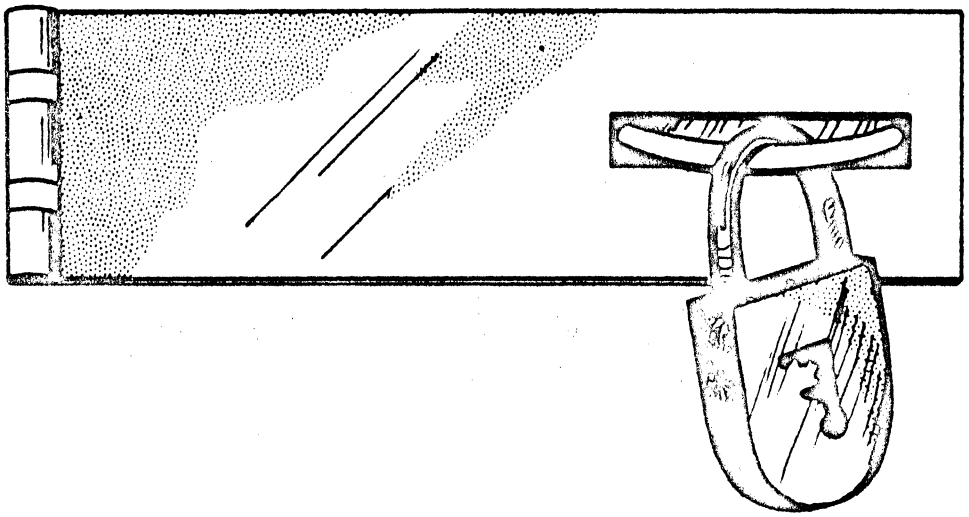
THE HASP SYSTEM



NEWSLETTER

HASP NEWSLETTER

5 March 1971 Issue No. 13

This document is one of an irregular series of bulletins containing information of general interest about the HASP SYSTEM. Distribution will automatically be made to all IBM representatives who have completed and returned the HASP NEWSLETTER SUBSCRIPTION FORM.

This Newsletter is distributed only through IBM Offices for appropriate dissemination of the information contained herein to customer personnel.

TABLE OF CONTENTS

Don't put HASP pseudo number in unit name.

1.0 HASP - VERSION 3.0

A new version of The HASP SYSTEM -- HASP-II, Version 3.0 -- is now available from the Program Information Department (Type III program number 360D-05.1.014).

This release is a major revision of, and a replacement for, the current HASP SYSTEM (HASP-II, Version 2.3). All users of record of the current HASP will receive automatic notification of availability together with ordering instructions for Version 3.

The following is a summary of the major support features and incremental improvements contained in the new release. Additional details concerning the generation and use of these items are contained in the HASP SYSTEMS Manual distributed with the HASP-II, Version 3 System.

New Support Items

- System/370 Support - Version 3 will operate in conjunction with OS Release 20 which provides support for the IBM System/370.
- 2770 Support - Version 3 contains support for the IBM 2770 Data Communication System as a remote batch workstation.
- System/3 Support - A workstation program to support the IBM System/3 as a HASP MULTI-LEAVING workstation is now provided.
- 3211 Printer Support - HASP device support has now been expanded to include support for the IBM 3211 Printer (when associated OS Support is available).
- 3330 Disk Support - The HASP direct-access allocation facilities have been expanded to accommodate the increased capacity of the IBM 3330 Disk Storage (concurrent with OS device support for 3330).

- 2260 Support - Basic support is now included to operate the IBM 2260 Display Station as a local HASP console.

Incremental Improvements

- System Restructure - HASP has now been segmented into multiple functional assembly modules. This restructuring includes a complete re-numbering of the HASP source statements.

- Overlay Structure - An overlay capability has been added such that selected sections of HASP may optionally be made resident on direct-access storage and fetched into a dynamic area within HASP to perform their required functions.

- Improved Operator Command Facilities - The HASP Operator Command Processor has been rewritten to provide a more flexible command format, a more powerful command set, abbreviation capabilities, and full use of the overlay capability in HASP.

- Improved OS Console Interface - Installations may now utilize OS console support rather than the HASP support and still retain HASP Remote Console Support, direct entry of HASP commands, short form REPLY, input stream HASP commands, and the auto-reader feature (Release 19 or later for MFT Systems).

- Punch Special Forms - Special forms may now be specified for SYSOUT data sets which are to be punched.

- Improved SYSOUT Forms Routing - Users may optionally cause grouping of SYSOUT data sets by forms type to minimize printer/punch setup time.

- MFT Dynamic Dispatching - The Dynamic Dispatching capability in HASP, previously restricted to MVT Systems, may now also be used with MFT Systems (Release 19 or later).

- Elimination of OS Writer Requirement - HASP now optionally provides a minimal module to interface to the OS job queue which eliminates the previous requirement for a resident OS writer in both MVT and MFT (Release 19 or later for MFT Systems).

- Execution Job Batching - Jobs may now be automatically grouped by class and passed directly to an executing job such as a one-step monitor or other direct job processor.

- Improved SPOOL Disk Allocation - Space on SPOOL disks is now dynamically allocated by logical track groups rather than by physical cylinders. Each bit in the HASP allocation map now represents a HASPGENable number of direct-access tracks.

- Non-MULTI-LEAVING Terminal Console Support - Users at non-MULTI-LEAVING remote workstations (2780, 2770, 1978, STR Model 20, etc.) may now receive responses to HASP commands submitted through the remote card reader.

- Improved SMF Compatibility - Provision has now been made to allow SMF to count I/O requests for pseudo devices.

- Priority Aging - Installations may optionally cause the priority of jobs to increase in proportion to the length of time the job has been in the system.

- Variable Buffer Pool - The number of buffers in the HASP Buffer Pool may now be dynamically varied by changing the HASP region or partition size.

- Additional Print Control - The operator now has the capability to both forward and backward space print data sets a variable number of pages. Print jobs may also be suspended during processing and resumed at a later time.

- Withdrawable HASP - An operator command is now provided to cause HASP to withdraw from the system leaving OS in an operational state.

- Maintenance - All previously reported problems have been corrected in this version.

2.0 HASP - QUESTIONS AND ANSWERS

2.0.1 Q: What is the current status of the HASP SYSTEM?

A: HASP is a Type-III program, number 360D-05.1.014, and has a program service classification of A.

2.0.2 Q: What is the latest version of HASP?

A: Version 3.0, which was announced as available on February 26, 1971, is the latest release of HASP.

2.0.3 Q: How long will the previous version of HASP be supported?

A: Version 2 of HASP will continue to receive Class A maintenance support when used with any supported release of the Operating System prior to Release 20.

2.0.4 Q: Will Version 2 of HASP be supported when utilized with Release 20 of the Operating System?

A: No... Installations on Release 20 of the Operating System should use Version 3 of the HASP SYSTEM.

2.0.5 Q: Will Version 3 of HASP be supported with releases of OS prior to 20?

A: Yes... Version 3 will be supported when used with any previous version of the Operating System which is, itself, supported.

2.0.6 Q: Will Version 2 of HASP operate correctly with Release 20 of OS?

A: Preliminary field reports indicate that Version 2.3 appears to operate correctly with Release 20 of the Operating System. As indicated in 2.0.4, this combination will not be supported.

2.0.7 Q: Will the current HASP MULTI-LEAVING workstation programs operate correctly with Version 3?

A: Yes... The various workstation programs available with Version 2.3 should operate correctly with Version 3. The workstation programs distributed with Version 3, however, have incorporated all previous maintenance items, include certain incremental improvements and have been resequenced for future maintenance purposes. All installations should plan to install the new workstation programs as soon as is possible when installing Version 3.

