IBM System/3
Model 6
Operator's Guide

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Preface

The organization of this manual is explained in the section *How To Use This Publication.* Be sure to read that section before using this manual.

This reference manual is intended for both IBM and customer system operators using the IBM System/3 Model 6.

Note: 24K and 32K processing units are available only as RPQs. See your IBM marketing representative for more information.

RELATED PUBLICATIONS

The *IBM System/3 Model 6 Halt Guide,* GC21-7541, lists all the Model 6 program halts. You must use the halt guide to determine what recovery actions are needed after a program halt.

OTHER PUBLICATIONS REFERENCED IN THIS MANUAL

- *IBM System/3 Card and Disk System Components Reference Manual,* GA21-9103

- *IBM System/3 RPG II Telecommunications Programming Reference Manual,* SC21-7507

- *IBM System/3 Model 6 System Programmer's Guide,* GC21-7530

- *IBM System/3 5496 Data Recorder Operator's Guide,* GA21-9086

- *IBM System/3 Model 6 Operation Control Language and Disk Utility Programs Reference Manual,* GC21-7516

- *IBM System/3 Model 6 Conversational Utility Programs Reference Manual,* SC21-7528

- *IBM System/3 Model 6 Components Reference Manual,* GA34-0001

- *IBM System/3 Model 6 RPG II Reference Manual,* SC21-7517

- *IBM System/3 BASIC Operator's Guide,* GC34-0003

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

- *IBM System/3 Disk FORTRAN IV Reference Manual,* SC28-6874

- *IBM System/3 3741 Reference Manual,* GC21-5113

- *IBM System/3 Model 6, 8, and 10 System Generation Reference Manual,* GC21-5126

Contents

How To Use This Publication

This manual is designed to give you information you need to operate the devices and programs that make up the System/3 Model 6. Because an operator's need for information varies depending on his level of experience, this manual includes both introductory information to help you gain an overall understanding of Model 6 operation and the step-by-step procedures you need to operate the system. These two levels of information — introductory and procedural — are presented as described below:

Section 1 — Tells what the System/3 Model 6 consists of and describes how the operator interacts with the system to get the job done. It also describes, in a general way, the operator's responsibilities for every job and the kind of instructions the operator should expect from the programmer.

Sections 2-10 — Present step-by-step procedures you need to operate system devices and system programs.

Here is how to use each section:

● Use Section 1 for an overall understanding of the operator's role in Model 6 operation.

● Use Sections 2-10 when you need to know where an operator control or indicator light is located or when you want to perform the step-by-step procedure for a device or program operation.

- System — Operator Interaction

- Operator Responsibilities

- Job Documentation

As an operator, you are not primarily concerned with the internal workings of the computer or the programs; rather, your concern is how you can use the system to get jobs done. Your duties include a number of tasks, from turning on system power, to loading programs, to performing restart procedures.
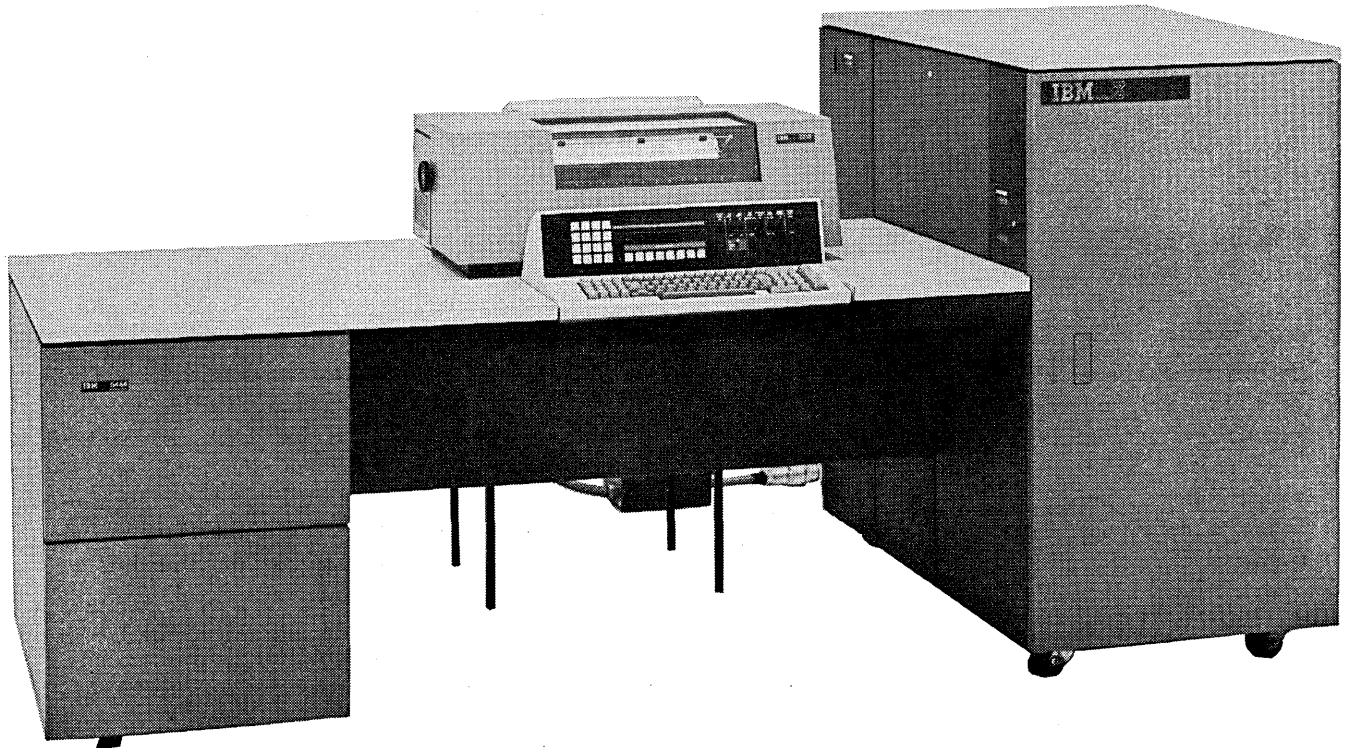
SYSTEM-OPERATOR INTERACTION

Your System/3 Model 6 consists of two main parts: devices and programs. Since every data processing job requires the system to take some input data, perform some operations on it, and produce output, we can classify the system devices according to which of these steps they perform. As you can see from the following chart, some devices can be used for both input and output.

Devices	General Functions Performed
Input	
● Operator Console Keyboard	The operator enters data into an input device from some source document.
● IBM 5444 Disk Storage Drive	
● Ledger Card Device	
● IBM 5496 Data Recorder Model 1 with the System/3 Model 6 Attachment Feature	
● IBM 129 Card Data Recorder with the Card Input/Output Attachment Feature	
● IBM 3741 Data Station Model 1 or 2 with the Direct Attach Feature or IBM 3741 Programmable Work Station Model 3 or 4 with the Direct Attach Feature	
Processing	
● IBM 5406 Processing Unit	The input device sends data to the processing unit where necessary calculations and logical operations are performed.

Output
● IBM 5213 Printer, Model 1, 2, or 3 or IBM 2222 Printer, Model 1 or 2
● IBM 5444 Disk Storage Drive
● Ledger Card Device
● IBM 5496 Data Recorder Model 1 with the System/3 Model 6 Attachment Feature
● IBM 2265 Display Station Model 2
● IBM 129 Card Data Recorder with the Card Input/Output Attachment Feature
● IBM 3741 Data Station Model 1 or 2 with the Direct Attach Feature or IBM 3741 Programmable Work Station Model 3 or 4 with the Direct Attach Feature

The processing unit sends calculated results (processed data) to an output device, which presents results in usable form (paycheck or printed report, for example).

Devices, alone, cannot perform even the simplest data processing job. For each job you want to run, you must first load programs into the processing unit. (Instructions, indicating what program is to be loaded and how, will be supplied by the programmer. See *Job Documentation* in this section for more information.) These programs tell the devices and other programs what operations to perform, such as reading or writing data, adding or comparing data, and supervising the overall operation of the system.

Once a program has been loaded (read into core storage), it can do a job with a minimum of operator attention. However, programs can stop (halt) at predefined points when some operator action is required. Halts usually occur when the program you are processing must wait for you to enter data from the keyboard, press certain command keys, or take some other action prescribed by the programmer. To indicate what action is required, the program turns on a field light on the console or prints a message. You then respond as required, using the instructions provided for the job by the programmer. When you have performed the operations requested, you press the start key to tell the system that you have finished. Only then can the system continue processing.

OPERATOR RESPONSIBILITIES

Your duties as a Model 6 operator are described here as they apply to the two parts of the system: the devices and the programs.

System Devices

You must perform certain mechanical operations for each device you have. For example, you must be able to:

● Load and align forms in the printer

● Change print ribbon on the printer and the data recorder

● Insert ledger cards in the ledger card device

● Mount disk cartridges on the disk drive

● Ready all devices for operation

Tasks such as these are basic and easily learned. After you have performed them several times, you can do so again with little or no difficulty. Sections 2 through 8 describe the indicators and controls on each device, as well as the procedures for operating each system device.

Summary of Operator Responsibilities

1. Select next job from daily work log supplied by the data processing department.

2. Select the instruction sheets supplied by the installation programmer for this job.

3. Ready input/output devices specified on the program run sheet for this job. Perform system initial program load (IPL) if necessary.

4. Supply program and input data (disk records, punched cards, keyed records) for processing.

5. Gather and distribute output data (printed reports, disk records, ledger cards, punched cards) according to instructions on program run sheet.

6. Sign daily work log, indicating job was completed. Start next job at step 1.

Programs

Jobs you run on the model 6 use a group of IBM-supplied programs in addition to the programs written by the programmer at your installation. In order to use these programs you must know how to:

● Run each program. (Instructions for running IBM-supplied programs are included in Section 10. Special instructions for running user programs will be provided by the programmer.)

● Interpret and respond to messages the programs display on the printer or CRT.

● Interpret and respond to halts the system displays on the HALT CODE display.

Because operating procedures for running programs differ from one job to another, you must rely on the programmer for instructions and special information concerning each job. To standardize the procedure for giving instructions for each job, the programmer can use the forms described in this section under *Job Documentation*.

JOB DOCUMENTATION

For each job you run on model 6, the programmer must provide three things:

1. A set of instructions telling you what to do

2. The program that is to be run

3. The data it will process

In some instances, the program, or the data, or both will already have been placed on disk. If this is the case, the programmer's instructions will tell you which disk contains the information and what steps to take before processing can begin.

To ensure some consistency in the kind of instructions you receive for each job, the programmer can use the following forms:

1. Operation control language (OCL) guide

2. Program run sheet

In each case, the programmer can use the preprinted forms shown in the following text, or he can design his own.

Operation Control Language (OCL) Guide

The responses you use during the OCL prompting for a job
are provided on the Operation Control Language (OCL)
Guide, GX21-9126 (Figure 1). The OCL Guide is given to
you by the programmer. The OCL CALL Cycle is not
included on this sheet, because OCL prompting for that
cycle is short. For more information on the Operation
Control Language (OCL) Guide, see the *IBM System/3
Model 6 System Programmer's Guide,* GC21-7530.

IBM

International Business Machines Corporation

System/3 Model 6

GX21-9126-0
Printed in U.S.A.

Job _____

Date _____ **OPERATION CONTROL LANGUAGE (OCL) GUIDE**

Programmer _____

Keywords				Responses		Considerations	
R E A D Y				B U I L D	OR L O A D		
0 0 0	B U I L D	N A M E				Procedure Name	
0 0 1		U N I T				F1, R1, F2 or R2	Other Possible Entry
0 1 0	L O A D	N A M E				Columns 75-80 of RPG Control Card or System Program Name	(Lines 020-058)
0 1 1		U N I T				F1, R1, F2 or R2	? for Delayed Response
0 2 0	D A T E					mmddyy or ddmmyy	
0 3 0	S W I T C H					1-On, 0-Off, X-No Change	
0 4 0	F I L E	N A M E				Columns 7-14 of RPG File Description Specifications or Predefined Filename	
0 4 1		U N I T				F1, R1, F2 or R2	
0 4 2		P A C K				Disk Name (Assigned by Disk Initialization Program)	
0 4 3		L A B E L				VTOC File Name (if different than response to FILE NAME)	
0 4 4		R E C O R D S				1-999999 (Maximum Number of Records in File)	
0 4 5		T R A C K S				1-398 (Maximum Number of Tracks for this File)	
0 4 6		L O C A T I O N				8-405 Location of First Track of File	
0 4 7		R E T A I N				S-Scratch, T-Temporary, P-Permanent	
0 4 8		D A T E				mmddyy or ddmmyy	
0 5 0	F I L E	N A M E				Columns 7-14 of RPG File Description Specifications or Predefined File Name	
0 5 1		U N I T				F1, R1, F2 or R2	
0 5 2		P A C K				Disk Name (Assigned by Disk Initialization Program)	
0 5 3		L A B E L				VTOC File Name (if different than response to FILE NAME)	
0 5 4		R E C O R D S				1-999999 (Maximum Number of Records in File)	
0 5 5		T R A C K S				1-398 (Maximum Number of Tracks for this File)	
0 5 6		L O C A T I O N				8-405 Location of First Track of File	
0 5 7		R E T A I N				S-Scratch, T-Temporary, P-Permanent	
0 5 8		D A T E				mmddyy or ddmmyy	
M O D I F Y						**MODIFY OPTIONS**	
						1. Enter RUN	
						2. Enter CANCEL	
						3. Correct Statement	
						Enter Statement number	
						Retype or delete (,) response	
						4. Create new Statement	
						INCLUDE, LOG, FORMS, *(For Comments)	

Figure 1. Operation Control Language (OCL) Guide

Program Run Sheet

The instructions you need to run each job are provided on
the program run sheet. This sheet is given to you by the
programmer. The program run sheet is on the back of the
OCL Guide, GX21-9126 (Figure 2).

Identifies the job you are to run.

IBM SYSTEM/3 MODEL 6
PROGRAM RUN SHEET

Program Name _____ Program Number _____
Programmer _____ Date _____ Application _____

Tells what input data, source program, and console switch settings to use.

JOB PREPARATION

DATA RECORDER

Description of Card Files

DISK: Removable 1
         Removable 2

Description of Disk Cartridges and/or Files

PRINTER: Form Number
            Form Name
            Forms Alignment

Description of Form

Primary | Secondary

Description of Console Switch Settings

On	On	On	Removable	On	Online	On	Start
System Reset	Disk 1	Disk 2	Disk Select	Program Load	Data Recorder	Inquiry Request	System
	Off	Off	Fixed		Offline		Stop

CONSOLE:

JOB COMPLETION

DATA RECORDER

Disposition of Card Files

DISK: Removable 1
         Removable 2

Disposition of Cartridges

Tells what output to expect and how to distribute it.

PRINTER: Burst? _____

Distribution of Forms

Primary | Secondary

Decollate ? _____

PROGRAMMED HALTS

Halt Code	Meaning	Operator Action	Field Indicator	Meaning	Operator Action
			1		
			2		
			3		
			4		
			5		
			6		
			7		
			8		

Indicates the corrective action you are to take when RPG II or field light halts occur.

Figure 2. Program Run Sheet

- Keyboard

- System Control Panel

- System Display Panel

KEYBOARD

To operate the Model 6, you will enter data into the system and control the operation of the system by using the keyboard, system display panel, and system control panel on the operator's console.

The keyboard is the device you will use most often to enter information into the Model 6. Using the keyboard, you can enter the following:

- OCL and utility control statements

- RPG II source programs

- Disk sort specifications

- Input data to user or system programs.
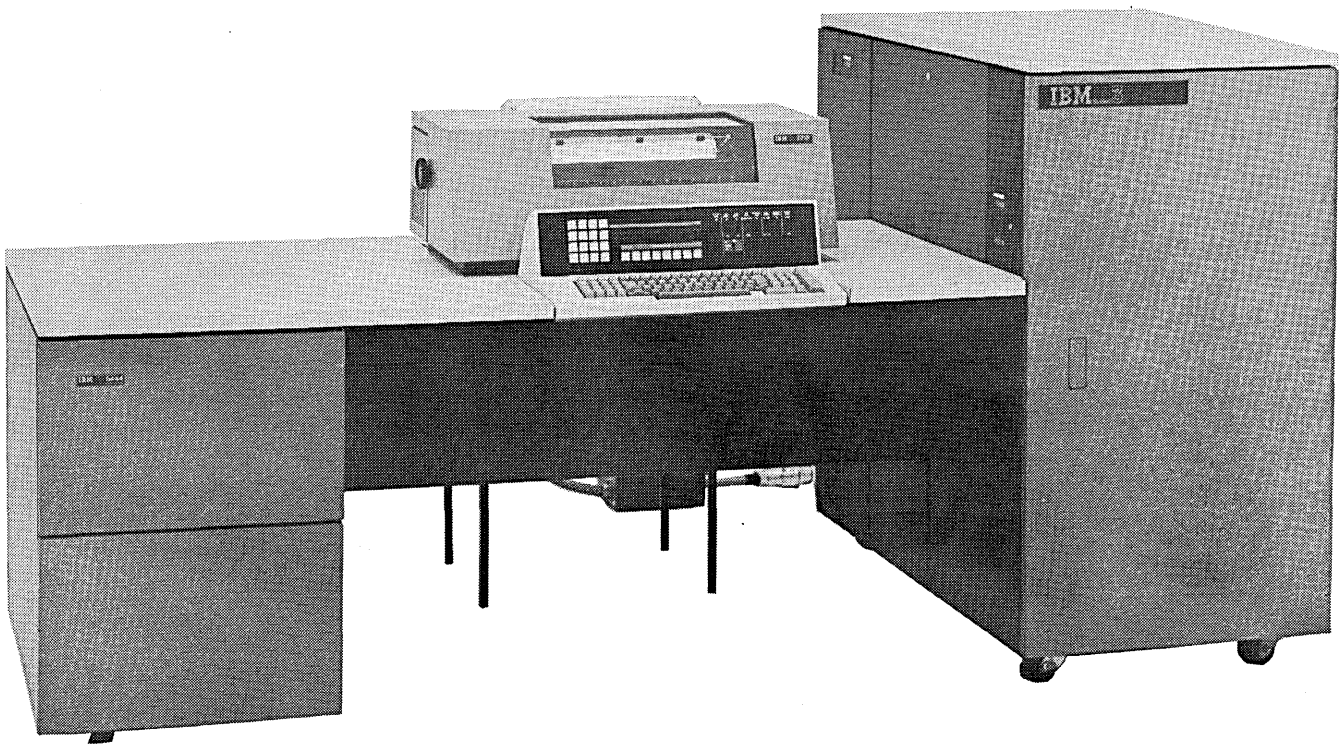
In addition to using the keyboard to enter data, you can use it to control operations performed by certain programs and to control certain printer operations, such as spacing and backspacing. To allow these various functions, the keyboard includes four groups of keys (Figure 3):

- Command keys

- Function keys

- Alphameric and special character keys

- Numeric keys

Command Keys

These keys allow you to control operations performed by RPG II programs and the IBM-supplied conversational utility programs. Only those command keys specified on your instruction sheet can be pressed at a given time. Should you press a command key other than the one specified, a halt occurs. See the *IBM System/3 Model 6 Halt Guide*, GC21-7541, for recovery procedures.

When you press a command key, two things happen:

1. The corresponding command key indicator is turned on in storage.

2. The corresponding command key light on the console is turned on.

The command key causes the program to vary its operation according to the programmer's instructions. For example, the program may skip several operations when a particular command key is pressed, or it may perform several operations over and over again.

All command key indicators are turned off by the user program in operation; the command key light is turned off to indicate when this is done.

