3.0 Technical Notes

3.1 Operating System Modifications

Common Disk Area

The Common Disk Area feature modifies the NOS system to recognize
and leave intact a Common Disk Area on the deadstart disk. This
area is created to provide a mechanism for installation of
programs and data used in common by the operating system and
diagnostic software products. NOS will not access or use any
information in the Common Disk Area at this release.

The size of this disk area is restricted to 1.1 megabytes.

High Speed Terminal Support (IAF)

The High Speed Terminal Support feature increases the performance
and usability of interactive applications which must send large
amounts of data to terminals at speeds up to 9600 BPS. An
associated component of this feature prevents mandatory rollout of
an interactive program requesting input from a terminal if that
data is already present (this condition is known as type-ahead).

In the current design, scheduling of jobs and terminal
communications are coupled. This feature removes some of that
coupling in order to improve the average output performance,
reduce system overhead by eliminating extraneous swapping, and
improve the smoothness of output streaming. Although there is no
change in the file interface mandated by this change, programs may
require certain changes in order to take full advantage of this
performance feature. TELEX and STIMULA do not support this
feature.

Remote Host Facility

The Remote Host Facility (RHF) feature provides a subsystem access
method, system applications and system modifications to support
interconnection of a computer system using the Loosely Coupled
Network (LCN). This release of NOS supports the following
operating systems with the RHF feature installed:

    NOS 5.5 (level 552)
    CYBER 205 OS 2.0

The following functions will be provided by the RHF feature on this NOS mainframe:

A)   Permanent File Initiation –

The user on the NOS local host can initiate a permanent file (data set) transfer to/from a linked remote host. The transfer will take place to/from a file which is assigned to the user's job and must be disk resident. The file will be transferred in its entirety (i.e. to EOI).

User validation and permission checking will be done. The type of operations which can be performed on the remote host are determined by the remote host.

B)   Permanent File Servicer –

The NOS local host will service user requests to transfer permanent files (data sets) to/from a remote host. The following are the directives which the NOS servicer will accept:

USER (must be first operation)
CHARGE (if required must be second)
APPEND
ATTACH (this operation is a file transfer with no interlock)
CHANGE
DEFINE (this operation is a file transfer with no interlock)
GET
PERMIT
PURGE
REPLACE
SAVE
PACKNAM

The file will be transferred in its entirety (i.e. to EOI). User validation and permission checking will be done.

C)   Queue File Initiation –

The user on the NOS local host can enter a file into the queue which is destined to a remote host. All standard NOS queue file types are supported. The user may use this feature from local batch, remote batch or interactive session. The user interface is provided as follows:

–   ST parameter on the JOB statement.

–   ST parameter on the ROUTE statement. MFQUEUE should be used instead of ROUTE for LCN queue file routing to a foreign mainframe. Normal ROUTE functions are supported when files are transmitted across the LCN NOS to NOS.

-    MFQUEUE statement.

User validation and permission checking will be done. The
type of operations which can be performed on the remote host
are determined by the remote host.

D)   Queue File Servicer -

The NOS local host will service requests to transfer queue
files from remote hosts. All standard NOS queue file types
are supported. The output from jobs received by NOS will, by
default, return to the originator unless the user provided
alternate directives in the form of MFQUEUE or ROUTE. The NOS
servicer will accept a directive which has a syntax similar to
a ROUTE card.

NOTE - Some types of hosts will not accept some types of queue
files. For example, the CYBER 205 will not accept a print
file.

The following maintenance support functions are provided as part
of the NOS software:

-    Controlware loading of local and remote Network Access Devices
     (NAD) online. Local NADS can be loaded at deadstart.

-    Dumping of local and/or remote NADs online by operator request.

-    Access validation for on-line diagnostic access to local and
     remote NADs.

-    Logging of local NAD errors in the ERRLOG.

-    Logging of all NAD detected errors in the BML for both local
     and remote NADs.

-    Host-to-host, application-level confidence testing of each
     logical network path (virtual connection) before its use for
     data.

RHF Queue File Compatibility Caution

The S1 queue file type is now used to queue input/output files
which are destined for another mainframe. If the installation is
running NOS 5.5 (552/552) and QDUMP's files from the S1 queue and
subsequently QLOAD's them on a pre NOS 5.5 (552/552) system, these
files will be put into the normal input/output queues and
processed as per normal pre-NOS 5.5 (552/552) procedures. The
same result can occur if a queue file is put into the S1 queue by
NOS 5.5 (552/552) and the queue files are subsequently recovered
by a pre-NOS 5.5 (552/552) deadstart.

Shared RMS WITHOUT ECS

The Shared RMS without ECS feature consists of
modifications/extensions to the NOS system routines which allow
permanent file devices to be shared without ECS. The disk
allocation (MST/TRT/MRT) tables and the shared device information
(DAT) tables are maintained on the shared device itself.

