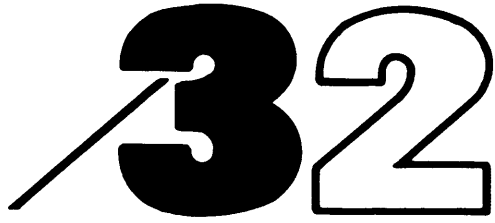


GC21-7591-3
File No. S32-40

IBM System/32 Operator's Guide

Fourth Edition (November 1976)

This is a major revision of, and obsoletes, GC21-7591-2. Extensive changes have been made throughout, and this publication should be reviewed in its entirety.

Additions in this edition include:

- Mag card unit
- Dual case keyboard/display
- Data recorder attachment

This edition applies to version 05 of IBM System/32 (Program Number 5725-SC1), Utilities Program Product (Program Number 5725-UT1), and RPG II Program Product (Program Number 5725-RG1), and to all subsequent versions until otherwise indicated in new editions or technical newsletters.

Requests for copies of IBM publications should be made to your IBM representative or to the IBM branch office serving your locality.

A Reader's Comments Form is at the back of this publication. If the form has been removed, address your comments to IBM Corporation, Publications, Department 245, Rochester, Minnesota 55901.

Preface

This manual provides the information you need to operate the IBM System/32 (Program Number 5725-SC1) and run the Utilities Program Product (Program Number 5725-UT1) and the RPG II Program Product (Program Number 5725-RG1).

The manual explains the operation of the following:

- Operator panel
- Display screen
- CE control panel
- Keyboard
- Printer
- Data recorder attachment
- Mag card unit

It also contains:

- System operation steps
- System message formats
- SCP command statements
- SCP word processing command statements
- Communications information
- System/32 Utilities Program Product and RPG II Program Product information
- Problem determination information
- Glossary

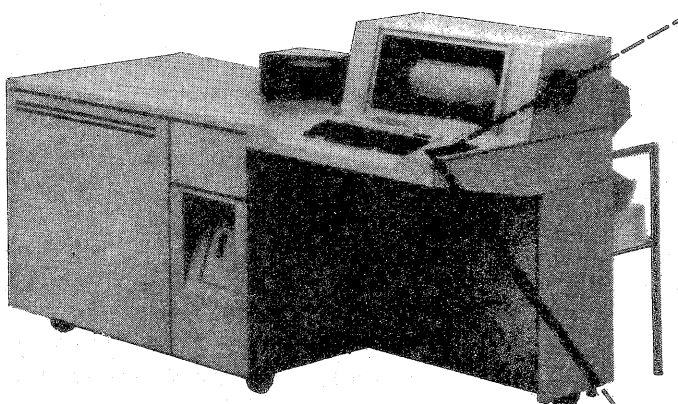
Related System/32 Publications

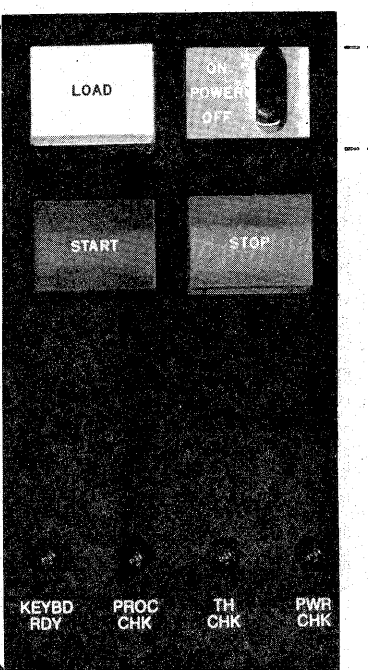
- *IBM System/32 System Control Programming Reference Manual,* GC21-7593
- *IBM System/32 System Control Programming Reference Manual—Word Processing,* GC34-0078
- *IBM System/32 RPG II Reference Manual,* SC21-7595
- *IBM System/32 Utilities Program Product Reference Manual—Data File Utility,* SC21-7600
- *IBM System/32 Utilities Program Product Reference Manual—Source Entry Utility,* SC21-7605
- *IBM System/32 Utilities Program Product Reference Manual—Sort,* SC21-7633
- *IBM System/32 Messages Guide—System,* GC21-7592
- *IBM System/32 Messages Guide—RPG II,* SC21-7617
- *IBM System/32 Messages Guide—Utilities Program Product,* SC21-7618

Titles and abstracts of related publications are listed in the *IBM System/32 Bibliography,* GC20-0032.

Contents

OPERATOR PANEL

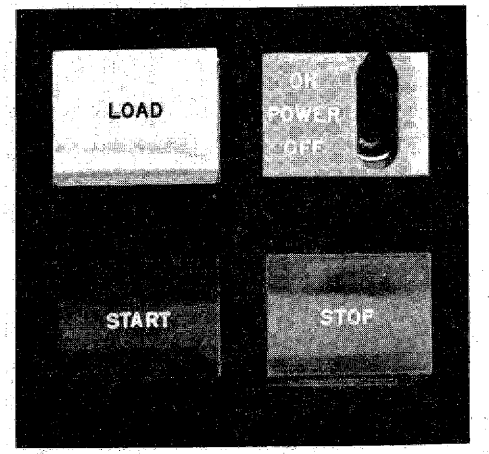




Note: The keylock switch is an optional feature that can replace the POWER switch.

POWER Switch

Set this switch to turn the power for the system on or off.



LOAD Key/Light

Press this key to start the initial program load (IPL). If the disk is not ready, the LOAD light turns on when you press the LOAD key. The LOAD light turns off when the disk is ready.

STOP Key/Light

Press this key to stop the system. The STOP light turns on when you press the STOP key, or when you set the POWER switch on.

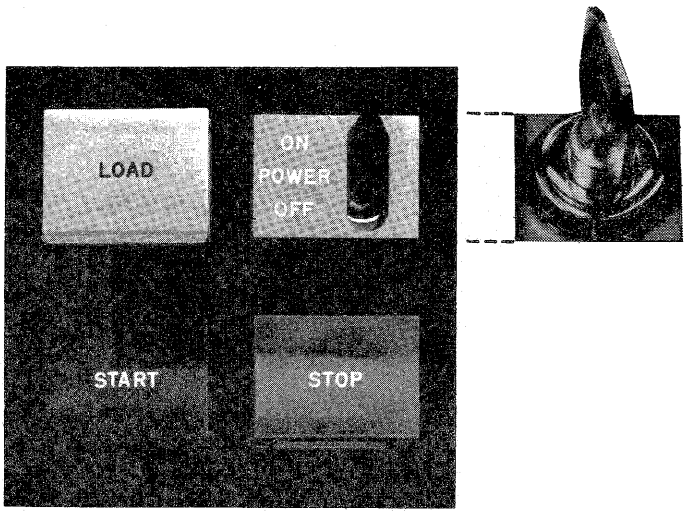
START Key/Light

Press this key to turn the STOP light off and start executing a program. The START key is lit during IPL. While it is on, the START light indicates that a program is running in the system.

Keylock Switch (Optional Feature)

The keylock switch replaces the POWER switch. Insert the key and turn it clockwise to turn the power on; turn the key counterclockwise to turn the power off.

Note: In this manual, the term *POWER switch* indicates the switch on the operator panel that turns power on and off. Therefore, if you have the keylock feature, all references to the POWER switch apply to your keylock switch.



KEYBD RDY Light

KEYBD RDY (keyboard ready) light turns on when the keyboard is ready to operate. If this light is off, the INQ, ERROR RESET, PRINT/RESET, and PAGE/LINE keys are the only working keys. If the light is off and the INQ, PRINT/RESET, or PAGE/LINE key does not work, press ERROR RESET, then try the key again.

PROC CHK Light

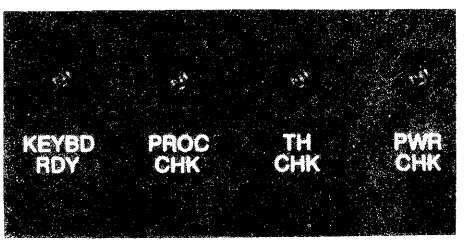
PROC CHK (processor check) light turns on when the error is detected by the processor. Refer to *Problem Determination* to help you determine how to resume processing when this condition occurs.

TH CHK Light

TH CHK (thermal check) light turns on when a high temperature is reached in the system. When this occurs, the system power turns off. Refer to the *Problem Determination* section to help you determine how to resume processing when this condition occurs.

PWR CHK Light

PWR CHK (power check) light turns on when a system power problem causes the power to turn off. Refer to the *Problem Determination* section to help you determine how to resume processing when this condition occurs.



DISPLAY SCREEN

The display screen shows you the following:

- Information you are entering, updating, or displaying.

  You can verify the data before pressing the ENTER key to signal the system to process it.

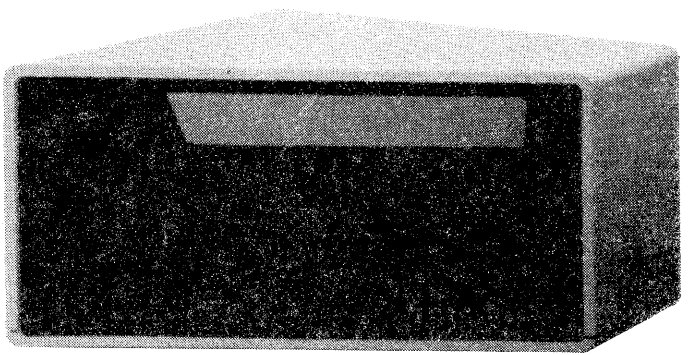
- Advisory messages that indicate the progress of your job.

- Error messages that identify errors as they occur.

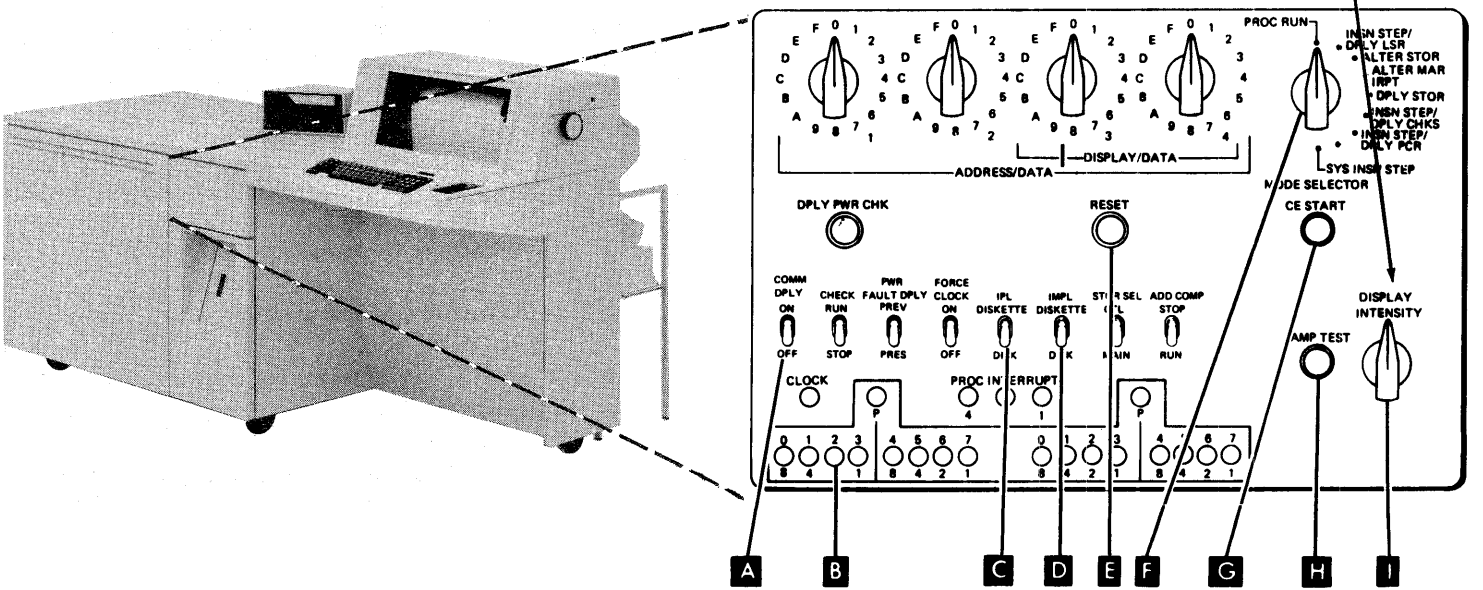
- Messages that prompt you for information that you must enter.

The cursor is an underscore (_) on the display screen that indicates *where you are* in the displayed data. It appears under a displayed character or blank. The *Keyboard* section explains the keys you press to move the cursor and the cursor movement that results from pressing the function keys.

The display screen shows a maximum of six lines with 40 characters in each line.



The brightness of the display screen is adjusted by the DISPLAY INTENSITY control on the customer engineer (CE) control panel.



CE CONTROL PANEL

You will use the following switches, controls, and lights on the CE control panel:

A COMM DPLY switch controls the lights to display the status of the BSCA or SDLC adapter.

B Console display lights display the current system status and the contents of the system registers. The MODE SELECTOR switch **F** and the COMM DPLY switch **A** determine which information is displayed.

C IPL switch indicates whether the initial program load (IPL) is from disk or diskette.

D IMPL switch indicates whether the initial microprogram load (IMPL) is from disk or diskette.

E RESET clears all current error conditions from the processing unit.

F MODE SELECTOR switch selects one of the processing modes.

G CE START restarts the system.

H LAMP TEST causes all CE control panel and operator panel lights to turn on. You can check that all lights are working properly.

I DISPLAY INTENSITY control adjusts the brightness of the display screen.

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CE Control Panel Settings for Normal Processing

Figure 1 shows how the CE control panel should be set for normal processing.

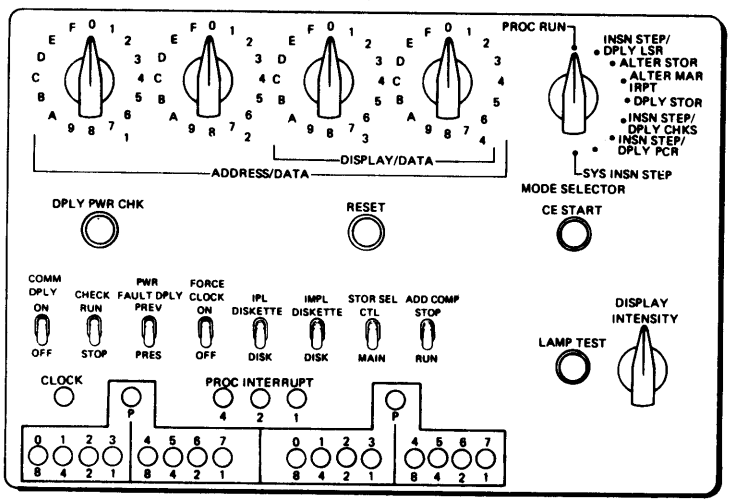
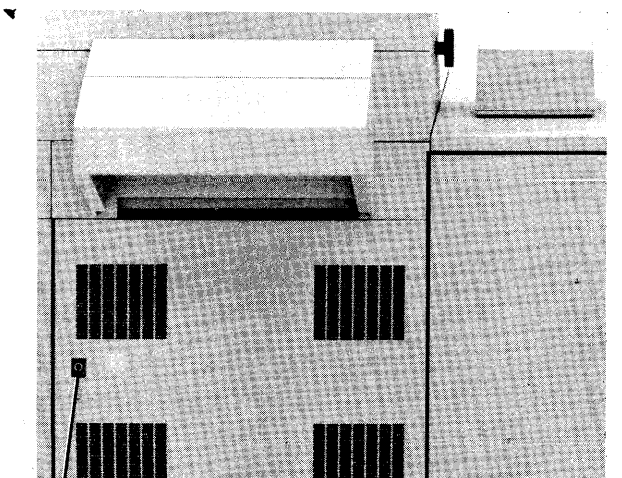


Figure 1. CE Control Panel Setting for Normal Processing

MAINLINE POWER SWITCH

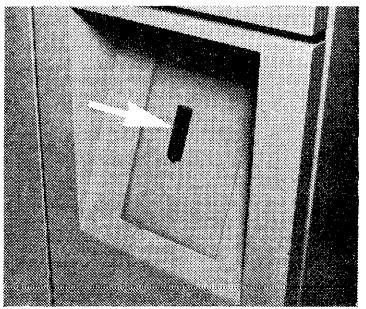
The MAINLINE POWER switch turns all power to the System/32 on or off. The POWER switch on the operator panel must be off when you set the MAINLINE POWER switch on.



MAINLINE
POWER
Switch

HOW TO INSERT THE DISKETTE

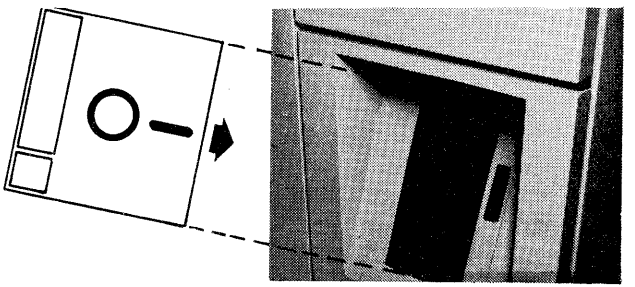
1. Press as shown and slide the cover to the right. Check to make sure the slot is empty.



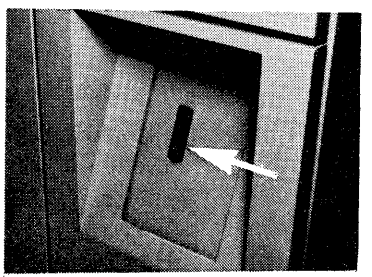
CAUTION

Be sure that you insert the diskette so that it rests against the back of the slot. Insert the diskette slowly, because it can bounce away from the back of the slot and not be fully seated. If it is not in all the way, the diskette can be damaged, and data may be lost.

2. Remove the diskette from its envelope and insert the diskette in the slot with the labels facing you as shown.

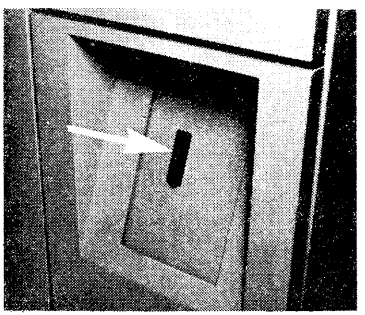


3. Close the cover by sliding it to the left until it latches.

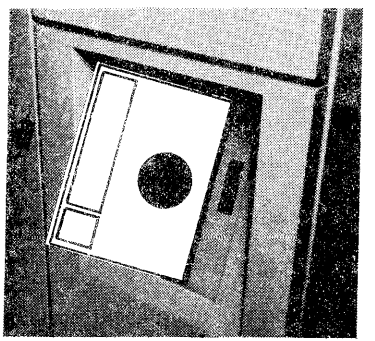


HOW TO REMOVE THE DISKETTE

1. Press as shown and slide the cover to the right.



2. Pull the diskette from the slot.



3. Label the diskette if required and put it in its envelope.

DISKETTE HANDLING

- Do not use damaged diskettes. They may cause errors.
- Put the diskette in its envelope when you are not using it or when you are writing on its label.
- Always handle the diskette by its label area to avoid touching the recording surface.
- Never write on a diskette with an erasable pencil. IBM recommends using fiber-tip or ballpoint pens for labeling diskettes.
- Do not use paper clips.
- Do not touch or clean the recording surface.
- Keep the diskette away from magnets. Any diskette exposed to a magnetic field will lose information.
- Do not expose the diskette to excessive heat or sunlight.
- Do not place heavy objects on the diskette.
- If mailing diskettes, place them in a box or a heavy cardboard mailer.

In short, HANDLE WITH CARE.

Contents

Keyboard

This section describes how you use the keyboard for system control programming functions. The keys have different meanings when you are running the various program products. The *Program Products* section explains how to use the keyboard for the utility program product.

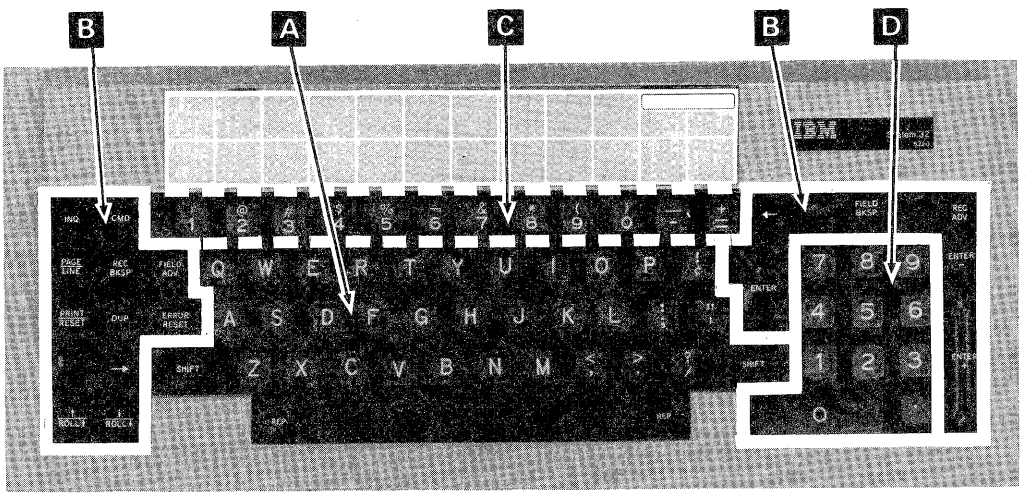
The keyboard consists of the following:

A Standard typewriter keys for entering alphabetic and numeric-only data.

B Function keys on the left and right of the keyboard for requesting system functions.

C Command keys (the top row of standard typewriter keys) used in conjunction with the CMD function key.

D Ten numeric keys for entering numeric-only data.



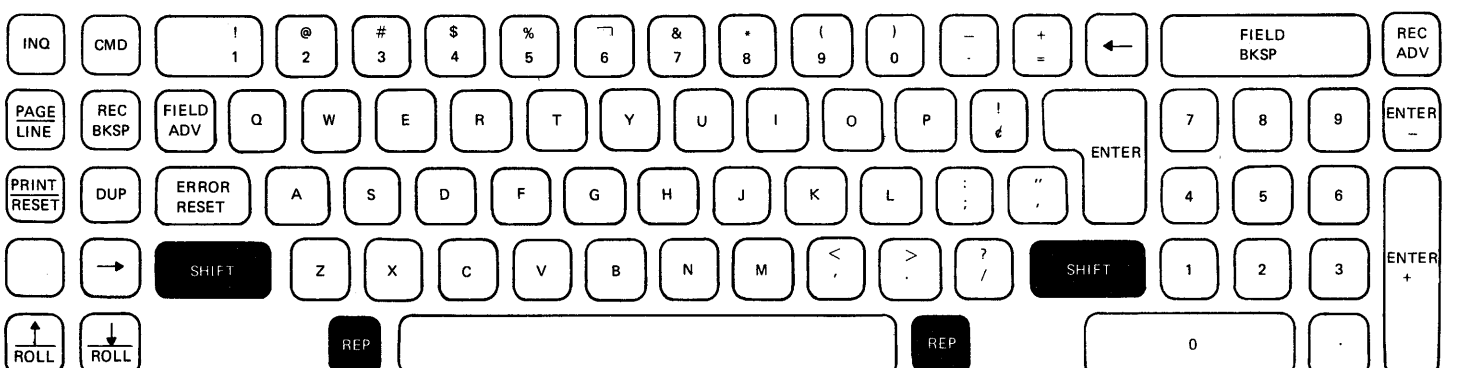
REP KEYS

REP (repeat) pressed simultaneously with another key, causes that character or function to be repeated until you release either key.

SHIFT KEYS

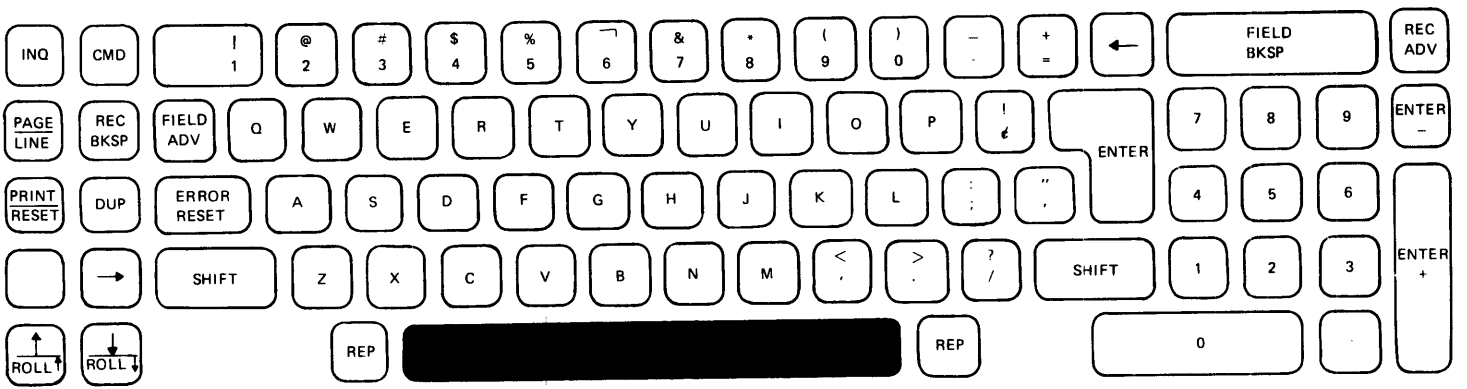
SHIFT pressed simultaneously with a two-purpose function key (for example, the PAGE/LINE key), causes the top function to be performed. If pressed simultaneously with a two-character key (for example, the # / 3 key), SHIFT causes the top character to be entered.

Note: If the dual case keyboard/display feature is installed, and if the keyboard is in upper/lower case mode, the shift keys can be used in conjunction with the alphabetic keys to enter upper and lower case alphabetic characters.



SPACE

SPACE causes the current position on the display screen to be blanked and the cursor to advance one position.



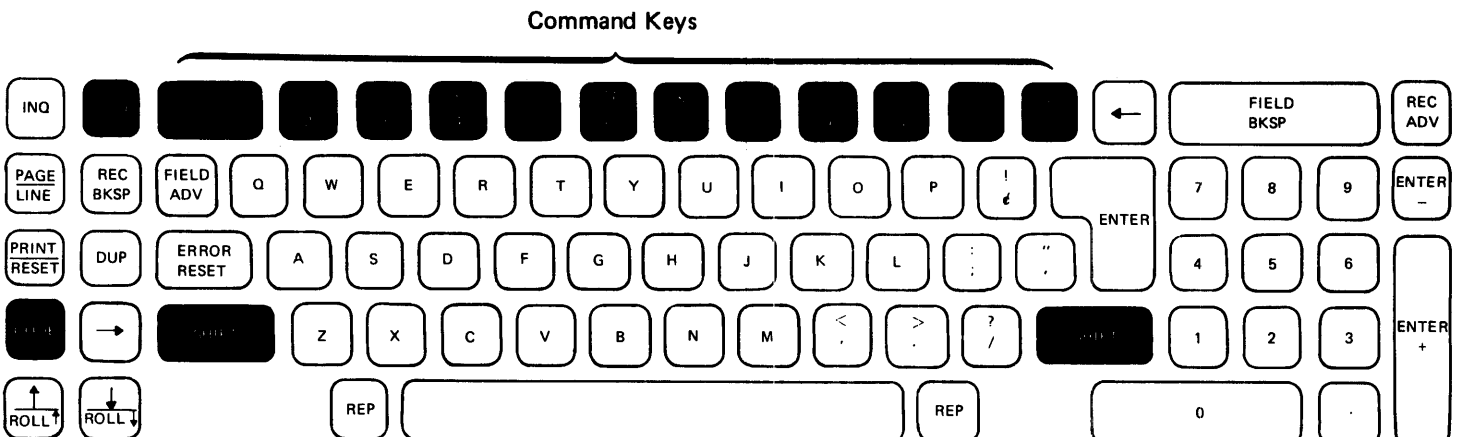
FUNCTION KEYS

CMD Key

CMD (command) indicates that the next key you press (this must be one of 12 top row keys of the typewriter keyboard with or without the SHIFT key) is a command key. The top row keys without the SHIFT key initiates commands 1 to 12 for the program currently executing. The top row keys with the SHIFT key initiates commands 13 to 24.

CODE Key

The CODE key, installed with the dual case keyboard and display feature, requires the SCP word processing feature for operation. The key is used to enter special purpose control codes for processing by user programs. In word processing applications, it can be used to specify such functions as tab, underscore, and required space.

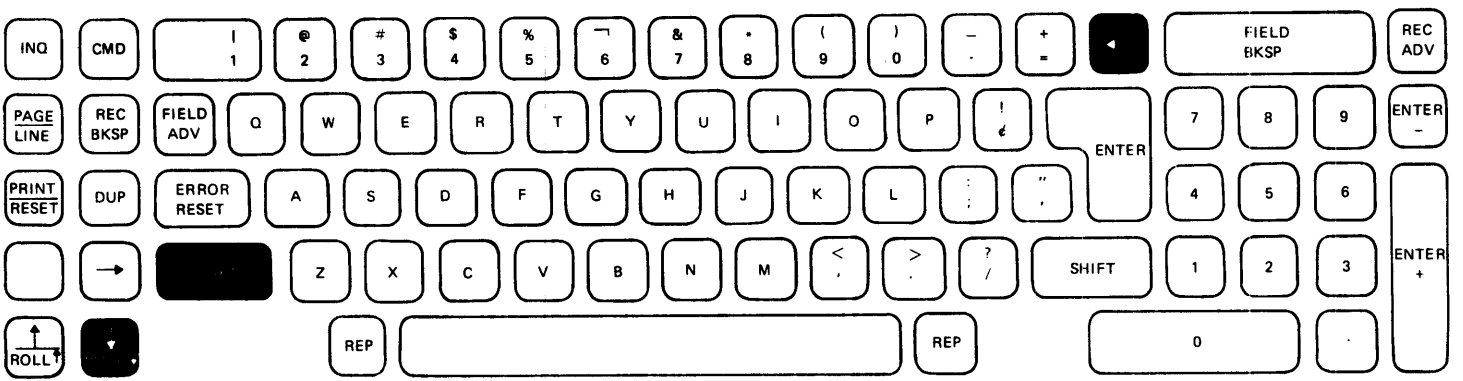


Cursor Down Key

Cursor Down (↓ with the SHIFT key) causes the cursor to move down one line from its current position, provided the new position is within the current record and not off the bottom of the display screen.

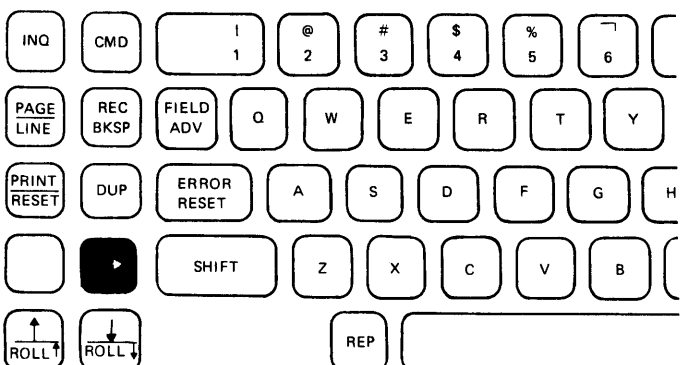
Cursor Left Key

Cursor Left (← without the SHIFT key) causes the cursor to move to the left one position, unless the cursor is in the first position of the record.



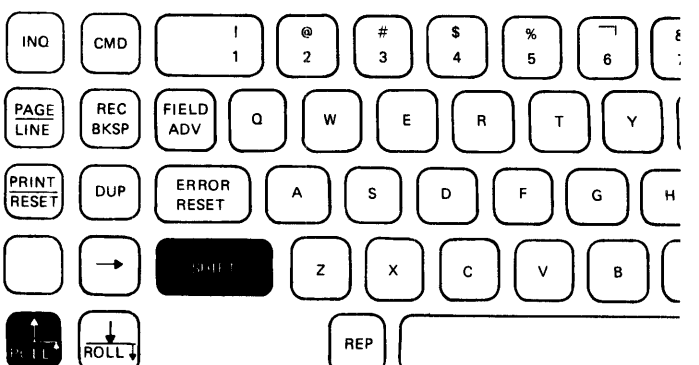
Cursor Right Key

Cursor Right (→ without the SHIFT key) causes the cursor to move to the right one position, unless the cursor is in the last position of the record. If the cursor is in the last position of a display screen line but not in the last position of a record, the display rolls up one line and the bottom line is set to blanks. The cursor is then placed in the first position of the blank line.



Cursor Up Key

Cursor Up (↑ with the SHIFT key) causes the cursor to move up one line from its current position, provided the new position is within the current record and not off the top of the display screen.

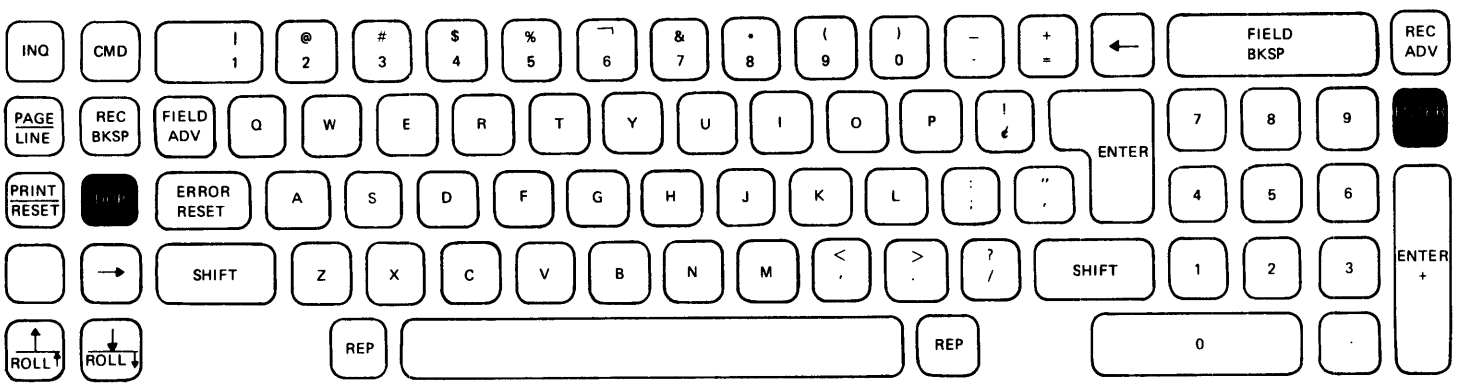


DUP Key

DUP (duplicate) duplicates the character in the corresponding position in the data record that you previously entered.

ENTER- Key

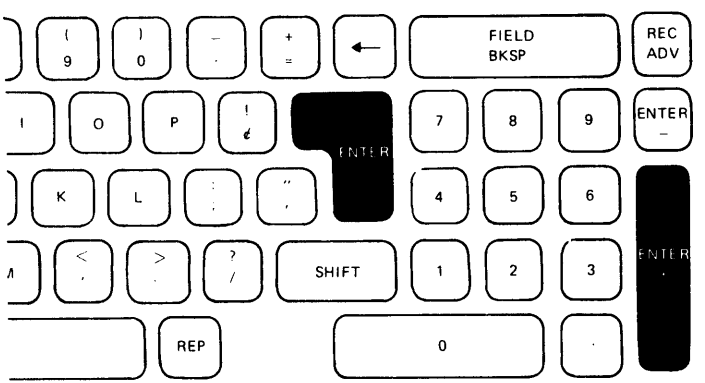
ENTER- signals the end of a field that has been entered and defines that field as negative. If the cursor is at a position within the record when the ENTER- key is pressed, the positions from the current position to the end of the field are set to blanks when the field is entered.



