SPERRY UNIVAC

1900/10 System

Operator's Guide

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PAGE STATUS SUMMARY

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Part/Section	Page Number	Update Level
Cover		
Title Page		
PSS	1	
Contents	1, 2	
1	1	
2	1 thru 6	
3	1 thru 6	
4	1 thru 14	
5	1 thru 35	
6	1 thru 45	
7	1 thru 23	
Glossary	1 thru 13	
Index	1 thru 4	
User Comment Sheet		

Part/Section	Page Number	Update Level

Part/Section	Page Number	Update Level

Contents

PAGE STATUS SUMMARY

CONTENTS

A detailed table of contents for this section is located on the last page of the preceding section.

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1. Your Role as a Keystation Operator

The SPERRY UNIVAC 1900/10 System is designed to be used through the keystation (or terminal) keyboard. If you can type or keypunch, the keystation keyboard should look familiar already. Your usual speed should appear after only a few days work.

YOUR RESPONSIBILITIES

These are your general responsibilities as a 1900/10 keystation operator:

- You should know generally how the 1900/10 system is used in your working environment and a little about how it functions.
- Your keystation is a tool to help you work effectively, so you need to know how to use it. The control keys, alarm conditions, attention tones, and display information are all things to understand before you begin to use it.
- The 1900/10 system is used in many ways. If you are in a data preparation department, you might prepare your own check box programs, similar to keypunch drum cards. If you are in some other department, the display might tell you what your choices of work will be; and your key entries will fill in the blanks on familiar layouts.

LOCATING THE INFORMATION

This book contains information to help you meet the general responsibilities listed above.

Section 2 will introduce computers and data processing. Section 3 is about the 1900/10 system operation.

Section 4, on basic information displays, and Section 5, on keyboard functions, give you the facts you'll need about how to use the keystation.

Section 6 describes basic data entry procedures and the alarm and response sequences. Section 7 provides some check box program information and explains how this assists in your work, if you are in data preparation. You may not need these sections, depending upon how your company is using the 1900/10 system.

The glossary in the back of this book lists most of the terms which might be new to you, and the index is helpful when you are looking for a specific subject.

2. A Look at Data Processing Systems

HOW DATA PROCESSING SYSTEMS ARE USED

A computer and its associated equipment form an electronic data processing system. These systems are found in nearly every aspect of business and industry. You probably know of businesses using data processing systems to maintain financial accounting records or inventory records. Data processing systems are also being used to store and print copies of reports, keep up-to-date records of bookings for airline seats, operate automated assembly lines in manufacturing plants, operate systems that feed cattle in stock yards, solve complex scientific problems, monitor the condition of hospital patients, and many other tasks.

This section explains some of the basic facts about electronic data processing systems — the equipment, the operation, and the principles.

WHAT COMPUTERS DO

The computer, of course, is the basis of any electronic data processing system. Figure 2-1 shows flow of information (data) into and out of a computer. As you can see, computers operate on some very simple principles:

- First, they can receive and store data. The data they receive is called *input.*
- Second, they can *process* the data.
- Third, they can rapidly and accurately recall the stored or processed data and present it as *output.*

Most important for you, computers and data processing techniques make your job easier to do!

Receive and Store Data

In its most basic form, a computer is nothing more than a sophisticated filing system. Instead of typing information on a sheet of paper and filing that sheet in a cabinet, you enter the information directly into the computer by using, for example, a keypunch or a typewriter-style keyboard. Then the computer stores your data on magnetic tape or some other magnetic material, but in just a fraction of the space required by conventional drawer files.

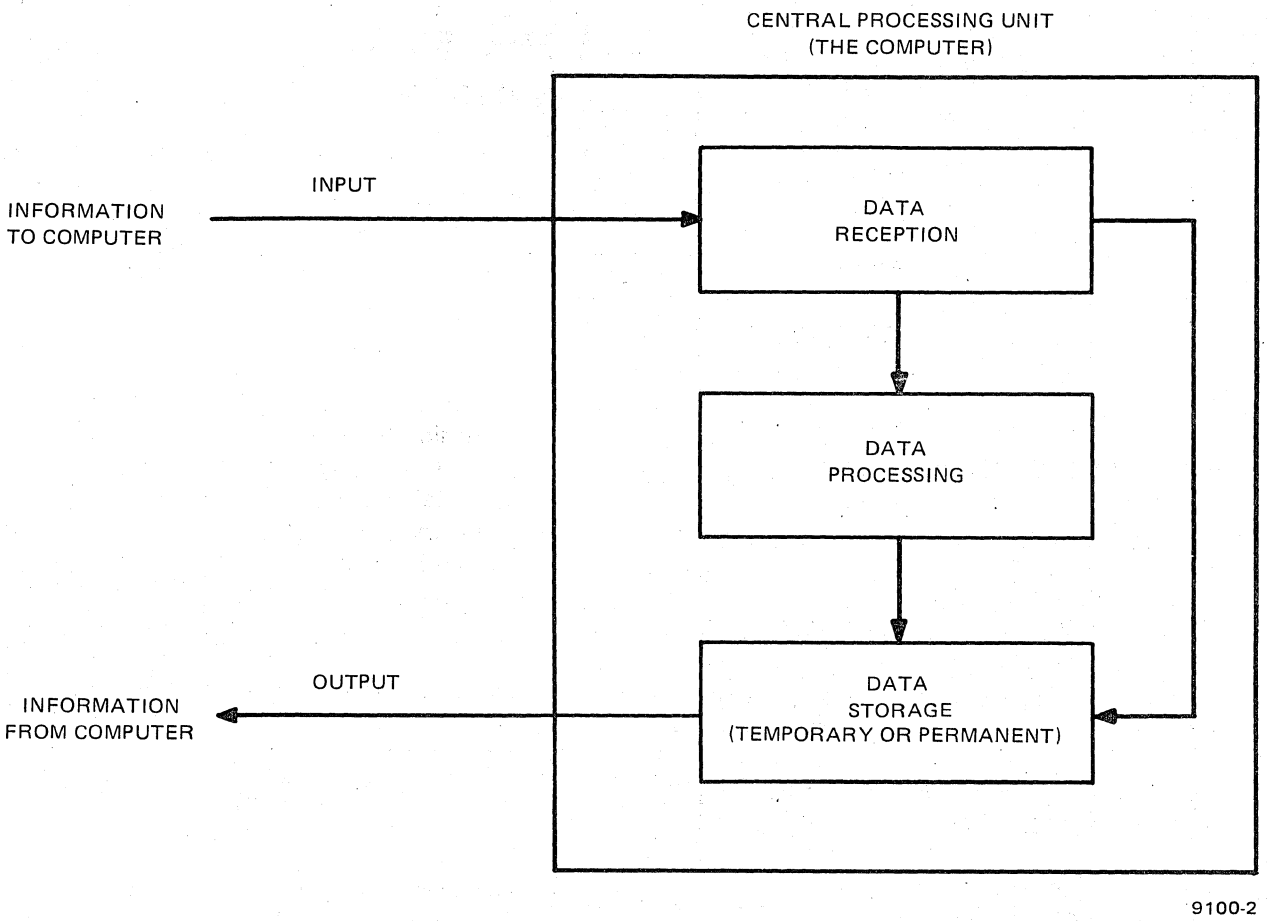


Figure 2-1. Flow of Information Into and Out of a Computer. In the computer, information may be modified by processing or it may be placed in storage without change.

Process and Recall Data

A computer can process stored data in many ways. It can automatically complete mathematical computations on numerical data. It can automatically edit and rearrange the contents of both numerical data and worded paragraphs and then present that edited and rearranged material, upon request, in the new format. It can take data entered into one of its files and automatically apply that data to several other files. Or a computer can present summaries of extensive data from several different electronic files.

Quality Control

The internal operations of a computer are designed to be reliable so there will be no question about the results given out. However, as part of the data processing procedure, computers also perform a check of their own operations. If a failure is detected, the computer will provide an alarm or notification of the problem.

THE HARDWARE IN A DATA PROCESSING SYSTEM

The physical equipment in a data processing system is called the hardware. Since equipment varies greatly from one system to another, we'll use only 1900/10 hardware for discussion here. Four basic types of hardware exist:

1. Input. These devices get information into the system. The 1900/10 keystation, which may also be called a terminal, is an input device.

2. Data Recording and Storage. The data received from input devices is "put away" on disk in the 1900/10 system. It might also be transferred to magnetic tape.

3. Central Processing Unit. The 1900/10 processor checks the data as it comes in from input devices and might change the data around (called reformatting) as well as perform other tasks according to the program. The "computing" part of a computer is the processor, which is housed in the central processing unit (CPU).

4. Output. The data a computer outputs for use might be on a printer or on your display screen. Magnetic tape and communications with another computer are other types of output.

Figure 2–2 shows basic hardware in the 1900/10 system and how this hardware might be used with another computer. The 1900/10 might be used only to prepare data for the larger computer, or your company might use only the 1900/10 for all its computer needs.

The functions of a computer were discussed earlier. The following paragraphs will tell you a little more about the peripheral equipment in the 1900/10 system. (Peripheral equipment is any data processing hardware related to the input and output functions rather than the processing function.) The 1900/10 peripherals are the terminals (keystation and printer) and the tape and disk drive units.

Terminals

Most people who work with computers don't see the computer itself. They, like you, work mainly with the terminals and associated equipment, and such equipment is seldom in the computer room.

Terminals are used to communicate either directly or indirectly with the computer and sometimes with other terminals in the system. Terminals, then, are the link between the human operator and the computer.

There are two basic types of terminals:

- Terminals that print their messages on paper — known as printer terminals.

- Terminals that display their messages on a television-like viewing screen. The screen is a cathode-ray tube, or CRT, and this type of terminal is known as a CRT terminal.

Some terminals, such as the printer in the 1900/10 system, are equipped only to receive output data from the computer. Others, such as the 1900/10 keystations, may also have keyboards; if so, they can send input data as well as receive output data.

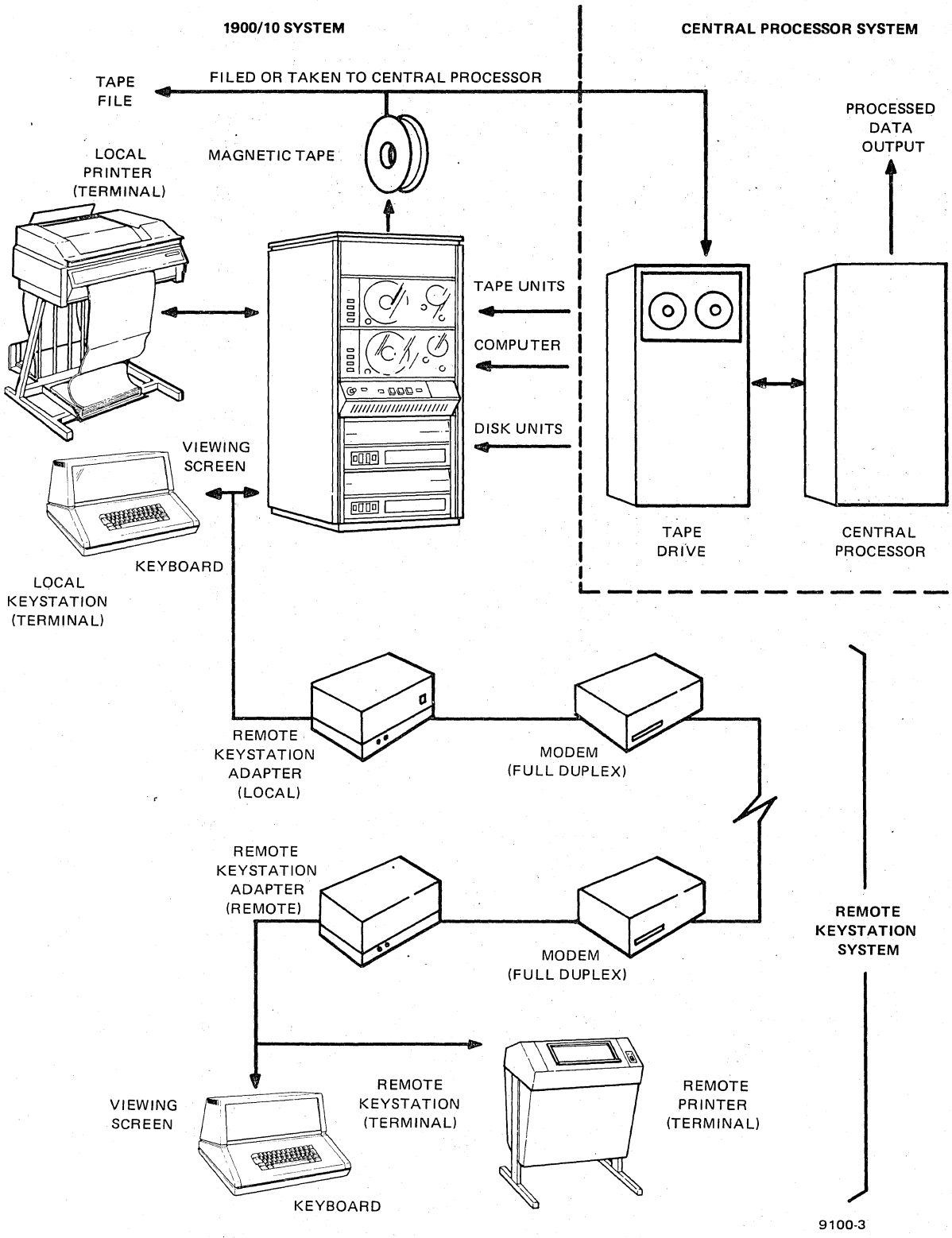


Figure 2-2. Various Types of Data Processing System Hardware. Notice the 1900/10 system has its own small computer and therefore can be operated as an independent system. Data may also be placed on magnetic tape by the 1900/10 system and the tape can then be used by a central processor to perform more sophisticated data processing.

Tape Drives, Disk Drives, and Drum Storage

A computer uses two kinds of storage:

- Working storage, where data is readily available. The working storage is called the computer memory and is usually located in the computer itself.
- Permanent storage, where data must be obtained from another recording and storage device outside the computer. Magnetic drums, magnetic disks, and magnetic tapes are the permanent storage used in data processing systems. (The 1900/10 system uses only tape and disk drive units.)

Basically, all these devices store data in the same way: they accept electronic impulses that form magnetic charges on or near their surfaces. These magnetic charges may represent data — for example, specific letters of the alphabet, numbers, or punctuation — or instructions to the computer. (You'll read more about computer instructions in the discussion of software that follows.) Upon request, the storage devices play back the data in much the same way as an automobile tape cassette stereo system plays music over a car radio, except that you receive the playback as a printed sheet or observe the output on a CRT screen.

Remote Application

Terminals and printers of the 1900/10 system may be located in the vicinity of the processor or they may be located remotely and connected to the processor by telephone lines. Remote application requires use of a remote keystation system as shown in Figure 2-2. The remote keystation system consists of two modems and two remote keystation adapters. Each remote keystation can handle up to four keystations and one character printer. The maximum number of keystations which one 1900/10 processor can handle remains at 32, whether local or remote.

THE SOFTWARE IN A DATA PROCESSING SYSTEM

Software, in the data processing world, means computer programs. Programs are a set of electronic instructions stored in the computer memory. These instructions tell the computer how to handle various kinds of input data. When the memory receives a certain electronic signal (an instruction), that signal conditions the computer to accept the incoming data and respond to additional instructions for processing the data. This concept is illustrated in Figure 2-3.

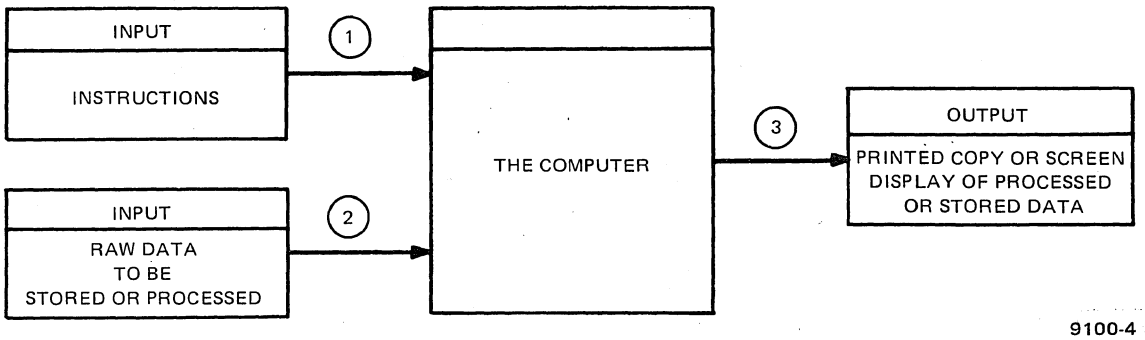


Figure 2-3. How the Computer Uses Instructions to Store, Process, and Provide Information. Circled numbers indicate the sequence of events.

Normally, when a computer is purchased, the hardware manufacturer also provides some software. The software may include these types of programs:

- Assemblers
- Compilers
- Routines

. . . all of which are those specialized electronic instructions telling the computer how to take additional instructions and how to process data.

Any computer program that is written specifically to perform one organization's unique data processing or storage requirements is called a source program. Source programs are written in a special computer language such as FORTRAN or COBOL that must be translated into the computer manufacturer's own computer language before they will work. The assemblers and compilers are the manufacturer-supplied software programs which do the translating.

Routines are sophisticated instructions given to computers to enable them to perform tasks. For example, routines may call for the computer to process data received from magnetic tape or a terminal keyboard.

To relate this to your own situation, the 1900/10 system needs some specific instructions from you whenever you want to process or store data. But you are working with a system where most of the instructions are already stored in the computer memory.

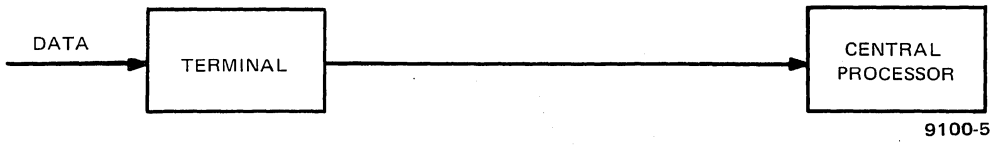
IN SUMMARY . . .

All human input to the computer is made or controlled through the terminal keyboard. Primarily, you make the system work by typing information on your keyboard. Once you have entered the data, the computer programs take over and the computer processes the data. In the 1900/10 system, the programs are also designed so that the response from the computer tells you if your input is valid (has been accepted by the computer). In many cases, the computer will tell you if you have tried to enter incorrect or improper data. If you enter an instruction the computer doesn't recognize, the computer may tell you the operation is illegal.

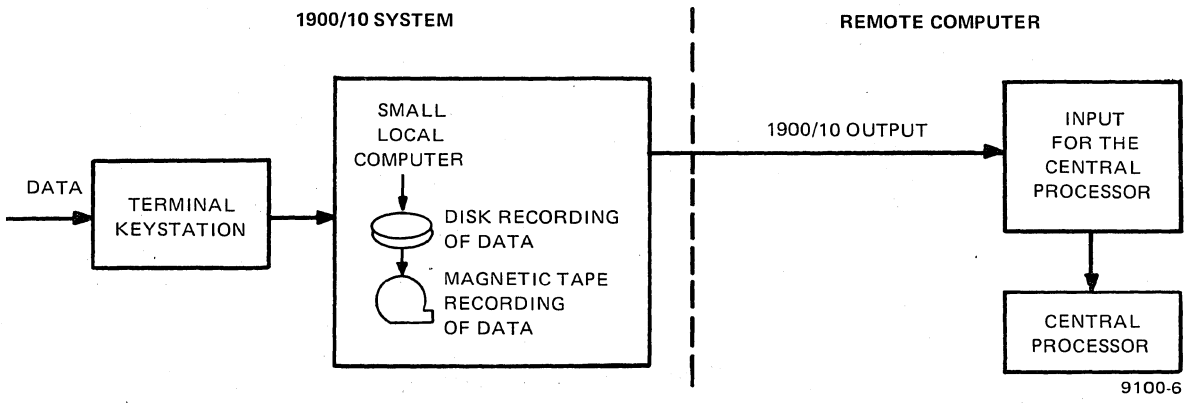
3. How the 1900/10 System Operates

WHAT IS THE 1900/10 SYSTEM?

Most data processing systems are an arrangement where a keyboard terminal is used to send data directly to a central processor:



This is your keystation and the 1900/10 system processor. Many 1900/10 systems work with a larger computer as a central processor, and the 1900/10 system only collects the data and makes sure it is correct before passing it along for further processing. The amount of processing done on your 1900/10 system depends on the needs of your company.



The input to the central processor is in the form of a magnetic tape or data communications, with the data that was originally entered from the keystations converted into a language the central processor can understand.

Figure 3-1 shows the basic 1900/10 system. The system may contain up to 32 keystations connected to a single 1900/10 computer. Housed in the 1900/10 computer cabinet are disk drive and tape drive recording units. Depending on your company's requirements, the cabinet may contain up to two disk drives and two tape drives. The tape drives can be either one maxitape unit (10.5-inch tape reel) or one or two minitape units (7-inch tape reels). The disk drives can be either one or two disk drives. These disk drives can be either 17.6-megabyte, single-platter drives or 8.8-megabyte, two-platter drives. Additional units may be added in expansion cabinet options in the same combinations, bringing the total available for a maximum system configuration to four tape drives and four disk drives.

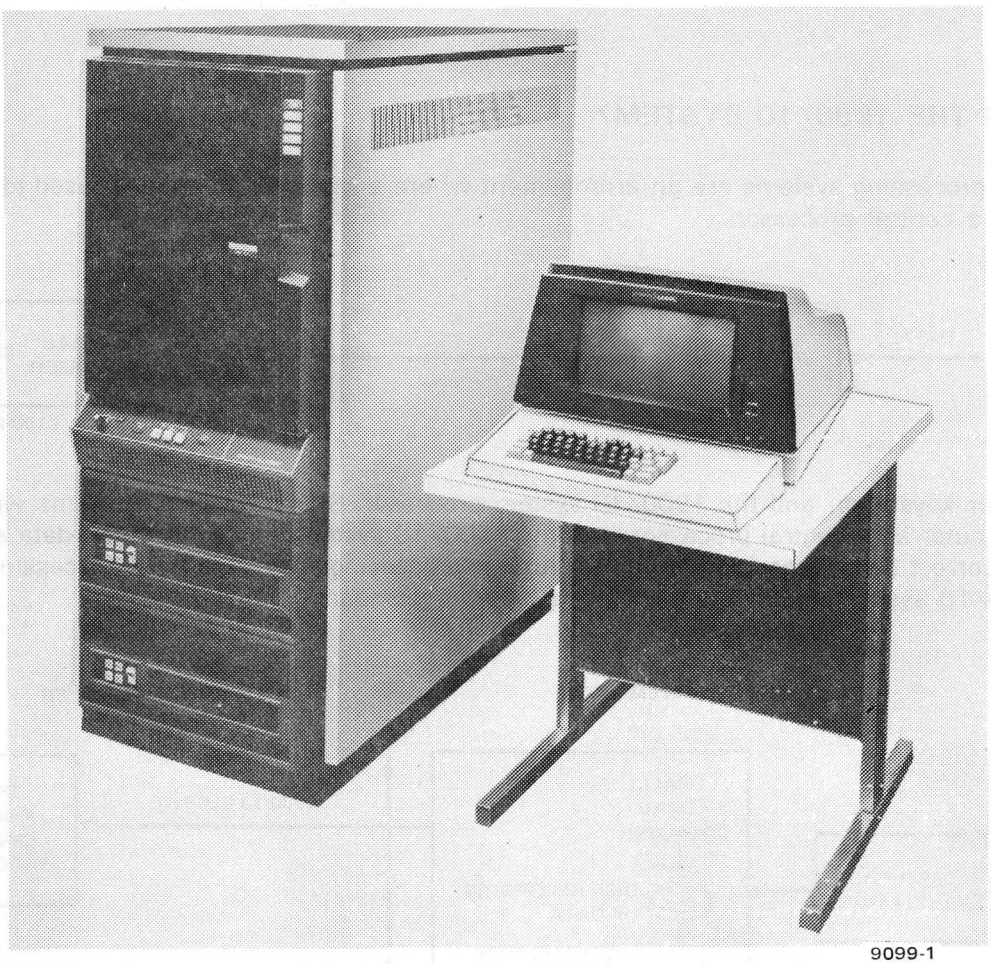


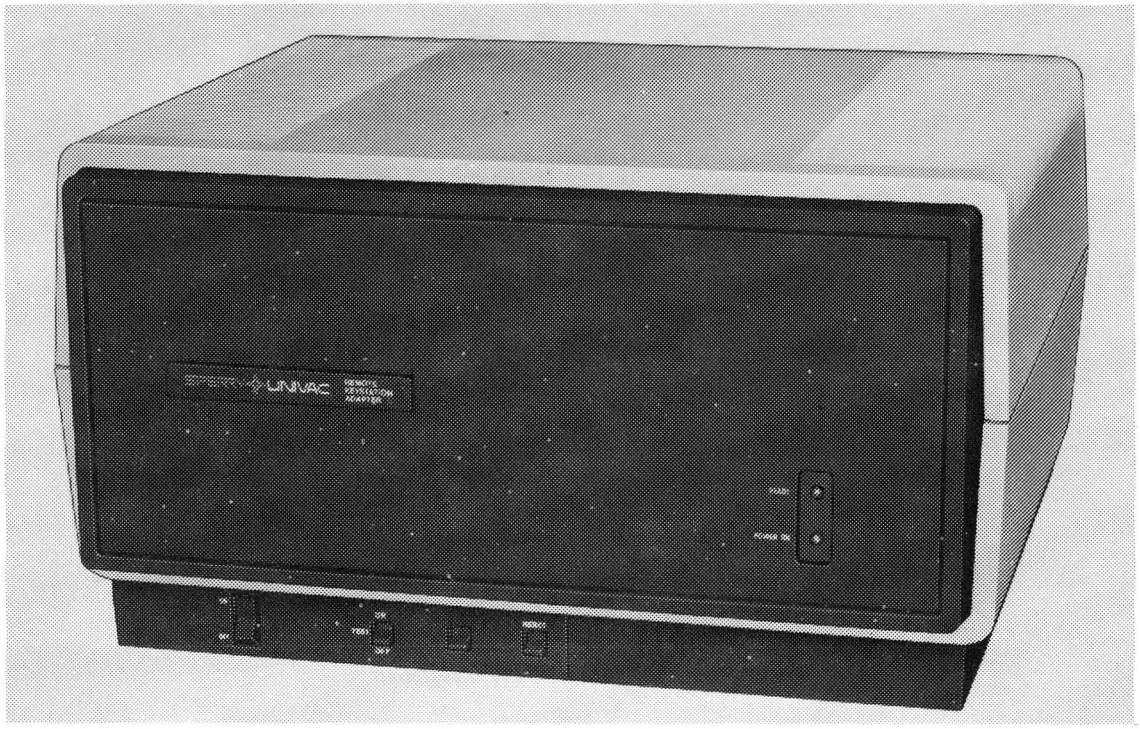
Figure 3-1. The 1900/10 System

Figure 3-2 shows the optional remote keystation adapter, which provides the means by which some keystations may be located at a remote distance and connected to the 1900/10 computer by telephone lines.

WHERE YOU FIT IN

As an operator concerned with data preparation, your primary job is to enter accurate data into the system. (Keying data into the system is referred to as "entering" data.) One of the two available keystation styles, shown close up in Figures 3-3 and 3-4, is your work area.

On your keyboard you'll find two types of keys: data keys and control keys. The data keys, of course, are used for data entry; the control keys are used to inform the computer of various conditions about your data entry operations.



8152-4

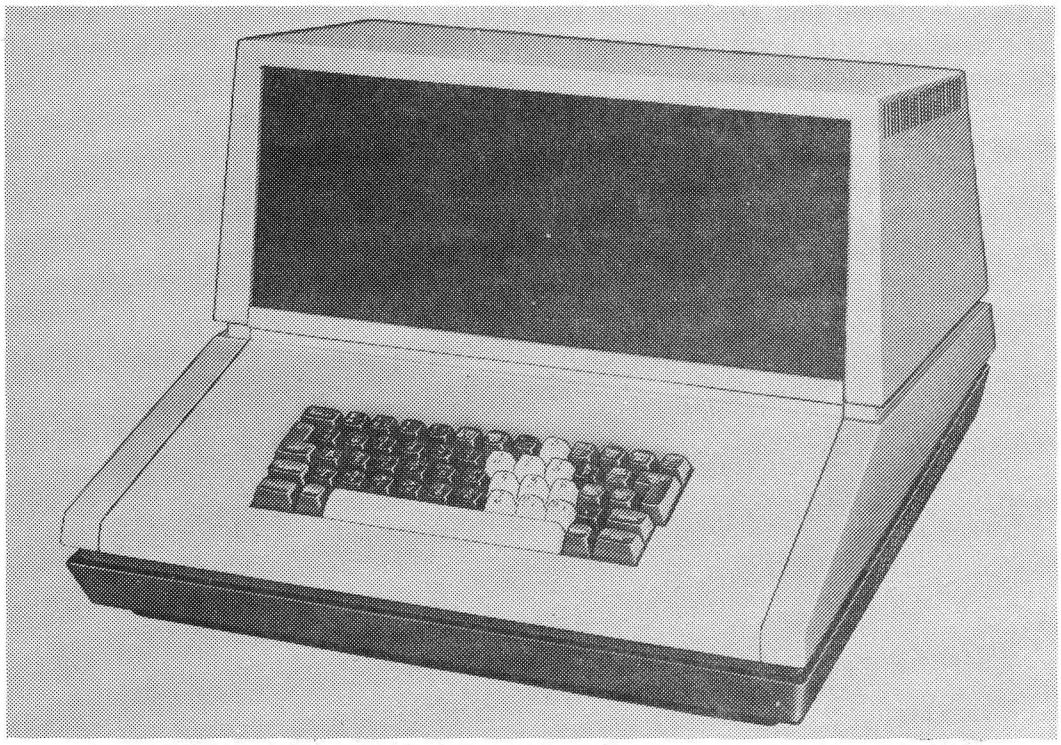
Figure 3-2. The Remote Keystation Adapter

In most operating situations, the data you enter on the keyboard will appear at the same time on the viewing screen so you can check it as necessary. Messages from the system will also appear on the screen from time to time — depending on operating circumstances.

Data entry activities at the keystation are classified into the following modes of operation:

- Entering
- Verifying
- Searching and modifying
- Updating
- File management
- Supervisor (not used by most keystation operators)

One function of the keyboard control keys is to help you inform the computer which mode you are going to work in.



44306

Figure 3-3. Model 3541 Keystation

9099-5

Figure 3-4. Model 3555 Keystation

WHAT THE 1900/10 SYSTEM DOES

All data is entered at the keystations under control of a format program. A basic format program could be similar to the program card of a keypunch. The format program, which is stored in the 1900/10 system, also contains instructions that direct the system and determine what type of processing is to be performed as the data is keyed in.

The format program governs what data is valid and what messages are to appear on the viewing screen. In some cases, for example, if you enter a character that the program determines to be invalid, the program will signal an alarm condition to the computer and a message describing the error will appear on the screen.

Data entered under control of a particular format program is processed by the computer in work units called fields, records, batches, and data files:

- A *field* is a set of one or more data characters (for example, an invoice number).
- A *record* is a set of one or more consecutive fields on a related subject (such as a complete invoice).
- A *batch* is a group of records considered as a single unit for the purpose of processing (for example, a complete group of invoices).
- A *data file* is a collection of related batches treated as a single unit (such as all invoices entered under control of a specific program).
- An *indexed file* is a file that has been specially organized to make selection of any particular information faster and easier, especially when very large amounts of data are invoiced (like a book with an index).
- A *sequential file* is a collection of records which can be manipulated only in sequential order.

When you enter a batch of records from your keystation, the data is sent to the computer, where it is checked and temporarily stored on a magnetic disk. Data stored in the 1900/10 system, either on disk or in memory, may be rapidly recalled for use. Using your keystation control keys, you can place the data on the viewing screen, or your supervisor may have a printed copy of the data made on the 1900/10 system printer.

After all the batches of a single job have been entered and checked (verified), your supervisor may transfer these batches — now called the data file — from the disk unit to the magnetic tape unit. The conversion from disk to tape, although performed by the processor, is ordered by the supervisor, using keystation control keys.

The magnetic tape is then removed from the computer cabinet. At this point, the tape can be forwarded to a data processing center or filed locally as a reference source. The stored tape data may also be placed back in the 1900/10 system when required. This work flow sequence is shown in Figure 3-5.