2.0.8 Q: Can the System/3 MULTI-LEAVING workstation program distributed with Version 3 be utilized with Version 2.3 of HASP?

A: Yes... Although no provision was made in Version 2 to define a remote System/3, the interface defined for any other MULTI-LEAVING workstation (with a comparable configuration) may be utilized by the System/3.

2.0.9 Q: Can System/3, Model 6 be used as a HASP MULTI-LEAVING workstation?

A: No... The workstation program distributed will operate correctly only on a System/3, Model 10.

2.0.10 Q: Does HASP utilize the Rotational Position Sensing feature available with the 3330 disk storage?

A: No... The direct-access allocation techniques implemented in HASP already provide a software means of minimizing rotational delay on all direct-access devices utilized by HASP.

2.0.11 Q: Can Version 3 be warm-started with SPOOL disks created by a Version 2 system?

A: No... The SPOOL disks are incompatible between Version 2 and Version 3 and must be reformatted if switched between systems. Because of the basic similarities of SPOOL disks created by each version, a SPOOL disk which has been formatted by one version may not be recognized as requiring reformatting by the other version. FAILURE TO SPECIFY THE "FORMAT" OPTION WHEN EITHER VERSION OF HASP IS STARTED UNDER THESE CIRCUMSTANCES WILL HAVE UNPREDICTABLE, BUT INVARIABLY BAD, RESULTS.

2.0.12 Q: Under what circumstances can a HASP be warm-started with data recorded on SPOOL disks by another generation of HASP in which different HASPGEN options were selected?

A: The two HASP Systems must be the same version and must have identical values for the HASPGEN variable &BUFSIZE. The only other requirement is that the size of the HASP checkpoint records must be the same for both systems. This can be easily accomplished by specifying the same values in both systems for the HASPGEN parameters - &NUMDA, &NUMTGV, &MAXJOBS, &JITSIZE, &NUMPRTS and &NUMTPPR. A more efficient means of compensating, in the checkpoint record, for the effect of the variables &NUMPRTS and &NUMTPPR can be accomplished via the MICRO-GEN facilities of HASPGEN and is left as an exercise for the reader. This warm-start procedure is generally independent of the release level or options selected for the Operating System used with each of the HASP Systems.

The above information is applicable only to Version 3 of HASP but similar procedures may be utilized with Version 2.

2.0.13 Q: Will the 1403 printer, recently announced for the System/3, be supported by the MULTI-LEAVING work-station program?

A: Yes... The System/3 workstation program currently available with Version 3 of HASP will support either model of the 1403 announced for the System/3.

3.0 HASP - MISCELLANEOUS INFORMATION

3.0.1 If the pseudo printer assigned to the OS writer function (&WTR) has been erroneously included in the group of pseudo printers defined for symbolic unit "A" and the HASP supplied writer is used (&WTRPART=*), problems may arise. Any SYSOUT data set which is allocated to this pseudo device will not be printed. This problem may be circumvented, until another SYSGEN can be done, by VARYing this pseudo printer OFFLINE after initiating HASP but before beginning job processing.

3.0.2 The Remote Terminal Support in Version 3 for the IBM 2780 Data Transmission Terminal requires the following engineering change (and associated and prerequisite changes) to be installed on the applicable devices:

Device	ECA	EC
2701	109	306749
2703	65	307702

This change was supported but not required by Version 2.3 BUT IS MANDATORY TO SUPPORT 2780s WITH VERSION 3.

3.0.3 The HASP SVC to be added to the OS Nucleus for Version 3 is not compatible with the SVC for the Version 2 HASP SYSTEM. It is recommended that the Version 3 SVC be assigned a number different from that of the Version 2 HASP SVC to allow the interchanging of the two HASP Systems.

3.0.4 The use of the SIGN-ON/SIGN-OFF capability of HASP RJE is in no way dependent on the physical characteristics of the communication line utilized (i.e., switched/non-switched, dial/leased, etc.). Any remote workstation may be generated as "SIGN-ONable" by specifying the characters "**" in the line number field of the HASPGEN parameter, RMTnn, which is used to describe the workstation characteristics. Many installations may find it advantageous to require all remotes (even those on non-switched lines) to submit a SIGN-ON card. In all cases, even if the SIGN-ON option is not selected, the /*SIGNOFF card should be submitted by remote locations to logically terminate operations.

3.0.5 A problem may arise when operating with the ASB reader feature of MVT if sufficient space has not been allocated to the OS SYS1.SYSJOBQE data set. If, during the interpreting of a HASP job, the queue becomes full, the Interpreter will issue the message - IEF336I QUEUE FULL AND WAITING - and will suspend processing of the job. When space becomes available, the job will be reprocessed but may have spurious JCL error messages. The problem may be circumvented by allocating sufficient space for SYS1.SYSJOBQE.

3.0.6 Installations, using OS Release 19, whose class specifications in the HASPGEN parameter &WTRCLAS include any of the classes S, T, U, V, W, X, Y and/or Z should reference OS APAR 36685 for restrictions on the use of the MSGCLASS parameter.

3.0.7 One of the most misunderstood messages which HASP issues is the I/O Error message for remote terminal adapters. Probably the most confusing factor is that the messages do not necessarily indicate actual hardware errors in the normal sense, but are also used to indicate other conditions which may or may not be relatable to hardware errors. The following is a discussion of the most common types of line adapter error messages with a brief description of the problem(s) implied by each message.

The basic form of the message is as follows:

```
I/O ERROR ON LINEn    uuu,cc,ssss,iirr,xyee
```

where:

- n = HASP RJE Line Number.
- uuu = Line Adapter Address.
- cc = CCW op-code used at the time the error was detected (for more information refer to "xy" described below).
- ssss = CSW Status Bytes (see discussion below).
- ii = Sense Information (see discussion below).
- rr = First significant response character (see discussion below).
- xy = Sequence and Command Type. This can be correlated to the internal code listed in figure 5.15.1 of the HASP Systems Manual to locate the actual CCW which was active at the time the error was detected as well as other CCWs in the sequence being executed.
- ee = Expected Response (see discussion below).

The following discussion concerns itself with specific error messages for EBCDIC BSC terminals and HASP-II Version 3.0 only. For STR terminals, the "IBM 2701 Data Adapter Unit Component Description" (GA22-6864) publication should be consulted for a complete discussion of the status and sense bit meanings.

For BSC terminals which employ the USASCII transmission code, the following substitutions should be made in the response fields listed below:

Response	EBCDIC	USASCII
EOT	37	04
NAK	3D	15
ACK1	61	31
ACK0	70	30

In the following discussion, the conventions observed are as follows:

UPPER CASE LETTERS AND NUMBERS -- indicate fields which will appear on the error log exactly as described.

LOWER CASE LETTERS -- indicate fields which have not been described in any previous example exactly the way that they appear in the error log.

ASTERISKS (**) -- indicate fields which should be ignored as they do not contribute to the meaning of the message.

I/O ERROR ON LINEn uuu,02,0000,00rr,{94 / B4}ee

Explanation: A block sequence error has been detected by HASP while communicating with a MULTI-LEAVING terminal. This indicates that one or more transmission blocks have been lost. "rr" indicates the count that was received and "ee" indicates the count that was expected.

System Action: Any job reading in will be deleted and must be re-submitted.

Operator Action: This represents a very serious error. Control records may have been lost which could cause partial loss of terminal function. The line should be drained ($P) and re-started ($S) as soon as practical.