Eight command keys (01-08) are standard on the operator keyboard. Eight additional command keys (09-16) can be installed as an optional feature.
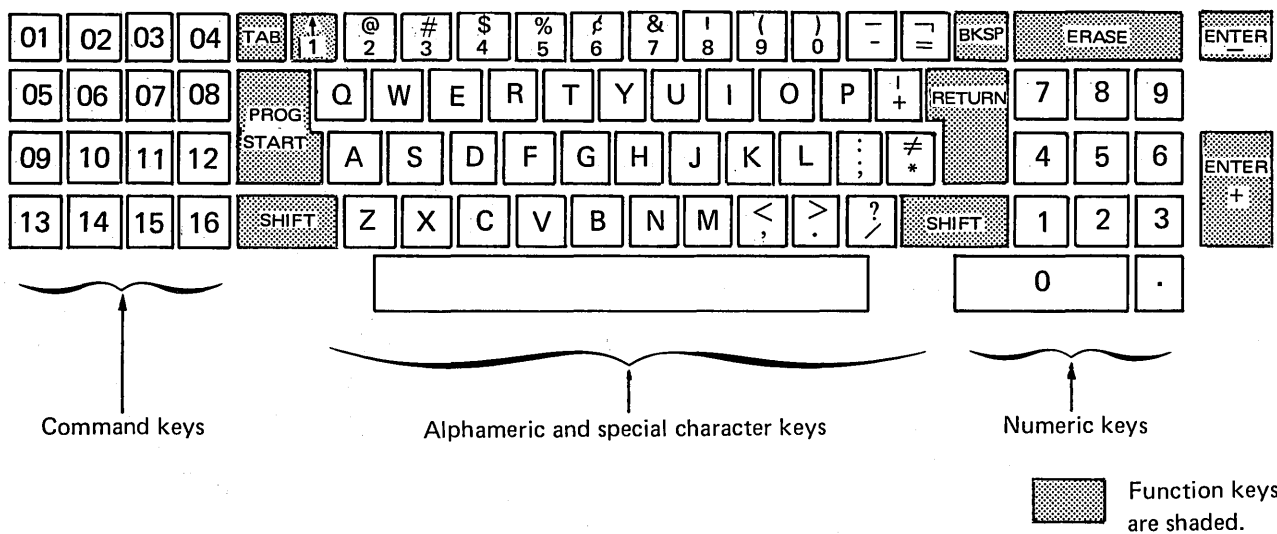
Figure 3. Operator Keyboard

Function Keys

These keys are used to control certain printer operations and to perform required program functions, such as designating the end of a keying operation or erasing fields from storage. The function key uses described here apply to most programs you will run. However, some function key uses differ depending upon the program being run or the device being used.

TAB: Press this key to move the print element to a programmed tab stop.

↑ (upper arrow) Key: This key causes a carriage restore (skip to 1) of the primary tractor, only if it is the first keyed character when the keyboard is enabled. If the CRT is the logging device, the ↑ key will not cause a restore of the primary tractor of the printer.

PROG START: Press this key to designate the end of a keying operation. If the field you keyed was numeric, a positive sign will be placed in the field. When keying fields containing alphabetic characters, special characters, or positive numbers, you can use e ther PROG START or ENTER + to designate the end of the field.

SHIFT: Press either the left or right SHIFT to key upper-case characters.

BKSP (Backspace): This key causes the print element to move back (left) one space. The last character keyed is blanked in storage when you press the BKSP key.

RETURN: This key causes an index (vertical skip) of the primary tractor of one line. If the CRT is the logging device, RETURN will not cause an index of the primary tractor.

ERASE: During a keying operation, if this key is pressed before PROG START, ENTER + or ENTER –, the field being keyed is erased from storage. In this case, the print element is returned to the start of the field, and the printer forms are advanced one line.

ENTER –: Press this key to indicate that you have finished keying a field containing a negative number.

ENTER +: Press this key to designate the end of a keying operation. If the field you keyed was numeric, a positive sign will be placed in the field. When keying fields containing alphabetic characters, special characters, or positive numbers, you can use either ENTER + or PROG START to designate the end of the field.

Alphameric and Special Character Keys

Use the alphabetic, numeric, and special character keys to enter alphameric data, such as customer names and addresses or part numbers. This group of keys can also be used to enter control information, such as OCL and utility control statements. These keys are arranged similar to those on a standard typewriter keyboard. The information entered from these keys can be printed directly on documents, saved in storage, or both.

Numeric Keys

Use the 10-key numeric section to enter numeric characters (0-9) when the data you are keying is primarily numeric. You can, of course, enter numeric characters using the alphameric and special keys. But if you have a lot of numeric data to key, you can do so much faster and more conveniently using the numeric section.

The 10-key numeric section is arranged similar to the standard 10-key grouping on a desk calculator. As with the desk calculator, you key numbers as you would write them; that is, key the leftmost digit first, then the next digit, until you have keyed the entire number.

Normally, the ENTER + and ENTER – keys are used with the numeric keys. In this way, you can designate the end of a numeric field and, at the same time, indicate whether it is plus or minus.

SYSTEM CONTROL PANEL

Switches on the system control panel (Figure 4), along with controls and indicators on the Model 6 devices, enable you to operate the system.

SYSTEM RESET: When SYSTEM RESET is moved to ON, all input/output and machine registers, controls, and indicators are reset. After a system reset, you must perform the initial program load (IPL) procedure and reload the program that was being processed when the reset occurred. MODE SELECTOR on the Customer Engineer (CE) control panel must be set at PROCESS for SYSTEM RESET to be effective.

DISK DRIVE 1 ON/OFF: This switch controls power to disk drive 1.

DISK DRIVE 2 ON/OFF: This switch controls power to disk drive 2.

DISK SELECT REMOVABLE/FIXED: This switch is used to select the disk from which you perform the initial program load (IPL) procedure. The REMOVABLE and FIXED positions refer to drive 1 only.

PROGRAM LOAD: This switch is used to start the initial program load procedures. Move this switch to ON after you have selected the unit (removable or fixed disk on drive 1) using the DISK SELECT switch. When PROGRAM LOAD is moved to ON, the system programs required to run your jobs are read into storage from disk.

DATA RCRDR (Data Recorder) ON LINE/OFF LINE: This switch, when set at ON LINE, allows you to use the IBM 5496 Data Recorder, Model 1, or the IBM 129 Card Data Recorder as a card input/output device. When set at OFF LINE, it allows you to use the data recorder for card punching, printing, and verifying. When this switch is at ON LINE, data recorder operations are controlled by the program being processed. When set at OFF LINE, data recorder operations are operator-controlled.

INQUIRY REQUEST: Move this switch to ON when you want to interrupt a program to load another program. Only one system program, Keyboard Data Entry (KDE) will accept inquiry.

SYSTEM START/STOP: When moved to START, this switch allows the system to continue normal operation. Move this switch to START only after the switch has been moved to STOP.
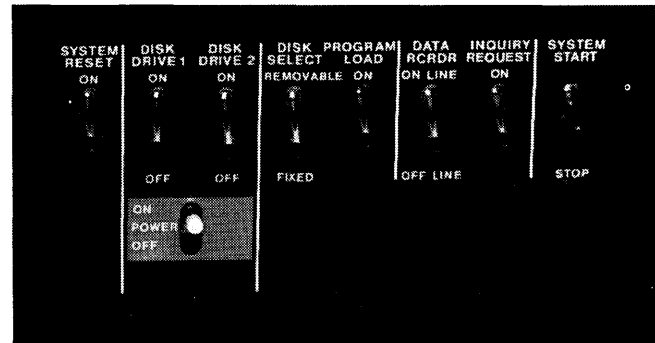
Figure 4. System Control Panel

When moved to STOP, this switch causes the system to stop after it completes the operation currently in process. STOP on the system display panel turns on as soon as processing stops. You restart the system by moving this switch to START.

POWER ON/OFF: This switch controls power to all units of the system, except the data recorder. When this switch is turned on, a system reset is performed and no I/O operations are performed until explicitly directed. The integrity of data in storage is not guaranteed after this switch is operated. To be assured of data integrity, the operator should perform the initial program load procedures.

SYSTEM DISPLAY PANEL

The lights on the system display panel (Figure 5) indicate the conditions that exist in the various system devices. A lamp for each indicator light is located behind the system display panel. If you think an indicator light is not working properly, press the LAMP TEST key. If the indicator does not turn on, replace the lamp. (See *Changing Indicator Lamps* in this section for the replacement procedure.)

LAMP TEST: Pressing this key turns on the indicator lights (on the console and the CE panel) for each system device you have. Use this key when you want to know if these indicator lights are working properly. The LAMP TEST key is located behind the cover on the system display panel.

Command Key Lights: When a command key on the operator keyboard is pressed, the corresponding command key light is turned on. The command key light remains on until the corresponding command key indicator is turned off by the program or until you move SYSTEM RESET to ON.

PROC CHECK (Processor Check): This light is turned on by an error in the processing unit. The error is displayed on the Customer Engineer (CE) panel of the processing unit.

SIOC (Serial Input/Output Channel): This light is operable only if your system has the optional SIOC feature. For more information about SIOC, see the *IBM System/3 Model 6 Components Reference Manual,* GA34-0001.

BSCA (Binary Synchronous Communications Adapter) or LCA (Local Communications Adapter): This light is operable only if your system has the optional BSC or LCA feature. For more information about BSCA and LCA, see *IBM System/3 RPG II Telecommunications Programming Reference Manual,* SC21-7507.

LCD (Ledger Card Device): When this light turns on, a ledger card should be placed in the feed chute of the ledger card device.

CRT (Cathode Ray Tube): This light turns on when the processing program requests the CRT to perform an operation after power to the CRT has been turned off. The light remains on until you press POWER ON on the CRT.

DATA RCRDR (Data Recorder): This light turns on to indicate one of these conditions:

1. Card jam in the hopper or transport area

2. Empty hopper

3. Full stacker

The light turns off when the condition is corrected.

PRINTR (Printer): This light is turned on to indicate:

1. The printer is out of forms.

2. The printer cover is not closed properly.

3. The printer line select lever (on the IBM 5213 Printer, Models 2 and 3, and the IBM 2222 Printer, Models 1 and 2) is set to neutral.

DISK DRIVE 1: This light is turned on when the system tries to perform a read or write operation on disk drive 1, but the drive is not ready (the drive is not up to the required speed, for example).

DISK DRIVE 2: This light is turned on when the system tries to perform a read or write operation on disk drive 2, but the drive is not ready (the drive is not up to the required speed, for example).

HALT CODE: This 9-position display unit displays characters when program halts occur. The displayed characters (some combination of ABCD12345) are used to identify the halt. The *IBM System/3 Model 6 Halt Guide,* GC21-7541, lists all System/3 Model 6 program halts and describes the operator action required for recovery.

POWER ON: This light comes on after you turn on the system power. It remains on until system power is turned off.

KEYBD (Keyboard) READY: This light turns on when the operator keyboard is ready for operation.

STOP: This light turns on when the SYSTEM START switch is moved to STOP. It turns off when you:

● Move the SYSTEM START to START.

● Move the SYSTEM RESET to on.

FIELD/OPERATION: This display unit has eight lights that tell you what data field to key in next.
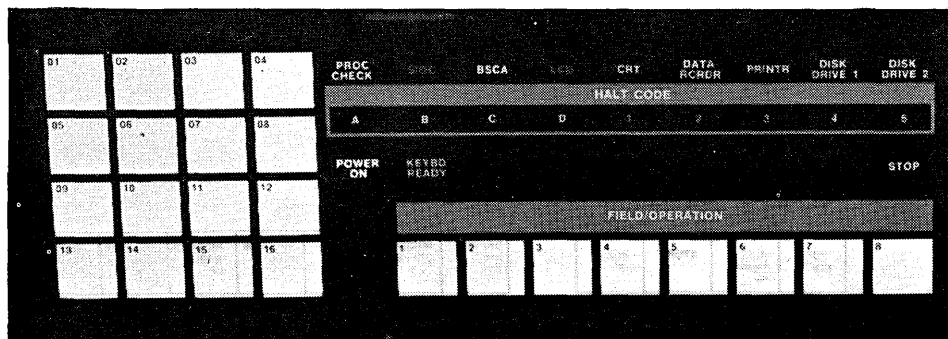
Figure 5. System Display Panel

System Display Panel Template

When your System/3 Model 6 is installed, you are given several blank templates. You can prepare a template for each application you run by typing or writing the appropriate field name or special note on the part of the template that fits under command key lights and field lights on the system display panel.

The note on the template indicates how that command key is being used. Also, when a particular field light is turned on, the field name or note on the template identifies the field you are to key or indicates what operator action is required.

Inserting a Template:

1. Pull system display panel cover forward.

2. Slide template, print side down, in the grooves on underside of system display panel.

3. Close system display panel cover.

Removing Template:

1. Pull system display panel forward.

2. Slide template out from under system display panel.

3. Close system display panel cover.

Changing Indicator Lamps

When you change lamps on the system display panel, the POWER switch should be set at OFF.

1. Pull system display panel forward.

2. Remove old lamp. (Use the special tool shipped with the system, part number 311977, to remove the lamp.)

3. Insert new lamp. (Use part number 2122160 for POWER lamp; part number 2391121 for all other lamps.)

4. Close system display panel.

USAGE METER PANEL

The usage meter panel, which you may use occassionally, is on the side of the processing unit and has the following functions:

CE Usage Meter: This meter records time the CE uses to service your system (Figure 6).

Customer Usage Meter: This meter records the time used to process programs and data.

CE Key Switch: When set at the CE position, this switch stops the customer usage meter and allows the CE meter to run instead.
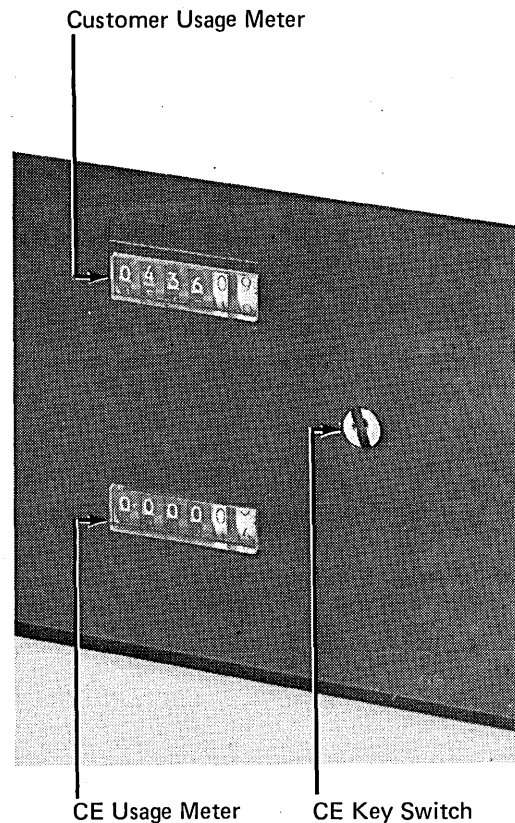
Figure 6. CE Usage Meter Panel

● Customer Engineer Control Panel

● Binary Synchronous Communications Adapter (BSCA) Panel

CUSTOMER ENGINEER CONTROL PANEL

The customer engineer (CE) panel is located behind the front cover of the processing unit. The switches, lights, and dials on this panel are used primarily by the customer engineer when servicing the system. It is only necessary for you to use this panel to record the status of the system after a processor check or an unidentifiable halt has occurred. See *Using the System/3 Model 6 Error Log Sheet* under *System Operation* for instructions on how to use the customer engineer panel. For a description of lights and switches on the CE panel, refer to *Appendix B.*

BINARY SYNCHRONOUS COMMUNICATIONS ADAPTER (BSCA) PANEL

If the optional BSCA support is installed in your system, the BSCA panel is located on the side of the processing unit facing the keyboard. This panel contains the lights and one switch needed to indicate and control the status of telecommunication processing. See *Appendix C* for a description of the lights and the switch on the BSCA panel and for a list of the steps required to execute a BSCA program.

Processing unit (customer engineer control panel behind cover)

- Labeling a Disk Cartridge

- Mounting a Disk Cartridge

- Removing a Disk Cartridge
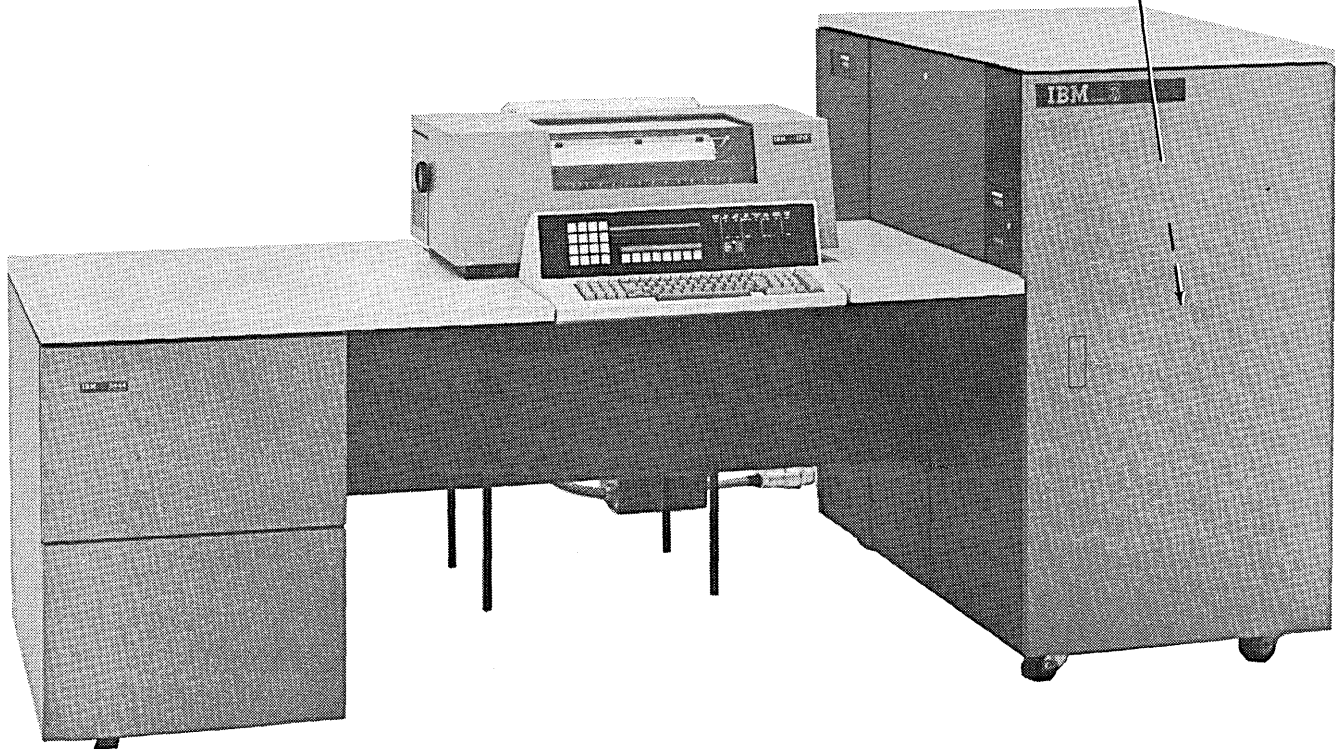
- Readying the Disk Storage Drive

LABELING A DISK CARTRIDGE

Place a label (a meaningful name) on the top and bottom cover of each disk cartridge containing files or programs. This allows you to readily identify the cartridge to be mounted for a job. The name you use as a label should be the same as the pack name assigned to the disk during initialization. The name should be meaningful in order to indicate which files or programs are stored on the cartridge.

Label disk cartridges with adhesive stickers that can be applied and removed easily. Never use an eraser or lead pencil to change the information on a label bacause this practice produces small magnetic particles that can interfere with the read/write heads.

Disk storage drive
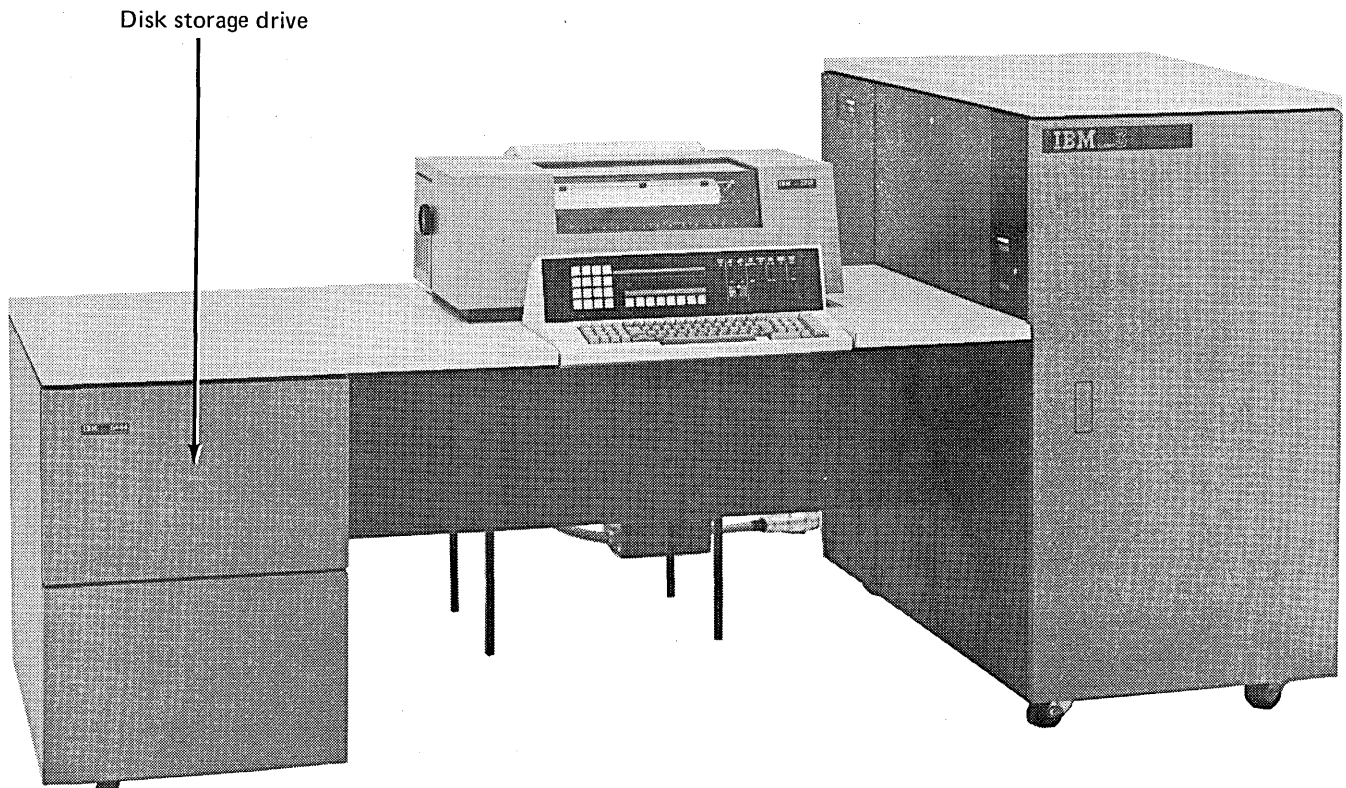
MOUNTING A DISK CARTRIDGE

The following procedures are for mounting a cartridge. If a cartridge is on the disk drive, remove it before placing a new cartridge on the disk drive. Follow the procedures later in this chapter for removing a cartridge.