The following controllers/disks are supported as shared devices:

7155/885
7X5X/844-XX

These devices are supported as shared in either full track or half
track mode.

It is transparent to the user whether the system is running in
stand-alone, MMF, or Shared RMS mode.

Up to eight machines may share a single device in Shared RMS
mode. However, the performance of such a device would suffer
substantially from that of a similar stand-alone device.

Two or more machines may share all, some, or none of a shared
device complex.

Use of ECS as a private device local to one machine is supported
by Shared RMS without ECS.

The shared RMS multi-mainframe feature provides the capability to
run in multi-mainframe mode without using ECS as the link device.
When running in shared RMS multi-mainframe mode, up .to eight
mainframes can share either full or half track 844's or 885's.
The following items are different between shared RMS and ECS
multi-mainframe systems:

The CMRDECK entry "LINK=A." must be specified if any devices are
to be shared in shared RMS mode. This is used in place of the
"LINK=xx." entry where xx is the EST ordinal of ECS in the ECS
multi-mainframe environment.

During a level 0 deadstart, the first machine accessing a device
must have a PRESET CMRDECK entry specified for the RMS shared
devices. The form of this entry is "PRESET=$xx_1,xx_2,..,xx_n$."
where xx_i is the EST ordinal of the device to be preset. In the
shared RMS multi-mainframe environment the devices themselves must
be preset whereas in ECS multi-mainframe only the ECS link device
has to be preset. The PRESET entry can only be specified on a
level 0 deadstart and must follow the LINK command. PRESET
initializes the device access table (DAT) and machine recovery
table (MRT) resident on the label track of the shared device. The
DATs contain the machine identifications (MID) of the mainframes
that can access the shared device.

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The mount command: "MOUNT,xx,P." has a new parameter P, which indicates that the device being mounted will be preset.

When initializing a mass storage device, the DSD command, INITIALIZE, must be entered on the machine from which the initialization is to take place. In an ECS multi-mainframe environment, if it is found that the INITIALIZE command has been entered from another machine, an error message is displayed. In a shared RMS multi-mainframe environment if the INITIALIZE command has been entered from another machine, no error message is displayed because each entry toggles INITIALIZE on and off.

When running shared RMS devices the machine ID is displayed to the right of the status on the DSD E,M display. It only appears when the machine is accessing that device and indicates which mainframe has the device interlocked at that time.

Other differences between ECS and shared RMS multi-mainframe exist in the areas of device recovery and machine recovery (MREC). In ECS multi-mainframe mode the existence of a common link device makes it possible to determine if a device is currently being shared or if a mainframe has gone down. The fact that these features do not exist in shared RMS mode requires added site and operator attention and caution.

Finally, due to the added overhead of maintaining critical tables on the device, system performance can be degraded. This requires the site review what type of device and files should be shared so as not to affect performance. To reduce the impact on system performance, the following can be done:

o   Put the system on a separate non-shared device.

o   Use multiple channels & multiple controllers to improve performance and provide redundant paths.

o   Put temporary files on non-shared devices.

o   Locate fast attach files that need not be global on non-shared devices.

CTI Enhancements

The default parameter definition for CTI utilities is now available. A CTI utility is provided which allows the user to establish default parameter information (channel, equipment, unit numbers, etc.) to be used by CTI for line printer dump, alternate deadstart, and installing CTI to disk. The following new features are available:

CTI/MSL (Disk) Area Utility

The CTI/MSL (Disk) Area Utility (CAU) is called into execution via selection of the -C- option of the CTI utilities (*U*) display. CAU will initialize as follows.

Detailed Description

The utility will present an initial display and request the
selection of the disk to be used.

    CTI/MSL DISK AREA UTILITY
    FOR INSTALLATION OF PROGRAMS
    AND DEFAULT PARAMETER DECK,
    AND DEFAULT PARAMETER SETTING.
    ENTER -CR- TO CONTINUE

    ENTER DISK CHANNEL - 01

Enter the two-digit octal channel number of the desired disk,
followed by a carriage return (CR), or a -CR- only to use the
indicated channel number. The following line will be added to the
initial display to request the unit number of the disk to be used.

    ENTER DISK UNIT - 00

Enter the two-digit octal unit number of the desired disk,
followed by a carriage return, or a -CR- only to use the indicated
unit number.

CAU will connect the disk and get initial status from the disk.
The following message will appear if status indicates that the
disk unit is reserved by another controller. If this occurs,
automatic retry will be initiated and CAU will continue, without
operator intervention, when the reserved status is cleared.

    DISK RESERVED.

If the disk is not reserved by another controller, CAU will check
general and detailed status information in order to determine the
type of disk being used. If the disk is an FMD, CAU will check
the status to determine if the 'READ ONLY' switch is active and if
it is, present the following message.

    READ ONLY SELECTED.

Automatic retry will be initiated and CAU will continue after the
condition is cleared.

