

Burroughs Corporation



BUSINESS MACHINES GROUP
SMALL SYSTEMS PLANT

HASP (SECTION I, II, III, IV)

PRODUCT SPECIFICATION

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GENERAL

The Burroughs B1700 HASP program enables a B1700 to operate in conjunction with an IBM OS/360, or OS/370, performing the functions normally associated with an off-line support computer. The IBM HASP system of automatic spooling and priority scheduling supports an unlimited number of remote peripherals operating simultaneously, via several classes of telephone lines.

Through the use of the HASP Remote Job Entry feature, a user, located perhaps thousands of miles from a particular System 360 or 370 installation, can utilize the capabilities of the installation much as if the central computer were located at the remote site. The unit record devices (card readers, punches and printers) at the remote station are logically operated by HASP as if they were local readers, printers, punches, and consoles, so that HASP can simultaneously, while operating all local unit record devices, read jobs from several remote readers into the queue of jobs awaiting processing and output to several remote printers and/or punches results of previously entered jobs which have completed execution.

A special set of programs have been written for the B1700 which can be considered a logical extension of the HASP system. These programs perform the same functions as the remote terminal program for the IBM 360/20 computer. The IBM 360/20 remote terminal program was selected as the model remote terminal in order to implement the "multi-leaving" feature of HASP.

While the IBM 360/20 remote terminal program is a stand-alone program, the B1700 HASP/RJE programs run under control of the B1700 MCP. This gives the B1700 HASP/RJE all the resources found in a computer controlled by an operating system. For information on operation and facilities of the B1700 MCP, please refer to the B1700 Software Operational Guide (SOG).

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This product specification consists of four sections, each with a self-contained index and table of contents. They are:

| | |
|-------------|-------------------------------|
| Section I | Remote Job Entry (HASP) |
| Section II | HASP Environment (HASP/SPOOL) |
| Section III | TESTBSC |
| Section IV | BURRBSC |

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SYSTEM ARCHITECTURE

The B1700 Remote Job Entry software consists of two programs, HASP and HASP/SPOOL. The remote terminal program, HASP, is responsible for maintaining the line discipline with the host system and managing the local I/O of the remote site during a RJE session. HASP/SPOOL, the off-line input/output program which creates input spools and produces output spools, is described more fully in HASP(Section II).

There are two modes of operation for the remote site: SPOOL and DIRECT.

SPOOL MODE

SPOOL mode consists of three distinct phases.

- Phase #1: Input spool creation (off-line) with HASP/SPOOL.
- Phase #2: Input spool transmission and receipt of output spool (on-line) with HASP.
- Phase #3: Output spool printing and punching (off-line) with HASP/SPOOL.

Note: "On-line" is defined as: connection, via data comm, to the host HASP system.

"Off-line" is defined as: no connection with the host HASP system.

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SPOOL Phase #1

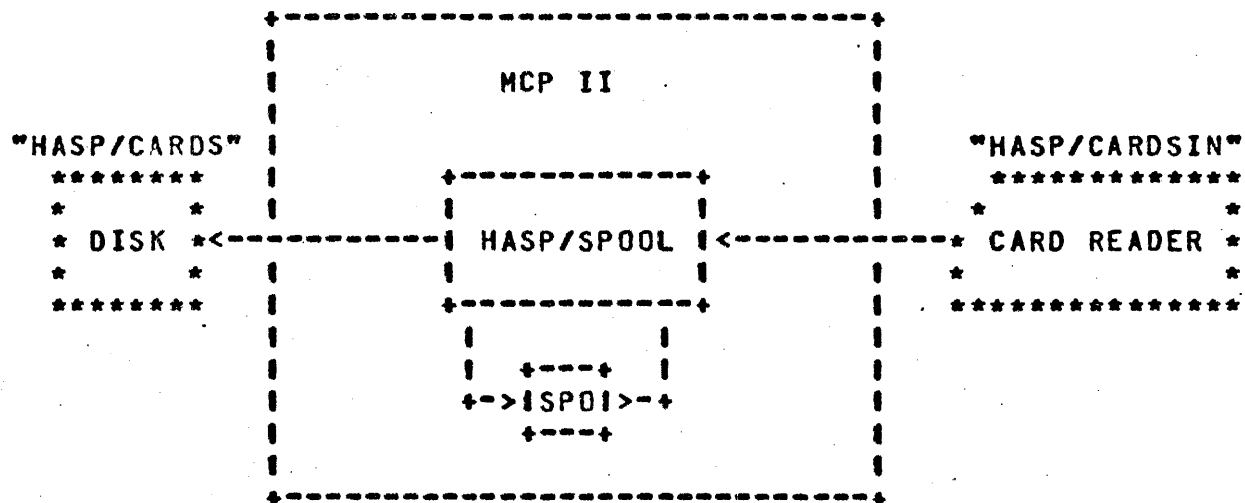
The input spool is created off-line by HASP/SPOOL in order to reduce system requirements during the actual HASP/RJE session with the host. Cards are read, compressed, blocked and stored in a disk file. Many card decks may be concatenated to form one input spool file. If more than one input spool disk file is to be transmitted during a session, each must have a unique name. The spool created by HASP/SPOOL is labelled "HASP/CARDS". A subsequent execution of HASP/SPOOL will create another file labelled "HASP/CARDS". In order to retain both files, the first one must be changed from "HASP/CARDS" to another name. Refer to B1700 SOG for disk file label changing information. Phase #1 is more fully described in Section II (HASP/SPOOL) of this document.

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SPOOL MODE

Phase #1 INPUT SPOOL CREATION



SPOOL Phase #2

Phase #2 consists of executing HASP, accepting appropriate run time parameters (refer to RUN TIME PARAMETERS), establishing communication, transmitting input spools, and receiving output from the host system. After communication is established, HASP signs on and enters a handshaking mode with the host. To transmit an input spool file, the operator merely starts an input reader by entering the local HASP command <mix # of HASP>AX.SR1 or <mix # of HASP>AX.SR1 <filename>, where <filename> is an optional name of the input spool if the input spool is not labeled "HASP/CARDS". Refer to LOCAL COMMAND SUBMISSION for .SR1 format.

After verifying that the input spool was created with the same run time parameters as HASP, a message is displayed "READER 1 OPEN" and

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the file is transmitted. After the file has been transmitted, HASP displays "READER 1 CLOSED". If another spool is to be transmitted, the operator repeats the above procedure.

Any output received during the spool mode HASP/RJE session is written in its blocked and compressed form into the output spool disk file, HASPOUT. HASPOUT is initially labelled "HASP/PRINT01". Whenever HASPOUT is closed and re-opened during the HASP/RJE session (see LOCAL COMMAND SUBMISSION), the label for HASPOUT is incremented by 1.

The operator may communicate with the host system by entering console messages to HASP; e.g., <mix # of HASP>AX\$DM<n>, "THIS IS A MESSAGE" would cause HASP to transmit the entire string following the <mix # >AX until ETX is encountered. <n> is the remote ID.

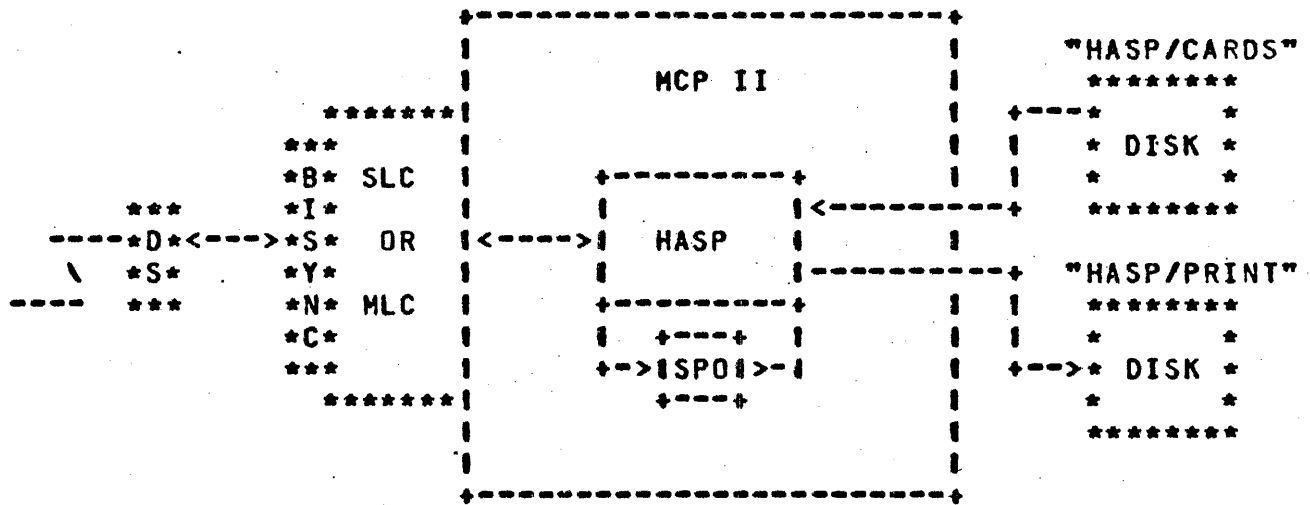
Any SPO command whose first characters is a "." is interpreted as a local command intended for HASP (see LOCAL COMMAND SUBMISSION). Termination of Phase #2 is done by entering <mix # of HASP>AX.CLOSE on the console which causes HASP to sign off, close the output file and print a summary statistics report for this session.

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SPOOL MODE

Phase #2 SPOOL TRANSMISSION



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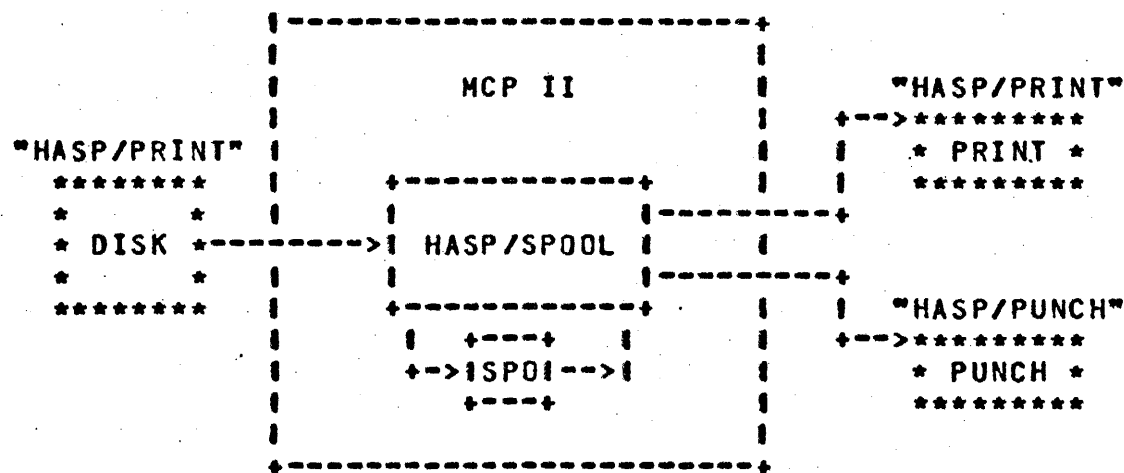
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SPOOL Phase #3

Phase #3 prints and punches data from the output spool file. The operator executes HASP/SPOOL and selects the output mode of operation. HASP/SPOOL reads the output spool disk file called "HASP/PRINT01", deblocks and decompresses the records, and then prints or punches the output. This is all done off-line to lessen system requirements during the actual HASP/RJE session with the host. Phase #3, is more fully documented in Section II (HASP/SPOOL).