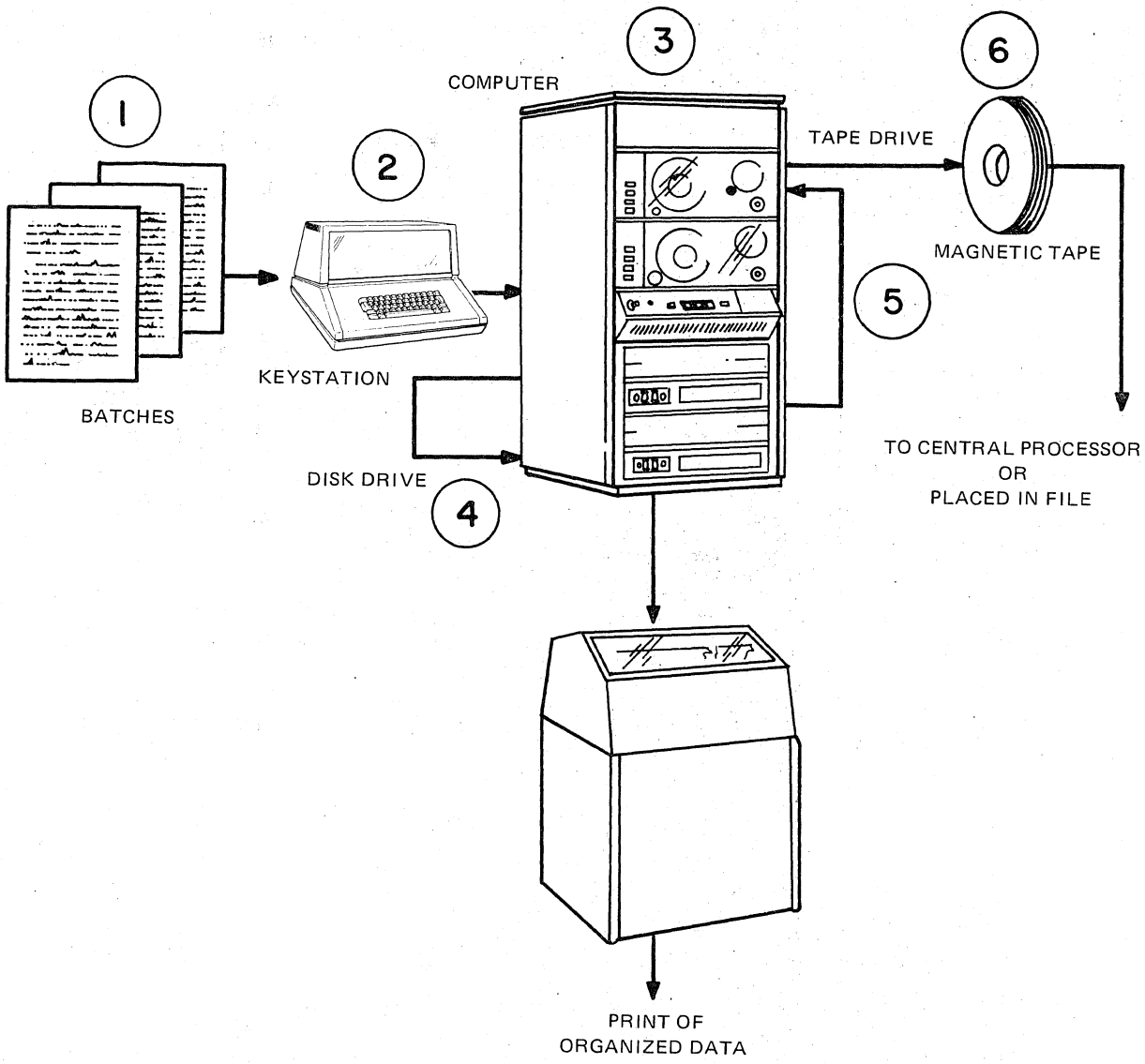


Figure 3-5. Data Flow in the 1900/10 System. Circled numbers show the normal sequence of events followed in using the system. First, batches of information ① are entered into the system with the keystation keyboard ②. The 1900/10 computer ③ accepts the data and records it on a magnetic disk ④. Data is then transferred to the tape drive ⑤ and recorded on magnetic tape. Recorded tapes of data ⑥ may be stored for future use or may be hand-carried to a larger central processor for additional processing. Data stored in the 1900/10 system or on magnetic tape may be printed on the system printer or placed on the keystation viewing screen.

4. How the Viewing Screen Directs Your Work

FOLLOWING THE VIEWING SCREEN DISPLAY SEQUENCE

When you press certain keys and combinations of keys on your keyboard, displays of information will appear in sequence on your viewing screen. These displays are a series of statements and questions which give you operating information and tell you what steps to take in entering data.

Data normally appears on the viewing screen as bright characters displayed against a dark background. A cursor (■) is used to highlight the area of the viewing screen where the next character is to be entered. The cursor, which looks like a bright rectangle on the screen, is large enough to completely enclose any character. On the Model 3541, a character covered by the cursor appears dark against the bright rectangle. On the Model 3555, the cursor and the character blink alternately.

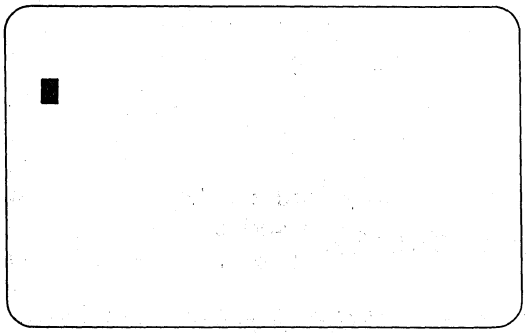
If an illegal operation is attempted while you are working with your keystation, a bright checkerboard pattern will appear on the screen for a short time, a tone will sound, and a message describing the error will be displayed. The keyboard will be locked and cannot be used until the RESET key is pressed.

When you first turn on power to your keystation, it will take approximately 15 seconds to warm up. Then the first display will appear on the screen. If you are at a remote location, it will also be necessary to turn on the remote keystation adapter.

The series of screen displays and steps on the following pages shows a typical sequence that could take place after you turn on power and begin to work with your station. Please note that this sequence is only an example; it may not exactly duplicate your particular operating situation. The screen displays on the left side of the page represent the Model 3541 keystation, and the displays on the right side represent the Model 3555 keystation.

(Step-by-step procedures for operating the keystation can be found in Section 6.)

1. When the machine is turned on, one of these displays will be automatically projected on the screen. If you do not get one of these displays, you must contact your supervisor for some corrective action before you can enter any data.



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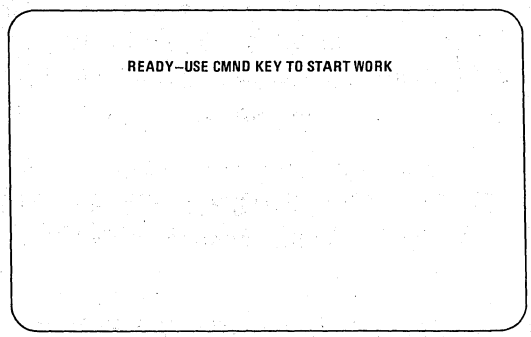
OR



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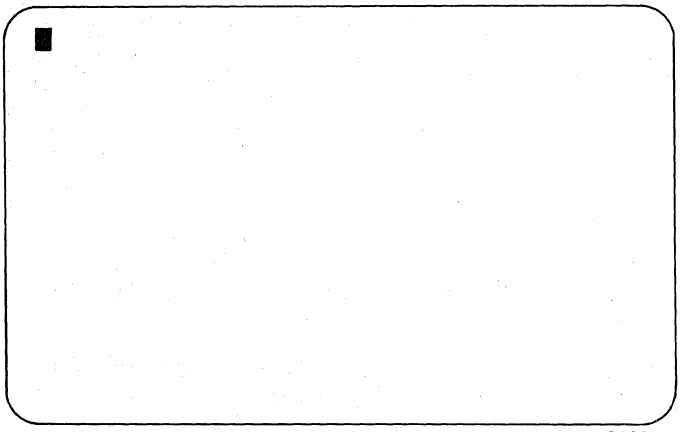
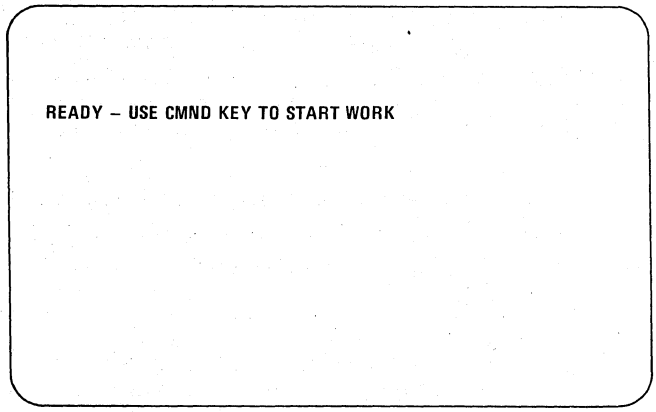


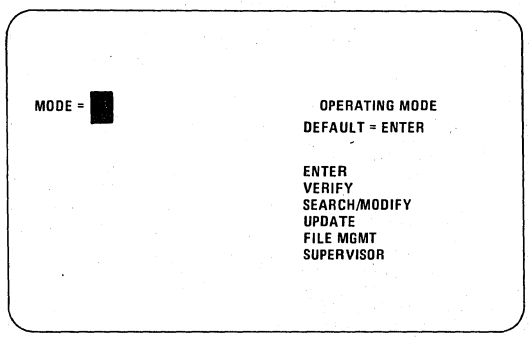
9100-32

OR

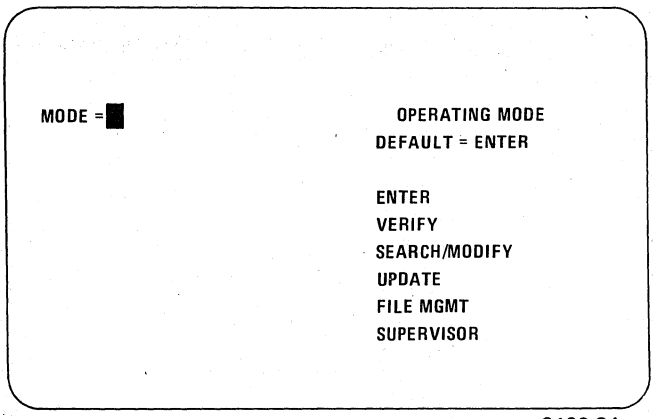


9100-33

2. After pressing the proper keys, you will get the next display, which asks you to select an operating mode. You have the six choices indicated on the right side of the screen.

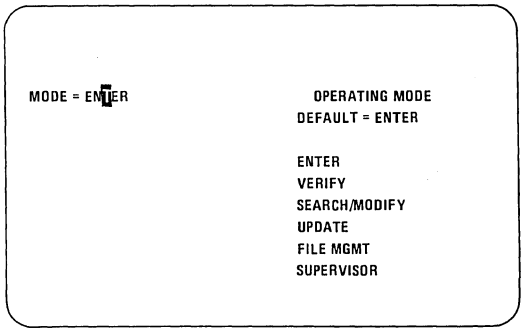


9100-12



9100-34

3. You select the Enter mode, as shown on the left of the screen.



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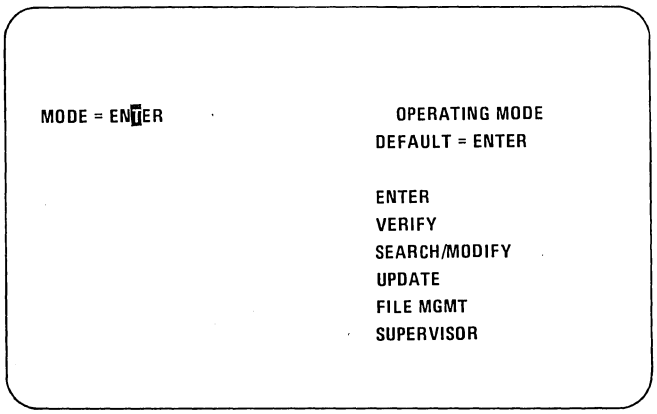
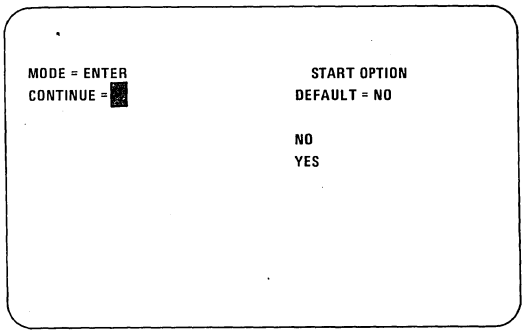


9100-35

4. After you have selected the operating mode, this display will appear, asking whether you are continuing with a previous batch of data. You answer NO. (When you answer NO to the "CONTINUE" question, the system assumes you are starting a new batch.) The File Management and the Search And Modify modes do not have a CONTINUE option.



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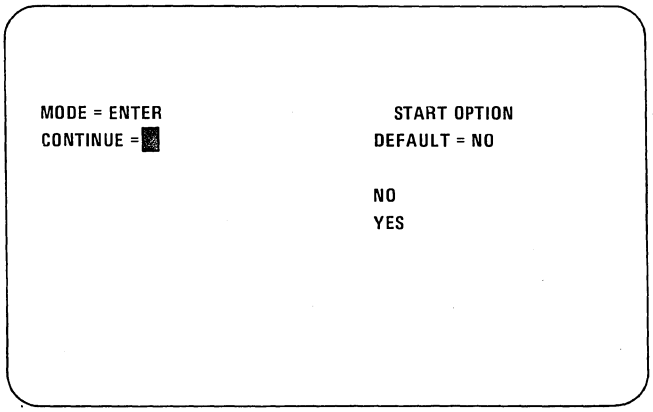
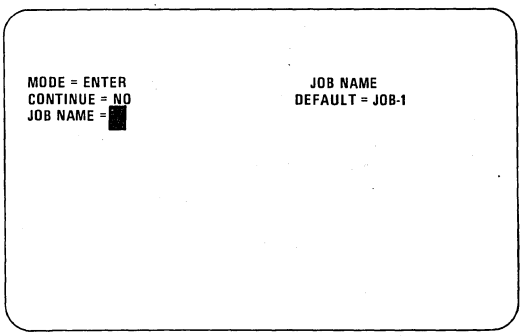


9100-36

5. This display, asking for a job name, will appear next on the screen. If you use the default entry technique, your job will be called JOB-1. However, you call your job PAYROLL* and key in that name.



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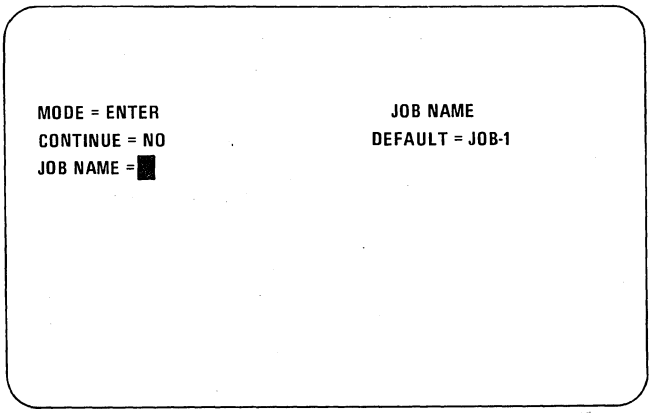
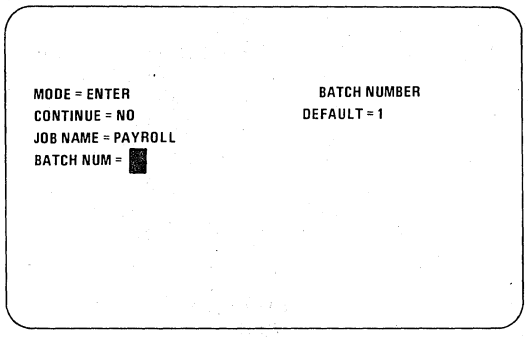


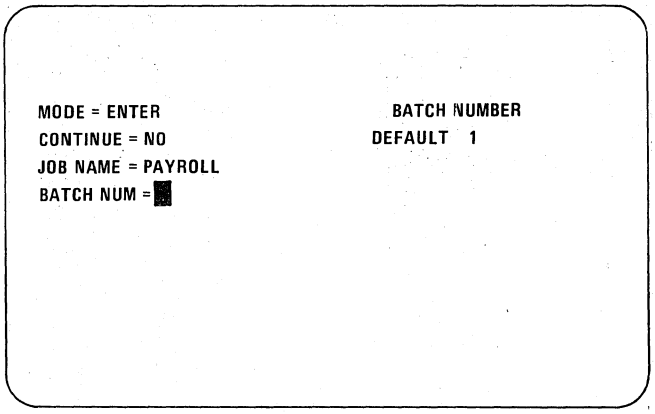
9100-37

This type of entry, which is variable, is determined by instructions given in your local operating situation.

6. After you have entered a job name, this display will be shown, calling for selection of a batch number. You assign the number 43.*

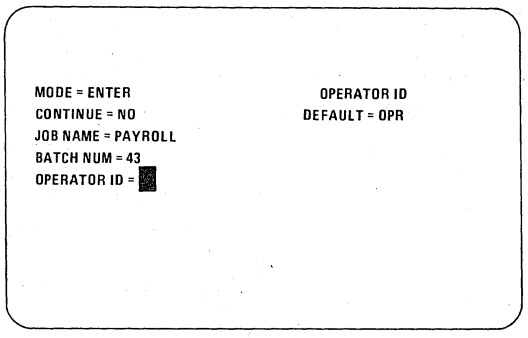


9100-18

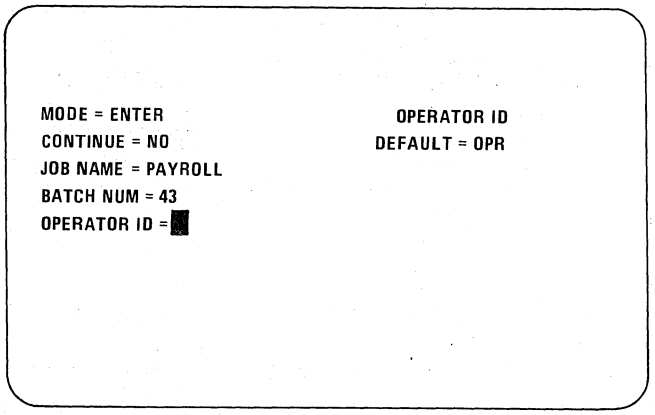


9100-38

7. The next display asks for the code* which identifies you as the person working at this keystation. You key your initials into the system.

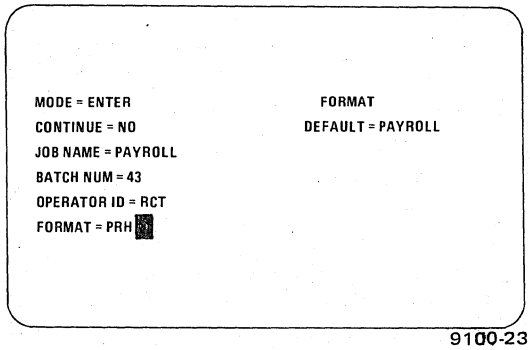


9100-20

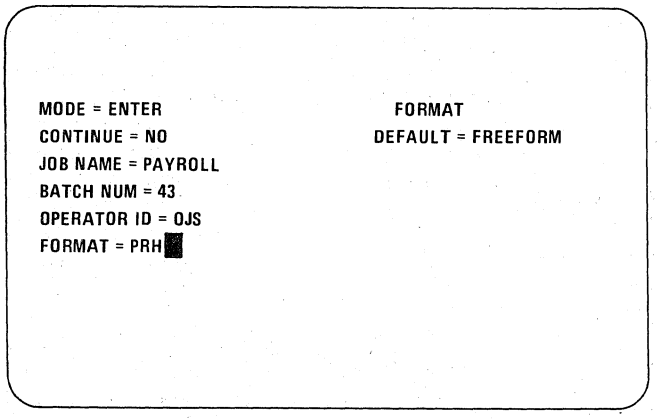


9100-39

8. The next screen display calls for entry of the format name. You insert the code PRH.* (This code could be any designated name or letters. In this case, the letters stand for payroll, hourly.)



9100-23



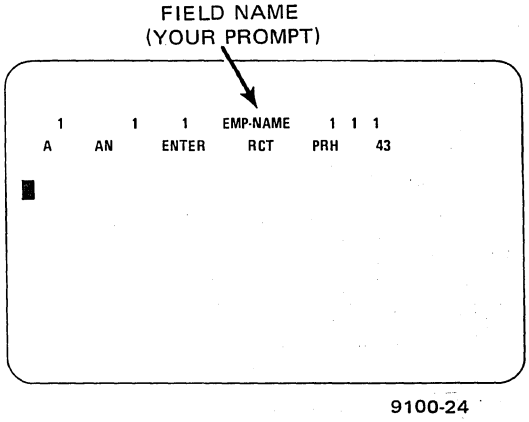
9100-40

This type of entry, which is variable, is determined by instructions given in your local operating situation.

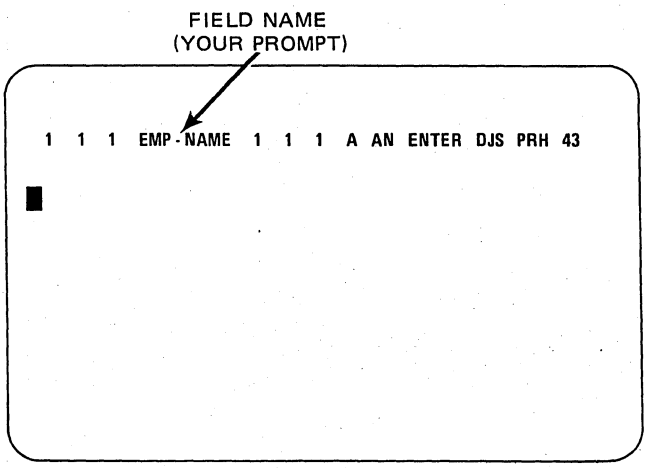
9. This next screen is a display of the 1900/10 system format. The information shown is standard for the 1900/10 system and indicates facts about the ongoing program. The field name (sometimes called a "prompt") tells you what information to enter into the system. An explanation of other information in the heading is given in Figure 4–1 and the associated discussion.

   The line below this information (which is shown as a blank line in the examples) is reserved for error and guide messages which will tell you when an illegal operation has been attempted.

   Following the message line are the data lines where you enter the field information, beginning at the location shown by the cursor.

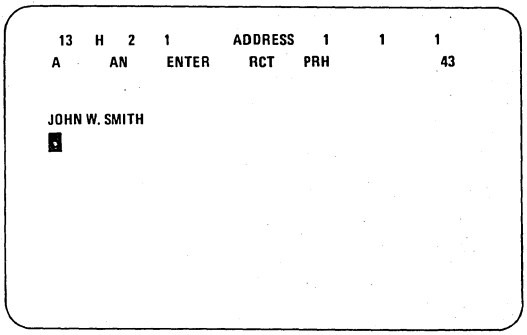


9100-24

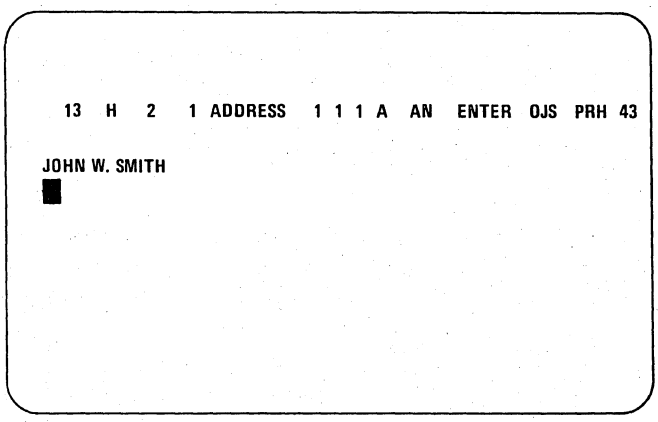


9100-41

10. When the first field of information (the employee's name, in this case) has been entered, the prompt changes and the second field is marked by the cursor for entry.



9100-25



9100-42

11. You continue to enter information in each additional field as requested by the field name prompt.

```
98   –   9   14   PERIOD      1    1    1
A    AN      ENTER    RCT    PRH           43

JOHN W. SMITH
1127 WALNUT ST.,
SALT LAKE CITY,
UTAH 84070
NONEXEMPT
6.75 HR
NONE
522-40-4231
MAY 7-14 197-
```

9100-26

```
127  0  15  7  PERIOD  1  1  2  A  AN  ENTER  OJS  PRH  43
JOHN W. SMITH
1127 WALNUT ST.,
SLAT LAKE CITY,
UTAH 84070
NONEXEMPT
6.75 HR
NONE
522-40-4231
MAY 7-14 1981
40
270.00
67.50
16.20
NONE
186.30█
```

9100-43

```
127   0   15   7   NET-PAY   1   1   2
A     AN     ENTER   RCT   PHR          43

MAY 7-14 197-
40
270.00
67.50
16.20
NONE
186.30█
```

9100-27

When all fields in this record are filled, the record is considered complete and would look approximately like the examples shown here.* Notice that this record required two screens to complete on the Model 3541 keystation. The names of the fields used in the example, in consecutive order, are:

Field Name	Meaning	Field Name	Meaning
EMP–NAME	Employee's name	PERIOD	(Repeat of last line on previous Model 3541 screen)
ADDRESS			
CITY	Employee's address		
STATE		HOURS	Hours worked
STATUS	Employment status	GROSS	Gross income
RATE	Hourly rate of pay	FEDTAX	Federal tax deduction
OTRATE	Overtime pay rate	STATAX	State tax deduction
SSID	Social Security No.	CRUNION	Credit union payment
PERIOD	Pay period	NET-PAY	Employees take-home pay

Data need not necessarily be placed in the format of one field to a line. The screens on the following page show another way to present the same kind of information. Your local operating requirements will determine the format.

**This series of fields is only an illustrative example and is not intended to duplicate an actual payroll record.*

```
140  0    15    7    NET-PAY    1   60  1
A    AN     ENTER     RCT     PRH     43

JOHN W. SMITH  1127 WALNUT STREET
SALT LAKE CITY, UTAH  84070
NONEXEMPT 6.75 HOUR  NONE  522-40-4231
MAY 7-14 197-  40  270.00  67.50
16.20  NONE  186.30█
```

9100-30

```
140  0  15  7  NET-PAY  1  60  1  A  AN  ENTER  OJS  PRH  43

JOHN W. SMITH  1127 WALNUT STREET  SALT LAKE CITY, UTAH 84070
NONEXEMPT  6.75 HR  NONE  522-40-4231  MAY 7-14 1981  40  270.00
67.50  16.20  NONE  186.30█
```

9100-44

12. Assume that at this point you have keyed in all the entries you wish to include in a batch. You enter the code to close the batch and get this display, which gives information about the batch and about operator performance.

```
127  0     15    7     NET-PAY     1     60  2
A     AN      ENTER    RCT     PRH            43

                BATCH STATISTICS
TOTAL REC     = 60               INV FIELDS      =
VERIFIED REC =                   UPDATED REC     =
               OPERATOR STATISTICS
TIME USED     = 60.02            RECORDS KEYED = 60
KEYSTROKES  = 7938               KEYSTROKES/HR = 7938
ERRORS        =                  CORRECTIONS    = 6
INSERTS       =                  DELETES         =
```

9100-29

```
140  0  15  7  NET-PAY  1  60  1  A  AN  ENTER  OJS  PRH  43

                    BATCH STATISTICS
TOTAL REC    = 60                    INV FIELDS     =
VERIFIED REC =                       UPDATED REC    =
                   OPERATOR STATISTICS
TIME USED    = 1.50                  RECORDS KEYED = 60
KEYSTROKES   = 7938                  KEYSTROKES/HR = 7938
ERRORS       = 6                     CORRECTIONS    = 6
INSERTS      =                       DELETES        =
```

9100-45

13. To clear the screen of batch and operator statistics, press the CMND or BYPASS key (Model 3541) or the CMND or PASS key (Model 3555). Then this message will appear on the screen, indicating that a new batch of work may now be entered.

```
READY–USE CMND KEY TO START WORK
```

9100-9

```
READY – USE CMND KEY TO START WORK
```

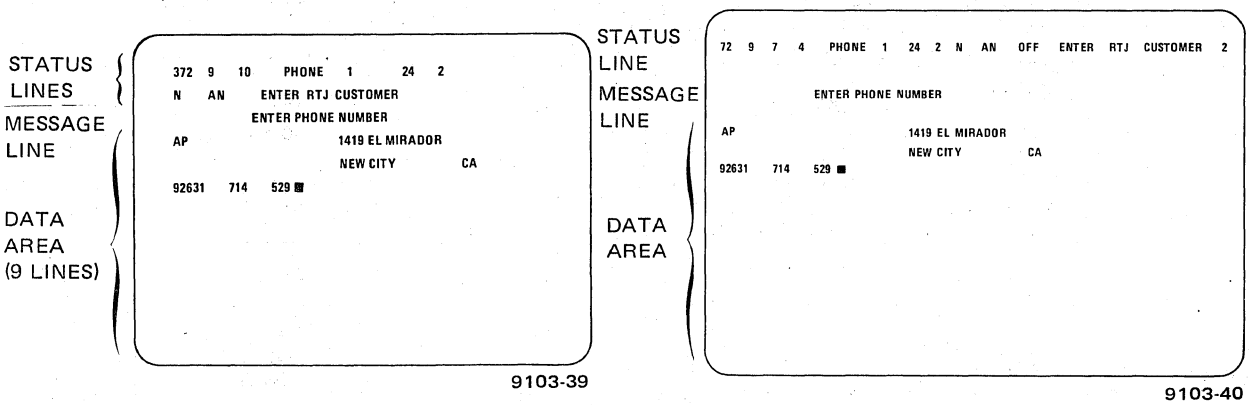
9100-46

HOW TO INTERPRET 1900/10 STATUS INFORMATION

Information on the viewing screen is divided into three parts: status line (or lines), message line, and data lines.

The Model 3541 keystation has two status lines, one message line, and nine data lines.

The Model 3555 keystation has one status line, one message line, and 23 data lines.



The information that appears on the status and message lines is supplied by the system or by your particular format program. You do not enter data on the status and message lines.

The status information pertains to the program and field you are working with and reflects the work status at your keystation. Status fields are explained in detail in the paragraphs following Figures 4–1 and 4–2.

The message line is where the 1900/10 system "talks" to you, although it is usually blank. But if you try to enter an incorrect or illegal function, a checkerboard pattern will be displayed on the screen, an alarm will sound, and then an alarm message such as "INVALID KEYSTROKE" will appear. This line is also used for guide messages, which tell you what action to take next or inform you of some special status of your keystation. "READY — USE CMND KEY TO START WORK" and "KEYBOARD DISABLED" are examples of these informative guide messages.

If you don't understand a message that appears on the message line, either ask your supervisor or, if it is an alarm message, refer to Table 6–1. This table lists and explains most of the alarm messages.

The remaining lines on the screen are where you enter data. The Model 3541 screen size allows a maximum of 40 characters per line. The model 3555 screen size allows a maximum of 80 characters per line.

You should thoroughly understand the information presented in the status line or lines, since you will be referring to it often. Figures 4–1 and 4–2 give a detailed breakdown of the status lines.

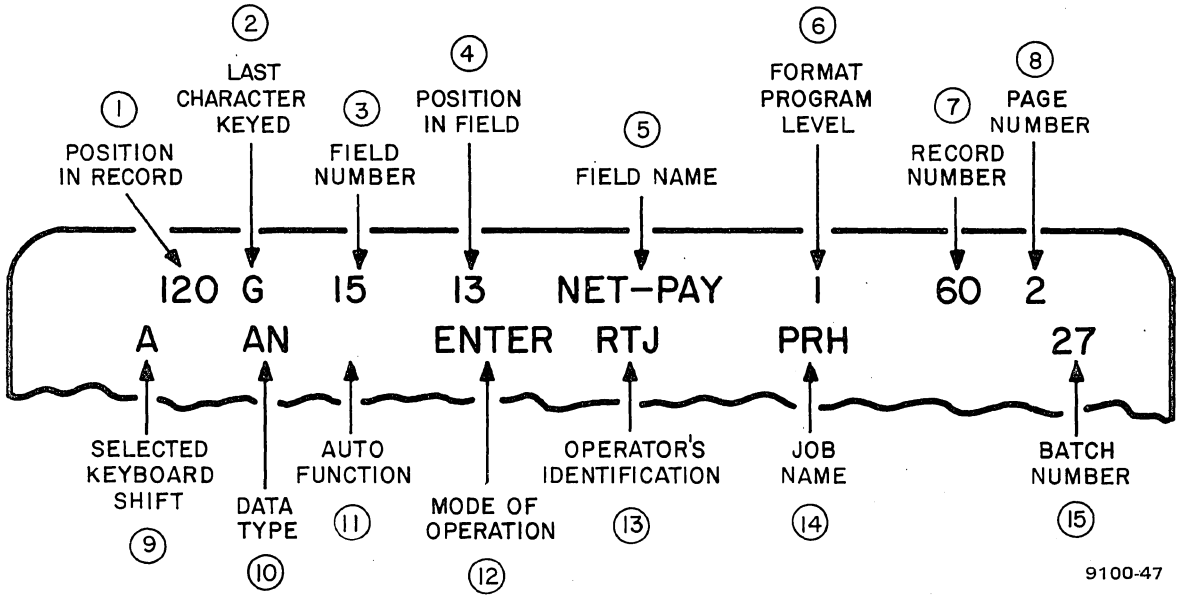


Figure 4–1. Status Lines of Model 3541 Keystation

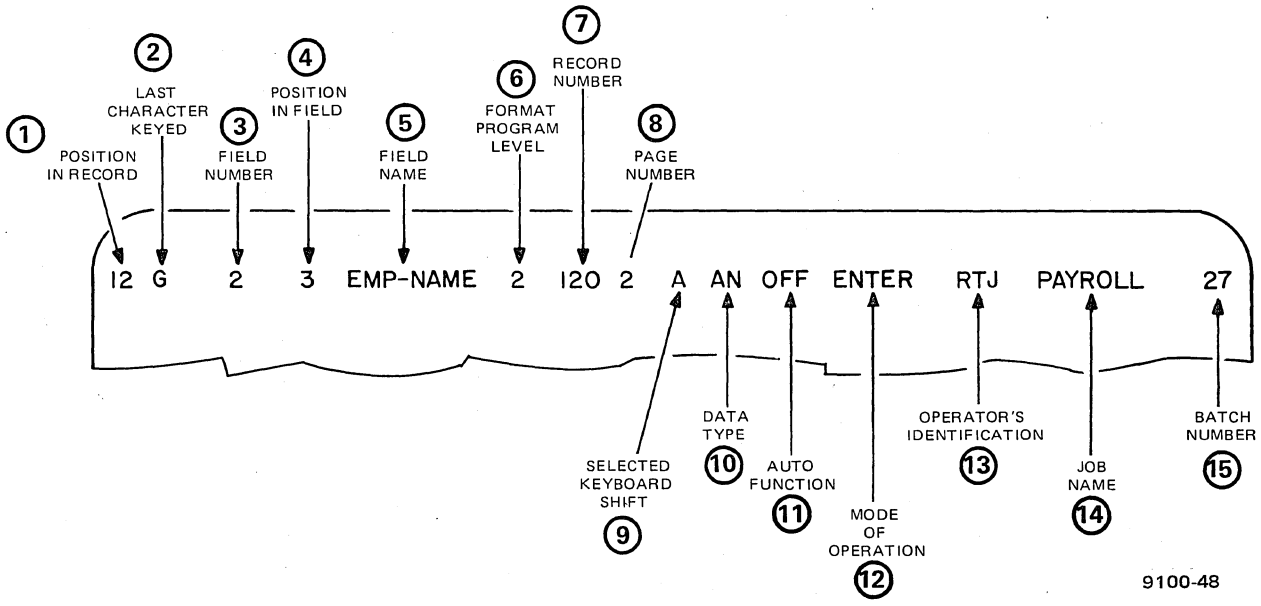


Figure 4–2. Status Line of Model 3555 Keystation

① Position in Record

The position-in-record field contains a number from 1 to 999, indicating the current character position in the data record. The first character position is 1. The Model 3541 keystation has a maximum of 360 character positions per page; the Model 3555 keystation will accommodate over the 999-character indication of this field. Prompts are not included in the count shown for the data record. The position in the record does not necessarily equal the position on the screen.

② Last Character Keyed

During keying, this position shows the letter, number, or character most recently entered. This area is blank before any entries are made.

During the "blind" mode of entry, when the information being keyed is not shown in the data area of the viewing screen, the character in this position is enclosed by the cursor for emphasis. (The "blind" mode of entry is a customer option and may or may not be used at your station.)