ENTER and ENTER+ Keys

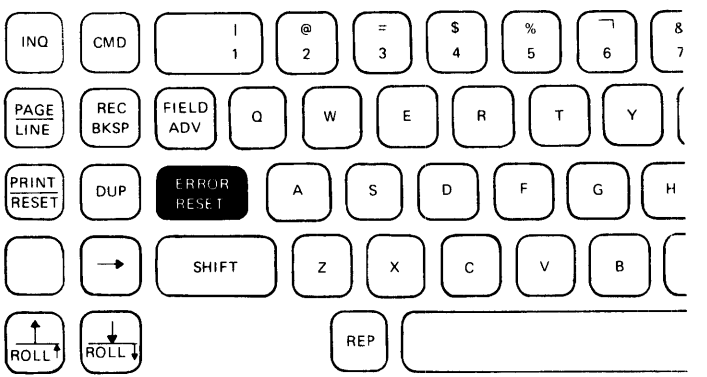
ENTER or ENTER+ signals the end of a field that has been entered and defines that field as positive. If the cursor is at a position within the field when ENTER+ or ENTER is pressed, the positions from the current position to the end of the field are set to blanks when the field is entered.

Note: Do not use the ENTER+ key when prompts, messages, or instructions request the ENTER key.



ERROR RESET Key

ERROR RESET readies the keyboard after an error and stops the display screen when it is flashing.



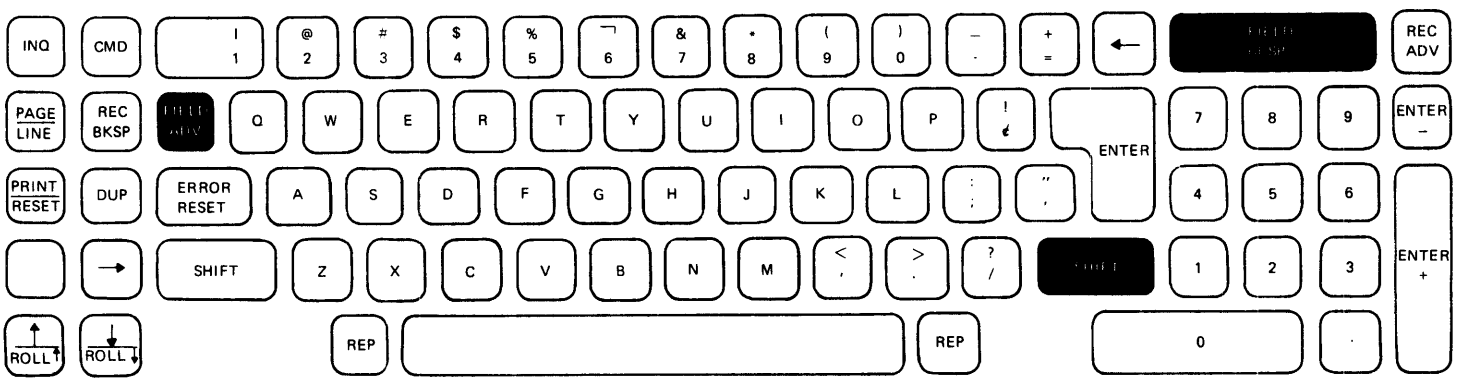
FIELD ADV Key

FIELD ADV (field advance) signals the end of the input for the current field.

FIELD BKSP Key (with SHIFT)

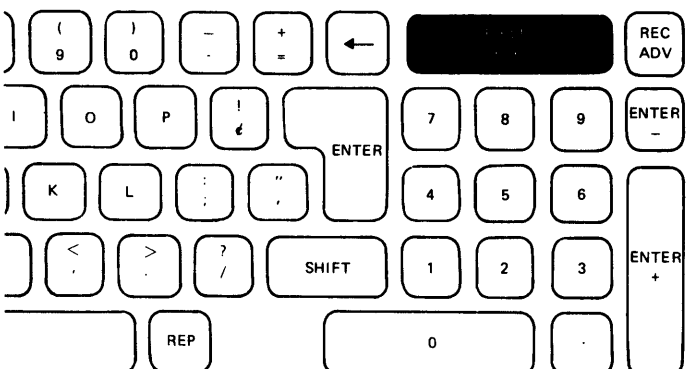
FIELD BKSP with the SHIFT key (field backspace or command key cancel) has two functions:

- It causes the cursor to move to the first position of the current field and blanks the field, or
- It cancels a command statement. If you choose a wrong but valid command key, press FIELD BKSP with the SHIFT key before you press ENTER.



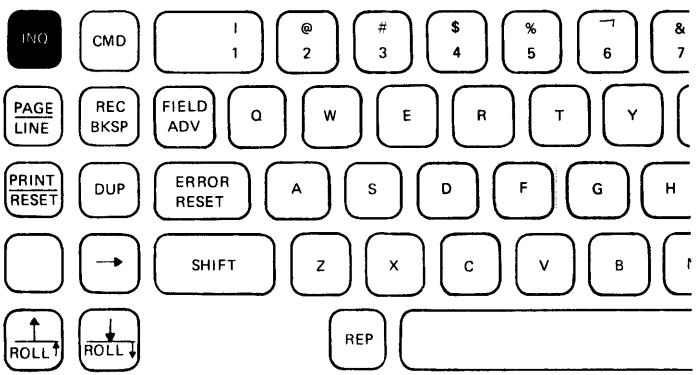
FIELD BKSP Key (without SHIFT)

FIELD BKSP without the SHIFT key (field backspace) causes the cursor to move to the first position of the current field.



INQ Key

INQ (inquiry) causes the program currently executing to be interrupted. A display appears on the display screen allowing you to return to the interrupted program, continue the inquiry and start another job, or terminate the job and close the file.



CAUTION

Never use the following utilities during inquiry:

$BACK	Backup library
$LOAD	Reload library
$PACK	Disk reorganization
$RBLD	Rebuild data file
$SETCF	Set

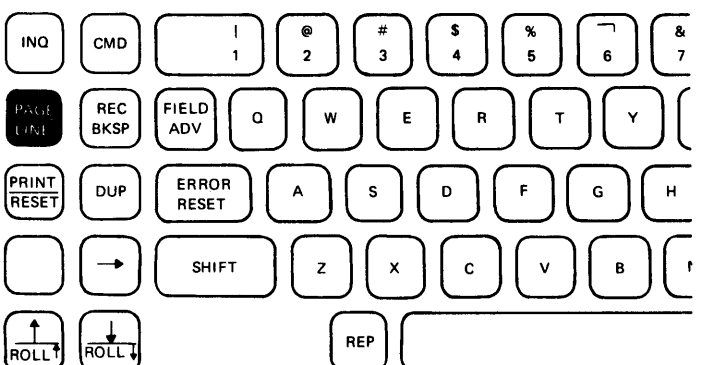
Do not use the following utilities on files that are being used by an interrupted program:

$BICR	Standard interchange
$COPY (including COPYALL)	
$DELET (including LABEL-ALL)	

See *Inquiry Option* in the *IBM System/32 System Control Programming Reference Manual,* GC21-7593, for additional information.

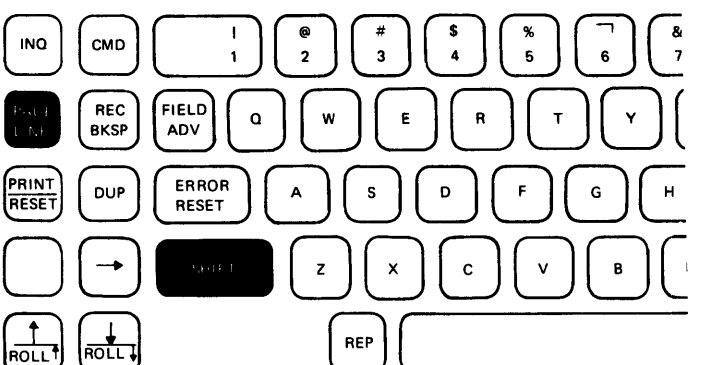
LINE Key

LINE without the SHIFT key causes the printer to skip to the next line, unless the printer is not ready.



PAGE Key

PAGE with the SHIFT key causes the form in the printer to skip to the first print line of the next page, unless the printer is not ready.



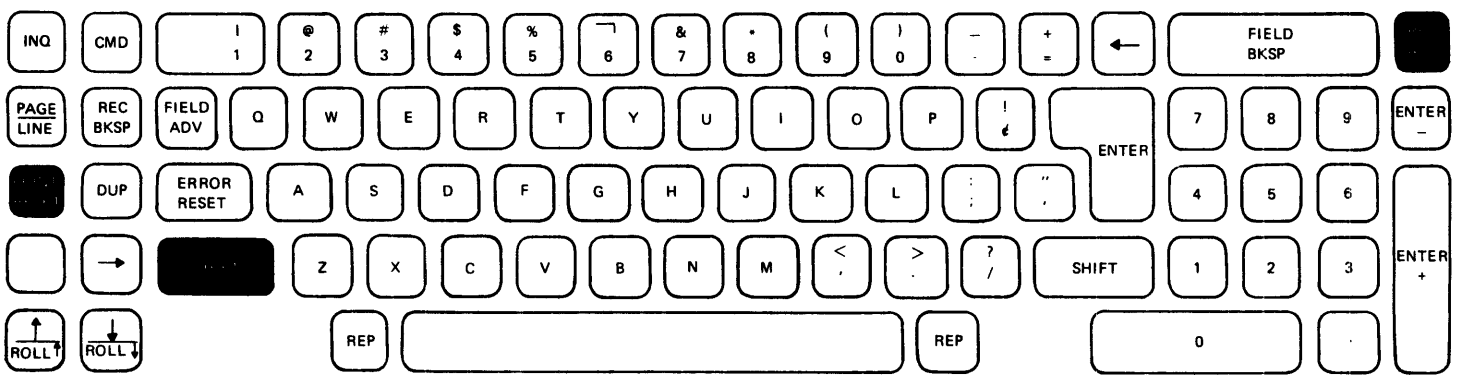
PRINT Key

PRINT with the SHIFT key causes the information that appears on the display screen to be printed, unless the printer is not ready. Wait until the display screen has been printed **before pressing any data or function keys on the keyboard.** Pressing a data or function key while the display is being printed may modify the printed information.

Note: If the printer has a 48-character print belt, all of the display screen characters may not be printed.

REC ADV Key

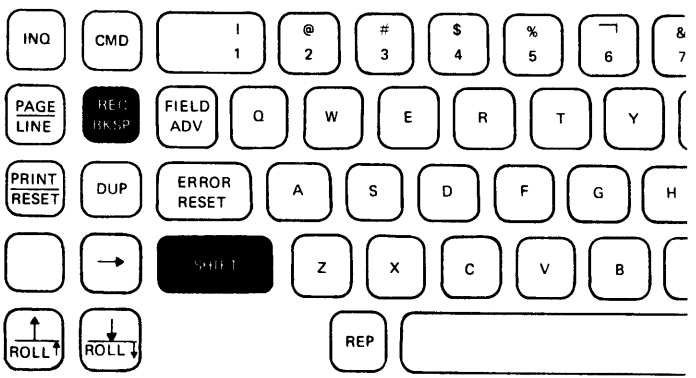
REC ADV (record advance) signals the end of the input for the current record.



REC BKSP Key (with SHIFT)

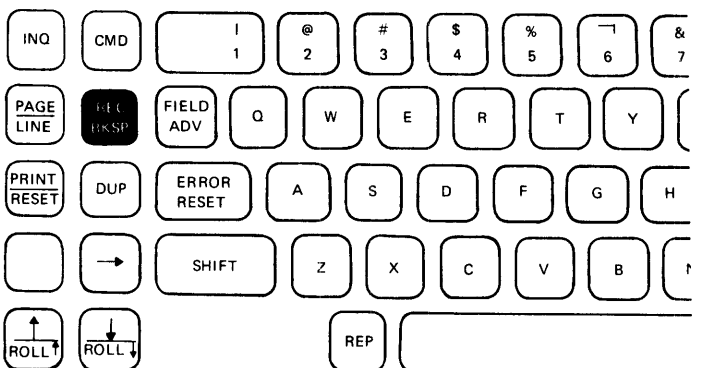
REC BKSP with the SHIFT key (record backspace or command key cancel) has two functions:

- It causes the cursor to move to the first position of the record and blanks the record, or
- It cancels a command statement. If you choose a wrong but valid command key, press REC BKSP with the SHIFT key before you press ENTER.



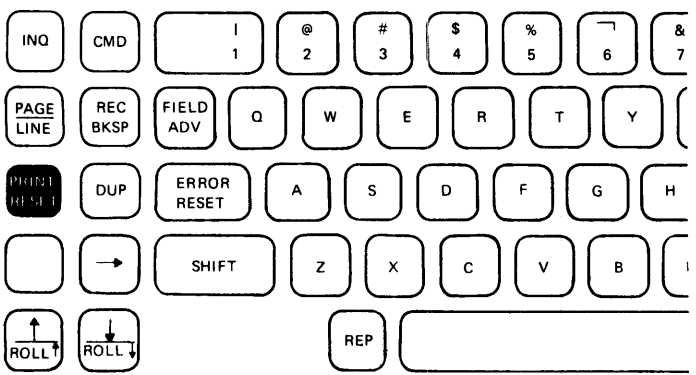
REC BKSP Key (without SHIFT)

REC BKSP without the SHIFT key (record backspace) causes the cursor to move to the first position of the current record.



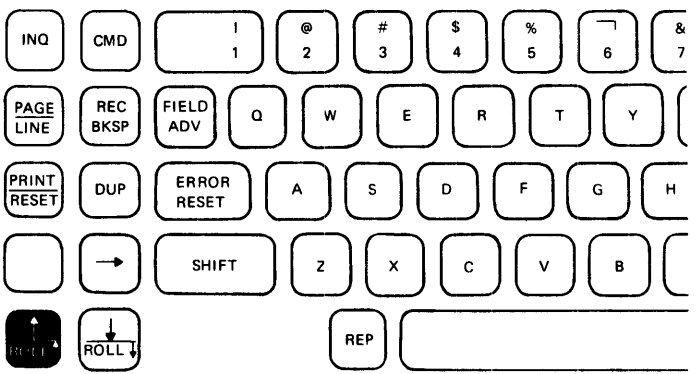
RESET Key

RESET without the SHIFT key defines the current line on the printer form as line 1 of the page, unless the printer is not ready. Press this key after you have aligned the first page of a set of forms as described by *How to Align the Forms to the First Print Line* in *Line Printer* in the *Printing* section.



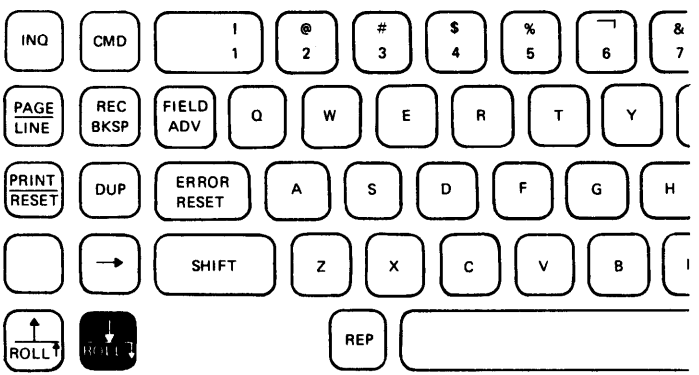
ROLL↑ Key

ROLL↑ without the SHIFT key (roll up) causes the next record to be displayed. The record may be one or more lines.



ROLL↓ Key

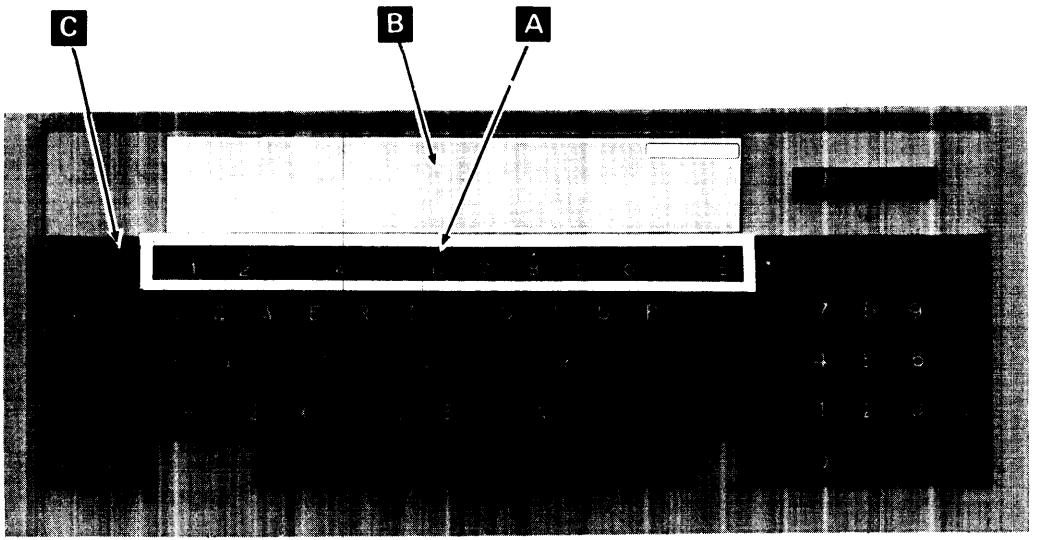
ROLL↓ without the SHIFT key (roll down) causes the previous record to be displayed. The record may be one or more lines. If you press ROLL↓ when the ←READY line is displayed, you automatically display six lines of the history file. You can use ROLL↓ to scan the history file. Press ENTER to return to the ←READY display.



COMMAND KEYS AND TEMPLATE

Command keys, the 12 top row keys of the typewriter keyboard **A**, are provided to help you initiate procedures and select functions in user programs. The specific definition of a command key can be different for each program.

Blank templates that fit on the keyboard above the row of command keys are available for your use (GX21-7638 or equivalent) **B**. For a specific program, the definition of each command key should be written on a template. When the program is to be run, the template should be inserted to indicate the command key definitions for the program.



Initiating Procedures

If a command key is to be used to initiate a procedure, that key must have been previously assigned a command statement. (The *IBM System/32 System Control Programming Reference Manual,* GC21-7593, explains how the assignment is done.)

Once the key has been assigned, the command can be entered as follows:

1. Press the CMD key C .
2. Press the command key (or the SHIFT key with the command key) that has been assigned to the command statement. The command statement appears on the display screen.
3. Enter parameters for the procedure, if required.
4. Press the ENTER key.

Note: If you choose a wrong, but valid, command key, press FIELD BKSP with SHIFT or REC BKSP with SHIFT before you press ENTER to cancel the command statement. Return to step 1.

Selecting Program Functions

If the program you are running is designed to accept command keys, you can use them as follows:

1. Press the CMD key C .
2. Press the command key (or the SHIFT key with the command key) to perform the desired function.
3. Enter necessary data.
4. Press the ENTER key.

Notes:

1. For some programs, such as the data file utility and source entry utility programs, you do not have to press the ENTER key in step 4.
2. If you choose a wrong, but valid, command key, press FIELD BKSP with SHIFT or REC BKSP with SHIFT before you press ENTER to cancel the command statement. Return to step 1.

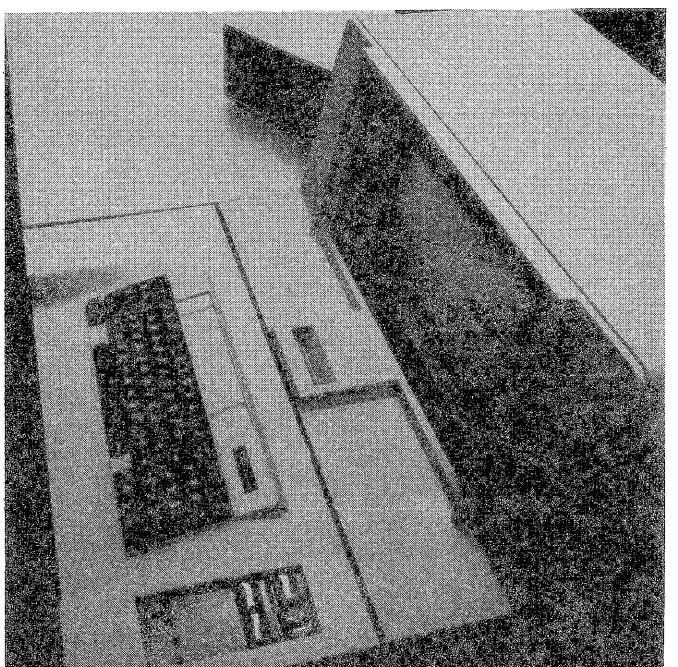
Contents

Note: It is recommended that you remove and discard the section (*Line Printer* or *Serial Printer*) that is not applicable to your printer.

Line Printer

The line printer provides you with printed output. It has the following characteristics:

- 132 print positions
- Interchangeable print belts
- Single and multiple line spacing
- 6 lines per inch vertical spacing
- 10 characters per inch horizontal spacing
- Replaceable ribbon cassette
- Forms thickness control for printing forms of varying thickness
- Pin feed carriage for printing continuous forms

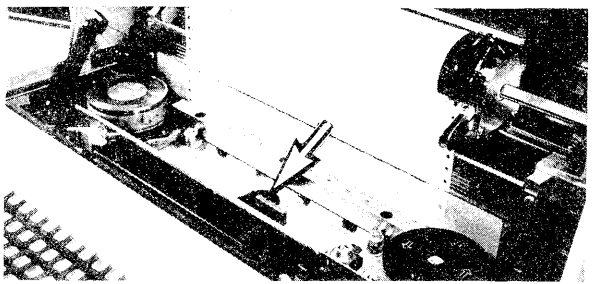


HOW TO PUT FORMS IN THE LINE PRINTER

1. Unlatch and open the printer cover.

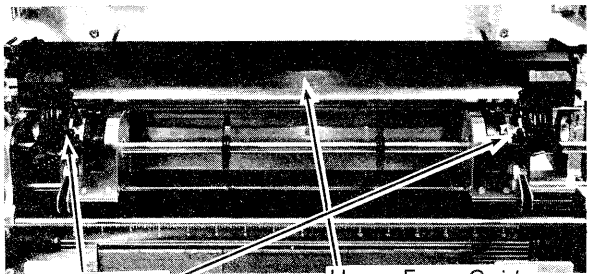
   DANGER
   Wait until the print belt stops before proceeding.

2. Pull the print unit release lever forward (toward you) to open the forms path.

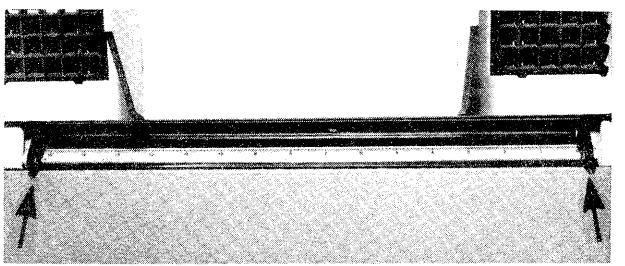


3. Open the tractor covers.

4. Press the upper form guide release bar. The guide will pop up.

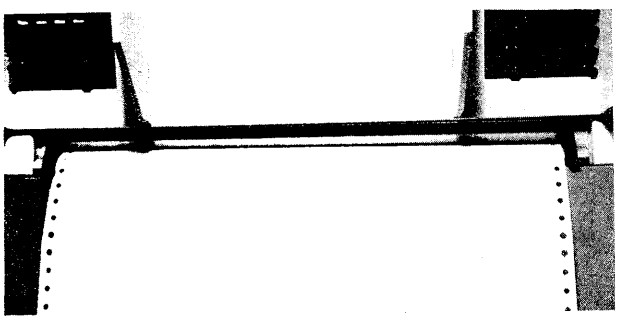


5. From behind the printer, slide the forms chute guides far enough apart so that the forms can be inserted.



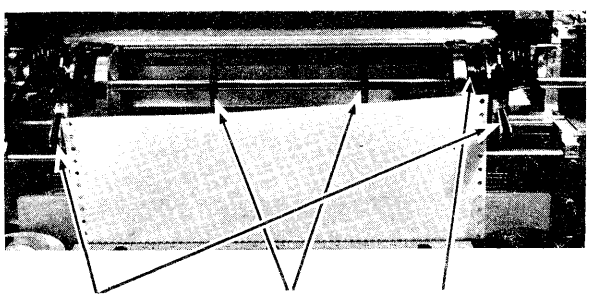
6. Insert about 15-20 inches (40-50 cm) of the forms squarely into the forms chute.

   The end of the forms should protrude from the forms path at the front of the printer.

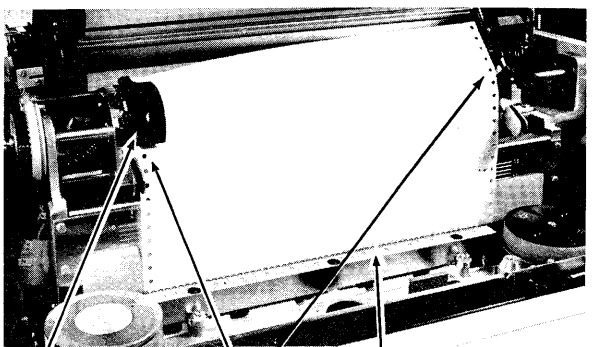


7. From the front of the printer, pinch each of the two tractor release levers together and move the tractors to fit the forms.

8. Slide each of the two center forms guides so they are equally spaced between the tractors.



9. Fit the holes on the left edge of the forms over the left tractor pins. (Pull more forms through the printer if necessary.) Close the left tractor cover. Fit the holes on the right edge of the forms over the right tractor pins. Be sure that the forms are square on the tractors, then close the right tractor cover.

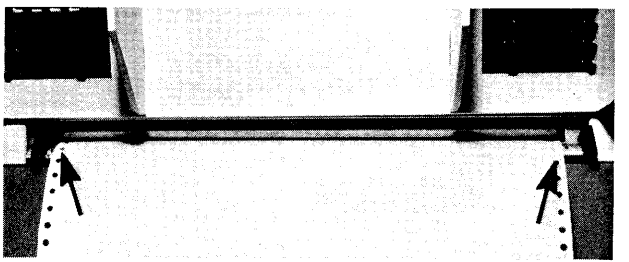


10. Check the alignment of the forms on the print position scale. If the form needs alignment, move the tractors to reposition the form.

Note: The tractors should keep the form taut, but not so tight that the tractor pins tear the holes in the edges of the form.

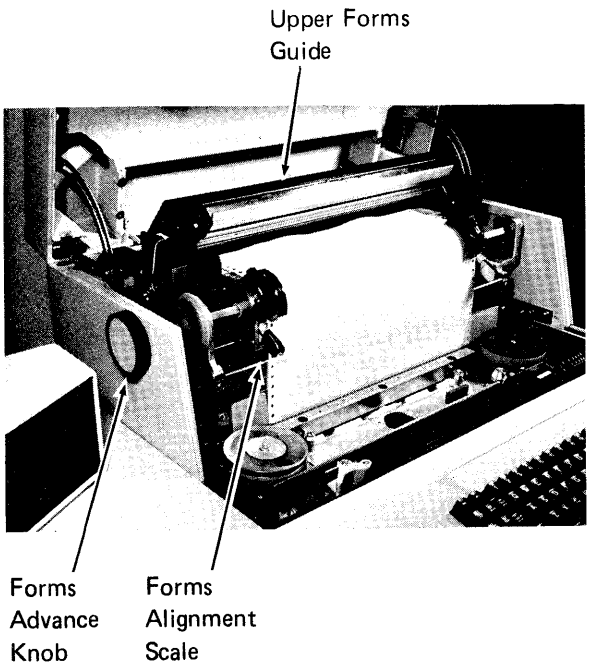
13. Note the number on the front forms alignment scale where the left edge of the form is positioned. Use this number in the next step (step 14) for aligning the form in the rear forms chute.

14. From behind the printer, align the right edge of the forms to the same number on the rear forms alignment scale that you noted in step 13. Adjust the two forms chute guides until they are near the edges of the forms.

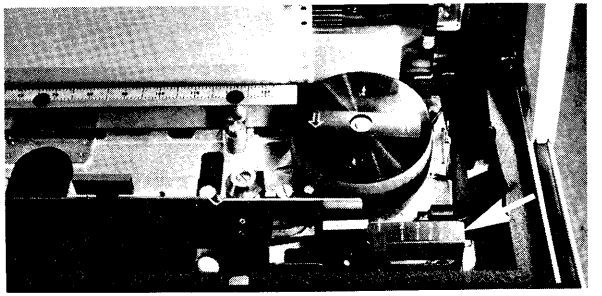


15. Move the forms input stack so that the forms feed squarely into the printer.

11. Press the left forms advance knob in and then turn it to feed forms into the upper forms guide. To help prevent forms jams, feed the forms through the guide until they begin to emerge at the back of the printer. Close the upper forms guide.

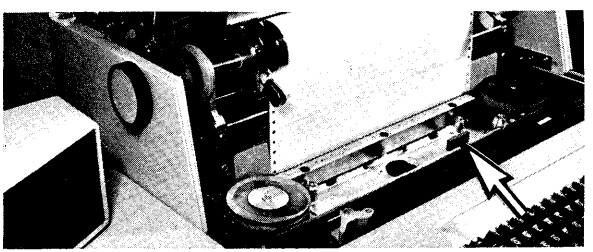


12. Set the forms thickness control to the setting that corresponds to the number of parts in the form being used. For example, if a two-part form is being used, set the control to 2. The setting of the forms thickness control can be varied slightly to achieve optimum print quality, ribbon life, and forms feeding. However, operating the printer with the control set incorrectly may decrease ribbon life and cause poor print quality.

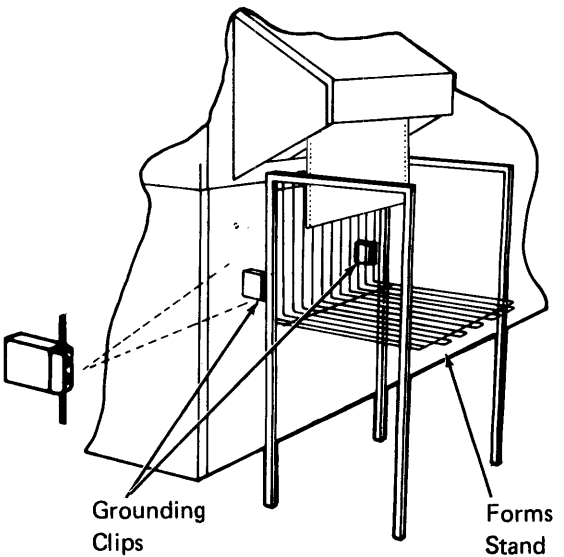


16. Push back on the print unit release lever until it latches.

Note: The first line can be any line on the form, depending on the job you are running. Continue by aligning the forms to the first print line.



17. Be sure that the forms stand is secure in its grounding clips. If the stand is not fastened securely, paper jams may occur as a result of a static buildup in the forms.



18. For optimum stacking, advance the forms until two or more forms lie in the forms stand.

HOW TO ALIGN THE FORMS TO THE FIRST PRINT LINE

1. Perform the IPL only if you are initially starting the System/32.

2. Push in on the left forms advance knob and slowly advance the forms until the perforation aligns with line 4 on the print line indicator. If you advance the forms too far, turn the forms knob backward and remove any slack from the paper by pulling it from the back of the printer.

3. With the left forms knob released (not pushed in), turn the forms back three spaces and remove the slack. Line 1 of the forms is now the first print line.

4. Close and latch the printer cover and then press the PRINT/RESET key to reset the line counter to line 1.

5. If you are printing on prelined forms, you may need to make a slight vertical adjustment of the paper. Do this by pressing the STOP key on the operator panel, pushing in on the left forms advance knob, and turning the paper forward or backward in the printer as required. Release the knob and press the START key on the operator panel to continue.

6. Some applications require that the first print line be a line other than line 1 of the forms. If line 2 or 3 is the first print line, back the forms two spaces or one space respectively in step 3. If line 4 or greater is the first print line, skip step 3 and align the forms perforation with the actual line number on the print line indicator.

HOW TO REMOVE FORMS FROM THE LINE PRINTER

Note: If forms are torn off while the printer is printing, the print line may be uneven.

1. Press the STOP key on the operator panel. If necessary, advance the printed forms to a tear-off point using the SHIFT and PAGE/LINE keys; then (from the back of the printer), carefully tear off the forms.

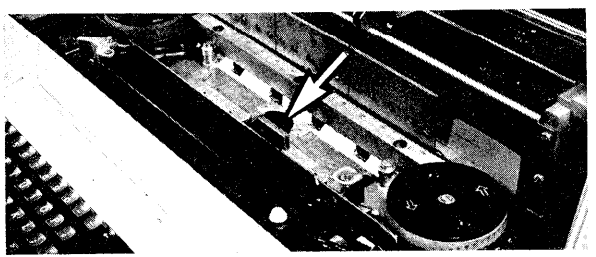
2. Do one of the following:
   a. If you wish to continue printing on forms remaining in the printer, realign forms by doing steps 4, 5, and 6 under *How to Align the Forms to the First Print Line.*
   b. If you wish to remove unused forms, do the following:
      - Open the printer cover, upper forms guide, tractor covers, and print unit (see *How to Put Forms in the Line Printer,* steps 1, 2, 3, and 4).
      - Remove the forms from the upper forms guide and lift them off the tractor pins.
      - From the rear of the printer, carefully pull the forms out through the forms chute.

HOW TO REMOVE THE RIBBON CASSETTE

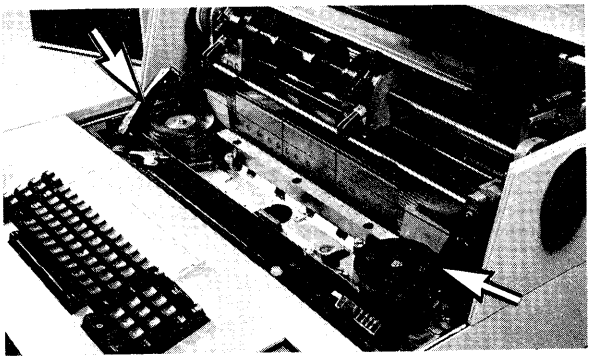
1. Unlatch and open the printer cover.

   DANGER
   Wait until the print belt stops before proceeding.

2. Pull the print unit release lever forward (toward you).

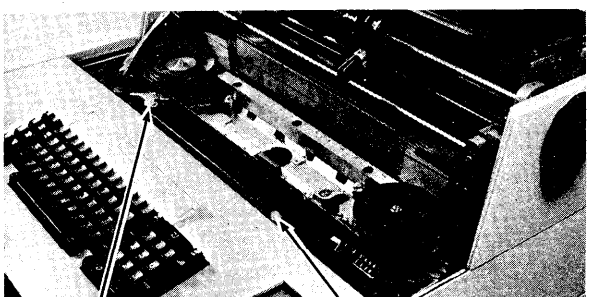


3. Raise both ribbon guides.



4. Push the ribbon drive release lever away from you to open it.

5. Press down on the ribbon cassette release button and slide the cassette to the right until it is free.



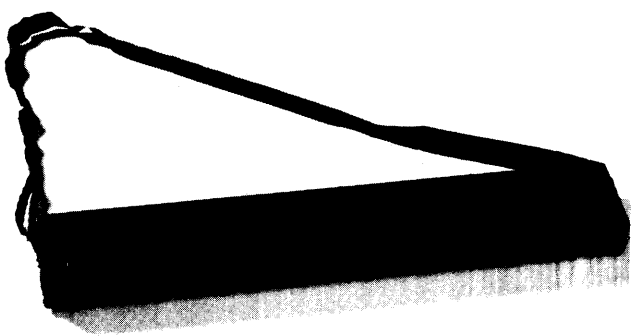
6. Lift the cassette from the printer and remove the ribbon from the ribbon guides.

7. Discard the ribbon and the cassette.

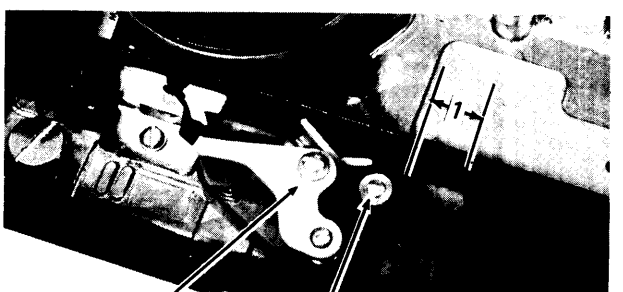
HOW TO REPLACE THE RIBBON CASSETTE

1. Remove the ribbon if it is still in the printer (see *How to Remove the Ribbon Cassette).*

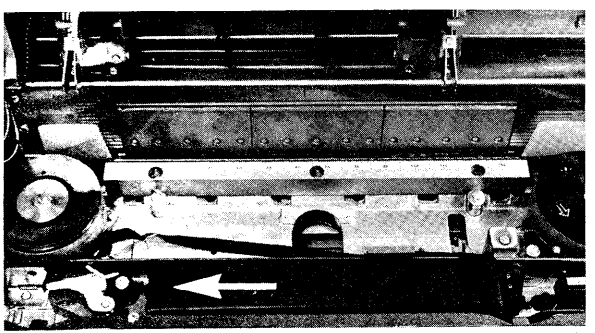
2. Pull about 6 inches (15 cm) of ribbon from the left end of the cassette and place the ribbon between the ribbon drive roll and the release lever.



