

SERIES 200

SPT MERGE C

GENERAL SYSTEM:

Honeywell Series 200/Operating System - Mod 1

SUBJECT:

SPT Merge C: A program for extracting programs from symbolic program tapes and copying these programs onto a new SPT created by the merge.

SPECIAL
INSTRUCTIONS:

This bulletin completely supersedes the Preliminary Information Bulletin, SPT Merge, DSI-407.

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FOREWORD

This bulletin describes the capabilities and features of the Series 200 SPT Merge C program. The reader is assumed to be familiar with the operating procedures for the control panel and the various peripheral devices as presented in the Honeywell Series 200 Equipment Operators' Manual (Model 200) DSI-294. The reader should also be familiar with the Honeywell Series 200 Programmers' Reference Manual (Models 200, 1200, 2200) File No. 113.0005.0000.00.00, and the bulletins Models 209/210 Paper Tape Equipment (DSI-322) and EasyCoder Assembler C and D Operating Procedures (File No. 122.1105.191C.00.00).

Section I of this publication contains a general description of the SPT Merge C program. The formats of the various action directors used with SPT Merge C are described in Section II. The options available with paper tape and the operation of the program with paper tape equipment are discussed in Section III. The format of the SPT Merge C program directory listing is described in Section IV and, in conclusion, operating procedures are presented in Section V.

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SECTION I

GENERAL DESCRIPTION

INTRODUCTION

The Honeywell Series 200 SPT Merge C program (program name AAGMER) permits easier and faster handling of object programs which are stacked on symbolic program tapes (SPT). SPT Merge C selects and extracts the programs designated by the user from one or more (up to four) SPT's. The extracted programs are written on a new SPT created by the SPT Merge C program. Thus, it is possible for the user to consolidate a number of SPT's onto one master SPT with the programs arranged in any order he desires. Most important, programs may be selected, copied, and rearranged (if desired) onto the master tape without having to reassemble any of the programs in the process.

Programs which are to be extracted by the SPT Merge C program are called for by action directors and may be extracted in any sequence desired. The action directors may be read from punched cards, magnetic tape, or punched paper tape in accordance with a standard format. Neither the program sequence of the input SPT(s) nor the order in which the SPT's are mounted need dictate the program sequence of the output SPT, which may be arranged in any way desired by the programmer. SPT Merge C produces a directory listing on the high-speed printer to record the revision numbers of the input SPT's and the sequence of the programs as they appear on the output SPT.

The output SPT is created by using three kinds of action directors, viz., Position, Duplicate, and Rewind. Each action director type performs a specific function which can be summarized briefly:

1. Position is an action director which causes an input SPT to be moved forward past a specified program.
2. Duplicate is a copying director which can alternatively copy one program, copy a group of programs, or copy all or part of an SPT.
3. Rewind is a positioning director which should be used when the input SPT is positioned beyond a program which is to be duplicated on the output SPT. If Rewind is not used, SPT Merge C searches forward to the end of the file, rewinds the tape, and begins to search forward again.

Detailed procedures for the use of the three action director types and their format are presented in Section II.

EQUIPMENT REQUIREMENTS

The equipment requirements for operation of SPT Merge C are detailed in Table 1-1. As shown in the table, a storage area of 12,288 characters is required. In addition, the processor must be equipped with the Advanced Programming Instructions feature. It should be noted that although the peripheral equipment requirements may be varied as the user wishes, the memory storage requirements remain the same.

Table 1-1. Equipment Requirements for the SPT Merge Program

Function	Device	Alternate Equipment
Program storage medium	Processor with 12,288-character storage area (minimum)	-----
Director Input File	One card reader (type 214, 223, or 227)	One paper tape reader (type 209); or one type 204B magnetic tape unit
SPT Input Files	Up to four magnetic tape units (type 204B)	-----
SPT Output File	One magnetic tape unit (type 204B)	-----
Directory Listing	One high-speed printer (type 206 or 222)	One magnetic tape unit (type 204B)
Program Input File	One magnetic tape unit (type 204B)	One card reader (type 214, 223, or 227)
Message Output	Control Panel	Console Typewriter (Type 220-1, 220-2, 220-3)

SECTION II

THE INPUT FILE

In the following discussions and illustrations, the SPT Merge C program directors are described only in punched-card format. If the director entries are to appear on a card-image tape or paper tape, the coding format for the various director entries remains the same (assuming normal use of control frames with paper tape).

The Input File is made up of the Equipment Configuration Descriptor and the program Director File. If an ECD card is used, it must precede the Director File.

EQUIPMENT CONFIGURATION DESCRIPTOR

The Equipment Configuration Descriptor (ECD) specifies, among other things, the input and output devices and memory size to be used for SPT Merge C or any other system program.

All system programs contain ten standard equipment configurations assembled within each program. Each standard configuration is identified by a number from 0 through 9. Based on the equipment he wishes to make available the user may choose one of these numbers and so obtain a smooth flow between systems programs without the necessity of constructing his own ECD card each time (see Appendix A).

If there are unusual run sequences, or only limited equipment is available, it may be undesirable to run with one standard configuration. In these instances it is possible to specify a standard configuration number for each run on an individual, one-at-a-time basis.

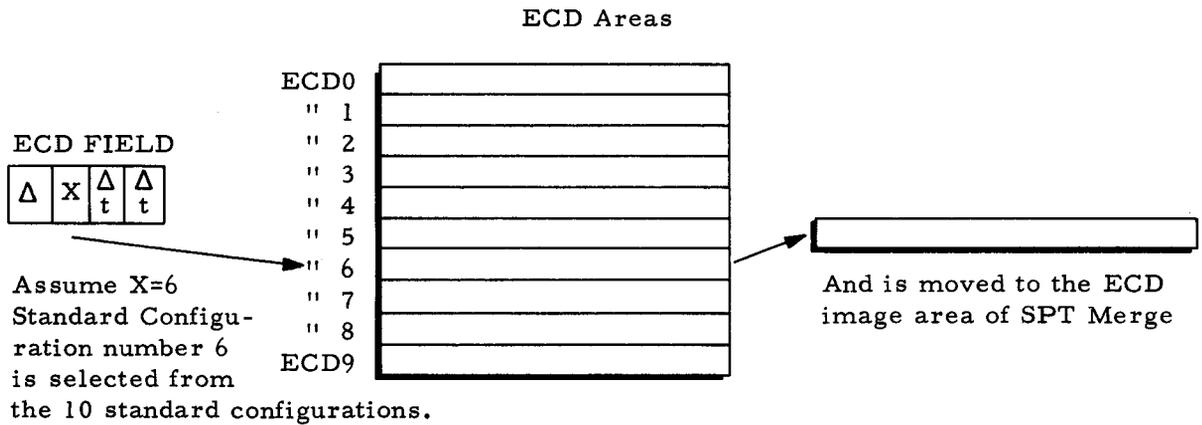
Should the desired configuration not be included among the standard equipment configuration, a full Equipment Configuration Descriptor may be constructed.

The standard configurations supplied may be changed at each installation by re-assembling the system program (see Appendix A). However, it should be noted that specification of memory size may be independent of the standard configurations. (See below.)

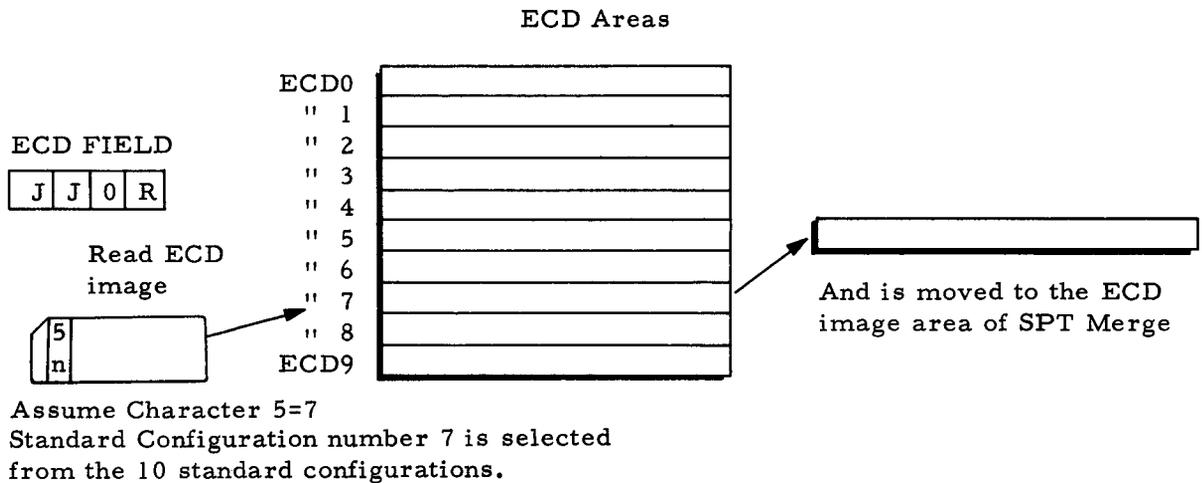
METHODS OF SPECIFYING THE CONFIGURATION

A four character area, called the ECD Field, has been set aside within the Loader-Monitor Communication Area to contain information pertaining to the Equipment Configuration Descriptor for the run.

