed that there will be another session available for input on MLU

terminals and an interruption will not be required.
If CHAINSIZ=0 is specified for the punch then interrupting the punch via the attention key to send in commands can take too much time. When CHAINSIZ=0 is specified, the terminal operator must wait until all the data queued in the NCP has been processed.
Depending on buffer size, VPACING, PACING, average card length, and punch speed the operator might have to wait several minutes. For example, if VPACING is 3,1 and the terminal's buffers are 512 bytes there might be over 3000 bytes of data to be punched before the operator would be able to send in a command. If there are an average of 30 bytes per card, the operator would have to wait while 100 cards punch.

The value that should be specified will depend on how long the operator is willing to wait for an attention interrupt to take effect. Too small a value for CHAINSIZ will degrade punch thruput.

2.2.19 Rnnn.RDm

The Rnnn.RDm parameter specifies the characteristics of a remote reader. See the JES2 System Programming Library manual and the discussion of Rnn.PRm above.

2.2.20 &RPRBOPT=YES/NO (Remote Printer Double Buffering Option)

This is not used for SNA devices.

2.2.21 &RPUBOT=YES/NO (Remote Punch Double Buffering Option)

This is not used for SNA devices.

2.2.22 &SPOLMSG (Remote Terminal Spool Message Count)

If messages are lost increase this value.

2.2.23 &TPBFSIZ (Teleprocessing Buffer Size)

The value specified should be as large as the largest buffer size for any device in the system. The largest buffer size for a 3790 is 256 bytes. For a 3776 or 3777 it could be 256 or 512. Other 3770s have 256 byte buffers.

2.2.24 &TPIDCT=nnn (Remote Printer Separator Page Line Count)

&TPIDCT may be set to zero to eliminate page seperators. This value affects all remote printers on the system. See also SEP/NOSEP on the Rnnn.PRm parameter above.

2.2.25 &WAITIME=nn (Remote Terminal Interval)

See WAITIME on the RMTnnn parameter.

2.3 VS1/RTAM GENERATION PARAMETERS

Refer to the VS1 RES System Programmer's Guide for more detail in generating support for remote workstations.

2.3.1 VS1 SYSTEM GENERATION CONSIDERATIONS

OPTIONS=REMOTE in SCHEDULR macro, ACSMETH=VSAM in DATAMGT macro. RDR and WRT parameters in JES macro.

Following are the system data sets required:

SYS1.RMTMAC contains RTAM macro definitions
SYS1.RMTOBJ default name for data set to hold input for linkage editor.
SYS1.UADS
SYS1.BRODCAST

2.3.2 RTAM MACROS

TERMINAL
RTAM
LINE is not required for SDLC.

2.3.2.1 TERMINAL MACRO

One required for each workstation that can use RTAM.

```
TDESCR=(w,t,d,f) where w specifies printer width
                       t specifies workstation type
                         (8 for SNA)
                       d specifies data transmission format
                         (5 for SNA)
                       f specifies workstation features
                         (3 for console and transparency)
```

=(3,8,5,3) would specify 132 character printer width, SNA workstation, SNA character, console support and transparency.

RDRS=n

Where n=0-9 default=1

PTRS=n

Where n=0-9 default=1

PCHS=n

Where n=0-1 default=1

PLGN=n

0=not permanent logon (default)
1=permanent logon

If 1 then you must specify the mode parameter.
(See also section 6.1.5)

On MLU 3770 terminals, only the first session will be logged on by VS1; remaining sessions can be logged on by the workstation operator.

COMPRES=YES/NO

If YES you must specify SNACOMP=YES on the RTAM macro.

BUFXSIZ=length

Specify maximum size (256 or 512) of VBUF sent to/by SNA workstation. This value should be compatible with terminal buffer support; the buffer switch setting on the 3776-1,2/3777-1; the maxout specification in the NCP; and the BIND RU size specification contained in the mode table entry. The BUFXSIZ value should agree with the RU sizes specified in the BIND and must be compatable with the MAXDATA value in the NCP generation.

256 is default.

CNMSGNO=wtonum

15 is a good value. More may be required if no console or special format. See Appendix B in OS/VS1 RES System Programmer's Guide.

TERMID=n

Specifies ID number for terminal being defined. The TERMID of the first (or only) TERMINAL macro instruction must be 1; and every succeeding TERMID must be one greater than the one preceeding it. Let it default.

VBUF=tpnum

Default is 6. Two are used for input and the rest for output. Recommend at least 14 for better performance.

On MLU 3770 terminals, VBUF determines the number of buffers or chainsize for each session active on the workstation.

NOTE: The number of VBUFs determines the size of the outbound chain that RTAM sends to the workstation without waiting for a response. Read Appendix B in the OS/VS1 RES Systems Programmer's Guide for the interaction with the VPACING specification in NCP and the number of buffers, buffer limit and buffer factor parameters in VTAM. Also note the effect on the interrupt outbound function of the workstation. (Recommendation: In order to evaluate effect on performance, generate extra workstations with different values and measure effect.)

NODE=name (as they are known to VTAM)

The label on the NCP LU macro should be specified for name. Represents the set of nodes that can initiate a session on this workstation. Must be specified if PLGN=1.

For MLU 3770 terminals, all LU names (from the NCP generations) for sessions to be logged on must be specified. The first LU name specified is used for permanent logon (PLGN).

LOGMODE=name

Name of the LOGMODE table entry to be used if PLGN=1. Default is LOGMODE=BATCH.

SESSLIM=n

Specifies maximum number (1 to 29) of sessions that can be initiated for the workstation. Must be 1 for SLU 3770s. MLU 3770s can have up to 6 sessions active. The default is 1.

CPACTBL=name/no

Name of compaction table used for this workstation. If NO is specified, RTAM will not perform compaction unless a valid compaction table name is specified in the user's JCL.

CONPR=value

Printer to be used for console support if console support is not specified (TDESCR statement) and more than one printer specified. Default is CONPR=1.

2.3.2.2 RTAM MACRO

Must follow the last TERMINAL macro.

TPREAD=n

Total number of readers associated with the maximum number of workstations that can be logged on at one time. Can be overridden at IPL. Default=number of BSC lines plus number of SNA workstations. The default may not be adequate if multiple readers are used concurrently on MLU 3770 terminals.

TPPRINT=n

Maximum number of concurrent print operations. Can be overridden at IPL. Default=number of BSC lines plus number of SNA workstations.

The default may not be adequate for MLU 3770s if multiple logical printers are to operate concurrently. Note, the diskette and tape may be "logical printers".

TPPUNCH=n

Maximum number of concurrent punch operations. Can be overridden at IPL. Default=number of BSC lines plus number of SNA workstations.

The default may not be adequate for MLU 3770s if multiple logical punches are to operate concurrently. Note, the diskette and tape may be "logical punches".

MXINTBR=n

Maximum size of any single interface buffer pool. For SNA workstations, at least 856 bytes. 1K better, 2K best. RTAM performs a task switch at the end of each buffer; therefore, the larger the buffer, the less CPU overhead.

MSGFCTR=factor

Factor used to dynamically increase the number of WTO(R) buffers. See WTO(R) buffer discussion in Appendix B of the OS/VS1 RES Systems Programmer's Guide.

STBUFNO=n

Specifies the number of RTAM subtask buffers. Can be overridden at IPL time. See Appendix B of the OS/VS1 RES System Programmer's Guide for guidelines.

PORTS=n

Specifies the maximum number of SNA workstations that can be logged on at the same time. Can be decreased, but not increased at IPL time.

PASSWD=password

Specifies a password that RTAM will use when it OPENS the VTAM ACB.

SNASCII=YES/NO

If any SNA workstations will use ASCII transmission code, specify YES. The ASCII code is selected at logon time through the VTAM BIND facility.

SNACOMP=YES/NO

Must be specified or defaulted to YES if any SNA workstation will use compression/expansion.

CPACT=YES/NO

Specify YES if any SNA workstation will use compaction for print or punch output. If you specify YES, you must also specify or default to SNACOMP=YES. If you specify YES, you can override RTAM's building of compaction tables at IPL time. If compaction support is generated, the feature may be selected at LOGON through the VTAM BIND facility. See Appendix C in the OS/VS1 RES System Programmer's Guide for a discussion of compression/compaction and details on the six compaction tables supplied by RTAM.

CPACTDF=name/NO

Specifies the name of the compaction table to be used for all SNA workstations if not otherwise specified in a TERMINAL macro or in the user's JCL. If NO is specified, RTAM will perform compaction only if a table name is specified in a TERMINAL macro or in the user's JCL. This parameter can be overridden at IPL time.

APPLID=name/,

Specifies the name RTAM will use when it issues OPEN ACB to establish the VTAM interface. If a comma is specified, RTAM issues OPEN ACB without an application name. The default name is RTAM. This parameter can be overridden at IPL time.

2.3.3 OVERRIDING RTAM GENERATION PARAMETERS

RES members can be defined and maintained in SYS1.PARMLIB. All RES member names must be 3-8 characters long and the first three characters must be RES. The name RESPARMS is used by the system as the default and it is the installation's responsibility to put this default member in SYS1.PARMLIB if a default is desired.

A RES member can contain one or more of the following RTAM parameters (only parameters applicable to SNA workstations are listed here; other BSC parameters may also be included):

TPREAD=n	PASSWD=password
TPPRINT=n	CPACTDF=name/NO/,
TPPUNCH=n	CTABLE=name/(name,m,xx...xx)
MSGFCTR=n	CPACT=NO
PORTS=n	STBUFNO=nAPPLID=name/,
OMIT=n	EXTRA=n

For a discussion of the above, see the VS1/RES System Programmer's Guide. Note that the function of CPACTDF, CTABLE and CPACT parameters differs from that described when specifying them in the RTAM macro. EXTRA and OMIT are applicable only to RES members of SYS1.PARMLIB.

2.3.4 LOGON PROCEDURES (SYS1.UADS, SYS1. PROCLIB)

When a RES user enters a LOGON command, he causes a logon procedure to be executed. Whether he is successful or not depends on:

1. Whether the procedure exists in SYS1.UADS for that user.
2. Whether the procedure is cataloged to SYS1.PROCLIB.

One or more logon procedures may be cataloged in the procedure library for use by all remote users with similar logon requirements. For an in-depth discussion of logon procedures, see the VS1/RES System Programmer's Guide.

2.3.5 STARTING AND STOPPING REMOTE DEVICES

When a reader, printer or punch is to be started for a workstation user, a JES reader or writer task must be started for that user. The task can be started by a START or STARTF command entered by the central operator, by the workstation user, or by RTAM when the user's logon procedure is executed (which is recommended).

Either the workstation user or the central operator can stop remote readers, writers, or punch's.

2.3.6 UNATTENDED WORKSTATION OPERATION

When operating in unattended mode, the following apply:

1. No WTOR's are sent to the workstation, RTAM routes them to the central operator who can reply on behalf of the remote operator.
2. When RTAM sends outbound data and the workstation responds with intervention required, RTAM either aborts the related JES writer task if job output was being sent, or aborts the workstation if console data was being sent.

2.4 DOS/VS and POWER/VS GENERATION PARAMETERS

This section describes all the generation parameters which are required in DOS/VS and POWER/VS in order to run SNA RJE.

2.3.1 DOS/VS GENERATION CONSIDERATIONS

In addition to the standard supervisor options for POWER/VS AP=YES and TP=VTAM must be specified. Note that this will add a total of 6996 bytes to a five partition system with no previous multitasking or teleprocessing support.

VTAM requires a partition of its own and the size of the POWER partition will grow as a result of the SNA support. Therefore the partition structure of the system should be reevaluated in light of the additional address space requirement. (Refer to the POWER and VTAM manuals for storage estimates.)

Multitasking, which is not normally required for POWER/VS operation, must be in the system using SNA RJE due to the nature of VTAM operation. VTAM does some of its processing under the PIB of the application task. This causes the DOS/VS page manager to handle VTAM page faults as if they were POWER/VS page faults. In order to minimize the effect of these page faults on non-RJE tasks, POWER/VS attaches a DOS/VS subtask under whose PIB VTAM processing can be executed.

2.4.2 POWER/VS PARAMETERS

2.4.2.1 POWER MACRO

The keyword operand of the POWER macro which describes SNA operation is shown below.

SNA = (<lucount|0><,password><,applid|POWER>)

Lucount = n, where n < 200

This parameter specifies the maximum number of LU's that can be logged on at any given time. The operand can be used to limit the amount of virtual storage which is acquired by POWER/VS during OPEN processing for use by SNA workstation control blocks. The control blocks which are suballocated from this area are the SUCB (SNA Unit Control Block) and the LUCB (SNA Logical Unit Control Block).

Basically there is one SUCB for each physical unit which is communicating with POWER/VS. It contains information about the device status and logical unit status for the one or more logical units currently logged on to POWER from the physical unit. This control block is 192 bytes in length.

The LUCB is referred to by the SUCB and is created by a logical unit logon to POWER/VS. It contains session accounting information, restart information, list and punch characteristics, and process status information. The LUCB is 160 bytes in length.

The GETVIS requirement is calculated during POWER/VS initialization by assuming one LU per PU.

By limiting the GETVIS pool, you can cause POWER/VS to reject a log on request once all the control blocks in the pool are in use. It is an effective way to limit the total number of sessions active at one time even though the cumulative total of SESSLIM specifications in the PRMT macro (described below) is larger.

Password

This is the one to eight character VTAM password that must correspond to the PRTCT operand when the ACB is opened. POWER/VS uses just one ACB for all RJE processing. It is opened during the PSTART SNA,RJE operation.

Applid

This is the POWER/VS application identification used by VTAM to extablish the application program interface. It must be identical to the applid specified to VTAM.

2.4.2.2 PRMT MACRO

This macro is used to define an SNA workstation, i.e. physical unit. The workstation can be either a single or multiple logical unit workstation.

```
<label>   PRMT  REMOTE=nnn,
                TYPE=LUT1,
                <,LSTROUT=remid|nnn>
                <,PUNROUT=remid|nnn>
                <,REF=mmm>
                <,CONSOLE=YES|NO>
                <,PSWRD=password>
                <,SESSLIM=n|1>
                <,CMPACT=name>
                <,LU=(name,name,name,...)>
```

REMOTE:

This value is used during remote sign on and can vary from 1 to 200. The two hundred value is the upper limit for the number of workstations for which POWER/VS support can be generated.

It is also the upper limit for the number of concurrent sessions. Although MLU workstations can support up to six concurrent sessions and 200 of these workstations can be generated, resulting in more than 200 LU's, only 200 LU's can be in session at any one time.

TYPE:

POWER/VS supports logical unit type one protocol.

LSTROUT & PUNROUT:

This is the default list and punch routing for ouput produced by jobs submitted at this remote ID. The default is to return output to the submitting location.

REF:

The specification of a reference remote ID will cause POWER to associate the workstation characteristics of the reference with this remote ID.

SESSLIM:

This parameter may be specified for workstations which have multiple logical unit capability. It is the maximum number of concurrent sessions which may be logged on from one remote ID. The number must be less then or equal to six.

Terminals which currently support MLU operation are: 3790, 3776-3, 3776-4, and 3777-3.

CMPACT:

On terminals for which compaction is supported, this parameter specifies the default compaction table name. This name may be overridden by a JECL parameter. The default is no compaction. The 3776 MLU, 3777, and 3790 terminals will support the compaction operation.

LU:

This parameters lists the logical names as they are specified to VTAM and NCP. It allows POWER to associate a groupt of LU names with a given remote ID.

CONSOLE:

CONSOLE=YES should only be specified for those terminals which support a console; such as the 3790 or 3770. For single logical unit terminals with no console, a specification of YES will cause an outbound session to be interrupted when POWER has a console message to send. This can result in console messages interspersed with printed output.

PSWRD:

This parameter is used to specify the POWER/VS SIGNON password. The password specified here has no relationship to the VTAM password that can be given in the SNA parameter.

The user would specify the signon password in the data portion of the logon command.

2.4.2.3 PCPTAB MACRO

The SNA terminals which support the compaction/decompaction feature make use of a table in deciphering data sent from the host. This table is defined to POWER/VS via the PCPTAB macro.

The compaction process is basically one of replacing two adjacent master characters with one compacted character in the data stream. Other characters, designated as non-masters, are not modified.

Inherent in the compaction operation is a limit on the number of characters which can be masters. This limit is governed by the total number of characters in the set which will be sent to the remote ID.

However it is possible to have several different compaction tables and use the one that best fits the character profile of the job being transmitted. This is done through a parameter on the * $$ LST statement.

```
<label>  PCPTAB  MASTER=(c,xx,xx,c,...)
               <,NOMASTER1=(xx,c,xx,c,c,...)>
               <,NOMASTER2=(c,c,xx,c,...)>
               <,NOMASTER3=(xx,xx,xx,c,c,...)>
```

MASTER:

This specifies the set of master characters. The characters can be given in either character or hexadecimal notation. From three to sixteen characters can be specified.

NOMASTER1,NOMASTER2,NOMASTER3:

This specifies the set of master characters. The characters can be given in either character or hexadecimal notation. The total number of non-master characters that must be specified depends on the number of master characters. This total must be equal to 256 - m(m+1) if m<16, and zero if m=16, where m represents the number of specified master characters.

3 3770 SNA IMPLEMENTATION

The intent of this section is to describe the implementation of SNA by the 3770 terminals with particular attention given to the 3776 and 3777.

The following chart illustrates 3770 support of SNA Data Flow Control (DFC) and Session Control (SC) functions. Following the chart is a discussion of this support for both inbound (3770 to host) and outbound (host to 3770) flow.

DATA FLOW CONTROL

FUNCTION	OUTBOUND	INBOUND
BID	Y	N
CANCEL	Y	Y
CHASE	Y	N
LUSTAT	N	Y
QC	N	N
QEOC	N	N
RELQ	N	N
RSHUTD	N	Y
RTR	N	N
SHUTC	N	Y
SHUTD	Y	N
SIGNAL	Y	Y

SESSION CONTROL

FUNCTION	OUTBOUND	INBOUND
ACTLU	Y	N
ACTPU	Y	N
BIND	Y	N
CLEAR	Y	N
DACTLU	Y	N
DACTPU	Y	N
REQ RECOV	N	N
SDT	Y	N
STSN	N	N
UNBIND	Y	N
CRV (MLU only)	Y	N

N - NOT SUPPORTED

Y - SUPPORTED

3.1 INBOUND (3770 GENERATED) - DATA FLOW CONTROL

3.1.1 CANCEL

FUNCTION: CANCEL is sent by 3770 to cancel a partially transmitted chain. The function will be sent if a partial chain is in the network and either the 3770 receives a negative response from the host to an inbound RU. A CANCEL will also be sent on an SLU 3770 when the operator depresses the CANCEL key. A CANCEL will also be sent on an MLU 3770 when the operator cancels the device or the source device encounters a device error.

REQUEST: 3770 will send CANCEL as follows:

TH0:	B'0010 1100'	(SEC-PRI,NORMAL)
TH1:	B'0000 0000'	
DAF:	OAF from bind	
OAF:	Session Number X'01' - X'06'	
SNF:	Sequence Number	
RH0:	B'0100 1011'	(REQ,DFC,FORMATTED,ONLY)
RH1:	B'1000 0000'	(DR1)
RH2:	B'0000 0000'	
RU0:	X'83'	

RESPONSE: Since the request requests definite response (DR1 in RH1) the host will send a response to the CANCEL. The 3770 will ignore all TH, RH and RU parameters on the CANCEL response, except EFI.

3.1.2 LUSTAT (Logical Unit Status)

FUNCTION: LOGICAL UNIT STATUS (LUSTAT) is used by the 3770 to send device status information to the host application program. Logical unit status is used to indicate when the device has become available after an intervention required situation. If the host selects another device before the intervention condition is corrected at the 3770, then an LUSTAT is not sent by the 3770. The MLU 3770 will also send LUSTAT if the session is in transmit mode or CRYPTO is in use and hardware errors are encountered.

REQUEST: 3770 will send LUSTAT as follows:

TH0:	B'0010 1100'	(SEC-PRI,NORMAL)
TH1:	B'0000 0000'	
DAF:	OAF from bind	
OAF:	Session Number X'01' - X'06'	
SNF:	Sequence Number	
RH0:	B'0100 1011'	(REQ,DFC,FORMATTED,ONLY)
RH1:	B'1000 0000'	(DR1)
RH2:	B'0**0 0000'	
RU0:	X'04'	
RU1-2:	X'0001'	(Intervention Required)
RU3-4:	X'0000'	

- OR FOR MLU -

RU0:	X'04'	
RU1-2:	X'0848'	(CRYPTO Component Failure)
RU3-4:	X'0000'	

- OR FOR MLU -

RU0:	X'04'	
RU1-2:	X'081B'	(Receiver in Xmit Mode)
RU3-4:	X'0000'	

** - If required an End Bracket will be set if 3770 initiated the Bracket and the secondary EB indicator in the BIND (byte 5 bit 7) is on.

- CD will be set when EB, as defined above, is not set.

RESPONSE: 3770 will ignore all TH, RH, and RU parameters on the response to LUSTAT, except EFI.

3.1.3 RSHUTD

FUNCTION: REQUEST SHUTDOWN (RSHUTD) is sent by the 3770 as a preliminary step to an orderly session shutdown resulting in a CLEAR, UNBIND from the host. If in receive state, the 3770 will send RSHUTD if an unrecoverable device error occurs. After request shutdown is sent and the response is received, the 3770 will remain in a communicate mode of operation so the host does not have to send the clear, unbind immediately. The host may send data to the 3770 before the clear, unbind is sent. This enables the host to clear his outbound data flow.

RSHUTD may be sent when the STOP JOB key is pressed on an SLU 3770 or when the RSHUTD command is executed on an MLU 3770.

REQUEST: 3770 will send RSHUTD as follows:

TH0:	B'0010 1101'	(SEC-PRI,EXPEDITED)
TH1:	B'0000 0000'	
DAF:	OAF from bind	
OAF:	Session Number X'01' - X'06'	
SNF:	X'0000'	
RH0:	B'0100 1011'	(REQ,DFC,FORMATTED,ONLY)
RH1:	B'1000 0000'	(DR1)
RH2:	B'0000 0000'	
RU0:	X'C2'	

RESPONSE: 3770 will ignore all parameters on the response to RSHUTD, except EFI.

3.1.4 SHUTC

FUNCTION: SHUTDOWN COMPLETE (SHUTC) is sent by the 3770 following SHUTD as soon as the 3770 enters the BETB (ie. between bracket) state (ie. receives an end Bracket). No inbound FM data will flow following SHUTC.

REQUEST: 3770 will send SHUTC as follows:

THO:	B'0010 1101'	(SEC-PRI,EXPEDITED)
TH1:	B'0000 0000'	
DAF:	OAF FROM BIND	
OAF:	Session Number X'01' - X'06'	
SNF:	X'0000'	
RHO:	B'0100 1011'	(REQ,DFC,FORMATTED,ONLY)
RH1:	B'1000 0000'	(DR1)
RH2:	B'0000 0000'	
RUO:	X'C1'	

RESPONSE: 3770 will ignore all parameters on the response to SHUTC, except EFI.

3.1.5 SIGNAL

FUNCTION: SIGNAL is sent by the 3770 to the Host application in order to interrupt data flow. On an SLU 3770, a SIGNAL will be sent each time the ATTN key is pressed, if the 3770 is in receive state or standby state and only if a response to any previous expedited flow command has been received. (e.g., a previous SIGNAL).

On an MLU 3770, a SIGNAL will be sent when:

1. Operator enters an APPL REQ message and there are no available sessions. The started sessions are checked in the order 'n' thru 'n+5' where 'n' is the first session bound. This algorithm tries to send all console data on the initial session, but if busy a subsequent session will be used.

2. The operator starts a HOSTIN function and there is no session available supporting the specified medium. The 3770 MLU will scan the sessions busy with outbound data flow in the order 'n+1' thru 'n' where 'n' is the first session bound. This algorithm attempts to keep the initial session free for console data flow.

NOTE: SIGNAL will be sent twice if MULT SIGNAL INTERRUPT was specified in the TIP or by the STATUS command.

The function associated with the signal is Request Change Direction. The host application has the option to honor or ignore the request for Change Direction.

REQUEST: 3770 will send SIGNAL as follows:

```
THO:      B0010 1101'        (SEC-PRI,EXPEDITED)
TH1:      B'0000 0000'
DAF:      OAF from bind
OAF:      Session Number  X'01' - X'06'
SNF:      X'0000'
RHO:      B'0100 1011'       (REQ,DFC,FORMATTED,ONLY)
RH1:      B'1000 0000'       (DR1)
RH2:      B'0000 0000'
RUO:      X'C9'
RU1:      X'00'
RU2:      X'01'
RU3:      X'00'
RU4:      X'00'
```

RESPONSE: 3770 will ignore all parameters on the response to SIGNAL, except EFI.

3.2 OUTBOUND (HOST TO 3770) - DATA FLOW CONTROL

3.2.1 BID

FUNCTION: BID may be sent by the host application to request permission to start a bracket. If the 3770 is in BETB (Between Bracket state), a positive response will be sent to the BID.

The host application may also start a bracket by sending an RU with BB (begin bracket) set (RH byte 2 bit 0). If the 3770 is in BETB, this RU will be accepted.

A BID or RU with BB indication will be rejected (negative response with sense) if the 3770 is already in bracket state or has a previously received BID outstanding. See the explanation for sense codes X'0813', X'081B', and X'080B' (SLU only).

3.2.2 CANCEL

FUNCTION: CANCEL is sent by the Host application to terminate a partially transmitted chain of RUs. CANCEL is normally sent when the 3770 sends a negative response to an element of a chain. CANCEL takes the 3770 out of purging chain state (ie. following the transmission of a negative response the 3770 will purge all RUs until a last-of-chain RU or a CANCEL is received). Previously received, and spooled data (data written on the diskette) for this chain is discarded.

REQUEST: CANCEL is sent primary to secondary, normal, formatted and DR1/2. The 3770 ignores all TH, RH and RU parameters on CANCEL except EB and CD. If EB is received, 3770 will go to BETB from INB. If CD is received, the 3770 will go to send state.

RESPONSE: 3770 will respond:

```
TH & RH = +RESP
     RU = X'83'
```

3.2.3 CHASE

FUNCTION: CHASE is sent from the host application to the 3770 to force all responses from previously sent RUs that were sent with an exception response. The 3770 will finish processing any requests currently in its buffers, respond if necessary to the requests, and then respond to the CHASE.

REQUEST: CHASE is sent primary to secondary, normal, formatted and DR1/2. The 3770 ignores all TH, RH and RU parameters on CHASE.

RESPONSE: 3770 will respond as follows:

```
TH & RH = +RESP
     RU = X'84'
```

3.2.4 SHUTD

FUNCTION: SHUTDOWN (SHUTD) is sent from the host application as a preliminary step to an orderly session shutdown. The 3770 will respond DR1/2 to SHUTD and subsequently send SHUTC to signal the host that the 3770 has entered the quiesce state.

REQUEST: SHUTD is sent primary to secondary, expedited, formatted and DR1/2. The 3770 ignores all TH, RH, and RU parameters on SHUTD.

RESPONSE: 3770 will respond to SHUTD as follows:

```
TH & RH = +RESP
     RU = X'C0'
```

3.2.5 SIGNAL

FUNCTION: SIGNAL (SIG) is sent by the host application to request a soft break, i.e., a break in the inbound flow to allow the host to send. Upon receipt of SIGNAL, the 3770 will respond DR1/2 and terminate the current chain as soon as possible. CD will be set on the EOC (or OC) request to indicate to the Host that 3770 is going to receive state and that he can send data.

REQUEST: SIGNAL is sent primary to secondary, expedited, formatted and DR1/2. The 3770 ignores all TH, RH, and RU parameters on SIGNAL.

RESPONSE: 3770 will respond:

```
TH & RH = +RESP
     RU = X'C9'
```

3.3 OUTBOUND (HOST TO 3770) - SESSION CONTROL

3.3.1 ACTLU

FUNCTION: ACTIVATE LOGICAL UNIT (ACTLU) is sent by SSCP to activate the 3770 logical unit. The 3770 will respond DR1/2 to ACTLU if the PU has been activated.

The SLU 3770 will ignore and purge all requests and responses received except ACTPU, DACTPU, and DACTLU until the LU has been bound.

On the MLU 3770, if ACTLU (ERP) is received and the LU is already active, a +RESP (ERP) will be returned; this will be transparent to the current session operation. If not active, the ACTLU (ERP) will have the same effect as an ACTLU (COLD) and a +RESP (COLD) will be returned. All requests and responses to the LU will be rejected with a -R(8009) until the LU has been activated.

REQUEST: ACTLU is sent primary to secondary, expedited, formatted and DR1/2. All RU bytes beyond '1' on ACTLU are ignored by the 3770.

RESPONSE: 3770 will respond to ACTLU as follows:

1. If the PU is not active:
   SLU 3770 - ignore and purge ACTLU
   MLU 3770 - send -R(8008)

2. On MLU 3770 if PU is active but the DAF is not between X'01' and X'06', send -R(8004).

3. If valid:

```
TH & RH = +RESP
    RU0 = X'0D'
    RU1 = X'01' (COLD) or X'02' (ERP)
```

3.3.2 ACTPU

FUNCTION: ACTIVATE PHYSICAL UNIT (ACTPU) is sent by SSCP to activate the 3770 control unit as a result of a VARY active VTAM command.

The 3770 will assume ACTPU state, reset all other states, and respond DR1/2 (COLD).

Until the SLU 3770 has been placed in an actpu state(activated), all requests and responses received by the SLU 3770 will be purged and ignored.

The MLU 3770 will reject all requests and responses received prior to physical activation with a -R(8008). If ACTPU (ERP) is received and the PU is already active, a +RESP (ERP) will be returned; this will be transparent to all sessions active in the MLU. If not active, the the ACTPU (ERP) will have the same effect as an ACTPU (COLD) and a +RESP (COLD) will be returned. Note: the OAF on ACTPU is used by the

Note: The OAF on ACTPU is used by the 3770 MLU as the DAF on all future requests for SSCP, both by the LU and PU.

REQUEST: ACTPU is sent by the Host primary to secondary, expedited, formatted, and DR1/2. The 3770 ignores all RU bytes beyond '1' on ACTPU.

RESPONSE: 3770 will respond to ACTPU as follows:

```
1. TH & RH = +RESP
       RU0 = X'11'
       RU1 = X'01' (COLD) or X'02' (ERP)
     RU2-9 = '404040404040404040'
```

3.3.3 BIND SESSION

FUNCTION: BIND SESSION (BIND) is sent by the primary LU to the 3770 logical unit to establish a session between the two logical units. BIND is sent as a result of the host application OPNDST either in response to a terminal initiated logon request or as an unsolicited (from 3770's point of view) request to start a session.

NOTE: Upon receipt of BIND, 3770 will set the CPM sequence numbers to zero.

REQUEST: BIND is sent by the host primary to secondary, expedited, formatted, and DR1/2. All TH, RH, and RU parameters that do not have an * in the checked (CK) column of the following chart are ignored by
the 3770 (ie. An * in the CK column indicates that the 3770 checks this bit or series of bits in the BIND). See the "BIND NOTES" following the chart for additional information.

BYTE	FIELD AND ATTRIBUTE	CK	VALUE
0	BIND Code	*	X'31'
1	Bits 0-3 Format	*	X'0'
	4-7 Type	*	X'1' - Cold
2	FM Profile	*	X'03' - FM Profile 3
3	TS Profile	*	X'03' - TS Profile 3
4	Primary NAU Protocols		
	Bit 0 Chaining Use		B'1' - Multiple RU chains is assumed
	Bit 1 Request Mode Selection	*	B'0' - Immediate Request Mode
	2-3 Chain Response Protocol	*	B'01' - Exception response
		*	B'10' - Definite response
		*	B'11' - Definite or exception response
	6 Compression		B'0' - Compression not used
			B'1' - Compression may be used
	7 Send EB Indicator		B'1' - Primary may send EB assumed
5	Secondary NAU Protocols		
	Bit 0 Chaining Use	*	B'1' - Multiple RU chains may be used
	1 Request Mode Selection	*	B'0' - Immediate Request Mode
	2-3 Request Protocol	*	B'01' - Exception response
		*	B'10' - Definite response
		*	B'11' - Definite or Exception (3770 sends definite)
	6 Compression	*	B'0' - Compression not used
		*	B'1' - Compression may be used
	7 Send EB Indicator	*	B'0' - Secondary may not send EB
		*	B'1' - Secondary may send EB

*6	Common NAU Protocol		
	Bit 1 FM Header Usage	* B'1'	- FM Headers allowed (Required on 3770P)
		* B'0'	- FM Headers Not Allowed
	2 Brackets	* B'1'	- Brackets will be used
	3 Bracket Termination Rules	* B'1'	- Unconditional termination on EB for uni-directional flows. Conditional termination for all others.
	4 Alternate Code	* B'1'	- ASCII session
		* B'0'	- EBCDIC session
7	Common NAU Protocol		
	Bit 0-1 FM Transaction Mode	* B'01'	- HDX Contention Interact no FMH spec. 3771, 3, 4, 5 NP & 4, 5P with enul. (Invalid on 3770P, 3776, and 3777)
		* B'10'	- HDX Flip-Flop (Required on 3776/3777) (Required on P Models)
	2 Recovery Responsibility	* B'0'	- Primary NAU responsible
	3 Brackets First Speaker	* B'0'	- Secondary is First Speaker
	6 Related Chains	B'0'	- No related chains
	7 Contention Resolution	* B'0'	- Secondary Speaks first in Data Traffic Active state if HDX-FF, Secondary wins if HDX-CON.
8	SLU INB Pacing-3776,3777 and Programmables		
	Bit 0-1 Reserved		
	2-7 Send Pacing Count	*	If zero, pacing will not set on inbound data requests; if not zero, pacing will be required per this value. ACF VTAM & ACF TCAM with NCP 6 and above supports inbound pacing.

```
 9    SLU OUTB Pacing 3776, 3777-1 and Programmables
      Bit 0-1 Reserved
      2-7 Receive pacing count      * Must be 0 or 1 for SLU NP
                                      Must be 1 to 7 for MLU 3770
                                      Must be 1 for programmables

10    SLU INB RU Size - 3776, 3777 and Programmables
      Bit 0-3 Mantissa              * B'0000' or B'1000'
          4-7 Exponent of 2         * B'0000' if mantissa =B'0000'
                                 = or ≥B'0101' for 256 byte mode
                                      if mantissa  is ≥B'1000'
                                 = or ≥B'0110' for 512 byte mode
                                      if mantissa  is ≥B'1000'

11    PLU OUTB RU Size - 3776, 3777 and Programmables
      Bit 0-3 Mantissa              * B'0000' or B'1000'
          4-7 Exponent of 2         * B'0000' if mantissa=B'0000'
                                 = or ≤B'0101' for 256 byte mode
                                      if mantissa  is B'1000'
                                 = or ≤B'0110' for 512 byte mode
                                      if mantissa  is B'1000'

12    Not checked by 3770 Models

13    Not checked by 3770 Models

14    LU PROFILE                    * X'00' or X'01' for SLU 3770
                                      X'01' for MLU 3770
                                      (For programmables, if =X'01',
                                       byte 16, bits 0-3 and 6-7 must
                                       be 0)

15
      Bits 0-3 FM Header Subset     *  X'0' or X'1' for 3776/3777-1,3
                                       ignored by other 3770 Models
           4-7 Data Stream Profile *   X'0' for SLU 3770s
                                       X'0' or X'1' for MLU 3770

16    FM Header Flags
      Bit     0 PLU Interruption    *  B'0' PLU may interrupt its
                                       transmission once
              1 Compacted Data         B'0' No compacted data allowed
                                       on all 3770 Models except
                                       3776-3,4 and 3777-1,3 where
                                       B'0' or B'1 is the users choice
                                       B'1' Compacted data may be
                                       sent to 3770

              2 PDIR                *  B'0' PDIR Not allowed
           3-7 Not checked by 3770 Models

17-25           Not checked by 3770 Models
```

```
| 26    CRYPTO                                                           |
|         Bits 0-1 EUM/PRIVATE          *  B'00' No PRIVATE/EUM CRYPTO   |
|              2-3 CRYPTO Session lvl   *  B'00' No CRYPTO session       |
|                                          B'01' Session level CRYPTO   |
|                                          B'11' Mandatory CRYPTO       |
|              4-7 CRYPTO Field length *  X'0'  No CRYPTO field         |
|                                          X'9'  CRYPTO field length    |
|                                                (byte 27 + 8 byte key  |
|                                                                       |
| 27                                                                   |
|         Bits 0-1 CRYPTO key mode      *  B'00' Session key (KS) enciph-|
|                                                ered under LU key (KLU) |
|              2-4 Reserved                                             |
|              5-7 CRYPTO cipher method*  B'000' Block chain cipher, DES |
|                                                                       |
| 28-35 SESSION KEY ENCIPHERED UNDER LU KEY (KLU)                       |
|-----------------------------------------------------------------------|
```

BIND NOTES:

BYTE 5 - SECONDARY NAU PROTOCOLS

Bits 2-3: Request Protocol

B'01', B'10', or B'11' must be specified.

If B'11' is specified (definite or exception response) the 3770 treats it the same as if B'10' were specified (definite response).

Bit 7 - Send EB Indicator

B'0' - The 3770 will never terminate a bracket (i.e. will not send EB). Thus, the Host must terminate all brackets.

B'1' - The 3770 will terminate brackets (send EB) only for those brackets which it initiated (sent BB). If bits 2 and 3 are B'01' and bit 7 is B'1', the BIND will be rejected.

For an interactive session, EB will be set on the first (or only) element of a chain if the 3770 set BB on the first (or only) element of the chain.

For a batch session, if the 3770 originates the bracket (BB) then it will end the bracket (EB) when an end-of-file condition is encountered.

Thus, the transmission from the 3770 to the host would be a bracket (both BB and EB sent by the 3770). Such transmission could be a single element chain, multiple element chain, or multiple chains (i.e., keyed in message, data set, or multiple data sets). The 3771, 3773, 3774, 3775, 3776, 3777-1, would go to standby state (keyboard unlocked) at the end of the inbound transmission; the programmable models will unlock the keyboard when between brackets FCS 8/78.

BYTE 6 - COMMON NAU PROTOCOL

Bit 1: FM Headers Allowed/Not Allowed

B'0' - FM Headers not allowed in this session. Bit 1 must be '0' if binding for an "interactive" session on the 3771, 3773, 3774, 3775, 3776, or 3777. Only the keyboard and printer devices can be used in an interactive session.

B'1' - Bit 1 must be '1' for batch sessions. Bit 1 must be '1' for all 3770 programmable models. This is the normal setting.

Bit 4: ALTERNATE CODE

B'0' - Indicates that EBCDIC data representation only, will be used for this session.

B'1' - Indicates that ASCII may be used in this session. The 3770 will support ASCII interchange for inbound and outbound flow of FM data only. EBDCIC must be used for all system and network control. ASCII and EBCDIC RUs can flow in the same session. The code for a particular transmission is determined by the code select indicator (CSI) bit. Compression, decompaction, SVF, SHF, and transparency cannot be supported in an ASCII block. The SCS functions will be the same for EBCDIC and ASCII except for TRN and FMT, which will be supported in EBDCIC only.

If this bit is on and the 3770 is not configured with the ASCII feature, the 3770 will reject the BIND with a sense of X'0821' (Invalid Session Parameter).

BYTE 7 - COMMON NAU PROTOCOL

Bits 0-1: FM Transaction mode - HDX Contention/HDX Flip-flop

B'01' - HDX Contention Protocol may be specified for 3771, 3773, 3774, or 3775 if byte 6 bit 1 specifies interactive session.

B'10' - HDX Flip-Flop Protocol. Must be specified for 3776, 3777 and 3770 programmable models. This is the normal setting and is required for RJE.

BYTE 8 - INBOUND PACING

Bits 2-7: Send Pacing Count. Specifies the number of normal flow RUs which the 3770 will send before requiring a pacing acknowledgement. Inbound pacing will be supported in ACF VTAM and ACF TCAM with NCP 6. Inbound acing can be used to pacing can be used to regulate the inbound data flow to prevent overrunning VTAM's PPBUF buffers.

BYTE 9 - OUTBOUND PACING

Bits 2-7:	Receive Pacing Count. Specifies the number of RUs which a 3770 can receive before a pacing acknowledgement is required.
B'000000'	Will be accepted by the 3771, 3773, 3774, and 3775; however, the net operational effect will be the same as if a pacing value of one were specified.
B'000001'	Required for 3776 models 1 and 2, 3777 model 1 and all 3770 programmable models. Recommended for 3771, 3773, 3774, and 3775.
B'000001'- B'000111'	A value of X'1' thru X'7' must be specified for 3776 models 3 and 4 and 3777 model 3.

BYTE 10 - INBOUND RU SIZE

The inbound RU size represented by the mantissa and exponent must be equal to or greater than the RU size sent by the 3770 (i.e., 256 bytes or 512 bytes depending on model and extend buffer switch setting). Note that represented value of greater than 256 or 512 may be specified.

Some application programs, such as IMS, use a value in byte 10 of the largest buffer size that they intend to receive from any terminal in the network (i.e., RECEIVE ANY buffer size). The expectation is that terminals using smaller buffers will accept the parameter since it at least is equal to or larger than the terminals normal transmission buffer size. Thus, if there were a 3270 in SNA mode anywhere in the network, byte 10 could conceivably have a value of 1,920 (X'F7'), which will presently cause the 3770s to issue a Bind Reject (X'0821').

If this problem occurs, have FE verify that an E/C level of micro-code is installed for the above terminals so that a value of 256 (X'85') or more will be accepted for the programmable terminals as well as the 3776 and 3777-1 when operating in non-extend Buffer Mode. A value of 512 (X'86') or more will be accepted for the 3776, and 3777-1 operating in extend buffer mode.

BYTE 11 - OUTBOUND RU SIZE

The outbound RU size represented by the mantissa and exponent must be equal to or less than the RU size which can be processed by the 3770 (i.e., 256 bytes or 512 bytes depending on model and extend buffer switch setting). Use X'85' for 256 bytes and X'86' for 512 bytes.

If the bind specifies 512 byte buffers (X'86') and the extend buffer switch on the 3776-1,2 or the 3777-1 is in the "OFF" position, the bind will be rejected with a sense of X'0821'.

BYTE 14 - LU PROFILE

This byte specifies the LU Profile to be used for this session (i.e., zero or one).

X'00' - Would not normally be specified. If X'00' then a value of X'01' is assumed anyway; bytes 15 through 25 of the BIND (presentation services) will not be examined by the 3770.

X'01' - Specifies LU Profile 1. Bytes 15 and 16 will be further evaluated by the 3770.

BYTE 15 - FM HEADER SUBSET AND DATA STREAM PROFILES

Bits 0-3: FM Header Subset. Must be X'0' or X'1' for 3776 and 3777-1; it is ignored by all other 3770 models.

X'0' - FM Header Subset 0. If subset 0 is selected, subset 2 will also be accepted; the RJE subsystems do not support subset 2.

X'1' - FM Header Subset 1.

X'2' - FM Header Subset 2. The BIND will be rejected. See FM Header Subset 0 for specification of FM Header Subset 2.

Bits 4-7: - Data stream profile. Must be X'0' for all SLU 3770 terminals. It is only checked by the 3776 and 3777 terminals. May be X'0' or X'1' for 3770 MLU terminals.

X'0' - Card data may not span RUs.

X'1' - Card data may span RUs. The 3776/3777 MLU will span card data inbound.

BYTE 16 - HEADER FLAGS

Bit 1 - Specifies whether compacted data may be sent to the 3770.

B'0' - For all models except the 3776-3,4 and 3777-1,3.
B'1' - For 3776-3,4 and 3777-1,3 if you wish to send compacted data to the 3770. In addition, you need to generate your host application for compaction support and send a compaction table

to the 3770.

Bit 2 - Must be B'0', or the BIND will be rejected -R(0821). The 3770 does not support PDIRs.

BYTES 17-25 - Are not checked by the 3770 terminals.

RESPONSE: 3770 will respond to the BIND as follows:

1. If BIND is received when the PU is not active (MLU ONLY):

```
TH & RH = -RESP
SENSE   = X'80080000'    (PU NOT ACTIVE)
RU      = X'31'
```

2. If BIND is received when the LU is not active:

```
TH & RH = -RESP
SENSE   = X'80090000'    (DAF NOT ACTIVE)
RU      = X'31'
```

3. If BIND is received when the terminal is not set up by the operator to accept unsolicited network traffic (ie. it is not in 'communicate mode'):

```
TH & RH = -RESP
SENSE   = X'080A0000'    (PERMISSION REJECTED)
RU      = X'31'
```

4. If BIND is received when the LU is already in session (SLU ONLY):

```
TH & RH = -RESP
SENSE   = X'08050000'    (SESSION LIMIT EXCEEDED)
RU      = X'31'
```

5. If BIND is received when the LU is already in session (MLU ONLY):

```
TH & RH = -RESP
SENSE   = X'08150000'    (FUNCTION ACTIVE)
RU      = X'31'
```

6. If BIND is received and buffers are not available to support the session within 3 minutes after receipt of the BIND (MLU ONLY):

```
TH & RH = -RESP
SENSE   = X'08120000'   (INSUFFICIENT RESOURCES)
RU      = X'31'
```

7. If BIND contains invalid parameters or if CRYPTO is specified and is not installed on an MLU 3770 (MLU only):

```
TH & RH = -RESP
SENSE   = X'08210000'   (INVALID SESSION PARAMETERS)
RU      = X'31'
```

8. If BIND specifies CRYPTO and CRYPTO is not operational (MLU ONLY):

```
TH & RH = -RESP
SENSE   = X'08480000'   (CRYPTO COMPONENT FAILURE)
RU      = X'31'
```

9. If everything is OK:

```
TH & RH = +RESP
RU      = X'31'
```

10. If everything is OK and CRYPTO is being used (MLU ONLY):

```
TH & RH = +RESP
RU0     = X'31'
RU1 -   = Echo of the BIND with bytes 28-35 containing
          the seed enciphered under the session key.
```

3.3.4 CLEAR

FUNCTION: CLEAR (CLEAR) is sent by the primary LU to purge all requests and responses related to the active session. CLEAR is normally used after a catastrophic error as the first step in the data traffic recovery sequence or prior to an unconditional UNBIND. CLEAR will reset the 3770 sequence numbers to 0. The 3770 will purge all outstanding requests and responses and then respond DR1/2 to CLEAR.

REQUEST: CLEAR is sent primary to secondary, expedited, formatted and DR1/2. All RU bytes beyond 0 are ignored by 3770.

RESPONSE: 3770 will respond:

```
TH & RH = +RESP
```

RU = X'A1'

3.3.5 DACTLU

FUNCTION: DEACTIVATE LOGICAL UNIT (DACTLU) is sent by SSCP to deactivate THE 3770 logical unit.

The SLU 3770 will respond DR1/2 to DACTLU if the PU is active. Otherwise, DACTLU will be ignored. The MLU 3770 will respond DR1 to DACTLU unless the LU or PU had not been activated, in which case the appropriate - RESP will be returned.

REQUEST: DACTLU is sent primary to secondary, expedited, formatted and DR1/2. All RU bytes beyond '0' are ignored.

RESPONSE: 3770 will respond to DACTLU as follows:

1. If the PU is not active:
   SLU 3770 - Ignore and purge DACTLU
   MLU 3770 - Send -R(8008)

2. If the LU is not active:
   SLU 3770 - Ignore and purge DACTLU
   MLU 3770 - Send -R(8009)

3. If valid:

```
TH & RH = +RESP
     RU = X'0E'
```

3.3.6 DACTPU

FUNCTION: DEACTIVATE PHYSICAL UNIT (DACTPU) is sent by SSCP to deactivate the 3770 controller. The 3770 will respond DR1/2 to the DACTPU if the PU is active.

REQUEST: DACTPU is sent primary to secondary, expedited, formatted and DR1/2. All TH, RH, and RU parameters on DACTPU are ignored except the following RU bytes.

```
RU0: X'12'
RU1: X'02' Type - not Final Use
     X'01' Type - Final Use
```

The Type parameter is used to determine final use of the 3770. If the parameter is a X'01', the 3770 will power down, if the remote power off feature is installed (remote power off is standard on the 3777), following the NSA to SDRM (i.e., following link level acknowledgement to the DISC command).

RESPONSE: 3770 will respond to DACTPU as follows:

1. If the PU is not active:
   SLU 3770 - Ignore and purge DACTLU
   MLU 3770 - Send -R(8008)

2. If the PU is active:

   TH & RH = +RESP
   RU = X'12'

3.3.7 SDT

FUNCTION: START DATA TRAFFIC (SDT) is sent by the host application to complete a data traffic recovery or initialization sequence. Following the receipt of BIND, 3770 will wait for a SDT to begin data traffic for the session. Any data requests that are received before SDT will be rejected by the 3770 with sense X'2005' (Data Traffic Reset).

REQUEST: SDT is sent primary to secondary, expedited, formatted and DR/2. All RU beyond 0 are ignored by the 3770.

RESPONSE: 3770 will respond:

TH & RH = +RESP
RU = X'A0'

3.3.8 UNBIND

FUNCTION: UNBIND SESSION (UNBIND) is received by the 3770 Logical Unit to disestablish the session between the two logical units. An SLU 3770 will always respond DR1/2 to UNBIND and go out of session whether or not the LU was in session. For MLU 3770's a negative response may be sent; see sense codes x'8008' and x'8009'. In addition an MLU will send -R(8005) if the OAF is not the same as on the session BIND.

REQUEST: UNBIND is sent primary to secondary, expedited, formatted and DR1/2. All RU bytes beyond 0 are ignored by the 3770.

RESPONSE: 3770 will respond:

TH & RH = +RESP
RU = X'32'

3.3.9 CRYPTO Verification

FUNCTION: CRV is send by the Primary LU to the Secondary LU following the BIND to verify that both the host and the terminal are using the same session key and both know how to use it.

REQUEST: Bytes 1 - 8 contain the partially inverted seed enciphered under the session key.

RESPONSE:

1. If non-CRYPTO SESSION:
   TH/RH = -RESP
   SENSE = X'10030000' (FUNCTION NOT SUPPORTED)
   RU-4 = X'C0'

2. If values don't match:
   TH/RH = -RESP
   SENSE = X'08210000' (PARAMETER ERROR)
   RU-4 = X'C0'

3. If CYPTO not operational:
   TH/RH = -RESP
   SENSE = X'08480000' (CRYPTO COMPONENT FAILURE)
   RU-4 = X'C0'

4. If OK:
   TH/RH = +RESP
   RU-0 = X'C0'

3.4 SENSE CODES (NEGATIVE RESPONSES SENT BY THE 3770)

The general format of a 3770 inbound negative response is as follows:

TH0:	B'SSSSSSSS'
TH1:	B'00000000'
DAF:	OAF From Request
OAF:	DAF From Request
SNF:	SNF From Request
RH0:	B'ISS0S111'
RH1:	B'S0S100SP' (P = Pacing Bit)
RH2:	B'00000000'
RU0=SB0:	Two bytes of sense data (see 3770 sense
RU1=SB1:	data below)
RU2=SB2:	Two bytes of user sense (set to binary
RU3=SB3:	zeros except for programmable models for X'1008' sense)

S = Same bit setting as on request
I = Inverse of bit setting on request

P = B'1' for normal DFC or FM data responses
when set on request B'0' for all others

3770 SENSE CODES:

The 3770 will set the ERR bit on inbound responses to identify an error response. The ERR bit refers to the exception response bit (RH byte 1 bit 3). Sense data will accompany the error response. The sense data consists of four bytes as follows:

MAJOR CODE (SB0)	*	MODIFIERS (SB1)
Path Error (X'80')		X'04' - Unrecognized DAF
	M	X'05' - No session
		X'07' - Segmenting Error
	M	X'08' - PU not active
		X'09' - LU Not Active
Request Header Error (X'40')		None
State Error (X'20')		X'01' - Sequence Number
		X'02' - Chaining
	S	X'03 - Bracket Error
		X'05' - Data Traffic Reset
	M	X'09' - CYPTO State Error
Request Error ('10')	M	X'01' - RU Data Error
		X'02' - RU Length Error
		X'03' - Function Not Supported
		X'05' - Parameter Error
		X'07' - Category Not Supported
		X'08' - Invalid FM Header
Request Reject (X'08')		X'02' - Intervention Required
	S	X'05' - Session Limit Exceeded
	M	X'06' - Resource Unknown
	S	X'0A' - Permission Rejected
		X'0B' - Bracket Race Error
	M	X'0C' - Procedure not supported
		X'11' - Break
		X'12' - Insufficient Resource
		X'13' - Bracket Bid Reject - No RTR Forthcoming
	M	X'15' - Function active
		X'1B' - Receiver In Transmit Mode
		X'1C' - Request Not Excutable
		X'21' - Invalid Session Parameters
		X'25' - Component Not Available
	M	X'48' - CRYPTO Component Failure

* blank - applicable to SLU and MLU 3770s
M - applicable to MLU 3770s only
S - applicable to SLU 3770s only

NOTE: All 3770s except the programmable models will not set the user data sense bytes (SB2 and SB3) to anything other than X'0000'. The programmable MODELS WITHOUT THE EMULATOR FEATURE WILL SET USER SENSE bytes for sense X'1008'; the user sense bytes are described in the programmer's guide.

3.4.1 8004 UNRECOGNIZED DAF

The DAF must be X'00' for PU requests (ACTPU,DACTPU).

The DAF must be X'01' for SLU 3770 LU requests (all other requests). The DAF must be X'01' to X'06' for MLU 3770 LU requests (all other requests).

If the DAF does not correspond to the above two specifications a negative response with sense X'8004' (eg, -R(8004)) will be sent by the 3770.

Note that there will not be any RU data with the error response. The 3770 will send the error response and then continue as though the request was never received. (Sequence checking will not have been performed when the illegal DAF was detected). Although the DAF may be X'00' or X'01', the function associated with the RU may not be valid for that DAF.

Problem Determination/Recovery:

Check to the NCP Generation and operational procedures to insure that a valid LU is being activated.

3.4.2 8005 NO SESSION (MLU only)

If the OAF received on a request is different than the OAF on the bind for that session the 3770 will send a -R(8005).

Problem Determination/Recovery:

Determine why the OAF for the session data and BIND are different.

3.4.3 8007 SEGMENTING ERROR

The 3770 does not support segmenting. The MPF bits (TH byte 0 bits 4 and 5) must be B'11'.

If the MPF bits are set to B'10' a -R(8007) will be sent by the 3770. Any RU received that has the MPF bits set to B'01' or B'00' will be purged and ignored. The MPF bits are the first to be checked on any received request.

Problem Determination/Recovery:

This normally occurs when the length of data passed from the Host application program to NCP is greater than the user data specification in the NCP MAXDATA parameter. Check the Host application "buffer size" and the MAXDATA parameter value.

3.4.4 8008 PU NOT ACTIVE (MLU only)

A -R(8008) is returned by the MLU 3770 for any request received, except ACTPU, if the PU has not been activated.

Problem Determination/Recovery:

Activate the PU

3.4.5 8009 LU NOT ACTIVE

If a BIND is received when the LU is not active, a -R(8009) will be sent by an SLU 3770.

An MLU 3770 will send a -R(8009) for any request received, except ACTLU and DACTLU, on a session which has not been activated via an ACTLU.

Problem Determination/Recovery:

Check the sequence of Host executed macros. Verify that a definite response is received for ACTLU prior to sending the BIND.

3.4.6 2001 SEQUENCE ERROR

If a synchronous request is received that is out of sequence (i.e., not in ascending sequential order) a -R(2001) will be sent by the 3770.

After sending -R(2001) the 3770 will wait for a CLEAR. A CLEAR will reset the sequence numbers.

Problem Determination/Recovery:

The Host application program should be capable of recognizing a -R(2001), sending a clear, and restarting data transmission.

3.4.7 2002 CHAINING ERROR

Elements of a chain must be in the proper sequence. FOC = FIRST-OF-CHAIN MOC = MIDDLE-OF-CHAIN LOC = LAST-OF-CHAIN OC = ONLY-ELEMENT OF-CHAIN.

Acceptable sequences are as follows:

OC,OC...;FOC,LOC,OC...	OC may follow OC or LOC
OC,FOC...;...LOC,FOC...	FOC may follow OC or LOC
FOC,MOC,LOC	MOC may follow FOC

FOC,MOC,LOC;FOC,LOC	LOC may follow FOC or MOC
OC...;FOC...	OC or FOC may be the first chain element of a transmission

When an invalid chain sequence is detected, the 3770 will send a -R(2002). The 3770 will then wait for a CLEAR to be sent by the host. A CLEAR will reset the 3770 chain state.

Problem Determination/Recovery:

The host application program should be capable of recognizing a -R(2002), sending a CLEAR, and restarting data transmission.

Check host application designation of chain elements. This error should not occur with an IBM RJE subsystem.

3.4.8 2003 BRACKET ERROR

The Begin-Bracket (BB) and End-Bracket (EB) bit settings (RH byte 2 bits 0 and 1) must be in accordance with the bracket protocol rules.

