Telecommunications Supervisory Package/2000

for HASP Multileaving RJE Workstation

User's Manual

HEWLETT-PACKARD COMPANY
5303 STEVENS CREEK BLVD., SANTA CLARA, CALIFORNIA, 95050

PART NO. 20240-90002
PRODUCT NO. 20240A

Printed in U.S.A. 1/76

HP Computer Museum
www.hpmuseum.net

For research and education purposes only.

LIST OF EFFECTIVE PAGES

The List of Effective Pages gives the most recent date on which the technical material on any given page was altered. If a page is simply re-arranged due to a technical change on a previous page, it is not listed as a changed page. Within the manual, changes are marked with a vertical bar in the margin.

Effective Pages	**Date**
Title	Jan 1976
ii to viii	Jan 1976
1-1 to 1-3	Jan 1976
2-1 to 2-5	Jan 1976
3-1 to 3-3	Jan 1976
4-1 to 4-14	Jan 1976
5-1 to 5-8	Jan 1976
A-1 to A-3	Jan 1976
I-1 to I-2	Jan 1976

PRINTING HISTORY

New editions incorporate all update material since the previous edition. Update packages, which are issued between editions, contain additional and replacement pages to be merged into the manual by the customer. The date on the title page and back cover changes only when a new edition is published. If minor corrections and updates are incorporated, the manual is reprinted but neither the date on the title page and back cover nor the edition change.

First Edition ..... Jan 1976

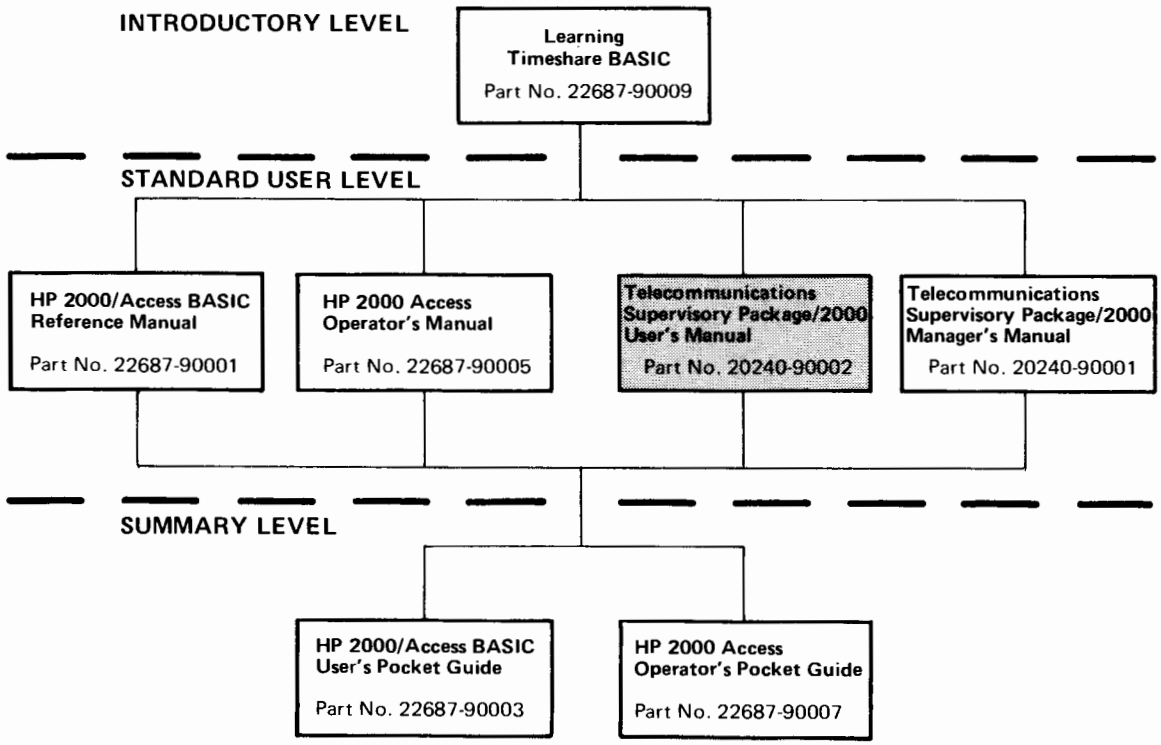
PREFACE

This is the reference manual for the Telecommunications Supervisory Package (TSP). It is designed for users having no prior knowledge of telecommunications and remote job processing. However, users must be familiar with the material covered in the *HP 2000/Access BASIC Reference Manual* (part number 22687-90001). That reference manual describes BASIC language programming on the Access system. Additionally, it describes the system and its Remote Job Entry (RJE) facility. Those persons desiring more information on these latter subjects should refer also to the *HP 2000 Access Operator's Manual* (part number 22687-90005).

In order to use this manual, knowledge of the IBM system is not required if job control information suitable for your job is already available in a library on the Access system. Job control libraries are discussed in Section II of this manual.

If you need additional information about job control and processing on the IBM system, refer to *OS/VS2 HASP II, Version 4, Operator's Guide* (IBM part number GC27-6993-0) and to *IBM System/360 Operating System Job Control Language* (IBM part number GC28-6539-9).

The following diagram presents the Hewlett-Packard manual plan for an Access system.



CONTENTS

ILLUSTRATIONS

TABLES

TERMINOLOGY AND CONVENTIONS

In this manual the following conventions apply:

- The word "card" is interchangeable with "card image" and "card deck" is interchangeable with "file." Although TSP works exclusively with card images that are contained in BASIC formatted files, it is convenient to refer to cards and card decks for purposes of illustration.

- The term "job" refers to a complete unit of work for the host computer. A job consists of card images containing job control statements (JCL), one or more programs, and any number of data sets.

- The term "host" refers to the IBM system where jobs are executed.

- Lowercase italics denotes a parameter that is replaced by a variable.

  Example: JOB *job name*

- Where it is necessary to distinguish user input from TSP output, user input is underlined.

  Example: PROCESSING FUNCTION?
  SUPPORT *return*

- Control characters are indicated by a superscript c.

  Example: Y^{c}

- "return" printed in italics indicates a carriage return.

- "linefeed" printed in italics indicates a linefeed.

- All responses to TSP prompts are stripped of blanks and space characters and shifted to upper case before being used by TSP.

INTRODUCTION

SECTION I

This section introduces you to the Telecommunications Supervisory Package and presents a general overview of how TSP handles your jobs. It briefly outlines subjects discussed in detail in subsequent sections.

WHAT IS TSP?

TSP stands for Telecommunications Supervisory Package. This application program provides easy-to-use access to the Remote Job Entry (RJE) facility of a Hewlett-Packard 2000 Access system. TSP provides scheduling and input/output control for jobs submitted to IBM 360 or IBM 370 systems that are using HASP (Houston Automatic Spooling Program). In addition, TSP provides a number of support functions to facilitate the job submission process.

TSP is designed to allow you to use the Access system's RJE facility from your terminal. There is no need to be present at the Access system site. All functions described in this manual can take place at a remote terminal.

WHAT DOES TSP DO?

TSP allows you to schedule and execute your job on an IBM host system and to select where the output will be routed. The output can be routed to a line printer, a punch, or a disc file.

Your job is made up of card images (80 character strings) stored in one or more BASIC formatted files. After you submit your job to TSP using a job submission dialogue, TSP transmits the card images to an IBM host system via the RJE facility of the Access system. Using TSP, you can check the status of your job both on the Access system and on the IBM host. You can modify jobs at any time before they are sent to the IBM HASP facility, and you can terminate jobs at any point in their processing. All of these operations are controlled from your terminal using dialogue between you and TSP.

HOW DO YOU USE TSP?

Before you can use TSP you must contact your TSP application manager to obtain use authorization and the job control information you will need to route your job's output. The manager is the person responsibile for planning how TSP will be implemented and controlled on your Access system. The manager assigns TSP passwords and supplies TSP configuration information concerning device and forms assignments, input error checking, defaults, etc.

After planning your job completely, you are ready to submit it through TSP to the host system. First, you log on at a terminal and execute the program named TSPHSP. TSPHSP resides in the system library (A000 account). TSP then begins the job submission dialogue by prompting for your password to insure that you are a legal TSP user.

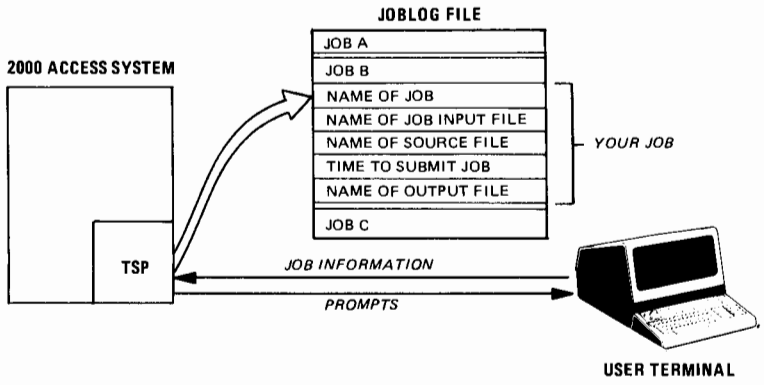
Next you are asked to name your job. TSP uses this name to identify your job during subsequent operations. You are also asked to provide the names of your Job Input File, Source Files (when they exist), and your Job Output File. A Job Input File is a file created on an Access system library by a user. It contains the card images for your job. Source Files are any additional files on the Access system that contain additional card images for your job. A Job Output File is a file on the Access system created by you for the purpose of receiving a job's output. (How to build and use Job Input and Source Files is described in Section II.)