- #1. Standard ECD Number Residing in the Tape Loader-Monitor C and Card Loader-Monitor B programs.



- #2. Standard ECD Number Read from ECD Image.



- #3. Full ECD Read from ECD Image.

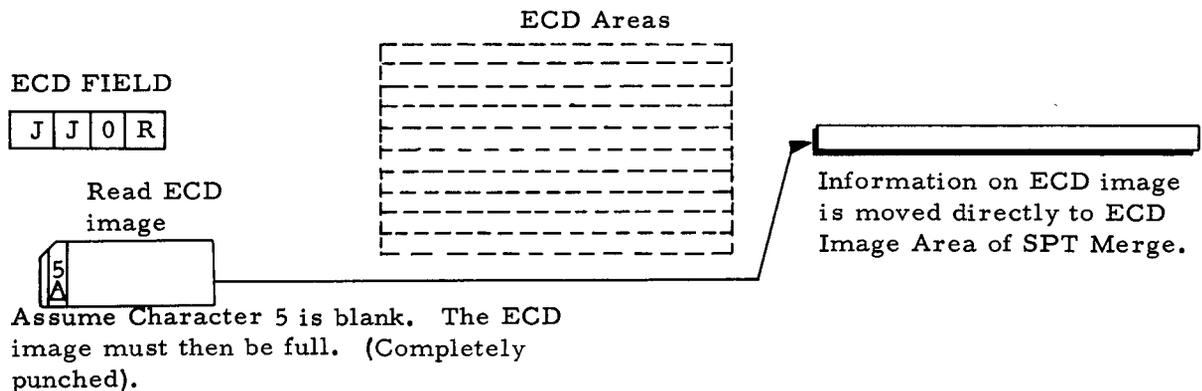


Figure 2-1. Methods of Specifying Equipment Configuration

The ECD Field occupies locations 227₈ - 232₈ and contains either:

1. A standard equipment configuration number which will be used for all system program runs including SPT Merge (Method #1).
2. A device address. The system program will read one record from that device (there is no anticipatory read; one and only one record will be read.) This record must be an Equipment Configuration Descriptor image.

This ECD image may specify either:

- a. A standard configuration number (Method #2)
- or
- b. A full, user constructed ECD (Method #3).

Method #1 - Standard ECD Number Residing in the Loader-Monitor

Locations 227₈ - 232₈ (ECD Field) of the Loader-Monitor Communications Area contain:

Δ	X	t	t
---	---	---	---

Table 2-1. ECD Field with Standard ECD Number

Character Number	Location (Octal)	Contents
1	227	Blank (Δ)
2	230	Standard Configuration Number (X)
3-4	231-232	Highest memory bank (octal) available to the system program. If these characters are blank, the memory size in the standard configuration is used. (tt)

NOTE: Referring to the table in Appendix A, should only one standard configuration number need be used for all system programs including SPT Merge, (as in configurations 7-9), then no ECD cards will be required. The Loader-Monitor will be assembled so that locations 227₈ - 232₈ contain

Δ	X	t	t
---	---	---	---

 as described in the preceding table.

Table 2-2 shows which function SPT Merge C will perform (selecting from one SPT or merging two SPT's) when the ECD Field is set up to contain a standard configuration number.

The merging of two SPT's is the most common operating mode and has therefore been given standard configuration numbers 1 through 9.

Standard Configuration number 0 is reserved for the special case where only one input SPT is used. This mode is used to re-order an SPT.

If it is desired to use both these operating modes, merging two SPT's on one occasion and re-ordering one SPT on another, then method #2 must be used as more than one standard configuration number is involved.

Method #2 - Standard ECD Number Obtained from ECD Image

Locations 227₈ - 232₈ (ECD Field) of the Loader-Monitor Communications Area contain:

J J 0 R

Table 2-2. ECD Field to Obtain ECD Image from Input Device

Character Number	Location (Octal)	Contents
1	227	Device Type (J)
2-3	230-231	Control Unit and Device (J0)
4	232	Read/Write Channel (R)

NOTE: Under this method the Loader-Monitor is assembled with locations 227₈ - 232₈ containing the values of J J 0 R ; meaning that the ECD image will be read from a card-reader on read/write channel 1. These locations may be changed at the installation by re-assembling the Loader-Monitor or by manual entry from the console.

The Equipment Configuration Descriptor image read in must be constructed as in Table 2-3 below.

Table 2-3. Standard ECD Image

Character Number	Contents	Explanation
5	n where n is a decimal number from 0 through 9.	The standard configuration which corresponds to this number will be used. (If this column is blank, the image is assumed to be a full ECD image; see Method #3)
6	E	This image is an Equipment Configuration Descriptor.
19-20	tt or ΔΔ	tt is the highest memory bank (octal) available to the system program. If these characters are blank, the memory size in the standard configuration is used.

NOTE: Method #2 will handle both merging two SPT's (standard configuration numbers 1-9) and re-ordering one SPT (standard configuration number 0). However SPT Merge C can merge up to four SPT's onto one. If it is desired to merge more than two SPT's onto one, Method #3 may be used.

Table 2-4. Standard Configurations for SPT Merge C

Configuration Number	0	1-9
Minimum Number of Tapes	3	4
Run Description	Select from one SPT	Merge two SPT's
Tape 0	PT ¹	PT
Tape 1	-	-
Tape 2	-	-
Tape 3	Input SPT #1 ²	Input SPT #1
Tape 4	Output SPT ³	Output SPT
Tape 5	-	Input SPT #2
Tape 6	-	-
Tape 7	-	-
Card Reader	Directors	Directors
Card Punch	-	-
Printer	SPT Directory	SPT Directory

- NOTES: 1. PT = program tape (BRT), source of system programs; a program card deck may replace this.
2. Input SPT #1 - the symbolic program tape from which the programs to be merged or re-ordered are taken.
3. Output SPT - the symbolic program tape which is the result of merging or re-ordering the chosen programs.

Method #3 - Full Equipment Configuration Descriptor as ECD Image

If it is desirable to specify an equipment configuration not included among the standard configurations, a full ECD image is required. (However, if this configuration is used frequently, one or more of the standard configurations should be re-assembled to incorporate it into the SPT Merge C Program.)

The format of the Full Equipment Configuration Descriptor is described below. (Figure 2-2, Table 2-5). Note that Character 5 must be blank to distinguish this from an Equipment Configuration Descriptor specifying a standard equipment configuration.