I/O ERROR ON LINEn uuu,02,0C00,0001,{84 / A6}**

Explanation: A 2770 or 2780 terminal has disconnected without signing off and a MULTI-LEAVING terminal has subsequently connected to the same line and is attempting to sign on.

System Action: The previous terminal will be signed off and the line disconnected.

Operator Action: The remote terminal operator must re-dial and attempt to sign on again.

I/O ERROR ON LINEn uuu,02,0C00,003D,{94 / A5 / A6 / B4}**

Explanation: A NAK has been received from the remote terminal indicating an error was detected at the terminal.

System Action: Normal error recovery procedures are invoked.

I/O ERROR ON LINEn uuu,02,0C00,0061,{A5 / A6}70

I/O ERROR ON LINEn uuu,02,0C00,0070,{A5 / A6}61

Explanation: HASP has received an incorrect acknowledgement from a 2770 or 2780 terminal. This may indicate that an output device (printer or punch) at the remote terminal has become not ready. It may also indicate that an output block has been lost.

System Action: The last block is re-transmitted.

Operator Action: The remote terminal operator should check (to any extent possible) for missing or duplicate output and request a backspace or restart if the output looks questionable.

I/O ERROR ON LINEn uuu,02,0C00,00rr,84**

Explanation: Invalid data has been received from a 2770 or 2780. "rr" indicates the first significant byte received.

System Action: Normal error recovery procedures are invoked.

I/O ERROR ON LINEn uuu,02,0C00,00rr,****

Explanation: An invalid response has been received from the remote terminal. "rr" indicates the first significant byte of the response.

System Action: Normal error recovery procedures are invoked.

I/O ERROR ON LINEn uuu,02,0C00,ii{01/02},{94/B4}**

Explanation: An invalid termination character was received from a MULTI-LEAVING terminal. "ii" indicates the termination character received.

System Action: Normal error recovery procedures are invoked.

I/O ERROR ON LINEn uuu,02,0D00,0037,84**

Explanation: The card reader on a 2770 or 2780 has become not ready. This may be caused by a card feed error or by the failure of the remote operator to activate the END-OF-FILE switch or button.

System Action: The system waits for the reader to be made ready and transmission to continue.

Operator Action: The remote terminal operator should correct the problem and ready the card reader (insuring that the END-OF-FILE switch or button is activated).

I/O ERROR ON LINEn uuu,02,0D00,0037,{94 / B4 / C6}**

Explanation: HASP has received an unexpected EOT.

System Action: Normal error recovery procedures are invoked.

I/O ERROR ON LINEn uuu,**,0E00,ii**,****

Explanation: A Unit Check has been detected by HASP on the Communications Adapter. For more detailed information concerning the exact nature of the error, the "IBM 2701 Data Adapter Unit Component Description" (GA22-6864) and/or the "System/360 Component Description -- 2703 Transmission Control" (GA27-2703) publications should be consulted. The following is a brief description of the sense bits for convenience only:

ii	Meaning
80	Command Reject -- "Abortive Disconnect" option of the 2701/2703 has been selected and the remote terminal has disconnected without signing off.
40	Intervention Required -- Remote terminal has disconnected without signing off and abortive disconnect is not selected.
20	Bus Out Check -- Hardware error.
10	Equipment Check -- Hardware error.
08	Data Check -- Line error or hardware error.
04	Overrun -- Hardware error or deficiency.
02	Lost Data -- Synchronization error.
01	Timeout -- Expected terminal response not received by HASP.

I/O ERROR ON LINEn uuu,02,FFFF,00rr,$\begin{Bmatrix}94\\B4\end{Bmatrix}$ee

Explanation: A block sequence error has been detected by a MULTI-LEAVING terminal. This indicates that one or more transmission blocks have been lost. "rr" indicates the count that was received at the remote terminal and "ee" indicates the count that was expected.

System Action: Any job printing on the terminal will be interrupted, and any job punching on the terminal will be restarted.

Operator Action: This represents a very serious error. Control records may have been lost which could cause partial loss of terminal function. The line should be drained ($P) and re-started ($S) as soon as practical.

I/O ERROR ON LINEn uuu,cc,ssss,ii**,****

Explanation: An unusual channel end condition has been detected by HASP on the Communications Adapter. For more detailed information concerning the exact nature of the error, the appropriate hardware component description manuals should be consulted.

System Action: The line is automatically restarted.

3.0.8 Section 10.2.1.6 of the HASP Systems Manual for Version 3.0 inadvertently omits a mandatory OS SYSGEN requirement for MFT Systems in order to use OS Console Support (&NUMCONS=0). The SUPRVSOR macro must contain the RESIDNT=(TRSVC,...) parameter in addition to the OPTIONS=(ATTACH,TRSVCTBL,...) parameter as documented.

4.0 HASP-II, VERSION 3 CHANGE GUIDE

The following section is intended for use as a removable manual to serve as a guide to provide the user a rapid orientation to HASP-II, Version 3.

HASP-II, VERSION 3.0

CHANGE GUIDE

26 FEBRUARY 1971

HASP-II, VERSION 3 GUIDE

A.O INTRODUCTION

B.O NEW SUPPORT ITEMS

- B.a System/370 - Release 20 Support
- B.b 2770 Support
- B.c System/3 Support
- B.d 3211 Printer Support
- B.e 3330 Disk Support
- B.f 2260 Support

C.O INCREMENTAL IMPROVEMENTS

- C.a System Restructure
- C.b Overlay Structure
- C.c Improved Operator Command Facilities
- C.d Improved OS Console Interface
- C.e Punch Special Forms
- C.f Improved SYSOUT Forms Routing
- C.g MFT Dynamic Dispatching
- C.h Elimination of OS Writer Requirement
- C.i Execution Job Batching
- C.j Improved SPOOL Disk Allocation
- C.k Non-MULTI-LEAVING Terminal Console Support
- C.l Improved SMF Compatibility
- C.m Priority Aging
- C.n Variable Buffer Pool
- C.o Additional Print Control
- C.p Withdrawable HASP
- C.q Inclusion of All Previous Maintenance

D.O MISCELLANEOUS CHANGES, REQUIREMENTS, ETC.

E.O INITIAL INSTALLATION STRATEGY

F.O SYSTEM MAINTENANCE HINTS

- F.a The Storage Dump Containing HASP
- F.b Service Aids
- F.c HASP APAR Information

A.O INTRODUCTION

The objective of this Guide is to help individuals become acquainted as rapidly as possible with the new release of HASP -- called HASP-II, Version 3.0. While this Guide itself is an overview of changes in the system, it is intended more as a guide to the HASP SYSTEMS Manual, distributed with Version 3 Systems.

An individual seeking comprehensive understanding of HASP and having little or no knowledge of previous versions could approach the Manual as follows:

> For introduction, generation, installation, operation, etc., read Sections 1, 2, 7.1, 12.2, 10.1, 10.2, 12.1, 11.1, 12.7, 12.10, and 12.13.
>
> For RJE generation and operation, read Sections 7.2 through 7.7, 10.3, 11.2 through 11.9, and 12.16. Selection of subsections in 7 and 11 should be made based upon interest in particular terminal type(s).
>
> For information about the internal logic of HASP, read Section 3 as an overview, then read selected subsections from 4, 5, 6, and 12, depending upon area of interest. Sections 8 and 9 should be used for reference while reading about internal logic.

An individual who is familiar with HASP-II, Version 2 from previous training and/or experience can approach Version 3 much more rapidly than by following the extensive reading program outlined above. In the following, there will be reference only to specific individual HASPGEN parameters, tables, figures, and subsections in the Manual which best describe the differences between Versions 3 and 2. A brief study (one day or less perhaps) of this Guide and the Manual references should enable an individual to generate, install, and operate HASP-II, Version 3; and to analyze a memory dump of a system containing Version 3, if that becomes necessary.