CAU will examine the selected disk for the presence of a CTI/MSL
Disk Area (CDA). If a CDA is in use on the disk, CAU will present
the option display. If a CDA is not in use on the disk, the
following message will be displayed.

    NO SPACE RESERVED FOR CTI/MSL
    DISK AREA. MSL/HVS OR OS FILES
    MAY BE LOST IF THE OPERATION
    CONTINUE. ENTER -BKSP- TO
    SELECT A DIFFERENT DISK,
    OR -CR- TO USE THE CURRENT DISK

If a -BKSP- is entered, CAU will return to the initial display for a new disk selection.

If a -CR- is entered, CAU will continue using the currently selected disk. The next display will be the options display.

Options

The CAU options display is used to select the type of operation to be performed utilizing the Common Disk Area.
     SELECT DESIRED OPTION

     A - MODIFY THE DEFAULT
       PARAMETER DECK.
     B - INSTALL DEFAULT PARAMETER
      DECK TO THE CTI/MSL DISK AREA

The selection of an illegal option character will cause CAU to add the following lines to the options display.

     INVALID OPTION - n (n = character entered)

Dump to Line Printer

The utility program described in this document, hereafter referred to as HDP, will provide CTI/OS/MSL users with the capability of performing dumps of PP memories, PPU memories, and status and control registers. HDP is installed to disk during the CTI installation process and will execute from the tape or disk. The capability for more than one dump per program load will be included in HDP. Dump printout capability will be supported on both 512 and 580 series line printers. HDP has default printer CH, EQ, and train types. To change these values a printer initialization must be selected.

The initial options display is presented by HDP at initial execution time and is again displayed whenever a selected option has completed execution. The initial options display is as follows:

     A - 512 PRINTER INITIALIZE
     B - 580 PRINTER INITIALIZE
     C - PP MEMORY DUMP
     D - CM DUMP
***E - SCR DUMP
 **F - PPU DUMP

**   Indicates that this option only appears when HDP is
         executed on a CYBER 176.

*** Indicates that this option only appears when HDP is executed
    on CYBER 17X's.

3.2 Product Set Modifications

CYBER Interactive Debug Version 1.2

This release of CYBER Interactive Debug (CID) extends CID to
provide interactive, symbolic debugging facilities for COBOL 5.3.
Formerly, CID provided symbolic level debugging for FTN4, FTN5 and
BASIC 3.5. In addition, this release also provides a new CID
command, STEP.

The following new features are provided for debugging COBOL
programs:

*   COBOL-like commands. CID provides COBOL-like MOVE, SET,
    DISPLAY, and GO TO commands that look and operate like
    corresponding COBOL statements. These commands enable the
    COBOL user to change and display program values using commands
    that are familiar to the COBOL programmer.

*   Symbolic access to COBOL names and line numbers - CID allows
    qualified, subscripted, indexed, and simple COBOL data names,
    qualified and simple procedure names, and source line numbers
    to be referenced in CID commands.

*   Procedure trap - CID provides a new trap type that enables CID
    users to gain control whenever a new procedure is reached.

*   Access to current procedure name - CID provides a new CID
    variable similar to HOME which will contain the current COBOL
    procedure name. By displaying this variable each time a
    procedure trap occurs, a procedure trace can be produced.

*   Runtime error trap - CID provides a trap type which enables
    the CID user to gain control whenever COBOL detects a runtime
    error. This trap is already available for BASIC users.

*   STEP Command - CID provides a new command that enables the CID
    user to gain control after n lines or procedures have been
    executed.

NOTE: The STEP n lines command is also available for FTN4, FTN5
         and BASIC 3.5.

APL2

A set of APL2 functions is provided which allows users of TOTAL
Universal to access TOTAL databases using APL2. The functions
cannot be used with TOTAL Universal Extended. The APL functions
are in the TOTALWS workspace under user-number APL1.

3.3 Network Modifications

X.25 Public Data Network Support

The X.25 software enhancement to CCP provides the capability of
connecting a 255X Network Processing Unit (NPU) to a Public Data
Network (PDN). This capability was formerly announced in the
Communication Control Program (CCP) 3 Level 532) Software
Availability Bulletin (SAB No. 244), dated May 19, 1981; that
description is repeated here to announce added PDN capability.

The X.25 software at level 552 is enhanced to provide extended
support of X.25; certification with both TELENET and TYMNET is now
complete. Asynchronous terminals connected to the Packet
Assembly/Disassembly (PAD) facility of the PDN as permitted access
to applications in a CYBER mainframe. The terminal user interface
to the CYBER application is similar to that provided for the same
terminal connected directly to a 255X. The supported terminals
are those supported by the existing asynchronous TIP except for
the IBM 2741 which is not supported.

The X.25 transport protocol is supported by two independent
software modules for the X.25 packet level (L3) and the link level
(L2). This software is capable of adapting to a variety of future
uses and can currently support more than one link to more than one
PDN. Configuration options are provided for PDN subscription
options.