In order to manage bracket protocol, the 3770 maintains three bracket states:

- Between Brackets (BETB) - No conversation is taking place. A begin bracket request or Bid may be accepted. The keyboard will be unlocked in this state; the 3774P/3775P SNA enhancements FCS 8/78 will provide this capability for the programmable models.

- Begin Bracket Pending (BBP) - The 3770 has given permission to the application program to begin a bracket. The BBP state is entered from the BETB state when the 3770 sends a positive response to a Bid. The BBP state exits to the INB state when the begin bracket request is received. The 3770 keyboard is locked.

- In Brackets (INB) - A conversation is taking place. The INB state is entered from the BETB state when a begin bracket request is initiated by the 3770 or a begin bracket request is accepted by the 3770. The INB state exits to the BETB state when the 3770 sends or receives an end bracket request. The 3770 keyboard is locked.

The 3770 will set BB on the first RU transmitted when 3770 enters INB from BETB. EB is normally sent by the Host application, but may originate from the 3770. If the secondary Send EB Indicator in BIND is on (byte 5, bit 7), 3770 will send BB and EB on the first (or only) member of a chain. The 3770 will ignore the BB and EB bits on all responses, and all inbound responses will have the bits set off.

The following figure shows 3770 bracket management decisions on accepting or rejecting bracket requests.

	3770 BRACKET STATE		
REQUEST UNIT	BETB	INB	BBP
Not Begin Bracket Not End Bracket	Reject -R(080B)	Accept -R(080B)	Reject -R(080B)
Begin Bracket Not End Bracket	Accept	Reject -R(0813)	Accept
Not Begin Bracket End Bracket	Reject -R(080B)	Accept	Reject -R(080B)
Begin Bracket End Bracket	Accept	Reject -R(0813)	Accept
Bid	Accept	Reject -R(0813)	Reject -R(0813)

Problem Determination/Recovery

Check the BB and EB settings generated by the Host application. This error should not occur when operating with an IBM RJE subsystem.

3.4.9 2005 DATA TRAFFIC STATE RESET

A Start Data Traffic (SDT) must be received prior to data RU's.

SDT is sent by the Host application to complete a data traffic recovery or initialization sequence. Following the receipt of a BIND, the 3770 will wait for a SDT to begin data traffic processing for the session. Any FM data requests with a DAF (of X'01' DAF of (X'01' to X'06' for MLU) that are received before the SDT will be rejected by the 3770 with sense X'2005'.

Problem Determination/Recovery:

Verify the data flow and determine why the Host application sends data prior to a SDT.

This should not occur when operating with an IBM RJE subsystem.

3.4.10 2009 CRYPTO STATE ERROR (MLU only)

The 3770 MLU will send a -R(2009) if encrypted data is received before the CRV command has been successfully processed for this CRYPTO session.

Problem Determination/Recovery:

Determine why encrypted data is send before the CRV command.

3.4.11 1001 RU DATA ERROR (MLU only)

The 3770 MLU will send a -R(1001) if:

1. An RU containing compacted data is received prior to receipt of a valid type 3 FMH containing a compaction table.
2. A character with a hex value less than X'40', other than valid SCS characters, is detected.

Problem Determination/Recovery:

1. Verify a compaction table is sent to the 3770 prior to compacted data transmission.
2. Check the data stream for non SCS characters less than X'40'. A translation or program change may be necessary in the host.

A 3770 trace can be used to accomplish the above.

3.4.12 1002 RU LENGTH ERROR

The 3770 will send -R(1002) for the following conditions:

1. A Session Control request (ACTPU, DATCTPU, ACTLU, DACTLU, BIND, UNBIND, CLEAR, or SDT) is received which does not contain an RU byte to indicate the SC function.
2. A Data Flow Control request (CANCEL, BID, CHASE, SIGNAL, or SHUTD) is received which does not contain an RU byte to indicate the DFC function.
3. The 3770 receives a data RU bigger than 256 bytes (or 512 bytes for the 3776-1,2 and 3777-1 with the buffer extend switch "on").

Problem Determination/Recovery:

For #1 and #2 determine why the host is improperly generating the above mentioned requests. For #3 check the extend buffer switch setting on the SLU 3776 or 3777; although, the BIND specifying RU size >256 should have been previously rejected. Check NCP MAXDATA parameter value.

For MLU 3770 , insure that the RU size in the bind is the same as the actual RU size generated by the subsystem; JES2 should not have this problem.

3.4.13 1003 FUNCTION NOT SUPPORTED

The 3770 will send -R(1003) if a Data Flow Control (DFC) request is received that is not supported by the 3770. Those supported outbound are: SIGNAL, CANCEL, BID, CHASE, and SHUTD. Those not supported outbound are: RTR, LUSTAT, QEOC, QC, RELQ, SHUTC, and RSHUTD.

A -R(1003) will also be sent on a 3770 MLU if CRV is received on a non-CRYPTO session.

Problem Determination/Recovery:

Determine why the Host application is sending a DFC function which is not supported.

This error should not occur when operating with an IBM RJE subsystem.

3.4.14 1005 PARAMETER ERROR

The 3770 will send -R(1005) for the following conditions:

1. A Set Horizontal Format (SHF) was received with one of the invalid parameter values listed below:

SHF Count =	>	0
Maximum Print Position (MPP)	>	132
Left Margin (LM)	>	MPP
Right Margin (RM)	(Not applicable to 3776/3777-1)	
RM	≤ OR =	LM
TAB	>	MPP
TAB	<	LM

2. A Set Vertical Format (SVF) was received with one of the invalid parameter values listed below:

SVF Count =		0
Bottom Margin (BM)	>	Maximum Print Line (MPL)
TAB	>	BM

Problem Determination/Recovery:

Correct your Host user specified SHF and SVF sequences.

3.4.15 1007 CATEGORY NOT SUPPORTED

The SNA architecture defines Network Control Functions (NC) and Network Services (NS). The 3770 does not support NC functions and will send a -R(1007) to any NC request. A NC request will have RH byte 0 bits 1 and 2 set to B'01'. An SLU 3770 does not support NS and will respond with a -R(1007) to any NS request. An MLU 3770 will accept only the REQMS NS request.

Problem Determination/Recovery:

Determine why the Host application is sending an unsupported request.

This error should not occur when operating with an IBM RJE subsystem.

3.4.16 1008 INVALID FM HEADER

When the 3770 receives an invalid FMH, it sends -R(1008).

All 3770 non programmable models support 6 byte type I FMH's.

The 3776-3,4 and 3777-1,3 also support type 3 FMH's (compaction table).

FOR SLU 3770 INVALID FM HEADER CONDITIONS ARE AS FOLLOWS:

1. The disk switch is not "on" and the FMH select field specifies a device that is invalid for the 3770. See sense X'0825'.
2. BDS received when in data set mode (ie. a BDS has been previously received for the current data set).
3. SDS received while not in data set mode (ie. a previous BDS has not been received).
4. RDS received when a data set has not been suspended (ie. no previous SDS).
5. EDS received when not in data set mode (ie. no previous BDS received).
6. SDS received when the data set is already suspended.

FOR MLU 3770, INVALID FM HEADER CONDITIONS ARE AS FOLLOWS:

1. BDS or RDS specified while currently "processing" a destination select.
2. EDS, ADS, or SDS specified when <u>not</u> currently "processing" a destination select.
3. RDS specified when there is no destination select suspended.
4. SDS specified when there is already one destination select suspended.
5. If a destination is supended and this destination is not for the console.
6. The Type 1 count is = X'06'.
7. The "Type" is not X'01' or X'03'.
8. If "Type" = X'03', the "Function" must be = X'02', i.e. compaction

table.

9. For compaction tables, the number of master characters must be greater than 2, i.e. the table may not span RU's.

10. If CDS is specified (inbound support only).

11. If an unsupported medium is specified.

12. If the ERCL field for card or exchange medium is greater than the maximum supported for the designated physical device.

Problem Determination/Recovery:

Correct the FMH or FMH sequence in error. The 3770 Component Description Manual describes FMH format and usage.

3.4.17 0802 INTERVENTION REQUIRED

If the 3770 is in receive state and cannot accept output data because of a device-not-ready condition, the 3770 will hold pacing until either the device is made ready or an intervention required time out occurs. If the device is not made ready within the time out period, the 3770 will send a negative response indicating Intervention Required, sense X'0802'. The 3770 will continue to monitor the status of the device and, when the condition is cleared, will send LUSTATUS with sense X'0001' (component now available). If the Host selects a different device or aborts before the condition is cleared the LUSTATUS would not be sent. The intervention required time out value is approximately 3 minutes for SLU 3770s. For MLU 3770s the time out value is set in the TIP by the customer, and may be from 1-99 minutes.

An SLU 3770 operating in unattended mode, sends a negative response with sense X'081C' (function not executable) when a device goes not ready.

Possible device-not-ready conditions:

1. A diskette becomes full
2. Printer is out of forms
3. Printer forms jam
4. The cover is raised on the printer
5. The card punch runs out of cards

NOTE: On SLU 3770's for items 2,3, and 4 above, if the HOLD PRINT switch is placed in the 'ON' position prior to the 3 minute timeout, then the intervention required sense will not be sent. This allows the operator additional time to correct the device-not-ready condition. On MLU 3770s, the time out value in the TIP may be set higher (i.e., up to 99 minutes).

Problem Determination/Recovery:

Correct the intervention situation and restart the job if necessary. Check the applicable RJE subsystem handling of negative responses; re-establishing the session and starting the writer may be required.

3.4.18 0805 SESSION LIMIT EXCEEDED (SLU only)

This negative response is generated if the 3770 receives a BIND when the LU is already in session. An LU can be in session with only one Host application at any given point in time.

Problem Determination/Recovery:

Do not send a BIND to a 3770 LU that is already in session.

3.4.19 0806 RESOURCE UNKNOWN (MLU only)

A - R(0806) will be sent by an MLU 3770 if a network services NS request other than REQMS (Request Maintenance Statistics) is received. The first five bytes of the RU must be X'4103040000'.

Problem Determination/Recovery

Determine why the host subsystem is sending an invalid NS request and correct.

3.4.20 080A PERMISSION REJECTED (SLU only)

This negative response is generated if the 3770 receives a BIND when it has not been set up by the operator to accept unsolicited network traffic. An operator can set up a 3770 to accept unsolicited network traffic by entering 'communicate mode'. The 3776 and 3777 enter 'communicate mode' when a line to device job or a device to line job is started.

Problem Determination/Recovery:

Properly set up the 3770 prior to session initiation. This would normally occur when a 'line' job had not been started at the 3770 or when the 3770 operator pressed 'STOP JOB' placing the terminal in local mode prior to receiving the BIND.

3.4.21 080B BRACKET RACE ERROR

The 3770 will send -R(080B) if it is NOT in-bracket (INB) state and it receives an Only-In-Chain (OC) or a First-Of-Chain (FOC) without a BB indication.

3.4.22 080C PROCEDURE NOT SUPPORTED (MLU only)

The 3770 MLU will return a -R(080C) to a REQMS request when the type code is not supported. The MLU supports the following type codes.

X'01' - Link Test Statistics

X'02' - Summary Error Data

X'03' - Communication Adapter Data

X'05' - EC Levels

Problem Determination/Recovery

Determine why host subsystem is requesting an invalid type code and correct.

3.4.23 0811 BREAK (INBOUND CANCEL)

An SLU 3770 will send a -R(0811) if the CANCEL key was pressed when the 3770 was in receive state. The CANCEL key would have been pressed to CANCEL outbound data flow.

Problem Determination/Recovery:

Not applicable - operator action.

3.4.24 0812 RESOURCE NOT AVAILABLE

An SLU 3770 will send a -R(0812) if it receives a message from SSCP and the console printer is not available.

An MLU 3770 will send a -R(0812) if there are insufficient buffers available to support the session.

Problem Determination/Recovery:

Ready the printer on SLU 3770s.

On MLU 3770s, terminate an active session to free additional buffers or activate an LU with lower pacing values.

3.4.25 0813 BRACKET BID REJECT - NO RTR

The 3770 will respond with a -R(0813):

1. To a BID when the 3770 is not in between-bracket-state.
2. To an RU containing BB set on (RH byte 2 bit 0) and the 3770 is not in between-bracket-state.

See also sense X'2003' and X'081B'

Problem Determination/Recovery:

The host application should resend the BID at a later time.

3.4.26 0815 FUNCTION ACTIVE (MLU only)

A -R (0815) is returned to a BIND received for a session that is already bound.

Problem Determination/Recovery

Logon to an available session.

Logoff the active session prior to logon for the session associated with the -R(0815).

3.4.27 081B RECEIVER IN TRANSMIT MODE

If an SLU 3770 is in send state and a data RU is received, the RU will be rejected with a -R(081B). If the Host attempted to send a chain, the first RU will be rejected and each subsequent member of the chain will be purged. If the 3770 rejects an RU with Receiver in Transmit Mode, and the operator cancels the input before it is sent, the 3770 will send LUSTAT sense X'0001' to notify the Host of state change.

Also see description for sense X'0813'.

An MLU 3770 will return a -R(081B) if an RU is received on a session that is allocated to a HOSTIN operation. If the HOSTIN operation is terminated without transmitting any data, LUSTAT (RU=0400010000) will be sent to indicate session is now available.

Problem Determination/Recovery:

The Host application should resend the RU at a later time. A SIGNAL could be sent to force the 3770 to receive mode.

For MLU, the HOSTIN operation could be terminated.

3.4.28 081C FUNCTION NOT EXECUTABLE

For SLU 3770's, A -R(081C) is sent if the 3770 is operating in unattended mode and a device-not-ready (intervention required) condition occurs.

Also see sense X'0802' - Intervention Required.

For MLU 3770's a -R(081C) indicates that the current output device being used by the session has encountered a permanent error.

Problem Determination/Recovery:

For SLU 3770s, correct the intervention required situation.

For MLU 3770s, if the condition reoccurs, call Field Engineering service personnel.

3.4.29 0821 INVALID SESSION PARAMETERS

If the BIND contains invalid parameters, the 3770 will send -R(0821). See the discussion of BIND for 3770 required parameter values, and acceptable parameter values where a choice is given.

-R(0821) is also returned by the 3770 MLU on a CRYPTO session to a CRV request if N an (-N) do not agree.

Problem Determination/Recovery:

Determine the BIND sequence actually sent to the 3770 from a line trace or an MLU terminal trace. What goes down the line may not be what you specified or thought you specified. Compare the BIND parameters transmitted to those discussed in Section 3.3.3 and/or to those discussed in Chapter 8 of the 3770 component description.

Determine why N and (-N) do not agree.

The most common causes of a 3770 bind reject are invalid or incompatible specification of:

1. Compaction

2. Buffer size (256 or 512) specification and extend buffer switch setting.

3. PDIR support.

4. MLU - CRYPTO is specified in bind and is not installed. CRYPTO parameters are not valid.

3.4.30 0825 COMPONENT NOT AVAILABLE

A -R(0825) will be sent by an SLU 3770 when:

1. The 3770 is in receive mode (receiving data) and an unrecoverable device error occurs.

2. An FM Header type I is received that selects a valid device other than the line printer that is not attached to the 3770, and the disk switch is not "ON". See sense X'1008'.

3. The disk switch is "ON", a basic exchange diskette is in drive 1, and an FMH1 is received which does not specify basic exchange (i.e., MEDIA=EXCHANGE AND DST=1) or console (i.e., MEDIA=CONSOLE).

4. The terminal is in unattended mode and an intervention required condition occurs.

An MLU 3770 will send -R(0825) if the medium/subaddress combination specified in the received FM Header is either undefined (i.e., is not assigned to a device prior to the 3 minute operation) or the associated device is assigned to another session or operation.

Problem Determination/Recovery:

For SLU 3770:

1. Determine the device error from the 3770 NPR display, follow recovery action covered in the appropriate operators guide.
2. Turn the disk switch on or correct the FMH creation.
3. Correct the intervention required condition or run in attended mode.

For MLU 3770:

1. Assign the medium subaddress to a device.
2. Cancel the current operation using the assigned device,
3. or retry the operation when the device is available.

3.4.31 0848 CRYPTO COMPONENT FAILURE (MLU only)

1. If crypto is specified in the BIND and is not operational or the hardware has encountered a permanent error a -R(0848) will be sent.

Problem Determination/Recovery:

Determine which is the cause, and take appropriate action.

3.5 3770 KEYS WHICH EFFECT SNA

Following is a description of SLU 3770 keys and the equivalent 3770 MLU function which can affect SNA Data Flow. There is a comprehensive comparison of the keys, lights, and switches on the 3776-1,2/3777-1 to the MLU terminals in the 3776-3,4 and 3777-3 Operators Guide (GA27-3165). This is an excellent migration aid from an oepratational viewpoint.

3.5.1 ATTN KEY (ATTENTION)

The ATTN key is used by an SLU 3770 operator to request permission to transmit or send data.

The attention key causes an asynchronous SIGNAL request to be sent. Note that a SIGNAL is a request; the host application may or may not honor the request. The host may send a Change Direction (CD) or an EB in order to allow the 3770 to transmit.

The ATTN key is valid (SIGNAL send) only when the 3770 is in receive state (receiving data) or in standby state (between brackets). Following depression of the ATTN key, SIGNAL is sent immediately (asynchronously) by the 3770; however, the host application will not send CD until the last-of-chain (LOC) is sent for the chain in process. That is why there is a longer delay prior to interrupting host data flow for longer chain sizes. Note that if chain size was set equal to data set size, you would not be able to interrupt the outbound data flow when operating with MOST IBM supplied host application programs (this is not true for JES2).

The MLU 3770 does not have an attention key. The MLU will automatically send a signal to interrupt an outbound session when a session is needed to input data or console messages. See the discussion for SIGNAL.

3.5.2 CNCL KEY (CANCEL)

The CNCL key is used on an SLU 3770 to cancel inbound and outbound data flow.

If the CNCL key is pressed while sending data to the host, the 3770 will clear its buffer and cancel the inbound data flow. If a partial chain has already been transmitted, the 3770 will transmit CANCEL followed by an ABORT DS FMH. If no partial chain is outstanding (3770 is currently building FOC or OC), only the ABORT DS FMH is sent. See the 'CANCEL' description.

The CNCL key may be pressed when the 3770 is receiving data (receive state) in order to cancel the outbound data. If pressed when in receive state, a negative response with Break sense X'0811' will be sent. See sense X'0811'.

The cancel function is accomplished on the MLU 3770s by canceling the procedure or the device via the CANCEL command.

3.5.3 STOP JOB (CODE/START JOB) KEYS

On the SLU 3770, if STOP JOB is pressed when in standby mode, all models will send RSHUTD.

If STOP JOB is pressed when receiving data:

1. The 3776 and 3777 will send a negative response with sense X'0825'-Component Not Available. See sense X'0825'.

2. All other 3770 models will send RSHUTD.

If STOP JOB is pressed when sending data, a CANCEL will be sent if a partial chain has been transmitted and an ABORT DS FMH will always be sent.

On the MLU 3770, the CANCEL command and the RSHUTD command may be used to accomplish the function of the stop job key on the SLU 3770.

3.5.4 SYS REQ KEY (SYSTEM REQUEST)

On an SLU 3770 in SNA mode, the System Request key is used only to initiate a logon or logoff. When the SYS REQ key is pressed, the 3770 buffer is flagged as Unformatted Network/System Services (USS) and transmitted to SSCP. If the 3770 receives a negative response to a USS request, it will enter receive state to allow the host to send an error message to the 3770 operator.

The SSCP REQ key on an MLU 3770 performs the same function as the SYS REQ key on a SLU 3770 operating in SNA mode. In addition, a logon may be sent from the MLU 3770 by executing an SSCP procedure (which contains the logon) or by referencing an SSCP procedure in the TIP (i.e., Terminal Intialization Program) resulting in automatic logon at power on time.

3.5.5 EOB/EOM KEY

EOB - Only the 3771, 3773, 3774, and 3775 terminals have an EOB key. Pressing the EOB key causes the buffer contents to be transmitted as a first-in-chain or a middle-in-chain RU.

EOM - Pressing the EOM key on a 3771, 3773, 3774, or 3775 causes the buffer contents to be transmitted as a last-in-chain or an only-in-chain RU. Pressing the EOM key on a 3776-1,2 or 3777-1 invokes a SYS REQ message, a start job, an extended code key, or a job definition procedure.

Pressing the EOM key on a 3776-3,4 or 3777-3 indicates the end of an action. It is normally used following the depression of APPL REQ, TERM REQ, or SSCP REQ and the entry of data to indicate that data should be sent to the host or a local function is to be executed.

3.6 3770 SWITCHES WHICH EFFECT SNA OPERATION

Following is a description of SLU 3770 switches and the equivalent MLU 3770 function which can effect SNA data flow. There is a comprehensive comparison of the keys, lights, and switches on the 3776-1,2 and 3777-1 to the MLU terminals in the "3776-3,4/3777-3 Operator's Guide (GA27-3165). This is an excellent migration aid from an operations viewpoint.

3.6.1 DISK SWITCH

The DISK switch on SLU 3770s is used to override the media select field in the FMH and route the associated data to a 3770 native mode diskette in T-format. The diskette must have been initialized with a CODE/02 function.

If the 3770 DISK switch is on, all valid selections except the console will be overridden. Console data will always go to the console printer.

The only valid devices for 3770 are console printer, line printer, disk, and punch. 3774/3775/3776/3777-1 do not allow disk 2 selection. Disk 2 is used for overflow. These devices map to "console", "print", "exchange" and "card" settings in the media field of the Type 1 FMH. The subaddress field for all selections must be X'0'.

Compacted print data, destined for a 3777-1 can not be written to diskette. On the MLU 3770s, compacted print data received from the line may be routed to a basic exchange diskette, but it will be decompacted before it is written to the diskette (note that records greater than 128 bytes will be truncated to 128 bytes).

Compressed data is written to diskette in compressed format, except data which is routed to an MLU basic exchange diskette.

If the DISK switch is not on and the media select field specifies a valid device other than the line printer that is not attached to the 3770, an exception response (Component Not Available) will be sent. If the line printer is selected and the device is not attached, selection will be forced to the console printer.

If the DISK switch is not on and the media select field specifies a device that is invalid for the 3770, the 3770 will send an exception response indicating Invalid FM Header. See sense codes X'1008' and X'0825'.

The MLU 3770 uses the media/subaddress assignment to device relationship to route print or punch data to a diskette device. See the explanation for the HOSTOUT procedures and the OUTPUT command in the "IBM 3776 models 3 and 4 and IBM 3777 model 3 Communication Terminals Operator's Guide (GA27-3165).

3.6.2 EXTEND BUFFER SWITCH

The EXTEND BUFFER switch on an SLU 3770 designates whether 256 byte or 512 byte buffer size (RU size) is to be utilized at the terminal. The switch setting is read by the 3770 at power on and system reset time; thus, changing the switch without subsequently performing a power on or system reset will have no effect.

The 3776 and 3777 will use dual 256 byte buffers if the switch is "OFF" or dual 512 byte buffers if the switch is set to extend buffer. If the switch is set to "OFF" and the 3776/3777 receives a BIND specifying an outbound RU size greater than 256, the BIND will be rejected with a -R(0821).

On a 3774/3775 or a 3774/3775 programmable terminal with the emulator feature if the "EXTEND/ALARM" switch is "ON", a single 512 byte buffer will be used for keyboard-to-line or keyboard-to-diskette jobs only. Thus, the 3774/3775 can not receive a 512 byte RU.

The MLU 3770 uses the RU size specification in the BIND to determine whether 256 or 512 byte RU sizes will be used on a given session. Buffers are allocated accordingly by the terminal.

3.6.3 HOLD PRINT SWITCH

If the HOLD PRINT switch on a SLU 3770 is placed in the "ON" position following a printer intervention required condition and prior to the three minute timeout (3770 running in attended mode), an intervention required, -R(0802), will not be sent to the host. In this case the 3770 will not send the pacing response until the printer is made ready and the HOLD PRINT switch is turned "OFF". Thus, when the printer is made ready and the HOLD PRINT switch is placed in the "OFF" position, printing will continue. The appropriate action should be taken to insure that the forms are aligned correctly.

The HOLD PRINT switch should always be placed "ON" before the printer cover is raised, when the 3770 is on line.

If the HOLD PRINT is "ON" an NPR 260 is displayed while the printer cover is raised.

If the HOLD PRINT is "OFF" and the cover is raised an NPR 322 will be displayed.

The 3770 MLU does not have a HOLD PRINT switch. An intervention required -R(0802) will be sent to the host when the timeout value specified in the TIP has expired, if the intervention required condition has not been corrected. The timeout value may be from 1-99 minutes.

4 SUBSYSTEM SNA IMPLEMENTATION

4.1 JES2 SNA IMPLEMENTATION

JES2 SNA implementation can be determined from JES2 messages. The sense code is included in the HASP094 message (see section 10.2). The sense code meaning can be determined from the SNA Reference Summary (GA27-3136). If the sense code was sent by the 3770 the cause can be determined from SECTION 3). When JES2 terminates a session due to an error condition a 292 will normally be displayed in the 3770 NPR; This is an indication to check the host console messages to determine the cause of error and session status.

4.2 VS1 SNA IMPLEMENTATION

For a complete description of RES data flows and handling of error conditions, see Appendix B of the OS/VS1 RES RTAM and Workstation Support Logic Publication.

4.2.1 VS1 HANDLING OF INBOUND DATA FLOW CONTROL

Errors detected by RTAM in the Inbound Flow

4.2.1.1 SIGNAL

In response to SIGNAL from the 3770, RES sends a definite response and continues outbound data to the end of the current chain. RES then sends OC, DR1, CD, FI (T1, PU/PRn, IDS) and stacks PU or PRn in the RTAM push down stack. The interrupting data set can then be handled (console or card inbound). When the interrupting data set has finished RES expects the 3770 to send OC, DR, CD, FI (T1, EDS) and responds with OC, DR1, FI (T1, PU/PRn, RDS). See Figure C.3 for data flow example.

4.2.1.2 CANCEL

In response to CANCEL from the 3770, RES sends a definite response, then OC, DR1, EB if there have been no data interruptions. If there have been data interruptions, RES sends OC, DR1, CD, FI (T1, SRI, ADS) and expects the 3770 to resume the suspended data set, send some other data (even perhaps the aborted data set) set or send console data.

4.2.1.3 INVALID CID

Session undergoing immediate termination.

Action: 1) Send CLEAR
2) Re-issue RECEIVE ANY.

4.2.1.4 X'4006'

LOC or OC RU requested EX response only.

Action: 1) Send exception response X'4006'.
2) Purge the chain.
3) Allow other flows to continue.
4) Abort the JES reader if affected.

4.2.1.5 X'4010'

ASCII RU received either RTAM generation or session parameters prohibit ASCII data.

Action: 1) Send exception response X'4010'.

2) Purge the chain.
3) Allow other flows to continue
4) Abort JES reader if affected.
5) Write messages to central and remote operators.

4.2.1.6 X'1001

Invalid SCB

Action:
1) Send exception response X'1001'.
2) Purge the chain.
3) Allow other flows to continue.
4) Abort JES reader if affected.
5) Write messages to central and remote operators.

Unrecognized LUSTAT status field

Action:
1) Send exception response X'1001'.
2) Write message to central operator.
3) Issue CLSDST.
4) Abort all JES readers active or suspended on this session.
5) If there is a suspended JES writer on this session, return with an error condition.

4.2.1.7 X'1003'

Unrecognized CONTROL (DFC) function.

Action:
1) Send exception response X'1003'.
2) Purge the chain.
3) Allow other flows to continue
4) Abort the JES reader if affected.

4.2.1.8 X'1008'

Valid FMH received for inbound card data but no JES reader started or JES reader active on another session.

Action:
1) Send exception response X'1008'.
2) Purge the chain.
3) Allow other flows to continue.
4) Re-issue RECEIVE ANY.
5) Write message to the remote operator.

Invalid FMH received.

Action:
1) Send exception response X'1008'.
2) Purge the chain.
3) Allow other flows to continue.

4) Abort JES reader if affected.
5) Write messages to central operator and remote operator if applicable.

Type 1 FMH received and:

a) Card medium selected but not allowed on this session.
b) Destination not found.
c) Compression bit on but either RTAM generation or session parameters prohibit inbound compressed data.
d) Compaction bit on.

Action:
1) Send exception response a) X'10084007', b) X'1008200B', c) X'10084003' or d) X'10084004'.
2) Purge the chain.
3) Allow other flows to continue.
4) Write message to central or remote operator as appropriate.
5) Re-issue RECEIVE ANY.

Type 1 FMH received with:

a) BDS, RDS, or BDS and EDS but the destination is currently active.
b) bds or BDS and EDS but the desintation is currently suspended.
c) RDS with no active destination, but there is no suspended inbound destination.
d) IDS but two other inbound destinations are currently suspended.

Action:
1) Send exception response a) X'10082001', b) X'10082003', c) X'10082004' or d) '10082005'.
2) Purge the chain.
3) Allow all flows to continue.
4) Write message to central or remote operator as appropriate.

Type 1 FMH received with IDS or ADS but RU contains other data or RU is not only in chain.

Action:
1) Send exception response X'1008200F'.
2) Purge the chain.
3) Allow other flows to continue.
4) Abort the JES reader if affected.
5) Write message to remote operator.

ASCII RU received and the FMH specifies that data is compressed.

Action:
1) Send exception response X'10084008'.
2) Purge the chain.
3) Allow other flows to continue.
4) Abort the JES reader if affected.
5) Write a message to the remote operator

Type 2 FMH or Type 3 FMH received.

Action: 1) Send exception response X'10084001'.
2) Purge the chain.
3) Allow all flows to continue.
4) Write message to central operator.

4.2.1.9 X'080A'

BDS FMH received for inbound card data, session undergoing orderly termination.

Action: 1) Send exception response X'080A'.
2) Purge the chain.
3) Allow other flows to continue
4) Write a message to the remote operator.
5) Re-issue RECEIVE ANY.

4.2.1.10 EXCEPTION REQUEST RECEIVED

Exception request received - not a sequence number error.

Action: 1) Send an exception response with the same sense code that was passed with the request.
2) Purge the chain.
3) Allow other flows to continue.
4) Abort JES reader if affected.
5) Write a message to the central operator.

4.2.1.11 ALL OTHER CONDITIONS

Action: 1) Write a message to the central operator.
2) Issue CLSDST.
3) Abort all JES readers active or suspended on this session.
4) If there is a suspended JES writer on this session, return with an error indication.

4.2.2 VS1 HANDLING OF INBOUND NEGATIVE RESPONSES

4.2.2.1 X'80xx', X'40xx' X'20xx' (except X'2003') and X'10xx' REC'D

Action: 1) Issue CLSDST and abort all active readers and writers for the workstation.
2) Write message to central operator.

4.2.2.2 X'2003', X'0813' and X'081B' RECEIVED

Action: 1) Wait for EB or CD.
2) Retry the request.

4.2.2.3 X'0802' RECEIVED

X'0802' and outbound request was console data RU and workstation not in unattended mode:

Action: 1) Wait for LUSTAT with component now available or for SIGNAL.

If console data did not interrupt outbound or if console data interrupted outbound and workstation sent LUSTAT:

2) Retry the RU

If console data interrupted outbound and workstation send SIGNAL:

3) Send a zero-length RU with CD.
4) Wait for workstation to complete inbound flow.
5) Retry the console data.

X'0802' and outbound request was condole data and workstation is in unattended mode, or exception response code is anything not previously mentioned and outbound request was console data: 2) Write message to central operator.

X'0802' and outbound request was not console data and workstation not in unattended mode:

Action:

1) Cancel current chain if necessary.
2) Wait for LUSTAT with component now available or for SIGNAL.

If workstation sent LUSTAT:

3) Retransmit lost data (1st chain).

If workstation sent SIGNAL:

3) Send IDS.FMH with CD.
4) Wait for workstation to complete inbound flow.
5) Send RDS FMH.
6) Retransmit lost data.

X'0802' not console data and unattended mode. (See section 4.2.2.4, for action taken)

4.2.2.4 X'080A', X'0812', X'081C', X'0825', and X'0802' RECEIVED

(X'0802' when console data and unattended mode)

Action: 1) Abort the affected JES writer.
2) Write message to central operator.
3) Cancel the current chain if necessary.
4) Abort the current destination situation if necessary (ADS FMH).

4.3 POWER/VS IMPLEMENTATION

4.3.1 RJE,SNA ROUTINES

ROUTINE	CALLED/ ATTACHED BY	RETURNS TO	FUNCTION AND NOTES
IPW$$IB	IPW$$SN	IPW$$NU	Issues RECEIVE specific request to VTAM to receive data and then deblocks it for spooling by IPW$$LR Processes remote operator commands: START STOP FLUSH RESTART SETUP GO SIGNOFF and transfers all other commands to IPW$$CP for processing Posts the outbound processor command following GO, or RESTART when intervention is required. Posts the SNA manager Detaches itself

ROUTINE	CALLED/ ATTACHED BY	RETURNS TO	FUNCTION AND NOTES
IPW$$LF Logoff Processor	IPW$$SN	IPW$$NU	Logs off a logical unit using the VTAM macros SESSIONC and CLSDST. Sends message 1V12I to the to the remote terminal and then sends the central operator the message 1V11I. Posts the SNA manager Detaches itself
IPW$$LE Logon Processor1	IPW$$SN		Completes SNA control block construction (SUCB,LUCB, WACB) Checks LOGON request and LU BIND parameters for validity. Sets an indicator for IPW$$SN to attach logon processor 2 (IPW$$LN). Posts the SNA manager. Detaches itself.
IPW$$LN Logon Processor""	IPW$$SN	IPW$$NU	Establishes SNA session and starts data traffic with VTAM macros OPNDST and SESSIONC Prints message "1V09I REMOTE rrr LOGGED ON TO POWER ON luname" at central operator console and then queues the same message for the remote terminal to be sent by the message processor (IPW$$MP) Posts the SNA manager. Detaches itself.
IPW$$MP Message Processor	IPW$$SN	IPW$$NU	Transmits messages in message queue using VTAM SEND. Detaches itself.

ROUTINE	CALLED/ ATTACHED BY	RETURNS TO	FUNCTION AND NOTES
IPW$$OB Outbound Processor	IPW$$SN as LSTn or PUN task	IPW$$NU	Obtains job output data from spool file and transmits data to the LU using the VTAM macro SEND. The following intermidiate steps occur: * Obtains spool file through IPW$$LW. * Create Function Management Headers (FMH). * Compress and compact if required. * Pack data into request units (RU). Wait on GO posting from IPW$$IB if SETUP remote command issued. Post the SNA manager and detaches itself.
IPW$$OC Outbound Compaction Manager	IPB$$OB	IPW$$OB	Creates and updates COCB(s) and loads compaction table phases into GETVIS area.
IPW$$SN SNA Manager	IPW$$CP	IPW$$NU	Sets up following ECBS in the TCB of IPW$$SN: * VTAM RECEIVE any ECB * Work ECB for RJE,SNA posting of IPW$$SN Attaches IPW$$SN-Segment SUBTASK which calls IPW$$VE-Segment INIT (see below.) Issues VTAM RECEIVE macro. Prints central operation message "1V04I RJE,SNA STARTED" Waits on ECB posting.

ROUTINE	CALLED/ ATTACHED BY	RETURNS TO	FUNCTION AND NOTES
IPW$$SN Segment"INIT" SUBTASK	IPW$$SN	DOS/VS RJE,SNA	When called the first time at start-up time, it calls the IPW$$VS-Segment INIT and enables communication through VTAM with SETLOGON macro. Then posts IPW$$SN ECB and POWER/VS master ECB, and waits on posting by IPW$$SN. At termination time, the VTAM macro SETLOGON QUIESCE is called to halt further LOGON requests.
IPW$$SN Segment MAIN	Posted by: * VTAM due to: RECEIVE ANY INPUT VTAM exits * POWER/VS routines: IPW$$AQ IPW$$CP IPW$$IB IPW$$LH IPW$$LN IPW$$MS IPW$$OB	IPW$$NU	After VTAM posting due to SNA line activity, a RDR task is attached which causes IPW$$IB to execute. After posting from other POWER/VS routines, a scan of the work station control blocks (SUCBs) and logical unit control blocks (LUCBs) is made. If any are found to be active, the appropriate processor tasks are attached: * LST or PUN tasks (IPW$$OB) * Messages (IPW$$MP) Then a loop back is made to wait on further posting.
IPW$$SN Segment TERM	IPW$$SN MAIN	IPW$$NU	Frees certain work areas and control blocks. Prints message "1V05I RJE,SNA TERMINATING" Detaches IPW$$SN task.

ROUTINE	CALLED/ ATTACHED	RETURNS TO	FUNCTION AND NOTES
IPW$$VE Segment LOGON	VTAM	VTAM	Creates and chains control blocks, used at logon time. Posts IPW$$SN work ECB and POWER/VS master ECB.
IPW$$VE Segment INIT	IPW$$SN SUBTASK	IPW$$SN SUBTASK	Inserts addresses of VTAM exits in the ACB exit list.
IPW$$VE Segment DFASY	VTAM	VTAM	If request to interrupt data flow, then the signal received indicator is set in the LUCB of the LU. If the request is to shut down, then stop session indicator is set. Posts IPW$$SN work ECB and POWER/VS master ECB.
IPW$$VE Segment TPEND	VTAM	VTAM	Sets SNA stop code in SNCB Post IPW$$SN work ECB and POWER/VS master ECB.
IPW$$VE Segment LOSTERM	VTAM	VTAM	Sets on the stop session indicator in the LUCB of the LU. Posts IPW$$SN work ECB and POWER/VS master ECB.

4.3.2 RJE,SNA CONTROL BLOCKS

The following is a discussion of the control blocks which have either been added or altered in the POWER/VS SNA implementation.

Control Address Table (CAT) - The CAT contains address pointers to POWER modules and major control blocks. It is created during POWER initialization by IPW$$IR. The CAT is resident in the real storage area.

SNA Control Block (SNCB) - This is the main RJE,SNA control block. It is created at POWER initialization if SNA support is generated. The SNCB is fixed in real storage.

Compaction Control Block (COCB) - The COCB contains compaction table names, pointers and status information. One COCB is generated for 64 default tables. The control block is created at the time of the first compaction table usage. It is first loaded with the default table name as specified in the PRMT macro. The COCB resides in the GETVIS area of the POWER partition.

Logon Request Control Block (LRCB) - The LRCB is created at the time of the first LU logon and is contained in the GETVIS area. It is used for LOGON processing and consists of a header plus LRUB's.

LU Control Block (LUCB) - The LUCB is created during the LOGON of the first LU of a work station. It contains information required for LU sessions, such as, variable BIND parameters. One is created for each LU logged on. The LUCB's are allocated in the GETVIS area.

Logon LUCB - This is similar to the previous control block (LUCB) and is used as a work area by IPW$$LH during logon processing.

SNA Unit Control Block (SUCB) - The SUCB is allocated in the GETVIS area during the LOGON of the first LU of a work station. It contains information pertaining to the work station type. General information (i.e., REMID, SESSLIM) is kept here as well as specific device information for LSTn, PUN, RDR, and console.

Logon SUCB - Similar to the SUCB, but used as a work area during LOGON processing.

Work Area Control Block (WACB) - One WACB is created for LU inbound data, for LU outbound data, and for inbound interruption. It contains VTAM RPL's, RU buffers and some BIND information. One exists for each SUCB for inbound console data, another exists for each LUCB logged on for inbound, and another exists for each LUCB logged on during outbound data or message handling.

Logon WACB - The WACB work area used during LOGON processing.

Remote Control Block (RMCB) - The RMCB is created during POWER initialization and contains the information specified in the PRMT macro.

LOGON Request Unit Control Block (LRUB) - The control block contains LOGON request information and is created in the partition GETVIS area at LOGON time.

5 THIS SECTION INTENTIONALLY OMITTED

6 SESSION INITIATION/TERMINATION

For VTAM to establish a session between a terminal and an application, the logon exit of the application must be driven and the application must request VTAM to "BIND" a session with the terminal. There are several ways to initiate a session, drive an application's logon exit, and send a BIND to the terminal.

To terminate a session, the session must be "UNBOUND". Again, there are several ways to terminate a session. The logoff exit of an application can be driven by a logoff request or by a protocol error. A session is terminated by the sending of an UNBIND to the terminal.

The subsequent sections cover logon, logoff, and the format and construction of the BIND.

6.1 SESSION INITIATION

There are four ways to initiate a session between a terminal and a VTAM subsystem (application).

WARNING: Only with an operator entered logon can a LOGMODE entry be specified (either explicitly keyed or from a USSTAB entry). With either of the other methods the entry used from the LOGMODE table specified for this terminal defaults to the first entry in the table.

6.1.1 3770 OPERATOR LOGON

On the SLU 3770, the terminal operator can enter a character coded logon from the keyboard by pressing the "SYS REQ" (System Request) key and entering a logon.

On the MLU, the logon can be sent as a result of the entries in the Terminal Initialization Program (TIP); or by executing a predefined SSCP definition; or by pressing the SSCP REQ key, entering the logon message and pressing the EOM key.

FOLLOWING IS THE CHARACTER CODED LOGON FORMAT:

JES2 without USSTAB:

```
LOGON APPLID(JES2) LOGMODE(BATCH) DATA(RMT1,,,LU1name)      "EOM"
                |              |             |       V
                |              |             V       FOR MLU 3770 THE
                |              |        USER DATA    NAME OF THE FIRST
                |              V       (SEE 2.2.4)   LU MUST BE SPECIFIED
                |       ENTRY IN LOGON               IN THE LOGON
                |       MODE TABLE
                V
      NAME ON APPL STATEMENT
```

```
JES2 with sample USSTAB ASUSST70:    SIGNON USER=RMT1      "EOM"
                              OR:    RMT97                 "EOM"
```

For 3770 MLU logons, the fourth parameter of the DATA field must contain the name of the first LU (i.e., the label associated with the first LU from the NCP generation). This is how JES2 ties multiple LU's (LOGONS) to a single PU or remote.

```
VS1 without USSTAB: LOGON APPLID(RTAM) LOGMODE(BATCH) DATA('user-id/

                        password,TERM(term-id),PROC(procname),

                         NOTICES/NONOTICES,MAIL/NOMAIL,UNATT)"EOM"
```

With VS1, the central operator may also logon the workstation using this format (see OS/VS1 Workstation User's Guide, GC28-6879).

The logon command can be simplified if a VTAM USSTAB is used. See Appendix D of the VS1 RES System Programmer's Guide for further details on USSTAB specification for RTAM.

POWER/VS without USSTAB:

```
LOGON APPLID(POWER) LOGMODE(MOD3770)
                      DATA('021,PW,USERINOFMATION')
```

Here is an example of a logon to POWER using the logmode table entry of MOD3770. This is remote ID 021 which has a password of PW. This LOGON command is sent to VTAM. VTAM will establish the logical connection between POWER/VS and the LU. POWER (as the VTAM application) will validate the remote ID and password parameters.

For the multiple logical unit workstation, multiple LOGONs would be entered. Note, however, that the remote ID and password parameters must be identical for all logical units of a given workstations.

When keying a logon from an SLU 3776 or 3777 keyboard, the EOM key does not transmit the logon. Transmission does not occur until you start a "LINE JOB", if one was not already established prior to keying the logon. For example, the logon should be immediately followed by a card reader to line job (START JOB S30 EOM) or a LINE TO PRINTER JOB (START JOB S08 EOM).

Remember, for SLU 3770s in SDLC mode, the "SYS REQ" key indicates a request for connection to SSCP (VTAM's System Services Control Point). This is good only for logon and logoff. Once logged onto a subsystem (for example JES), to enter commands in stand-by mode on a 3776 or 3777 simply key the command and press 'EOM'. If the terminal is printing, press "ATTN", and wait for the printing to stop (normally at the end of a page - skip to channel 1), and key the command and press 'EOM'. On 3770 models other than the 3776 and 3777-1, a keyboard to line job must be started to transmit commands. Print out should resume at this point.

For MLU 3770s, the logon may be contained in the SSCP definition. The logon can be sent using the EXECUTE command or at power on time by referring the SSCP definition name in the Terminal Initialization Program (TIP). If desired, you can logon from an MLU 3770 in the same manner as an SLU 3770, using the SSCP REQ key. The 3770 MLU terminals have a separate console which uses an available session or interrupts an in use session to transmit commands.

6.1.2 BY VTAM OPERATOR (POF)

The VTAM operator or VTAM Programmed Operator Facility can drive the application's logon exit by issuing the VARY command and using the logon parameter.

```
V NET,ACT,ID=LUNAME,LOGON=JES2
                |             |
                |             V
                V             NAME ON APPL STATEMENT IN APPCONxx
                NAME ON THE LU MACRO WITHIN NCP
```

6.1.3 AUTOMATIC LOGON BY VTAM

Automatic logon by coding the LOGAPPL=name parameter in the NCP where name is the same as the name on an APPL statement in APPCONxx, a member of SYS1.VTAMLST.

(The application, NCP, LINE, PU and LU must all be active).

6.1.4 AUTOMATIC LOGON BY JES2

The automatic logon facility can also be driven by JES2 itself if you code the LUNAME= operand on the RMTnnn parameter and issue the following JES commands (after $SLGN1 and $SLNEn have been issued):

$T RMTn To automatically logon RMTn if there is output queued for it.

Or $SRMTn to automatically logon RMTn whether or not there is output. (Caution must be used in coding the LUNAME operand because JES will only allow the LU named on this operand to use this RMT number, for leased lines this is no problem, for dial it may be.)

See Chapter 5, 'Starting and Stopping RJE' (for SNA RJE stations) JES2, section 2.2.16.8.1, or the JES2 commands section. 4.1 SPL.

6.1.5 PERMANENT LOGON BY VS1 RTAM

If permanent logon is specified, RTAM will automatically logon the terminal when RTAM is started. Note, this occurs at RTAM start, restart, or modify (V=Y) time. If a session is deactivated, it will not automatically be logged on again. This is applicable to leased or switched lines.

In order for SNA workstations to be permanently logged on, the following requirements must be met:

1. PLGN=1 and NODE=xyz must be specified in the TERMINAL macro.
2. A permanent logon data set must be created and include a LOGON command for the workstation. (Note: only the first LU will be logged on on a MLU terminal.)
3. The data set for the permanently logged-on workstation(s) must be described in a //LOGON DD statement in the procedure used to start RTAM.

The permanent logon data set can be a member of SYS1.PARMLIB.

The VS1/RES System Programmer's Guide contains more details regarding the creation and use of the permanent logon data set.

6.1.6 AUTOMATIC LOGON BY POWER/VS

POWER/VS has no facility to automatically logon a remote terminal. Therfore, the remote termianl operator must enter the logon message at the terminal. One LOGON command must be submitted by the remote operator for each session that is to be established between the workstation and POWER/VS. For single LU 3770s, only one LOGON is needed since just one session can be supported.

The multiple LU 3770 will allow the operator to enter multiple LOGONs to a maximum number as specified in the SESSLIM parameter of the PRMT macro.

6.2 BIND

(See APPENDIX A for mode table entries for 3770 bind)

6.2.1 SOURCES OF BIND DATA

The BIND is a combination of the mode table entry, NCP parameters, and the subsystem issuing the BIND. The mode table entry can be one you assemble or an entry from the default table. You specify the name of the table you wish to use in the MODETAB operand in the NCP. Which entry you use within the table can be entered on the character coded logon as the LOGMODE parameter, or by inclusion from a USSTAB entry, or if neither of those is done, VTAM will default to the first entry in the table.

For a definition of how to code a logon mode table, see:

1. MVS SPL: VTAM GC28-0688 Chapter 4
2. VS1 SPG: VTAM GC27-6996
3. DOS SPG: VTAM GC27-6957

You will also find the LOGMODE entries in the IBM supplied logon mode table in that chapter. Note that the logon parameter LOGMODE(name) should be the same as the LOGMODE=name on the MODEENT you wish to use. For instance on the default table, the IBM 3770 entry is used by specifying LOGMODE(BATCH) on your logon. To use the 512 byte buffer on a 3770, the entry from the sample logon mode table, RJEMODE, you would specify LOGMODE(BUF512) or you could use the sample USSTAB in section A.6, ASUSST70, which defaults LOGMODE to BUF512 when you enter the "SIGNON" command. See the following section to determine how the bind is constructed by RES and JES.

For a complete breakdown of the BIND image acceptable to a 3770 and what it means, see Section 3.3.3 or Figure 3-4 of the 3770 System Components Manual (GA27-3097).

6.2.2 JES2 BIND CONSTRUCTION

When JES2 is the RJE subsystem, most of the BIND image is dependent upon the initialization parameters specified in the JES2 RMTnnn parameter. The JES2 initialization parameters are stored in SYS1.PARMLIB. This means that it doesn't make too much difference what is specified in the logon mode table if the JES2 initialization parameters are wrong. Fields that affect the BIND are: BUFSIZE, COMPCT/NOCOMPCT, COMP/NOCOMP, NUMPU, and SETUPHDR/SETUPMSG. With ACF VTAM and NCP the pacing and vpacing values specified in the logon mode table will override the generation values, from NCP and VTAM list. When a terminal sends sense information indicating invalid bind parameters, the JES2 initialization parameters should be checked first and then a VTAM buffer and I/O trace should be used to determine the bind image that is actually being sent. JES2 ignores most of the bind parameters that are specified in the mode table and builds its own bind command based on the JES2 initialization parameters as follows:

Field Name	Value in Mode Table	Value Generated by JES
FMPROF	not used	03
TSPROF	not used	03
PRIPROT	if compression is specified (bit 6) JES 2 will not change it.	B1 if no compression and no compaction in JES parms and bit 6 not on in mode table. B3 if compression or compaction specified in JES parms.
SECPROT	ignored	A3
COMPROT	all bits ignored except bit 4 of byte 1 which indicates an alternate code may be used.	7080 if bit 4 was 0. 7880 if bit 4 was 1.
RUSIZES	ignored	8585 if BUFSIZE=256. 8686 if BUFSIZE=512.
PSERVIC	ignored	Bits are set depending on the specification of features in the JES2 initialization parameters for the terminal.

If you cannot get your 3770 to respond positively to a BIND from JES, check the image of the BIND (in the RU on a trace) with section 3.3.3.

6.2.3 RES BIND CONSTRUCTION

At session initiation, the LOGMODE operand on the LOGON command must specify an entry in the LOGMODE TABLE defined for the node or the first entry in the table will be used. Conversely, when RTAM initiates a session for an SNA workstation to be permanently logged on, RTAM uses the first entry in the table specified by the LOGMODE operand on the TERMINAL macro for the workstation.

THe valid BIND parameters for RTAM are discussed in Appendix D of the VS1/RES System Programmer's Guide. Valid BIND parameter selections from the LOGMODE TABLE are based on the following considerations:

1. RTAM uses the set of parameters as passed or disallows the session.
2. RTAM allows a function to be selected for outbound data, even if it will not perform the function. For example, if SNACOMP=NO was specified on the RTAM macro, RTAM will not perform compression, but it will allow compression to be specified on the BIND. Therefore, if a function is specified in the BIND, the receiver must be prepared to support the function (or reject the BIND), but the sender is not obliged to use it.
3. RTAM will not allow a function to be selected for inbound data if it is not prepared to perform the function. For example, if you specified SNACOMP=NO, RTAM will not allow inbound compression, because RTAM would not include the routines for decompression of inbound data.
4. Carefully match the BIND parameters with the capabilities of the secondary LU. RTAM supports a variety of functions, not all of which are supported by all SNA workstations.

6.2.4 POWER/VS BIND CONSTRUCTION

The bind image for 3770 RJE is defined by assembling the MODTAB, MODEENT, and MODEEND macros and link editing the result into the core image library. The parameters which can be specified are discussed below.

LOGMODE=name - The name here corresponds to the mode name specified in the VTAM LOGON command entered by the remote operator. This allows several different bind constructions to be used based on the processing options which are necessary or optional.

FMPROF=X'03' - POWER/VS uses function management profile 3 as its protocol.

TSPROF=X'03' - LIkewise, transmission services profile 3 is used.

PRIPROT=X'A1' or X'A3' - This defines the primary protocol used by POWER/VS. Terminals which support compression should use a value of X'A3'. Those that do not have compression capability should use X'A1'.

The settings which are common to both include: multiple RU's per chain, only one data chain may be outstanding for a definite response, definite response to chains is required, and the primary NAU (network addressable unit) may send the end bracket.

SECPROT=X'A1' - This is the specification of the protocol used by the secondary logical unit (that is, the RJE terminal). The indicators here are for definite response to chains, compression may not be used, and the secondary NAU may send end bracket.

COMPROT=X'7080' or X'7880' - This is the specification of the protocol which is common to both LU's. If ASCII is to be used the X'7880' value should be specified.

The other indicators here have the following meanings:

BIT	CONTENT	MEANING
0	B'0'	Reserved
1	B'1'	The primary and secondary may use function management headers

2	B'1'	The primary and secondary may use bracket protocol
3	B'1'	Bracket termination rule 1 will be used, that is, when terminating an existing bracket, the bracket will be terminated unconditionally unless the last message of the chain that indicates end of bracket requests a definite response. In that case the bracket will not be terminated unless a positive response is processed.
4	B'0' or B'1'	ASCII indicator
5-7	B'000'	Reserved
0-1	B'10'	Half duplex flip-flop communciations will be used. The contention resolution bit may also be set.
2	B'0'	Primary is responsible for error recovery
3	B'0'	This is the brackets first speaker bit. The secondary will act as the first speaker.
4-6	B'000'	Reserved
7	B'0'	The secondary will win when in contention with the primary.

RUSIZE=X'8585' - This represents the maximum request unit size which can be used by the primary sending to the secondary and by the secondary sending to the primary. The interrpretation is X'85' = 8 x (2**5) = 256.

PSERVIC= This parameter contsructs bytes 14-25 of the bind which are used by presentation services. Part of this information can be set by the user, the rest is mandatory. Shown below are the meaning of each byte and an explanation of the choices which can be made.

BYTE	BIT	CONTENT	MEANING
14		X'01'	Logical unit presentation service profile 1 is used by POWER/VS
15	0-3	X'1'	Function management header subset 1 is used
	4-7	X'0'	Data stream subset 0 is used

Bytes 16 through 20 apply to the primary LU (that is, outbound traffic).

16	0	B'0'	The transmission may be interrupted once to send to another LU
	1	B'0'	LU does not support compaction
		or B'1'	LU does support compaction
	2	B'0'	No peripheral data information records (PDIR) are used by POWER with 3770 terminals
	3-7	B'000000'	Reserved
17		X'00'	Reserved

18	0	B'1'	The primary or secondary may send an interactive data stream
	1	B'1'	The primary or secondary may send horizontal format data stream
	2	B'1'	The primary or secondary may send a vertical tab data stream
	3	B'1'	The primary or secondary may send a vertical select data stream
	4-6	B'000'	Reserved
	7	B'1'	The primary or secondary may send a transparency data stream
19		X'00'	Reserved
20	0	B'0'	Document output not allowed
		or B'1'	Document output allowed (use this)
	1	B'1'	Card format allowed
	2	B'0'	Exchange media format not allowed
	3	B'0'	Disk, data management not allowed
	4-7	B'0000'	Reserved

Bytes 21-25 have the same meanings as 14-20 except that they apply to the secondary LU (inbound traffic).

6.3 SESSION TERMINATION

6.3.1 3770 OPERATOR LOGOFF

The operator can enter a character coded logoff in the same manner that a logon is entered. Key "SYS REQ" followed by the character coded logoff of:

WITHOUT A USSTAB:

```
    LOGOFF (APPLID(name)) (TYPE(cond/uncond)) (HOLD(yes/no))
    "EOM"
```

Remember brackets ( ) indicate these operands are optional, but HOLD=NO (the default) will power off the 3770 (if the 3770 has THE REMOTE POWER OFF feature) and disconnect the line, if switched.

WITH THE SAMPLE USSTAB ASUSST70:

```
                    SIGNOFF
                    "EOM"
```

HOLD=YES is the default on the logoff in the sample USSTAB (ASUSST70), so that the 3770 will not be powered off.

If you use the JES2 "SIGNOFF" command all sessions will be logged off.

6.3.2 BY VTAM OPERATOR

A terminal can also be disconnected by the VTAM operator issuing a vary inactive command.

V NET,INACT,I,ID=LUname

6.3.3 BY JES2

There are several JES commands which will force disconnection.

See the JES Operator Commands Manual or "Starting and Stopping RJE' (for SNA RJE Stations) Chapter 5, JES 2/4.1 SPL for a description of how $P LNE, $P RMT, and $E will affect the 3770.

Also /*SIGNOFF will still work from THE CARD READER OR DISKETTE.

6.3.4 BY VS1

VS1 will not initiate a logoff under normal conditions. A logoff may be accomplished by an operator or an abnormal session termination.

6.3.5 BY POWER/VS

Remote operators may terminate sessions in one of two ways. The VTAM LOGOFF command or the POWER/VS SIGNOFF command may be used.

When using the VTAM LOGOFF, the operator may specify conditional or unconditional. If conditional is chosen, VTAM informs POWER/VS that log off has been requested. This allows POWER/VS to complete sending or receiving any output or job input before terminating the session. The unconditional option means that VTAM first terminates the session and then informs POWER/VS. This should only be used in emergency situations as it results in termination whether or not data is being transmitted.