As you supply the file names and other information pertaining to job submission and output routing, TSP stores your responses in its Joblog File. It does this for each job submitted for TSP handling. Part A of figure 1-1 illustrates how TSP processes your job to this point.

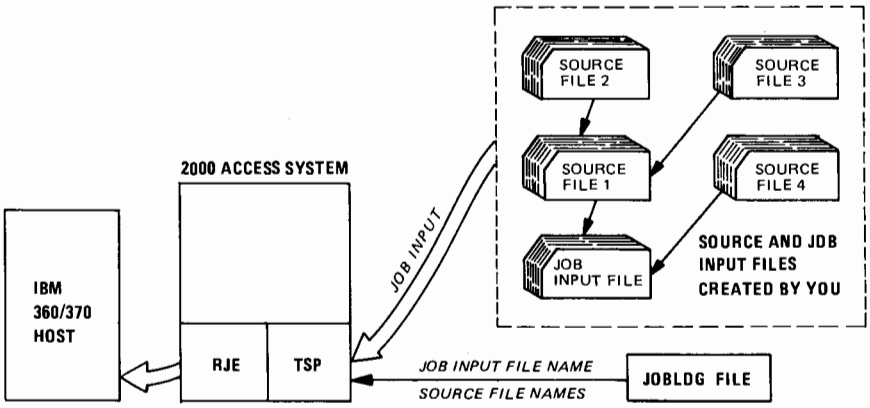
When you submit your job, you may specify that it be transmitted immediately (in which case the HASP-RJE communication link must be currently established), or you can request that your job be queued by TSP for transmission during a scheduled RJE session. In the latter case, you can have transmission scheduled for a particular day and time or you can request that your job be transmitted as soon as possible after a transmission session has been initiated by the TSP manager.

When it is time to transmit your job to the host system, TSP reads its Joblog File to obtain the names of the Job Input File and any Source Files. It then transmits the card images from the specified files. Part B of figure 1-1 illustrates how TSP processes your job to this point.

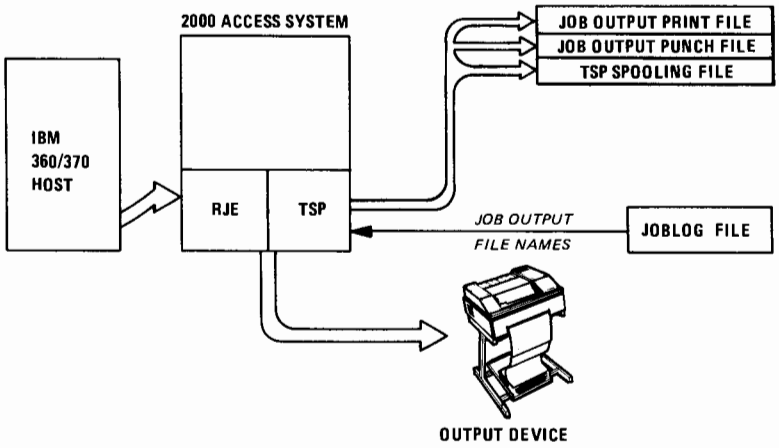
After the host system has completed your job, or after the job has terminated due to an error, the job output is returned to the Access system. TSP accepts the output, compares the job name to identify the job, and obtains the correct processing information from the Joblog File. The output is then routed (per your submission dialogue instructions) to an output device, to your Job Output File, or to the TSP Spooling File that will be dumped at a scheduled time. Output processing is illustrated in Part C of figure 1-1.



A. JOB SUBMISSION



B. JOB TRANSMISSION



C. OUTPUT PROCESSING

Figure 1-1. How TSP Processes Your Job

CREATING YOUR JOB DECK

SECTION II

A job deck consists of card images for a complete unit of work to be executed on a host computer. This section deals with planning your job input, creating your job deck, and with the file handling aspects involved.

JOB INPUT

Job input consists of a collection of IBM job control cards, HASP control cards, program decks, and data decks merged together to form a job deck. The card images are stored in one file or in several files on the Access system. TSP permits only BASIC formatted files created by the rules set forth in the 2000/Access BASIC Reference Manual. Each string in a file constitutes one card image. In the simplest case, one file (your job Input File) constitutes all the card images of one job deck. In a less simple case, your Job Input File references other files known as Source Files which, in turn, can reference still other Source Files. Source Files are created by users and can contain additional programs or data. Together the merged files constitute all the card images of one job deck.

TSP accepts up to three levels of files: your initial Job Input File, level-one Source Files, and level-two Source Files. It transmits card images of each Source File in the proper order as specified by the presence of ##SD cards. (These cards are discussed later.)

Both your Job Input File and any Source Files it references reside in Access system accounts having PFA (Program File Access) capability. The files are either protected or unrestricted.

ORGANIZING FILES

In order to best utilize the job input facility of TSP you should consider the function of cards in your job deck. There are three major components in each job:

- Job control cards
- Source programs
- Data decks

You (or your application manager) may plan to isolate these components into separate disc files residing in the same or different accounts. TSP permits you to then merge these files in varying combinations for execution. When you and others on your system maintain libraries of job control files, commonly used programs, and frequently accessed data files, it is possible for you to determine your own level of involvement with each. For instance, you might write a program in FORTRAN but use a source deck statement (##SD *file name.account number)* to call a job control file to run your program. Another possibility is to reference a sort program (written by another person) to sort data you have

collected. Of course, you might also reference a job control file to provide the card images required to run the sort job. In each case, the job control card images must precede the program and data card images.

Storing functional groups of card images in separate disc files and libraries can greatly facilitate using TSP, the Access system, and the host system. However, to be really useful, the files should be created in such a way that they can be easily maintained and modified. There are a number of programs in the Access System Library designed to aid you in creating files that satisfy this requirement.

There is a final note about files. Your TSP manager may assume responsibility for establishing files containing the job control necessary to execute your jobs on the IBM system. He will probably also maintain frequently used programs that are accessible by all TSP users. Whether you write your own entire job or reference files maintained by the manager, you are nevertheless responsible for insuring that your job deck constitutes a valid job for execution on the host system.

JCL AND HASP CONTROL CARDS

As mentioned previously, your TSP manager may establish libraries of job control decks designed to run a variety of jobs on the host system. However, if you desire to plan your own job control, the statements must conform to the job control statement formats described in the *IBM System/360 Operating System Job Control Language* (IBM part number GC28-6539-9). These cards always begin with two slashes (//) in the first two columns.

TSP permits you to include HASP control cards in your job deck. These cards may be used to communicate with the IBM-HASP facility. These cards always begin with a slash followed by an asterisk (/*) and they must conform to HASP statement formats described in *OS/VS2 HASP II, Version 4, Operator's Guide* (IBM part number GC27-6993-0). Three HASP control statements are not permitted on the Access system. The following are illegal statements:

```
/*COMMAND

/*SIGNON

/*SIGNOFF
```

TSP checks your job to insure only legal HASP control cards are present. Illegal statements are not sent to the host.

If your JCL and HASP control cards are not in the proper order, your job will not execute on the host system. It is your responsibility to set up the proper card images in the proper sequence either in the Job Input File itself or by referencing a Source File maintained on the Access system.

TSP checks that no card image except a /*PRIORITY card precedes the //JOB card. If any other card precedes the job card, the illegal card is not transmitted.

Figure 2-1 presents a typical job deck containing your own job control. The example can only be typical because job control format is dependent upon the configuration of each host system.