Connection into a Public Data Network requires a CDC 2563-11, 12,
or 13 Communications Line Adaptor (CLA) for the Host 255X NPU.

NPU Performance Counters Sent To Host

CC4C079 allows the reporting of the NPU performance counters to be
sent to the CYBER Host instead of the local NPU console.

The data of the NPU statistics service message is replaced with
the performance data. The NPU statistics service message is
reported every - CBTIMTBL (COPERF).CBINTVAL - (and -CBTIMER-),
divided by 2, seconds.
The following performance parameters are reported:

o   CPU load of the NPU (% of time CPU is not idle).
o   Minimum data buffers available in the last reporting period.
o   Average characters per second received from the host.
o   Average characters per second sent to the host.
o   Average number of worklists (OPS level worklist entries)
     processed per second.
o   Theoretical max number of active printers at end of report
     period.
o   Number of rejects during sampling period of input from
     terminals due to regulation.
o   Numbers of rejects during sampling period of data from host
     due to insufficient buffer space.
o   Actual number of active printers at end of report period.

The data is reported in the ACCOUNT dayfile SCNP messages in the order shown above: SCNP...Cl contains the first 3 parameters, SCNP...C2 the next 3 parameters, SCNP...C3 the last 3 parameters.

3.4 MISCELLANEOUS MODIFICATIONS

In earlier releases, if the NAM Network Access Method's Communication Supervisor (CS) was built with DEBUG defined, it would abort when it encountered a Supervision Error. If CS was built with DEBUG not defined, it would abort when it encountered two Supervision Errors. Now CS will never abort on a Supervision Error unless sense switch one is turned on at CS's control point. Sense switch one can be turned on, by either inserting an ONSW(1) control statement in JOBCS or having the operator turn on the sense switch when CS is executing at a control point. Whether DEBUG is defined or not no longer affects CS Supervision Error aborts.

After an application issues a NETPUT call, the completion bit will usually be set unless a worklist transfer was initiated and the application is running in parallel mode. The downline message will be queued within AIP. In the earlier releases, NETCHEK could then be called to update the status of the I and S bits in the NSP word and no worklist transfer would occur. Now if NETCHEK is called, AIP will initiate a worklist transfer and the completion bit for the NETPUT call will be cleared to indicate it was not completed.

3.4.1 CMRDECK

All flaws = entries have been moved from the CMRDECK to the
AFRDECK.

The following update is not totally present in the Installation
Handbook (IHB) describing AFRDECK processing:

GENERAL DESCRIPTION

The auxiliary function deck (AFRDECK) is a text record on the
deadstart tape that is processed during system initialization. It
contains entries defining track reservations. The installer can
place up to 64 AFRDECKs on the deadstart tape. Placing several
AFRDECKs on the same deadstart tape allows the installer to use
the same tape to deadstart severla configurations. The installer
can list all AFRDECKs using the CATALOG control statement. Refer
to the NOS Reference Manual, Volume 1 for more information
concerning CATALOG.

CMRDECK ENTRY

ENTRY FORMAT	DEFAULT VALUE	SIGNIFICANCE
AFR=afrdeck	First AFRDECK on deadstart tape	This parameter indicates which AFRDECK to use at deadstart. The AFRDECK contains track reservation entries described below.

TRACK RESERVATIONS

AFRDECK entries identify areas of mass storage that are unusable
(flawed areas) and prevent the system from accessing them. The
system uses the information in these entries to build the TRT for
each device which resides in CMR and also in the mass storage
device label.

The released version of the AFRDECK contains no entries. Flaws
can be entered at three different times.

  o   During deadstart after entering the NEXT subsequent to all
      CMRDECK modifications.

  o   During system operation using the FLAW entry that is
      defined in the NOS System Maintenance Reference Manual.

  o   When configuring a deadstart tape.

The formats described in this section are those for entering flaws
during deadstart or on the deadstart tape.

  o   Use the CTK entry to clear all reservations on a device.

o   Use the RTK entry to specify the physical address of a
    flaw in ECS. (If that reservation already exists, it
    remains in effect.)

o   Use the TTK entry to cancel a particular RTK entry. (If
    that reservation does not exist, TTK makes that
    reservation instead of cancelling.)

o   Use the STK entry to specify the logical address of a
    flaw. (If that reservation already exists, it remains in
    effect.)

Obtain flaw addresses from the customer engineer or the system
analyst, or run the MST (mass storage test) on the device to
determine the bad areas. MST specifies the address of flaws. For
making the correspondence between logical and physical track
number, refer to Mass Storage Data Organization in the Systems
Programmer's Instant.

The total number of reservations entered in the AFRDECK for all
mass storage devices in the system cannot exceed 100_8.

The flaw information recorded on the utility flaw map of an
881/883/885 disk pack is read during the initialization of 844/885
equipment, and the system reserves the appropriate areas. This
automatic flawing occurs in addition to any CTK or STK entry.
However, areas recorded as flawed on the 881/883/885 pack cannot
be cleared using the CTK entry. Refer to the NOS System
Maintenance Reference Manual for information on clearing these
flaws.