The POWER/VS SIGNOFF command is passed directly to POWER on the normal inbound data flow. It is handled by POWER/VS as a conditional logoff request.

The command itself is issued without operands.
Example: SIGNOFF

7 SYSTEMS SUPPORT OF 3770 FEATURES AND COMPONENTS

7.1 PRINTER

7.1.1 FUNCTIONS SUPPORTED

The 3770 printer support is with a few exceptions the same in SDLC mode as in BSC mode. Here are a few differences.

Compaction is supported on the 3776-3,4 and 3777-1,3 only.

Horizontal Format Control (SHF) is not supported by the 3776-3,4 and 3777-1,3.

PDIR (FMH type 2) is NOT supported for any 3770 terminal.

Channel 1 must be defined as line 1 on the 3776/3777 if the forms definition (FCB) is loaded from the host; Channel 1 can be defined as any line if loaded at the 3776/3777. Note the difference in printer operation and forms definition compatability if loading from both the host and the 3776/3777.

In BSC/JES2 operation, if the printer was at channel x and a skip to channel x was issued the forms would not move. In SNA operation, if the printer was at channel x and a skip to channel x was issued the form would move to the next occurrence of channel x.

All 3770 models have forms control definition and selection as under BSC, plus in SDLC mode the host can load an FCB into the 3770 forms control buffer. The 3770 MLU models do not support Horizontal Format Control (Set Horizontal Format).

7.1.2 FORMS CONTROL

FOR SLU 3770:

For selection of forms control other than the 3770 default values, you should not use the SLU 3770 "System Defined Job" operation. (The default values will work with normal SYSOUT, but may not be adequate for special forms). No operator intervention is required for print that does not request special forms or a special FCB (either FORMS=nnnn or FCB=nnnn in the JCL) since when the CPU selects the printer, the SLU 3770 will automatically start a line to printer job if it is in standby mode.

The two ways to select printer forms control are by either operator defined jobs or host loaded FCBs. To select an operator defined job it must have been predefined and loaded into one of the five job definition buffers. This can be accomplished by keyboard definition, cards, or from the Operator Job Definition (OJD) data set on a SLU 3770 diskette. (IF YOU REQUIRE A JOB DEFINITION THAT IS NOT ONE OF THE FIVE DEFINITIONS LOADED IN THESE BUFFERS, THEN YOU MUST LOGOFF IN ORDER TO LOAD THE REQUIRED DEFINITION, AND LOGON AGAIN - READ OJD IS AN OFFLINE FUNCTION.) These jobs need not all be line to printer jobs, but since those jobs which involve forms control are often more complex for the operator, most if not all of these jobs will probably be used for forms control unless you select the host loaded FCB facility.

The following procedures establish how each media can be used for job definition and/or selection for forms control.

For MLU 3770:

On MLU 3770s, the forms control can be supplied by a host loaded FCB or by a predefined carriage procedure definition. The CARRIAGE definition name is specified in the HOSTOUT, OUTPUT, or UTILITY procedure definition.

7.1.2.1 DEFINING AND SELECTION FROM KEYBOARD

For SLU 3770:

Forms control jobs can be defined and stored in the 3770 buffers by following the procedure "Entering An Operator Defined Job From The Keyboard" in the Operating Procedures Guide.

Once the job definitions are in the buffers, the only way to select which of the five jobs is to be used, is via the keyboard procedure "Start Job" n, or "CODE/8" n (Change Forms procedure), where n = the number of the buffer that contains the desired job definition. The printer forms control is automatically changed when an operator job definition is executed, only if the printer is the output device.

FOR MLU 3770:

A default CARRIAGE definition is loaded at "POWER ON" time if one was specified in the Terminal Initialization Program (TIP). Otherwise, the CARRIAGE definition is loaded when a HOSTOUT, OUTPUT, or UTILITY procedure is executed.

7.1.2.2 DEFINING JOB DEFINITION ON CARD

FOR SLU 3770:

If your 3770 does not have diskette, or you require more than 5 operator job definitions, then you may want to define job definitions on card. For the procedure on how to enter a job definition on card and how to load these definitions, carefully read the section "Entering An Operator Defined Job From The Card Reader" in the Operating Procedures Guide.

FOR MLU 3770:

You may restore all procedures from cards, if previously saved on cards; CARRIAGE definitions may not be selectively added from cards.

7.1.2.3 STORING AND LOADING JOB DEFINITION ON DISKETTE

FOR SLU 3770:

Once job definitions have been entered into the 3770 buffers, they can be stored in the OJD data set on the first diskette and then reloaded when the terminal is powered off and back on. This saves having to reenter the definition from the keyboard everytime. (The same is true of having the definitions on card). To use the diskette as the storage media for job definitions refer to sections "Writing Operator Defined Jobs To The Diskette Storage Device" and "Entering Operator Defined Jobs From The Diskette Storage Device" in the Operating Procedures Guide.

FOR SLU 3770

Procedure definitions are stored on the 3770 system diskette. These procedures may be saved (USERSAVE) on diskette, tape, or cards for backup purposes. They can be restored to the 3770 system diskette using the USERREST command. Note: USERSAVE and USERREST applies to all procedures. Procedures can not be selectively saved or restored. Individual procedure deletion or addition must be done from the keyboard.

7.1.2.4 HOST LOADED FCB WITH JES2

In SDLC operation, JES2 can load an FCB into the 3770.

To use host loading, specify FCBLOAD on the RMT parameter in the JESPARMS and use either of the following JCL conventions to select the appropriate FCB from SYS1.IMAGELIB:

```
          //PRINTOUT     DD        SYSOUT=A,FCB=nnnn
    OR
          //PRINTOUT     DD        SYSOUT=(A,,ABCD)
          //*OUTPUT      ABCD      FCB=nnnn
```

After the following JES2 command is entered by the operator, JES2 will load the FCB and start print jobs queued for that FCB.

```
$T Rnn.PR1,C="FCBNAME"
```

NOTE: The name you specify for an FCB as nnnn or "FCBNAME", should not include the prefix (i.e., FCB2). So, to select a member of SYS1.IMAGELIB of FCB26, the name you would use is FCB=6.

Please note the following constraints on 3770 FCB's:

1. Channel 1=Top Of Page
2. Channels must be defined in ascending order. (Fixed with 3770 EC)
3. Only one stop per channel may be defined.
4. No stops can be defined as X'00'. (Fixed with 3770 EC)

7.1.2.5 HOST LOADED FCBs WITH VS1

VS1 does not support host loaded FCBs.

7.1.2.6 HOST LOADED FCBs WITH POWER/VS

POWER/VS does not support host loaded FCBs.

7.2 DISKETTE SUPPORT

When designing an SNA application or migrating from BSC to SNA the diskette support implemented by the 3770 and by the RJE subsystems must be understood. This includes an understanding of 3770 created formats and formats acceptable to the RJE subsystems for inbound data and RJE created formats and 3770 processing for outbound data. The Type 1 Function Management Header (FMH1) becomes very important, since it is the prime source used to determine acceptability of data and the subsequent means of processing for the data.

Although most of the needed 3770 diskette information is available, it is contained in multiple SRLs. The following references are included for your awareness.

3770 Operators Guide (the one applicable to your terminal - see the list included in Section 1).

Chapter 2:
1. "Diskette Storage Device Jobs" - for general diskette support.
2. "Code/5 - List Diskette" - for a description of data set label contents.
3. "Operator Defined Jobs" - for option selection.

3770 System Components:
1. The chapter containing the description of your terminal - for general diskette support.
2. Chapter 8 - for SNA inbound and outbound processing (GA27-3097).
3. Appendix E - for label descriptions, diskette interchange requirements, and BSC compression example.

Refer to the Table of Contents and the Indexes of these manuals for specific subjects covered.

7.2.1 COMMON DISKETTE PROBLEMS

Experience has shown that there are three common problem areas or areas of misunderstanding related to diskette support. The three areas are:

1. Multiple active data sets inbound (data set concatenation)
2. Basic exchange outbound for subsequent processing on a 3740.
3. Keyboard to diskette (3773/3774/3775) for subsequent diskette to line transmission.

These three areas and others will be more fully explained in the following sections.

1. MULTIPLE ACTIVE DATA SETS INBOUND (DATA SET CONCATENATION)

The current BSC operation of the 3770 SLU terminals (programmable and non-programmable 3774-3777/1), in conjunction with the host RJE components, process MULTIPLE ACTIVE DATA SETS as a single job stream by concatenating each of the separate data sets.

Example:

Data Set Name	RJE Function
AA11	Beginning JCL Data Set
BB11	Text Data Set
CC11	Ending JCL Data Set

The three (3) data sets would be transmitted to the RJE component, which would treat them as a single "JOB".

Problem Description:

This same data stream when transmitted under SNA/SDLC by an SLU 3770 will not be concatenated by RES; will be concatenated by POWER; will be concatenated by JES2 if the 3770 systems manager RPQ is installed (see description under "3770 DISKETTE INBOUND PROCESSING").

An MLU 3770 will concatenate inbound data sets transparent to the host application program if the media, subaddress, and properties (FMH1 field) do not change and if the record sizes of the data sets do not cross the 80 byte boundary (i.e., do not vary from less than or equal to 80 bytes to greater than 80 bytes or vice versa). If any of the above four conditions occur, the 3770 MLU will send an FMH1 CDS (Continue Destination Select) between the changing data sets. JES2 is the only subsystem that supports FMH1 with CDS.

The SLU 3770s without the systems manager RPQ will send each physical data set as a separate logical entity deliniated by a Beginning of Data Set and an End of Data Set FMH1. As a result of the host component queueing each data set is treated as a separate "Job"; separate execution of each of the transmitted data sets will have unpredicatable results.

Considerations:

FOR NON-PROGRAMMABLE MLU 3770 MODELS (3776-3,4/3777-3):

For MLU 3770 installations, inbound data set concatenation is not a problem unless FMH1 CDS support is required by non-JES2 accounts.

DOS/VS POWER will concatenate inbound data sets. However, the POWER implementation is not consistent with SNA architecture and could change.

JES2 installation can accomplish inbound data set concatenation by installing the appropriate 3770 systems manager RPQ(s).

FOT NON-PROGRAMMABLE SLU 3770 MODELS (3774-3777/1):

With existing SLU 3770 and RJE subsystem support, the customer can achieve the desired job stream capability by changing the operating philosophy from one of transmitting multiple active data sets to transmitting multivolume data sets. When multivolume is used, the JCL and data to be submitted to the host are on separate diskettes that are linked together as a single job stream by the use of the Multivolume Indicator in the data set label. (For additional information regarding multivolume refer to the "Operating Procedures Guide" for the appropriate terminal as well as Appendix E of the IBM 3770 Data Communication System - System Components - GA 27-3097, GA27-3145, or GA27-3146).

Example:

Diskette Number	Data Set Name	Multivolume Indicator	RJE Function
1	AA11	'C' (continued)	Beginning JCL Data Set
2	AA11	'C' (continued)	Text Data Set
3	AA11	'L' (last)	Ending JCL Data Set

Using this method, diskette #1 and #3 could have up to 18 unique beginning and ending JCLs, each using a different data set name. The text diskette (#2) associated with the JCL would use the same data set name as that JCL.

As an alternative to the above Multivolume Procedure, all information (JCL and text) can be created under a single data set.

FOR PROGRAMMABLE 3770 MODELS:

Since the programmable models do not support multivolume data sets, the JCL and data must be self contained in a single data set.

2. BASIC EXCHANGE OUTBOUND TO BE PROCESSED ON A 3740.

Problem Description:

The SLU 3770 does support basic exchange format and will write one record per sector if the FMH1 so indicates (i.e., MEDIA=exchange, DST=basic exchange, and ERCL=record length). However, only JES2 will build an FMH1 as described above.

Therefore, neither a non-3770 created diskette nor a 3770 created exchange diskette (Code/02I) can be written on by an SLU 3770 in an

SNA/RJE environment, except with JES2.

A 3770 native mode created diskette (Code/02) can be written; however, native mode diskettes use a non-sequential sector arrangement (i.e., sector 1,4,7,10,etc) and can not be properly read by a 3740.

The MLU 3770 via a procedure definition can direct any media/subaddress to any device. Print or punch data can be written on a basic exchange diskette in basic exchange format (i.e., 1 record per 128 byte sector). Note that printer compressed/compacted data will be decompressed/decompacted prior to being written to the diskette. Thus, print lines greater than 128 bytes will be truncated to 128 bytes.

Considerations:

For SNA/RJE, you can write a basic exchange diskette on a 3770 to be subsequently processed on a 3740 if you are using JES2 or a 3770 MLU terminal

For BSC/RJE, it is possible through special host programming. The host program could send an 80 byte record followed by a "dummy" 46 byte record. This would align each 80 byte record on a sector boundary. Note there would be an IRS in columns 81 and 128. There are special considerations for compression and trailing blank suppression. Compression should not be used and there must be a non blank character in the last column of each card (cc 80 and 46). There are also 3740 operator considerations: The OJD data set will have a record length of 256 bytes which will cause an error and other data sets will have a record length of 128 bytes which may cause an error. To eliminate these errors the record length in the HDR1 label must be changed to 80 bytes. See section 11.3 for an example.

3. KEYBOARD TO DISKETTE (3773/3774/3775) FOR SUBSEQUENT DISKETTE TO LINE TRANSMISSION. The 3776/3777 terminals do not have a keyboard to diskette capability.

Problem Description:

When entering data to diskette (keyboard to diskette job) the 3770 microcode will build an FMH1 and insert it into the first record of the data set. The FMH1 media field would indicate console (console created). When the data set is subsequently transmitted to the host RJE component (RES, JES2, or POWER/VS), the "Job" is ignored (i.e., the FMH1 is rejected with an invalid FMH sense code), because the RJE components recognize only <u>card media</u> as a valid input source for job execution. Diskette data with <u>console media</u> can be used to send RJE commands only, from the terminal.

There are 3770 systems manager RPQs which allow the media field in the FMH1 to be changed from 'console' to 'card' prior to transmission to the host. Thus, allowing data entered from the keyboard to the diskette to be transmitted to the RJE subsystem, and processed by the RJE subsystem as 'card' data.

Considerations:

Obtain the appropriate 3770 systems manager RPQ(s).

There is a patch to VS1 on RETAIN to allow console media input.

7.2.2 3770 DISKETTE INBOUND PROCESSING

The combination of the Function Management Header Type 1 (FMH1) and the data format created by the 3770 determines: 1) acceptability to the RJE subsystem and 2) processing done on the data by the RJE subsystem. If the FMH1 is not acceptable to the host, it will be rejected with an invalid FMH sense code (X'1008').

The 3770 SLU models will create FMH1 values as discussed in the subsequent sections. However, there are 3770 systems manager RPQs which provide the capability to override these values prior to host transmission. Thus, for reference purposes, a description of the RPQs is appropriate at this point.

The systems manager RPQ support is primarily for operations in an SNA/RJE environment.

The 3770 microcode changes will be distributed as systems manager RPQ's to provide this support on the non-programmable 3770 models. The RPQ numbers are as follows:

S30210 for the 3773
S30211 for the 3774
S30212 for the 3775
S30213 for the 3776
S30214 for the 3777-1

To obtain the 3770 systems manager RPQ, follow the normal RPQ procedure.

3770 DISKETTE SUPPORT ENHANCEMENTS SUMMARY (EXCEPT 3773):

A. ABILITY TO CHANGE THE MEDIA AND SUBADDRESS.

The media and subaddress fields (e.g., FMH1) used while transmitting diskette data to an SDLC line may now be altered, prior to transmission, with the Code/04 change diskette status function. The fields can also be set on another device (e.g., 3740).

This allows a media and subaddress specification for diskette data which is acceptable to the RJE subsystem. For example, "diskette data may be sent to the host as "card" data.

B. DATA SET CONCATENATION OPTION.

This option allows like media and subaddress data sets to be concatenated by use of a CDS FMH while doing a "transmit all active data sets" job.

This allows multiple data sets to be treated as a single job by the RJE subsystems. For example, three data sets containing JCL, data, and JCL would be treated as a single job rather than as three jobs. This capability exists in BSC, but did not previously exist in SNA except with DOS/POWER.

Note that data set concatenation, with the exception of DOS/POWER, requires both 3770 support and RJE subsystem support. Thus, as of this writing VS1 does not support data set concatenation.

Pressing the CODE/C keys invokes the concatenate Data Set Option.

While this option is set and a transmit all active data sets job is started, data sets that appear consecutively on the diskette that have the same media and subaddress fields will be concatenated through the use of the CDS FMH. CDS, Continue-Destination-Select, is a new FMH (Function Management Header) specification. When a CDS is encountered by an RJE subsystem supporting CDS (i.e., JES2 with the PTF is the only one at this time), it will treat the data sets separated by the CDS as a single data set.

If a data set with a different media or subaddress field is found, an EDS FMH followed by a new BDS FMH will be transmitted.

Following is an example of the FMH's that would be transmitted for the data sets shown.

Diskette Data Sets and Media	Subaddress	FMH's Transmitted
Data Set 1 - CARD	0	BDS (CARD)
Data Set 2 - CARD	0	CDS
Data Set 3 - CARD	0	CDS
		EDS
Data Set 4 - Console	0	BDS (CONSOLE)
		EDS
Data Set 5 - CARD	0	BDS (CARD)
		EDS

CODE/D will reset the concatenate data set option, as well as the Code I, U and X options described in the operators's guide.

C. AUTC NEW LINE OR EJECT.
When processing exchange type data sets received from the host, the terminal will automatically cause a card eject or a new line, based on the record length received in the FMH1.

For example, if you subsequently printed a basic exchange data set with a record length of 80 bytes, an IRS character would be appended to each 80 byte diskette record. This will cause the printer to space a line after each 80 byte record.

3773 DISKETTE SUPPORT ENHANCEMENTS AND OPERATIONS PROCEDURES:

Permits input to the host component of data previously entered from the 3773 keyboard to diskette, as "card" data by providing a change to the function management header FMH Type 1). That is all data entered from the keyboard to diskette will be marked as "card" in the media field of the FMH1. DST and ERCL bits of the FMH1 will be set to zero. Records should be 80 bytes or less.

Note that RJE commands that are keyed to diskette can not subsequently be transmitted to the RJE host component, unless the RJE host component allows commands to be entered from cards.

There is no operator action required to invoke this function on a 3773.

7.2.2.1 3770 FMH TYPE 1 CREATION

See the 3770 System Components Manual GC 27-3097, Chapter 8; GC27-4145, Chapter 7; or GC27-4146, Chapter 6; for a full description of FMH1.

The 3770 Programmable models will create FMH1 values dependent upon the data set transmit options selected by the operator or supervisor program. Note, the options selected must be compatible with the actual data format and content on diskette.

The 3770 MLU models will create FMH1 values dependent upon the data set options and media/subaddress selection defined in the HOSTIN or INPUT procedure definition. The options selected must be compatible with the actual data format and content on diskette.

On 3770 native mode diskettes, "T" formatted data sets are created by the 3770NP (except 3771) when the terminal writes an FMH1 as the first record of a data set for the following jobs:

- Card to diskette (excluding 3773)
- Keyboard to diskette (excluding 3776/3777)
- Line to diskette

The definition of a "T" formatted data set is a data set which contains an FMH1 in the first record.

All non-programmable 3770 created FMH1's are 6 bytes long.

FMH1's for basic exchange diskettes are created at transmission time.

FMH1's are sent only-in-chain. Following receipt of a positive response (define response mode), the 3770 will transmit the associated data set.

The SLU 3770 Non-Programmable FMH1's listed below are the ones that are subsequently transmitted to the host application program via a Disk to Line Job after having been created by another "JOB".

SIGNIFICANT FMH INDICATORS SENT TO HOST

"Job" Operation that created the data set	Prob- lems	Medium (Byte 2)	Properties (Byte 3-DST) Indicator only)	Exchange Record Length (ERCL-value is in HEX)
1-Card to Diskette	none	X'20'* (Card)	DST=0 (not basic exchange)	X'00'
2-Keyboard to Diskette (3773/3774/3775 only)	RJE	X'00'* (Console)	DST=0 (not basic exchange)	X'00'
3-Line to Diskette				
(A) Punch Selected (1) (3773/3774/3775 only)	none	X'20'* (Card)	DST=0 (not basic exchange)	X'00'
(B) Printer Selected (2)	NS**	X'30'* (Printer)	DST=0 (not basic exchange)	X'00'
(C) Diskette Selected				
1-Not Exchange	NS**	X'10'* (Exchange)	DST=0 (not basic exchange)	X'00'
2-Exchange-1-80 (3)	***	X'20' (5) (Card)	DST=1 (basic exchange)	X'01-50'
3-Exchange-81-128 (4)	NS**	X'10' (5) (Exchange)	DST=1 (basic exchange)	X'51-80'

* These FMHs are written on the diskette as the first record of that data set.

NS** This capability is not supported as a valid input MEDIA for IBM RJE subsystems, except JES2.

*** An FMH1 with DST=1 is not supported by POWER.

Notes:
1) Disk Switch used to override PUNCH media selection

2) Disk Switch used to override LINE PRINTER media selection (console printer selection can not be overridden by disk switch)
3) Host output FMH1 specified an Exchange Record Length of 1 to 80 characters. (This FMH1 creation not supported by RJE subsystems).
4) Host output FMH1 specifies an Exchange Record Length of 81 to 128 characters. (This FMH1 creation not supported by RJE subsystems).
5) These FMHs are dynamically created by the terminal when the Disk to Line Job is started. Also diskette must have been previously created as an EXCHANGE DISKETTE (Code Key/02I or by a basic exchange terminal).

7.2.2.2 3770 DATA FORMAT CREATION

***NOTE: The SLU 3773-3777 terminals when operating in SDLC mode will only write to a basic exchange diskette, either created with the code/02I function or by another basic exchange terminal, when the data comes from the communication line with a FMH1 where the DST field specifies basic exchange and the MEDIA field specifies exchange. In SDLC mode the code/02I function will create a diskette with an owner ID of "blanks" as opposed to '377X' in BSC mode. The SLU 3770s will write T-Type data sets in all other situations. Remember, only JES2 can create an FMH1 as described above.

The MLU 3776/3777 terminals can write to a basic exchange data set when receiving data from the line, the card reader, the tape, or another diskette device. The MLU terminals can only write a T-type data set when receiving data from the line. When writing to a basic exchange data set, the 3770 will write one record per 128 byte sector. The record length is determined by the ERCL (i.e., record length) field in the FMH1 or by the record length field in the Procedure/Utility definition.

When writing to a T-Type diskette data set, the 3770 will write its buffer contents (256 or 512 bytes) to either two or four 128 byte diskette sectors; thus, the diskette format is dependent upon the format of the original source. If the original source was card (i.e., card to diskette job) the data format will depend upon the options selected for the job (i.e., transparency, compression, neither). If the original source was the keyboard (3773, 3774, 3775 only), the format will be the same as that keyed. If the original source was the communication line, the format will be the same as transmitted from the host. Remember, the 3770 just "dumps" its buffer contents to the applicable number of diskette sectors, if basic exchange is not indicated in the FMH1 as described in 7.2.11.1. and if a 3770 native mode (created code/02) diskette is loaded.

One or more diskette data sets (i.e., the number specified for transmission to the host, either by selecting a single data set, selecting the transmit all active data sets option or by concatenating data sets within an MLU procedure) will be contained within a bracket (ie. Begin bracket, End Bracket sequence).

A data set will be a single chain unless an IUS character is encountered within the diskette data. An IUS will cause the current chain to end (LOC) and a new chain to be started (BOC). An IUS character can be created from the original source by a /*EOC card in the case of cards and by pressing the EOM key in the case of a keyboard to diskette job. The IUS character is not transmitted to the host. On an MLU the inbound chain size can be governed by specifying "maximum RU chain size" in the Terminal Initiation Program (TIP).

A. CARD TO DISK (Card=Original Source)

On a MLU terminal the card data will be written in basic exchange format (i.e., one card per 128 byte sector).

Since card is the original source, the format created on diskette is dependent upon the inbound card data options selected. See chapter two of the applicable 3770 Operators Guide defining "Operator Defined Jobs" for selection options for SLU 3770s and the utility definitions in the 3776-3,4/3777-3 Operators Guide. If both the transparent and compress option are specified, transparency overrides compression.

<u>Non-Transparent/Non-Compressed</u>

1. Trailing blanks are truncated.
2. IRS code is appended to the resultant card image to denote end of record to the host application program.
3. RU size (buffer size) can vary from 0 to 256 bytes (512 bytes on 3776/3777) (i.e., two or four 128 byte sectors).
4. 3770 <u>will</u> <u>not</u> <u>span</u> records accross RU boundaries; an RU boundary is the equivalent to the end of each second or fourth sector.
5. TRN and IGS codes are not allowed in data. The 3770 does not check for TRN and IGS codes in card data. If these codes exist in card data, use the transparent mode of data transmission to ensure proper processing at the host.

<u>Non-Transparent/Non-Compress</u> <u>Example</u>

Card Data:
//* TEST THE 3776 AS REMOTE 95
THIS DISK IS INITIALIZED 02

Diskette Data in EBCDIC:
RECORD 0001:
---bbb-

The first six bytes is the FMH1. The seventh byte is an IUS (FMH sent only-in-chain).

RECORD 0002:
//* TEST THE 3776 AS REMOTE 95 - THIS DISK IS INITIALIZED 02 -

The dashes are unprintable characters; IRS's in this case. Note, trailing blanks are truncated without an SCB inserted.

Diskette Data In HEX:
RECORD 001:
0601200040001F (padded with nulls to 256 or 512 bytes).

RECORD 0002:
61615C40E3C5E2E340E3C8C540F3F7F7F640C1E250
D9C5D4D6E3C540F9F5 1E E3C8C9E250C4C9E2D240C9
D5C9E3C9C1D3C9E9C5C440F0F2 1E

Blanks included for readability only. This is first part of 256 (512) byte record.

Non-Transparent/Compressed

1. Duplicate characters and blanks are compressed. (See explanation in "Space Compression/Expansion" in 3770 System Components Manual or Appendix D).
2. Items 1-5 listed under "Non-Transparent/Non-Compressed", above.

Non-Transparent/Compress Example:

Card Data:
THIS DISK IS INITIALIZED 02
THIS IS COMPRESSION TEST

Diskette Data In EBCDIC:
RECORD 1:
---b-b-

The first six bytes is the FMH1. The seventh byte is an IUS (FMH1 sent only-in-chain).

RECORD 2:
THIS DISK IS INITIALIZED 02 - THIS IS COMPRESSION TEST -

The dashes are unprintable characters (SCB's and IRS). This is the first part of a 256 (512) byte record.

Diskette Data In HEX:
RECORD 1:
0601200044001F Padded with nulls to 256 (512) bytes.

RECORD 2:

1B E4C8C9E250C4C9E2D240C9E240C9D5C9E3C9C1D3

C9E9C5C440F0F2 B5011E0E C4C8C9E240C9E250C4D6
D4D7D9C5 C2 E2 08 C9D6D540E3C5E2E3 B8011E

Spacing included for readability only. Underlines denote SCB and IRS characters.

Transparent Cards

1. Trailing blanks are truncated.
2. TRN code followed by a one-byte binary count (0-80) precedes the truncated card image.
3. IRS code is appended to the resultant card image.
4. RU size (buffer size) can vary from 0-256 bytes (512 bytes on 3776/3777). (i.e., two or four 128 byte sectors).
5. The 3770 will not span card records accross RU boundaries, an RU boundary is equivalent to the end of each second or fourth sector.

Transparent Data Example:

Card Data:
THIS DISK IS INITIALIZED 02
THIS IS A TRANSPARENCY TEST

Diskette Data In EBCDIC:
RECORD 1:
---bbb-

The first bytes is an FMH1. The seventh byte is an IUS (FMH1 sent only-in-chain).

Record 2:
THIS DISK IS INITIALIZED 02 - THIS IS TRANSPARENCY TEST -

The dashes are unprintable characters (TRN, count, and IRS).

Diskette Data In HEX:
Record 1:
0601200040001F Padded with nulls to 256 (512) bytes.

Record 2:
351B E4C8C9E250C4C9E2D240C9D5C9E3C9C1D4C9E9C5
C440F0F2 1E3519 E4C8C9E240C9E340E4D9C1DE2D7C1
D9C5D5C3E840C4C5E2E3 1E

Spacing is included for readability only. Underlines denote TRN, count, and IRS bytes.
X'35'=TRN, X'1E'=IRS

HIGHLIGHTS

Note that trailing blanks are always truncated and IRS characters are inserted to dilineate cards.

B. KEYBOARD TO DISKETTE (not available on 3776/3777)

The data contained on the diskette will be the same as that entered from the keyboard. The data is written from the 3770 buffer to diskette when the EOB or the EOM key is pressed; thus, when the EOB or EOM key is pressed either two or four diskette sectors will be written, even if 256 or 512 bytes had not been entered. For example, if you entered 20 bytes of data, two or four diskette sectors would be used.

If the EOB key is pressed the data will be subsequently transmitted as a FOC or MCC RU (ETB for BSC). If the EOM key is pressed an IUS character will be written to diskette, causing the data to be subsequently transmitted as a LOC or OC RU (ETX for BSC). Therefore, the EOB/EOM keys are used to control chaining within a data set created from the keyboard.

HIGHLIGHTS

1. The IUS character takes a byte of diskette storage, but is not transmitted to the host; it is a control character to the 3770 only.

2. IRS character (code/3) must be inserted by the 3770 operator when keying data if the record size is greater than 80 bytes or the record will not be processed as expected by the host RJE subsystem. The RJE subsystems expect to find an IRS in the record ("card image"). If an IRS is not found the RJE assumes byte 81 is an IRS. Thus, if a 120 byte record were transmitted, byte 81 would be lost, byte 82 would become byte 81, and so forth.

3. The FMH1 created by the 3770 specifies CONSOLE media (see FMH CREATION TABLE above). Therefore, keyboard created data is not "supported" by the RJE subsystems as valid input data, and will be rejected.

There is a fix on RETAIN for VS1 to allow input of data with disk or console media specified. See VS1 Inbound Processing, below. See the 3770 systems manager RPQ description above.

C. BASIC EXCHANGE DISKETTE

All diskette input from an MLU 3770 will be in basic exchange format unless (1) the data was previously recieved from the line and written in T-format or (2) the diskette was created in T-format on an SLU 3770 terminal.

No Record Compression

1. The 3770 will read one sector at a time from the diskette and transmit one sector per RU. The RU length will be what is specified as the record length in the data set label. You should understand the performance implications of basic exchange transmission.

2. The entire data set will be transmitted as a single chain unless IUS characters have been inserted within the data set by the originating terminal or a 3770 MLU terminal is being used with "maximum chain size" specified in the TIP.

With Record Compression (3776-1,2/3777-1 Only, RPQ on 3774/3775)

Record compression may be used for basic exchange diskettes on the 3776 or 3777 for either a diskette to line job or a diskette to diskette job. The latter would be used to compress records onto a "3770 native" format diskette (i.e., sectors 1, 4, 7, etc). Record compression is invoked by specifying the "compress" option in the Operator Job Definition. This option should be used for performance and transmission efficiency. The DUAL JOB facility can be used for the disk to disk operation while the printer is receiving data from the communication line. See chapter 4 of the 3770 Component Description Manual and chapter 2 of the 3776/3777 Operators Guide for additional information.

Records are compressed as follows:

1. Duplicate character and blank characters are compressed (space compression only for BSC) in each record.

2. As many 1 to 128 character records as possible are compressed into a single 256 or 512 byte buffer, with IRS characters inserted between the input records.

HIGHLIGHTS

1. On SLU 3770s, the media field is determined by the record length in the data set label. "Card" is used for a record length of 80 or less and "disk" is used for a record length greater than 80. "Disk" media (record length >80) is not always supported. See "Subsystem Inbound Processing," and "3770 Diskette Inbound Processing."

   On MLU 3770s, the media field is determined by the HOSTIN or INPUT definition.

2. The record length in the data set label determines the RU length. Without record compression IRS's are not inserted; with record compression IRS's are inserted after each record. Thus, if the record length were greater than 80 bytes and the restriction in #1 above was

overcome, the RJE subsystem would not process the record as expected (i.e., the 81st character would be assumed to be an IRS).

3. If the basic exchange terminal creates records lengths greater than 80 bytes, and you are not using JES, then you must:

   a. Change the record length to 80 bytes using a terminal with this capability, such as a 3740.
   b. Or modify the RJE subsystem to accept "Diskette" media FMH1's and insert IRS's where applicable on the creating terminal.

7.2.3 JES2 INBOUND PROCESSING

FMH Inbound Support:

1. Only 6 byte FMH Type 1's (FMH1) are supported (accepted).

2. The media field must be "card" (X'20') or EXCH (X'10'). If the media is card, JES2 expects the records to be 80 bytes or less. The 3770 sets the ERCL field to zero. If the mmedia is exchange with DST=1 then the EXCL field determines the record length. The 3770 will set the ERCL value up to 128 bytes, based on the record size in the data set label or the record length specified in the procedure definition for MLU terminals.

3. Console data is normally sent without an FMH1.

4. When an invalid FMH is received, a negative response X'1008' (Invalid FMH will be sent to the terminal).

Data Format Processing:

JES2 uses the ERCL field in the FMH1 to determine record size. If the ERCL field is zero, then JES takes the default of 80 bytes. JES2 scans the input record looking for an IRS character in order to logically deblock the input record. If no IRS is found in the first n (where n=the record length as determined above) charcters, the n t 1 character is assumed to be an IRS. Since IRS's are control characters, they are removed from the data characters by JES2.

For example, if JES2 received a "card" image data set (the MEDIA = card, DST=0, ERCL=0) and all records were less than 80 bytes, it would be processed as expected. If JES2 received a basic exchange data set (MEDIA=EXCH, DST=1, and ERCL=128) and all records were 128 or less, it would be precessed as expected. However, if JES2 received a "card" image data set (i.e., MEDIA=card, DST=0, and ERCL=0) containing 128 byte records without any IRS characters, JES2 would throw away the 81st byte, leaving127 bytes of data (bytes 82 through 128 becomes bytes 81-127).

7.2.4 VS1 INBOUND PROCESSING

FMH Inbound Support:

1. Only 6 byte FMH Type 1's (FMH1) are supported (accepted).
2. The media field must be "card" (X'20'). An inbound FMH1 specifying a media of diskette, console, or printer will be rejected.

**** There is a patch on RETAIN for VS1 (#AX16835) This patch allows acceptance by VS1 of other than card media (i.e., diskette media and console media).

3. Console data is normally sent without an FMH1.
4. When an invalid FMH is received, a negative response X'1008' (Invalid FMH) will be sent to the terminal. If the terminal is operating in unattended mode an error message will be printed on the host operator console. If operating in attended mode an error message will be printed on the 3770 console.

Data Format Processing:

VS1 expects the input record to be in "card image" format (record length of 80 or less). RTAM/VS1 scans the input record looking for an IRS character in order to logically deblock the input record. If no IRS is found in the first 80 characters, the 81st character is assumed to be an IRS. Since IRS's are control characters, they are removed from the data characters by VS1.

For example, VS1 received a basic exchange 128 byte record (installation of the above mentioned patch is assumed) without any IRS characters. VS1 would throw away the 81st byte, leaving 127 bytes of data (bytes 82-128 become bytes 81-127).

POWER/VS INBOUND PROCESSING

FMH Inbound Support:

1. Only 6 byte FMH Type 1's (FMH1) are supported (accepted).
2. The media field must be "card" (X'20'). An inbound FMH1 specifying a media of diskette, console, or printer will be rejected.

3. Console data is normally sent without an FMH1.
4. When an invalid FMH is received, a negative response X'1008' (Invalid FMH) will be sent to the terminal. If the terminal is operating in unattended mode an error message will be printed on the host operator console. If operating in attended mode an error message will be printed on the 3770 console.

Data Format Processing:

POWER/VS expects the input record to be in "card image" format (record length of 80 or less). POWER scans the input record looking for an IRS character in order to logically deblock the input record. If no IRS is found in the first 80 characters, the 81st character is assumed to be an IRS. Since IRS's are control characters, they are removed from the data characters by POWER.

For example, POWER RJE received a basic exchange 128 byte record without any IRS characters. POWER would throw away the 81st byte, leaving 127 bytes of data (bytes 82-128 become bytes 81-127).

7.2.7 JES2 OUTBOUND DATA

JES2 does support outbound data to a 3770 T-format diskette (SELECT=EXCHn), a basic exchange diskette (SELECT=BASICn), the console, card punch, and printer. A combination of the FMH1 contents (or lack of) and the disk switch setting at the SLU 3770 determines whether the data is routed to the RJE intended device or to the diskette. (See 3770 Outbound Processing for more information.) The media and subaddress fields of the FMH1 in conjunction with the media/subaddress to device assisgnment at the 3770 MLU terminal determines to what device the data is to be routed at the MLU 3770.

7.2.7.1 CONSOLE DATA

Console data is sent without an FMH1 and will be printed on the SLU console printer or the MLU console display.

7.2.7.2 CARD PUNCH DATA

1. The media field in the FMH1 is card (X'2').
2. The device address field in the FMH1 is the relative number of this punch as defined for this remote or as specified in the SELECT= operand of the Rnnn.PUm macro. In most cases this would be the first and only punch and would have a value of X'0'. The device address (subaddress) may be X'0'-X'F' for MLU 3770s, but must be X'0' for SLU 3770s.
3. Record length is a maximum of 255 bytes; default is 80 and normally should be specified.
4. Trailing blanks are truncated (i.e., if the last non blank column was column 52, then columns 53-80 would be truncated).
5. Compression is supported if GEN'D.
6. Transparency is supported if GEN'D.
7. IRS characters are inserted between each "card" image.
8. As many records as possible are contained in a 256 (512) byte RU.
9. Chainsize is dependent upon the CHAINSIZ parameter specification.
10. The data set is bracketed with an FMH1 (BDS) and an FMH1 (EDS).

7.2.7.3 PRINTER DATA (SYSOUT Data As Opposed To Console Data)

1. The media field in the FMH1 is printer (X'3')
2. The device address field in the FMH1 is the relative number of this printer as defined for this remote (i.e., a remote may have multiple printers defined to be used for different output classes) or as specified in the SELECT= parameter of the Rnnn.Pm macro. This field will normally be X'0'. This field may be X'0'-X'F' for MLU3770s, but must be X'0' for SLU3770s.
3. The record length has a maximum value of 255. This value must not exceed the values for &PRTSIZE or &PRFOTLW RMT generation parameters. Default is 120, 132 should normally be specified.
4. Compression is supported if GEN'D.
5. Compaction is supported by JES2 if GEN'D; supported by 3777-1 printer only.
6. Transparency is not supported for print data.
7. IRS characters are inserted between each print line.
8. Trailing blanks are truncated.
9. As many records (print lines) as possible are contained in a 256 (512) byte RU. Print records may be spanned across RU boundaries, but not across chains.
10. The chainsize is dependent upon the CHAINSIZ parameter specification for this remote printer.
11. The data set is bracketed with an FMH1 (BDS) and an FMH1 (EDS).

7.2.7.4 DISKETTE DATA

JES2 supports output data to either a 3770 T-format diskette or a 3770 basic exchange diskette. The SELECT= parameter of the Rnnn.PRm or Rnnn.PUm is used to define diskette output to JES2.
SELECT=EXCHn defines T-format diskette output. The device subaddress (n) may be X'1'-X'F' on MLU 3770 terminals and must be X'1' on SLU 3770s terminals. An FMH1 with media=EXCH, DST=0, and device address=(n-1) will be sent by JES2. Record size (LRECL) can be up to 255. Compacted data may not be sent to a T-format data set. Compressed data will be written in compressed form on the SLU 3770 and decompressed form on the MLU 3770.

SELECT=BASIC defines Basic Exchange diskette output FMH1 with media=EXCH, DST=1, ERCL=LRECL, and device address=(n-1) will be sent by JES2. Record size (LRECL) must be 128 or less. NOCCTL must be specified (i.e., data will not be compacted nor compressed).

7.2.8 VS1 OUTBOUND DATA

VS1 does not explicitly support outbound data to a 3770 diskette. It supports output to the console, card punch, and printer. A combination of the FMH1 contents (or lack of) and the disk switch setting at the SLU 3770 determines whether the data is routed to the RJE intended device or to the diskette. (See 3770 Outbound Processing for more information).

The media/subaddress fields in the FMH1 in conjunction with the media/subaddress assignment and the 3770 MLU terminal determines to what device the data is to be routed at the MLU 3770 terminal.

7.2.8.1 CONSOLE DATA

Console data sent without an FMH1 will be printed on the SLU 3770 printer (console) or MLU 3770 console display.

7.2.8.2 CARD PUNCH DATA

1. The media field in the FMH1 is card (X'2').
2. The device address field in the FMH1 is the relative number of this punch as defined for this remote. In most cases this would be the first and only punch and would have a value of X'0'. The device subaddress may be X'0'-X'F' on MLU 3770 terminals and must be X'0' on SLU 3770s terminals.
3. Record length is a maximum of 80 bytes.
4. Trailing blanks are truncated (i.e., if the last non blank column was column 52, then columns 53-80 would be truncated).
5. Compression is supported if GEN'D.
6. Transparency is supported if GEN'D.
7. IRS characters are inserted between each "card" image.
8. As many records as possible are contained in a 256 (512) byte RU.
9. Chainsize is dependent upon the VBUF parameter specification.
10. The data set is bracketed with an FMH1 (BDS) and an FMH1 (EDS).

7.2.8.3 PRINTER DATA (SYSOUT Data As Opposed To Console Data)

1. The media field in the FMH1 is printer (X'3').
2. The device address field in the FMH1 is the relative number of this printer as defined for this remote (i.e., a remote may have multiple printers defined to be used for different output classes). This field will normally be X'0'. The device subaddress may be X'0'-X'F' on MLU 3770 terminals and must be X'0' on SLU 3770s terminals.
3. The record length has a maximum value of that specified in the GEN for this remote printer. Normally 132 for 3770.
4. Compression is supported if GEN'D.
5. Compaction is supported by VS1 if GEN'D; supported by 3776-3,4 and 3777-1,3 printers only. If compacted data is routed to a 3770 MLU basic exchange diskette, the data will be decompacted and truncated to 128 bytes before being written to diskette.
6. Transparency is not supported for print data.
7. IRS characters are inserted between each print line.
8. Trailing blanks are truncated.
9. As many records (print lines) as possible are contained in a 256 (512) byte RU. Print records may span RU boundaries, but not chains.
10. The chainsize is dependent upon the VBUF parameter specification.
11. The data set is bracketed with an FMH1 (BDS) and an FMH1 (EDS).

7.2.9 POWER/VS OUTBOUND DATA

POWER/VS does not explicitly support outbound data to a 3770 diskette. It supports output to the console, card punch, and printer. A combination of the FMH1 contents (or lack of) and the disk switch setting at the SLU 3770 determines whether the data is routed to the RJE intended device or to the diskette. (See 3770 Outbound Processing for more information).

The media/subaddress fields in the FMH1 in conjunction with the media/subaddress assignment and the 3770 MLU terminal determines to what device the data is to be routed at the MLU 3770 terminal.

7.2.9.1 CONSOLE DATA

Console data sent without an FMH1 will be printed on the SLU 3770 printer (console) or MLU 3770 console display.

7.2.9.2 CARD PUNCH DATA

1. The media field in the FMH1 is card (X'2').
2. The device address field in the FMH1 is the relative number of this punch as defined for this remote. In most cases this would be the first and only punch and would have a value of X'0'. The device subaddress may be X'0'-X'F' on MLU 3770 terminals and must be X'0' on SLU 3770s terminals.
3. Record length is a maximum of 80 bytes.
4. Trailing blanks are truncated (i.e., if the last non blank column was column 52, then columns 53-80 would be truncated).
5. Compression is supported.
6. Transparency is supported if GEN'D.
7. IRS characters are inserted between each "card" image.
8. As many records as possible are contained in a 256 byte RU.
9. The data set is bracketed with an FMH1 (BDS) and an FMH1 (EDS).

7.2.9.3 PRINTER DATA (SYSLST Data As Opposed To Console Data)

1. The media field in the FMH1 is printer (X'3').
2. The device address field in the FMH1 is the relative number of this printer as defined for this remote (i.e., a remote may have multiple printers defined to be used for different output classes). This field will normally be X'0'. The device subaddress may be X'0'-X'F' on MLU 3770 terminals and must be X'0' on SLU 3770s terminals.
3. The record length has a maximum value of that specified in the GEN for this remote printer. Normally 132 for 3770.
4. Compression is supported if GEN'D.
5. Compaction is supported by POWER if GEN'D; supported by 3776-3,4 and 3777-1,3 printers only. If compacted data is routed to a 3770 MLU basic exchange diskette, the data will be decompacted and truncated to 128 bytes before being written to diskette.
6. Transparency is not supported for print data.
7. IRS characters are inserted between each print line.
8. Trailing blanks are truncated.
9. As many records (print lines) as possible are contained in a 256 byte RU. Print records may span RU boundaries, but not chains.
10. The data set is bracketed with an FMH1 (BDS) and an FMH1 (EDS).

7.2.11 3770 OUTBOUND PROCESSING

7.2.11.1 DEVICE SELECTION

<u>Never Routed To Diskette</u>

The following data can never be routed to the diskette.

1. Data that does not have an FMH1 preceeding it (console data).
2. Data following an FMH1 which has console X'0' in the media field (console data), except on MLU 3770s.
3. Compacted data destined for a 3777-1 printer. FMH1: media field=printer (X'3') and CPI (byte 4 bit 6)=compacted data (B'1').
4. Compacted data destined for a 3770 MLU T-format data set.

NOTE: These exceptions override any general comments related to device selection that follow.

SLU 3770 DEVICE SELECTION:

<u>Disk Switch Off</u>

If the disk switch is "OFF", data will be routed to the output device selected by the CPU, or to the printer if device selection is not sent by the CPU.

For those RJE subsystems, all except JES2, that <u>do not</u> specify the media field in the FMH1 as diskette (X'1'), the diskette <u>will never be</u> selected for RJE outbound data. (See Sense Codes X'1008' and X'0825').

<u>Disk Switch On</u>

With the disk switch "ON", all data (excluding the above exceptions will be routed to the diskette. Note, the diskette must be created with a Code/02 function (i.e., 3770 native mode).

In addition, if the FMH1 media field selects a valid 3770 device which is not configured on the terminal, the data will go to diskette.

The disk switch must be turned "OFF" before a dual data path job is started.

MLU 3770 DEVICE SELECTION:

MLU device selection will depend upon the media/subaddress to device assignment at the 3770 MLU terminal (eg., via a procedure definition).

A device can be selected (assigned) for any media/subaddress combination and for output from local devices with the following exceptions:

1. Data with no FMH1 will go to the console display.

2. Compacted data may not be routed to a T-format data set.

3. T-format data sets may be selected from the line only. T-format data sets may not receive data from other 3770 local devices.

7.2.11.2 DISKETTE FORMATS

SLU 3770 FORMATS:

The SLU data set name is that name specified at 3770 start job time. If a data set name was not specified, the 3770 assigns data set names beginning with SL00.

IGNORE EDS (Code/X) not selected: The data set name will be incremented for each data set (e.g., SL00,SL01,SL02,...). An FMH1 (EDS) will cause the current data set to be closed. A succeeding FMH1 (BDS) will cause the data set name to be incremented and the new D.S. to be opened.

IGNORE EDS (Code/X) selected: The data set name will remain the same. An FMH1 (EDS) will cause the current data set to be closed. A succeeding FMH1 (BDS) will cause the same data set to be reopened.

Note that each time a data set is opened or closed (if the EOD pointer is changed), the diskette arm must travel to track 0 (the label track). Seek time is 54 m.s. per track.

MLU 3770 FORMATS:

The MLU 3770 data set name is that name specified in the procedure or definition being executed. An option is available, where the 3770 MLU will assign the data set name. The algorithm used for system generated data set names is somewhat different than the 3770 SLU; although, the format is the same (i.e., SLxx). The last two digits, xx, are based upon the time-of-day. Thus, you could not expect the first three data sets to have the names SL00, SL01, SL02.

The ignore EDS option can be accomplished on an MLU 3770 by re-executing a procedure with the same data set name.

<u>Non-Basic Exchange Data Sets</u>:

A "T" formatted data set is created by the 3770; which means that the FMH1 is placed in the 1st record of the data set.

Two (four, if 512 byte RU's) 128 byte sectors will be written per RU.

If the RU contains fewer than 256 (512) bytes of data, the 3770 will pad with nulls before writing the diskette.

The extent of each chain (OC or LOC) is mainted by inserting an IUS in the buffer before writing the diskette.

Compressed data is written to diskette in compressed format.

Transparent data is written to diskette in transparent format.

Remember the 3770 dumps its buffers to diskette; thus, the format is the same as that created by the host subsystem, with the exception of padded nulls and IUS insertion.

Basic Exchange Data Sets:

Only data received at an MLU 3770 or Basic Exchange data received from JES2 can be written to a basic exchange data set.

A host created basic exchange data set will have an FMH1 with media=diskette (X'1'); DST=B'1' (basic exchange); and ERCL=the record length in HEX for basic exchange data sets.

***Only JES2 will build an FMH1 as described above.

The 3770 uses the record length specified in the ERCL field to deblock the records in an RU. If the RU contains an uneven multiple of the specified record length, the record is padded with nulls to force an even multiple.

One record per 128 byte sector is written to diskette. If the record length is less than 128, the 3770 will pad with nulls.

A basic exchange data set may contain multiple chains, but the extent of the chains is lost once the data is written to diskette (i.e., no IUS characters are inserted).

Basic exchange data containing compressed data are not supported on on an SLU 3770. Compressed/compacted data will be decompressed/ decompacted on 3770 MLU terminals and truncated to 128 bytes prior to being written to basic exchange diskette.

See problem #2 in Section 7.2.1.

7.2.12 DISKETTE EXCHANGE BETWEEN IBM EQUIPMENT

- Non-3770 diskettes cannot be written on by the 3770 in BSC mode.
- In SDLC mode, data received from the communication line, defined as exchange data, can be written on an SDLC exchange diskette (refer to the System Components manual Appendix E - some non-3770 diskettes can accept this data). "Defined as exchange data" means the FMH1 has the media field=diskette, the DST field=1 (basic exchange) and the ERCL field=xx (the record length).
- Non-3770 diskettes can be read by the 3770 if they adhere to the rules for basic exchange format, and the record length does not exceed 128 characters. (May not be acceptable to RJE if record length exceeds 80 bytes).
- ASCII or EBCDIC compatibility must be maintained.
- For a SLU 3770, a diskette written in 256-byte mode should be read in 256-byte mode (EXTEND BUFFER switch off), or if written in 512-byte mode must be read in 512-byte mode (EXTEND BUFFER switch on).
- A data set written in BSC mode can be read later in SDLC mode, but any BSC space compression sequences will be ignored.
- A data set written in SDLC mode cannot be read later in BSC mode.
- MLU 3770 and SLU 3770 basic exchange diskettes are compatible. MLU 3770 and SLU 3770 T-format diskettes are compatible.

Following are some general steps to follow in order to determine if diskettes are interchangeable between two different terminals.

1. Determine the Volume Label content created by Product A. The volume label fields are written at diskette creation (or initialization) on Product A. Most products (terminals) allow the creation of diskettes to be used for exchanging data with other terminals, as well as diskettes to be used only on the terminal family on which it was created (native mode).

2. Next determine the data set labels (HDR1 labels) that Product A will write on a diskette with the particular Volume Label it just created. The Data Set Labels define the data sets written on the diskette, and there is one Data Set Label per data set.

3. Next find out if Product B will read the Product A Data Set label and the associated Data Set on the Product A created diskette.

4. If Product B will read the Data Set label and associated Data Set written by Product A, the exchange of the Data Set information is possible.

The above mentioned information related to 3770 diskette processing can be found in Appendix E of the 3770 System Components manual (GA27-3097, GA27-3145, or GA27-3146).

7.3 COMPRESSION AND COMPACTION

The RJE subsystems support both compression and compaction. See the appropriate subsystem generation section for specifying support.

The bind parameters must specify the support desired for a given session. See the sections on bind construction (6.2.2 for JES2 and 6.2.3 for RES).

The 3770's support compression and compaction as follows:

1. Only the 3776-3,4 and 3777-1,3 support compaction; outbound only.
2. All models support compression.

See section 9.6 and D.3 for usage guidelines.

8 RJE OPERATIONAL PROCEDURES AND COMMANDS

8.1 3770 OPERATIONAL PROCEDURES

Also see sections 8.2 and 8.3 for associated host programs related operational procedures.

8.1.1 TERMINAL INITIALIZATIONN

SLU 3776/3777:

STEP	DESCRIPTION
1. Power on the 3776 with extended buffer off	*This switch setting takes effect only after "POWER ON" or "SYSTEM RESET".
2. Wait until only the proceed light is on	
3. Load OJD's into 3770	Put disk switch "ON" to load OJD from diskette #1.
3a Put OJD card in reader and ready reader	
3b Enter Code/4 on keyboard	
4. Set up printer align forms at top of page	If 3777-1, load print train buffer if other than the default train image is desired (Code/9n, where n=the train desired); reset line counter.
5. Press CODE/START JOB	
6. Press CODE/M	*Select manual disconnect, if dial network.
7. Press CODE/U	Select upper case Alpha (needed for RJE commands except VS1R6 for SNA).
8. Press CODE/K	*Select 8 lines/inch.
9. Select Forms Definition	*Load FCB desired at 3770.
9a Hold PRINT=ON	
9b Press CODE/8	Select forms definition.
9c Enter 1	*Select forms definition contained in OJD #1.
9d Hold PRINT=OFF	
10. If dial line, establish link	If leased line or host-to-3770 dial operation skip this step.
10a Press START JOB	10a, 10b, 10c starts a com-
10b Enter S08	munication line to printer job,

10c Press EOM	which places the 3770 in communicate mode.
10d Make physical line	This is a 3770 to host dial example. If the host were dialing out to the 3770, skip #10.
10e Press CODE/START JOB	Stop the "dummy" line to printer job and log on.
11. Insure the disk, alarm, and hold print switch are in their proper position as defined by your installation environment.	

*Denotes this entry is installation dependent.

MLU 3776/3777:

1. Set up printer - align forms at top of page.
2. POWER on the MLU 3770. "POWER ON" causes the following to occur:
   a. Execute 3770 internal diagnostics.
   b. Operator prompts for Date/Time and Line Enable=(YES,NO).
   c. The Terminal Initialization Program (TIP) to be invoked.

   The TIP, among other things, will assign a customer predefined default carriage control and default print train image. Optionally, HOSTOUT definitions (i.e., job definitions including device assignment, carriage control, print train, data set name, etc.) may be invoked by the TIP. Logon commands may also be predefined and automatically transmitted by the TIP.

   Keyboard input data to the host is always in upper case.

   Proper planning should be exercised in defining the TIP and the associated procedures. This will, in most cases, be done by host site personnel.

8.1.2 LOGON

(Also see Section 6.1).

SLU 3776/3777:

STEP	DESCRIPTION
1. Press SYSTEM REQUEST	
2. Enter RMT95	The exact form at the logons is dependent upon host defined USSTAB's and/or host defined names. The exact logon should be obtained from the host site system programmer. The long form of the logon is LOGON APPLID (application name)

	LOGMODE (logmode entry name) DATA (application data) where: Application name=JES2 or RTAM Logmode Entry name=BATCH (IBM supplied) Application data=RMTnn for JES2 (nn=the remote number) =PROC name for RTAM
3. Press EOM	
4. Press START JOB	Start a communication job, which will cause the 3770 to invoke communicate mode; thus, allowing the logon to be transmitted to the host.
5. Enter S08	*
6. Press EOM	The on line light comes on when the logon has been processed by the host and a session has been successfully initiated. If you did an outbound job (i.e., line to printer) in Step 5 and there is no output for your remote, you should do a CODE/START job and proceed with an inbound job. If you did an inbound job (i.e., card to line) in Step 5, the job will begin.

MLU 3776/3777:

You may logon from MLU 3770 in one of three ways:

1. Have the name of a predefined SSCP procedure, containing the logon message, in the TIP. This will cause the logon to be automatically transmitted at power on or system reset time.

2. a) Press the TERM REQ key,
   b) Use the EXECUTE command to execute a predefined SSCP precedure, and
   c) press EOM.

3. a) Press the SSCP REQ key,
   b) key the logon message,
   c) press EOM.

8.1.3 CARD TO LINE JOB (TRANSPARENT DATA)

SLU 3776/3777:

To send transparent card data (or non-compressed data) to the host the job must have previously been defined in an operator job definition (OJD) and loaded into the 3770 if necessary (see Section 8.1.1). The OJD must define the DEV=field as 30T.

When the on-line, stand-by, and proceed lights are on:

```
     Press   START JOB
     Enter n  where n is the OJD number
     Press    EOM
```

MLU 3776/3777:

Execute a predefined HOSTIN procedure or EXECUTE the INPUT command and complete the associated prompts.

If Hot Card Reader with transparency is active, then place the cards in the card reader and press the START button.

8.1.4 LINE TO DISKETTE JOB (MULTIVOLUME)

SLU 3776/3777:

Place the "Disk" switch in the ON position.

Start a line to printer, line to punch, or line to disk job (either a system job or an operator defined job).