SPOOL MODE

Phase #3 OUTPUT SPOOL PRINTING AND PUNCHING



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DIRECT MODE

In DIRECT mode, HASP maintains the line discipline with the host and directly handles all local I/O (card reader, card punch, line printer and SPO) at the remote site.

The DIRECT mode is initiated by executing HASP and entering appropriate parameters for the particular remote site (refer to RUN TIME PARAMETERS for formats). Input can be sent to the host by entering the local command .SR1 followed optionally by a file name. The format for .SR1 is described in command submission.

After receiving a .SR1 command, HASP will request permission to send from the host, open the input file and display "READER 1 OPEN". All input is read, compressed, blocked and transmitted to the host until end of file is detected. Upon detecting end of file in the card file, HASP will transmit an end of file message to HASP and display "READER 1 CLOSED".

All output received is decompressed and output to either printer, punch or SPO.

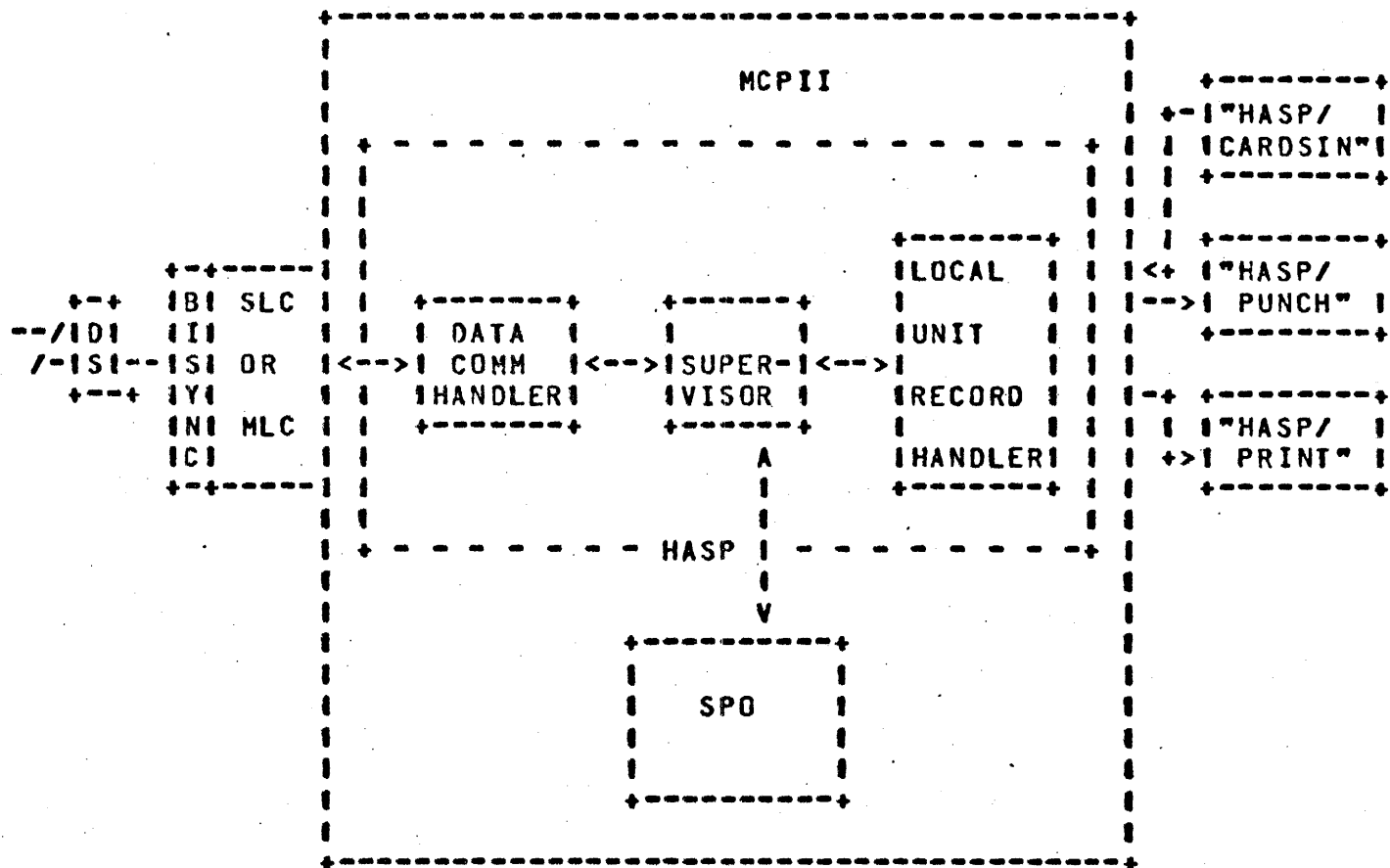
The operator can communicate with the host via HASP by entering <mix # of HASP>AX\$DM<n>, "THIS IS A MESSAGE". HASP sends everything following the AX until an ETX is encountered. The session can be terminated by sending a sign off card or by entering <mix # of HASP>AX.CLOSE. Either one will cause HASP to sign off, print a summary statistics report, and then go to end of job.

Any SPO command whose first character is a "." is interpreted as a local command and intended for HASP. (see LOCAL COMMAND SUBMISSION)

<n> is the Remote's ID.

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BLOCK DIAGRAM OF HASP-DIRECT MODE

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SYSTEM REQUIREMENTS

The system requirements for B1700 HASP/RJE are:

MCPII
48K Bytes Main Memory
80- or 96-Column Card Reader
120- or 132-Position Printer
SPO
Disk (Cartridge, Disk Pack or Head-per-Track)
Single Line or Multi Line Control
EBCDIC Bisync Adapter
80- or 96-Column Punch (optional)

Note: IBM OS object code reading and punching is supported on
80 and 96 column equipment for MCPII 5.1 or higher.

Larger memory sizes are required when multi-programming other jobs
with HASP remote programs.

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RUN TIME PARAMETERS

Each remote B1700 HASP/RJE system will have unique run time parameters, i.e., buffer size, remote ID, compression type, etc. that are dynamically set at beginning of job. In the past these HASP variables were compiled into a remote program and any change in the remote necessitated a recompilation of the remote program.

Currently, however, HASP has a list of default run time parameters that the operator can keep or override at the start of a HASP/RJE session.

At the beginning of job, HASP will interrogate program switch zero for a zero value. If a zero value is found (meaning switch was not set by operator when executing HASP), HASP will attempt to read a disk file labelled "HASP/PARMS" to obtain the appropriate run time parameters for this HASP/RJE session. If the "HASP/PARMS" file is found the syntax of the parameters in the file is checked. If the parameters are syntax error free, HASP proceeds to the establishment phase of the HASP/RJE session. To bypass the search for the "HASP/PARMS" file on disk, the operator should execute HASP as follows:

```
EX HASP SW 0 2F2;
```

"HASP/PARMS" disk file can be created by "DMPALL" or any suitable card-to-disk program. Refer to PARAMETER DEFAULTS AND FORMATS for parameter defaults and formats.

If any of the following occurs:

- a.) SW 0 is set
- b.) "HASP/PARMS" disk file not present
- c.) "HASP/PARMS" disk file contains an invalid parameter

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HASP will display the message:

USE DEFAULT PARAMETERS?

Run time parameter entry occurs at this time. The acceptable responses to "USE DEFAULT PARAMETERS?" are:

<mix # of HASP>AXYES

"YES" means use of all the default parameters. Refer to PARAMETER DEFAULTS AND FORMATS for defaults.

<mix # of HASP>AXR

"R" means read run time parameters from a card file "PARMS" labeled "HASP/PARMS". Refer to PARAMETER LIST ENTRY for format of parameter file.

<mix # of HASP>AX[Parameter List]

[Parameter List] is a list of run time parameters. Refer to PARAMETER LIST ENTRY for format of parameter list.

<mix # of HASP>AX/*SIGNON...

"/*SIGNON..." is the exact format of the first 72 columns of a SIGNON card. This entry will override the default SIGNON card and any IDs or /*SIGNON found in subsequent parameter entry. After HASP has accepted the signon entry, the operator can continue with a YES, R, or [Parameter List] response.

If none of the above are entered, an "INVALID RESPONSE, TRY AGAIN" message will be displayed.

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PARAMETER DEFAULTS AND FORMATS

The table below lists default run time parameters. These parameters will be used if reply in RUN TIME PARAMETERS is "YES". Specific run time parameter defaults are overridden by entry of that parameter in the [Parameter List] or by the presence of that parameter in the card file "HASP/PARMS". Omission of a parameter causes the default to be used.

Default parameters should not be set. For example, SPOOL means SPOOL mode of operation and the absence of SPOOL means DIRECT mode of operation since DIRECT is not a valid parameter.

RUN TIME PARAMETER DEFAULTS

| Parameter ----- | Meaning ----- | Default ----- |
|--------------------|---|--------------------------------|
| SPOOL | SPOOL mode of operation | DIRECT mode of operation |
| LEASED | Leased Line | Switched Line |
| PROBLEM | Run with the DEBUG file open | Run with the DEBUG file closed |
| /*SIGNON... | Signon card image | REMOTE1 with no password |
| ID=<n> | Remote's ID, where <n> is a one or two digit number. If the ID is only one digit, do not precede it with a leading zero. Correct ID=1, incorrect ID=01. | ID=1 |
| BUFFER=<n> | Teleprocessing buffer size, where <n> is 3 or 4 digits from 132 to 4095. Note <n> | BUFFER=400 |

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must match the buffer size
 of the host system and
 dynamic memory size must be
 changed if default is not
 used (See DYNAMIC MEMORY SIZE).

ADDRESS=
 P:C:A:

Address of bisync
 adapter, where:

ADDRESS=7:12:0:

P = one digit port # (0-7)

C = one or two digit
 channel # (0-15)

A = one or two digit
 adapter # (0-15)

Note: Ending colon is
 required.