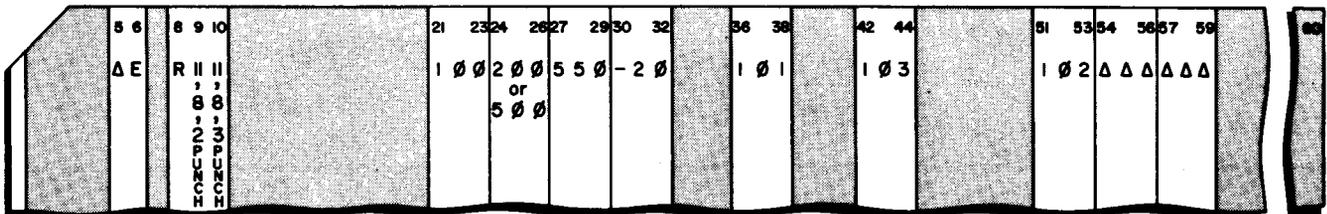


Figure 2-2. Equipment Configuration Descriptor Card

Table 2-5. Equipment Configuration Descriptor Coding

Character	Value	Contents and Meaning ¹	
5	Δ	This is a Full Equipment Configuration Descriptor.	
6	E	Equipment Configuration Descriptor – Must be E.	
8	R	Read/Write Channel used for input SPT(s). If the channel is not to be re-assigned, the character is an R (11, 9) punch for a channel 1.	
9	11, 8, 2	Read/Write Channel used for output SPT. If the channel is not to be re-assigned, the character is an 11, 8, 2 punch for channel 2.	
10	11, 8, 3	Read/Write Channel used for the director file and the directory listing. If the channel is not to be re-assigned, the character is an 11, 8, 3 punch for channel 3.	
21-23	100	File media field for the program tape. Character 21 is the device type and is a 1. Character 22 is the peripheral address. Character 23 is the tape drive number.	
24-26	200 or 500	File media field for the console device. Character 24 is the device type and is a 5 for the Console Typewriter and a 2 for the Control Panel. Character 25 is the peripheral address. Character 26 is a 0.	
27-29	JJ0	File media field for the director file. Character 27 is the device type and may be J (card reader), L (paper tape), or 1 (magnetic tape). Character 28 is the peripheral address. Character 29 is the drive number when the device type is 1; otherwise it is a 0.	
30-32	-20	File media field for listing device. The device type (character 30) may be - (11 punch) for printer or 1 for magnetic tape. Character 31 is the peripheral address, and character 32 is the drive number when applicable.	
36-38	101	Input SPT #1	<p>The first character of each of these fields is the device type and must always be 1 if the device is present. If the device is absent, the first character is a blank and all remaining characters are assumed blank (not only for this device but for all remaining devices). The first field that can be blank is for input SPT #2.</p> <p>The second character is the peripheral address.</p> <p>The third character is the number of the drive on which the SPT is mounted.</p>
42-44	103	Output SPT	
51-53	102	Input SPT #2	
54-56	ΔΔΔ	Input SPT #3	
57-59	ΔΔΔ	Input SPT #4	
¹ Values are shown as keypunch characters.			

DIRECTOR FILE

The director file for SPT Merge C (whether on punched cards, magnetic tape, or paper tape) must appear in the order shown in Figure 2-3 and stated below:

1. System Specific Header.
2. Revision Number Director.
3. Action Directors.
4. End of File.

The Revision Number Director may be absent from the director file. The results of omitting this director are discussed in the paragraphs which describe the director.

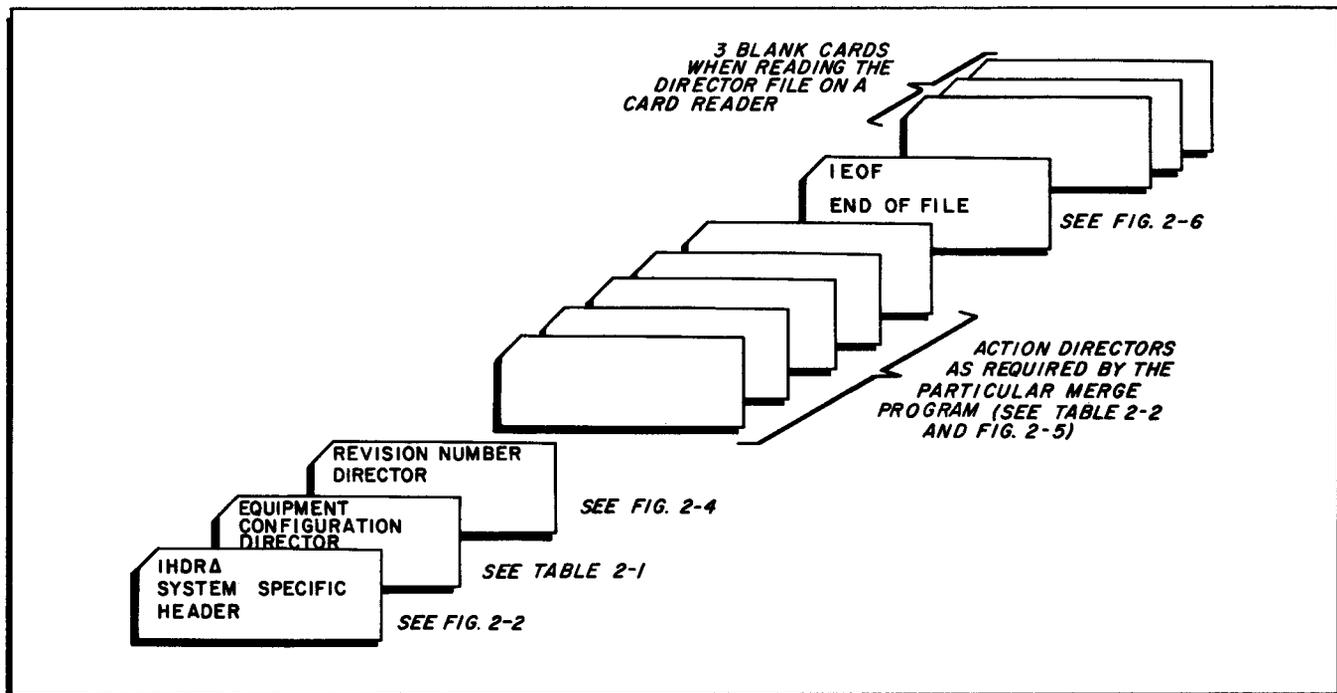


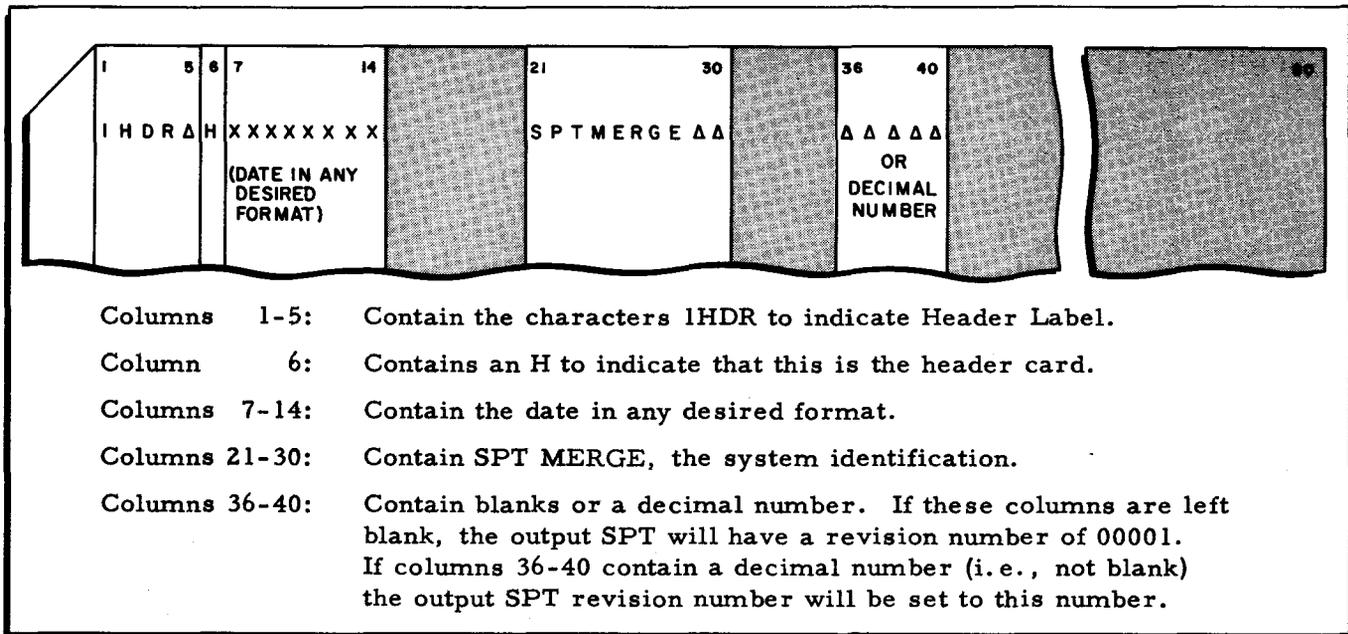
Figure 2-3. The Director File Order

SYSTEM SPECIFIC HEADER

The SPT Merge director file must begin with a header card which usually specifies the date, the name of the system, and the revision number of the output SPT. The date and revision number can be omitted, with the following results:

1. Omission of date results in no date appearing in the directory listing heading.
2. Omission of the revision number (i.e., left blank) causes the output SPT to have a revision number of 00001.

The format of the System Specific Header card and its specific coding entries are illustrated in Figure 2-4.