③ Field Number

This is the number of the field (1 to 333) into which the next data character is to be keyed. This number advances with each new field.

④ Position in Field

This is the position number (1 to 999) within the current field of the next data character to be keyed. As you key data in a field, this number advances as each new character is typed in that field.

⑤ Field Name

This is the name of the field currently being keyed (when specified by the program). When no name is specified by the program, this display is blank. The display changes with each new field.

⑥ Format Program Level

This is the number or letter of the format program level currently in control of your keystation. A program may consist of from 1 to 32 levels designated by the numbers 0 through 9 and the letters A through Z.

⑦ Record Number

This is the number (1 to 65,535) of the record currently being keyed. As you read in Section 3, a record is one part of a larger group of information called a batch. The record number display changes when the current record is completed and released to the system, or during record backspace/forward operations. Adjustments are made automatically for record insertions or deletions. (These operations are described in Section 6.)

⑧ Page Number

This is the page number (1 to 4) of the record being displayed. A page is that portion of a record that can be displayed in the nine data lines of the Model 3541 keystation viewing screen.

A record may consist of four separate pages. When page 1 is being displayed on the screen, the page number is blank. When any other page number is displayed in the data area, the last line of the previous page is shown as the first line of the current page.

⑨ Selected Keyboard Shift

A typewriter has only two shift levels, uppercase and lowercase. These two positions will permit typing of all uppercase letters, lowercase letters, numbers, punctuation marks, and special symbols. The 1900/10 system, however, has three shift levels. The shift level in use is indicated in this position by the symbol A, N, or A, as described below.

If the shift level is changed by pressing and locking another shift key, the new shift symbol will appear on the display.

Display Symbol	Shift Level	Function
A	Alpha	The lower character shown on the key top will be entered when a key is pressed.
N	Numeric	The upper character shown on the key top will be entered when a key is pressed.
A or a	Lowercase alpha (LCA)	When an alphabetic key is pressed, the lowercase equivalent of that letter will be generated electronically. For most other keys, this shift produces characters equivalent to the alpha shift. However, some key tops have three symbols; in the LCA shift level, the third symbol (on the right of the key top) is produced. Look at the "9" key on the keypunch keyboard, for example; the symbol "}" is produced in the LCA shift. When keyed, alphabetic letters may appear on the screen as capitals with an underscore, even though signals for lowercase letters have been generated. Some keystations actually display the lowercase "a" in the status information and have a complete lowercase alphabet.

More information on shift levels is found in Section 5.

⑩ Data Type

This indicator is controlled by the computer program. It states the type of character or characters that may be entered into the current field as follows:

A	Uppercase alphabetic
N	Decimal digits
A or a	Lowercase alphabetic
B	Blanks
S	Signed decimal digits
P	Punctuation (special characters)
Blank	Any character
C	COBOL character subset
H	Hexadecimal (0-9, A-F)
1-8	User character subset

Many situations call for entry of more than one character type. For example, if the display shows AN, both alphabetic and numeric characters can be entered. In addition, some special characters may be entered. Consult your local instructions.

⑪ Auto Function

This display indicates the condition of the automatic skip, duplicate, or generate function of the 1900/10 system as follows:

.OFF	Automatic condition is off
Blank	Automatic condition is on

Consult your supervisor for local operating conditions. Normally, you would want the automatic condition on.

⑫ Mode of Operation

This display indicates the current operating mode of the keystation:

ENTER	Entry mode
VERIFY	Verify mode
SEARCH	Search And Modify mode
UPDATE	Update mode
FILE M	File Management mode (indexed and sequential file access)

⑬ Operator's Identification

This is the identification of the current keystation operator. Up to three alphanumeric characters are allowed.

(14) Job Name

This is the name of the job currently in process. A job name may consist of one to eight characters containing any combination of alphabetic and numeric characters and hyphens. The job name must start with an alphabetic character and must not end with a hyphen or contain embedded blanks.

(15) Batch Number

This is the number of the batch currently being keyed (1 to 50,000).

Section 5 Contents

5. Keystation Keyboards and Controls

Most of the keystation controls you will use to operate the 1900/10 system are located on the keyboard below the viewing screen. In addition to the controls on the keyboard, some other operator controls are mounted elsewhere on the keystation.

NOTE:

Throughout this section, when key or control differences exist between the Model 3541 keystation and the Model 3555 keystation, the Model 3555 key name is shown following the Model 3541 key name. Illustrations are shown throughout with Model 3541 on the left and Model 3555 on the right.

CONTROLS NOT ON THE KEYBOARD

The BRIGHTNESS and VOLUME controls of the Model 3541 keystation are on the back of the keystation, and the power switch is mounted on the right side underneath the keyboard. The BRIGHTNESS, TONE, and CLICK controls for the Model 3555 keystation are on the front base of the screen cabinet. The power switch for the Model 3555 is on the right side of the display screen cabinet. These controls are shown in Figures 5-1 and 5-2.

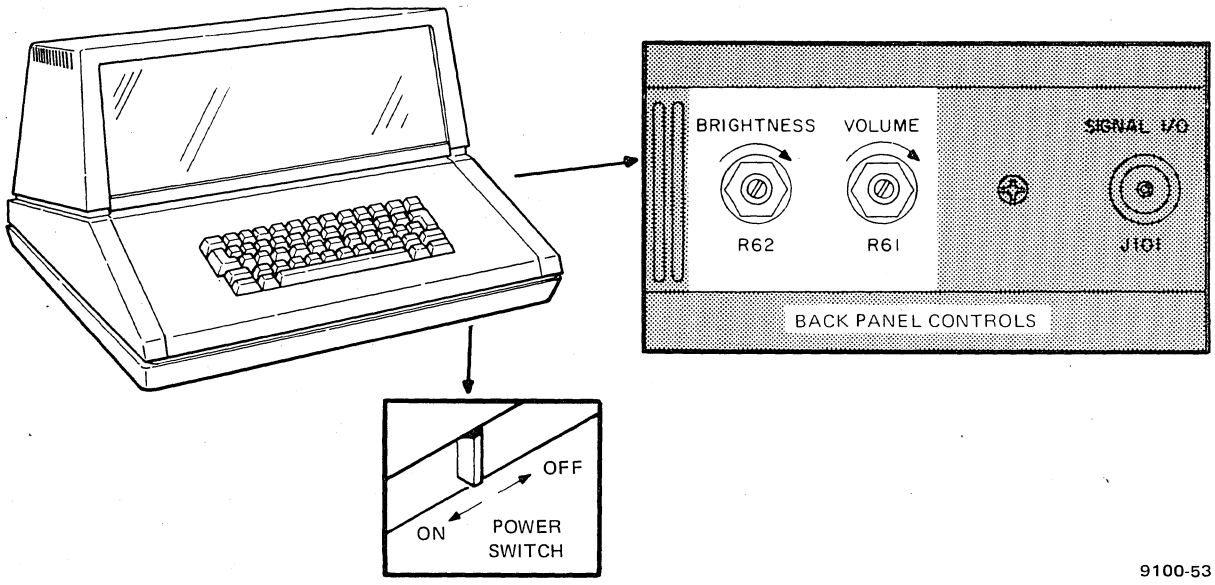


Figure 5-1. Operator Controls Not on Model 3541 Keystation Keyboard

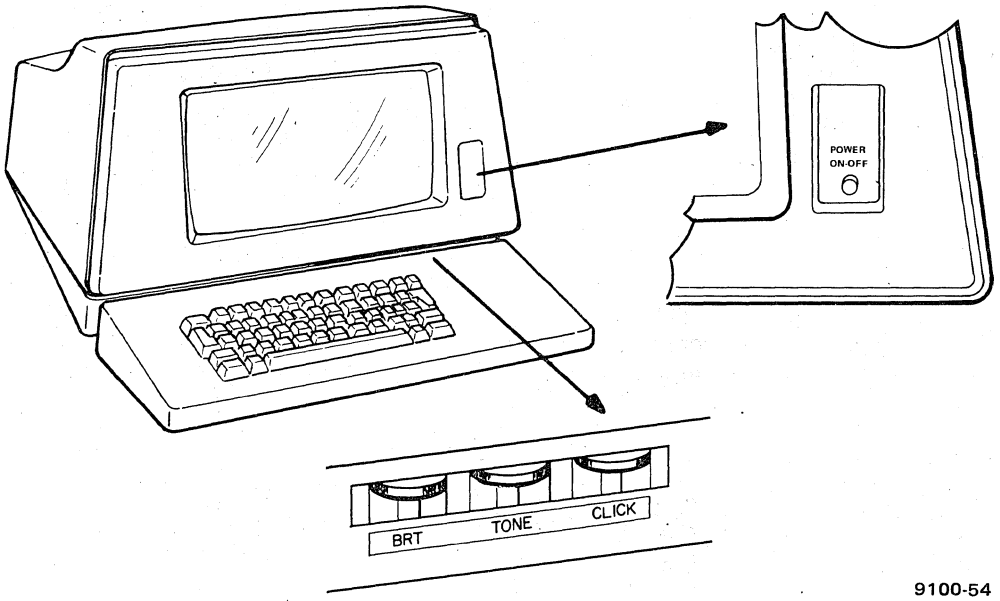
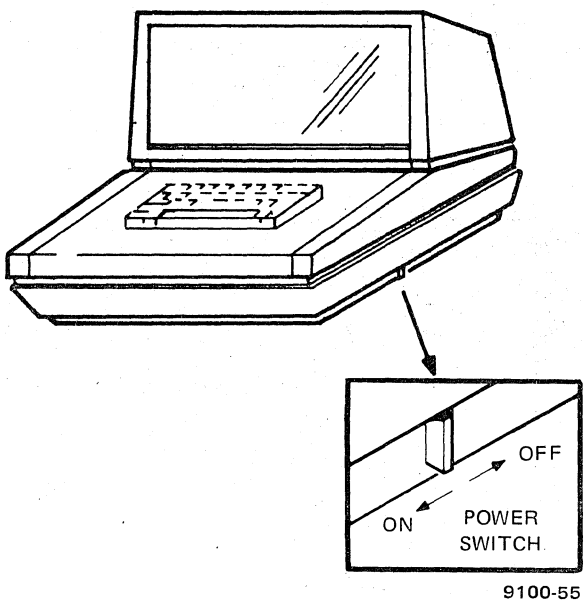
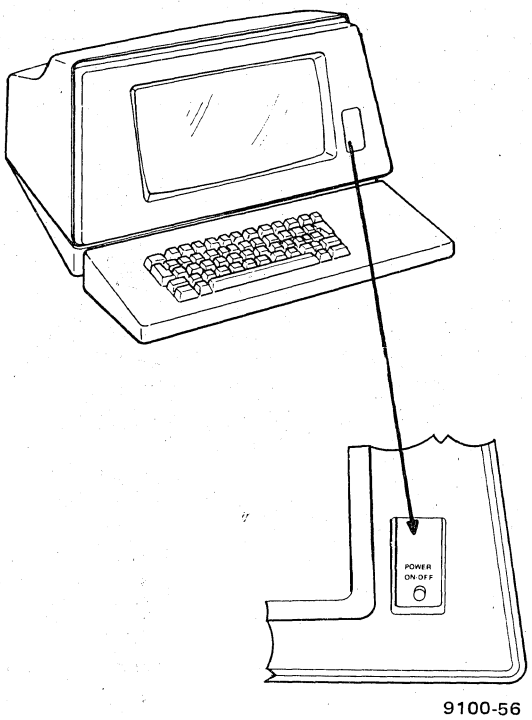


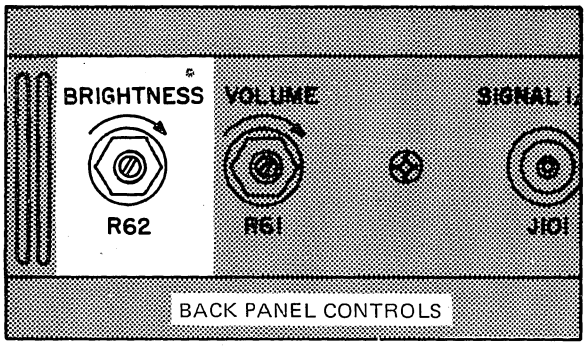
Figure 5-2. Operator Controls Not on Model 3555 Keystation Keyboard

Power Switch. The power switch is used to turn keystation power on or off. When the Model 3541 keystation switch is pushed toward the rear, power is turned off; when pulled toward the front, power is turned on. When the Model 3555 keystation pushbutton is pushed in, power is turned on; when pushed again, power is turned off.

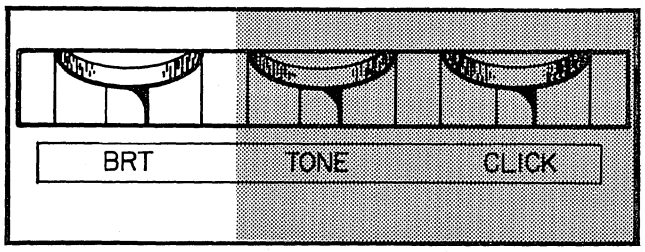




BRIGHTNESS Control. This control adjusts the brightness of the characters displayed on the viewing screen. Turn the control clockwise by hand to increase character brightness or counterclockwise to decrease brightness. (Turning the control counterclockwise as far as it will go completely eliminates the displayed characters.) We recommend that you adjust the control for a clear image, but not an extremely bright image. If the screen intensity is turned too high, the life of the viewing screen will be shortened.



9100-57

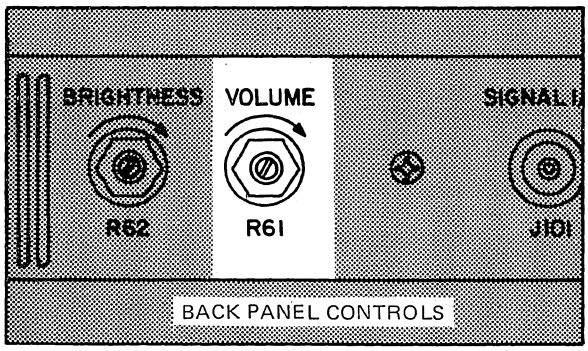


9100-58

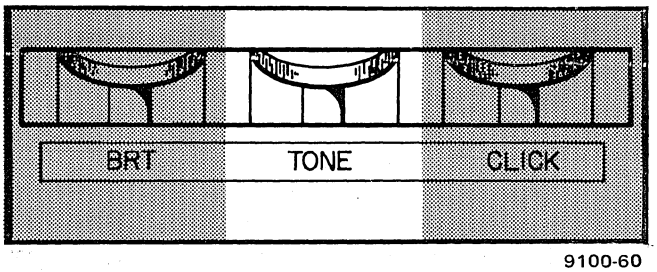
VOLUME Control (Model 3541) or TONE Control (Model 3555). This control adjusts the loudness of both the attention tone and the ready tone. Turn the control clockwise by hand to increase the volume or counterclockwise to decrease the volume. (Turning the control counterclockwise as far as it will go eliminates the tone.)

The attention tone is used to attract your attention when operator intervention is required, and the ready tone indicates that a time-consuming task (such as automatic record search) has been completed. The tones have different sounds so that you can easily tell them apart.

The sound of the key click, which helps you maintain typing (keying) rhythm, is not affected by the VOLUME control. When an error occurs, the key click sound stops.

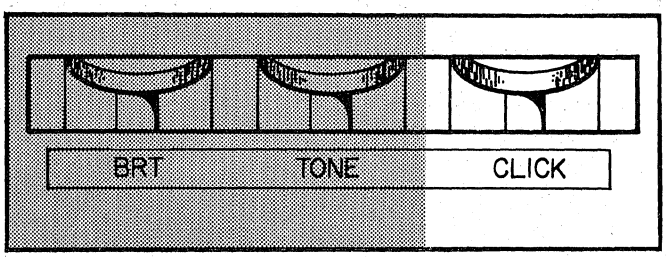


9100-59



9100-60

CLICK Control. Available only on the Model 3555 keystation, this control adjusts the keyboard key click volume. Turn the dial clockwise by hand to increase the volume or counterclockwise to completely suppress the click.



9100-61

KEYBOARD STYLES

A variety of keyboard styles is available for both keystation models. Each keystation model has three keyboard styles available: keypunch, keypunch/adding machine, and typewriter/numeric pad. You may have one or more of these keyboards in your working environment; each has a preferred use. The keyboard arrangements are similar to those of standard typewriter or keypunch keyboards. Figures 5-3 through 5-8 show the three types available for each of the two keystation models.

Each of the three keyboard styles may have either an EBCDIC or an ASCII set of characters; but for the operator, the only differences between the two keyboards are a few of the special symbols. Thus, three EBCDIC and three ASCII type keyboards are available for each keystation model. (EBCDIC and ASCII are defined in the glossary.) Figures 5-3, 5-4, and 5-5 are the EBCDIC keyboards for Model 3541 keystations; Figures 5-6, 5-7, and 5-8 are the ASCII keyboards for Model 3555 keystations.

The characters produced for each keyboard style and character set are listed in Table 5-1.

NOTE:

The EBCDIC keypunch-style keyboard shown in Figure 5-3 is used for all Model 3541 keyboard illustrations in this book. The ASCII keypunch-style keyboard shown in Figure 5-6 is used for all Model 3555 keyboard illustrations.

On all three keyboards, individual keys are color coded according to the function they perform:

	Model 3541	Model 3555
Alphabetic keys	Gray	Black
Numeric keys and space bar	White	Black
Control keys	Blue	Blue

Each time you press a data key, a key click is produced electronically. Should the keyboard become inactive so that the keyed data is no longer accepted (during an error condition, an automatic record search, etc.), the key click is automatically turned off.

On Model 3541 keystations, only the data entry keys click; the control keys do not produce key clicks. On Model 3555 keystations, all keys produce a click.

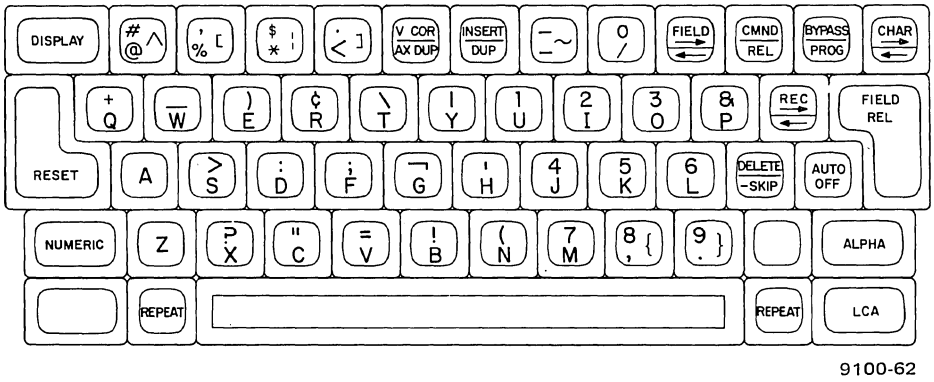


Figure 5-3. Model 3541 Keystation Keypunch-Style Keyboard

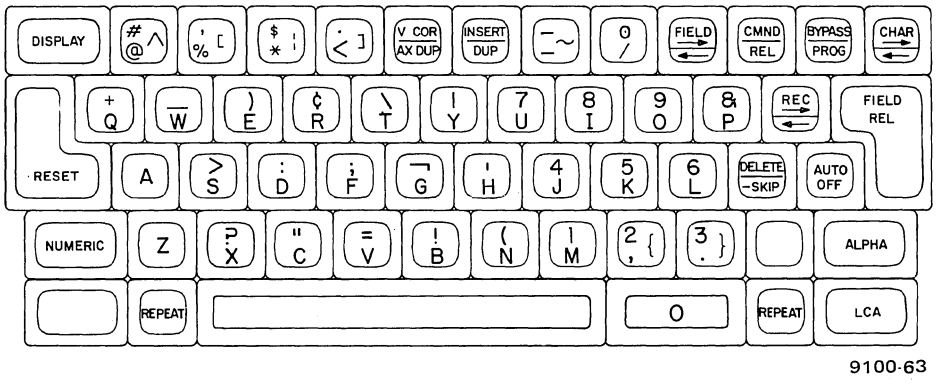


Figure 5-4. Model 3541 Keystation Keypunch/Adding Machine-Style Keyboard

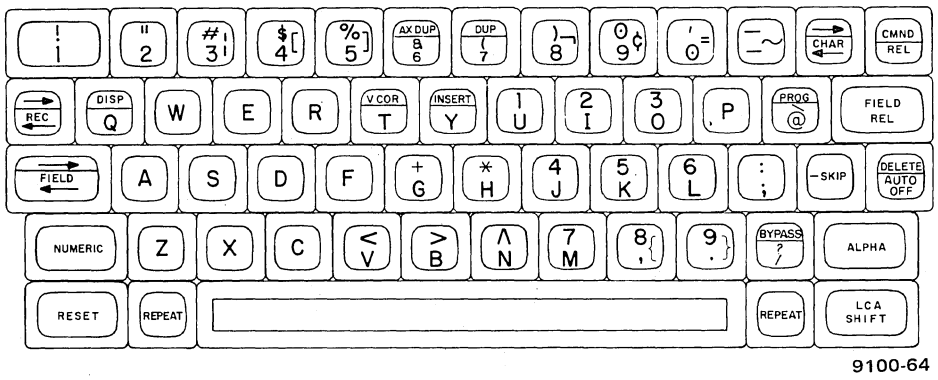


Figure 5-5. Model 3541 Keystation Typewriter-Style Keyboard with Numeric Pad

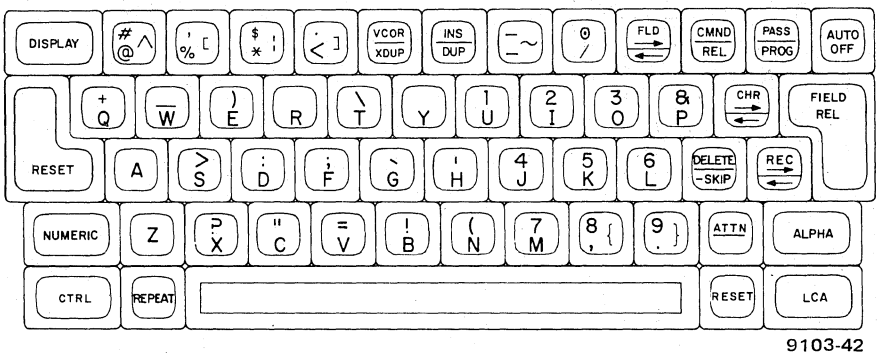


Figure 5-6. Model 3555 Keystation Keypunch-Style Keyboard

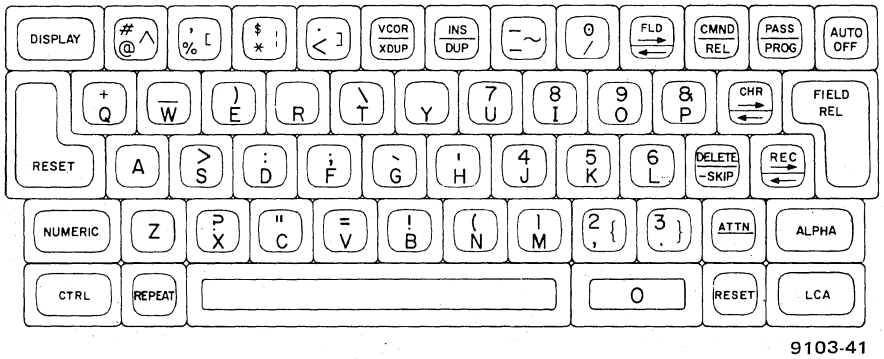


Figure 5-7. Model 3555 Keystation Keypunch/Adding Machine-Style Keyboard

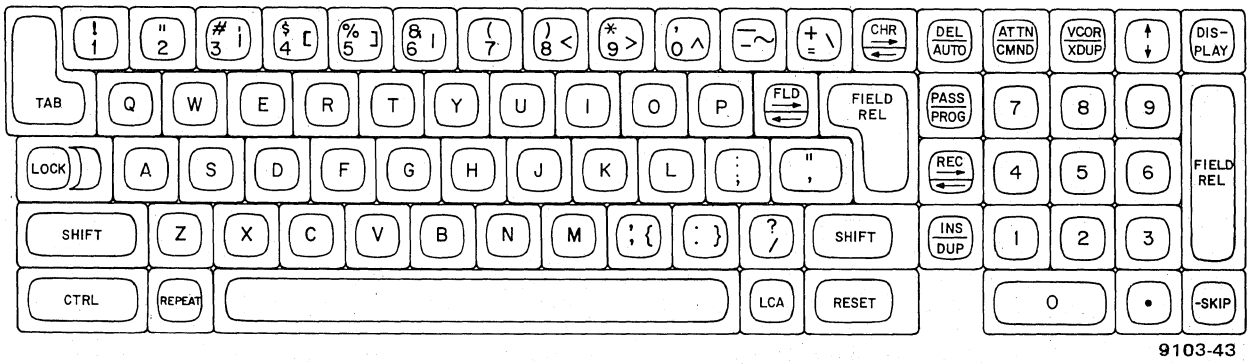


Figure 5-8. Model 3555 Keystation Typewriter-Style Keyboard with Numeric Pad

Table 5–1. Shift Level-to-Character Relationship (Part 1 of 4)

Keypunch and Keypunch/Adding Machine Keyboards (EBCDIC)					
ALPHA	NUMERIC	LCA	ALPHA	NUMERIC	LCA
@	#	∧ or @	S	>	s or S
%	,	[or %	D	:	d or D
*	$	¦ or *	F	;	f or F
<	·	] or ≤	G	¬	g or G
–	–	~ or =	H	ı	h or H
/	0	/ or /	J	4	j or J
Q	+	q or Q	K	5	k or K
W	_	w or W	L	6	l or L
E	)	e or E	Z	Z	z or Z
R	¢	r or R	X	?	x or X
T	\	t or T	C	"	c or C
Y	|	y or Y	V	=	v or V
U	1 or 7	u or U	B	!	b or B
I	2 or 8	i or I	N	(	n or N
O	3 or 9	o or O	M	7 or 1	m or M
P	&	p or P	,	8 or 2	{ or ,
A	A	a or A	·	9 or 3	} or ·

Table 5–1. Shift Level-to-Character Relationship (Part 2 of 4)

Keypunch and Keypunch/Adding Machine Keyboards (ASCII)					
ALPHA	NUMERIC	LCA	ALPHA	NUMERIC	LCA
@	#	^ or @	S	>	s or S
%	,	[or %	D	:	d or D
*	$	¦ or *	F	;	f or F
<	.	] or ≤	G	\	g or G
–	–	~ or ¬	H	¦	h or H
/	0	/ or /	J	4	j or J
Q	+	q or Q	K	5	k or K
W	—	w or W	L	6	l or L
E	)	e or E	Z	Z	z or Z
R	R	r or R	X	?	x or X
T	\	t or T	C	"	c or C
Y	Y	y or Y	V	=	v or V
U	1 or 7	u or U	B	!	b or B
I	2 or 8	i or I	N	(	n or N
O	3 or 9	o or O	M	7 or 1	m or M
P	&	p or P	,	8 or 2	{ or ,
A	A	a or A	.	9 or 3	} or .

Table 5–1. Shift Level-to-Character Relationship (Part 3 of 4)

Typewriter/Numeric Keyboard (EBCDIC)					
ALPHA	NUMERIC	LCA	ALPHA	NUMERIC	LCA
1	!	1 or 1	@	\	@ or @
2	"	2 or 2	A	A	a or A
3	#	¦ or 3	S	S	s or S
4	$	[or 4	D	D	d or D
5	%	] or 5	F	F	f or F
6	&	6 or 6	G	+	g or G
7	(	7 or 7	H	*	h or H
8	)	¬ or 8	J	4	j or J
9	0	¢ or 9	K	5	k or K
0	'	= or 0	L	6	l or L
–	–	~ or –	;	:	; or ;
Q	Q	q or Q	Z	Z	z or Z
W	W	w or W	X	X	x or X
E	E	e or E	C	C	c or C
R	R	r or R	V	<	v or V
T	T	t or T	B	>	b or B
Y	Y	y or Y	N	^	n or N
U	1	u or U	M	7	m or M
I	2	i or I	,	8	{ or ,
O	3	o or O	.	9	} or .
P	P	p or P	/	?	/ or /

Table 5–1. Shift Level-to-Character Relationship (Part 4 of 4)

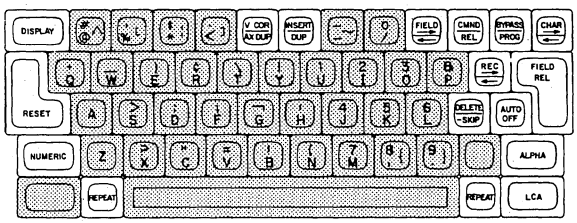
Typewriter/Numeric Keyboard (ASCII)					
ALPHA	NUMERIC	LCA	ALPHA	NUMERIC	LCA
1	!	1 or 1	@	\	@ or @
2	"	2 or 2	A	A	a or A
3	#	¦ or 3	S	S	s or S
4	$	[or 4	D	D	d or D
5	%	] or 5	F	F	f or F
6	&	6 or 6	G	+	g or G
7	(	7 or 7	H	*	h or H
8	)	< or 8	J	4	j or J
9	0	> or 9	K	5	k or K
0	'	= or 0	L	6	l or L
—	—	~ or —	;	:	; or ;
Q	Q	q or Q	Z	Z	z or Z
W	—	w or W	X	X	x or X
E	^	e or E	C	C	c or C
R	\	r or R	V	V	v or V
T	T	t or T	B	B	b or B
Y	Y	y or Y	N	N	n or N
U	1	u or U	M	7	m or M
I	2	i or I	,	8	{ or ,
O	3	o or O	.	9	} or .
P	P	p or P	/	?	/ or /

CONTROL KEYS

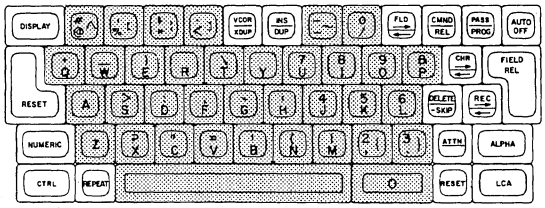
The blue control keys permit you to:

1. Issue commands to the computer.
2. Control data entry into fields and records.
3. Position the cursor in a particular place on the viewing screen.
4. Automatically repeat characters, select shift levels, and obtain special displays for the viewing screen.

Some control keys have two labels, upper and lower. The lower control key function is selected by simply pressing the key; the upper function is selected by first pressing and holding the RESET key (Model 3541) or the CTRL key (Model 3555) and then pressing the desired control key. The control keys are emphasized in the following illustrations:



9100-65



9100-147

In the following paragraphs, the control keys are discussed in five groups according to their use:

- Shift
- Basic control
- Field control
- Record control
- Positioning control

Shift Keys and Shift Levels

As described in Section 4, the 1900/10 system has three shift levels: alpha, numeric, and LCA (which stands for lowercase alpha). These shift levels determine the type of data character that is entered in the system when you press a data key.

NOTE:

Shift levels do not affect the control keys.

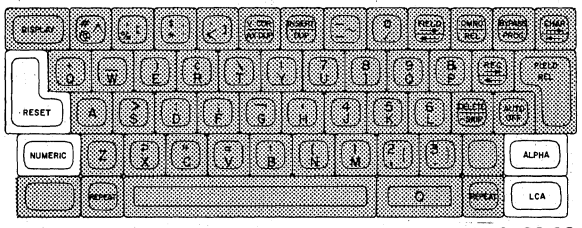
When the keystation is under control of the computer program, certain shifts may be automatically made by the program to simplify your job. As you will recall, the ninth position in the status line indicates the current keyboard shift selection (A = alpha, N = numeric, etc.). You can also select shift levels manually by using the ALPHA, NUMERIC, and LCA shift keys on the keyboard (except for the Model 3555 keystation typewriter-style keyboard, which uses the SHIFT, LOCK, LCA, and CTRL keys to select the shift level).

Even though the keyboard shift may have been specified automatically by the program, you can override (cancel) the shift and select another shift level, as follows:

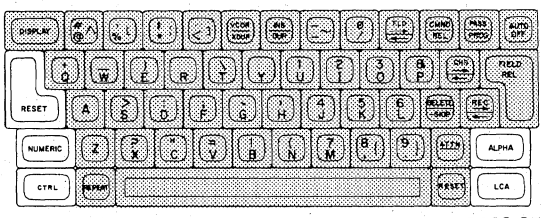
1. Press and hold the RESET or CTRL key.
2. Press the shift key for another shift level.
3. Release the shift key.
4. Release the RESET or CTRL key.

If you select a shift level that inserts an invalid character into a field, however, an alarm condition will result.

The shift keys are shown in the accompanying figures and are described in the following paragraphs. At the conclusion of this discussion you will find two tables containing the shift information in condensed form for your quick reference.

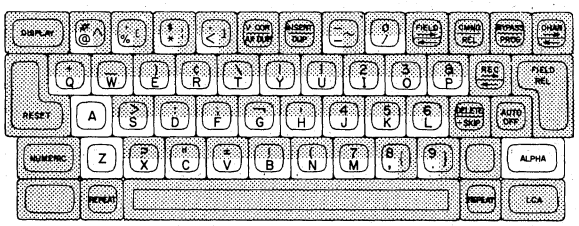


9100-66

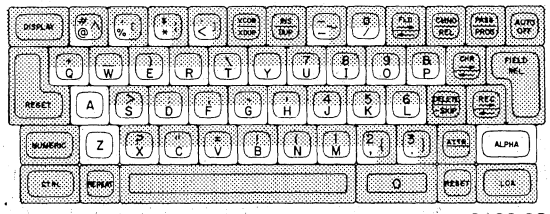


9100-97

ALPHA Key. This shift key is used to manually specify the bottom character on the data keys. On the Model 3555 keystation typewriter-style keyboard, there is no ALPHA shift key, and the lower graphics are automatically entered unless the SHIFT or LCA key is pressed.



9100-67



9100-98

When the ALPHA key is pressed or is in the locked position, any programmed shifts are overridden.

To place the ALPHA key in the locked position:

1. Press and hold the RESET or CTRL key.
2. Press and release the ALPHA key.
3. Release the RESET or CTRL key.

The keyboard is now locked in the alphabetic shift level. The keyboard can be returned to the programmed shift level by pressing and releasing the ALPHA key twice.

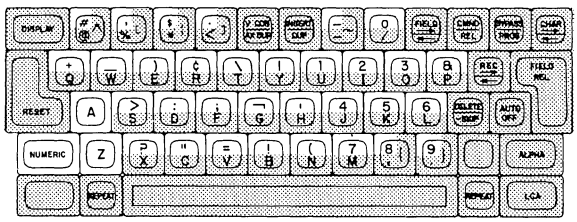
NUMERIC Key. This shift key is used to manually specify the top character (numeric or uppercase symbol) on the data keys.