NONTRANS

Non-transparent text

Transparent text

PRINTER=<n>

Printer line size, where
 <n> is = 132 or 120. <n> must
 match size of remote
 printer line and
 generated size in host.

PRINTER=132

QUEUE=<n>

Number of buffers
 allowed to be queued
 internally before host
 is told to suspend
 transmission. <n> is
 a value from 2 to 4.

QUEUE=2

COMP.TYPE=<n>

Type of data compression
 where <n> = 0, 1, 2, or 3

COMP.TYPE=3

0 = no compression

1 = no compression, but
 strip trailing blanks

2 = compress two or more
 blanks and strip
 trailing blanks

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3 = all of the above plus
 compress any occurrence
 of duplicate characters
 equal to or greater than
 COMPRESSION.MIN

COMPRESSION.
 MIN=<n>

Number of consecutive
 duplicate characters
 before compression
 occurs. <n> = 2 to 31.

COMPRESSION.MIN=4

AUDIT

Open "DC/AUDIT.FILE"
 at start of session
 and monitor data comm
 I/O.

No AUDITing

PARAMETER LIST ENTRY

If the operator desires to override one or more of the default run time parameters, he enters either "R" or [Parameter List], in response to "USE DEFAULT PARAMETERS?".

If the entry is through a [Parameter List] on the SPO, the operator can enter up to 72 characters to override the default parameters. If more characters are required, the operator must submit the parameter(s) through the card file labeled "HASP/PARMS".

If the entry is through the card file, there may be one or more parameters per card and all 80 columns of the card may be used. However, a parameter must be contained completely on a card because there is no parameter continuation.

The parameter entry, whether from cards or SPO, is free form with the following exception:

Any parameter with an equal sign must:

- a.) not have any imbedded blanks
- b.) be ended with a blank

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If an error is detected (invalid keyword or value) the parameter scan is ended, the next 8 characters are displayed and the operator must correct the error and resubmit the entire list of default overrides again.

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OPERATING INSTRUCTIONS

At the beginning of job HASP will set the run time parameters and verify that the data comm control and bisync adapter are present. Then HASP will wait for data set ready (always present on leased line, present upon host answering call on switched lines) and then transmits a SOHENO sequence. Upon receipt of an ACKO sequence from the host, the message "COMMUNICATIONS ESTABLISHED" is displayed on the B1700 SPO. If the format of the signon message, remote ID or password is invalid, the host will disconnect the remote. If the signon is correct, the B1700 and the host will go into a "handshaking" phase until either one has a data stream to transmit to the other.

LOCAL COMMAND SUBMISSION

To submit a command to the host HASP system, enter the following:

<mix # of HASP>AX.[local command]

Presently there are five local commands supported.

(a.) .SR1 - Start Input Reader has four formats.

- 1) .SR1 - SPOOL mode will cause transmission of "HASP/CARDS" input spool disk file. In DIRECT mode it will cause transmission of "HASP/CARDSIN" input card file.
- 2) .SR1 A - SPOOL mode will cause transmission of input spool disk file labelled "A" *. In DIRECT mode it will cause transmission of input card file, labelled "A".*
- 3) .SR1 A/B - SPOOL mode will cause transmission of input spool disk file labelled "A/B" *. In DIRECT mode it will cause transmission of input card file "A/B". *

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- 4) .SRI A/B/C - SPOOL mode will cause transmission of "B/C" from disk pack labelled "A" *. In DIRECT mode it will cause transmission of "B/C" from disk pack labelled "A".
 *

* A, B and C are character strings of 10 characters or less.

(b.) .CLOSE - Close down system. .CLOSE will cause transmission of a /*SIGNOFF card and close down of system when current streams have completed.

(c.) .NEW-SPOOL - If in SPOOL mode, .NEW-SPOOL will cause the current output spool to be closed as soon as all current output streams are finished and a new output spool to be opened with a new name. Any new output streams will be suspended until a new output spool is open. If in DIRECT mode .NEW-SPOOL is an invalid local command.

(d.) .AUDIT - If the data comm I/O monitor is auditing the data comm I/O, .AUDIT will stop the auditing and close the audit file.

If the data comm I/O monitor is not auditing the data comm I/O .AUDIT will open the audit file and start data comm I/O monitoring.

(e.) .JCL1 - Allows the remote HASP user to separate his JCL from the data stream. .JCL1 can be used for any job that contains all necessary JCL before the data stream that is, multi-step jobs are precluded unless the JCL for step 2 and further steps is included in the data stream.

.JCL1 opens a card file labelled "HASP/JCL" that must contain all the necessary JCL for this job execution. End of file on "HASP/JCL" will cause "HASP/JCL" to be closed and a card file labelled "HASP/CARDSIN" to be opened. The records in "HASP/JCL" and "HASP/CARDSIN" will appear as one contiguous card stream to the host. .JCL1 is an invalid local command when in SPOOL mode.

Unless it appears somewhere within the "HASP/CARDSIN" file, the last JCL card in "HASP/JCL" must be:

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//NAME DD * .

Alternate file names that are supported for .SR1 are not supported for .JCL1.

.JCL1 example:

Given:

- a.) JCL is a card deck.
- b.) Data stream is a tape file.

Place the following deck in the card reader:

```
?DATA HASP/JCL
+-----+
| JCL CARDS |
+-----+
//NAME DD *
?END
```

Mount tape labelled "HASP/CARDSIN".

Enter the following local command:

```
<mix # of HASP>AX.JCL1
```

The cards in the card reader will be read and then the records on the tape will be read. All records will be sent to the host as one contiguous data stream.

All SPD entries not beginning with a "." are sent to the host for analysis and error reporting.

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CHANGE FORMS PROCESSING

In DIRECT mode when a special LOAD FORMS message is received, the HASP program will display the message and the host will wait for a start message signaling completion of forms change.

When necessary forms have been changed (cards for punch), the start message is as follows:

<MIX # of HASP>AX\$SRM<n>. PR1 (or PU1)

where <n> is the remote ID.

In SPOOL mode when a special LOAD FORMS message is received, the HASP program writes the LOAD FORMS message to the output spool and generates the correct response to the host automatically.

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SUMMARY STATISTICS REPORT

When closing down the B1700 HASP/RJE session, a summary statistics report, named HEREP (Hasp Environment Recording Error Printout), is printed. The format of the HEREP report is:

HASP ENVIRONMENT RECORDING ERROR PRINTOUT

| ERROR ID | CUMULATIVE COUNT OF LAST SESSION |
|-------------------|----------------------------------|
| BLOCK SEQ CK | XXXXXXXX |
| ERROR REPLY | XXXXXXXX |
| INVALID RESP | XXXXXXXX |
| TOTAL LINE ERRORS | XXXXXXXX |
| TIMEOUTS | XXXXXXXX |
| CRC | XXXXXXXX |
| OTHER LINE ERRORS | XXXXXXXX |
| NAKS RCVD | XXXXXXXX |
| NAKS SENT | XXXXXXXX |
| BLOCKS WRITTEN | XXXXXXXX |
| BLOCKS READ | XXXXXXXX |

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FILES

I. Common Files

Parameter file - "PARMS" labeled "HASP/PARMS".
Record Size is 80.
Blocking factor is 1.
Device: a.) If program switch zero is not set,
device is disk.
b.) If program switch zero is set,
device is card.
c.) If device is disk and file is not
present, device is changed to card.

Audit File - "AUDIT" labeled "DC/AUDIT.FILE"
Record Size is 180.
Blocks per area is 10.
Areas are 100.
Device is random disk.
The audit mechanism may be started by entering AUDIT
as a run time parameter or entering .AUDIT as a local
command.

Debug File - "DEBUGPRT" labeled "DEBUG/PRINTER"
Record Size is 132.
Blocking factor is 1.
Device is printer.
The debug mechanism may be started by entering
"PROBLEM" as a run time parameter.

Summary Results File - "HEREP" labeled "HEREP/REPORT"
Record Size is 132.
Blocking factor is 1.
Device is printer or backup disk.

II. SPOOL Mode Files

Input - "HASPIN" labeled "HASP/CARDS".
Record Size = buffer size.
Blocking factor is 1.
Device is disk.

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Note: Operator may request "HASPIN" with another label by use of the .SRI filename local command.

Output - "HASPOUT" labeled "HASP/PRINT01".
Record Size = buffer size.
Blocking factor is 1.
Device is disk.

Note: "HASPOUT" output spool #1 is labeled "HASP/PRINT01". Any subsequent spool, due to spool filling completely or .NEW-SPOOL local command, will be labeled "HASP/PRINT<nn>", where <nn> is incremented by 1 for each subsequent spool.

III. DIRECT Mode Files

Input - "HASPCARDS" labeled "HASP/CARDSIN".
Record Size is 80.
Blocking factor is 1.
Device is card.

Note: Operator may request "HASPCARDS" with another label by use of the .SRI filename local command.

Output - "HASPPRINT" labeled "HASP/PRINT".
Record size is print size.
Blocking factor is 1.
Device is printer or backup disk.

"HASPPUNCH" labeled "HASP/PUNCH".
Record size is 80.
Blocking factor is 1.
Device is punch or backup disk.

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DYNAMIC MEMORY SIZE

The HASP buffer sizes are determined by the run time parameter, Buffer=<n>, where <n> is the size of the teleprocessing buffer declared in the host system. In order to accommodate all installations, memory buffers are kept in a dynamic memory area. The dynamic size is computed by:

$[(\text{BUFFER SIZE} + 14) * 4 * 8] + (\text{BUFFER SIZE} * ((\text{QUEUE SIZE} * 2) + 3) * 8]$

For any buffer size different from the default size of 400 bytes (3200 bits), the HASP program must be modified via the MCP or executed with a memory statement, i.e.,

?EX HASP
 ?ME=35648

where the ME statement specifies the number of bits as computed above.

NOTE: In SPOOL mode whenever the dynamic memory size of HASP is changed, the dynamic memory size of HASP/SPOOL must be changed. Refer to HASP/SPOOL documentation for modifying of HASP/SPOOL dynamic memory size.