The cartridge to be used by the system should be in the environment in which it is to be used for at lease three hours. A cartridge should always be on the disk drive when the system is not in use. This keeps dust from entering the drive.

1.   Set the disk drive on/off switch (DISK DRIVE 1 or DISK DRIVE 2) on the console at OFF.

2.   Squeeze the drawer release lever and slide the disk storage drawer out until it stops.
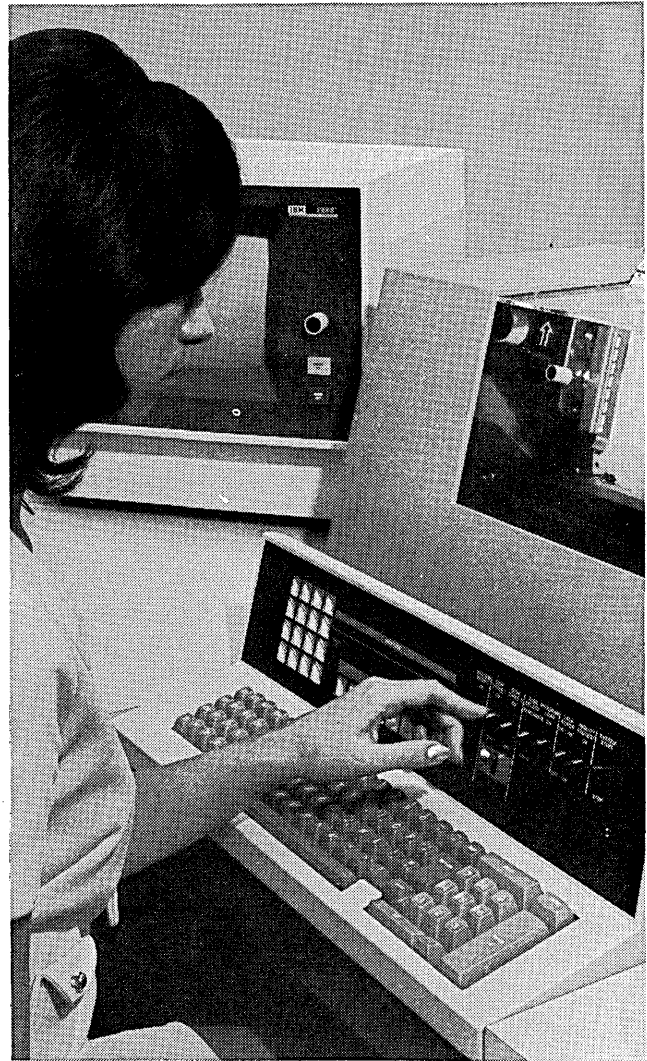
3.   Pull both clamp arms outward.
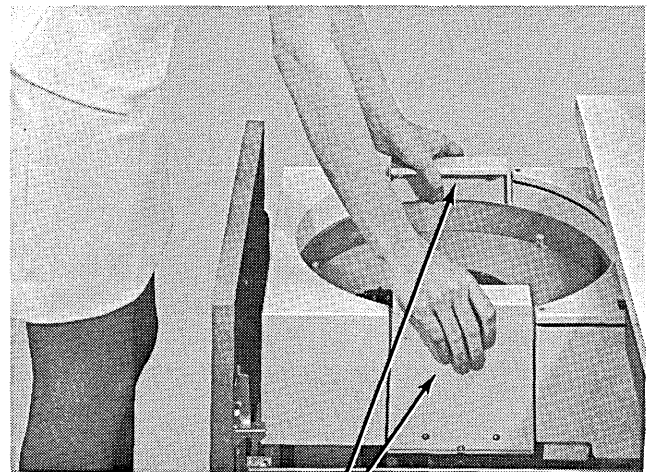
Clamp arms

4.   Select the cartridge to be mounted as specified on the Program Run Sheet.

5.   As you slide the release button on the cartridge to the left, place one hand under the bottom cover to catch it when it is released.
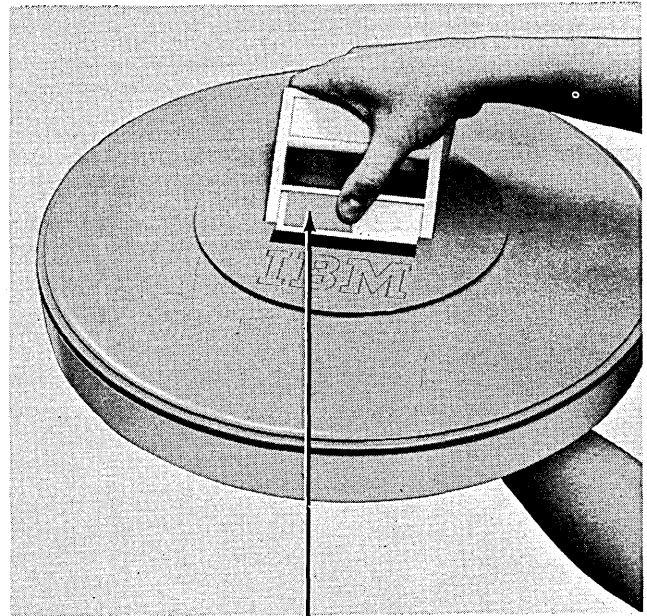
Release Button

6.   Raise the carrying handle to its upright position.
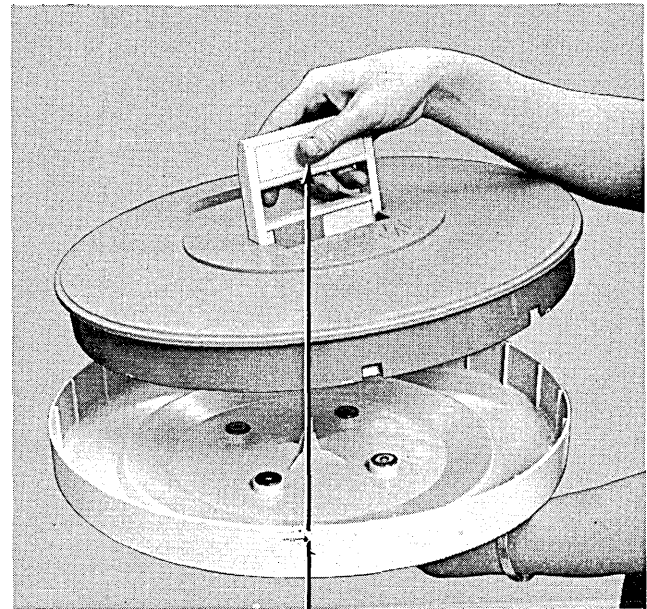
Carrying Handle

7. With the IBM label pointed toward the front of the disk storage drawer, lower the cartridge onto the disk drive.

8. Release the carrying handle. (It will automatically rest flat against the cartridge.)

Disk Drive

9. Invert the bottom cover you just removed, and place it on top of the cartridge.

10. Push the clamp arms in so that they extend over the cartridge.

11. Slide the disk storage drawer all the way in. The disk cartridge is now mounted. Before the system can read data from or write data on the disk, however, you must follow the procedure in this section under *Readying the Disk Storage Drive.*

REMOVING A DISK CARTRIDGE

To remove a disk cartridge, use the following procedure:

1. Set the disk drive on/off switch (DISK DRIVE 1 or DISK DRIVE 2) at OFF. The disk takes about 30 seconds to stop spinning. During this time, the drawer release lever is locked and the disk storage drawer cannot be opened.

2. Squeeze the drawer release lever and slide the drawer out until it stops.
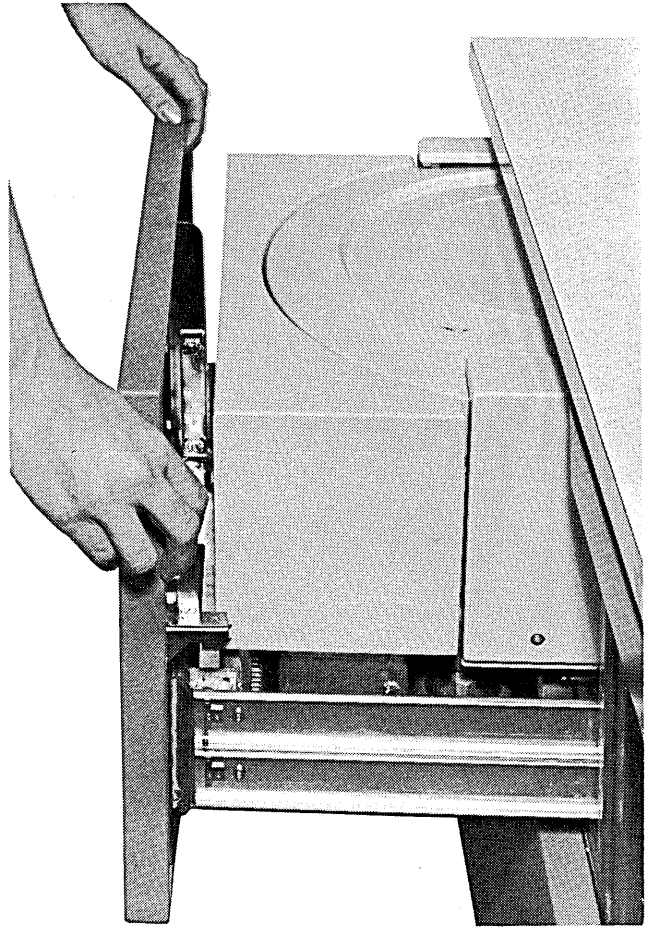
3. Pull both clamp arms outward.
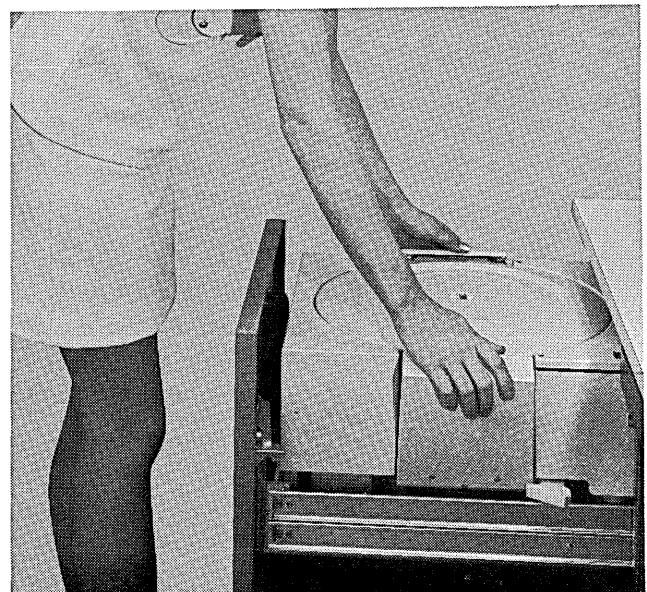
4.   Lift the inverted bottom cover off the cartridge.

5.   Slide the release button on the cartridge to the left
     as you raise the carrying handle to release the cartridge
     from the disk drive.
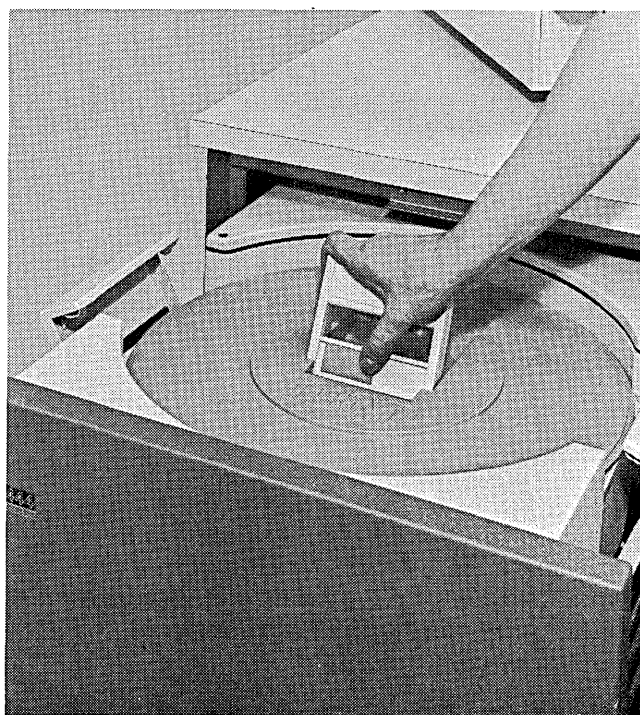
6. Lift the cartridge off the disk drive.

7. Set the bottom cover upright and place it back on the cartridge. Store the cartridge.
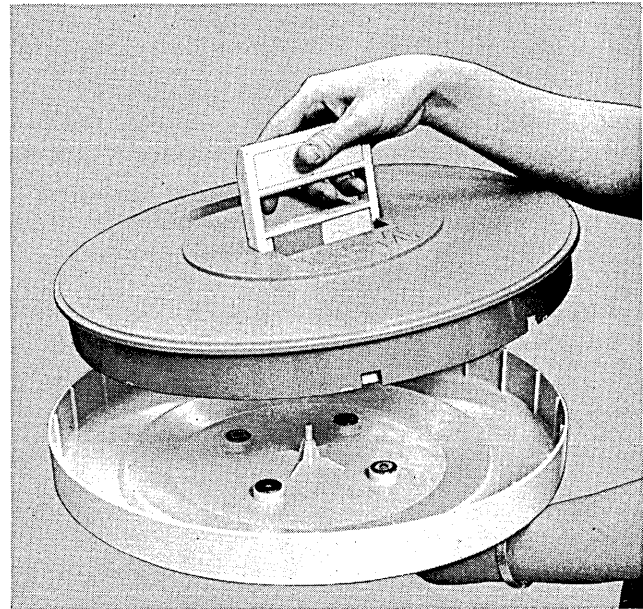
READYING THE DISK STORAGE DRIVE

To make the disk storage drive ready for operation, set the disk drive on/off switch (for DISK DRIVE 1 or DISK DRIVE 2) at ON. After you have turned on power to the disk drive, it takes a short while (approximately 60 seconds) before the system can perform read or write operations. If the system tries to perform such operations before the disk is up to speed, the disk drive indicator light (DISK DRIVE 1 or DISK DRIVE 2) turns on. The indicator light turns off when the disk drive is up to speed. The drive is then ready for operation.

- IBM 5213 Printer Model 1

- IBM 5213 Printer Models 2 and 3

- IBM 2222 Printer Models 1 and 2

- Changing the Ribbon Cartridge in the System Printer

The model 6 system printer is a serial printer; that is, it prints one character at a time, up to 85 characters per second. The system printer is located above and behind the operator console. All printer operations are controlled by the program in storage.

When end-of-forms is indicated and you need to print additional lines to finish the current page, move SYSTEM START/STOP to START. This will cause one line to be printed. Repeat this process for each additional line to be printed until the page is completed. Then load new forms in the printer, setting the paper to line number one.

The system printer in your installation can be any one of the following:

- IBM 5213 Printer Model 1 (132 print positions)

- IBM 5213 Printer Models 2 and 3 (132 print positions)

- IBM 2222 Printer Models 1 and 2 (220 print positions)

IBM 5213 PRINTER MODEL 1

The IBM 5213 Printer Model 1 can print up to 132 characters across a page, with vertical spacing of six lines to the inch. The model 1 uses a pin-feed platen to move forms through the printer; that is, forms with holes along the outside edges are attached to pins on both ends of the platen. Forms are advanced through the printer by spacing or skipping operations under program control.
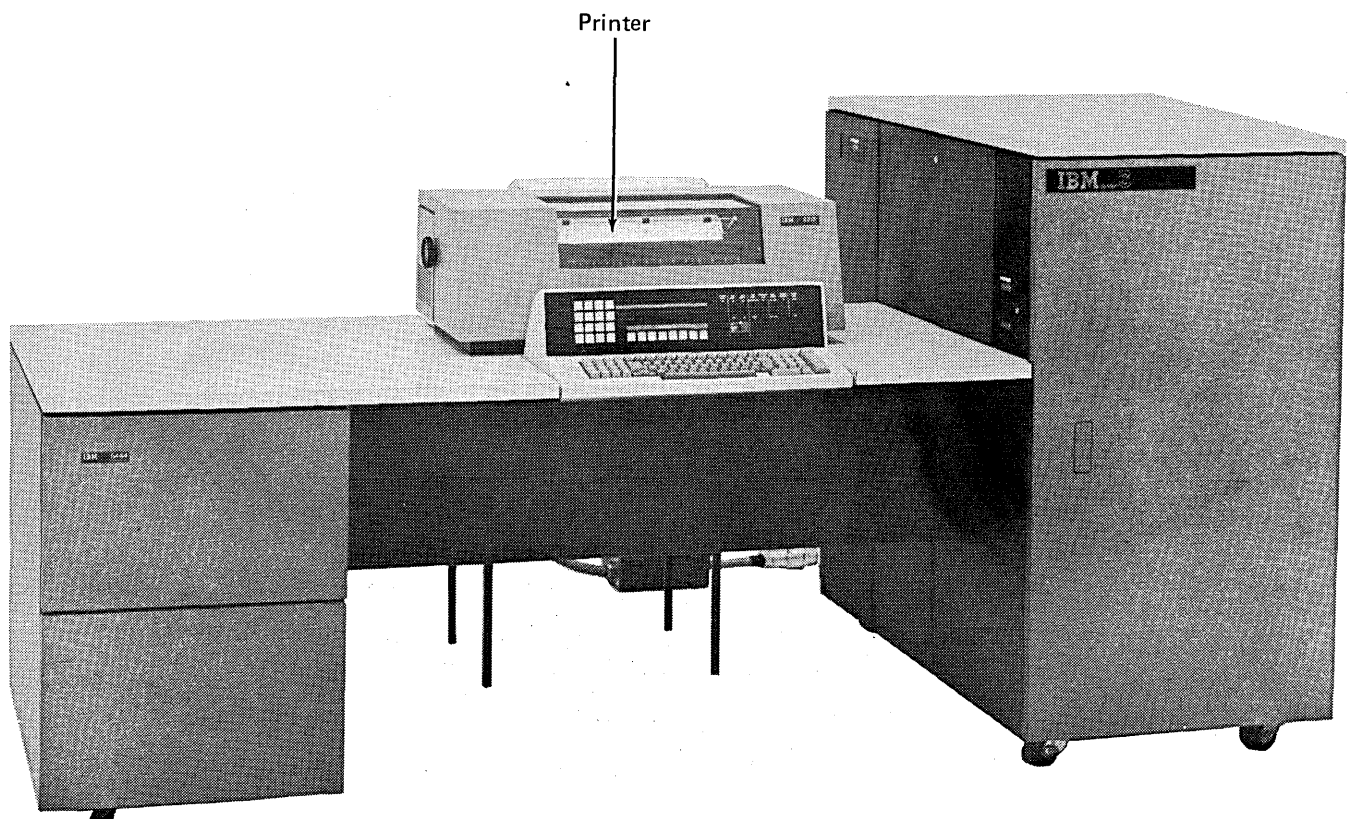
Printer

Operator Controls and Indicator Lights

The system uses PRINTR on the system display panel of the operator console to tell you:

- The printer is out of forms.

- The printer cover is not closed properly.

You use the following manual controls when operating the IBM 5213 Printer Model 1. These controls are located under the printer cover.

① *Forms thickness lever:* Use this lever to move the platen toward or away from the print head to allow printing multiple-copy forms. When you are loading printer forms, set the forms thickness lever at the position farthest away from you. Set the lever at the position nearest you when printing an original and up to three carbon copies. For additional copies, move the lever back until you achieve the print quality you want. The position you select will depend on the weight of the forms you are using and the number of carbons being printed.