When the NUMERIC key is pressed or is in the locked position, any programmed shifts are overridden.

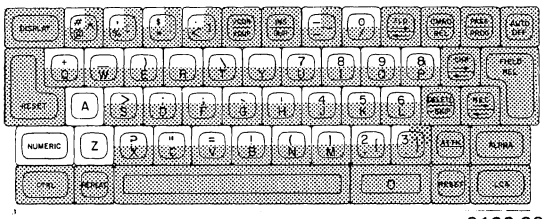
To place the NUMERIC key in the locked position:

1. Press and hold the RESET or CTRL key.
2. Press and release the NUMERIC key.
3. Release the RESET or CTRL key.

The keyboard is now locked in the numeric shift level. The keyboard can be returned to the programmed shift level by pressing and releasing the NUMERIC key twice.

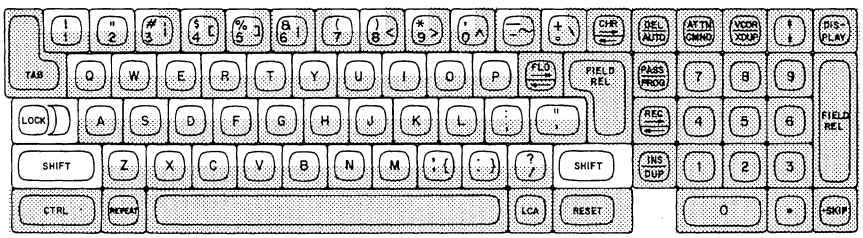


9100-68



9100-99

SHIFT Key (Model 3555 Keystation Typewriter Keyboard). When the SHIFT key is pressed or locked, the upper graphics of the data keys are entered. The SHIFT key is locked by pressing the LOCK key. The locked keyboard is released to the original shift level by pressing the SHIFT or LCA key.

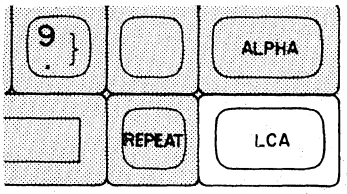


9100-100

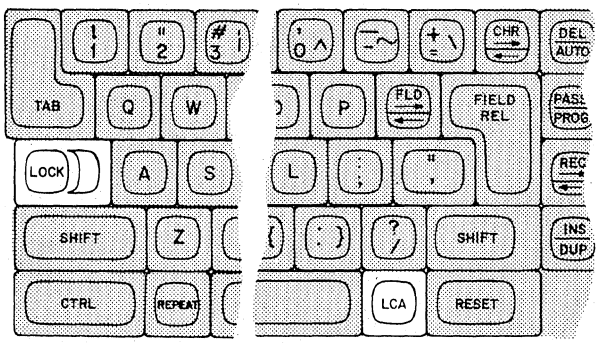
LCA Key. This shift key is used to manually specify lowercase letters corresponding to selected alphabetic keys. On keyboards having keys marked with three characters, LCA is used to select the character on the right side of these keys (except the typewriter keyboard for Model 3555).

Uppercase letters and the special right-hand symbols are displayed with an underline. For keys with no right-hand characters and for nonalphabetic data keys, LCA functions as an ALPHA shift key.

On typewriter keyboards, the LCA key can also be used to unlock the upper shift after the LOCK key has been pressed. The keys with three characters require the use of the CTRL key to select the right-hand symbol.



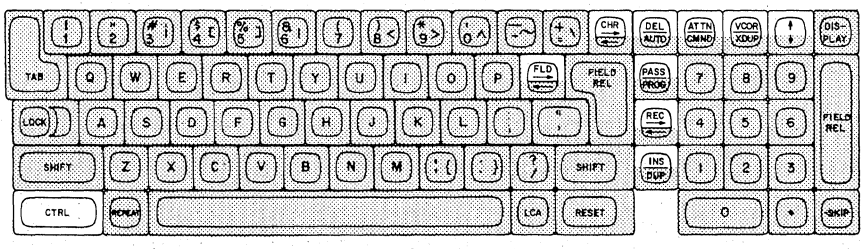
9100-69



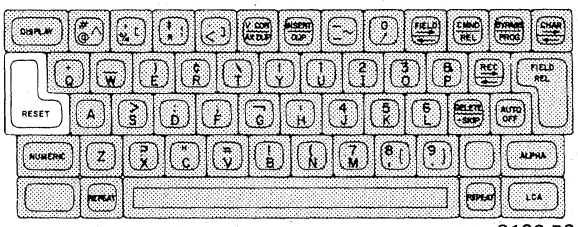
9100-101

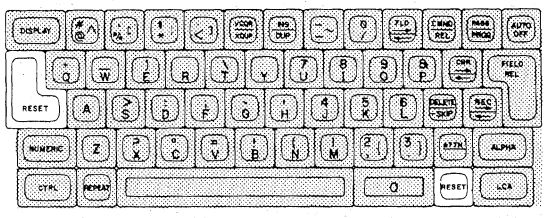
LOCK Key (Model 3555 Keystation Typewriter Keyboard). The LOCK key locks the keyboard in upper shift position. It is released by pressing the SHIFT key or the LCA key.

CTRL Key (Model 3555 Keystation Typewriter Keyboard). The CTRL key is used to select special right-hand graphics on keys with three symbols. It is also used to temporarily select the upper function of control keys.


9100-102

RESET Key (All Model 3541 Keystation Keyboards). This key performs two functions as a shift key: it permits the ALPHA, NUMERIC, and LCA shift keys to be placed in the locked position, and it is used to temporarily select the upper function of control keys.


9100-70


9100-103

To lock a shift key:

1. Press and hold the RESET key.
2. Press and release the shift key to be locked.
3. Release the RESET key.

To select the upper function of a control key:

1. Press and hold the RESET key.
2. Press and release the desired control key.
3. Release the RESET key.

The RESET key also has other nonshift functions; both shift and nonshift functions are explained in more detail in Table 5-2.

Shift Level Summary Tables. Table 5-1 lists the data characters produced in each shift level. Tables 5-2 and 5-3 summarize the shift-key and shift-level information.

Table 5-2. Model 3541 Keystation Keyboard Shift Levels (Part 1 of 2)

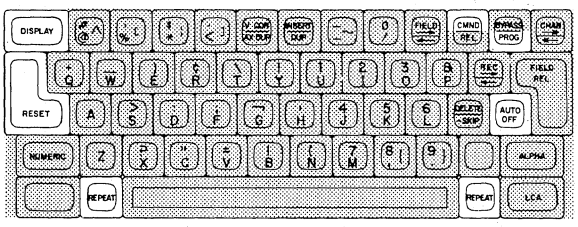
Shift Level	How to Select	How to Lock	How to Release Lock	Type of Character on Screen	Status Display Telling What Shift Level Is In Use
Alpha	Press ALPHA	Press and hold RESET Press and release ALPHA Release RESET	Shift to another level	Bottom character on data keys	A
Numeric	Press NUMERIC	Press and hold RESET Press and release NUMERIC Release RESET	Press NUMERIC twice. Shift will return to alpha level	Top character on data keys	N

Table 5-2. Model 3541 Keystation Keyboard Shift Levels (Part 2 of 2)

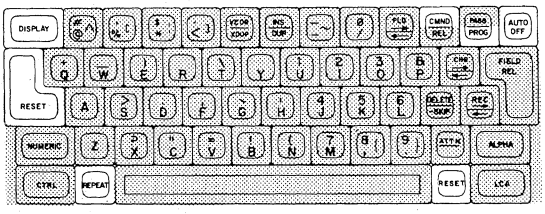
Shift Level	How to Select	How to Lock	How to Release Lock	Type of Character on Screen	Status Display Telling What Shift Level Is In Use
LCA (lowercase alpha)	Press [LCA]	Press and hold [RESET]. Press and release [LCA]. Release RESET	Press [LCA] twice. Shift will return to alpha level	Lowercase of alphabetical character shown on data keys. If the key is not an alphabetic character, for example, [0 /] the system will produce the bottom symbol. If the key has three symbols, for example, [9 } .] the system will produce the symbol on the right (}). Some systems will not display the lowercase alphabetic character on the screen but instead display an uppercase letter with a line under it (A). The system is, however, generating a lowercase electrical signal.	A or a

Basic Control Keys

The basic control keys are used to enter instructions into the keystation. These control keys are indicated in the following illustration and described in the following paragraphs.



9100-71



9100-104

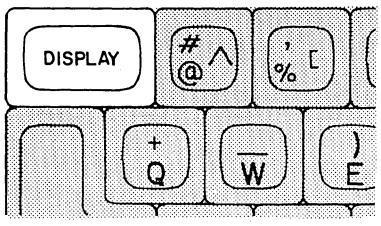
Table 5-3. Model 3555 Keystation Keyboard Shift Levels (Part 1 of 2)

Shift Level	How to Select	How to Lock	How to Release Lock	Type of Character on Screen	Status Display Telling What Shift Level Is In Use
Alpha (keypunch/ adding machine keyboards)	Press ALPHA	ALPHA key cannot be locked		Bottom character on data keys.	A
For typewriter keyboards, lower graphics are auto-matically entered				Lower graphics on data keys.	A
Numeric (keypunch/ adding machine keyboards)	Press NUMERIC		Press NUMERIC twice. Shift will return to alpha level	Numerals on dual function keys and special characters shown on top of keys.	N
(Labeled SHIFT on typewriter keyboard)	Press SHIFT	Press LOCK	Press SHIFT or LCA		
LCA (lower-case alpha)	Press LCA	Press and release LCA	Press LCA twice. Shift will return to alpha level	Lowercase of alpha-betic character shown on data keys. If the key is not an alphabetic character, for example, the system will produce the bottom symbol. If the key has	a

Table 5-3. Model 3555 Keystation Keyboard Shift Levels (Part 2 of 2)

Shift Level	How to Select	How to Lock	How to Release Lock	Type of Character on Screen	Status Display Telling What Shift Level Is In Use
				three symbols, for example, 9 } the system will produce the symbol on the right (} on keypunch keyboards). Some systems will not display the lowercase alphabetic character on the screen but instead display an uppercase letter with a line under it (A). However, the system is generating a lowercase electrical signal.	
CTRL (typewriter)	Press CTRL			Special right-hand characters on keys with 3 symbols.	a
LOCK (type writer)	Press LOCK	Press and release LOCK	Press SHIFT or LCA	Top character on data keys	Does not change shift

DISPLAY Key. This key is used either to erase the data area of the viewing screen or to display information regarding the current record or batch being keyed in.



9100-72

To blank out the data area of the viewing screen, press and release the DISPLAY key and then press and release the N key.

To display information regarding the current record or batch, press and release the DISPLAY key and then press and release the data key corresponding to the desired information as follows:

A* Display contents of arithmetic register
B* Display contents of balance register
C* Display contents of character register
D* Display contents of auxiliary duplicate register

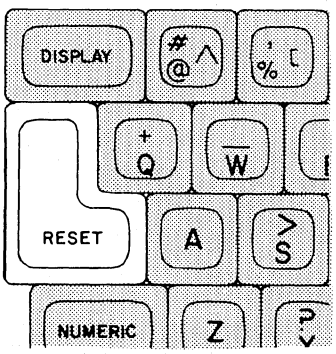
K Display batch keying time and number of strokes
L Display current record in Verify mode
R Display current page of record
T Display current time and keystation number

The display remains on the screen until replaced by another message, or in the case of L, until the next keystroke.

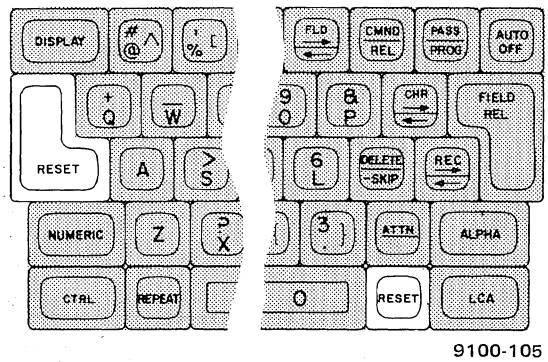
RESET Key. This key is used to reactivate the keyboard after a guide message or an alarm condition has occurred.

This key is also used to select the upper function of control keys and to lock the shift keys.

The CNTL key selects the upper key function of control keys.



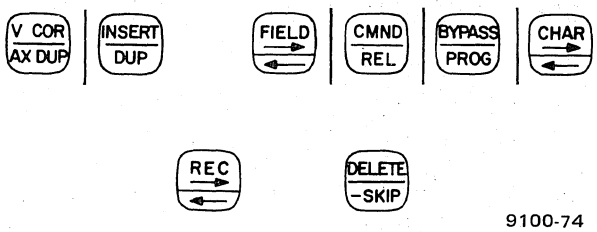
9100-73



9100-105

**After a letter is keyed in, a number corresponding to the desired register number must be keyed in (for example, A01). A register is defined as a place in the memory where an amount of data is stored. The content of registers is determined by computer programming techniques. Local programmers at your company or organization will tell you what registers are used and what information they contain.*

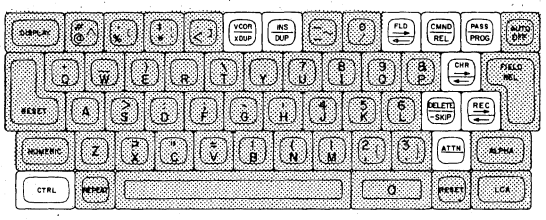
To select the upper function of a dual-function control key (for example, the CMND portion of the CMND/REL key), press the RESET key and hold it while you press and release the control key. Keys which have dual functions include:



9100-74

To lock the ALPHA, NUMERIC, or LCA shift key, press the RESET key and hold it while you press and release the shift key. The selected shift key remains in the locked position (the shift key is locked electronically, not mechanically) until it is again pressed twice and released. The current keyboard shift will be displayed at the beginning of the second line on the viewing screen. (See Figure 4-1.)

To select the upper function of a dual-function control key (for example, the CMND portion of the CMND/REL key), press the CTRL key and hold it while you press and release the control key. Keys which have dual functions include:



9100-106

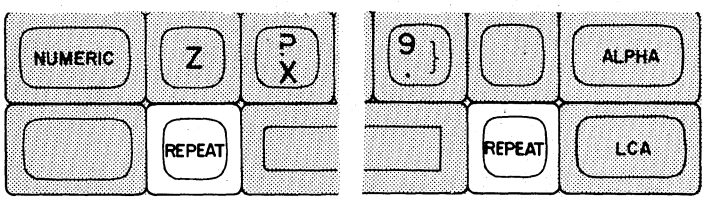
To lock the ALPHA, NUMERIC, or LCA shift key, press the CTRL key and hold it while you press and release the shift key. The selected shift key remains in the locked position (the shift key is locked electronically, not mechanically) until it is again pressed twice and released. The current keyboard shift will be displayed at the ninth position of the status line. (See Figure 4-2.)

If an alarm condition occurs during data key-in, the keyboard will be locked until the alarm condition is removed. Press the RESET key to remove the alarm condition. After the alarm message is erased, the cursor symbol will be automatically displayed in the correct character position. Then you can correct the error or bypass the field containing the error (if applicable) and continue your keying task — unless directed otherwise by the format program.

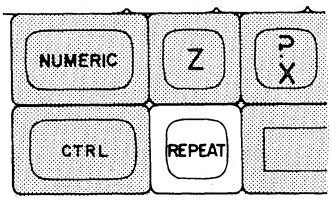
If a guide message which locks the keyboard is received, press the RESET key to unlock the keyboard. (Not all guide messages will lock the keyboard, so it isn't always necessary to use RESET.)

REPEAT Key. When you press and hold the REPEAT key, the next positioning control key or data key you press will repeat. Repeating continues at approximately 10 times per second until the REPEAT key is released (even if the key being repeated is released). Should another key be pressed during the repeat operation, it will have no effect on the keystation.

The repeat function is automatically disabled at the end of a field.



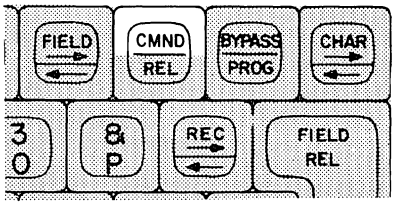
9100-75



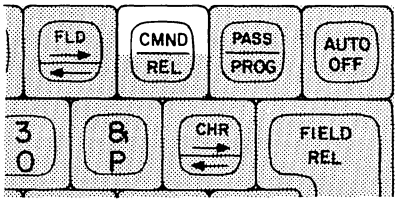
9100-107

CMND Key. This key is selected by pressing and holding the RESET key (Model 3541) or CTRL key (Model 3555, except typewriter keyboard) and then pressing the CMND key.

The CMND key is used to begin work at your keystation, to select the mode of operation, to close a batch, to interrupt an entry, to enable or disable the keystation, and to change a search record when in the Search And Modify mode.



9100-76



9100-108

At the beginning of the work day when the "READY — USE CMND KEY TO START WORK" message is displayed on the viewing screen or the cursor symbol (▮) is displayed, press the RESET key (or the CTRL key) and then press the CMND key to activate the work initiation command.

To close a batch:

1. Finish keying the current record.
2. Press and hold the RESET or CTRL key.
3. Press the CMND key; then release both keys.
4. Press the C key.

NOTE:

CMND C in File Management mode can cause unpredictable results with indexed file data. (A level-Z program should be provided that can either be automatically selected or operator selected. Check with your supervisor.)

To interrupt data entry to a batch:

1. Finish keying the current record.
2. Press and hold the RESET or CTRL key.
3. Press the CMND key; then release both keys.
4. Press the I key.

NOTE:

Interrupting data entry to an incomplete batch is not allowed in File Management mode.

To temporarily disable the keystation:

1. Finish keying the current record.
2. Press and hold the RESET or CTRL key.

3. Press the CMND key; then release both keys.

4. Press the D key.

To activate a keystation that has been temporarily disabled:

1. Press and hold the RESET or CTRL key.

2. Press the CMND key; then release both keys.

3. Press the A key.

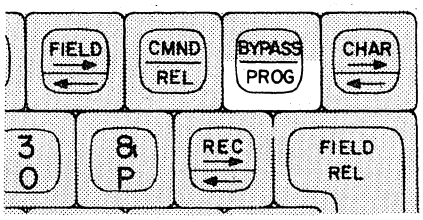
In the Search And Modify mode, the CMND key may be used in conjunction with other keys to permit particular types of searches or to change the search mask. To initiate these operations, press and hold the RESET key (or CTRL key), press the CMND key, release both keys, and then press the G or M key to cause the following:

G key Continue search from the last record displayed and search for the same record contents. (You may wish to relate the G key to the "go ahead" command.) (The G key is not valid in a numeric search, where the search calls for location of numbers.)

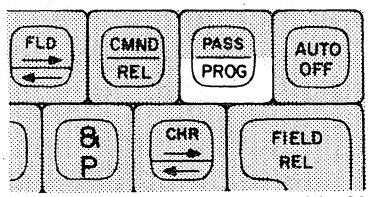
M key Search from the last record displayed, using a new mask (new record contents). (You may wish to relate the M key to the "new mask" command.)

Refer to Section 6 for more details regarding the Search And Modify mode.

PROG key. This key is used to manually select the format program level (if manual program-level selection is allowed in your local operation). Use of the PROG key is valid only in the first position of a field.



9100-77



9100-109

To manually select the level of the current program:

1. Move the cursor (▮) to the start of the selected field.

2. Press the PROG key and release.

3. Press the data key corresponding to the program level desired. (You will require local instructions on which data key to press.)

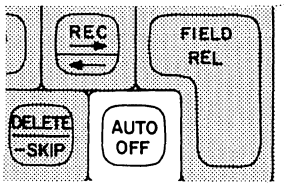
If the selected level is valid, the selected character is displayed in the program-level area of the status line. When this display appears, you may key data into the field.

If the selected level is not valid, or if manual level selection is not allowed by the program, an alarm condition occurs.

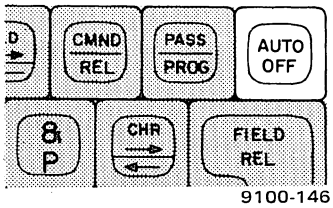
Under no circumstances may an operator field backspace and then change levels. Deleting records and levels by use of the CMND and PROG keys is not allowed in File Management mode.

Refer to the "SPECIAL PROCEDURES" paragraph in Section 6 for more detailed instructions on manual program-level selection.

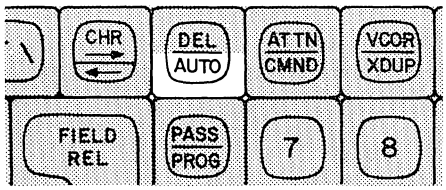
AUTO OFF or AUTO Key. This key is used to disable (turn off) the automatic skip, duplication, or generation of fields on a single-field basis. The status of these automatic functions is displayed in the 11th position of the status line. (Refer to Figure 4–1 or 4–2.)



9100-78



9100-146



9100-110

When the automatic function is on (AUTO OFF or AUTO key not pressed), programmed automatic skipping, duplication, or generation of fields takes place. When this function is off (AUTO OFF or AUTO key is pressed), fields that are programmed to be automatically skipped, duplicated, or generated can be manually entered. Pressing the AUTO OFF or AUTO key causes a field backspace to the first auto field located and disables the automatic functions for one field to allow manual data entry. The changes made to that auto field will be automatically made in corresponding auto fields of subsequent records.

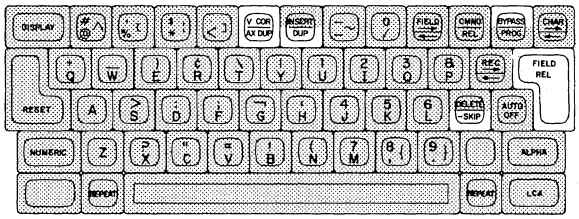
Backspacing to multiple auto fields is accomplished by pressing the AUTO OFF or AUTO key several times. Pressing this key when no previous auto fields exist causes an error and produces an alarm condition. Any change to an auto field using the AUTO OFF or AUTO key is duplicated in the following auto fields, and batch replay occurs.

NOTE:

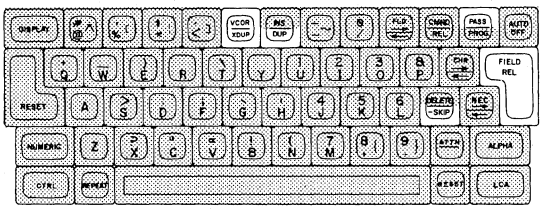
Use of this key in the File Management mode is not allowed.

Field Control Keys

The field control keys are used to duplicate, correct, bypass, or manually end a field. These control keys are shown in the accompanying figure and are described in the following paragraphs.

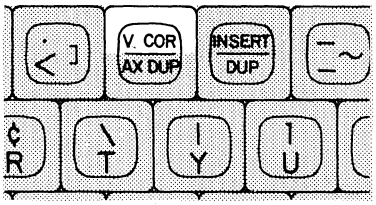


9100-79

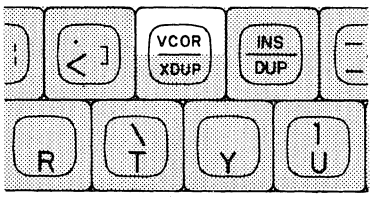


9100-111

V COR (or VCOR) Key. This key is selected by pressing and holding the RESET or CTRL key and then pressing the V COR/AX DUP (VCOR/XDUP) key.



9100-80



9100-112

The V COR or VCOR key is used in the Verify operating mode to correct an entire field by rekeying and then verifying the field.

To make corrections to a field in the Verify mode:

1. Press and hold the RESET or CTRL key.
2. Press and release the V COR or VCOR key.
3. Release the RESET or CTRL key. The cursor (■) will be positioned at the beginning of the current field.
4. Key in the correct field data.
5. If in an automatic-release field, note at the last character position that:
   a. The alarm sounds.
   b. The keyboard is disabled.
   c. "REKEY FIELD TO VERIFY" appears on the message line.
6. If in a must-release field, press the FIELD REL key and note that:
   a. The alarm sounds.
   b. The keyboard is disabled.
   c. "REKEY FIELD TO VERIFY" appears on the message line.

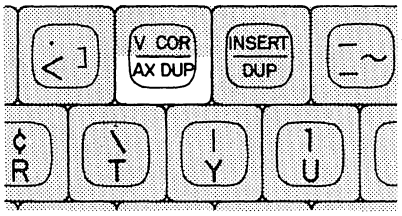
7. Press the RESET Key. The cursor will again be positioned at the beginning of the current field.

8. Again key in the field data to verify corrections.

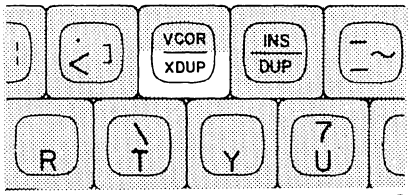
NOTE:

Use of this key is allowed only in the Verify mode.

AX DUP or XDUP Key. This key permits the contents of a particular data storage area (program-selected auxiliary duplicate register) to be entered as a field during the Enter, Update, Search And Modify, or File Management mode. In Verify mode, this key permits a program-selected auxiliary duplicate register to be used for comparison against the contents of the field being verified.



9100-81



9100-113

In the Enter, Update, Search And Modify, or File Management mode, use the AX DUP or XDUP key as follows:

1. Move the cursor (▒) to the start of the selected field that is programmed to allow this function.

2. Press the AX DUP or XDUP key.

The contents of the program-selected auxiliary duplicate register will be automatically inserted in the current field and the current field will be automatically ended.

In the Verify mode, use the AX DUP or XDUP key as follows:

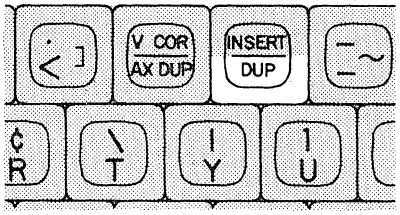
1. Move the cursor to the start of the selected field that is programmed to allow this function.

2. Press the AX DUP or XDUP key.

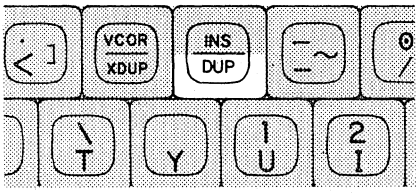
The contents of the program-selected auxiliary duplicate register will be automatically verified against the current field, and the current field will be automatically ended.

If a verify miscompare occurs, the VCOR key can be used to correct the field, or the DISPLAY key can be used to view the contents of the program-designated auxiliary duplication register.

DUP Key. This key is used to copy the characters contained in a field of a previous record into the corresponding field positions of the current record. This key is invalid when you are keying in the first record of a batch.



9100-82



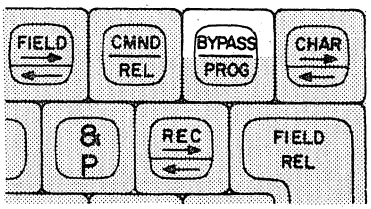
9100-114

To duplicate a field:

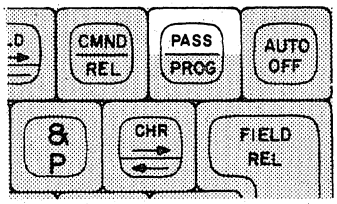
1. Move the cursor to the start of the selected field.
2. Press the DUP key.

The field will be duplicated and automatically ended.

BYPASS or PASS Key. This key is selected by pressing and holding the RESET or CTRL key and then pressing the BYPASS/PROG or PASS/PROG key.



9100-83



9100-115

The BYPASS or PASS key is used to skip over a field when the source information you have for that field is unreadable or incorrect. Use of this key causes the field to be blank or zero filled, as determined by the program, and bypassed in Enter mode or to be unchanged and bypassed in Verify mode. The field, record, and batch are flagged as invalid.

To bypass a field (or any data within a field):

1. Press and hold the RESET or CTRL key.
2. Press and release the BYPASS or PASS key.
3. Release the RESET or CTRL key.

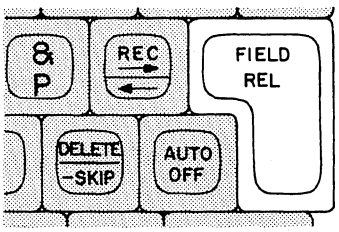
The cursor moves to the start of the next field. Programmed keying and validation checks are not performed on a bypassed field.

This key can also be used to exit from the work initiation command portion of a mode before the match is opened, as follows:

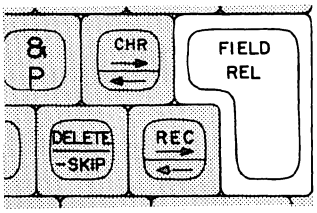
1. Press and hold the RESET or CTRL key.
2. Press and release the BYPASS or PASS key.
3. Release the RESET or CTRL key.

"READY — USE CMND KEY TO START WORK" will appear on the message line.

FIELD REL Key. This key is used to manually exit from a field either because you have finished keying in the necessary characters or because the field is programmed to require manual exit. When the FIELD REL key is pressed, the format program automatically justifies and fills the field as required and the cursor is positioned at the beginning of the next keyed field.



9100-84



9100-116

Here are the general operating situations that apply to the FIELD REL key:

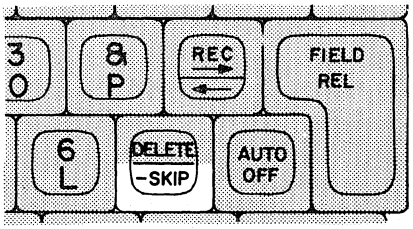
1. Manual exit from the field may not be required at all. Exit will be automatic when the required number of characters have been keyed.
2. You may be required to press the FIELD REL key, REL (TAB) key, or -SKIP key to release a field.
3. Keying may be performed in a field with no restrictions applied. To skip the field, press the FIELD REL key or -SKIP key.
4. Keying may be required in at least one character position of the field. Press the FIELD REL key when keying is finished.

The local field restrictions (applying to the format program that you'll be using to process your input data) will be explained to you by your supervisor.

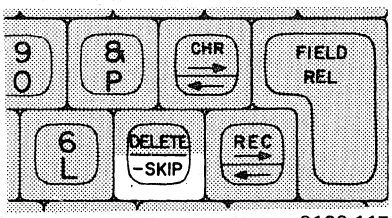
Refer to the -SKIP key and the REL key descriptions below for additional field-control information.

-SKIP Key. This key is used to manually end programmed decimal number fields which are to be flagged as negative numbers. The cursor moves to the start of the next keyed field when the -SKIP key is pressed.

The -SKIP key functions as a FIELD REL key for all fields that do not contain signed decimals.



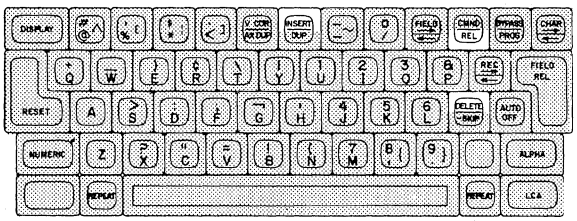
9100-85

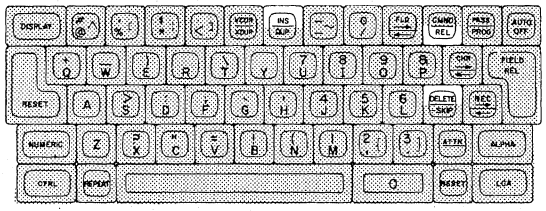


9100-117

Record Control Keys

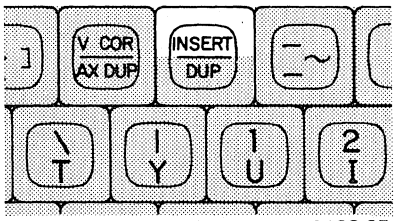
The record control keys are used to insert, delete, and release records. These control keys are shown in the accompanying illustrations and described in the following paragraphs.


9100-86

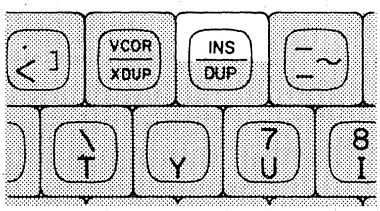

9100-118

INSERT Key or INS Key. This key is selected by pressing and holding the RESET or CTRL key and then pressing the INSERT/DUP or INS/DUP key.

The INSERT or INS key allows a record to be inserted at a selected position within a data batch. The INSERT key can be used in all operating modes except Enter and File Management.



9100-87



9100-119

To insert a record into a batch:

1. Position the cursor in the first keyed position of the record past the area where the record is to be inserted.

2. Press and hold the RESET or CTRL key.

3. Press and release the INSERT or INS key.

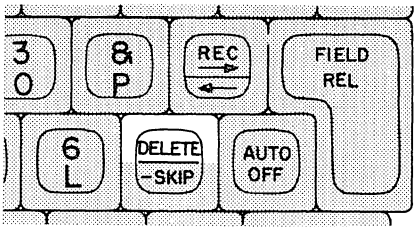
4. Release the RESET or CTRL key. The record at which the cursor was positioned is now set up to move forward and make room for the new record.

5. Key in the new record. This new record will be positioned ahead of the record at which the cursor was positioned in step 1.

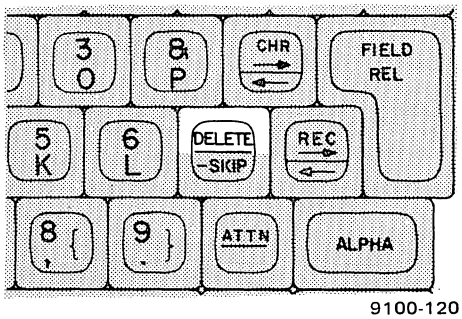
6. The new record is automatically released to the batch after the last field is keyed. You may then close the batch. Do not press the REL key (TAB key on the Model 3555 typewriter keyboard) to release the record or you will erase the next record!

7. If you wish to release the batch before the last field is keyed, you may do so by pressing the REL (or TAB) key.

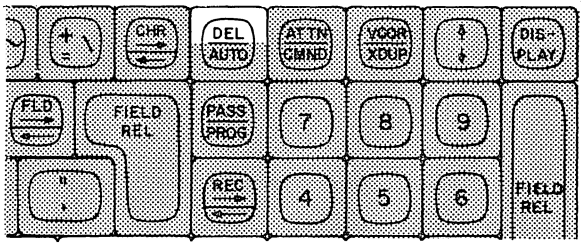
DELETE Key. This key is selected by pressing and holding the RESET or CTRL key and then pressing the DELETE/-SKIP key (DEL/AUTO on Model 3555 typewriter keyboards).



9100-88



9100-120



9100-121

The DELETE key is used to delete a complete record from a data batch. The key can be used in all operating modes except Enter and File Management.