NOTE: Output which can be directed to the diskette is described in Section 7.2.7.1.

NOTE: If the data set becomes full (multi-volume), a second diskette drive is not available, and the 3770 is operating in unattended mode (Code/Z) a negative response (with sense X'081C' will be sent by the 3770 and the RJE subsystem will terminate the session. If not operating in unattended mode a negative response indicating intervention required (X'0802') will be sent by the 3770 after three minutes.
If a second diskette drive is available and a diskette is loaded, processing will continue on the second diskette.

MLU 3776/3777:

Execute a predefined HOSTOUT procedure or EXECUTE the OUTPUT command and complete the associate prompts.

8.1.7 LINE TO PRINTER JOB

8.1.7.1 INTERRUPT THE PRINTER

SLU 3776/3777:

If you wish to interrupt the printer in order to enter commands (hold printout, cancel printout, restart printout), or read in cards or diskette data, follow these steps:

1. Press "ATTN".
2. Wait for "STANDBY" light.
3. Enter commands or start card RDR/diskette.
4. If 3 was INTERRUPT PRINT or HOLD JOB then either align paper or enter further commands.
5. If 3 or 4 was STOP PRINTER or HOLD JOB then restart printer or release job if required.

See section on commands to determine which are applicable.

MLU 3776/3777:

Since the MLU 3776/3777 has a console and will normally have multiple sessions, it should not be necessary to interrupt the printer to input RJE commands or data. If it becomes necessary, the MLU terminal will interrupt and restart the printer without operator intervention.

8.1.7.2 PAPER JAM OR END OF FORMS

SLU 3776/3777:

1. Turn HOLD PRINT switch "on".
2. Stop Job (code and start job keys)
3. Wait until standby light comes on (up to 15 seconds)
4. Enter the command to stop the printer (may require ATTN key).
5. Fill in LOAD/RELOAD forms.
6. Turn off HOLD PRINT switch.
7. Enter command to restart printer.

MLU 3776/3777:

1. Press APPL REQ, enter command to stop the printer, press EOM (printer will probably be automatically stopped by JES).
2. Fix/Load/Reload forms
3. Press PRTR START key on 3776 or START key on 3203 printer (for 3777).
4. Press APPL REQ, enter command to restart the printer, press EOM.

8.2 JES2 COMMANDS AND ENTRY

8.2.1 JES2 INITIALIZATION

For normal logon procedures, the $S LGN1 command should be issued after VTAM has been started. (When VTAM has been started, both the network controllers or communication links needed to establish a path to the remote station and the physical unit and logical unit associated with the station must be activated). To allow an SNA remote station to log on, the operator must also issue a $S LNEn to activate a line to VTAM for the SNA/RJE station.

All commands for JES2 from an SNA terminal may begin with any character. In the examples a $ is used. Blanks may be used within JES2 commands, but are ignored. If a blank is actually required in a display message command, the message must be enclosed in quotes. More than one command may be entered on a line by entering semicolons between commands, for example, $PPR1;IPR1. JES commands entered from a 3770 card reader or diskette must be preceded by a /* (eg., /*$da). The OS/VS2 MVS JES2 Commands Manual explains all the commands that can be entered on the 3770. The appendix in the back of the JES2 Command Manual shows the commands that are valid from a remote workstation. The most commonly used ones are shown below.

8.2.2 MONITOR JOBS AT HOST

$DA

Displays information about currently active jobs.

$DN

Display a job's number, name, status, class, and priority.

$DQ

Display the number of jobs in a particular queue.

8.2.3 CONTROLLING OUTPUT FROM THE HOST

$AJn

Release a job that has been held.

$BPR1,n

Backspace the printer n pages.

$CPR1

Cancel the output that is currently printing.

$CJn

Immediately terminate a job that is executing or awaiting execution.

$CJn,P

Immediately terminate a job and cancel its output.

$DMRO,'message'

Display a message to the host computer operation.

$DU,RMTn.PR1

Display information about the printer on remote n. This information includes special forms, print train, forms control buffer, etc.

$EPR1

Restart the job that is currently printing. It is returned to the printer queue and will start printing again if the printer has not been stopped and there are no higher priority jobs waiting.

$FPR1,n

Forward space the printer n pages.

$FPR1,D

Forward space the printer to the end of the data set.

$HJn

Hold job n. If a job that is awaiting printing is held by the operator it will not be released for printing until the operator enters a $AJn command.

$IPR1

Interrupt printing. The job that is currently printing will be stopped and its output requeued. When printing starts again JES2 will automatically backspace one or more pages. If the printer backspaces too far, ask the systems programmer to check the line count value for the job. You should hold the job before interrupting the printing to prevent the output from restarting immediately.

$LJn or $LJn-n or $L 'JOBNAME' or $LJn-n,HOLD

Display the amount of output for a job. The operator could key

$LJ1-999,HOLD to display the output waiting for all jobs for his terminal with job numbers between 1 and 999 that are held.

$NPR1

Repeat the printing of a job. The job that is currently printing will print again after it finishes the current copy.

$OQ

Release all held output for this terminal.

$OQ,CANCEL

Cancel all held output for this terminal.

$OQ,Q = CLASSES

Release all held output in specified classes.

$OQ,CANCEL,Q=CLASSES

Cancel all held output in specified classes.

$PPR1

Stop the printer from starting any more jobs after completion of the current job.

$RPRT,J=n,D=Rm

Route the printer output for job n to remote m.

$SPR1

Start printer 1.

$TPR1,F=FORM

Notify JES2 that special forms are in a printer. Any output requiring these forms may now be selected by JES2 for printing.

8.2.4 SPECIAL FORMS HANDLING

Output print jobs in the Job Entry System are identified as to form type (pre-printed paper), print belt and forms control block data. Depending on the choices made in defining the job entry system (discussion in section 2.2), output will be queued and may be grouped and released by an operator command. Also, the job may either be preceded by forms control information (the actual FCB) or the 3770 operator may need to change the job definition controlling the 3770. The response (after setting up) is $T as shown below.

$DF

Use this command to find what jobs are queued for output and what forms and output class they required.

$DU,RMTn,PRn

The $DU command allows the operator to see if his printer is set correctly for receiving the output that is queued for his terminal.

$TPR1,F=FORM,Q=CLASS

If special forms output is waiting, the operator should change forms in the printer and then issue the $T command to notify JES2 that the forms are in the printer. He can also notify JES2 that the terminal is ready to process a particular class of output by using Q=CLASS.

8.2.5 PRINT RECOVERY AND FORMS ALIGNMENT

Paper loading and positioning are covered in detail in the 3770 Operations Guide. If the output on the printer prints incorrectly due to a forms jam or incorrect paper alignment, the operator can restart printing at the beginning of the report using the $BPR1,D command or he can backspace a given number of pages by entering $BPR1,n.

Usually the operator will want to stop JES2 from sending data to the printer to allow him to adjust it. To do this enter the following commands:

$PPR1

Stop JES2 from selecting this printer for additional output.

$IPR1

Interrupt the job thats printing and return it to the print queue. When the printer stops, the operator can adjust it.

$SPR1

After the printer has been adjusted it must be restarted.

8.3 RTAM COMMANDS AND ENTRY

8.3.1 STARTING RTAM

After IPL and the associated creation of the RTAM partition, the central operator can initiate remote processing by giving a start command for the RTAM procedure. See the VS1/RES System Programmer's Guide for an example of an RTAM procedure.

If SNA workstations are specified (PORTS not equal zero in the RTAM macro), the RTAM procedure identifies itself to VTAM by opening a VTAM ACB. If any SNA workstations are to be permanently logged on, LOGON statements for them must be in the permanent logon data set. These users are permanently logged on (via SIMLOGON) every time the VTAM ACB is opened.

If the VTAM interface is not established for SNA workstations, but BSC lines are defined, processing starts for BSC workstations. If no BSC lines are defined, STOP processing is executed and RTAM waits for another START command. If the VTAM interface is not established because VTAM has not been previously started, the operator receives a message. After VTAM is started, the operator can issue:

1. Another START command for RTAM, if RTAM is not already started for BSC lines, or
2. MODIFY RTAM,V=Y if RTAM has been started for BSC lines. (See discussion of MODIFY command in the VS1/RES System Programmer's Guide).

Readers and writers associated with workstation devices are started by logon procedures or by START commands given by either the central operator or a workstation user.

<u>STOPPING RTAM</u>

The central operator begins termination of RTAM processing by issuing the STOP command. When the command processor recognizes a STOP command for RTAM:

1. RTAM allows no new LOGON commands from remote users and no new starts (MODIFY V=Y, START or RESTART).
2. If any SNA workstations are active, message IFS525I is issued to the central operator. Stop processing is completed only when there are no SNA workstations being used.
3. If no SNA workstations are active, STOP is immediate.

8.3.2 RES/RTAM WORKSTATION COMMANDS

The VS1/RES Workstation User's Guide (GC28-6879) very adequately describes the use of the workstation commands. Figure 3, "VS1 Operator Commands

Valid From RES Workstations", defines the command subset available to the workstation operator. Part III of that manual contains a summary of workstation commands.

8.4 POWER/VS COMMANDS AND ENTRY

8.4.1 SINGLE LOGICAL UNIT MODELS

8.4.1.1 LOGON

OPERATOR DESIRES TO	OPERATION IN PROCESS	3770 STATE	ACTION SEQUENCE OPERATOR ACTION	HOST RESP
LOGON TO POWER/VS	NONE	PROCEED ON		
			PRESS SYSREQ	
				UNLOCK KB
		PROCEED ON KB UNLOCKED		
			ENTER LOGON EOM	
				1V09I ISSUED (IF LOGON IS SUCCESSFUL
		PROCEED ON KB UNLOCKED ON LINE ON STANDBY ON		

8.4.1.2 ENTER COMMAND

OPERATOR DESIRES TO	OPERATION IN PROCESS	3770 STATE	ACTION SEQUENCE OPERATOR ACTION	HOST RESP
ENTER CMD (DISPLAY ALTER, ETC.)	NONE	PROCEED ON KB UNLOCKED STANDBY ON ON LINE ON		
			ENTER CMD EOM	
				NORMAL CMD RESPONSE
		PROCEED ON KB UNLOCKED STANDBY ON ON LINE ON		
	JOB INBOUND	ON LINE ON READER ON		
			ENTER CMD IN CARD FORM OUTSIDE JOB BOUNDARY OR WAIT UNTIL JOB COMPLETES	
				NORMAL CMD RESPONSE
		PROCEED ON KB UNLOCKED STANDBY ON ON LINE ON		
	JOB OUTBOUND	ON LINE ON PRINTER ON		
			PRESS ATTN	
				OUTBOUND STOPS KB UNLOCKS
		PROCEED & STANDBY ON		
			ENTER CMD EOM	
				NORMAL CMD RESP OUTBOUND JOB CONTINUES

8.4.1.3 ENTER JOB

OPERATOR DESIRES TO	OPERATION IN PROCESS	3770 STATE	ACTION SEQUENCE OPERATOR ACTION	HOST RESP
ENTER JOB	NONE	PROCEED ON		
		KB UNLOCKED		
		STANDBY ON		
		ON LINE ON		
			PLACE DECK IN	
			READER & READY IT	
			PRESS START JOB	
			ENTER 'S30'	
			EOM	
				JOB READ
		ON LINE ON		
		READER ON		
	JOB OUTBOUND			
		ON LINE ON		
		PRINTER ON		
			PRESS ATTN	OUTBOUND
				STOPS
				KB UNLOCKS
			PLACE DECK IN	
			READER & READY IT	
			PRESS 'START JOB'	
			ENTER 'S30'	
			EOM	
		ON LINE ON""JOB READ		
		PRINTER ON		
		PRINTING RESUMES AT EOF		

8.4.1.4 RECEIVE OUTPUT

OPERATOR DESIRES TO	OPERATION IN PROCESS	3770 STATE	ACTION SEQUENCE OPERATOR ACTION	HOST RESP
RECEIVE OUTPUT	NONE	PROCEED ON KB UNLOCKED STANDBY ON ON LINE ON	ENTER S LST,CLASS COMMAND	SENDS OUTPUT FOR MATCHING REMOTE ID
	JOB INBOUND	ON LINE ON READER ON	SINCE POWER DOES NOT SUPPORT INBOUND INTERRUPTION, THE JOB MUST BE COMPLETE (I.E., PHYSICAL READING) BEFORE OUTPUT CAN BE TRANSMITTED TO THE TERMINAL	
		NOTE: OUTPUT WILL BE SENT AUTOMATICALLY WHILE THE START COMMAND IS IN EFFECT. THERE IS A PAUSE AT OUTPUT JOB BOUNDARIES TO ALLOW AN INBOUND JOB OR COMMAND TO BE SUBMITTED.		

8.4.1.5 CHANGE FORMS

OPERATOR DESIRES TO	OPERATION IN PROCESS	3770 STATE	ACTION SEQUENCE OPERATOR ACTION	HOST RESP
CHANGE FORMS & BUFFER	FORMS CHANGE MESSAGE 1Q40A FOLLOWED BY MESSAGE 1V17A	ON LINE ON PRINTER ON		
			PRESS ATTN. MOUNT FORMS ENTER SETUP CMD. ** SEE NOTE **	KB UNLOCKS
				PRINT SETUP PAGES REPEAT MSG 1V17A
			REPEAT ABOVE SETUP STEPS AS NEEDED	
				REDISPLAY MSG 1V17A
			PRESS ATTN ENTER GO CMD.	KB UNLOCKS PRINTING OF OUTPUT STARTS
		ON LINE ON PRINTER ON		

** NOTE ** If the forms change requires an equivalent change in forms definition, the change must be accomplished before the setup command is issued. The operator must select one of the five forms definitions that have been previously loaded via operator defines jobs. If a forms definition is required that is not one of the five existing ones, then the operator must LOGOFF in order to enable the terminal to accept additional job definitions. Once the new ones have been loaded, the operator can LOGON, start the printer, select the appropriate definition, and resume operation.

8.4.1.6 FLUSH JOB

OPERATOR DESIRES TO	OPERATION IN PROCESS	3770 STATE	ACTION SEQUENCE OPERATOR ACTION	HOST RESP
FLUSH JOB	JOB OUTBOUND			
		ON LINE ON PRINTER ON		
			PRESS ATTN	
				OUTBOUND STOPS KB UNLOCKS
		PROCEED & STANDBY ON		
			ENTER FLUSH CMD EOM	
				ISSUE FLUSH MESSAGE

8.4.1.7 SIGNOFF

OPERATOR DESIRES TO	OPERATION IN PROCESS	3770 STATE	ACTION SEQUENCE OPERATOR ACTION	HOST RESP
SIGNOFF ""KB UNLOCKED	NONE	PROCEED ON STANDBY ON LINE ON	ENTER SIGNOFF CMD	MSGS 1V11I & 1V12I ISSUED
	JOB INBOUND			
	JOB OUTBOUND			

** NOTE ** The SIGNOFF and LOGOFF...TYPE(COND) are equivalent commands.

8.4.2 MULTIPLE LOGICAL UNIT MODELS

With the capability of establishing up to six concurrent sessions on the MLU models of the 3776 and 3777, it is no longer necessary to interrupt inbound or outbound operations in order to enter a command. These commands, such as PDISPLAY or PALTER, can be sent on a free session by pressing the application request key, entering the command, and specifying the session to be used (1 through 6) to send the command. POWER will direct the response to the command to the console and use whichever session is free at the time.

If a session is specified which is currently in use for inbound processing, the 3770 MLU terminal will save this request and send it to POWER when the session is available. (The terminal will give the message 'L252 APPL REQ QUEUES TO SESSION 1' in this case.)

On the other hand, if a session is specified for the command which is currently being used for outbound processing, the terminal will interrupt the session to transmit the command and issue an appropriate message.

The terminal also issues messages when inbound and outbound jobs are begun and when they have ended. An indication of the session being used is given. This can help in deciding which session should be used for commands so as not to interrupt input or output.

8.4.2.1 MLU LOGON

Example of MLU logon sequence as displayed on the 3770 console:

```
13.20.06 TERMINAL STARTED
13.22.05 L243 PU ACT
13.22.10 L259 LU 1 ACT
13.22.11 L259 LU 2 ACT
13.22.12 L259 LU 3 ACT
13.22.13 L259 LU 4 ACT
13.22.14 L259 LU 5 ACT
13.22.16 L259 LU 6 ACT
13.22.44 S-1- LOGON APPLID(POWER) LOGMODE(BATCH) DATA('006')
13.22.45 S-2- LOGON APPLID(POWER) LOGMODE(BATCH) DATA('006')
13.22.46 S-3- LOGON APPLID(POWER) LOGMODE(BATCH) DATA('006')
13.22.46 S-4- LOGON APPLID(POWER) LOGMODE(BATCH) DATA('006')
13.22.47 S-5- LOGON APPLID(POWER) LOGMODE(BATCH) DATA('006')
13.22.47 S-6- LOGON APPLID(POWER) LOGMODE(BATCH) DATA('006')
13.22.52 L271  SESS 1 BOUND
13.22.52 L271  SESS 6 BOUND
13.22.52 L271  SESS 5 BOUND
13.22.57 L271  SESS 2 BOUND
13.22.57 L271  SESS 3 BOUND
13.22.57 L271  SESS 4 BOUND
13.23.28 S-1- 1V09I  REMOTE 006 LOGGED ON TO POWER ON P76ALU1
13.23.31 S-1- 1V09I  REMOTE 006 LOGGED ON TO POWER ON P76ALU2
13.23.43 S-1- 1V09I  REMOTE 006 LOGGED ON TO POWER ON P76ALU3
13.23.44 S-1- 1V09I  REMOTE 006 LOGGED ON TO POWER ON P76ALU4
13.23.45 S-1- 1V09I  REMOTE 006 LOGGED ON TO POWER ON P76ALU5
13.23.45 S-1- 1V09I  REMOTE 006 LOGGED ON TO POWER ON P76ALU6
```

8.4.2.2 ENTER COMMANDS

Example of entering a display command:

```
Press APPL REQ
Enter M = D RDR                                         S=1
Displayed on the console:
13.30.01 S-2- 1R46I  READER QUEUE   P D C FROM         CARDS
              1R46I  AIDSLIST 00011 5 * 4 006              7
13.30.02 S-1- 1R46I  SYSLIST  00009 5 * A 006              6
```

8.4.2.3 ENTER JOB

Example of entering a job from the card reader:

```
16.31.24 L265  INPUT STARTED, SESS 6, M/SA=C/0, DEV=CR
16.34.13 L266  INPUT ENDED, SESS 2, M/SA=C/0, DEV=CR
```

By specifying a record length of 80 bytes on an exchange media diskette, jobs can be entered from diskette to POWER/VS. It is also possible to concatenate diskette data sets with the MLU models by specifying additional input in a HOSTIN procedure. The example below shows the console messages issued for the input process

```
Press TERM REQ
Enter: C = EXEC
Enter: NAME = POWERIN    (Name of the HOSTIN procedure)
       STARTING REC = 1
16.40.25 L265  INPUT STARTED, SESS 1, M/SA=C/0, DEV=D2
16.42.26 L266  INPUT ENDED, SESS 1, M/SA=C/0, DEV=D2
```

8.4.2.4 RECEIVE OUTPUT

The example below shows the sequence for receiving output:

```
Press APPL REQ key
Enter: M = S LST,A
16.25.24 S=1> S LST,A
16.25.28 L268  OUTPUT STARTED, SESS 1, M/SA=P/0, DEV=PR
16.36.17 L269  OUTPUT ENDED, SESS 1, M/SA=P/0,DEV=PR
```

8.4.2.5 CHANGE FORMS

An example of a forms change sequence on the MLU model is shown below:

```
Press APPL REQ key
Enter: M = S LST,A
16.38.12 S=1> S LST,a
16.38.17 S=2 1Q40A  ON LST1  FORMS ABCD NEEDED FOR POWEROUT
             00076
16.38.26 L268  OUTPUT STARTED, SESS 1, M/SA=P/0, DEV=PR
```

```
16.38.30 S=2 1V17A  LST1 SUSPENDED FOR FORMS MOUNT
16.38.44 S=1> G LST
16.43.24 L269  OUTPUT ENDED, SESS 1, M/SA=P/0,DEV=PR
```

9 SDLC PERFORMANCE ON POINT-TO-POINT LINES

Several factors affect the performance of SNA terminals when they are used for batch output on point to point lines. This section addresses several performance tuning considerations.

Several factors including NCP pause value, modem strapping options, VPACING, attention delay, terminal buffer size, chain size, compression, compaction and host delays can have a significant impact on terminal performance. All these factors should be considered when a SDLC terminal is used in a batch mode such as for RJE.

9.2 TERMINAL BUFFER SIZE

The 3776 and 3777 have buffers of 512 bytes as standard features. 512 byte buffers should be used with the 3776 and 3777 to minimize the effects of modem and line delays, where possible, and to decrease the CPU overhead by decreasing the number of RU's processed by VTAM. On MLU 3770s, the combination of the number of active sessions and the associated pacing values may limit the RU size (buffer size) to 256 bytes. See the discussion on pacing, below.

9.3 VPACING

A good rule of thumb is to make VPACING two times the PACING value, if 3705 storage capacity permits. For example: if PACING=(1,1), then VPACING should be (2,1); if PACING=(2,1), then VPACING should be (4,1), etc.

At any rate, VPACING should be at least one greater than the PACING value. This discussion is primarily for SLU 3770 terminals which must have a PACING value of (1,1) specified. Following is a discussion of determing the VPACING value for a PACING value of (1,1). VPACING might be specified as (2,1) or (3,1) depending on line speed, 3705 storage capacity, buffer size, and the expected delay by VTAM in servicing a request for data from NCP. Other VPACING values could also be used. For example, with VPACING of 2,1 the 3705 will request 2 more RU's (blocks of data) as soon as it begins processing the 2 that it has. On a 2400 bps line it takes about .9 seconds to transmit each RU so the NCP could wait for up to 1.8 seconds before it must have more data to send on the line. If the attention delay specified in the NCP is 1 second, then VTAM would have at least .8 seconds to honor that request. On a 9600 bps line it takes about .45 seconds to transmit two RU's of 256 bytes so with an attention delay of 1 second, VPACING of 2,1 is not adequate.

To compute the time to transmit an RU and the separate poll that follows it, use the following formula:

$$\text{Seconds} = \frac{\text{BUF} + 21}{\text{LS}}$$

Where: BUF is the terminal buffer size, 21 is added for the transmission header (6 bytes), the request header (3 bytes), and 2 SDLC frames (12 bytes). LS is the line speed in characters per second.

This formula gives a conservative number because it does not take into consideration modem and line delays. The effect of attention delay becomes less significant when there is a large amount of data inbound to the host because NCP's buffers will fill before the attention delay expires.

If there is sufficient 3705 storage, a high value for VPACING, such as (7,1) may be specified.

9.4 PACING

A pacing value of (1,1) must be specified for SLU 3770s (i.e. 3771, 3773,3774,3775,3776-1,2 and 3777-1). A pacing value of (1,1) to (7,1) may be specified for MLU 3770s (i.e. 3776-3,4 and 3777-3).

Higher PACING values results in better performance because more RUs can be transmitted to the terminal before a link level acknowledgement is required (i.e. intervening poll and response). However, the pacing values for each session, the number of active sessions and the RU size (256 or 512 bytes) have an interdependent relationship which is limited by the number of internal I/O buffers in the 3770 MLU.

The 3770 MLU:

1. Can have up to 6 active sessions
2. Any session can have a PACING value up to (7,1)
3. Supports both 256 and 512 byte RUs
4. Has 16 internal I/O buffers available
5. Allocates internal buffers for sessions according to the following algorithms:

   2n - 1 for 256 byte RUs, where n is the PACING value
   4n - 2 for 512 byte RUs, where n is the PACING value

   If adequate buffers are not available to support the session, the MLU 3770 will reject the bind.

Following are some examples to clarify the above discussion.

EXAMPLE 1:

Session 1	RU size=256	pacing=(1,1)	3770 buffers used= 1
Session 2	RU size=256	pacing=(1,1)	3770 buffers used= 1

Session 3	RU size=256	pacing=(3,1)	3770 buffers used= 5
Session 4	RU size=256	pacing=(3,1)	3770 buffers used= 5

			TOTAL 12

EXAMPLE 2:

Session 1	RU size=512	pacing=(1,1)	3770 buffers used= 2
Session 2	RU size=512	pacing=(1,1)	3770 buffers used= 2
Session 3	RU size=512	pacing=(1,1)	3770 buffers used= 2
Session 4	RU size=512	pacing=(3,1)	3770 buffers used= 6

			TOTAL 12

In these examples, since the total 3770 buffers used is less than 16, four sessions with the above pacing values could be active.

EXAMPLE 3:

Session 1	RU size=256	pacing=(2,1)	3770 buffers used= 3
Session 2	RU size=256	pacing=(3,1)	3770 buffers used= 5
Session 3	RU size=256	pacing=(3,1)	3770 buffers used= 5
Session 4	RU size=256	pacing=(3,1)	3770 buffers used= 5

			TOTAL 18

EXAMPLE 4:

Session 1	RU size=512	pacing=(1,1)	3770 buffers used= 2
Session 2	RU size=512	pacing=(3,1)	3770 buffers used=10
Session 3	RU size=512	pacing=(3,1)	3770 buffers used=10

			TOTAL 22

In these examples, the total 3770 buffers exceeded 16. When this occurs, the 3770 will not accept a bind for the session exceeding the available buffer resource (session 4 and 3, respectively).

A higher pacing value improves performance for a session, but restricts the number of sessions which may be active. 512 byte RUs provide better performance and less cpu overhead, but restricts the number of sessions and/or the pacing values. Each installation must strike a balance of pacing values, number of sessions active, and RU size which will meet their individual requirements. The first step is to determine the the number of sessions needed for your 3770 operational environment.

For JES2, the pacing values should be in ascending sequence. For example, LU #1=(1,1), LU #2=(1,1), LU #3=(3,1), LU #4=(3,1). The reason for this is that JES2 looks for available sessions beginning with the last session and works backwards (i.e. session #4, #3, etc. in this example).

For VS1/RES, the pacing values should be in descending sequence beginning with LU #2 (LU #1 is reserved for console usage). For example, LU #1=(1,1), LU #2=(3,1), LU #3=(3,1), LU #4=(1,1). VS1/RES looks for available sessions beginning with the second session and works forward (session #2, #3, etc. in this example).

For POWER/VS, the pacing values should be in descending sequence beginning with LU #1. For example, LU #1=(1,1), LU #2=(3,1), LU #3=(3,1), LU

#4=(1,1). POWER/VS looks for available sessions beginning with the first session and works forward (session #1, #2, etc. in this example). This method of assigning pacing values to LUs (i.e. sessions) should result in the best performance since the most frequently selected sessions will have the highest pacing values.

For exceptional conditions when high performance is desired, you may wish to define an additional inactive LU with a high pacing value, such as (4,1) or (5,1). One or more low pacing sessions could be deactivated and the high pacing session activated to accomplish the data transfer for a high priority situation. Keep in mind the additional operational procedures required by the VTAM operator and the 3770 operator.

9.5 CHAIN SIZE

With MVS, JES2 uses a CHAINSIZ parameter to determine the number of print lines to be transmitted before requesting an SNA response from the terminal. With VS1, RES uses a parameter called VBUF. VBUF minus 2 is the number of RUs that will be transmitted as a chain before requesting a response. In several installations, specifying too small a value for these parameters has caused serious performance degradation. See section 2.2.17.2 for more information on chainsiz with JES2. VBUF should be equal to or greater than 14 for VS1/RES; a value of 30 or more improves performance very little.

9.6 COMPRESSION AND COMPACTION

See Appendix D for more detail.

On outbound data the RJE subsystems first perform compression and then compaction, if specified.

To use compression of compaction, the RJE subsystem must be generated for the support, the bind must specify its (their) use and the terminal must support it (them).

See Appendix D for more detailed information on FMH3's, SCB's, compression, and compaction.

COMPRESSION

This feature reduces the amount of data sent as output to the 3770. It does this by:

A. Removing trailing blanks
B. Replacing up to 63 consecutive blanks by 1 character
C. Replacing up to 63 consecutive occurrences of any character with 2 characters

Compression typically saves from 20-60% on print data. ie. It would not be unusual to compress the average print line from 120 to 60.

CONSIDERATIONS

The use of Compression yields the following advantages.

1) Host CPU cycles will decrease if the effect of compression is to reduce the data transmitted by 20%. The extra cycles used in doing the compression will be more than offset by the reduction in passes through VTAM, because fewer RU's will be required to send the data.

2) Host storage will not be impacted.

3) Line traffic should be considerably reduced.

4) Remote diskette storage will be reduced, because the file is stored in compressed form (if output is routed to a non-basic exchange.

5) Remote print speed should be increased, as more print lines will come across the line in a given amount of time. However, in cases where the TP line is faster than the printer, or the number of characters compressed is marginal, the print speed might not increase.

There are, however, some slight disadvantages:

1) Remote cycles will be slightly increased, because the 3770 must scan the data stream for repetitive characters and rebuild the original print lines.

COMPACTION

This feature takes advantage of the fact that some characters are used much more frequently than others in most printed output. Compaction allows for the reduction of output data by converting each occurrence of a set of MASTER characters to 4 bits. This means that whenever 2 adjacent master characters occur, 1 byte is saved in the transmitted data. Master chars that are not adjacent to other masters are transmitted in 8-bit form.

The set of master chars is defined in a compaction table. Multiple compaction tables may be defined, and a user can specify in his JCL which table he wants. It could be one supplied by RES (JES2 does not supply any) or any installation tailored one.

CONSIDERATIONS

The use of compaction yields the following advantages:

1) Host cycles will decrease if the data is reduced by 20% (not including data already compressed). This should be achievable for reports containing mostly numeric data, and for text output. Other types of output may or may not benefit from compaction, depending on the frequency of occurrence of the MASTER chars in the data.

2) Line traffic will be reduced.

3) Printer speed should be increased as explained under compression.

There are, however, some slight disadvantages:

1) Host storage will be slightly increased. (1k per COMPACTION table)

2) Remote cycles will be slightly increased due to decompaction.

SPECIFYING COMPRESSION AND COMPACTION

Both these features are optional, and must be specified to the host RJE system. Compression is a prerequisite for compaction. Compaction can be specified to default to a standard compaction table, or to compact only if the user specifies a table in his JCL, or to disallow compaction entirely.

If neither compression nor compaction is specified, trailing blanks are still truncated.

In most situations, the positive impacts of compression and compaction will outweigh the negative impacts, so that both should be used, where supported. In some cases, however, the negatively impacted resources may be critical, and dictate against the use of either. In some cases, compaction will add little benefit once compression is done.

9.7 NCP PAUSE PARAMETER

This discussion is primarily intended for SLU 3770s and MLU 3770's using a pacing value of (1,1).

SDLC 3770 terminals on point-to-point lines may experience poor performance when they are receiving batch data because of unnecessary polling by NCP while processing pacing responses. This problem occurs if line speed rather than terminal print speed is the limiting factor on thruput. For example, on a dial line at 2400 bits per second using modems with a request to send delay of 150 ms and a terminal with 256 byte buffers, selection of the proper PAUSE value could increase thruput by 25%. The increase in performance would be less with smaller modem and line delays. Thruput may be maximized through selection of an appropriate NCP PAUSE value for the line.

The following illustration depicts the problem:

```
              NCP                                     3770


         POLL        DATA
        ------>     ------>
         (2)         (1)


                                   PACING RESPONSE + FINAL
                                 <-------------------------
                                            (3)


                     POLL
                    ------>
                     (4)


                                   FINAL
                                 <-------------------------
                                     (5)
```

(1) NCP sends data to the 3770.

(2) The data is followed by a frame containing no data with the poll bit on.

(3) The terminal sends a pacing response with the final bit on.

(4) NCP always gives priority to scheduling activity on the line, so before the pacing response is processed, NCP puts a poll on the line. As soon as the poll is started, NCP processes the pacing response and schedules output for the terminal but the line is now busy with the poll.

(5) The terminal responds indicating that it has nothing to send.

To optimize performance, a pause value must be selected so that there will be enough time for NCP to process the pacing response and schedule output on the line before the pause expires. This will eliminate the poll and response at (4) and (5).

When there is only one entry in the service order table, as there will be on a point-to-point line, the pause value is the minimum amount of time NCP will wait from when it first processed the entry until it will poll it for input. For example, NCP will wait for at least the pause value between the time it begins to send the data at (1) and the time it sends the poll at (2).

A pause value must be selected that is short enough to expire while the data at (1) is being transmitted yet big enough so that it will not expire between the time NCP sends the poll at (2), processes the pacing response at (3) and schedules output for the line. If NCP has output ready to go out on the line, it will be sent even if the pause value has not expired.

If, in the example the data at (1) takes 225 ms to transmit and a pause value of 200 ms is used, then while the data at (1) is being transmitted, the pause will expire and the poll at (2) will be sent immediately after the data. When the poll at (2) is sent, the NCP begins another pause of 200 ms. This pause should be long enough to allow receipt of the pacing response by NCP. When NCP processes the pacing response, it will schedule output for the line and the unnecessary polling will be eliminated.

A pause value that is too short will not allow enough time for receipt of the pacing response and a pause value that is too long will also cause poor performance. For example, a pause value of 400 ms will cause the NCP to wait 400 ms between starting to send the data at (1) and sending the poll at (2). The line would be idle for about 175 ms.

There are several factors that go into determining a pause value. First, the pause value may only be specified in 100 ms increments and the timer in the 3705 has a resolution of 100 ms. This means that if a value of 200 ms is specified, the NCP will use a value of between 100 and 200 ms.
In calculating the pause value, terminal buffer size, modem turnaround time, modem propagation delay and line propagation delay should be known.

The following formula may be used to determine an initial value for PAUSE.

$$\text{PAUSE} = \frac{25}{\text{LS}} + 2\,(\text{LP}) + \text{RTS} + .1$$

Where: LS is the line speed in characters per second, RTS is the request to send delay at the 3770 in seconds.

LP is the line propagation time plus modem propagation time in seconds.

After a value is calculated, round up to the nearest tenth of a second.

The pause value for a 3770 on a 9600 bit per second line using modems having zero request to send delay and modem plus line propagation of 16 ms would be:

$$\text{PAUSE} = \frac{25}{1200} + 2\,(.016) + 0 + .1$$

$$= .153$$

$$= .2$$

For a 3770 on a 2400 bit per second dial line using modems having a 150 ms request to send delay with a line plus modem propagation of 20 ms the PAUSE value is computed as follows:

$$\text{PAUSE} = \frac{25}{300} + 2\,(.020) + .150 + .1$$

$$= .373$$

$$= .4$$

Depending on a combination of factors such as terminal buffer size and line speed, a range of pause values may give the same performance. To estimate the high end of the range use the following formula:

$$\text{Maximum PAUSE} = \frac{\text{BUF}}{\text{LS}} + \text{RTS}$$

Where: BUF is the terminal buffer size.

LS is the line speed in characters per second.
RTS is the request to send delay at the 3705.

After a value is calculated for Maximum PAUSE, round down to the nearest tenth second. For the 3770 on a 2400 bit per second line in the example above, if the terminal's buffer size is 256 bytes, the maximum pause would be:

Maximum PAUSE = 256 + .150

```
    ---
    300
  = 1.003
  = 1.0
```

According to the formulas, PAUSE values for this terminal on a 2400 bps dial line of between .4 and 1.0 seconds will give good performance.

Once a value of PAUSE is determined, it will be necessary to make several test runs increasing and decreasing PAUSE until maximum thruput is obtained. Use a value slightly less than the smaller of the 2 PAUSE values calculated with the first formula, as the starting point for performance runs. If several values of PAUSE give the same thruput, choose the smallest value. If it is not possible to make multiple test runs, use the first formula for the PAUSE value.

The calculated PAUSE value may be specified by partial assembly of the NCP (CONDASM=TABLES in the BUILD macro), modification of stage 1 NCP output, or complete assembly of the NCP. If partial or complete assembly of the NCP is performed and PAUSE is specified for a switched line, the fix described by APAR R03886 must be installed because PAUSE is not a valid operand for a dial line. It is also possible to change PAUSE thru the control panel of the 3705.

Depending on the level of VTAM used, PAUSE may be flagged as an invalid parameter. If it is, it should be removed from the copy of the NCP used by VTAM (VTAMLST).

10 PROBLEM ISOLATION

10.1 SYSTEM INITIALIZATION/PROBLEM ISOLATION CHECKLIST

The checklist starts at the point where the operating system has been IPLed and the job entry system has been initialized. Some activation steps (LINE, PU, LU in the NCP) can be automated by coding ISTATUS=ACTIVE on the appropriate parameters on the member of VTAMLST being used.

	OBJECTIVE	EXAMPLE		
1.	Activate VTAM by starting your cataloged procedure	(S NET)		
2.	LOAD/ACTIVATE the NCP (if not done by VTAM, AUTOIPL)	(V NET,ACT,ID=ncpname)		%
3.	Start the test subsystem if different from the production system	(S JESA)	JES	%
4.	Open supsystem VTAM ACB	($S LGN1)	JES	#
5.	Start lines	($S LNEnnn)	JES	#
6.	Activate LINE/PU/LU	(V NET,ACT,ID=LNE3770)	VTAM	%
7.	Display status of nodes	(D NET,E,ID=PU3770)	VTAM	

- $S commands can be included in a PROC in a production system, but for initial testing we recommend that you enter these and VARY ACTIVE to the physical unit manually.

% - Optional steps dependent upon initial status of resource or installation dependencies.

* - Where we show a command with an ID=, you must use the resource ID from your own configuration (i.e., the name from the line or PU macro in your NCP).

The 3770 operator should now be able to logon. For initial testing it is recommended that you run the trace facilities. Catalogue a procedure to start the trace facility and add these steps to above checklist.

5.1	Start trace facility procedure	(S GTF)
5.2	Start recording trace for resource	(V NET,TRACE,ID=)

If you follow the checklist, and you cannot get the 3770 logged on, then you need to determine at what point in the checklist initialization failed.

1. If VTAM or the NCP will not activate, double check installation and start up procedures with VTAM/NCP Installation Student Text (SR20-4567) and Appendix A.

2. If a "D NET,E,ID=JES2" does not show STATUS=ACT, then do the following:
   (a) Insure that you have an APPL statement for JES2 in the APPCONnr which is referenced in your VTAM start up definition.
   (b) Insure that you have issued the "$S LGN1" command.
   (c) Insure that you have included "LOGON1" and "APPLID=JES2" in the JES initialization parameters.

3. If the "D NET,E,ID=PU3770" does not show STATUS=ACT:
   (a) The line is not active, do a "V NET,ACT,ID=LNE3770" or code ISTATUS=ACTIVE in the NCP.
   If the line will not become active then there is a coding problem in the NCP or you have a physical line/connection problem.
   (b) The PU has not been activated "V NET,ACT,ID=PU3770" if a "D NET,ACT,ID=PU3770" shows STATUS=INA/C. This means NCP has issued a contact (SNRM) but has received no response (NSA). Either the 3770 is not powered on or, there is a physical line connection problem, NRZI does not agree on the NCP line macro and the 3770, or the address does not agree on the NCP macro and the 3770.

4. If the PU shows STATUS=ACTIVE but you cannot get logged on, then:
   (a) Insure that the LU is active.
   (b) Insure that the subsystem is active and that lines have been started ($S LNEnn).
   (c) Verify that you have entered a valid logon (see section on Session Initiation).
   (d) If you get a message "Session Not Bound" printed at the 3770 or an 0821 sense code in a message on the system console:
   Check your LOGMODE entry, the JES2 parameters for the RMTnn,

   and the characteristics and switches on the 3770. (Most common problems are RUSIZE/BUFSIZE/EXTEND BUFFER SWITCH, or COMPACTION).

*****AGAIN, PLEASE NOTE: In examples of VTAM VARY (V) and DISPLAY (D) commands, substitute your resource ID for the one in the example. And we recommend for test, code ISTATUS=ACTIVE on the line and LU macros in NCP but inactive for the PU. The PU then will not be active until you issue the "V NET,ACT,ID=". In a production environment you may wish to have ISTATUS=ACTIVE on all LINEs, PUs, and LUs.

10.2 HASP094 ERROR MESSAGE FORMAT

The HASP094 I/O ERROR MESSAGE will be displayed on the operator console whenever JES receives sense data from a 3770.

The sense data will be the third numeric field of the message and can be found in Chapter 3 to define what caused the sense data to be returned.

The format of the complete message is as follows.

*HASP094 I/O ERROR ... SNA,RR,LLLL,SSSS,ttrrffeebbssccgwvvkkkkkk

JES2 LUTYPE1 SNA/RJE Reference

```
RR - VTAM request type
        1A - INQUIRE
        17 - OPNDST
        1F - CLDST
        22 - SEND
        23 - RECEIVE
        24 - RESETSR

LLLL - Data Length
       (INCLUDES FM HEADERS

SSSS - Sense Information
See:
GA27-3136 Systems Network
          Architecture Reference
          Summary
GC27-6995 VTAM Macro Language
          Reference
GC22-9033 IBM 3790 Host System
          Programmer's Guide
GA27-3097 IBM 3770 Data
          Communications System
          - System Components

tt - JES2 RPL Sequence Type

        NORMAL SEQUENCES
   00 - Normal RECEIVE
   01 - Normal SEND
   02 - RESETSR (cs)
   03 - RESETSR (ca)

        SPECIAL SEQUENCES
   1x - Connection sequence
   3x - Disconnection sequence
   6x - Autologon sequence

rr - VTAM return code   (RTNCD)
ff - VTAM feedback code (FDBK2)

      (see GC27-6995 VTAM Macro
       Language Reference Guide)

ee - FM Header Type

   00 - No FM Header
   01 - Type 1 FM Header
          (Destination Select)
   02 - Type 2 FM Header
      -   (PDIR)
   03 - Type 3 FM Header

ss - SEND/RECEIVE type

Send response         - x'80'
Receive response      - x'0C'
Receive synch data    - x'00'
Receive asynch DFC    - x'06'

cc - Chaining Control
          First    - x'80'
          Middle   - x'40'
          End      - x'20'
          Only     - x'10'

gw - FM Header Properties

  Destination Select - g
      0 - Resume
      2 - Normal End
      4 - Begin
      8 - Suspend
      A - Abort End
      1 - Basic Exchange (used
          in combination with
          the above

  Data Stream Properties - w
      0 - No Compression or
            Compaction
      2 - Compaction Only
      4 - Compression Only
      6 - Compression and
            Compaction

vv - VTAM flags

 x'80' - POST = SCHED

 x'04' - Exception Response
 x'02' - No Definite Response 1
           (note inverse)
 x'01' - Definite Response 2

kkkkkk - Controls

    Normal Data - x'800000'

  Data Flow Controls  (DFCs)
    CANCEL -------- x'400000'
    RTR ----------- x'004000'
    LUSTAT -------- x'002000'
    SIGNAL -------- x'001000'
```

(Compaction Tabel	RSHUTD -------- x'000002'
bb - Bracket and Direction Controls Begin Bracket - x'80' End Bracket - x'40' Change Direction - x'20'	

11 MISCELLANEOUS

11.1 XID (IDBIK, IDNUM) AND SDLC ADDRESS

A 3770 has an SDLC polling address and a switched SDLC terminal ID. The polling address is a one byte HEX address which you select between X'01' and X'FE'. This becomes the last two HEX digits (one byte) of the terminal ID. The terminal ID is a combination of several inputs. These must agree between what is specified on the host and on the terminal since in a switched environment the terminal transmits the ID to the host and it must match an ID listed in a VTAMLST VBUILD member (Switched Mode Definition).

The terminal ID is composed of jumper settings on SLU 3770s and must be correctly jumpered by an IBM CE. On MLU 3770s the terminal ID is specified in the ID field of the Terminal Initialization Program (TIP) and may be entered or altered by customer personnel.

The complete terminal ID has the following format:

```
            |------|--------|-------|-------|-------|
            | X'0' | PUTYPE | X'00' | IDBLK | IDNUM |
            |------|--------|-------|-------|-------|
Bit         0      4        8       16      28      47
```

PUTYPE=2 for 3770 It is hardwired on SLU 3770s and is specified in
VBUILD on a PU statement
PUTYPE=n/2

IDBLK is a 12 bit binary number assigned by terminal type. It is hardwired on SLU 3770s and is specified in VBUILD on a PU statement IDBLK= .

The HEX representation of IDBLK is: X'0mm'

```
    Where mm = 0F   for  3773
               10        3774/3775
               11        377P/3774P/3775P
               12        3771
               13        3776/3777
```

IDNUM is a 20 bit number which is partly hardwired and partly jumpered on SLU 3770s by the CE to a user supplied value. It is then specified in the VBUILD PU statement IDNUM= .

The HEX representation is: X'00JSS'

Where: J is a HEX digit you supply the CE to jumper on the SLU 3770 system card (TID byte 2).
SS is the SDLC polling address which you have the CE jumper on the SLU 3770 system card (TID byte 1).

It is also specified (just these two HEX digits) on an ADDR=PARAMETER both on an NCP PU macro and a PU macro in the VBUILD statement.

As an example, lets take an SLU 3776 and we will ask the CE to jumper an SDLC address of X'C1' (TID byte 1) and a jumper of 'B' on TID byte 2 (you only jumper bits 0-3 on TID byte 2).

The complete terminal ID would be: X'0200 0130 0BC1'

Where: ADDR=C1
PUTYPE=2
IDBLK=-13
IDNUM=000BC1

For this example on an MLU 3770, '01300BC1' would be entered in ID field of the TIP.

11.2 JES2 TESTING (JES2 UNDER JES2)

If you wish to test 3770 SNA under JES2 and you want to isolate the production system as much as possible until you have a stable operating environment, then you may want to run a test JES2. A test or alternate JES2 can be run concurrent with the production JES2. If you wish to do this, read the section "Alternate Subsystem Options With JES2" in Chapter 3, JES2 Initialization, of the OS/VS2 MVS JES2 SPL (GC23-0002).

In this system, remember to give the alternative subsystem a different &COMCHR. In the initialization parameters, code the SNA dependent parameters into the member of SYS1.PARMLIB which will be used by the alternate subsystem for testing. Then after the production JES2 is running, you can start and stop your test JES at will without impact to the production system. Just remember to start your commands with the right delimiter for each system.

11.3 BSC 3740/3776 DISKETTE COMPAT. (KP/3780 REPLACEMENT)

This section is included here because it illustrates a method of implementing 3740/3776 diskette compatability. Although, this section references only the 3776 for simplicity sake; it is, in principle, also applicable to the 3773, 3774, 3775, and 3777. Note that there are some minor differences in data set naming conventions.

If you plan to replace a keypunch/3780 application with a 3740/3776, there will be some operational differences to consider. Here are a few which relate to diskette usage.

1. Data set labels have few restraints on the 3740. However, on the 3776, data set labels must be of the form AANN and any subsequent characters are ignored. One exception is the 3776/3777, which will allow up to an 8 character name to be used for basic exchange data sets. An operator defined job must be used and a comma must precede the data set name in order to utilize a data set name not in the AANN format. See the 3776 or 3777 Operators Guide, chapter 2 for additional information.

   Therefore, data sets labeled DS0101C, DS0102C, and DS0103 are not the same data set to a 3740, but are all DS01 to a 3776. <u>This is actually advantageous</u>. Consider the following data set sequence: JCL, DATA1, EOF. The JCL and EOF can be addressed separately from "Data" data sets on the 3740, but transmitted as one data set on the 3776 by doing a START JOB, diskette to line, DS01, EOM. DS01 being the first four characters of all the data sets. (Be sure that the data is in the same physical sequential order on the diskette as are the sequence of the data set labels).

2. Reuse of diskettes can be a problem if you plan to reinitialize the diskettes on the 3776 as interchange by doing a code 02I. This procedure completely clears the diskette and if there was a JCL data set, it must now be rekeyed. A possible avoidance of this is to key the JCL on a separate diskette from the data remembering (a) to use the same four character data set name for the corresponding JCL and DATA data sets, (b) mark the JCL data set and intervening data sets as continued (a C in column 44 of the DS label) and mark an L in column 44 of the data set label for the last data set.

3. Probably the biggest operational hurdle to overcome is where your customer, as an intermediate step, sent punched output back to the terminal, this output was then added to on the 3740 and transmitted to the host for further processing.

   This becomes a problem because as the 3776 receives output without a <u>DC1</u> device selection and with the disk switch on, it will take its 512 byte input buffer and lay that into four 128 byte diskette sectors exactly <u>as is</u>. This data has blank compression, if the option were specified for the terminal, and blank suppression with IRS characters and compression characters in the data stream.

   The data in this format is unusable on the 3740 since it leaves no blank fields for data insertion and records do not start on 128 sector boundaries with one record per sector, a criteria for normal 3740 program usage. (See figure 2)

   The problem, therefore, is to get the data into exactly the format we need on the 3740 before we send it to the 3776 from the host. (See figure 3). The following must be accomplished to get the desired compatability:

1. In order to obtain full 80 character records there must be a character in position 80 to avoid blank suppression and we must eliminate blank compression. Blank compression can be turned on and off under RES (see the RES workstation users guide) which now makes it a problem of coordination of turning it on and off at the right time. I am assuming that under normal operation, such as receipt of print, you would want to take advantage of compression.

   An alternative is to eliminate the effect of blank compression by substituting a non blank character for blanks in the data stream. The obvious choice is nulls (HEX 00) because they are non-display on the 3740, however, we couldn't seem to get nulls to work on the 3776.

2. The second part of the problem is to get each 80 character record on the start of a 128 byte sector. The only solution I see is to insert dummy records of 46 characters between each 80 character record forward to the next 128 byte boundary. (My arithmetic is not so bad as it seems because there will be an IRS character after each record. 80 + 1 + 46 + 1 = 128).

Included is a sample procedure that accomplishes the steps described above. It will cause the data to be formatted in the 3776 buffer and on the 3740 diskette just as in Figure 3. You will note in the program that we do not put out a fourth fill record (second fill record for 256 byte buffer). This record is not needed since we will not span records between transmission buffers. On the input side, the same program, using Option U, will remove the % signs that we inserted above under Option F. On the 3740, the operator keys the data over the % signs. Any symbol could have been chosen such as underscore, DASH, etc.

<u>NORMAL HOST PROGRAM OUTPUT</u>

```
    Position
1                                       80
RECORD1 b FIELD1 bbbbbbbbbb FIELD2 b    bb
RECORD2 b FIELD1 b        b FIELD2 b     b
RECORD3 b FIELD1 b        b FIELD2 b     b
RECORD4 b FIELD1 b        b FIELD2 b     b
```

FIG. 1

<u>Normal Format Received At 3770 And Written Onto Diskette</u>

RECORD1 b FIELD1 (BCC) FIELD2 (IRS) RECORD2 b FIELD1 (BCC) FIELD2 (IRS)
RECORD3 b FIELD1 (BCC) FIELD2 (IRS) RECORD4 b FIELD1 (BCC) FIELD2 (IRS)
and on to fill 512 BYTES

IRS=Inter Record Separator

BCC=Blank Compression Character

FIG. 2

<u>Desired Format To Be Received At 3770 And Written Onto Diskette (Usable On 3740)</u>.

```
    Position
1                                               80                  128
RECORD1 b FIELD1 %    % FIELD2%                 %(IRS) %            % (IRS)
RECORD2 b FIELD1 %    % FIELD2%                 %(IRS) %            % (IRS)
RECORD3 b FIELD1 %    % FIELD2%                 %(IRS) %            % (IRS)
RECORD4 b FIELD1 %    % field2%                 %(IRS)                       512
```

FIG. 3

SAMPLE PROCEDURE

```
// DISKETTE              JOB
// JOBLIB                DD          DSN=
// BG017050              PROC
// GAR1750               EXEC        PGM=
// SYSLOG 9              DD          SYSOUT=A
// SYSODUMP              DD          SYSOUT=A
// SYSLST                DD          SYSOUT=A
// DDA                   DD          DUMMY
// DD1                   DD          DUMMY
// SYS028                DD          SYSOUT=B, DCB=BLKSIZE=8343
//                       PEND
// G017050               EXEC        PROC=G017050
// GARL1750.SYS027       DD          *
-Put F or U here for option choice-
/*
```

```
.
.
.
Remarks                      Option F. Fill 80 COL Card for Updating
                             Option U. Remake Cards for Program Input
.
.
.
File Section
FD Card-In
   Recording Mode is F
   Label Record is Omitted
   Record Contains 80 Characters
   Data Record is Old-Card
01 Old-Card
   02 CC1-46
      03 CC1                 PIC X
      03 Filler              PIC X(45)
      02 Filler              PIC X(34)
FD Card-Out
   Recording Mode is F
   Label Record is Omitted
   Record Contains 80 Characters
   Data Record is New-Card
01 New-Card                  PIC X(80)
Working-Storage Section
77 OPT                       PIC X
77 A11-Low                   PIC X (46) Value Low-Values
77 A11-PCT                   PIC X(46)
77 CTR   Value = 0           PIC S9(7)  Comp-3
Procedure Division
111-Open-Files
   Open Input Card-In Output Card-Out
121-Get-Option
   Read Card-In at End Go To 999-End-Job
   If CC1 Not='F' and 'U' Go To 999-End-Job
   Move CC1 to OPT
   Move A11 '%' to A11-PCT
131-Read-Write
```

```
Read Card-In at End Go To 999-End-Job
If CC1-46 = All-PCT Go To 131-Read-Write
If CC1-46 = All-Low Go To 131-Read-Write
If OPT = 'U' Transform Old-Card Characters from '%' to ' '
        Else Transform Old-Card Characters from ' ' to '%'
Write New-Card From Old-Card
Add = 1 to Ctr.
If = 3 Less CTR Move = 0 to CTR Go To 131-Read-Write
If OPT = 'F' Write New-Card from All-PCT
Go To 131-Read-Write
.
.
.
   999-End-Job
Close Card-In Card-Out
Stop Run
```

11.4 SOME SLU 3770 AND JES2 BSC/SNA DIFFERENCES CHECKLIST

- The 3770 keyboard may be used to enter RJE commands.
  Caution is needed from an operational viewpoint - purging the printer and then entering a command gives the appearance of a hang condition at the terminal (ie. the printer is the output half of the console).

NOTE: This is not a consideration with MLU 3770 since it uses the display for the output half of the console.

- Forms Control in SNA Mode
  - OJDs, set-up, or application program changes may be required if converting from BSC because of the following two differences:
  - Channel 1 must be defined as line 1 in SNA if FCBs are loaded from the host.
  - When the form is at channel X and a skip to channel X is issued-paper movement occurs in SNA (paper movement did not occur in BSC).

- Local Operations
  - The loading of OJDs, and local operations such as reader to printer and reader to punch, cannot be done without logging off in SNA Mode.

Note: This is not the case with MLU 3770s.

- Line and Terminal Security
  - JES2 terminology referring to dedicated lines is confusing. If dedicated lines are used, no line security is available (JES2 SPL Page 40, 118). A terminal is considered dedicated and the remote password will not be checked if the LINE subparameter is specified on the JES2 RMTnnn parameter.

- Logon Procedure for SNA
  - A 3770 initiated LOGON must be from the keyboard using the SYS REQ key. The card reader can not be used to LOGON.

Note: The MLU 3770s can use a predefined SSCP procedure stored on diskette to log on.

- Cancel Key
  - No function in Bisync.
  - Causes Job Cancelling and purging of data in SNA.

- Chainsize Specification in JES Parms (new in SNA)
  - Rnnn.PRn CHAINSIZ= can be key in performance of printer operations. Suggest using CHAINSIZ=0.
  - Rnnn.PUn CHAINSIZ= Documentation correct. Will vary with site requirements.

- Attention Key Operation
  - An important customer decision. Maximum print speed or possible long waits for an attention interrupt to take effect.

- The amount of time the operator will have to wait for the attention key to stop output to the terminal will depend on the specification of CHAINSIZ, VPACING, and how much data is queued in the RJE subsystem buffers.

Note: This should not be a consideration with MLU 3770s.

- Toltep
  - A key RAS item.
  - For Toltep usage, see the Toltep User's Guide (D99-3700D) and the SNA Maintenance Aids Handbook (G226-3544).

- Translate Specification
  - &PRTRANS=Yes may be specified to remove unprintable data characters which otherwise would print as dashes. Under Bisync it could be specified by terminal. User must modify HASP PRPU translate table for special characters not on PN Trains.