3. Place the ribbon cassette in the printer so that the left end of the cassette is about 1 inch (2.5 cm) from the ribbon drive roll. (The right end of the cassette will cover the release button.)



4. Press down on the cassette and slide it to the left until the release button slides up to hold the cassette. Be sure that the ribbon does not jam between the ribbon drive roll and the ribbon cassette.

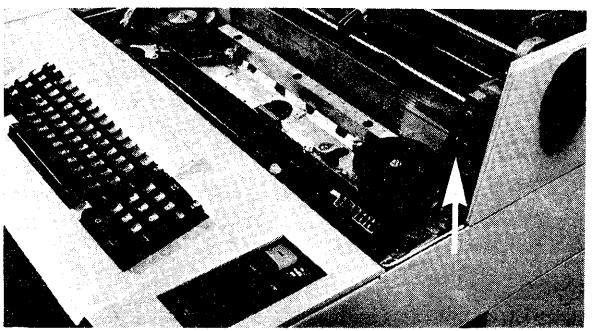


5. Feed the ribbon through the slot in the bottom of the left guide, then on around the guide. Be sure that the ribbon is not twisted.

6. Close the ribbon drive release lever.

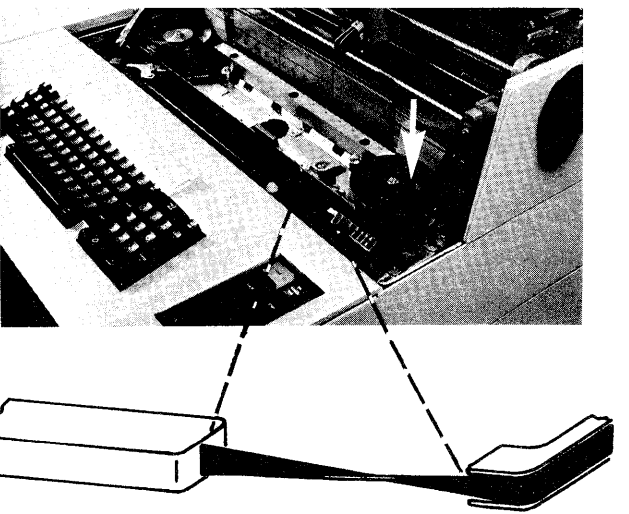
Ribbon Drive Release Lever

7. Pull about 12 inches (30 cm) of ribbon out of the right end of the cassette and feed the ribbon from the left guide on around the right guide.



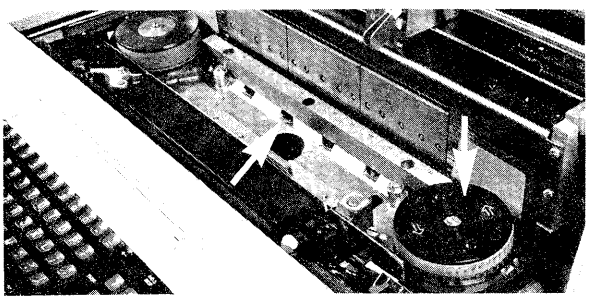
8. Take up any extra ribbon slack by rotating the right pulley counterclockwise. When the ribbon is tight, it should be twisted as shown.

9. Lower the ribbon guides.



10. Turn the right pulley counterclockwise to feed the ribbon down between the print belt and the ribbon shield. Continue rotating the pulley to make sure that the ribbon is feeding properly.

11. Close the print unit by pushing back on the print unit release lever until it latches.



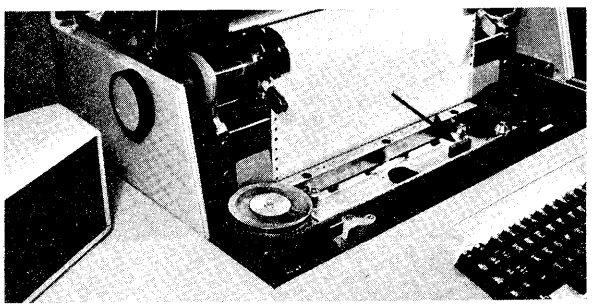
12. Close and latch the printer cover.

HOW TO REMOVE THE PRINT BELT

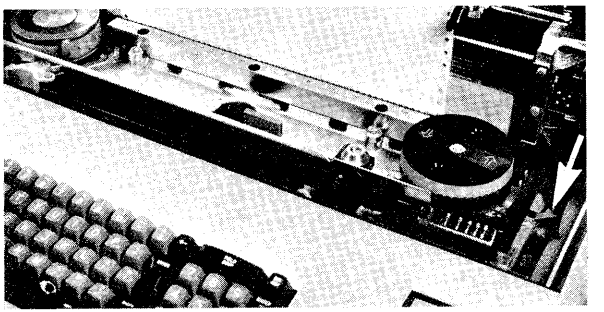
1. Unlatch and open the printer cover.

> **DANGER**
> Wait until the print belt has stopped. Be careful when handling the print belt; the edges are sharp.

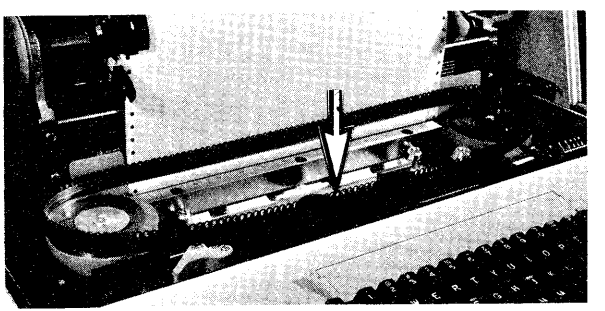
2. Pull the print unit release lever forward (toward you).



3. Pull the print belt release lever forward (toward you).



4. Lift the print belt from the printer and put the belt in its container.

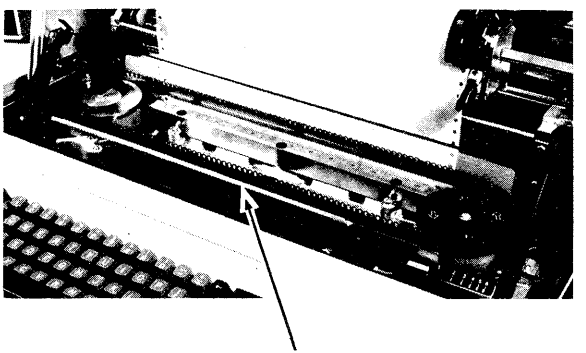


HOW TO REPLACE THE PRINT BELT

1. Raise both ribbon guides.

2. Push the print belt release lever back as shown.

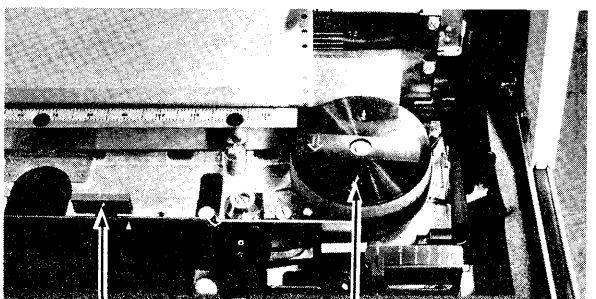
3. Hold the print belt with the type up, and place it carefully and evenly around both pulleys and behind the belt guard. The belt does not have to be seated on the bottom of the pulleys.



4. Turn the right pulley counterclockwise and watch the print belt as it moves down on the pulleys. If the belt does not move down, pull the print belt release lever forward, remove the belt, and check for obstructions. Then return to step 2.

5. Lower the ribbon guides.

6. Turn the right pulley counterclockwise several times to make sure that the print belt and the ribbon are operating correctly.



7. Close the print unit by pushing back on the print unit release lever until it latches.

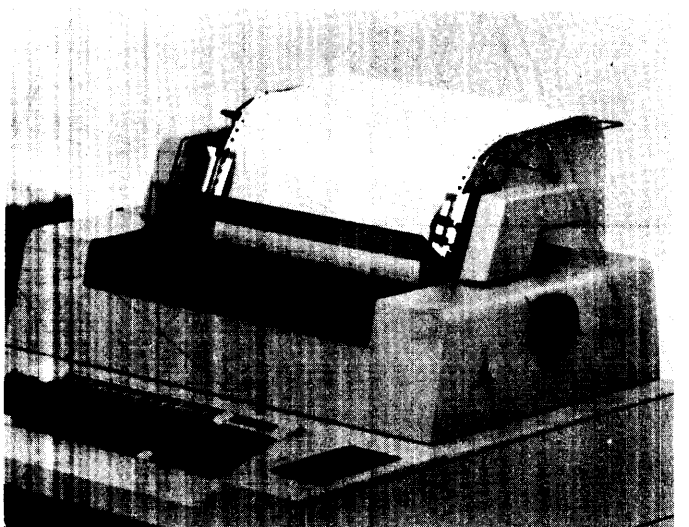
8. Close and latch the printer cover.

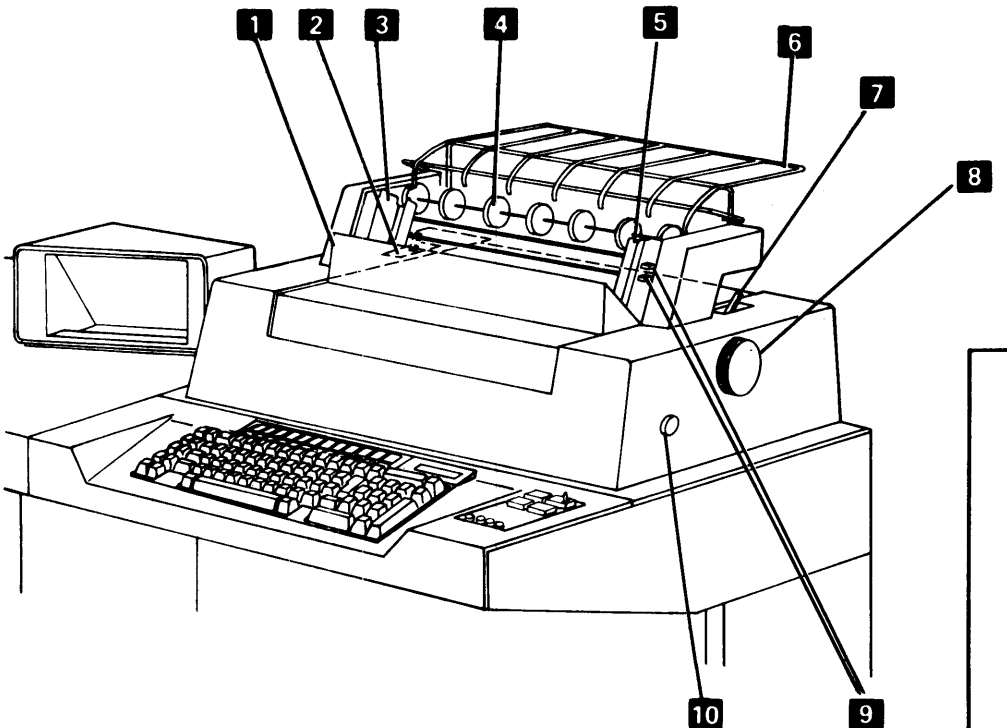
If you install a print belt with a character set different from the one you removed from the printer, you must also change the print image in the processing unit. To do this, use the SET command statement as described in the *Command Statements* section.

Serial Printer

The serial printer provides printed output. It has the following characteristics:

- 132 print positions
- Single and multiple line spacing
- 6 lines per inch vertical spacing
- 10 characters per inch horizontal spacing
- Replaceable ribbon
- Forms thickness control for printing forms of varying thickness
- Pin feed carriage for printing continuous forms
- Single form/ledger cards print capability

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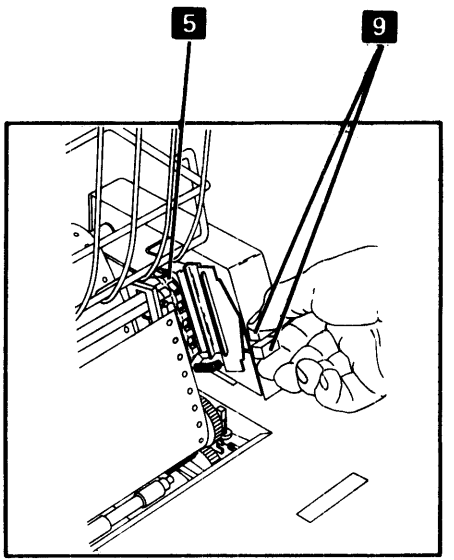
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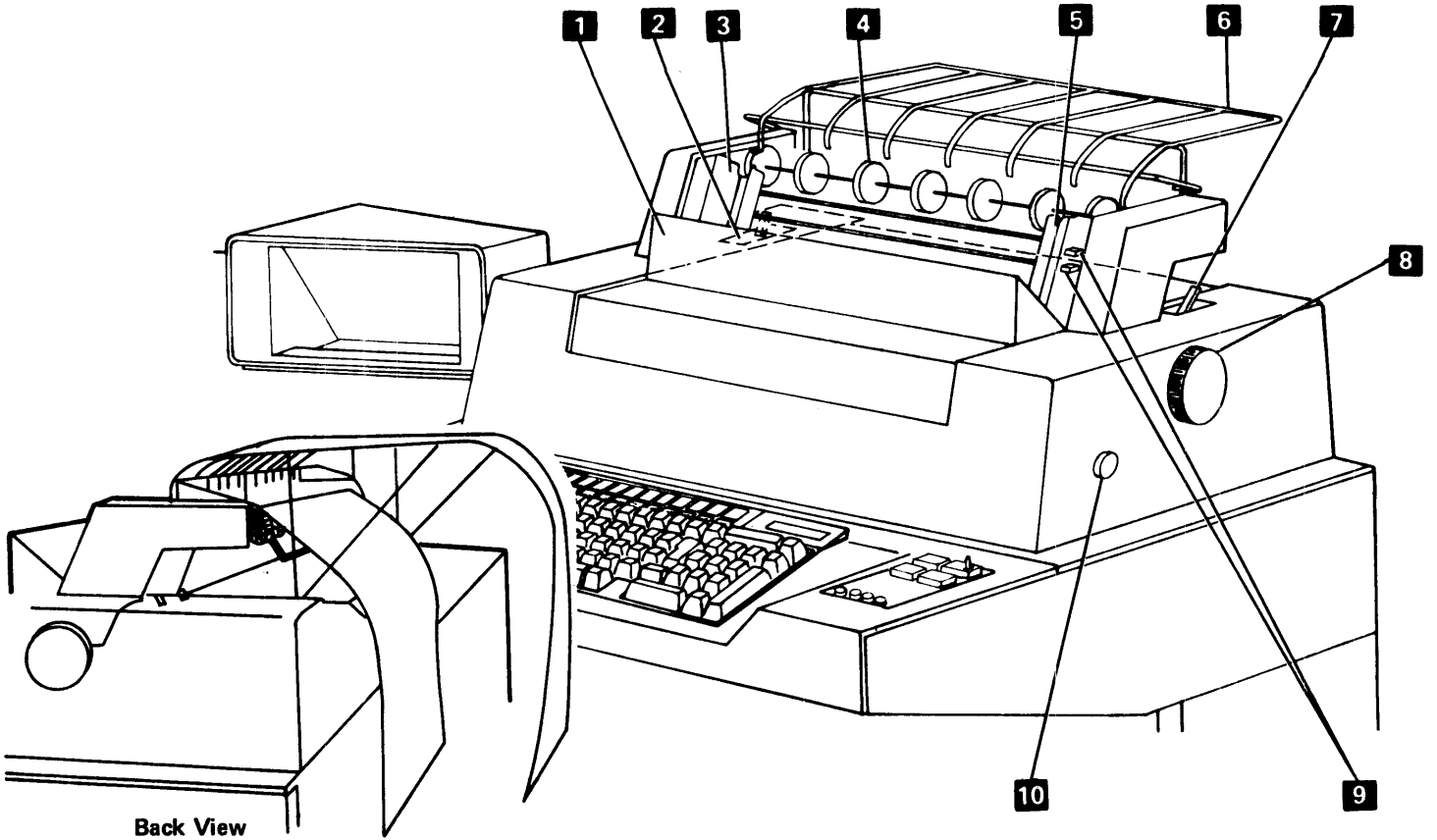
HOW TO PUT SINGLE-PART CONTINUOUS FORMS IN THE SERIAL PRINTER

1. Lift the plastic canopy 1 and pivot it toward the front of the machine.
2. Push the left margin forms guide all the way to the left.
3. Push the print head to its leftmost position.
4. Place the forms guide rack 6 in its vertical position.
5. Push the paper release lever 7 back (away from you).
6. Insert the forms from behind the printer. The side to be printed must be facing down.
7. Place the paper over the rollers 4, behind the tractors 3 and 5, and behind the platen, ensuring that the paper covers the slot in the platen.
8. Turn either paper advance knob 8 to move the paper around the platen and up to the tractors.
9. From the front of the printer, open both tractor covers.
10. Pull the paper release lever 7 forward.
11. Return the form guide rack 6 to its horizontal position.
12. Pull the paper up so it is straight in the printer, and fit the left margin holes over the left tractor pins.
13. Close the left tractor cover.
14. Pinch the two tractor positioning knobs 9 on the right tractor and move the tractor to align its pins with the right margin holes.



Back View

15. Fit the right margin holes over the tractor pins. Check that the paper is aligned properly on the left and right tractor pins.

16. Close the right tractor cover.

17. Turn either paper advance knob **8** to position the form for the first line to be printed. (The horizontal red line on the print head indicates the bottom of the print line.) The paper should feed over the form guide rack **6**.

    Note: To move the form backward, turn the paper advance knob **8** backward and pull the form from behind the printer to keep the form from buckling.

18. Check that the forms mode selector switch **2** is pushed to the rear for printing continuous forms.

19. Press PRINT/RESET.

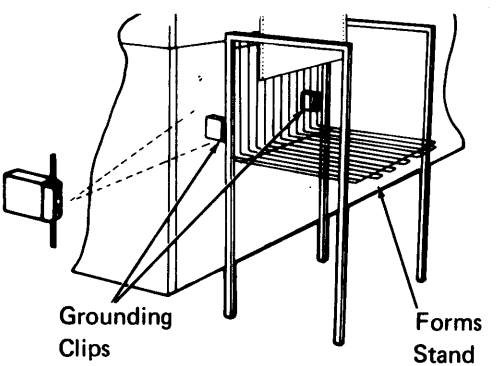
20. Adjust the forms thickness control (refer to *How to Adjust the Forms Thickness Control* in this section).

21. Return the plastic canopy **1** to its original position.

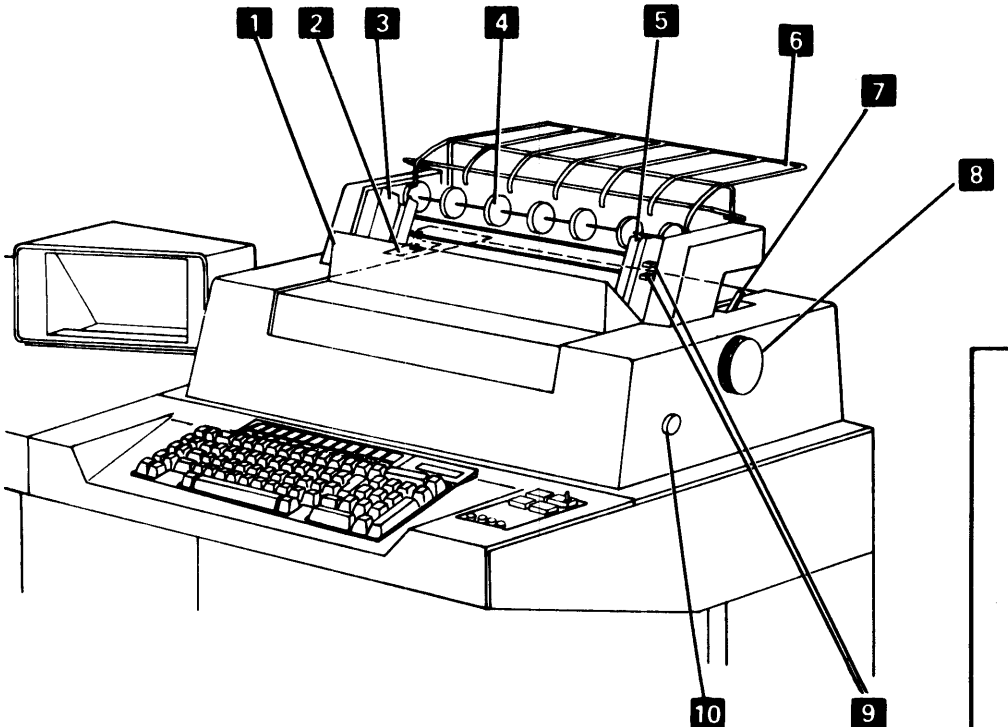
22. If necessary, print head alignment with the first print position can be made with the horizontal fine adjustment knob **10** and the left and right tractors **3** and **5**. Maximum adjustment is two print positions.

    Note: The paper must be inserted properly through the forms guide rack to ensure correct paper tension. See the back view.

23. Be sure that the forms stand is secure in its grounding clips. If the stand is not fastened securely, paper jams may occur as a result of a static buildup in the forms.



24. For optimum stacking, advance the forms until two or more forms lie in the forms stand.


1
2
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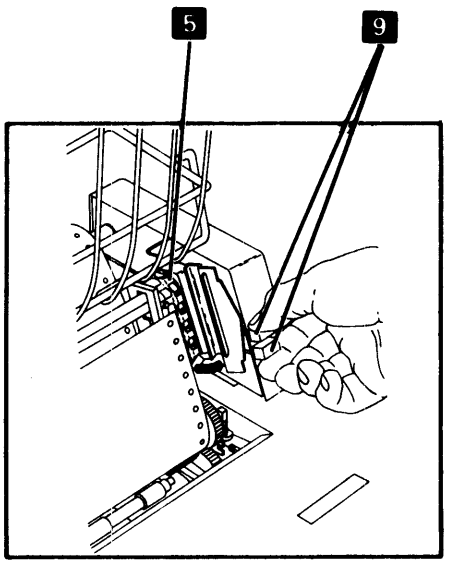
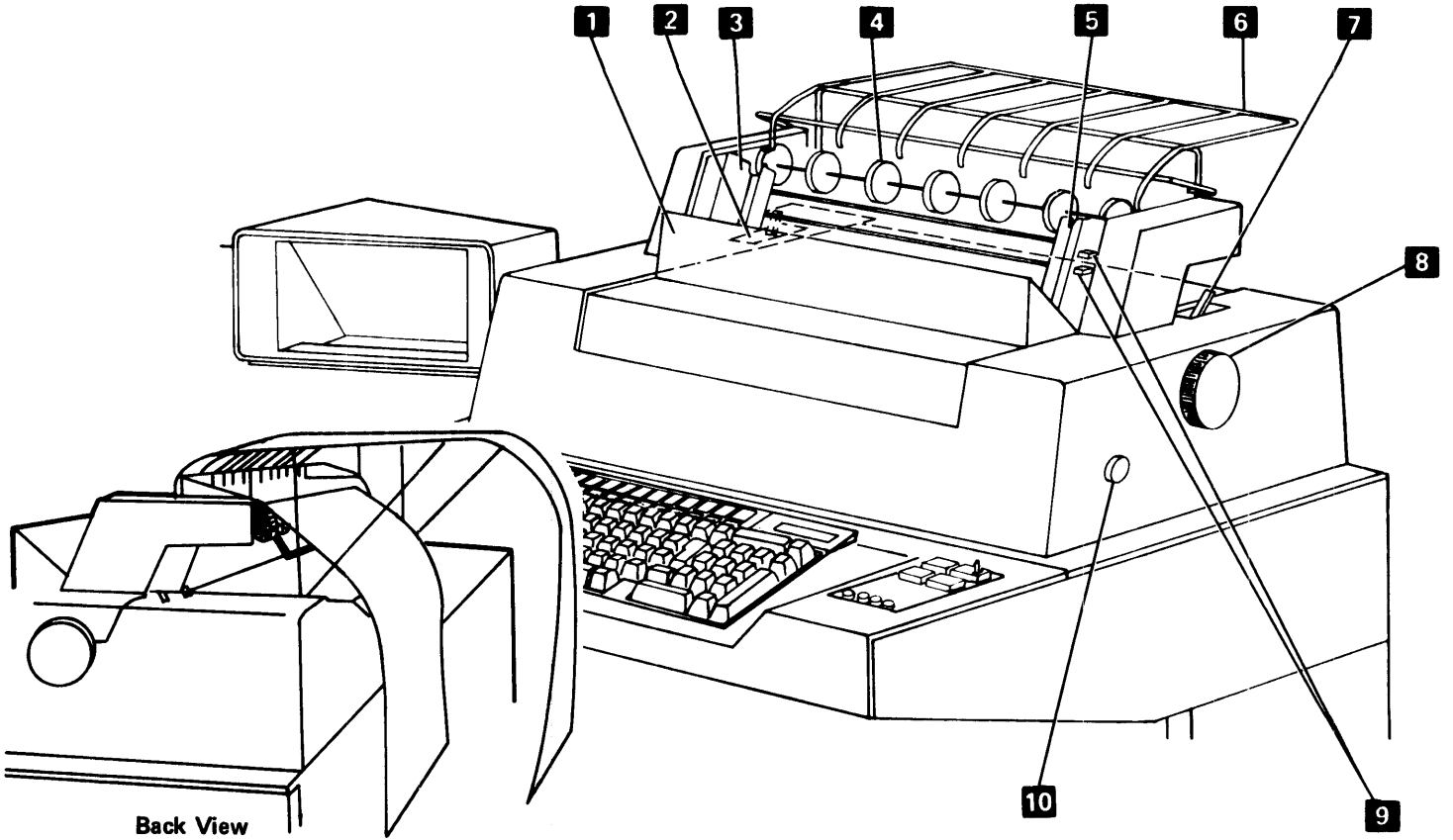

5
9

HOW TO PUT MULTIPLE-PART CONTINUOUS FORMS IN THE SERIAL PRINTER

1. Lift the plastic canopy 1 and pivot it toward the front of the machine.
2. Push the left margin forms guide all the way to the left.
3. Push the print head to its leftmost position.
4. Ensure that the paper release lever 7 is toward the front of the machine.
5. Insert the forms from behind the printer. The side to be printed must be facing down.
6. Place the paper over the rollers 4, behind the tractors 3 and 5, and behind the platen, ensuring that the paper covers the slot in the platen.
7. Pull the paper release lever 7 toward the back of the machine.
8. Turn either paper advance knob 8 to move the paper around the platen and up to the tractors.
9. From the front of the printer, open both tractor covers.
10. Pull the paper release lever 7 forward.
11. Pull the paper up so it is straight in the printer, and fit the left margin holes over the left tractor pins.
12. Close the left tractor cover.
13. Pinch the two tractor positioning knobs 9 on the right tractor and move the tractor to align its pins with the right margin holes.



Back View

14. Fit the right margin holes over the tractor pins. Check that the paper is aligned properly on the left and right tractor pins.

15. Close the right tractor cover.

16. Turn either paper advance knob **8** to position the form for the first line to be printed. (The horizontal red line on the print head indicates the bottom of the print line.) The paper should feed over the form guide rack **6**.

    Note: To move the form backward, turn the paper advance knob **8** backward and pull the form from behind the printer to keep the form from buckling.

17. Check that the forms mode selector switch **2** is pushed to the rear for printing continuous forms.

18. Press PRINT/RESET.

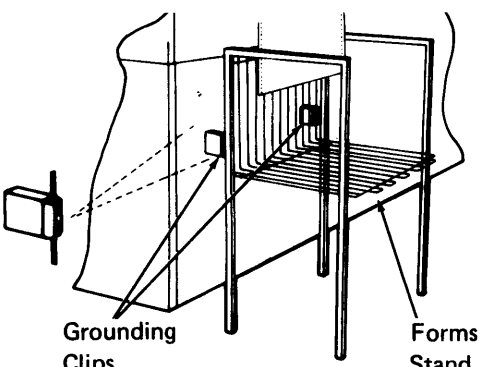
19. Adjust the forms thickness control (refer to *How to Adjust the Forms Thickness Control* in this section).

20. Return the plastic canopy **1** to its original position.

21. If necessary, print head alignment with the first print position can be made with the horizontal fine adjustment knob **10** and the left and right tractors **3** and **5**. Maximum adjustment is two print positions.

    Note: The paper must be inserted properly through the forms guide rack to ensure correct paper tension. See the back view.

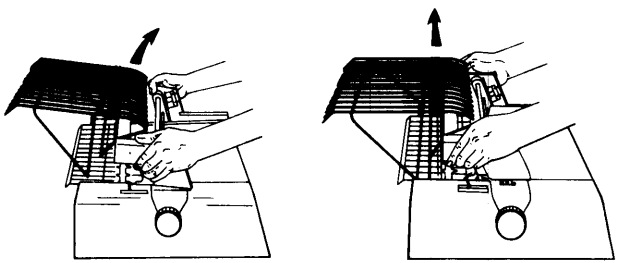
22. Be sure that the forms stand is secure in its grounding clips. If the stand is not fastened securely, paper jams may occur as a result of a static buildup in the forms.



23. For optimum stacking, advance the forms until two or more forms lie in the forms stand.

HOW TO PUT SINGLE FORM/LEDGER CARDS IN THE SERIAL PRINTER

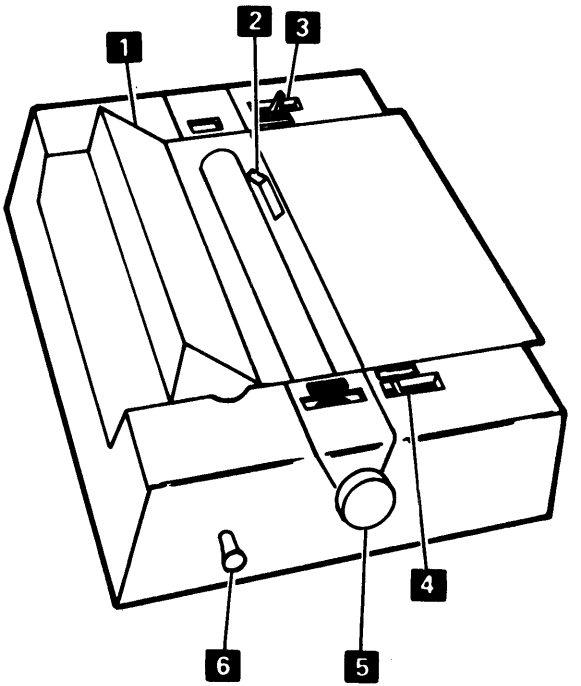
1. From the front of the printer, remove the forms tractor unit by pivoting it toward you (as shown) until the rear *legs* snap free. Then lift straight up on the unit and set it aside.



2. Lift the plastic canopy **1** and move it forward (toward you).

3. Push the print head to its leftmost position.

4. Set the left margin forms guide **2** (if the guide is set more than 1 inch from its leftmost position, form damage can occur during the printing process).



5. Push the paper release lever **4** back (away from you).

6. Check that the forms mode selector switch **3** is forward.

7. Insert the single form/ledger card as in typewriter operation, aligning it against the left margin forms guide and pushing the form behind the platen until it stops.

8. While maintaining pressure on the document with one hand, turn the paper advance knob **5** with the other hand until the line on the print head paper guide aligns with the first line to be printed.

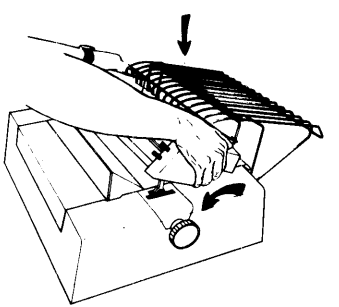
9. Adjust the forms thickness control; refer to *How to Adjust the Forms Thickness Control* in this section.

10. If necessary, print head alignment with the first print position can be made with the horizontal fine adjustment knob **6**. Maximum adjustment is one print position.

11. Press PRINT/RESET.

12. After all printing is complete, remove the form by rotating the paper advance knob. Hold the form until it clears the platen, then remove it from the printer.

13. Replace the forms tractor unit by snapping its rear legs in place and then pivoting it forward. Make sure that all four legs are firmly in place. Failure to do so may result in paper jams due to static buildup in the forms.



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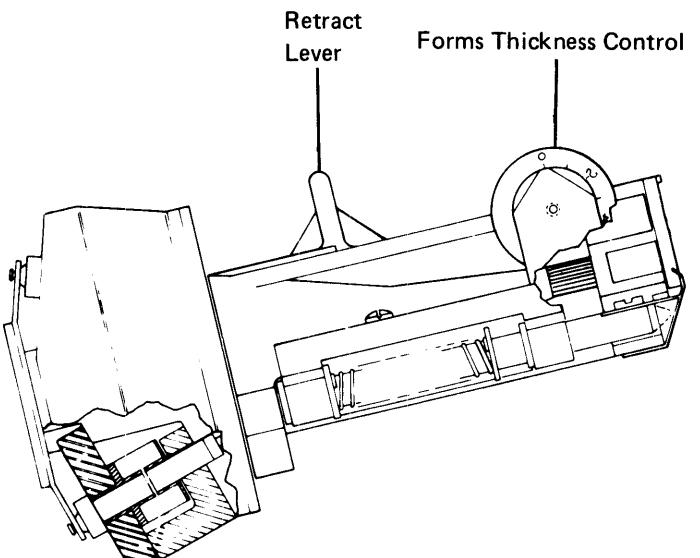
HOW TO ADJUST THE FORMS THICKNESS CONTROL

1. Lift the plastic canopy and pivot it toward the front of the machine.

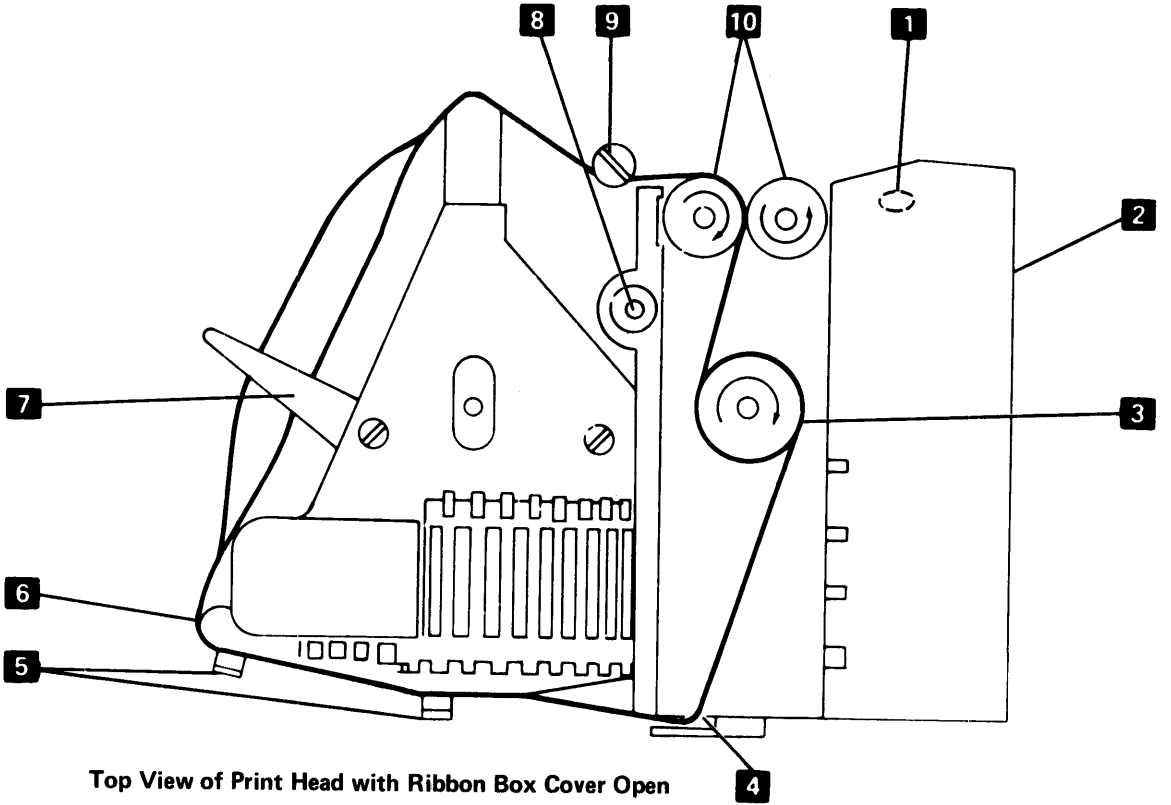
2. If you are using single-part forms, set the forms thickness control to 0; turn it toward 8, one step at a time, until there is no smudging and the print quality is acceptable.