To delete a record:

1. Position the cursor at the first keyed position of the record to be deleted.

2. Press and hold the RESET or CTRL key.

3. Press and release the DELETE (DEL) key.

4. Release the RESET or CTRL key.

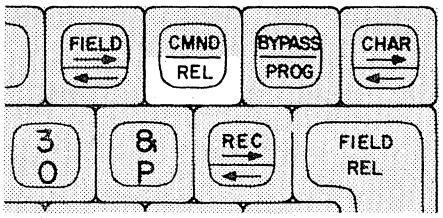
That record is now deleted from the batch. You may then close the batch.

Additional information about deletion techniques is given in Section 6.

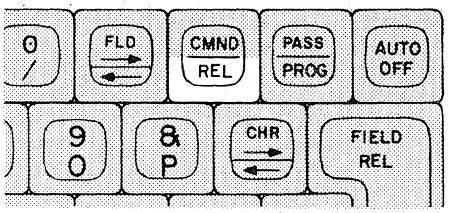
REL Key (TAB Key on Model 3555 Typewriter Keyboard). In the Enter, File Management, Update, and Search And Modify modes, the REL key is used to end a record at any point without keying in any more data. If none of the remaining fields in the record are programmed as must-enter fields (fields which must be keyed in by the operator), the record is released when the REL key is pressed. If one or more must-enter fields exist in the record when the REL key is pressed, the cursor is positioned at the first character position of the next must-enter field, an alarm sounds, and the record is not released. The RESET key must be pressed to recover from the alarm condition before the must-enter field can be keyed in.

Keep in mind that it is not necessary to use the REL key after keying the final field of a record. The record is then automatically released.

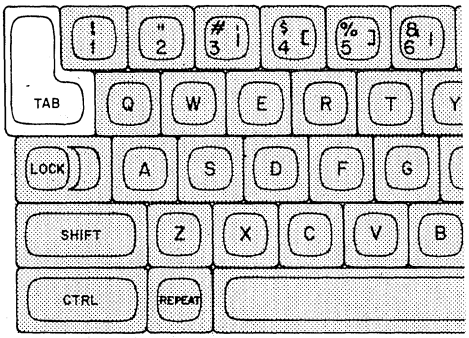
In the Verify mode, the record is automatically released after the last must-verify field if the record has been verified. If the REL (TAB) key is pressed when one or more must-verify fields still exist in the record, the cursor is positioned at the first character position of the next must-verify field, an alarm sounds, and the record is not released. The RESET key must be pressed to recover from the alarm condition before the must-verify field can be keyed in.



9100-89



9100-122

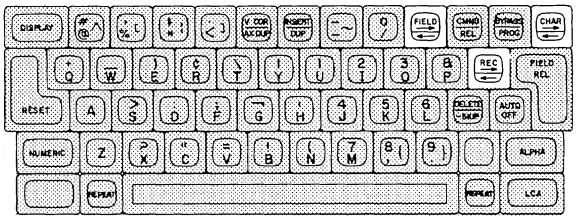


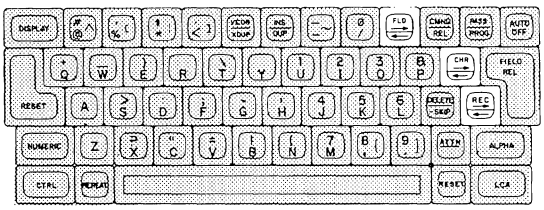
9100-123

The REL (TAB) key can also be used similarly to a typewriter tab key (if local conditions permit). When tab fields are programmed, pressing the REL (TAB) key causes the cursor to skip to the start of the next field designated as a tab stop by the program.

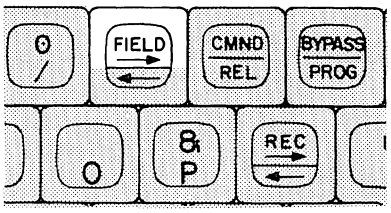
Positioning Control Keys

The positioning keys are used to position the cursor forward or backward in a field or record. The six positioning keys are easily identified by their arrow markings (—►, ◄—). These keys are shown in the accompanying illustration and described in the following paragraphs.

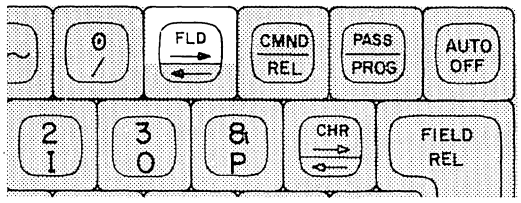

9100-90


9100-124

FIELD ⟶ or FLD ⟶ Key. This key is selected by pressing and holding the RESET or CTRL key and then pressing the FIELD ⟶/⟵ or FLD ⟶/⟵ key.



9100-91



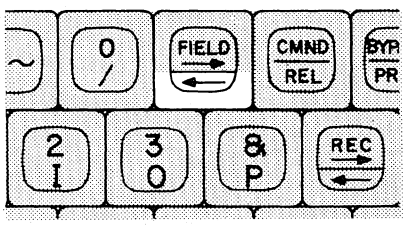
9100-125

The FIELD ⟶ or FLD ⟶ key is used to position the cursor to the start of the next field. If the next field has been established in your local operating situation as a continuation field (this causes the keystation to recognize the next field as a continuation of the current field), the cursor advances to the first field not programmed as a continuation field.

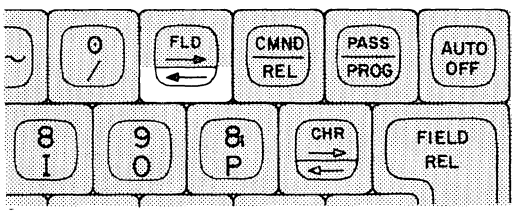
The FIELD ⟶ or FLD ⟶ key is used in the Verify mode to complete verification of a field that has been sight verified (rather than key verified). Pressing the FIELD ⟶ or FLD ⟶ key indicates that the field has been sight verified and is considered to be correct. When the key is pressed, the cursor moves to the first position of the next field to be verified.

Using this key to move the cursor beyond the last keyed or key-verified field of a record is, in most cases,* an invalid operation which causes an alarm condition. (Refer to the paragraph on the REC ⟶ key).

FIELD ⟵ or FLD ⟵ Key. This key is used to position the cursor to the first keyed position of the previous field or the first character position of the current field. When the cursor is in the first keyed position of a field and the FIELD ⟵ or FLD ⟵ key is pressed, the cursor backspaces to the first keyed position of the previous field. When the cursor is not in the first keyed position of a field and the FIELD ⟵ or FLD ⟵ key is pressed, the cursor backspaces to the first keyed position of the current field.



9100-92



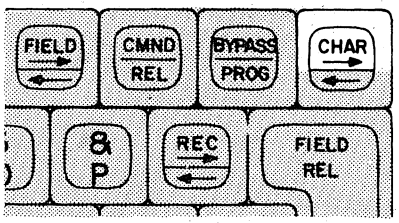
9100-126

Some format programs may permit this key to be used to move beyond the last keyed field. Your supervisor will notify you if this is the case in your operating situation.

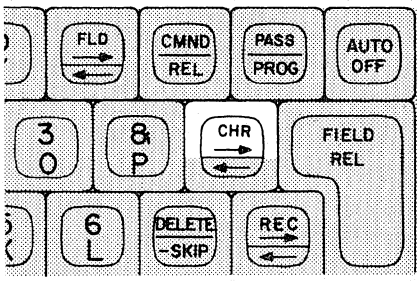
Using this key to backspace beyond the start of a record is an invalid operation which causes an alarm condition. (Refer to the paragraph on the REC ⟵ key.)

In the File Management mode, backspacing is allowed only within the current field.

CHAR ⟶ or CHR ⟶ Key. This key is selected by pressing and holding the RESET or CTRL key and then pressing the CHAR ⟶ or CHR ⟶ key.



9100-93

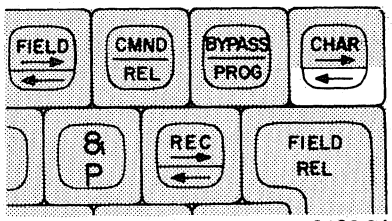


9100-127

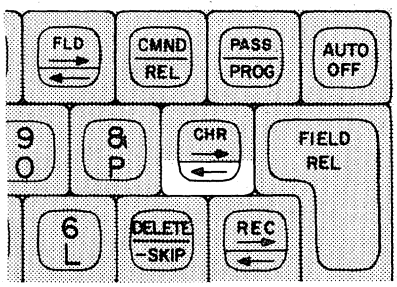
The CHAR ⟶ or CHR ⟶ key is used to position the cursor forward one character position within a field.

Using this key to move beyond the last character entered or programmed within a field is an invalid operation which causes an alarm condition. In the Verify mode, when key verification is required, using this key to move beyond the last verified character within a field is also an invalid operation which causes an alarm condition.

CHAR ⟵ or CHR ⟵ Key. This key is used to position the cursor backward one character position within a field or to backspace from the first character position of one field to the last character position of the previous field.



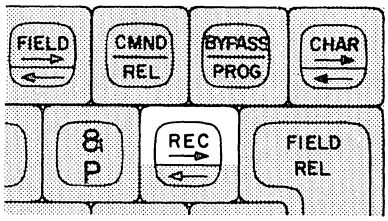
9100-94



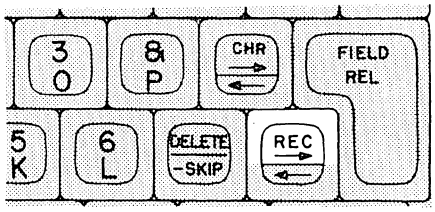
9100-128

Backspacing beyond the start of a record is an invalid operation which causes an alarm condition.

REC ⟶ Key. This key is selected by pressing and holding the RESET or CTRL key and then pressing the REC ⟶ / ⟵ key.



9100-95



9100-129

The REC —▷ key is used to position the cursor to the start of the next record within a data batch.

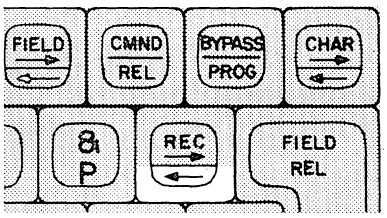
In the Enter and Update modes, using this key to move beyond the last record of a data batch is an invalid operation which causes an alarm condition. In Verify mode, moving beyond the last verified record is invalid and causes an alarm condition. In Search And Modify mode, moving beyond the last record of a batch causes the batch to be closed.

In any operating mode except File Management, after a record backspace to a previous record and modification to a field in that record, the cursor should be advanced out of the record with the REC —▷ key before continuing the work sequence or closing the batch. Before an operator-entered command is keyed in the Search And Modify mode, the REC —▷ key should be used to move out of the last record modified.

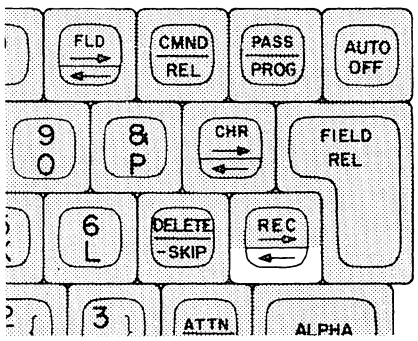
NOTE:

Use of this key in the File Management mode is not allowed.

REC ◁— Key. This key is used to position the cursor to the first keyed position of the previous record or the current record. When the cursor is in the first keyed position of a record and the REC ◁— key is pressed, the cursor backspaces to the first keyed position of the previous record. When the cursor is not in the first keyed position of a field and the REC ◁— key is pressed, the cursor backspaces to the first keyed position of the current record.



9100-96



9100-130

Using this key to backspace beyond the start of a batch is an invalid operation which causes an alarm condition.

If a field is partially keyed behind penetration or if the cursor is in a field as a result of an ALLOW or DISALLOW procedure execution, the REC ◀— key is invalid.

NOTE:

Use of this key in the File Management mode is not allowed.

Section 6 Contents

6. Operating the Keystation

With a basic understanding of how the system operates, what the control keys do, and how to interpret the data on the viewing screen, you are now prepared to begin operating the keystation. If possible, sit at a keystation when you read this section so you can try the switches, keys, and techniques as you read about them.

If you have any questions about the basic operation of your keystation, first refer to the previous sections in this book. Should you need additional assistance, ask your supervisor.

This book is written primarily for new operators. Therefore, you should follow these instructions carefully the first few times you operate your keystation. You will soon develop proficiency and won't have to rely on the book. Again, please keep in mind that the procedures and examples described here may vary somewhat from the requirements of your specific operating situation.

These instructions apply to both of the keystation models (Model 3541 and Model 3555). However, for simplicity of text, many of the illustrations for the instructions show only the Model 3541 screen display. Text references to keys bearing different terms show the Model 3541 key label first, then the Model 3555 label.

POWER TURN-ON AND READY STATUS

Before you can operate your keystation, the power to the whole 1900/10 system must be turned on and several preliminary procedures must be performed by your supervisor. While the system is being prepared for operation, the power switch on your keystation may be in either the on or off position. Although the keystation is generally turned off when not in use, local operating procedures will dictate the use of the power switch. The power to individual keystations can be turned off by the supervisor program.*

If the power switch is in the on position while the system is being prepared, messages will be displayed on the viewing screen. The first message is:

WAIT — SYSTEM PERFORMING SELF TEST (very brief display)

and is followed by a second message:

RECOVERY IN PROGRESS (may also be very brief)

The supervisor program is the computer program that controls the keystations.

and then followed by:

READY — USE CMND KEY TO START WORK

When the "READY" message is displayed, you may set up your keystation to begin work. Press and hold the RESET or CTRL key and then press the CMND key to bring the list of operating modes to the screen.

NOTE:

On Model 3555 keystation typewriter-style keyboards, the CMND key label is in a lower graphics position and does not require use of the CTRL key.

If your keystation power switch is turned on after your supervisor has completed the system turn-on procedures, the first display on your viewing screen will be a bright cursor (■). When the cursor appears, you may press and hold the RESET or CTRL key and then press the CMND key to bring the list of operating modes to the screen.

If you are at a remote site, the ON OFF switch on the remote keystation adapter at the local site must be set to ON. The ON OFF switch on the remote keystation adapter must also be turned on, and the RESET switch must be pressed momentarily. These actions will cause the display:

BASIC POC CHECK SUCCESSFUL

followed quickly by

SYSTEM READY

NOTE:

The speed of transmission from a remote keystation to the 1900/10 processor is limited by the speed of the interconnecting telephone line. If typing speed is too great for the line, the following message will appear on the screen:

CHARACTER LOST — REKEY

When this message occurs, retype the lost material and reduce typing speed to a rate which the line can handle.

HOW TO ENTER DATA INTO THE SYSTEM

Certain standard procedures must be performed with every batch of data that you enter with your keystation. These standard procedures are called commands. A command is a signal telling the computer that a certain task will be performed by you on your keystation. (A command can also be used to request the computer to perform a task, or to terminate keystation activities.)

Understanding the Work Initiation Command

Before you start entering data, you must send a work initiation command, which you key in from the keyboard. This command takes you through a series of steps that ready your keystation for operation.

The work initiation command is divided into the following steps:

- Mode
- Start option
- Job name
- Batch number
- Operator identification
- Format name

These steps are called "elements." You might think of each command element as a question you must answer before you can enter data. The command elements and your possible answers are described in the following paragraphs.

Mode. This command element selects the operating mode of your keystation. Key in the first two letters of the mode name to indicate the mode you want. The modes and the corresponding letters to be entered are:

Batch entry	ENter
Batch verification	VErify
Batch modification	SEarch and modify
Batch update	UPdate
Indexed file/sequential file access	FIle management

Start Option (or Continue). This command element indicates whether you are continuing a batch that was previously ended or interrupted or are starting a new batch. If a new batch is to be keyed in, enter NO. If a previously closed or interrupted batch is to be keyed in, enter YE (YEs). There is no START OPTION for the File Management mode or the Search And Modify mode.

Job Name. The job name is the name assigned (for identification purposes) to the batch you are going to key in. This name must contain at least one but not more than eight characters. The first character must be alphabetic. Job names may be whole or hyphenated terms, but not two words.

Don't confuse the job name with the format name. (The format name is explained on the following page.)

Batch Number. The batch number is the identifying (or sequence) number assigned to the batch you are going to key in. A number from 0 to 50,000 may be inserted.

Operator Identification. This command element identifies the person who is presently operating the keystation. From one to three alphanumerics* may be inserted.

Format Name. The format name specifies the format program that will be used to control operation of your keystation. Your supervisor will give you the format name for the batch you are going to key in before you begin a particular job. The format name must begin with an alphabetic character and may contain up to seven additional alphanumerics.

Keying In the Work Initiation Command

To enter the work initiation command:

1. Press and hold the RESET or CTRL key.
2. Press and release the CMND key.
3. Release the RESET or CTRL key.
4. Key in at least the first two letters of the desired operating mode, as follows:

ENter	Batch entry
VErify	Batch verification
SEarch and modify	Batch modification
UPdate	Batch update
FIle management	Indexed file or sequential file access

5. Press the FIELD REL key.
6. In all modes except Search And Modify or File Management, key your answer to the "CONTINUE" or "START OPTION" request as follows:

   NO — Indicates that a new batch will be entered

   YEs — Indicates that entries will be made to a batch that was previously closed or interrupted

NOTE:

The "START OPTION" request is not presented in either the Search And Modify mode or the File Management mode.

7. Press the FIELD REL key.
8. Key in the job name and press the FIELD REL key.
9. Key in the batch number and press the FIELD REL key.
10. Key in your operator identification and press the FIELD REL key.
11. Key in the format name and press the FIELD REL key.

**"Alphanumeric" is a combining word meaning alphabetic and numeric characters.*

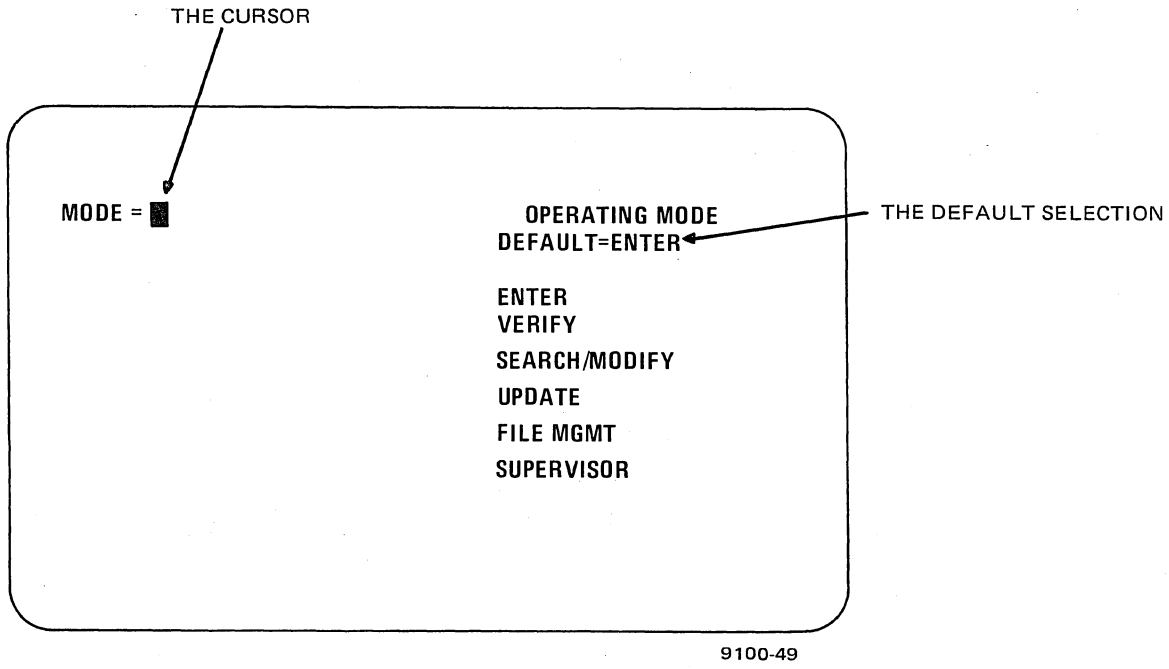
You are now ready to begin entering data.

The next few pages give you some information to help you use your keystation efficiently. You'll also learn about other computer commands used in your work. Then on page 6–9 you'll find a practical example of how to use all these operating techniques.

Using the Default Command

During the day you may key in many different batches of work. When you start a new batch, you have to key in only those command elements that have changed from the last work initiation command. When you come to an unchanged element of a work initiation command, you may enter it simply by pressing the FIELD REL key once. This is called "default entry."

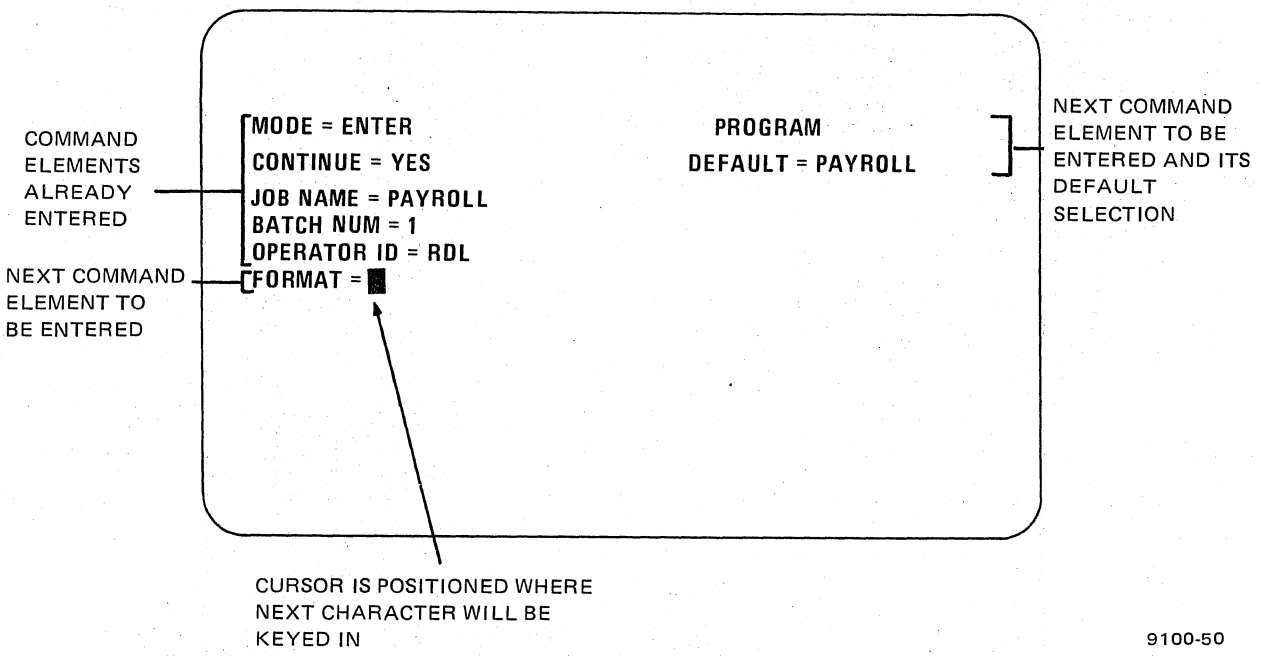
The default selection (that is, the information entered if you choose to default) for each command element is displayed on the right side of the viewing screen, as shown in the following illustration. In this example, if the mode name were not keyed in, the system would automatically make the default selection when the FIELD REL key was pressed.



The default selection is either the most likely choice you would make or the choice that you last made — depending upon your local operating situation.

How Prompts Help You Key In Information

You will be guided throughout your work by a series of instructions (called prompts) that appear on your viewing screen. The following illustration shows the prompts that tyically appear while you are keying in the work initiation command. The prompts on the right side of the screen indicate the command element to be keyed in next, its default selection, and (where applicable) the answers from which you may choose. The prompts on the left side of the screen show you which command elements have already been entered and which command element is to be keyed in next. The position of the next keyed character is indicated by the cursor.



In other operating conditions, prompts may appear on the message line of your viewing screen. The field name information on the first line of the screen may also be used as a prompt (see page 6–15).

What To Do When an Alarm Occurs

If any element of a command that you are entering is found to be invalid (unacceptable) by the system, an alarm condition will occur immediately. When this condition occurs, a checkerboard pattern appears on the viewing screen for a half second, an alarm sounds, and an alarm message appears on the message line of the screen. The keyboard is locked, and keying cannot proceed until the alarm condition and the message are cleared. At a local keystation, the message displayed on the message line is intensified (shown brighter than any other displayed information) so it can easily be distinguished from the rest of the display. Intensification of the alarm message, however, does not occur on the screens of remote keystations when a remote keystation system is employed.

To clear the error, press the RESET key; this removes the alarm message from the viewing screen. The command element can then be rekeyed. If the correct entry cannot be made, the command may be bypassed by pressing first the RESET or CTRL and then the BYPASS or PASS key. After the command has been bypassed, the "READY" message will appear on the viewing screen and you can start your entries over again.

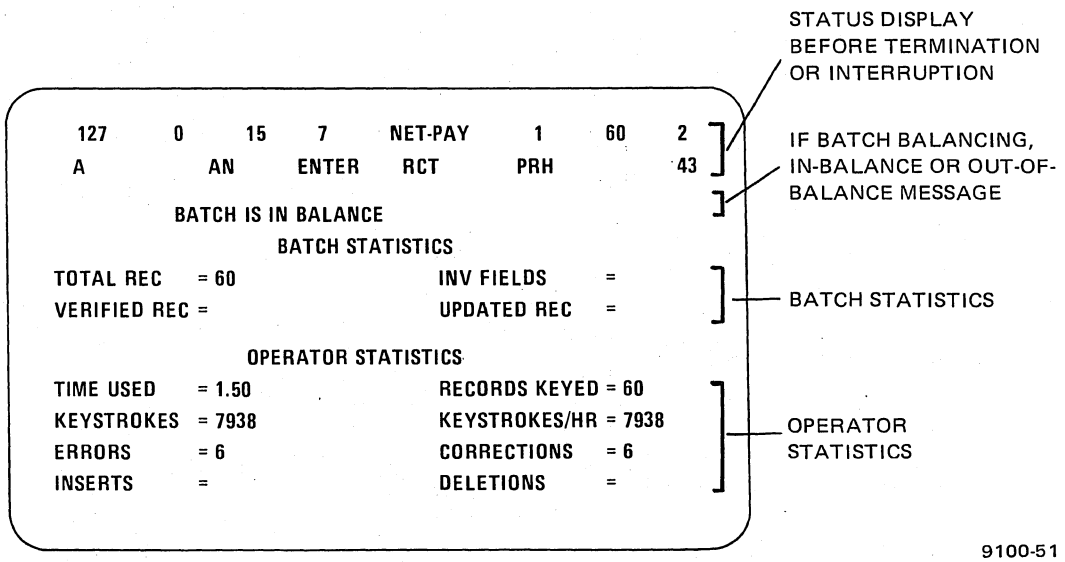
An alarm condition may occur during any phase of keystation operation, not just during command entry. The purpose of the alarm message is to tell you what caused the alarm condition. Table 6–1 lists all the possible alarm messages you could receive and the steps required to recover from the alarm condition in each case.

Closing a Batch

After you have entered the last record, close the batch as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the CMND key.
3. Release the RESET or CTRL key.
4. Key in the letter C.

A work termination display will be presented on your viewing screen. A typical work termination display is shown here.



If balance registers are being used, an in-balance or out-of-balance message will also be displayed on the message line of the viewing screen. (Local instructions will be given to you on batch balancing.)

5. If applicable, read the balance message and then press the RESET key to clear the balance message.
6. Press and hold the RESET or CTRL key and then press the BYPASS or PASS key to clear the entire display from the screen and complete the operation.

Interrupting a Batch

You may interrupt before a batch is complete and then reopen the same batch later. First finish the field or record you're working on. Then:

1. Press and hold the RESET or CTRL key.
2. Press and release the CMND key.
3. Release the RESET or CTRL key.
4. Key in the letter I.

A work interruption display (including batch statistics) will appear on the viewing screen if your keystation contains this option.

5. Press and hold the RESET or CTRL key and then press the BYPASS or PASS key to clear the display from the screen and complete the operation. (CTRL/CMND will also clear Model 3555 displays.)

NOTE:

If you are working in File Management mode, you will not be allowed to interrupt data entry in this manner. Even if you press the specified keys, no interruption will occur.

Reopening a Batch

A batch that has been previously closed or interrrupted may be reopened if the same mode is selected and YEs is specified in response to the "CONTINUE (START OPTION)" prompt during the work initiation command. The reopen sequence is:

1. Press and hold the RESET or CTRL key.
2. Press and release the CMND key.
3. Release the RESET or CTRL key.
4. Key in the first two letters of the mode in response to the "MODE" prompt.
5. Press the FIELD REL key.
6. Key in YEs in response to the "START OPTION" prompt.
7. Finish keying in the work initiation command (or defaulting through the command elements) for the selected batch. Be sure to enter the same batch number you were using when the batch was interrupted.

Disabling a Keystation

You may temporarily suspend operation at your keystation, without interrupting or closing the batch, as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the CMND key.
3. Release the RESET or CTRL key.
4. Key in the letter D.

The message "KEYSTATION DISABLED" will appear on the viewing screen. When you resume operation (see next paragraph), you won't have to go through the work initation command again.

Once you have disabled your keystation, you may not key any more data until you activate your station again. Pressing any key on a disabled station will result in an error.

Activating a Disabled Keystation

You can resume operation at your keystation after it has been disabled as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the CMND key.
3. Release the RESET or CTRL key.
4. Key in the letter A.

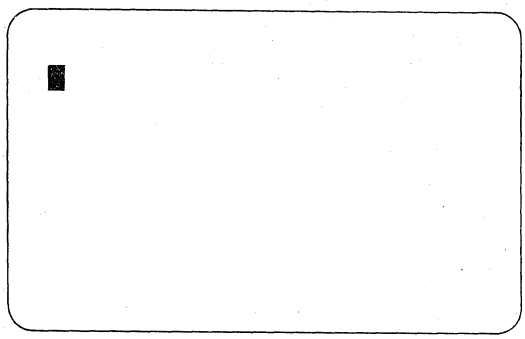
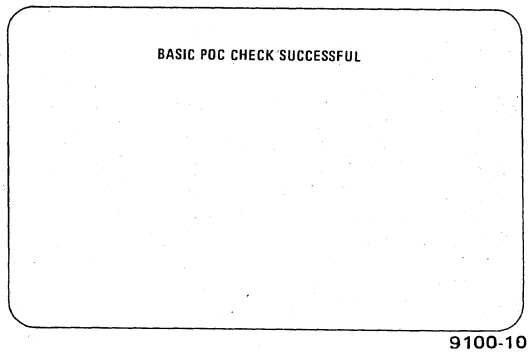
You may now continue keying in the batch.

A PRACTICAL DEMONSTRATION OF THE OPERATING TECHNIQUES

In Section 4, a series of viewing screen displays were presented to show the sequence of events that might occur when data is entered into the 1900/10 storage system. Now that you know more about operating your keystation, let's review the same sequence of events, this time with the complete, step-by-step operating procedures.

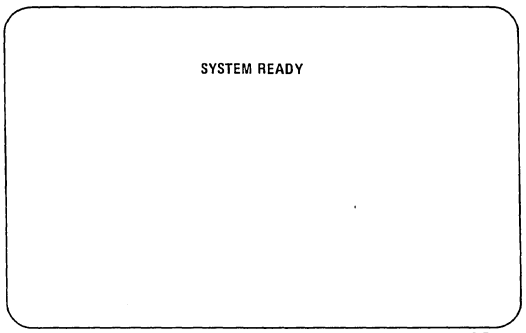
NOTE:

Since you now know the differences and similarities between the Model 3541 and Model 3555 keystations, only the displays as they appear on the Model 3541 will be used in the following sequence of events. You can now easily relate the Model 3555 displays to those shown.

Sequence of Events	Explanation
When you first sit down at your keystation, the screen is dark but the system is turned on. To activate the Model 3541 keystation, reach down on the lower right side and pull the power switch to the on position. To activate the Model 3555 keystation, push the power ON OFF pushbutton in. A tone sounds briefly; then in about 15 seconds your screen looks like this:	
 9100-8	Your viewing screen has warmed up.
If you are at a remote site, you have a remote keystation adapter to which your keystation is connected. You must set the adapter ON OFF switch to ON to turn on the adapter. The POWER ON light comes on. A similar adapter is at the local site with the 1900/10 processor. This adapter must also be turned on by personnel at the local site. The adapters may be turned on either before or after you turn on your keystation. You must then momentarily press the RESET switch on the adapter. The READY light comes on, and the screen displays this message:	
 9100-10	

Sequence of Events

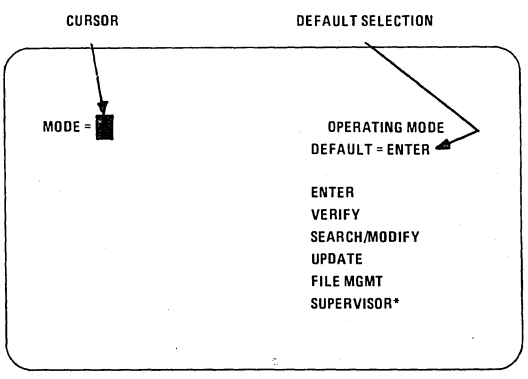
Immediately following, your screen then displays this message:



9100-11

Whether you are at a remote or a local keystation:

1. Press and hold RESET or CTRL key.
2. Press and release CMND key.
3. Release RESET or CTRL key.



*NOT NORMALLY USED BY KEYSTATION OPERATOR

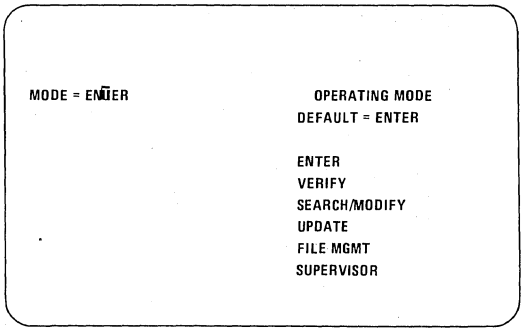
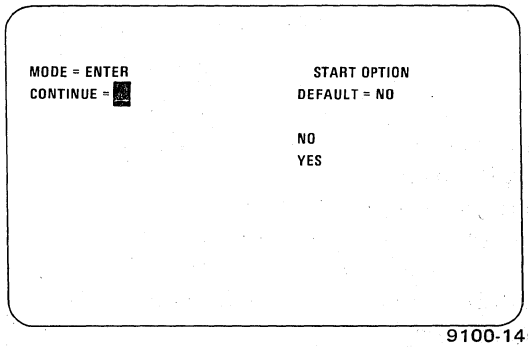
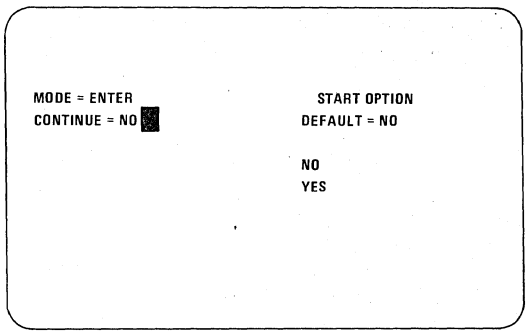
9100-31

Explanation

The power-on confidence test has been run and successfully completed.