APPENDIX A - SAMPLE GENERATIONS

A.1 MVS/JES2 SYSTEM

A.1.1 ATCSTRAC - VTAM START LIST

THIS COMES FROM VTAM.LIST.SOURCE(ATCSTRAC) or ((SYS1.VTAMLST(ATCSTRAC))
WHICH IS INVOKED BY THE START NET COMMAND
       S NET,,,(LIST=AC)

```
TNSTAT,CNSL,TIME=10,                                                          X00000000
MAXSUBA=31,                                                                   X00000000
NOPROMPT,                                                                     X00000000
CONFIG=AC,                                                                    X00000000
SSCPID=01,                                                                    X00000000
HOSTSA=13,                                                                    X00000000
MAXAPPL=100,                                                                  X00000000
VTAMEAS=200,                                                                  X00000000
NETSOL=NO,                                                                    X00000000
SFBUF=(64,,2,,01,3),     *** XPANNO OF 1 WILL CAUSE ACF/VTAM TO ACQUIRE       X00000000
LFBUF=(37,,2,,01,3),         1 PAGE OF BUFFERS SINCE THEY ARE ALWAYS          X00000000
LPBUF=(44,,1,,05,2),         ACQUIRED IN PAGE INCREMENTS ***                  X00000000
NPBUF=(23,,2,,01,3),                                                          X00000000
CRPLBUF=(60,,2,,01,3),                                                        X00000000
IOBUF=(80,152,4,,01,26),                                                      X00000000
APBUF=(66,,2,,01,3),                                                          X00000000
SPBUF=(66,,2,,01,3),                                                          X00000000
UECBUF=(39,,2,,01,3),                                                         X00000000
WPBUF=(27,,2,,01,3),                                                          X00000000
PPBUF=(29,152,2,,01,3)                                                         00000000
END                                                                            00000000
```

A.1.2 ATCCONAC - VTAM CONFIGURATION LIST

THIS COMES FROM VTAM.LIST.SOURCE(ATCCONAC) WHICH IS POINTED TO
BY PARAMETER CONFIG IN ATCSTRAC OF VTAM.LIST.SOURCE or
((SYS1.VTAMLST(ATCCONAC)).
ALL NAMES IN THIS MEMBER ARE MEMBERS OF VTAM.LIST.SOURCE, WHICH CONTAIN
NODES TO BE ACTIVATED BY VTAM AT STARTUP TIME.
JES2 APPLID IS CONTAINED IN JESAPAC.

```
IMSAPAC,LOC3272,TSOAPAC,CICSAPAC,SWITCHAC,JESAPAC,LHA3274A,                   X00000000
NOSP,CDRPATH,CDRSCAPL,CRDSCMVS,CDRMLIST,DSXAPPL,NCPACFI                        00000000
```

A.1.3 JES2 APPLID DEFINITIONS FOR VTAM

```
THIS COMES FROM VTAM.LIST.SOURCE(JESAPAC) WHICH DEFINES THE TWO JES
APPLIDS TO VTAM. BOTH WILL BE ACTIVATED AT STARTUP TIME BECAUSE THE
MEMBER NAME IS IN VTAM.LIST.SOURCE(ATCCONAC). ONE APPLID IS FOR THE
PRODUCTION JES AND ONE IS FOR A TEST JES (JES UNDER JES).               00000000


JES2     APPL AUTH=ACQ,EAS=20                                            00000000
JESA     APPL AUTH=ACQ,EAS=20                                            00000000
```

A.1.4 JES2 COMMAND LIST

```
&WTO *THIS COMMAND PROCEDURE DOES THE FOLLOWINGS:
&WTO *     A) START JES2 INTERFACE TO VTAM FOR JES TESTING
&WTO *     B) START JES2 LOGICAL LINE 1 FOR RJE CONNECTION
&WTO *     C) TO STOP JES2, ENTER $PJES2
&WTO *     ************************************************
&WTO *     *  PLEASE NOTE THAT ALL COMMANDS ISSUED FOR THE*
&WTO *     *  TEST JES START WITH THE SPECIAL CHARACTER # *
&WTO *     ************************************************
S JES2
&WAIT 30
$SLGN1
$SLINE1
```

A.1.5 JES2 PROC

```
//JES2     PROC MEMBER=NJE33776,ALTMEM=JES2PARM                          00000000
//IEFPROC  EXEC PGM=NJE33776,DPRTY=(15,15),TIME=1440,PERFORM=9,          00000000
//      PARM='NOLIST,NOREQ'                                              00000000
//PROC00     DD DSN=SYS1.PROCLIB,DISP=SHR                                00000000
//HASPPARM   DD DSN=IPO21.PARMLIB(&MEMBER),DISP=SHR                      00000000
//ALTPARM    DD DSN=SYS1.PARMLIB(&ALTMEM),DISP=SHR                       00000000
//HASPLIST   DD DDNAME=IEFRDER                                           00000000
//* NOTE TO FIND ERROR IN JES2PARM ---> S JES2,00E (00E OR ANY PRINTER)  00000000
```

A.1.6 JES2 PARMS

```
./ ADD LIST=ALL,NAME=IEAAPF00                                                  00000000
//PARMUP JOB 'UPDATE PARMLIB',MSGLEVEL=1,CLASS=A                               00000000
//        EXEC  PGM=IEBUPDTE,PARM=NEW                                          00000000
//SYSPRINT DD SYSOUT=A                                                         00000000
//SYSUT2 DD    DSNAME=IPO1.JES2PARM,DISP=SHR                                   00000000
//SYSIN  DD    *                                                               00000000
./        ADD   LIST=ALL,NAME=SNAPARM                                          00000000
./        NUMBER NEW1=10000,INCR=100000                                        00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*            JES2 REL 4.1 INITIALIZATION PARAMETERS                   * 00000000
*            (MODIFIED FROM IPO TO INCLUDE VTAM RJE)                  * 00000000
*            PARAMETERS SPECIFIED ARE THOSE THAT ARE                  * 00000000
*            DIFFERENT FROM THE DEFAULTS OR DEFAULTS WERE             * 00000000
*            CODED FOR DOCUMENTATION PURPOSES.                        * 00000000
*            DEFAULTS AND OTHER PARAMETERS EXPLAINED IN:              * 00000000
*             OS/VS2 MVS SPL: JES2    GC23-0002-0                     * 00000000
*                                                                     * 00000000
* NOTE: CHANGING THE FOLLOWING WILL CAUSE A WARM START TO BE DENIED:  * 00000000
*      &SPOOL      &BUFSIZE     &MAXJOBS     &NUMJOES                 * 00000000
*      &SPOLMSG    &NUMRJE      &NUMTGV      &NUMDA                   * 00000000
*      &TCELSIZ    &RECINCR                                           * 00000000
* I.E. WILL NEED EITHER A COLD START OR A FORMAT TO USE THEM          * 00000000
* IN MULTI-ACCESS SPOOL ENVIRONMENT &MINJOES PLUS THE ABOVE           * 00000000
*  PARAMETERS MUST BE THE SAME ON ALL SYSTEMS SHARING SPOOL           * 00000000
*********************************************************************** 00000000
*--------------------------------------------------------------------*  00000000
*                               JES2PARM                             *  00000000
*--------------------------------------------------------------------*  00000000
*                         PALO ALTO  SYSTEMS CENTER                  *  00000000
*                                                                    *  00000000
*                     DATE OF LAST MODIFICATION    10/78             *  00000000
*--------------------------------------------------------------------*  00000000
HASPSSSM=HASPSSSM                                                       00000000
* RELEASE 3 158 PRODUCTION PARM SU 25 JES 4.1 ====> 10/78    <====      00000000
*EWS +=================================================================-00000000
*EWS ================================================================== 00000000
*EWS  ==                                                               -00000000
*EWS                                                                === 00000000
*EWS  ==  * * * * * * * * * *              P A L O  A L T O  S Y S T E-00000000
*EWS  M S  S U P P O R T  C E N T E R        * * * * * * * * * *    === 00000000
*EWS  ==                                                               -00000000
*EWS                                                                === 00000000
*EWS  =================================================================-00000000
*EWS ================================================================== 00000000
&BUFSIZE=4008                IPO                                        00000000
*                                                                       00000000
*  8 INITS ALL STARTED.                                                 00000000
*                                                                       00000000
I1  NAME=1,CLASS=BDA                                                    00000000
I2  NAME=2,CLASS=ALB                                                    00000000
I3  NAME=3,CLASS=LBA                                                    00000000
I4  NAME=4,CLASS=BDA                                                    00000000
I5  NAME=5,CLASS=FEMB                                                   00000000
I6  NAME=6,CLASS=GZ                                                     00000000
I7  NAME=7,CLASS=N                                                      00000000
I8  NAME=8,CLASS=CY                                                     00000000
```

```
I8   NAME=9,CLASS=I,DRAIN       IPO                                00000000
*                                                                  00000000
&JCOPYLM=10                                                        00000000
*                                                                  00000000
LINE1 UNIT=059,TRANSP        IPO                                   00000000
LINE2 UNIT=05B,FDUPLEX,TRANSP      IPO                             00000000
*                                                                  00000000
&LINECT=80                                                         00000000
&MAXJOBS=300                   IPO                                 00000000
&MAXPART=9                     IPO                                 00000000
&SPOOL=IPOJ01                  IPO                                 00000000
&CHKPT=IPOJ01                  IPO                                 00000000
&ESTLNCT=12                    IPO                                 00000000
&NUMINRS=4                     IPO                                 00000000
&NUMPRTS=5                     IPO                                 00000000
&NUMPUNS=3                                                         00000000
&NUMRDRS=3                                                         00000000
&NUMLNES=4                                                         00000000
&NUMCMBS=60                    IPO                                 00000000
&NUMTGV=1919                   IPO                                 00000000
&NUMTPBF=8                                                         00000000
&PRIDCT=35                     IPO                                 00000000
&TPIDCT=35                                                         00000000
&SID=YGL2                                                          00000000
PRINTER1 FORMS=STD.,CLASS=V,UNIT=002                               00000000
PRINTER2 FORMS=STD.,CLASS=C,UNIT=004                               00000000
PRINTER3 FORMS=STD.,CLASS=R,UNIT=00F                               00000000
PRINTER4 ROUTECDE=0,FORMS=STD.,CLASS=A,UNIT=00E                    00000000
PRINTER5 ROUTECDE=0,FORMS=STD.,CLASS=R,UNIT=20E                    00000000
*                                                                  00000000
&PRTRANS=NO                                                        00000000
*                                                                  00000000
PUNCH1  ROUTECDE=0,CLASS=B,FORMS=STD.,PAUSE,UNIT=013               00000000
PUNCH2  ROUTECDE=0,CLASS=B,FORMS=STD.,PAUSE,UNIT=20D               00000000
PUNCH3  ROUTECDE=0,CLASS=B,FORMS=STD.,DRAIN,UNIT=00D               00000000
*                                                                  00000000
READER1 PRDEST=0,PRIOINC=0,PRIOLIM=13,CLASS=A,AUTH=0,UNIT=012      00000000
READER2 PRDEST=0,PRIOINC=0,PRIOLIM=13,CLASS=A,AUTH=0,UNIT=20C      00000000
READER3 PRDEST=0,PRIOINC=0,PRIOLIM=13,CLASS=A,AUTH=0,UNIT=00C      00000000
&RJOBOPT=2                                                         00000000
RMT1 S/370,CONSOLE,MULTI                                           00000000
R1.PR1 OPERATOR,PRWIDTH=132                                        00000000
R1.PU1 DRAIN                                                       00000000
R1.RD1                                                             00000000
*                                                                  00000000
RMT2 S/370,CONSOLE,MULTI                                           00000000
R2.PR1 OPERATOR,PRWIDTH=132                                        00000000
R2.PU1 DRAIN                                                       00000000
R2.RD1 PRIOLIM=3                                                   00000000
*                                                                  00000000
RMT3 3780,COMP,TRANSP                                              00000000
R3.PR1 OPERATOR,PRWIDTH=132                                        00000000
R3.PU1 DRAIN                                                       00000000
R3.RD1 PRIOLIM=3                                                   00000000
*                                                                  00000000
&RPS=YES                                                           00000000
&TSU CONVPARM=00014390051211E00011,NOJOURN,PERFORM=002             00000000
&STC CONVPARM=00014390020011E00011,NOJOURN,PERFORM=001             00000000
&A   CONVPARM=00014390020011E00011,NOJOURN,PERFORM=001,            00000000
```

```
          NOUJP,NOUSO                                                   00000000
&B   CONVPARM=00014390020011E00011,NOJOURN,PERFORM=001,                 00000000
          NOUJP,NOUSO                                                   00000000
&C   CONVPARM=00014390020011E00011,NOJOURN,PERFORM=001,                 00000000
          NOUJP,NOUSO                                                   00000000
&D   CONVPARM=00014390020011E00011,NOJOURN,PERFORM=001,                 00000000
          NOUJP,NOUSO                                                   00000000
&E   CONVPARM=00014390020011E00011,NOJOURN,PERFORM=001,                 00000000
          NOUJP,NOUSO                                                   00000000
&F   CONVPARM=00014390020011E00011,NOJOURN,PERFORM=001,                 00000000
          NOUJP,NOUSO                                                   00000000
&G   CONVPARM=20014390020011E00011,NOJOURN,PERFORM=001,                 00000000
          NOUJP,NOUSO                                                   00000000
&H   CONVPARM=00014390020011E00011,NOJOURN,PERFORM=001,                 00000000
          NOUJP,NOUSO                                                   00000000
&J   CONVPARM=20014390020011E00011,NOJOURN,PERFORM=001,                 00000000
          NOUJP,NOUSO                                                   00000000
&N   CONVPARM=20014390020011E00011,NOJOURN,PERFORM=003,                 00000000
          NOUJP,NOUSO                                                   00000000
&Y   CONVPARM=00014390020011E00011,NOJOURN,PERFORM=010,                 00000000
          NOUJP,NOUSO                                                   00000000
STCMCLAS=S                                                              00000000
TSUMCLAS=Q                                                              00000000
&TPBFSIZ=516                                                            00000000
*------------- 3800 SYSOUT CLASSES --------------------*                00000000
$$D  TRKCEL                                                             00000000
$$E  TRKCEL                                                             00000000
$$F  TRKCEL                                                             00000000
$$H  TRKCEL                                                             00000000
*-----------------------------------------------------*                 00000000
$$K  PUNCH,HOLD                                                         00000000
$$J  HOLD                                                               00000000
$$O  HOLD                                                               00000000
$$Q  DUMMY                                                              00000000
$$S  DUMMY                                                              00000000
$$L  DUMMY                                                              00000000
*                                                                       00000000
$TOSC1,D=T                                                              00000000
$TOSC2,D=T                                                              00000000
$TOSC3,D=T                                                              00000000
$TOSC4,D=T                                                              00000000
$TOSC5,D=T                                                              00000000
$TOSC6,D=T                                                              00000000
$TOSC7,D=T                                                              00000000
$TOSC8,D=T                                                              00000000
$TOSC9,D=T                                                              00000000
*                                                                       00000000
*******************************************************                 00000000
&MAXSESS=30                                                             00000000
*  MAXIMUM NUMBER OF CONCURRENT VTAM SESSION -- LINES X 5 LU EACH       00000000
&NUMLNES=40                                                             00000000
* NUMLNES MUST REFLECT ADDITIONAL SNA LOGICAL LINES                     00000000
&NUMRJE=110                                                             00000000
&NUMTPBF=200                 FM 50   (MJL 9/29/77)                      00000000
* ADDITIONAL TP BUFFERS WILL BE NEEDED FOR SNA PROCESSING               00000000
&TPBFSIZ=800                                                            00000000
&WAITIME=15            15 SECONDS FOR RMT CMD(FROM 1 DEFAULT)           00000000
*                                                                       00000000
*   The following compaction tables are included in the IPO system.     00000000
```

```
*   They are not necessarily designed for performance.  See the           00000000
*   JES2 sample compaction tables.                                        00000000
*                                                                         00000000
COMPACT=40,15,A,C,D,E,H,I,L,N,O,R,S,T,U,40,0,                            C00000000
      B,F,G,J,K,M,P,Q,V,W,X,Y,Z,1,2,3                                     00000000
COMPACT=41,16,0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F                             00000000
LOGON1 APPLID=JES2                                                        00000000
*                                                                         00000000
*  - RMT LINE DEFAULTS - CODEA,LOWSPEED,IFACEA,ADISCON,EBCDIC,HDUPLEX     00000000
*                                                                         00000000
LINE35 UNIT=SNA                                                           00000000
LINE36 UNIT=SNA                                                           00000000
LINE37 UNIT=SNA                                                           00000000
LINE38 UNIT=SNA                                                           00000000
LINE39 UNIT=SNA                                                           00000000
LINE40 UNIT=SNA                                                           00000000
*  - RMT NUM DEFAULTS - BLOCKED,NOMRF,NOTRANSP,HARDWARE,NOTABS,NUMPR=1,   00000000
*                       NUMRD=1,NUMPU=0,VARIABLE,NOBUFEX,NOABUFEX,        00000000
*                       NOCOMP,NOCON,DISCINTV=0,PASSWORD=,LINE=           00000000
*                                                                         00000000
*  - RMT PRT DEFAULTS - OPERATOR,CLASS=AJ,START,NOFCBLOD,SEP,SUSPEND,     00000000
*                       PRWIDTH=120,FORMS=STD.,UCS=,FCB=                  00000000
*                                                                         00000000
*  - RMT PUN DEFAULTS - OPERATOR,CLASS=BK,START,SEP,SUSPEND,FORMS=STD.    00000000
*                                                                         00000000
*  - RMT RDR DEFAULTS - CLASS=A,MSGCLASS=A,START,NOHOLD,PRDEST=,          00000000
*                       PRIOLIM=15,PRIOINC=,PUDEST=                       00000000
*                                                                         00000000
************************************************************************ 00000000
********** RMT1 IS THE 3777-1, 512 BUFFERS, COMPACTION **************** 00000000
************************************************************************ 00000000
RMT1  LUTYPE1,BUFSIZE=512,COMP,CMPCT,NUMPR=1,                         *   00000000
      NUMRD=1,SETUPMSG                                                *   00000000
R1.PR1 PRWIDTH=132,FCBLOAD                                            *   00000000
R1.RD1 PUDEST=1,PULCL                                                 *   00000000
************************************************************************ 00000000
******* RMT2 IS THE 3777-1, 512 BUFFERS, COMPACTION, AUTO LOGON ******* 00000000
************************************************************************ 00000000
RMT2  LUTYPE1,BUFSIZE=512,COMP,CMPCT,NUMPR=1,LUNAME=LU3777R,          *   00000000
      NUMRD=1,SETUPMSG                                                *   00000000
R2.PR1 PRWIDTH=132,FCBLOAD                                            *   00000000
R2.RD1 PUDEST=1,PULCL                                                 *   00000000
************************************************************************ 00000000
****** RMT3 IS THE 3774P, 256 BUFFERS, NO COMPACTION ****************** 00000000
************************************************************************ 00000000
RMT3  LUTYPE1,BUFSIZE=256,COMP,NUMPR=1,                                  C00000000
      SETUPMSG                                                            00000000
R3.PR1 PRWIDTH=132,FCBLOAD                                                00000000
************************************************************************ 00000000
* RMT4 IS A 3770 MLU, 256 BUFFERS, PR1=PRINTER, PR2=BASIC EXCH DISK    * 00000000
* PR3=PRINTER, PU1=PUNCH, PU2=BASIC EXCH DISK, PU3=3770 T-FORMAT DISK * 00000000
************************************************************************ 00000000
RMT4 LUTYPE1,BUFSIZE=256,COMP,CONSOLE,CMPCT,NUMPR=3,NUMPU=3,NUMRD=1      00000000
R4.PR1 CHAINSIZ=0,FCBLOAD,COMPACT=40,CLASS=A,LRECL=132,SELECT=PRINT1     00000000
R4.PR2 NOCCTL,CHAINSIZ=0,NOCMPCT,CLASS=Y,LRECL=128,SELECT=BASIC1         00000000
R4.PR3 CHAINSIZ=200,CLASS=A,LRECL=132,SELECT=PRINT2                      00000000
R4.PU1 CLASS=B,NOCMPCT,LRECL=80,SELECT=PUNCH1                            00000000
R4.PU2 CHAINSIZ=0,CLASS=M,NOCCTL,NOCMPCT,LRECL=80,SELECT=BASIC2          00000000
R4.PU3 CLASS=P,CCTL,NOCMPCT,LRECL=80,SELECT=EXCH3                        00000000
```

```
R4.RD1                                                                  00000000
************************************************************************ 00000000
* RMT5 IS A 3770 MLU, 512 BUFFERS, PR1=PRINTER, PR2=3770 T-FMT DISK    * 00000000
* PR3=PRINTER, PU1=PUNCH, PU2=BASIC EXCH DISK, PU3=3770 T-FORMAT DISK * 00000000
************************************************************************ 00000000
RMT5 LUTYPE1,BUFSIZE=512,COMP,CONSOLE,CMPCT,NUMPR=3,NUMPU=3,NUMRD=1     00000000
R5.PR1 FCBLOAD,COMPACT=40,CLASS=A,LRECL=132,SELECT=PRINT1               00000000
R5.PR2 CCTL,CLASS=Z,FCBLOAD,LRECL=255,SELECT=EXCH1,NOCMPCT              00000000
R5.PR3 CHAINSIZ=200,CLASS=A,LRECL=132,SELECT=PRINT2                     00000000
R5.PU1 CLASS=B,NOCMPCT,LRECL=80,SELECT=PUNCH1                           00000000
R5.PU2 CHAINSIZ=0,CLASS=M,NOCCTL,NOCMPCT,LRECL=80,SELECT=BASIC2         00000000
R5.PU3 CLASS=P,CCTL,NOCMPCT,LRECL=80,SELECT=EXCH3                       00000000
R5.RD1                                                                  00000000
************************************************************************ 00000000
* RMT6 IS A 3770 MLU, 256 BUFFERS, PR1=PRINTER, PR2=BASIC EXCH DISK    * 00000000
* PR3=T-FMT DISK, PU1=PUNCH, PU2=BASIC EXCH DISK, PU3=3770 T-FMT DISK,* 00000000
* AUTO LOGON                                                           * 00000000
************************************************************************ 00000000
RMT6 LUTYPE1,BUFSIZE=256,COMP,CONSOLE,CMPCT,NUMPR=3,NUMPU=3,NUMRD=1,    00000000
      LINE=002,LUNAME=P76ALU1                                           00000000
R6.PR1 FCBLOAD,COMPACT=40,CLASS=A,LRECL=132,SELECT=PRINT1               00000000
R6.PR2 NOCCTL,CLASS=Y,NOCMPCT,FCBLOAD,LRECL=128,SELECT=BASIC1           00000000
R6.PR3 CHAINSIZ=200,CLASS=Z,LRECL=255,SELECT=EXCH2,NOCMPCT              00000000
R6.PU1 CLASS=B,NOCMPCT,LRECL=80,SELECT=PUNCH1                           00000000
R6.PU2 CHAINSIZ=0,CLASS=M,NOCCTL,NOCMPCT,LRECL=80,SELECT=BASIC2         00000000
R6.PU3 CLASS=P,CCTL,NOCMPCT,LRECL=80,SELECT=EXCH3                       00000000
R6.RD1                                                                  00000000
************************************************************************ 00000000
* RMT7 IS A 3770 MLU, 256 BUFFERS, PR1=PRINTER, PR2=BASIC EXCH DISK    * 00000000
* PR3=T-FMT DISK, PU1=PUNCH, PU2=BASIC EXCH DISK, PU3=3770 T-FMT DISK,* 00000000
************************************************************************ 00000000
RMT7 LUTYPE1,BUFSIZE=256,COMP,CMPCT,NUMPR=3,NUMPU=3,NUMRD=1             00000000
R7.PR1 FCBLOAD,COMPACT=40,CLASS=A,LRECL=132,SELECT=PRINT1               00000000
R7.PR2 NOCCTL,CLASS=Y,NOCMPCT,FCBLOAD,LRECL=128,SELECT=BASIC            00000000
R7.PR3 CHAINSIZ=200,CLASS=Z,LRECL=255,SELECT=EXCH2,NOCMPCT              00000000
R7.PU1 CLASS=B,NOCMPCT,LRECL=80,SELECT=PUNCH1                           00000000
R7.PU2 CHAINSIZ=0,CLASS=M,NOCCTL,NOCMPCT,LRECL=80,SELECT=BASIC2         00000000
R7.PU3 CLASS=P,CCTL,NOCMPCT,LRECL=128,SELECT=EXCH3                      00000000
R7.RD1                                                                  00000000
************************************************************************ 00000000
****** RMT95 IS A 3770, 256 BUFFERS, NO COMPACTION, 1 PRINTER  ******** 00000000
************************************************************************ 00000000
RMT95 LUTYPE1,BUFSIZE=256,COMP,NUMPR=1,                                C00000000
      SETUPMSG,PASSWORD=PAMSSC76                                        00000000
R95.PR1 PRWIDTH=132                                                     00000000
************************************************************************ 00000000
*** RMT96 IS A 3777-1, 256 BUFFERS, COMPACTION, 1 PRINTER, AUTO LOGON * 00000000
************************************************************************ 00000000
RMT96 LUTYPE1,BUFSIZE=256,COMP,CMPCT,NUMPR=1,                          C00000000
      SETUPMSG,PASSWORD=PAMSSC77,LUNAME=LUMV3D3                         00000000
R96.PR1 PRWIDTH=132                                                     00000000
************************************************************************ 00000000
*** RMT97 IS A 3777-1, 256 BUFFERS, COMPACTION, 1 PRINTER, AUTO LOGON * 00000000
************************************************************************ 00000000
RMT97 LUTYPE1,BUFSIZE=256,COMP,CMPCT,NUMPR=1,                          C00000000
      SETUPMSG,LUNAME=LUMV3D3                                           00000000
R97.PR1 PRWIDTH=132                                                     00000000
************************************************************************ 00000000
*** RMT98 IS A 3777-1, 512 BUFFERS, COMPACTION, 1 PRINTER              * 00000000
```

```
*********************************************************************** 0000000
RMT98 LUTYPE1,BUFSIZE=512,COMP,CMPCT,NUMPR=1,                          C00000000
      SETUPMSG                                                          0000000
R98.PR1 PRWIDTH=132                                                     0000000
*********************************************************************** 0000000
*** RMT99 IS A 3777-1, 256 BUFFERS, COMPACTION, 1 PRINTER             * 0000000
*********************************************************************** 0000000
RMT99 LUTYPE1,BUFSIZE=256,COMP,CMPCT,NUMPR=1,                          C00000000
      SETUPMSG                                                          0000000
R99.PR1 PRWIDTH=132,COMPACT=40   TEST COMPACTION                        0000000
*********************************************************************** 0000000
** RMT100 IS A 3770, 256 BUFFERS, COMPRESSION,  1 PRINTER, AUTO LOGON * 0000000
*********************************************************************** 0000000
RMT100 LUTYPE1,BUFSIZE=256,NUMPR=1,COMP,                               C00000000
      SETUPMSG,LUNAME=LUMV3D3                                           0000000
R100.PR1 PRWIDTH=132                                                    0000000
*********************************************************************** 0000000
** RMT101 IS A 3770, 256 BUFFERS, NO COMPRESS, 1 PRINTER, AUTO LOGON ** 0000000
*********************************************************************** 0000000
RMT101 LUTYPE1,BUFSIZE=256,NUMPR=1,                                    C00000000
      SETUPMSG,LUNAME=LUMV3D3                                           0000000
R101.PR1 PRWIDTH=132                                                    0000000
./ ENDUP                                                                0000000
/*                                                                      0000000
```

PTF REQUIREMENTS FOR JES2

RETAIN MUST BE CHECKED FOR JES2 APARS.

A.1.7 USSTAB FOR 3770

```
//USST70 JOB 'USSTAB ASSEMBLY',CLASS=A                                  00000000
//STEP1 EXEC ASMFCL                                                     00000000
//ASM.SYSPUNCH DD  DUMMY                                                00000000
//ASM.SYSIN DD *                                                        00000000
ASUSST70 USSTAB                                                         00000000
LOG      USSCMD CMD=LOG,REP=LOGON,FORMAT=BAL                            00000000
         USSPARM PARM=P1,REP=APPLID                                     00000000
         USSPARM PARM=P2,REP=LOGMODE                                    00000000
         USSPARM PARM=P3,REP=DATA                                       00000000
SIGNON   USSCMD CMD=SIGNON,REP=LOGON,FORMAT=BAL                         00000000
         USSPARM PARM=APPLID,DEFAULT=JES2                               00000000
         USSPARM PARM=LOGMODE,DEFAULT=BUF512                            00000000
         USSPARM PARM=USER,REP=DATA                                     00000000
RMT1     USSCMD CMD=RMT1,REP=LOGON,FORMAT=BAL                           00000000
         USSPARM PARM=APPLID,DEFAULT=JES2                               00000000
         USSPARM PARM=LOGMODE,DEFAULT=BUF512                            00000000
         USSPARM PARM=DATA,DEFAULT=RMT1                                 00000000
RMT3     USSCMD CMD=RMT3,REP=LOGON,FORMAT=BAL                           00000000
         USSPARM PARM=APPLID,DEFAULT=JESA                               00000000
         USSPARM PARM=LOGMODE,DEFAULT=BATCH                             00000000
         USSPARM PARM=DATA,DEFAULT=RMT3                                 00000000
RMT100   USSCMD CMD=RMT100,REP=LOGON,FORMAT=BAL                         00000000
         USSPARM PARM=APPLID,DEFAULT=JES2                               00000000
         USSPARM PARM=LOGMODE,DEFAULT=NOCOMP                            00000000
         USSPARM PARM=DATA,DEFAULT=RMT100                               00000000
IMS      USSCMD CMD=IMS,REP=LOGON,FORMAT=BAL                            00000000
         USSPARM PARM=APPLID,DEFAULT=IMS                                00000000
         USSPARM PARM=LOGMODE,DEFAULT=BATCH                             00000000
TEST     USSCMD CMD=TEST,REP=LOGON,FORMAT=BAL                           00000000
         USSPARM PARM=APPLID,DEFAULT=ISTOLTEP                           00000000
         USSPARM PARM=LOGMODE,DEFAULT=INTERACT                          00000000
RMT101   USSCMD CMD=RMT101,REP=LOGON,FORMAT=BAL                         00000000
         USSPARM PARM=APPLID,DEFAULT=JES2                               00000000
         USSPARM PARM=LOGMODE,DEFAULT=NOCOMP                            00000000
         USSPARM PARM=DATA,DEFAULT=RMT101                               00000000
RMT97    USSCMD CMD=RMT97,REP=LOGON,FORMAT=BAL                          00000000
         USSPARM PARM=APPLID,DEFAULT=JES2                               00000000
         USSPARM PARM=LOGMODE,DEFAULT=BUF256                            00000000
         USSPARM PARM=DATA,DEFAULT=RMT97                                00000000
RMT98    USSCMD CMD=RMT98,REP=LOGON,FORMAT=BAL                          00000000
         USSPARM PARM=APPLID,DEFAULT=JES2                               00000000
         USSPARM PARM=LOGMODE,DEFAULT=BUF512                            00000000
         USSPARM PARM=DATA,DEFAULT=RMT98                                00000000
LOGOFF   USSCMD CMD=LOGOFF,FORMAT=BAL                                   00000000
         USSPARM PARM=APPLID                                            00000000
         USSPARM PARM=TYPE,DEFAULT=COND                                 00000000
         USSPARM PARM=HOLD,DEFAULT=YES                                  00000000
EOD      USSCMD CMD=EOD,REP=LOGOFF,FORMAT=BAL                           00000000
         USSPARM PARM=APPLID                                            00000000
         USSPARM PARM=TYPE,DEFAULT=UNCOND                               00000000
         USSPARM PARM=HOLD,DEFAULT=NO                                   00000000
SIGNOFF  USSCMD CMD=SIGNOFF,FORMAT=BAL                                  00000000
         USSPARM PARM=APPLID                                            00000000
         USSPARM PARM=TYPE,DEFAULT=COND                                 00000000
         USSPARM PARM=HOLD,DEFAULT=YES                                  00000000
         USSEND                                                         00000000
         END                                                            00000000
```

```
//LKED.SYSLMOD  DD  DSN=SYS1.VTAMLIB(ASUSST70),DISP=SHR                  00000000
/*                                                                       00000000
```

```
NOTE: The sample USSTAB entries shown above have LOGMODE entries for     00000000
      256 and 512 byte buffers (BUF256 and BUF512) and for no compression     00000
      (NOCOMP).  With MVS, specification of options ,except pacing and        00000
      vpacing with ACF, is done through JES2                                  00000
      initialization parameters rather than through specification of logon   00000
      mode table entries and it is not necessary to specify special entries   00000
      in the logon mode table.  See section 6.2.2 for more information on     00000
      JES2 bind construction.                                                 00000
```

A.1.8 LOGON MODE TABLE FOR 3770

```
The MLU1, MLU2, and MLU3 entries to be used with ACF have pacing        00000000
and vpacing values of (1,1) and (2,1); (2,1) and (4,1); and (3,1)       00000000
and (6,1); respectively.                                                00000000


//LOGMOD JOB 'LOGTAB ASSEMBLY',MSGLEVEL=1,CLASS=C                        00000000
//STEP1 EXEC ASMFCL                                                     00000000
//ASM.SYSPUNCH DD  DUMMY                                                00000000
//ASM.SYSIN DD *                                                        00000000
RJEMODE MODETAB                                                         00000000
        MODEENT LOGMODE=BATCH,FMPROF=X'03',TSPROF=X'03',               X00000000
              PRIPROT=X'A3',SECPROT=X'A1',COMPROT=X'7080'               00000000
        MODEENT LOGMODE=MLU1,FMPROF=X'03',TSPROF=X'03',                X00000000
              PSNDPAC=2,SRCVPAC=1,                                     X00000000
              PRIPROT=X'A3',SECPROT=X'A1',COMPROT=X'7080'               00000000
        MODEENT LOGMODE=MLU2,FMPROF=X'03',TSPROF=X'03',                X00000000
              PSNDPAC=4,SRCVPAC=2,                                     X00000000
              PRIPROT=X'A3',SECPROT=X'A1',COMPROT=X'7080'               00000000
        MODEENT LOGMODE=MLU3,FMPROF=X'03',TSPROF=X'03',                X00000000
              PSNDPAC=6,SRCVPAC=3,                                     X00000000
              PRIPROT=X'A3',SECPROT=X'A1',COMPROT=X'7080'               00000000
        MODEENT LOGMODE=INTERACT,FMPROF=X'03',TSPROF=X'03',            X00000000
              PRIPROT=X'B1',SECPROT=X'A0',COMPROT=X'3040'               00000000
        MODEENT LOGMODE=NOCOMP,FMPROF=X'03',TSPROF=X'03',              X00000000
              PRIPROT=X'A1',SECPROT=X'A1',COMPROT=X'7080'               00000000
        MODEENT LOGMODE=COMP,FMPROF=X'03',TSPROF=X'03',                X00000000
              PRIPROT=X'A3',SECPROT=X'A3',COMPROT=X'7080'               00000000
        MODEENT LOGMODE=ASCII,FMPROF=X'03',TSPROF=X'03',               X00000000
              PRIPROT=X'A1',SECPROT=X'A1',COMPROT=X'7880'               00000000
        MODEENT LOGMODE=BUF512,FMPROF=X'03',TSPROF=X'03',              X00000000
              PRIPROT=X'A3',SECPROT=X'A3',COMPROT=X'7080',             X00000000
              RUSIZES=X'8686'                                           00000000
        MODEENT LOGMODE=BUF256,FMPROF=X'03',TSPROF=X'03',              X00000000
              PRIPROT=X'A3',SECPROT=X'A3',COMPROT=X'7080',             X00000000
              RUSIZES=X'8585'                                           00000000
        MODEENT LOGMODE=CMPACT,FMPROF=3,TSPROF=3,PRIPROT=X'A3',        X00000000
              SECPROT=X'A1',COMPROT=X'7080',RUSIZES=X'8585',           X00000000
              PSERVIC=X'01106000F10080800010040'                        00000000
        MODEEND                                                         00000000
        END                                                             00000000
//LKED.SYSLMOD  DD  DSN=SYS1.VTAMLIB(RJEMODE),DISP=SHR                  00000000
/*                                                                      00000000
```

A.1.9 NCP GEN FOR 3770 SUPPORT

NOTE: This NCP gen originally contained additional PU and LINE definitions, which were edited out for simplicity. 000000 000000

```
//YGLONCPU JOB ,'XXXXXXXXXXXXXXXXXXX',CLASS=A                           00000000
//         EXEC  PGM=IEBUPDTE,PARM=NEW                                  00000000
//SYSPRINT DD  SYSOUT=A                                                 00000000
//SYSUT2 DD    DSNAME=SYS1.VTAMLST,DISP=SHR                             00000000
//SYSIN  DD    DATA                                                     00000000
*./        ADD   LIST=ALL,SSI=20000607,NAME=NCPACFI                     00000000
*./      NUMBER NEW1=10000,INCR=10000                                   00000000
*********************************************************************** 00000000
*********************************************************************** 00000000
*********************************************************************** 00000000
*********************************************************************** 00000000
*           IBM 3705 ACF/NCP GENERATION  04-27-78                       00000000
*                                                                       00000000
*   SYSTEM:  PAVMS  - 3705-I ADDRESS 418 AND 019                        00000000
*                                                                       00000000
*   GENERATED FROM THE 3705 NCP OS/VS SUPPORT PACKAGE 5747-CH1 V6 M2    00000000
*                                                                       00000000
*   WITH PTF 01003                                                      00000000
*                                                                       00000000
*********************************************************************** 00000000
*********************************************************************** 00000000
*********************************************************************** 00000000
         TITLE 'PCCU SPECIFICATIONS  04-27-78'                          00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*       PCCU SPECIFICATIONS - VTAM 2 ONLY                             * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
NCPV     PCCU  CUADDR=019,          3705 CONTROL UNIT ADDRESS          X00000000
               MAXDATA=3000,        MAX OUTBOUND PIU                   X00000000
               AUTOSYN=YES,         PROMT IF ALREADY LOADED            X00000000
               AUTODMP=NO,          PROMPT BEFORE DUMPING NCP          X00000000
               AUTOIPL=YES,         AUTOIPL AND RESTART NOT AUTO       X00000000
               DUMPDS=NCPDUMP,      AUTODUMP REQUESTED                 X00000000
               SUBAREA=01,          VTAM 2 REQUIREMENT                 X00000000
               INITEST=NO           NCP INITIALIZATION TEST             00000000
         TITLE 'PCCU SPECIFICATIONS  04-27-78'                          00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*       PCCU SPECIFICATIONS - ACF/VTAM                                * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
NCPACF   PCCU  CUADDR=418,          3705 CONTROL UNIT ADDRESS          X00000000
               MAXDATA=4000,        MAX OUTBOUND PIU                   X00000000
               AUTOSYN=YES,         PROMT IF ALREADY LOADED            X00000000
               AUTODMP=NO,          PROMPT BEFORE DUMPING NCP          X00000000
               AUTOIPL=YES,         AUTOIPL AND RESTART NOT AUTO       X00000000
               DUMPDS=NCPDUMP,      AUTODUMP REQUESTED                 X00000000
               SUBAREA=13,          VTAM   REQUIREMENT                 X00000000
               INITEST=NO           NCP INITIALIZATION TEST             00000000
         TITLE 'BUILD MACRO  04-27-78'                                  00000000
*********************************************************************** 00000000
```

```
*                                                                     * 00000000
*        BUILD MACRO SPECIFICATIONS                                   * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
HONEDEV  BUILD TYPGEN=NCP,                                             X00000000
               MAXSUBA=31,                                             X00000000
               PARTIAL=YES,                                            X00000000
               CONDASM=(00),                                           X00000000
               CATRACE=(YES,255),                                      X00000000
               MAXSSCP=2,          BOTH HOSTS ACTIVE                   X00000000
               MEMSIZE=256,                                            X00000000
               MODEL=3705-2,                                           X00000000
               NEWNAME=NCPACFI,                                        X00000000
               CA=(TYPE4,TYPE4-0),                                     X00000000
               NCPCA=(ACTIVE,ACTIVE),                                  X00000000
               LTRACE=2,                                               X00000000
               TYPSYS=OS,                                              X00000000
               LESIZE=200,                                             X00000000
               QUALIFY=NCP6,                                           X00000000
               LOADLIB=NCPLIB,                                         X00000000
               OBJLIB=NCPACFI,                                         X00000000
               ABEND=YES,          ABEND FACILITY INCLUDED             X00000000
               ANS=YES,            AUTOMATIC NETWORK SHUTDOWN          X00000000
               ASMXREF=NO,         NO ASSEMBLER CROSS-REFERENCE        X00000000
               BFRS=64,            NCP BUFFER SIZE                     X00000000
               CSMHDR=27F5C711C3F0405C40C8C4D9405C, 3270 CRITSIT HEADERX00000000
               CSMHDRC=40E3C5E7E3405C5C, 3270 CRITST HEADER EXTRA TEXT X00000000
               CSMSG=C3D9C9E3E2C9E35A40E385819440F040, CRITSIT MESG    X00000000
               CSMSGC=6040C1D5E240828587A4954B, CRITST MESG EXTRA TEXT X00000000
               ERASE=NO,           DO NOT ERASE BUFFERS                X00000000
               JOBCARD=MULTI,      JOBCARDS PROVIDED BY NCP GEN        X00000000
               OLT=YES,            ONLINE TEST AVAILABLE               X00000000
               SLODOWN=12,         SLOWDOWN WHEN 12% OF BUFFERS AVAIL  X00000000
               SUBAREA=21,                                             X00000000
               TIME=,              NO TIME ON STAGE 2 EXEC CARDS       X00000000
               TRACE=(YES,64),     64 ADDRESS-TRACE ENTRIES            X00000000
               UNIT=VIO,           DATA SET FOR ASSEMBLY AND LINK EDIT X00000000
               XITB=NO             NO ITB SUPPORTED BSC UNITS           00000000
         TITLE 'SYSCNTRL MACRO  04-27-78'                               00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*        SYSCNTRL OPTIONS                                             * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
NCPSYSC SYSCNTRL OPTIONS=(MODE,DVSINIT,LNSTAT,SESINIT,                 X00000000
               RCNTRL,RCOND,RECMD,RIMM,ENDCALL,SSPAUSE,                X00000000
               BHSASSC,NAKLIM,SESSION,XMTLMT)                           00000000
         TITLE 'DOS VTAM-2 HOST MACRO SPECIFICATIONS 04-27-78'          00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*       HOST MACRO SPECIFICATIONS DOS VTAM-2                          * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
NCPHOST1 HOST  INBFRS=8,           INITIAL 3705 ALLOCATION             X00000000
               MAXBFRU=10,         VTAM BUFFER UNIT ALLOCATION         X00000000
               SUBAREA=01,         REQUIRED FOR VTAM2                  X00000000
               UNITSZ=128,                                             X00000000
               BFRPAD=15,                     DOS VTAM 15              X00000000
               DELAY=.1,           .1 SECOND ATTENTION DELAY           X00000000
```

```
         STATMOD=YES,                                              X00000000
         TIMEOUT=(180)       AUTO SHUT DOWN IF NO RESP IN 180SEC   00000000
      TITLE 'ACF/TCAM HOST MACRO SPECIFICATIONS 04-27-78'          00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*       HOST MACRO SPECIFICATIONS OS ACF/TCAM                         * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
NCPHOST3 HOST  INBFRS=8,             INITIAL 3705 ALLOCATION           X00000000
               MAXBFRU=20,           TCAM BUFFER UNIT ALLOCATION       X00000000
               SUBAREA=14,                                             X00000000
               UNITSZ=156,           MUST MATCH MCP UNITSZ             X00000000
               BFRPAD=17,                                              X00000000
               DELAY=.1,             .1 SECOND ATTENTION DELAY         X00000000
               STATMOD=YES,                                            X00000000
               TIMEOUT=(180)       AUTO SHUT DOWN IF NO RESP IN 180SEC   00000000
      TITLE 'OS ACF/VTAM HOST MACRO SPECIFICATIONS 04-27-78'           00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*       HOST MACRO SPECIFICATIONS OS ACF/VTAM                         * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
NCPHOST4 HOST  INBFRS=8,             INITIAL 3705 ALLOCATION           X00000000
               MAXBFRU=20,           VTAM BUFFER UNIT ALLOCATION       X00000000
               SUBAREA=13,                                             X00000000
               UNITSZ=152,                                             X00000000
               BFRPAD=0,                                               X00000000
               DELAY=.1,             .1 SECOND ATTENTION DELAY -OS     X00000000
               STATMOD=YES,                                            X00000000
               TIMEOUT=(180)       AUTO SHUT DOWN IF NO RESP IN 180SEC   00000000
      TITLE 'DOS ACF/VTAM HOST MACRO SPECIFICATIONS 04-27-78'          00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*       HOST MACRO SPECIFICATIONS DOS ACF/VTAM                        * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
NCPHOST5 HOST  INBFRS=8,             INITIAL 3705 ALLOCATION           X00000000
               MAXBFRU=20,           VTAM BUFFER UNIT ALLOCATION       X00000000
               SUBAREA=12,                                             X00000000
               UNITSZ=136,                                             X00000000
               BFRPAD=0,                                               X00000000
               DELAY=.1,             .1 SECOND ATTENTION DELAY -OS     X00000000
               STATMOD=YES,                                            X00000000
               TIMEOUT=(180)       AUTO SHUT DOWN IF NO RESP IN 180SEC   00000000
      TITLE 'CSB MACRO SPECIFICATIONS'                                 00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*       CSB MACRO SPECIFICATIONS                                      * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
*                                                                        00000000
*   3705 COMMUNICATION SCANNER  -  BASE MODULE                           00000000
*   LIB ADDRESS RANGE:  020 - 04F                                        00000000
*   CHANNEL ADDRESSES:  090 - 09F                                        00000000
*                                                                        00000000
FRAME1  CSB    SPEED=(134),                                            X00000000
               MOD=0,                                                  X00000000
               TYPE=TYPE2                                               00000000
      TITLE 'LUPOOL SPECIFICATIONS'                                     00000000
```

```
************************************************************************ 00000000
*                                                                      * 00000000
*     LUPOOL MACRO SPECIFICATION (MUST BE SPECIFIED BEFORE             * 00000000
*         FIRST GROUP MACRO)                                           * 00000000
*                                                                      * 00000000
************************************************************************ 00000000
POOL1    LUPOOL  NUMBER=120        ALLOW FOR LARGE CLUSTER               00000000
         TITLE 'IBM 3270 BSC SPECIFICATIONS'                             00000000
************************************************************************ 00000000
*                                                                      * 00000000
*        SPECIFICATIONS FOR SDLC LEASED LINES                          * 00000000
*        GROUP MACRO SPECIFICATIONS                                    * 00000000
*                                                                      * 00000000
************************************************************************ 00000000
SDLCGV1I  GROUP LNCTL=SDLC,         SYNCHRONOUS DATA LINK              X00000000
               DIAL=NO,            REQUIRED FOR LEASED LINE            X00000000
               REPLYTO=1.0,        USE DEFAULT                         X00000000
               TYPE=NCP            NCP ONLY                             00000000
          EJECT                                                         00000000
************************************************************************ 00000000
*                                                                      * 00000000
*        LINE MACRO SPECIFICATION   FULL DUPLEX                        * 00000000
*    ADDRESSES ARE FOR 3777 PRODUCTION RJE, NRZI=NO                      00000000
*              LINE ID 1000070                                         * 00000000
************************************************************************ 00000000
SDLCI20  LINE  ADDRESS=(020,021),  TRANSMIT AND RECEIVE ADDRESSES      X00000000
               DUPLEX=FULL,        MODEM STRAPPING IS FULL-DUPLEX      X00000000
               ISTATUS=INACTIVE,                                       X00000000
               SPEED=9600,         LINE SPEED IS 9600 BPS              X00000000
               NEWSYNC=YES,        NORMAL                              X00000000
               PAUSE=.2,                                               X00000000
               INTPRI=(3,3),       INTERRUPT PRIORITY                  X00000000
               CLOCKNG=EXT,        MODEM PROVIDES CLOCKING             X00000000
               NRZI=NO,                                                X00000000
               POLLED=YES,                                             X00000000
               RETRIES=(5)         5 RETRIES PER SEQUENCE               00000000
************************************************************************ 00000000
*                                                                      * 00000000
*        SERVICE ORDER FOR FULL-DUPLEX LINE (02C,02D)                  * 00000000
*                                                                      * 00000000
************************************************************************ 00000000
         SERVICE ORDER=(PU3777R)                                         00000000
         TITLE  'PU3777R PU SPECIFICATIONS'                              00000000
************************************************************************ 00000000
*                                                                      * 00000000
*           PU  SPECIFICATION FOR ANY SLU 3770                         * 00000000
*                                                                      * 00000000
************************************************************************ 00000000
PU3777R  PU    ADDR=C2,                                                X00000000
               ISTATUS=INACTIVE,                                       X00000000
               PACING=(1,1),                                           X00000000
               MODETAB=RJEMODE,                                        X00000000
               VPACING=(2,1),                                          X00000000
               MAXDATA=521,        MAXIMUM AMOUNT OF DATA              X00000000
               MAXOUT=1,           MAX PATH INFO UNITS BEFORE RES      X00000000
               PASSLIM=1,                                              X00000000
               PUTYPE=2            DEFINE AS PU                         00000000
************************************************************************ 00000000
*                                                                      * 00000000
```

```
*       SLU 3770 REQUIRES ONE LU                                       * 00000000
*                                                                      * 00000000
*********************************************************************** 00000000
LU3777R  LU     LOCADDR=1,                                             X00000000
                ISTATUS=ACTIVE,                                        X00000000
                SSCPFM=USSSCS,        REQUIRED FOR 3770                X00000000
                USSTAB=ASUSST70,      USSTAB FOR 3770                  X00000000
                BATCH=YES             BATCH DEVICE                      00000000
         EJECT                                                          00000000
*********************************************************************** 00000000
*                                                                      * 00000000
*        LINE MACRO SPECIFICATION   HALF DUPLEX,  NRZI=NO              * 00000000
*        LINE MATCHES ADDRESS IN  TERMINAL ROOM                        * 00000000
*                                                                      * 00000000
*********************************************************************** 00000000
SDLCI28  LINE   ADDRESS=(028),        TRANSMIT AND RECEIVE ADDRESSES   X00000000
                DUPLEX=FULL,          MODEM STRAPPING IS FULL-DUPLEX   X00000000
                ISTATUS=INACTIVE,                                      X00000000
                SPEED=7200,           LINE SPEED IS 7200 BPS           X00000000
                PAUSE=.2,                                              X00000000
                NEWSYNC=YES,          NORMAL                           X00000000
                CLOCKNG=EXT,          MODEM PROVIDES CLOCKING          X00000000
                NRZI=NO,                                               X00000000
                POLLED=YES,                                            X00000000
                RETRIES=(5)           5 RETRIES PER SEQUENCE            00000000
*********************************************************************** 00000000
*                                                                      * 00000000
*        SERVICE ORDER FOR FULL-DUPLEX LINE (028)                      * 00000000
*                                                                      * 00000000
*********************************************************************** 00000000
         SERVICE ORDER=(PU3774X,PU3776X,PU3777X)                        00000000
         TITLE '3770PX PU SPECIFICATIONS'                               00000000
*********************************************************************** 00000000
*                                                                      * 00000000
*            PU  SPECIFICATION FOR  IBM 3770 PROGRAMABLE               * 00000000
*                                                                      * 00000000
*********************************************************************** 00000000
PU3774X  PU     ADDR=C2,                                               X00000000
                ISTATUS=INACTIVE,                                      X00000000
                PACING=(1,1),                                          X00000000
                MODETAB=INCOMP,                                        X00000000
                VPACING=(2,1),                                         X00000000
                MAXDATA=521,          MAXIMUM AMOUNT OF DATA           X00000000
                MAXOUT=1,             MAX PATH INFO UNITS BEFORE RES   X00000000
                PASSLIM=1,                                             X00000000
                PUTYPE=2              DEFINE AS PU                      00000000
*********************************************************************** 00000000
*                                                                      * 00000000
*       IBM 3770 REQUIRES ONE LU                                       * 00000000
*                                                                      * 00000000
*********************************************************************** 00000000
LU12     LU     LOCADDR=1,                                             X00000000
                ISTATUS=ACTIVE,                                        X00000000
                SSCPFM=USSSCS,        REQUIRED FOR 3770                X00000000
                USSTAB=ASUSST70,      USSTAB FOR 3770                  X00000000
                BATCH=YES             BATCH DEVICE                      00000000
*********************************************************************** 00000000
*                                                                      * 00000000
*             PU MACRO SPECIFICATION FOR 3776X                          00000000
```

```
*                (ANY SLU 3770)                                       * 00000000
********************************************************************** 00000000
PU3776X   PU     ADDR=C3,                                              X00000000
                 PUTYPE=2,                                             X00000000
                 MAXOUT=1,             MAX PATH INFO UNITS BEFORE RESPONSE X00000000
                 MAXDATA=521,          MAXIMUM AMOUNT OF DATA          X00000000
                 PASSLIM=1,                                            X00000000
                 PACING=(1,1),                                         X00000000
                 MODETAB=RJEMODE,                                      X00000000
                 VPACING=(2,1),                                        X00000000
                 ISTATUS=INACTIVE,                                     X00000000
                 RETRIES=(,1,4)        4 RETRIES, 1 SECOND BETWEEN      00000000
********************************************************************** 00000000
*                                                                     * 00000000
*        LOGICAL UNIT SPECIFICATIONS                                  * 00000000
*                                                                     * 00000000
********************************************************************** 00000000
LU3776X  LU      LOCADDR=1,            IN REQ'D FOR 1ST 3760X LU       X00000000
                 SSCPFM=USSSCS,        REQUIRED FOR 3770               X00000000
                 USSTAB=ASUSST70,      USSTAB FOR 3770                 X00000000
                 BATCH=YES,            BATCH DEVICE                    X00000000
                 ISTATUS=ACTIVE        WILL ACTIVATE WITH PU            00000000
         TITLE '3770X PU SPECIFICATIONS'                                00000000
********************************************************************** 00000000
*                                                                     * 00000000
*            PU  SPECIFICATION FOR  IBM 3770X                         * 00000000
*                (ANY SLU 3770)                                       * 00000000
********************************************************************** 00000000
PU3777X  PU      ADDR=C4,                                              X00000000
                 MAXDATA=521,          MAXIMUM AMOUNT OF DATA          X00000000
                 ISTATUS=INACTIVE,                                     X00000000
                 PACING=(1,1),                                         X00000000
                 VPACING=(2,1),                                        X00000000
                 PASSLIM=1,                                            X00000000
                 MAXOUT=1,             MAX PATH INFO UNITS BEFORE RES  X00000000
                 PUTYPE=2              DEFINE AS PU                     00000000
********************************************************************** 00000000
*                                                                     * 00000000
*       IBM 3770 REQUIRES ONE LU                                      * 00000000
*                                                                     * 00000000
********************************************************************** 00000000
LU3777X  LU      LOCADDR=1,                                            X00000000
                 ISTATUS=ACTIVE,                                       X00000000
                 SSCPFM=USSSCS,        REQUIRED FOR 3770               X00000000
                 USSTAB=ASUSST70,      USSTAB FOR 3770                 X00000000
                 MODETAB=RJEMODE,                                      X00000000
                 BATCH=YES             BATCH DEVICE                     00000000
        EJECT                                                           00000000
         TITLE 'SDLCI24   LINE SPECIFICATION'                           00000000
********************************************************************** 00000000
*                                                                     * 00000000
*        LINE SPECIFICATION HALF DUPLEX FOR 3774 PROGRAMMABLE         * 00000000
*                  LINE ID 1000061                                   *  00000000
********************************************************************** 00000000
SDLCI24  LINE    ADDRESS=(024),        TRANSMIT AND RECEIVE ADDRESSES  X00000000
                 DUPLEX=FULL,          MODEM STRAPPING IS FULL-DUPLEX  X00000000
                 SPEED=4800,           LINE SPEED IS 4800 BPS          X00000000
                 PAUSE=.2,                                             X00000000
                 NEWSYNC=NO,           TRY WITHOUT                     X00000000
```

```
              CLOCKNG=EXT,        MODEM PROVIDES CLOCKING           X00000000
              NRZI=NO,            NOT NEEDED ON FULL DUPLEX         X00000000
              POLLED=YES,                                           X00000000
              RETRIES=(5)         5 RETRIES PER SEQUENCE             00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*       SERVICE ORDER FOR FULL-DUPLEX LINE (024)                      * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
        SERVICE ORDER=(PU70P,PU70C)                                      00000000
        TITLE  '3770P PU SPECIFICATIONS'                                 00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*           PU  SPECIFICATION FOR  IBM 3770 PROGRAMABLE               * 00000000
*              (ANY SLU 3770)                                         * 00000000
*********************************************************************** 00000000
PU70P    PU   ADDR=C1,            PU ADDRESS = A (EBCDIC)           X00000000
              PACING=(1,1),                                         X00000000
              ISTATUS=ACTIVE,                                       X00000000
              VPACING=(2,1),                                        X00000000
              MAXDATA=521,        MAXIMUM AMOUNT OF DATA            X00000000
              MAXOUT=1,           MAX PATH INFO UNITS BEFORE RES    X00000000
              PASSLIM=1,                                            X00000000
              PUTYPE=2            DEFINE AS PU                       00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*       IBM 3770P LU FOR BATCH LU                                     * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
P70LU1   LU   LOCADDR=1,                                            X00000000
              MODETAB=MODE3770,   REQUIRED FOR 3770 SLU1            X00000000
              SSCPFM=USSSCS,      REQUIRED FOR 3770                 X00000000
              USSTAB=ASUSST70,    USSTAB FOR 3770                   X00000000
              ISTATUS=ACTIVE,                                       X00000000
              BATCH=YES           BATCH DEVICE                       00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*      IBM 3770P LU'S FOR SNA/PC INTERACTIVE PROGRAMMED COMMUNICATIONS* 00000000
*                                                                     * 00000000
*         - ONLY ONE CAN BE ACTIVE AT A TIME                          * 00000000
*********************************************************************** 00000000
P7OLU2   LU   LOCADDR=2,                                            X00000000
              SSCPFM=USSSCS,      REQUIRED FOR 3770                 X00000000
              USSTAB=ASUSST70,    USSTAB FOR 3770                   X00000000
              ISTATUS=INACTIVE,                                     X00000000
              BATCH=NO                                               00000000
P70LU3   LU   LOCADDR=3,                                            X00000000
              SSCPFM=USSSCS,      REQUIRED FOR 3770                 X00000000
              USSTAB=ASUSST70,    USSTAB FOR 3770                   X00000000
              ISTATUS=INACTIVE,                                     X00000000
              BATCH=NO                                               00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*     SECOND PU  SPECIFICATION FOR  IBM 3770 PROGRAMABLE              * 00000000
*                                                                     * 00000000
*     DEFINED 2 PUs SO COULD DEFINE MORE THAN 4 COMPONENTS TO IMS/VS  * 00000000
*********************************************************************** 00000000
PU70C    PU   ADDR=C1,            PU ADDRESS = A (EBCDIC)           X00000000
              PACING=(1,1),                                         X00000000
```

```
             ISTATUS=INACTIVE,                                         X00000000
             VPACING=(2,1),                                            X00000000
             MAXDATA=521,        MAXIMUM AMOUNT OF DATA                X00000000
             MAXOUT=1,           MAX PATH INFO UNITS BEFORE RES        X00000000
             PASSLIM=1,                                                X00000000
             PUTYPE=2            DEFINE AS PU                           00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*       IBM 3770P LU FOR BATCH LU                                     * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
C70LU1   LU  LOCADDR=1,                                                X00000000
             MODETAB=MODE3770,   REQUIRED FOR 3770 SLU1                X00000000
             SSCPFM=USSSCS,      REQUIRED FOR 3770                     X00000000
             USSTAB=ASUSST70,    USSTAB FOR 3770                       X00000000
             ISTATUS=ACTIVE,                                           X00000000
             BATCH=YES           BATCH DEVICE                           00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*      IBM 3770P LU'S FOR SNA/PC INTERACTIVE PROGRAMMED COMMUNICATIONS* 00000000
*                                                                     * 00000000
*         - ONLY ONE CAN BE ACTIVE AT A TIME                          * 00000000
*********************************************************************** 00000000
C70LU2   LU  LOCADDR=2,                                                X00000000
             SSCPFM=USSSCS,      REQUIRED FOR 3770                     X00000000
             USSTAB=ASUSST70,    USSTAB FOR 3770                       X00000000
             ISTATUS=INACTIVE,                                         X00000000
             BATCH=NO                                                   00000000
C70LU3   LU  LOCADDR=3,                                                X00000000
             SSCPFM=USSSCS,      REQUIRED FOR 3770                     X00000000
             USSTAB=ASUSST70,    USSTAB FOR 3770                       X00000000
             ISTATUS=INACTIVE,                                         X00000000
             BATCH=NO                                                   00000000
         EJECT                                                          00000000
         TITLE 'SDLCI26   LINE SPECIFICATION'                           00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*        LINE SPECIFICATION FULL DUPLEX FOR 3776 MLU                  * 00000000
*            LINE ID 1000066                                          * 00000000
*********************************************************************** 00000000
SDLCI26  LINE ADDRESS=(026,027), TRANSMIT AND RECEIVE ADDRESSES        X00000000
             DUPLEX=FULL,        MODEM STRAPPING IS FULL-DUPLEX        X00000000
             SPEED=4800,         LINE SPEED IS 4800 BPS                X00000000
             PAUSE=.2,                                                 X00000000
             NEWSYNC=NO,         TRY WITHOUT                           X00000000
             CLOCKNG=EXT,        MODEM PROVIDES CLOCKING               X00000000
             NRZI=NO,            NOT NEEDED ON FULL DUPLEX             X00000000
             POLLED=YES,                                               X00000000
             RETRIES=(5)         5 RETRIES PER SEQUENCE                 00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*        SERVICE ORDER FOR FULL-DUPLEX LINE (026,027)                 * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
         SERVICE ORDER=(PU76A,PU76B,PU76C,PU76D,PU76E)                  00000000
         TITLE  '3776MLU PU SPECIFICATIONS'                             00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*          PU  SPECIFICATION FOR  IBM 3770 MLU                          00000000
```

```
*           FOR ACF SYSTEMS                                               * 00000000
*           6 LUs: PACING= 1;1;1;1;1;1;                                   * 00000000
************************************************************************* 00000000
PU76A    PU    ADDR=C1,              PU ADDRESS = A (EBCDIC)              X00000000
               PACING=(1,1),                                              X00000000
               ISTATUS=INACTIVE,                                          X00000000
               VPACING=(2,1),                                             X00000000
               MAXDATA=521,          MAXIMUM AMOUNT OF DATA               X00000000
               MAXOUT=7,             MAX PATH INFO UNITS BEFORE RES       X00000000
               RETRIES=(,3,5),       IMMED, PAUSE, TOTAL RETRIES          X00000000
               PASSLIM=7,                                                 X00000000
               MODETAB=RJEMODE,      REQUIRED FOR 3770 SLU1               X00000000
               SSCPFM=USSSCS,        REQUIRED FOR 3770                    X00000000
               USSTAB=ASUSST70,      USSTAB FOR 3770                      X00000000
               PUTYPE=2              DEFINE AS PU                          00000000
P76ALU1  LU    LOCADDR=1,ISTATUS=ACTIVE,BATCH=NO                           00000000
P76ALU2  LU    LOCADDR=2,ISTATUS=ACTIVE,BATCH=NO                           00000000
P76ALU3  LU    LOCADDR=3,ISTATUS=ACTIVE,BATCH=NO                           00000000
P76ALU4  LU    LOCADDR=4,ISTATUS=ACTIVE,BATCH=NO                           00000000
P76ALU5  LU    LOCADDR=5,ISTATUS=ACTIVE,BATCH=NO                           00000000
P76ALU6  LU    LOCADDR=6,ISTATUS=ACTIVE,BATCH=NO                           00000000
************************************************************************* 00000000
*                                                                         * 00000000
*           PU  SPECIFICATION FOR  IBM 3770 MLU                             00000000
*           FOR JES2 NON ACF SYSTEMS - ONE APPROACH                       * 00000000
*           6 LUs: PACING= 1;2;2;2;2;2;  SESSION 6 WON'T BIND             * 00000000
************************************************************************* 00000000
PU76B    PU    ADDR=C1,              PU ADDRESS = A (EBCDIC)              X00000000
               PACING=(2,1),                                              X00000000
               ISTATUS=INACTIVE,                                          X00000000
               VPACING=(4,1),                                             X00000000
               MAXDATA=521,          MAXIMUM AMOUNT OF DATA               X00000000
               MAXOUT=7,             MAX PATH INFO UNITS BEFORE RES       X00000000
               RETRIES=(,3,5),       IMMED, PAUSE, TOTAL RETRIES          X00000000
               PASSLIM=7,                                                 X00000000
               MODETAB=RJEMODE,      REQUIRED FOR 3770 SLU1               X00000000
               SSCPFM=USSSCS,        REQUIRED FOR 3770                    X00000000
               USSTAB=ASUSST70,      USSTAB FOR 3770                      X00000000
               PUTYPE=2              DEFINE AS PU                          00000000
P76BLU1  LU    LOCADDR=1,ISTATUS=ACTIVE,PACING=(1, 1)                      00000000
P76BLU2  LU    LOCADDR=2,ISTATUS=ACTIVE,BATCH=NO                           00000000
P76BLU3  LU    LOCADDR=3,ISTATUS=ACTIVE,BATCH=NO                           00000000
P76BLU4  LU    LOCADDR=4,ISTATUS=ACTIVE,BATCH=NO                           00000000
P76BLU5  LU    LOCADDR=5,ISTATUS=ACTIVE,BATCH=NO                           00000000
P76BLU6  LU    LOCADDR=6,ISTATUS=ACTIVE,BATCH=NO                           00000000
************************************************************************* 00000000
*                                                                         * 00000000
*           PU  SPECIFICATION FOR  IBM 3770 MLU                             00000000
*           FOR DOS AND VS1 SYSTEMS                                       * 00000000
*           6 LUs: PACING= 3;2;1;1;1;1;                                   * 00000000
************************************************************************* 00000000
PU76C    PU    ADDR=C1,              PU ADDRESS = A (EBCDIC)              X00000000
               PACING=(1,1),                                              X00000000
               ISTATUS=INACTIVE,                                          X00000000
               VPACING=(6,1),                                             X00000000
               MAXDATA=521,          MAXIMUM AMOUNT OF DATA               X00000000
               MAXOUT=7,             MAX PATH INFO UNITS BEFORE RES       X00000000
               RETRIES=(,3,5),       IMMED, PAUSE, TOTAL RETRIES          X00000000
               PASSLIM=7,                                                 X00000000
```

```
                MODETAB=RJEMODE,    REQUIRED FOR 3770 SLU1              X00000000
                SSCPFM=USSSCS,      REQUIRED FOR 3770                   X00000000
                USSTAB=ASUSST70,    USSTAB FOR 3770                     X00000000
                PUTYPE=2            DEFINE AS PU                         00000000
P76CLU1  LU     LOCADDR=1,ISTATUS=ACTIVE,PACING=(3,1)                    00000000
P76CLU2  LU     LOCADDR=2,ISTATUS=ACTIVE,PACING=(2,1)                    00000000
P76CLU3  LU     LOCADDR=3,ISTATUS=ACTIVE,PACING=(1,1)                    00000000
P76CLU4  LU     LOCADDR=4,ISTATUS=ACTIVE,BATCH=NO                        00000000
P76CLU5  LU     LOCADDR=5,ISTATUS=ACTIVE,BATCH=NO                        00000000
P76CLU6  LU     LOCADDR=6,ISTATUS=ACTIVE,BATCH=NO                        00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*             PU  SPECIFICATION FOR  IBM 3770 MLU                        00000000
*             FOR MLU TERMINALS EMULATING SLU 3770s                   * 00000000
*             1 LU: PACING= 3;                                           00000000
*********************************************************************** 00000000
PU76D    PU     ADDR=C1,            PU ADDRESS = A (EBCDIC)             X00000000
                PACING=(1,1),                                           X00000000
                ISTATUS=INACTIVE,                                       X00000000
                VPACING=(6,1),                                          X00000000
                MAXDATA=521,        MAXIMUM AMOUNT OF DATA              X00000000
                MAXOUT=7,           MAX PATH INFO UNITS BEFORE RES      X00000000
                RETRIES=(,3,5),     IMMED, PAUSE, TOTAL RETRIES         X00000000
                PASSLIM=7,                                              X00000000
                MODETAB=RJEMODE,    REQUIRED FOR 3770 SLU1              X00000000
                SSCPFM=USSSCS,      REQUIRED FOR 3770                   X00000000
                USSTAB=ASUSST70,    USSTAB FOR 3770                     X00000000
                PUTYPE=2            DEFINE AS PU                         00000000
P76DLU1  LU     LOCADDR=1,ISTATUS=ACTIVE,PACING=(3,1)                    00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*             PU  SPECIFICATION FOR  IBM 3770 MLU                        00000000
*             FOR EXPERIMENTATION                                     * 00000000
*             6 LUs: PACING= 6;1;3;5;4;2;                             * 00000000
*********************************************************************** 00000000
PU76E    PU     ADDR=C1,            PU ADDRESS = A (EBCDIC)             X00000000
                PACING=(1,1),                                           X00000000
                ISTATUS=INACTIVE,                                       X00000000
                VPACING=(12,1),                                         X00000000
                MAXDATA=521,        MAXIMUM AMOUNT OF DATA              X00000000
                MAXOUT=7,           MAX PATH INFO UNITS BEFORE RES      X00000000
                RETRIES=(,3,5),     IMMED, PAUSE, TOTAL RETRIES         X00000000
                PASSLIM=7,                                              X00000000
                MODETAB=RJEMODE,    REQUIRED FOR 3770 SLU1              X00000000
                SSCPFM=USSSCS,      REQUIRED FOR 3770                   X00000000
                USSTAB=ASUSST70,    USSTAB FOR 3770                     X00000000
                PUTYPE=2            DEFINE AS PU                         00000000
P76ELU1  LU     LOCADDR=1,ISTATUS=ACTIVE,PACING=(6,1)                    00000000
P76ELU2  LU     LOCADDR=2,ISTATUS=ACTIVE,PACING=(1,1)                    00000000
P76ELU3  LU     LOCADDR=3,ISTATUS=ACTIVE,PACING=(3,1)                    00000000
P76ELU4  LU     LOCADDR=4,ISTATUS=ACTIVE,PACING=(5,1)                    00000000
P76ELU5  LU     LOCADDR=5,ISTATUS=ACTIVE,PACING=(4,1)                    00000000
P76ELU6  LU     LOCADDR=6,ISTATUS=ACTIVE,PACING=(2,1)                    00000000
         EJECT                                                           00000000
         TITLE 'SDLC DIAL LINE SPECIFICATION'                            00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*        SPECIFICATIONS FOR SDLC DIAL LINE                            * 00000000
*        GROUP MACRO SPECIFICATIONS                                   * 00000000
```

```
*                                                                       * 00000000
************************************************************************ 00000000
SDLCGV2  GROUP LNCTL=SDLC,        SYNCHRONOUS DATA LINK                 X00000000
               DIAL=YES,          REQUIRED FOR DIAL LINE                X00000000
               TYPE=NCP           NCP ONLY                               00000000
************************************************************************ 00000000
*                                                                       * 00000000
*        LINE MACRO SPECIFICATION - HALF-DUPLEX, SWITCHED.              * 00000000
*        MAY BE USED FOR 3790, 3770, AND 3767                           * 00000000
*                                                                       * 00000000
************************************************************************ 00000000
SDLCI2E  LINE  ADDRESS=(02E),     TRANSMIT AND RECEIVE ADDRESS          X00000000
               CALL=INOUT,        REQUIRED BY VTAM                      X00000000
               DUPLEX=HALF,       MODEM IS STRAPPED FOR HALF DUPLEX     X00000000
               SPEED=2400,                                              X00000000
               NRZI=NO,           UNITS NOT SPECIFIED WITH NRZI         X00000000
               CLOCKNG=EXT,       MODEM PROVIDES CLOCKING               X00000000
               POLLED=YES,                                              X00000000
               RETRIES=(5)                                               00000000
************************************************************************ 00000000
*                                                                       * 00000000
*      NO SERVICE ORDER FOR SDLC SWITCHED LINE                          * 00000000
*                                                                       * 00000000
************************************************************************ 00000000
************************************************************************ 00000000
*                                                                       * 00000000
*         PU MACRO SPECIFICATION FOR SWITCHED LINK                      * 00000000
*                                                                       * 00000000
************************************************************************ 00000000
PUV1     PU    PUTYPE=(1,2),      SUPPORT TYPE 1 AND 2 PU'S             X00000000
               MAXLU=60           MAXIMUM NUMBER OF LU'S FOR LINE        00000000
************************************************************************ 00000000
*                                                                       * 00000000
*        SPECIFICATIONS FOR SDLC DIAL LINE 2                            * 00000000
*        GROUP MACRO SPECIFICATIONS                                     * 00000000
*                                                                       * 00000000
************************************************************************ 00000000
SDLCGV3  GROUP LNCTL=SDLC,        SYNCHRONOUS DATA LINK                 X00000000
               DIAL=YES,          REQUIRED FOR DIAL LINE                X00000000
               TYPE=NCP           NCP ONLY                               00000000
************************************************************************ 00000000
*                                                                       * 00000000
*        LINE MACRO SPECIFICATION - HALF-DUPLEX, SWITCHED.              * 00000000
*        MAY BE USED FOR 3790, 3770, AND 3767                           * 00000000
*                                                                       * 00000000
************************************************************************ 00000000
SDLCI2F  LINE  ADDRESS=(02F),     TRANSMIT AND RECEIVE ADDRESS          X00000000
               CALL=INOUT,        REQUIRED BY VTAM                      X00000000
               DUPLEX=HALF,       MODEM IS STRAPPED FOR HALF DUPLEX     X00000000
               SPEED=2400,                                              X00000000
               NRZI=NO,           UNITS SPECIFIED WITH NRZI = NO        X00000000
               CLOCKNG=EXT,       MODEM PROVIDES CLOCKING               X00000000
               POLLED=YES,                                              X00000000
               RETRIES=(5)                                               00000000
************************************************************************ 00000000
*                                                                       * 00000000
*      NO SERVICE ORDER FOR SDLC SWITCHED LINE                          * 00000000
*                                                                       * 00000000
************************************************************************ 00000000
```

```
************************************************************************ 00000000
*                                                                      * 00000000
*          PU MACRO SPECIFICATION FOR SWIICHED LINK                    * 00000000
*                                                                      * 00000000
************************************************************************ 00000000
PUV2     PU    PUTYPE=(1,2),         SUPPORT TYPE 1 AND 2 PU'S        X00000000
               MAXLU=60              MAXIMUM NUMBER OF LU'S FOR LINE   00000000
         TITLE 'GENEND SPECIFICATIONS'                                 00000000
************************************************************************ 00000000
*                                                                      * 00000000
*        GENEND DELIMITER                                              * 00000000
*                                                                      * 00000000
************************************************************************ 00000000
         GENEND                                                          00000000
         END                                                             00000000
/*                                                                       00000000
```