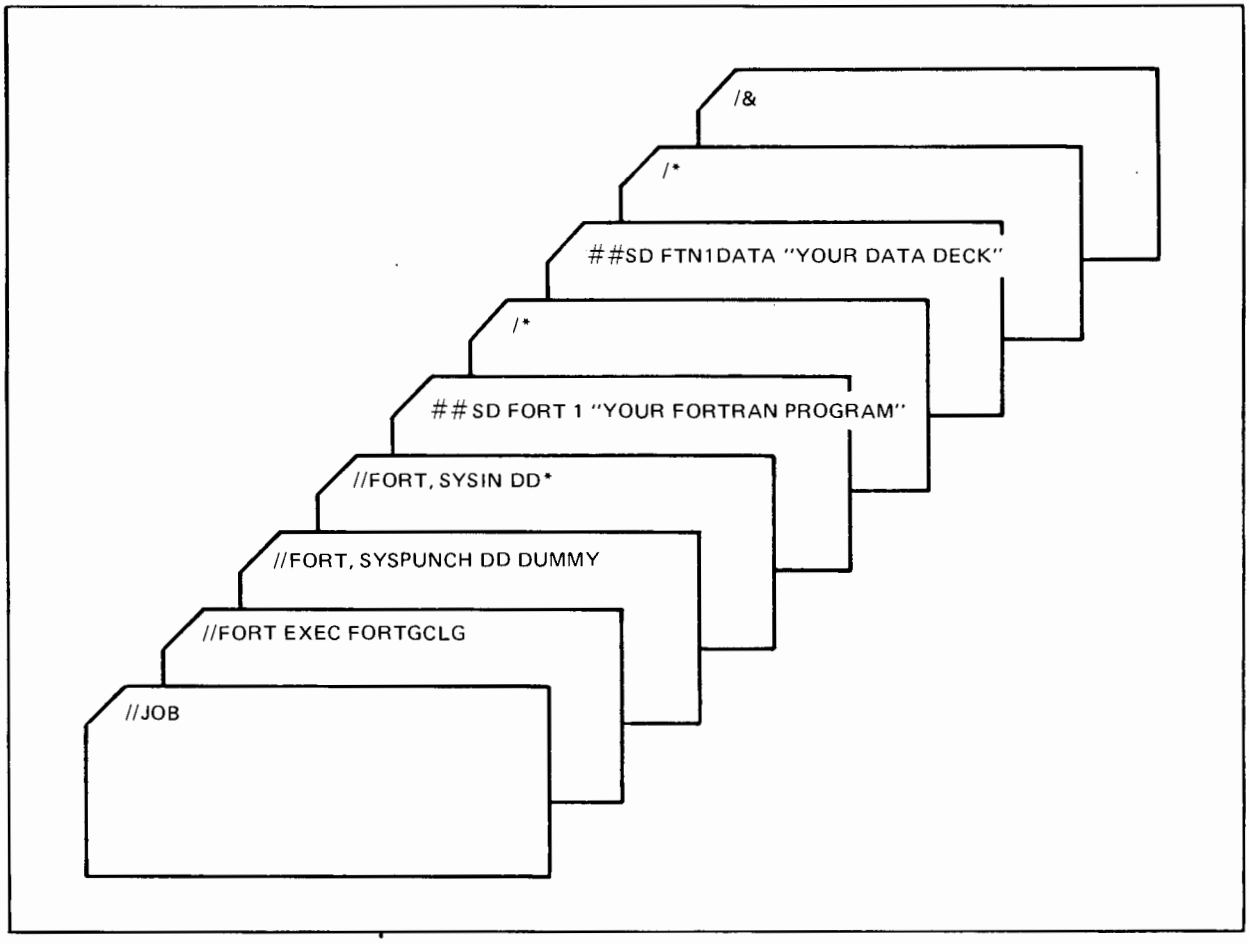


Figure 2-1. A Sample Job Deck

SOURCE DECK CARDS

Source deck cards are used to call files containing the additional job statements required to complete your job. Source card images can be in either of the following formats:

##SD *file name "optional comment"*

##SD* *"optional comment"*

The first form includes the name of the Source File to be merged into the job stream. The second form includes instead, an asterisk (*) requesting that TSP ask the user for the file name during the job submission dialogue. Only the Job Input File may contain the ##SD* form of source deck card.

The optional comment that can be included in either format serves as a useful reference to you during the job submission dialogue. Use it often to record information you might otherwise forget.

MERGING DISC FILES TO FORM A JOB DECK

Figure 2-2 illustrates how TSP combines several levels of disc files to form a job deck. The ##SD cards that appear in Files A and B are are not transmitted to the host as part of the job deck, but rather they point to the Source Files containing additional card images to be merged into the job deck. In the illustration, Files B and E are level-one Source Files since they are pointed to by the Job Input File, and Files C and D are level-two Source Files since they are pointed to by a level-one Source File.

When TSP sends the job illustrated in figure 2-2 to the host system, it sequentially transmits as follows: *(Numbers are keyed to the job deck shown at the bottom of figure 2-2.)*

1. The card images in the Job Input File until the first source deck card occurs (##SD B). In the example, these would be job control cards.

2. The card images of level-one Source File B to its first source deck card (##SD C). These might be any executable program (FORTRAN, Cobol, Assembler, etc.).

3. The card images from level-two Source File C. These might be a subroutine stored in File C, or they could be data. (TSP does not distinguish between programs and data.)

4. Resumes with Source File B but encounters a second source deck card (##SD D), thus TSP reads the images from Source File D next. File D might contain more data.

5. Resumes with Job Input A at card A6. Continues until the next source deck card occurs. These could be more job control for a second program stored in File E.

6. The first level Source File E in its entirety. These images could be a second executable program.

7. Resumes reading File A to the End-of-File.

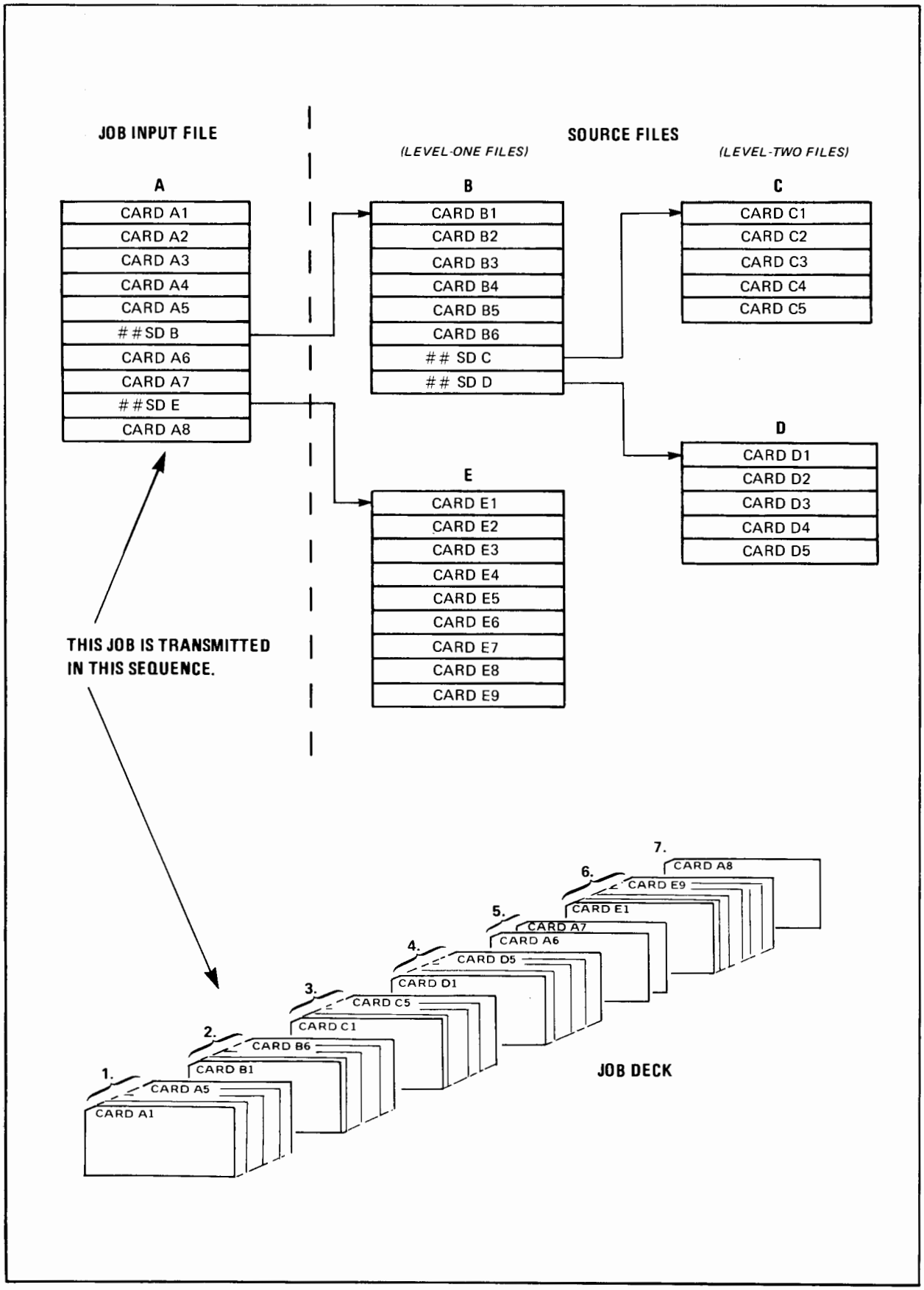


Figure 2-2. Combining Files to Form a Job Deck

USING TSP

SECTION III

This section explains how to respond to prompts, how to begin and end a TSP session, and how to use //CANCEL and //STOP.

HOW TO RESPOND TO PROMPTS

TSP prompts for input so that you can indicate the functions you want TSP to perform. When responding to prompts for functions, you may type one or more letters of the valid response. However, if you reply with a partial response, you must enter the letters in the proper order. As an example, you may reply "J", "JO", or "JOB" to the prompt PROCESSING FUNCTION?