3. If you are using multiple-part forms and the last sheet is not readable, turn the forms thickness control toward 0, one number at a time, until you obtain the maximum legibility.

4. If you are using multiple-part forms and the ribbon is smudging the first sheet, turn the forms thickness control toward 8, one number at a time, until the smudging stops.



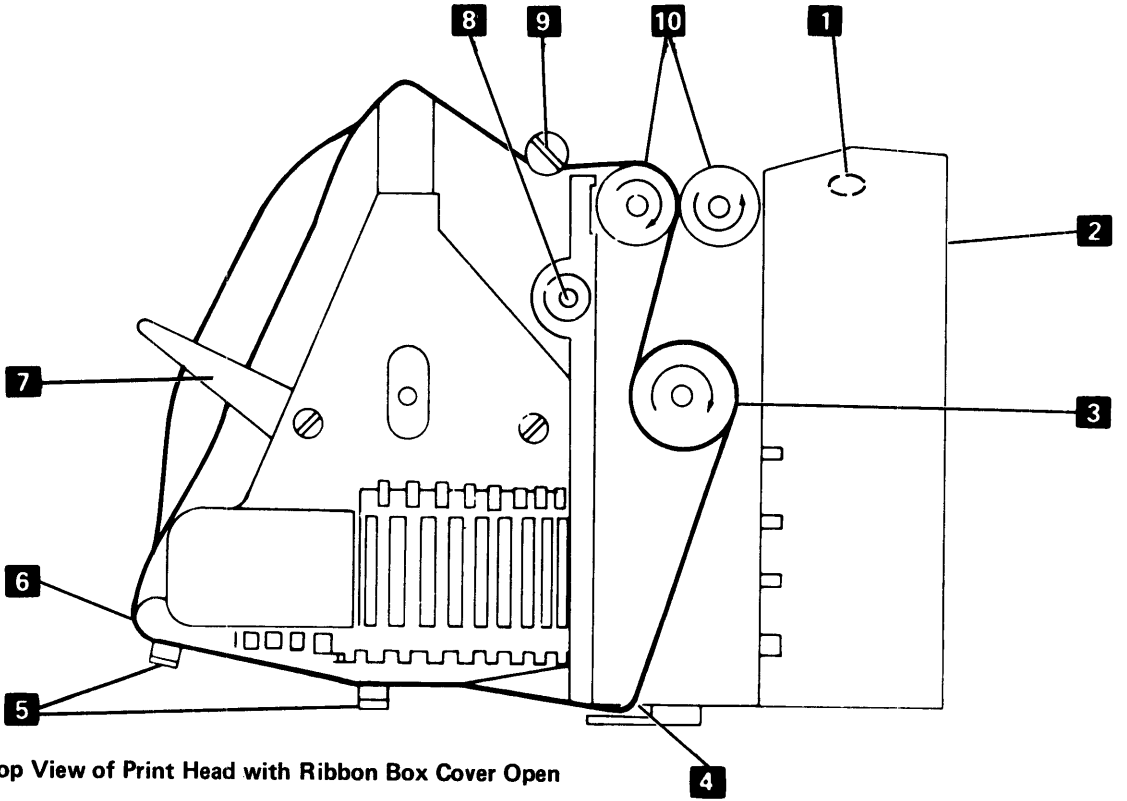
Side View of Print Head



Top View of Print Head with Ribbon Box Cover Open

HOW TO CHANGE THE RIBBON

1. Press STOP on the operator panel.
2. Lift the plastic canopy and print head cover.
3. Move the print head to the middle of the printer.
4. Open the ribbon feed rolls by rotating the release knob **1** counterclockwise.
5. Put on the gloves supplied with the new ribbon.
6. Open the ribbon box cover **2** .
7. Carefully remove the old ribbon from the guides. Lay the ribbon loop on top of the ribbon in the ribbon box; then pick up the entire ribbon and discard it.
8. Eject the new ribbon roll **3** from its holder into the ribbon box by pressing on the disk in the circular hole. Remove the disk from the ribbon and discard it and the holder.
9. Hold the coil lightly with one hand and pull about 10 inches (2.5 cm) of ribbon from the coil; lay the ribbon across the print head.



Top View of Print Head with Ribbon Box Cover Open

10. Form a loop from the ribbon across the print head.

11. Thread the loop side nearest the platen between the ribbon feed rolls 10 on your side of the guide post 9 .

12. Close the ribbon feed rolls by rotating the release knob 1 clockwise.

13. Thread the ribbon between the print head and the guide.

14. Thread the other part of the loop through the slot in the ribbon box 4 .

15. Continue threading the ribbon through the guide shoes 5 and around the left guide post 6 .

16. Slide the horizontal part of the ribbon twist, bottom edge first, between the two horizontal guides 7 .

17. Rotate the manual ribbon feed knob 8 at the left of the ribbon box to remove slack from the ribbon. Continue turning the knob until you are sure the ribbon feeds properly.

18. Close the ribbon box cover.

19. Remove your gloves.

20. Close the plastic canopy and print head cover and press START on the operator panel.

Contents

System Operation

Before the system can accept and run programs, certain operations must be done each time you turn the power on. These operations are called the initial program load (IPL) procedure. During the IPL procedure, system control programs are read from disk into main storage to prepare the system for running a program.

INITIAL PROGRAM LOAD

The following steps are required to perform the IPL procedure:

1. Set the MODE SELECTOR switch on the CE control panel to PROC RUN.

2. Set the POWER switch on the operator panel on.

3. Check the IPL and IMPL switches on the CE control panel; they should both be set to DISK.

4. Press the LOAD key on the operator panel; this causes the system control programs to be read from disk into main storage. The printer turns on and the print belt begins to spin.

The system also performs diagnostic checks at this time. When the IPL is done and the system checks have been completed successfully, the following display appears:

```
**** INITIAL PROGRAM LOAD COMPLETE ****
             DATE  XXXXXX
             LINES   XX
ENTER COMMAND

_                                  ← READY
```

Continue to the next page.

5. If the date is correct, go to step 6. Otherwise, enter the DATE command statement and specify today's date. The format of this command statement is shown in the *Command Statements* section.

   Note: The date must be correct. If it is not, any diskette files you create will be incorrectly labeled and could be destroyed the next time you perform an IPL and run a job that uses the files.

6. Enter the command statement or the OCL to start the first job.

RELOAD OF THE SYSTEM CONTROL PROGRAMMING

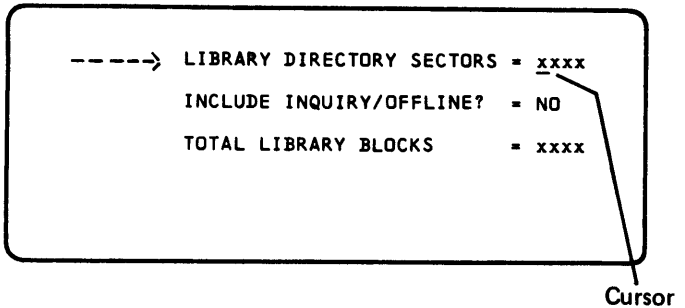
Note: Reloading the SCP deletes the history file. If you want a copy of the history file, enter the HISTORY command statement before doing the reload procedure.

Perform the following steps to reload the system control programs from diskettes:

1. Insert the first backup diskette.

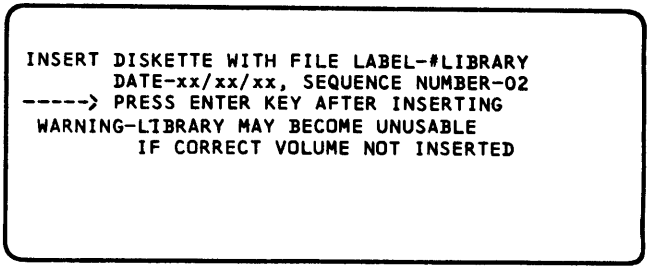
2. If the READY line appears on the display screen, enter RELOAD. If you cannot enter RELOAD, set the IPL switch on the CE panel to DISKETTE and press the LOAD key on the operator panel.

3. When the following display appears, press the ENTER key. The diskette information is copied onto the disk.



Note: The values on the display can be changed before you press the ENTER key. If you need to change them refer to the *IBM System/32 System Control Programming Reference Manual,* GC21-7593, for considerations and instructions.

4. When the following display appears, remove the diskette and insert the second backup diskette:



5. When this diskette information has been copied onto the disk, the following display appears:

```
RELOAD COMPLETE - REMOVE LAST

DISKETTE AND IPL FROM DISK
```

Remove the backup diskette and set the IPL switch on the CE control panel to DISK if you set it to DISKETTE in step 2. Press the LOAD key on the operator panel to perform an IPL from disk.

The following display appears:

```
**** INITIAL PROGRAM LOAD COMPLETE ****
             DATE  XXXXXX
             LINES   XX
ENTER COMMAND
                                  <- READY
_
```

6. Enter the DATE command statement, specifying today's date. The format of this command statement is shown in the *Command Statements* section.

7. Enter the command to start the first job.

INITIAL PROGRAM LOAD ERROR MESSAGE

Figure 2 shows the format of the error message that can appear on the display screen while you are doing an initial program load. The first line of the display **A** consists of one, two, three, four, or five entries separated by blanks. Each entry consists of four numbers/letters. The bottom line **B** indicates that this is error message 19.

Record the first line of the display exactly as it appears, and refer to the *Problem Determination* section to see if you can correct the error. If not, contact your IBM customer engineer, and give him the information you have recorded.

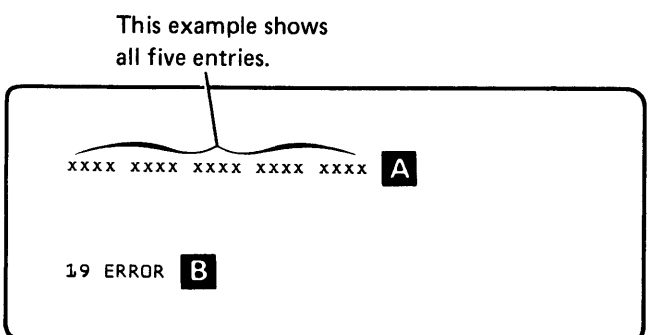


Figure 2. Initial Program Load Error Message

Flashing Display Screen

While you are operating the system, the display screen flashes on and off when action is required of you. Press the ERROR RESET key to stop the flashing, read the display, then take the appropriate action to continue.

Note: When a data communications function is active, the display screen does not flash.

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System Messages

While you are operating the system, a two-line message may be shown on the display screen. Two types of messages can appear: formatted and unformatted.

Note: The display screen flashes on and off (except when a data communications function is active). Press the ERROR RESET key to stop the flashing.

FORMATTED MESSAGE

The system stops to display the formatted message. The message can indicate an error that has occurred or information that you should be aware of. You must take action by entering an option to resume processing. Figure 3 shows an example of a formatted message.

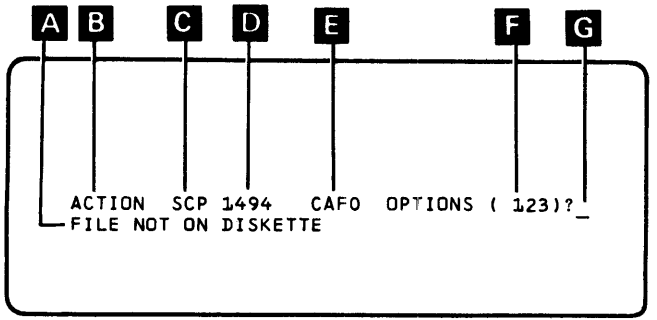


Figure 3. Formatted Message Example

The following explains the information in the message:

A Message text appears on the second line.

B ACTION indicates that this is a formatted message and that you must select an option before processing resumes.

C Characters that indicate the program issuing the message. The SCP (system control programming) has issued this message.

D A four-digit message identification code (MIC) identifies the message. Use this number to find a more complete explanation of the message in the *IBM System/32 Messages Guide—System,* GC21-7592.

E Characters that identify the SCP program that issued the message.

F One or more numbers in parentheses represent the options available to you for this message. Press ERROR RESET to stop the display screen when it is flashing. Press the key corresponding to the option you select. If you want to change the option you have keyed, press the cursor left key (←) and enter the correct option. Press the ENTER or ENTER+ key.

G The cursor is positioned to accept your response.

Second Level Message

When a formatted message appears, you may be able to display additional information about the message by pressing the ENTER key. This information is called a second level message.

UNFORMATTED MESSAGE

The unformatted message appears when an error has been found in a command statement. Figure 4 shows an example of an unformatted message.

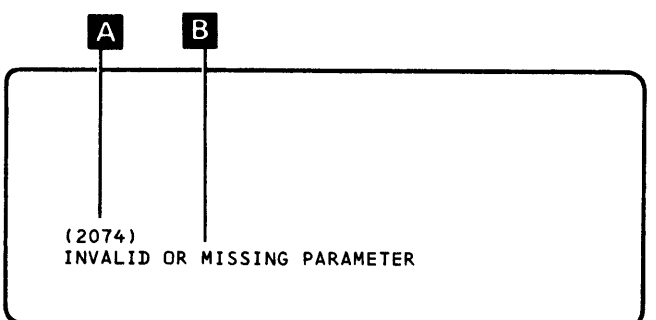


Figure 4. Unformatted Message Example

A The first line contains the message identification code that you use to find a more complete explanation of the error in the *IBM System/32 Messages Guide—System,* GC21-7592.

B The second line contains the message text.

You are not required to respond to the message. The system cancels the job and then continues processing.

GENERAL DESCRIPTION OF MESSAGE OPTIONS

The following is intended to provide a *general* explanation of the message options. Their meanings depend upon the message that appears. Refer to the *IBM System/32 Messages Guide—System,* GC21-7592, for an explanation of the options as they pertain to a particular message.

Generally, if you select option 0 or 1, the job continues. However, data used by the job might be changed or destroyed. Therefore, refer to the message guide before selecting either option 0 or 1. A corrective action is often required before you select option 1.

Generally, if you select option 2 or 3, the job is canceled. If you select option 2, any data already created by this job is preserved. If you select option 3:

- The number of lines in a form is reset to the value set during the initial program load procedure.
- The printer skips to the next page. (If necessary, reset the printer forms.)
- No new data is preserved.

If option 2 or 3 is selected during an application program, refer to the application operating procedures for more information.

Option D is also available whenever a formatted message is issued. When you select option D, the contents of main storage are dumped to an area on disk called the CE cylinder, and the system actions described for option 3 occur. Message 0016 is then displayed. Generally, select option D only if advised in the message guide or in the program operating instructions.

Each time you select option D, the data saved on the CE cylinder is overwritten; therefore, save the CE cylinder information on a diskette using the APAR service command statement.

Contents

Command Statements

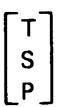
SCP COMMAND STATEMENT FORMATS

Figure 5 shows the SCP command statement formats. Capitalized parameters, numbers, nonalphabetic characters, brackets [ ], and braces { } have the following special meanings:

- Capitalized parameters must be entered exactly as they are shown in the formats.

  If numbers or other nonalphabetic characters appear in a capitalized parameter, enter them as they are shown. For example, in the SAVE command statement, enter the #SAVE parameter as #SAVE.

- Brackets [ ] can have two meanings. You can omit anything enclosed in brackets. For example, you can enter the command statement HISTORY [ALL] [,RESET] as HISTORY. If two or more parameters are enclosed in brackets, you can choose one of them or you can omit the parameter. For example:

  indicates that you do not have to enter the parameter, but if you do, it must be either T, S, or P.

Underlined values are called default values. Default values are automatically substituted if you omit the parameter. For example, if you omit the [ALL / filename] parameter of the CATALOG command statement, ALL is assumed.

Note: When entering a command statement, if you omit a parameter, enter a comma in its place if you enter another parameter that follows the position reserved for the omitted parameter. For example, you could enter the

INIT [vol-id / system-date], [owner-id / OWNER-ID] [,RENAME / ,DELETE / ,FORMAT / ,FORMAT2]

command statement as INIT ,,FORMAT

- Braces { } indicate that you must choose one of the values shown. For example, for CLOCK - { Y / N }

  you must enter CLOCK-Y or CLOCK-N

- Replace noncapitalized parameters with the appropriate value (the *Reminders* column in Figure 5 might help you determine the value to enter). For example, you might enter the RESTORE command as RESTORE ALL,PAYROLL to restore your file named PAYROLL.

The *System/32 System Control Programming Reference Manual,* GC21-7593, contains a detailed explanation of the parameters for each command statement in Figure 5.

The *Initiating Procedures* portion of the *Keyboard* section explains how you use a command key to display the command statement.

Command	Format	Reminders
ALTERBSC	ALTERBSC [BRATE- {F/H}] [,CLOCK- {Y/N}] [,DEBUG- {Y/N}] [,ERC- {number/Z}] [,SLINE- {Y/N}] [,TEST- {Y/N}] [,TONE- {Y/N}]	At least one parameter must be given in each ALTERBSC command statement.
ALTERSDL	ALTERSDL [BRATE- {F/H}] [,CLOCK- {Y/N}] [,DEBUG- {Y/N}] [,SLINE- {Y/N}] [,TEST- {Y/N}] [,TONE- {Y/N}]	At least one parameter must be given in each ALTERSDL command statement.
BACKUP	BACKUP vol-id, [retention-days / 1] [,filename / ,#LIBRARY]	
BWSUD	BWSUD sluname, host	
BWSUR	BWSUR sluname	
CATALOG	CATALOG [ALL / filename] [,I1 / ,F1]	
COMPRESS	COMPRESS	
CONVERT	CONVERT	

Figure 5 (Part 1 of 10). SCP Command Statement Formats

Command	Format	Reminders
COPYI1	COPYI1 [ALL],,vol-id [,DELETE] or COPYI1 filename, [mmddyy / ddmmyy / yymmdd] ,vol-id	COPYI1: vol-id specifies the volume label of the output diskette DELETE indicates that expired files are not copied
CREATE	CREATE sourcename [,REPLACE]	CREATE: REPLACE indicates that the message load member to be created replaces the existing message load member with the same name.
DATE	DATE {mmddyy / ddmmyy / yymmdd}	DATE format is set at system installation time. You can separate the month, day, and year by any nonnumeric symbol (except comma, quotation mark, question mark, or blank), or they can be run together without any separation.
DCPRINT	DCPRINT [filename]	
DELETE	DELETE filename, [F1 / I1] , [SCRATCH / REMOVE / ERASE] [,mmddyy / ,ddmmyy / ,yymmdd]	
DISPLAY	DISPLAY filename [,mmddyy / ,ddmmyy / ,yymmdd] or DISPLAY filename, [mmddyy / ddmmyy / yymmdd] ,RECORD,value-1 [,value-2]	DISPLAY: value-1 specifies the starting record number to be displayed. value-2 specifies the ending record number to be displayed. If value-2 is not specified, records from value-1 through the last record in the file are displayed.

Figure 5 (Part 2 of 10). SCP Command Statement Formats

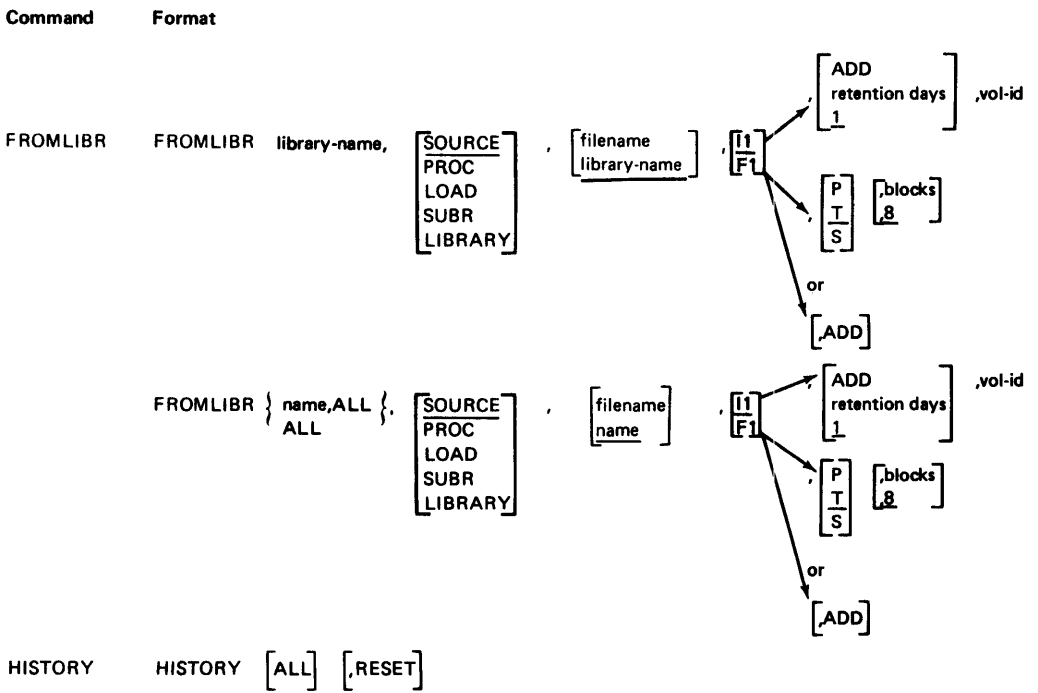


Figure 5 (Part 3 of 10). SCP Command Statement Formats

Command	Format
INIT	INIT [vol-id / system-date] , [owner-id / OWNER-ID] [,RENAME / ,DELETE / ,FORMAT / ,FORMAT2]
LINES	LINES [number / 66]
LISTLIBR	LISTLIBR DIR [,SOURCE / ,PROC / ,LOAD / ,SUBR / ,LIBRARY] or LISTLIBR DIR,SYSTEM or LISTLIBR {library-name / name,ALL / ALL} [,SOURCE / ,PROC / ,LOAD / ,SUBR / ,LIBRARY]

Figure 5 (Part 4 of 10). SCP Command Statement Formats

Reminders

INIT:

RENAME	allows the diskette to be renamed with the vol-id and owner-id
DELETE	deletes active files
FORMAT	formats the entire surface of the diskette in the 128-bytes-per-sector basic data exchange format.
FORMAT2	formats the surface of the diskette in extended format with eight 512-byte sectors-per-data track; the index track is formatted in twenty-six 128-byte sectors.

LINES:

number	a one- or two-digit number from 1 through 84 that specifies the maximum number of lines per page.

Command	Format	Reminders
LOG	LOG [CRT / PRINTER] [EJECT / NOEJECT]	
MRJE	MRJE [filename for TDISKPR1] [number of blocks for TDISKPR1] [number of blocks for PDISKPR1] [number of blocks for PDISKPU1]	
ORGANIZE	ORGANIZE filename-1, [mmddyy / ddmmyy / yymmdd] ,F1,filename-2, [T / S / P] [,position,character] or ORGANIZE filename-1, [mmddyy / ddmmyy / yymmdd] , [I1] ,vol-id, [retention-days / 1] [,position,character]	ORGANIZE: filename-1 specifies the name of the file to be reorganized. filename-2 specifies the name of the disk file to contain the organized file. position indicates deletion of the records that have a certain character in this position. character specifies a character or the hexadecimal representation of a character (in the form xdd). Records containing this character in the position specified by the position parameter are deleted. If 999 retention days are specified, the diskette file will never expire.

Figure 5 (Part 5 of 10). SCP Command Statement Formats

Command	Format	Reminders
OVERRIDE	OVERRIDE [ADDR-nn] [,LINE-{C P R S T}] [,SWTYP-{AA MA MC}]	OVERRIDE: C switched line (CDSTL-World Trade). P point-to-point nonswitched line. R line type specified in RPG II source statements. S point-to-point switched line. T tributary station line on multipoint. AA indicates the System/32 operator automatically answers the call. MA indicates the System/32 operator (or user) manually answers the call. MC indicates the System/32 operator (or user) manually initiates the call.
REBUILD	REBUILD	
RELOAD	RELOAD [vol-id] , [mmddyy / ddmmyy / yymmdd] [,filename / ,#LIBRARY]	*Notes:* 1. If LINE-C or LINE-S is specified, SWTYP must be specified. 2. At least one parameter must be given in each OVERRIDE command statement.
REMOVE	REMOVE {library-name / name,ALL / ALL} [,SOURCE / ,PROC / ,LOAD / ,SUBR / ,LIBRARY]	

Figure 5 (Part 6 of 10). SCP Command Statement Formats

Command	Format
RESTORE	RESTORE [ALL] , [filename-1 / #SAVE] [,mmddyy / ,ddmmyy / ,yymmdd] or RESTORE filename-2, [mmddyy / ddmmyy / yymmdd] [,RECORDS,value-1 / ,BLOCKS,value-2]
SAVE	SAVE [ALL], [retention-days / 1] , [filename-1 / #SAVE] ,vol-id or SAVE filename-2, [retention-days / 1 / ADD] , [mmddyy / ddmmyy / yymmdd] ,vol-id
SET	SET [value] , [source-name] , [MDY / DMY / YMD] [,mmddyy / ,ddmmyy / ,yymmdd]

Figure 5 (Part 7 of 10). SCP Command Statement Formats

Reminders

RESTORE:

filename-1 specifies the name of the file(s) previously saved when the SAVE command statement was used with the ALL parameter.

filename-2 specifies the name of the file on the diskette to be restored on the disk.

value-1 specifies the number of records the disk file is to contain.

value-2 specifies the number of blocks the disk file is to contain.

SAVE:

filename-1 specifies the name associated with all saved files. If filename-1 is not specified, #SAVE is the name associated with all of the saved files.

filename-2 specifies the name of the disk file to be saved.

If 999 retention days are specified, the diskette file will never expire.

SET:

(At least one parameter must be entered.)

value specifies the number of lines to be printed per page. The minimum value is 1, and the maximum value is 84.

source-name specifies the library source member containing the print belt image to be used.

Command	Format	Reminders
SPECIFY	SPECIFY [ADDR-nn] [,LINE-{C|P|S|T}] [,SWTYP-{AA|MA|MC}] [,ID-nnnnn]	SPECIFY: ADDR-nn — A hexadecimal 2-character SDLC address. LINE-C — CDSTL (connect data set to line) switched line (World Trade only). P — point-to-point nonswitched line. S — point-to-point switched line. T — tributary station on multipoint line. SWTYP-AA — if switched line (LINE-C or LINE-S) is specified and the modem is in autoanswer mode, the System/32 automatically answers the call. MA — if switched line (LINE-C or LINE-S) is specified, the System/32 operator manually answers the call. MC — if switched line (LINE-C or LINE-S) is specified, the System/32 operator manually initiates the call. ID-nnnnn — a 5-character hexadecimal number used as an exchange of identification between the host system and the System/32 SDLC station. Valid characters for this parameter must be from 0-9 and A-F. The characters specified are converted to hexadecimal characters by the system. If the ID parameter is not specified the default is 00000.

Figure 5 (Part 8 of 10). SCP Command Statement Formats

Command	Format	Reminders
		SPECIFY: (cont'd) *Notes:* 1. If LINE-C or LINE-S is specified, the SWTYP parameter must be specified. 2. If the SWTYP parameter is specified, LINE-C or LINE-S must be specified. However, if the line type was set previously to a switched line (LINE-C or LINE-S), the line type does not have to be respecified. 3. If the SWTYP parameter (MA or MC) is specified on a switched line, a message is displayed that indicates a manual answer or a manual call is required. If the SWTYP parameter (AA) is specified on a switched line, no message is displayed. 4. If LINE-P or LINE-T is specified, the switch type (SWTYP) automatically defaults to 0 (zero). 5. The line type defaults to a point-to-point nonswitched line (LINE-P) if the standby line (SLINE) is specified in the ALTERSDL procedure as SLINE-N. 6. The line type defaults to a point-to-point switched line (LINE-S) if the standby line (SLINE) is specified in the ALTERSDL procedure as SLINE-Y.

Figure 5 (Part 9 of 10). SCP Command Statement Formats

Command	Format	Reminders
STATUS	STATUS	
SYSLIST	SYSLIST [PRINTER / CRT / OFF]	SYSLIST: If SYSLIST CRT is specified, the roll-up key must be used to display each new record.
TOLIBR	TOLIBR filename, [F1 / I1] , [mmddyy / ddmmyy / yymmdd] [,REPLACE]	
TRANSFER	TRANSFER filename-1, [I1] , [mmddyy / ddmmyy / yymmdd] ,ADD, [filename-2 / filename-1] [,date]	TRANSFER: filename-1 specifies the name of the file being transferred. filename-2 specifies the existing disk file to which a basic data exchange diskette file is to be added. value-1 specifies the key length for a disk file that is being created. value-2 specifies the relative displacement of the start position of the record keys for a disk file that is being created. value-3 specifies the number of records the disk file to be created should contain. value-4 specifies the number of blocks the disk files to be created should contain. I1 specifies that the file is to be transferred from diskette to disk. F1 specifies that the file is to be transferred from disk to diskette. If 999 retention days are specified, the diskette file will never expire.
	or TRANSFER filename-1, [I1] , [mmddyy / ddmmyy / yymmdd] , [NOADD] , {value-1,value-2} [,RECORDS,value-3 / ,BLOCKS,value-4]	
	or TRANSFER filename-1,F1,[mmddyy / ddmmyy / yymmdd] ,vol-id [,retention-days / ,1]	

Figure 5 (Part 10 of 10). SCP Command Statement Formats

SCP COMMAND STATEMENT DESCRIPTIONS

Figure 6 lists the SCP command statements and provides a general explanation of each. Detailed command statement information is contained in *IBM System/32 System Control Programming Reference Manual,* GC21-7593.

SCP Command Statement	Use
ALTERBSC	Alters the following BSC items in the system configuration record: *Item* — *Parameter* Bits per second (bps) rate — BRATE Modem clocking — CLOCK Debug facility — DEBUG Error retry count — ERC Standby line — SLINE Modem test — TEST Non-U.S.A. — TONE *Note:* The ALTERBSC command statement should be used only with data communication programming that uses BSC (binary synchronous communications).

Figure 6 (Part 1 of 13). SCP Command Statements

SCP Command Statement	Use
ALTERSDL	Alters the following SDLC items in the system configuration record: *Item* — *Parameter* Bits per second (bps) rate — BRATE Modem clocking — CLOCK Debug facility — DEBUG Standby line — SLINE Modem test — TEST Non-U.S.A. — TONE *Note:* The ALTERSDL command statement should be used only with data communication programming that uses SDLC (synchronous data link control).

Figure 6 (Part 2 of 13). SCP Command Statements

SCP Command Statement	Use
BACKUP	Creates a multivolume diskette file that contains: • The reorganized disk library (unused space between members is collected at the end of the library). • A program that can be used to change the directory and library size. The RELOAD command statement can be used to copy the system library back to the disk.
BWSUD	Executes the CICS or IMS Batch Work Station Utility, which provides the ability to communicate with CICS or IMS applications via SDLC.

Figure 6 (Part 3 of 13). SCP Command Statements

SCP Command Statement	Use
BWSUR	Executes the RJE Batch Work Station Utility, which provides the ability to submit, execute, and obtain results of jobs from the host system via SDLC.
CATALOG	Displays the disk or a diskette VTOC (or VTOC entry) on the display screen or printer, depending on which is being used for output. (See the SYSLIST command statement.)
COMPRESS	Collects available disk space by moving permanent and temporary files into an area immediately following the library.
CONVERT	Converts diskette header labels from preversion 5 format to version 5 format.

Figure 6 (Part 4 of 13). SCP Command Statements

SCP Command Statement	Use
COPYI1	Copies a single diskette file to another diskette. Also copies all files on a diskette to another diskette and collects available space by placing copied files in an area at the beginning of the *copied-to* diskette.
CREATE	Creates a library message load member.
DATE	Sets either the system date or job date. If entered between the LOAD and RUN OCL statements, the job date is set to the date you specify and reset to the system date when the job ends. If entered immediately after an IPL from disk, the system date is set to the date you specify.
DCPRINT	Prints punch and printer output that was written to disk by a data communication utility.

Figure 6 (Part 5 of 13). SCP Command Statements

SCP Command Statement	Use
DELETE	Makes file space available on the disk or a diskette by freeing space used by unwanted files.
DISPLAY	Displays all or part of a disk file on the display screen or printer, depending on which is being used for output. (See the SYSLIST command statement.)
FROMLIBR	Creates a sequential disk or diskette file from specified library members.
HISTORY	Displays either the entire contents of the history file or only those items in the history file that have been previously displayed. The information appears on the display screen or printer, depending on which is being used for output. (See the SYSLIST command statement.)

Figure 6 (Part 6 of 13). SCP Command Statements

SCP Command Statement	Use
INIT	Does one of the following: • Assigns a name to the diskette. • Removes all VTOC entries from the diskette. • Prepares (initializes) a diskette for use by formatting it in addition to assigning a name and removing all VTOC entries.
LINES	Sets the number of lines per page for the printer. *Note:* Realign the forms to the first print line when the number of lines per page is changed.

Figure 6 (Part 7 of 13). SCP Command Statements

SCP Command Statement	Use
LISTLIBR	Displays the library directory entries, the library system directory, or individual members of the library.
LOG	Specifies whether messages and OCL statements are displayed only on the display screen or on both the printer and display screen.
MRJE	Provides the ability to submit, execute, and obtain results of OS jobs from a host system via the BSC.
ORGANIZE	Copies a disk file to another area on the disk (and optionally deletes specified records), or copies a disk file to a diskette (and optionally deletes specified records).

Figure 6 (Part 8 of 13). SCP Command Statements

SCP Command Statement	Use
OVERRIDE	Overrides the following BSC items specified in RPG II source statements without recompiling the RPG II program: *Item* — *Parameter* Tributary station address — ADDR Line type — LINE Switch type — SWTYP *Note:* The OVERRIDE command statement should be used only with data communications programming that uses BSC.
REBUILD	Restores disk file labels that were being processed when a system failure occurred.

Figure 6 (Part 9 of 13). SCP Command Statements

SCP Command Statements	Use
RELOAD	Copies the system library from a diskette file created from the BACKUP command statement to disk. The system library can then be accessed by an IPL from disk. The RELOAD command statement enables you to change the disk space allocated for the library and the library directory. It also enables you to specify whether the inquiry program and multivolume file support are to be included. Refer to the *IBM System/32 System Control Programming Reference Manual,* GC21-7593, for information on modifying these items.
REMOVE	Deletes one or more library members.
RESTORE	Recreates a saved or organized file (a file copied to diskette by a SAVE or ORGANIZE command statement) on the disk.

Figure 6 (Part 10 of 13). SCP Command Statements

SCP Command Statements	Use
SAVE	Copies all files or a specified file on the disk to a diskette. Also adds a single file to a specified sequential file previously saved on a diskette.
SET	Sets the number of lines per page, the print belt image, date format, and/or system date. *Note:* Realign the forms to the first print line when the number of lines per page is changed.

Figure 6 (Part 11 of 13). SCP Command Statements

SCP Command Statements	Use
SPECIFY	Alters the following SDLC items in the system configuration record: *Item* — *Parameter* SDLC station address — ADDR Line type — LINE Switch type — SWTYP Unique identification data — ID *Note:* The SPECIFY command statement should be used only with data communications programming that uses SDLC.
STATUS	Displays system status information on the display screen and/or printer, depending on which is being used for logged output. (See the LOG command statement.)

Figure 6 (Part 12 of 13). SCP Command Statements

SCP Command Statements	Use
SYSLIST	Specifies that listing output is displayed on the display screen or printer, or that listing output is not to be displayed.
TOLIBR	Copies one or more library members from the disk or diskette file created by the FROMLIBR command statement to the system library.
TRANSFER	Converts a basic data exchange diskette file to a sequential or indexed file on disk; adds a diskette file that is in basic data exchange format to an existing sequential disk file; or converts a disk file to a basic data exchange file on diskette.