② *Platen knobs:* Use these knobs, one on each end of the platen, to align forms (vertically) on the desired print line.

③ *Line space lever:* For single spacing, move this lever forward; for double spacing, move it back. When the printer is operating under program control, leave this lever in the single space position.

④ *Pin-feed platen:* This roller rotates when you turn the platen knobs; it rotates automatically when the printer is operating. Full width forms are placed on the pins at each end of the platen.

⑤ *Print-position indicator scale:* This scale ranges in print positions from 1 to 132. An arrow on the print head points to the position where the next character will be printed. Together, the scale and the arrow serve as a guide when you want to adjust forms horizontally with respect to print positions.

⑥ *Forms release lever:* This lever must be forward to advance paper placed on the pins. When narrow printer forms (with or without margin holes) are used, the forms release lever must be pushed back. This keeps such forms from twisting, thus reducing the need to align them frequently.
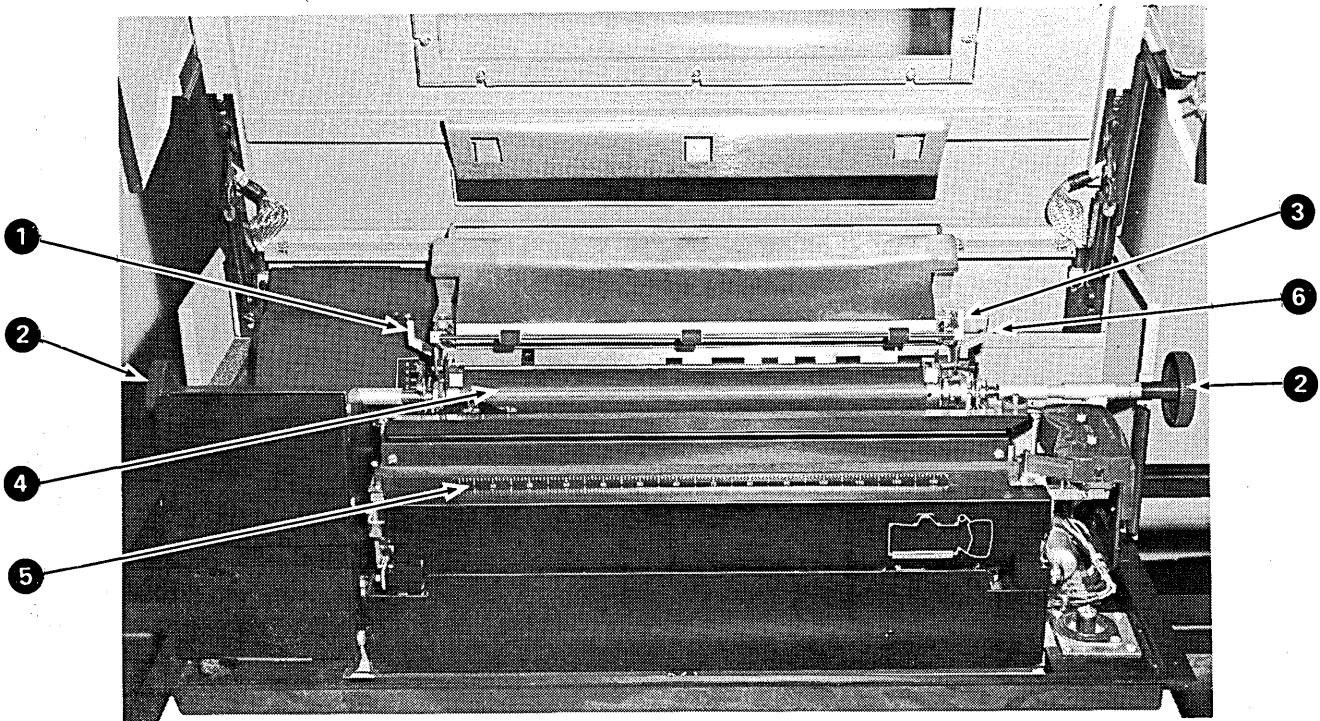
Loading Forms in the IBM 5213 Printer Model 1

1. Raise printer cover.

2. Raise covers off platen pins.

3. From rear of printer, place box of forms on floor or on forms stand. Remove flaps from box.

4. Insert form (printed side down) in paper feed slot at rear of printer. (The form enters easily if you insert one corner in the slot before the other.)

5. From front of printer, turn platen knob to feed form up in front of platen.

6. Place holes on forms on pins at both ends of platen.

7. Lower covers into the platen pins.

8. Turn platen knob to advance form to the first printing line.

9. Press right platen knob and turn it until print head is aligned with print line.

10. Set forms thickness lever at desired position.

11. Set the line space lever for either single or double spacing.

12. Close printer cover securely. If cover is not closed properly, PRINTR on the system operator's console turns on when the program tries to use the printer. Move SYSTEM START/STOP to START to continue processing.

Note: Use the upper arrow key (↑) to skip the paper forward a sheet at a time.

IBM 5213 PRINTER MODELS 2 AND 3

The IBM 5213 Printer Models 2 and 3 can print up to 132 characters across a page, with vertical spacing of six lines to the inch. Models 2 and 3 use a pair of forms tractors to move forms through the printer and into the stacker. In this case, the form is attached to the pins on both forms tractors so that it can be advanced through the printer by spacing and skipping operations under program control.

The model 3 differs from the model 2 in the following ways:

● The model 3 has a special feature that allows printing in both directions across the form.

● An optional attachment is available for the model 3 to increase its speed to 110 characters per second. (The speed of other models is 85 characters per second.)

Operator Controls and Indicator Lights

The system uses PRINTR on the system display panel of the operator console to tell you:

● The printer is out of forms.

● The printer cover is not closed properly.

● The line select lever is set at neutral.

You use the following manual controls when operating the IBM 5213 Printer Models 2 and 3. These controls are under the printer cover.
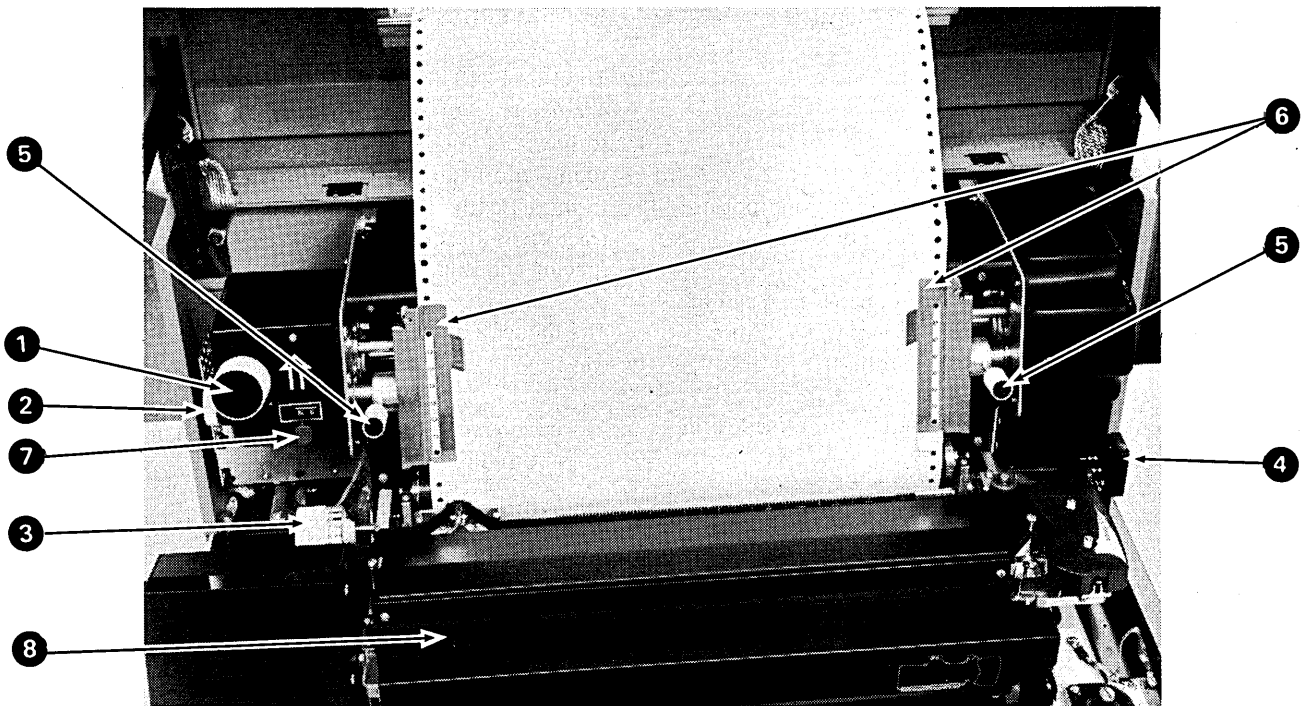
1 *Vertical forms alignment knob:* Press this knob and turn it to align forms vertically on the desired print line. Make sure the line select lever is set at N (neutral) before using the vertical forms alignment knob.

2 *Horizontal forms alignment knob:* Use this knob to align forms horizontally at the desired print position. Using this knob, you can move forms as much as one-half inch.

3 *Forms thickness knob:* Use this knob to move the platen toward or away from the print head to allow for printing multiple-copy forms. This thickness scale ranges from 1 to 10. When you are loading printer forms, set the forms thickness knob at the load position to make forms loading easier. The numbers printed on this knob indicate settings that correspond to the number of copies being printed.

4 *Forms tension control lever:* Use this lever to adjust the amount of tension on the printer forms. When loading forms, set the lever at 0. Suggested settings, corresponding to the weight of the forms, are printed to the right of this lever.

5 *Forms tractor knobs:* Use these knobs to adjust the tractors for various form widths. Loosen the tractor knobs to move the tractors to the desired print position, then tighten the knobs to hold the tractors at that position.

6 *Forms tractor doors:* The spring-loaded door on each forms tractor holds the forms on the tractor feed pins. Open these doors to remove or load forms on the tractor feed pins; close them to secure forms in the tractors.

7 *Line select lever:* Set this lever at N (neutral) when you are using the vertical alignment knob and when you are loading printer forms. The line select lever must be set at 6 for the printer to operate. If this lever is not at 6, PRINTR turns on after the printer cover is closed.

8 *Print-position indicator scale:* This scale ranges in print positions from 1 to 132. An arrow on the print head points to the next print position. Together, the scale and the arrow serve as a guide when you want to adjust forms horizontally with respect to print positions.

Loading Forms in the IBM 5213 Printer Models 2 and 3

1.   Raise printer cover.
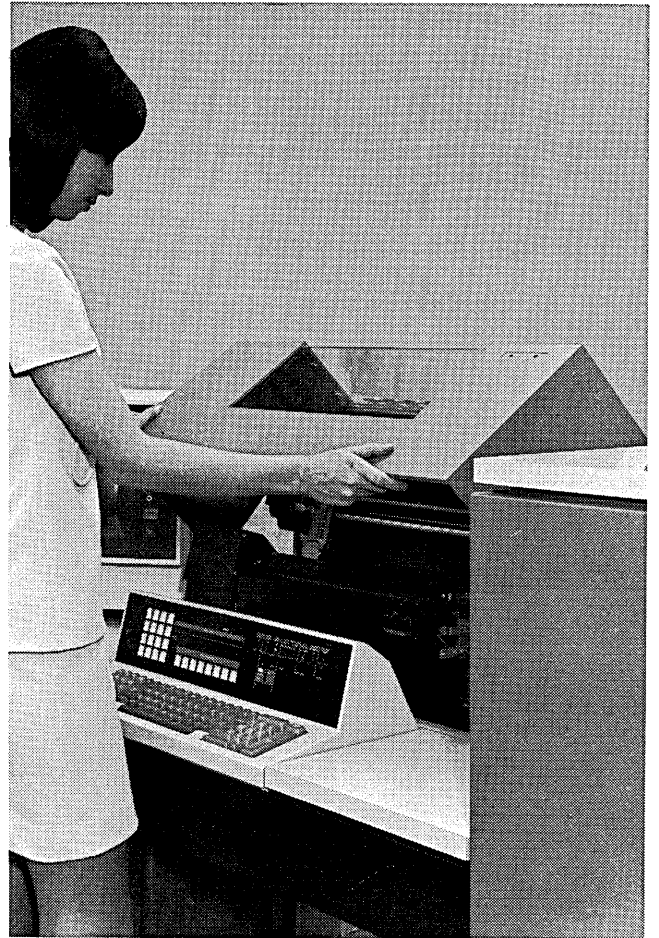
2.   Set line select lever at N; set forms thickness knob at 10 for maximum clearance between print head and platen.
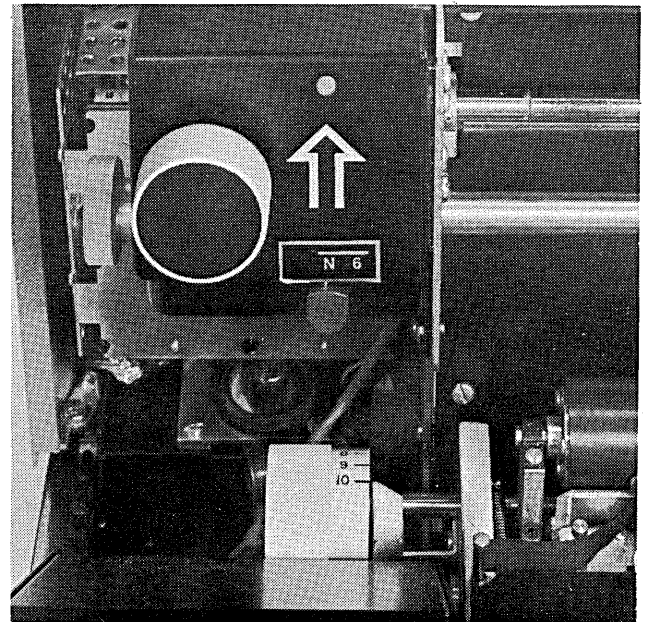
3. Set forms tension control lever at 0.
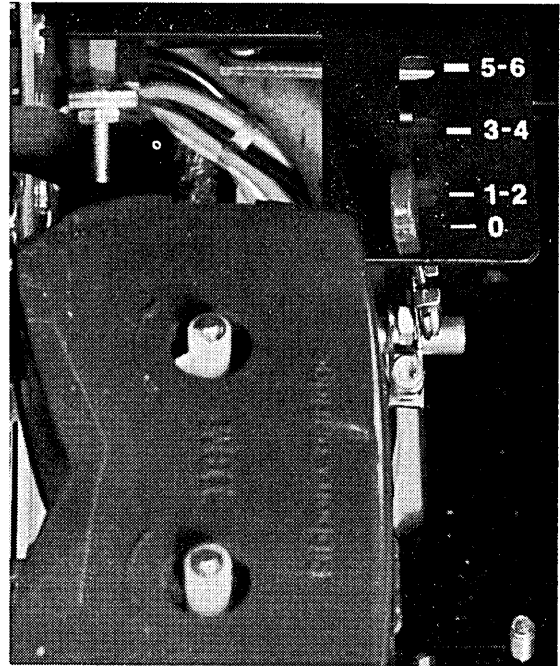
4. From rear of printer, place box of forms on floor or on forms stand. Remove flaps from box.

5. Insert form (printed side down) in paper feed slot at rear of printer. (Form enters easily if you insert one corner in the slot before the other.)

6. Work form up and in front of platen.
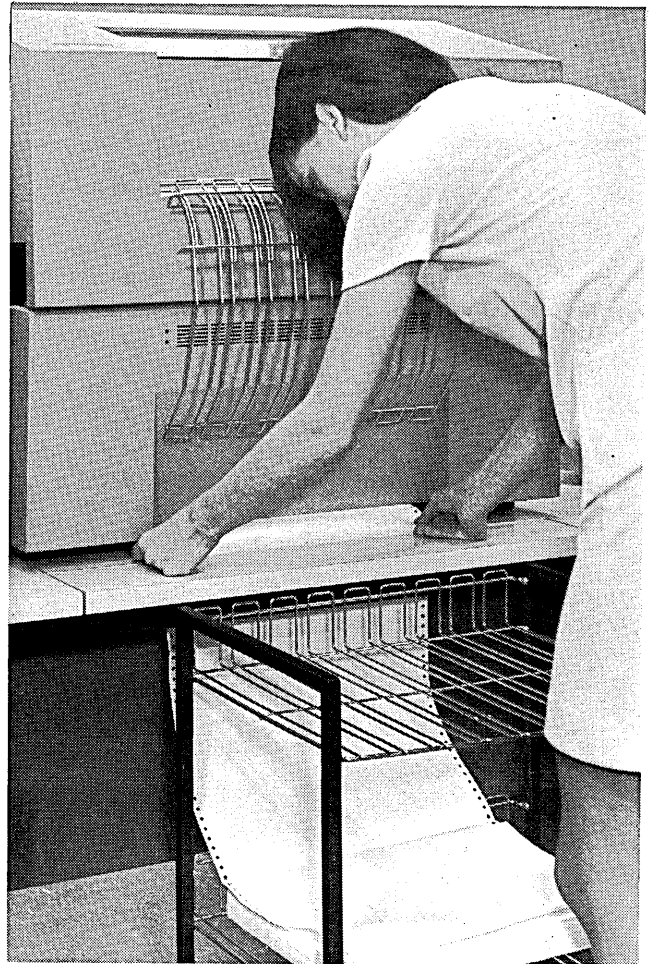
7. From front of printer, loosen tractor knobs on both forms tractors and move tractors to accommodate the position and width of form used.
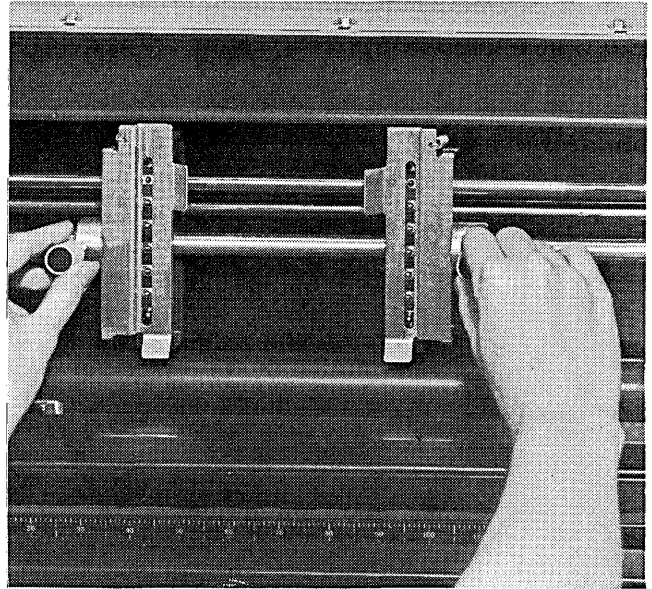
8. Position the form at left margin, or within one inch of print position 1, so that an end-of-forms can be detected.