All HASPGEN parameters are described in Section 7.1 of the Manual and are arranged in alphabetical order, ignoring a leading & or $. The amount of descriptive material about most parameters (cross references to related parameters, OS requirements, etc.) has been increased and the default value of each is given as part of each description.

Any parameter which is not specifically referenced in the remainder of this Guide is either unchanged from its meaning and values as in Version 2 or is changed only in minor way(s), e.g., first character $ instead of &, values YES/NO instead of 1/0 or different default value. See E.0 in this Guide for a quick method of re-checking all these parameters without reading about each one.

Each Operator's Guide is a self-contained subsection of Section 11 in the Manual. Because some of these Operator's Guides have their own internal sections, references to them are made as follows, e.g., 11.1 - 7.3 refers to the section in the HASP Operator's Guide describing Special Forms Routing.

B.O NEW SUPPORT ITEMS

B.a System/370 - Release 20 Support

HASP-II, Version 3 will operate in conjunction with OS Release 20 which provides support for the IBM System/370 in addition to System/360. Version 3 will also operate properly with any previous Release of OS which is supported.

All prior releases of HASP-II, Version 2 will remain supported while operating in conjunction with supported Releases of OS prior to Release 20, therefore, as long as Release 19 of OS remains supported.

HASP-II, Version 2 will not be supported if operated with Release 20 of OS or later releases.

B.b 2770 Support

HASP-II, Version 3 contains support for the IBM 2770 Data Communication System as a remote batch workstation. The supported configuration is described in Section 12.12.1. A 2770 Operator's Guide is included as Section 11.8.

The new parameter &BSC2270 must be set to YES to include this support. Changes to the RMTnn parameter allow description of the specific features on a particular 2770.

2770 support, when compared with the previously available Component Release for HASP-II, Version 2.3, benefits from the improvements described in C.e, C.f, and C.k below. However, because there is no performance benefit, the mechanical tab function of the 2213 Printer is no longer supported as it was in the Component Release.

B.c System/3 Support

A workstation program to support the IBM System/3 as a HASP MULTI-LEAVING workstation is now provided. This support applies only to the Model 10. A System/3 Operator's Guide is included as Section 11.9; it contains a description of the supported card, printer, and console I/O units.

The HASP support is included if &BSCCPU=YES, just as for other MULTI-LEAVING remotes. The RMTnn parameter is changed to include System/3 as a supported type.

RMTGEN parameters for System/3 are described in Section 7.7. The RMTGEN procedure is unchanged, but a new System/3 remote description card is included in Table 10.3.3. System/3 users must order the Starter System (a 96-column loadable card deck) as Optional Material when they order HASP and use it according to Section 10.3.6 to obtain the output of their RMTGEN as a 96-column card deck.

Although the System/3 workstation program must be created by RMTGEN from HASP-II, Version 3, it will operate properly with a HASP-II, Version 2.3 system which is generated to support any other type of MULTI-LEAVING remote with comparable configuration.

B.d 3211 Printer Support

HASP device support has now been expanded to include support for the IBM 3211 Printer.

The UCS Buffer is loaded based upon a setting of parameter &PRTUCS and/or by operator command. The Forms Control Buffer is loaded by operator command. See the $T command in 11.1 - 1.7.

The new functions of the &PRTUCS parameter and the $T operator command also apply to loading of the UCS Buffer for 1403 Printers.

B.e 3330 Disk Support

The HASP direct-access allocation facilities have been expanded to accommodate the increased capacity of the IBM 3330 Disk Storage.

Parameters &NUMDA and &NUMTGV affect use of 3330s and other DASDs by HASP. Rotational Position Sensing is not utilized by HASP. See also C.j below.

B.f 2260 Support

Basic support is now included to operate the IBM 2260 Display Station as a local HASP console. The support applies to any model of 2260s (and associated 1053 if any) attached to a local 2848 control unit.

This support is available only if HASP is controlling all consoles (&NUMCONS>0) and is included by setting new parameter &SIZ2260 to the screen width of the 2260s, either 40 or 80. New parameter &SPD2260 is set to control the rate of message display on 2260s.

Operation of the 2260 as a HASP console is described on a single page in Section 11.1 - 5.1.

C.0 INCREMENTAL IMPROVEMENTS

C.a System Restructure

HASP has now been segmented into multiple functional assembly modules. Many HASP macros are now separate source members. A source member for the System/3 remote program has been added.

This restructuring includes a complete re-numbering of the HASP source statements. The sequence numbers of each member begin with one or two unique alphabetic characters so that PTFs cannot be mistakenly applied to a wrong member.

Table 10.1.1 shows all the source members of the distributed HASP System. During HASPGEN, 14 of these are assembled to produce the 14 object modules shown in the table as members of SYS1.HASPOBJ. Table 10.1.4 describes the jobs in the first tape file used for a complete HASPGEN. They are very similar to the first file of the Version 2 tape, except that there are several more assemblies.

Ten of these modules are later combined to form the main HASP program. The contents of each is described below, approximately in the order of occurrence in the assembly listing or in a storage dump. The majority of names of processors, programs, and control blocks will be familiar to experienced HASP-II, Version 2 users.

HASPNUC contains:

- HASP Communication Table (HCT)
- Control Services Subprograms called by HASP macros
- Channel End Appendages
- Asynchronous I/O Processor
- Timer Processor
- Overlay Roll Processor
- Trace Routines (if &TRACE>0)
- Processor Control Elements (PCEs)

HASPRDR contains:

- Input Service Processor

HASPXEQ contains:

Execution Control Processor
IOS (SVC 0) Interface
OS RDR JCL Exit
LINK/XCTL Intercepts
Thaw Processor
Log Processor
Data Definition Tables (DDTs)
Partition Information Tables (PITs)

HASPPRPU contains:

Output Service (Print/Punch) Processor

HASPACCT contains:

Accounting Card Subroutine (if &ACCTNG=YES)

HASPMISC contains:

Purge Processor
Execution Task Monitor Processor (if &MONINTV>0)
Checkpoint Processor and IOB
HASP Job Queue and Checkpoint Record Area
Job Information Table (JIT, if &JITSIZE>0)
Priority Aging Processor (if &PRIRATE>0)

HASPCON contains:

Console Buffering and Queueing Subroutines
WTO/WTOR (SVC 35) Interface
Reply Elements (if &NUMCONS>0)
WTL (SVC 36) Interface (if &WTLOPT=YES)
Console Attention Processor (if &NUMCONS>0)
Attention Appendage
Console I/O Processor and IOBs (if &NUMCONS>0)
HASP WTO Task (if &NUMCONS=0)
OS MGCR (SVC 34) Interface (if &NUMCONS=0)

HASPRTAM contains: (if &NUMLNES>0)

RTAM Subroutines
Code Translation Tables
Line Manager Processor
Remote Console Processor
Message Allocation Control Block (MSA, if &SPOLMSG>0)

HASPCOMM contains:

HASP Command Processor

HASPINIT contains:

- Master Track Group Allocation Bit Maps
- Printer Checkpoint Elements
- Device Control Tables (DCTs)
- DCBs, DEBs
- Console Message Buffers (CMBs)
- Overlay Areas, each with IOB
- TP Buffers, each with IOB (if &NUMLNES>0)
- Line and Remote Definitions (if &NUMLNES>0)
- Dump Programs (if &DEBUG=YES and/or &DMPTAPE>0)
- Assembled Buffers, each with IOB
- Initialization Coding (physically in the preceding Buffers)

The four other assembled modules are link edited separately from the main HASP program.