Figure 6 (Part 13 of 13). SCP Command Statements

SCP SERVICE COMMAND STATEMENTS

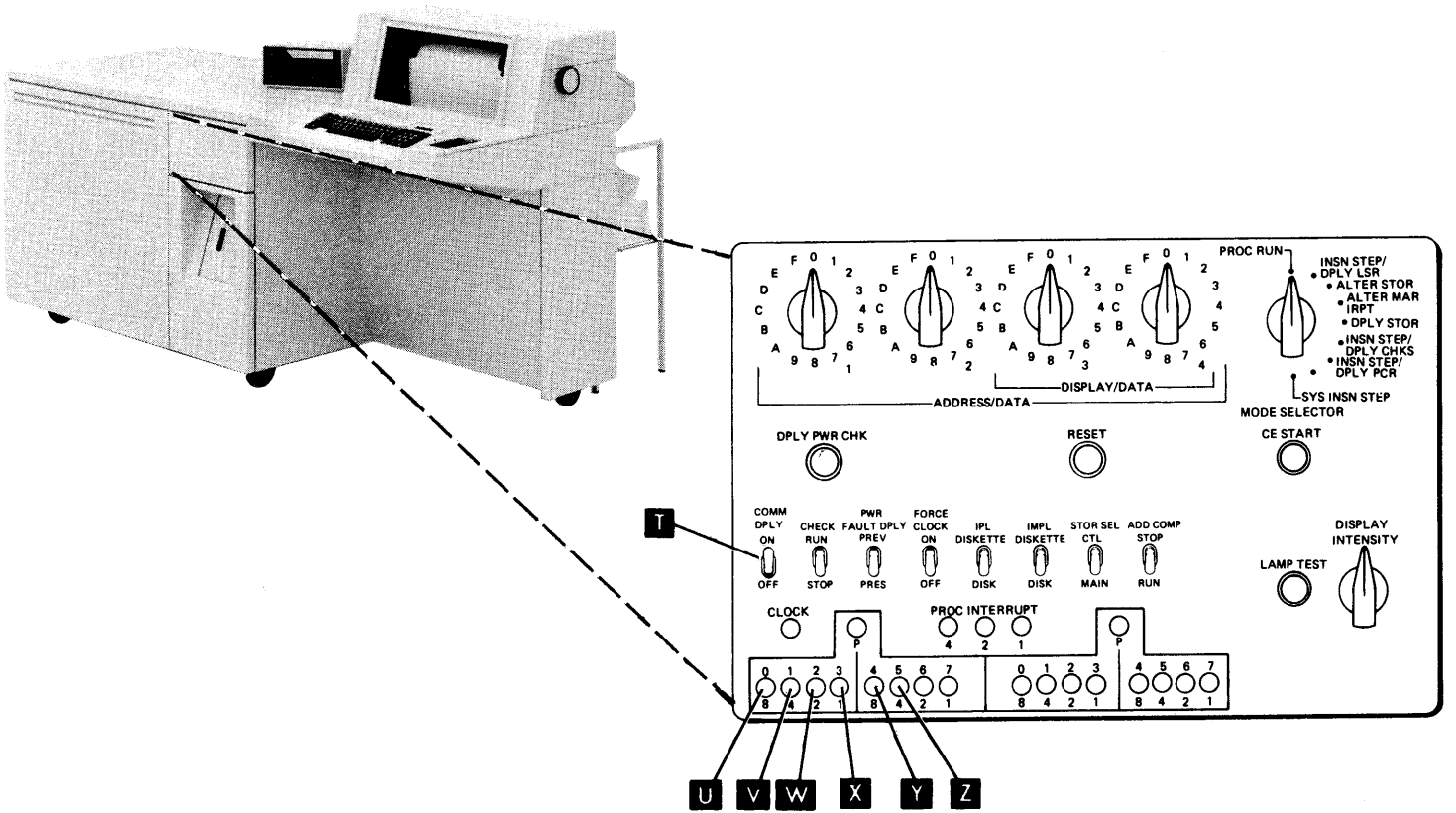
Figure 7 lists the SCP service command statements, explains how they are used, and shows their formats. The *IBM System/32 System Control Programming Reference Manual,* GC21-7593, contains a detailed explanation of the parameters for each SCP service command statement in Figure 7.

Command	Use	Format
APAR	Collects diagnostic information that can help IBM service personnel isolate and correct programming problems. The information is stored in the following files on diskette: APARFILE FIXDFILE APARLOAD (only if the object program name is specified) APARSRC (only if the source program name is specified)	APAR vol-id,[object program name] [,source program name]
APPLYPTF	Used to apply PTFs to the system. For further information, see the *IBM System/32 System Control Programming Reference Manual*, SC21-7593.	APPLYPTF [SC1nn / RG1nn / UT1nn] [,OLD / ,ALL / ,ptflognumber]
BUILD	Reconstructs defective sectors on the disk.	BUILD
CNFIGSCP	Used for system configuration. For further information, see the *IBM System/32 System Control Programming Reference Manual*, SC21-7593.	CNFIGSCP
DUMP	Prints or displays one of the following: • main storage • control storage • history file • PTF log module • system configuration record • disk/diskette sectors This information can be used for problem diagnosis.	DUMP [MAIN / CONTROL / HISTORY / PTF / CONFIG / DISK], [PRINTER / CRT] [,F1 / ,I1]
INSTALL	Used to install program products. For further information, see the *IBM System/32 System Control Programming Reference Manual*, SC21-7593.	INSTALL [DFU] [,SEU] [,SORT] [,RPG]

Figure 7 (Part 1 of 2). SCP Service Command Statements

Command	Use	Format
PATCH	Allows the service representative to patch or modify a disk or diskette sector by keying modifications from the keyboard.	PATCH [E1 | I1] [,NOHEX]
TRACE	Maintains a record of the important events occurring in the system.	TRACE [ALL | OFF] [,WAIT] [,FDIOS] [,CSFDIOS] [,PUSH] [,PULL] [,DISABLE] [,ENABLE] [,QUEUE] [,LDCS] [,LOADER] [,XIENT]

Figure 7 (Part 2 of 2). SCP Service Command Statements


PROC RUN
INSN STEP/
DPLY LSR
ALTER STOR
ALTER MAR
IRPT
DPLY STOR
INSN STEP/
DPLY CHKS
INSN STEP/
DPLY PCR
SYS INSN STEP
MODE SELECTOR
ADDRESS/DATA
DISPLAY/DATA
DPLY PWR CHK
RESET
CE START
COMM DPLY ON OFF
CHECK RUN STOP
PWR FAULT DPLY PREV PRES
FORCE CLOCK ON OFF
IPL DISKETTE DISK
IMPL DISKETTE DISK
STOR SEL CTL MAIN
ADD COMP STOP RUN
DISPLAY INTENSITY
LAMP TEST
CLOCK
PROC INTERRUPT
T
U
V
W
X
Y
Z

Contents

Data Communication Adapter (BSC or SDLC)

CONSOLE DISPLAY LIGHTS AND SWITCH

The lights and switch that indicate data communication processing are on the CE control panel.

Set the COMM DPLY switch T on to display the indicators (U V W X Y Z).

Light 0 U indicates that the adapter and the System/32 are ready for use.

Light 1 V indicates that the modem is ready for use.

Light 2 W indicates that the System/32 was requested to send data.

Light 3 X indicates that the modem has acknowledged a request to send data and allows the data to be sent.

Light 4 Y indicates that data is being transmitted.

Light 5 Z indicates that data is being received by the System/32.

EXECUTING DATA COMMUNICATION PROGRAMS

This section explains the steps required to execute a data communication program. The steps you take depend upon the type of network you are operating: nonswitched or switched. For nonswitched networks, there is always a direct communication line between stations. For switched networks, a direct communication line is not always established. The modem must be dialed to establish the communication lines.

When executing data communication programs, you and the operator of the remote terminal should set up a schedule so that you each load your programs at the proper time.

Note: If you encounter problems while attempting to perform any of the following steps, refer to the *Problem Determination* section of this manual.

Executing a Data Communication Program Using a Point-to-Point Nonswitched Network

For BSC:

1. Prepare the printer, inserting the proper forms.

2. If your BSC program transmits data:
   a. Ensure that the receiving station is ready to receive data.
   b. Load your program. The programs begin executing and data is transferred.

3. If your BSC program receives data, load your program. When both stations are ready, the programs begin executing and data is transferred.

For SDLC:

1. Prepare the printer, inserting the proper forms.

2. If your SDLC program transmits or receives data, load your program. When both stations are ready, the programs begin executing and data is transferred.

Executing a Data Communication Program Using a Multipoint Nonswitched Network

1. Prepare the printer, inserting the proper forms.

2. If your programs transmits or receives data, load your program. When both stations are ready, the programs begin executing and data is transferred.

Executing a Data Communication Program Using a Switched Network

If you are initiating the call, do the following:

1. Prepare the printer, inserting the proper forms.

2. Load your program.

3. When SCP message 3295, 3401, or 4549 appears, do the following:
   a. Put your modem in talk mode.
   b. Pick up the receiver and dial the remote terminal. Either the operator of the remote terminal will answer your call or you will hear a high-pitched tone indicating that the remote modem has been placed in auto-answer mode. If you talk to the operator, request that the remote modem be placed in data mode.
   c. Enter option 0.
   d. Place your modem in data mode and hang up the receiver. The program begins executing and data is transferred.

If you are receiving the call and will talk to the calling operator, do the following:

1. Prepare the printer, inserting the proper forms.

2. Load your program.

3. When SCP message 3290, 3400, or 4549 appears, do the following:
   a. After you are called, lift the receiver and talk to the operator of the other system.
   b. Enter option 0 to continue.
   c. Put your modem in data mode *before* the caller puts the calling modem in data mode and hang up the receiver. The programs begin executing and data is transferred.

If you are receiving the call and will answer automatically, do the following:

1. Prepare the printer, inserting the proper forms.

2. Load your program.

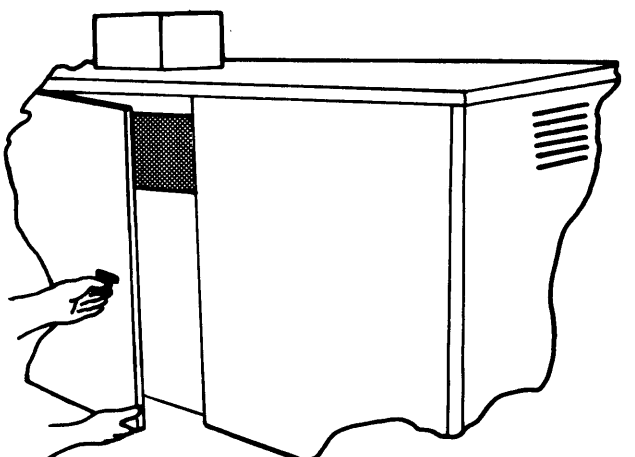
3. Put your modem in auto-answer mode. When your phone rings, the programs begin executing and data is transferred.

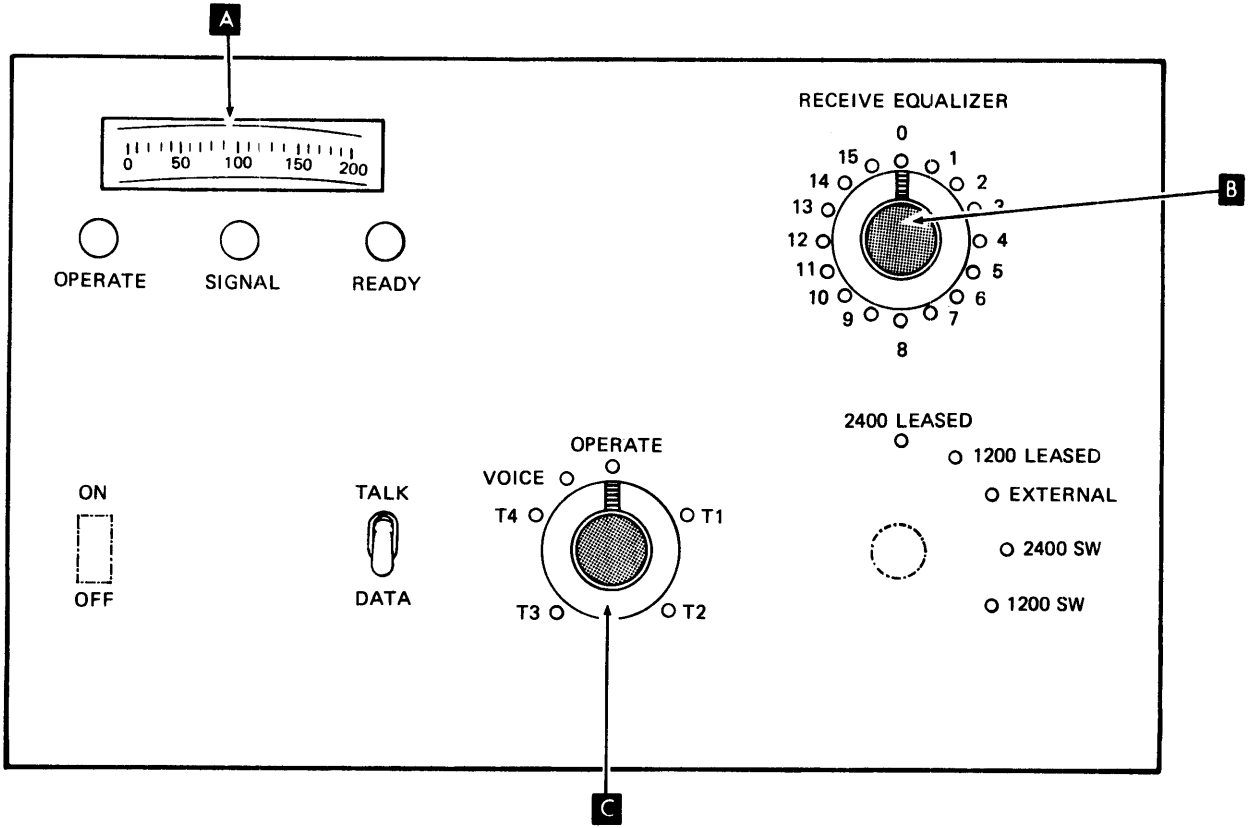
EQUALIZATION FOR THE 2400-BPS INTEGRATED MODEM

Line equalization (adjusting the modem to communication line characteristics) is done at installation time for nonswitched lines only, but may need to be repeated if transmission errors increase. Changes in the communication line characteristics can cause transmission errors. Equalization usually corrects these errors.

To do line equalization, open the back cover; use a coin or other thin object to release the latch as shown. Then follow the procedure for the type of network you have: point-to-point or multipoint tributary.

Note: For either procedure, begin by telephoning the remote operator; then, together, coordinate the equalization procedure over the phone.




A
0
50
100
150
200
OPERATE
SIGNAL
READY
RECEIVE EQUALIZER
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
B
ON
OFF
TALK
DATA
OPERATE
VOICE
T1
T2
T3
T4
C
2400 LEASED
1200 LEASED
EXTERNAL
2400 SW
1200 SW

Point-to-Point Nonswitched Network

1. Set your test/OPERATE switch C to T3.

2. Tell your remote operator to set the test/OPERATE switch to T4, and the RECEIVE EQUALIZER switch B to 0.

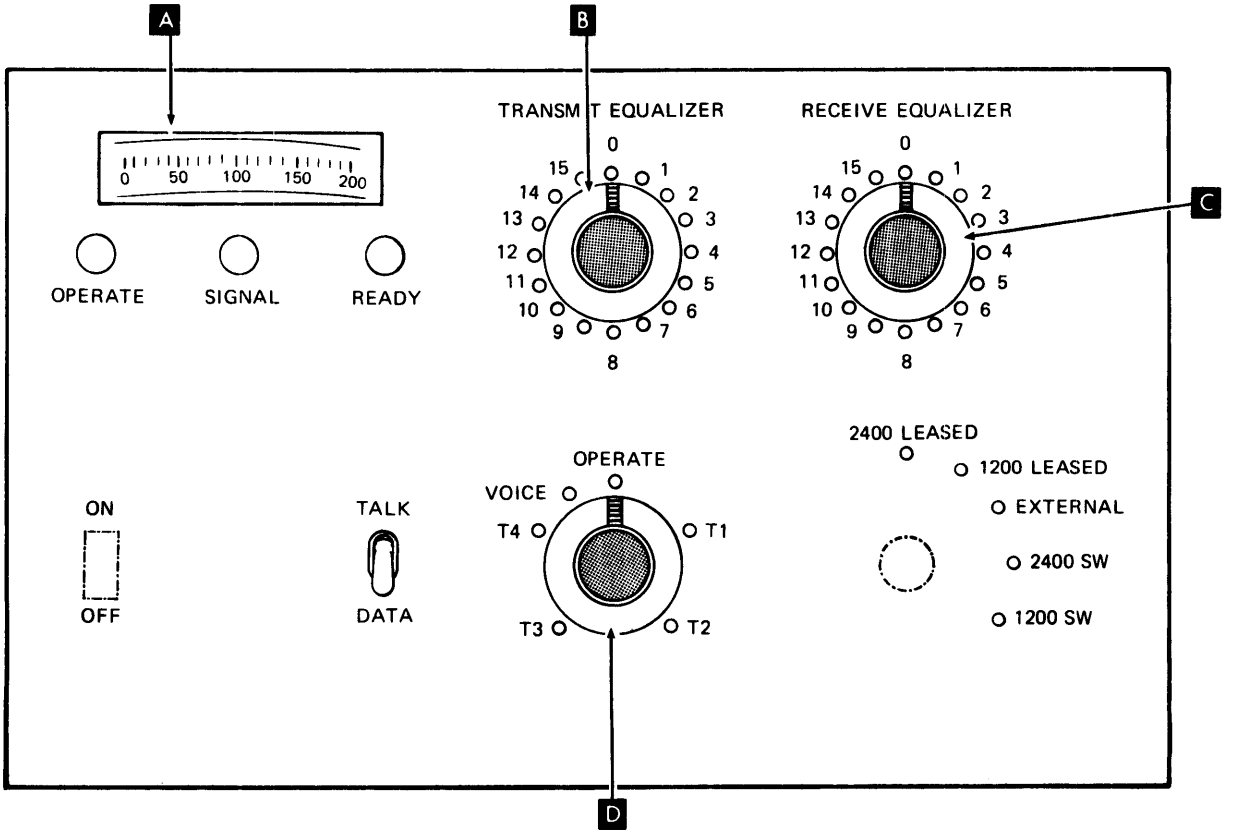
3. Tell your remote operator to turn the RECEIVE EQUALIZER switch to each position and, for best operation, set it at the position that produces the lowest meter reading.

4. Set your test/OPERATE switch to T4 and your RECEIVE EQUALIZER switch to 0.

5. Tell your remote operator to set the test/OPERATE switch to T3.

6. Turn your RECEIVE EQUALIZER switch to each position and, for best operation, set it at the position that produces your lowest meter reading A .

7. Set your test/OPERATE switch to OPERATE, and also tell your remote operator to set the test/OPERATE switch to OPERATE.


A
B
C
D
0 50 100 150 200
OPERATE
SIGNAL
READY
TRANSMIT EQUALIZER
RECEIVE EQUALIZER
0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15
ON
OFF
TALK
DATA
OPERATE
VOICE
T1
T2
T3
T4
2400 LEASED
1200 LEASED
EXTERNAL
2400 SW
1200 SW

Multipoint Nonswitched Network

1. Set your test/OPERATE switch D to T4.

2. Tell your multipoint control operator to set the test/ OPERATE switch to T3.

3. Turn your RECEIVE EQUALIZER switch C to each position and, for best operation, set it at the position that produces your lowest meter reading A.

4. Set your test/OPERATE switch to T3.

5. Tell your multipoint control operator to set the test/ OPERATE switch to T4.

6. Turn your TRANSMIT EQUALIZER switch B to each position and, for best operation, set it at the position that produces their lowest meter reading.

7. Set your test/OPERATE switch to OPERATE, and tell the multipoint control operator to set the test/ OPERATE switch to OPERATE.

Contents

IBM System/32 Utilities Program Product

The IBM System/32 utilities program product allows you to create, maintain, and sort data files, and create and maintain source and procedure members in the library.

The program product consists of three separate programs:

- Source entry utility (SEU)
- Data file utility (DFU)
- Sort

SOURCE ENTRY UTILITY PROGRAM

The source entry utility (SEU) program allows you to enter and maintain source and procedure members in the library. Using SEU, you can enter and maintain:

- RPG II and auto report specifications
- Sort specifications
- Procedures containing OCL and utility control statements
- Source statements other than RPG II, auto report, and sort

There are four SEU functions, called modes of operation:

- *Enter/Update* allows new statements to be entered or existing ones to be modified.
- *Include* allows statements from a library member to be included in the member you are processing.
- *Move* allows statements to be moved to a new location in a member while deleting them from their original location.
- *Delete* allows statements to be deleted from a member.

This section explains the SEU command, the function and command keys you use, and how you use the four modes of operation.

The following terms and concepts are used without explanation:

Auto dup/skip indicator
Field type
Format description
Format description type
Library member
Print option indicator
Statement numbering
Syntax checking option indicator

If you need information about any of these items, refer to the *IBM System/32 Utilities Program Product Reference Manual—Source Entry Utility,* SC21-7605, for their explanation.

SEU Command

Enter a command of the following format to initiate SEU:

SEU member-name, [A / F / P / R / S] [format description member name],
[statement length]

This command and its parameters are explained in the *IBM System/32 Utilities Program Product Reference Manual—Source Entry Utility,* SC21-7605.

Enter/update mode is automatically selected when you enter SEU. If you want to initiate the include, move, or delete mode, press the INCLUDE, MOVE, or DELETE command key.

Command Keys, Function Keys, and SEU Template

The SEU program converses with you by displaying messages and prompts on the display screen. You enter responses to each prompt via the keyboard (responses to prompts provide control information to the SEU program). Responses are made as follows:

- Press one of the command or function keys to initiate the desired function, or

- Key the response (it will be displayed on the display screen) and then press one of the command or function keys to indicate the end of the response.

A preprinted template showing the SEU command key assignments is available for your use (form number GX21-7638 or equivalent). Insert the template when you are using SEU. Figure 8 shows the keyboard with the inserted SEU template.

Figures 9 through 16 show how the function and command keys are used with each SEU mode.

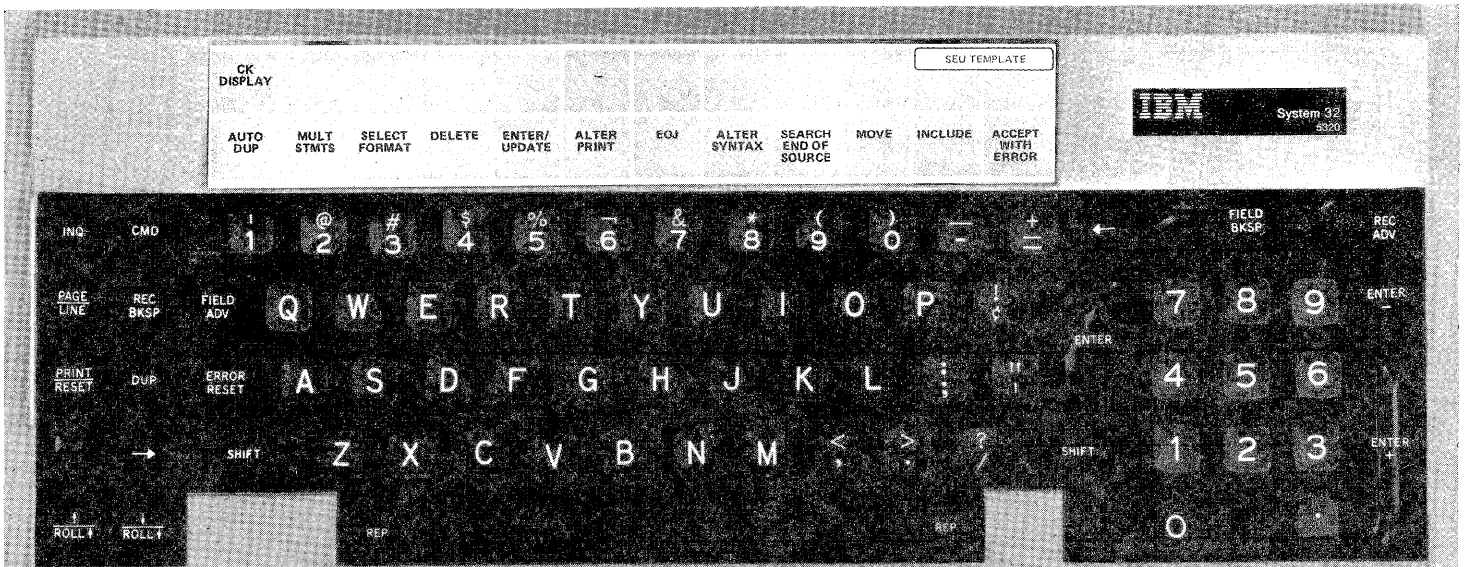


Figure 8. Keyboard with SEU Template Inserted

Command Keys	When prompted with: ENTER/UPDATE STATEMENT NUMBER	When statement is being entered or updated
AUTO DUP	Reverses status of indicator.	
MULT STMTS	Indicates to SEU that multiple consecutive statements are to be entered or updated.	(Not allowed)
SELECT FORMAT	(Not allowed)	Allows the format description type to be changed.
DELETE	Changes mode to delete mode.	Changes mode to delete mode. Stops processing of displayed statement.
ENTER/ UPDATE	Repeats prompt ENTER/UPDATE STATEMENT NUMBER.	Repeats prompt ENTER/UPDATE STATEMENT NUMBER. Stops processing of displayed statement.
ALTER PRINT	Reverses status of indicator.	
EOJ	Displays end of job options.	
ALTER SYNTAX	Reverses status of indicator.	

Figure 9 (Part 1 of 2). Command Keys for Entering/Updating Statements

Command Keys	When prompted with: ENTER/UPDATE STATEMENT NUMBER	When statement is being entered or updated
SEARCH END OF SOURCE	Displays last statement in member.	Stops processing of displayed statement and displays last statement in member. Multiple statement function is terminated.
MOVE	Changes mode to move mode.	Changes mode to move mode. Stops processing of displayed statement.
INCLUDE	Changes mode to include mode.	Changes mode to include mode. Stops processing of displayed statement.
ACCEPT WITH ERROR	(Not allowed)	Allowed only if syntax checking option is on and error occurred after entering an RPG II or auto report statement. Statement with error is placed in member.
CK DISPLAY	Displays keyboard keys used as command keys and a one-word description of each key. (Press and hold the SHIFT key each time you press the CK DISPLAY command key.)	

Figure 9 (Part 2 of 2). Command Keys for Entering/Updating Statements

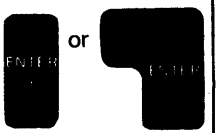
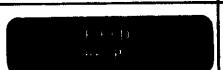
Function Keys	When prompted with ENTER/UPDATE STATEMENT NUMBER	When statement is being entered or updated
	(Not allowed)	Upper case enters character in cursor position from same position in previous statement. Lower case enters field starting in cursor position from same position in previous statement.
	Indicates that you have finished entering the response.	Field is accepted as displayed. If statement is all one field, or if this is the last field in statement, same as REC ADV.
	Indicates that you have finished entering the response.	All characters preceding cursor in field being processed are accepted. Remaining positions in field are set to blanks.
	(Not allowed)	Allowed only for signed numeric fields. All characters preceding cursor in field being processed are accepted. Remaining positions in field are set to blanks (makes numeric field negative).
	Cursor is set to first position of response.	Backspaces one field.

Figure 10 (Part 1 of 2). Function Keys for Entering/Updating Statements

Function Keys	When prompted with ENTER/UPDATE STATEMENT NUMBER	When statement is being entered or updated
	(Not allowed)	Backspaces to start of currently displayed statement. Cursor is positioned at first position of first field to be processed.
	(Not allowed)	Causes the displayed statement to be placed in the member.
	Displays next statement. (If last statement, displays first statement.)	Stops processing of displayed statement and displays next statement. Multiple statement function is terminated.
	Displays preceding statement. (If first statement, displays last statement.)	Stops processing of displayed statement and displays preceding statement. Multiple statement function is terminated.

Figure 10 (Part 2 of 2). Function Keys for Entering/Updating Statements

Command Keys	When prompted with: INCLUDE MEMBER NAME	When prompted with: INCLUDING AT STATEMENT NUMBER	When prompted with: INCLUDING FROM STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be included
AUTO DUP		(Not allowed)			
MULT STMTS	(Not allowed)	Indicates to SEU that multiple consecutive statements are to be included.		(Not allowed)	
SELECT FORMAT		(Not allowed)			
DELETE	Changes mode to delete mode.	Changes mode to delete mode. No statements are included.			
ENTER/ UPDATE	Changes mode to enter/update mode.	Changes mode to enter/update mode. No statements are included.			
ALTER PRINT		Reverses status of indicator.			
EOJ		Displays end of job options.			
ALTER SYNTAX		(Not allowed)			

Figure 11 (Part 1 of 2). Command Keys for Including Statements

Command Keys	When prompted with: INCLUDE MEMBER NAME	When prompted with: INCLUDING AT STATEMENT NUMBER	When prompted with: INCLUDING FROM STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be included
SEARCH END OF SOURCE	Displays last statement in signed on member.		Displays last statement in included member.		No statements are included. Displays last statement and repeats last prompt.
MOVE	Changes mode to move mode.	Changes mode to move mode. No statements are included.			
INCLUDE	Repeats prompt: INCLUDE MEMBER NAME.		Repeats prompt: **INCLUDING AT STATEMENT NUMBER. No statements are** included.		
ACCEPT WITH ERROR	(Not allowed)				
CK DISPLAY	Displays keyboard keys used as command keys and a one-word description of each key. (Press and hold the SHIFT key each time you press the CK DISPLAY command key.)				

Figure 11 (Part 2 of 2). Command Keys for Including Statements

Function Keys	When prompted with: INCLUDE MEMBER NAME	When prompted with: INCLUDING AT STATEMENT NUMBER	When prompted with: INCLUDING FROM STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be included
[redacted]	(Not allowed)				
[redacted]	Indicates that you have finished entering the response.				(Not allowed)
[redacted] or [redacted]	Indicates that you have finished entering the response.				(Not allowed)
[redacted]	(Not allowed)				
[redacted]	Cursor is set to first position of response.				(Not allowed)
[redacted]	(Not allowed)				
[redacted]	(Not allowed)				Causes the statement to be included in the signed on member.

Figure 12 (Part 1 of 2). Function Keys for Including Statements

Function Keys	When prompted with: INCLUDE MEMBER NAME	When prompted with: INCLUDING AT STATEMENT NUMBER	When prompted with: INCLUDING FROM STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be included
	Displays next statement. (If at last statement, displays first statement.)				Stops processing of displayed statement and displays next statement. Response to last prompt is blanked and can be reentered.
	Displays next statement. (If at first statement, displays last statement.)		(Not allowed)		

Figure 12 (Part 2 of 2). Function Keys for Including Statements

Command Keys	When prompted with: MOVING TO STATEMENT NUMBER	When prompted with: MOVING FROM STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be moved
AUTO DUP	(Not allowed)			
MULT STMTS	Indicates to SEU that multiple consecutive statements are to be moved.		(Not allowed)	
SELECT FORMAT	(Not allowed)			
DELETE	Changes mode to delete mode.	Changes mode to delete mode. No statements are moved.		
ENTER/ UPDATE	Changes mode to enter/ update mode.	Changes mode to enter/update mode. No statements are moved.		
ALTER PRINT	Reverses status of indicator.			
EOJ	Displays end of job options.			

Figure 13 (Part 1 of 2). Command Keys for Moving Statements

Command Keys	When prompted with: MOVING TO STATEMENT NUMBER	When prompted with: MOVING FROM STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be moved
ALTER SYNTAX	(Not allowed)			
SEARCH END OF SOURCE	Displays last statement in member.			No statements are moved. Displays last statement in member and repeats last prompt.
MOVE	Repeats prompt MOVING TO STATEMENT NUMBER	Repeats prompt: MOVING TO STATEMENT NUMBER. No statements are moved.		
INCLUDE	Changes mode to include mode.	Changes mode to include mode. No statements are moved.		
ACCEPT WITH ERROR	(Not allowed)			
CK DISPLAY	Displays keyboard keys used as command keys and a one-word description of each key. (Press and hold the SHIFT key each time you press the CK DISPLAY key.)			

Figure 13 (Part 2 of 2). Command Keys for Moving Statements

Function Keys	When prompted with: MOVING TO STATEMENT NUMBER	When prompted with: MOVING FROM STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be moved
[redacted]	(Not allowed)			
[redacted]	Indicates that you have finished entering the response.			(Not allowed)
[redacted] or [redacted]	Indicates that you have finished entering the response.			(Not allowed)
[redacted]	(Not allowed)			
[redacted]	Cursor is set to first position of the response.			(Not allowed)

Figure 14 (Part 1 of 2). Function Keys for Moving Statements

Function Keys	When prompted with: MOVING TO STATEMENT NUMBER	When prompted with: MOVING FROM STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be moved
	(Not allowed)			
	(Not allowed)			Causes the statements to be moved and the original statement numbers to be deleted.
	Displays next statement. (If at last statement, displays first statement.)			Stops processing of displayed statement and displays next statement. Response to last prompt is blanked and can be reentered.
	Displays preceding statement. (If at first statement, displays last statement.)			Stops processing of displayed statement and displays preceding statement. Response to last prompt is blanked and can be reentered.

Figure 14 (Part 2 of 2). Function Keys for Moving Statements

Command Keys	When prompted with: DELETING STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be deleted
AUTO DUP	(Not allowed)		
MULT STMTS	Indicates to SEU that multiple consecutive statements are to be deleted.	(Not allowed)	
SELECT FORMAT	(Not allowed)		
DELETE	Repeats prompt: DELETING STATEMENT NUMBER.	Repeats prompt: DELETING STATEMENT NUMBER. No statements are deleted.	
ENTER/ UPDATE	Changes mode to enter/update mode.	Changes mode to enter/update mode. No statements are deleted.	
ALTER PRINT	Reverses status of indicator.		
EOJ	Displays end of job options.		

Figure 15 (Part 1 of 2). Command Keys for Deleting Statements

Command Keys	When prompted with: DELETING STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be deleted
ALTER SYNTAX [redacted]	(Not allowed)		
SEARCH END OF SOURCE [redacted]	Displays last statement in member.		No statements are deleted. Displays last statement in member and repeats last prompt.
MOVE [redacted]	Changes mode to move mode.	Changes mode to move mode. No statements are deleted.	
INCLUDE [redacted]	Changes mode to include mode.	Changes mode to include mode. No statements are deleted.	
ACCEPT WITH ERROR [redacted]	(Not allowed)		
CK DISPLAY [redacted]	Displays keyboard keys used as command keys and a one-word description of each key. (Press and hold the SHIFT key each time you press the CK DISPLAY key.)		

Figure 15 (Part 2 of 2). Command Keys for Deleting Statements

Function Keys	When prompted with: DELETING STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be deleted
[redacted]	(Not allowed)		
[redacted]	Indicates that you have finished entering the response.		(Not allowed)
[redacted] or [redacted]	Indicates that you have finished entering the response.		(Not allowed)
[redacted]	(Not allowed)		
[redacted]	Cursor is set to first position of response.		(Not allowed)
[redacted]	(Not allowed)		

Figure 16 (Part 1 of 2). Function Keys for Deleting Statements

Function Keys	When prompted with: DELETING STATEMENT NUMBER	When prompted with: ENDING STATEMENT NUMBER	When statements are ready to be deleted
	(Not allowed)		Causes the selected statements to be deleted.
	Displays next statement. (If at last statement, displays first statement.)		Stops processing of displayed statement and displays next statement. Response to last prompt is blanked and can be reentered.
	Displays preceding statement. (If at first statement, displays last statement.)		Stops processing of displayed statement and displays preceding statement. Response to last prompt is blanked and can be reentered.

Figure 16 (Part 2 of 2). Function Keys for Deleting Statements

Enter/Update

One of two initial displays can appear for enter/update mode. If the SEU command names a new member to enter, the new member display in Figure 17 appears. If the initial SEU command names an existing member, or if the enter/update mode is entered because you pressed the ENTER/UPDATE command key, the existing member display in Figure 17 appears.