9. Open both tractor doors. Place holes in form on tractor pins and close tractor doors.
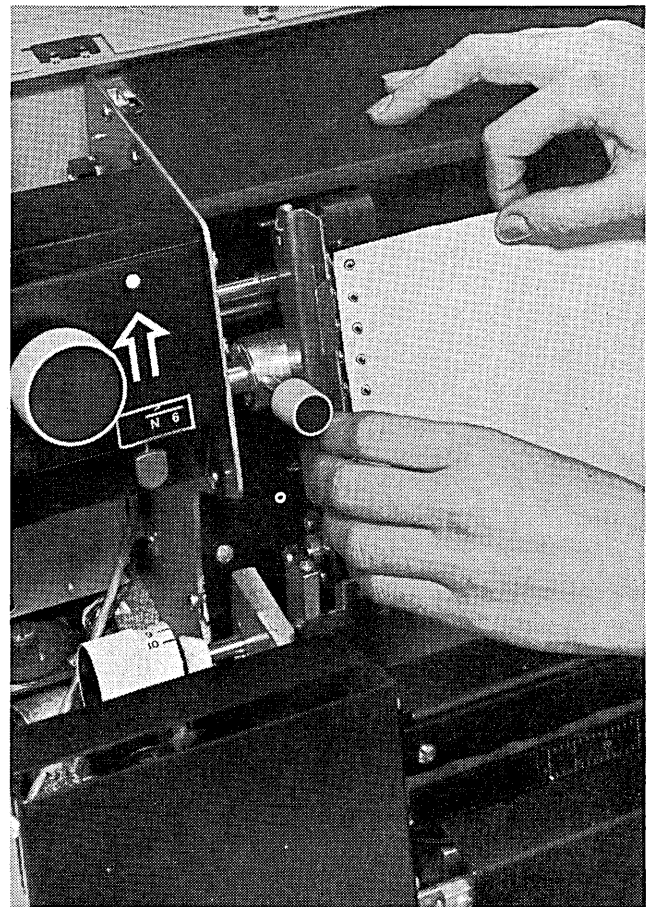
10. Tighten left tractor knob. Adjust right forms tractor for adequate tension on form. Tighten right tractor knob.
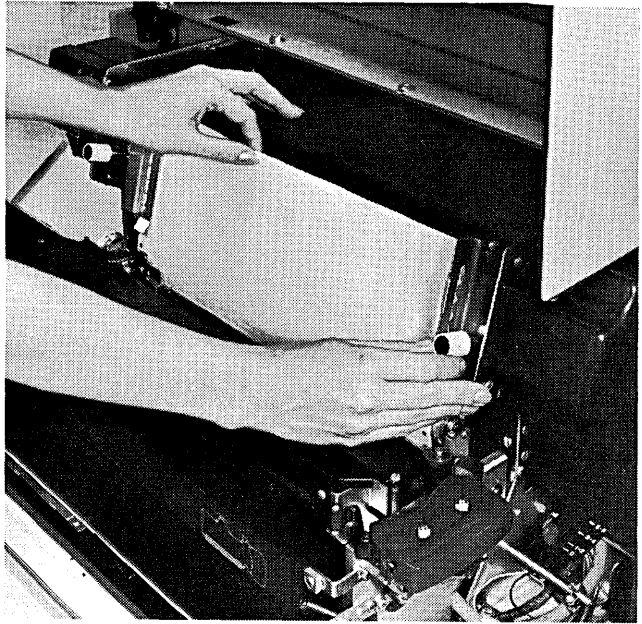
11. Turn horizontal forms alignment knob for precise alignment with specific print position if required.
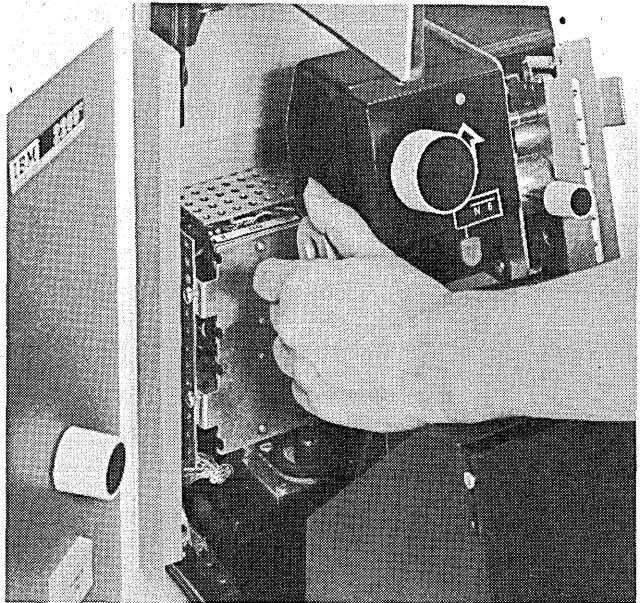
12. Press and turn vertical forms alignment knob until print head is aligned with first print line.
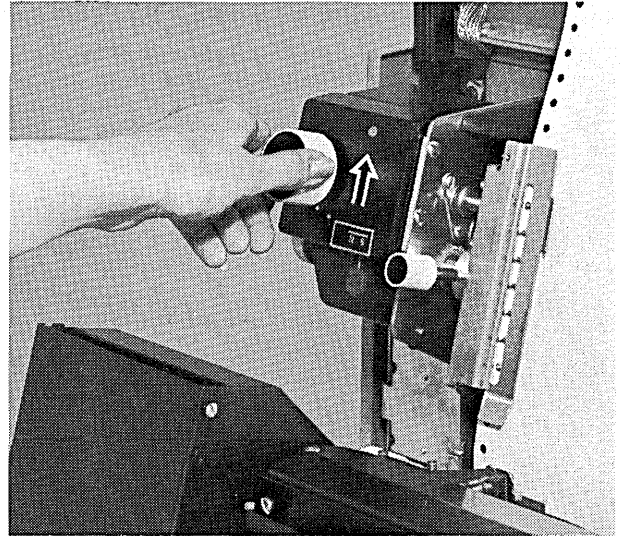
13. Set line select lever at 6.
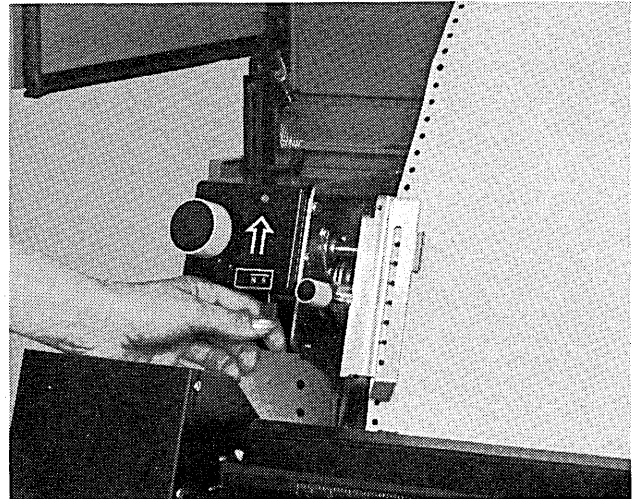
14. Turn forms thickness knob to setting recommended for forms being used.
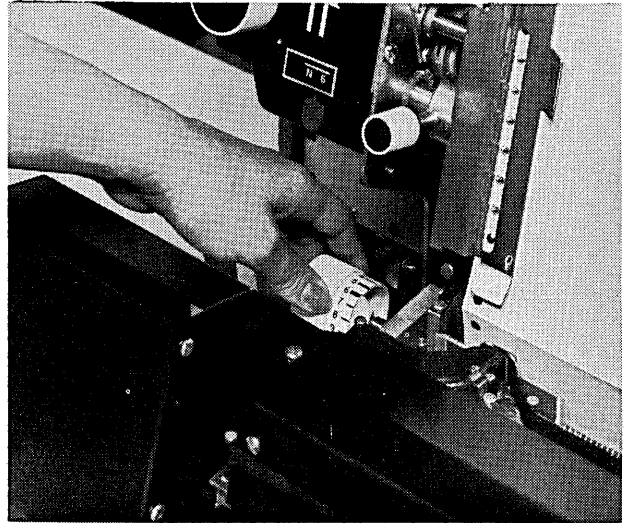
15. Place forms tension control lever at setting recommended for forms being used.

16. Close the printer cover securely. If cover is not closed properly, PRINTR turns on when the program tries to use the printer. Move SYSTEM START/STOP to START to continue processing.
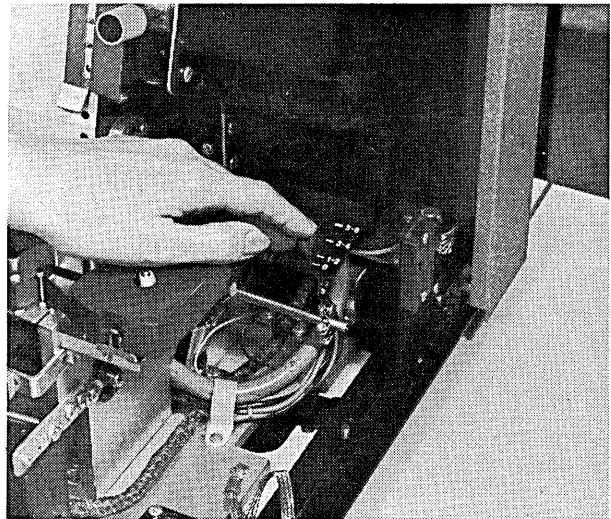
IBM 2222 PRINTER MODELS 1 AND 2

The IBM 2222 Printer Models 1 and 2 (Figure 7) can print
up to 220 characters across a page with vertical spacing of
six lines to the inch. Models 1 and 2 use independent
pairs of forms tractors to move forms through the printer
and into the forms stackers. The IBM 2222 Printer Models
1 and 2 can print on two printer forms, each having holes
along the outside edges, at the same time. These forms can
be of the same or different design. The two sets of tractors
are designated as primary and secondary, with the secondary
tractor located behind the primary tractor. In addition to
printing on two forms, the 2222 Printer can print on ledger
cards. All forms movement and ledger card operations are
program-controlled.

The Model 2 differs from the Model 1 only in that the
Model 2 has a special feature which allows printing in
both directions across the form.

Operator Controls and Indicator Lights

The system uses PRINTR on the system display panel of
the operator console to tell you:

● The printer is out of forms.

● The printer cover is not closed properly.

● The line select lever is set at neutral.

You use the following manual controls when operating
the IBM 2222 Printer Models 1 and 2. These controls are
under the printer cover.
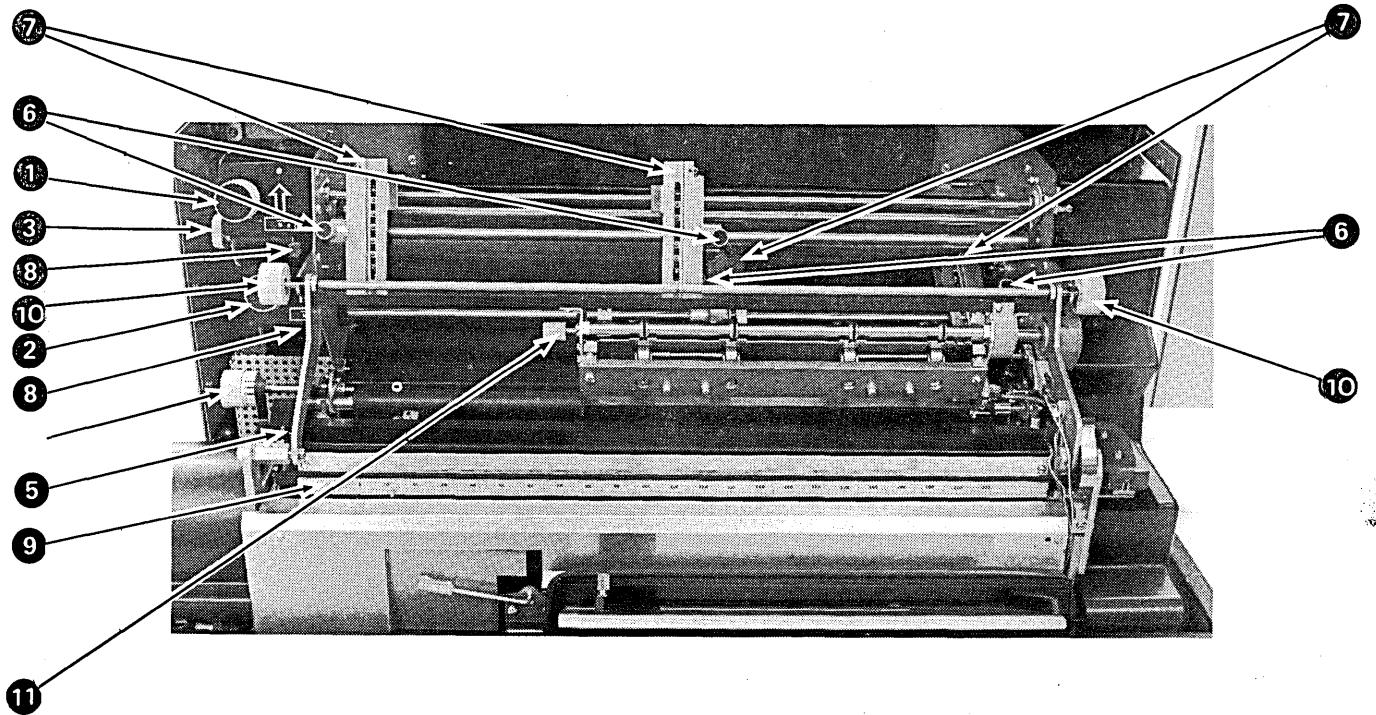
Figure 7. IBM 2222 Printer Models 1 and 2

1 *Vertical forms alignment knob (primary tractor):* Press this knob and turn it to align forms in the primary print unit on the desired print line.

2 *Vertical forms alignment knob (secondary tractor):* Press this knob and turn it to align forms in the secondary print unit on the desired print line.

3 *Horizontal forms alignment knob (primary tractor):* Use this knob to align forms to the desired print position. Using this knob, you can move the forms in the primary print unit as much as one-half inch.

4 *Forms thickness knob:* Use this knob to move the platen toward or away from the print head to allow printing multiple-copy forms. The thickness scale ranges from 1 to 10. When you are loading printer forms, set the forms thickness knob at the load position to make forms loading easier. The numbers on this knob indicate settings that correspond to the number of copies being printed.

5 *Forms tension control lever:* Use this lever to adjust the amount of tension on the printer forms. When loading forms in the printer, set this lever at 0. Suggested settings, corresponding to the weight of the forms, are printed to the left of this lever.

6 *Forms tractor knobs:* Use these knobs to adjust the primary or secondary tractors to accommodate forms of various widths. Loosen the tractor knobs to move the tractors to the desired print position; then tighten the knobs to hold the tractors at that position.

7 *Forms tractor doors:* The spring-loaded door on each forms tractor holds the forms on the feed pins. Open these doors to remove forms from the tractors; close them to secure forms in the tractors.

8 *Line select levers (primary tractor and secondary tractor):* Set the lever for the primary or secondary tractor at N (neutral) when you are using the vertical alignment knob and when you are loading printer forms. The line select lever must be set at 6 for the printer to operate. If this lever is not at 6, PRINTR on the display panel turns on after the printer cover is closed.

9 *Print-position indicator scale:* This scale ranges in print positions from 1 to 220. An arrow on the print head points to the next print position. Together, the scale and the arrow serve as a guide when you want to adjust forms horizontally with respect to print positions.

10 *Stacker release knobs:* Turn either one of the ledger card stacker release knobs when you want to pull the ledger card stacker away from the platen or secure the stacker against the platen while loading printer forms or clearing forms jams.

11 *Stacker engagement knob:* Turn this knob when you want to return the ledger card stacker to its normal position against the platen.

12 *Forms release control:* Press this control to remove forms that have been inserted in either the primary or secondary feed slot but are not yet past the platen. When forms are inserted in the printer, the forms release control automatically locks in position, preventing partially inserted forms from sliding out of the feed slot.
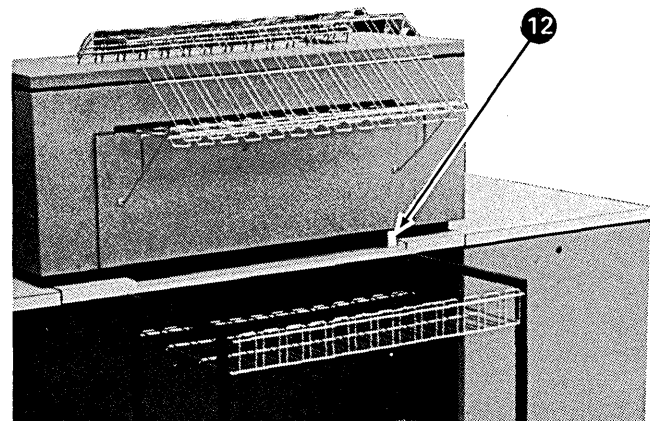
Loading Forms in the IBM 2222 Printer

When the IBM 2222 Printer Model 1 or 2, is used, printing can be done on the primary tractor (positions 1-132), the secondary tractor (positions 133-220), or on both. When instructions on the program run sheet require you to load forms in both tractors, you will find it easier to load the secondary tractor first.

The forms loading procedure that follows lists the steps you should perform to load forms on both the secondary and primary tractors. If instructions on the program run sheet require you to load forms on the primary tractor only, do steps 1-4 and 13-25. If only the secondary tractor is to be used, do steps 1-12 and 22-25.

1.   Raise printer cover.

2.   Set forms thickness knob at the load position for maximum clearance between print head and platen.

3.   Set line select lever at N; set forms tension control lever at 0.
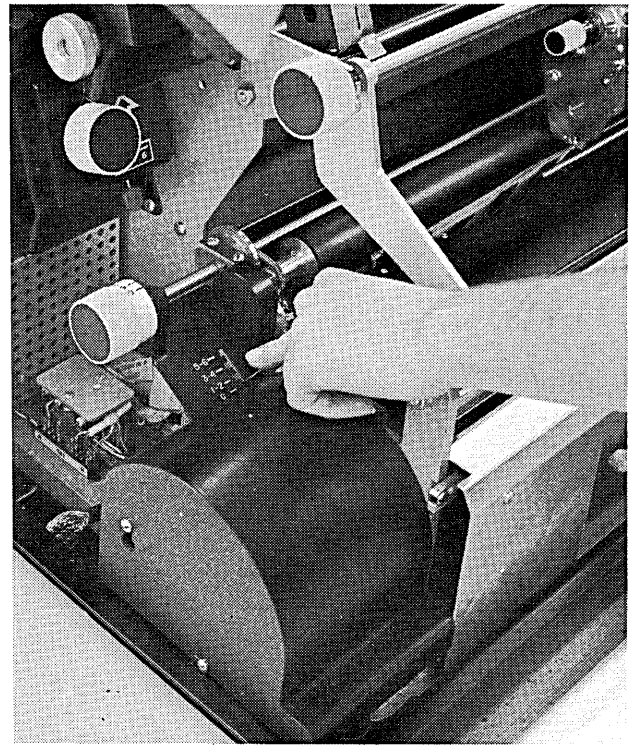
4. If your printer has a ledger card device, turn one of the stacker release knobs to unlock the ledger card stacker. Pull ledger card stacker forward and away from platen.
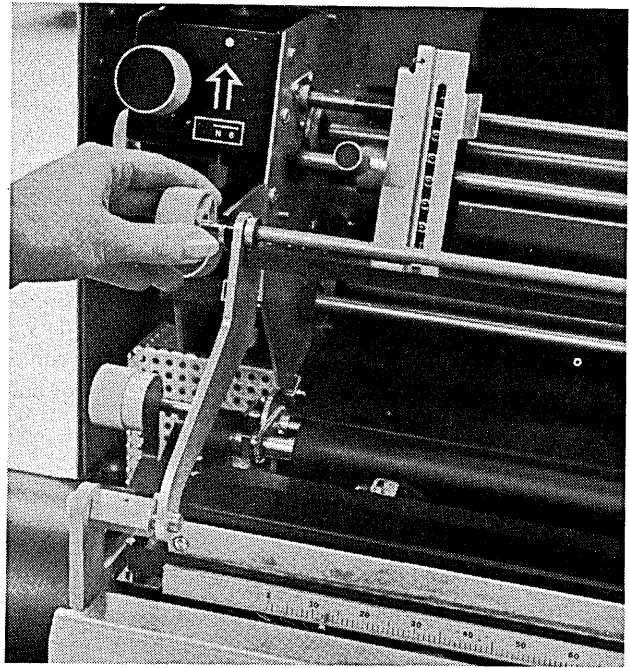
Loading the Secondary Tractor

5. From rear of printer, place box of forms on the floor or on forms stacker. Remove flaps from box.

6. Insert form in secondary feed slot at rear of the printer. Forms enter more easily if you insert one corner in the slot before the other.