If you respond improperly to a prompt, you receive an error message that lists the valid responses. A typical error message is:

```
INVALID RESPONSE - ENTER 'JOB' OR 'SUPPORT'
```

Following any prompt, you can type //HELP or a question mark (?) to obtain a list of valid responses for that prompt. After TSP prints the list, it repeats the original prompt.

Example:

```
SUPPORT FUNCTION?
//HELP return

ENTER 'DISPLAY' TO DISPLAY THE CONTENTS OF JOBLOG ENTRY
ENTER 'MODIFY' TO MODIFY JOB SUBMISSION INFORMATION
ENTER 'STATUS' TO DISPLAY HASP STATUS OF JOB
ENTER 'TERMINATE' TO CANCEL JOB PROCESSING

SUPPORT FUNCTION?
```

Following any prompt, you may also type //STOP or //CANCEL. These responses are normally used only to terminate the current operation or to end a TSP session.

HOW TO BEGIN A TSP SESSION

You begin a session by logging on the Access system and executing $TSPHSP. The first prompt asks for your TSP password. This password is assigned by the application manager and subsequently used each time you initiate a TSP session.

Example:

```
PLEASE LOG IN
HEL-C001,M return

READY

EXE-$TSPHSP return
TSPHSP

PASSWORD?
USER /return

PROCESSING FUNCTION?
```

The last prompt in the example asks you to indicate a processing function. You may elect to initiate a job submission dialogue by responding JOB (refer to "How to Submit a Job") or you may request to support a previously submitted job by responding SUPPORT. Respond SUPPORT when you plan to use the STATUS, DISPLAY, MODIFY, or TERMINATE functions to inquire about, modify, or cancel a job (refer to "How to Support a Job").

HOW TO END A TSP SESSION

The normal way to end your TSP session is to enter //STOP or //CANCEL after the prompt:

```
PROCESSING FUNCTION?
```

At other points in a TSP session, these responses have different effects based upon whether they occur during or after a job or support function dialogue. In general however, at any point during a particular function dialogue, //CANCEL requests that TSP ignore your responses up to the point when you typed the cancel; and //STOP requests that input supplied to that point should be entered into TSP files and remaining prompts in that particular dialogue should be assigned default values. Pressing *break* during any function dialogue is not recommended.

USING //CANCEL AND //STOP DURING JOB SUBMISSION

At any point during job submission, responding //CANCEL returns you to the PROCESSING FUNCTION? prompt.

When you have been asked to supply the job name or Job Input File name, responding //STOP returns you to the processing function prompt. Once you have supplied both file names, you may type //STOP to skip to the WHEN TO TRANSMIT JOB? prompt. In this case, TSP assigns default values to all skipped prompts.

Responding //STOP to the transmit job prompt is not permitted. You receive an error message if you attempt to stop at this point. You must either cancel your job (and be returned to the processing function prompt) or you must say when you want the job transmitted.

USING //CANCEL AND //STOP DURING A SUPPORT FUNCTION DIALOGUE

Responding //CANCEL or //STOP to the SUPPORT FUNCTION? prompt returns you the PROCESSING FUNCTION? prompt.

At any point after you have typed DISPLAY, STATUS, TERMINATE, or //HELP, you can return to the support function prompt by typing //CANCEL or //STOP.

At any point after you have typed MODIFY, the following applies:

- If you have not yet supplied the name of the job to modify, //STOP or //CANCEL returns you to the support function prompt.

- After the modification dialogue begins, //CANCEL causes TSP to ignore your input and return you to the job to modify prompt. //STOP causes your input to be entered in the Joblog File and also returns you to the job to modify prompt.

In either case, once you again receive the JOB TO MODIFY? prompt, you can use //STOP or //CANCEL to first return to the support function prompt and then to the processing function prompt.

HOW TO SUBMIT A JOB

SECTION IV

This section leads you step-by-step through the procedures for submitting a job using TSP.

Once you have executed TSPHSP to initiate a session (refer to Section III), you can submit a job by responding JOB to the PROCESSING FUNCTION? query. This begins a dialogue that includes the prompts summarized in figure 4-1. These prompts help you to enter the information required by TSP.

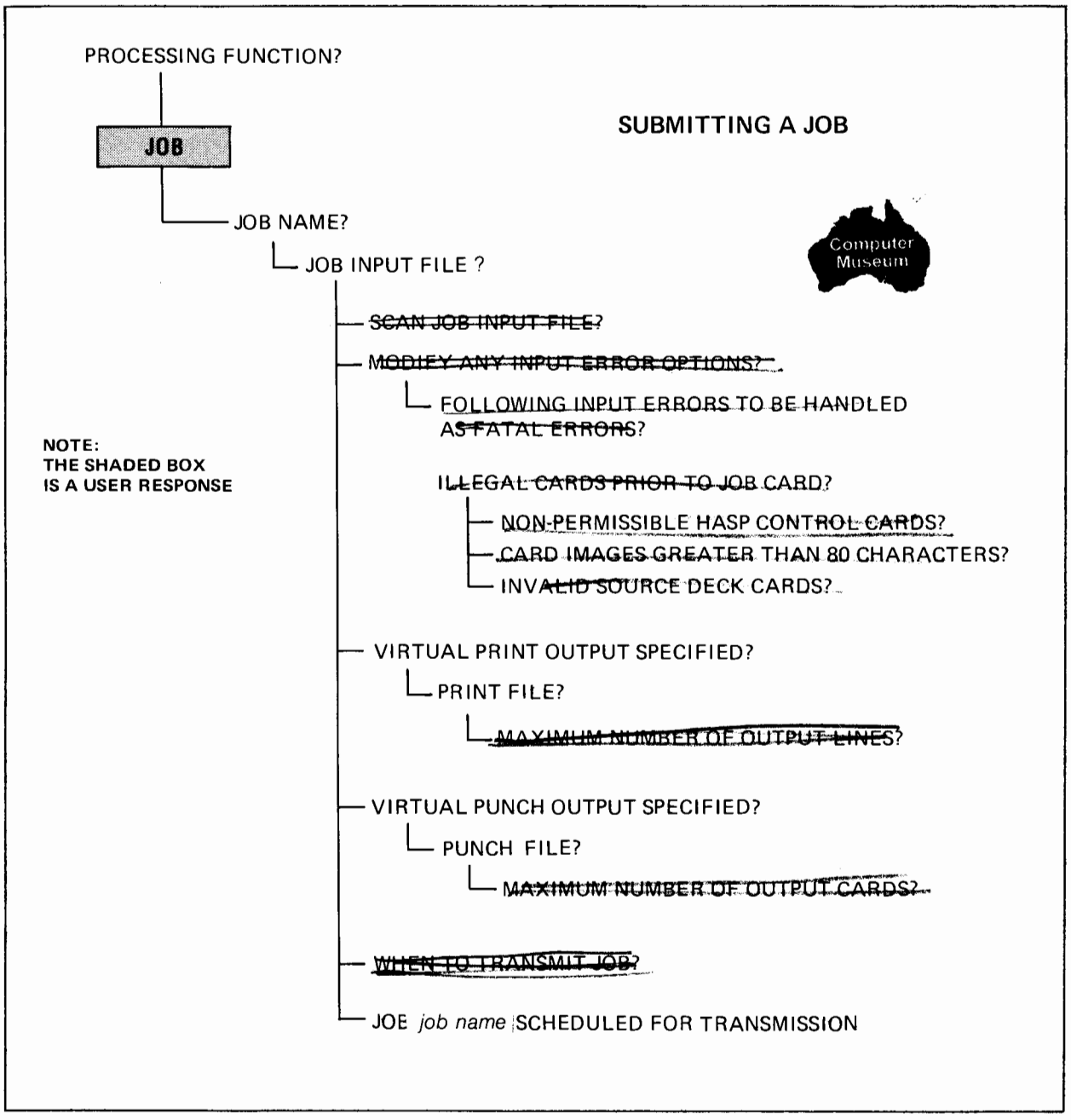


Figure 4-1. A Summary of JOB Function Prompts

NAMING YOUR JOB

The first prompt in a job submission dialogue asks you to name your job. The five-character name you assign must begin with a letter of the alphabet (A-Z) and must contain four additional alphanumeric characters (A-Z, 0-9).

Example:

```
PROCESSING FUNCTION?
JOB return

JOB NAME?
TEST1 return
```

During processing, TSP appends three alphanumeric characters to your job name so that it conforms to internal TSP requirements. This modified name is printed after the submission process ends. At that time you should make a note of it because TSP uses the modified name when referencing your job on both the Access system and host system. You must use it if you subsequently modify, inquire about, or terminate your job. The name is inserted into the //JOB card image in your Job Input File when your job is transmitted to the host system. It replaces the name that already exists on the //JOB card.

IDENTIFYING A JOB INPUT FILE

The next prompt in the job submission dialogue asks you to enter the name of your Job Input File.