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SPO MESSAGES

HASP has five types of SPO messages:

- (a.) INFORMATIONAL
- (b.) PARAMETER ANALYSIS
- (c.) INPUT SPOOL ANALYSIS
- (d.) ERROR
- (e.) HASP

INFORMATIONAL MESSAGES

Informational messages display the status of HASP. The following is a table of informational messages:

Message

| | |
|--|---|
| RETRIES EXHAUSTED ON I/O ERRORS COUNTER REINITIALIZED | 121 consecutive I/O errors occurred and exhausted all retry counters. HASP continues to execute but the session should be terminated and the connection hardware checked. |
| RETRIES EXHAUSTED ON INVALID RESPONSES COUNTER REINITIALIZED | 121 consecutive invalid responses were received. HASP continues to execute but the session should be terminated and the connection hardware checked. |
| NNNN SPOOLS TRANSMITTED | HASP displays the number of spools transmitted during the current SPOOL mode session. This message is displayed at end of job. |
| READER 1 OPEN | HASP has opened the input spool (if SPOOL mode) or input card file if in DIRECT mode. |

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| | |
|--------------------------------------|---|
| READER 1 CLOSED | HASP has sent an end of file message to the host system for the current input stream. |
| <Filename> MISSING READER NOT OPENED | Operator started reader while in SPOOL mode and the disk-file filename was not present. |
| SPOOL WAS EMPTY | The input disk spool contained no records. |
| CAN'T SEND INPUT SIGNING OFF | Operator has attempted to start an input reader while HASP is signing off. |

PARAMETER ANALYSIS MESSAGES

PARAMETER ANALYSIS MESSAGES are messages displayed whenever an error is detected in analyzing run time parameter entry.

| Message ----- | Reason ----- |
|---------------------------|--|
| INVALID ID PARAMETER | Run time parameter for ID=<n> is not a one or two digit entry or is not followed by a blank. |
| NO PARAMETER ENTERED | No entries on record in file "HASP/PARMS". |
| INVALID ADDRESS PARAMETER | Run time parameter for ADDRESS= is not in the form ADDRESS=P:C:A: or the port, channel or adapter number is invalid. |
| INVALID BUFFER PARAMETER | Run time parameter for BUFFER= is not in the range of 132 to 4095 or is not followed by a blank. |
| INVALID PRINTER PARAMETER | Run time parameter for PRINTER= is not 120 or 132. |
| COMPRESSION TYPE INVALID | Run time parameter for COMP.TYPE= is not 0, 1, 2 or 3. |
| INVALID COMPRESSION MIN | Run time parameter for COMPRESSION.MIN= is not in the range 2 - 31. |

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| | |
|---|---|
| INVALID QUEUE PARAMETER | Run time parameter for QUEUE= is not in the range 2 - 4. |
| XXXXXX INVALID PARAMETER PLEASE CORRECT AND RE-ENTER | Message is displayed upon detection of first error in a parameter list. XXXXXX is invalid entry. All parameters must be re-entered. |
| USE DEFAULT PARAMETERS? | Request for run time parameter entry (see RUN TIME PARAMETERS) |
| INVALID RESPONSE, TRY AGAIN | Neither "R", "YES", parameter list nor /*SIGNON was entered in response to "USE DEFAULT PARAMETERS". |
| PARAMETER FILE ON DISK NOT VALID | "HASP/PARMS" disk file contained invalid parameter and will not be used for run time parameters. |

INPUT SPOOL ANALYSIS MESSAGES

When the input disk spool is opened, the first record which contains the parameters with which the spool was created are compared to the current run time parameters and the following messages are displayed if any errors are detected:

| Message ----- | Reason ----- |
|--|--|
| SPOOL HAS WRONG BUFFER SIZE, FILE CLOSED | Spool was created with a different buffer size than the current HASP buffer size. |
| WARNING COMPRESSION TYPES ARE DIFFERENT | The compression type of HASP is not the same as the spool. The spool is still transmitted to the host. |
| WARNING SPOOL INDICATED NON-TRANSPARENT TRANSMISSION | HASP is executing in transparent mode but the spool indicates non-transparent. The spool is still transmitted to the host. |

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WARNING SPOOL'S ID XX NOT
THE SAME AS HASP ID XX

The ID of the spool does not match
that of HASP. The spool is still
transmitted to the host.

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ERROR MESSAGES

Error messages are displayed whenever an operational error is detected by HASP.

Message

Reason

INVALID SPO MESSAGE

Operator entered an invalid local command. "." must precede local commands, for example.

SWITCHED ADAPTER BUT HASP
 CALLS FOR LEASED

HASP was executed with run time parameters indicating a leased line. However, the adapter was found to be strapped for switched line. The adapter must be removed and the jumper chip changed. A Clear/Start is then required.

LEASED ADAPTER BUT HASP
 CALLS FOR SWITCHED

HASP was executed with run time parameters indicating a switched line. However, the adapter was found to be strapped for leased line. The adapter must be removed and the jumper chip changed. A Clear/Start is then required.

NON BISYNC ADAPTER
 NNNNNNN

NNNNNNN is the adapter ID. Either the wrong adapter was used or the address of adapter was wrong.

NO CONTROL PRESENT

HASP determined that there was no data comm control at specified address.

INVALID PERMISSION TO
 SEND

An invalid permission to send was received from the host. The permission to send is ignored. Permission was not in response to request to send.

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INVALID RCB

An invalid RCB was received from the host. The block is discarded.

DYNAMIC SPACE NOT LARGE ENOUGH

The dynamic memory area was not large enough to hold the buffers. HASP is cancelled and the dynamic memory size must be corrected.

ERROR: CONTROL BYTE INVALID, BLOCKED SKIPPED

The first record in the message blocks passed between the RTP and IO procedures contains a control byte. Should this control byte be invalid this message will be displayed and the block ignored.

ERROR: ONLY ONE INPUT OR OUTPUT STREAM CURRENTLY ALLOWED

Since multiple devices are not currently possible, should a block be received for a non supported device, this message is displayed and the block ignored.

SEQUENCE ERROR ENCOUNTERED (COUNT)

All message blocks passed between the RTP and IO procedures contain a sequence number. Should an out-of-sequence message block be detected, this message is displayed.

ERROR: ONLY ONE OUTPUT STREAM ALLOWED, RECORD SKIPPED

Message block contained a control byte for other than stream number 1.

ERROR: INVALID "SRCB" RECORD SKIPPED

Message block contained an invalid SRCB.

ERROR: INVALID SCB LENGTH ENCOUNTERED

Length of SCB was greater than output record size. Only portion of record equal to record size is processed.

INVALID MESSAGE LENGTH ENCOUNTERED

All message blocks have a length field giving the length in bytes of the text in the block. Should this length be greater than permitted, this message will be displayed and the permitted portion of the block is processed.

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HASP MESSAGES

All operator messages received from the host system are decompressed and displayed. These messages will always start with a "\$".

B1700 HASP OPERATING EXCEPTIONS WITH 360/20

I. Channel Skips:

Not all Burroughs' line printers are capable of handling a skip to channel 12. If such a skip is to be done, check to verify that this is possible on the system on which HASP is to be run.

II. File Closing:

HASP opens and closes its output files many times within a session. Often an open is issued immediately after the file has been closed, and the MCP has not completely closed the device. When this is the case, a message:

"PRINTER OR BACKUP DISK REQUIRED FOR "HASP/PRINT<nn>"

will be displayed. When the device is fully closed, the file will be automatically opened. All printer and punch files are declared optionally as disk backup. If the MCP "PBD" option is set and above case occurs or output is directed by the MCP command "OU" to disk, all subsequent output will automatically go to disk backup.

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GENERAL

This section describes the use of a Burroughs B1700 as a HASP remote station, i.e., the HASP/SPOOL program and its use in the HASP environment. The HASP program was described in HASP(Section I).

SPOOL MODE

SPOOL mode consists of three distinct phases.

- Phase #1 Input spool creation (off line) with HASP/SPOOL.
- Phase #2 Input spool transmission and receipt of output spool (on line) with HASP.
- Phase #3 Output spool printing and punching (off line) with HASP/SPOOL.

NOTE: "On line" is defined as: connected via data comm to the host HASP system.

"Off line" is defined as: no connection with the host HASP system.

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SPOOL Phase #2

Phase #2 consists of executing HASP, accepting appropriate run time parameters (refer to RUN TIME PARAMETERS of HASP(Section I)), establishing communication, transmitting input spools, and receiving output from the host system. After communication is established, HASP signs on and enters a handshaking mode with the host. To transmit an input spool file, the operator starts an input reader by entering the local HASP command <mix # of HASP>AX.SR1 or <mix # of HASP>AX.SR1 <filename>, where <filename> is an optional name of the input spool if the input spool is not labelled "HASP/CARDS".

After verifying that the input spool was created with the same run time parameters as HASP, a message is displayed "READER 1 OPEN" and the file is transmitted. After the file has been completely transmitted, HASP displays "READER 1 CLOSED". If another spool is to be transmitted, the operator repeats the above procedure.

Any output received during the spool-mode HASP/RJE session is written in its blocked and compressed form into the output spool disk file HASPOUT. HASPOUT is initially labelled "HASP/PRINT01". Whenever HASPOUT is closed and reopened during the HASP/RJE session (see SPOOL MODE INPUT OPERATION of HASP(Section I)), the label for HASPOUT is incremented by 1.

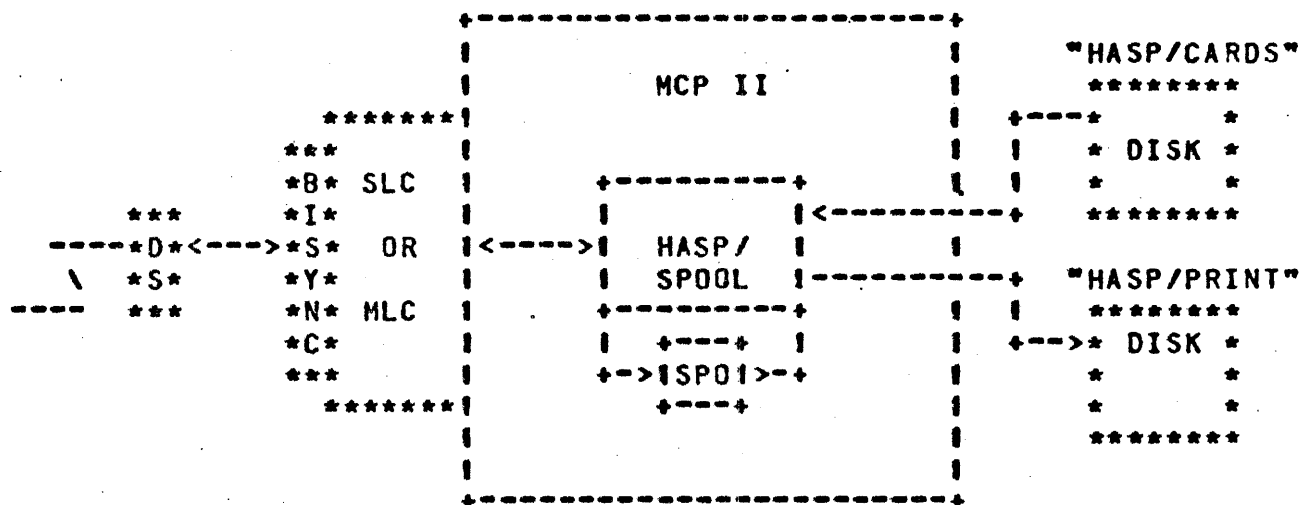
The operator may communicate with the host system by entering console messages to HASP. For example, <mix # of HASP>AX\$DM, "THIS IS A MESSAGE" would cause HASP to transmit the entire string following the <mix #>AX until ETX is encountered. Any SPO command whose first character is a "." is interpreted as a local command intended for HASP (see SPOOL MODE INPUT OPERATION of HASP(Section I)). Phase #2 is terminated by entering <mix # of HASP>AX.CLOSE on the console which causes HASP to sign off, close the output file and print a summary statistics report for this session.