7. Work form up and in front of platen.
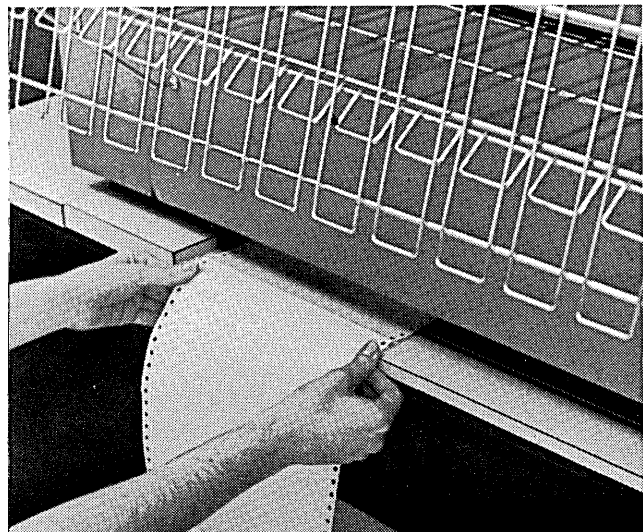
8. From front of printer, pull form up and back over platen. Position it at left margin specified on program run sheet. The right edge of the form must be positioned between print positions 170 and 220 so that the end-of-forms condition can be detected.
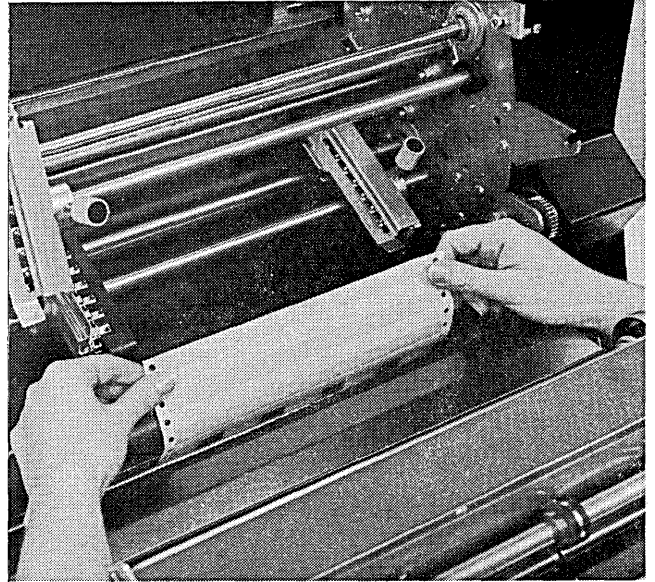
9. Loosen tractor knobs on secondary tractors and move tractors to accommodate the position and width of form.
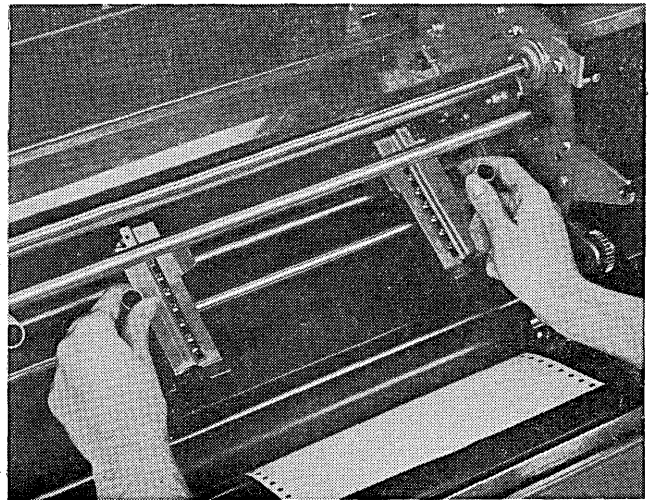
10. Open doors on both secondary forms tractors. Place holes in the form on tractor pins, and lower tractor doors back into position.
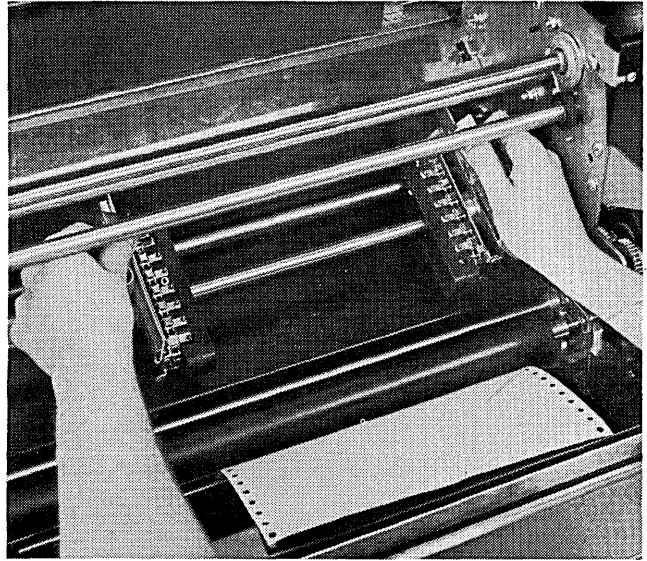
11. Tighten left tractor knob. Adjust right forms tractor for adequate tension across form. Tighten right tractor knob.
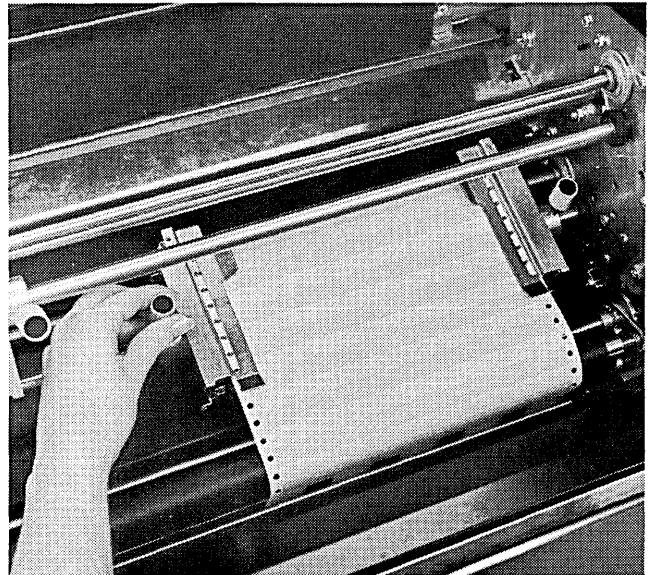
12. Press and turn vertical forms alignment knob until forms can be fed through the slot in the back of printer cover. At the same time, make sure you align print head with the first print line.

Loading the Primary Tractor

13. From rear of printer, place box of forms on floor or on forms stacker. Remove flaps from box.

14. Insert form in primary feed slot at rear of printer. Forms enter more easily if you insert one corner in the slot before the other.

15 Work form up and in front of platen.
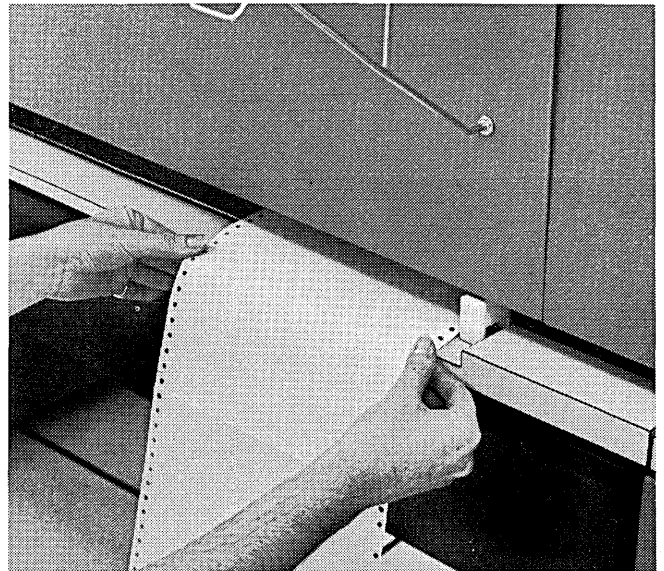
16. From front of printer, pull form up and back over platen. Position it at left margin as specified on program run sheet. The left edge of the form must be positioned between print positions 1 and 20 so that the end-of-forms condition can be detected.
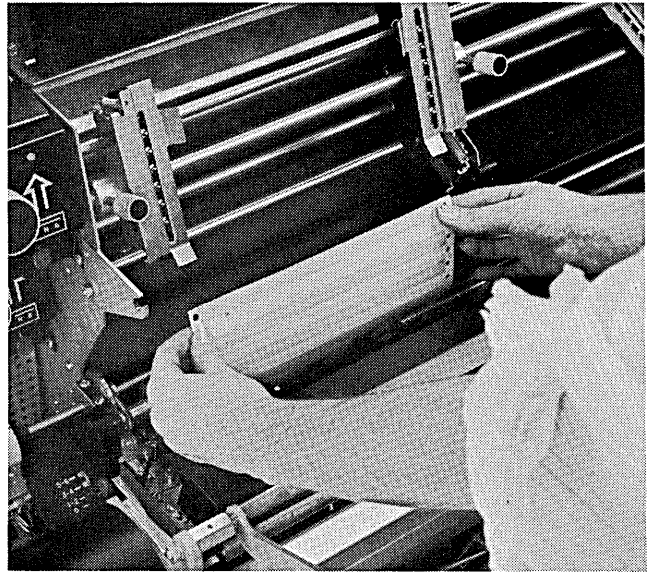
17. Loosen tractor knobs on primary tractors and move tractors to accommodate position and width of form.
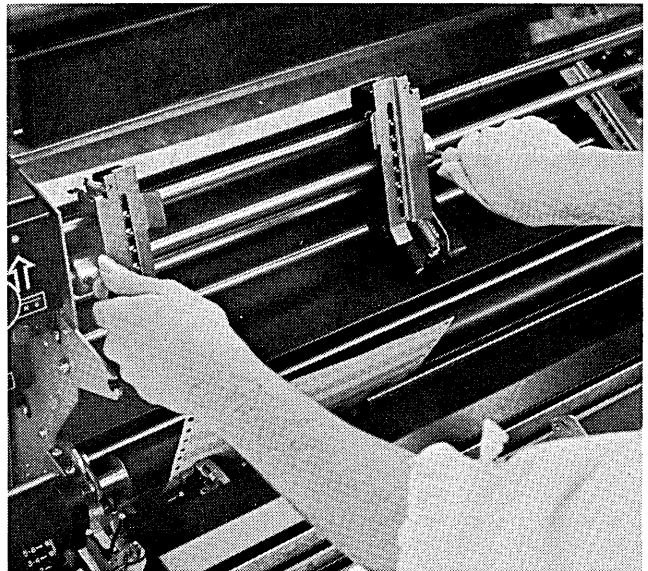
18. Open doors on both primary forms tractors. Place holes in form on tractor pins, and lower tractor doors into position.
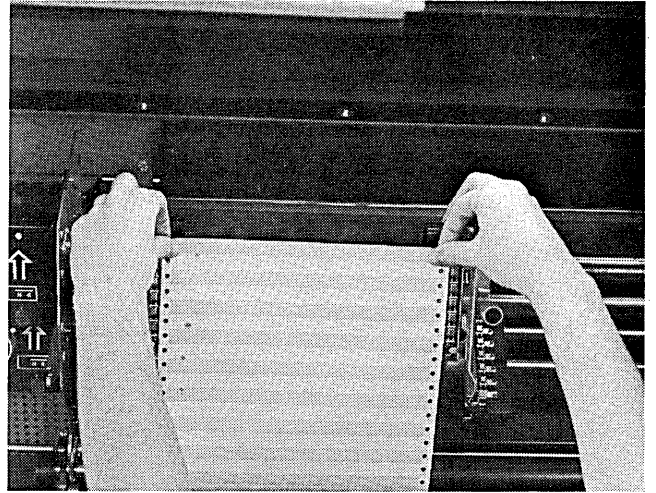
19. Tighten left tractor knob. Adjust right forms tractor for adequate tension across form. Tighten right tractor knob.
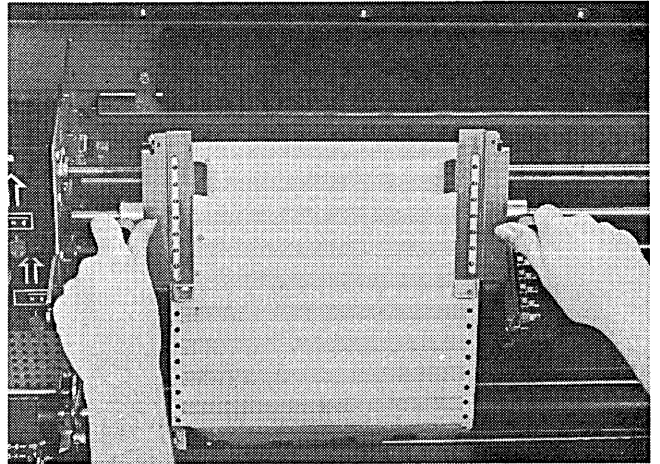
20. Press and turn vertical forms alignment knob until form can be fed through slot in the top of the printer cover. At the same time, make sure you align print head with first print line.

21. Turn horizontal forms alignment knob if precise alignment with a specific print position is required.
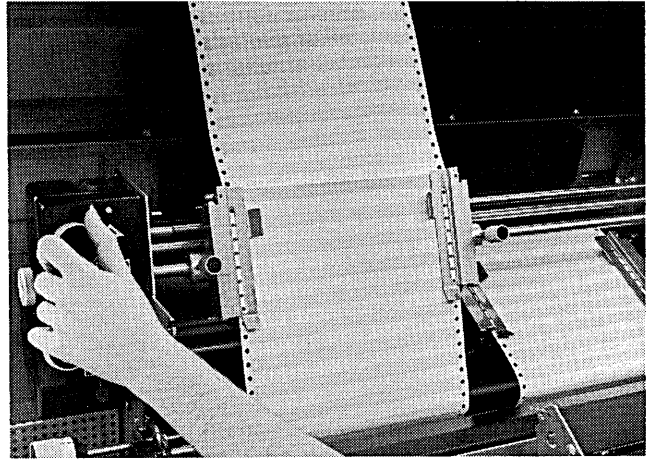
22. Set line select lever at 6.

23. Push ledger card stacker back into its original position and turn stacker engagement knob until the stacker is into position. Turn one of the stacker release knobs until the stacker is secured in this position.

24. Turn forms thickness knob to setting recommended for forms being used. For best results when printing carbon copies, use forms of the same thickness.

25. Place forms tension control lever at setting recommended for forms being used. Close printer cover securely. Move SYSTEM START/STOP to START to continue processing.
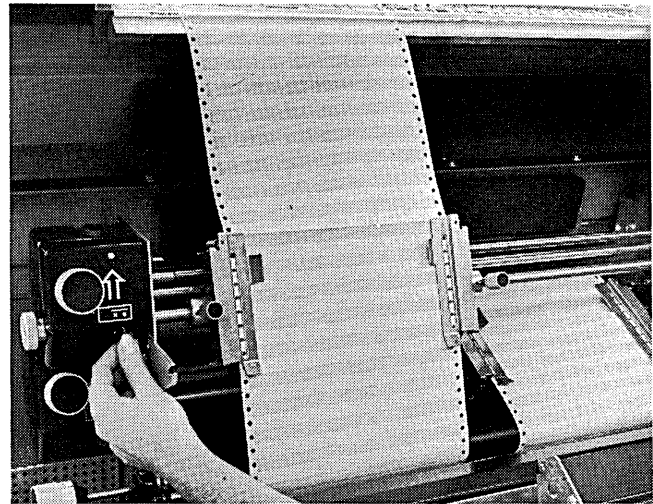
CHANGING THE RIBBON CARTRIDGE ON THE SYSTEM PRINTER

The print ribbon, which is enclosed in a small cartridge, should be changed whenever printing becomes too faint to be read easily.

There are two ribbon cartridges available for the IBM 5213 Printer Models 1, 2, and 3:

Part number 1136906

Part number 1136970

Only ribbon cartridge part number 1136906 can be used on the IBM 2222 Printer Models 1 and 2.

Removing the Ribbon Cartridge, Part Number 1136906

To remove the ribbon cartridge, part number 1136906, follow this procedure:

1. Raise printer cover.

2. Lift cartridge off ribbon cartridge spindles.

3. Ease ribbon out of rollers along ribbon path.
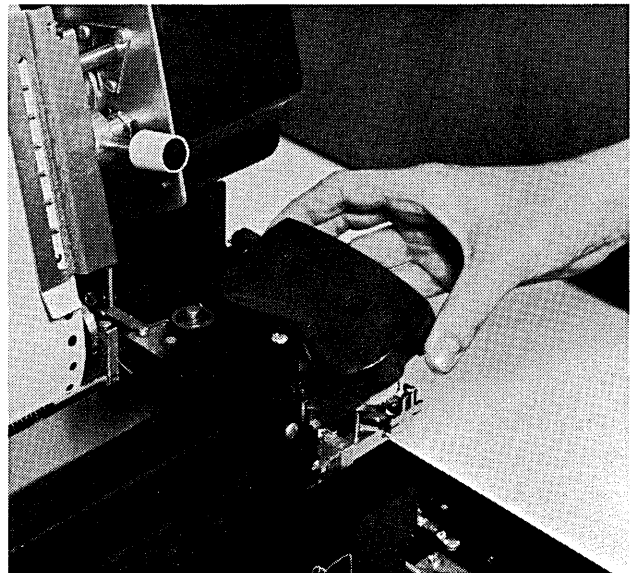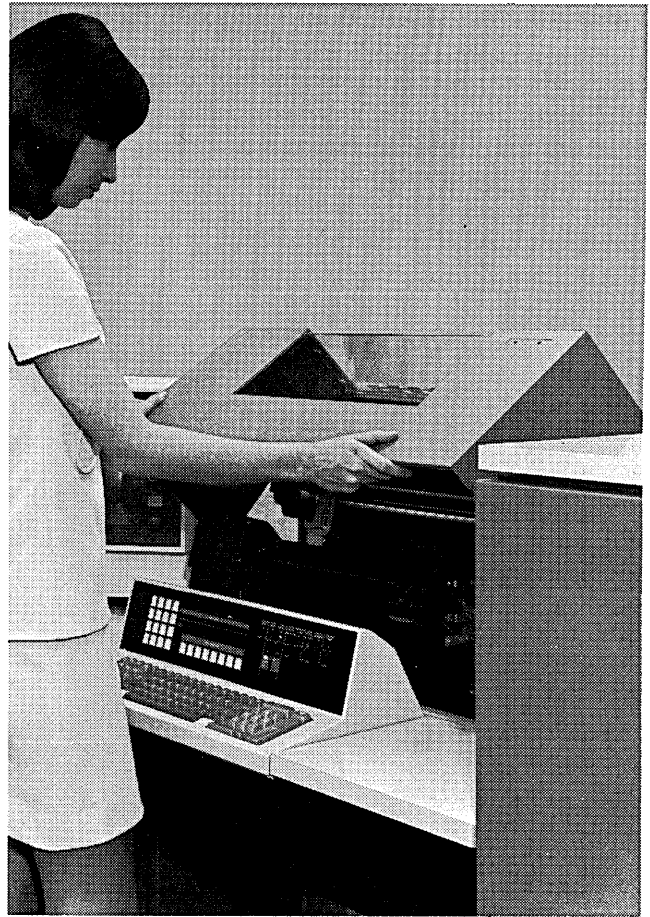
Installing the Ribbon Cartridge, Part Number 1136906

To install a ribbon cartridge, part number 1136906, follow this procedure:

1. Place cartridge on two ribbon cartridge spindles, and press down evenly and firmly. The cartridge will snap into place. Make sure cartridge is firmly secured to prevent ribbon from jamming in cartridge.

2. Pull some ribbon from cartridge.
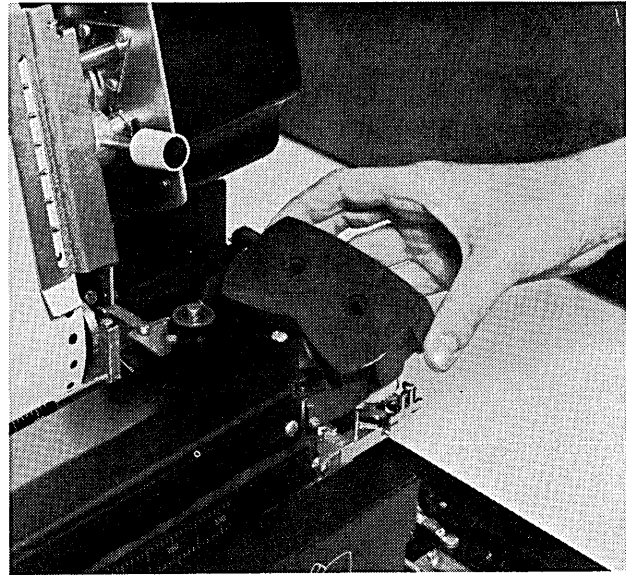
3. Thread ribbon according to the diagram shown. (Diagram is also printed on left side of printer, in front of platen.)