New Member Display

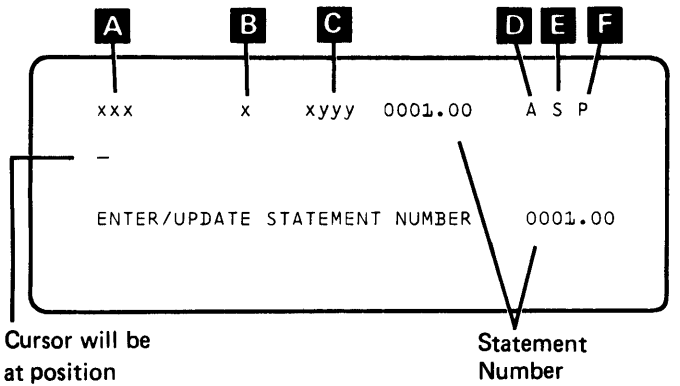
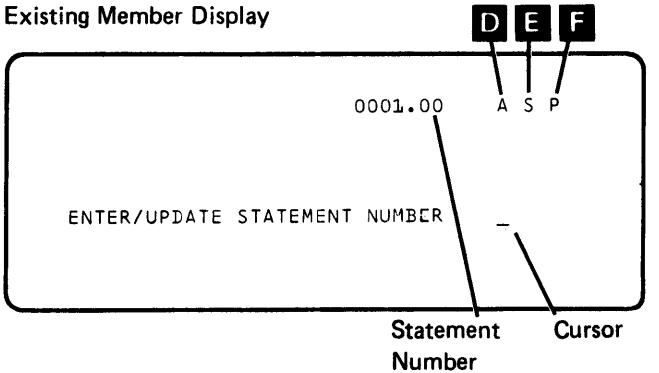


Figure 17 (Part 1 of 2). Initial Displays for Enter/Update Mode

Existing Member Display



Legend:

- **A** Column counter
- **B** Format description type
- **C** Field type and length
- **D** Auto dup/skip indicator (either A or blank)
- **E** Syntax checking option indicator (either S or blank)
- **F** Print option indicator (either P or blank)

In this section, the display screens frequently show these items. Where they appear, they will be shown but not labeled.

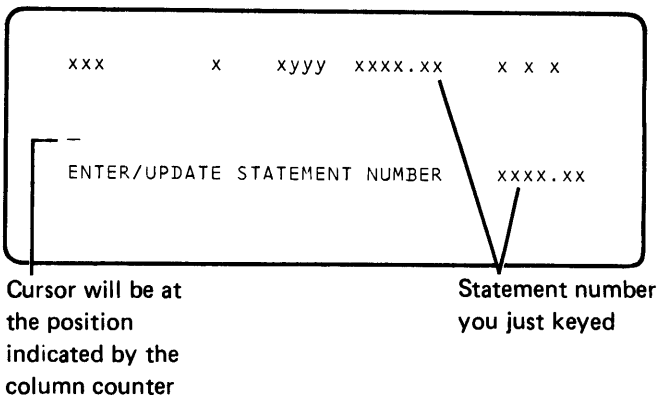
Figure 17 (Part 2 of 2). Initial Displays for Enter/Update Mode

Entering Statements in a New Member

1. If the format description type is not correct, change it using the SELECT FORMAT command key.

2. Enter a statement, then press the REC ADV key. Repeat steps 1 and 2 until all statements have been entered.

3. When you finish entering statements, you can select another SEU mode (press the appropriate command key) or end the job (press the EOJ command key).



Entering Statements in an Existing Member

1. Enter a statement number that is either between two existing statement numbers or higher than the last statement number in the member. If you want to enter a group of statements, press the MULT STMTS command key.

   If you want to enter a single statement, press the ENTER key. The following display appears:

2. If the format description type is not correct, change it using the SELECT FORMAT command key.

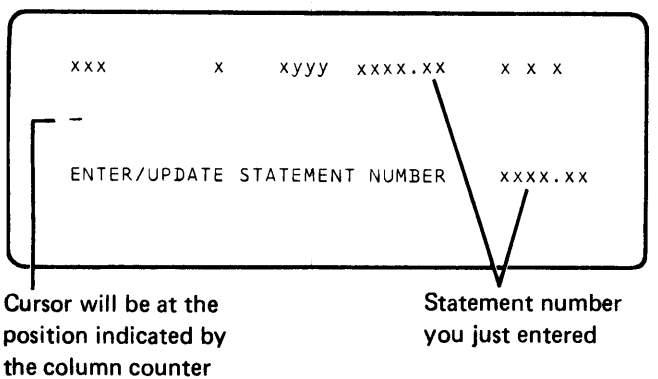
3. Enter a statement, then press the REC ADV key. If you are entering a group of statements, repeat this step until the last statement has been entered.

4. When you have finished, you can continue entering statements (return to step 1), select another SEU mode (press the appropriate command key), or end the job (press the EOJ command key).

Updating Statements

1. Enter an existing statement number. If you want to update a group of statements, press the MULT STMTS command key.

   If you want to update a single statement, press the ENTER key. The following display appears:



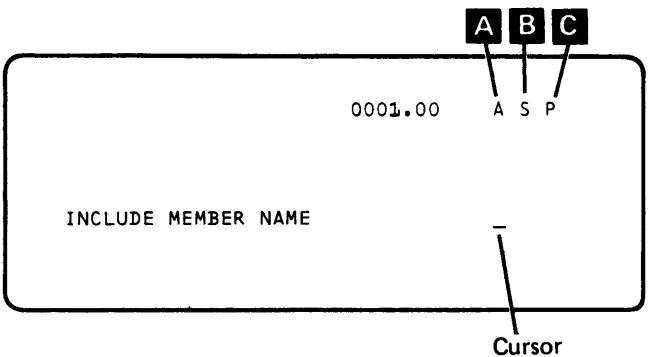
2. If the format description type is not correct, change it using the SELECT FORMAT command key.

3. Update the statement, then press the REC ADV key. The next statement in the member is displayed.

4. If you are updating a group of statements, return to step 3. If not, you can continue updating (return to step 1), select another SEU mode (press the appropriate command key), or end the job (press the EOJ command key).

Include

Initial Include Mode Display



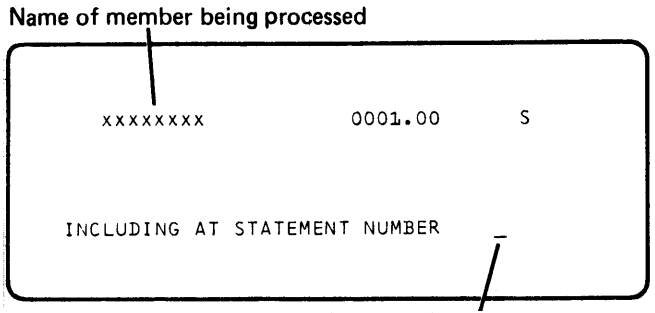
Legend:

A Auto dup/skip indicator (either A or blank)

B Syntax checking option indicator (either S or blank)

C Print option indicator (either P or blank)

1. Key the name of the member containing the statements to be included (if the member is a procedure, key member name,P). Press the ENTER key. The following display appears:



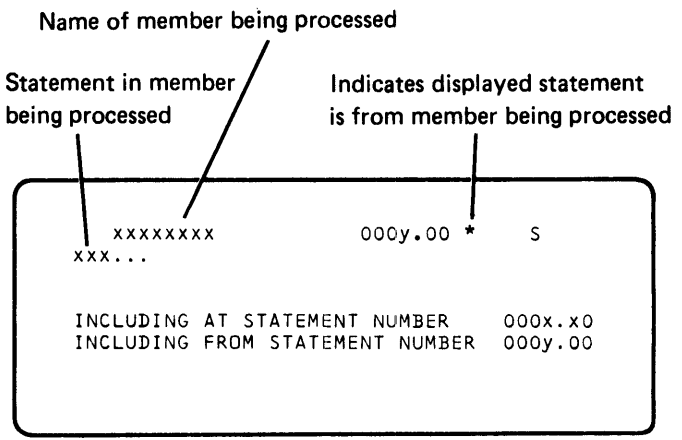
2. Key the statement number at which statements will be included. This cannot be an existing statement number. If you want to include a group of statements, press the MULT STMTS command key.

   If you want to include a single statement, press the ENTER key.

3. Key the number of the first (or only) statement being included.

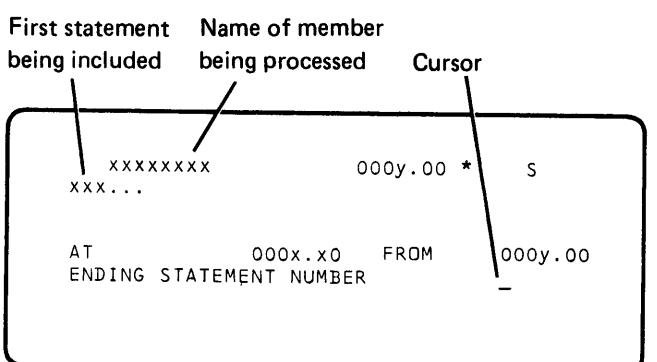
4. If you want to include a single statement, press the ENTER key. The following display appears:

   Note: If you want to include a group of statements, go to step 5.



a. Press the REC ADV key. The statement is included and the next statement in the member being processed (the member you specified in the SEU command) is shown on the display screen.
b. You can continue to include statements from the same member (return to step 2), select another SEU mode (press the appropriate command key), or end the job (press the EOJ command key).

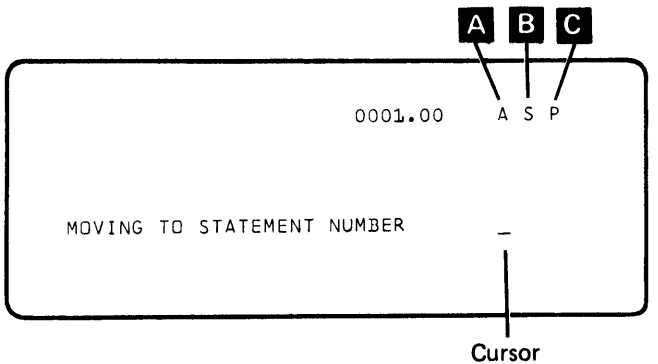
5. To include a group of statements, press the MULT STMTS command key (you can press the ENTER key, if you pressed the MULT STMTS command key in step 2). The following display appears:



a. Key the ending statement number in the group to be included or press the ROLL↑ key until the ending statement is shown on lines 2, 3, and 4 of the display. Then press the ENTER key.
b. Press the REC ADV key. The group of statements is included in the member being processed. The statement following the included statements in the member being processed is displayed.
c. You can continue to include statements from the same member (return to step 2), select another SEU mode (press the appropriate command key), or end the job (press the EOJ command key).

Move

Initial Move Mode Display

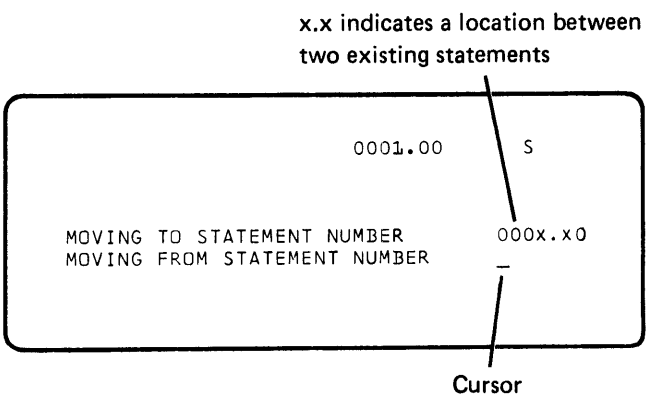


Legend:

- **A** Auto/dup skip indicator (either A or blank)
- **B** Syntax checking option indicator (either S or blank)
- **C** Print option indicator (either P or blank)

1. Key the statement number to which the move will be made. This cannot be an existing statement number. If you want to move a group of statements, press the MULT STMTS command key.

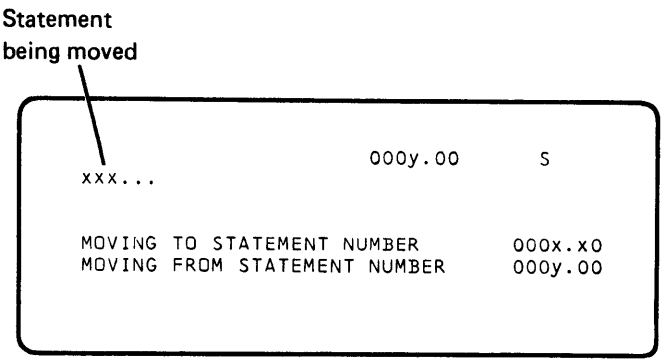
   If you want to move a single statement, press the ENTER key. The following display then appears:



2. Key the statement number of the first (or only) statement being moved.

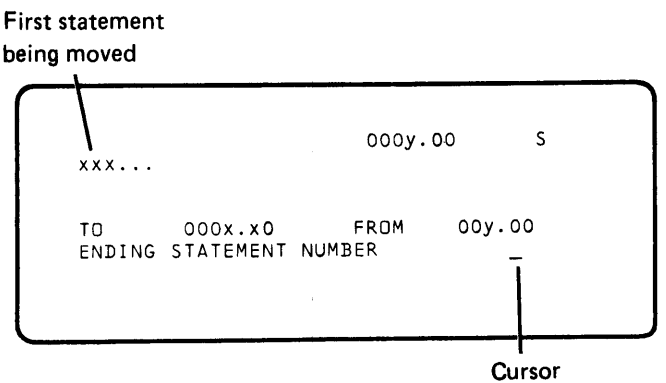
3. If you want to move a single statement, press the ENTER key. The following display appears:

   Note: If you want to move a group of statements, go to step 4.



   a. Press the REC ADV key. The statement is moved and deleted from its original location. The statement following the statement moved appears on the display screen.
   b. You can continue to move statements (return to the beginning of step 1), select another SEU mode (press the appropriate command key), or end the job (press the EOJ command key).

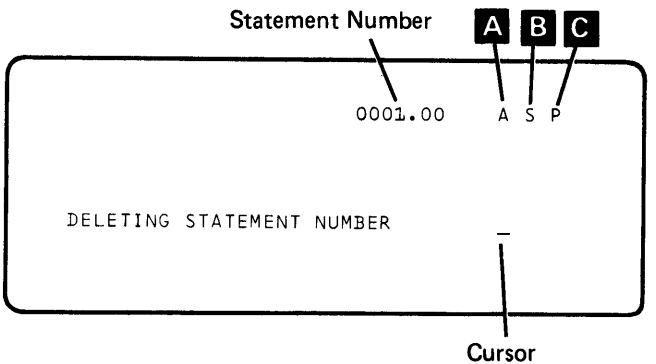
4. If you want to move a group of statements, press the MULT STMTS command key (you can press the ENTER key if you pressed the MULT STMTS key in step 1). The following display appears:



a. Key the statement number of the last statement in the group or press the ROLL↑ key until the last statement to be moved is shown on lines 2, 3, and 4 of the display screen. Then press the ENTER key.
b. Press the REC ADV key. The statements are moved and deleted from their original positions. The statement following the last statement moved appears on the display screen.
c. You can continue to move statements (return to the beginning of step 1), select another SEU mode (press the appropriate command key), or end the job (press the EOJ command key).

Delete

Initial Delete Mode Display



Legend:

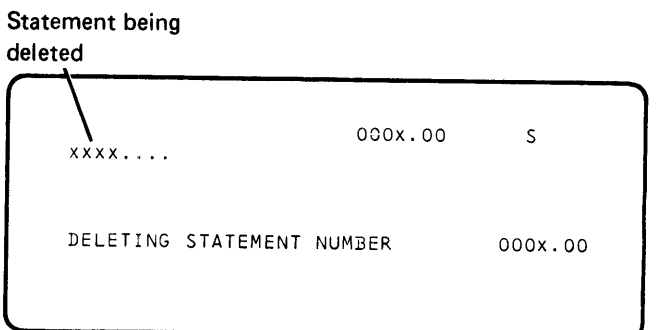
A Auto dup/skip indicator (either A or blank)

B Syntax checking option indicator (either S or blank)

C Print option indicator (either P or blank)

1. Key the statement number of the first (or only) statement to be deleted.

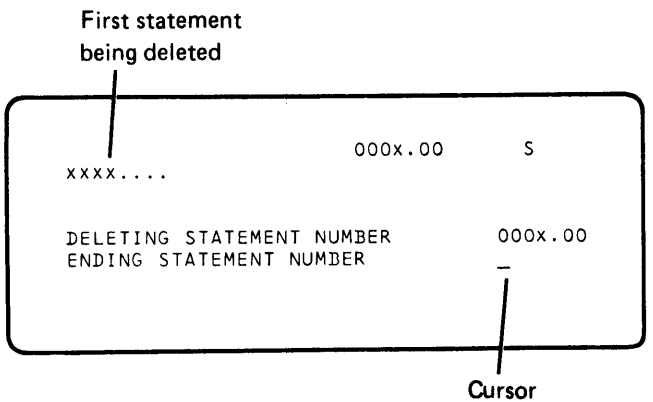
2. If you want to delete a group of statements, go to step 3. If you want to delete a single statement, press the ENTER key. The following display appears:



   a. Press the REC ADV key. The statement is deleted and the next statement in the member appears on the display screen.
   b. You can continue to delete statements (return to step 1), select another SEU mode (press the appropriate command key), or end the job (press the EOJ command key).

3. If you want to delete a group of statements, press the MULT STMTS command key. The following display appears:

   Note: If you delete all statements from a member, enter/update is entered.



   a. Key the statement number of the last statement in the group, or press the ROLL↑ key until the last statement to be deleted is shown on lines 2, 3, and 4 of the display screen. Then press the ENTER key.
   b. Press the REC ADV key. The statements are deleted and the statement following the last statement deleted appears on the display screen.
   c. You can continue to delete statements (return to step 1), select another SEU mode (press the appropriate command key), or end the job (press the EOJ command key).

DATA FILE UTILITY PROGRAM (DFU)

The Data File Utility (DFU) is a program product designed to process your data files. There are four basic uses of DFU. They are:

1. Creating data files.

2. Maintaining data files (modifying, adding, and deleting information).

3. Displaying information from a data file.

4. Preparing and printing reports from information in a data file. (At your option, data can be sorted prior to printing.)

Note: DFU can also be used to process source and procedure members and sort data files using a SORT command statement.

DFU is a two-step program. The first step involves defining the job to be done by responding to a series of prompts that appear on the display screen. Your responses are used by DFU to build a format description—information about your job that can be given the name you specify, stored in the system library, and made available for future use.

If you want to do the same job in the future (that is, process the same or an identical file in the same manner) you can skip step 1 if you have saved the format description.

The second step involves running the job—doing the actual entering, updating, inquiry, listing, or sorting of the file.

In most cases, the job will be defined for you and you will begin with step 2. For this reason, this section explains the command and function keys you use and the steps in running the job.

For information on creating format descriptions, refer to the *IBM System/32 Utilities Program Product Reference Manual—Data File Utility,* SC21-7600.

In this section, the following DFU terms and concepts are used without explanation. If you require an explanation of any of these items, or further explanation of the DFU program, refer to the *System/32 Utilities Program Product Reference Manual—Data File Utility,* SC21-7600.

Auto dup indicator
Automatic field duplication
Automatic record key generation
Batch accumulator
Delete code
Field accumulation
Format description
Null response
Record identification indicator
Record key
Record type
Total accumulator

Command Keys, Function Keys, and DFU Template

The DFU program converses with you by displaying messages and prompts on the display screen. You enter responses to each prompt via the keyboard (responses to prompts provide control information to the DFU program). Responses are made as follows:

- Press one of the command or function keys to initiate the desired function, or

- Key the response (it will be displayed on the display screen) and then press one of the function keys to indicate the end of the response.

A preprinted template is available for your use (form number GX21-7638, or equivalent) that shows the DFU command key assignments. Insert the template when you are using DFU. Figure 18 shows the keyboard and inserted DFU template. Figures 19 and 20 show how the command and function keys are used when you are running a DFU job.

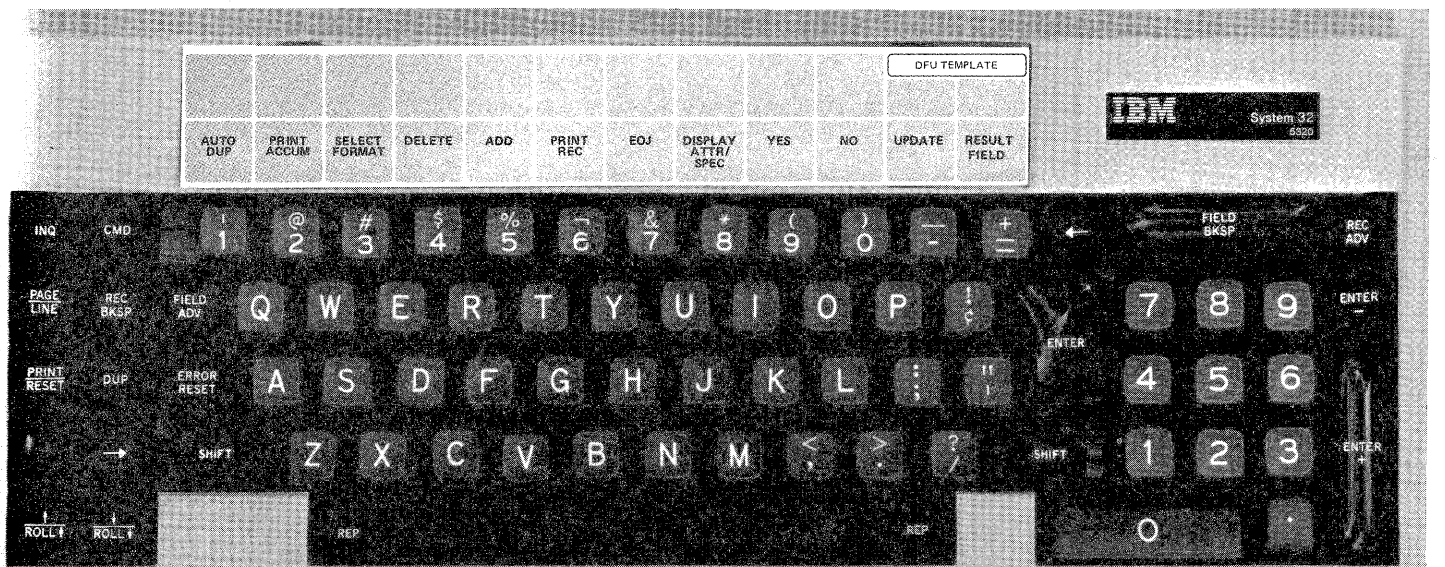


Figure 18. Keyboard with DFU Template Inserted

Function Key	When Used	Results
◄ (cursor left)	ENTER/UPDATE INQUIRY	The cursor moves left one position.
► (cursor right)	ENTER/UPDATE INQUIRY	The cursor moves right one position.
	ENTER/UPDATE	The current record is ignored and the cursor returns to the first field that can be entered or updated.
	ENTER/UPDATE	Processing for this record is complete. All fields that have been entered or updated are written to the file.

Figure 19 (Part 1 of 7). DFU Function Keys

Function Key	When Used	Results
	ENTER/UPDATE	The entire field displayed on line 5 is entered into the record (rightmost slashes are blanked out). If it is a numeric field, the data is right-adjusted and padded with leading zeroes.
	INQUIRY	Displays the next field, shifting the record being displayed left one field.

Figure 19 (Part 2 of 7). DFU Function Keys

Function Key	When Used	Results
[redacted]	ENTER/UPDATE	If the cursor is in the first position of a field, it is repositioned at the start of the preceding field. If the cursor is not in the first position of a field, it is reset to the start of the field. FIELD BKSP cannot be used with the record key field. *Note:* FIELD BKSP cannot be used to access auto dup fields unless the auto dup indicator is turned off.
	INQUIRY	Displays the previous field, shifting the record being displayed right one field.

Figure 19 (Part 3 of 7). DFU Function Keys

Function Key	When Used	Results
[redacted] or [redacted]	ENTER/UPDATE	Blanks the field from the cursor position to the end of the field, then enters the keyed data into the record. If the field is numeric, the data is right-adjusted and padded with leading zeros.
	INQUIRY	Enters the record key of a record that you want to display.
[redacted]	ENTER/UPDATE	Performs the same tasks as ENTER and ENTER+ except the field is entered with a minus (-) sign.

Figure 19 (Part 4 of 7). DFU Function Keys

Function Key	When Used	Results
 (lower case-field duplication)	ENTER/UPDATE	The character that the cursor is positioned under and all characters to its right are duplicated from the corresponding field in the previous record, and the field is entered into the record. This key is active only if: 1) the preceding record was the same record type as the current record, or 2) the auto dup indicator is off, but the field is specified as an auto dup field and its length and end position match that of an auto dup field from the previous record.

Figure 19 (Part 5 of 7). DFU Function Keys

Function Key	When Used	Results
 (upper case-single character duplication)	ENTER/UPDATE	The character that the cursor is positioned under is duplicated from the corresponding character in the previous record, and the cursor moves to the next character position. If the cursor is currently in the last position of a field, it duplicates that character and performs a field enter function. The DUP key is active only if: 1) the preceding record type is the same type as the current record, or 2) the auto dup indicator is off, but the field is specified as an auto dup field and its length and end position match that of an auto dup field from the previous record.

Figure 19 (Part 6 of 7). DFU Function Keys

Function Key	When Used	Results
	INQUIRY	Causes the next record in the file to be retrieved and displayed on line 4.
	INQUIRY	Causes the preceding record in the file to be retrieved and displayed on line 4.
	ENTER/UPDATE INQUIRY	Stops the display screen when it is flashing a message. The message can be read and the appropriate keyboard response can be made.

Figure 19 (Part 7 of 7). DFU Function Keys

Command Key	When Used	Results
AUTO DUP 	ENTER/UPDATE	Reverses the status of the auto dup indicator. If off, it is turned on; if on, it is turned off.
SELECT FORMAT 	ENTER/UPDATE	Requests a new record type.
	INQUIRY	When pressed, another record type is prompted for. Allows you to display a record in any defined type.
PRINT ACCUM 	ENTER/UPDATE	Prints the batch accumulators, adds them to the total accumulators, and resets them to zero.
UPDATE 	ENTER/UPDATE	Changes processing mode to update. In update mode, only existing records can be altered.

Figure 20 (Part 1 of 3). DFU Command Keys

Command Key	When Used	Results
DELETE 	ENTER/UPDATE	Inserts a delete code into the record displayed on line 4.
ADD 	UPDATE	Changes processing mode from update to add. New records can be entered in add mode. If DFU is generating record keys, add mode allows the entering of record keys from the keyboard (automatic key generation is suspended). Only keys lower than the last DFU-generated key can be entered. To resume automatic key generation, respond with a null entry when prompted for the next record key.

Figure 20 (Part 2 of 3). DFU Command Keys

Command Key	When Used	Results
PRINT REC [redacted]	INQUIRY	Prints the record currently shown on the display screen.
EOJ [redacted]	ENTER/UPDATE INQUIRY	Prompts for end of job.
YES [redacted]	ENTER/UPDATE INQUIRY	Causes a positive response to be given to the prompt END OF JOB? Final totals are printed (if creating or maintaining a data file) and the job is terminated.
NO [redacted]	ENTER/UPDATE INQUIRY	Causes a negative response to be given to the prompt END OF JOB? Processing continues.

Figure 20 (Part 3 of 3). DFU Command Keys

Creating a Data File

The following information explains how to create a data file. It is assumed that the format description already exists. If the format description does not exist, refer to Chapter 3 of the *IBM System/32 Utilities Program Product Reference Manual—Data File Utility,* SC21-7600, for assistance in creating the format description before proceeding.

ENTER Command Statement

When creating a file, key the word ENTER and press the ENTER key. A prompt is then issued for the filename:

ENTER FILENAME OF FILE TO BE CREATED

Your response gives a name to the data file being created. The filename is a maximum of eight characters in length, and must start with an alphabetic character. The filename must not be a duplicate of an existing file.

The next prompt is:

ENTER NAME OF FORMAT DESCRIPTION
(THE DEFAULT NAME IS #DFUOBJ)

Your response specifies the name of the format description for processing this job.

The next prompt is:

ENTER NUMBER OF RECORDS TO BE IN FILE

Your response is the number of records the file will contain.

The preceding prompting sequence can be skipped by initially keying the complete command statement or the name of the procedure that contains the complete command statement:

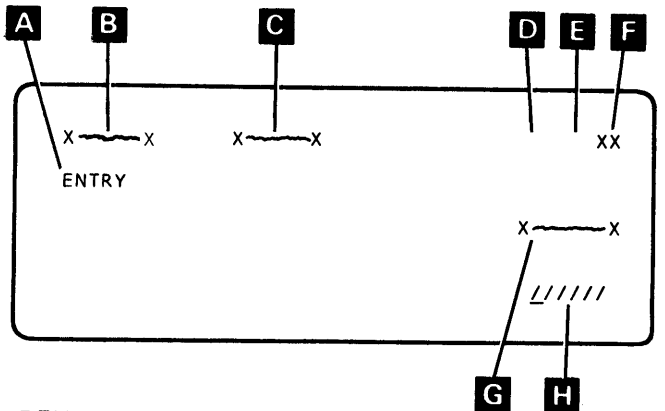
ENTER filename,format description name,,number of records.

One of the two initial displays appears after the command statement is keyed: one if DFU generates record keys for you, and one if you supply the record keys. Figure 21 shows a sample initial display when DFU is generating the record keys. Figure 22 shows the format of both displays.

```
1    SALESORD      DAILY SALES ORDERS        01
2    ENTRY                                00010
3                        *KEY     ITEM NUMBER
4                          10
5                                      //////
```

Figure 21. Sample Initial Display for Entering Records

You are supplying keys:



DFU is generating keys:

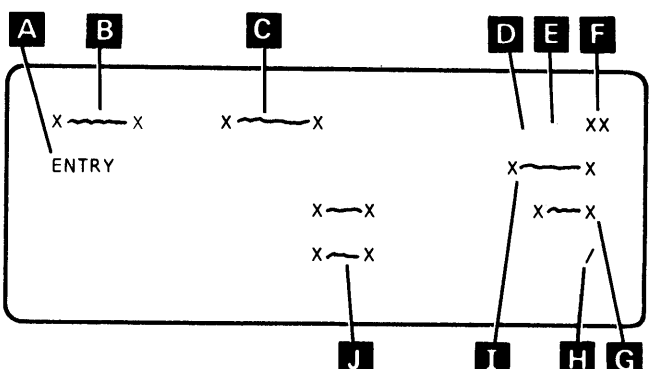


Figure 22. Initial Displays for Creating a Data File

Legend:

A The word ENTRY indicates that you are entering records in the data file.

B Name of the file you are now entering.

C Job title (may be blank).

D Auto dup indicator (either A or blank).

E Record identification of the previous record (blank for the initial display).

F Record identification of the record being entered.

G Heading of data to be entered.

H The cursor is positioned to accept your entry. The number of slashes (/) indicates the maximum number of positions in the field.

I Key of the record being entered.

J Key and its heading for the record to be entered.

Steps for Entering a Data File

1. Check the status of the auto dup indicator. If necessary, press the AUTO DUP command key to reverse the status. (A indicates on, blank indicates off.)

2. Check that the record type on the first line of the display is the same as the record type being entered. If the record types are different, use the SELECT FORMAT command key to select the proper type.

3. The rightmost heading on line 3 of the display names the field to be keyed. Line 5 of the display contains as many slashes (/) as there are positions in the field. Key the data for this field. As each field is keyed, one of the following function keys is pressed to enter the field into the record or write the record to disk:

   ENTER, ENTER+, FIELD ADV can be used to enter a field into a record. If any of these are pressed after the last defined field of a record, the record will be written to disk and printed (if the print option was specified in the format description built in the setup step).

   ENTER- is used to enter a negative field into a record. If pressed after the last defined field of the record type has been keyed, the record will be written to disk and printed (if print was specified in the setup step).

   REC ADV is used to write the record to disk and print the record (if specified) when keying of the defined field(s) in the record is not required. (Example: if you have a seven-field record and only the first four fields are required, the REC ADV key can be pressed after the fourth field has been keyed. This allows you to skip the prompts for the remaining fields.)

4. When the batch totals are to be printed, press the PRINT ACCUM command key.

5. If more records are to be entered, return to step 1.

   If DFU is generating record keys and you want to change (correct) records that you have already entered, press the UPDATE command key and return to step 1. This allows you to enter the key of an existing record and then update that record.

   If there are no more records to be entered or changed, press the EOJ command key, and the YES command key to end the program.

Maintaining a Data File

The following information explains how to update a data file. It is assumed that the format description already exists, If the format description does not exist, refer to Chapter 3 of the *IBM System/32 Utilities Program Product Reference Manual—Data File Utility,* SC21-7600, for assistance in creating the format description before proceeding.

UPDATE Command Statement

When updating an existing file, key the word UPDATE and press the ENTER key. A prompt is then issued for the filename:

ENTER FILENAME OF FILE TO BE MAINTAINED

Your response must be the name of an existing file. The filename is a maximum of eight characters in length and must start with an alphabetic character.

The next prompt is:

ENTER NAME OF FORMAT DESCRIPTION
(THE DEFAULT NAME IS #DFUOBJ)

Your response specifies the name of the format description for processing this job.

You can skip the preceding prompting sequence by initially keying the complete command statement or the name of the procedure that contains the complete command statement:

UPDATE filename,format description name

One of two initial displays appears after the command statement is keyed; one if you supply the record keys and one if DFU generates keys for you. These are the same displays as for creating a data file. Figure 22 shows the format of both displays.

Steps for Maintaining a Data File

Note: If DFU is generating keys for your job and you want to stop automatic key generation, use either the ADD or the UPDATE command keys as described below. To resume automatic key generation, respond with a null entry when prompted for the next record key.

1. If you want to insert a record in the file, press the ADD command key, enter a record key (the key you enter must not already exist, and it must be lower than the last DFU-generated key), then:
   a. Check the status of the auto dup indicator. If necessary, press the AUTO DUP command key to reverse the status.
   b. Check that the record type on the first line of the display is the same as the record type being entered. If not, use the SELECT FORMAT command key to select the proper type.
   c. Key data in the defined fields as the prompts appear and enter the new record into the file.

2. To display the record to be updated or deleted, press the UPDATE command key, then enter the record key. If a record is displayed you do not want to update or delete, press the REC BKSP key. You can then enter the key of the record you want.

3. To delete a record, press the DELETE command key. The record is marked for deletion and a RECORD DELETED message is printed along with the record.

4. To change the record type, use the SELECT FORMAT command key to select the proper type.

5. To update a field in the record, press the FIELD ADV or FIELD BKSP key until the field is displayed. Update the field and press the ENTER, ENTER+, ENTER-, or FIELD ADV key to record the change.

6. When all updates to the record have been made, press the REC ADV key. The record is written to the disk file and printed.

7. If there are no more records to add, update, or delete, press the EOJ command key.

Displaying Records from a Data File

The following information explains how to display records from a data file, and, if necessary, print those records. It is assumed that the format description exists. If the format description does not exist, refer to Chapter 3 of the *IBM System/32 Utilities Program Product Reference Manual—Data File Utility,* SC21-7600, for assistance in creating the format description before proceeding.

INQUIRY Command Statement

To display records from a file, key the word INQUIRY and then press the ENTER key. A prompt is issued for the filename:

ENTER FILENAME OF INQUIRY FILE

Your response must be the name of an existing file.

The next prompt that appears is:

ENTER NAME OF FORMAT DESCRIPTION
(THE DEFAULT IS #DFUOBJ)

Your response specifies the name of the format description for processing this job.

You can skip the preceding prompting sequence by initially keying the complete command statement or the name of the procedure that contains the following complete command statement:

INQUIRY filename,format description name

After you key the INQUIRY command statement, the first record in the file is displayed on the screen. If the first record does not match any of the record types defined in the format description, the following message is displayed:

UNABLE TO IDENTIFY FIRST RECORD IN FILE

Respond to this message by doing one of the following:

Enter the key of an existing record.
Press the ROLL↑ key.
Press the SELECT FORMAT command key to specify the format in which to display the record.