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SPOOL MODE

Phase #2 SPOOL TRANSMISSION



SPOOL Phase #3

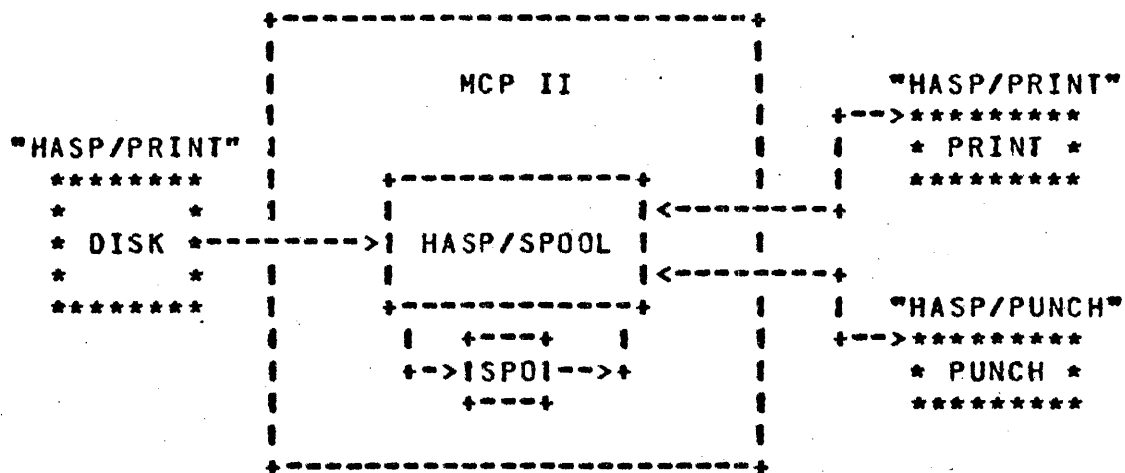
Phase #3 prints and punches data from the output spool file. The operator executes HASP/SPOOL and selects the output mode of operation. HASP/SPOOL reads the output spool disk file called "HASP/PRINT01", deblocks and decompresses the records, and then prints or punches the output. This is all done off-line to lessen system requirements during the actual HASP/RJE session with the host.

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SPOOL MODE

Phase #3 OUTPUT SPOOL PRINTING AND PUNCHING



DIRECT MODE

HASP/SPOOL program is only an off-line service program and does not execute in Direct Mode. Refer to HASP (Section I) for description of Direct Mode.

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SYSTEM REQUIREMENTS

The system requirements for B1700 HASP/RJE are specified in Section I of the HASP documentation. The minimum system for HASP/SPOOL are:

MCPII
32K Bytes Main Memory
80- or 96-Column Card Reader
120- or 132-Position Printer
SPO
Disk (Cartridge Disk Pack or Head-Per-Track)
An 80- or 96-Column Card Punch in optional

NOTE: IBM OS object code reading and punching is supported on 80- and 96-column equipment.

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RUN TIME PARAMETERS

Each remote B1700 HASP/RJE system will have unique run time parameters, i.e., buffer size, remote ID, compression type, etc. that are dynamically set at beginning of job. In the past these HASP variables were compiled into a remote program and any change in the remote necessitated a recompilation of the remote program.

HASP/SPOOL requires knowledge of some of these parameters to create compatible spools for later transmission and to process spools from a previous HASP/RJE session.

HASP/SPOOL requires only a subset of the run time parameters required by HASP. For ease of operation, the same parameters, whether required by HASP/SPOOL or not, can be entered to HASP/SPOOL as to HASP. Unused parameters are syntax checked and then ignored.

HASP/SPOOL has a list of default run time parameters that the operator can change or override at the start of HASP/SPOOL execution.

At the beginning of job, HASP/SPOOL will interrogate program switch zero for a zero value. If a zero value is found (meaning switch was not set by operator when executing HASP/SPOOL), HASP/SPOOL will attempt to read a disk file labelled "HASP/PARMS" to obtain the appropriate run time parameters for this execution of HASP/SPOOL. If the "HASP/PARMS" file is found, the syntax of the parameters in the file are checked. If the parameters are syntax error free, HASP/SPOOL sets a flag indicating parameters from disk were read and are valid.

To bypass the search for the "HASP/PARMS" file on disk the operator should execute HASP/SPOOL as follows:

```
EX HASP/SPOOL SW 0 2F2;
```

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"HASP/PARMS" disk file can be created by "DMPALL" or any suitable card-to-disk program. Refer to PARAMETER DEFAULTS AND FORMATS for parameter defaults and formats.

After HASP/SPOOL has determined the run mode for this execution of HASP/SPOOL (Refer to SPOOL MODE OPERATING INSTRUCTIONS for operating instructions) and if any of the following occurred:

- a) SWO is set,
- b) "HASP/PARMS" disk file not present,
- c) "HASP/PARMS" disk file contains an invalid parameter,

HASP/SPOOL will display the message:

USE DEFAULT PARAMETERS?

Run time parameter entry occurs at this time. The acceptable responses to "USE DEFAULT PARAMETERS?" are:

- <mix # of HASP/SPOOL>AXYES "YES" means use of all the default parameters. Refer to PARAMETER DEFAULTS AND FORMATS for defaults.
- <mix # of HASP/SPOOL>AXR "R" means read run time parameters from a card file "PARMS" labeled "HASP/PARMS". Refer to PARAMETER LIST ENTRY for format of parameter file.
- <mix # of HASP/SPOOL>AX
 [Parameter List] [Parameter List] is a list of run time parameters. Refer to PARAMETER LIST ENTRY for format of parameter list.
- <mix # of HASP/SPOOL>
 AX/*SIGNON... /*SIGNON... is the exact format of the first 72 columns of a signon card. This entry will override the default signon card and any IDs or /*SIGNON found in subsequent parameter entry. After HASP/SPOOL entry, the operator can continue with a YES, R, or [Parameter List] response.

If none of the above are entered, an "INVALID RESPONSE, TRY AGAIN" message will be displayed.

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PARAMETER DEFAULTS AND FORMATS

The table below lists all the default run time parameters. These parameters will be used if the reply in RUN TIME PARAMETERS is "YES". Specific run time parameter defaults are overridden by entry of that parameter in the parameter list or by the presence of that parameter in the card file "HASP/PARMS". Omission of a parameter causes the default to be used.

Note: Default parameters should not be set. For example: SPOOL, means SPOOL mode of operation and absence of SPOOL means DIRECT mode of operation. DIRECT is not a valid parameter.

RUN TIME PARAMETER DEFAULTS

| Parameter ----- | Meaning ----- | Default ----- |
|--------------------|--|--------------------------------|
| *SPOOL | SPOOL mode of operation | DIRECT mode of operation |
| *LEASED | Leased Line | Switched Line |
| *PROBLEM | Run with the DEBUG file open | Run with the DEBUG file closed |
| */*SIGNON... | Signon card image | REMOTE1 with no password |
| *ID=<n> | Remote's ID, where <n> is a one or two digit number. If the ID is only one digit, do not precede it with a leading zero. Correct: ID=1, Incorrect: ID=01 | ID=1 |

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** BUFFER=<n> Teleprocessing buffer size BUFFER=400
 where <n> is 3 or 4 digits
 from 132 to 4095. Note <n>
 must match the TP buffer
 size of the host system
 and dynamic memory size
 must be changed if default
 is not used (See DYNAMIC
 MEMORY SIZE).

*ADDRESS=
 P:C:A Address of Bisync Adapter ADDRESS=7:12:0:
 where:
 P=one digit port # (0-7)
 C=one or two digit channel
 # (0-15)
 A=one or two digit adapter
 # (0-15)

Note: Ending colon is required.

*NONTRANS Non-transparent text Transparent text

**PRINTER=<n> Printer line size, where <n> PRINTER=132
 is = 132 or 120. <n> must
 match size of remote
 printer line and generated
 size in host.

*QUEUE=<n> Number of buffers allowed QUEUE=2
 to be internally queued
 before host is told to
 suspend transmission. <n> is
 a value from 2 to 4.

**COMP.TYPE=<n> Type of data compression, COMP.TYPE=3
 where <n> = 0, 1, 2, or 3
 0=no compression
 1=no compression but strip
 trailing blanks
 2=compress two or more

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blanks and strip trailing
 blanks

3=all of the above plus
 compress any occurrence of
 duplicate characters equal
 to or greater than
 COMPRESSION.MIN

*AUDIT Open "DC/AUDIT.FILE" at No AUDITing
 start of session and
 monitor data comm I/O.

**COMPRESSION.
 MIN=<n> Number of consecutive COMPRESSION.MIN=4
 duplicate characters before
 compression occurs.
 <n>=2 to 31.

*Only included to keep parameter file compatible with HASP parameters.
 **Parameter is vital to HASP/SPOOL.

PARAMETER LIST ENTRY

If the operator desires to override one or more of the default run time parameters, he either enters R or [Parameter List] on the SPD, in response to "USE DEFAULT PARAMETERS".

If the entry is through a [Parameter List] on the SPD the operator can enter up to 72 characters to override the default parameters. If more characters are required the operator must submit the parameters through the card file labeled "HASP/PARMS".

If the entry is through the card file, there may be one or more parameters per card and all 80 columns of the card may be used. However, a parameter must be contained completely on a card because there is no parameter continuation.

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The parameter entry, whether from cards or SPO, is free form with the following exception:

Any parameters with an equal sign must

- (a.) not have any imbedded blanks
- (b.) be ended with a blank

If an error is detected (invalid keyword or value) the parameter scan is ended, the next 8 characters are displayed and the operator must correct the error and resubmit the ENTIRE list of default overrides again.