HASPBR1 is used to ATTACH the HASP WTO Task whose coding is actually in HASPCON (when &NUMCONS=0). See also C.d below. Although the executable coding of BR1 is only two bytes long, its listing contains the most complete documentation of all HASP Control Blocks.

HASPSVC is link edited into the OS Nucleus and performs the same function as (but is not compatible with) HASPINIT in Version 2.

HASPWTR is ATTACHed as a separate Task if &WTRPART=*. See also C.h below.

HASPOBLD is a utility used only as a pre-processor when link editing the 10 modules of the main HASP program. See C.b below.

Later comments in this Guide will further highlight the more important internal changes related to the restructuring.

C.b Overlay Structure

An overlay capability has been added such that selected sections of HASP may optionally be made resident on direct-access storage and fetched into a dynamic area within HASP to perform their required functions.

Sections of code in several of the 10 main assemblies are selected for potential overlay by use of the $OVERLAY macro, which causes a section of code to become a separate CSECT within its assembly. These CSECTs are then written to an overlay data set for subsequent use. During HASP processing, a requirement for an overlay routine (indicated by a $LINK, $LOAD, or $XCTL macro) invokes HASP Overlay Services to fetch the required overlay. The overlay routine is later released by use of a $RETURN or $DELETE macro. For a routine to be used as an overlay segment, it must be re-entrant (in the HASP sense), and location independent (movable during execution).

The new parameter &NUMOACE specifies the number of fixed size (currently 1024 bytes) overlay areas assembled into HASP for use as dynamic areas to contain overlay sections during processing. New parameter &OLAYLEV provides a means of making certain sections permanently resident and not subject to dynamic fetching. &NUMOACE=1 is probably adequate for M40 and M50 users. Also, the default value &OLAYLEV=15 (meaning all overlay sections disk resident) is probably adequate for most users. To improve overlay performance for large systems, it is probably wiser to increase &NUMOACE to three or four before decreasing &OLAYLEV from 15, thereby making more important overlays permanently resident.

The process of combining the 10 assemblies into the main HASP program is now a multiple step operation, best described by Sections 10.2.2.3 and 12.1.3 of the Manual. Briefly, the HASPOBLD utility reads all the object decks, extracts overlay CSECTs writing each as one record in the overlay data set, resolves inter-CSECT references to overlays, and passes resident CSECTs to the standard OS Linkage Editor which creates the HASP load module. Control cards to HASPOBLD may be used to override the effect of &OLAYLEV on any overlay routine.

The HASPOBLD listing shows each overlay and its disk address. The Linkage Editor listing (when &OLAYLEV=15) shows one resident CSECT from each of the 10 assemblies and the HASPOTAB CSECT, created by HASPOBLD and used during processing to reference overlays on direct-access.

Sections of HASP chosen for overlay are those with the least impact on system performance: initialization and termination logic of Input, Execution, and Output Processors; Operator Command, Checkpoint, Purge, Execution Task Monitor, Priority Aging, and Remote Console Processors; Accounting Subroutine; and sections of Initialization.

C.c Improved Operator Command Facilities

The HASP Operator Command Processor has been rewritten to provide a more flexible command format, a more powerful command set, abbreviation capabilities, and full use of the overlay capability in HASP.

The new command format begins with a $ (of course) followed by a single character verb, followed by one or more operands separated by commas (see Section 11.1 - 1.1). The verbs are listed alphabetically in Table 11.1 - 1.1.1. As can be seen from that table, in many cases a HASP verb has a meaning similar to the same single letter used as an OS command abbreviation.

Table 11.1 - 1.1.2 illustrates the partial compatibility provided for the Version 2 long form of HASP command verbs. The long verbs are replaced by the characters shown for the equivalent short verbs, then the operands are interpreted. Most new verbs replace only a single old verb. However, $T, $D, and $P each replace several old verbs.

Operand formats for most single references to jobs and devices are unchanged, e.g., $A JOB5 or $P LNE2. Examples in Table 11.1 - 1.1.2 show some of the more notable changes in operand format: "In" must be used for HASP logical initiators in both MFT or MVT; syntax for altering job priorities, setting initiator classes, and single spacing the printer is changed; a HASP input tape is assigned a unit address and started by a single command.

The new commands are not just changed a little but also have significant new capability. Table 11.1 - 1.1.3 best summarizes the total capability of all commands in seven functional groups. The Job List commands each allow lists of one or more jobs and/or ranges of job numbers. The Device List commands allow multiple devices in a single command. The $F and $I commands are completely new (see also C.o). Individual Remotes and Lines may now be displayed. Finally, the response to any commands which refer to jobs or queues is now systematized as described in Section 11.1 - 1.3.

The entire HASP Operator's Guide has been rewritten. For example, Sections 11.1-6 and 7 approach the commands from a functional standpoint rather than as individual commands. However, a working knowledge of most new commands can be gained from a review of the three above referenced tables alone, especially Table 11.1 - 1.1.3. One of the Job List commands should be reviewed in Section 11.1 - 1.5 to learn the freedom of the job number range operand format. The $T device command should be studied in Section 11.1 - 1.7 because of its great variety of options. Sections 11.1 - 1.4 through 1.10 provide detailed material about all commands and are intended primarily for operator reference rather than straight through reading.

The control of console devices has been improved considerably. OS console support can be used (&NUMCONS=0, see C.d) or HASP console support can be used if the device type(s) are limited to those listed under &NUMCONS.

HASP messages in previous versions were routed to logical console designations and given importance levels (as shown on the second page of 11.1 - 5.1) but the correpondence between physical (CON1, CON2, etc.) and logical (UR, MAIN, etc.) consoles had to be altered by assembly changes (previously described in HASP Newsletter #11, page 2.4). Now this correspondence and the importance level can both be set by the $T command (third page of 11.1 - 5.1). Table 11.1 - 5.1.1 gives the logical routing of all HASP messages. These routings have been revised to allow greater "separation" of messages by logical console.

New parameter &CONAUTH and the $T command provide for limiting the types of commands which can be entered from HASP consoles. Section 11.1, page 127 gives further information.

Though not required for understanding and use of Version 3, Section 4.5 of the Manual may be read for further information about the Command Processor. Its internal logic has been designed to facilitate addition of new commands.

C.d Improved OS Console Interface

Installations may now utilize OS console support rather than the HASP support and still retain HASP Remote Console Support, direct entry of HASP commands, short form REPLY, input stream - HASP commands, and the auto-reader feature (Release 19 or later for MFT Systems).

The OS SYSGEN macro SUPRVSOR for an MFT System must contain the OPTIONS=(ATTACH,TRSVCTBL,...) and RESIDNT=(TRSVC,...) parameters in order to use this feature. ATTACH need not be resident.

The new parameter &NUMCONS (replaces &NUM1052) should be set to zero to use this interface. OS will then physically support all consoles, subject to features included in the OS SYSGEN. The Notes under &NUMCONS give further important information, especially the requirement to set &NUMCONS=0 when HASP is used with the MCS, M65MP, or TSO options of OS. See also Section 12.7 for restrictions concerning console support.

With OS controlling all consoles, such functions as establishing correspondence between physical and logical consoles and setting authority of certain consoles to enter commands is performed by using the OS VARY command, as described in appropriate OS documentation. Section 11.1 - 5.2 describes the equivalences between OS and HASP logical consoles and OS and HASP console authority which are assumed when &NUMCONS=0, for purposes of HASP message output and HASP command input respectively. A special case of the $T command (described in Section 11.1, page 57) is provided to set the message importance level for HASP logical consoles when &NUMCONS=0 (rather than for physical consoles as with HASP console support, see 11.1 - 5.1), because OS has no equivalent function.