CTK: CLEAR DEVICE TRACK RESERVATIONS

The CTK entry clears all flaw reservations that were previously
made with RTK, STK, or TTK entries. This is the only way to
cancel reservations made with STK entries. Reservations made with
an RTK or TTK entry can be cancelled with duplicate TTK entry as
well as with a CTK entry.

Entering EQord=0 (refer to Clear EST Assignment Entry) does not
clear flaw entries for that equipment.

    CTK=ord,...,ord.

        ord   One- or two-digit octal EST ordinal of mass storage
               device; 1 through 37_8. This range depends on the
               value of NMSD (refer to PPCOM Parameters, section
               4). One or more ordinals may be specified with one
               CTK entry.

STK: RESERVE LOGICAL AREAS ON ANY MASS STORAGE DEVICE

Use this entry to specify the logical address of a flaw. If the
track was reserved previously, that reservation remains in effect.

    STK=ord,track.

        ord   One- or two-digit octal EST ordinal; 1 through
                 37 . This range depends upon the value of NMSD
                 (refer to PPOM Parameters, section 4).

        track   One-through four-digit octal logical track number:

4000_8-7100_8	841 disk (MD)
4000_8-7137_8	844-21 disk (DI/DK)
4000_8-7147_8	844-41/44 disk (DJ/DL)
4000_8-7222_8	885 disk (DM/DQ)
4000_8-7620_8	2048K ECS (DE)

RTK: RESERVE PHYSICAL ECS TRACK OR AREAS OF MULTIPLE DISK DRIVE

Use this entry to prevent the system from using blocks (tracks) of
ECS.

    RTK=ord,Aaddress.

        ord   One- or two-digit octal EST ordinal of ECS; 1
                    through 37_8. This range depends upon the value
                    of NMSD (refer to PPCOM Parameters, section 4).

        address   One- through six-digit octal logical address in a
                    track of ECS; track containing absolute address
                    is reserved.

Use the following entry to reserve areas of an 841 multiple disk
drive.

    RTK=ord,Ccylinder,Ssector.

        ord   One- or two-digit octal 841 EST ordinal; 0
                    through 17_8 (this range depends upon the value
                    of NMSD (refer to PPCOM Parameters, section 4).

        cylinder One- through three-digit octal cylinder number; 0
                    through 307_8.

        sector   One- through four-digit octal sector number; 0
                    through 2315_8.

TTK: TOGGLE PHYSICAL ECS RESERVATION

To cancel a flaw made with an RTK entry, enter the identical
information with a TTK entry. If, however, the flaw did not exist
before the TTK is entered, the area specified is reserved in the
same way as with an RTK entry. A TTK entry can be cancelled with
a duplicate TTK entry.

       TTK=ord,Aaddress.

              ord   One- or two-digit octal EST ordinal of ECS
                         device; 1 through 37_8. This range depends upon
                         te value of NMSD (refer to PPCOM Parameters,
                         section 4).

              address   One- through six-digit octal logical address in a
                         track of ECS; track containing absolute address
                         is reserved.

3.4.2 COMPASS CAUTION

PROBLEM: Redefinable instructions (SET, MIN, MAX, MICCNT) were not
all being undefined at the end of PASS 1 of COMPASS. Thus,
reference to the symbol prior to its first definition was not
diagnosed, and the last value defined was used for the symbol.

SOLUTION: Code CPS211, transmitted at L552 corrects COMPASS to
handle redefinable symbols as advertised in the COMPASS reference
manual.

CAUTION: This code may cause previously diagnostic-free programs
to get UNDEFINED SYMBOL errors if redefinable symbols are being
used incorrectly.

EXAMPLE:

```
          IDENT    TEST
          ENTRY    TESTER
A         SET      0
B         SET      0
            .
            .
            .
          IFC      GT,*"JDATE"*81275*
A         SET      *
            .
            .                 PROCEDURE A
            .
          ELSE
B         SET      *
            .
            .                 PROCEDURE B
            .
          ENDIF
TESTER    MAX      A,B
          END      TEST
```

This will now get an UNDEFINED SYMBOL error on the ENTRY pseudo
because TESTER is being referenced before it is defined. To
correct this program, replace

```
TESTER   MAX        A,B
```

with

```
TEST1    MAX        A,B
TESTER   EQU        TEST1
```

Since the EQU defines a non-redefinable symbol, TESTER is defined
for the entire program.

3.4.3 Central Memory Resident

Changes in standard NOS central memory resident will require
programs which reference this area to be reassembled and possibly
modified to accommodate these changes. Following is a list of
fields which were modified:

```
MFLL - Machine field length
CPUL - CPU configuration word
PPUL - PP configuration word
ACML - Available central memory length
STSW - Control point area status word
ECSW - ECS status word
SVJT - Service control
FLSW - Reference address/field length word
```

3.4.4 PP Routine Reassembly

Locally written PP routines should be reassembled to assure proper
execution, due to the restructuring of PPRES.