A.1.10 VTAM SWITCHED DEFINITION

```
//UPDATLST JOB MSGLEVEL=1                                               00000000
//       EXEC  PGM=IEBUPDTE,PARM=NEW                                    00000000
//SYSPRINT DD  SYSOUT=A                                                 00000000
//SYSUT2 DD    DSNAME=SYS1.VTAMLST,DISP=SHR                             00000000
//SYSIN   DD   DATA                                                     00000000
./       ADD   NAME=SWITCHAC,LEVEL=00,SOURCE=0,LIST=ALL                 00000000
./       NUMBER NEW1=10,INCR=10                                         00000000
*                                                                     * 00000000
*********************************************************************** 00000000
*********************************************************************** 00000000
*********************************************************************** 00000000
SWITCHAC VBUILD TYPE=SWNET,        SWITCHED NET                        X00000000
               SUBAREA=4,          SUBAREA ADDRESS = 4                 X00000000
               MAXNO=4,            4  DIALNO                           X00000000
               MAXGRP=1            1 PATH GROUP                         00000000
*********************************************************************** 00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*            PU  SPECIFICATION FOR  IBM 3770                          * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
*********************************************************************** 00000000
*********************************************************************** 00000000
SW3770   PU    ADDR=C3,            PU ADDRESS = C (EBCDIC)             X00000000
               PUTYPE=2,           DEFINE AS TYPE 2 PU                 X00000000
               IDBLK=010,          IDENTIFICATION BLOCK                X00000000
               IDNUM=000C3,        IDENTIFICATION NUMBER               X00000000
               MAXDATA=265,        MAXIMUM AMOUNT OF DATA              X00000000
               MAXPATH=2,          2 paths                             X00000000
               MAXOUT=7,           MAX PATH INFO UNITS BEFORE RES      X00000000
               PASSLIM=7,          EQUAL TO MAXOUT                     X00000000
               PACING=(1,1),                                           X00000000
               VPACING=(2,1),                                          X00000000
               IRETRY=YES                                               00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*  1ST   PATH STATEMENT                                               * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
PATH03   PATH  GID=1,                                                  X00000000
               GRPNM=SDLCGP2,      NCP SWITCHED LINE GROUP(NCPRAL)     X00000000
               PID=2,              ID FOR THIS PU                      X00000000
               DIALNO=83334444     TIE OR WATTS                         00000000
*********************************************************************** 00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*  2ND   PATH STATEMENT                                               * 00000000
*                                                                     * 00000000
*********************************************************************** 00000000
PATH03B  PATH  GID=1,                                                  X00000000
               GRPNM=SDLCGP2,      NCP SWITCHED LINE GROUP(NCPRAL)     X00000000
               PID=3,              ID FOR THIS PU                      X00000000
               DIALNO=12225554444  STATION TO STATION                   00000000
*********************************************************************** 00000000
*                                                                     * 00000000
*       IBM 3770 REQUIRES ONE LU                                      * 00000000
*                                                                     * 00000000
```

```
************************************************************************ 00000000
BA3770SW LU     LOCADDR=1,                                              X00000000
                MODETAB=RJEMODE,                                        X00000000
                USSTAB=ASUSST70,                                        X00000000
                SSCPFM=USSSCS,                                          X00000000
                BATCH=YES           BATCH DEVICE                         00000000
************************************************************************ 00000000
************************************************************************ 00000000
************************************************************************ 00000000
*                                                                      * 00000000
*            PU  SPECIFICATION FOR  IBM 3770 PR                        * 00000000
*                                                                      * 00000000
************************************************************************ 00000000
************************************************************************ 00000000
************************************************************************ 00000000
SW3770P  PU     ADDR=C4,            PU ADDRESS = C (EBCDIC)             X00000000
                PUTYPE=2,           DEFINE AS TYPE 2 PU                 X00000000
                IDBLK=011,          IDENTIFICATION BLOCK                X00000000
                IDNUM=000C4,        IDENTIFICATION NUMBER               X00000000
                MAXDATA=265,        MAXIMUM AMOUNT OF DATA              X00000000
                MAXPATH=2,          2 paths                             X00000000
                MAXOUT=7,           MAX PATH INFO UNITS BEFORE RES      X00000000
                PASSLIM=7,          EQUAL TO MAXOUT                     X00000000
                PACING=(1,1),                                           X00000000
                VPACING=(2,1),                                          X00000000
                IRETRY=YES                                               00000000
************************************************************************ 00000000
*                                                                      * 00000000
*  1ST   PATH STATEMENT                                                * 00000000
*                                                                      * 00000000
************************************************************************ 00000000
PATH04   PATH   GID=1,                                                  X00000000
                GRPNM=SDLCGP2,      NCP SWITCHED LINE GROUP(NCPRAL)     X00000000
                PID=2,              ID FOR THIS PU                      X00000000
                DIALNO=83334444     TIE OR WATTS                         00000000
************************************************************************ 00000000
************************************************************************ 00000000
*                                                                      * 00000000
*  2ND   PATH STATEMENT                                                * 00000000
*                                                                      * 00000000
************************************************************************ 00000000
PATH04A  PATH   GID=1,                                                  X00000000
                GRPNM=SDLCGP2,      NCP SWITCHED LINE GROUP(NCPRAL)     X00000000
                PID=3,              ID FOR THIS PU                      X00000000
                DIALNO=12225554444  STATION TO STATION                   00000000
************************************************************************ 00000000
*                                                                      * 00000000
*        IBM 3770 REQUIRES ONE LU                                      * 00000000
*                                                                      * 00000000
************************************************************************ 00000000
PR3770SW LU     LOCADDR=1,                                              X00000000
                MODETAB=RJEMODE,                                        X00000000
                USSTAB=ASUSST70,                                        X00000000
                SSCPFM=USSSCS,                                          X00000000
                BATCH=YES           BATCH DEVICE                         00000000
************************************************************************ 00000000
************************************************************************ 00000000
```

A.2 VS1/RES SYSTEM

A.2.1 ATCSTR00 - VTAM START LIST

```
//UPDATE JOB
// EXEC PGM=IEBUPDTE,PARM=NEW
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.VTAMLST
//SYSUT2 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.VTAMLST
//SYSIN DD DATA
./ ADD NAME=ATCSTR00,LIST=ALL
NOPROMPT,                                                               *
SSCPID=01,                                                              *
CONFIG=00,                                                              *
MAXSUBA=63,                                                             *
UECBUF=(100,,5,,10,20),                                                 *
WPBUF=(150,,15,,15,30),                                                 *
IOBUF=(300,300,30,,30,60),                                              *
APBUF=(150,,15,,15,30),                                                 *
PPBUF=(280,300,28,,28,56),                                              *
SFBUF=(240,,24,,24,48),                                                 *
SPBUF=(10,,1,,10,2),                                                    *
LFBUF=(100,,10,,10,20),                                                 *
LPBUF=(180,,18,,18,36),                                                 *
NPBUF=(225,,23,,23,46),                                                 *
CRPLBUF=(200,,20,,20,40),                                               *
MAXAPPL=150
/*
//
//
```

A.2.2 ATCCON00 - VTAM CONFIGURATION LIST

```
//UPDATE JOB
// EXEC PGM=IEBUPDTE,PARM=NEW
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.VTAMLST
//SYSUT2 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.VTAMLST
//SYSIN DD DATA
./ ADD NAME=ATCCON00,LIST=ALL
 APPLSNA2,PEPSNA2
./ ENDUP
```

A.2.3 VS1 APPLID DEFINITION FOR ACF/VTAM

```
//UPDATE JOB
// EXEC PGM=IEBUPDTE,PARM=NEW
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.VTAMLST
//SYSUT2 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.VTAMLST
//SYSIN DD DATA
./ ADD NAME=APPLSNA2,LIST=ALL
RTAM     APPL AUTH=(ACQ,VPACE,NOBLOCK,NOPASS),PRTCT=RTAMVTAM,          X
               VPACING=5,BUFFACT=40,ENCR=OPT
/*
//
```

```
//
```

A.2.4 VS1 LOGON PROCEDURES

```
//UPDATE JOB                                                            UPD00010
// EXEC PGM=IEBUPDTE                                                    UPD00020
//SYSPRINT DD SYSOUT=A                                                  UPD00030
//SYSUT1 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.PARMLIB         UPD000
//SYSUT2 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.PARMLIB         UPD000
//SYSIN DD DATA                                                         UPD00060
./ REPL NAME=PLOGS,LIST=ALL
LOGON RUSER30 TERM(30) PROC(RMUSER30)
LOGON RUSER31 TERM(31) PROC(RMUSER30)
LOGON RUSER32 TERM(32) PROC(RMUSER30)
LOGON RUSER33 TERM(33) PROC(RMUSER30)
LOGON RUSER34 TERM(34) PROC(RMUSER30)
LOGON RUSER35 TERM(35) PROC(RMUSER30)
/*
//
```

```
//UPDATE JOB                                                            UPD00010
// EXEC PGM=IEBUPDTE                                                    UPD00020
//SYSPRINT DD SYSOUT=A                                                  UPD00030
//SYSUT1 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.PROCLIB
//SYSUT2 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.PROCLIB
//SYSIN DD DATA                                                         UPD00060

./ ADD NAME=RMUSER30,LIST=ALL                                           UPD00070
MN JOBNAMES,T
MN SESS,T
//
MN JOBNAMES,T
SEND 'MLU REMOTE USER LOGGED ON TO RES/RTAM READY FOR ACTION !!!!!!'
SF WTR.RM30PRT1,PR1,,A
SF WTR.RM30PRT2,PR2,,C
SF WTR.RM30PRT3,PR3,,D
SF WTR.RM30PRT4,PR4,,E
SF WTR.RM30PUN1,PU1,,B
SF RDR.RM30RDR1,RD1
SF RDR.RM30RDR2,RD2
SF RDR.RM30RDR3,RD3
SF RDR.RM30RDR4,RD4
   .                                                                    UPD00070
   .
   .

./ ADD NAME=RMUSER34,LIST=ALL                                           UPD00070
MN JOBNAMES,T
MN SESS,T
//
MN JOBNAMES,T
SEND 'MLU REMOTE USER LOGGED ON TO RES/RTAM READY FOR ACTION !!!!!!'
SF WTR.RM34PRT1,PR1,,ACDE
SF WTR.RM34PUN1,PU1,,B
SF RDR.RM34RDR1,RD1
SF RDR.RM34RDR2,RD2
```

```
/*
//
//
```

A.2.5 RTAM PROC

```
//UPDATE JOB                                                             UPD00010
// EXEC PGM=IEBUPDTE                                                      UPD00020
//SYSPRINT DD SYSOUT=A                                                    UPD00030
//SYSUT1 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.PROCLIB          UPD00040
//SYSUT2 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.PROCLIB          UPD00050
//SYSIN DD DATA                                                           UPD00060
./ REPL NAME=RTAM,LIST=ALL
//RES PROC LINE1=040,LINE2=041,LINE3=042,LINE4=043,LINE5=044,
// LINE6=045,LINE7=046,LINE8=047,LINE9=048,LINE10=049,LINE11=04A,
// LINE12=04B
//RTAM EXEC PGM=IFSRTAM,PARM=(12,NOLIST)
//LOGON  DD DSN=SYS1.PARMLIB(PLOGS),DISP=SHR
//LINE1  DD UNIT=&LINE1
//LINE2  DD UNIT=&LINE2
//LINE3  DD UNIT=&LINE3
//LINE4  DD UNIT=&LINE4
//LINE5  DD UNIT=&LINE5
//LINE6  DD UNIT=&LINE6
//LINE7  DD UNIT=&LINE7
//LINE8  DD UNIT=&LINE8
//LINE9  DD UNIT=&LINE9
//LINE10 DD UNIT=&LINE10
//LINE11 DD UNIT=&LINE11
//LINE12 DD UNIT=&LINE12
/*
//
//
```

A.2.6 VS1 RTAM PARAMETERS

```
//RTAMGEN JOB
//RTAM EXEC ASMFC,PARM='DECK,NOLOAD'                                      RTA00020
//ASM.SYSLIB DD DSN=SYS1.RMTMAC,DISP=SHR,UNIT=3330-1,VOL=SER=000000       RTA00030
//ASM.SYSPUNCH DD SYSOUT=B                                                      40
//SYSIN DD *                                                              RTA00050
        LINE  LINEID=1,LDESCR=(2,0)    FULL DUPLEX 56K EBCDIC             RTA00060
        LINE  LINEID=2,LDESCR=(2,0)    FULL DUPLEX 56K EBCDIC             RTA00070
        LINE  LINEID=3,LDESCR=(2,2)    FULL DUPLEX 56K ASCI               RTA00080
        LINE  LINEID=4,LDESCR=(2,2)    FULL DUPLEX 56K ASCI               RTA00090
        LINE  LINEID=5,LDESCR=(0,0)    HALF DUPLEX 9600 EBCDIC            RTA00100
        LINE  LINEID=6,LDESCR=(0,0)    HALF DUPLEX 9600 EBCDIC            RTA00110
        LINE  LINEID=7,LDESCR=(1,0)    FULL DUPLEX 9600 EBCDIC            RTA00120
        LINE  LINEID=8,LDESCR=(1,0)    FULL DUPLEX 9600 EBCDIC            RTA00130
        LINE  LINEID=9,LDESCR=(0,2)    HALF DUPLEX 9600 ASCI              RTA00140
        LINE  LINEID=10,LDESCR=(0,2)   HALF DUPLEX 9600 ASCI              RTA00150
        LINE  LINEID=11,LDESCR=(1,2)   FULL DUPLEX 9600 ASCI              RTA00160
        LINE  LINEID=12,LDESCR=(1,2)   FULL DUPLEX 9600 ASCI              RTA00170
        LINE  LINEID=13,LDESCR=(1,2)   FULL DUPLEX 56000 EBCDIC            RTA0017
```

```
         LINE  LINEID=14,LDESCR=(1,2)   FULL DUPLEX 19200 EBCDIC          RTA00

         TERMINAL   TERMID=1,VBUF=14,TDESCR=(3,8,5,3),                   XRTA00180
               NODE=(MLULUC1),                                            X
               RDRS=6,PTRS=6,PCHS=1,PLGN=1,CNMSGNO=10,BUFXSIZ=512         RTA00190

         .                                                                RTA00200
         .
         .                                                                RTA00210

         TERMINAL   TERMID=29,TDESCR=(3,3,4,2),COMPRES=NO,               XRTA00740
               RDRS=1,PTRS=1,PCHS=1,PLGN=0,CNMSGNO=10                     RTA00750
         TERMINAL   TERMID=30,VBUF=14,TDESCR=(3,8,5,3),                  XRTA00760
               RDRS=3,PTRS=6,PCHS=1,PLGN=1,CNMSGNO=10,BUFXSIZ=512,       XRTA00770
               LOGMODE=BATCH,CPACTBL=NO,                                  X
               NODE=(MLULUC1,                                             X
               MLULUC2,MLULUC3,MLULUC4,MLULUC5,MLULUC6),                  X
               SESSLIM=6
         TERMINAL   TERMID=31,VBUF=14,TDESCR=(3,8,5,3),                  XRTA00800
               RDRS=3,PTRS=6,PCHS=1,PLGN=0,CNMSGNO=10,BUFXSIZ=256,       XRTA00810
               LOGMODE=BATCH,CPACTBL=NO,                                  X
               NODE=(MLULUC1,                                             X
               MLULUC2,MLULUC3,MLULUC4,MLULUC5,MLULUC6),                  X
               SESSLIM=6

          .                                                               RTA00850
          .
          .

         RTAM  PORTS=29,PASSWD=RTAMVTAM,SNASCII=YES,HALFGEN=NO,          XRTA01000
               SNACOMP=YES,TPBUF=20,INTPR=YES,TPREAD=130,TPPRINT=131,    XRTA01010
               TPPUNCH=47,STBUFNO=50,MXINTBR=2004,USASCII=YES,           XRTA01020
               TPBFSIZ=856,MLBFSIZ=512,CPACT=YES,WAITIME=01               RTA01030
         END                                                              RTA01040
/*                                                                        RTA01050
//                                                                        RTA01060
//                                                                        RTA01070
```

A.2.7 USSTAB FOR 3770

```
//ASMFCL JOB
//ASM  EXEC PGM=IFOX00,PARM=OBJ
//SYSLIB DD DSN=SYS1.MACLIB,DISP=SHR
//SYSUT1 DD VOL=SER=000000,UNIT=3330-1,DISP=NEW,SPACE=(1700,(600,100))
//SYSUT2 DD VOL=SER=000000,UNIT=3330-1,DISP=NEW,SPACE=(1700,(600,100))
//SYSUT3 DD VOL=SER=000000,UNIT=3330-1,DISP=NEW,SPACE=(1700,(600,100))
//SYSPRINT DD SYSOUT=A,DCB=BLKSIZE=1089
//SYSPUNCH DD DUMMY
//SYSGO DD DSN=&&OBJSET,UNIT=3330-1,DISP=(MOD,PASS),SPACE=(80,(200,50))
//SYSIN DD *
ISTINADT USSTAB TABLE=STDTRANS
LOGON    USSCMD CMD=LOGON,FORMAT=PL1
        USSPARM PARM=APPLID
        USSPARM PARM=LOGMODE
        USSPARM PARM=DATA
LOGOFF USSCMD  CMD=LOGOFF,FORMAT=PL1
        USSPARM PARM=APPLID
        USSPARM PARM=TYPE,DEFAULT=UNCOND
```

```
       USSPARM PARM=HOLD,DEFAULT=NO
MESSAGES USSMSG MSG=1,TEXT='INVALID COMMAND SYNTAX'
         USSMSG MSG=2,TEXT='% COMMAND UNRECOGNIZED'
         USSMSG MSG=3,TEXT='% PARAMETER UNRECOGNIZED'
         USSMSG MSG=4,TEXT='% PARAMETER INVALID'
         USSMSG MSG=5,TEXT='UNSUPPORTED FUNCTION'
         USSMSG MSG=6,TEXT='SEQUENCE ERROR'
         USSMSG MSG=7,TEXT='SESSION NOT BOUND'
         USSMSG MSG=8,TEXT='INSUFFICIENT STORAGE'
         USSMSG MSG=9,TEXT='MAGNETIC CARD DATA ERROR'
STDTRANS DC     X'000102030440060708090A0B0C0D0E0F'
         DC     X'101112131415161718191A1B1C1D1E1F'
         DC     X'202122232425262728292A2B2C2D2E2F'
         DC     X'303132333435363738393A3B3C3D3E3F'
         DC     X'404142434445464748494A4B4C4D4E4F'
         DC     X'505152535455565758595A5B5C5D5E5F'
         DC     X'606162636465666768696A6B6C6D6E6F'
         DC     X'707172737475767778797A7B7C7D7E7F'
         DC     X'80C1C2C3C4C5C6C7C8C98A8B8C8D8E8F'
         DC     X'90D1D2D3D4D5D6D7D8D99A9B9C9D9E9F'
         DC     X'A0A1E2E3E4E5E6E7E8E9AAABACADAEAF'
         DC     X'B0B1B2B3B4B5B6B7B8B9BABBBCBDBEBF'
         DC     X'C0C1C2C3C4C5C6C7C8C9CACBCCCDCECF'
         DC     X'D0D1D2D3D4D5D6D7D8D9DADBDCDDDEDF'
         DC     X'E0E1E2E3E4E5E6E7E8E9EAEBECEDEEEF'
         DC     X'F0F1F2F3F4F5F6F7F8F9FAFBFCFDFEFF'
RTAM     USSCMD CMD=RTAM,REP=LOGON,FORMAT=BAL
         USSPARM PARM=P1,REP=APPLID,DEFAULT=RTAM
         USSPARM PARM=L,REP=LOGMODE,DEFAULT=CMPACT
         USSPARM PARM=D,REP=DATA,DEFAULT='RUSER11 TERM(36)'
RUSER01  USSCMD CMD=RUSER01,REP=LOGON,FORMAT=BAL
         USSPARM PARM=P1,REP=APPLID,DEFAULT=RTAM
         USSPARM PARM=L,REP=LOGMODE,DEFAULT=BATCH
         USSPARM PARM=D,REP=DATA,DEFAULT='RUSER01 TERM(01)'

         .
         .
         .

RUSER13  USSCMD CMD=RUSER13,REP=LOGON,FORMAT=BAL
         USSPARM PARM=P1,REP=APPLID,DEFAULT=RTAM
         USSPARM PARM=L,REP=LOGMODE,DEFAULT=CMPACT
         USSPARM PARM=D,REP=DATA,DEFAULT='RUSER13 TERM(38)'

         .
         .
         .

RUSER30  USSCMD CMD=RUSER30,REP=LOGON,FORMAT=BAL
         USSPARM PARM=P1,REP=APPLID,DEFAULT=RTAM
         USSPARM PARM=L,REP=LOGMODE,DEFAULT=BATCH
         USSPARM PARM=D,REP=DATA,DEFAULT='RUSER30 TERM(30)'

         .
         .
         .

END      USSEND
         END
```

```
/*
//LKED EXEC PGM=IEWL,PARM=(XREF,LET,LIST,NCAL),COND=(8,LT,ASM)
//SYSLIN DD DSN=&&OBJSET,DISP=(OLD,DELETE)
//SYSUT1 DD DSN=&&SYSUT1,UNIT=3330-1,SPACE=(1024,(50,20))
//SYSPRINT DD SYSOUT=A
//LKED.SYSLMOD DD DSN=SYS1.VTAMLIB(ISTINADT),UNIT=3330-1,DISP=SHR,
// VOL=SER=000000
/*
//
//
```

A.2.8 LOGON MODE TABLE FOR 3770

```
//ASMLOG JOB
//STEP1 EXEC ASMFCL,MAC1='SYS1.VTAMLIB'
//ASM.SYSPUNCH DD DUMMY
//ASM.SYSIN DD *
ISTINCLM MODETAB
         MODEENT   LOGMODE=INTERACT,                                   X
               FMPROF=3,                                               X
               TSPROF=3,                                               X
               PRIPROT=X'B1',                                          X
               SECPROT=X'B1',                                          X
               COMPROT=X'3040'
         MODEENT   LOGMODE=BATCH,                                      X
               FMPROF=3,                                               X
               TSPROF=3,                                               X
               PRIPROT=X'A3',                                          X
               SECPROT=X'A3',                                          X
               COMPROT=X'7080',                                        X
               RUSIZES=X'8585',                                        X
               PSERVIC=X'01100000F100C08000010040'
         MODEENT   LOGMODE=NOSECCMP,                                   X
               FMPROF=3,                                               X
               TSPROF=3,                                               X
               PRIPROT=X'A3',                                          X
               SECPROT=X'A1',                                          X
               COMPROT=X'7080',                                        X
               RUSIZES=X'8585',                                        X
               PSERVIC=X'01104000F100C08000010040'
         MODEENT   LOGMODE=BUF256,                                     X
               FMPROF=3,                                               X
               TSPROF=3,                                               X
               PRIPROT=X'A3',                                          X
               SECPROT=X'A3',                                          X
               COMPROT=X'7080',                                        X
               RUSIZES=X'8585',                                        X
               PSERVIC=X'01100000F100C08000010040'
         MODEENT   LOGMODE=BUF512,                                     X
               FMPROF=3,                                               X
               TSPROF=3,                                               X
               PRIPROT=X'A3',                                          X
               SECPROT=X'A3',                                          X
               COMPROT=X'7080',                                        X
               RUSIZES=X'8686',                                        X
               PSERVIC=X'01100000F100C08000010040'
         MODEENT   LOGMODE=EXCH,                                       X
               FMPROF=3,                                               X
```

```
         TSPROF=3,                                                      X
         PRIPROT=X'A3',                                                 X
         SECPROT=X'A3',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         PSERVIC=X'01104000F100E08000010060'
MODEENT    LOGMODE=EXCHOUT,                                             X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'A3',                                                 X
         SECPROT=X'A3',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         PSERVIC=X'01104000F100E08000010040'
MODEENT    LOGMODE=EXCHIN,                                              X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'A3',                                                 X
         SECPROT=X'A3',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         PSERVIC=X'01104000F100C08000010060'
MODEENT    LOGMODE=BATCH1,                                              X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'A3',                                                 X
         SECPROT=X'A3',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         OPACING=X'01',                                                 X
         PSERVIC=X'01100000F100E08000010060'
MODEENT    LOGMODE=CMPACT,                                              X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'A3',                                                 X
         SECPROT=X'A3',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         PSERVIC=X'01104000F100C08000010040'
MODEENT    LOGMODE=CPCPPRT,                                             X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'A3',                                                 X
         SECPROT=X'A3',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         PSERVIC=X'01104000F10080800001000 0'
MODEENT    LOGMODE=NOCPPUN,                                             X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'A3',                                                 X
         SECPROT=X'A3',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         PSERVIC=X'01100000F100408000010000'
MODEENT    LOGMODE=S3770P,                                              X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'B3',                                                 X
```

```
         SECPROT=X'B3',                                               X
         COMPROT=X'7080'
MODEENT    LOGMODE=CMPAK256,                                          X
         FMPROF=3,                                                    X
         TSPROF=3,                                                    X
         PRIPROT=X'A3',                                               X
         SECPROT=X'A3',                                               X
         COMPROT=X'7080',                                             X
         RUSIZES=X'8585',                                             X
         PSERVIC=X'01104000F100C08000010040'
MODEENT    LOGMODE=CMPAK512,                                          X
         FMPROF=3,                                                    X
         TSPROF=3,                                                    X
         PRIPROT=X'A3',                                               X
         SECPROT=X'A3',                                               X
         COMPROT=X'7080',                                             X
         RUSIZES=X'8686',                                             X
         PSERVIC=X'01104000F100C08000010040'
         COMPROT=X'2000'
MODEENT    LOGMODE=MLUSP3,                                            X
         FMPROF=3,                                                    X
         TSPROF=3,                                                    X
         PRIPROT=X'A3',                                               X
         SECPROT=X'A3',                                               X
         OPACING=X'03',                                               X
         COMPROT=X'7080',                                             X
         RUSIZES=X'8585',                                             X
         PSERVIC=X'01100000F100C08000010040'
MODEENT    LOGMODE=MLUSP2,                                            X
         FMPROF=3,                                                    X
         TSPROF=3,                                                    X
         PRIPROT=X'A3',                                               X
         SECPROT=X'A3',                                               X
         OPACING=X'02',                                               X
         COMPROT=X'7080',                                             X
         RUSIZES=X'8585',                                             X
         PSERVIC=X'01100000F100C08000010040'
MODEENT    LOGMODE=MLUSP7,                                            X
         FMPROF=3,                                                    X
         TSPROF=3,                                                    X
         PRIPROT=X'A3',                                               X
         SECPROT=X'A3',                                               X
         OPACING=X'07',                                               X
         COMPROT=X'7080',                                             X
         RUSIZES=X'8585',                                             X
         PSERVIC=X'01100000F100C08000010040'
MODEENT    LOGMODE=MLULP2,                                            X
         FMPROF=3,                                                    X
         TSPROF=3,                                                    X
         PRIPROT=X'A3',                                               X
         SECPROT=X'A3',                                               X
         RUSIZES=X'8686',                                             X
         OPACING=X'02',                                               X
         COMPROT=X'7080',                                             X
         PSERVIC=X'01100000F100C08000010040'
MODEENT    LOGMODE=MLUSP1,                                            X
         FMPROF=3,                                                    X
         TSPROF=3,                                                    X
         PRIPROT=X'A3',                                               X
```

```
         SECPROT=X'A3',                                                  X
         COMPROT=X'7080',                                                X
         RUSIZES=X'8585',                                                X
         PSERVIC=X'01100000F100C08000010040'
MODEENT  LOGMODE=MLULP1,                                                 X
         FMPROF=3,                                                       X
         TSPROF=3,                                                       X
         PRIPROT=X'A3',                                                  X
         SECPROT=X'A3',                                                  X
         COMPROT=X'7080',                                                X
         RUSIZES=X'8686',                                                X
         PSERVIC=X'01100000F100C08000010040'
MODEENT  LOGMODE=MLUCOMPR,                                               X
         FMPROF=3,                                                       X
         TSPROF=3,                                                       X
         PRIPROT=X'A3',                                                  X
         SECPROT=X'A3',                                                  X
         COMPROT=X'7080',                                                X
         RUSIZES=X'8585',                                                X
         IPACING=X'00',                                                  X
         OPACING=X'00',                                                  X
         PSERVIC=X'01100000F100C08000010040'
MODEENT  LOGMODE=MLUASCII,                                               X
         FMPROF=3,                                                       X
         TSPROF=3,                                                       X
         PRIPROT=X'A1',                                                  X
         SECPROT=X'A1',                                                  X
         COMPROT=X'7880',                                                X
         RUSIZES=X'8585',                                                X
         IPACING=X'00',                                                  X
         OPACING=X'00',                                                  X
         PSERVIC=X'01100000F100C08000010040'
MODEENT  LOGMODE=MLULS,                                                  X
         FMPROF=3,                                                       X
         TSPROF=3,                                                       X
         PRIPROT=X'A3',                                                  X
         SECPROT=X'A3',                                                  X
         COMPROT=X'7080',                                                X
         RUSIZES=X'8685',                                                X
         IPACING=X'00',                                                  X
         OPACING=X'00',                                                  X
         PSERVIC=X'01104000F100C08000010040'
MODEENT  LOGMODE=MLUSL,                                                  X
         FMPROF=3,                                                       X
         TSPROF=3,                                                       X
         PRIPROT=X'A3',                                                  X
         SECPROT=X'A3',                                                  X
         COMPROT=X'7080',                                                X
         RUSIZES=X'8586',                                                X
         IPACING=X'00',                                                  X
         OPACING=X'00',                                                  X
         PSERVIC=X'01104000F100C08000010040'
MODEENT  LOGMODE=MLULL,                                                  X
         FMPROF=3,                                                       X
         TSPROF=3,                                                       X
         PRIPROT=X'A3',                                                  X
         SECPROT=X'A3',                                                  X
         COMPROT=X'7080',                                                X
         RUSIZES=X'8686',                                                X
```

```
         IPACING=X'00',                                                 X
         OPACING=X'00',                                                 X
         PSERVIC=X'01104000F100C08000010040'
MODEENT  LOGMODE=KNOCPCON,                                              X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'A1',                                                 X
         SECPROT=X'A1',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         IPACING=X'00',                                                 X
         OPACING=X'00',                                                 X
         PSERVIC=X'01100000F10008000010000',                            X
         CRYPTO=X'39000000000000000000'
MODEENT  LOGMODE=KCPCON,                                                X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'A3',                                                 X
         SECPROT=X'A3',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         IPACING=X'00',                                                 X
         OPACING=X'00',                                                 X
         PSERVIC=X'01100000F10008000010000',                            X
         CRYPTO=X'39000000000000000000'
MODEENT  LOGMODE=KNCPINLY,                                              X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'A1',                                                 X
         SECPROT=X'A1',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         IPACING=X'00',                                                 X
         OPACING=X'00',                                                 X
         PSERVIC=X'01100000F10008000010040',                            X
         CRYPTO=X'39000000000000000000'
MODEENT  LOGMODE=KCPINLY,                                               X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'A3',                                                 X
         SECPROT=X'A3',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         IPACING=X'00',                                                 X
         OPACING=X'00',                                                 X
         PSERVIC=X'01100000F10008000010040',                            X
         CRYPTO=X'39000000000000000000'
MODEENT  LOGMODE=NOCRPSKY,                                              X
         FMPROF=3,                                                      X
         TSPROF=3,                                                      X
         PRIPROT=X'A3',                                                 X
         SECPROT=X'A3',                                                 X
         COMPROT=X'7080',                                               X
         RUSIZES=X'8585',                                               X
         IPACING=X'00',                                                 X
         OPACING=X'00',                                                 X
         PSERVIC=X'01104000F100C08000010040',                           X
         CRYPTO=X'09000000000000000000'
MODEENT  LOGMODE=SESCRYPT,                                              X
```

```
         FMPROF=3,                                               X
         TSPROF=3,                                               X
         PRIPROT=X'A3',                                          X
         SECPROT=X'A3',                                          X
         COMPROT=X'7080',                                        X
         RUSIZES=X'8585',                                        X
         IPACING=X'00',                                          X
         OPACING=X'00',                                          X
         PSERVIC=X'01104000F100C08000010040',                    X
         CRYPTO=X'1900000000000000000'
MODEENT    LOGMODE=MANCRYPT,                                     X
         FMPROF=3,                                               X
         TSPROF=3,                                               X
         PRIPROT=X'A3',                                          X
         SECPROT=X'A3',                                          X
         COMPROT=X'7080',                                        X
         RUSIZES=X'8585',                                        X
         IPACING=X'00',                                          X
         OPACING=X'00',                                          X
         PSERVIC=X'01104000F100C08000010040',                    X
         CRYPTO=X'3900000000000000000'
         CRYPTO=X'1000000000000000000'
MODEENT    LOGMODE=PRT3256,                                      X
         FMPROF=3,                                               X
         TSPROF=3,                                               X
         PRIPROT=X'A3',                                          X
         SECPROT=X'A3',                                          X
         COMPROT=X'7080',                                        X
         RUSIZES=X'8585',                                        X
         OPACING=X'03',                                          X
         PSERVIC=X'01104000F10080800010000'
MODEENT    LOGMODE=PRT2512,                                      X
         FMPROF=3,                                               X
         TSPROF=3,                                               X
         PRIPROT=X'A3',                                          X
         SECPROT=X'A3',                                          X
         COMPROT=X'7080',                                        X
         RUSIZES=X'8586',                                        X
         OPACING=X'02',                                          X
         PSERVIC=X'01104000F10080800010000'
MODEENT    LOGMODE=PUN2256,                                      X
         FMPROF=3,                                               X
         TSPROF=3,                                               X
         PRIPROT=X'A3',                                          X
         SECPROT=X'A3',                                          X
         COMPROT=X'7080',                                        X
         RUSIZES=X'8585',                                        X
         OPACING=X'02',                                          X
         PSERVIC=X'01104000F10040800010000'
MODEENT    LOGMODE=PUN4256,                                      X
         FMPROF=3,                                               X
         TSPROF=3,                                               X
         PRIPROT=X'A3',                                          X
         SECPROT=X'A3',                                          X
         COMPROT=X'7080',                                        X
         RUSIZES=X'8585',                                        X
         OPACING=X'04',                                          X
         PSERVIC=X'01104000F10040800010000'
MODEENT    LOGMODE=ALL2256,                                      X
```

```
         FMPROF=3,                                                   X
         TSPROF=3,                                                   X
         PRIPROT=X'A3',                                              X
         SECPROT=X'A3',                                              X
         COMPROT=X'7080',                                            X
         RUSIZES=X'8585',                                            X
         IPACING=X'00',                                              X
         OPACING=X'02',                                              X
         PSERVIC=X'01104000F100C08000010040'
     MODEENT   LOGMODE=ALL3256,                                      X
         FMPROF=3,                                                   X
         TSPROF=3,                                                   X
         PRIPROT=X'A3',                                              X
         SECPROT=X'A3',                                              X
         COMPROT=X'7080',                                            X
         RUSIZES=X'8585',                                            X
         IPACING=X'00',                                              X
         OPACING=X'03',                                              X
         PSERVIC=X'01104000F100C08000010040'
     MODEENT   LOGMODE=ALL1512,                                      X
         FMPROF=3,                                                   X
         TSPROF=3,                                                   X
         PRIPROT=X'A3',                                              X
         SECPROT=X'A3',                                              X
         COMPROT=X'7080',                                            X
         RUSIZES=X'8586',                                            X
         IPACING=X'00',                                              X
         OPACING=X'01',                                              X
         PSERVIC=X'01104000F100C08000010040'
     MODEENT   LOGMODE=ALL2512,                                      X
         FMPROF=3,                                                   X
         TSPROF=3,                                                   X
         PRIPROT=X'A3',                                              X
         SECPROT=X'A3',                                              X
         COMPROT=X'7080',                                            X
         RUSIZES=X'8586',                                            X
         IPACING=X'00',                                              X
         OPACING=X'02',                                              X
         PSERVIC=X'01104000F100C08000010040'
     MODEEND
     END
//LKED.SYSLMOD DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,
// DSN=SYS1.VTAMLIB(ISTINALM)
/*
// EXEC PGM=IMASPZAP
//SYSPRINT DD SYSOUT=A
//SYSLIB DD DISP=SHR,DSN=SYS1.VTAMLIB,UNIT=3330-1,VOL=SER=000000
//SYSIN DD *
 NAME ISTINALM ISTINCLM
 DUMPT ISTINALM ISTINCLM
/*
//
//
//
//
```