When &NUMCONS=0, a separate HASP WTO Task is created by ATTACHing load module HASPBR1. This module branches immediately to coding which physically exists in module HASPCON but which continues to operate as a separate task. The primary motivation for this separate task is to issue WTOs for all HASP messages. If OS forces this task into a WAIT condition when there are no WTO buffers, the main HASP Task will not lose dispatchability. Though not required for understanding and use of this feature, Section 12.15 of the Manual may be read for further information about all the interfaces with OS console support.

C.e Punch Special Forms

Special forms may now be specified for SYSOUT data sets which are to be punched.

To use this feature, pseudo 1442 UCBs must be provided by OS SYSGEN (see Section 10.2.1.1) just as pseudo 1443s are provided for print special forms. See also C.f.

C.f Improved SYSOUT Forms Routing

Users may optionally cause grouping of SYSOUT data sets by forms type to minimize printer setup time.

Two new values (1 and 2) are allowed in specifying the meaning of various SYSOUT classes using the $$x HASPGEN parameter. When classes set to these values are used (J and K are the defaults), the data sets are not printed or punched with the rest of the job's standard output.

After standard printing, a job is re-queued and then available only to a printer or punch conditioned for special forms routed processing of the particular form number specified in the SYSOUT. When printed or punched, such a data set will be processed with all other data sets from the same or other jobs, requesting the same form number, which are in the queue at that time.

After all special forms routed printing and punching is completed (which may require several re-queueing operations for different form numbers), the job proceeds to standard punching.

The conditioning of printers and punches to do special routed output is controlled by the $T command and described in Section 11.1 - 7.3. Special considerations for 2780 and 2770 terminal operators are given in the "Central Computer Control" Sections of Sections 11.7 and 11.8.

For 3211 printers, the operator may reset the FCB with $T when setting a new forms type. For 1403 and 3211 printers, the UCBS may be reset as part of "forms mounting" if a new chain/train is mounted.

Processing of standard output classes (usually A and B) requesting special forms operates just as in Version 2, i.e., forms must be mounted and dismounted from one data set to the next during printing or punching of that job. If the forms field in the JOB card is used, all print data sets without special forms will use that form number and be subject to the new special routing.

See 12.7 for a restriction on characters in the forms field.

C.g MFT Dynamic Dispatching

The Dynamic Dispatching capability in HASP, previously restricted to MVT Systems, may now also be used with MFT Systems (Release 19 or later).

The OS SYSGEN macro SUPRVSOR must contain the OPTIONS=(ATTACH,...) and TIMER=JOBSTEP parameters if the MFT System is to support this HASP feature. ATTACH need not be resident.

The inclusion of this feature in HASP is controlled, as previously, by the parameter &MONINTV. Two new parameters, &XZMFTH and &XZMFTL, control the range of MFT task priorities to be included in the dynamically dispatched group. Because of the potential benefit and negligible overhead of this feature for most installations, the default values for these parameters (and the &XZPRTY and &PRI parameters for MVT Systems) are set such that most jobs executed under HASP control are subject to Dynamic Dispatching.

The internal algorithms for adjusting dispatching priorities every &MONINTV seconds remain the same as in Version 2.

C.h Elimination of OS Writer Requirement

HASP now optionally provides a minimal module to interface to the OS job queue which eliminates the previous requirement for a resident OS writer in both MVT and MFT (Release 19 or later for MFT Systems).

The OS SYSGEN macro SUPRVSOR for an MFT System must contain the OPTIONS=(ATTACH,...) parameter in order to use this feature. ATTACH need not be resident.

To use this feature, parameter &WTRPART should be set to *. The default value is set this way, since most installations will want to eliminate the OS writer partition. The new parameter &WTRCLAS specifies one to eight MSGCLASSes which are processed from the OS job queue by either the HASP Writer module or the OS writer. HASP continues to supply a valid MSGCLASS parameter for jobs which omit this parameter or use one which is not in &WTRCLAS.

The new parameter &WCLSREQ may be used to activate a feature available only with the HASP Writer. After being processed to terminate a job's execution, SMBs of certain classes in &WTRCLAS may be re-queued for processing by other system writers. As an example, this feature might be used with terminal systems which have been modified to submit jobs through the HASP Internal Reader interface.

C.i Execution Job Batching

Jobs may now be automatically grouped by class and passed directly to an executing job such as a one-step monitor or other direct job processor.

This optional feature is included by setting new parameter &XBATCHC to a list of job classes to be scheduled in this special way. New parameter &XBATCHN is used to specify jobnames reserved for internal use with this feature.

Section 12.13 describes requirements of batch processing programs and special actions necessary to install and use this feature.

C.j Improved SPOOL Disk Allocation

Space on SPOOL disks is now dynamically allocated by logical track groups rather than by physical cylinders. Each bit in the HASP allocation map now represents a HASPGENable number of direct-access tracks.

New parameter &NUMDA specifies the maximum number of SPOOL volumes to be used and replaces parameters &MAX2314 and &MAX2311. Mixtures of supported device types are permitted and the capacities of each are used to their fullest. Old parameter &NUMCYL is replaced by new parameter &NUMTGV which divides each volume, regardless of type, into the same number of track groups. The size of a track group depends upon the device type and &NUMTGV; e.g., if &NUMTGV=400, then a track group contains five tracks on a 2311, 10 tracks on a 2314, and 19 tracks on a 3330.

A single extent data set named SYS1.HASPACE must now be allocated on each SPOOL volume prior to starting HASP. Only space within this extent will be used. Recommended procedures are discussed in Sections 10.2.2.4 and 12.1.4. HASP-II, Version 2 allocated

SYS1.HASPACE data sets itself so that in most cases such volumes may be used immediately with Version 3. However, Version 3 cannot be warm started using SPOOL volumes last operated under Version 2.

The HASP form of direct-access addresses is still four bytes long, but has been changed to accommodate the larger capacities of the 3330 and the track group concept. Figure 3.2.2 illustrates the new form of address.

C.k Non-MULTI-LEAVING Terminal Console Support

Users at non-MULTI-LEAVING remote workstations (2780, 2770, 1978, STR Model 20, etc.) may now receive responses to HASP commands submitted through the remote card reader. 2770 users may also submit commands from the standard keyboard.

This feature is included by setting new parameter &SPOLMSG to the number of records on SPOOL1 reserved for operator messages to be returned to these terminals. A description of this feature has been added to the end of the "Central Computer Control" Sections of Operator's Guides for the 2780 and 2770 (Sections 11.7 and 11.8).

The commands available are those valid from a remote source as indicated by Table 11.1 - 1.1.3. In addition to command responses, the terminals also receive the "JOBj ON device --" message, from jobs submitted, and messages from other operators in the system, created by use of the $DM command.

C.l Improved SMF Compatibility

Provision has now been made to allow SMF to count I/O requests for pseudo devices. This function does not depend upon any HASPGEN parameter and is activated automatically if HASP detects the presence of SMF in the host MFT or MVT System.

C.m Priority Aging

Installations may optionally cause the priority of jobs to increase in proportion to the length of time the job has been in the system.

To include this feature, the new parameter &PRIRATE should be set to the desired amount of priority increase in a 24 hour period. New parameters &PRIHIGH and &PRILOW provide a means of limiting the range of job priorities which are affected by aging.

C.n Variable Buffer Pool

The number of buffers in the HASP Buffer Pool may now be dynamically varied by changing the HASP region or partition size.