3.4.5 HIVS

Installation of HIVS Level 132 may destroy permanent files even if
a previous level of HIVS was installed. It is recommended that
the device on which HIVS resides be dumped on the predecessor
system; then insall HIVS, then initialize and reload permanent
files on the NOS 552/552 system.

3.4.6 NOS ERROR FLAGS

Changes with the numbers associated with NOS error flags returned
by the system will require programs which utilize them to be
reassembled and possibly modified to accommodate these changes.

4.0 Operating System Notes

KRA768

MSS transport read/write heads can now be cleaned as a part of
read parity error recovery, without having to idle MSS. If 5
attempts at reading a block fail, the cartridge is unloaded and
the K-display message "CLEAN READ/WRITE HEAD ASSEMBLY" appears
along with the transport's EST ordinal and MST ID. The operator
then turns the transport offline, cleans the heads, puts the
device back online and answers the message. Once answered, the
message "HEADS CLEANED, MST ID = XX" is placed in the user dayfile
and also displayed at line 1 of the MSS control point. The
cartridge is then re-loaded and error recovery continues, with
more attempts made at reading the block.

If, after cleaning the heads, the operator forgets to turn the MST
back online and answers the above K-display message, another
K-display message, "PUT DEVICE ON LINE", comes up to remind the
operator to do so. Answering the message up to 4 times without
actually putting the MST back online will cause the message to be
re-issued. Answering it for a fifth time in such a manner will
cause the transport to be turned off, and any cartridges in it to
be returned.

KRA800

Modset KRA800 redesigned the processing of external requests (such
as the RETURN CIO function) to MAGNET to prevent PP deadlock
situations, tape jobs hanging at a control point, and return of
imcomplete tapes (EOF trailer sequence not written). External
RETURN requests are now queued rather than clearing all pending
tape processing from the unit descriptor table (UDT) in MAGNET.

A side effect of queuing the RETURN function occurs on
multi-volume tapes on which a REWIND, CLOSE/REWIND, or CLOSE CIO
function had just been issued before job termination. To allow
the user program to continue processing, REWIND, CLOSE/REWIND, and
CLOSER functions had previously set the FET complete immediately
(also releasing job tape activity assignment, allowing job
advance) and then initiated reel swap or tape mount processing.
But since there was no tape activity assignment to prevent job
advance, the job was allowed to terminate from the system. If the
RETURN request issued for job termination is queued until the reel
swap processing is complete, the tape unit will remain assigned to
a job which is no longer in the system, because the reel swap
requires the presence of the user job in the system in order to
complete.

To correct this problem the following design changes have also
been made by modset KRA800:

1.   The EOF trailer label sequence is now written to the tape
      for a REWIND function before setting the FET complete.

2.   For REWIND and CLOSE/REWIND processing, rewind of the
       current reel is initiated and then a flag is set in the UDT
       to indicate that further rewind and/or repositioning may be
       required (for multi-volume and/or multi-file set tapes).
       When a new CIO function is issued on the tape, reel swap
       processing or multi-file set repositioning is then
       initiated, since the tape activity assignment is again set
       to prevent job advance. If a RETURN or UNLOAD CIO function
       is issued on the tape (via the external request queue), the
       rewind required flag in the UDT is cleared, since no further
       tape repositioning needs to be done.

3.   For CLOSER function processing, the FET will be set complete
       only after all end-of-volume, reel swap processing and
       initial labeling of the next reel has been done.

This design change also eliminates several trailing error cases;
where errors such as in writing trailer labels are now returned on
the CIO operation that caused them, rather than being detected on
the next CIO function.

These design changes will impact multi-volume and multi-file set
tape processing. Reel swap/reel mount processing and multi-file
set tape repositioning for a REWIND or CLOSE/REWIND function will
be delayed until the next CIO operation is issued on the tape
(this may even be visable to the user by the position of the NEXT
VSN message in their job dayfile). Additional time will be
required to complete reel swap/tape repositioning before the
processing of the next CIO function can be initiated. CLOSER
processing will not set the FET complete until all processing to
switch to the next reel has been done.

<u>KRA809</u>

Problem - If an equivalenced *VSN* is used to assign a tape, the
tape is not immediately assigned when mounted since the *VSN*
event does not match that required by *RESEX*. The tape is not
assigned until the time expires for the job in timed-event
rollout. This delay could be prevented by the operator manually
rolling the job in, if use of an equivalenced *VSN* was known.

Solution - Display an *=* in the seventh character position of the
VSN field on the *E,P* display if an equivalenced *VSN* is
specified for a tape request. The operator will then know whether
to expect an immediate assignment. For multi-reel tapes, the *=*
on the *E,P* display for *MOUNT* requests will indicate that
equivalenced *VSN*-S are specified for the next reel.