Ribbon Shield

Print Head

Ribbon

Margin Scale Bar
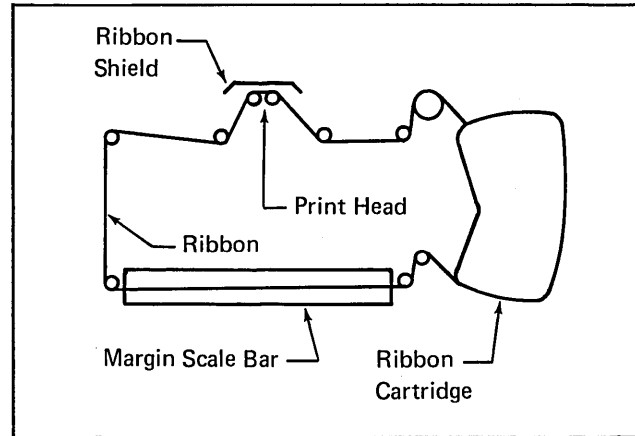
Ribbon Cartridge

4. Take up excess ribbon by turning either spindle in direction of arrow.

5. Close printer cover.
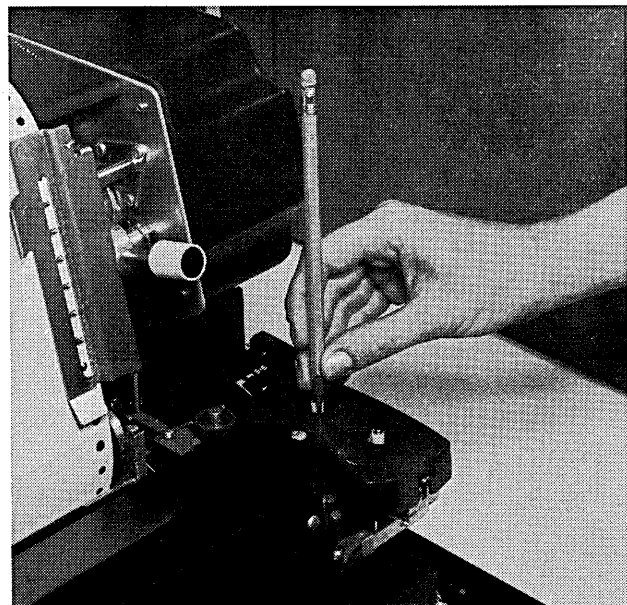
Removing the Ribbon Cartridge, Part Number 1136970

To remove the ribbon cartridge, part number 1136970, follow this procedure:

1. Raise printer cover.

2. On a 5213 Model 1, set the forms tension control lever for maximum distance between the print head and platen; on Models 2 and 3, rotate the forms thickness knob to 10.
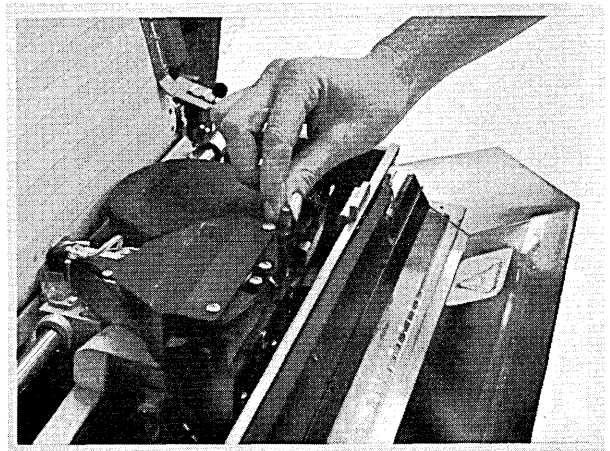
3. Lower the safety shield from over the print head. Back of shield has a ribbon-threading decal for reference.

Decal ⟶
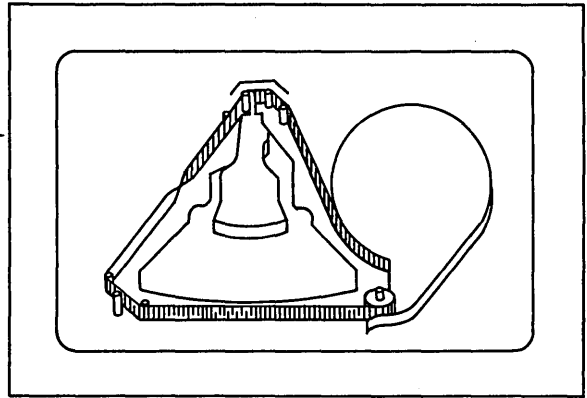
4. Remove ribbon from around guide posts and from under plastic guide.

Plastic Guide

Guide Post

Guide Post
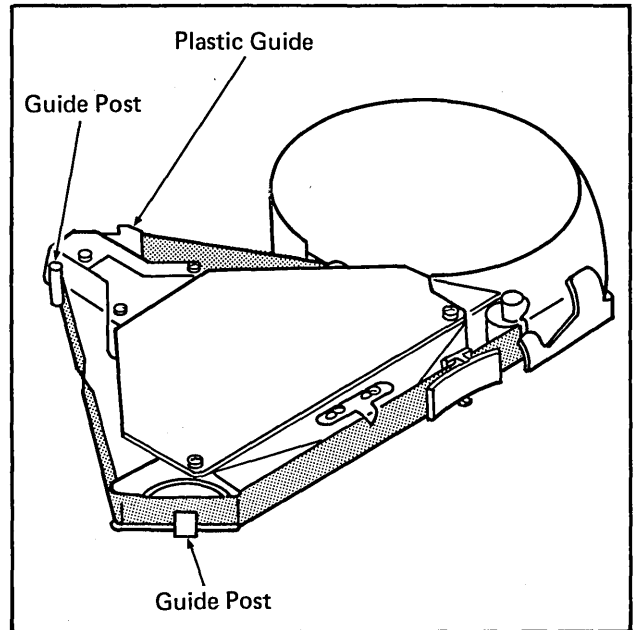
5. With your left hand, pull and hold the latching lever while rotating the ribbon cartridge counterclockwise with your right hand to release the cartridge from the aligning fingers. Lift out the cartridge. (Rotating the cartridge back and forth eases its removal.)

Aligning Fingers   Ribbon Cartridge
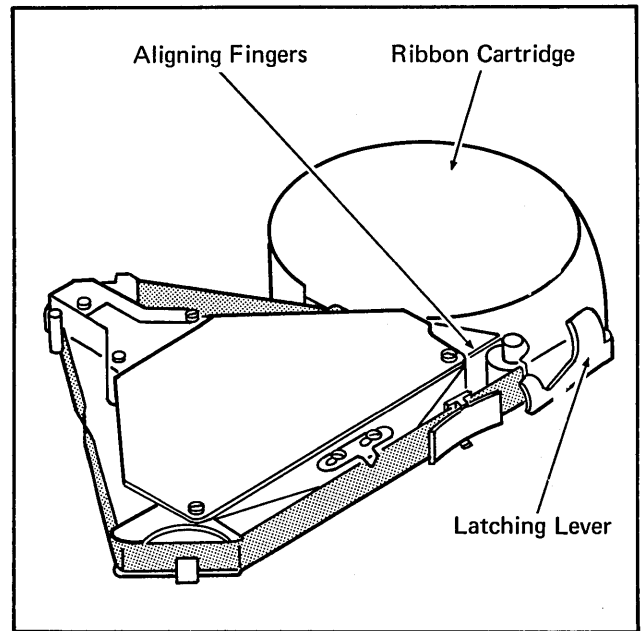
Latching Lever

Installing the Ribbon Cartridge, Part Number 1136970

To install a ribbon cartridge, part number 1136970, follow this procedure:

1. With your left hand, pull and hold the cartridge latching lever.

2. Place the ribbon cartridge on the pivot and rotate the cartridge clockwise to engage the aligning fingers with the aligner.

3. Release the latching lever.
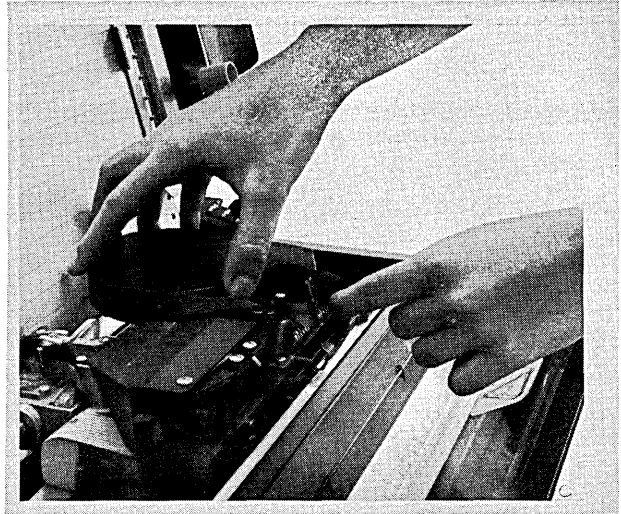
4. Thread the ribbon according to the decal. (Be careful not to get oil on the ribbon from the oil wick.) Work the ribbon under the plastic guide, in front of the print head, and back around the front guide post.

5. Locate the twist in ribbon between the front and rear guide posts.

6. Place the ribbon over the rear guide post. Remove (and discard) the tab protecting the ribbon entrance to the cartridge.

Twist in Ribbon

Tab
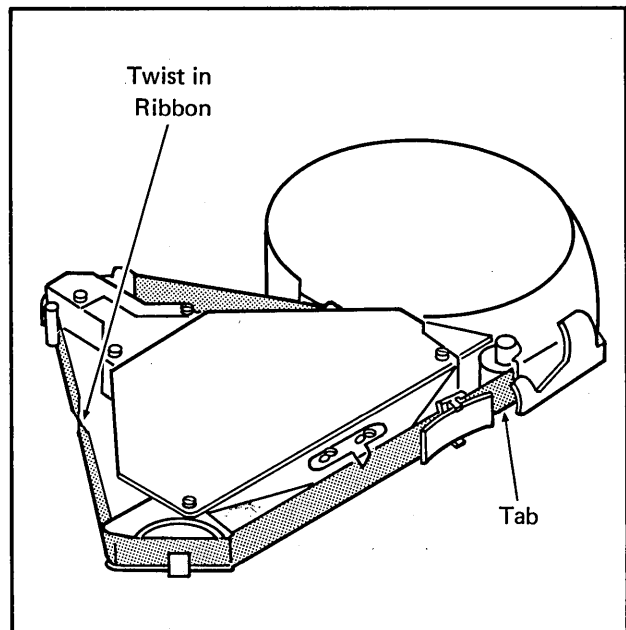
7. Rotate the drive roll knob counterclockwise to take up the ribbon slack. Continue rotating the knob several turns to be certain that the ribbon is feeding properly.

8. Raise safety shield. Close printer cover.

- Using the Ledger Card Device

- Ledger Card Device Controls
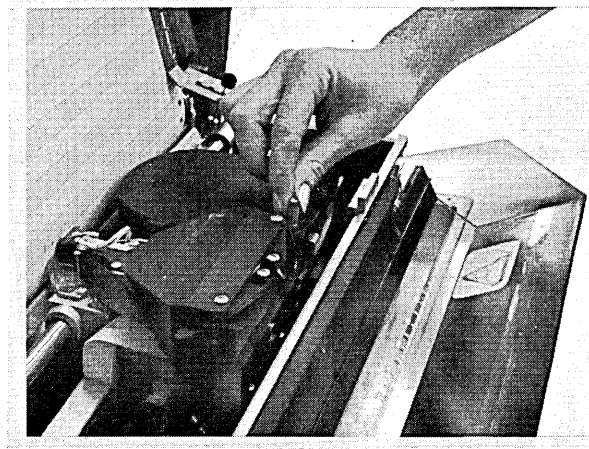
- Operating Procedures
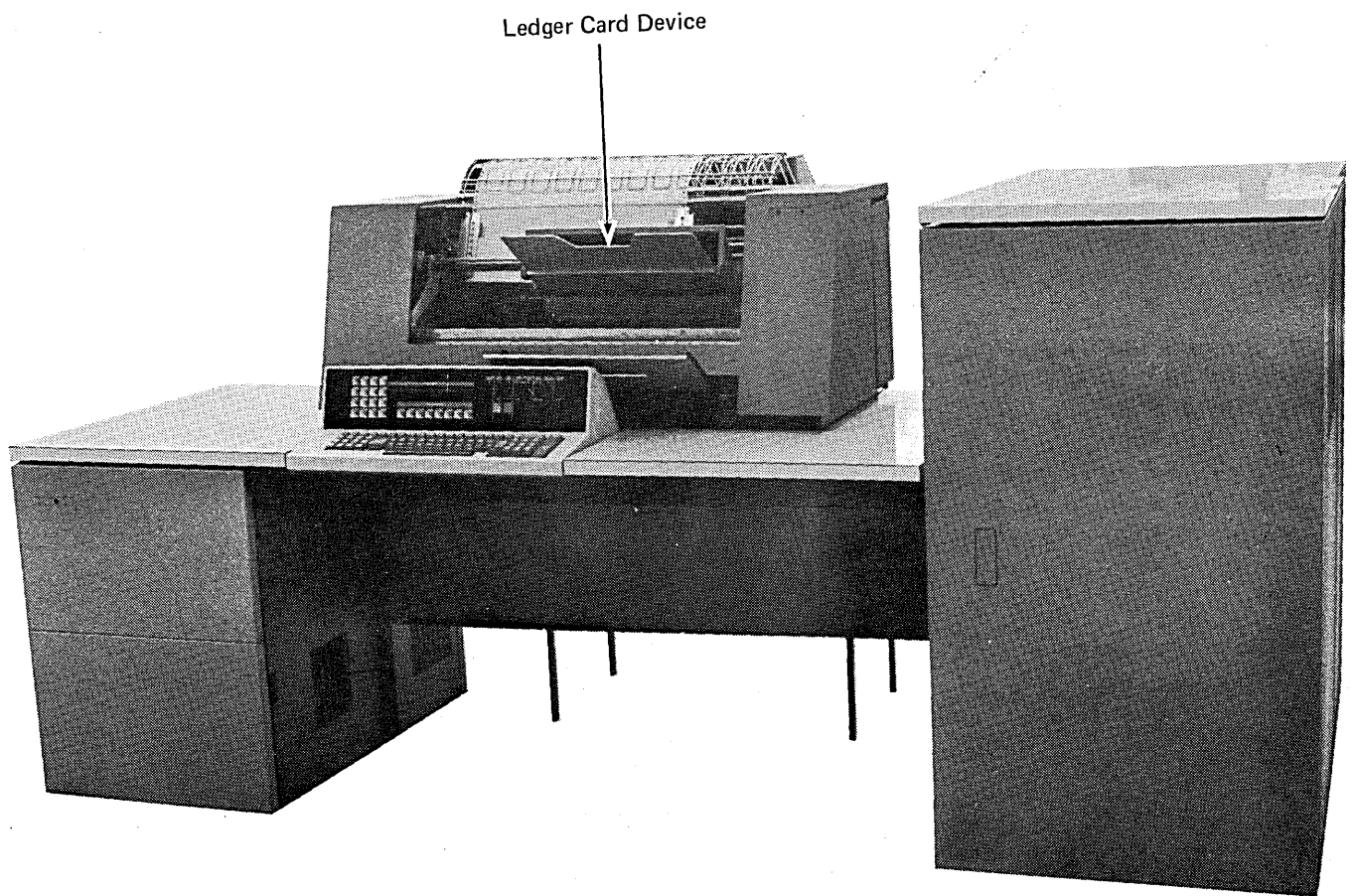
Ledger Card Device

USING THE LEDGER CARD DEVICE

The ledger card device is in the upper front cover of the
IBM 2222 Printer Models 1 and 2. The device consists of
an input chute and an output tray. A movable guide on
the chute allows you to insert ledger cards of different
widths (Figure 8).

When ledger cards are being processed, all input or output
operations (such as printing, spacing, line skipping, and
ejecting) are controlled by the program. When necessary,
you can eject ledger cards manually, by either using the
card eject switch or removing them by hand.

The card eject switch causes a ledger card to be ejected
from the ledger card device. The switch is on the right side
of the printer, just below the front cover (Figure 8).

Output Tray

Movable Guide
(allows for ledger
cards of different
widths)

Input Chute

Card Eject Switch
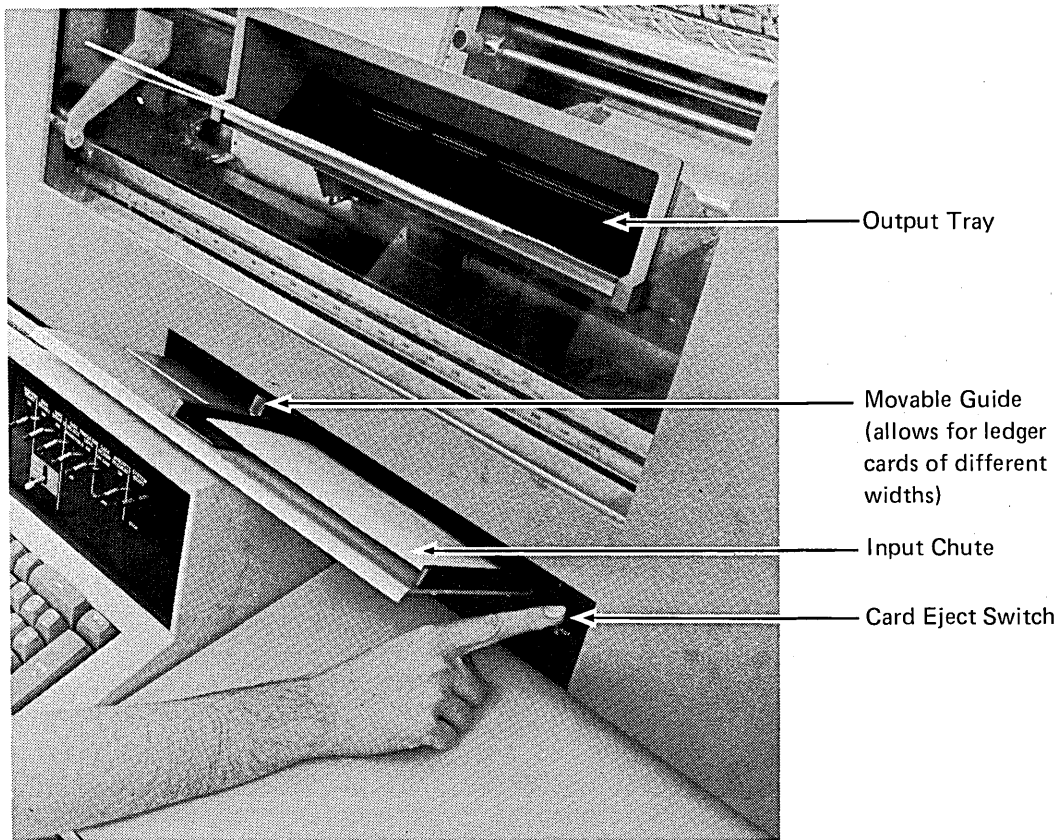
Figure 8. Ledger Card Device

Stacker Release Knob

Stacker Release Knob

Stacker Engagement
Knob

Ledger Card
Release Lever
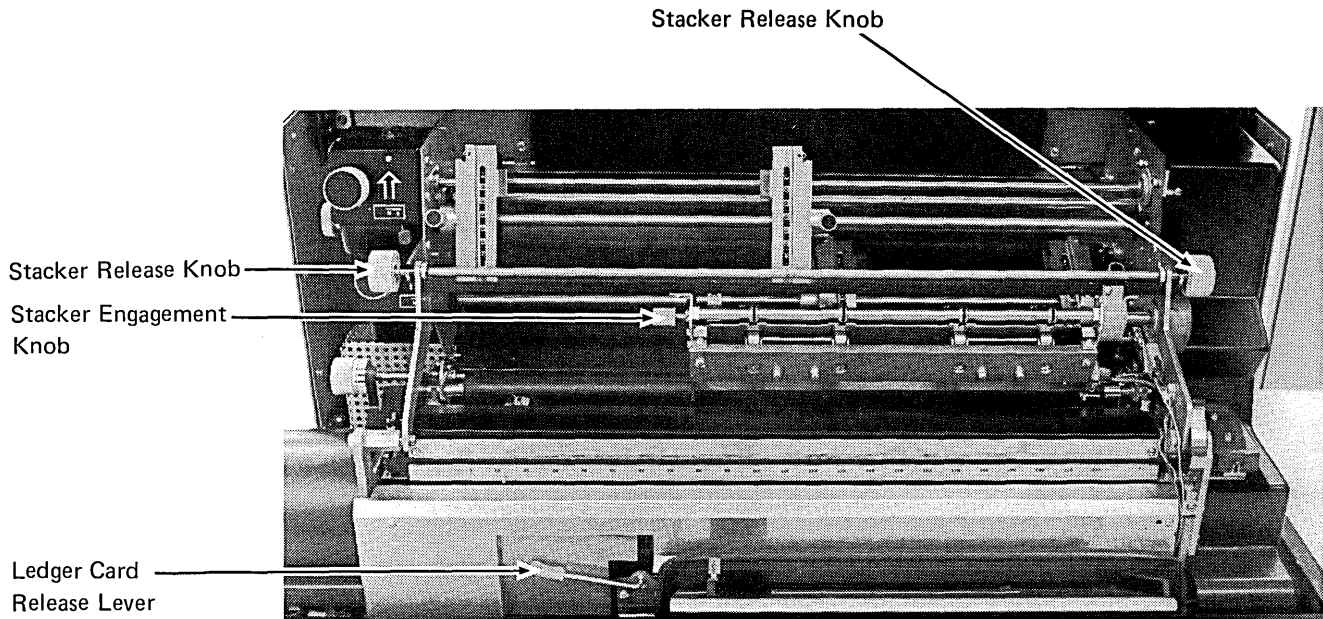
Figure 9. Ledger Card Controls

LEDGER CARD DEVICE CONTROLS

Stacker Release Knobs: Turn one of the ledger card
stacker release knobs when you want to pull the ledger
card stacker away from the platen, or secure the stacker
against the platen while loading printer forms or clearing
forms jams (see Figure 9).

Stacker Engagement Knob: Turn this knob when you
want to return the ledger card stacker to its normal position
against the platen.

Ledger Card Release Lever: Use this lever when you want
to remove ledger cards that have been inserted in the input
chute but are not yet past the platen.