Example:

```
JOB NANE?
TEST1 return

JOB INPUT FILE?
MYJOB.C002 return
```

The name you supply is that of a file in an account library on the Access system. The file must reside in an account having Program File Access (PFA) capability and it must be either protected or unrestricted. These requirements do not apply if the Job Input File resides in your own account and you plan to use the NOW transmission option. (Refer to "Immediate Job Transmission.") The Job Input File contains card images of the job you are submitting. Remember that a job contains job control statements (JCL), one or more programs, and any amount of data. It can also contain references to additional files on the Access system which contain additional card images of the job you are

submitting. These additional files are the Source Files discussed in Section II. Source Files must be accessible in the same way that Job Input Files must be accessible. In fact, you are responsible for insuring that all files referenced in your job are BASIC formatted, either unrestricted or protected, and that they reside in an account having PFA.

Although you can name your Job Input File now and actually build it later in a library on the Access system, this is normally not done for several reasons. First, it is to your advantage to be able to scan the contents of the file for errors during the job submission process (refer to "Scanning Your Job Input File"). Also, you can never specify that your job be sent NOW if you have not yet built the files it references.

After you enter the Job Input File name, TSP checks whether the file is currently in a library and accessible. When it is missing or not accessible, you receive the prompt:

SPECIFIED FILE IS NOT ACCESSIBLE - WAS CORRECT FILE SPECIFIED?

This prompt can serve as a check that you spelled the file name correctly. If you simply made an error, reply NO and the prompt is repeated.

Example:

```
JOB INPUT FILE?
MYJOV return

SPECIFIED FILE IS NOT ACCESSIBLE - WAS CORRECT FILE SPECIFIED?
NO return

JOB INPUT FILE?
MYJOB return

SCAN THE JOB INPUT FILE?
```

This prompt also serves as a reminder when the file is not accessible or you have not yet created it. In either case, you can respond YES to the prompt; but be sure to make the file accessible or build the nonexistent file before TSP attempts to transmit your job.

Example:

```
JOB INPUT FILE?
MYJOB return

SPECIFIED FILE IS NOT ACCESSIBLE - WAS CORRECT FILE SPECIFIED?
YES return

SCAN THE JOB INPUT FILE?
```

SCANNING YOUR JOB INPUT FILE

After the Job Input File has been verified as currently accessible, or after you respond YES to the correct file prompt, you are given the opportunity to scan that file. TSP prints the prompt:

SCAN THE JOB INPUT FILE?

If you respond NO, you are skipped to the query about modifying input error options (discussed later).

If you respond YES to the scan prompt, your Job Input File is scanned and tested for the following conditions:

- The presence of ##SD* cards.
- Source Files not accessible.
- Numeric values. (These are permissible at the TSP manager's option.)
- Missing //JOB card.
- More than one //JOB card.
- A card other than a HASP priority card preceding the //JOB card.
- Strings greater than 80 characters.
- Invalid source deck card.
- Non-permissible HASP control cards.

Any errors found during the scan are printed at your terminal. Of course, when the Job Input File has not yet been built, there can be no errors so you are skipped immediately to the modify input error options prompt.

You must respond YES to the scan prompt if your job contains any source cards using the ##SD* form of reference. (Refer to Section II for information on ##SD* formats.) Responding YES allows you to name the Source Files represented by the *. When you respond YES, TSP scans for source deck cards that use the * form of reference and each time one is found it prints:

SOURCE DECK CARD FOUND WITH FILE TO BE SPECIFIED
contents of source deck card including the optional comment
SOURCE FILE?

At this point you should enter the name of a Source File. When your job is sent to the host system, the Source Files you designate will be accessed and their card images transmitted along with the rest of the Job Input File. Remember, unless you intend to use the NOW job transmission option, all Source Files must reside in accounts having PFA capability and they must be either protected or unrestricted. If you plan to use the NOW transmission option, Source Files referenced in your own account need not conform to these requirements.

In the following example, a Source File is named SOURC1. The file was checked and found to be non-accessible. As a result, a prompt asks if the correct file was specified.

Example:

```
SCAN THE JOB INPUT FILE?
YES  return

SOURCE DECK CARD FOUND WITH FILE TO BE SPECIFIED
##SD* "DATA FOR WEEK 46"
SOURCE FILE?
SOURC1.C003  return

SPECIFIED FILE IS NOT ACCESSIBLE - WAS CORRECT FILE SPECIFIED?
YES  return

MODIFY ANY INPUT ERROR OPTIONS?
```

MODIFYING INPUT ERROR OPTIONS

After completing the optional Job Input File scan operation, you are asked if you want to change the standard error conditions flagged by TSP when your job is sent to the host system. The modifying procedure is initiated by this prompt:

MODIFY ANY INPUT ERROR OPTIONS?

Reply NO to accept the default error checks and resulting system options listed in table 4-1. After a NO response, you are skipped to the series of prompts concerning output files.

If you respond YES, you can establish four types of error that will terminate your job. TSP prompts with each currently nonfatal input error that you are permitted to define as fatal.

Example:

```
FOLLOWING INPUT ERRORS TO BE HANDLED
AS FATAL ERRORS?

ILLEGAL CARDS PRIOR TO JOB CARD?
NO /return

NON-PERMISSIBLE HASP CONTROL CARDS?
NO /return

CARD IMAGES GREATER THAN 80 CHARACTERS?
YES /return

INVALID SOURCE DECK CARDS?
Y /return

VIRTUAL PRINT OUTPUT SPECIFIED?
```

Table 4-1. Job Input Errors Checked by TSP

NON-FATAL*	
Error Condition	**Effect On Your Job**
HASP control card other than a priority card precedes the job card.	The illegal card preceding the job card is not transmitted.
Improper HASP control card. These cards not permitted: /*COMMAND /*SIGNON /*SIGNOFF	The card image is not transmitted.
Card images >80 characters.	The card image is truncated from the right to 80 characters during transmission.
Illegal or improperly formatted source deck card.	The source deck card image is not transmitted.

FATAL ERRORS*	
Error Condition	**Effect On Your Job**
A specified file is not accessible. A numeric (non-string) value in a Job Input File or Source File.** Missing job card.	TSP terminates job transmission and the job is terminated on the host system.

*Following job transmission, all errors are listed at the terminal that initiated the job.

**The effect of this condition may be changed by the application manager so that numeric values will be skipped instead of terminating the job.

ROUTING JOB OUTPUT

The next group of prompts allows you to specify where output is to be sent. You can direct it to a real output device (printer or punch), to the TSP Spooling File, or to an Output Print or Punch File. All output that is routed to any type of file is known as "virtual output."

NOTE

As you read about output routing, remember that your output will not go where you specify unless your job control cards conform to the conventions established by the TSP manager. For example, you must follow his instructions for using a forms control number.

PRINT OUTPUT

TSP initiates the job output routing dialogue by asking if you are planning virtual output (i.e. output to the TSP Print Spooling or a user's Output Print File).

VIRTUAL PRINT OUTPUT SPECIFIED?

If you respond NO, your output bypasses TSP and goes directly to a line printer. If the line printer is not available, an appropriate message is printed on the system console and your output remains in the HASP spooling file until the Access system can receive it. After you respond NO, TSP skips you immediately to the virtual punch output query.

Respond YES if you are planning virtual print output. In this case, TSP asks for the name of the disc file that is to receive the virtual print output.

Example:

```
VIRTUAL PRINT OUTPUT SPECIFIED?
YES  return

PRINT FILE?
```

You can respond SPOOLING to route your output to the TSP Print Spooling File. A TSP manager creates this file to receive users' virtual print output. The file is dumped (usually by the system operator) at regularly scheduled intervals. You should check with your manager to learn how you can obtain your output after it has been returned to the Print Spooling File.

If you want your output sent to a BASIC formatted file in an account on the Access system, you can respond with the name of that file. The file must have been created large enough to provide adequate storage space for all anticipated print output, and it must be accessible (reside in an account having PFA and be unrestricted).

TSP stores output in your Output Print File in 134-character strings. These strings are formatted as follows:

Character 1	Forms control
Character 2	Undefined
Characters 3 through 134	Line printer columns 1 through 132

This formatting in your file makes it convenient to programmatically send output to a 132-character line printer. Here is an example of how you might code a program to accomplish such routing.

```
10 FILES LP
    .
    .
    .
60 PRINT #1;CTL(NUM(A$(1));A$(3)
```

If you respond with an Output Print File name rather than the word SPOOLING, TSP checks whether the file is currently accessible. If it is not, you receive the prompt:

```
SPECIFIED FILE IS NOT ACCESSIBLE - WAS CORRECT FILE SPECIFIED?
```

When you are planning to create the Output Print File later, reply YES. If you simply made an error, reply NO and the name prompt is repeated.

Example:

```
PRINT FILE?
RESOLT  return

SPECIFIED FILE IS NOT ACCESSIBLE - WAS CORRECT FILE SPECIFIED?
NO  return

PRINT FILE?
RESULT  return

MAXIMUM NUMBER OF OUTPUT LINES?
99  return

VIRTUAL PUNCH OUTPUT SPECIFIED?
```

After you type SPOOLING or supply an Output Print File name, TSP insures it is valid and then asks you to enter the maximum number of output lines.