KRA842

Modset KRA842 introduces a new installation parameter in PFM.
This symbol, MNHS, defines the minimum size of a hole that PFM
will create when using an existing hole. If, when searching for a
hole to save an indirect access file in, PFM finds that the use of
the largest available hole would result in the creation of a new
hole shorter than MNHS, PFM will instead allocate space at the end
of the indirect chain. In addition, on the creation of a hole, if
a delink operation would cause the hole to be smaller than MNHS,
PFM will delink one less track to avoid this. It should be noted,
however, that a hole smaller than MNHS will still result from the
PURGE of a file whose total length is less than MNHS.

Too small a value of MNHS may result in the fragmentation of the
available hole space into very small holes; too large a value may
result in medium-sized holes not being used for some time. The
released value for MNHS is 5 sectors (including system sector and
EOI); an installation might want to change this value if it
observes that their average indirect access file size is much less
or much greater than this value. MNHS may be changed by modifying
COMSPFM and reassembling PFM.

MODVA25

Special user numbers such as SYSTEMX and LIBRARY are now created
by MODVAL with 7 character passwords.

TDUMP9

TDUMP has been corrected by TDUMP9 to interpret input and display
alphanumeric output as 6/12 display code when the user is in ASCII
time-sharing mode and the output file is assigned to a terminal.

COMCARG

If COMCARG processes an argument equivalenced to a null parameter"
(Modify (P=1)), it will be treated as if it was not specified at
all; this holds whether or not that parameter is allowed to be
equivalenced. This change will be noticeable in any assembled
program which uses this NOS common deck. The change was made to
make the writing of CCL procedures easier.

RESEX16

ASSIGN, LABEL, REQUEST, and RESOURC control statements no longer
allow = as a separator between parameters or with keywords that
cannot be equivalenced. Use of = as a separator is allowed only
with keywords requiring an equivalenced value.

KRA813

This modset introduces a new capability for *Taf/CRM* which allows an operator to change the base and expandable FL for CMM by initialization *K-DISPLAY* commands *K.BFL=N.* and *K.EFL=N*. The initialization symbols corresponding in these operator commands are *CMMBFL* and *CMMEFL*. The default values for *CMMBFL* and CMMEFL* are 40,000B and 30,000B respectively. *CMMEFL* are 20,000B to 100,000B and 0B to 100,000B. It is recommended that the TAF initialization FWA *IFL=* be set to a higher value (200,000B) if the CRM Data Manager is to be used.

KRA820

Problem - The *SETTL* control statement and Macro round up the specified job step time limit to the nearest 10B seconds. This rounding is no longer necessary, since the job step time limit field in *CPJW* has been expanded from 12 bits to 18 bits. Also, the time parameter on the job card is rounded up to the nearest 10B seconds.

Solution - remove the code that performed the rounding. Also, *JTSS* in *COMSSSE* has been expanded from 12 bits to 18 bits so the user-supplied time parameter can be used without the need for rounding.

DAYFI10

DAYFILE default search option has been changed from *OP=F* to *OP=I* for terminal output files.

Resubmittal - 81/08/13.
Problem - The original version of this modset cause the *FR* parameter to be unusable for terminal user-s.

Solution - set *OP=M* if *FR* is specified, rather than *OP=I*. Correct code that generates page headers to perform as documented.

5.0 FUTURE CHANGES

5.1 CEDIAG/KEDIAG Diagnostic Replacement

The diagnostics for Unit Record Equipment written in COMPASS and
currently residing in REL2B will be removed. These diagnostics,
named CR1 for the 405 Card Reader, CP1 for the 415 Card Punch and
LP1 for the 512 Line Printer, execute under the control of
CEDIAG/KEDIAG.

The programs CR1, CP1 and LP1 will be removed from the
CEDIAG/KEDIAG libraries for NOS Version 2 and MALET diagnostics
with the same name and capabilities will be provided on the
Concurrent Maintenance Library (CML).

5.2 Error Flag Changes

It is anticipated that in NOS Version 2 the values of the NOS
error flags will be changed and new ones added. Sites should
insure that programs checking NOS error flag values are using the
NOSTEXT symbols so that they will be able to reassemble the
programs.

5.3 Indirect Access File Size

At NOS Version 2 the absolute maximum size for an individual
indirect access file will be reduced from 262143D sectors to
131071D sectors.

5.4 PF and Queue Utilities

Several control card parameter inconsistencies exist among the
various permanent file and queue utilities. For example, some of
the PF utilities have a NU parameter while others do not. The
queue utilities use the system default tape type (MT or NT)
whereas the PF utilities assume MT unless the NT parameter is
specified. None of the utilities have a way to specify the
density to use. Rather than add all of the tape related
parameters to all of the utilities, it has been decided to remove
the tape request from the utilities. It is felt it will simplify
the utilities to use the standard tape request control cards
instead. The utilities will also be changed to not automatically
rewind or unload the dump file before or after the operation. The
NR, NU, and NT parameters will be removed from the permanent file
utilities. The ME and VSN parameters will be removed from the
queue utilities. These changes will be implemented in NOS Version
2.