As in Version 2, the parameter &NUMBUF controls the number of buffers assembled as part of the HASP load module. During HASP Initialization, additional buffers are built in all available storage of the hierarchy indicated by new parameter &BUFHICH. However, new parameter &RESCORE allows reserving a portion of storage for other OS functions. New parameter &MINBUF provides a means of warning the operator if &NUMBUF plus the additional buffers do not provide a minimum number of buffers.

C.o Additional Print Control

The operator now has the capability to both forward and backward space print data sets a variable number of pages. Print jobs may also be suspended during processing and resumed at a later time.

These functions are implemented by the $F, $B, and $I operator commands, which are described in Section 11.1 - 1.7. For $F and $B, the next forward or backward data set boundary may be specified, rather than a number of pages.

For 2780 and 2770 terminals only, an optional feature (included by setting &BSHPRSU=YES) is available which allows the operator to simulate a $I function by simply stopping and starting the terminal printer. Operator commands and/or jobs may be transmitted to HASP before printing resumes. See the end of the "Error Recovery When Receiving" Sections of Operator's Guides for these terminals (Sections 11.7 and 11.8) for a description of this feature.

C.p Withdrawable HASP

An operator command is now provided to cause HASP to withdraw from the system leaving OS in an operational state.

The command $PHASP is issued, when HASP is in an ALL AVAILABLE FUNCTIONS COMPLETE state, to cause the withdrawal. Another HASP may then be started or the same HASP may be started, perhaps with a different partition size; see C.n above.

The command is described in Section 11.1 - 1.8 and certain restrictions on its results are given in Section 12.7.

C.q Inclusion of All Previous Maintenance

All previously reported problems have been corrected in this version. All previously distributed PTFs through number DPA2273 have been logically integrated into the source coding.

Previous modifications, which were separately available, to improve operation in an MP65 System are also logically included and do not require any special HASPGEN parameter settings to function.

D.O MISCELLANEOUS CHANGES, REQUIREMENTS, ETC.

The following HASPGEN parameters, in addition to those already mentioned, are new or significantly changed.

&OSINOPT when set to YES causes data sets begun by DD * and DATA which include a DCB parameter to be passed to OS for SPOOLing as temporary disk data sets. This feature may be used to provide re-readable input data sets, concatenation of "like" attribute data sets, etc.

&DMPTAPE specifies a tape address and inclusion of an optional high speed dump-to-tape program for use at system failure time. The tape produced may be printed using Service Aid IMDPRDMP.

&NUMLNES is now the controlling parameter for inclusion of RJE support, rather than &NUMRJE. These two parameters are otherwise unchanged.

$PRTBOPT, $PUNBOPT, $RPRBOPT, and $RPUBOPT all replace &PBUFOPT in specifying the buffering logic of Print/Punch Processors. The defaults (all single buffering except local printers which are double) are probably best for most installations.

&OSC(n) now specifies the internal classes of jobs passed to OS for MVT Systems (thereby replacing &MVTCLAS) as well as for MFT Systems. Now only one MVT initiator will be POSTed for each job passed to OS.

$PRICONA now specifies the hardware console address for HASP CATASTROPHIC error messages, which always indicate system failure. These messages previously went to HASP CONSOLE1. Also, this type of message will now result if HASP is ABENDed by OS for any reason (STAE exit is used), increasing the probability of a valid memory dump taken at that time.

Old parameters have been eliminated: &TIMER (HASP now assumes at least TIMER=INTERVAL in OS), &MAXERR (HASP console error retries are now fixed at 4), and &$START (all assemblies begin at origin zero).

New parameter &OREPSIZ must be set to some value greater than 10 if the HASP repping facility, standard for resident CSECTs, is to be available for overlay CSECTs.

Certain 1130 RMTGEN parameters have been added, or have had default values changed, see Sections 7.5 and 7.6. 1130 RMTGEN has been improved and now produces an assembled instruction listing with correct 1130 instruction format. Other workstation programs are unchanged except for inclusion of previous PTFs and re-numbering.

HASP-II, Version 3 requires that the following engineering changes be installed, in order to support the 2780 terminal.

Device	ECA	FC
2701	109	306749
2703	65	307702

ETX, EOT is now sent to the 2780 at the end of each job's printed or punched output. This makes possible automatic turnaround from print to read. See the end of Section 11.7 - 2.1.1.

Punch error recovery and pocket selection have been generalized to support the 2520 and 1442 punches.

Jobs which are failed or cancelled prior to execution now produce a listing indicating the nature of the error.

Jobs may now be referenced by operator commands while being read into the system.

The HASP Dispatcher has been re-coded to reduce CPU time required for scanning PCEs, especially for large configurations.

Section 12.7 of the Manual should be reviewed for General Restrictions about the use of HASP-II, Version 3.

As indicated by Section 12.2, the basic storage requirements of the HASP load module have been reduced by approximately 6700 bytes, despite substantially increased functions, e.g., in the area of operator commands, special forms, etc. Many optional features now require less storage than previously. Use of the HASPWTR module results in an additional storage saving of from 6K to 10K when compared with a previous MFT System (without ATTACH but with a writer partition) or MVT System (with a writer region).

E.0 INITIAL INSTALLATION STRATEGY

Many installations will want to install a test HASP-II, Version 3 System as rapidly as possible, to gain familiarity and first hand experience with it, while working toward a production Version 3 System including, perhaps, re-integration of local modifications. The following suggestions may aid such an effort.

For HASPGEN, the suggested data set allocation deck is the same except that BLKSIZE=400 is recommended for SYS1.HASPOBJ. A trial HASPGEN (run only the first job in the first tape file, use no parameters, reply 'end' to the WTOR) will produce a complete listing of all HASPGEN parameters with defaults. All parameters not specifically mentioned in this Guide should then be checked and changes made as required to the previous HASPGEN parameter deck because of new defaults, first character $, or YES/NO values. Parameters specifically mentioned previously in this Guide should be reviewed in Section 7.1 and values for them should be chosen. Finally, after re-running the data set allocation, the complete HASPGEN should be performed using the parameter deck, and using Table 10.1.4 and Section 10.1.4 for guidance.

The new HASPSVC must be installed in the OS Nucleus (see 10.2.2.1 and 12.1.1) since it is not compatible with the old one. If more than one Type I User SVC slot was specified in SYSGEN, the new SVC can be installed without disturbing the old one by using a different value for &INITSVC.

The new procs must be installed (see 10.2.2.2 and 12.1.2). The new RDR and WTR procs have different names, so no conflicts occur with old ones. The new HASP proc should replace the old one. By proper naming of the STRTHASP jobs (old and new) and use of the JOB= keyword, both old and new HASPs can be started under the same system.

The job to install the HASP overlay data set and load modules has already been referenced (see C.b, 10.2.2.3, and 12.1.3). The HASP load module name may be changed (corresponding change in STRTHASP job required) to avoid conflict with an old HASP in SYS1.LINKLIB.

See C.j for comments about old SPOOL disk use. Specify FORMAT when using a SPOOL disk under Version 3 for the first time.

For RJE users, the Version 2.3 workstation programs will operate correctly with Version 3. However, a new RMTGEN with Version 3 is recommended to insure that all latest maintenance is included.

F.0 SYSTEM MAINTENANCE HINTS

F.a The Storage Dump Containing HASP

Although Version 3 may appear to be greatly changed by restructure, overlay, and a completely new command set, the logical organization presented in a storage dump is very similar to Version 2. A few of the more significant differences will be highlighted here.