A.2.9 NCP GEN FOR 3770 SUPPORT

```
//UPDATE JOB
// EXEC PGM=IEBUPDTE,PARM=NEW
//SYSPRINT DD SYSOUT=A
//SYSUT1 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.VTAMLST
//SYSUT2 DD UNIT=3330-1,VOL=SER=000000,DISP=SHR,DSN=SYS1.VTAMLST
//SYSIN DD DATA
./ ADD NAME=PEPSNA2,LIST=ALL
         PCCU  CUADDR=008,DUMPDS=DUMPDD                                 PEP00010
*
* THIS NCP5 MATCHES NCP6 (PEPSNA3)                                      PEP00020
*
         BUILD LOADLIB=LLOCNCP5,OBJLIB=KDHNCP,QUALIFY=SNA2,            XPEP00030
               MAXSUBA=63,SUBAREA=5,MEMSIZE=256,TYPGEN=PEP,            XPEP00040
               ABEND=YES,ANS=YES,ASMXREF=YES,BFRS=248,                 XPEP00050
               DIALTO=60,DSABLTO=5,ENABLTO=5,JOBCARD=MULTI,OLT=YES,    XPEP00060
               MODEL=3705-2,NEWNAME=PEPSNA2,SLODOWN=12,TIME=1440,      XPEP00070
               TRACE=(YES,20),UNIT=2314,CHANTYP=(TYPE4,TYPE4),         XPEP00080
               CA=(TYPE4,TYPE4),                                       XPEP00090
               DYNADMP=NO,HICHAN=(3F,3F),LOCHAN=(30,30)                 PEP00100
      SYSCNTRL OPTIONS=(BHSASSC,ENDCALL,MODE,RCNTRL,RCOND,RECMD,RIMM,  XPEP00110
               NAKLIM,SESSION,SSPAUSE,XMTLMT,BACKUP,DVSINIT,LNSTAT,    XPEP00120
               SESINIT)                                                 PEP00130
* THE FOLLOWING HOST MACRO IS FOR VTAM - SNA2                           PEP00140
         HOST  INBFRS=25,MAXBFRU=21,DELAY=.2,STATMOD=YES,              XPEP00150
               UNITSZ=300,BFRPAD=0                                      PEP00160
         CSB   SPEED=(150,600,1200,2400),MOD=0,TYPE=TYPE3,WRAPLN=02E    PEP00170
         CSB   SPEED=(150,600,1200,2400),MOD=1,TYPE=TYPE3,WRAPLN=0CB    PEP00180
MLUPOOL LUPOOL NUMBER=14                                                PEP00190
MLBSCG1   GROUP LNCTL=BSC,TYPE=EP                                       PEP00200
MLPBSCL1  LINE  ADDRESS=(0B8,030,30-1),SPEED=4800,CLOCKNG=EXT,         XPEP00210
               NEWSYNC=NO,TERM=2770,CODE=EBCDIC                         PEP00220
MSBSCG1   GROUP DIAL=YES,LNCTL=BSC,TYPE=EP                              PEP00230
* DIAL EP LINE.                                                         PEP00240
MSBSCL1   LINE  ADDRESS=(0B9,032),SPEED=4800,CLOCKNG=EXT,CODE=EBCDIC,  XPEP00260
               MODEM=OPTION2,NEWSYNC=NO,TERM=2770                       PEP00270
* TPNS LINES FOLLOW                                                     PEP00290
* END OF TPNS SECTION                                                   PEP02980
-----------------------------------------------------------------------
|       THE FOLLOWING MLU DEFINITIONS ARE FOR 512 BYTE RU'S           |
|       MAXDATA=521 CAN BE USED FOR 512 OR 256 BYTE RU'S              |
|SEE SECTION 9 FOR ADDITIONAL VALUES ON PACING, NUMBER SESSIONS, ETC. |
-----------------------------------------------------------------------
MSDPTPT1 GROUP LNCTL=SDLC,TYPE=NCP,DIAL=NO,REPLYTO=3                    PEP03000
MLUHSDI1 LINE  ADDRESS=020,SPEED=56000,CLOCKNG=EXT,DUPLEX=FULL,        XPEP03020
               INTPRI=3,NEWSYNC=NO,NRZI=NO,                            XPEP03030
               POLLED=YES                                               PEP03040
       SERVICE ORDER=(MLUPU1,MLUPU2,MLUPUAA)                            PEP03050
*
MLUPU1   PU    ADDR=C1,IRETRY=YES,MAXDATA=521,MAXOUT=7,PASSLIM=7,      XPEP03070
               PUTYPE=2,RETRIES=(,3,5)                                  PEP03080
MLULU11  LU    LOCADDR=1,PACING=(1,1),VPACING=(2,1),BUFLIM=5,          XPEP03090
               SSCPFM=USSSCS,ENCR=OPT
MLULU12  LU    LOCADDR=2,PACING=(1,1),VPACING=(2,1),BUFLIM=5,          XPEP03110
               SSCPFM=USSSCS,ENCR=OPT
MLULU13  LU    LOCADDR=3,PACING=(1,1),VPACING=(2,1),BUFLIM=5,          XPEP03130
               SSCPFM=USSSCS,ENCR=OPT
MLULU14  LU    LOCADDR=4,PACING=(1,1),VPACING=(2,1),BUFLIM=5,          XPEP03150
```

```
                    SSCPFM=USSSCS,ENCR=OPT
MLULU15  LU         LOCADDR=5,PACING=(1,1),VPACING=(2,1),BUFLIM=5,         XPEP03170
                    SSCPFM=USSSCS,ENCR=OPT
MLULU16  LU         LOCADDR=6,PACING=(1,1),VPACING=(2,1),BUFLIM=5,         XPEP03190
                    SSCPFM=USSSCS,ENCR=OPT
*                                                                           PEP03220
MLUPU2   PU         ADDR=C2,IRETRY=YES,MAXDATA=521,MAXOUT=7,PASSLIM=7,     XPEP03230
                    PUTYPE=2,RETRIES=(,3,5),ISTATUS=INACTIVE                PEP03240
MLULU21  LU         LOCADDR=1,PACING=(1,1),VPACING=(3,1),BUFLIM=5,         XPEP03250
                    SSCPFM=USSSCS                                           PEP03260
MLULU22  LU         LOCADDR=2,PACING=(2,1),VPACING=(4,1),BUFLIM=5,         XPEP03270
                    SSCPFM=USSSCS                                           PEP03280
MLULU23  LU         LOCADDR=3,PACING=(1,1),VPACING=(3,1),BUFLIM=5,         XPEP03290
                    SSCPFM=USSSCS                                           PEP03300
MLULU24  LU         LOCADDR=4,PACING=(1,1),VPACING=(3,1),BUFLIM=5,         XPEP03310
                    SSCPFM=USSSCS                                           PEP03320
MLULU25  LU         LOCADDR=5,PACING=(1,1),VPACING=(3,1),BUFLIM=5,         XPEP03330
                    SSCPFM=USSSCS                                           PEP03340
MLULU26  LU         LOCADDR=6,PACING=(1,1),VPACING=(3,1),BUFLIM=5,         XPEP03350
                    SSCPFM=USSSCS                                           PEP03360
*
MLUPUAA  PU         ADDR=C3,IRETRY=YES,MAXDATA=521,MAXOUT=7,PASSLIM=7,     XPEP03370
                    PUTYPE=2,RETRIES=(,3,5),ISTATUS=INACTIVE                PEP03380
MLULUAA  LU         LOCADDR=1,PACING=(1,1),VPACING=(3,1),BUFLIM=5,         XPEP03390
                    SSCPFM=USSSCS                                           PEP03400
MLULUAB  LU         LOCADDR=2,PACING=(2,1),VPACING=(4,1),BUFLIM=5,         XPEP03410
                    SSCPFM=USSSCS                                           PEP03420
MLULUAC  LU         LOCADDR=3,PACING=(2,1),VPACING=(4,1),BUFLIM=5,         XPEP03430
                    SSCPFM=USSSCS                                           PEP03440
MLULUAD  LU         LOCADDR=4,PACING=(1,1),VPACING=(3,1),BUFLIM=5,         XPEP03450
                    SSCPFM=USSSCS                                           PEP03460
------------------------------------------------------------------------
| THE FOLLOWING MLU DEFINITIONS ARE FOR 256 BYTE RU'S WITH ENCRYPTION  |
|       MAXDATA=521 CAN BE USED FOR 512 OR 256 BYTE RU'S               |
|SEE SECTION 9 FOR ADDITIONAL VALUES ON PACING, NUMBER SESSIONS, ETC.  |
------------------------------------------------------------------------
MLUHSDI2 LINE       ADDRESS=022,SPEED=56000,CLOCKNG=EXT,DUPLEX=FULL,       XPEP04210
                    INTPRI=3,NEWSYNC=NO,NRZI=NO,                           XPEP04220
                    POLLED=YES                                              PEP04230
         SERVICE ORDER=(MLUPU1A)                                            PEP04240
*
MLUPU1A  PU         ADDR=C1,IRETRY=YES,MAXDATA=521,MAXOUT=7,PASSLIM=7,     XPEP04250
                    PUTYPE=2,RETRIES=(,3,5)                                 PEP04260
MLULU11A LU         LOCADDR=1,PACING=(1,1),VPACING=(2,1),BUFLIM=5,         XPEP04270
                    SSCPFM=USSSCS,ENCR=OPT                                  PEP04280
MLULU12A LU         LOCADDR=2,PACING=(4,1),VPACING=(8,1),BUFLIM=5,         XPEP04290
                    SSCPFM=USSSCS,ENCR=OPT
MLULU13A LU         LOCADDR=3,PACING=(4,1),VPACING=(8,1),BUFLIM=5,         XPEP04310
                    SSCPFM=USSSCS,ENCR=OPT
MLULU14A LU         LOCADDR=4,PACING=(1,1),VPACING=(2,1),BUFLIM=5,         XPEP04330
                    SSCPFM=USSSCS,ENCR=OPT
*                                                                           PEP04350
------------------------------------------------------------------------
|       THE FOLLOWING MLU DEFINITIONS ARE FOR 256 BYTE RU'S            |
|       MAXDATA=521 CAN BE USED FOR 512 OR 256 BYTE RU'S               |
|SEE SECTION 9 FOR ADDITIONAL VALUES ON PACING, NUMBER SESSIONS, ETC.  |
------------------------------------------------------------------------
MLUEIA1  LINE       ADDRESS=026,SPEED=9600,CLOCKNG=EXT,DUPLEX=FULL,        XPEP06190
                    INTPRI=3,NEWSYNC=NO,NRZI=NO,                           XPEP06200
```

```
                  POLLED=YES                                                PEP06210
         SERVICE ORDER=(MLUPU4,MLUPUA,MLUPUB,MLUPUC)                        PEP06220
MLUPU4   PU       ADDR=C1,IRETRY=YES,MAXDATA=521,MAXOUT=7,PASSLIM=7,       XPEP06230
                  PUTYPE=2,RETRIES=(,3,5)                                   PEP06240
MLULU41  LU       LOCADDR=1,PACING=(1,1),VPACING=(3,1),BUFLIM=5,           XPEP06250
                  SSCPFM=USSSCS                                             PEP06260
MLULU42  LU       LOCADDR=2,PACING=(5,1),VPACING=(10,1),BUFLIM=5,          XPEP06270
                  SSCPFM=USSSCS                                             PEP06280
MLULU43  LU       LOCADDR=3,PACING=(3,1),VPACING=(6,1),BUFLIM=5,           XPEP06290
                  SSCPFM=USSSCS                                             PEP06300
MLULU44  LU       LOCADDR=4,PACING=(1,1),VPACING=(2,1),BUFLIM=5,           XPEP06310
                  SSCPFM=USSSCS                                             PEP06320
*                                                                           PEP06330
MLUPUA   PU       ADDR=C2,IRETRY=YES,MAXDATA=521,MAXOUT=7,PASSLIM=7,       XPEP06370
                  PUTYPE=2,RETRIES=(,3,5),ISTATUS=INACTIVE                  PEP06380
MLULUA1  LU       LOCADDR=1,PACING=(1,1),VPACING=(1,1),BUFLIM=5,           XPEP06390
                  SSCPFM=USSSCS                                             PEP06400
MLULUA2  LU       LOCADDR=2,PACING=(4,1),VPACING=(8,1),BUFLIM=5,           XPEP06410
                  SSCPFM=USSSCS                                             PEP06420
MLULUA3  LU       LOCADDR=3,PACING=(4,1),VPACING=(8,1),BUFLIM=5,           XPEP06430
                  SSCPFM=USSSCS                                             PEP06440
MLULUA4  LU       LOCADDR=4,PACING=(1,1),VPACING=(2,1),BUFLIM=5,           XPEP06450
                  SSCPFM=USSSCS                                             PEP06460
*                                                                           PEP06470
MLUPUB   PU       ADDR=C3,IRETRY=YES,MAXDATA=521,MAXOUT=7,PASSLIM=7,       XPEP06510
                  PUTYPE=2,RETRIES=(,3,5),ISTATUS=INACTIVE                  PEP06520
MLULUB   LU       LOCADDR=1,PACING=(1,1),VPACING=(2,1),BUFLIM=5,           XPEP06530
                  SSCPFM=USSSCS                                             PEP06540
MLULUB2  LU       LOCADDR=2,PACING=(3,1),VPACING=(6,1),BUFLIM=5,           XPEP06550
                  SSCPFM=USSSCS                                             PEP06560
MLULUB3  LU       LOCADDR=3,PACING=(2,1),VPACING=(4,1),BUFLIM=5,           XPEP06570
                  SSCPFM=USSSCS                                             PEP06580
MLULUB4  LU       LOCADDR=4,PACING=(2,1),VPACING=(4,1),BUFLIM=5,           XPEP06590
                  SSCPFM=USSSCS                                             PEP06600
MLULUB5  LU       LOCADDR=5,PACING=(2,1),VPACING=(4,1),BUFLIM=5,           XPEP06610
                  SSCPFM=USSSCS                                             PEP06620
MLULUB6  LU       LOCADDR=6,PACING=(1,1),VPACING=(2,1),BUFLIM=5,           XPEP06630
                  SSCPFM=USSSCS                                             PEP06640
*
MLUPUC   PU       ADDR=C4,IRETRY=YES,MAXDATA=521,MAXOUT=7,PASSLIM=7,       XPEP06650
                  PUTYPE=2,RETRIES=(,3,5),ISTATUS=INACTIVE                  PEP06660
MLULUC1  LU       LOCADDR=1,PACING=(1,1),VPACING=(1,1),BUFLIM=5,           XPEP06670
                  SSCPFM=USSSCS                                             PEP06680
MLULUC2  LU       LOCADDR=2,PACING=(3,1),VPACING=(6,1),BUFLIM=5,           XPEP06690
                  SSCPFM=USSSCS                                             PEP06700
MLULUC3  LU       LOCADDR=3,PACING=(3,1),VPACING=(6,1),BUFLIM=5,           XPEP06710
                  SSCPFM=USSSCS                                             PEP06720
MLULUC4  LU       LOCADDR=4,PACING=(2,1),VPACING=(4,1),BUFLIM=5,           XPEP06730
                  SSCPFM=USSSCS                                             PEP06740
MLULUC5  LU       LOCADDR=5,PACING=(1,1),VPACING=(2,1),BUFLIM=5,           XPEP06750
                  SSCPFM=USSSCS                                             PEP06760
MLULUC6  LU       LOCADDR=6,PACING=(1,1),VPACING=(2,1),BUFLIM=5,           XPEP06770
                  SSCPFM=USSSCS                                             PEP06780
*                                                                           PEP06800
---------------------------------------------------------------------
|        THE FOLLOWING DEFINITION IS FOR SLU 3770                   |
|        MAXDATA=521 CAN BE USED FOR 512 OR 256 BYTE RU'S           |
---------------------------------------------------------------------
MSNAGRP2 GROUP LNCTL=SDLC,DIAL=NO,REPLYTO=1                         PEP12790
```

```
MLSDMPT3 LINE   ADDRESS=02E,CLOCKNG=EXT,SPEED=4800,DUPLEX=HALF,          XPEP12810
                POLLED=YES,NRZI=YES                                       PEP12820
         SERVICE ORDER=(MRTAP11)                                          PEP12830
MRTAP11  PU     ADDR=A1,IRETRY=YES,MAXDATA=521,MAXOUT=7,PASSLIM=7,       CPEP12840
                PUTYPE=1,RETRIES=(,3,5),ISTATUS=INACTIVE                  PEP12850
MRTAL11  LU     LOCADDR=0,PACING=(1,1),VPACING=(3,1),BUFLIM=5,           CPEP12860
                SSCPFM=USSSCS                                             PEP12870
*
-----------------------------------------------------------------------
|        THE FOLLOWING DEFINITION IS FOR A SWITCHED MLU               |
|        MAXDATA=521 CAN BE USED FOR 512 OR 256 BYTE RU'S              |
|SEE SECTION 9 FOR ADDITIONAL VALUES ON PACING, NUMBER SESSIONS, ETC. |
-----------------------------------------------------------------------
MSSDLCG1 GROUP LNCTL=SDLC,REPLYTO=NONE,TYPE=NCP,POLLED=YES,DIAL=YES,     XPEP13110
                ISTATUS=INACTIVE,CALL=INOUT                               PEP13120
MSSDLCL1 LINE   ADDRESS=02F,SPEED=4800,CLOCKNG=EXT,                      CPEP13140
                DUPLEX=HALF,NEWSYNC=NO,NRZI=YES                           PEP13150
MSSDLP11 PU     MAXLU=6,PUTYPE=(1,2)                                      PEP13160
         GENEND HSPDSEL=(11000000,00010000),SCANCTL=(3,2)                 PEP13850
         END                                                              PEP13860
/*
//
//
```

A.3 DOS/VS POWER/VS SYSTEM

A.3.1 ATCSTRAC BOOK

```
* $$ JOB JNM=ATCSTRAC,CLASS=0,USER='VTAM.START.UP'                      ATC00010
* $$ LST CLASS=S,JSEP=0                                                  ATC00020
// JOB ATCSTRAC  CATALOG B.ATCSTRAC VTAM STARTUP PARAMETERS              ATC00030
// EXEC PROC=$$RESET                                                    ATC00040
// EXEC MAINT                                                           ATC00050
        CATALS B.ATCSTRAC                                               ATC00060
          BKEND B.ATCSTRAC                                              ATC00070
*----------------------------------------------------------------------* ATC00080
*----------------------------------------------------------------------* ATC00090
*                                                                      * ATC00100
*                B.ATCSTR00 MUST ALWAYS EXIST IN SLB                   * ATC00110
*                                                                      * ATC00120
*     BOOK NAME: ATCSTRAC - VTAM STARTUP PARAMETERS                    * ATC00130
*                                                                      * ATC00140
*     NOTE: THE IOBUF (BUFSIZE) PARAMETER MUST EQUAL THE UNITSZ        * ATC00150
*           VALUE IN THE NCP HOST MACRO DEFINITION.  THE FORMAT        * ATC00160
*           OF THE BUFFER POOL START PARAMETERS IS EITHER              * ATC00170
*                                                                      * ATC00180
*           XXBUF=(BASENO,BUFSIZE,SLOWPT,XPANNO,XPANPT)                * ATC00190
*                      OR                                              * ATC00200
*           XXBUF=VBSZ  AS INDICATED BELOW                             * ATC00210
*                                                                      * ATC00220
*           XPANNO OF 1 WILL CAUSE ACF/VTAM TO ACQUIRE 1 PAGE          * ATC00230
*           OF BUFFERS SINCE THEY ARE ALWAYS ACQUIRED IN PAGE          * ATC00240
*           INCREMENTS                                                 * ATC00250
*                                                                      * ATC00260
*----------------------------------------------------------------------* ATC00270
*----------------------------------------------------------------------* ATC00280
SSCPID=01,                 VTAM IDENTIFIER REQUIRED FOR ACF/VTAM       XATC00290
CONFIG=AC,                 CONFIGURATION DEFINITION SUFFIX             XATC00300
HOSTSA=12,                 HOST SUBAREA FOR THE ACF/VTAM               XATC00310
MAXSUBA=15,                MAXIMUM NUMBER OF MAJOR NODES               XATC00320
NETSOL=NO,                 NO NETWORK SOLICITOR TO BE STARTED          XATC00330
PROMPT,                    TO ALLOW OPERATOR TO ENTER STARTUP DATA     XATC00340
SUPP=NOSUP,                DO NOT SUPPRESS ANY CONSOLE MESSAGES        XATC00350
*                                                                       ATC00360
* ACTIVE AND INACTIVE CONNECTION BUFFER POOL, IN PAGEABLE STORAGE       ATC00370
*                                                                       ATC00380
APBUF=(64,,0,1,5),         BUFSIZE=64                                  XATC00390
*                                                                       ATC00400
* LARGE FIXED-STORAGE BUFFER POOL, SERVES AS I/O BUFFER                 ATC00410
*                                                                       ATC00420
LFBUF=(32,,2,1,5),         BUFSIZE=NCP UNITSZ                          XATC00430
*                                                                       ATC00440
* LARGE PAGEABLE-STORAGE BUFFER POOL                                    ATC00450
*                                                                       ATC00460
LPBUF=(3,,0,2,1),          BUFSIZE=1131                                XATC00470
*                                                                       ATC00480
* DEVICE CONNECTION BUFFER POOL IN PAGEABLE STORAGE                     ATC00490
*                                                                       ATC00500
NPBUF=(14,,0,1,3),         BUFSIZE=288                                 XATC00510
*                                                                       ATC00520
* PAGEABLE DATA BUFFER POOL                                             ATC00530
*                                                                       ATC00540
```

```
PPBUF=(30,,0,1,5),          BUFSIZE=NCP UNITSZ                                 XATC00550
*                                                                               ATC00560
* SMALL FIXED STORGE BUFFER POOL                                                ATC00570
*                                                                               ATC00580
SFBUF=(34,,0,1,5),          BUFSIZE=120                                        XATC00590
*                                                                               ATC00600
* SMALL PAGEABLE STORAGE BUFFER POOL                                            ATC00610
*                                                                               ATC00620
SPBUF=(26,,0,1,3),          BUFSIZE=156                                        XATC00630
*                                                                               ATC00640
* USER EXIT CONTROL BLOCK BUFFER POOL IN PAGEABLE STORAGE                       ATC00650
*                                                                               ATC00660
UECBUF=(415,,4,1,10),       BUFSIZE=100                                        XATC00670
*                                                                               ATC00680
* DEVICE CONNECTION BUFFER POOL IN PAGEABLE STORAGE                             ATC00690
*                                                                               ATC00700
WPBUF=(24,,0,1,3),          BUFSIZE=164                                        XATC00710
*                                                                               ATC00720
* VARIABLE LENGTH BUFFER POOL IN FIXED STORAGE                                  ATC00730
*                                                                               ATC00740
VFBUF=6144,                                                                    XATC00750
*                                                                               ATC00760
* VARIABLE LENGTH BUFFER POOL IN PAGEABLE STORAGE                               ATC00770
*                                                                               ATC00780
VPBUF=63488                                                                     ATC00790
          BKEND                                                                 ATC00800
/*                                                                              ATC00810
/&                                                                              ATC00820
* $$ EOJ                                                                        ATC00830
```

A.3.2 ATCCONAC BOOK

```
* $$ JOB JNM=ATCCONAC,CLASS=0
* $$ LST,CLASS=S
// JOB ATCCONAC
// EXEC MAINT
        CATALS   B.ATCCONAC,0.0
        BKEND   B.ATCCONAC
***********************************************************************
*    CONFIGURATION DEFINITION                                         *
*       NETWORK INCLUDES APPLICATION PROGRAM LIST, AND                *
*       LOCAL 3270 DEFINITION.                                        *
***********************************************************************
APPCONAC,LOCCONAC,NCPACFI
        BKEND
/*
/&
* $$ EOJ
```

A.3.3 APPCONAC BOOK

```
* $$ JOB JNM=APPCONAC,CLASS=0
* $$ LST CLASS=S
// JOB APPCONAC
// EXEC MAINT
        CATALS  B.APPCONAC,0.0
        BKEND   B.APPCONAC
```

```
************************************************************************
*                                                                      *
* APPLICATION PROGRAM DEFINITION FOR VTAM                              *
*    WHERE THE OPERANDS AVAILABLE ARE:                                 *
*             PRTCT=PASSWORD,       PASSWORD MUST ALSO BE DEFINED IN   *
*                                   APPLICATION PROGRAM 'ACB'.         *
*             BUFFACT=N|1,          MAXIMUM NUMBER OF VTAM PPBUF'S. IT *
*                                   MAY NEED TO BE ADJUSTED FOR BATCH  *
*                                   INPUT.                             *
*             AUTH=(ACQ|NOACQ,      ALLOWS APPLICATION PROGRAM TO USE  *
*                                   THE OPNDST MACRO WITH THE          *
*                                   ACQUIRE OPTION.                    *
*               BLOCK|NOBLOCK,      NOT USED WITH SDLC OR 3270.        *
*               PASS|NOPASS)        ALLOWS USE OF CLSDST MACRO         *
*                                   WITH THE PASS OPTION.              *
*                                                                      *
************************************************************************
SAMP1    APPL    AUTH=(ACQ)
CICS     APPL    AUTH=(ACQ)
PROG1    APPL    AUTH=(ACQ)
INQALL   APPL    PRTCT=OKAYOKAY
INQ      APPL    AUTH=(ACQ)
BATCH    APPL    AUTH=(ACQ)
INQ3790  APPL    AUTH=(NOACQ)
TEST3    APPL    AUTH=(ACQ)
SYSSSS   APPL    AUTH=(ACQ)
POWER    APPL    AUTH=(ACQ)
         BKEND
/*
/&
* $$ EOJ
```

A.3.4 DOS/VS SUPERVISOR PARAMETERS

```
* $$ JOB JNM=$$A$SUPV,DISP=D,CLASS=0,PRI=9,USER='HOYT'
// JOB SUPVR (XXXXXXXXXXXXXX) ASSMB AND CATAL SIPOSUPV MOD2 10/2/78
* MODIFIED 4/4/78 CHG 3705 X'080' FROM MODE X'01' TO X'02'
* 6/2/78 CHANGED TIME ZONE OFFSET FROM 8 TO 7 FOR PDT
* 158 SUPVR,VM=YES,8 MEG                                              PNK00448
* 10/2/78 OPTIMIZED FOR POWER/VS AND VTAM
// OPTION ERRS,LIST,XREF,NODECK,NOEDECK,CATAL
// OPTION NOXREF                                                      PNK00450
// EXEC ASSEMBLY,SIZE=40K
          PRINT   NOGEN                                               PNK00453
          SUPVR                                                      XPNK00454
                 ID=V,             $$A$SUPV                          XPNK00455
                 AP=YES,                                             XPNK00456
                 ERRLOG=RDE,                                         XPNK00457
                 NPARTS=6,                                           XPNK00458
                 POWER=YES,        'P O W E R / V S'                 XPNK00459
                 PAGEIN=24,                                          XPNK00460
                 PHO=YES,          REQUIRED FOR POWER/VS             XPNK00461
                 TP=(BTAM,VTAM),                                     XPNK00462
                 VM=YES          VM LINKAGE ENHANCEMENTS              PNK00463
$CONFG    EQU    *                                                    PNK00464
          CONFG                                                      XPNK00465
                 FP=YES,                                             XPNK00466
                 MODEL=158                                            PNK00467
```

```
$STDJC   EQU    *                                                    PNK00468
         STDJC                                                      XPNK00469
               ACANCEL=NO,                                          XPNK00470
               DECK=NO,                                             XPNK00471
               DUMP=NO,                                             XPNK00472
               LINES=60,                                            XPNK00473
               SPARM=YES,                                           XPNK00474
               XREF=NO                                               PNK00475
$FOPT    EQU    *                                                    PNK00476
         FOPT                                                       XPNK00477
               AB=YES,                                              XPNK00478
               ASYNOC=YES,                                          XPNK00479
               DASDFP=(1,4),       (TO ALLOW SYSRES ON CHANNELS 1-4) XPNK00480
               DOC=NO,                                              XPNK00481
               ECPREAL=YES,        REQUIRED FOR POWER/VS            XPNK00482
               ERRQ=10,                                             XPNK00483
               EVA=(10,10),                                         XPNK00484
               FASTTR=YES,         FAST CCW TRANSLATE (R32 FEATURE) XPNK00485
               GETVIS=YES,                                          XPNK00486
               IDRA=YES,                                            XPNK00487
               IT=YES,                                              XPNK00488
               JA=(12,12,12,12,12),                                 XPNK00489
               JALIOCS=(64,64),                                     XPNK00490
               OC=YES,                                              XPNK00491
               OLTEP=YES,                                           XPNK00492
               PC=YES,                                              XPNK00493
               PCIL=YES,                                            XPNK00494
               PD=YES,                                              XPNK00495
               PFIX=YES,           REQUIRED FOR POWER/VS            XPNK00496
               PRTY=(BG,F5,F4,F3,F2,F1),   F1-VTAM F2-POWER         XPNK00497
               PSLD=12,                                             XPNK00498
               RELLDR=YES,         REQUIRED FOR POWER/VS            XPNK00499
               RPS=YES,                                             XPNK00500
               SLD=15,                                              XPNK00501
               SYSFIL=YES,                                          XPNK00502
               TOD=YES,                                             XPNK00503
               TRKHLD=12,                                           XPNK00504
               USERID=SIPOSUP1MOD2VMLE,                             XPNK00505
               VSAM=YES,                                            XPNK00506
               WAITM=YES,                                           XPNK00507
               XECB=YES,           INTER-PARTITION COMMUNICATION (R32) XPNK00508
               ZONE=(WEST,7,00)                                      PNK00509
$PIOCS   EQU    *                                                    PNK00510
         PIOCS                                                      XPNK00511
               BLKMPX=YES,                                          XPNK00512
               BMPX=YES,                                            XPNK00513
               DISK=(3330,3340,3350),                               XPNK00514
               TAPE=9                                                PNK00515
$VSTAB   EQU    *                                                    PNK00516
         VSTAB                                                      XPNK00517
               RSIZE=512K,                                          XPNK00518
               VSIZE=7680K,     8 MEG VIRTUAL MACHINE               XPNK00519
               BUFSIZE=150,                                         XPNK00520
               SVA=(570K,40K)                                        PNK00521
$ALLOC   EQU    *                                                    PNK00522
         ALLOC                                                      XPNK00523
               F1=2048K,           VTAM RUNNING AT THE HIGHEST PRTY XPNK00524
               F2=512K,            POWER/VS SNA/RJE                 XPNK00525
               F3=2048K,           CICS/VS + DL/1 + VSAM OR VTAM    XPNK00526
```

```
               F4=1024K,           CICS/VS BUT NOT EVERYTHING        XPNK00527
               F5=450K             PRODUCTION                         PNK00528
*              BG=1024K       BG = VSIZE - (SVA + F1 + F2 + F3 + F4 + F5 PNK00529
$ALLOCR  EQU   *                                                      PNK00530
         ALLOCR                                                      XPNK00531
               BGR=80K,                                              XPNK00532
               F4R=40K,                                              XPNK00533
               F5R=80K,                                              XPNK00534
               F3R=80K,                                              XPNK00535
               F2R=56K,              POWER RSIZE                     XPNK00536
               F1R=40K                                                PNK00537
*              (BGR + F1R + F2R + F3R + F4R + F5R + 20K + SUPERVISOR) PNK00538
*              MUST BE NO GREATER THAN 'RSIZE'.                       PNK00539
$IOTAB   EQU   *                                                      PNK00540
         IOTAB                                                       XPNK00541
               BGPGR=40,                                             XPNK00542
               CHANQ=64,                                             XPNK00543
               D3330=16,                                             XPNK00544
               D3340=32,                                             XPNK00545
               D3350=8,                                              XPNK00546
               D3420=8,                                              XPNK00548
               F1PGR=24,                                             XPNK00549
               F2PGR=40,                                             XPNK00550
               F3PGR=39,                                             XPNK00551
               F4PGR=39,                                             XPNK00552
               F5PGR=10,                                             XPNK00553
               IODEV=110,                                            XPNK00554
               JIB=200,                                              XPNK00555
               NRES=64             REQUIRED FOR VSAM II               PNK00556
$DVCGEN  EQU   *          'REAL' DEVICES                              PNK00557
         DVCGEN CHUN=X'00C',DVCTYP=2540R   READER FOR DMS             PNK00558
         DVCGEN CHUN=X'01C',DVCTYP=2501    DUMMY READER FOR 'SPM II'  PNK00559
         DVCGEN CHUN=X'02C',DVCTYP=2501
         DVCGEN CHUN=X'03C',DVCTYP=2501
         DVCGEN CHUN=X'04C',DVCTYP=3505                               PNK00560
         DVCGEN CHUN=X'05C',DVCTYP=2501
         DVCGEN CHUN=X'00D',DVCTYP=2540P   PUNCH FOR DMS              PNK00561
         DVCGEN CHUN=X'04D',DVCTYP=3525P                              PNK00562
         DVCGEN CHUN=X'00E',DVCTYP=1403U                              PNK00563
         DVCGEN CHUN=X'00B',DVCTYP=1403U                              PNK00564
         DVCGEN CHUN=X'009',DVCTYP=1050A                              PNK00565
         DVCGEN CHUN=X'030',DVCTYP=2703    2703/OR 370X IN EMULATION  PNK00566
         DVCGEN CHUN=X'031',DVCTYP=2703    2703/OR 370X IN EMULATION  PNK00567
         DVCGEN CHUN=X'070',DVCTYP=3705,MODE=X'01' 370X NATIVE MODE   PNK00568
         DVCGEN CHUN=X'080',DVCTYP=3705,MODE=X'02' 370X NATIVE MODE   PNK00569
         DVCGEN CHUN=X'040',DVCTYP=3277    LOCAL 3270 FOR MONITOR, CICS PNK00570
         DVCGEN CHUN=X'041',DVCTYP=3277    LOCAL 3270 FOR APPLIC.     PNK00571
         DVCGEN CHUN=X'042',DVCTYP=3277,MODE=X'01' LOC. 3286 PRT      PNK00572
         DVCGEN CHUN=X'043',DVCTYP=3277    FOR CONSOLE SUPPORT        PNK00573
*                                                                     PNK00574
*    MULTIPLE PRINTERS FOR POWER/VS CONTROL                           PNK00575
         DVCGEN CHUN=X'01E',DVCTYP=1403U    ALL OF THESE PRINTERS AND PNK00576
         DVCGEN CHUN=X'02E',DVCTYP=1403U    PUNCHES ARE DEFINED UNDER PNK00577
         DVCGEN CHUN=X'03E',DVCTYP=1403U    VM/370. A POWER/VS WRITER PNK00578
         DVCGEN CHUN=X'04E',DVCTYP=1403U    TASK, EACH SERVICING A    PNK00579
         DVCGEN CHUN=X'05E',DVCTYP=1403U    UNIQUE CLASS, IS STARTED  PNK00580
         DVCGEN CHUN=X'06E',DVCTYP=1403U    FOR EACH PRT/PUN DEVICE.  PNK00581
         DVCGEN CHUN=X'07E',DVCTYP=1403U    VM/370 SPOOLING IS USED   PNK00582
         DVCGEN CHUN=X'08E',DVCTYP=1403U    TO DIRECT THE OUTPUT FROM PNK00583
```

```
*                                             EACH TASK TO A SPECIFIC      PNK00584
*    MULTIPLE PUNCHES FOR POWER/VS CONTROL    CMS USER. THE EFFECT IS      PNK00585
*        DVCGEN CHUN=X'01D',DVCTYP=3525P      TO GIVE EACH CMS USER (IN    PNK00586
*        DVCGEN CHUN=X'02D',DVCTYP=3525P      THIS CASE A TOTAL OF 8,      PNK00587
*        DVCGEN CHUN=X'03D',DVCTYP=3525P      BUT IT COULD BE MORE) THE    PNK00588
*        DVCGEN CHUN=X'05D',DVCTYP=3525P      DEDICATED USE OF A POWER/VS  PNK00589
*        DVCGEN CHUN=X'06D',DVCTYP=3525P      PRINTER AND PUNCH.           PNK00590
*        DVCGEN CHUN=X'07D',DVCTYP=3525P      THE TASKS ON 00E/00D ARE     PNK00591
*        DVCGEN CHUN=X'08D',DVCTYP=3525P      FOR SYSTEM OUTPUT.           PNK00592
*                                                                          PNK00593
         DVCGEN CHUN=X'140',DVCTYP=3350                                    PNK00594
         DVCGEN CHUN=X'141',DVCTYP=3350                                    PNK00595
         DVCGEN CHUN=X'142',DVCTYP=3350                                    PNK00596
         DVCGEN CHUN=X'143',DVCTYP=3350                                    PNK00597
         DVCGEN CHUN=X'144',DVCTYP=3350                                    PNK00598
         DVCGEN CHUN=X'145',DVCTYP=3350                                    PNK00599
         DVCGEN CHUN=X'146',DVCTYP=3350                                    PNK00600
         DVCGEN CHUN=X'147',DVCTYP=3350                                    PNK00601
*                                                                          PNK00602
         DVCGEN CHUN=X'160',DVCTYP=3340                                    PNK00603
         DVCGEN CHUN=X'161',DVCTYP=3340                                    PNK00604
         DVCGEN CHUN=X'162',DVCTYP=3340                                    PNK00605
         DVCGEN CHUN=X'163',DVCTYP=3340                                    PNK00606
         DVCGEN CHUN=X'164',DVCTYP=3340                                    PNK00607
         DVCGEN CHUN=X'165',DVCTYP=3340                                    PNK00608
         DVCGEN CHUN=X'166',DVCTYP=3340                                    PNK00609
         DVCGEN CHUN=X'167',DVCTYP=3340                                    PNK00610
*                                                                          PNK00611
         DVCGEN CHUN=X'280',DVCTYP=3420T9                                  PNK00612
         DVCGEN CHUN=X'281',DVCTYP=3420T9                                  PNK00613
         DVCGEN CHUN=X'282',DVCTYP=3420T9                                  PNK00614
         DVCGEN CHUN=X'283',DVCTYP=3420T9                                  PNK00615
         DVCGEN CHUN=X'284',DVCTYP=3420T9                                  PNK00616
         DVCGEN CHUN=X'285',DVCTYP=3420T9                                  PNK00617
         DVCGEN CHUN=X'286',DVCTYP=3420T9                                  PNK00618
         DVCGEN CHUN=X'287',DVCTYP=3420T9                                  PNK00619
*                                                                          PNK00620
         DVCGEN CHUN=X'350',DVCTYP=3330                                    PNK00621
         DVCGEN CHUN=X'351',DVCTYP=3330                                    PNK00622
         DVCGEN CHUN=X'352',DVCTYP=3330                                    PNK00623
         DVCGEN CHUN=X'353',DVCTYP=3330                                    PNK00624
         DVCGEN CHUN=X'354',DVCTYP=3330                                    PNK00625
         DVCGEN CHUN=X'355',DVCTYP=3330                                    PNK00626
         DVCGEN CHUN=X'356',DVCTYP=3330                                    PNK00627
         DVCGEN CHUN=X'357',DVCTYP=3330                                    PNK00628
*                                                                          PNK00629
         DVCGEN CHUN=X'370',DVCTYP=3330B
         DVCGEN CHUN=X'371',DVCTYP=3330B
         DVCGEN CHUN=X'372',DVCTYP=3330B
         DVCGEN CHUN=X'373',DVCTYP=3330B
         DVCGEN CHUN=X'374',DVCTYP=3330B
         DVCGEN CHUN=X'375',DVCTYP=3330B
         DVCGEN CHUN=X'376',DVCTYP=3330B
         DVCGEN CHUN=X'377',DVCTYP=3330B
*
$ASSGN   EQU   *                                                           PNK00630
*    SYS                                                                   PNK00631
         ASSGN SYSLOG,X'009'                                               PNK00632
         ASSGN SYSREC,X'160'                                               PNK00633
```

```
         ASSGN SYSCAT,X'160'        VSAM MASTER CATALOG                       PNK00634
         ASSGN SYSCAT,X'160',F4     VSAM MASTER CATALOG THESE  ASSGNS         PNK00635
         ASSGN SYSCAT,X'160',F5     VSAM MASTER CATALOG  SHOULD NOT BE        PNK00636
         ASSGN SYSCAT,X'160',F3     VSAM MASTER CATALOG   NEEDED, BUT         PNK00637
         ASSGN SYSCAT,X'160',F2     VSAM MASTER CATALOG   WERE FOUND TO       PNK00638
         ASSGN SYSCAT,X'160',F1     VSAM MASTER CATALOG   BE NECESSARY.       PNK00639
*     BG                                                                      PNK00641
         ASSGN SYSRDR,X'00C' BG                                               PNK00642
         ASSGN SYSIPT,X'00C' BG                                               PNK00643
         ASSGN SYSPCH,X'00D' BG                                               PNK00644
         ASSGN SYSLST,X'00E' BG                                               PNK00645
*                                                                             PNK00646
         ASSGN SYSLNK,X'161' BG                                               PNK00647
         ASSGN SYS001,X'161' BG                                               PNK00648
         ASSGN SYS002,X'161' BG                                               PNK00649
         ASSGN SYS003,X'161' BG                                               PNK00650
         ASSGN SYS004,X'161' BG                                               PNK00651
*     F5
         ASSGN SYSRDR,X'00C',F5
         ASSGN SYSIPT,X'00C',F5
         ASSGN SYSPCH,X'00D',F5
         ASSGN SYSLST,X'00E',F5
*     F4
         ASSGN SYSRDR,X'00C',F4
         ASSGN SYSIPT,X'00C',F4
         ASSGN SYSPCH,X'00D',F4
         ASSGN SYSLST,X'00E',F4
         ASSGN SYSLNK,X'161',F4
         ASSGN SYS001,X'161',F4
         ASSGN SYS002,X'161',F4
         ASSGN SYS003,X'161',F4
         ASSGN SYS004,X'161',F4
*     F3
         ASSGN SYSRDR,X'00C',F3
         ASSGN SYSIPT,X'00C',F3
         ASSGN SYSPCH,X'00D',F3
         ASSGN SYSLST,X'00E',F3
*     F2  POWER/VS PARTITION
         ASSGN SYSLST,X'00E',F2
         ASSGN SYS000,X'161',F2
         ASSGN SYS001,X'161',F2
         ASSGN SYS002,X'161',F2
*     F1  VTAM PARTITION
*                                                                             PNK00652
$SEND    EQU   *                                                              PNK00658
         SEND                                                                 PNK00659
         ENTRY NUCEND               IDENTIFY ACTUAL END OF SUPERVISOR.        PNK00660
         SUPPARMS           LIST PARAMETERS, AHEAD OF PRINT GEN               PNK00663
         END
/*
// EXEC LNKEDT
/&
* $$ EOJ
```

A.3.5 POWER/VS PARAMETERS

```
* $$ JOB JNM=POWERASM,CLASS=0                                                 POW00010
* $$ LST CLASS=A                                                              POW00020
```

```
// JOB POWERASM                                                        POW00030
// OPTION ERRS,LIST,XREF,NODECK,NOEDECK,CATAL                           POW00060
// EXEC ASSEMBLY,SIZE=128K                                              POW00070
         TITLE 'POWER SNA - RELEASE 34'                                 POW00080
         PRINT GEN                                                      POW00090
POWSNA   POWER DBLK=1966,                                              XPOW00100
               TRACKGP=3,                                              XPOW00110
               LTAB=(10,00,05,10,15,20,25,30,35,40,45,50,56),          XPOW00120
               PRI=5,                                                  XPOW00130
               SUBLIB=P,                                               XPOW00140
               ACCOUNT=YES,                                            XPOW00150
               STDLINE=(10000,10000),                                  XPOW00160
               STDCARD=(500,500),                                      XPOW00170
               JLOG=YES,                                               XPOW00180
               JSEP=(2,0),                                             XPOW00190
               RBS=(150,100),                                          XPOW00200
               RDREXIT=YLZ1REX,                                        XPOW00210
               PAUSE=NO,                                               XPOW00220
               SPOOL=YES,                                              XPOW00230
               SNA=(20,,POWER)                                          POW00240
         EJECT                                                          POW00250
*
*    BISYNCH SWITCHED LINES
*
         PLINE ADDR=X'030',                                            XPOW00260
               SWITCH=YES,                                             XPOW00270
               TRNSP=YES                                                POW00280
         PLINE ADDR=X'031',                                            XPOW00290
               SWITCH=YES,                                             XPOW00300
               TRNSP=YES                                                POW00310
         EJECT                                                          POW00320
*
*    BISYNCH TERMINALS
*
         PRMT  REMOTE=1,                                               XPOW00330
               TYPE=3780,                                              XPOW00340
               TRNSP=YES,                                              XPOW00350
               TRACE=YES                                                POW00360
         PRMT  REMOTE=2,                                               XPOW00370
               TYPE=3780,                                              XPOW00380
               SCE=YES,                                                XPOW00390
               TRACE=YES                                                POW00400
         PRMT  REMOTE=3,                                               XPOW00410
               TYPE=2770,                                              XPOW00420
               TRNSP=NO,                                               XPOW00430
               SCE=YES,                                                XPOW00440
               BE=YES,                                                 XPOW00450
               ABE=YES,                                                XPOW00460
               TRACE=YES                                                POW00470
         PRMT  REMOTE=4,                                               XPOW00480
               TYPE=2770,                                              XPOW00490
               TRNSP=YES,                                              XPOW00500
               SCE=NO,                                                 XPOW00510
               BE=YES,                                                 XPOW00520
               ABE=YES,                                                XPOW00530
               TRACE=YES                                                POW00540
         EJECT                                                          POW00550
*
*     SINGLE LU 3770
```

```
*
         PRMT  REMOTE=5,                                                  XPOW00560
               TYPE=LUT1,                                                 XPOW00570
               CONSOLE=NO,                                                XPOW00580
               SESSLIM=1,                                                 XPOW00590
               LU=(P76ALU1)                                                POW00600
*
*    MULTIPLE LU 3770
*
         PRMT  REMOTE=6,                                                  XPOW00610
               TYPE=LUT1,                                                 XPOW00620
               CONSOLE=YES,                                               XPOW00630
               LU=(P76ALU1,P76ALU2,P76ALU3,P76ALU4,P76ALU5,P76ALU6),      XPOW00640
               SESSLIM=6                                                   POW00650
*
*    3790
*
         PRMT  REMOTE=7,                                                  X
               TYPE=LUT1,                                                 X
               CONSOLE=YES,                                               X
               LU=(RJE01,RJE02,RJE03,RJE04,RJE05),                        X
               SESSLIM=5
         PRMT  REMOTE=8,                                                  X
               TYPE=LUT1,                                                 X
               CONSOLE=YES,                                               X
               LU=(P70LU1),                                               X
               SESSLIM=1
         END                                                               POW00660
/*                                                                         POW00670
// EXEC LNKEDT                                                             POW00680
/*                                                                         POW00690
/&                                                                         POW00700
* $$ EOJ                                                                   POW00710
```

A.3.6 DOS/VS NCP

The NCP used in conjunction with the above sample system is the same as that shown in section A.1.9.

A.3.7 LOGON MODE TABLE FOR 3770

```
// JOB RJEMODE
// OPTION CATAL
  PHASE RJEMODE,*
// EXEC ASSEMBLY,REAL,SIZE=64K
RJEMODE MODETAB
        MODEENT LOGMODE=BATCH,FMPROF=X'03',TSPROF=X'03',                  X
                PRIPROT=X'A3',SECPROT=X'A1',COMPROT=X'7080'
        END
/*
// EXEC LNKEDT
/&
```

APPENDIX B - 3770 MLU INSTALLATION CONSIDERATIONS

The topics addressed in this discussion are categorized into three areas: Host Considerations, Operational Considerations, and Hardware Considerations.

Before looking at the Host Considerations, let's briefly review the enhancements/differences of the 3776/3777 MLU.

MLU INCREASED FUNCTION

- FULL CONSOLE SUPPORT

  CONSOLE DISPLAY STANDARD
  Optional on 3777-2
  Not available on 3776-1,2 and 3777-1 (SLU 3770)

  CONTROL OF LOCAL DEVICE OPERATIONS

  ENTRY OF HOST RJE COMMANDS

  NO INTERRUPTION OF ACTIVE DATA STREAM
  To input commands to host application
  To run local jobs

- HOT CARD READER OPTION
  Standard on SLU 3776/3777 - compressed/nontransparent
  Option for transparency support on MLU 3776/3777

- TAPE AND DISKETTE INPUT/OUTPUT
  Tape not previously available
  Diskette usability enhanced

- MULTI MEDIA INPUT
  You can concatenate input from multiple devices for single job input.
  3777-2 allowed concatenation of card and disk data for input in BSC mode.

- EXCHANGE FORMAT IS STANDARD
  The MLU will write to a BASIC EXCHANGE diskette using the stAndard RJE support.
  3776/3777 SLU models will write to basic exchange diskette only if the host application supports basic exchange.

- CRYPTOGRAPHY

- LINE SPEEDS TO 19.2 KB
  19.2 KB is available on 3777-1 and 3777-2

B.1 HOST CONSIDERATIONS

SUMMARY OF JES2 CHANGES FOR 3770 MLU SUPPORT

CONSOLE

Specify CONSOLE support for a 3770 MLU.

&MAXSESS

This is the total number of concurrent sessions which can be active for for all JES2 remote terminals.
A value of one (1) should be specified for each active session. Thus, one should be added for each additional session resulting from an MLU installation.
The default is one per line with UNIT=SNA.

&NUMBUF

The JES2 I/O buffer count should be incremented for each additional session resulting from an MLU installation.
A good rule of thumb is:

&NUMBUF = 4 X number of sessions + 6

&NUMJOES

The &NUMJOES count should be increased by one for each additional output class, active reader, or active punch. Normally, a JES2 system will have adequate JOES absorb small additions.

&NUMTPBUF

The number of JES2 TP buffers should be incremented for each additional session resulting from an MLU installation.
A good rule of thumb is: add 6 for each additional inbound session
add 3 for each additional outbound session

WAITIME

WAITIME should have a small value specified (01) for MLU 3770 terminal since they have a console and since there would normally be a session available for console input.

LOGON

The LOGON message must be changed to include the first LU name in the user data portion for all sessions logging onto a given MLU. JES2 ties all sessions logged on with the same LU name to one RMT.

EXAMPLE: LOGON APPLID(JES2) LOGMODE(xxxxxxx) DATA(RMTnnn,,,LU1name)

SUMMARY OF VS1/RTAM CHANGES FOR 3770 MLU SUPPORT

TDESCR=(w,t,d,f)

Change the 'f' subparameter of the TDESCR parameter of the TERMINAL macro to include console support. The MLU 3770 has a console.

```
TDESCR=(w,t,d,f)
  Where 'f' specifies workstation features as follows:
    0 = no console; no transparency support
    1 = no console; transparency support
    2 = console; no transparency support
    3 = console; transparency support
```

RDRS=n, PTRS=n, PCHS=n

With SLU 3770s the number (n) of readers, printers, and punches was limited to one. VS1 increments the subaddress for each reader, printer, or punch in order to have unique media subaddress combinations. For three printers and three punches the media/subaddresses would be: print/0, print/1, print/2, card/0, card/1, and card/2. The SLU 3770s will only accept FMH1s specifying a subaddress of 0.

Multiple readers, printers, and punches may be specified for MLU 3770s. The subaddress may have a value from X'0' to X'F'.

NODE=(luname1,luname2,...,lunamen)

NODE is a parameter in the TERMINAL macro.
The name of each LU (from the NCP generation) that may log on from an MLU 3770 must be included in the NODE parameter of the TERMINAL macro. VS1 will allow only those names listed to logon from a remote terminal.

The first LU name will be used by VS1 for permanent logon if PLGN is specified. If permanent logon is used, only the first session will be logged on by VS1; all remaining sessions must be logged on from the workstation.

SESSLIM=n

The SESSLIM parameter of the TERMINAL macro specifies the number of sessions which may be initiated for this workstation. The default is 1. The 3770 MLU can have up to 6 concurrent active sessions; however, four will be adequate for most installations.

CPACTBL=name/no

CPACTBL is a parameter in the TERMINAL macro.
All MLU 3770s models support compaction. If you are replacing terminals that did not support compaction of if the MLU 3770 is a new terminal, the specifications for compaction support and compaction tables may need modification.

Related parameters are the CPACT=yes/no and CPACTDF=name/no parameters of the RTAM macro.

TPREAD=n, TPPRINT=n, and TPPUNCH=n

These parameters of the RTAM macro specifies the maximum number of remote readers, printers, and punches associated with all workstations logged on at any point in time.

The default is the number of BSC lines plus the number of SNA workstations.

The default may not be adequate for MLU terminals with multiple readers, printers, or punches.

SUMMARY OF DOS/POWER CHANGES FOR 3770 MLU SUPPORT

SNA = lucount

This parameter in the POWER macro specifies the maximum number of LUs that can be logged on at any given time. This number may need to be increased for MLU 3770 terminals.

SESSLIM = n

The SESSLIM parameter of the PRMT macro specifies the maximum number of sessions which may be active for this remote workstation. A value of 1 to 6 is valid for both POWER and 3770 MLU terminals. A value of 1 is adequate for 3770 SLU terminals.

LU = (name,name,...)

The LU parameter of the PRMT macro lists the LU names (from the NCP generation) which can logon to this remote. If the LU name is not listed here, then that LU will not be permitted to logon. All LU names (up to 6) generated for an MLU 3770 should be specified.

CONSOLE = (yes,no)

The CONSOLE parameter of the PRMT macro specifies whether there is a separate console output device on the terminal. If CONSOLE = yes is specified and there is no separate output console device, the console data will be interspersed with print data. Specify CONSOLE = no for SLU 3770 terminals. Specify CONSOLE = yes for MLU 3770 terminals.

SUMMARY OF VTAM/NCP CHANGES FOR 3770 MLU SUPPORT

MAXLU=n (For Switched Lines Only)

Specifies the number of sessions that will be established with this PU. Specify the number of concurrent active sessions desired for this switched 3770 MLU terminal.

MAXOUT=n

Seven (7) should be specified to indicate that 7 PIUs may be transmitted from NCP to this 3770 MLU before requesting an SDLC acknowledgement. (i.e. up to 7 PIUs transmitted without a poll).

PASSLIM=n

Seven (7) should be specified to indicate that 7 PIUs may be transmitted by NCP to this 3770 MLU each time the entry is processed in the service order table (i.e. up to 7 PIUs transmitted to this terminal before processing the next terminal on the line).

PACING=(m,n)

A pacing value of (1,1) must be specified for SLU 3770s (i.e. 3771, 3773,3774,3775,3776-1,2 and 3777-1). A pacing value of (1,1) to (7,1) may be specified for MLU 3770s (i.e. 3776-3,4 and 3777-3).

Higher PACING values results in better performance because more RUs can be transmitted to the terminal before a link level acknowledgement is required (i.e. intervening poll and response). However, the pacing values for each session, the number of active sessions and the RU size (256 or 512 bytes) have an interdependent relationship which is limited by the number of internal I/O buffers in the 3770 MLU.

The 3770 MLU:

1. Can have up to 6 active sessions
2. Any session can have a PACING value up to (7,1)
3. Supports both 256 and 512 byte RUs
4. Has 16 internal I/O buffers available
5. Allocates internal buffers for sessions according to the following algorithms:

   2n - 1 for 256 byte RUs, where n is the PACING value
   4n - 2 for 512 byte RUs, where n is the PACING value

   If adequate buffers are not available to support the session, the MLU 3770 will reject the bind.

Following are some examples to clarify the above discussion.

EXAMPLE 1:

Session 1   RU size=256   pacing=(1,1)   3770 buffers used= 1

Session 2	RU size=256	pacing=(1,1)	3770 buffers used= 1
Session 3	RU size=256	pacing=(3,1)	3770 buffers used= 5
Session 4	RU size=256	pacing=(3,1)	3770 buffers used= 5

			TOTAL 12

EXAMPLE 2:

Session 1	RU size=512	pacing=(1,1)	3770 buffers used= 2
Session 2	RU size=512	pacing=(1,1)	3770 buffers used= 2
Session 3	RU size=512	pacing=(1,1)	3770 buffers used= 2
Session 4	RU size=512	pacing=(2,1)	3770 buffers used= 6

			TOTAL 12

In these examples, since the total 3770 buffers used is less than 16, four sessions with the above pacing values could be active.

EXAMPLE 3:

Session 1	RU size=256	pacing=(2,1)	3770 buffers used= 3
Session 2	RU size=256	pacing=(3,1)	3770 buffers used= 5
Session 3	RU size=256	pacing=(3,1)	3770 buffers used= 5
Session 4	RU size=256	pacing=(3,1)	3770 buffers used= 5

			TOTAL 18

EXAMPLE 4:

Session 1	RU size=512	pacing=(1,1)	3770 buffers used= 2
Session 2	RU size=512	pacing=(3,1)	3770 buffers used=10
Session 3	RU size=512	pacing=(3,1)	3770 buffers used=10

			TOTAL 22

In these examples, the total 3770 buffers exceeded 16. When this occurs, the 3770 will not accept a bind for the session exceeding the available buffer resource (session 4 and 3, respectively).

A higher pacing value improves performance for a session, but restricts the number of sessions which may be active. 512 byte RUs provide better performance and less cpu overhead, but restricts the number of sessions and/or the pacing values. Each installation must strike a balance of pacing values, number of sessions active, and RU size which will meet their individual requirements. The first step is to determine the the number of sessions needed for your 3770 operational environment.

For JES2, the pacing values should be in ascending sequence. For example, LU #1=(1,1), LU #2=(1,1), LU #3=(3,1), LU #4=(3,1). The reason for this is that JES2 looks for available sessions beginning with the last session and works backwards (i.e. session #4, #3, etc. in this example).

For VS1/RES, the pacing values should be in descending sequence beginning with LU #2 (LU #1 is reserved for console usage). For example, LU #1=(1,1), LU #2=(3,1), LU #3=(3,1), LU #4=(1,1). VS1/RES looks for available sessions beginning with the second session and works forward (session #2, #3, etc. in this example).

For POWER/VS, the pacing values should be in descending sequence. For example, LU #1=(3,1), LU #2=(3,1), LU #3=(1,1), LU #4=(1,1). POWER/VS looks for available sessions beginning with the first session and works forward (session #1, #2, etc. in this example). This method of assigning pacing values to LUs (i.e. sessions) should result in the best performance since the most frequently selected sessions will have the highest pacing values.

For exceptional conditions when high performance is desired, you may wish to define an additional inactive LU with a high pacing value, such as (4,1) or (5,1). One or more low pacing sessions could be deactivated and the high pacing session activated to accomplish the data transfer for a high priority situation. Keep in mind the additional operational procedures required by the VTAM operator and the 3770 operator.

NOTE: In ACF/VTAM and ACF/NCP, PACING and VPACING can be specified in the logmode table entries. When this is done, the logmode table values override the values for PACING and VPACING specified in the NCP generation and VTAM list. Thus, you can change PACING and VPACING values by selecting a different entry in the logmode table at logon time. When this approach is used, PACING=(1,1) and VPACING=(2,1) should be specified in the NCP generation. This method provides simplified tuning capabilities and a more flexible operating environment. This approach is recommended for and should be strongly considered by customers with ACF products installed.

VPACING=(m,n)

A good rule of thumb is to make the VPACING value two times the PACING value. If restricted by 3705 storage, make VPACING at least 1 larger than PACING values.

EXAMPLES:

```
pacing=(1,1)        vpacing=(2,1)
pacing=(2,1)        vpacing=(4,1)
pacing=(3,1)        vpacing=(6,1)
```

GET TO LATEST MAINTENANCE LEVEL

To insure a successful 3770 MLU installation, the host subsystems must be at the latest current maintenance level. This is of utmost importance for MVS systems. If not at the current maintenance level, JES2 failures and/or JES2 functional failures are probable. These failures can erroneously be attributed to the 3770.

This area is often overlooked or an inadequate amount of time is allocated in the installation plan. Do not be caught short. "You pay now or you pay later, with greater pain."

B.2 OPERATIONAL CONSIDERATIONS

We are now ready to start on the second category of topics, Operational considerations.

A successful 3770 MLU installation dependends a great deal upon a thorough understanding of terminal operations and proper planning for and implementation of the operator interface; since operator acceptance significantly impacts overall installation success.

The 3770 has significantly enhanced the terminal operator interface with the gas panel display, stored operational procedures, operator commands, operator messages, and the operator prompting implementation. In order to take advantage of the stored procedures, initial planning and procedure definition creation must be done.