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SPOOL MODE OPERATING INSTRUCTIONS

HASP/SPOOL is executed by the operator. By the use of operator commands, HASP/SPOOL can perform the following functions:

1. Read a card file, compress it, build HASP transmission blocks and write these blocks to a disk file "HASP.OUT" labeled "HASP/CARDS".
2. Read a disk file "HASP.IN" labeled "HASP/PRINT<nn>", decompress the disk file and print or punch the files records, where <nn> is 01 to 99.

Upon executing HASP/SPOOL, the following messages will be displayed:

```
SPOOLED MODE
ENTER .SR1 FOR INPUT OR .SP1
FOR OUTPUT OR .BOTH FOR INPUT
AND OUTPUT TOGETHER
ACCEPT
```

The operator then enters:

<mix # of HASP/SPOOL>

a. .SR1 <filename>

.SR1 is for reading an input card file and creating "HASP/CARDS" disk spool.

Filename is optional. When filename is not used the input card file opened will be labeled "HASP/CARDSIN". If filename is present the file opened will be labeled <filename>.

Filename can be of the following formats:

1. A
2. A/B
3. A/B/C

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Where A, B and C are character strings of 10 or less characters.

b. .SP1 <filename>

.SP1 is for reading a HASP disk output spool and printing or punching the records. Filename is optional. When filename is not used the spool file opened will be labeled "HASP/PRINT01". If filename is present the spool file opened will be labeled <filename>. <Filename> can be of the following formats:

1. A
2. A/B
3. A/B/C

Where A, B, and C are characters strings of 10 or less characters.

c. BOTH

BOTH is for reading a card file labeled "HASP/CARDSIN" and creating a spool file labeled "HASP/CARDS" while reading a HASP output spool labeled "HASP/PRINT01" and printing or punching the records.

There is no optional filename with BOTH.

After the operator has correctly responded, HASP/SPOOL will test if run time parameters are already set from disk. If not, HASP/SPOOL will display the following message:

USE DEFAULT PARAMETERS?

Run time parameter entry occurs at this time. See RUN TIME PARAMETERS for explanation of run time parameters.

SPOOL MODE OUTPUT OPERATION

When HASP/SPOOL is executing in the output environment (SP1), HASP/SPOOL opens a disk file labeled "HASP/PRINT01" or optional "filename". The first record of the file is a parameter record.

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HASP/SPOOL compares its run time parameters with the parameters used to create "HASP/PRINT01". Should the differences between the spooled file and HASP/SPOOL parameters be serious (for example, buffer size), the program will print an error message and stop. Any non-serious difference will cause a warning message to be printed and HASP/SPOOL will continue.

After the parameter check HASP/SPOOL starts decompressing and outputting the disk file. The disk file is read until end of file is detected and then closed.

Should the special forms request message display:

"JOB XXX LOAD XXX FORMS IN RM<ID>.PRI"

HASP/SPOOL will wait until the operator loads the special forms and answers with:

<mix # of SPOOL>AX\$SRM<ID>.PRI or
 <mix # of SPOOL>AX\$SRM<ID>.PUI

depending upon whether a punch or printer request was seen.

All other SPD messages received by HASP when the spool file was being created will also be displayed.

SPOOL MODE INPUT OPERATION

When HASP/SPOOL is executing in the input environment (.SR1), HASP/SPOOL opens an output disk file labeled "HASP/CARDS" and an input card file named "HASP/CARDSIN" or optionally "filename". The card file is read until end of file is detected and then the card file is closed. All card records are compressed, blocked and written to the disk files. Subsequent card files can now be added (see FILES).

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END OF INPUT OR OUTPUT OPERATION

When either the output mode detects end of file on disk spool or the input mode detects end of file on the card file, the following messages are displayed on the SPO:

END OF FILE, ENTER COMMAND
ACCEPT

The four valid responses are:

1. <mix # of SPOOL>AX.SR1 <filename>

AX.SR1 causes HASP/SPOOL to again open a card file named "HASP/CARDSIN" or optionally "filename" and add it to the existing "HASP/CARDS" disk file.

2. <mix # of SPOOL>AX.SP1 <filename>

AX.SP1 causes HASP/SPOOL to again open a disk file named "HASP/PRINT01" or optionally "filename". A parameter comparison test is made and the disk file is output.

3. <mix # of SPOOL>AX.RS1

AX.RS1 is an operator command to resume printing or punching a spool. If during the execution of HASP in the spool mode the output spool file "HASP/PRINT01" is filled with compressed data, that file is closed and a new file labelled "HASP/PRINT02" is opened to receive the continuation of compressed data. At the end of the HASP session there will be two spool files, "HASP/PRINT01" and "HASP/PRINT02". <mix # of SPOOL>AX.RS1 can be used to output the continuation spool.

NOTE: Continuation spools are maintained automatically until end of current session.

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The following is an example procedure to follow in order to output the spool when the spool is contained in more than one file.

- I. HASP fills the first disk area allocated to "HASP/PRINT01" and the following messages are displayed:

END OF OUTPUT SPOOL AT (sequence #)
 HASP/PRINT01 FULL - RESUMED AS HASP/PRINT02.

- II. HASP/SPOOL is now executed by the operator with the following displays and responses:

SPOOLED MODE
 ENTER .SR1 FOR INPUT OR .SP1 FOR OUTPUT...
 ACCEPT
 1AX.SP1
 USE DEFAULT PARAMETERS?
 ACCEPT
 1AXYES
 END OF FILE, ENTER COMMAND

- III. Now the operator can finish outputting the spool with the resume command:

1AX.RS1

4. <mix # of SPOOL>AX.CLOSE

.CLOSE causes HASP/SPOOL to close all files currently open and go to end of job.

These responses are only permitted when the "END OF FILE" message has been displayed.

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FILES

I. SPOOL MODE FILES

Input: "HASP.IN" labeled "HASP/PRINT01"
Record size = buffer size
Blocking 1 record per block
Device is disk

"HASPCARDS" labeled "HASP/CARDSIN"
Record size = 80
Blocking 1 record per block
Device is card

Output: "HASPPRINT" labeled "HASP/PRINT"
Record size = print size
Blocking 1 record per block
Device is printer or backup disk

"HASPPUNCH" labeled "HASP/PUNCH"
Record size = 80
Blocking 1 record per block
Device is punch or backup disk

"HASP.OUT" labelled "HASP/CARDS"
Records size = Buffer size
Blocking 1 record per block
Device is disk

Parameter: "PARMS" labeled "HASP/PARMS"
Record size = 80
Blocking 1 record per block
Device: a) If program switch
zero is not set,
device is disk.
b) If program switch
zero is set, device
is card.
c) If device is disk
and file is not
present, device is
changed to card.

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DYNAMIC MEMORY SIZE

The HASP/RJE buffer sizes are determined by the run time parameter, BUFFER = <n>, where n is the size of the teleprocessing buffer declared in the host system. In order to accommodate all installations, memory buffers are kept in a dynamic memory area. The dynamic size is computed by:

$$[(\text{buffer size}) * 2] * 8 = \# \text{ of bits required}$$

For any buffer size different from the default size of 400 bytes (3200 bits), the HASP/SPOOL program must be modified via the MCP or executed with a memory statement, i.e.,

```
?EX HASP/SPOOL  
?ME=6400
```

where the ME statement specifies the number of bits as computed above.

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SPO MESSAGES

HASP/SPOOL has four types of SPO messages:

- a. OPERATIONAL
- b. PARAMETER ANALYSIS
- c. INPUT SPOOL ANALYSIS
- d. ERROR

OPERATIONAL MESSAGES

OPERATIONAL MESSAGES that require a response from the operator to direct the further operation of HASP/SPOOL.

| Message ----- | Reason ----- | Response ----- |
|--|---|--|
| SPOOLED MODE | Run Mode | None |
| ENTER .SR1 FOR INPUT .SR1 FOR OUTPUT OR BOTH FOR INPUT AND OUTPUT TOGETHER | Request | See SPOOL MODE OPERATING INSTRUCTIONS |
| END OF FILE, ENTER COMMAND | Input card file or input spool EOF detected | See END OF INPUT OR OUTPUT OPERATION |

PARAMETER ANALYSIS MESSAGES

Parameter analysis messages are messages displayed whenever an error is detected in analyzing run time parameter entry.

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Message

Reason

INVALID ID PARAMETER

Run time parameter for ID= is not a one or two digit entry, or is not followed by a blank.

NO PARAMETER ENTERED

No entries in record in file "HASP/PARMS".

INVALID ADDRESS
PARAMETER

Run time parameter for ADDRESS= is not in the form ADDRESS=P:C:A: or the port, channel or adapter number is invalid.

INVALID BUFFER
PARAMETER

Run time parameter for BUFFER= is not in the range of 132 to 4095, or is not followed by a blank.

INVALID PRINTER
PARAMETER

Run time parameter for PRINTER= is not 120 or 132.

COMPRESSION TYPE
INVALID

Run time parameter for COMP.TIME= is not 0, 1, 2, or 3.

INVALID COMPRESSION
MIN

Run time parameter for COMPRESSION.MIN= is not in the range 2 - 31.

INVALID QUEUE
PARAMETER

Run time parameter for QUEUE= is not in the range 2 - 4.

XXXXXX INVALID
PARAMETER, PLEASE
CORRECT AND RE-ENTER

Message is displayed upon detection of first error in a parameter list XXXXXX is invalid entry. All parameters must be re-entered.

USE DEFAULT PARAMETERS?

Request for run time parameter entry (see RUN TIME PARAMETERS).

INVALID RESPONSE, TRY
AGAIN

Neither "R", "YES", [Parameter List] nor /*SIGNON was entered in response to "USE DEFAULT PARAMETERS".

PARAMETER FILE ON DISK
NOT VALID

"HASP/PARMS" disk file contained invalid parameter and will not be used for run time parameters.

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INPUT SPOOL ANALYSIS MESSAGES

When HASP/SPOOL is executing in the spool output mode, the "HASP/PRINT01" disk spool is opened and the first record which contains the parameters with which the spool was created is read. These parameter are compared against the current run time parameters and if an error occurs one or more of the following messages are displayed:

| Message ----- | Reason ----- |
|---|--|
| ERROR: "BUFFER"- PARAMETER DOES NOT | Current size of HASP/SPOOL buffer does not match spool buffer size. Correct AGREE WITH SPOOL.= and re-execute program. |
| ERROR: "COMP.TYPE" PARAMETER INVALID | Current COMP.TYPE of HASP/SPOOL does not match COMP.TYPE of spool. |
| ERROR: "COMPRESSION.MIN" PARAMETER INVALID | Current COMPRESSION.MIN of HASP/SPOOL does not match COMPRESSION.MIN of spool. |

ERROR MESSAGES

Error messages are displayed whenever an operational error is detected by HASP/SPOOL.

| Message ----- | Reason ----- |
|---|---|
| ERROR: CONTROL BYTE INVALID, BLOCK SKIPPED | The first byte of a record to or from HASP/SPOOL is a control byte. Should it be invalid, this message will be displayed and the block ignored. |
| ERROR: ONLY ONE INPUT | Since multiple devices are not currently |

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OR OUTPUT STREAM
CURRENTLY ALLOWED

possible, should a block be received for an additional device, this message is displayed and the block ignored.