Steps for Displaying a Data File

Once the first record is displayed, you can display the succeeding records by:

1. Pressing the ROLL↑ key.

2. Keying a record key and pressing ENTER.

   Note: If all the keys in the file are numeric, you need enter only the rightmost digits of a record key. The field is automatically right-justified and leading zeros are inserted before the record is retrieved.

If the ROLL↑ key is pressed, the next record in the file is displayed on line 4 of the display. You can scan the entire file by pressing the ROLL↑ key for each succeeding record.

Similarly, you can retrieve the preceding records in the file by:

1. Pressing the ROLL↓ key.

2. Keying the record key and pressing ENTER.

When the record on display is the one you want to look at, use the FIELD ADV key to display the fields in the record.

Printing Reports from Information in a Data File

The following information explains how to print reports from information in a data file. It is assumed that the format description already exists. If the format description does not exist, refer to Chapter 3 of the *IBM System/32 Utilities Program Product Reference Manual—Data File Utility,* SC21-7600, for assistance in creating the format description before proceeding.

LIST Command Statement

There are two ways to key the LIST command statement. The first way is:

1. Key the word LIST. The following prompt appears:

   ENTER FILENAME OF LIST FILE

2. Key the name of the list file from which the report is printed. The following prompt appears:

   ENTER NAME OF FORMAT DESCRIPTION
   (THE DEFAULT NAME IS #DFUOBJ)

3. Key the name of the format description for the job. The following prompt appears:

   INDICATE IF THE DATA IS TO BE SORTED BEFORE LISTING ('NOSORT',SORT)

4. Key NOSORT (or press the ENTER key) if you do not want DFU to sort the file before printing it. Key SORT if you want DFU to sort the file before printing it.

   Note: If NOSORT was specified in the format description, DFU will not accept a response of SORT. If SORT was specified in the format description and your response is NOSORT, DFU offers you the option of ending or continuing the job. If you press ENTER without keying a response, DFU lists the file without sorting it. After you respond to this prompt, DFU prints the report.

You can also key the LIST command statement by keying the following complete command statement or the name of the procedure that contains the complete command statement:

LIST filename,format description name,, [SORT / NOSORT]

The methods of keying the LIST command statement are modified as follows when you use a related master file:

For the first method of keying the command statement, step 1 is:

Key LIST ,,,,,,,master filename

The following prompt appears:

ENTER FILENAME OF LIST FILE

Steps 2, 3, and 4 remain the same.

For the second method, the complete command statement is:

LIST filename, format description name,,
[SORT / NOSORT] ,,,, master file name

Steps for Sorting Records

1. Enter the SORT command statement or the name of the procedure that contains the SORT command statement. The SORT command statement is:

   SORT input filename,source member name, output filename, number of records

   The parameters are explained in Appendix D of *IBM System/32 Utilities Program Product Reference Manual — Data File Utility,* SC21-7600.

2. If the source member you specified does not exist, DFU enter mode is automatically active and you must enter the sort sequence specifications. When all specifications have been entered, control is given to the sort program to sort your file.

3. When the sort ends, the READY line appears on the display screen. Enter the command statement to continue with your next job.

Note: You can also sort a data file without using the data file utility SORT command statement. The *sort program* information following explains another method of initiating a sort.

SORT PROGRAM

The sort program allows you to sequence records in a file or reformat records in a file.

Initiating the Sort Program

You initiate a sort by entering the procedure name that contains the OCL for the job. This method of initiation requires sort sequence specifications that are stored as a source member in the library.

You can also initiate the sort by using the SORT command statement of the data file utility program. The data file utility information preceding explains the SORT command statement.

For further information about the sort program and for additional methods of initiating it, refer to the *IBM System/32 Utilities Program Product Reference Manual—Sort,* SC21-7633.

UTILITIES PROGRAM PRODUCT MESSAGES

While you are running the SEU, DFU, or sort program, a message may appear on the display screen. For information about a program product message, refer to the *IBM System/32 Messages Guide — Utilities Program Product,* SC21-7618.

RPG II Program Product

This section shows the command statement you enter to compile an RPG II program and explains how you use the interactive data entry function of RPG II. If you require additional information about RPG II or interactive data entry, refer to the *IBM System/32 RPG II Reference Manual,* SC21-7595.

COMPILING RPG II SOURCE PROGRAMS

To compile an RPG II source program, enter a command statement that has the following format:

RPG source program name ,[$SOURCE file size / 20 blocks] [,$WORK file size / 20 blocks]

INTERACTIVE DATA ENTRY

Interactive data entry is a function of RPG II that allows you to enter input data for an RPG II program while it is running. Figure 23 shows and explains the initial display screen that appears when you are to start entering the data.

Figure 24 shows a sample interactive data entry display.

Note: If, during interactive data entry, the prompt

PRESS ERROR RESET

occurs, it indicates that interactive data entry has been suspended. Press ERROR RESET. What you do next is controlled by the application program; therefore, refer to the operating instructions for the program.

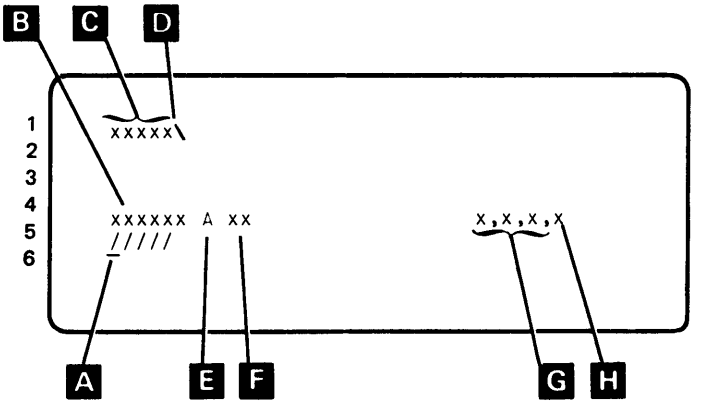


Figure 23. Initial Interactive Data Entry Display

Legend:

A The cursor is positioned to accept your entry for the first field of the first record. The number of slashes (/) indicate the maximum number of positions in the field.

B Name of the field to be entered.

C Current record ID (identifying indicator).

D The backward slash (\) indicates the end of a field.

E Field type (can be A for alphameric or N for numeric).

F Field length (can have the form xx.y where y indicates the number of decimal positions in the field).

G Other record types that you can select at this time.

H Record type of the record to be entered.

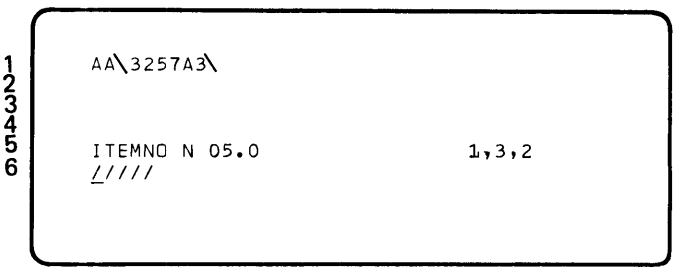


Figure 24. Sample Interactive Data Entry Display

Steps in Entering Data

When the initial display appears, follow these steps to enter data for the program:

1. Check that the record ID on line 1 of the display is correct for the record you will enter. If the ID is wrong, press the appropriate command key to select the record type.

   The leftmost heading, on line 5 of the display, names the field to enter. Line 6 contains a number of slashes (/), the same as the number of positions in the field (indicated by **F** in Figure 23).

2. Key the field.

If the record is not full and you will enter more fields in the record:

Press ENTER, ENTER+,or FIELD ADV to enter a positive or alphameric field; press ENTER- to enter a negative field. The field will be shown on line 1 of the display with a backward slash (\) separating it from the previous field entered in the record.

A negative field is indicated by an underscore (_) beneath the rightmost digit: (for example, 21546). A prompt for the next field appears on line 5. Return to the beginning of this step.

Note: If you enter an alphameric character in a numeric field or if you enter too many characters in a field, the display screen flashes, indicating your error. Press the ERROR RESET key and reenter the field.

If the record is not full, but you have keyed the last field for the record:

Press REC ADV to enter a positive or alphameric field; press ENTER-, then REC ADV to enter a negative numeric field. The record will be entered in the file. If you have more records to enter, return to step 1. Otherwise, go to step 3.

If the record is full:

Press ENTER, ENTER+, or FIELD ADV to enter a positive or alphameric field; press ENTER- to enter a negative numeric field. The record will be entered in the file. If you have more records to enter, return to step 1. Otherwise, go to step 3.

3. Press the CMD key, then press the 

key to end the interactive data entry.

Function and Command Keys for Interactive Data Entry

Figures 25 and 26 show how the function and command keys are used during interactive data entry.

Function Key	Results
REC BKSP	Causes the record you are entering to be ignored and prompts you for the first field in the record.
FIELD BKSP	If the cursor is not in position 1 of line 6 (you have entered some data in the field), resets the cursor to position 1 of line 6 and you are reprompted for the field. If the cursor is in position 1, the data entered in the previous field is removed from line 1 of the display and you are reprompted for that field.

Figure 25 (Part 1 of 2). Function Keys Used for Interactive Data Entry

Function Key	Results
FIELD ADV, ENTER, or ENTER +	Enters the field (from the beginning of the field to the position indicated by the cursor) on line 6 of the display into the record. Also enters the record in the file if the record is full.
ENTER-	Enters a numeric field displayed on line 6 into the record as a negative field. Also enters the record in the file if the record is full.
ERROR RESET	Readies the keyboard after an error occurs. You must press this key before you can continue entering records.
REC ADV	Signals that you have entered the last field in the record and prompts you for the first field of the next record.

Figure 25 (Part 2 of 2). Function Keys Used for Interactive Data Entry

Command Key	Function
! 1	Selects record type one.
@ 2	Selects record type two.
# 3	Selects record type three.
$ 4	Selects record type four.
% 5	Selects record type five.
¬ 6	Selects record type six.
& 7	Selects record type seven.
* 8	Selects record type eight.
(9	Selects record type nine.
) 0	Selects record type ten.

Figure 26. Command Keys Used for Interactive Data Entry

Note: These command keys are valid only when prompted for the first field in the record (and you have not pressed the FIELD BKSP key to cause the prompt for the first field in the record). Line 5 of the display (G in Figure 23) indicates the record types that you can select.

RPG II MESSAGES

While you are running the RPG II program, a message may appear on the display screen. For information about an RPG II program message, refer to the *IBM System/32 Messages Guide—. RPG II,* SC21-7617.

Contents

Problem Determination

System *down time,* time you cannot operate the system because of system problems, can be substantially reduced if you are able to determine problems and perform appropriate recovery actions. The following pages provide descriptions of problem situations and actions that you can take before, or instead of, calling for service.

In general, always follow the operating instructions and recovery actions described in your application operating instructions. Remember that it is not always possible to retry a failing job without either restoring disk information that was partially updated or removing information that was being created on the disk. For some failures, the system library must be reloaded from diskettes to disk.

If you were entering a large amount of information when the failure occurred, it may be possible to save the records already entered in a disk file by entering the REBUILD command statement (see the *Command Statements* section) immediately after the failure is corrected.

LOCATING THE PROBLEM

For any problem that occurs on the system, you may be able to resume operation by checking the following:

What to Check	What to Look For
Plugs and lights	– System plugged in. – KEYBD RDY light on (if it is not on, check that it is working by pressing LAMP TEST on the CE control panel).
Printer	– Proper forms used. – Proper adjustment of forms and the print belt. – Cover closed. – Ribbon guides lowered. – Print unit closed.
Diskette drive	– Proper diskette inserted correctly. – Door latched.

What to Check	What to Look For
Switches	– Proper setting of the IPL and IMPL switches on the CE control panel (normally, both switches are set to DISK), and the operator panel POWER switch is on. – MODE SELECTOR switch on the CE control panel set to PROC RUN. – Proper setting of the DISPLAY INTENSITY control on the CE control panel. – Each ADDRESS/DATA switch on the CE control panel set to 0.
Data	– Proper data files restored to the disk. – Correct commands and parameters entered for each job.
Commands	– Proper commands and parameters entered in correct sequence. *Note:* You can use the HISTORY command statement (see the *Command Statements* section) or the ROLL↑ and ROLL↓ keys to display and review the command statements you have entered.

If you cannot correct the problem, call IBM for service. You may be able to reduce the time required to resume system operation by collecting needed information (for example, by recording error messages and saving any program output) and having it available.

DETERMINING THE PROBLEM

1. Does the system power turn on when you set the operator panel POWER switch on?
   YES NO
   - NO: Is the TH CHK light on the operator panel on?
     NO YES
     - YES: See *TH CHK Light On* in this section.
     - NO: Is the PWR CHK light on the operator panel on?
       NO YES
       - YES: See *PWR CHK Light On* in this section.
       - NO: See *No System Power* in this section.
   - YES:
2. Can you complete the initial program load (IPL) — Is the READY line on the display screen?
   YES NO
   - YES: (A)
   - NO: See *Cannot IPL* in this section.

(A)

3. Are you trying to run a data communication program?
   NO YES
   - YES: See *Data Communication Problem Determination* in this section.
   - NO:
4. Are you trying to run a program that uses the mag card unit?
   NO YES
   - YES: See *Mag Card Unit Problem Determination* in this section.
   - NO:
5. Is there visible system action (either the START light on the operator panel is on or a job has ended and the READY line is shown on the display screen)?
   YES NO
   - NO: See *No Visible System Action* in this section.
   - YES:
6. Is the PROC CHK light on the operator panel on?
   NO YES
   - NO: (A)
   - YES: See *PROC CHK Light On* in this section.

(A)

7. Was correct output received from the job?
   YES NO
   - NO: See *Incorrect Output for the Job* in this section.
   - YES:

8. Retry your job. If the problem continues to occur, call IBM for service.

No System Power

Set the POWER switch on the operator panel off. Press LAMP TEST on the CE control panel. If the TH CHK and PWR CHK lights turn on, set the POWER switch on the operator panel on. If you cannot continue, call your IBM customer engineer. If the TH CHK and PWR CHK lights do not turn on, check (1) that the MAINLINE POWER switch on the back of the System/32 is set on, (2) that the system is plugged in, and (3) that the power in the building or room is on. Set the POWER switch on and press the LOAD key on the operator panel to continue processing.

Cannot IPL

- The DISPLAY INTENSITY control on the CE control panel may be set so low that the READY line is not visible on the display screen. Check the adjustment.

- The IPL and IMPL switches on the CE control panel may be incorrectly set. They should both be set to DISK unless you are reloading from diskettes. The switches to the left and right of the IPL and IMPL switches should be in the down position (set to STOP, PRES, OFF, MAIN, and RUN). Check the switches, set them correctly, and press the LOAD key on the operator panel again.

- The MODE SELECTOR switch on the CE control panel should be set to PROC RUN.

- Each ADDRESS/DATA switch on the CE control panel should be set to 0.

- If message 19 is shown on the display screen, an error has been detected during the IPL. The first line of the message contains from one to five entries. Each entry consists of four hexadecimal numbers. The first two numbers specify the area of error, and the second two numbers specify the type of error.

First Two Numbers	Area of Error
01	Processor
10	Keyboard
40	Display screen
A0	Disk
D0	Diskette
E0	Printer

1026 Entry: If a 1026 entry is on the first line of the display screen, one or more keys on the keyboard may be stuck. Release any keys that are stuck and press the START key to continue.

E021 Entry: If an E021 entry is on the first line of the display screen, check for a missing print belt or an open print unit. Correct the problem and then press the ENTER key to continue.

For other entries on the first line of the display, you should record the entries exactly as they appear and then retry the IPL. If the error occurs again, call the IBM customer engineer and give him the information you have recorded.

- The SCP or the microprogram may have been accidently modified. If you are doing an IPL from disk, reload the system control programming and other programs by doing a reload from diskettes (see the *System Operation* section).

  If you are doing a reload from diskettes, you must use another diskette copy of the system control programming.

  If neither of the previous work, the microprogram may have been accidently modified. If so, it must be reloaded from diskette by an IBM customer engineer.

- If you cannot correct the problem after checking the above possible causes, call your IBM customer engineer.

No Visible System Action

- If the START light on the operator panel is lit, your program is running. Do not take any action unless you are sure that some expected system action is overdue. Some programs require significant amounts of processing time with no visible changes occurring in the system.

- If the STOP key is lit, check the system for any possible problem that may have caused someone to press the STOP key. Press the START key on the operator panel to continue.

- The ENTER key may not have been pressed. Check the display screen. If the cursor is still displayed following the last keyed entry and the KEYBD RDY light is on, press the ENTER key to continue.

- The program may be looping. This means that a program failure or another error is causing the program to execute the same series of instructions repeatedly.

If you want to have the program checked for a possible error, you should cause a storage dump to be taken by pressing RESET, then CE START on the CE control panel. When message 0016 appears on the display screen, select option 3. The information required to analyze the possible program failure is recorded on the CE cylinder of the disk.

Enter the APAR command statement (see the *Command Statements* section) if you want to save the recorded information on a diskette.

If you want to cancel the looping program so that you can retry this job or another, press the INQ key and select the cancel option (option 2) to terminate this job. The job should be retried after checking that:

1. Correct input data was entered.

2. Correct sequence of jobs was executed.

3. Correct diskettes were provided.

4. Data on the disk will not be incorrectly modified if you retry this job. Check your application operating instruction if you are running an application.

Note: Remember that you may have to execute the backup and restore procedures for the job (refer to the job run book) in order to retry it.

If the same failure occurs again, consult the programmer responsible for the program.

PROC CHK Light On

The processor has detected an error. Set the MODE SELECTOR switch on the CE control panel to INSN STEP/DPLY CHKS. If no console display lights on the CE control panel come on, the display screen provides the error information for you. Refer to the *IBM System/32 Messages Guide—System,* GC21-7592, for an explanation of the error and for the steps to continue.

If console display lights are on, record their status (press LAMP TEST on the CE control panel to check that all of the lights are working). Set the MODE SELECTOR switch to PROC RUN. Press RESET, then CE START on the CE control panel. When message 0016 appears on the display screen, select option 3. The information required to analyze the problem is recorded on the CE cylinder of the disk. Enter the APAR command statement if you want to save the recorded information on a diskette.

If you are not able to resume processing, call your IBM customer engineer and give him the information that you have recorded.

TH CHK Light On

Warm temperatures have caused the system power to turn off. Check the room temperature. If it is extremely warm, let the system and room temperature return to normal. Then do the following:

1. Set the POWER switch on the operator panel off.

2. Press RESET on the CE control panel. If the TH CHK light does not turn off, the temperature is still too warm. Wait for the system and room temperature to return to normal and then repeat this step.

3. Set the operator panel POWER switch on. If the TH CHK light turns on again, call your IBM customer engineer.

PWR CHK Light On

A power problem has caused system power to turn off. You may be able to recover by doing the following:

1. Set the POWER switch on the operator panel off.

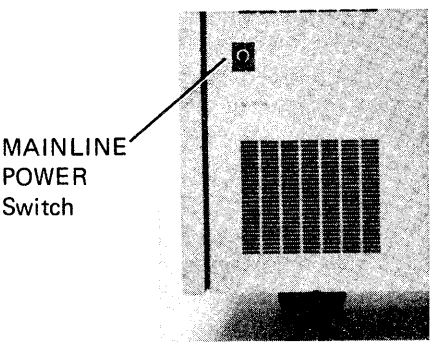
2. Press RESET on the CE control panel.

3. Set the POWER switch on.

If the PWR CHK light remains on, do the following:

1. Set the POWER switch on the operator panel off.

2. Set the MAINLINE POWER switch off, wait a few seconds, and then return the MAINLINE POWER switch to its on position.



3. Set the POWER switch on the operator panel on.

If neither of these procedures corrects the problem, contact your IBM customer engineer.

Incorrect Output for the Job

- If you receive incorrect output for a job, you should first check your application operating instructions. If running an application, you should follow the procedures for checking output and making corrections or rerunning a job.

- The output may indicate an error in the input that was provided. Check the input, correct it if it is not correct, then rerun the job.

- Check that you have run the jobs in the correct sequence. You may have omitted a job that processes the data in error. Rerun the sequence of jobs involved.

- Check that the print image matches the print belt on the printer. If the printed output contains incorrect or meaningless characters, the wrong print image may be in main storage or the wrong belt may be on the printer. Check the proper setup instructions and, if necessary, the restart procedures from the operating instructions for this job. Either put the proper print belt on the printer or use the SET command statement (see the *Command Statements* section) to correct the print belt image in main storage.

- If you cannot correct the problem, call the person responsible for the program for further assistance.

Data Communication Problem Determination

Nonswitched Network

- Set the CE control panel COMM DPLY switch on. The modem ready light (the second light from the left on the CE control panel) should be on while the program is executing. If it turns off, check that the modem is plugged in. If you cannot determine the cause of the loss of power to the modem, call your modem service representative.

- Set the CE control panel COMM DPLY switch on.

  If no lights on the CE control panel are flashing, check the data terminal ready light (the leftmost light on the CE control panel). If it is off, reload your program. If it is on, do the following:

  1. Contact the operator of the remote terminal and check that the proper program is being executed.

  2. Before you call for service, check that all of the communication equipment involved is operating properly.

- If you have the 2400-bps integrated modem, do the equalization procedure described in the *Communications* section of this manual before you call for service.

Switched Network

If you initiate a call and talk to the operator of the called terminal, but fail to complete the network connection:

- Contact the operator of the called terminal and check that their modem was in data mode and that their program was properly loaded and ready to receive data before the operator replaced the receiver on the modem.

- Retry the call, following the steps in the *Communications* section of this manual.

- Before you call for service, check that all of the communication equipment involved is operating properly.

If you initiate a call and the operator of the called terminal has placed the modem in the auto mode :

- If that modem does not stop ringing, the called terminal is not ready to begin communications. Contact the operator and request that the terminal be made ready for communication.
- If you receive a busy signal, the called terminal may be communicating with another terminal or the communication equipment may have failed. Contact the operator of the called terminal.
- If the modem stops ringing but you do not hear a high-pitched tone, there may be a poor connection. Replace your receiver on the modem, then reattempt to make the connection. If this continues to occur, the operator of the called terminal should check their modem for equipment problems.

If you receive a call, talk to the operator of the calling terminal, but fail to complete the network connection:

- Repeat the steps for receiving a call and talking to the calling operator in the *Communications* section of this manual. Be sure that you do each step in its proper sequence. Also check that you load the proper program and that you place your modem in the data mode *before* the caller enters data mode.
- Before you call for service, check that all of the communication equipment involved is operating properly.

If you receive a call and answer automatically:

Did your modem ring?

YES NO

- NO: The calling terminal operator has specified the wrong program or has dialed the wrong number, a calling terminal modem error has occurred, or a line problem has occurred. Contact the operator of the calling terminal.

Set the CE control panel COMM DPLY switch on. Did the modem ready light turn on (second light from the left on the CE control panel)?

YES NO

- NO: Call your modem service representative.

If the program does not begin within the expected amount of time, reload the program. Before you call for service, check that all of the communication equipment involved is operating properly.

Mag Card Unit Problem Determination

Power Light Off

If the Power light on the mag card unit operator panel fails to come on when System/32 power is turned on, check that the mag card unit is plugged in (there is a power cord and a System/32 connector cord). Also, make sure power in the room is on. Before contacting your IBM customer engineer, press LAMP TEST on the CE control panel of the System/32 to check that the light is working. If the light is working, make one last test by performing the power recovery procedure in this section (under *PWR CHK Light On*).

Ready Light Off

If the Ready light on the mag card unit operator panel fails to come on when the Start key is pressed, check the single card feed slot for a magnetic card and remove it if found. If there is no card showing, press Stop (on mag card unit), then Eject, and remove the magnetic card if there is one. Before contacting your IBM customer engineer, press LAMP TEST on the CE control panel of the System/32 to check that the light is working.

Message Light On

The Message light indicates that there is a message on the display screen to which you may respond. The *Mag Card Unit* portion of the *I/O Features* section of this manual describes the messages and responses for the mag card unit. If the display screen shows no message when the Message light is on, check the DISPLAY INTENSITY control on the CE control panel for the System/32 (it may be set so low that the message cannot be seen).

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Contents

Note: This section describes how to use the various I/O devices available as features on the IBM System/32. Because you cannot have more than one of these features on a system, it is recommended that you remove and discard any sections that are not applicable to your system.

DATA RECORDER ATTACHMENT

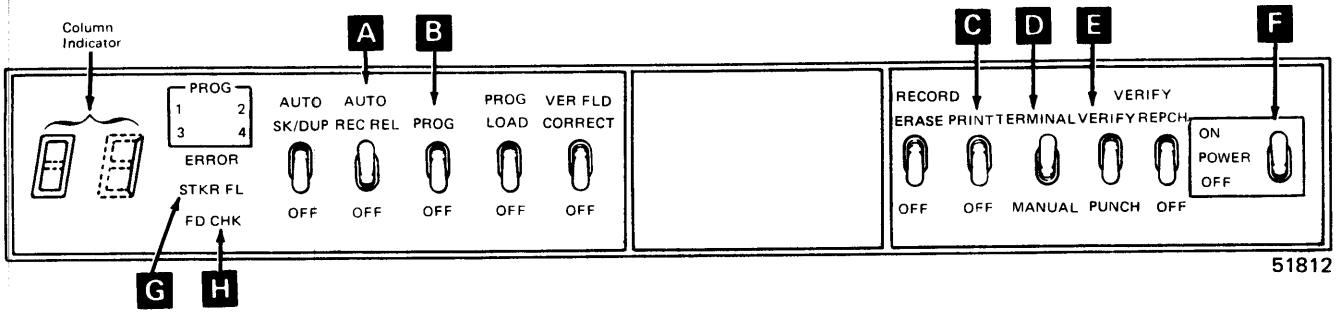
With the data recorder attachment feature, the 129 Card Data Recorder (80-column) or the 5496 Data Recorder (96-column) functions as an auxiliary online reader/punch for System/32. Offline, both data recorders operate in their normal mode.

Certain switches and indicator lights on both data recorders must be in specific positions for online operation. Operation of keys or switches other than those required for online operation can cause machine or program malfunctions. Only the switches and keys pertaining to online operation are discussed in this guide. Refer to the following manuals for related information and instructions for offline operation of the data recorders:

IBM 129 Card Data Recorder Operator's Reference Manual, GA22-6968

IBM 5496 Model 1 and 2 Data Recorder Operator's Guide, GA21-9086

5496 Data Recorder Switches, Keys, and Indicator Lights



The 5496 switches, keys, and indicator lights that apply to online mode are:

A *Auto Record Release Switch:* This switch must be in the AUTO position.

B *Program Switch:* This switch must be in the OFF position.

C *Print Switch:* This switch can be set to either the PRINT or OFF position. When the switch is set to the PRINT position, each column punched during the punch operation is also printed.

D *Terminal/Manual:* This switch must be in the TERMINAL position. When this switch is in the MANUAL position, the 5496 functions as a standalone data recorder.

E *Punch/Verify Switch:* This switch must be in the PUNCH position.

F *Power Switch and Column Indicator:* This switch controls the main power supply to the machine; it must be in the ON position for both online and offline operation. Illumination of the column indicator indicates that power is on.

G *Stacker Full Indicator:* This light is turned on when the stacker is full; it is turned off when the cards are removed from the stacker.

H *Feed Check Indicator:* This light is turned on when a card jam or card misfeed occurs. To reset the indicator, clear the card punch transport, then press the RELEASE key.

Release Key (keyboard): This key is used for clearing hopper jams and transport jams.

Note: In the online mode, this is the only active key on the data recorder.

Moving Cards through the 5496 Transport

When the 5496 is in the process of reading or punching, the card enters the transport from the hopper and continues through the punch station, the read station, and the print station before ending up in the stacker.

Hopper: The cards are loaded in the hopper, face up, with the print area to the top of the hopper, as viewed by the operator. Cards are taken from the top of the deck and moved to the left when they are fed into the transport.

Punch Station: After a card is fed from the hopper, it passes through the punch station. Here information received from the system is punched into the card.

Read Station: After the card goes through the punch station, it passes the read station, where the card is read, if that operation is specified by the system.

Print Station: The print station is the last station the card passes through. If the PRINT switch is in the PRINT position, data that has been punched in the card is also printed at the top of the card.

Stacker: After the card passes through the print station, it is put in the stacker. When the stacker is full, the STKR FL indicator light on the operator panel turns on.

5496 Error Recovery

Following are the 5496 recovery procedures for hopper, transport, and stacker problems. See the *IBM System/32 Message Guide–System*, GC21-7592, for the recovery procedures for all card I/O errors.

Hopper Jam/Hopper Empty: The FD CHK indicator light is on for this condition. Fill the hopper if it is empty; if the hopper is jammed, clear it. Repair or replace any damaged cards, and reload the hopper.

Stacker Full: The STKR FL indicator light is on for this condition. Empty the stacker.

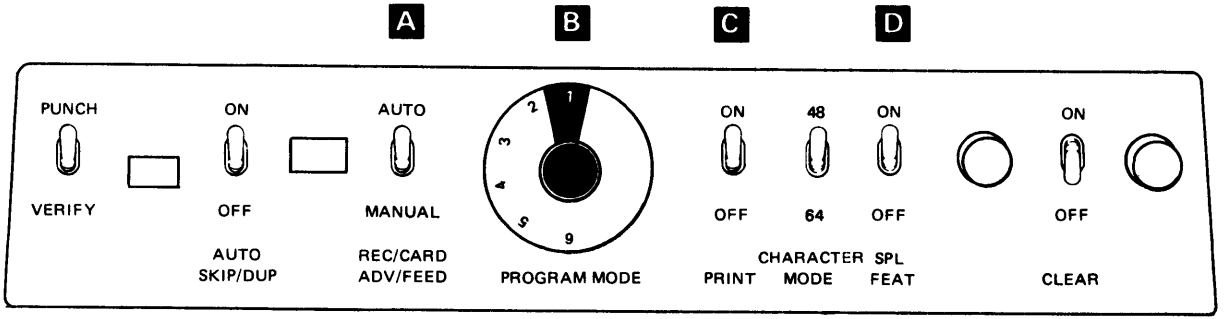
Transport Jam: With a transport jam, the FD CHK indicator light is on. Clear the jam. If the data recorder was reading cards, replace any damaged cards, and place the cards back in the hopper in proper order. Press the RELEASE key and retry the command.

How to Replace a Card

If a card is damaged during a read operation, you may punch a new card manually by doing the following:

1. Set the TERMINAL/MANUAL switch to MANUAL.
2. Press the RELEASE key.
3. Punch the new card in the normal offline mode.
4. Place the new card in the proper position in the hopper.
5. Set the TERMINAL/MANUAL switch to TERMINAL and retry the command.

129 Card Data Recorder Switches, Keys, and Indicator Lights



The 129 switches, keys, and indicator lights that apply to online mode are:

Power Switch (located under keyboard countertop): The switch controls the mainline power supply to the 129. This switch must be in the ON position for both online and offline operation. Illumination of the column indicator indicates power on status.

Note: If the special features (SPL FEAT) switch is in the ON position when the power switch is turned on, a transport jam may occur. To correct this condition, use the CLEAR switch to clear the transport, press the FEED key and hold it until two cards are fed, then press the VERIFY RESET key.

A *Record Advance/Card Feed Switch:* This switch must be set to the AUTO position.

B *Program Mode Switch:* This dial switch must be in the DATA READ position.

C *Print Switch:* This switch can be set to either the ON or OFF position. When the switch is set to the ON position, each column punched is also printed across the top of the card.

Note: Only characters in the 64-character set are printed.

D *Special Features Switch:* This switch must be in the ON position. When this switch is in the OFF position, the 129 functions as a standalone card data recorder.

Feed Key (keyboard): You must press and hold this key to feed cards into the register and preregister stations. When the 129 is operating online, there must be a card at each station.

Register Key (keyboard): You must press this key if a card is only preregistered or if a card is manually inserted in the card bed. The register key aligns the card at the punch/read station, but no card feed occurs.

Verify Reset Key (keyboard): You must press the VERIFY RESET key to reset the following conditions and their associated indicator light: transport jam, hopper jam, hopper empty, and stacker full.

Note: When the 129 is operating online, the data and function keys are locked except for the REGISTER, VERIFY RESET, and FEED keys.

Moving Cards through the 129 Transport

References to the 80-column card designate the 12-edge and the 9-edge. The 12-edge is the top (corner cut) edge of the card; the 9-edge is the lower edge of the card.

Hopper: The cards are loaded in the hopper, face forward, with the 9-edge down. When the FEED key is pressed and held, two cards are fed from the hopper. The first card is fed to the register station, and the second card is fed to the preregister station.

Punch/Read Unit: Punching is performed at this station when the 129 is in punch mode. The first card is positioned at the punch station and automatically registered for punching. The second card is at the preregister position. When column 80 of the first card passes the punch station, that card is transported out, the second card is registered, and the next card is fed down to the card bed into the preregister position. If the system calls for a read operation, cards are read at the read portion of the punch/read unit.

CAUTION

Never use any unauthorized tool to clear a card jam from the punch/read unit; the read optical system could be damaged. When clearing a card jam, use a blank card or the special *IBM 129 card removal tool* that is included with every machine.

Stacker: The cards are moved into the stacker after they have been processed. The card stacker contains a switch that stops card feeding when the stacker reaches capacity. Power is not interrupted by the operation of this switch, but certain error recovery procedures must be followed before the operation can continue.

129 Error Recovery

Following are the 129 recovery procedures for the hopper, transport, and stacker. See the *IBM System/32 Message Guide—System*, GC21-7592, for the recovery procedures for all card I/O errors.

Hopper Empty/Jam: Empty the stacker or fill the hopper. If the jam occurred on a read operation, press the FEED key until two cards are fed in. Note that the 88 is not displayed in the 129 column indicator. If the jam occurred on a punch operation, hold down the MULT PCH key and operate the CLEAR switch. (Note that the 88 displayed in the column indicator changes to 8A.) Press the FEED key until two cards are fed in, then press the VERIFY RESET key.

Transport Jam: 8A displayed in the column indicator indicates a transport jam. The last card processed did not exit the punch/read station at the proper time. Clear the jam, then press and hold the FEED key until two cards are fed in. Press the VERIFY RESET key.

Stacker Full: Empty the stacker or fill the hopper; if the halt occurred on a read operation, press the FEED key until two cards are in the transport. Note that the 88 will not be displayed in the 129 column indicator. If the halt occurred on a punch operation, hold down the MULT PCH key and operate the CLEAR switch. (Note that the 88 displayed in the column indicator changes to 8A.) Press the FEED key until two cards are fed in, then press VERIFY RESET.

No Card Registered: This condition is equivalent to the hopper jam or hopper empty condition.