Enter a carriage return or any positive number up to 9999. The value you supply is the maximum number of output lines that will be stored in the specified file or in the Spooling File. During TSP generation, the TSP manager establishes a default that is used if you press *return*. In the foregoing example, 99 lines of output are expected; if more than 99 lines are transmitted, the extra lines will be lost.

PUNCH OUTPUT

After you finish supplying print output information, TSP requests punch output information.

```
VIRTUAL PUNCH OUTPUT SPECIFIED?
```

If you respond NO, your punch output bypasses TSP and goes directly to a punch device. If the punch is not available, an appropriate message is printed on the system console and the output remains in the HASP spooling file until the Access system can receive it. After you respond NO, TSP skips immediately to the query about when to transmit your job.

Respond YES to the virtual punch query when you are planning virtual punch output. Next TSP asks for the name of the disc file that is to receive the output.

Example:

```
VIRTUAL PUNCH OUTPUT SPECIFIED?
YES return

PUNCH FILE?
```

You can respond SPOOLING to route your output to the Punch Spooling File. A TSP manager creates this file to receive users' virtual punch output. The file is dumped (usually by the system operator) at regularly scheduled intervals. You should check with your manager to learn how to obtain your output after it has been returned to the Punch Spooling File.

You can also respond to the punch output prompt with the name of a BASIC formatted disc file in an account on the Access system. This file (known as your Output Punch File) must have been created large enough to provide adequate storage space for all anticipated punch output, and it must be accessible (reside in an account having PFA and be unrestricted). TSP stores output in your Output Punch File in 82-character strings. These strings are formatted as follows:

Character 1	Forms control
Character 2	Undefined
Characters 3 through 82	Data characters 1 through 80

This formatting in your file makes it convenient to programmatically send your output from the file to a punch device. Here is an example of how you might code your program to accomplish such routing.

```
10 FILES PP
    .
    .
    .
90 FILES #1;CTL(NUM(A$(1));A$(3)
```

If you respond with Output Punch File name rather than the word SPOOLING, TSP checks whether the file is currently accessible. If it is not, you receive the prompt:

```
SPECIFIED FILE IS NOT ACCESSIBLE - WAS CORRECT FILE SPECIFIED?
```

When you are planning to create the Output Punch File later, reply YES. If you simply made an error, reply NO and the name prompt is repeated.

Example:

```
PUNCH FILE?
PNFLE  return

SPECIFIED FILE IS NOT ACCESSIBLE - WAS CORRECT FILE SPECIFIED?
NO  return

PUNCH FILE?
PUNFLE  return

MAXIMUM NUMBER OF OUTPUT CARDS?
50  return

WHEN TO TRANSMIT JOB?
```

After you type SPOOLING or an Output Punch File name, TSP insures it is valid and then asks you to enter the maximum number of output card images.

Respond with a carriage return or any positive number up to 9999. The value you supply is the maximum number of output cards that will be stored in the specified file or in the Spooling File. The TSP application manager establishes a default value to be used if you press *return*. In the foregoing example, 50 cards of output are expected; but if more than 50 card images are transmitted, the extra card images are lost.

SCHEDULING JOB TRANSMISSION

When you have finished supplying virtual output information, you are asked when you want your job transmitted to the host system.

WHEN TO TRANSMIT JOB?

You can enter NOW, ASAP, transmission date and time, or //CANCEL. You cannot enter //STOP at this point.

NOTE

In the following messages, *job name* is the TSP modified job name. You should note it and use it in all future references to your job.

IMMEDIATE JOB TRANSMISSION

Type NOW to request that your job be transmitted immediately. If you plan to use this response, you should ask the application manager about RJE session schedules to be certain the RJE communication link is established. If the RJE communication link is not established when you type NOW, you receive the message:

TRANSMISSION NOT POSSIBLE BECAUSE HASP LINE NOT ACTIVE

In this case, you are returned to the when to transmit prompt.

If the RJE communication link is established, you receive the message:

JOB *job name* CURRENTLY BEING TRANSMITTED

Your terminal is "locked" while your job is being transmitted. However, after transmission is complete, you receive the messages:

JOB *job name* TRANSMISSION WAS SUCCESSFUL
PROCESSING FUNCTION?

You may now elect to submit another job, request a support function, or terminate your TSP session by typing //STOP.

ASAP JOB TRANSMISSION

Type ASAP to request that your job be transmitted as soon as possible. It is added to the ASAP job input queue and sent during the next scheduled RJE transmission session. (Transmitting schedules are established by the TSP manager.) Jobs in the scheduled job input queue (refer to "Date and Time Job Transmission") take priority over jobs in the ASAP queue. After your job has been added to the ASAP queue, you receive the message:

> *job name* SCHEDULED FOR TRANSMISSION AS SOON AS POSSIBLE
> PROCESSING FUNCTION?

You may now elect to submit another job, request a support function, or terminate your session.

DATE AND TIME JOB TRANSMISSION

Type the date and time to request that your job be transmitted to the host at a specific time. Enter your response in the form:

MM/DD,hh,mm

MM/DD is a month (01-12) and day (01-31) not more than ten days beyond the current date. *hh,mm* is the hour (00-23) and minute (00-59) of transmission.

Jobs thus scheduled are added to the TSP scheduled job input queue. They are sent to the host system during the first RJE transmission session following the date and time you specify. Scheduled jobs due for transmission will be sent before jobs in the ASAP queue.

In the next example, the desired transmission date is July 1 at 1:30 P.M.

Example:

```
WHEN TO TRANSMIT?
07/01,13,30   return

JOB MYJOBA12 SCHEDULED FOR TRANSMISSION

PROCESSING FUNCTION?
```

Once you have specified when your job is to be transmitted, you are returned to the initial processing function prompt. You may enter another job, request to support a job previously submitted, or terminate the TSP session.

We have now described the complete job submission procedure illustrated in figure 4-2.

```
EXE-$TSPHSP return
TSPHSP

PASSWORD?
USER return

PROCESSING FUNCTION?
JOB return

JOB NAME?
TEST1 return

JOB INPUT FILE?
MYJOB return

SCAN JOB INPUT FILE?
YES return

SOURCE DECK CARD FOUND WITH FILE TO BE SPECIFIED
##SD* "ENTER NAME OF FORTRAN SOURCE PROGRAM
SOURCE FILE?
SOURCE return

SOURCE DECK CARD FOUND WITH FILE TO BE SPECIFIED
##SD* "ENTER NAME OF DATA DECK
SOURCE FILE?
DATA return

MODIFY ANY INPUT ERROR OPTIONS?
YES return

FOLLOWING INPUT ERRORS TO BE HANDLED
AS FATAL ERRORS?

ILLEGAL CARDS PRIOR TO JOB CARD?
NO return

NON-PERMISSIBLE HASP CONTROL CARDS?
NO return

CARD IMAGES GREATER THAN 80 CHARACTERS?
YES return

INVALID SOURCE DECK CARDS?
YES return

VIRTUAL PRINT OUTPUT SPECIFIED?
YES return

PRINT FILE?
RESULT return

MAXIMUM NUMBER OF OUTPUT LINES?
500 return

VIRTUAL PUNCH OUTPUT SPECIFIED?
YES return

PUNCH FILE?
PUNCH return

MAXIMUM NUMBER OF OUTPUT CARDS?
100 return

WHEN TO TRANSMIT JOB?
ASAP return

JOB TEST1A02 SCHEDULED FOR TRANSMISSION

PROCESSING FUNCTON?
//STOP return

DONE
```

Figure 4-2. A Typical Job Submission Dialogue

HOW TO SUPPORT A JOB

SECTION V

This section describes how to check the status of jobs, how to alter original job submission instructions, and how to terminate a job.

Once a job has been submitted, you may want to review and possibly change some of the job processing instructions. You may want to check on the job's status on the host system, or you may want to terminate the job. You can perform all these operations by entering SUPPORT in response to the processing function prompt.

Example:

```
PROCESSING FUNCTION?
SUPPORT  return
```

This begins a dialogue that prompts for the name of the support function and subsequently for information about your job. These prompts are summarized in figure 5-1 and described in the following paragraphs.

After you type SUPPORT, TSP prompts:

```
SUPPORT FUNCTION?
```

You may type one of the following responses:

STATUS -- to display the current status of a job.

DISPLAY -- to display Joblog processing information for a job.

MODIFY -- to change information supplied during the job submission dialogue.

TERMINATE -- to cancel a job.

//STOP or //CANCEL -- to stop the support function dialogue and return to the processing function prompt.