SEQUENCE ERROR
ENCOUNTERED (count)

All message blocks in the spool are internally sequenced. Should a block be lost, this message is displayed along with the sequence count of expected. The block is unpacked and output.

ERROR: ONLY ONE OUTPUT
OR OUTPUT STREAM
CURRENTLY ALLOWED

Message block contained a RCB for other than stream number 1. Blocking is skipped and the first portion is output on the SPO.

ERROR: INVALID "SRCB",
RECORD SKIPPED

Message block contained an invalid SRCB.

ERROR: INVALID SCB
LENGTH ENCOUNTERED

Length of SCB was greater than output record size. Only the portion of the record equal to output record size is processed.

INVALID MESSAGE LENGTH
ENCOUNTERED

All message blocks have a length field giving the length in bytes of the text in the block. Should this length be greater than permitted, this message is displayed and the permitted portion of the block is processed.

INVALID "RCB" DETECTED,
BLOCK SKIPPED

HASP/SPOOL detected an invalid RCB; the block is ignored.

ERROR: SPOOL FILE EMPTY

The input spool contains no records.

INVALID RESPONSE

This message will be displayed for any invalid response to an ACCEPT condition. The program will then wait for another input message.

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GENERAL

TESTBSC is a B1700 SDL program written to exercise and verify the quality of a Binary Synchronous (BSC) line between a Burroughs B1700 computer with a Single Line Control (SLC) or Multi-Line Control (MLC), using the Burroughs BSC EBCDIC line adapter, and an IBM computer with a compatible Binary Synchronous Control.

TESTBSC requires a Burroughs-written 360/370 OS BAL program named BURRBSC to be executing in the IBM computer. See technical documentation of BURRBSC, HASP(section IV), for a description of the host program.

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OPERATION

TESTBSC can run in one of four modes:

- (1) Leased transparent
- (2) Leased non-transparent
- (3) Switched transparent
- (4) Switched non-transparent

TESTBSC makes the connection with the IBM computer (dependent on leased or switched) and transfers 256 messages to the IBM computer which will echo the message back. The format of each message is different and all possible bit configurations are transmitted. The echoed message is compared to the transmitted message and any noncompares are logged.

After 256 messages have been successfully echoed or error retries are exhausted, TESTBSC prints the results of the test and goes to end of job.

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OPERATING INSTRUCTIONS

RUN TIME PARAMETERS

After execution of TESTBSC, the following messages will be output to the SPO.

USE DEFAULT PARAMETERS?

TESTBSC is asking whether to use the default parameters

SWITCHED
 TRANSPARENT
 ADDRESS 7:12:0:

or to use the parameters entered through the SPO or via a card file.

To use the default parameters, reply: <MIX # OF TESTBSC>AXYES.

To override a default, enter <MIX # OF TESTBSC>AX[Parameter List] or <MIX # OF TESTBSC>AXR where [Parameter List] is a free form list of parameters, and R signifies that the parameters are in a card file labelled "HASP/PARMS". Valid parameters are:

LEASED for leased line

NONTRANS for non-transparent

ADDRESS=P:C:A: for address of adapter where

P = 1 digit port number

C = 1 or 2 digit channel number

A = 1 or 2 digit adapter number

EXAMPLE:

<MIX # OF TESTBSC>AX LEASED

<MIX # OF TESTBSC>AX NONTRANS LEASED

<MIX # OF TESTBSC>AX ADDRESS=7:12:0: LEASED NONTRANS

<MIX # OF TESTBSC>AXR

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If an invalid parameter is entered, an error message will be displayed containing the first 8 bytes of the parameter in error. The operator can correct the error and re-enter YES, [Parameter List] or R.

To be compatible with the HASP/RTP program, the same HASP/PARMS card file can be used. Unused parameters including the /*SIGNON card are ignored.

After successful parameter input, the line is broken if it is a switched line; then the presence of the adapter and the control is checked and the strapping option of the adapter is verified to be the same as specified (either LEASED or SWITCHED). Appropriate error messages are displayed.

If the proper hardware is ready and the connection is a LEASED line, then one of the following messages will be displayed:

- (1.) BURRBSC TEST 2 MUST BE RUNNING IN IBM COMPUTER
for transparent data or
- (2.) BURRBSC TEST 4 MUST BE RUNNING IN IBM COMPUTER
for non-transparent data.

If the connection is a switched line, one of the following messages will be displayed:

- (1.) DIAL IBM COMPUTER WITH BURRBSC TEST 2 RUNNING
for transparent data or
- (2.) DIAL IBM COMPUTER WITH BURRBSC TEST 4 RUNNING
for non-transparent data.

After connection has been made the following message will be displayed:

CONNECTION MADE

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INQUIRY

After the connection has been established, TESTBSC will send an SOH ENQ sequence to BURRBSC, which will respond with an ACK0.

If there is no reply to the SOH ENQ sequence and the connection is leased, an error message is printed. On both leased and switched lines, the retry counter is decremented and tested. If the retry counter is not zero, the SOH ENQ is retransmitted. If the retry counter goes to zero before receiving a valid ACK0, TESTBSC will print summary results and go to end of job.

TEST TRANSFER

Text transfer starts after connection has been made and an ACK0 received to the SOH ENQ sequence. The test buffer will be of two formats.

Transparent - all 256 possible bit patterns.

Non-transparent - 256 characters with Hex 00-3F having the most significant bit on to avoid being a line control character.

Before transmission, the text buffer is rotated.

Upon completion of the transmission and the following read for the echoed response, the I/O operation is tested for errors. If an error is detected, the error is logged on the printer, the error retry counter is decremented and tested. If the retry counter is zero, the summary results are printed and TESTBSC goes to end of job. If the retry counter is not zero, the last message is retransmitted.

If no line error was detected, the read buffer is tested for a NAK and if a NAK was received, the NAK is logged on the printer and the last message is retransmitted.

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If completion is good and a NAK was not received, the received data is compared to the transmitted data. If a compare error is detected, an error message is printed, the retry counter decremented, and the last message retransmitted.

If the received and transmitted data compare then the text buffer is rotated one position so that each of the 256 messages transmitted will be different and the end of messages condition is tested. If not end of messages, the next text buffer is transmitted. If end of messages, a DLE EOT is sent to tell BURRBSC that the test is complete. TESTBSC then prints the test results and goes to end of job.

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ERROR MESSAGES

Message

Meaning

| | |
|---|--|
| READ TEXT ERROR | I/O exception during message transfer |
| SEND ENQ ERROR | I/O exception during Inquiry |
| RESULT DESCRIPTOR ONE N...N | First result descriptor - Write Op |
| RESULT DESCRIPTOR TWO N...N | Second result descriptor - Read Op |
| READ EXCEPTIONS | Read Op failed - reason follows message |
| WRITE EXCEPTIONS | Write Op failed - reason follows message |
| CRC ERROR | Exception |
| READ MEMORY ACCESS ERROR | Exception |
| WRITE MEMORY PARITY ERROR | Exception |
| TIME OUT ERROR | Exception |
| BREAK RECEIVED OR DETECTED | Exception |
| NO ENDING CONTROL DETECTED | Exception |
| LOSS OF DATA SET READY | Exception |
| LOSS OF CLEAR TO SEND ON WRITE OR LOSS OF CARRIER ON READ | Exception |
| WRITE BUFFER | Write buffer follows in Hex |
| READ BUFFER | Read buffer follows in Hex |
| READ OF DID NOT COMPLETE | No read buffer because Write Op failed |
| NO DATA RECEIVED | No data read into receive buffer |

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RESULT MESSAGE

At end of job the following message will be printed.

B1700 BSC LINE VERIFICATION RESULTS
 | SWITCHED |
 < > LINE
 | LEASED |
 | |
 | |
 | TRANSPARENT |
 < > TEXT
 | NON-TRANSPARENT |
 | |

ADDRESS = P:C:A:

NUMBER OF SUCCESSFUL MESSAGES ECHOED nnnn

NAKS RECEIVED nnnn

CRC ERRORS nnnn

TIME OUTS nnnn

OTHER LINE ERRORS nnnn

DATA COMPARE ERRORS nnnn

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SPD MESSAGES

Message

Meaning

DIAL IBM COMPUTER WITH
 BURRBSC TEST 2 RUNNING

TESTBSC was executed with the switched line and transparent options. The compatible host test is BURRBSC Test 2. Operator must now manually dial host.

DIAL IBM COMPUTER WITH
 BURRBSC TEST 4 RUNNING

TESTBSC was executed with the switched line and non-transparent options. The compatible host test is BURRBSC Test 4. Operator must now manually dial host.

BURRBSC TEST 2 MUST BE
 RUNNING IN IBM COMPUTER

TESTBSC was executed with the leased line and transparent options. The compatible host test is BURRBSC Test 2 which must be running or after 11 consecutive line errors TESTBSC will abort.

BURRBSC TEST 4 MUST BE
 RUNNING IN IBM COMPUTER

TESTBSC was executed with the leased line and non-transparent options. The compatible host test is BURRBSC Test 4 which must be running or after 11 consecutive line errors TESTBSC will abort.

SWITCHED ADAPTER BUT TEST
 CALLS FOR LEASED

TESTBSC was executed with the leased line option but the adapter was found to be a "switched" adapter. TESTBSC will abort.

LEASED ADAPTER BUT TEST
 CALLS FOR SWITCHED

TESTBSC was executed with the switched line option but the adapter was found to be a "leased" adapter. TESTBSC will abort.

NON BSC ADAPTER NNNNNNN

The adapter was found not to be the EBCDIC BSC line adapter. NNNNNNN is the ID of adapter found. TESTBSC will abort.

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ERROR RETRIES EXHAUSTED
 ON | BREAK |
 | SEND ENQ |
 | READ TEST |

Error retry counter reached zero. Seven consecutive errors were detected on all operations except send SOH ENQ where the count is 11. Summary results will now be printed and TESTBSC will abort.

USE DEFAULT PARAMETERS

TESTBSC is asking operator whether or not to use the default parameters. Correct responses are:

"YES", use defaults

"R", parameters are in card file labelled HASP/PARMS

[Parameter List] list of parameters.