How to Replace a Card

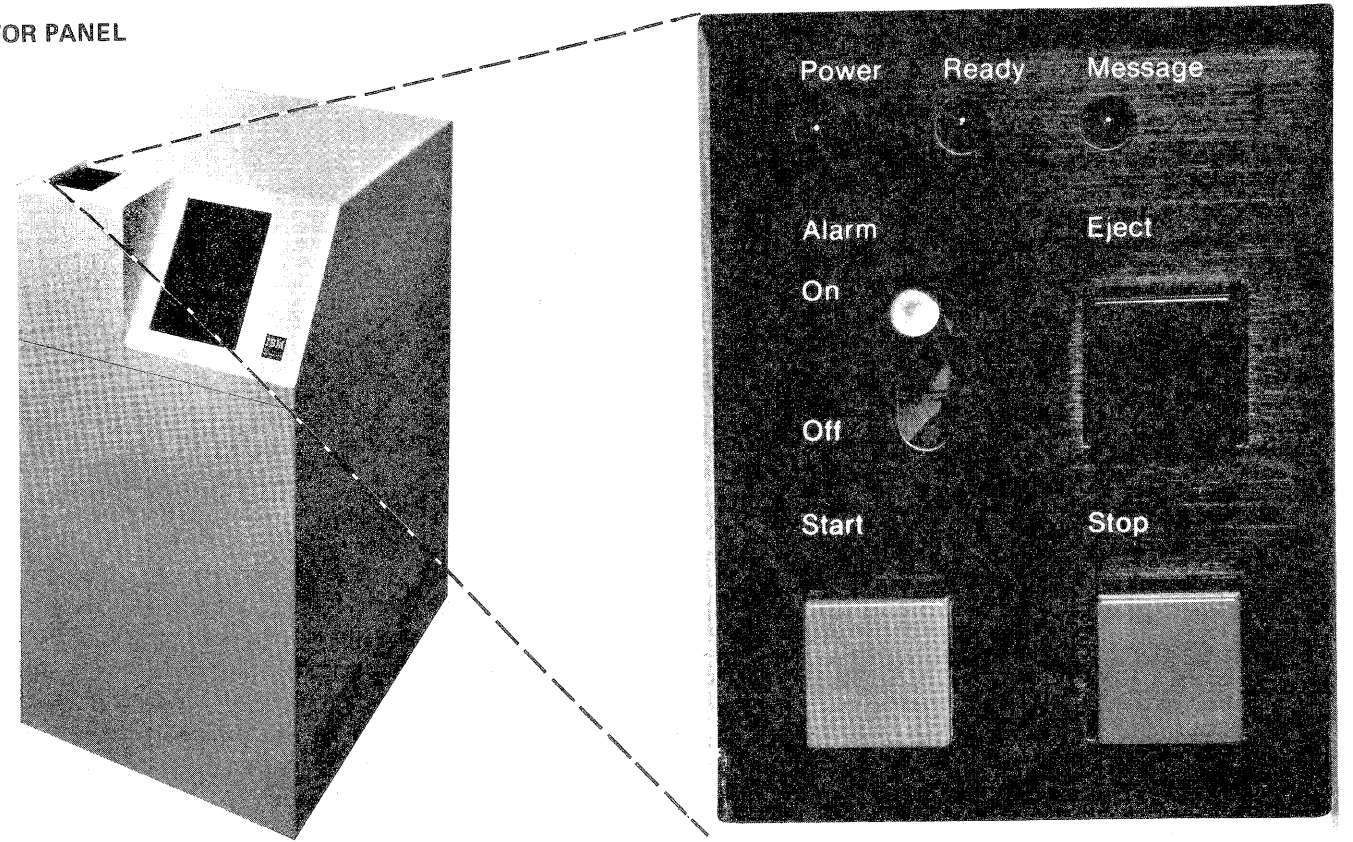
If a card is damaged during a read operation, you can punch a new card manually by doing the following:

1. Set the SPL FEAT switch to OFF.
2. Clear the transport and the register and preregister stations using the CLEAR switch.
3. Punch a new card in the normal offline mode.
4. Place the new card and the cards from the register and preregister stations, in proper order, in the hopper.
5. Press the FEED key and hold it until a card is registered and a second card is fed and preregistered.
6. Set the SPL FEAT switch to the ON position.
7. Press the VERIFY RESET key and continue the online operation.

MAG CARD UNIT

The IBM 5321 Mag Card Unit enables System/32 to read and write magnetic cards. Magnetic cards are used in numerous word processing applications to record text for letters and reports, as well as being used in data processing applications. Refer to the *Word Processing* section of this manual for more information about using System/32 for word processing.

OPERATOR PANEL



Mag Card Unit Operator Panel

Power Light

The Power light indicates that the mag card unit has power. The POWER switch on the System/32 operator panel turns the power for the mag card unit on and off.

Ready Light

The Ready light indicates that the mag card unit is set to process a magnetic card.

Message Light

The Message light indicates that a message is on the System/32 display screen.

Alarm Switch

The Alarm switch in the On position allows System/32 to turn on the audible alarm at the same time as the Message light. In the Off position, it prevents the system from turning on the audible alarm.

Eject Key

The Eject key causes the card to eject through the single card feed slot. The Eject key works only when the mag card unit is stopped.

Start Key

The Start key signals System/32 that the mag card unit is prepared for operation and turns on the Ready light.

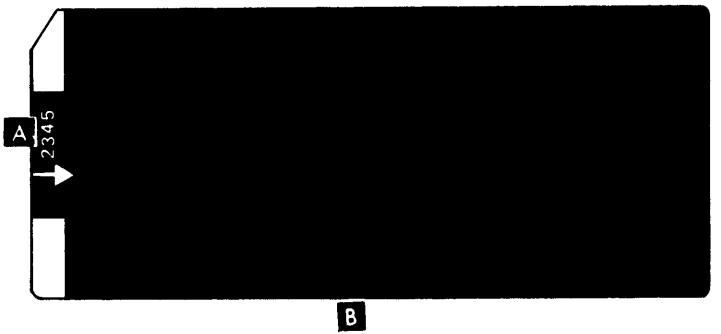
Stop Key

The Stop key stops the processing of magnetic cards, turns off the Ready light, and turns off the audible alarm.

Magnetic Card Handling

- Handle cards by the printed edge.
- Clean cards with soft tissue or cloth by gently wiping in a length-wise direction.
- Do not let metal objects such as paper clips come in contact with the surface of the card.
- Store cards in the file box or folders provided for this purpose.
- Keep cards away from magnets.
- Do not place heavy objects on the cards.
- Do not expose the cards to excessive heat or sunlight.
- Do not use a wax crayon or grease pencil or a hard writing instrument such as a pencil or ballpoint pen to label your cards. Use a fiber-tipped marking pen for best results.

In short, HANDLE WITH CARE.

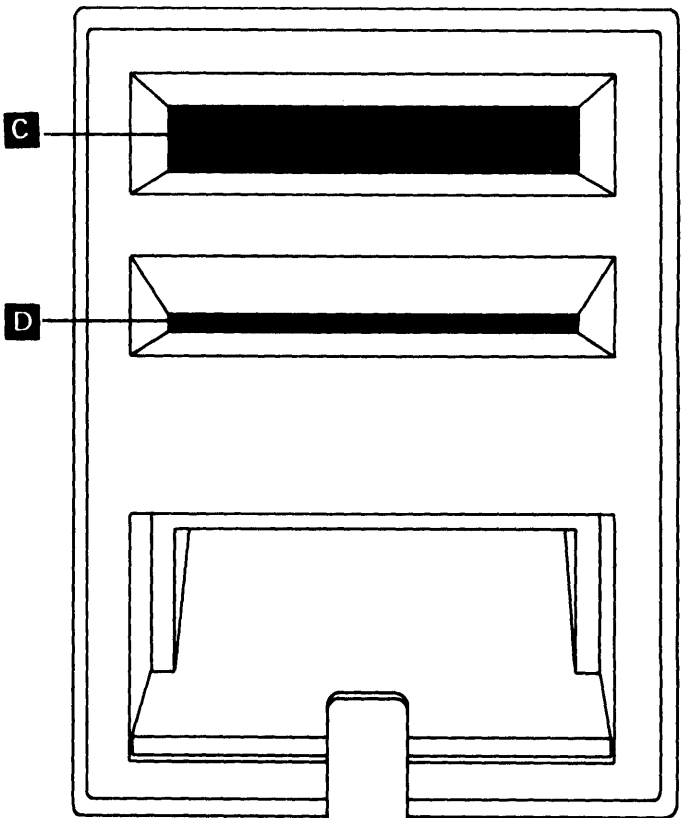


Using a Single Magnetic Card

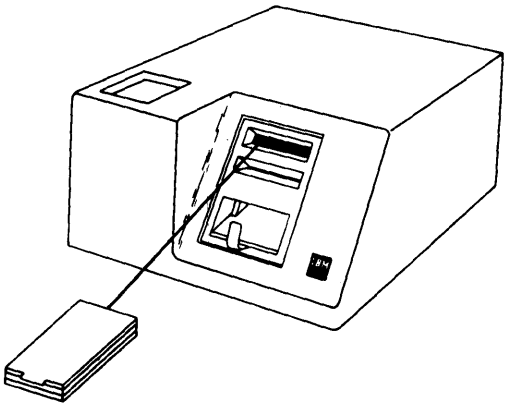
1. Hold card by the numbered end **A** with the numbers facing up.

2. Push the card **B** into either the pack feed slot **C** or the single card feed slot **D** as far as it goes. If cards are present in the pack feed slot, the single card may be placed at the bottom of the stack so that it is processed first by the system.

3. Press the Start key. The system can now process this card.



Using a Deck of Magnetic Cards



1. Hold the stack of cards (up to 50) by the numbered end with the numbers facing up.

2. Push the cards into the pack feed slot (hopper) as far as they can go. The numbered end protrudes out of the slot.

3. Press the Start key. System/32 can now process starting with the bottom card in the hopper.

Mag Card Unit Error Recovery

Check the operator panel for the Message light or audible alarm. If either is on, see the display screen for the error message. Each message and your response is discussed in the *IBM System/32 Messages Guide—System*, GC21-7592.

Wait for a prompt to START MCU before pressing the Start key on the mag card unit. For example, should you accidently eject a card, reinsert the card in the single card feed slot and wait for a prompt to START MCU. If you wish to place a card in the single card feed slot, press the Stop key, insert the card, and wait for a prompt to START MCU.

If the system ejects a magnetic card, you must remove it from the single card feed slot and reinsert it before the System/32 can issue any command to the mag card unit. If you insert a card in the single card feed slot and there are other cards in the pack feed slot, the card in the single card feed slot is fed first.

Contents

Word Processing

SETUP

The commands that must be used to obtain the word processing capabilities of the IBM System/32 are listed in this section. A more detailed explanation is given in *IBM System/32 System Control Programming Reference Manual—Word Processing*, GC34-0078.

Document Library

Ensure that your document library is available on disk.

- If a new document library is required, create it using the WPINIT command (see Figure 27).
- If the library is on diskette, load it on disk using the WPRESTOR command (see Figure 27).

Security Files

If you are including security keys in your word processing jobs, build a security file using the WPKEY command (see Figure 27).

Upper/Lower Case

Determine whether or not you need upper/lower case capabilities before initializing your word processing environment. If you need upper/lower case:

- Use the KEYBOARD command (see Figure 27) to define your System/32 keyboard/display screen.
- Check that the correct print belt is on the printer, then use the SET command (see Figure 27) to define your print belt.

Input

You need input for the input device. The input can be magnetic cards if the input device is the mag card unit, or it can be a System/32 file on disk if the disk is the input device, or it can be the keyboard if you want to enter text directly through the keyboard.

ACTIVATION

To activate word processing:

1. Issue WPSTART command (see Figure 27), specifying the input device and the document library files.

2. If you choose a System/32 file for the input device, a message appears requesting the System/32 filename.

3. If you choose either the mag card unit or a System/32 disk file for the input device, further prompting is done for job control information:
   a. When the following display appears, type YES or NO. In stop mode, certain error messages offer you the option to continue or terminate word processing.

```
DO YOU WANT TO RUN IN STOP MODE ?
ANSWER YES OR NO
_
```

   In nonstop mode, these messages are put in the error history file, the job is terminated, and processing continues with the next job.

   b. When the following message appears, type YES or NO.

```
DO YOU WANT TO START WITH THE FIRST JOB
ANSWER YES OR NO
_
```

If you do not wish to begin with the first job, the following display appears. Enter the name of the job you want to begin with.

```
WHAT IS THE NAME OF THE FIRST JOB ?
_
```

4. The jobs in the job stream are executed.

INQUIRY SUPPORT

After word processing has started and an inquiry is honored, the following display appears. Respond with one of the three options.

```
    *** INQUIRY REQUEST ***
0 - RETURN TO INTERRUPTED PROGRAM
1 - CONTINUE INQUIRY REQUEST
2 - TERMINATE WORD PROCESSING
ACTION  SCP 4749  EWDI  OPTIONS (012 )?_
END OF WORD PROCESSING INQUIRY MENU
```

If you select option 2 to terminate word processing, the following display appears. Again, select one of the three options.

```
*** TERMINATE WORD PROCESSING ***
0 - STOP AT END OF JOB
1 - STOP AT END OF TASK
2 - STOP IMMEDIATELY
ACTION  SCP 4750  EWDI  OPTIONS (012 )?_
END OF WORD PROCESSING STOP MENU
```

TERMINATION

Normal Termination

Word processing is terminated when:

- End of file is encountered on the disk input file.
- The WPSTOP (see Figure 27) command is encountered in the job stream.
- You press the INQ key and respond with option 2 to terminate word processing.

Abnormal Termination

You can cause abnormal termination of word processing by choosing option 3 or option D for certain messages. During abnormal termination, active (open) files may be altered unpredictably because the word processing work file (WPWRKFLE) and document library files are not closed. When abnormal termination occurs, you must delete the WPWRKFLE using the DELETE command (see Figure 27) before issuing the WPSTART command again.

COMMAND STATEMENT FORMATS

Figure 27 shows the word processing command statement formats. Capitalized parameters, numbers, nonalphabetic characters, brackets [ ], and braces { } have special meanings, described in the *Command Statements* section of this manual.

Figure 28 shows how eight keyboard keys are affected by each of the 11 keyboard name parameters (as specified in the KEYBOARD command statement, shown in Figure 27).

Remember to press the SHIFT key on the keyboard when you have a dual case keyboard and display in effect to enter capitalized commands and parameters. You have a dual case keyboard and display in effect when you specify any keyboard (with the KEYBOARD command statement) except keyboard 100.

Command	Format	Reminders
DELETE	DELETE filename, [F1 / 1] [SCRATCH / REMOVE / ERASE] [,mmddyy / ,ddmmyy / ,yymmdd]	
KEYBOARD	KEYBOARD [002 / 003 / 004 / 005 / 007 / 008 / 016 / 017 / 018 / 100 / 250]	Press SHIFT key to enter uppercase alphabetic characters when using any keyboard except 100. Figure 28 shows the difference between the keyboards.
SET	SET [value] , [source-name] , [MDY / DMY / YMD] [,mmddyy / ,ddmmyy / ,yymmdd]	SET: (At least one parameter must be entered.) value — specifies the number of lines to be printed per page. The minimum value is 1, and the maximum value is 84. source-name — specifies the library source member containing the print belt image to be used.
WPBELT	WPBELT- {64 / 48}	Use SET command statement to specify 96-character belt.

Figure 27 (Part 1 of 4). Word Processing Command Statement Formats

Command	Format	Reminders
WPDELETE	WPDELETE filename-1,filename-2	filename-1 specifies the document directory file. filename-2 specifies the document storage file corresponding to filename-1. This command deletes all records in the specified files.
WPFREE	WPFREE [filename-1 / WPLDDO] , [filename-2 / WPLDSO] , [key / NULL] , [group] , [docname] , [yymmdd-1 / 000000] [,yymmdd-2 / ,999999]	Deletes only documents you are allowed access (through the *key*). At least one of the last four parameters must be entered.
WPINIT	WPINIT [filename-1 / WPLDDO] , [records-1 / 01] , [filename-2 / WPLDSO] [,records-2 / ,80]	records-1 specifies the size of the document directory. The default supplies one directory record that has space for 80 document segments. records-2 specifies the size of the document storage file on disk. The default supplies 80 document records with space for 256 characters in each record.
WPKEY	WPKEY	Respond to prompts to create, delete, or udpate the security file. Figure 29 takes you through the prompts.

Figure 27 (Part 2 of 4). Word Processing Command Statement Formats

Command	Format	Reminders
WPMCCARD	WPMCCARD [ERASE]	Specify ERASE to erase all characters from every track of the magnetic card. Otherwise, only the first character on the first track of the magnetic card is replaced with an eject code.
WPPRINT	WPPRINT [filename / WPLDDO] , [key / NULL] , [ALL / ACCEPT,[group],[docname], [yymmdd-1 / 000000] [,yymmdd-2 / ,999999]]	Only a directory of documents you are allowed to access (by knowing the correct key) can be printed.
WPRESTOR	WPRESTOR [filename-1 / WPLDDO] , [filename-2 / WPLDSO] , [filename-3 / WPLBUO] , [ALL / ACCEPT,[group],[docname], [yymmdd-1 / 000000] [,yymmdd-2 / ,999999]]	You must have saved the file on diskette with the WPSAVE command statement before using this command. If the saved file consists of more than one diskette, an INSERT DISKETTE message appears after each diskette is finished being read.

Figure 27 (Part 3 of 4). Word Processing Command Statement Formats

Command	Format	Reminders
WPSAVE	WPSAVE [filename-1 / WPLDDO] , [filename-2 / WPLDSO] , [filename-3 / WPLBUO] , [retention-days / 999] , vol-id, [ALL / ACCEPT,[group],[docname], [yymmdd-1 / 000000] [,yymmdd-2 / ,999999]]	The diskette becomes the master copy of the document directory and storage files if you delete the disk file copy after using this command statement. If the saved file takes up more than one diskette, an INSERT DISKETTE message appears after each diskette is finished being written.
WPSTART	WPSTART [FD / KB / MC] , [filename-1 / WPLDDO] [,filename-2 / ,WPLDSO]	FD — disk is sysin device KB — keyboard is sysin device MC — mag card unit is sysin device filename-1 — specifies document directory file filename-2 — specifies document storage file
WPSTOP	WPSTOP	

Figure 27 (Part 4 of 4). Word Processing Command Statement Formats

Affected Keyboard Keys:		Characters Assigned to Redefinable Keys							
Parameter	Keyboard Defined	; :	' "	` ¬	- _	= +	\ |	, <	. >
002	American Standard 101-A	! 1	@ 2	¢ 6	* 8	+ =	¼ ½	, ,	. .
003	American Standard 101-B	± 1	@ 2	¢ 6	* 8	+ =	¼ ½	, ,	. .
004	American Standard 101-C	[ ]	@ 2	¢ 6	* 8	+ =	º !	, ,	. .
005	American Standard 101-D	± 1	@ 2	¢ 6	* 8	+ =	º !	, ,	. .
007	Legal 149	º 1	¶ 2	§ 6	* 8	+ =	[ ]	, ,	. .
008	Legal 177	º 1	¶ 2	§ 6	* 8	+ =	¼ ½	, ,	. .
016	Pica 046	[ ]	@ 2	¢ 6	* 8	+ =	º ®	, ,	. .
017	Accounting 172 (see note 1)	£ 1	@ 2	¢ 6	* 8	= ¼	+ =	, ,	. .
018	Accounting 174 (see note 1)	! 1	@ 2	+ 6	£ 8	= =	* ¢	, ,	. .
100	Standard System/32 Monocase EBCDIC (see note 2)	| 1	@ 2	¬ 6	* 8	+ =	! ¢	< ,	> .
250	Modified System/32 Dual Case EBCDIC	[1	@ 2	] 6	* 8	+ =	! ¢	± ,	º .

Notes:

1. The double underscore (__) is not on any of the line printer print belts and therefore prints as blank. The double underscore appears as a single underscore (_) on the display screen.
2. To print <, >, |, and ¬, you must have a monocase print belt on the printer. All other characters print using the 96-character dual case print belt.

Figure 28. Characters (Keys) Affected by the KEYBOARD Command Statement

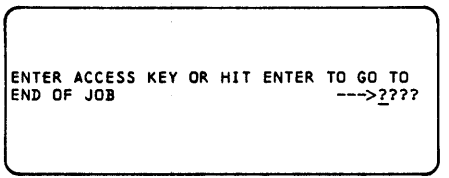
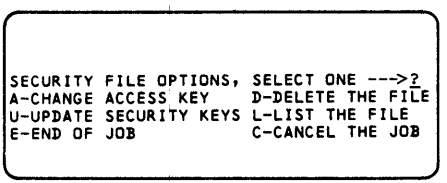
Step	When the Prompt is:	And You Enter:	You Have:	Go to Step:
1		A valid access key	Entered a 4-character key for the security file	2
		An invalid access key	Caused this error message: ***ERROR*** INCORRECT ACCESS KEY	1
		ENTER	Canceled the job	-
2		A	Selected the change access key option	3
		U	Selected the key update option	5
		D	Selected the file delete option	4
		L	Caused the security file to be listed	2
		T	Turned on tracking if it was off or turned off tracking if it was on	2

Figure 29 (Part 1 of 6). Security File Prompting

Step	When the Prompt is:	And You Enter:	You Have:	Go to Step:
2 (cont'd)		E	Written the file to disk and ended the job	-
		Any other character	Entered an invalid option and caused this error message: ***ERROR*** INVALID OPTION	2
3	ENTER NEW ACCESS KEY, OR HIT ENTER TO RETURN TO SECURITY FILE OPTIONS--->????	A 4-character access key	Changed the access key for the security file	2
		ENTER	Canceled the change	2
4	THE ENTIRE SECURITY FILE WILL BE DELETED IF THIS OPTION IS EXECUTED. TYPE Y TO CONTINUE, N TO RETURN TO THE SECURITY FILE OPTIONS --->	Y	Deleted all security keys on the file, except the file access key	2
		Any other character	Done nothing	2

Figure 29 (Part 2 of 6). Security File Prompting

Step	When the Prompt is:	And You Enter:	You Have:	Go to Step:
5	KEY UPDATE OPTIONS, SELECT ONE ---> A-ADD A KEY C-CHANGE A KEY D-DELETE A KEY R-RESPECIFY CLASSES E-END. RETURN TO SECURITY FILE OPTIONS	A	Selected the *add a key* option	6
		C	Selected the *change a key* option	7
		D	Selected the *delete a key* option	8
		R	Selected the *respecify classes* option	9
		E	Ended the *key update* option	2
		Any other character	Entered an invalid option, causing this error message: ***ERROR*** INVALID OPTION	5
6	ENTER SECURITY KEY, OR HIT ENTER TO RETURN TO KEY UPDATE OPTIONS --->	A security key when the file is full	Caused this error message: ***ERROR*** FILE IS FULL, KEY NOT ADDED	6
		A security key already in the file	Caused this error message: ***ERROR*** DUPLICATE KEY IN FILE	6

Figure 29 (Part 3 of 6). Security File Prompting

Step	When the Prompt is:	And You Enter:	You Have:	Go to Step:
6 (cont'd)		A valid security key with no classes	Added a security key to the file	10
		ENTER	Canceled the add option	5
7	ENTER NEW SECURITY KEY, OR HIT ENTER TO RETURN TO KEY UPDATE OPTIONS ---><u>?</u>???	A nonexistent security key	Caused this error message: ***ERROR*** KEY NOT IN FILE	7
		A valid security key	Specified the security key to be changed	11
		ENTER	Canceled the change option	5
8	ENTER SECURITY KEY, OR HIT ENTER TO RETURN TO KEY UPDATE OPTIONS ---><u>?</u>???	A nonexistent security key	Caused this error message: ***ERROR*** KEY NOT IN FILE	8
		A valid security key	Deleted the security key from the file	5
		ENTER	Canceled the *delete* option	5

Figure 29 (Part 4 of 6). Security File Prompting

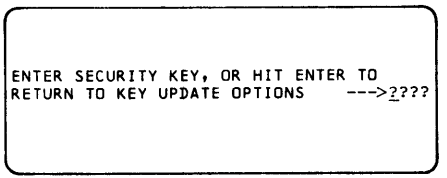
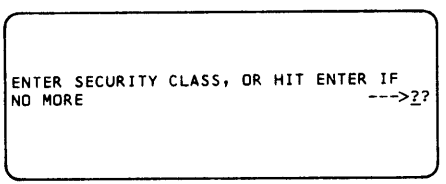
Step	When the Prompt is:	And You Enter:	You Have:	Go to Step:
9		A nonexistent security key	Caused this error message: ***ERROR*** KEY NOT IN FILE	9
		A valid security key	Deleted all the security classes for this key (but not the key)	10
		ENTER	Canceled the *respecify* option	5
10		Valid security class	Assigned a security class to a key	10
		An invalid security class	Entered something other than a number between 1 and 32 and caused this error message: ***ERROR*** SECURITY CLASS NOT 1 THRU 32	10
		ENTER	Finished assigning security classes to a security key	5

Figure 29 (Part 5 of 6). Security File Prompting

Step	When the Prompt is:	And You Enter:	You Have:	Go to Step:
11	ENTER NEW SECURITY KEY, OR HIT ENTER TO RETURN TO KEY UPDATE OPTIONS --->????	A security key already in the file	Caused this error message: ***ERROR*** DUPLICATE KEY IN FILE	11
		A valid security key	Changed the old security key to this new one	5
		ENTER	Canceled the *change* option	5

Figure 29 (Part 6 of 6). Security File Prompting

COMMAND STATEMENT DESCRIPTIONS

Figure 30 lists the word processing command statements and provides a general explanation of each. Detailed command statement information is contained in *IBM System/32 System Control Programming Reference Manual–Word Processing*, GC34-0078.

Word Processing Command Statement	Use
DELETE	Makes file space available on the disk or a diskette by freeing space used by unwanted files.
KEYBOARD	Changes the keyboard/display screen character set to one of 11 different configurations. Eight of the keys on the keyboard are affected by the command. All but one of the keyboards display alphabetic characters in both upper and lower case. To enter an uppercase letter on these dual case keyboards, you must press the SHIFT key.

Figure 30 (Part 1 of 6). Word Processing Command Statements

Word Processing Command Statement	Use
SET	Sets the number of lines per page, the print belt image, date format, and/or system date. *Note:* Realign the forms to the first print line when the number of lines per page is changed.
WPBELT	Converts data stored in 96-character print belt format into either 48- or 64-character print belt format. The characters from the 96-character belt that are not found on either of the other belts are substituted as follows (note that the data is not changed, only the character printed): *96-character* / *64-character* / *48-character* ¢ / ¢ / c (/ (/ / [/ (/ /

Figure 30 (Part 2 of 6). Word Processing Command Statements

Word Processing Command Statement	Use		
WPBELT (cont'd)	*96-character*	*64-character*	*48-character*
	!	!	.
	)	)	/
	;	;	,
	]	)	/
	—	—	-
	?	?	%
	:	:	-
	=	=	#
	"	"	'
	±	&	&
	§	S	S
	°	D	D
	®	R	R
	£	L	L
	¶	P	P
	¼	F	F
	2	2	2
	3	3	3

Figure 30 (Part 3 of 6). Word Processing Command Statements

Word Processing Command Statement	Use		
WPBELT (cont'd)	*96-character*	*64-character*	*48-character*
	½	H	H
	a to z	A to Z	A to Z
WPDELETE	Deletes an entire document directory and document storage file. All members of the document directory and the document storage file are eliminated from the disk.		
WPFREE	Deletes selected members from a document library. If the document is secured with a security key, it can only be deleted with that key.		
WPINIT	Allocates a document directory and a document storage file.		
WPKEY	Updates the word processing security file.		

Figure 30 (Part 4 of 6). Word Processing Command Statements

Word Processing Command Statement	Use
WPMCCARD	Blanks or erases magnetic cards for reuse. Blanking puts a CARD EJECT character in the first position of the first track on each card. Erasing writes a blank character in every position of every track on each card.
WPPRINT	Lists the contents of the document directory file. Prints only those document directory records you can access (through the security key).
WPRESTOR	Adds to document library on disk from diskette. Members on diskette created by the WPSAVE command can either replace or be added to library members already on disk.

Figure 30 (Part 5 of 6). Word Processing Command Statements

Word Processing Command Statement	Use
WPSAVE	Copies library members on disk to diskette. Selected members or a complete document library can be copied.
WPSTART	Activates word processing. Defines printer as the syslist device and keyboard/display as the syslog device.
WPSTOP	Terminates word processing. Closes all files and ends active jobs.

Figure 30 (Part 6 of 6). Word Processing Command Statements

Glossary

$SOURCE file: The file into which the RPG II program reads the RPG II source programs.

$WORK file: The file required by the RPG II program while processing the RPG II source program.

accumulating totals: The process of totaling a particular field's values as records are being processed.

auto dup indicator: For DFU and SEU, the indicator that is turned on and off by the AUTO DUP command key. If the indicator is on, position 34 of line 1 of the display contains an A. It indicates that certain types of predetermined fields will be duplicated from the previous statement and that certain types of fields will be skipped. If the indicator is off, position 34 of line 1 is blank and duplication and skipping do not occur.

auto dup/skip indicator: See auto dup indicator.

auto mode: A modem feature that allows a called station to respond to a call it receives over a switched line.

automatic field duplication: A DFU feature that allows one or more fields to be copied from one record to another.

automatic record key generation: A DFU feature of assigning 5-digit keys to the records of a file.

baseplate: The location of the magnetic card in the MCU when the card is being read or written on.

basic data exchange: Diskette labels as defined in *IBM Diskette General Information manual,* GA21-9182. This is also referred to as standard interchange.

basic data exchange format: Diskette files consisting of fixed, 128-character records. This format is also referred to as standard interchange format.

batch accumulator: An area on disk where subtotals for a field are kept.

block: A unit of space assignment for files on the disk; that is, 1 block = 10 sectors.

BSCA: Binary synchronous communications adapter.

BWS: Batch work station.

cancel: End the current job. A *controlled* cancel ends the current job and saves all data created by the job.

CE cylinder: A cylinder on disk for customer engineer use as a save area for dump or main and control storage and history file. Also used as a read/write area for customer engineer diagnostics.

closed: The condition of a file when all of the data entered in the file has been saved.

command key: One of the 12 keys in the top row of the keyboard (numeric, -, and =) when pressed immediately after the CMD key. Command keys control system functions as well as the execution of application programs.

command statement: A command statement is used to request the performance of a particular function. It always contains the command name and may include parameters. Specifically, a command statement is a special form of the // INCLUDE statement. A command statement evokes a procedure and can pass information to the procedure via parameters included in the statement. The procedure named by the command name is evoked by the command statement.

control storage: A portion of storage that primarily contains microprogram instructions.

cursor: A dash of light on the display screen that indicates where the next character will be entered.

data mode: A modem feature that allows data transmission over communication lines.

delete: Removal of a unit of data; for example, delete a character, field, record, or entire file. A deleted file is one that has been removed from the VTOC.

delete code: Character that identifies an inactive record in a file.

DFU attributes: A group of 40 character records, each record having five 8-position fields, that is created from the RPG II specifications when the DFU job is being defined.

DFU specifications: A group of 40 character records, each record having five 8-position fields, that is created from the responses to prompts when the DFU job is being defined.

directory: An area of the library for recording information about each member in the library; for example, name, size, and location.

diskette: A small flexible magnetic disk permanently enclosed in a protective jacket. A diskette is a removable storage medium used to store information until it is required for processing.

diskette drive: The mechanism used to read data from or write data to the diskette.

display screen: The screen on which the system displays data, messages, and other information for the operator.

duplicating fields: The process of copying a field from the previous record into the current record regardless of record type.

edit: To punctuate a field by suppressing zeros and inserting commas, decimal points, dollar signs, or other constant information.

enabled: Available for use. For example, the keyboard is enabled when the keyed input will be accepted for processing.

EOJ: End of job.

erase: Removal of a unit of data.

extended format diskette: A diskette with eight 512-byte sectors per data track.

field: One or more adjacent record positions that contain related information.

field accumulation: A DFU feature that enables one or more fields to be totaled during processing.

field type: Predefined indication in the SEU format description that specifies one of the following types of fields that you will enter. For example, numeric, alphameric, numeric auto dup, alphameric auto dup, uncondition bypass, auto skip, unsigned numeric, or constant character.

format description

SEU: Used to control input to a statement. Format descriptions consist of a field definition for each field in the statement being processed. The field definitions define the type of data in each field and the field length.

DFU: The end result of the setup step. It describes your file and exactly how you want DFU to process it. DFU creates it by combining information from the DFU attributes and DFU specifications. It is stored in the library as a load member with the name you specify.

format description type: The type of format description being used to control your input. Position 12 on line 1 of the display screen contains the format description type of the statement that you are entering.

formatted message: A message that appears on the display screen in a constant format. The display consists of two lines. The format line provides information about the message, the message text line contains the message text.

free space: Space on the disk that is not being used for data files. New files that are created can use this space.

function keys: Special keys on the keyboard used to request specific system functions. Though one function key may be used in different ways by the system or IBM program products, the function of the keys cannot be assigned by application programs.

history file: An area on the disk where a log of the OCL that has been entered is recorded.

IMPL: Initial microprogram load.

initial micro program load (IMPL): A process that causes the system microcode to be loaded from disk to control storage.

initial program load (IPL): A process that causes the system control program to be loaded into main storage. This prepares the system for execution of jobs.

inquiry request: A request by the operator that stops the job that is running so that another program or function can be done.

IPL: Initial program load.

job date: The date associated with a job. If no // DATE statement is specified between the // LOAD and // RUN statements for a job, the job date is the same as the system date. Otherwise, the job date is the date specified in the // DATE statement.

label: Information that identifies a file.

library: An area on the disk that contains procedure members, source members, load members, and subroutine members as well as areas required by the system control program.

library member: A named collection of statements or records in the library that can contain source statements, format descriptions, OCL statements, utility control statements, or executable instructions.

library message member: A type of library member that contains messages to be used by the system.

mag card unit: The IBM 5321 Mag Card Unit (MCU) used by the system to record on, or read from, magnetic cards.

magnetic card: The small flexible magnetic card used as a recording medium by the IBM Mag Card II Selectric® Typewriter.

main storage: The general purpose storage of a computer. Main storage stores program instructions for a job and data to be processed during that job.

MCU: See mag card unit.

message identification code (MIC): A 4-character identifier associated with a specific error or informational message.

modem: A device used to connect a communications adapter to the communication line.

MRJE: MULTILEAVING remote job entry.

network: A number of communication lines connecting a computer with remote terminals.

nonswitched network: A connection between the computer and a remote station that does not have to be established by dialing.

null response: A response made by pressing the ENTER key without keying any information.

patch: Modify a disk or diskette sector by keying the modifications from the keyboard.

print image: Data that defines the characters on the mounted print belt.

print option indicator: Indicates whether statements you are entering, updating, moving, or deleting are to be printed. If position 38 of line 1 is a P, the indicator is on. If position 38 of line 1 is blank, the indicator is off.

procedure: A named collection of related OCL statements and, possibly, utility control statements.

PTF log module: A library member that contains information about all PTFs that have been applied to the system.

record: A collection of related data, treated as a unit. For example, one line of an invoice may form a record. A complete set of records may form a file.

record identification indicator: A code placed in a record to identify that record type.

record key: (1) One or more characters within an item of data that are used to identify the data. (2) When running DFU, the record key is entered to obtain the record to be processed.

When entering/updating records, either you or the DFU program can create the record key.

record types: Records from one file that have different fields and/or format.

RJE: remote job entry.

RPG II source program: RPG II file description and input specifications that describe the file to be processed.

SDLC: synchronous data link control.

sector: A unit of data recorded on disk. A sector of data is the smallest unit that can be read from disk, or the smallest amount of data that can be transferred by a single data transfer operation.

self-check field: A field that is verified by DFU as you enter it to check that you have entered it correctly. If an error is found, the cursor returns to the beginning of the field and it can be entered again.

sequential file: A file in which the order of records is determined by the order that they are put in the file. For example, the tenth record entered occupies the tenth record position.

sort sequence specifications: Information that specifies the type of sort to be done, which records are to be sorted, and how the records are to be sorted.

source member: A collection of records used as input for a program product, such as RPG II specifications or sort sequence specifications. Source members are stored in the library. A source member contains information needed for processing data.

standard interchange: A format for diskettes as defined in *IBM Diskette General Information Manual,* GA21-9182. This is also referred to as basic data exchange.

standard interchange format: Diskette files consisting of fixed, 128-character records. This format is also referred to as basic data exchange format.

statement: A collection of one or more related items of data or control information (source, format, or procedure entries) treated as a unit.

statement numbering: The method of numbering statements in the library member you are processing. Each statement in the member is assigned a number that you can use in response to prompts in order to process that statement. These numbers are not a part of the statement.

station: Any of the computers, terminals, or devices that use the communication facilities.

switched network: A connection between the computer and a remote station that is established by dialing.

syntax checking option indicator: Indicates whether RPG II and auto report statements are checked for errors before being placed in the member. If the indicator is on, position 36 of line 1 of the display contains an S. If the indicator is off, position 36 of line 1 is blank.

syslist: An output function of the system that displays data on the printer or display screen, depending on which output device is designated by the syslist command.

syslist device: The printer or display screen.

system configuration record: Information that is stored in the library directory and describes the system control programming required.

system date: Specified by entering the // DATE statement during IPL or specified by a SET command statement at any other time.

system library: An area on the disk used for storing load members, procedure members, subroutine members, and source members.

system utility: An IBM-supplied program or set of programs that provide basic system services. For example, the history file display utility displays the contents of the history file.

talk mode: A modem feature that allows voice communication from one station to another.

total accumulator: An area on disk where final totals for a field are kept.

track: A unit of data recorded on a magnetic card. The card is divided into 50 tracks; each track can contain up to 101 data characters.

unformatted message display: A message display that does not contain a format line. The message has no required format but will contain system component, MIC, and message text.

volume table of contents (VTOC): A table of contents on a disk or a diskette that describes each file on the disk or diskette.

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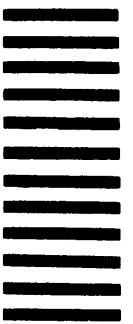

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