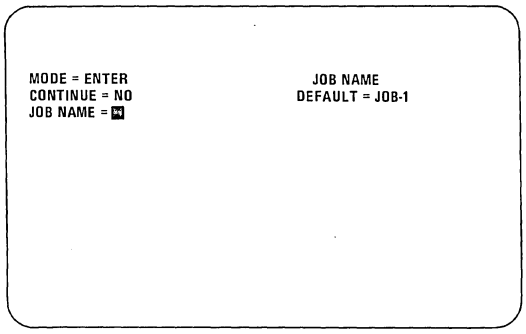
This display then appears on the screen. The display asks you to select an operating mode. You have the six choices indicated on the screen.

In this case, you want to work in the Enter mode. You can select it by keying in the letters EN or by pressing the FIELD REL key. (Pressing the FIELD REL key selects the default entry.)

Sequence of Events	Explanation
1. Key in EN.	
 9100-13	The rest of the word "enter" is automatically shown on the screen, as indicated here.
2. Press FIELD REL key.	
 9100-14	This display prompts you to answer whether you are beginning a new batch of information or continuing with a previous batch.
1. Key in NO.	
 9100-15	When you answer NO, it means you are starting a new batch, not continuing a previous one.
2. Press FIELD REL key.	

Sequence of Events

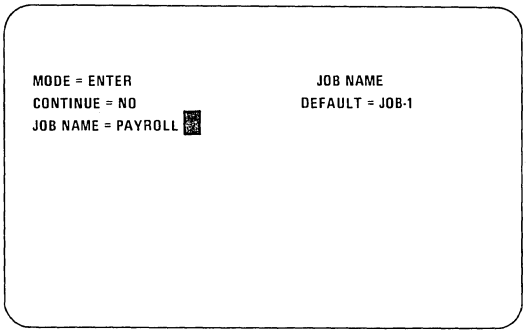
Explanation



9100-16

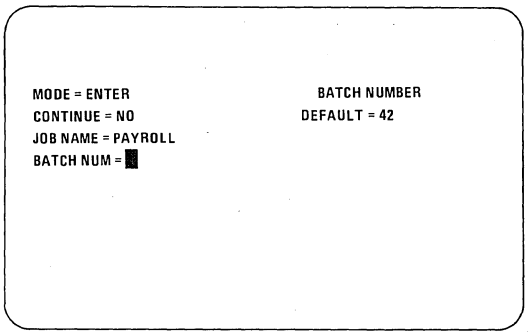
This display appears next on the screen. If you use the default entry technique, the job will be called JOB-1. However, your job is called PAYROLL.

1. Key in PAYROLL.



9100-17

2. Press FIELD REL key.

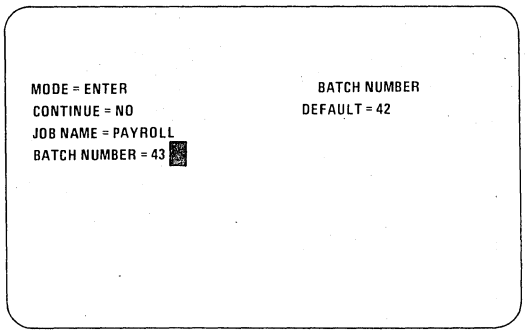


9100-18

And this display appears, asking for a batch number. This batch is assigned the number 43. You cannot key in or default to the previous batch number (batch 42, in this example) when in the Enter mode because you previously answered NO to the "CONTINUE" option.

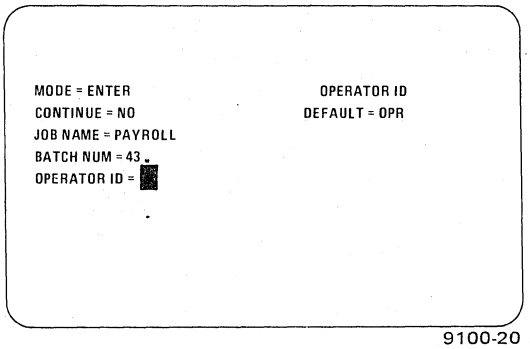
Sequence of Events

1. Key in 43. (You cannot default in Enter mode.)



9100-19

2. Press FIELD REL key.

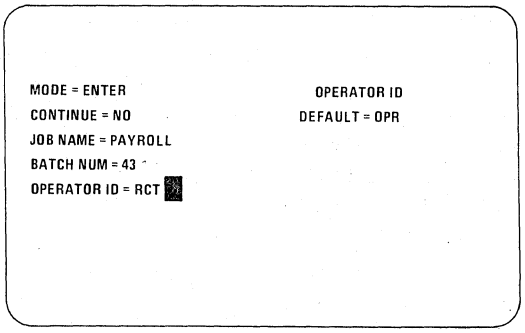


9100-20

Explanation

The next display asks for the code which identifies you as the person working at this keystation.

1. Key in RCT (your initials).

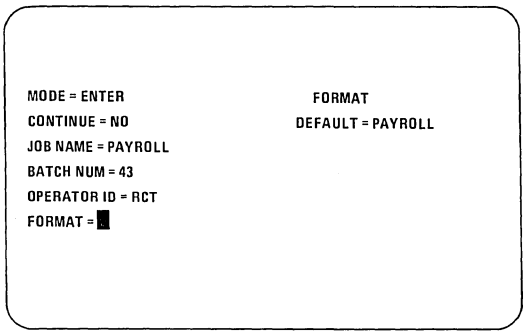


9100-21

2. Press FIELD REL key.

Sequence of Events

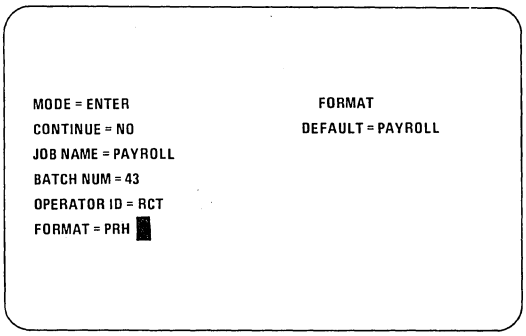
Explanation



9100-22

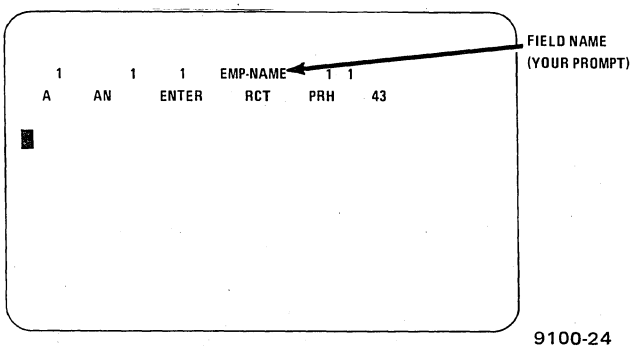
The last display of the work initiation command asks for the program name. (This entry could be any designated name or letters. In this example the letters stand for payroll, hourly.)

1. Key in PRH.



9100-23

2. Press FIELD REL key.



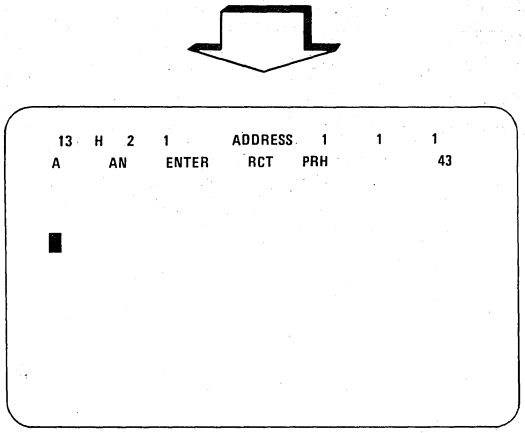
9100-24

After you have finished keying in the work initiation command, this display appears. The display is the 1900/10 system format, with the first field name of this particular program shown. (The field name prompt, in this example, asks for the employee's name.) Notice that the cursor is automatically positioned so you may begin keying in the first field.

1. Key in employeee's name.

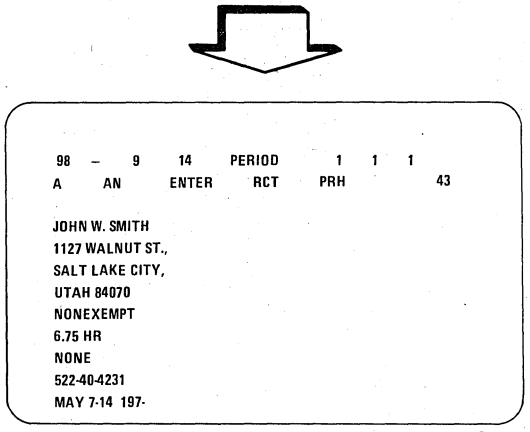
2. Press FIELD REL key.

Sequence of Events

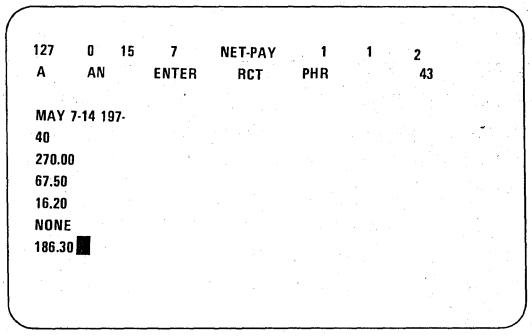


9100-25

Continue to enter data in the remaining fields, pressing the FIELD REL key at the completion of each field.



9100-26



9100-27

**This series of fields is only an example and is not intended to duplicate an actual payroll record.*

Explanation

When the FIELD REL key is pressed, field number 1 is completed and the cursor advances to field number 2, where the address may be keyed in. Notice that the information on the status line changes to reflect the progress of your entries.

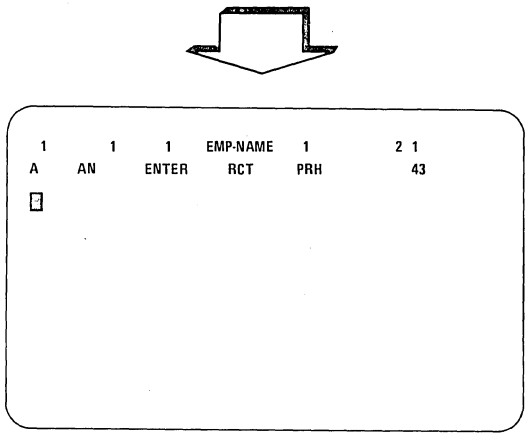
When all fields in this record have been filled, the record is considered complete. This example shows the completed payroll record for one employee.* Notice that this record required two screens to complete on the Model 3541 keystation. The same record is handled by one screen on the Model 3555 keystation.

Names of the fields used in this example, in consecutive order, are:

Field Name	Meaning
EMP—NAME	Employee's name
ADDRESS	Employe's address
CITY	
STATE	
STATUS	Employment status
RATE	Hourly rate of pay
OTRATE	Overtime pay rate
SSID	Social Security No.
PERIOD	Pay period
PERIOD	(Repeat of last line on previous screen)
HOURS	Hours worked
GROSS	Gross income
FEDTAX	Federal tax deduction
STATAX	State tax deduction
CRUNION	Credit union payments
NET-PAY	Employee's take-home pay (net pay)

Sequence of Events

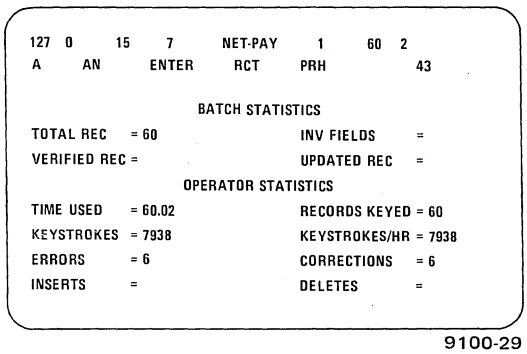
1. Press FIELD REL key.



9100-28

Complete record number 2 and all subsequent records in the batch in the same way as record number 1, pressing the FIELD REL key to move from one record to the next.

1. Press and hold RESET or CTRL key.
2. Press CMND key.
3. Release both keys.
4. Press C key.



9100-29

5. Press and hold RESET or CTRL key.
6. Press BYPASS or PASS key.
7. Release both keys.

Explanation

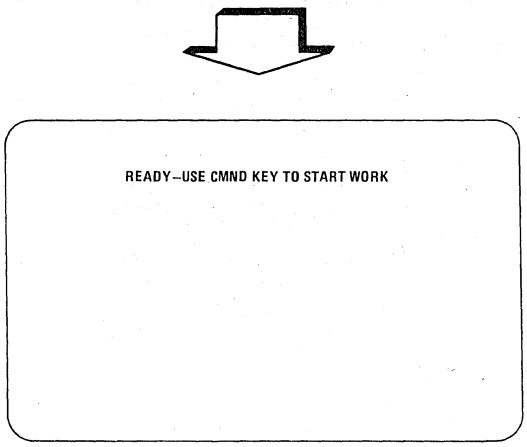
Now assume you want to begin a new record for a different employee without closing the batch. Just press the FIELD REL key,* and this display appears again.
You are now ready to begin entering data in record number 2.

When you have keyed in the last field of the last record in a batch and you wish to close the batch, first follow these steps to get the batch and operator statistics.

These are the batch and operator statistics.

Finish closing the batch with these steps.

**Some programs will automatically advance to the next record when the last field of the current record has been entered, without the operator pressing the FIELD REL key.*

Sequence of Events	Explanation
 9100-9	The message will then appear on the screen, indicating that a new batch of work may now be started.

HOW TO USE THE ENTER MODE

The Enter mode is used to create a new batch or to continue entry in an existing batch. No data may be verified, modified, or updated until it has been entered into the system in this mode.

The Enter mode is selected during the work initiation command (page 6–4). When the work initiation command has been released to the system, the Enter mode is activated and the cursor is positioned to the first field to be keyed.

Bypassing an Unreadable or Invalid Field

If your source data for a particular field contains information which is unreadable or which does not pass the program validity check, you may bypass the field as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the BYPASS or PASS key.
3. Release the RESET or CTRL key.
4. Continue keying in the next field.

That particular field will be flagged in the computer as invalid and this fact will be indicated in batch statistics.

Recovering From an Error Condition During Enter Mode

Several types of error conditions may occur during data entry, and the correction method you use will depend on the type of error. The following paragraphs describe how to recover from the various error conditions.

Invalid Character Detected by Format Program. The format program in control of your keystation checks the data, keystroke by keystroke, as you key it in. If an invalid character is detected, an alarm condition occurs and an alarm message is displayed. To recover from this condition:

1. Press the RESET key.
2. Key in the correct character.

Character Miskeyed (Operator-Detected Error). If you key in an incorrect character during data entry, correct the error as follows:

1. Press the CHAR ◄— or CHR ◄— key.
2. Key in the correct character.

Invalid Field Detected by Format Program. When an invalid field is keyed in during data entry, an alarm condition occurs and an alarm message is displayed. To recover from this condition:

1. Press the RESET key.
2. Press the FIELD ◄— or FLD ◄— key.
3. Rekey the entire field.

HOW TO USE THE VERIFY MODE

In the Verify mode, previously entered data is compared (verified) with the source document data for accuracy and corrected if necessary.

The Verify mode is selected during the work initiation command (page 6-4). When the work initiation command has been completed, the Verify mode is activated and the cursor is automatically positioned at the start of the first field to be verified. (If balance registers are being used in the batch, an in-balance or out-of-balance message will be displayed when the Verify mode is activated. Press the RESET key to clear the message and begin verification.)

All entered fields are displayed on the viewing screen, but the cursor stops only at fields previously flagged as invalid or at fields programmed for verification. These are the only fields which may be verified. If the system encounters a field that has been flagged invalid but is not programmed for verification, you will be notified by this message on your viewing screen: "INVALID FIELD — CORRECT OR BYPASS" and an audible alarm will sound. The invalid field must then be keyed in (see "Error Correction During Key Verification" on page 6-21).

After a field has been verified, the cursor is automatically positioned at the start of the next field to be verified. When the last field of a record has been verified, that record is automatically released and the next record is then ready to be verified.

Closing a Batch in Verify Mode

If field release is automatic, the batch is automatically closed when the last record of a batch is verified.

A batch may also be closed manually as follows:

1. Finish verifying the record.
2. Press the FIELD REL key.
3. Press and hold the RESET or CTRL key.
4. Press and release the CMND key.
5. Release the RESET or CTRL key.
6. Key in the letter C.

Batch statistics will be displayed on the viewing screen.

If balance registers are being used, an in-balance or out-of-balance message will also be displayed on the message line of the screen. (You will receive local instructions about the use of balance registers.)

7. If applicable, read the balance message and then press the RESET key to clear the balance message.
8. Press and hold the RESET or CTRL key and then press the BYPASS or PASS key to clear the batch statistics from the screen. (CTRL/CMND will also clear Model 3555 displays.)

Closing a Batch Before Last Record

If you need to close a batch before the last record has been verified, proceed as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the CMND key.
3. Release the RESET or CTRL key.
4. Key in the letter C.
5. Press the FIELD REL key.
6. If a batch balance message is displayed, press the RESET key.

Batch and operator statistics will be displayed on the viewing screen.

Verification Types

Two types of verification may be made on data: key verification and sight verification. In key verification, you must manually key in the field again so the system can compare this field with the previously entered field. Sight verification allows you to visually compare the data originally keyed in (as displayed on the viewing screen) with the source document. Key verification and sight verification are explained in more detail in the following paragraphs.

Key Verification

In a field programmed for key verification, the entire field must be rekeyed, as follows:

1. Key in each character of the field.
2. Press the FIELD REL key at the end of the field if it is a must-release field; otherwise, field release is automatic (unless the field is not fully or accurately keyed).

If a character keyed in during Verify mode does not match the character keyed in the Enter mode, the message "VERIFY MISCOMPARE" is displayed on the message line of the screen, the checkerboard pattern flashes, an alarm sounds, and the cursor does not advance to the next character position. Then you must perform error correction procedures. (The last character you keyed in Verify mode is shown in position 2 of the status line. The character *originally* keyed is shown in the data area of the screen.)

Error Correction During Key Verification

Although the system can detect miscomparisons or invalid fields during key verification, you must still determine what the error is. After you have identified the error, follow the appropriate procedures below to correct it.

Correcting Character Error Made in Enter or Verify Mode. Regardless of whether the error was made during Enter or Verify mode, a character error is corrected as follows:

1. Press the RESET key.
2. Key in the correct character.
3. Continue key verification.

Correcting Field Error Made in Enter or Verify Mode. Field errors are corrected the same way whether they were made during Enter or Verify mode. Correct the field as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the V COR or VCOR key.
3. Release the RESET or CTRL key.
4. Key the correct data into the field.

5. Press the FIELD REL key if in a must-release field; otherwise, release is automatic if the field is fully keyed. The message "REKEY FIELD TO VERIFY" will appear on the viewing screen.

6. Press the RESET key.

7. Key verify the corrected field.

8. Press the FIELD REL key if in a must-release field; otherwise, release is automatic if the field is fully keyed.

Simultaneous Entry and Key Verification in the Same Batch

A batch may be verified by one oeprator at the same time that another operator is keying data into the batch in the Enter mode. The following restrictions apply in this situation:

- There must be a separation of several records between the Enter and Verify operations. If the separation is not large enough, the message "ENTER/VERIFY SEPARATION TOO SMALL" will appear on the Verify operator's screen and an alarm condition will occur. The Verify operator should proceed as follows:

  1. Wait until the Enter operator has completed more records.

  2. Press and release the RESET key.

  3. Continue key verification from the point of interruption.

- Records cannot be inserted or deleted by the Verify operator.

- The Enter operator may not backspace to the point of verification.

Sight Verification

When you have sight verified a complete field, you may flag it as verified, as follows:

1. Press and hold the RESET or CTRL key.

2. Press the FIELD ⟶ or FLD ⟶ key.

3. Release the RESET or CTRL key.

4. Continue with sight verification of the next field.

Error Correction During Sight Verification

You may choose to correct one or more characters on an entire field when you detect an error during sight verification.

Correcting One or More Characters. Correct characters in a sight-verified field as follows:

1. Press and hold the RESET or CTRL key.
2. Press the CHAR ⟶ or CHR ⟶ key as many times as necessary to position the cursor over the incorrect character.
3. Release the CHAR ⟶ or CHR ⟶ key and then the RESET or CTRL key.
4. Key in the correct character. The message "VERIFY MISCOMPARE" will appear on the viewing screen and the alarm will sound.
5. Press the RESET key.
6. Rekey the correct character.
7. Press and hold the RESET or CTRL key.
8. Press the CHAR ⟶ or CHR ⟶ key as many times as necessary to position the cursor over the next incorrect character, if applicable.
9. Release the CHAR ⟶ or CHR ⟶ key and then the RESET or CTRL key.
10. Repeat steps 4 through 9 until all characters have been corrected.
11. Press and hold the RESET or CTRL key.
12. Press the FIELD ⟶ or FLD ⟶ key. The cursor is now positioned at the start of the next field to be verified.

Correcting a Field. Correct an entire sight-verified field as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the V COR or VCOR key.
3. Release the RESET or CTRL key.
4. Key in the correct field.
5. Press the FIELD REL key if the field is not programmed to release automatically. The message "REKEY FIELD TO VERIFY" will appear on the viewing screen.
6. Press the RESET key.
7. Key verify the field.
8. Press the RESET or CTRL and the FIELD ⟶ or FLD ⟶ key to go over the field and flag it as verified.

Unreadable Field Detected

Source data which does not pass the program validity check or which is unreadable can be bypassed as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the BYPASS or PASS key.
3. Release the RESET or CTRL key.
4. Continue keying in the next field.

The field will be flagged in the computer as invalid and this information will be reflected in the batch statistics.

HOW TO USE THE UPDATE MODE

The Update mode is used to key new data into some or all of the records in an existing batch. The Update mode is identical to the Enter mode in all respects except that data may be keyed only into those fields programmed for update in the format program controlling your keystation.

The Update mode is selected during the work initiation command (page 6-4). When the work initiation command has been released to the system, the Update mode is activated and the cursor is positioned at the start of the first field to be updated.

To update data in a field, perform the following:

1. Key the new data into the field.
2. Press the FIELD REL key; the cursor is now positioned at the start of the next field to be updated. (If the field is programmed to release automatically, pressing the FIELD REL key is not necessary; the cursor moves automatically to the start of the next update field.)
3. Repeat steps 1 and 2 until all fields requiring update have been completed.

When all the fields programmed for update have been updated, the batch is automatically closed.

Bypassing an Unreadable or Invalid Field

If your source data for a particular field contains information which is unreadable or which does not pass the program validity check, you may bypass the field as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the BYPASS or PASS key.
3. Release the RESET or CTRL key.
4. Continue keying in the next field.

The field will be flagged in the computer as invalid and this information will be reflected in the batch statistics.

Recovering From an Error Condition During Update Mode

Several types of error conditions may occur during Update mode. The following paragraphs describe how to recover from the various error conditions.

Invalid Character Detected by Format Program. The format program in control of your keystation checks the data as you key it in. If an invalid character is detected, an alarm condition occurs and an alarm message is displayed. To recover from this condition:

1. Press the RESET key.
2. Key in the correct character.

Character Miskeyed. If you key in an incorrect character during data update, correct it as follows:

1. Press the CHAR ← or CHR ← key.
2. Key in the correct character.

Invalid Field Detected by Format Program. When an invalid field is keyed in during data update, an alarm condition occurs and an alarm message is displayed. To recover from this condition:

1. Press the RESET key.
2. Press the FIELD ← or FLD ← key if not in the first position of the current field.
3. Rekey the entire field.

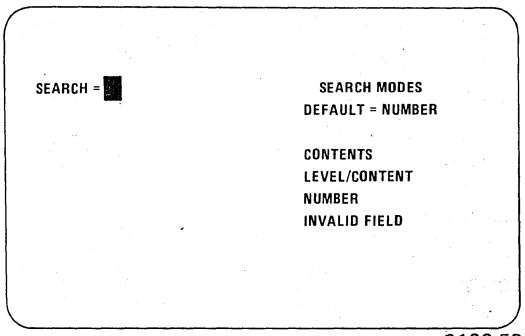
HOW TO USE THE SEARCH AND MODIFY MODE

The Search And Modify mode is used to locate and display a record that is stored in the computer. The system can search for:

- Specific record contents
- Specific contents in a record keyed under a particular level in a format program
- Specific record number
- Invalid field

When the record has been found by the system and is displayed on the viewing screen, you may modify it by keying new data into the field or record.

The Search And Modify mode is selected during the work initiation command (page 6-4). When the work initiation command has been released to the system, a prompt listing the available types of searches is displayed on the viewing screen as shown in this illustration:



The various types of searches are called submodes. At least the first two letters of the desired type of search must be keyed in to enter a specific submode, as follows:

COntents	Specific record contents
LEvel/content	Specific contents in a record keyed under a particular level in a format program
NUmber	Specific record number
INvalid field	Records containing invalid fields

Detailed instructions for each submode are presented in the following paragraphs.

Search for Record Contents

Locate specific record contents as follows:

1. Key in the letters CO in response to the submode prompt.
2. Press the FIELD REL key. The "INPUT RECORD CONTENTS" prompt will be displayed.
3. Key the characters to be searched in the exact order and position in which they appear in the record. The information as keyed and positioned is called a search mask. A search mask may contain up to 999 characters of data and 999 characters of prompt data. If you don't want certain positions within the record to be searched, indicate those characters as follows:
   a. Press and hold the RESET or CTRL key.
   b. Press the CHAR ⟶ or CHR ⟶ key in each character position where the search is not to be made. (Dashes are automatically inserted in these positions.)
   c. Release the RESET or CTRL key and continue keying in characters to be searched.

4. To end the search mask:

   a. Press and hold the RESET or CTRL key.

   b. Press the FIELD ⟶ or FLD ⟶ key or REC ⟶ key.

   c. Release the RESET or CTRL key.

5. Press the FIELD REL or CTRL key. The first record containing the selected search contents will be displayed.

NOTE:

If no matching record is found in the batch, the message "SEARCH ARGUMENT NOT FOUND" will be displayed. By pressing the RESET key at this point, you can terminate the search. The batch will be closed automatically.

6. If required, modify the record.

7. To locate the next sequential record with the same characters or to search for other records that match the current search mask:

   a. Press and hold the RESET or CTRL key.

   b. Press and release the CMND key.

   c. Release the RESET or CTRL key.

   d. Key in the letter G. The next record containing the selected search contents will be displayed. (Refer to the note in step 5 if no matching record is found.)

8. To change to a different search mask (starting from the presently displayed information through the end of batch only):

   a. Press and hold the RESET or CTRL key.

   b. Press and release the CMND key.

   c. Release the RESET or CTRL key.

   d. Key in the letter M. The "INPUT RECORD CONTENTS" prompt will be displayed.

   e. Repeat steps 3, 4, and 5.

9. To end the search for record contents:

   a. Finish keying the record you're on or use the REC ⟶ key to move the cursor forward to the start of the next record.

   b. Press and hold the RESET or CTRL key.

c. Press and release the CMND key.

d. Release the RESET or CTRL key.

e. Key in the letter C.

Search for Record Contents and Level

Locate specific contents in a record keyed under a particular level as follows:

1. Key in the letters LE in response to the submode prompt.
2. Press the FIELD REL key. The "LEVEL" prompt will be displayed.
3. Key in the program level identification code under which the record was originally entered. (This code will be given to you locally.)
4. Press the FIELD REL key. The "INPUT RECORD CONTENTS" prompt will be displayed.
5. Key the characters to be searched in the exact order in which they appear in the record. If you don't want certain characters within the record to be searched, indicate those characters as follows:

   a. Press and hold the RESET or CTRL key.

   b. Press the CHAR ⟶ or CHR ⟶ key in each character position where the search is not to be made. (Dashes are automatically inserted in these positions.)

   c. Release the RESET or CTRL key.

6. To end the search mask:

   a. Press and hold the RESET or CTRL key.

   b. Press and release the FIELD ⟶ or FLD ⟶ key or the REC ⟶ key.

   c. Release the RESET or CTRL key.

7. Press the FIELD REL key. The first record containing the selected search contents will be displayed.

NOTE:

If no matching record is found in the batch, the message "SEARCH ARGUMENT NOT FOUND" will be displayed. By pressing the RESET key at this point, you can terminate the search. The batch will be closed automatically.

8. If required, modify the record.

9. To search for other records that match the current search mask:

   a. Press and hold the RESET or CTRL key.

   b. Press and release the CMND key.

   c. Release the RESET or CTRL key.

   d. Key in the letter G. The next record containing the selected search contents will be displayed. (Refer to the note in step 7 if no matching record is found.)

10. To change to a different search mask:

   a. Press and hold the RESET or CTRL key.

   b. Press and release the CMND key.

   c. Release the RESET or CTRL key.

   d. Key in the letter M. The "INPUT RECORD CONTENTS" prompt will be displayed.

11. To end the search for record contents and level:

   a. Finish keying the record you're on or use the REC ⟶ key to move the cursor forward to the start of the next record.

   b. Press and hold the RESET or CTRL key.

   c. Press and release the CMND key.

   d. Release the RESET or CTRL key.

   e. Key in the letter C.

Search for Record Number

Locate a specific record number as follows:

1. Key in the letters NU in response to the submode prompt.

2. Press the FIELD REL key. The "NUMBER" prompt will be displayed.

3. Key in the number of the record.

4. Press the FIELD REL key. The cursor will move to the start of the first manually keyed field of the selected record.

NOTE:

If the record number selected is larger than the total number of records in the batch, the message "SEARCH ARGUMENT NOT FOUND" will be displayed and the batch will be closed automatically.

If a record number is selected that is smaller than the previously specified number, the message "INVALID COMMAND SELECTED" will be displayed and the system will request another record number. The RESET key must be pressed and another record number keyed in to continue the search.

5. To modify the record:
   a. Press and hold the RESET or CTRL key.
   b. Press REC ⟶ key.
   c. Release the RESET or CTRL key.
   d. Release the REC ⟶ key.
6. To search for another record number:
   a. Press and hold the RESET or CTRL key.
   b. Press and release the CMND key.
   c. Release the RESET or CTRL key.
   d. Key in the letter M. The "NUMBER" prompt will appear again.
7. Repeat steps 3 through 5 to continue record modification in the same batch.
8. To end the search for record numbers:
   a. Finish keying the record you're on or use the REC ⟶ key to move the cursor forward to the start of the next record.
   b. Press and hold the RESET or CTRL key.
   c. Press and release the CMND key.
   d. Release the RESET or CTRL key.
   e. Key in the letter C.

Search for Invalid Fields

Locate records containing invalid fields as follows:

1. Key in the letters IN in response to the submode prompt.
2. Press the FIELD REL key. The cursor will automatically move to the start of the first invalid field in the batch.

3. If required, correct the field.

4. To search for the next invalid field:

   a. Press and hold the RESET or CTRL key.

   b. Press and release the CMND key.

   c. Release the RESET or CTRL key.

   d. Key in the letter G. The cursor will move to the start of the next invalid field.

NOTE:

When the end of the batch is reached, or if the batch does not contain any more invalid fields, the message "SEARCH ARGUMENT NOT FOUND" will be displayed. By pressing the RESET key at this point, you can terminate the search. The batch will be closed automatically.

5. To end the search for invalid fields before the end of the batch is reached:

   a. Finish keying the record you're on or use the REC ⟶ key to move the cursor forward to the start of the next record.

   b. Press and hold the RESET or CTRL key.

   c. Press and release the CMND Key.

   d. Release the RESET or CTRL key.

   e. Key in the letter C.

HOW TO USE THE FILE MANAGEMENT MODE

The File Management mode is used to access indexed data files or to build indexed files.

The File Management mode is selected during the work initiation command (page 6–4). When the work initiation command has been released to the system, the File Management mode is activated and the cursor is positioned to the first field to be keyed.

Keys That Are Not Allowed

Data entry in the File Management mode is the same as in the Enter mode except that use of certain keys is not allowed. These keys are:

CMND plus the letter C (to be used with caution; check with supervisor)
CMND plus the letter I
CMND plus PROG
AUTO OFF
V COR or VCOR

INSERT
DELETE
FIELD ◄— or FLD ◄— (allowed only in the current field)
FIELD —► or FLD —► (usually not allowed; check with supervisor)
REC —► (usually not allowed; check with supervisor)
REC ◄—

Bypassing an Unreadable or Invalid Field

If your source data for a particular field contains information which is unreadable or which does not pass the program validity check, you may bypass the field as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the BYPASS or PASS key.
3. Release the RESET or CTRL key.
4. Continue keying in the next field.

That particular field will be flagged in the computer as invalid and this fact will be indicated in batch statistics.

Recovering From an Error Condition During File Management Mode

Several types of error conditions may occur during data entry, and the correction method you use will depend on the type of error. The following paragraphs describe how to recover from the various error conditions.

Invalid Character Detected. The format program in control of your keystation checks the data, keystroke by keystroke, as you key it in. If an invalid character is detected, an alarm condition occurs and an alarm message is displayed. To recover from this condition:

1. Press the RESET key.
2 Key in the correct character.

Character Miskeyed (Operator-Detected Error). If you key in an incorrect character during data entry, correct the error as follows:

1. Press the CHAR ◄— or CHR ◄— key.
2. Key in the correct character.

Invalid Field Detected by Format Program. When an invalid field is keyed in during data entry, an alarm condition occurs and an alarm message is displayed. To recover from this condition:

1. Press the RESET key.
2. Press the FIELD ◄— or FLD ◄— key if not in the first position of the current field.
3. Rekey the entire field.

Record Backspace Key Pressed. Use of the REC ←— key is invalid in the File Management mode and will cause an alarm condition to occur and an alarm message to be displayed. To recover from this condition:

1. Press the RESET key.
2. Continue keying in data.

Closing a Batch

After you have entered the last record, close the batch as follows, if your system provides a manually selected level Z program:

1. Press and release the PROG key.
2. Key in the letter Z.

A work termination display will be presented on your viewing screen.