XXXXXXXX INVALID PARAMETER
 CORRECT AND RE-ENTER

TESTBSC parameter analysis found an invalid parameter. XXXXXXXX is the first eight characters of the parameter detected as invalid. This message is printed as the first invalid parameter in a card image or SPO entry is detected. Subsequent parameters on that card image or SPO entry are not checked. The operator at this time has the same options as to the response of "USE DEFAULT PARAMETERS".

For a card file each card image is analyzed before operator is given a chance to correct the invalid parameters.

It is important to note that all parameters must be re-entered and not just the corrected invalid parameter.

NO PARAMETERS
 ENTERED

TESTBSC parameter found no parameters in the card image or SPO entry. Operator now has the same options as to the response to "USE DEFAULT PARAMETERS".

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ENTER OTHER PARAMETERS
OR YES FOR DEFAULTS

The first SPO entry was a "SIGNON".
Operator now has the same options as
to the response to "USE DEFAULT
PARAMETERS".

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GENERAL

BURRBSC is a diagnostic program designed to perform two functions:

- a. To aid Burroughs field engineers using the B1700 diagnostic BSC/5.3 in the installation and maintenance of an EBCDIC binary synchronous connection between a B1700 used as a remote terminal and an IBM 360/370 HASP/RJE host.
- b. To be a responder to the B1700 binary synchronous line verification program, TESTBSC. TESTBSC and BURRBSC can be used to verify the operation of the binary synchronous hardware (adapters, controls, modems, lines) before a HASP/RJE session.

BURRBSC is designed to run in the host 360/370 under the IBM Operating System (OS) environment to minimize system interference at the IBM System 360/370 site.

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DESCRIPTION OF TESTS

BURRBSC will act as a responder to messages received from either Burroughs Field Engineering diagnostic BSC/5.3 or Burroughs line verification program, TESTBSC. Refer to the documentation of BSC/5.3 or TESTBSC, HASP(section III) for a description of operating instructions for these two programs.

BURRBSC consists of a series of tests that can be run individually or sequentially. The tests are designed to check all aspects of binary synchronous transmission protocol as used with the HASP/RJE system.

The following is a list of all corresponding tests between BURRBSC and the B1700 programs BSC/5.3 and TESTBSC:

| <u>BURRBSC</u> | <u>BSC/5.3</u> | <u>TESTBSC</u> |
|----------------|----------------|----------------------|
| 02 | 1 | Transparent Mode |
| 04 | 2 | Non Transparent Mode |
| 06 | 5 | N/A |
| 12 | (1 + 2 + 5) | N/A |

INITIALIZATION OF TESTS

All tests start with the following channel program to receive the bid (SOH ENQ) from the B1700:

DISABLE

SET MODE

ENABLE

READ

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If a timeout occurs at the READ command, the channel program is restarted at the READ command with no error message. Timeouts waiting for SOH ENQ are not considered line errors by HASP/RJE. All other line errors are reported and the channel program is restarted at the DISABLE command. All non-timeout errors are retried until the error retry limit is reached. When the limit is reached the test is ended with an error message to the operator.

TEST ECHO PHASE

After the initialization phase, all tests will respond ACK0 to the SOH ENQ and begin echoing received text. The type of echoing by test is as follows:

| | |
|---------|---|
| Test 02 | Echoes Transparent Text |
| Test 04 | Echoes Non Transparent Text |
| Test 06 | Echoes with a 2 second delay and then ACK0 |
| Test 12 | Is a sequential execution of test, 02, 04 and 06. |

Each test will run until a DLE EOT sequence is received from BSC/5.3 or TESTBSC in the B1700. This allows the Burroughs B1700 program to determine the length of time for each test to run. In addition the message length and content will be selected at the B1700 computer. For BSC/5.3, the length will be selected at run time and may vary from 10 to 400 bytes. The data will be selected at run time and may be either "canned" messages or user specified. For TESTBSC, a 259 byte test buffer will always be received. The buffer will contain 3 data link control characters and 256 non-transparent or transparent text bytes.

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TEST ENDING PHASE

All tests will continue to echo received text until a DLE EOT sequence is received. At that time the test will end. If the selected test was test 12 (run all tests sequentially), and the last test was not Test 06, then BURRBSC will step to the next test (04 or 06), bypass the DISABLE, SET MODE and ENABLE and issue the READ command to wait for the next bid (SOH ENQ).

TEST ERROR RECOVERY

Error recovery procedures are designed to be similar to those used by HASP/RJE system with a few changes to facilitate the diagnosing of line errors. The main change is the addition of an extensive printout for each line error detected. The error printout is described in I/O errors printout.

The basic error recovery philosophy is to log any error and then write a NAK chained to a read text command. There are two exceptions to this:

- a. If a timeout occurs during the initialization phase no error is logged and only the read command is re-issued. This is to prevent excessive logouts while waiting for the SOH ENQ from the B1700.
- b. If a NAK is received, the NAK is logged and the last message is retransmitted. This will prevent a NAK-NAK loop between the two programs.

After each error is logged the retry limit is tested to see if the consecutive number of errors detected is equal to the limit. If the limit is reached, the operator is notified by an error message on the console typewriter and the test is ended. The retry limit is reinitialized after each successful reception.

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OPERATING INSTRUCTIONS

BURRBSC will be released as a source deck that must be assembled and linked prior to execution.

ASSEMBLING AND LINKING BURRBSC

Prior to assembling BURRBSC, proper JCL information must be obtained from the IBM site's system programmer to insure the JCL meets all the unique specifications for that installation. The following JCL is a sample of the JCL needed to assemble and link BURRBSC into SYS1.LINKLIB (OS normal execution library). The punching of JCL cards must start on column one (1) of the card.

```
//ASEM JOB MSGLEVEL=1
//A EXEC ASMFCL,ASM.PARM='NODECK'
//ASM.SYSIN DD*
```

```
NAME BURRBSC(R)
/*
```

EXECUTION OF BURRBSC

The following is an example of JCL required to execute BURRBSC.

```
//BSC JOB MSGLEVEL=1
//A EXEC PGM=BURRBSC
//SYSPRINT DD SYSOUT=A (A)
//TCDD DD UNIT=XXX (B)
```

(A) UNIT=XXX (XXX=Unit Address) may be substituted for SYSOUT=A, if a printer is available for direct allocation.
 (B) XXX in UNIT=XXX is the address of line to be tested.

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TEXT EXECUTION

After the program has started it will display on the system console

```
BURRBSC BURROUGHS B1700 TO IBM BISYNC TEST
*XX BURRBSC - ENTER TEST REQUEST
```

To start a test reply in the following manner:

```
r XX,'t/mm,p/y or n'
```

t/mm is the only required parameter, where mm is the two digit test number. p/y or n is optional and specifies whether error printouts will be printed (y) or not (n). The default is p/y (print errors). When the selected test has completed, the test request message will be repeated to allow the operator to enter another test request or terminate the program.

TEST TERMINATION

To terminate BURRBSC reply "rXX,'end'" to any test request message.

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BURRBSC CONSOLE MESSAGES

| <u>Message</u> | <u>Meaning</u> | <u>Action</u> |
|---|--|--|
| BURRBSC-ENTER TEST REQUEST | To enter next test request or "end". | Enter appropriate request. |
| BURRBSC LINE OPEN ERROR | Error occurred on open macro for the line. | Line labeled TCDD |
| INVALID PARAMETER- TRY AGAIN | Invalid parameter entered on test request. | Check parameters and re-enter request. |
| INVALID TEST- TRY AGAIN | The test parameter was not a valid test number. | Check test number and re-enter. Test must be two digits. |
| I/O ERROR STATUS XXXX SENSE YY | A permanent I/O error occurred on the line. | None, program will terminate current test and issue new test request message. |
| NO TEST PARAMETER- TRY AGAIN | A test request was made without a T parameter. | Check request and re-enter. |
| PRINTER OPEN ERROR | Error occurred on open macro for the printer. | Check specifications on DD card labeled SYSPRINT. |
| TEST STARTED | A valid test request was received and the test has been started. | None |
| TEST ENDED XXXXXXXXXX MESSAGES TRANSFERRED | The requested test ended either normally or abnormally. XXXXXXXXXX is the total number of messages echoed by the program. | None |

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BURRBSCn
BURROUGHS B1700
TO IBM BISYNC
TEST

Test start up message.n None
is the level number of
BURRBSC.

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I/O ERROR PRINTOUT

The following is an explanation of the printout associated with each error detected.

I/O ERROR FAILURE = XXXXXXXXX

XXXXXXXXXX is an English representation of the sense information.

SENSE = XX

XX is the sense byte from the IOB. See appropriate IBM manual for specific bit meanings.

STATUS = XXXX

XXXX are the status bytes from the CSW. See appropriate IBM manuals for specific bit meanings.

ECB = XXXXXXXXX

XXXXXXXXXX is a standard OS event control blocks. See appropriate IBM manuals for meaning.

CSW = XXX...XXX

XXX...XXX is the channel status word from the IOB. See appropriate IBM manuals for meaning.

CHANNEL PGM ADDRESS = XXXXXXXXX

XXXXXXXXXX is the address of the first CCH executed in the last I/O operation. See CHANNEL PGM = below for actual CCH's.

FAILING CCH ADDRESS = XXXXXXXXX

XXXXXXXXXX is the address of the CCH that failed in the last I/O operation. Use this field with the previous field to find the failing CCH in the CHANNEL PGM = field below.

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FLAGS - AABCCDD

AABCCDD are the flag bytes used by the program. They are defined below with bits numbered from left to right (0-7).

| FLAG 1 = AA | BIT | USE (If On) | USE(If Off) |
|-------------|-----|---------------|-----------------|
| | 0 | Test started | No test entered |
| | 1 | Print negated | Print is on |
| | 2-7 | Not used | |

FLAG 2 = BB Test number in Hex.

| FLAG 3 = CC | BIT | USE |
|-------------|-----|---------------|
| | 0 | Enable Mode |
| | 1 | Response Mode |
| | 2 | Text Mode |
| | 3 | End Mode |
| | 4 | Error Mode |
| | 5-7 | Not used |

| FLAG 4 = DD | Hex | USE |
|-------------|-------|--|
| | '00' | if test 2, 4 or 6 |
| | '0C7' | if test 12. See flag 2 for actual test number. |

MSG - COUNT = XXXXXXXX

XXXXXXX is the number of messages echoed before the error occurred.

CHANNEL PGM = XXX...XXX

XXX...XXX is the actual channel program executed on this I/O operation. See channel PGM ADR & FAILING CCW ADDRESS fields for more information.

WRITE BUFFER

The first byte of the next line is the beginning of the contents of the write buffer of the last write command. This field may be empty on a single read command failure.

READ BUFFER

The first byte of the next line is the beginning of the contents of the read buffer of the last read command. If the I/O error

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occurred on a write command or no data was received, then this field will be empty.

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