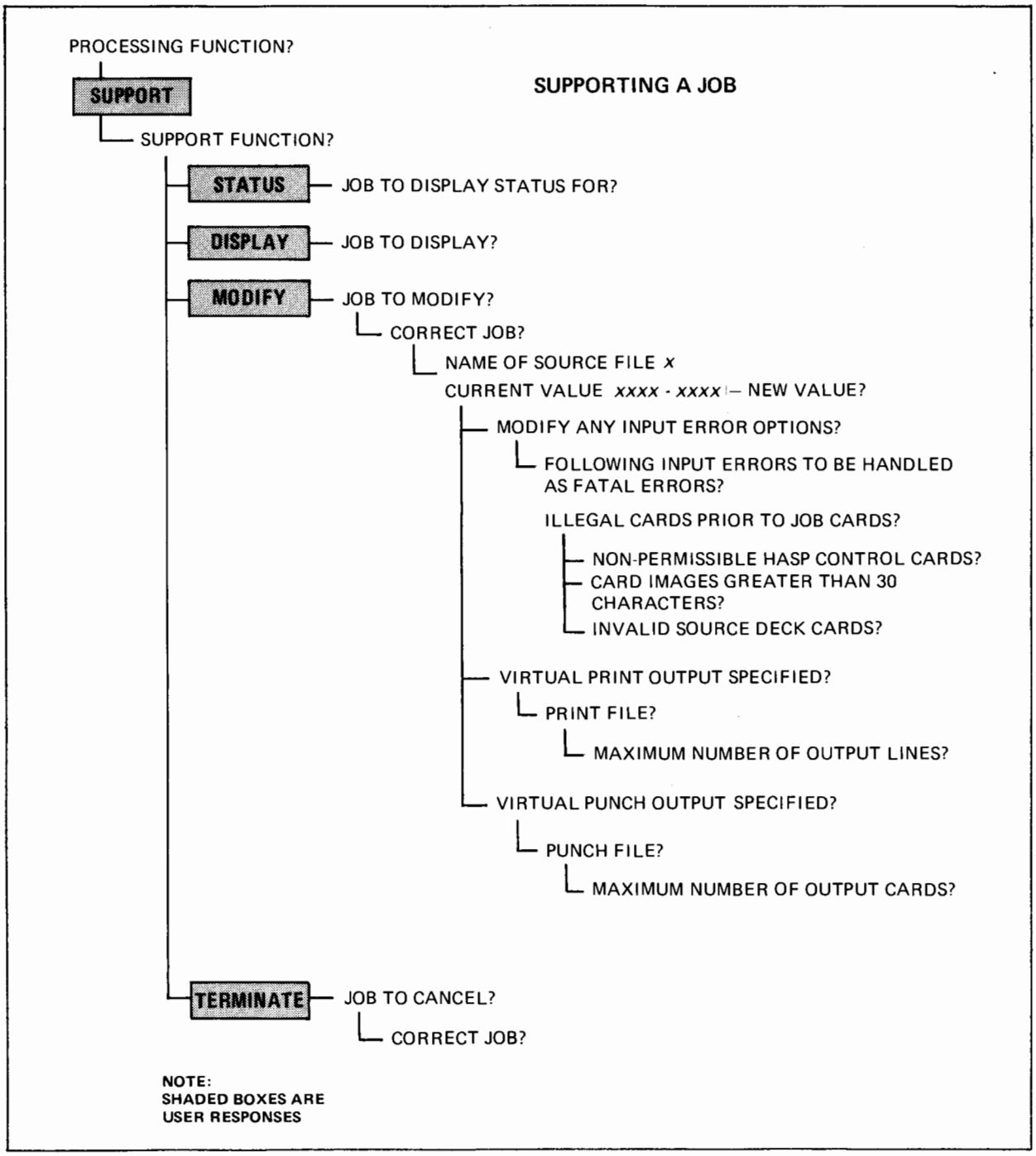


Figure 5-1. A Summary of SUPPORT Function Prompts

DISPLAYING JOB STATUS

Responding STATUS to the support function prompt causes the current status of your job to be printed at your terminal. (Refer to figure 5-2.) The RJE communications link to the host system must be active, otherwise you receive an error message. After entering STATUS, you are asked for a job name. In the following example, the name originally entered by a user was TEST1 but the modified name required for all support function activities is TEST1A02.

Example:

```
SUPPORT FUNCTION?
STATUS return

JOB TO DISPLAY STATUS FOR?
TEST1A02 return
```

The current status of the job is printed in one of the following formats:

Format 1: *(your job name has not been sent to the host)*

JOB *job*
HASP NO. 0
TSP status message

Format 2: *(your job has been sent to the host)*

HASP status message

After the status has been printed, you are returned to the original JOB TO DISPLAY STATUS FOR? prompt.

```
PROCESSING FUNCTION?
SUPPORT return

SUPPORT FUNCTION?
STATUS return

JOB TO DISPLAY STATUS FOR?
TEST1A02 return

JOB TEST1A02
HASP NO: 0
SCHEDULED FOR TRANSMISSION ON 6/4/75 AT 13:30

JOB TO DISPLAY STATUS FOR?
//STOP return

SUPPORT FUNCTION?
//STOP return

PROCESSING FUNCTION?
//STOP return

DONE
```

Figure 5-2. Using the STATUS Function

DISPLAYING JOBLOG INFORMATION

Respond DISPLAY to the support function prompt when you want to display processing information for a particular job. (Refer to figure 5-3.) The information displayed is that gained during job submission together with the current status. After you type DISPLAY, you are asked for the name of the job to be displayed. In the following example, the modified job name is TEST1A02.

Example:

```
SUPPORT FUNCTION?
DISPLAY return

JOB TO DISPLAY?
TEST1A02 return
```

```
PROCESSING FUNCTION?
SUPPORT return

SUPPORT FUNCTION?
DISPLAY return

JOB TO DISPLAY?
TEST1A02 return

JOB TEST1A02
HASP NO: 0
SCHEDULED FOR TRANSMISSION ON 6/4/75 AT 13:30
JOB INPUT FILE: MYJOB.C000
INPUT ERRORS SPECIFIED AS FATAL:
      STRINGS GREATER THAN 80 CHARACTERS
      INVALID SOURCE DECK CARDS
PRINT FILE: RESULT.C000
STATUS: NO OUTPUT RECEIVED
LINES RECEIVED: 0  LINES ALLOWED: 88
PUNCH FILE: PUNCH.C000
STATUS: NO OUTPUT RECEIVED
CARDS RECEIVED: 0  CARDS ALLOWED: 10

JOB TO DISPLAY?
//STOP return

SUPPORT FUNCTION?
```

Figure 5-3. Using the DISPLAY Function

TSP now reports the following information:

JOB *job name*
HASP NO: *(0 if job not yet sent to HASP)*
SCHEDULED FOR TRANSMISSION ON *date and time*
JOB INPUT FILE: *file name*
SOURCE FILES: *file name list*
INPUT ERRORS SPECIFIED AS FATAL: *error list*
PRINT FILE: *file name*
STATUS: *status*
LINES RECEIVED: *nnnn* LINES ALLOWED: *nnnn*
PUNCH FILE: *file name*
STATUS: *status*
CARDS RECEIVED: *nnnn* CARDS ALLOWED: *nnnn*

The HASP NO. is the number assigned to your job by the host system. Once a job has been scheduled for processing on the host, this number may be used in place of the modified job name when you request a support function.

MODIFYING JOBLOG INFORMATION

Respond MODIFY to the support function prompt to review and modify job processing information for any job that has been submitted to TSP but has not been transmitted to the host system. If a job has been transmitted but no output has been returned, you may modify only the output processing information stored in the Joblog File. After you type MODIFY, TSP asks for the name of the job to be modified.

Example:

```
SUPPORT FUNCTION?
MODIFY  return

JOB TO MODIFY?
TEST1A02  return
```

At this point, information about the job is printed (refer to figure 5-4) and you are asked to verify this is the job you want to modify.

Example:

```
JOB TO MODIFY?
TEST1A02

    .
    .
    .

CORRECT JOB?
YES  return
```

Now TSP lists all Source Files referenced by your job and gives you the opportunity to change the names. If the job does not contain references to Source Files, you are skipped to the modify input error options prompt.

In the following example, the name of the first Source File is changed to YORPRO, while the second Source File remains unchanged because *return* was pressed.

Example:

```
CORRECT JOB?
YES  return

NAME OF SOURCE FILE 1
CURRENT VALUE MYPROG.C002 - NEW VALUE?
YORPRO.C004  return

NAME OF SOURCE FILE 2
CURRENT VALUE DATA.AL02 - NEW VALUE?
return

MODIFY ANY INPUT ERROR OPTIONS?
```

Note in the preceding example that the dialogue continues with an original job submission prompt:

MODIFY ANY INPUT ERROR OPTIONS?

You can continue through to the end of the modify input error prompts, changing whenever you so desire, or you can terminate the modification process at any point by typing //STOP.