If your program has automatic batch closing, follow the instructions supplied locally. (Check with your supervisor.)

Interrupting a Batch

Interruption of data entry to an incomplete batch with the CMND I command is not permitted in the File Management mode.

Reopening a Batch

The "CONTINUE (START OPTION)" cannot be used in the File Management mode.

Disabling a Batch

Temporarily suspend data entry as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the CMND key.
3. Release the RESET or CTRL key.
4. Key in the letter D.

The message, "KEYSTATION DISABLED" will appear on the message line of the screen.

Activating a Disabled Batch

Activate a disabled batch as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the CMND key.
3. Release the RESET or CTRL key.
4. Key in the letter A.

SPECIAL PROCEDURES

The special procedures described in the following paragraphs permit you to insert and delete records from batches and to enter special commands into the system.

Record Insertion Into a Batch

In all modes except Enter and File Management, a record can be inserted into an existing batch as follows:

1. Position the cursor in the first keyed position of the record immediately past the area where you wish to insert the record. Use a record number search technique to locate the record.
2. Press and hold the RESET or CTRL key, press the INSERT or INS key, and then release the RESET or CTRL key. The record at which the cursor was positioned is now set up to move forward to make room for the additional record as it is keyed in.
3. Key in the new record. This record will be positioned ahead of the record at which the cursor was positioned in step 1.

NOTE:

The FIELD ← or FLD ← key and the REC ← key may not be used during record insertion.

Record Insertion at End of Batch

A record can be inserted at the end of a batch as follows:

1. Select the Enter mode during the work initiation command.
2. Key in the letters YEs in response to the "START OPTION (CONTINUE)" prompt and complete the work initiation command.
3. Key in the new record.
4. Press and hold the RESET or CTRL key.

5. Press and release the CMND key.
6. Release the RESET or CTRL key.
7. Key in the letter C to close the batch.

Record Deletion

In all modes except Enter and File Management, a record can be deleted from the batch as follows:

1. Press and hold the RESET or CTRL key.
2. Press and release the DELETE or DEL key.
3. Release the RESET or CTRL key.

User Code Selection (Optional)

Any of 10 special user codes may be selected in the following manner:

1. Press and hold the RESET or CTRL key.
2. Key in the assigned user code number (0 through 9).
3. Release the RESET or CTRL key.

Format Level Selection

Format levels may be manually selected (if required in your local operation) in the Enter or File Management mode. In the Update, Verify, and Search And Modify modes, the format level that was used during the Enter or File Management mode is automatically selected; manual format level selection is permitted in these three modes only during record insertion.

A format level is manually selected as follows:

1. Move the cursor to the start of the selected field.
2. Press the PROG key and release.
3. Key in the 1-character format level identification. (This character will be given to you locally.)

If manual format-level selection is required at a certain point in your keying operation but you have inadvertently passed that point, the partially keyed record must be eliminated and then rekeyed so the format-level change can be made.

1. Eliminate the partially keyed record as follows:

   a. Press and hold the RESET or CTRL key.

   b. Press the CMND key; then release both keys. The cursor will be automatically placed at the first character position of the record.

2. Manually select the appropriate format level for the beginning of the record.

3. Rekey the entire record, making the format-level change at the proper point.

NOTE:

A level change is not allowed after a field backspace.

SYSTEM DISPLAYS

You can request the system to display the contents of certain storage areas (called registers) in the computer, as well as some other types of information, when required. You can also blank out the data area on the screen.

To get these system displays on the screen, press the DISPLAY key and then key in the appropriate code, as given in the following paragraphs.*

Blank Data Option

To blank out the data area on the viewing screen:

1. Press the DISPLAY key.

2. Key in the letter N.

The last character entered will be shown in position 2 of the status line and will be covered by the cursor.

Current Record (All Modes Except Verify)

If the blank data option is used or if the computer program has called for a no-display field (or record), the current record can be displayed as follows:

1. Press the DISPLAY key.

2. Key in the letter R.

**Consult your local instructions for more detailed information on use of the system displays.*

Current Record (Verify Mode Only)

If the blank data option is used or if the computer program has called for a no-display field (or record), the current record can be displayed as follows:

1. Press the DISPLAY key.
2. Key in the letter L.

Operator and Batch Statistics

To display operator and batch statistics while in an operating mode:

1. Press the DISPLAY key.
2. Key in the letter K.

The statistics will appear on the message line of the viewing screen.

Current Time and Terminal Number

To display current time and keystation terminal number while in an operating mode:

1. Press the DISPLAY key.
2. Key in the letter T.

The information will appear on the message line of the viewing screen.

Arithmetic Register Contents

To display the contents of an arithmetic register:

1. Press the DISPLAY key.
2. Key in the letter A and the 2-digit number of the register to be displayed (for example, A01).

Balance Register Contents

To display the contents of a balance register:

1. Press the DISPLAY key.
2. Key in the letter B and the 2-digit number of the register to be displayed (for example, B01).

Character Register Contents

To display the contents of a character register (40 characters maximum):

1. Press the DISPLAY key.
2. Key in the letter C and the 2-digit number of the register to be displayed (for example, (C01).

Auxiliary Duplicate Register Contents

To display the contents of an auxiliary duplicate register (40 characters maximum):

1. Press the DISPLAY key.
2. Key in the letter D and the 2-digit number of the register to be displayed (for example, D01).

ALARM MESSAGES AND RECOVERY PROCEDURES

There are many types of alarm messages. When an alarm condition occurs, read the alarm message displayed on the message line of the viewing screen. Then press the RESET key. If a guide message (sometimes called a "prompt") is then displayed, perform the indicated action. If no guide message is given, look up the alarm message in Table 6-1 and perform the indicated recovery procedures. The messages are arranged in alphabetical order in the table.

Table 6-1. Alarm Message Explanations and Recovery Procedures (Part 1 of 6)

Alarm Message Displayed	What Message Means	How To Recover
BATCH IS ACTIVE	Another operator is working on selected batch.	1. Press RESET key. 2. Check that job name and batch number are keyed in correctly. 3. If they are correct, either wait for the batch to become inactive or select another batch.
BATCH IS IN BALANCE	All balance registers are equal to zero.	1. Press RESET key. 2. Note displayed batch statistics.
BATCH IS NOT FOUND	Batch number selected is not in system.	1. Press RESET key. 2. Check that job name and batch number are keyed in correctly. 3. If they are correct, notify supervisor.

Table 6–1. Alarm Message Explanations and Recovery Procedures (Part 2 of 6)

Alarm Message Displayed	What Message Means	How To Recover
BATCH IS OUT OF BALANCE	Completed batch does not meet a requirement that has been established by the format program.	1. Press RESET key. 2. Note displayed batch statistics. 3. Follow local operating procedures.
BATCH NO RANGE ERROR	Batch number is not between 1 and 50,000.	1. Press RESET key. 2. Key in correct batch number.
BLANK NOT ALLOWED	Program does not allow blanks in field.	1. Press RESET key. 2. Key in correct data or bypass the field and notify supervisor.
CHAR FWD INVALID	Illegal to use CHAR —► or CHR—► key to move cursor beyond last character entered or verified, or beyond end of field.	1. Press RESET key. 2. Continue keying in data.
CHARACTER LOST – REKEY	Last character keyed was not accepted by system.	1. Press RESET key. 2. Rekey last character.
CHARACTER TRANSMISSION ERROR – REKEY		
DATA ERROR – NOT ALPHA	Keyed data must be alphabetic.	1. Press RESET key. 2. Key in correct type of data. If source data is incorrect: 1. Press RESET key. 2. Press and hold RESET or CTRL key. 3. Press and release BYPASS or PASS key. 4. Release RESET or CTRL key. 5. Continued keying in next field.
DATA ERROR – NOT ALPHANUMERIC	Keyed data must be alphanumeric.	
DATA ERROR – NOT BLANK	Keyed data must be blank.	
DATA ERROR – NOT COBOL	Keyed data must be COBOL.	
DATA ERROR – NOT HEX	Keyed data must be hexadecimal.	
DATA ERROR – NOT LOWER CASE ALPHA	Keyed data must be lowercase alphabetic.	
DATA ERROR – NOT NUMERIC	Keyed data must be numeric.	
DATA ERROR – NOT PUNCTUATION	Keyed data must be punctuation.	
DATA ERROR – NOT SIGNED DECIMAL	Keyed data must be signed decimal.	

Table 6–1. Alarm Message Explanations and Recovery Procedures (Part 3 of 6)

Alarm Message Displayed	What Message Means	How To Recover
DATA ERROR – NOT USER 1 DATA ERROR – NOT USER 2 DATA ERROR – NOT USER 3 DATA ERROR – NOT USER 4 DATA ERROR – NOT USER 5 DATA ERROR – NOT USER 6 DATA ERROR – NOT USER 7 DATA ERROR – NOT USER 8 DATA ERROR – NOT USER 9 DATA ERROR – NOT USER 10	Character keyed in is not contained in data-type subset.	1. Press RESET key. 2. Key in correct character.
DISK FULL – TASK TERMINATED	Disk is full. Batch closes automatically.	Notify supervisor.
DUP KEY INVALID ON FIRST RECORD	No previous record to duplicate.	1. Press RESET key. 2. Key in data.
DUPLICATE JOB AND BATCH NUMBER	Job name and batch number just entered were entered previously.	If incorrect job name or batch number: 1. Press RESET key. 2. Key in correct job name and/or batch number. If additional records are to be entered into batch: 1. Press RESET key. 2. Press and hold RESET or CTRL key. 3. Press and release BYPASS or PASS key. 4. Release RESET or CTRL key. 5. Press and hold RESET or CTRL key. 6. Press and release CMND key. 7. Release RESET or CTRL key.

Table 6–1. Alarm Message Explanations and Recovery Procedures (Part 4 of 6)

Alarm Message Displayed	What Message Means	How To Recover
DUPLICATE JOB AND BATCH NUMBER (Continued)		8. Select mode and key in YEs in response to "CONTINUE (START OPTION)" prompt. 9. Finish keying in work initiation command. 10. Enter data.
ENTER/VERIFY SEPARATION TOO SMALL	Record being verified is too near record currently being keyed.	1. Press RESET key. 2. Wait until operator working in Enter mode has completed more records.
FLD BKSP INVALID ON FIRST FIELD	Illegal to press FIELD ◄— or FLD ◄— key in first field of record.	1. Press RESET key. 2. Press REC ◄— key. 3. Press FIELD —► or FLD —► key as often as necessary to advance to desired field.
FIELF FWD INVALID	Illegal to use FIELD —► or FLD —► key to move beyond last field entered or verified unless field is programmed for sight verification.	1. Press RESET key. 2. Key in data or key verify field.
FIELD MUST BE FULLY KEYED	All character positions of field must be keyed in.	1. Press RESET key. 2. Key in entire field, or bypass field and notify supervisor.
FIELD MUST BE KEYED	At least one character position of field must be keyed in.	1. Press RESET key. 2. Key in at least one character position.
FORMAT ERROR (describes type)	System error has occurred.	Notify supervisor.
FORMAT NOT FOUND	Format (program) is not found in system.	1. Press RESET key. 2. Rekey program name. Be sure that name and spelling of name are correct.
ILLEGAL FILL CHAR	Space was keyed in field where not allowed by program.	1. Press RESET key. 2. Press FIELD ◄— or FLD ◄— key. 3. Rekey field.

Table 6–1. Alarm Message Explanations and Recovery Procedures (Part 5 of 6)

Alarm Message Displayed	What Message Means	How To Recover
ILLEGAL FILL CHAR (Continued)		If source data is incorrect: 1. Press RESET key. 2. Press and hold RESET or CTRL key. 3. Press and release BYPASS or PASS key. 4. Release RESET or CTRL key. 5. Continue keying in next field.
INCOMPATIBLE FORMAT SELECTED	Format program just selected is not compatible with program used to enter batch.	1. Press RESET key. 2. Select correct format program.
INVALID COMMAND SELECTED	Key other than C, I, D, A, G, or M was selected after CMND key was pressed in Search And Modify mode.	1. Press RESET key. 2. Press correct key.
	Record number lower than the previous number was selected in Search And Modify mode.	1. Press RESET key. 2. Key in another record number.
INVALID FIELD – CORRECT OR BYPASS	Data entered does not pass validation check.	1. Press RESET key. 2. Rekey field. If error returns: 1. Press RESET key. 2. Press and hold RESET or CTRL key. 3. Press and release BYPASS or PASS key. 4. Release RESET or CTRL key.
INVALID JOB NAME	Form of job name not correct: 1. Must contain 1 to 8 characters. 2. Must begin with an alphabetic. 3. Must not contain embedded blanks.	1. Press RESET key. 2. Key in correct job name.
INVALID KEY AT MIDFIELD	Use of PROG key not valid because not at proper program-level selection point.	1. Press RESET key. 2. Press and hold RESET or CTRL key. 3. Press and release CMND key. 4. Release RESET or CTRL key. 5. Rekey record, selecting new level at appropriate point.

Table 6–1. Alarm Message Explanations and Recovery Procedures (Part 6 of 6)

Alarm Message Displayed	What Message Means	How To Recover
INVALID KEY AT FIRST FIELD	Field or character backspacing not valid in first field of record.	1. Press RESET key. 2. Press REC ← key.
INVALID KEYSTROKE	Character keyed is not allowed by program.	Press RESET key and then: 1. Key in the correct character, or 2. Bypass the field as follows: a. Press and hold RESET or CTRL key. b. Press and release BYPASS or PASS key. c. Release RESET or CTRL key. d. Continued keying in next field.
INVALID LEVEL CHANGE	Level change not allowed or an incorrect level designation has been keyed.	1. Press RESET key. 2. Key the correct level or resume keying at current level. 3. Check operating instructions for job.
JOB NOT FOUND	Job name entered does not exist in system.	1. Press RESET key. 2. Check that correct operating mode is selected. 3. Rekey job name. Be sure name and spelling of name are correct.
REC BKSP INVALID IN FILE MGMT MODE	Illegal to use REC ← key in File Management mode.	1. Press RESET key. 2. Continue keying data.
REC BKSP INVALID AT FIRST REC	REC ← key is not allowed in the first record of the batch.	1. Press RESET key. 2. Continue keying record.
REC FWD INVALID	Illegal to use REC → key to move beyond last fully keyed record.	1. Press RESET key. 2. Continue keying record.
REKEY FIELD TO VERIFY	Field is programmed for key verification.	1. Press RESET key. 2. Key verify the field.
	Field must be key verified after V COR or VCOR key is pressed.	

Alarm Message Displayed	What Message Means	How To Recover
SEARCH ARGUMENT NOT FOUND	Search data does not exist in batch, or there are no further occurrences of search data in batch.	Press RESET key to end search and close batch.
	Record number selected for search is higher than total number of records in batch.	1. Press RESET key. 2. Key in another record number.
SYSTEM ERROR ##	Error in system	Contact supervisor, who must perform a "warm start" before recovery can take place. Wait for "READY—USE CMND KEY TO START WORK." Select same batch, using work-initiation-command portion of desired mode by entering YEs to "CONTINUE (START OPTION)" prompt.
OPR TERMINAL BUSY	System is processing a previous command or performing a batch replay.	Wait until message disappears, then proceed.
UNRECOVERABLE DISK ERROR—BATCH CANCELLED	Unrecoverable disk error has occurred. Batches erroneously flagged as active on disk are inaccessible.	Notify supervisor.
UNRECOVERABLE DISK ERROR—JOB CANCELLED	Unrecoverable disk error has occurred. Batches erroneously flagged as active on disk are inaccessible.	Notify supervisor.
VERIFY MISCOMPARE	Last character keyed does not match character keyed in Enter mode.	Press RESET key and: 1. Key the correct character, or 2. Press V COR or VCOR key and rekey entire field.
XDUP KEY IS INVALID	Program does not allow duplicate function in field.	1. Press RESET key. 2. Key in field data.

Section 7 Contents

7. Check Box Programming

The purpose of this section is to show you how to lay out your jobs into more useful format programs.

To begin this task, you must first know the applicable features of the 1900/10 system. A summary of 1900/10 format information is presented in Figure 7–1 for your review.

PLANNING A FORMAT PROGRAM

Planning a format program consists of analyzing a set of data entry requirements and determining how the 1900/10 format program may be used to increase your data processing rate and improve your efficiency as an operator.

In establishing a format program, you will determine what fields are to appear on the viewing screen for that program, and the order in which those fields will appear.

Thus, your first step in setting up a format program is to analyze the situation and determine what fields are necessary to provide a complete and useful record.

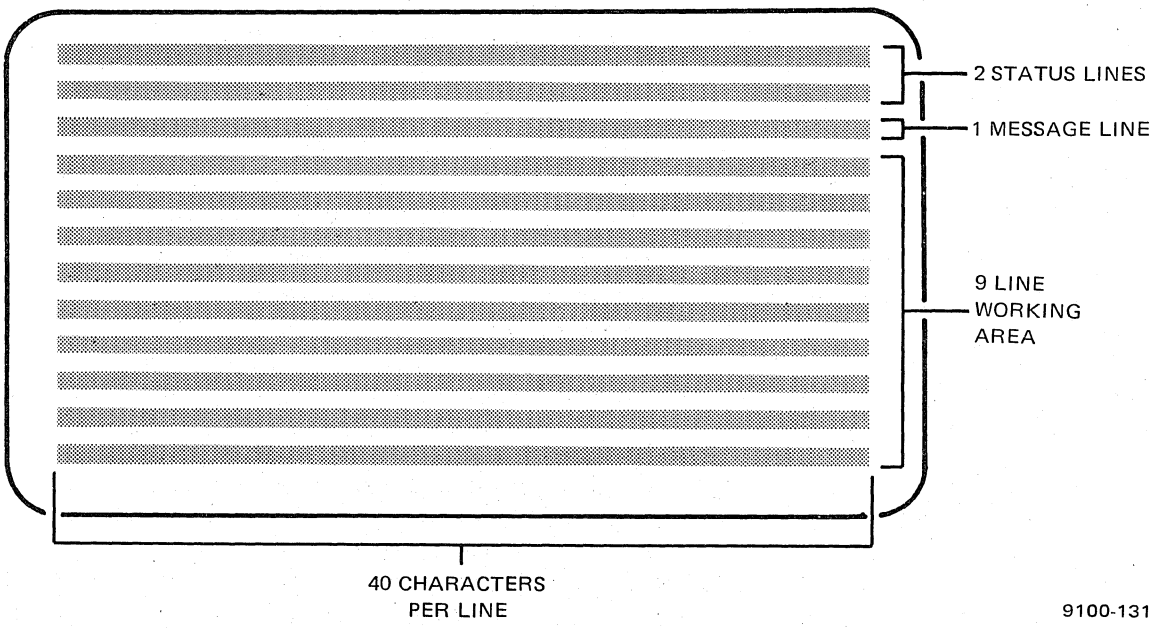
Once you have established the fields you want, how can you get the computer to supply the fields in a format program? By a process called check box programming — which is really nothing more than filling out various parts of the check box programming form shown in Figure 7–2. The key is to learn *how* to fill out this coding form. Once the form is properly filled out, the information on that form will be entered into the computer by your supervisor or by other supervisory personnel at your organization. When entered, the new program can be called by an operator and data may be entered in the fields; records and batches of information are then assembled by the 1900/10 system.

The check box programming form shown in Figure 7–2 is designed in such a way that you can learn to prepare a key-entry/key-verify routine for the system. Some of the entries in the form describe keying characteristics such as field name, field size, keyboard shift, data type, left or right justification, field fill, and automatic operations.

The form has two major divisions — the header and the field description, as shown in Figure 7–2. Figure 7–3 shows the breakdown of information within the two major divisions on the form. The first major division, the header, is used to describe the overall characteristics of the fields described in the second division of the form.

FACTS ABOUT THE 1900/10 FORMAT

- The basic data group which answers a question is called a field.
- A page of information is made up of one or more fields (usually several).
- A record is a complete set of related information fields which may be from one to four pages in length.
- A page consists of all the information that can be put on a single viewing screen display. (See the example of the Model 3541 keystation screen below.)



On page 1 of a record for Model 3541 keystations, there are 9 lines of 40 character positions to work with. But remember, on pages 2, 3, and 4 of a record there are only 8 lines of 40 characters, because the last line of the previous page is automatically displayed as the first line of the next page.

On page 1 of a record for Model 3555 keystations, there are 23 lines and 80 character positions to work with. On pages 2, 3, and 4 of a record, there are only 22 lines of 80 characters because the last line of the previous page is automatically displayed as the first line of the next page.

Figure 7-1. The 1900/10 System Page Format

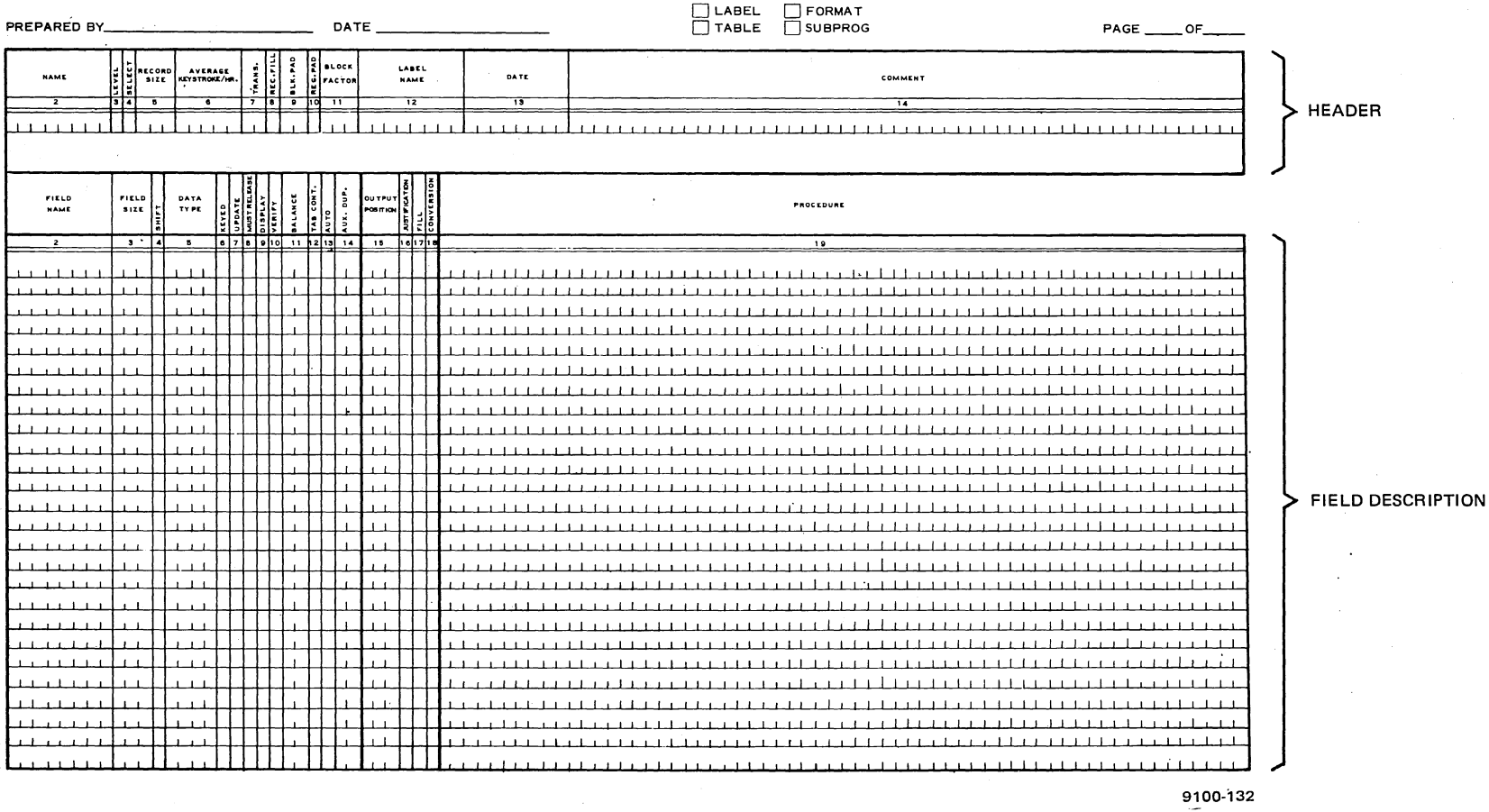


Figure 7-2. Check Box Programming Form

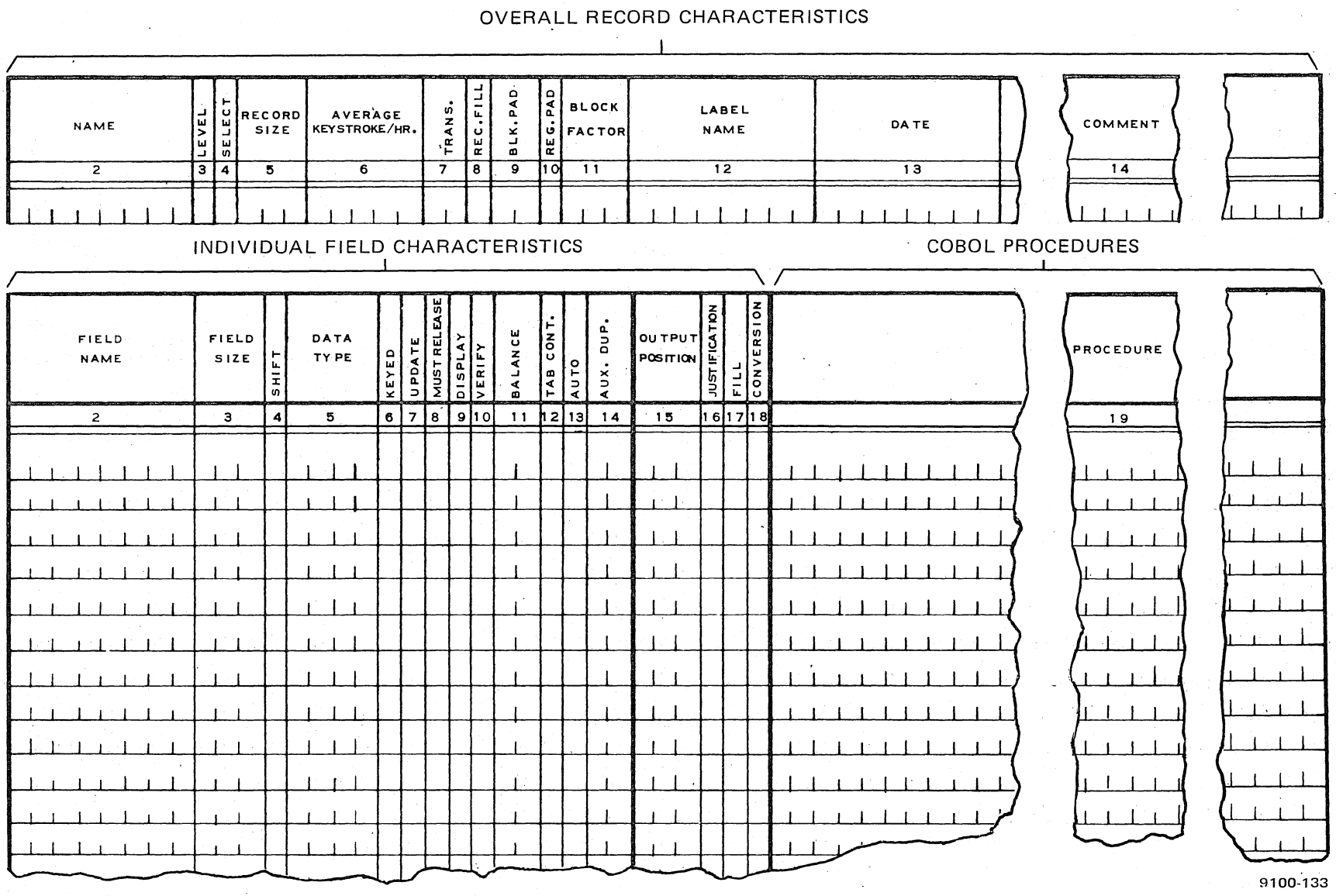


Figure 7-3. Field Description and Header Elements of Check Box Programming Form

The second division of the form (Figure 7-3) is reversed for field descriptions. This division is subdivided into two sections: field characteristics and COBOL* procedures. The field characteristics section consists of a series of check boxes which describe the fields, and this is the section of the form you'll be most concerned with. Field descriptions are used to describe input fields, output fields, calculated fields, and procedure statements.

The procedures section is reserved for COBOL procedure statements. As a keystation operator, you will not fill out the "procedure" portion of the form. This work will be completed by a computer programmer.

Each individual field description is entered on a separate line of the coding form. (The "procedure" information corresponding to the field description may require continuation lines, however.)

The following paragraphs show how to establish the fields and explain the purpose and use of each entry that you will fill out on the form.

DETERMINING YOUR FIELDS

Let's examine the example of a payroll record previously discussed in this book.

First, list all the fields you wish to have appear on the screen for this program.

Employee's name	Hours worked during pay period
Employee's address	Gross pay
Exempt or nonexempt	Federal tax
Hourly rate paid	State tax
Overtime rate paid	Credit union payments
Social Security number	Net pay
Pay period	

Now rewrite the fields as single-word terms with no more than eight characters:

**	EMP-NAME	PERIOD
	ADDRESS	HOURS
	CITY	GROSS
	STATE	FEDTAX
	STATUS	STATAX
	RATE	CRUNION
	OTRATE	NET-PAY
	SSID	

Your goal is to make each one of these fields appear in sequence in status line position 5 of your viewing screen. Completed fields will remain on the screen as the cursor moves to the beginning of the next field. Notice that since there are 15 lines of fields, this record requires two pages (screens) to complete for Model 3541 keystations. All of these lines of fields could appear on page 1 of the record for Model 3555 keystations.

**This term is defined in the glossary.*

***Written this way because some addresses are longer than one line.*

COMPLETING THE CHECK BOX PROGRAMMING FORM

Unfold the first foldout sheet behind this section. This sheet is a blank copy of the check box programming form. Then return to this page and follow the instructions in the rest of the section to fill out the form. Keep in mind that you cannot simply select any one of the choices listed for filling in the blanks. Also remember that when a space is left blank on the form, the blank has a meaning. Consult a programmer at your company or your supervisor to determine the proper entries in the check boxes.

NOTE:

After you have completed the form, you may compare it to the second foldout sheet at the end of this section. Your coding does not necessarily have to agree with the data presented there. But if you do not agree, be able to defend the choices you have made.

Write your name and the date on the form. Then, you must select the method of entering your program by placing a check in the appropriate box. These methods include format, label, table, and subprogram.

- A *format program* is a set of instructions defining the characteristics of a particular data entry application. Operator keying and system functions such as automatic validation, computation, and insertion of data are controlled by a format program.
- A *subprogram* is a special format program used in a specific local situation to enter format instructions.
- A *table program* is a special format program used in a specific local situation to enter format data tables.
- A *label program* is a special format program used in a specific local situation to process labeled or unlabeled magnetic tape volumes.

Header

Each level of a format program must contain a header. As an operator writing a format program, you should check with a system analyst or programmer to determine what the header entries should be.

If a format program consists of only one level, only one entry (the format name, entered in the "name" box) is required in the header. If, however, a format program consists of more than one level, each level must be identifed by number in the "level" box (item 3) and described in the remaining header entries. All levels should have the same format name.

A format program may contain up to 32 levels. If a format program consists of more than one level, each level describes a separate record or a different type of keying procedure.

NOTE:

In the following descriptions of the header entries, the number in parentheses after the entry name corresponds to the number on the coding form for the same entry. We again recommend that you fold out the figures at the end of this section so you can see the coding form as you read the discussion.

Name (2). A format name may consist of a maximum of eight alphanumeric characters and/or hyphens. The format name must start with a letter and may not end with a hyphen.

An entry in the "name" box is required only in the first level header of a format program. It is optional in all other levels of the same format program.

The format name entry identifies the name of the *compiled* format program. The compiled format name need not be the same as the job name assigned to the source batch, but it can be the same without creating a duplicate name conflict. In fact, assigning the same name to a source batch and the compiled format program may avoid confusion, especially when searching for a source batch that needs to be modified.

Level (3). This entry identifies the format program level assigned to a set of field descriptions. The 1-character level identification entry is optional; however, if a format program consists of more than one level, each level must have a unique identification. If no level is specified, the system assumes a default level of 1.

Although 36 allowable level identifications are provided, only 32 levels may be used in any one format program.

The following are valid entries:

1 thru 9 and A thru Z	The character identifies the level
( )	No entry defaults to level 1

Select (4). This 1-character entry indicates whether an operator may select the level through use of the PROG key. If a level is not operator selectable, any attempt to select it with the PROG key will cause an alarm condition.

All levels are selectable through the SELECT LEVEL statement in the coding form procedure section.

The following entries are valid:

Y	Yes, the operator may select this level
N	No, the operator may not select this level
( )	No entry defaults to Y

Record Size (5). This entry specifies the output record size in terms of total characters permitted in the entire record. This number should be as large as or larger than the sum of all numbers listed in the "field size" column (check box 3). A maximum of three numeric characters may be entered in this box.

The "record size" entry is optional in the first level header and invalid in all later headers. If no entry is made, the record size will default to 80.

The record size must not be smaller than the sum of the output position (check box 15) and the field size (check box 3) for any field description contained in the program.

The maximum record size is 999 characters. The minimum record size that can be written to tape is 14 characters.

Average Keystrokes/Hour (6). This field is not used.

Translation (7). The translation entry specifies the output character code conversion. An entry in this box is optional in the first level header and invalid in later headers.

The translation specified in the format program may be overridden by the supervisor during the WRITE command.

A maximum of two characters are allowed in this box. The following entries are valid:

1	Translate to suit device: 7-track = BCD 9-track = EBCDIC
2	EBCDIC (no translation)
3	ASCII
4	BCD
5 thru 25	Number of a user-defined translation table (20, 21, and 22 are reserved for line printer functions)
( )	No entry defaults to 1

Record Fill (8). This 1-character entry, which is optional in the first level header and invalid in later headers, is used to fill out any unused portion of the output record.

A record fill character is used to maintain consistent record lengths in a batch when levels within a format program contain different record sizes. Any character may be specified as record fill. If no entry is made, the record fill defaults to blanks.

Block Pad (9). This 1- or 2-character entry specifies the character (or characters) that will be used to fill any unused portion of a physical tape block on an output tape containing multiple data records. The block padding maintains consistent block lengths on the output tape.

An entry in this box is optional in the first level header and invalid in later headers.

The padding specified may be changed by the supervisor during the WRITE command — where the system must reveal data.