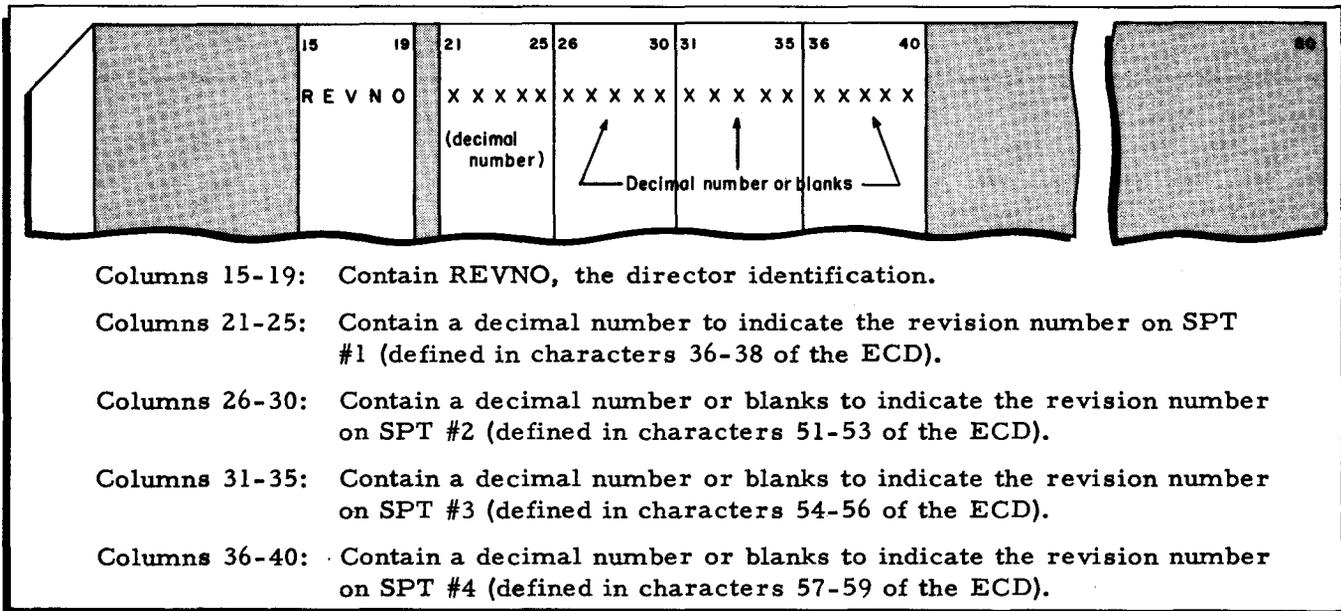
- Columns 1-5: Contain the characters IHDR to indicate Header Label.
- Column 6: Contains an H to indicate that this is the header card.
- Columns 7-14: Contain the date in any desired format.
- Columns 21-30: Contain SPT MERGE, the system identification.
- Columns 36-40: Contain blanks or a decimal number. If these columns are left blank, the output SPT will have a revision number of 00001. If columns 36-40 contain a decimal number (i. e., not blank) the output SPT revision number will be set to this number.

Figure 2-4. System Specific Header Card

REVISION NUMBER DIRECTOR

The Revision Number Director requests SPT Merge to compare the revision numbers in the header labels of the input SPT's with those specified on the director. The format of the Revision Number Director card and the specific coding which may be inserted is illustrated in Figure 2-5.

The Revision Number Director may be omitted from the director file at the option of the user; if it is omitted, no check will be made. A revision number field may only be left blank if the corresponding file media field of the Equipment Configuration Descriptor is also blank.



- Columns 15-19: Contain REVNO, the director identification.
- Columns 21-25: Contain a decimal number to indicate the revision number on SPT #1 (defined in characters 36-38 of the ECD).
- Columns 26-30: Contain a decimal number or blanks to indicate the revision number on SPT #2 (defined in characters 51-53 of the ECD).
- Columns 31-35: Contain a decimal number or blanks to indicate the revision number on SPT #3 (defined in characters 54-56 of the ECD).
- Columns 36-40: Contain a decimal number or blanks to indicate the revision number on SPT #4 (defined in characters 57-59 of the ECD).

Figure 2-5. Revision Number Director Card

ACTION DIRECTORS

The action directors specify to SPT Merge which programs are to be extracted from the input SPT(s) and placed on the output SPT. The user first selects from the directory listing of each input SPT the names of the programs he wishes to use (i. e., to have extracted to the output SPT). An action director is then coded by the user to designate the first program which shall be extracted. Action directors specify how the input tapes shall be positioned to obtain the user's selection of programs in the order desired. Positioning of tapes and copying of programs to the output SPT is accomplished by the action codes specified on the action directors. An action director must be coded for each program which is to be extracted unless a series of programs are to be extracted in the order in which they appear on an input SPT. In the latter case, only one action director need be coded in order to extract the entire series.

Action Codes

There are three types of action directors which may be used in the SPT Merge program: Position, Duplicate, and Rewind. Their action codes are listed and the function performed by each is described in Table 2-6.

Table 2-6. Action Directors

Action Code	Description
POS	Position action code. The input SPT specified in character 8 of an action director is moved past the program named in characters 21 through 26 of the same director.
DUP	Duplicate action code. The input SPT specified in character 8 of an action director is copied to the output SPT. The number of programs which will be copied is dependent upon the following conditions: <ol style="list-style-type: none">1. Characters 21-26 and 28-33 of the action director contain program names. The two programs named, and any programs between them, will be copied in the same order from the input SPT to the output SPT.2. Characters 21-26 of the action director contain a program name and characters 28-33 are blank. Only the program named by characters 21-26 will be extracted to the output SPT.3. Characters 21-26 of the action director contain 1EOFΔ. The input SPT will be copied from its present position through the last program on the tape. After copying, when the 1EOFΔ record is reached, the input SPT will be rewound and positioned in front of the first program record on the tape.
RWD	Rewind action code. The input SPT specified in character 8 of an action director is rewound and positioned in front of the first program record on the tape.

NOTE: A search is made for the program named in columns 21-26 of the action director card for either a POS or a DUP action code. In order to copy a program, it is not necessary first to specify a POSITION director. Simply specifying DUPLICATE will cause the correct program to be located and extracted to the output SPT.

Action Director Format

The format of the action directors is illustrated and described in Figure 2-6.

END-OF-FILE RECORD

The end-of-file record terminates the SPT Merge program. Its format is illustrated in Figure 2-7.