In NOS Version 2, a simple procedure file can be used to request a
tape with the desired parameters and then call the utility to
bring up the K display or call the utility with the correct
parameters. If no tape or other file type is preassigned, the
dump utilities will write to a local disk file name. PFLOAD, when
loading a series of incremental dumps, will request the tapes
following the first one. The tape attributes used will be the
same as the first tape.

At the same time the DT and TM parameters and the B option of the
OP parameter will be removed from the PF utilities because they
have been replaced with new parameters. The N option of the OP
parameter will be removed because it has no effect. Also, the V
parameter will be removed since the VF parameter is sufficient to
specify the use of the verify file option.

5.5 026 Processing

In NOS Version 2, the OUT command in 026 will be eliminated.
Output files may be released to the queue by using the OUT control
statement under DIS.

5.6 File Queuing

In NOS Version 2, the following control statements, macros, and
RA+1 requests will no longer be supported:

CONTROL STATEMENTS

Function Being Eliminated	Alternative
DISPOSE control statement	ROUTE control statement
SETID control statement	Specify an ID code with the ID parameter on a ROUTE control statement

MACROS

Name	Function Being Eliminated	Alternative
COMMON	LFM 2 – Enter common file	Use permanent files
RELEASE	LFM 4 – Release print file	Use DSP with the ROUTE macro
RELEASE	LFM 5 – Release 026 punch file	"
RELEASE	LFM 6 – Release PUNCHB file	"
RELEASE	LFM 7 – Release P8 file	"
RELEASE	LFM16B – Release file	"
SETID	LFM17B – Set file ID code	"
RELEASE	LFM30B – Release 029 punch file	"
SUBMIT	SFM 13B – Release file to CYBERLINK queue	None
SUBMIT	QFM 17B – Release file to input queue	Use DSP with the ROUTE macro
NONE	QFM 20B – Assign file to queue device	Use LFM function 15B with the REQUEST macro

RA + 1 REQUESTS

Function Being Eliminated	Alternative
OUT	Use DSP calls

5.7 PFLOAD Processing

PFLOAD currently ignores the secondary mask for direct access
files on user indexes above AUIMX (377700B), and loads them to the
PF device where they previously resided (from the PF catalog entry
on the dump tape). When reconfiguring, PF device numbers and
masks may change, but PFLOAD still loads these files back to their
original PF device number, where the new secondary mask may not
allow them to reside. This can result in files residing on a
device where they are not cataloged and whose user indexes do not
fall within the device's secondary mask definition.

When using tapes created by PFDUMPs using the DN parameter to
reload an individual equipment, the normal process requires
selecting tapes based on the equipment's device number and
secondary mask. This is to insure that all files residing on the
equipment but not cataloged there will also be reloaded. However,
because of the potential situation created by PFLOAD, noted above,
it is not possible to determine if still additional tapes must be
used to guarantee that all required files will be reloaded.

To avoid this problem, PFLOAD will be changed to not override the
secondary mask when loading direct access files. The only special
case will be to insure that direct access files for user indexes
377760-377767 (the MSF subfamily user indexes) reside on their
master device.

The ability of jobs running under user indexes greater than AUIMX
to DEFINE an existing file as a direct access permanent file on
any device, regardless of its secondary mask, is being retained.
Anyone using this feature should be careful to load the proper
tapes and be aware of the above changes in the way PFLOAD will
handle these files. Permanent files created by DFTERM from
terminated dayfiles fall in this category.

5.8   RHF Changes

The following changes are anticipated in the first NOS Version 2
release of RHF:

o   The control cards MFLINK and MFQUEUE will, by default read
        the control card stream for remote text. If the keyword "I"
        is specified the INPUT file will, by default, be read for
        remote text.

o   MFLINK and MFQUEUE will automatically convert 8/12 ASCII
        files to LCN ASCII files. The user does not need to
        pre-convert or post-convert the data with FCOPY. The C8
        data declaration assumes 8/12 ASCII with zero byte end of
        line terminators and will convert the data to/from the LCN
        ASCII format.

o   The FCOPY conversion in LCN ASCII (ASC8) will be deleted.

o   A potential deadlock situation can occur with RHF jobs and
        the support of removable packs. Support of removable packs
        by the permanent file server (PTFS) will be an assembly
        option. Removable pack support will be, by default,
        deselected.

o   All the parameters on the ROUTE control card will not be
        supported between systems at different levels (i.e. , NOS
        5.5 to NOS Version 2).

o   To provide a more consistent user view between batch and
        interactive processing, the automatic interactive prompting
        of "MFLINK" will be deleted. Since there is no automatic
        prompting the interactive user does not need to terminate
        the MFLINK sequenced with a USER BREAK.