The topics listed are the ones to be covered.

GAS PANEL DISPLAY

```
 ----------------------------------------
|                                        |
| DDHHMM  XXXXXXXXXXXXXXXXXX             |
| DDHHMM  XXXXXXXXXXXXXXXXXX             |
| DDHHMM  XXXXXXXXXXXXXXXXXXXXX          |
|>DDHHMM  LATEST MESSAGE XXXX            |
|                                        |
| DDHHMM  YYYYYYYYYYYYYYYYY              |
| DDHHMM  YYYYYYYYYYYYYYYYY              |
| DDHHMM  YYYYYYYYYYYYYYYYY              |
|                                        |
|                                        |
|________________________________________|
|                                        |
|                                        |
|________________________________________|
```

1024 CHARS 16 X 24

TOP 13 LINES MESSAGES AND JOB INFORMATION
The top 13 lines are for messages and job information (primarily host messages). The top 16 lines may also be used for lengthly terminal displays, such as DISPLAY SESSION.

A > (greater than sign) identifies the last message. In addition a blank line follows the last message.

BOTTOM 3 LINES COMMAND ENTRY, PROMPTS
The bottom 3 lines are used to enter terminal commands and to receive terminal prompts.

MESSAGES ALSO SPOOLED TO DISKETTE DATA SET
The messages displayed are automatically spooled to disk

FORWARD & BACKWARD PAGING
The messages spooled on diskette can be scanned with the PAGE FWD and PAGE BACK keys. In addition the FIND command can be used to find messages by date and time.

3770 MLU COMMANDS

This foil and the next foil list the 3770 MLU command set. The purpose is to provide an overview of the command capability available to the operator; and not to discuss each command in detail (commands can be found in the operator"s guide GA27-3165).

Commands are executed by (1) PRESSING THE TERM REQ KEY, (2) ENTERING the COMMAND NAME or abbreviation, and (3) PRESSING EOM. I have grouped the commands into IMMEDIATE commands, DEFINITION commands, and MISCELLANEOUS commands.

IMMEDIATE- command functions are executed immediately. For example, the OUTPUT command provides the same information to the terminal as the HOSTOUT definition command. However, the associated prompts must be completed by the operator on a real time basis.

DEFINITION- commands are used to prompt the operator for information to be stored on diskette for later use. After the procedures are stored on diskette, the job or function can be invoked with the EXECUTE operator command.

Procedure definitions should be used where possible to reduce operator key strokes and time.

MISCELLANEOUS- commands are used to execute specific functions or utilities.

SSCP EXAMPLE

```
- PRESS TERM REQ KEY
- ENTER - SSCP, EOM
```

(use the tab key to go from field to field)

```
-------------------------------------------
|  NAME = LOG                             |
|  FUNCTION (ADD, CHANGE, DELETE) = A     |
|  SSCP                                   |
-------------------------------------------
- PRESS EOM
```

NAME- LOG is the name you wish to assign to this procedure
FUNCTION- A is the default
SSCP- tells the operator he is defining an SSCP procedure

```
-------------------------------------------
|  M = LOGON APPLID(JES2) MODETAB(MLU12)  |
|  DATA(RMT7,,,LU1NAME)              S=*  |
|  SSCP ADD LOG                           |
-------------------------------------------
- PRESS EOM
```

M- is where you enter the logon message; it can be continued
   on the next line.
S- designates the session number on which you wish to send
   to send the logon message.
   * is the default: indicates to send the logon on all sessions
SSCP- an SSCP procedure is being ADDed by the name of LOG

```
-------------------------------------------
|                                         |
|  PRESS EOM TO SAVE                      |
-------------------------------------------
- PRESS EOM
```

CARRIAGE EXAMPLE

This is an example of a CARRIAGE or forms control definition
This is the electronically stored equivalent of a printer carriage tape.

- PRESS TERM REQ KEY
- ENTER - CARRIAGE, EOM

```
-----------------------------------------
|  NAME = CC1                           |
|  FUNCTION-ADD/CHANGE/DELETE(A,C,D) = A |
|  CARRIAGE                             |
-----------------------------------------
```

- PRESS EOM

```
----------------------------------------------
|  LINES PER PAGE = 66     LAST PRNT LINE = 62 |
|  LINES PER INCH (6,8) = 6   LEFT MARGIN = 1 |
|  CARRIAGE ADD CC1                          |
----------------------------------------------
```

- PRESS EOM

These prompts default to the values shown.
The left margin prompt is displayed only for the 3776.

```
----------------------------------------------
|  VERT STOPS:        C1=  C12=  C2=  C3=    |
|  C4=  C5=  C6=  C7=  C8=  C9=  C10=  C11=  |
|  CARRIAGE ADD CC1                          |
----------------------------------------------
```

- PRESS EOM

Cx- Defines the line number associated with the channel stop An * can be specified for a channel stop to indicate there are additional lines associated with this channel stop. This is analogous to having multiple holes punched for a single channel in a carriage tape.

```
-----------------------------------------
|                                       |
|  PRESS EOM TO SAVE                    |
-----------------------------------------
```

- PRESS EOM

HOSTOUT EXAMPLE

```
- PRESS TERM REQ KEY
- ENTER - HOSTOUT, EOM

-----------------------------------------
|  NAME = PRINTOUT                      |
|  FUNCTION-ADD/CHANGE/DELETE(A,C,D) = A |
|  HOSTOUT                              |
-----------------------------------------
- PRESS EOM

----------------------------------------------------
|  MED(C,E,P) = P        SUBADDR(0-9,A-F)  = 0     |
|  DEV(D,D1,D2,T,CP,CR)= _  ACTIVE AFTER USE(Y,N)=N |
|  HOSTOUT  ADD PRINTOUT                           |
----------------------------------------------------
- PRESS EOM
```

MED- (card,exchange,print) - The media specified in the FMH1 for the data received from the host.
P is the default.

SUBADDR- The subaddress specified in the FMH1 for the data received from the host.
0 is the default.

DEV- (disk,disk1,disk2,tape,card punch,card reader) - The device you want the data with the specified media/subaddress routed to

ACTIVE AFTER USE- Do you want this media/subaddress to device relationship to remain active after this job finishes?

```
-----------------------------------------
|  CARR CNTRL = CC1        TRAIN = AN   |
|                                       |
|  HOSTOUT ADD PRINTOUT                 |
-----------------------------------------
- PRESS EOM
```

CARR CNTRL- What carriage control definition do you want to be in in effect for this printout.
'*' is the default and means to use the currently loaded forms control definition.

TRAIN- Specifies the train image to be used on a 3777.
'*' is the default and means to use the currently loaded train image buffer.

```
-----------------------------------------
|                                       |
|  PRESS EOM TO SAVE                    |
-----------------------------------------
- PRESS EOM
```

TIP COMPLETION

2 blank lines denotes the beginning of a new prompt on the bottom three lines of the gas panel display.

IS READ AND EXECUTED - POWER ON

When the TIP is modified, the terminal must be powered off and on to pick up the new version.

IS EXECUTED - SYSTEM RESET

LEASED OR SWITCHED (L,S)=L	L for leased, S for switched,SNBU
RTS-PERM/CTRL(P,C)=P	Consult modem supplier. Should usually be P for leased pt to pt.
NRZI (Y,N)=N	Must match NCP generation.
ATTENDED MODE (Y,N)=Y	Should by Y unless terminal is unattended on a switched line.
SNA ENABLE (Y,N)=Y	Should be Y; can override at POWER ON and SYSTEM RESET time.
ID=013000C1	Same as IDBLK and IDNUM for switched terminal. Will work for all MLUs and must match NCP gen. 4th byte is SDLC terminal address.
EXTENDED ID (Y,N)=N	Must be N at this time.
DFLT CARR CTRL=CC1	This CARRIAGE def'n must be created
TIME INTRVL (1-99)=4	Intervention Required timeout value
MAXIMUM RU CHAIN-*=NO LIMIT (*,1-32767)=*	Inbound chainsize. Use to regulate flow to NCP if inbound pacing is not used.
CARD RDR HOT (Y,N)=Y	Do you want a 'hot' card reader?
TRANSPARENT (Y,N)=N	Transparency for hot card reader input?
SESS (*,1,2,3,4,5,6)=1	Session to be used for hot card reader
SUBADDR (0-9,A-F)=0	Subaddress used for hot card reader
MULT SIGNAL INTRPT (Y,N)=Y	Y for JES2; N for VS1 and POWER
FULL SNA MONITOR (Y,N)=Y	Y for additional SNA related messages

SSCP PROCS - S1= S2= S3= S4= S5= S6= — SSCP procs to be used for each session. Must be predefined.

HOSTOUT DEF - 1= 2= 3= 4= 5= — HOSTOUT definitions to be invoked by TIP. Must be predefined.

3770 MLU INITIATION

After the 3770 is powered on; and the operator satisfies the date, time, and enable communications prompts; the 3770 will automatically:

- Enable the communications adapter
- Set up the configurations options defined in the TIP
- Activate the HOSTOUT definitions specified in the TIP. This establishes media/subaddress to device relationships for routing ensueing data.
- Send the designated logon message for sessions as specified in in the TIP.

Thus, logons can be accomplished and data received with very little operator action. This is an example of the 3770 MLUs simplified operator interface.

PROCEDURE NAMING CONVENTIONS

By now you have probably concluded that a terminal could have a substantial number of procedures. Not only different types of procedures (ie., HOSTOUT, CARRIAGE, UTILITIES, etc.), but also several procedures of each type. This may become confusing to an operator if procedure names are selected arbitrarily.

Thus, the recommendation to establish a naming convention for procedure definitions.
A suggested approach is to categorize jobs by usage (ie., production jobs and commonly used jobs).

PRODUCTION JOBS are jobs that are run periodically and use a specific form, form definition, data set name, etc.

COMMONLY USED JOBS are common RJE functions without any specific requirements. For example, a line to print job using standard forms or a card to line job.

FOLLOWING ARE SOME SUGGESTED FORMATS FOR YOUR CONSIDERATION:

For repetitive production jobs, relate the procedure name to the application name or possibly to the form name. The intent is to associate the procedure name to something already known to the operator.

For commonly used jobs, associate the procedure name to the input and output devices being used. The intent is to define a logical set of rules for naming procedures.
For example: LIPR - Line to printer
D1pr - Disk 1 to printer
PRINTOUT - LIne to printer

COMPLETE PROCEDURE DEFINITIONS

Once you have established a procedure naming convention, you are ready to determine what procedure definitions are required to support your RJE environment.

Define and complete the procedure definitions for the production jobs and the commonly used jobs.

Delete the TRAIN images not used in order to free up procedure storage space on diskette. All procedure definitions use a common storage area.

WHEN COMPLETING THE PROCEDURE DEFINITIONS, KEEP IN MIND:

REMAIN ACTIVE AFTER USE (YES,NO)=
This determines if the media/subaddress will remain assigned to the device after the job completes.
A given media/subaddress combination can only be assigned to one device at a time.
If this procedure is for standard line to print jobs with standard forms, you should probably specify yes.
If this procedure is for non standard forms to be used once or for one time device assignments, such as print media to diskette, you should probably specify no.

D/P PRINT CONTROL-(M,A,N)=
If spooling print data to tape or BE diskette, you need to specify the print control characters used (machine, ANSI, or none).

D DSN (*=AUTO) = *
The 3770 will automatically create a diskette D.S. name if specified (DSN=*). The operator would have to do a LISTDISK to obtain the DS name in order to retrieve the data.

D DATASET (OLD,NEW)=
Similar to OS JCL, a data set must be specified as new when it is created and old when it is subsequently accessed.

D DATASET TYPE (E,T)=
An E diskette data set type is basic exchange format:
128 byte sectors/records
data is decompressed/decompacted before being written to diskette
T diskette data set is 3770 T-format:
256 byte records (2 sectors)
data cannot be compacted
compressed data is written in compressed format

D OUTPUT TO DEVICE = DN
If you specify Dn, rather than D1 or D2, the 3770 will select either disk 1 or disk 2.

D SEQUENCE NUMBERS
3770 MLU created diskette data sets complete the sequence

number field.
If the first volume of a multivolume data set has a valid sequence number, all volumes are expected to have valid sequence numbers.
Sequence numbers can be used for additional control for the sequencing of input data.
Be careful when mixing 3770 and non-3770 created diskettes for an input job (ie., JCL-card to diskette on 3770, data created on a 3740).

PROCEDURE MAINTENANCE / BACKUP

This discussion is intended to identify some procedure maintenance/ backup considerations and to lead your thinking in the implementation of these areas. The philosophy and implementation of host site control, host site responsibilities, and host site support are different for each account. The sophistication will depend upon the customer and the number of remote terminals. Here, some questions will be asked which should be answered in the overall system design and installation plan.

WHO CREATE/MAINTAIN PROCEDURES?

REMOTE SITE?
CENTRAL SITE?

Will the host site or remote site initially create the procedures?
Will the host site or remote site add and modify procedures?
The information contained in the definitions, the relationship to RJE subsystem parameters, and the remote operator capabilities must be understood before making these decisions.

HOW?

How will the procedures be maintained?
If done at the central site, what is the terminal configuration?
The new DUMMYDEV command can be used to define devices not physically attached, in order to assist in defining procedures for other terminals. Of course, the procedures cannot be executed (tested) for a device that is not physically attached.
How will both the central and remote site know what procedures are defined and the contents of each at any given point in time.
The work sheets in appendix c of the operators guide (GC27-3165) were created for this purpose.

HOW / WHEN BACK UP PROCEDURES?

- RECOVERY
- NEW EC DISKETTES

The 3770 MLU terminals have microcode on diskette, the same diskette which is used to store the procedure definitions. Thus, when a new EC level diskette is installed, the procedure definitions must be recreated on the new diskette. The USERSAVE and USERREST commands shown below are provided to assist in backing up procedures and installing new EC diskettes.

It is recommended that all ECs be shipped to central site. Central site should test the new EC level and then ship new EC diskettes to remote sites with guidelines for saving and restoring procedures when the new diskette is installed.

USERSAVE - TRANSFERS PROCEDURES TO DISKETTE, TAPE, PUNCH

USERREST - RESTORES PROCEDURES SAVED WITH USERSAVE

AT A MINIMUM:

IMPLEMENT EC CONTROL PROCEDURES
-RECOMMEND CENTRAL SITE DISTRIBUTION

KEEP A COPY OF PROCEDURE WORKSHEETS AT BOTH THE HOST AND TERMINAL LOCATIONS

HOST CONTROLLED PROCEDURES

USERSAVE-REMOTE TERMINAL	Do a USERSAVE at the remote 3770
TRANSMIT DS TO HOST	Transmit the data set, cards, or file to a host application program. Send the data set to the host terminal with a host application program.
SEND DS TO HOST TERM	The diskette, cards, or tape could be mailed to the host site.
USERREST-HOST TERMINAL	Restore the procedures at the host 3770.
UPDATE PROC DEFINITIONS	Add, delete, update procedures.
USERSAVE-HOST TERMINAL	Save the new procedures.
SEND DS TO HOST	Send the new procedures to a host application program. Send the new procedures to the remote 3770.
XMIT DS TO REMOTE TERM	The diskette, cards, or tape could be mailed to the remote 3770.
USERREST-REMOTE TERMINAL	Restore the new procedures at the remote 3770.

UPDATE OPERATIONAL PROCEDURES

To significantly assist in making your RJE installation successful, it is recommended that a pilot or the first 3770 MLU terminal be installed at the host site. This will provide the opportunity to become familiar with the terminal; to develop and test procedure definitions; and to develop operational procedures.

If remote operational procedures exist, they should be updated; if none exist, new ones should be created.

Appendices A and B in the 3776-3,4 and 3777-3 operators guide (GA27-3165) contain very useful operational comparisons between the 3776-1,2; the 3777-1; the 3777-2; and the MLU models (3776-3,4 and 3777-3).

NETWORK MANAGEMENT/PROBLEM DETERMINATION AIDS

(IN ADDITION TO DIAGNOSTICS AND FE SERVICE AIDS)

The following 3770 MLU aids can be very useful for problem determination and/or network management. You should become familiar with the information contained in each and incorporate their use, where applicable, into day-to-day operations.

The 3770 command is in 'quotes'.

3770 MLU TRACE

- 'TRACE' to PRINTER
- RU CONTENTS
- SESSION NUMBER
- TRANSMIT or RECEIVE
- NEGATIVE RESPONSE

CONSOLE MESSAGES

- ACTPU
- ACTLU
- SESSIONS BOUND/UNBOUND
- NEGATIVE RESPONSES
- OPERATOR ACTION

DISPLAY SESSION

- 'DI,S' TO CONSOLE

- BIND IMAGE RECEIVED
- SESSION STATUS INFO

CONSOLE LOG

- 'LISTSPOL' to DISK
  TAPE, CARD, PRINTER

ERROR LOG

- 'LISTLOG' to PRINTER

LINE STATISTICS

- 'LINE' to PRINTER

TAPE STATISTICS

- 'TSTAT' to PRINTER

LIGHTS

DATA SET READY -
THE COMMUNICATION ADAPTER IS ENABLED AND THE
TERMINAL MODEM HAS ACTIVATED THE DSR LEAD

REMOTE DETECT -
A VALID SDLC FRAME HAS BEEN RECEIVED
IN THE LAST 20 SECONDS

RECEIVE -
DATA IS BEING RECEIVED

TRANSMIT -
DATA IS BEING TRANSMITTED

YOUR PLAN SHOULD INCLUDE:

In summary, your installation plan should include the following operational related items.

_ PROCEDURE DEF./MAINT. STANDARDS

_ TERMINAL OPERATOR PROCEDURES

_ EC CONTROL PROCEDURES

B.3 PHYSICAL PLANNING

These are the topics to be covered in the third category, Physical planning.

SPACE	Insure there is adequate space for the controller and attached devices.
HEAT	See PHYSICAL PLANNING NOTES 1 and 3.
POWER	See PHYSICAL PLANNING NOTES 2 and 4.
TAPE DRIVE - RAISED FLOOR	See PHYSICAL PLANNING NOTE 5.
COMMUNICATION FACILITIES - 19.2 KB	

3770 MLU PHYSICAL PLANNING NOTES

1. A 3776 with all attachable devices will provide the following heat output:

3776 - 3,4	2500 BTU/hr
3411 - 1	2200 "
3782/3521	1650
3782/2502	2100

	8450 BTU/hr

   The Customer should assure that adequate cooling is provided.

2. A 3776 with all atachable devices will require four power receptacles:

UNIT	POWER TYPE volts/phase	RECEPTACLE
3776 - 3,4	115/1	NEMA 5-15R
3411-1	208-230/1	R&S 3753
3782/3521	115/1	NEMA 5-15R
3782/2502	115/1	NEMA 5-15R

3. A 3777 with all attachable devices will provide the following heat output:

3777/2502	4500 BTU/hr
3411 - 1	2200 "
3203 - 3	6200 "
3782 - 1	1650 "

	14550 BTU/hr

   The Customer should assure that adequate cooling is provided.

4. A 3777 with all attachable devices will require four different power receptacles:

UNIT	POWER TYPE volts/phase	RECEPTACLE
3777 - 3	115/1	NEMA 5-20R
3411 - 1	208-230/1	R&S 3753
3203 - 3	208-230/3	R&S 3744
3782/2502	115/1	NEMA 5-15R

5. The 3411 was designed for installation on a raised floor. If it is installed with cables above the floor, it will be necessary to utilize the knockout in the rear cover.

3770 COMMUNICATION FACILITIES

3770 MODEL	FC 3701 EIA	FC 4501 HSD	FC 5650/1 DDSA
3776-1,2	X		
3777-1	X	X	
3777-2	X	X	
3776-3,4	X	X	X
3777-3	X	X	X

*** FIGURE 1 ***

3770 FC	SPEED BPS	3770 INTFC		3705 INTFC	3705 LINE SET
3701	2400-9600	EIA		EIA	1D (HDX)
					1H (FDX)
3701	19.2K	EIA	***	HSD	1G (HDX)
4501	19.2K	HSD		HSD	1G (HDX)
5650/1	2400-9600	CSU		DSU	1D (HDX)
					1H (FDX)

*** FIGURE 2 ***

EIA - STD 25 PIN
HSD - HIGH SPEED DIGITAL 12 PIN
CSU - CHANNEL SERVICE UNIT 15 PIN
DSU - DATA SERVICE UNIT, EIA 25 PIN

FIGURE 1 shows the communication interfaces available on the various 3776 and 3777 models.

Figure 2 shows the associated line speeds supported, the 3770 interface and the 3705 line sets supported for each communication facility. Note that EIA interface at 19.2 KB requires an EIA interface at the 3770 and an HSD interface at the 3705; the 3705 does not EIA at 19.2 KB.

3770 MLU COMMUNICATION FACILITIES NOTES

There are three types of Communications Adapters available for the MLU. Although they provide about the same speed capabilities, there are significant differences in the modem interface and in the communication facilities provided. It is important that the features specified for the MLU be coordinated with the modem and carrier supplier in order to assure that the interfaces will be properly matched when the MLU is installed. A discussion of these features follows:

FC 3701 EIA Interface

This is the conventional EIA interface used on terminal products to communicate at 1200 to 9600 BPS with a large variety of standard modems. At the Host site a 1D or 1H type line set on the 3705 provides an identical interface. On the MLU this interface also allows operation at 19.2 KBPS. You should recognize that the modem to be used with this feature code must also utilize the EIA (25 pin) rather than the High Speed Digital (12 pin) interface usually supplied with modems at 19.2 KBPS. The 3705 does not provide an EIA line set for 19.2 KBPS, but requires a 1G (12 pin) interface, with appropriate modifications to the scanner function. If this EIA feature is to be used for 19.2 KBPS, be sure that the modem supplier can also provide the digital interface to satisfy the 3705 requirement.

FC 4501 High Speed Digital Interface

This feature uses the Digital (12 pin) interface to the modem, like the 3705 1G line set, and should be ordered if the MLU is to run only at 19.2 KBPS with modems using this interface.

FC 5650/5651 DDS Adapter

This feature uses a special common carrier facility called Dataphone* Digital Service. The special service does not utilize the normal analog (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 which would be compatible with FC 3701. The second is a "Channel Service Unit" using the DDSA interface (15 pin) provided by FC 5650/5651. Note that the DDS Adapter does not support 19.2 KBPS.

APPENDIX C - SNA, FMH, AND DATA FLOWS

3770 INITIATED BRACKET - CARD, DISK DATA

```
HOST            BB, OC, DR1, FMH (BDS)          3770
      <-------------------------------------
                        +RESP
      -----   -----   -----   -----   ----->
                    BOC, EX DR1
      <-------------------------------------
                         .
                         .
```

```
                         .
                     EOC, DR1                  An IUS character
<-------------------------------------------   or /*EOC card was
                      +RESP                    contained in the
-----   -----   -----   -----   ----->         input data stream
                         .
                         .
                         .
                   BOC, EX DR1
<-------------------------------------------
                         .
                         .
                         .
                     EOC, DR1
<-------------------------------------------
                      +RESP
-----   -----   -----   -----   ----->*
             EB, OC, DR1, FMH (EDS)
<-------------------------------------------
                      +RESP
-----   -----   -----   -----   ----->
```

3770 INITIATED BRACKET - KEYBOARD DATA

```
              BB, EB, BOC, EX DR1           * BIND option in-
<-------------------------------------------   dicates secondary
                  MOC, EX DR1                  may send EB. If
<-------------------------------------------   EB not allowed
                         .                     from secondary,
                         .                     CD will be set
                         .                     on last (or only)
                   EOC, EX DR1                 element of last
<-------------------------------------------   chain.
```

FIGURE C.1: 3770 INITIATED BRACKET-CARD, DISK DATA

HOST INITIATED BRACKET

```
HOST                    BID                          3770
      ------------------------------------->  Note: BID or Bid
                       +RESP                   with data may be
      <-----  -----  -----  -----  -----      used.
        BB, BOC, EX DR, FMH (BDS, SEL)
      ------------------------------------->
                         .
                         .
                         .
                      EOC, DR
      ------------------------------------->
                       +RESP
      <-----  -----  -----  -----  -----
                         .
                         .
                         .
            EB, BOC, EX DR, FMH (EDS)
      ------------------------------------->
                         .
                         .
                         .
                      EOC, DR
      ------------------------------------->
                       +RESP
      <-----  -----  -----  -----  -----
```

The host initiated bracket may consist of many chains and many data sets.

If an FM Header is sent on an RU containing data, the data must not exceed 250 bytes.

If no FM Header is present on an outbound data set, the data will go to the console printer.

FIGURE C.2: HOST INITIATED BRACKETS

```
               |-
      HOST     |    BB, BOC, EX DR, FMH (BDS, SEL)      3770
               |----------------------------------->
               |             MOC, EX DR
               |----------------------------------->
               |            SIGNAL (BREAK)              ATTN key
               |<-----------------------------------
Outbound       |             MOC, EX DR
Data Set       |----------------------------------->
               |         +RESP (TO SIGNAL)
               |-----  -----  -----  -----  ----->
               |              EOC, DR
               |----------------------------------->
               |               +RESP
               |<-----  -----  -----  -----  -----
               |      OC, DR, CD, FMH (SUSP)
               |----------------------------------->
               |               +RESP
               |<-----  -----  -----  -----  -----
               |*
               |            BOC, EX DR1
               |<-----------------------------------
Inbound        |                 .
Keyboard       |                 .
Data Set*      |                 .
               |          EOC, DR1, CD
               |<-----------------------------------
               |               +RESP
               |-----  -----  -----  -----  ----->
               |
               |
               |     BOC, EX DR, FMH (RDS, SEL)
               |----------------------------------->
               |                 .
               |                 .
               |                 .
Outbound       |              EOC, DR
Data Set       |----------------------------------->
Continued      |              +RESP
               |<-----  -----  -----  -----  -----
               |                 .                     If the origin of
               |                 .                     the inbound data
               |                 .                     set is card
               |      EB, OC, DR, FMH (EDS)            reader or disk,
               |----------------------------------->   the data set will
               |              +RESP                    be delimited by
               |<-----  -----  -----  -----  -----     FM Headers.
               |-
```

FIGURE C.3: 3770 REQUEST CHANGE DIRECTION

```
            |-
     HOST   |         BB, OC, DR1, FMH (BDS)             3770
            |<------------------------------------------
            |                   +RESP
            |-----   -----   -----   -----   ----->
            |              BOC, EX, DR1
            |<------------------------------------------
Inbound     |              MOC, EX, DR1
Data Set    |<------------------------------------------
            |               SIGNAL (CD)
            |------------------------------------------>
            |                   +RESP
            |<-----   -----   -----   -----   -----
            |              MOC, EX, DR1
            |<------------------------------------------
            |              EOC, DR1, CD
            |<------------------------------------------
            |                   +RESP
            |-----   -----   -----   -----   ----->
            |
            |
            |         BOC, EX DR1, FMH (BDS)
            |------------------------------------------>
            |                     .
            |                     .
Outbound    |                     .
Data Set    |               EOC, DR, CD
            |------------------------------------------>
            |                   +RESP
            |<-----   -----   -----   -----   -----
            |
                           BOC, EX, DR1
             <------------------------------------------
                                  .
                                  .
                                  .
            |-
            |              EOC, EX, DR1
            |<------------------------------------------
Inbound     |                   +RESP
Data Set    |-----   -----   -----   -----   ----->
Continued   |          EB, OC, DR1 FMH (EDS)
            |<------------------------------------------
            |                   +RESP
            |-----   -----   -----   -----   ----->
            |
```

FIGURE C.4: HOST REQUEST CHANGE DIRECTION

HOST REQUESTED CHANGE DIRECTION (EXCEPTION RESPONSE)

```
HOST           BB, OC, EX, FMH (BDS)           3770
      <---------------------------------------
                   FOC, EX
      <---------------------------------------
                   MOC, EX
      <---------------------------------------
                 SIGNAL (CD)
      --------------------------------------->
                   MOC, EX                     3770 forces EOC
      <---------------------------------------  emptying buffer
                 EOC, EX, CD
      <---------------------------------------
                   FOC, EX                    -|
      ---------------------------------------> |
                      .                        |
                      .                        |
                      .                        |
                   EOC, EX                    *|Data to console
      ---------------------------------------> |printer**
                      .
                      .
                      .                        |
                 OC, EX, CD                    |
      ---------------------------------------> |
                   FOC, EX                    -|3770 restarts in-
      <---------------------------------------  terrupted job
                      .                         automatically.
                      .
                      .
                   EOC, EX                      IUS or /*EOC
      <---------------------------------------  detected.
                 SIGNAL (CD)
      --------------------------------------->
                    +RESP
      <-----   -----   -----   -----   -----
                 OC, EX, CD
      <---------------------------------------
                   OC, EX
      --------------------------------------->
                      .
                      .
                      .
                 OC, EX, CD
      --------------------------------------->
                   FOC, EX
      <---------------------------------------
                      .
                      .
                      .
                   EOC, EX
      <---------------------------------------
             OC, EX, CD, FMH (EDS)              EOF detected
      <---------------------------------------
                   OC, EX
      --------------------------------------->
                      .
                      .
```

```
                    EB, OC, EX                   BIND should not
            ----------------------------------->  allow secondary
                                                 to send EB.
```

*Primary may use exception or definite response mode.

*If end-use device is not the console printer, FM Headers must be used.

FIGURE C.5: HOST REQUESTED CD (EXCEPTION RESPONSE)

```
HOST        BB, OC, DR1, FMH (BDS,CARD)         3770
       <--------------------------------------
                      +RESP
       -----   -----   -----   -----   ----->
                  BOC, EX DR1
       <--------------------------------------
                        .
                        .
                        .
                    EOC, DR1                    /*EOC READ
       <--------------------------------------
                      +RESP
       -----   -----   -----   -----   ----->
                  BOC, EX DR1
       <--------------------------------------
                        .
                        .
                        .
                    EOC, DR1                    /*EOC READ
       <--------------------------------------
                      +RESP
       -------------------------------------->
                        .
                        .
                        .
            EB, OC, DR1, FMH (EDS)              EOF
       <--------------------------------------
                      +RESP
       -----   -----   -----   -----   ----->
```

FIGURE C.6: INBOUND CARD DATA

```
HOST     DS, OC, DR1, FMH (BDS, KBD or CRD)  * 3770
       |<-----------------------------------
       |             +RESP
       |-----  -----  -----  -----  ----->
       |           BOC, EX DR1
       |<-----------------------------------
       |              .
       |              .
       |              .
       |            EOC, DR1
       |<-----------------------------------
       |             +RESP
       |-----  -----  -----  -----  ----->
Diskette               .
"T" Type               .
Data Set               .
       |       OC, DR1, FMH (EDS)
       |<-----------------------------------
       |             +RESP
       |-----  -----  -----  -----  ----->
       |   PC. DR1, FMH (BDS, KBD or CRD)*
       |<-----------------------------------
       |             +RESP
       |-----  -----  -----  -----  ----->
       |              .
       |              .
       |              .
       |     EB, OC, DR1, FMH (EDS)
       |<-----------------------------------
       |             +RESP
       |-----  -----  -----  -----  ----->
```

*Original source of data is specified in FM Header.

FIGURE C.7: INBOUND DISK DATA

```
                 |-                                    (CRD)
        HOST     |   BB, OC, DR1, FMH (BDS, EXCH (DSK)   **3770
                 |<-----------------------------------
                 |                  +RESP
                 |-----   -----   -----   -----   ----->
                 |                    .
                 |                    .
                 |                    .
                 |              OC, DR1, FMH (EDS)
                 |<-----------------------------------
                 |                  +RESP
                 |-----   -----   -----   -----   ----->
Basic Exchange   |                    .
Data Sets        |                    .
                 |                    .
                 |       OC, DR1, FMH (BDS, EXCH, DSK)
                 |<-----------------------------------
                 |                  +RESP
                 |-----   -----   -----   -----   ----->
                 |                    .
                 |                    .
                 |                    .
                 |              OC, DR1, FMH (EDS)
                 |<-----------------------------------
                 |                  +RESP
                 |-----   -----   -----   -----   ----->
```

** PROGRAMMABLES: SOURCE OF DATA FOR ALL DISKETTE DATASETS IS "DISK".

NON-PROGRAMMABLES: SOURCE OF DATA FOR BASIC EXCHANGE DATASETS IS A FUNCTION OF THE RECORD LENGTH.
IF RECLEN > 80 SOURCE = "EXCHANGE"
IF RECLEN ≤ 80 SOURCE = "CARD"

FIGURE C.7: INBOUND DISK DATA (CONTINUED)

```
HOST              BB, EB, BOC, EX DR1            * 3770
       <-----------------------------------
                    MOC, EX DR1
       <-----------------------------------
                         .
                         .
                         .
                     EOC, DR1
       <-----------------------------------
                       +RESP
       -----  -----  -----  -----  ----->
```

*If secondary is not allowed to send EB, CD will be on in last element of chain.

FIGURE C.8: INBOUND KEYBOARD DATA

```
HOST       BB, OC, EX DR, FMH (BDS,CARD)        3770
        ------------------------------------->
                    MOC, EX DR
        ------------------------------------->
                        .
                        .
                        .
                     EOC, DR
        ------------------------------------->
                      +RESP
        <-----   -----   -----   -----   -----
                    BOC, EX DR
        ------------------------------------->
                        .
                        .
                        .
                     EOC, DR
        ------------------------------------->
                      +RESP
        <-----   -----   -----   -----   -----
                        .
                        .
                        .
              EB, OC, DR, FMH (EDS)
        ------------------------------------->
                      +RESP
        <-------------------------------------
```

FIGURE C.9: OUTBOUND PUNCH DATA

```
HOST      BB, BOC, EX DR, FMH (BDS,PTR)    -|3770
      --------------------------------------->|
                      .                       |To Line
                      .                       |Printer
                      .                       |
                   EOC, DR                    |
      --------------------------------------->|
                    +RESP                     |
      <-----   -----   -----   -----   -----|
                      .                       |
                      .                       |
                      .                       |
           OC, DR, FMH (EDS)                 -|
      --------------------------------------->|
                    +RESP                    -|
      <-----   -----   -----   -----   -----|
               EB, BOC, EX DR                 |To Console
      --------------------------------------->|Printer
                      .                       |
                      .                       |
                      .                       |
                   EOC, DR                    |
      --------------------------------------->|
                    +RESP                     |
      <---------------------------------------|
```

FIGURE C.10: OUTBOUND PRINTER DATA

```
HOST               BB, OC, DR1, FMH (BDS)              3770
                <------------------------------------
                             +RESP
                -----   -----   -----   -----   ----->
                          BOC, EX, DR1
                <------------------------------------
                          MOC, EX, DR1
                <------------------------------------
Host detects                 -RESP
error           -----   -----   -----   -----   ----->
                            CANCEL
                <------------------------------------
                             +RESP                     3770 goes to
                -----   -----   -----   -----   -----> Receive Mode
               |-     OC, DR1, CD (MESSAGE TO OP)
               |------------------------------------->
               |             +RESP                     Operator takes
               |<-----   -----   -----   -----   ----- corrective
               |          BOC, EX, DR1                 action and re-
               |<------------------------------------  starts trans-
Host wishes    |            EOC, DR1                   mission
to continue    |<------------------------------------  continues
               |             +RESP
               |-----   -----   -----   -----   ----->
               |          BOC, EX, DR1
               |<------------------------------------
                                 .
               |.
               |                 .
               |            EOC, DR1
               |<------------------------------------
               |             +RESP
               |-----   -----   -----   -----   ----->
               |        EB, OC, DR1, FMH (EDS)
               |<------------------------------------
               |                +RESP
               |-----   -----   -----   -----   ----->
```

-OR SEE NEXT PAGE

FIGURE C.11: INBOUND BATCH ERP

```
Host does not  |-        OC, DR1, FMH (ABORT DS)            Transmission of
wish to        |------------------------------------->  the data set
continue -     |               +RESP                     will not be
ABORTS data set|<-----   -----   -----   -----   -----  continued
|
               |
               |                  -OR-
               |
               |
Host does not  |               EB, OC, DR1               Transmission of
wish to        |------------------------------------->  data set will
continue -     |                  +RESP                  not continue
ABORTS ALL     |<-----   -----   -----   -----   -----  plus any sus-
data sets                                                pension data set
                                                         will be aborted
```

FIGURE C.11: INBOUND BATCH ERP(CONTINUED)

The usual medium for transmitting data to and from the host computer is a telephone line. The rate at which the data is transmitted is expressed in baud, or bits per second. A commonly used rate is 4800 baud or 4800 bits per second. If we assume that the performance of system is dependent upon the rate at which a printer can be driven, some simple arithmetic can show the speed of the line may be a limiting factor.

For discussion, assume that a data stream consists of 120 byte print lines, each byte being 8 bits. Also assume that bits are put on the line in an infinite stream without any errors -- in other words, assume that all data is printed and no overhead exists. In this case, consider the following: 4800 baud translates to 600 bytes per second. For 120 byte print lines, that is 5 lines per second, or 300 lines per minute. Therefore, if all the bytes in the data stream must be put on the line, the upper limit for a 4800 baud line is 300 lines per minute. However, if a way can be found to reduce the number of bytes transmitted per print line, the performance of the system improves.

A number of ways have been devised to reduce the amount of data to be transmitted per print line. One of these ways is truncation of trailing blanks. A print line may contain as many as, say, 132 print positions, but if the lines being printed are, say, card images then the last non-blank character may be followed by a control character (SCB) to denote that the remainder of the line is blank. In this case, only 81 bytes per print line would need to be transmitted. However, this method does not improve system performance if the last character in the line is non-blank.

Another method in use is blank compression. This method uses a control character (SCB) and a count to replace a number of consecutive blanks wherever they occur in a line. This method is very helpful because print lines with a significant number of consecutive blanks are quite common.

A third method is full compression. This method uses a control byte (SCB) to delimit strings of data with differing characteristics.

The SCB method of compression improves performance when strings of consecutive like characters (blank or non-blank) exist within the data, but actually causes an increase in the number of bytes to be transmitted if the strings include few duplicate characters. Unfortunately, many data streams (text, for example) have this characteristic.

SNA compression support includes blank compression and duplicate character compression. Trailing blanks are always truncated for card data.

Compaction provides a method by which non-duplicate characters may be compressed. It takes advantage of the fact that most data streams use a relatively small subset of the 256 possible EBCDIC characters.

For compaction, the user (host) must supply a compaction table to the LU (terminal). The process is relatively simple, but the user must know the data to be transmitted. First determine the set of all possible characters that may appear in the data stream. Next count the number of possible characters, then characters must be selected for the corresponding number of compact code characters.

D.1 FMH3 (FMH TYPE 3)

The Compaction Table Header is sent using an FMH3 (applying to the entire LU-LU session). This is supported outbound only. This header is used to change the contents of a compaction table at the receiving terminal dynamically on a session basis.

FMH3 HEADER FORMAT

BYTE	BITS	NAME	CONTENT
0.	0---7	Length	Variable length
1.	0	FMHC	Zero, no concatenation
	1		Reserved
	2---7	Type	B'000011'
2.		Code	X'02' Compaction Table
3---,N		Parameters	
		M	Number of master characters $3<M<16$
		Table	The representation of the compact code table (the non-compacted entries)

See compaction, Section D.3.

D.2 SCB'S

The compression and compaction bits in the FMH1 indicate the usage of compression/compaction. The Type 1 FMH is constructed by the RJE subsystem according to generation parameters and possibly by MODETAB entries.

CMI and CPI bits may have the following combination:

CMI/CPI
00 Not SCB in the data stream (no compression and no compaction)
01 Compaction
10 Compression
11 Both compaction & compression

If either CMI or CPI bit is on, the RU begins with an SCB.

The SCB describes a data string and contains a count, which locates the next SCB or completes the particular SCB code definition. The last SCB in each RU points to one byte beyond the length of the RU.

The SCB is one byte in length. It consists of two-bit code field definition, followed by a six-bit count field. The two-bits specify the type of compression/compaction in effect. The count field specifies the count of the number of characters described by this SCB.

The SCB definition is:

CODE (Bits 0, 1)	COUNT (Bits 2-7)	DESCRIPTION
00	---	No Compressed Characters. The binary count field (bits 2-7) contains the number of the bytes between this SCB and the next SCB.
01	---	Compacted Data Stream (CPU to 3776-3, 4 and 3777-1, 3 only). Bits 2-7 represent a group of bytes each of which may represent two consecutive master characters or a single character in the compact code subset. Both kinds of bytes may exist in the same character string. The previously received host-created decompaction table is stored in the 3776-3, 4/ 3777-1,3 controller.
10	---	Compressed Space Characters. The count field contains the number of space characters represented by this SCB. The next SCB follows in the next byte.
11	---	Compressed Data Characters. The count field contains the number of times the character following this SCB is to be repeated at the receiver. The next SCB follows the character to be repeated.

Zero count is ALWAYS reserved, and the count length is ALWAYS between 1 and 63 inclusive.

Obviously to get beyond the break-even point from a transmission point-of-view, count greater than 1 for SCB code 10, and count greater than 2 for SCB code 11, is recommended.

D.3 COMPACTION

For compaction, the user must supply a compaction table for the LU's. Foremost is the requirement that the content of the data stream be known.

First determine the complete set of characters that may appear in the data stream. Next count the number of characters in this set. Using Table 1, match this number with the closest (but not smaller) number appearing in the first column. The second column shows how many master characters must be selected for the corresponding number of compact code characters. If the number of compact code characters is greater than 247, no compaction is needed.

Since the 3770 printers support 48, 64, and 96 character sets, the number of master characters that can be chosen are 13, 14, or 15.

TABLE 1

Number of Compact Code Characters	Number of Master Characters
247	3
240	4
231	5
220	6
207	7
192	8
175	9
156	10
135	11
112	12
87	13
60	14
31	15
16	16

For example, to choose a master character subset for this document, we would define the possible characters that may occur as follows:

CHARACTERS	NAME	HEX CODE
A - I	Upper	C1 - C9
J - R	Case	D1 - D9
S - Z	Letters	E2 - E9
a - i	Lower	81 - 89
j - r	Case	91 - 99
s - z	Letters	A2 - A9
0 - 9	Numerals	F0 - F9
b	Blank	4C
[	Open Brackets	4A
.	Period	4E
(	Open Parenthesis	4D
+	Plus	4E
&	Ampersand	50
]	Close Brackets	5A
$	Dollar Sign	5E
*	Asterisk	5C
)	Close Parenthesis	5D
;	Semicolon	5E
-	Hyphen	60
/	Slash	61
,	Comma	6B
%	Percent	6C
	Underscore	6D
?	Question Mark	6F
:	Colon	7A
#	Pound Sign	7B
@	Commercial At	7C
'	Single Quote	7D
=	Equals	7E
"	Double Quote	7F

Thus, we have determined this document may include up to 85 characters. In the first column of Table 1, the number closest to 85 (but not smaller) is 87. Now increase the number of characters in the character set to equal the number from the table. For this document, let us choose:

<	Less than	4C
>	Greater Than	6E

Now from this character subset, choose the N most frequently used characters, where N is the number of master characters in Table 1 in the large subset. For a large subset of 87, N equals 13. For the N most frequent characters in this document, we shall choose:

a, d, e, g, i, l, n, o, r, s, t, u, and blank

To define the compaction table to RES for sending we specify a CTABLE parameter when the primary LU is generated as follows:

```
CTABLE=(TXT1, 13, 81 84 85 87 89 93 95 96 99 A2 A3 A4 40
4C 6E 7C 82 83 86 88 91 92 94 97 98 A5 A6 A7 A8 A9 C1 C2
C3 C4 C5 C6 C7 C8 C9 D1 D2 D3 D4 D5 D6 D7 D8 D9 E2 E3 E4
E5 E6 E7 E8 E9 F0 F1 F2 F3 F4 F5 F6 F7 F8 F9 4A 4B 4D 4E
50 5A 5B 5C 5D 5E 60 61 6B 6C 6F 7A 7B 7D 7E 7F
```

Note: TXT1 is the name by which the table will be known. Blanks in CTABLE for readability only.

The following would be used to define the same table to JES2:
COMPACT=1,13,81,83,.....
where 1 is the compaction table number.

The order of the characters is not important, except, of course, that the master subset must come first: but if you are interested in getting the last drop out of the compaction algorithm, the characters following the master subset in the CTABLE specification should be the least likely characters in the compact code subset (explanation below). The sender builds tables using this parameter. Then to compress and compact the data stream, the sender:

1. Scans the data, looking for consecutive duplicate character strings of length 3 or greater.

2. For each string of non-duplicate characters, check if any character is not a member of the set of compact code characters. If so, the sender creates an SCB for non-compressed characters and goes on to the next string.

3. If all characters are in the compact code subset, the sender translates the whole string to compact code. Then the sender scans the string, looking for two consecutive master characters. Each time this occurs, the sender compacts the two bytes into a single byte and continues. A fourth kind of SCB describes the compacted string.

Most likely it has become obvious that it is very important that the compact code subset include all (or almost all) characters in the data stream. Otherwise, an entire string may miss being compacted.

A discussion follows of how RES/JES2 does compression and compaction and how it builds its tables for compaction and decompaction.

The SCB as defined for SNA is a byte consisting of a two bit string identifier and a six bit count field.
There are two important rules which must be followed for SCBs. First, an SCB and its string may not span RU boundaries. Second, compression and compaction operate on byte strings. There is not necessarily any

relationship between the boundaries of an SCB string and the boundaries of a logical record. A logical record may begin or end in the middle of an SCB string. (In the same manner, SCS control characters may be compressed as well as data).

A LU builds a control block for each compaction table specified to it. The control block is called a CTBL. The CTBL contains three 256-byte tables - a translate-and-test table for compaction (TRTC), a translate table for compaction (XLTC), and a table (XLTD) for decompation which is both a translate-and-test table and a translate table. IFSPREIN, the RTAM pre-initialization routine, builds CTBLs from the CTABLE parameters specified in the LU generation.

The LU builds the TRTC so that it contains zeros at the displacements corresponding to each member of the compact code subset, and non-zeros at all other displacements. The XLTC table contains meaningful entries only at displacements corresponding to the compact code subset members. The values at those displacements are such that no compact code character will translate into a byte whose high-order digit and low-order digit are less than m, where m is the number of master characters.
The value for the first master character is always X'FO'. The second master character gets X'F1', and so forth, until the master character subset is exhausted. If the number of master characters is 16, there are no non-master characters, and the XLTC is then complete. If m is less than 16, the first non-master character gets X'Fm'. The next non-master character gets X'Fm+1', and so forth, up to X'FF'.

If m is less than 15, the next 16 non-master characters are assigned X'FO'-X'FF'. If m is less than 14, the next 16 non-masters are assigned X'DC'-X'DF', and so forth, until the point is reached such that if X'XO' were assigned to the next non-master, both digits would be less than m. When that point is reached, the next non-master gets X'yz', where y=m-1 and z=m. The following non-master gets X'yz+1, and so forth, up to X'yF'. The next non-masters get X'y-1z', X'y-1z+1', up to X'y-F'. Each time X'F' is reached, the high-order digit is reduced by 1, until the last non-master gets X'0F'.

The LU builds the XLTD so that it contains zeros for those bytes in a compact code string which represent two consecutive master characters. The rest of XLTD contains a mirror image of XLTC: that is, if you do a translate using XTLC followed by a translate using XLTD on a string of characters in the compact code subset, you would end up with the original string.

Using the previous example from this topic, the tables are as follows. For the TRTC table, a dash represents any non-zero value. For the XLTC table, a dash represents any value, because such a character will not occur in the string.

TRCT	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F

	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Order	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digit	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	00	-	-	-	-	-	-	-	-	-	00	00	00	00	00	-
	5	00	-	-	-	-	-	-	-	-	-	00	00	00	00	00	-
	6	00	00	-	-	-	-	-	-	-	-	-	00	00	00	00	00
	7	-	-	-	-	-	-	-	-	-	-	00	00	00	00	00	00
	8	-	00	00	00	00	00	00	00	00	00	-	-	-	-	-	-
	9	-	00	00	00	00	00	00	00	00	00	-	-	-	-	-	-
	A	-	00	00	00	00	00	00	00	00	00	-	-	-	-	-	-
	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C	-	00	00	00	00	00	00	00	00	00	-	-	-	-	-	-
	D	-	00	00	00	00	00	00	00	00	00	-	-	-	-	-	-
	E	-	00	00	00	00	00	00	00	00	00	-	-	-	-	-	-
	F	00	00	00	00	00	00	00	00	00	00	-	-	-	-	-	-

XLTC		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
High-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Order	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Digit	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	4	FC	-	-	-	-	-	-	-	-	-	6D	6E	FD	6F	5D	-
	5	5E	-	-	-	-	-	-	-	-	-	5E	4D	4E	4F	3D	-
	6	3E	3F	-	-	-	-	-	-	-	-	-	2D	2E	2F	FE	1D
	7	-	-	-	-	-	-	-	-	-	-	1E	1F	FF	0D	0E	0F
	8	-	F0	F0	F1	F1	F2	F2	F3	F3	F4	-	-	-	-	-	-
	9	-	F4	F5	F5	F6	F6	F7	F7	F8	F8	-	-	-	-	-	-
	A	-	-	F9	FA	FB	F9	EA	EB	FC	ED	-	-	-	-	-	-
	B	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	C	-	FF	FF	D0	D1	D2	D3	D4	D5	D6	-	-	-	-	-	-
	D	-	D7	D8	D9	DA	DB	DC	DD	DF	DF	-	-	-	-	-	-
	E	-	-	CD	CF	CF	BD	BF	BF	AD	AE	-	-	-	-	-	-
	F	AF	9D	9E	9F	8D	8E	8F	7D	7E	7F	-	-	-	-	-	-

XLTD		0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
	0														7D	7E	7F
High-	1														6F	7A	7B
Order	2														6B	6C	6D
Digit	3														5F	6C	61
	4														5B	5C	5D
	5														4E	50	5A
	6						All zeros								4A	4B	4D
	7														F7	F8	F9
	8														F4	F5	F6
	9														F1	F2	F3
	A														E8	E9	F0
	B														E5	E6	E7
	C														E2	E3	E4
	D	C3	C4	C5	C6	C7	C8	C9	D1	D2	D3	D4	D5	D6	D7	D8	D9
	E	82	83	86	88	91	92	93	97	98	A5	A6	A7	A8	A9	C1	C2
	F	81	84	85	87	89	93	95	96	99	A2	A3	A4	40	4C	6F	7C

Now we can see how to decipher a byte in a compact code string. If the byte is within the m by m matrix where zeros exist in the XLTD table, the byte represents two consecutive master characters. If the byte is outside that matrix, it represents a single compact code character. In order to discover which two master characters a byte within the matrix represents, take each of the digits of the byte and put X'F' in front of them, creating two bytes of the form X'FX', where X is less than m. The resulting two bytes now represent single characters in compact code. For example, using the above table, a X'AB' becomes X'FAFB' when expanded. Once all bytes within the matrix have been expanded, the string consists of bytes which represent single compact code characters. In order to restore the string to its non-compacted state, we use the XLTD table for a translate instruction.

Notice that a master character may be represented as a single character in compact code (Z'FX'), or may be represented, along with an adjacent master character, as a single hex digit whose value is less than m. Notice also that if a compaction table with 16 master characters is used, all bytes in a compact code string represent two adjacent master characters.

The compaction table FM header is constructed from the XLTD table. The compact code characters exist in the header starting with the bottom row left to right (F0-FF), and proceeding with each row upwards in the same manner. Since the values in the upper left-hand m by m matrix are not meaningful, they are omitted from the FMH.

Now let us see how the sender uses the TRTC and XLTC tables to do compaction. As stated previously, the sender first scans the data to separate strings of duplicate data from strings of non-duplicate characters. When it finds the boundaries of a non-duplicate string of length greater than one (terminated either by the beginning of a string of duplicate characters or by reaching the maximum allowable byte count for an SCB,63), it executes a TRT instruction, using the TRTC table, to scan the string for characters outside the compact code subset.

If a character outside the compact code subset is found, the sender does not attempt to do compaction. The string goes into the RU as a non-compressed string. If all characters are members of the compact code subset, the sender translates them to compact code, using the XLTC table.

The sender then scans the data, looking for two adjacent master characters. It does so by testing the high-order digit of the first byte for X'F'. If it is not X'F', the sender begins the scan again, starting with the second byte. If the high-order digit of the first byte is X'F', the sender tests the second byte. If the high-order digit of the second byte is not X'F', the sender begins the scan again, starting with the third byte. If both bytes are found to have X'F' for high-order digits, the sender compares both bytes against the highest value which a master character can have. If either byte is greater than that value, the sender starts the scan again at the third byte. If both types are less than or equal to that value, both bytes are master characters and may be combined into a single byte in the RU.

To combine two master characters into a single byte, the sender executes a MVC instruction on the first byte and a MVN instruction on the second byte, with the same target byte for both instructions. A single PACK instruction could be used in place of the MVC, MVN sequence, but since the sender target buffer overlaps the record being compressed, the sender must use the MVO, MVN sequence.

The characters immediately following the master character subset in the CTABLE specification should be the least likely occurring characters in the compact code subset because they will be assigned values in compact code with high-order X'F'. The sender compaction algorithm is most efficient when compact code characters with high-order digit X'F' nearly always turn out to be master characters.

Now let us see how this algorithm works for the sentence used previously as an example. The sentence is:

1. Scans the data, looking for consecutive duplicate character strings of length 3 or greater. (1.b scans< the< data, looking< for duplicate character strings of length<3 or greater+).

```
1.bS | cans | <the | <dat | a,bl | ooki
ng<f | orbc | onse | cuti | vebd | upli
cate | bcha | ract | erbs | trin | gsbo
fble | ngth | <3bo | rbgr | eate | rt
```

This would appear in storage (in hex) as:

```
F14B40E2   838195A2   4CA38885   4C8481A3   816B4093   96969289
95874C86   96994083   9695A285   83A4A389   A5854084   A4979389
8381A385   40838881   998183A3   859940A2   A3998995   87A24096
86409385   9587A388   4CF34096   99408799   8581A385   994E
```

The sender scans the data looking for consecutive strings of length 3 or greater. No such string exists in the first 63 characters, so the sender would establish the "1" (X'F1') as the beginning of a non-duplicate string, and the blank (X'40) between the words "character" and "strings" as the end of the non-duplicate string. The sender then executes TRT on this string, using the example TRTC table, and finds that all characters are members of the compact code subset. The sender then translates the whole string to compact code, using the XLTC table. The resulting string (first 63 bytes only) becomes:

```
9D6EFCCD   E1F0F6F9   FCFAF3F2   FCF1F0FA   F02DFCF5   F7F7E5F4
F6F3FCF2   F7F8FCF1   F7F6F9F2   E1FBFAF4   E9F2FXF1   FBE7F5F4
B1F0FAF2   FCE2E3F0   F8F0F1FA   F2F8FC
```

Now the sender scans the string, looking for two adjacent master characters. The third character has high-order digit X'F', but the following character does not, so the sender begins the scan again at the fifth character. The sixth character has high-order digit X'F', and so does the following character. And both characters are less than or equal to the highest value a master character can have ('XFC' in this case), so both characters are master characters. The sender executes the MVC, MVN sequence, and the result is X'06' in the target buffer. The sender continues scanning, moving non-compactable characters to the target buffer and executing the MVC, MVN sequence to move and compact pairs of master characters, until the string is exhausted. Each time the sender compacts two bytes into one, it decrements the string length by one. The resulting string length becomes the count field in the compact code SCB. The target buffer for our example becomes (first byte is the SCB):

```
6A9D6EFC   CDE1069C   FAE32C10   AC2DC577   E5463CE2   78FCE176
              -----         ----   --  ----   ----       --  ---
92E1BAF4   F92CF1BF   754E1CA2   CE1E308F   0F1A28C
--  --       ----     --- ---    -    --       ----
```

The underlined bytes represent two master characters. A total of 63 characters have been reduced to 43, including the SCB.

The sender now proceeds to the next string. Once again, there are no duplicate character strings of length 3 or greater, and all characters belong to the compact code subset, so the sender translates and compacts. The target buffer for the whole sentence becomes:

```
EA9D6EFC   CDE1069C   FAE32C10   AC2DC577   E5463CF2   78FCE176
               ----       ----   --  ----    --        --   ---
92F1BAF4   F92C1EF7   54E1CA2C   E1E308F0   E1A28C53   9A84639C
--  --       ----     --  ----       --       ----     --------
F7E2C526   3AE3FC9F   C78C3820   A2F86F
    ----   --         --------   --
```

The sender performs compression and compaction on a logical record basis. For each logical record, the sender truncates trailing blanks, performs compression and compaction, adds the transparency sequence to the beginning of the record and SCS control characters to the end, and, if applicable and necessary, does RU spanning. (The sender does not perform compaction on SCS control sequences, because it is unlikely that a compaction table would contain SCS control characters in the compact code subset).

Both the compaction and decompaction algorithms require different processing if there are 16 master characters. For compaction, since there is no way to represent a master character as a single character, and since all pairs of bytes in the string will be compactable, the length of the original string must be an even number. For decompaction, since all bytes in the compact code string represent two characters, and since XLTD is being used under other circumstances as both TRT and TR tables, the receiver does not do the TRT. Instead, it does UNPK for every byte. XLTD is still used for translation.