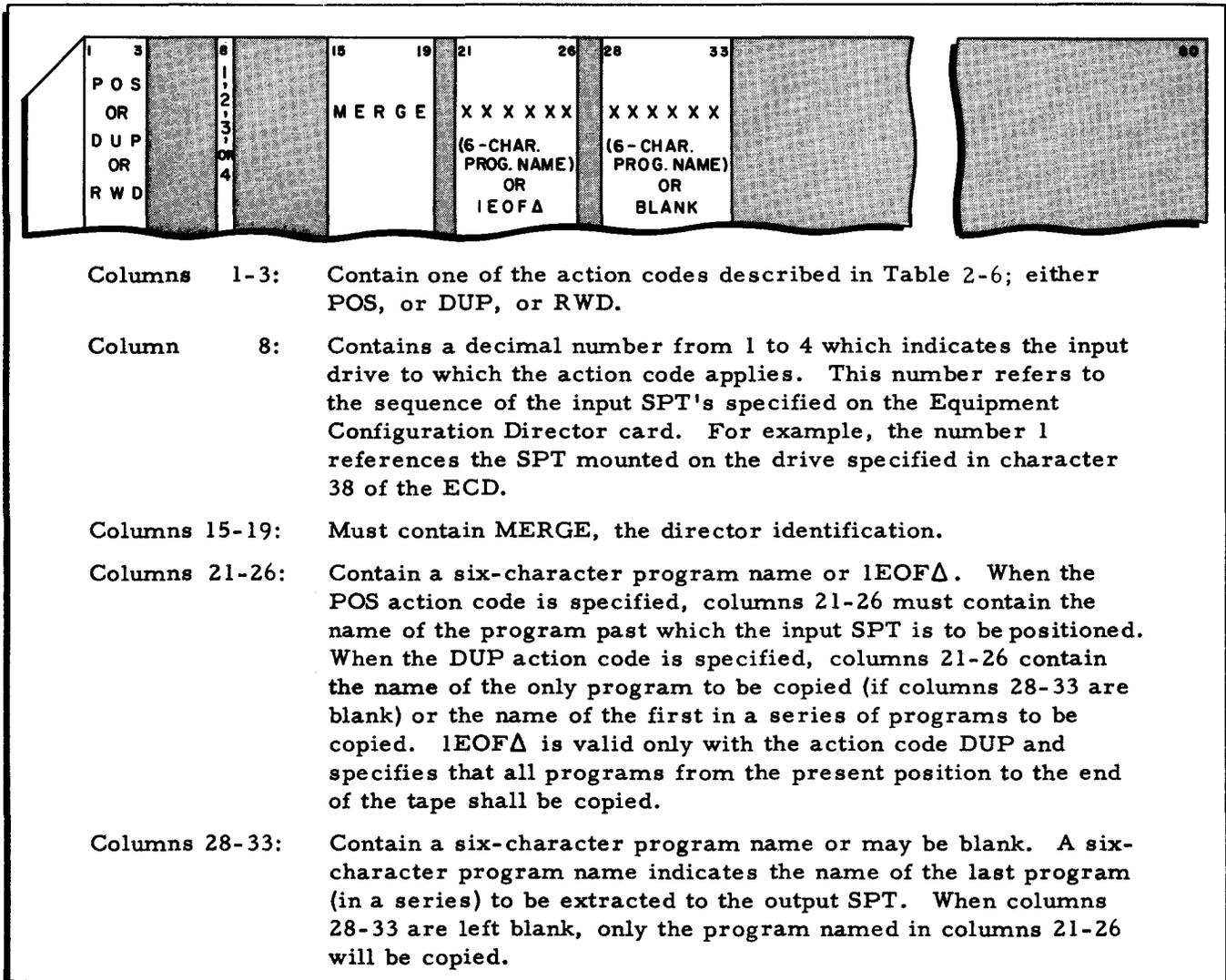


Figure 2-6. Action Director Format

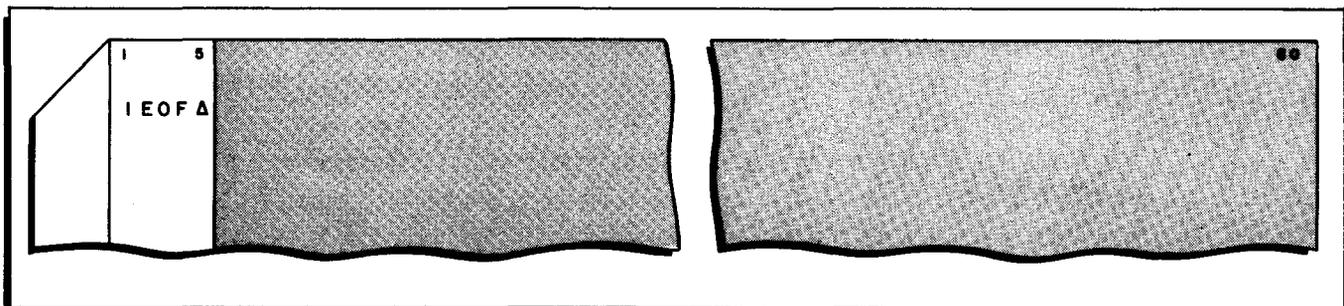


Figure 2-7. End-of-File Record

SECTION III
STANDARD PAPER TAPE VERSION OF SPT MERGE

In general, paper tape processing closely parallels punched card processing. Paper tape data may be read directly into memory, interpreted by a programmed routine, and processed. Alternatively, paper tape data in any code may be translated into Series 200 code and edited prior to being written on magnetic tape. The data is then sorted and processed in a manner similar to card-generated input.

The SPT Merge program converts the frames punched in paper tape into Series 200 six-bit internal code by means of a translation routine and table. This table is easily changed to reflect the character sets of different paper tape perforators. The standard version of AAGMER accepts paper tape input punched with six data channels. The data channels must be the six lowest-order channels on the paper tape; either 7/8" or 1" wide paper tape may be used. The six-bit values read from paper tape are translated to internal codes as shown in Table 3-1, unless otherwise specified.

Table 3-1. Translation of Paper Tape Code to Internal Code

Paper Tape Code (octal)	Internal Code (octal)	Paper Tape Code (octal)	Internal Code (octal)	Paper Tape Code (octal)	Internal Code (octal)
00	72	26	65	54	73
01	21	27	66	55	40
02	22	30	67	56	33
03	23	31	70	57	61
04	24	32	71	60	00
05	25	33	15	61	01
06	26	34	Delete line*	62	02
07	27	35	End field*	63	03
10	30	36	End reel or strip*	64	04
11	31	37	End line*	65	05
12	41	40	15	66	06
13	42	41	15	67	07
14	43	42	55	70	10
15	44	43	52	71	11
16	45	44	53	72	14
17	46	45	35	73	32
20	47	46	17	74	15
21	50	47	12	75	13
22	51	50	74	76	15
23	62	51	34	77	Ignore char.*
24	63	52	54		
25	64	53	20		

SPT Merge may be reassembled to allow for various modifications of paper tape input. These modifications are described below.

NOTE: All internal codes are word marked. In addition to the word mark, the control characters (those which have an asterisk in the above table) have an item mark.

Parity Check

The constant tagged CRDTY has a standard value of #1C77 (77 means no parity checking). If even parity checking is desired, this constant should be changed to #1C00; for odd parity, the constant should be changed to #1C04.

SIX-LEVEL TAPE

To read six data channels (not including parity) using a single non-standard translation table, the 64-character table beginning at the location tagged CRDTT must be changed. The revised translation table must not include a control frame indicator for "switch tables" (35g with an item mark), and the data channels must always be punched as the six low-order channels on the paper tape. Parity may be punched in either channel 7 or channel 8. (The tape may be 7/8-inch or 1-inch wide.)

SIX-LEVEL TAPE WITH TWO TRANSLATION TABLES

It may at times be desired to read six data channels (not including parity) using two translation tables (so that a paper tape frame may have two different meanings depending on which translation table is being used). To accomplish this operation, the first (lower-case) translation table should be set up as a 64-character table beginning at the location tagged CRDTT, while the second (upper-case) translation table should be set up as a 64-character table beginning at the location tagged CRDTR.

The data channels must always be punched as the six low-order channels on the paper tape, and parity may be punched in either the seventh or the eighth channel. The tape may be 7/8-inch or 1-inch wide.

SEVEN-LEVEL TAPE

To read seven data channels (not including parity) the constant tagged CRDMK should be changed (from its standard value of #1C00) to #1C01. In addition, the 64-character translation table must be expanded to 128 characters. This latter operation should be performed by (1) modifying the table beginning at location CRDTT to contain the internal codes corresponding to paper tape frames between 000g and 077g; and (2) inserting the internal codes corresponding to paper tape frames between 100g and 177g (starting at the location tagged CRDTR). The resulting 128-character translation table must not include a control frame indicator for "switch tables" (35g with an item mark).

The data channels must always be punched as the seven low-order channels on the paper tape, and parity may be punched in channel 8. The tape may be 7/8-inch or 1-inch wide.

FIVE-LEVEL TAPE

It may occasionally be desired to read five data channels (not including parity) using two translation tables (so that a paper tape frame may have two different meanings depending on which translation table is being used). To accomplish this operation, the first (lower-case) translation table should be set up as a 32-character table beginning at the location tagged CRDTT, while the second (upper-case) translation table should be set up as a 32-character table beginning at the location tagged CRDTR. Following this, the 32-character table starting as CRDTT should be repeated starting at location CRDTT+32, and the 32-character table starting at CRDTR should be repeated starting at location CRDTR+32.

The data channels must always be punched as the five low-order channels on the paper tape, and parity may be punched in the sixth, seventh, or eighth channel. The tape may be 11/16-inch, 7/8-inch or 1-inch wide.

PREPARATION OF PAPER TAPE INPUT

Preparation of paper tape input must adhere to the standards specified in the Honeywell Information Bulletin, Easycoder Paper Tape Assembly and Loader Programs (DSI-395), as well as to the preparation considerations discussed below.

Positioning Paper Tape Input

A delete line character or a series of ignore characters should precede the input data at the beginning of a paper tape strip or reel. This convention allows the operator to position the paper tape in order to read the initial input data on tape. If only sprocket holes are present at the beginning (or end) of a paper tape strip or reel, then parity errors may occur when parity is being checked. The presence of only sprocket holes in the above positions will be detected as parity errors during even-parity checking for 11/16" or 7/8" tape and during odd-parity checking for 1" tape.

Field Definitions

Standard paper tape field definitions are equivalent to card fields beginning in card columns 1, 15, and 21. Respecialization of the Terminal I/O routine, \$CI, is required in order to change those field definitions.

Data immediately following a field termination character will be considered to be positioned at the beginning of the next field unless the field termination character is in the first column of

the next field, in which case the field termination character will be ignored. Thus, if positioning to the next field is desired, then at least one character must precede the field termination character.

Beginning of Each Card Image

Each card image on paper tape is always considered to begin by using the first (lower-case) translation table.

End of Paper Tape Strip or Reel

An end-of-strip control frame must be punched at the end of every reel or strip of paper tape. As soon as an end-of-strip frame is read, the paper tape is run out. The operator should then mount the next strip or reel of input to this program, if additional input is required.