If the dump has OS control blocks formatted, e.g., as printed by IMDPRDMP, the multiple task structure of HASP will be apparent. The main HASP task uses the main load module (usually named HASP). If &NUMCONS=0, a subtask using HASPBR1 should be present. If &WTRPART=*, a subtask using HASPWTR should be present.

The beginning of the main load module can be found by looking in the lower part of the HASP region for the version number " V 3.0" in EBCDIC. Then by using the link edit listing (produced as described under C.b), each of the resident CSECTs (normally one from each of the 10 main assemblies plus HASPOTAB) can be found.

The first part of CSECT HASPNUC (which is usually first in the load module) is the HASP Communication Table or HCT. This is documented in Figure 8.1.1 but is best seen in the HASPNUC assembly listing. It begins with a series of branches to HASP Control Service Subprograms (new with Version 3) and contains most of the globally used status bytes, counters, control block chain pointers, and queue pointers which were in roughly the same area of a Version 2 listing. Other assemblies expand an HCTDSECT which allows them to call Control Service Subprograms by branching to the branches in HASPNUC and to reference the other HCT cells directly. ENTRY, EXTRN, Vcon type referencing is used for other inter-module communication.

The PCEs are now in module HASPNUC, rather than toward the end of HASP. The first one can be found by looking in cell $PCEORG in the HCT or by following the OS save area chain from the system provided first save area. PCEs are now chained together exactly like OS save areas: forward chain in word 3, back chain in word 2. In fact, HASP now uses this forward chain as its PCENEXT or dispatching chain. This same chain is, of course, used when analyzing the state of all HASP Processors in a storage dump. The other major PCE dispatching fields, i.e., re-entry address PCER15 and dispatchability PCEEWF, are logically unchanged.

The order of things in the remainder of the dump is very similar but not identical to Version 2. The description in C.a may be used as a guide to the contents of the various CSECTs, to determine which assembly listing is needed when investigating a specific portion of a dump.

The other major control blocks (DCTs, DDTs, PITs, JCTs, JQEs, JITs, CMBs, Buffers, etc.) have only had minor bit re-definitions in Version 3. Pointers to the various chains of these elements are in the HCT.

It may be desirable to analyze the overlay status of HASP when working on an undetermined problem. The overlay areas should first be inspected.

A pointer to the first area can be found in cell $OACEADR in HASPNUC. All area control fields are defined in BUFDSECT. Subsequent areas are chained from OACECHN of the previous area.

The CSECT in each area can be determined by looking at OACENAME (which is the first four bytes read from disk) for the last three or four characters of the CSECT name. OACEOCON also identifies the routine assigned to the area. OCONS can be interpreted by looking at the listing produced by HASPOBLD.

If any PCEs are using the routine, OACEPCE will be non-zero and point to the first of a chain of PCEs.

If BUFECBCC is zero, an uncompleted read operation was in progress to load the routine from disk.

Once the status of overlay areas is known, PCEs should be inspected for possible use of overlay.

A PCE which is using a routine currently in memory should be on a chain which begins with OACEPCE of an area and continues through PCEOPCE of one or more PCEs. PCEOCON of each should match OACEOCON.

If a PCE is not on an area chain but does have the $EWFOLAY bit on in its PCEEWF, it should be on a queue beginning at cell $WAITACE in HASPNUC. This queue continues through PCEBASE3 of subsequent PCEs. Side chains of other PCEs from PCEOPCE may be present if several PCEs have equal PCEOCONs (requesting the same routine).

A PCE which has the $EWFOROL bit on in its PCEEWF is not on any chain (PCEOPCE is not meaningful) but its PCEOCON indicates the requested routine. PCER15 may be a very small value which then represents the relative displacement into the routine at which execution will later resume.

PCEORTRN contains the return address from the original $LINK which invoked overlay. A PCE not in one of the three above states is not using overlay and its PCEOCON is not meaningful.

F.b Service Aids

The optional &DMPTAPE facility has already been mentioned in D.O as an alternative to IMDSADMP. Output of either can be printed with IMDPRDMP.

ABEND of the main HASP task is now un-equivocally indicated by a "CATASTROPHIC" error message with "CODE = ABND". A dump taken then should show the HASP task structure and region intact, with completion code in the TCB.

HASP REPing at initialization time is a standard feature for resident CSECTs, but &OREPSIZ must be set to reserve a small amount of storage if REPing of overlay CSECTs is desired. REP cards may specify absolute storage locations or locations in any CSECT, as taken from assembly listings. See Section 6.4.1 for a description of the new REP card format.

Permanent machine language patching may be performed using IMASPZAP. Resident CSECTs in the load module may be ZAPed using familiar NAME, VERIFY, and REP cards. Resident CSECTs are usually assembled at zero so that listing addresses may be used. A patch area at symbol $PATCHSP in HASPNUC is provided and is reachable by any code with HASP BASE1 addressability.

For ZAPing overlay CSECTs, the SYSLIB card should reference the sequential overlay data set. The example below shows control cards that may be used. The address for the CCHHR is taken from the listing produced by HASPOBLD. BASE adjusts for non-zero assembly origin of the CSECT. Most overlay CSECTs are shorter then the overlay record size of 1024 bytes. The space in the record following the last assembled location of the CSECT may be used as patch area. ABSDUMP cards may be used to dump the entire overlay data set or single CSECTs.

```
CCHHR     000A000501
BASE      0007A8
VERIFY    000824   47F0,8236
REP       000824   4780,8242
```

F.c HASP APAR Information

HASP APAR information is placed in RETAIN under the program number 360D51014. Most PTFs are few enough source cards to be contained in the RETAIN entry.

Information purged from RETAIN is placed in Early Warning microfiche, group ZP, and Programming Systems Memoranda, Group 48.

As in the past, it is strongly recommended that all PTFs which may become available for HASP-II, Version 3 be installed at the earliest convenience, whether specific symptoms have occurred or not. The procedure for PTF installation is described in Section 10.1.3.

5.0 HASP - VERSION 2.3 - MAINTENANCE SUMMARY

The following is a summary of all current PTFs relevant to the Version 2.3 system. It is recommended that, to avoid duplicate effort, all applicable PTFs be applied to HASP immediately, even if the problem described has not been encountered. Detailed information concerning the APARs listed below and, in most cases, the actual program fix, can be found in the RETAIN information, the early-warning microfiche (group ZP), and/or Programming System Memoranda (group 48).

Number	Symptom
PA0093	1130 Text Compression problem
PA0094	$DRAIN/$STARTline/error recovery may cause Abend
PA0096	Pseudo device protection
PA0098	CCW count of zero fails
PA0100	REQUIRED FOR SUPPORT OF 2780s
PA0461	Special forms problem if $TPIDCT=0
PA0464	SLI not simulated in CCW
PA0477	Loop if pseudo-units on SYSRES channel
PA0479	1130 problem if punch-only 1442
PA0886	Abnormal channel-end appendage error
PA0888	$ROUTE error
PA0889	Mod/20 XIO loop
PA0898	NOP CCW gives early 2540 EOF
PA0900	REQUIRED FOR USE WITH RELEASE 19 SYSTEMS
PA1221	Loop if EXCP to a line gives SIO CC=3
PA1225	OCx if PIB CSCB pointer = 0
PA1226	OCx in XTHAW
PA1230	Wrong message if printer error
PA1237	1130 I/O device loss
PA1238	Bad backspace on big SYSOUTS
PA1240	Permanent wait on warm start
PA1590	Premature job termination (SMB Swap)
PA1598	Warm start fails if SPOOL disk order changed
PA1600	Mod 20 - 2152 problem
PA1812	$Display disks incomplete if SWAP command used
PA1835	ABEND - punch uses bad JCT
PA2273	MP65/HASP CPU conflict