The following entries are valid:

NO	No padding will be used on the output tape
BL	The tape blocks will be padded with blanks
FF	The tape blocks will be padded with binary 1's
ZZ	The tape blocks will be padded with binary 0's
Blank followed by any character	The tape blocks will be padded with the character specified after the blank
( )	No entry defaults to NO

Required Padding (10). This 1-character entry specifies whether padding is required. If so, the unused portion of a physical tape block is filled with the padding character specified in the "block padding" entry (check box 9). If the last tape block is full, a separate block of padding characters is written on tape.

The following entries are valid:

Y Yes, block padding is required
N No, block padding is not required
( ) No entry defaults to N

Block Factor (11). This entry specifies the number of records contained in a physical tape block. A maximum of three characters is used in this box, and up to 999 records can be specified. A tape block must contain at least 14 characters and must not exceed 32,758 characters. The number of characters in a tape block is obtained by multiplying the record size (check box 5) times the block factor specified.

The "block factor" entry is optional in the first level header and invalid in later headers. The block factor specified may be overridden by the supervisor during the WRITE command.

If no entry is made in this box, the block factor defaults to 1.

Label Name (12). This entry identifies the label program that will be used to label the output tape. A label program name may be no more than eight characters.

The "label name" entry is optional in the first level header and invalid in later headers. If no entry is made, no tape labeling will be performed. If a label is specified, the compiled label program must be resident in the system when the output tape is written.

The label name specified in the format program may be overridden by the supervisor during the WRITE command.

For a File Management and Report Writer program, the name entered in this field is the name of the record being defined in the data division. This name will be used in the procedures section of the form (discussed under "Field Descripiton" below).

Date (13). This 8-character optional entry (mm/dd/yy) is used to record the latest date of the format program. If an entry is made in this box, the date accompanies the compiled program so that the most recent program version may be identified.

Comment (14). The "comment" box is provided to record any information that should accompany the format program (for example, the creator of the program or the program's use). Comments are ignored by the system.

Field Description

The field description consists of a characteristics section and a procedures section (see Figure 7-2). The characteristics section consists of all the entries on the coding form to the left of the procedures section. By means of the information in a series of check boxes, the characteristics section identifies a field and its keying and output characteristics.

A long procedure coded in the procedures section may be continued on subsequent lines by leaving the corresponding lines in the characteristics section blank. In most situations, a keystation operator would not complete the procedures section of the form. For information on using the COBOL computer language to program the 1900/10 system, please see *SPERRY UNIVAC 1900/10 System Supervisor's Reference, UP-9103.*

The only required entry for the field description is field size. A field size of 0 is used for procedure-only field descriptions. The field description entries are described in the following paragraphs.

Field Name (2). The field name is an optional entry which identifies the field for symbolic reference within procedures. A field name may consist of up to eight characters; the first character must be alphabetic and the last character may not be a hyphen. All other characters may be alphanumeric or hyphens.

A field name may be used only once in a particular format program level; however, it may be repeated in another level of the same format program.

To conserve memory space, it is recommended that a field not be named unless necessary as a reference in a COBOL procedure or as an operator prompt.

Field Size (3). This is a required entry that defines the length of the field; that is, how many characters may be entered in the field. The "field size" entry contains a maximum of three characters. To make this entry, you must anticipate the largest number of characters that will be entered in this field when it is used to enter data.

If the field size is 0, the field is used for procedure-only calculations. In this case, all other entries in the characters section of the field description must be blank.

The field size specified must be large enough to accommodate the results of any calculations performed by entries in the procedure section of the field.

Shift (4). This 1-character entry specifies the programmed keyboard shift. The programmed shift may be overridden by a keystation operator using the shift keys.

The following are valid entries:

A	Uppercase alphabetic shift
N	Numeric shift
a or A	Lowercase alphabetic shift
( )	No entry defaults to A

Data Type (5) This entry describes the character subsets allowed in a field.

The following are valid entries:

A	Uppercase alphabetic characters allowed
N	Decimal digits allowed
a or A	Lowercase alphabetic characters allowed
B	Blank characters allowed
S	Signed-decimal* digits allowed

**A signed decimal is a number which can have a - (minus) appearing after it on the viewing screen.*

C COBOL 51-character subset allowed

P Punctuation characters allowed

H Hexadecimal characters allowed

U Unspecified, any characters can be entered. If used, U must be the only data type specified for this field. A field which will contain ASCII characters must contain a U entry. (The U will not appear in the status line of the viewing screen.)

1 thru 8 User character subsets 1 through 8

( ) No entry, data type defaults to the type specified in the "shift" entry (check box 4)

A maximum of four data types may be specified. If more than four data types are contained in a field, a U entry (all characters allowed) must be contained in this box. An entry of ANP allows a character if it is an uppercase alphabetic (A), a numeric (N), or a punctuation character (P).

The keystation operator is immediately alerted by an alarm message if the keyed character does not match the data type specified. The data type(s) specified cannot be overridden by the keystation operator.

The entries in the "data type" check box are related to several other check boxes in the characteristics section of the coding form: the must-release (8), justification (16), and fill (17) check boxes. The following precautionary statements may apply to these entries in relation to the "data type" entry:

- A field is assumed to be numeric if the "data type" entry contains an N (numeric), an S (signed-decimal), or an H (hexadecimal), or any combination of these three letters. Any other entry, even if it is combined with these numeric field designations, causes the field to be considered nonnumeric.

- Numeric fields are automatically right-justified and zero-filled. Nonnumeric fields are automatically left-justified and blank-filled. Therefore, it is possible, when using mixed data types, to obtain an unexpected justification and fill if these parameters are not *explicitly specified* in their appropriate boxes.

- When an S (signed decimal) is contained in the "data type" check box, the field is automatically programmed as a must-release field. Therefore, it is not valid to code an N in the must-release box of a signed-decimal field. An N specifies that the operator does not have to explicitly release from the field by pressing the -SKIP or FIELD REL key.

- Except for the contents of arithmetic registers, all data, regardless of type, is stored as EBCDIC characters.

If a field is signed-decimal, pressing the -SKIP key causes the last character of the field to be minus-overpunched when the record is output. The contents of the field are displayed to the keystation operator, followed by a minus sign. If a signed-decimal field is released by pressing the FIELD REL key, the contents of the field are displayed followed by a blank, and the field is considered positive.

Keyed (6). This 1-character entry defines the extent that a field must be entered by a keystation operator.

The following entries are valid:

Y	Yes, the field is keyed with no control. ("No control" means that some, all, or none of the fields may be keyed by the keystation operator.)
N	No, the field is not keyed by the operator. Nonkeyed fields are used to perform operations such as inserting constants into a field, storing the result of a calculation, or displaying prompts in the data area.
F	The field must be fully entered.
S	At least some of the fields must be keyed.
E	The field must be either fully keyed or entirely empty.
P	Required when the "PROMPT" verb is used.
( )	No entry defaults to Y.

A field that must be keyed contains either an F or an S in this box. This type of field is called a must-key field.

A nonkeyed field (N in this check box) may not be defined as a sight- or key-verified field (check box 6), a must-release field (check box 8), or an auxiliary duplicate field (check box 24).

Update (7). This 1-character entry specifies whether a field is to be keyed in the Enter or Update mode. The entry also indicates that a field is not mode-dependent.

The following entries are valid:

N	The field is not mode-dependent. If it is a keyed field, it may be keyed in both the Enter mode and the Update mode.
E	The field is keyed only in the Enter mode.
U	The field is keyed only in the Update mode.
( )	No entry defaults to N.

Must Release (8). This entry defines the ways an operator may exit from a field.

The following entries are valid:

N	No, the operator does not have to explicitly exit from the field.
Y	Yes, the operator must press the FIELD REL, REL, or –SKIP key to exit from the field.
( )	No entry defaults to N unless the data type specified is S (signed-decimal). If the data type is S, no entry defaults to Y.

A signed-decimal entry in the "data type" check box must contain either a Y or a blank in the "must release" box.

Display (9). This 1-character entry controls the field display on the keystation viewing screen.

The following entries are valid:

Y	Yes, the field is to be displayed.
N	No, the field is not to be displayed.
( )	No entry defaults to Y.

A field that is specified as sight verified in check box 10 must contain either a Y or a blank in the "display" box. When a field is defined as N, blanks are displayed in place of the data contents of the field.

Verify (10). This 1-character entry defines the type of field verification required.

The following entries are valid:

N	No, verification is not performed on this field.
K	Key verification is required in the Verify mode.
S	Sight verification is required in the Verify mode.
B	Field is key verified in Verify mode only if the batch is out of balance.
R	Key verification of this field is required in all modes. The R entry causes the "REKEY TO VERIFY" guide message to appear on the viewing screen as soon as keying in the field is completed.
( )	No entry defaults to N.

Invalid fields, regardless of the entry in this box, are always presented to the operator for key verification.

Balance (11). This numeric entry indicates that the contents of the field are to be subtracted from the balance register specified in this check box. The subtraction does not occur until all other field procedures have been executed.

The following are valid entries:

1 thru 99	The effective contents of the field will be subtracted from the balance register specified in this box.
( )	No entry indicates that no balance registers are affected by the field.

When a field is being entered, verified, modified, or updated, the balance register specified in this box is adjusted by the effective contents of this field. When a balance register reaches zero, the batch is in balance; otherwise, it is out of balance.

A balance register is initialized to its initial balance total during data entry. The INITIALIZE procedure statement is used to accomplish this function.

In the Verify mode, an audible alarm sounds and an alarm message is displayed at the keystation whenever a balance register changes state from in balance to out of balance, or vice versa.

When a batch is closed, the current values of any balance registers in the format program are written on the disk.

Tab Cont (12). This 1-character entry defines tab stops, tab starts, and continuation fields for a keystation.

Tab stops allow you (as the operator) to skip a group of fields with one depression of the REL (or TAB) key.

The following entries are valid:

N	No, this field is neither a tab start nor a tab stop.
S	If the REL (TAB) key is pressed at the start of this field or before, all automatic functions, procedures, and must-key specifications are disabled, *starting with this field,* until the next tab stop (T specification) or the end of the record.
T	Tab stop
C	This field is considered a continuation of the previous field and is therefore skipped when the FIELD REL, DUP, -SKIP, FIELD ⟶ or FLD ⟶, or FIELD ⟵ or FLD ⟵ key is pressed.
B	The first keyed position of this field is both the start of a group (like an S specification) and a tab stop (like a T specification).
( )	No entry defaults to N.

A tab stop terminates a tabbing operation; a tab start suppresses automatic functions while tabbing is in progress. Tab stop and tab start need not be used together.

If the REL (or TAB) key is pressed anywhere within a record, the cursor tabs to the beginning of the next tab stop field. While tabbing, the system performs all automatic functions and executes all COBOL procedures. If a must-key field is encountered, the system stops and indicates an error condition; the operator must then enter the necessary data. All fields skipped are filled with the character specified in the "fill" box (check box 17).

If the system encounters a tab start while tabbing is in progress or if the operator presses the REL (or TAB) key at the beginning of a tab start field, tabbing proceeds as above but all automatic functions, all COBOL procedures, and all must-key specifications are ignored.

A continuation field is treated as a continuation of the previous field by the FIELD REL, DUP, -SKIP, FIELD ⟶ or FLD ⟶, and FIELD ⟵ or FLD ⟵ keys.

Auto (13). This entry allows automatic skipping, duplicating, and field generation, or the manual override of these functions in favor of manual field entry from a keystation. These functions are logically connected to the keystation AUTO OFF (or AUTO) key. When the AUTO OFF key is pressed, an automatic field may be manually entered.

The following are valid entries:

N	No, this is not an automatic field.
S	Skip this field and fill it with the fill indicated in the "fill" box (17).
D	Duplicate this field from the preceding record.
P	Execute the procedure coded in the procedure section of this field.
( )	No entry defaults to N.

AUX. DUP. (14). This entry controls the operation of the keystation AX DUP or XDUP key. If the AX DUP or XDUP key is pressed when the cursor is positioned at the first keyed position of the field, the field is automatically filled with the contents of the auxiliary duplicate register specified in this box.

The following entries are valid:

01 thru 99	Fill the field with the contents of the auxiliary duplicate register indicated.
( )	No entry indicates that the AX DUP or XDUP key is an invalid keystroke in the field.

The auxiliary duplicate register must be initialized using the MOVE or COMPUTE statement.

Output Position (15). This entry specifies the starting position of a field in the output record. Field positions in the output record do not have to agree with the order in which fields are keyed during data entry, except that fields designated for binary conversion (check box 18) must follow the immediately preceding keyed field when output. Further, the binary representation of the field must be considered when determining the number of character positions allowed for a binary field on output.

The following entries are valid:

1 thru 999	The field will be output in the output position specified. Normally, the field position is determined by adding the field sizes (see box 3) consecutively.
0	The field is not to be output. (A 0 designation may be used for fields that contain prompting messages, initialize balance registers, etc.).
( )	No entry means that the field will be output starting with the next available position in the output record.

Justification (16). This entry specifies the justification of data within the field in the batch and within the field when it is output.

The following entries are valid:

R The field is right-justified.

L The field is left-justified.

( ) No entry defaults to R for numeric fields and L for nonnumeric fields (refer to "data type" entry).

Fill (17). This entry describes the character used to fill an output field that is not completely filled by its keyed or generated fields.

The following entries are valid:

B The field is to be filled with blanks.

Z The field is to be filled with zeros.

* The field is to be filled with asterisks.

E The field is either zero-filled if its data type is numeric or blank-filled if its data type is nonnumeric.

S The field is to be filled with blanks if it is skipped (that is, if the FIELD REL, –SKIP, or REL (TAB) key is pressed at field start or the automatic skip function specified in check box 13 is indicated); otherwise, it is filled with zeros.

( ) No entry defaults to E.

The fill entry is related to the data type (check box 5).

Conversion (18). This entry defines the conversion of a data field within the output record.

The following entries are valid:

N No conversion is performed.

H The field is converted to packed hexadecimal.

D The field is converted to IBM* S/360 packed decimal format.

B The field is converted to binary. The binary representation is right-justified within the output field and zero-filled or truncated to fit the output field size.

( ) No entry defaults to N.

Procedure (19). The procedure section of the coding form is used to write COBOL computer language statements. This information will be placed on the form by a computer programmer.

*Trademark of International Business Machines Corporation.

NOTE:

After you have written all field data on the form, write the word "END." in the first four spaces of item 19, on the line following your last field entry. The remaining portion of item 19 will be completed by a computer programmer.

Checking Your Work

Compare your completed form with the second foldout sheet. Your coding does not necessarily have to agree with the entries on this sheet, but if it doesn't, you should understand why.

Limiting a Format Program Size

The size of a format program can severely reduce the amount of memory space available in the 1900/10 system for processing. Therefore, it is desirable to limit the size of a format program to conserve memory space. Careful consideration of the format program during the coding process can influence the size of the field descriptors provided for the format program when it is compiled, resulting in reduced memory requirements for the compiled format.

The field descriptor is an element provided by the compiler when the format program is compiled. The compiler has a choice of two sizes of field descriptor, one of one word of memory and one of five words of memory. Your control is not directly on these field descriptors, but the entries that you make on the format coding form for the field definition can influence which size field descriptor the compiler will assign to the field. By minimizing the definition of a field without changing its meaning, it is possible to force the compiler to use the one-word descriptor.

Every field descriptor that is reduced in size to one word represents an 80-percent reduction in field descriptor size for that field. Although not all field descriptors can be limited to one word, the memory savings for very large programs can be considerable.

Since a short field descriptor is one word in length, the amount of information it can hold is limited. Therefore, certain items appearing in the field definition area of a format program will automatically disqualify that field from being translated into a short field descriptor. Check box entries that always produce the long field descriptor are:

Check Box (and Number)	Entry
Field Size (3)	16 or greater
Shift (4)	Lowercase alpha
Update (7)	E or U
Must Release (8)	Y
Display (9)	N
Verify (10)	R
Balance (11)	Any entry
Tab Continue (12)	Any entry
Auto (13)	Any entry
Aux Dup (14)	Any entry
Output Position (15)	Any entry
Conversion (18)	Any entry

On the other hand, certain combinations of entries in field descriptions can be made and still qualify the field for the short field descriptor:

Check Box (and Number)	Entry
Field Size (3)	15 or less
Shift (4)	Any legal entry except lowercase alpha
Keyed (6)	Any legal entry
Verify (10)	Any legal entry except R

Also, you can further ensure translation of field descriptions into the one-word field descriptor by giving the field a name (check box 2) *only* when it is used as a reference by a COBOL procedure or as an operator prompt.

Following are some examples of check box considerations based on the entries that can be used to influence assignment of the one-word field descriptors, as previously discussed.

NOTE:

The numbers in parentheses following the entry names are the check box numbers on the coding form.

1. Prompt and nonkeyed fields that are used for formatting the screen display should be limited, whenever possible, to no more than 15 characters in size. This is easier to do for a prompt field without a prompt procedure than for one with a prompt procedure.

Example No.	Field Name (2)	Field Size (3)	Keyed (6)	Procedure (19)
1	(no entry)	18	P	(no entry)
	(no entry)	10	N	(no entry)
2	(no entry)	14	P	(no entry)
	(no entry)	14	N	(no entry)

Example 1 requires four more words of memory than example 2 because the 18 characters of field size is greater than the 15-character limit for a one-word field descriptor.

2. Any entry in the output position check box (15) will force a long field descriptor. Whenever possible, make your data entry format so that the output position can be left blank. Leaving an output position blank will force the field to be output in the next position past the previous field.

Example No.	Field Name (2)	Field Size (3)	Output Position (15)
3	FIELD1	5	16
	FIELD2	7	21
4	FIELD1	5	16
	FIELD2	7	(no entry)

Example 3 forces the descriptor for FIELD2 to be long although its defaulted output position would be 21. Example 4 performs the same function but permits the use of four fewer words for the field descriptor.

3. Some format programs (such as File Management programs) are designed not to create a data batch. Whenever you have a program that you know will never be used to write or print, you should leave the output position blank in all fields. As mentioned previously, any entry in the output position check box, even zero, will force a long descriptor.

4. Every field name is stored inside the format program. The field name requires a five-word field descriptor. Any field that is not referenced by a subsequent procedure should not be named, except a field name that provides information to the operator.

Example No.	Field Name (2)	Field Size (3)	Keyed (6)	Procedure (19)
5	FIELD1	5	N	(no entry)
6	(no entry)	5	N	(no entry)

Example 5 takes four more words of memory than example 6.

SPERRY UNIVAC

UNIVAC 1900 CODING FORM

PREPARED BY_____ DATE _____

☐ LABEL ☐ FORMAT
☐ TABLE ☐ SUBPROG

PAGE _____ OF_____

NAME	LEVEL	SELECT	RECORD SIZE	AVERAGE KEYSTROKE/HR.	TRANS.	REC.FILL	BLK.PAD	REG.PAD	BLOCK FACTOR	LABEL NAME	DATE	COMMENT
2	3	4	5	6	7	8	9	10	11	12	13	14

FIELD NAME	FIELD SIZE	SHIFT	DATA TYPE	KEYED	UPDATE	MUST RELEASE	DISPLAY	VERIFY	BALANCE	TAB CONT.	AUTO	AUX. DUP.	OUTPUT POSITION	JUSTIFICATION	FILL	CONVERSION	PROCEDURE
2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19

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SPERRY UNIVAC

UNIVAC 1900 CODING FORM

PREPARED BY_____ DATE _____

☐ LABEL ☐ FORMAT
☐ TABLE ☐ SUBPROG

PAGE ____ OF ____

NAME	LEVEL	SELECT	RECORD SIZE	AVERAGE KEYSTROKE/HR.	TRANS.	REC. FILL	BLK. PAD	REC. PAD	BLOCK FACTOR	LABEL NAME	DATE	COMMENT
2	3	4	5	6	7	8	9	10	11	12	13	14
ARH	1	Y	200	18000	1		NON		30	PAYROLL	10-01-7X	

FIELD NAME	FIELD SIZE	SHIFT	DATA TYPE	KEYED	UPDATE	MUST RELEASE	DISPLAY	VERIFY	BALANCE	TAB CONT.	AUTO	AUX. DUP.	OUTPUT POSITION	JUSTIFICATION	FILL	CONVERSION	PROCEDURE
2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
EMP-NAME	30	A		US	N	Y	Y	K		N	N		1			N	
ADDRESS	22	A		US	N	Y	Y	K		N	N		31			N	
CITY	22	A		US	N	Y	Y	K		N	N		53			N	
STATE	22	A		US	N	Y	Y	K		N	N		75			N	
STATUS	9	A		AS	N	Y	Y	K		N	N		97			N	
RATE	5	N	BANS	S	N	Y	Y	K		N	N		106	R	B	N	
OTRATE	5	N	BANS	S	N	Y	Y	K		N	N		111	R	B	N	
SSID	11	N	PNE	N	N	Y	K			N	N		116			N	
AGRIOD	8	A	BANS	N	N	Y	Y	K		N	N		127			N	
HOURS	3	N		NS	N	Y	Y	K		N	N		135			N	
GROSS	6	N		NS	N	Y	Y	K		N	N		138	R	B	N	
FEDTAX	6	N		NS	N	Y	Y	K		N	N		144	R	B	N	
STATAX	6	N		NS	N	Y	Y	K		N	N		150	R	B	N	
CRUNION	6	N		NS	N	Y	Y	K		N	N		156	R	B	N	
NET-PAY	6	N		NS	N	Y	Y	K		N	N		162	R	B	N	
																	END.

Glossary

A

Access

The process of obtaining data from, or placing data into storage.

Alarm

A keystation condition in which an operator error or a system fault has been detected within the system. When an alarm occurs, a checkerboard pattern appears briefly on the viewing screen and a buzzer sounds. A message is then displayed on the viewing screen which defines the condition and gives an indication of what to do to correct the problem. At a local keystation, the message displayed on the message line is intensified (shown brighter than the other displayed information) so it can easily be distinguished from the rest of the display. Intensification of the alarm message, however, does not occur on the screens of remote keystations when a remote keystation system is employed.

Alpha

Alphabet or alphabetic.

Alphanumeric

A combining word meaning that both alphabetic and numeric characters are involved. Usually other characters may be used as well.

ASCII

American Standard Code for Information Interchange. A form of electronic code used to transmit data over electrical lines. When a key on an ASCII keyboard is pressed, it generates an electrical signal which is unique for that character. The unique signal is in ASCII code.

Assembler program (and compiler program)

A general computer program that interprets the user's unique computer programs and translates them into language which can be understood by the computer system. The computer manufacturer usually prepares the assembler program.

Auto, Au

Automatic.

Auxiliary duplicate register

A special memory storage area in the computer where frequently used items of information may be stored and recalled for insertion in specified fields or used for display on the viewing screen.

AX DUP (XDUP)

Auxiliary duplicate.

B

Balance

An operating situation in which stored facts in the computer serve as checks to determine if the proper quantities of information have been entered into the system during a given operation. A balance message is displayed on the viewing screen after an operation is completed.

Batch

A group of records that are stored in a computer. These records are considered as a single unit for purposes of data processing (for example, a complete group of invoices).

Batch statistics

Information displayed at the end of a batch entry sequence which gives a summary of facts about the batch. Data includes such items as the total number of records in the batch and the number of verified records.

BKSP

Backspace.

Bypass (Pass)

To skip over without using.

C

Central processor

Another term for computer.

Char, CHAR, CHR

Character.

Character

Any alphabetical, numerical, punctuation, or other type of symbol that appears on the viewing screen.

Character error

An incorrect letter, number, or symbol that has been keyed onto the viewing screen or into the record.

Check box programming

A method of preparing a computer program by completing the blanks on a preprinted form.

CMND

Command.

COBOL

Common Business Oriented Language. A standardized business language for programming a computer.

Compiler program (and assembler program)

A general computer program that interprets the user's unique computer programs and translates them into language which can be understood by the computer system. The computer manufacturer usually prepares the compiler program.

Computer

A machine which uses principles of electronics and magnetism to record data, modify data, and, upon demand, recall the recorded or modified data. Often called a central processor unit (CPU).

Controls

Any switch or keyboard key that causes the keystation to operate according to the special needs of a given situation. Power on/off, screen brightness, and sound volume are examples of functions that are activated or modified by controls.

COR

Correction.

CPU

Central processor unit; a computer.

CRT

Cathode ray tube; a data viewing screen on a keystation or terminal.

Cursor

A small rectangular spot of light which is projected on a viewing screen. This spot indicates the place where the next character will be displayed when it is keyed in from the keyboard.

D

Data processing

A process which occurs when data submitted to a computer is modified and/or stored by the computer and made more useful to people who require use of that data.

Default

A positive response to a prompt on the viewing screen of a keystation in which the operator makes a choice by pressing a single key instead of entering several characters.

Delete

To take out or remove. To erase.

Disable

To discontinue an operation. An operating condition in which a keystation is made inoperable.

Disk drive

A device used by a computer to store data on a magnetic disk.

Display

The information projected on a keystation or terminal viewing screen.

Drum storage unit

A device used by a computer to store data on a magnetic drum. Often magnetic drums are located within the main computer cabinet.

DUP

Duplicate or duplication.

E

EBCDIC

Extended Binary Coded Decimal Interchange Code. Another form of electronic code used to transmit data (see ASCII).

Enable

To activate a keystation or a specific computer program.

Enter

To record data into the computer system.

Exit

To discontinue use. To stop using a keystation or a specific program.

F

Field

A set of one or more data characters that are entered into a computer to answer a prompt. For example, the prompt may read "INV NO." (for invoice number), and the field is complete when the invoice number has been entered. May also be a specified area on a viewing screen that is used for a particular category of data.

File

A complete computer storage system where groups of related batches of information are stored. For example, there could be 10 fields of data in one record, 50 records in one batch, and 22 batches in one file. These numbers could be added to or subtracted from. Computer files are maintained on magnetic tapes, disks, or drums.

Flag

To mark or tag a field or record of data so that corrections, changes, or completions can be made later.

Fld

Field.

Format

The arrangement and sequence of program information that is displayed on the viewing screen.

Format program

A set of instructions stored in a computer that define the characteristics of a particular data entry application, such as the kinds of prompts, the order of prompts, and the conditions and limitations placed on data that may be entered into a field. System functions such as validation, computation, and insertion of data are also part of a format program. Label program, table programs, and subprograms are special types of format programs.

FORTRAN

Formula translation. A standardized language for programming a computer.

Freeform

A 1900/10 software program that has only one field with no prompts, so that any information can be entered on the data lines of the screen.

Fwd

Forward.

G

Guide messages

Messages on the keystation viewing screen that tell the operator what to do. A general prompt that is not part of a specific program.

H

Hard copy

Computer messages that are printed on paper.

Hardware

All of the physical equipment in a computer system.

Header

The upper part of a check box programming form which lists summary facts about the program being written on the form. Such items as program name and record size are presented.

Hexadecimal

Refers to a numbering system with a base of 16. Pertaining to a characteristic involving a selection, choice, or condition in which there are 16 possibilities.

I

Illegal character

A keyboard character that cannot or should not be used in a specific situation.

Indexed file

A file that has an index, providing a means to quickly gain access to the randomly sequenced data in the larger file of data when operating in the File Management mode.

Input

Any information or code that is entered into the computer.

Insert

To place a new record in a batch of existing records.

Invalid

Refers to an attempted entry of data which the computer system will not accept. When an invalid entry is made, an alarm condition will usually occur and must be cleared from the system before additional data may be entered.

I/O

Input and/or output.

J

Job

A name of a program used to perform a specific computer task or function, such as payroll, invoices, or accounts receivable.

Justification (justify)

To align data lines with left and/or right even margins.

K

Keying

To use the keystation keyboard to enter data into the computer system.

Keystation

The operator's working equipment, consisting of a cabinet that contains a viewing screen and a keyboard. A keystation is the link between human operator and the computer system; it is the equipment where data is entered into and received from the system in a form understandable to the operator.

L

Label program

A special format program used to process labeled or unlabeled magnetic tape volumes. (See format program.)

Language

Codes that can be usefully entered into a computer. The electronic characteristics of a computer software system which permit the computer to accept, store, modify, and reveal data. (See software.) A set of representations, conventions, and rules used to convey information between human and computer.

LCA

Lowercase alphabet.

Level

A subordinate part of a computer program. A program may have several levels. Use of a specific level must be requested in the work initiation command.

Local

Refers to the unique operating procedures or requirements of a particular company or business situation.

M

Magnetic drum

A device used by a computer to store data. Magnetic drums are often located within the computer's main cabinet.

Mask

Precise instructions keyed into a computer to enable a search for a specific record to be made.

Memory

A device within the computer which accepts data for storage and recall, and is capable of storing system operating programs as well as temporary data.

Message line

The line on the viewing screen following the status line or lines, where informative messages are given to the operator of a 1900/10 keystation.

Miscompare

A condition that may occur during the Verify mode of operation in which the display field data does not compare favorably with keyed or visual verification data.

Miskey

To make a mistake and press the wrong key on the keyboard.

Mode

A specific method of operating a keystation to achieve the desired results. In the 1900/10 system, there are five modes of operation: Enter, Verify, Search And Modify, Update, and File Management.

Modem

A device used in conjunction with long-distance transmission of digital signals over telephone lines.

Modify

A technique used to change or correct data that has already been entered into the computer files.

O

Operator

A person skilled in use of the 1900/10 system keystation.

Operator statistics

A display shown at the end of a batch entry keying operation which gives information about operator performance.

Option

An operation or procedure in which a choice can be made.

Output

Any information or data that is given out by a computer, either on a viewing screen or as printed copy.

P

Page

That data which can be displayed on a single viewing screen at one time.

Peripheral equipment

Computer system equipment used for input and output functions. Usually located outside the main computer cabinet.

Permanent storage

Computer data (stored on disks or tapes) which must be manually placed on a drive unit before it can be recalled by a terminal for use. (See working storage.)

Printout

A printed copy of data that has been retrieved from computer storage.

Prog

Program.

Program

Instructions stored in a computer which permit the system to accept, modify, store, and retrieve data.

Prompt

A word or phrase displayed on the viewing screen which calls for the terminal or keystation operator to enter data or perform some keying task.

R

Read

To recall stored data from the computer files and present that data on the viewing screen or as a printout.

Ready message

A message on the viewing screen which states that the system is ready for use: READY — USE CMND TO START WORK.

Record

A set of one or more consecutive fields of computer data that are written on a related subject.

Recover

To correct a condition caused by an error so that additional entries may be made with the program.

Reenable

To activate a keystation or specific program after it has been temporarily disabled.

Register

A computer storage device capable of storing a specified amount of data.

Rekey

To correct or modify data in a field.

Rel

Release

Remote keystation adapter

A unit of equipment which enables keystations to be placed at remote locations and connected to the 1900/10 processor by telephone lines. One adapter is used at the remote site; another is at the local site, where the 1900/10 processor is located. In conjunction with a full duplex modem at each end of the telephone line, these units comprise the remote keystation system.

Retrieve

To obtain data from a computer storage file.

Routines

Instructions stored in the computer which permit the computer to perform general or frequent tasks.

S

Search

A technique (using keyboard-entered code) to find specific data stored in a computer file. To electronically examine the contents of a computer file for characteristics that will select a portion of the file for display or printout.

Shift level

A set of electrical signals, generated through use of the keyboard that produce a specific set of characters when the keytops are pressed. The 1900/10 system has three shift levels: *alpha,* to select the lower characters shown on the keytops; *numeric,* to select the upper characters on the keytops; and *lowercase alpha (LCA),* to select lowercase alphabetical letters.

Signed decimal

A number (with a decimal in it) which has either a positive or negative value assigned to it.

Software

Computer programs. Instructions stored in the computer which tell the computer how to handle incoming data, process that data, and present output information.

Source program (source code)

A computer program written by the user of a computer system to handle the user's unique data processing and data storage requirements.

Status lines

The first two lines (Model 3541 keystation) or one line (Model 3555 keystation) of information on the viewing screen. These lines give facts about the current data being entered into the system, such as page number, field number, field name, mode of operation, and batch number.

Storage

The principle of putting data into a computer so that it may be recalled and used later.

Subprogram

A special format program used to enter secondary programs under a main format program.

Supervisor routine

A computer routine that controls the execution of other routines. (See routine.)

T

Table program

A special format program used to enter data tables.

Tape drive

A device used by a computer to store data on magnetic tape and to recall data from the tape.

Terminal (keystation)

A device used to submit data to a computer and/or receive data from a computer. A terminal is the link between a human operator and a computer.

Terminate

To stop entering data into the system.

U

Update

A technique used to bring data already entered into a computer file up to date by adding, removing, and correcting the stored information.

V

V COR (VCOR)

Verify correction. A correction made in the Verify mode of operation.

Valid

Something acceptable. An entry that will be accepted by the computer system.

Viewing screen

A cathode ray tube mounted in a computer terminal. This tube is similar to a television viewing tube except that the viewing screen displays data (written information) instead of pictures.

Verify

To check the accuracy of data already entered into the computer. In most systems, the operator must sight verify or key verify.

W

Work initiation command

A combination of letters entered from the keystation keyboard. The command conditions the keystation so an operator can use computer programs to enter data into the system.

Working storage

Computer data which is stored in such a way that is is readily available for use by operating a terminal (keystation) to obtain it. (See permanent storage.)

Write

To record data in a computer system.

X

XDUP (AX DUP)

Auxiliary duplicate.

Z

ø, 0

Symbols, used in data processing to indicate a zero rather than the capital alphabetic letter "O."

Index

L

M

N

O

P

R

S

T

U

V

W

X

SPERRY UNIVAC
COMPUTER SYSTEMS

PUBLICATIONS RELEASE

1900/10 System

SPERRY UNIVAC 1900/10 System

Operator's Guide

UP-9100

This library memo announces the release and availability of "SPERRY UNIVAC® 1900/10 System Operator's Guide," UP-9100. It is a Standard Library Item (SLI).

The 1900/10 is an advanced, shared-processor, key-to-disk data-entry system that is both versatile and sophisticated, yet easy to use and to program. The basic 1900/10 system consists of one keystation, the processor, one magnetic tape unit, and one disk drive. However, the system can be expanded to include additional tape units and disk drives and up to 32 local and remote keystations and printers (up to 16 printers).

The data communication option allows the 1900/10 system to interface modem equipment to communicate with other 1900/10 systems or with a central processor. Transmission can take place over switched or dedicated telephone lines in either point-to-point or multipoint configurations.

The remote keystations option provides for keystations and character printers to be located at remote distances from the control unit and to be connected to it through telephone lines.

This book is intended as a training guide for a new operator. A brief survey of general data processing principles, as well as a general description of 1900/10 system operation, is presented as an introduction. Descriptions are provided of both the 3541 and 3555 keyboards, of the keyboard controls, and of all other controls and indicators. A general discussion of how to interpret and respond to the screen prompts precedes a list of screen messages and response or recovery procedures. Detailed procedures are supplied for use in the various operating modes. In addition, a short, operator-oriented discussion of the check box programming form is provided for operators who may be interested.

Additional copies may be ordered by your local Sperry Univac representative.

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