After the last modification entry has been made, you receive the message JOB MODIFICATION COMPLETED. Now you are returned to the job to modify prompt.

```
PROCESSING FUNCTION?
SUPPORT return

SUPPORT FUNCTION?
MODIFY return

JOB TO MODIFY?
TEST1A43 return

JOB TEST1A43
HASP NO: 0
SCHEDULED FOR TRANSMISSION AS SOON AS POSSIBLE
JOB INPUT FILE: MYJOB.A102
SOURCE FILES: SOURCE.A102, DATA.A102
INPUT ERRORS SPECIFIED AS FATAL:
      STRINGS GREATER THAN 80 CHARACTERS
      INVALID SOURCE DECK CARDS
PRINT FILE: RESULT.A102
STATUS: NO OUTPUT RECEIVED
LINES RECEIVED: 0  LINES ALLOWED: 500
PUNCH FILE: PUNCH.A102
STATUS: NO OUTPUT RECEIVED
CARDS RECEIVED: 0  CARDS ALLOWED: 100

CORRECT JOB?
YES return

NAME OF SOURCE FILE 1
CURRENT VALUE SOURCE.A102 - NEW VALUE?
PROGA return

NAME OF SOURCE FILE 2
CURRENT VALUE DATA.A102 - NEW VALUE?
return

MODIFY ANY INPUT ERROR OPTIONS?
YES return

FOLLOWING INPUT ERRORS TO BE HANDLED
AS FATAL?

ILLEGAL CARDS PRIOR TO JOB CARD?
return

NON-PERMISSIBLE HASP CONTROL CARDS?
return

CARD IMAGES GREATER THAN 80 CHARACTERS
NO return

INVALID SOURCE DECK CARDS?
return

VIRTUAL PRINT OUTPUT SPECIFIED?
YES return

PRINT FILE?
return

MAXIMUM NUMBER OF OUTPUT LINES?
return

VIRTUAL PUNCH OUTPUT SPECIFIED?
YES return

PUNCH FILE?
return

MAXIMUM NUMBER OF OUTPUT CARDS?
200 return

JOB MODIFICATION COMPLETED

JOB TO MODIFY?
//STOP return

SUPPORT FUNCTION?
```

Figure 5-4. Using the MODIFY Function

TERMINATING YOUR JOB

Responding TERMINATE to the support function prompt causes the job you name to be placed in "purge status" on the TSP Joblog File. After you enter TERMINATE, TSP asks for the name of the job to be terminated.

Example:

```
SUPPORT FUNCTION?
TERMINATE return

JOB TO CANCEL?
TEST1A02
      •
      •
CORRECT JOB?
YES return
```

Information stored in the Joblog File concerning the specified job is printed so that you can verify the correct job has been named (refer to figure 5-5). You are next asked if this is the correct job.

In order to terminate your job after it has been transmitted to the host computer, the communication line must be active when you respond TERMINATE. In this case, any job activity currently in progress at the host stops. If your job is waiting to be transmitted, it's processing information is cancelled. You are next returned to the JOB TO CANCEL? prompt.

```
SUPPORT FUNCTION?
TERMINATE return

JOB TO CANCEL?
TEST1A02 return

JOB TEST1A02
HASP NO: 0
SCHEDULED FOR TRANSMISSION ON 6/4/75 AT 13:30
JOB INPUT FILE: MYJOB.C000
INPUT ERRORS SPECIFIED AS FATAL:
      STRINGS GREATER THAN 80 CHARACTERS
      INVALID SOURCE DECK CARDS
PRINT FILE: RESULT.C000
STATUS: NO OUTPUT RECEIVED
LINES RECEIVED: 0  LINES ALLOWED: 88
PUNCH FILE: PUNCH.C000
STATUS: NO OUTPUT RECEIVED
CARDS RECEIVED: 0  CARDS ALLOWED: 10

CORRECT JOB?
YES return

JOB CANCELLATION COMPLETED

JOB TO CANCEL?
```

Figure 5-5. Using the TERMINATE Function

TSP USER ERROR MESSAGES

APPENDIX A

//CANCEL GENERATED BY SYSTEM BECAUSE OF LACK OF RESPONSE
Explanation: TSP generated a //CANCEL because user did not respond to the HIT ANY KEY TO INDICATE YOU ARE STILL THERE prompt within 255 seconds.

EXECUTION TERMINATED - CONTROL FILE IS NOT ACCESSIBLE
Explanation: TSP control file is missing. Contact TSP application manager.

EXECUTION TERMINATED - CONTROL FILE IS NOT USABLE
Explanation: TSP control file is improperly formatted. Contact your TSP application manager.

EXECUTION TERMINATED - JOBLOG FILE IS NOT ACCESSIBLE
Explanation: TSP joblog file is missing. Contact your TSP application manager.

EXECUTION TERMINATED - MESSAGE FILE IS MISSING
Explanation: TSP message file is missing. Contact your TSP application manager.

FUNCTION NOT POSSIBLE BECAUSE HASP LINE NOT ACTIVE

HIT ANY KEY TO INDICATE YOU ARE STILL THERE
Explanation: User has not responded within the TSP response time limit (255 seconds) and TSP is checking if a user is still there.

INVALID FILE NAME

INVALID JOB NAME

INVALID RESPONSE - ENTER 'DISPLAY', 'MODIFY', 'STATUS' OR 'TERMINATE'

INVALID RESPONSE - ENTER 'JOB NUMBER' OR 'JOB NAME'

INVALID RESPONSE - ENTER 'JOB' OR 'SUPPORT'

INVALID RESPONSE - ENTER 'NOW', 'ASAP' OR 'DAY, HOUR, MINUTE'

INVALID RESPONSE - ENTER 'YES' OR 'NO'

INVALID RESPONSE - MUST BE A NUMBER BETWEEN 0 AND 9999

JOB *jobname* CANCELLED BECAUSE *(one of the following:)*
FILE *filename* NOT ACCESSIBLE
NO JOB CARD
NUMERIC VALUE IN FILE *filename*
STRING GREATER THAN 80 CHARACTERS IN FILE *filename*
ILLEGAL CARD PRIOR TO JOB CARD
NON-PERMISSIBLE HASP CONTROL CARD IN FILE *filename*
INVALID SOURCE DECK CARD IN FILE *filename*

Explanation: Job transmission cancelled because of the stated reason.

JOB CANNOT BE SUBMITTED BECAUSE JOBLOG FILE FULL

Explanation: Joblog File must be reorganized before any more jobs can be submitted. Contact the TSP application manager.

JOB *jobname* COMPLETED UPON DETECTION OF SECOND JOB CARD

Explanation: Only the card images prior to the second job card were transmitted.

JOB *filename* HAD THE FOLLOWING ERRORS IN TRANSMISSION:
n STRINGS GREATER THAN 80 CHARACTERS
n ILLEGAL CARDS PRIOR TO JOB CARD
n NON-PERMISSIBLE HASP CONTROL CARDS
n INVALID SOURCE DECK CARDS

Explanation: The specified error occurred during job transmission. These errors were regarded as non-fatal.

MODIFICATION CANNOT BE COMPLETED

Explanation: Job modification cancelled because output reception occurred while the job was being modified.

PASSWORD NOT RECOGNIZED - PLEASE RETRY

SCAN DETECTED THE FOLLOWING ERRORS:
FATAL ERRORS:
NO JOB CARD
n FILES NOT ACCESSIBLE
n NUMERIC VALUES IN JOB INPUT FILE
NON-FATAL ERRORS:
MORE THAN ONE JOB CARD
n STRINGS GREATER THAN 80 CHARACTERS
n ILLEGAL CARDS PRIOR TO JOB CARD
n INVALID SOURCE DECK CARDS

SPECIFIED FILE IS NOT ACCESSIBLE - WAS CORRECT FILE SPECIFIED?

SPECIFIED JOB CANNOT BE MODIFIED

Explanation: Job has been transmitted and output has already been received.

SPECIFIED JOB DOES NOT EXIST.

SPECIFIED JOB IS IN LOCKED STATUS

Explanation: The specified function cannot be performed because another function is currently active on the same job. Display job processing information to find out what other function is active.

SYSTEM ACCESS NOT DEFINED FOR CURRENT ACCOUNT ID

Explanation: Contact your TSP application manager about establishing a TSP account.

TRANSMISSION NOT POSSIBLE BECAUSE HASP LINE NOT ACTIVE

INDEX

READER COMMENT SHEET

20240-90002 **Jan 1976**

Telecommunications Supervisory Package/2000
for HASP Multileaving RJE Workstation
User's Manual

We welcome your evaluation of this manual. Your comments and suggestions help us improve our publications. Please use additional pages if necessary.

Is this manual technically accurate?

Did you have any difficulty in understanding concepts or wording? Where?

Is the format of this manual convenient in size, arrangement, and readability? What improvements would you suggest?

Other comments?

FROM:

Name _____

Company _____

Address _____

_____

_____

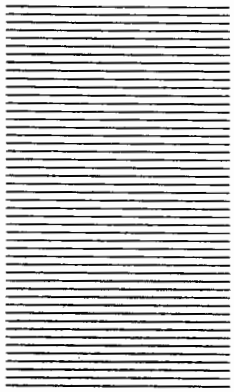
FOLD FOLD

FIRST CLASS
PERMIT NO. 1020
SANTA CLARA
CALIFORNIA

BUSINESS REPLY MAIL

No Postage Necessary if Mailed in the United States. Postage will be paid by

Publications Manager, Product Support Group
Hewlett-Packard Company
General Systems Division
5303 Stevens Creek Boulevard
Santa Clara, California 95050



FOLD FOLD

PART NO. 20240-90002
Printed in U.S.A. 1/76

HEWLETT hp PACKARD

Sales and service from 172 offices in 65 countries.
5303 Stevens Creek Blvd., Santa Clara, California 95050