SECTION IV
SPT MERGE PROGRAM DIRECTORY LISTING

A directory listing of the SPT Merge run records all pertinent information associated with the extracted programs and lists any errors found during execution. A sample directory listing of an SPT Merge run is shown in Figure 4-1.

```

                                02/28/65 MERGE PROGRAMS FROM SPT NOS 00167, 00166, 00168

                                D I R E C T O R Y   L I S T I N G  - - S P T           N O   00001

PROGRAM REV. NO. 0000000000 VISIBILITIES0000000000 DATE           SPTNO.

AAAMON      004   A                               FEB 1         00158
AAACLM      000   A                               NOV 10        00113
AAAUPS      004   A                               DEC 31        00003

DIRECTOR REJECTED DUP      MERGE
DIRECTOR REJECTED DUP 1   MERGE

AABINI      009   C                               FEB 12        00165
AABBTL      010   C                               FEB 12        00165
AABDCT      003   C                               FEB 12        00165
AABPRS      011   C                               FEB 12        00165
AABPRQ      013   C                               FEB 12        00165
STBI        001   READ FAIL ON RECORD NO. 00019   NOV 1         00103
AABPS1      012   C                               FEB 17        00167
AABPS2      013   C                               FEB 12        00165
AACLIB      005   A                               JAN 27        00154
CACI        001   A                               NOV 1         00103

NOPROG NOT FOUND ON SPT 2

CAPO        001   A                               NOV 1         00103
AAAMEM      000   A                               NOV 1         00103
AAATAP      005   ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789   FEB 12        00165
AAFTOR      001   A                               DEC 11        00132
AADS2       001   A                               DEC 15        00137
AAJANA      001   A                               DEC 15        00137
AAGMER      001   ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789   FEB 16        00001

END

```

Figure 4-1. Directory Listing of an SPT Merge Run

LINES OF THE DIRECTORY LISTING

Two kinds of lines appear in the SPT Merge directory listing: heading lines and directory lines.

Heading Lines

There are three levels of heading lines in the listing. They appear as follows:

1. A first-level heading line appears only once, on page 1 of the listing. Its format is described in Table 4-1, and its physical appearance is illustrated in the first heading line of Figure 4-1.
2. A second-level heading line appears only once, on page 1 of the listing. Its format is described in Table 4-2, and its physical appearance is illustrated in the second heading line of Figure 4-1.
3. A third-level heading line appears on all pages of the listing. Its format is described in Table 4-3, and its physical appearance is illustrated in the third heading line of Figure 4-1.

Table 4-1. First-Level Heading Line

Characters	Contents
28 - 35	A date furnished to the program in characters 7-14 of the System Specific Header card.
38 - 64	MERGE PROGRAMS FROM SPT NOS
66 - 70	The revision number in the header label of SPT #1.
71	,
72 - 76	The revision number in the header label of SPT #2.
77	,
78 - 82	The revision number in the header label of SPT #3.
83	,
84 - 88	The revision number in the header label of SPT #4.

Table 4-2. Second-Level Heading Line

Characters	Contents
28 - 72	DΔIΔRΔEΔCΔTΔOΔRΔYΔΔΔ LΔIΔSΔTΔ IΔNΔGΔ -- ΔSPTΔ Δ ΔNO
75 - 79	The revision number of the output SPT—will be 00001 if a number is not given in characters 36-40 of the System Specific Header.

Table 4-3. Third-Level Heading Line

Characters	Contents
2 - 8	PROGRAM
11 - 17	REV. NO.

Table 4-3 (cont). Third-Level Heading Line

Characters	Contents
20 - 55	□□□□□□□□□□ VISIBILITIES □□□□□□□□□□
60 - 63	DATE
68 - 73	SPTNO.

Directory Lines

The lines of the SPT Merge directory proper (after the heading lines) list all pertinent information pertaining to each program specified for extraction to the output SPT. All errors encountered during execution of SPT Merge are also listed. Each directory line will list one of the five conditions described below.

1. Successful extraction of the specified program. If the program is successfully extracted to the output SPT, a directory line of the format described in Table 4-4 is printed. Directory line 1 of Figure 4-1 (program name AAAMON) and all other lines of the same format in the figure illustrate the directory line format which is printed upon successful extraction.

Table 4-4. Successful Extraction Line

Characters	Contents
2 - 7	The name of the successfully extracted program.
13 - 15	The revision number of the program.
20 - 56	The visibility of the program.
59 - 64	The date the program was originally put on the input SPT.
69 - 73	The SPT number that appears in the header record of this program. (This is the number of the SPT on which the program was first assembled.)

2. Uncorrectable read. If an uncorrectable read error has occurred during copying of a program, a directory line of the format described in Table 4-5 is printed to indicate why the program has not been copied to the output SPT. Directory line 11 of Figure 4-1 (program name STB1) illustrates the directory line format which is printed upon occurrence of an uncorrectable read error.

Table 4-5. Uncorrectable Read Error Line

Characters	Contents
2 - 7	The name of the program that was <u>not</u> extracted to the output SPT.

Table 4-5 (cont) Uncorrectable Read Error Line

Characters	Contents
13 - 15	The revision number of this program.
18 - 40	READΔFAILΔONΔRECORDΔNO.
42 - 46	A decimal number indicating which record of this program could not be read.
59 - 64	The date that the program was originally put on the input SPT.
69 - 73	The SPT number that appears in the header record of this program. (This is the number of the SPT on which the program was first assembled.

3. Director error. If the action director is in error, a directory line of the format described in Table 4-6 is printed. Directory lines 4 and 5 of Figure 4-1 illustrate the directory line format which is printed when a director error is encountered.

Table 4-6. Director Error Line

Characters	Contents
2 - 18	DIRECTORΔREJECTED
22 - 24	Characters 1-3 of the action director which is in error.
26	Character 8 of the action director.
31 - 35	Characters 15-19 of the action director.
38 - 43	Characters 21-26 of the action director.
45 - 50	Characters 45-50 of the action director.

4. Program not found. If the specified program can not be found, a directory line of the format described in Table 4-7 is printed. Directory line 16 of Figure 4-1 illustrates the directory line format which is printed when a specified program is not found by AAGMER.

Table 4-7. Program Not Found Line

Characters	Contents
2 - 7	The name of the program that can not be found.
9 - 24	NOTΔFOUNDΔONΔSPT
29	The SPT number from character 8 of the action director.

5. End of run. To signify the end of the SPT Merge run and the end of the directory listing, the following directory line is printed:

<u>Characters</u>	<u>Contents</u>
2 - 4	END

The last directory line of Figure 4-1 illustrates the directory line format which is printed at the end of the run.

SECTION V OPERATING PROCEDURES

The SPT Merge C program, which has a loading unit name AAGMERGE, can be loaded from: (1) a binary card deck using Card Loader-Monitor B; or (2) a binary run tape (BRT) using Tape Loader-Monitor C. Both the card and the tape loading methods are described in this section.

LOADING WITH CARD LOADER-MONITOR B

When the Card Loader-Monitor B program is used to load SPT Merge C, the operating procedures discussed below must be followed. If additional information on card loading is desired, the reader is referred to the Honeywell Series 200 Software Bulletin Card Loader-Monitor B, File Number 122.5105.040B.00.00

Initial Setup Procedures

The procedures for setting up the various peripheral devices are described below. Note that in all cases the devices must be set up according to the values specified on the Equipment Configuration Descriptor.

1. Mount the output SPT reel on logical Tape drive 4 if using a standard Equipment Configuration Descriptor, or on the drive indicated by Character 44 of the full ECD card. Insure that the write-enable ring is inserted and that the PERMIT-PROTECT switch is set to PERMIT on this drive. If the directory listing is to be placed on magentic tape rather than printed, another tape must be mounted in PERMIT status.
2. Initialize the printer, ascertaining that it is ready to accept programmed commands.
3. Place the self-loading deck containing the Card Loader-Monitor B into the card reader. Place the SPT Merge C program and any input cards into the card reader immediately after Card Loader-Monitor B. Initialize the card reader, ascertaining that it is ready to accept programmed commands.
4. If paper tape input is employed, mount this tape on the paper tape reader. Initialize the paper tape reader, insuring that it is ready to accept programmed commands.

NOTE: If the paper tape reader is not to be used, omit this step and proceed to step 5.

5. The input SPT(s) should now be mounted on the tape drive(s) to be used for input. Insure that each drive used for this purpose has its PERMIT-PROTECT switch set in the PROTECT position.
6. Depress the INITIALIZE button. (This action causes the resetting and/or clearing of the central processor registers necessary for the operation.)

NOTE: All actions taken via the console typewriter, specifically the type 220-2, presuppose that the proper conditions exist regarding the STOP button and the logging mode. (See Honeywell 200-Equipment Operator's Manual, DSI-294).

BOOTSTRAP PROCEDURES

Table 5-1. Bootstrap Procedures for Control Panel and Console Typewriter (Card Loader-Monitor B)

Control Panel	Console Typewriter
<ol style="list-style-type: none"> 1. Set the ADDRESS buttons to octal 1620. 2. Set the CONTENTS button to designate the octal address assignment of the card reader. (The recommended address of the card reader is octal 41.) 3. Depress the BOOTSTRAP button. This action causes the first card (bootstrap card) to be read. 4. Depress the RUN button. 5. A halt occurs, and the contents of the B-address register should be 17002. This halt indicates that the Loader-Monitor is in memory and awaiting a console call. 	<ol style="list-style-type: none"> 1. B XX 001620 (XX is the octal address of the card reader-recommended as 41). This action causes the first card (bootstrap card) to be read. 2. Depress the RUN button. 3. A halt occurs, and the contents of the B-address register should be 17002. EX: P10 017002 (See control panel step 5.)

CONSOLE CALL PROCEDURES

1. The Card Loader-Monitor B does not accept a Console Call card. However, the principle of the console call (i. e., a request by the operator for the loading of a unit) is still applicable. Thus the 17002 halt is provided for several reasons.
 - a. If the cards listed in step 3 of the "Initial Setup Procedures" above have not been placed in the card reader, they should be placed there at this time.
 - b. If the operator wishes to search for a specific unit by program and segment name, to start the specific unit at some address other than its normal starting address, or to perform any other non-standard action, the appropriate parameters should be entered into the Loader communication area at this time.
2. Depress the RUN button. The next loading unit is now loaded. Following the loading of this unit, the Loader resets the search mode parameter to 20 ("search by program and segment name").

LOADING WITH THE TAPE LOADER-MONITOR

If Tape Loader-Monitor C is used, it is located on a binary run tape (BRT). For more information on tape loading, refer to the PLUS-Tape Loader-Monitor bulletin (DSI-327).

Preparation of Console Call Card

The Console Call card, which directs the loader to load the SPT Merge C program, is coded as illustrated in Figure 5-1. It should be noted that, as with other programs loaded by Tape Loader-Monitor C, the contents of the Console Call card may optionally be entered from the control panel or console typewriter.

Initial Setup Procedures

The procedures for setting up the various peripheral devices are described below. Note that in all cases the devices must be set up according to the values specified by the Equipment Configuration Descriptor.

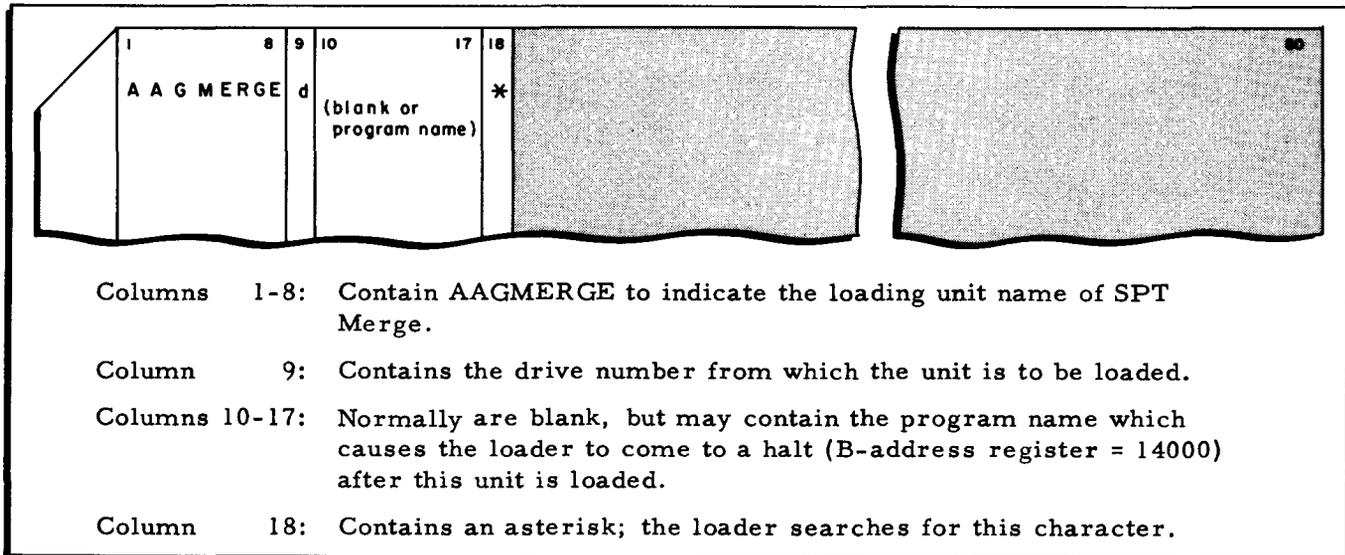


Figure 5-1. Console Call Card for the SPT Merge Program

1. Mount the program tape (PT) on the tape drive designated as logical 0. Set the PERMIT-PROTECT switch to PROTECT.
2. Mount the output SPT, on logical tape drive 4, if using a standard Equipment Configuration Descriptor. If using a full equipment configuration description, mount the output SPT on the drive indicated by character 44 of the ECD card. Insert the "write-enable ring" and set the PERMIT-PROTECT switch to PERMIT.
3. Initialize the printer, ascertaining that it is ready to accept programmed commands.

NOTE: If the directory listing is to be placed on magentic tape rather than printed, another tape must be mounted in PERMIT status.

4. If cards are to be read, they should be placed in the card reader at this time. If the console call information has been punched on a card (as described above), this card should be placed in the card reader immediately preceding the Equipment Configuration Descriptor card. If an ECD card is not used, the Console Call Card should immediately precede the System Specific Header card. Initialize the card reader, ascertain that it is ready to accept programmed commands.

NOTE: If the card reader is not to be used, omit this step and proceed to step 5.

5. If paper tape input is employed, mount this tape on the paper tape reader. Initialize the paper tape reader, insuring that it is ready to accept programmed commands.

NOTE: If the paper tape reader is not used, omit this step and proceed to step 6.

6. The input SPT(s) should now be mounted on the tape drive(s) to be used for input. Insure that each drive used for this purpose has its PERMIT-PROTECT switch set in the PROTECT position.
7. Depress the INITIALIZE button. (This action causes the resetting and/or clearing of the central processor registers necessary for the operation.)

Bootstrap Procedures

Table 5-2. Bootstrap Procedures for Control Panel and Console Typewriter (Tape Loader-Monitor C)

Control Panel	Console Typewriter
<ol style="list-style-type: none"> 1. Set the CONTENTS buttons to designate the octal address assignment of the program tape. (The recommended address assignment of the program tape is octal 40.) 2. Depress the BOOTSTRAP button. (This causes the tape label record to be bypassed.) 3. Set the CONTENTS buttons as in step 1. 4. Depress the BOOTSTRAP button. (This causes the first bootstrap record to be read.) 5. If the CONTENTS buttons were set to octal 40 (steps 1 and 3 above) proceed to step 6. Otherwise set the following (octal) memory locations to lnnnnn where nnnnn is the peripheral control number: <ul style="list-style-type: none"> 65 73 101 6. Depress the RUN button. 	<ol style="list-style-type: none"> 1. B XX 00000 (XX is the octal address assignment of the program tape — recommended as octal 40.) This action causes the tape label record to be bypassed. 2. B XX 00000 (XX is the same as in step 1). This action causes the first bootstrap record to be read. 3. If XX was 40 proceed to step 4. Otherwise set locations 65, 73, and 101 to lnnnnn where nnnnn is the peripheral control unit number. Example: A00000065 ln A00000013 nn A000000101 nn

Table 5-2 (cont). Bootstrap Procedures for Control Panel and Console Typewriter
(Tape Loader-Monitor C)

Control Panel	Console Typewriter
7. A halt occurs and the contents of the B-address register should be 17001. (An explanation of this halt may be found in the <u>PLUS-Tape Loader-Monitor Bulletin</u>)	4. Depress the RUN button.
8. Depress the RUN button.	5. A halt occurs, and the contents of the B-address register should be 17001. Example: P10 017001 (See control panel step 7)
9. Another halt occurs and the contents of the B-address register should be 17002. This halt indicates that the Loader-Monitor is in memory and awaiting a console call.	6. Depress the RUN button.
	7. A halt occurs and the contents of the B-address register should be 17002. (See control panel step 9)

Console Call Procedure

The eight-character program and segment name for an SPT Merge run is AAGMERGE. If the required console call information has not been punched on a Console Call card, it must be entered from the control panel or console typewriter at this time. The information to be entered into octal locations 100 and 104 through 114 is as follows:

<u>Location</u>	<u>Contents (octal)</u>
100	01 ("Do not read card")
104 - 111	21, 21, 27, 44, 25, 51 (AAGMER)
112 - 113	27, 25 (GE)
114	Address of tape (0) from which the program is to be loaded

Final Operating Procedures

1. Depress the RUN button.

ERROR CONDITIONS

For all halts, the B-Address Register (which indicates the reason for the halt) should be displayed first. This operation is accomplished as follows:

Table 5-3. Displaying B-Address Register

Control Panel	Console Typewriter
1. Depress the STOP button on the control panel if the machine is not already stopped.	1. Depress the STOP button on the control panel if the machine is not already stopped.

Table 5-3 (cont). Displaying B-Address Register

Control Panel	Console Typewriter
<ol style="list-style-type: none"> 2. Set the CONTROL buttons to octal 10 (to designate the B-address register). 3. Depress CONTROL DISPLAY. This action causes the halt code for the particular halt condition to be displayed in the CONTENTS portion of the control panel. 	<ol style="list-style-type: none"> 2. Strike the P key, and the 1 and 0 keys (to designate the B-address register). Example: P10 <u>017001</u> is typed out

In some cases, the A-address register contains supplementary information. The A-address register is location octal 14. It is displayed in the manner indicated above.

The SPT Merge error conditions are listed in Table 5-4 below.

If the SPT Merge program is using the control panel, the following conditions occur:

1. SPT Merge halts.
2. Displaying the B-address gives the reason for the halt.
3. If the run is to be continued, the RUN button is depressed.

If the SPT Merge program is using the console typewriter, the following conditions occur:

1. The console warning bell rings.
2. The error message is typed.
3. The TYPE Light is illuminated.
4. SPT Merge stalls.
5. If the run is to be continued, the G key is depressed.

Table 5-4. SPT Merge Error Conditions

Contents of B-Address Register	Console Typewriter Message	Cause and Action
07025	: NO E CARD□	<p>The card image that has been specified as the ECD does not contain an E in character 6.</p> <ol style="list-style-type: none"> 1. If the ECD is to be entered through the input device specified by the ECD parameter in the Loader Communications Area, ascertain that the desired ECD is in the input device and continue the run. 2. If the ECD is <u>not</u> to be entered through the input device specified by the ECD`

Table 5-4 (cont). SPT Merge Error Conditions

Contents of B-Address Register	Console Typewriter Message	Cause and Action
		<p>parameter in the Loader Communications Area, the ECD field, locations 227g-232g, may be changed to</p> <ol style="list-style-type: none"> a. Accept the ECD from a different device or b. Select one of the ten standard equipment configurations. <p>When this has been done, continue the run.</p>
04007	: WRONG INPUT ON d□	<p>The revision number of the input SPT mounted on tape drive "d" does not agree with the Revision number given in the REVNO Director. (If no console typewriter is present, the A-address register contains the address of the drive on which the SPT in question is mounted.)</p> <ol style="list-style-type: none"> 1. To accept the input SPT as is, continue the run or 2. Start the run over changing either the REVNO Director or the SPT.
04010	: NO SYSTEM HEADER□	<p>The System Header card was not found.</p> <p>Correct the director file and start the run over.</p>
04011	: ECD IN ERROR□	<p>One of three file media fields on the Equipment Configuration Descriptor is in error. The FMF's are for the output SPT, input SPT, and printer.</p> <p>Correct the necessary FMF's and start the run over.</p>
0culd	: RD ER cu d□	<p>If "cu" is the number of a <u>tape control unit</u>, an <u>uncorrectable read error</u> has occurred on tape "d" of that control unit. Continuing this run results in the following:</p> <ol style="list-style-type: none"> 1. If the read error occurred during the copying of a program, a message appears on the printer indicating the number of the record which could not be read. (Refer to Section IV, "Directory Lines".) This program will not appear on the output SPT. 2. If the read error occurs during a search for a particular program, the error is ignored.
0cull	: RD ER cu l□	<p>If "cu" is the control unit number of the <u>card reader</u>, a <u>hole count error</u> has occurred.</p>

Table 5-4 (cont). SPT Merge Error Conditions

Contents of B-Address Register	Console Typewriter Message	Cause and Action
		<ol style="list-style-type: none"> 1. Remove the cards from the input hopper. 2. Run-out the cards in the reader. 3. Place the cards from the run-out hopper back into the card reader followed by the remaining input cards. 4. Continue the run.
0cu12	: RD ER cu 2□	<p>If "cu" is the control unit number of the <u>card reader</u>, an <u>illegal punch</u> has been detected.</p> <ol style="list-style-type: none"> 1. Proceed as for a hole-count error. 2. Correct the first card in the run-out hopper to remove the illegal punch. 3. Continue the run.
0cu2d	: WR ER cu d□	<p>If "cu" is the number of a tape control unit, an <u>uncorrectable write error</u> has occurred on <u>tape "d"</u> of that control unit.</p> <p>Continue the run to retry the correction procedure.</p>
0cu3d	: END cu d□	<p>If "cu" is the number of tape control unit, <u>end of tape</u> has been reached <u>on output tape "d"</u>.</p> <p>The amount of input must be reduced and the run started over.</p>
0cu10	: RD ER cu 0□	<p>If "cu" is the number of the paper tape control unit, a <u>parity error</u> has been detected on <u>paper tape</u>.</p> <p>Continue the run to ignore the error.</p> <p>(The operator may make note of which program is currently being merged.)</p>
0cu7d	: PRINT cu J□	<p>If "cu" is the number of a tape control unit, the print routine has determined there is <u>no printing "stacked"</u> on the print tape on drive "d".</p> <p>This halt or message occurs only when an off-line print tape has been specified in the Equipment Configuration Descriptor.</p> <ol style="list-style-type: none"> 1. If the information on the tape is not to be preserved, continue the run. The directory will be written on this tape. 2. If the information is to be preserved, replace it with a work tape and continue the run. The directory will be written on this tape.

APPENDIX A
PROCEDURE FOR CHANGING STANDARD CONFIGURATIONS

The standard Equipment Configurations have been designed to accommodate the majority of users. However, it is understood that there will be occasions when it becomes desirable to change them.

They must be changed to allow SPT Merge to accept paper tape or to type messages on the console.

Each of the ten standard configurations is represented in a segment of the SPT Merge program by an 80-character area (ECD area). The contents of this area correspond exactly to the ECD card image described in Section II as Method #3 (Full ECD).

The leftmost character of each ECD area is tagged ECDn, where n is the number of the standard configuration corresponding to that ECD image.

Each ECD area is coded as shown in Figure A-1. This configuration illustrates the ECD area for SPT Merge standard configurations 1-9.

To allow SPT Merge, or any system program, to use a console Typewriter, change the CONSOLE DEVICE field of each ECD area to:

DC @5u0@ CONSOLE DEVICE

where u is the address of the control unit of the typewriter.

To allow input to be read from the paper tape reader, change the CARD INPUT DEVICE field to:

DC @Lu0@ CARD INPUT DEVICE

where u is the address of the paper tape reader control unit.

EASYCODER

CODING FORM

PROBLEM _____ PROGRAMMER _____ DATE _____ PAGE _____ OF _____

CARD NUMBER	TYPE	OPER	LOCATION	OPERATION CODE	OPERANDS	
					14 15	20 21
1			ΔECD7	DC	@ΔΔΔΔΔEΔ@	
2				DC	#3C515253	RWC Assignment
3				DC	@ΔΔΔΔΔ00Δ@	
4				DC	@02@	Highest Bank Available
5				DC	@100@	Loading Device
6				DC	@200@	Console Device
7				DC	@JJ0@	Card Input Device
8				DC	@-20@	Listing
9				DC	@ΔΔΔ@	Not Used
10				DC	@103@	File 1 : Input SPT #1
11				DC	@ΔΔΔ@	File 2 : Not Used
12				DC	@104@	File 3 : Output SPT
13				DC	@ΔΔΔ@	File 4 : Not Used
14				DC	@ΔΔΔ@	File 5 : Not Used
15				DC	@105@	File 6 : Input SPT #2
16				DC	@ΔΔΔ@	File 7 : Not Used
17				DC	@ΔΔΔ@	File 8 : Not Used
18				RESV,	20	
19		L		DCW	#1C00	

Figure A-1. Coding for SPT Merge C Standard Configurations 1-9

COMPUTER-GENERATED INDEX

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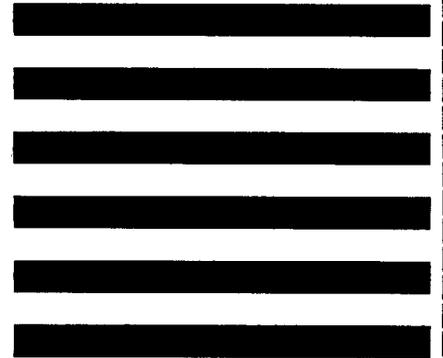
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