OPERATING PROCEDURES

Figure 10 shows a System/3 ledger card. The following steps are involved in ledger card operations:

1. LCD indicator light on console turns on when program is ready to process a ledger card.

2. Operator inserts appropriate ledger card in ledger card feed chute. Ledger card is inserted face up, top margin first.

3. Ledger card device performs input or output operations requested by program.

4. Ledger card device ejects ledger card and feeds it into output tray.

5. If an error occurs, preventing the ledger card from being ejected, see the *IBM System/3 Model 6 Halt Guide*, GC21-7541, for recovery procedures.

6. Operator removes ledger cards from the output tray, one by one as they are ejected, or at end of job.

```
WINBUSH AND COMPANY          CUST. NO. 1234567              - - -
2911 SOUTH LANE                                             -
NEWMAN, GEORGIA   32063                                     -   -
                                                            -   -
                                                            -
DATE          REFERENCE NO.  CHARGES     CREDITS    BAL     -   -
                                                            -
                                                            - -
 5/04/69      12368          187.72                 187.72  -
 6/11/69      12566           13.91                 201.63  - - -
 7/27/69      12671          304.11                 505.74  -   -
 8/07/69                                  187.72    318.02  -
 8/26/69      12802          156.12                 474.14  -   -
 9/04/69      13094           73.17                 547.31  -   -
 9/23/69      13308           75.00                 622.31  -   -
10/04/69                                  195.00    427.31  - -
10/09/69                                   20.00    407.31  -   -
10/16/69      15103           46.98                 454.29  - - -
10/25/69      15487          141.98                 596.27  -
10/29/69      15782           88.06                 684.33  -
10/30/69      15802           16.07                 700.40  -
11/04/69      15987         1390.50                2090.90  -
11/06/69                                  700.13   1390.77  -
```

Figure 10. IBM System/3 Ledger Card

- Using the Data Recorder

- Data Recorder Controls and Indicator Lights

- Readying the Data Recorder

- Clearing a Card Jam

- Changing the Data Recorder Print Ribbon

- Clearing a Print Ribbon Jam

- Emptying the Data Recorder Chip Box
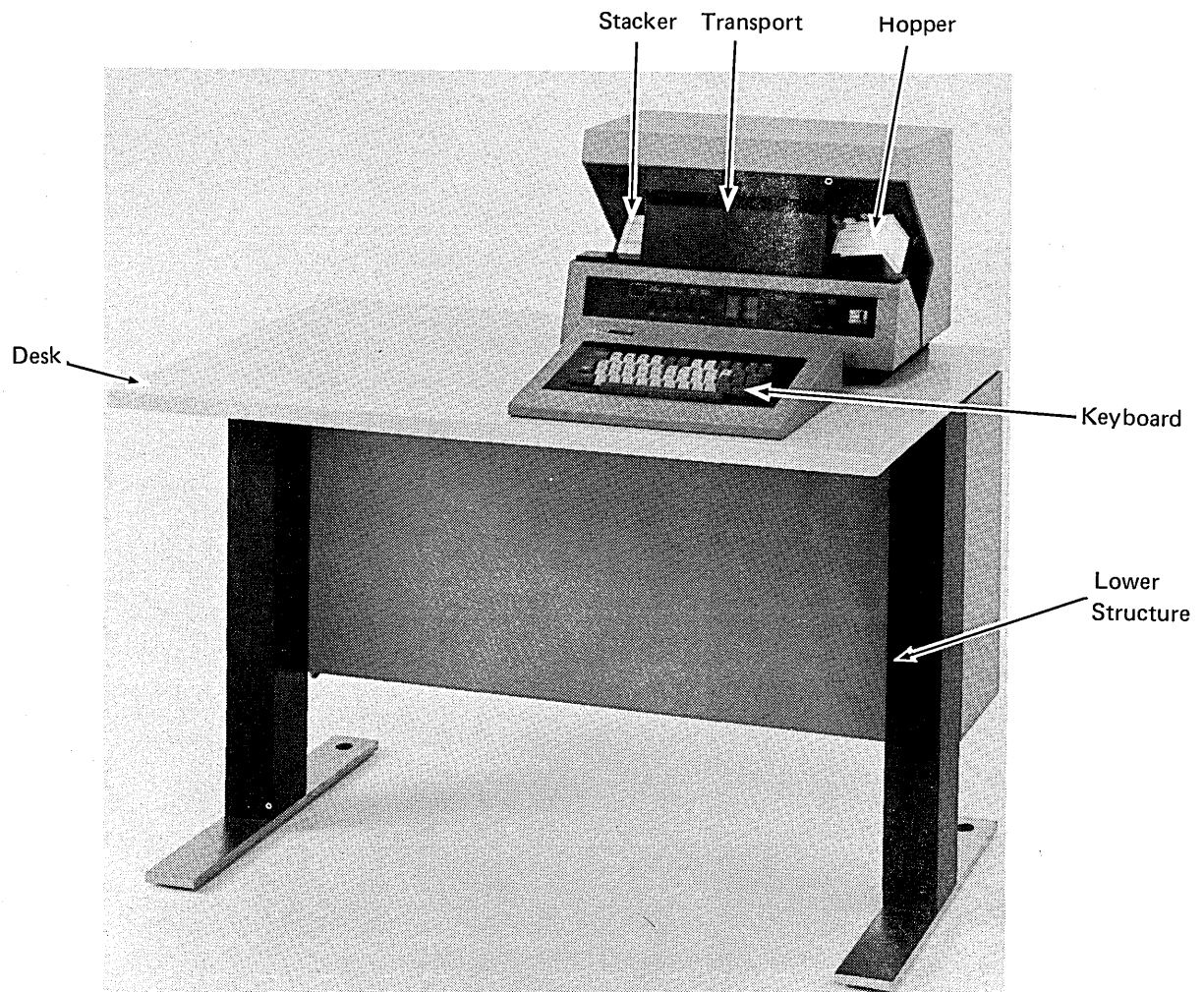
USING THE DATA RECORDER

The data recorder is an optional device. You can use the data recorder to:

● Perform operator-controlled card punching, printing, and verifying offline. (The data recorder is not under control of the model 6.)

● Perform program-controlled card reading or card punching online. (The data recorder is under direct control of the model 6.)

The lights and switches you use to control the data recorder are on the data recorder operator's console and system operator's console.

Descriptions and operating procedures in this section apply only to operating the data recorder as an online card read/punch device. To perform online operations, you must have the IBM 5496 Data Recorder Model 1 with the IBM System/3 Model 6 Attachment Feature. For information on the use of the data recorder offline, see the *IBM 5496 Data Recorder Operator's Guide*, GA21-9086.

You can also use the IBM 129 Card Data Recorder in place of the 5496. For description and operating procedures see *IBM 129 Card Data Recorder Operator's Reference Manual*, GA22-6968, and *IBM System/3 Model 6 Operation Control Language and Disk Utility Programs Reference Manual*, GC21-7516.

Data Recorder Operator's Console

The following lights and switches on the data recorder operator's console are used for online control of the data recorder (Figure 11).
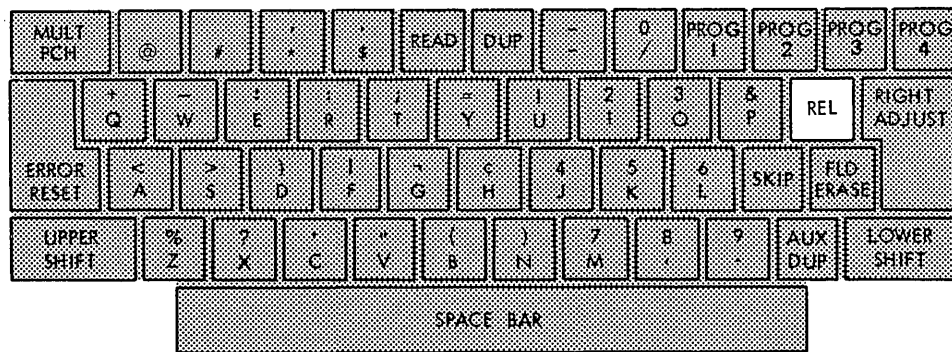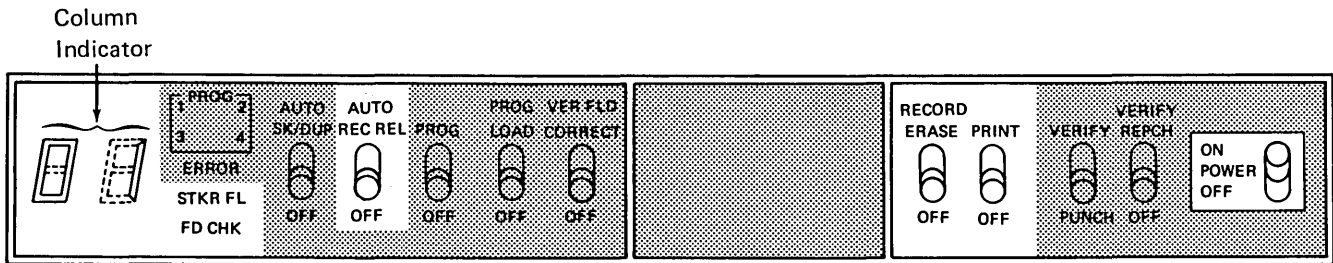
Note: Only the unshaded keys, lights, and switches can be used when operating the data recorder online.

Figure 11. Data Recorder Operator's Panel and Keyboard

Switches and Lights

Most of the switches on the data recorder operator's panel have two positions, up and down. The down position is labeled OFF; the up position is labeled with the name of the function the switch performs.

Only those switches described here are effective during online operation. All other switches on the operator's panel must be off.

AUTO REC REL (Automatic Record Release): Move this switch up to the AUTO position. This switch must always be in the AUTO position when you are operating the data recorder online.

PRINT: Move this switch up to the PRINT position if you wish to print on cards when you are using the data recorder to perform card punching operations. When this switch is in the PRINT position, characters punched in a card are also printed at the top of the card. No characters are printed when the PRINT switch is set at OFF.

POWER ON/OFF: This switch controls power to the data recorder. When this switch is set at OFF, any information in the data recorder storage area is erased and must be read in again if you want to use it in subsequent operations.

Column Indicator: This light turns on when the data recorder POWER ON/OFF switch is set at ON. When this light is on, the data recorder is ready for operation. This 2-digit indicator can display any number from 00 through 96.

STKR FL (Stacker Full): This light turns on when the stacker is full of cards. You turn the light off by removing cards from the stacker and pressing the REL key on the data recorder keyboard.

FD CHK (Feed Check): This light indicates that a card misfeed or jam has occurred in the transport area or stacker. You can turn this light off by removing the card that jammed (see *Clearing A Card Jam*), then pressing the REL key on the data recorder keyboard.

Keyboard

Of all the keys on the data recorder keyboard, the REL (release) key is the only one you can use during online operations (Figure 11). If you use any other function keys or data keys, unpredictable results can occur.

REL (Release) Key: Press this key to turn the FD CHK light off after you have removed jammed cards from the hopper, transport area, or stacker. See *Clearing A Card Jam* in this section for specific instructions.

System Operator's Console

The DATA RCRDR ON LINE/OFF LINE switch and the DATA RCRDR indicator light on the operator console are used in data recorder operations.

DATA RCRDR ON LINE/OFF LINE Switch: This switch allows you to use the data recorder as a card read/card punch device (online) or for card punching, printing, and verifying (offline). When this switch is at ON LINE, data recorder operations are controlled by the program being processed. When this switch is OFF LINE, data recorder operations are operator-controlled.

DATA RCRDR: This light is turned on by any of these conditions:

1. Card jam in the hopper or transport area

2. Stacker full

3. Hopper empty

4. DATA RCRDR ON LINE/OFF LINE switch set at OFF LINE when the system tries to perform a card read/punch operation.

5. Data recorder POWER ON/OFF switch set at OFF when the system tries to perform a card read or punch operation.

READYING THE DATA RECORDER

To ready the data recorder for operation, do the following:

1. Set DATA RCRDR ON LINE/OFF LINE on the system operator's console at ON LINE.

2. Set POWER ON/OFF switch on the data recorder operator's console at ON.

3. Press REL key on the data recorder keyboard to clear cards from transport area. Remove cards from stacker.

4. Place appropriate cards in the hopper. Load cards face up, left edge first.

CLEARING A CARD JAM

When the data recorder is reading or punching, cards are fed from the hopper into the transport area for movement through the punch, read, and print stations (Figure 12). From the transport area, cards are placed in the stacker. Along this feed path from hopper to stacker, problems can occur causing cards to jam. Card jams can occur in the hopper, the transport area, or the stacker.

A card jam in any of these areas causes the feed check (FD CHK) light to turn on. Use the following procedures to remove a card jam.

How to Clear a Hopper Card Jam

To clear a hopper jam:

1. Push down on cards in hopper and allow platform to push them back up to top of hopper.

2. Press REL key to turn FD CHK off.

How to Clear a Transport Area Card Jam

Card jams in the transport area can occur at the punch, read, or print station. The system displays a halt code on the HALT CODE display when transport area card jams occur.

1. Swing cover on transport area out and up towards the top of the data recorder.

2. Remove jammed card.

3. Press REL key to turn FD CHK off.

4. Set DATA RCRDR ON LINE/OFF LINE at OFF LINE.

5. Repunch the damaged card offline. If data cannot be punched offline, you will have to run the job again to get the desired output.

6. Place the new card on top of the deck in the hopper.

7. Set DATA RCRDR ON LINE/OFF LINE at ON LINE.

8. Select option 0 from the halt displayed on HALT CODE display.
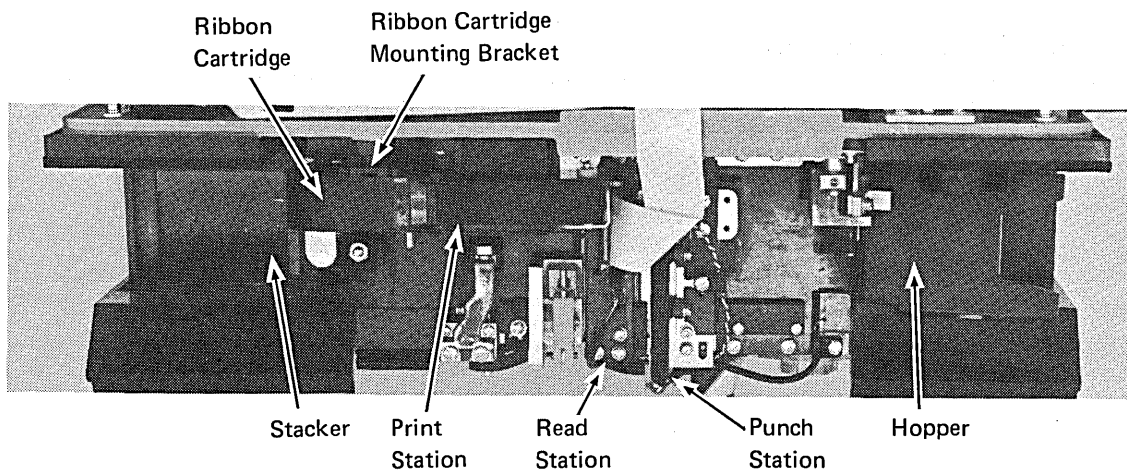
Figure 12. Data Recorder Card Feed Path

How to Clear a Stacker Card Jam

To clear a stacker card jam:

1. Remove jammed cards.

2. Press REL key to turn FD CHK off.

3. Whenever possible, repunch damaged cards offline and continue. If data cannot be repunched offline, you will have to do the job again to get the desired punched output.

CHANGING THE DATA RECORDER PRINT RIBBON

The print ribbon is enclosed in a small cartridge (Figure 13). It should be changed whenever printing on cards is not easily read.

To Remove Ribbon

1. Turn power switch off and open cover.

2. Raise lift lever until cartridge snaps up.

3. Slide cartridge off machine, unthread ribbon, and discard.
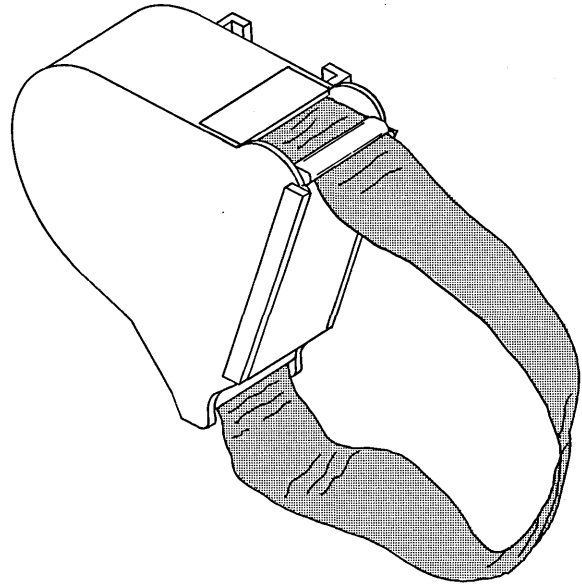
Figure 13. Data Recorder Ribbon Cartridge
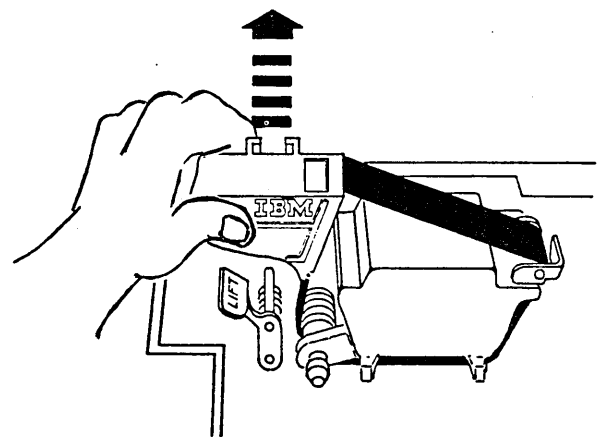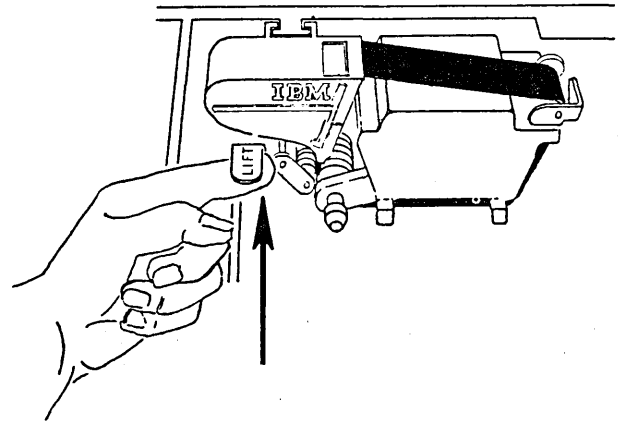
To Install New Ribbon

4.   Pull ribbon out (About 12 inches).

5.   Slide cartridge part way down bracket.
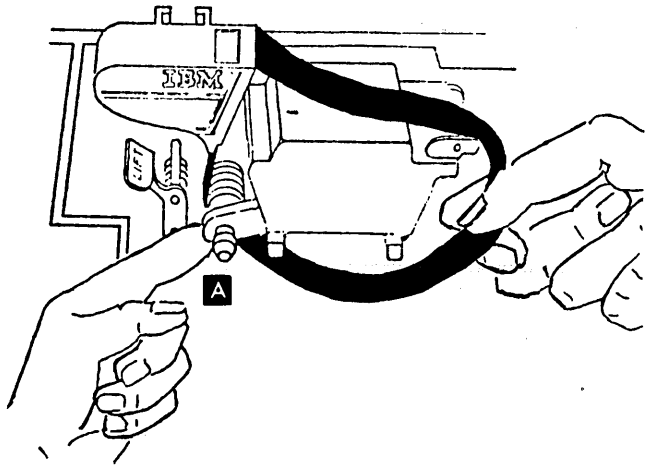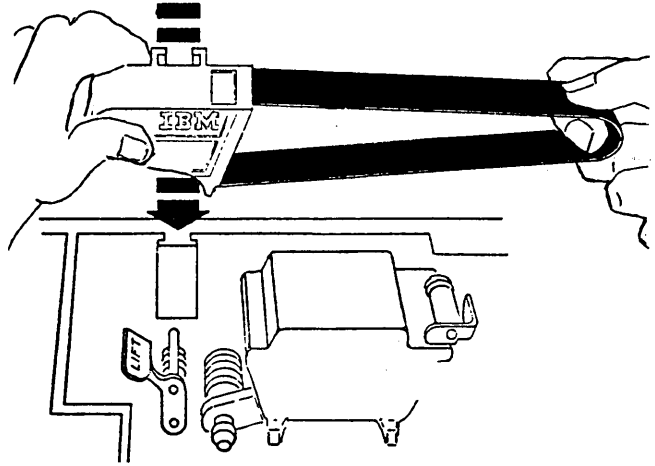
6.   Thread ribbon first at **A**, then at **B** and **C** .
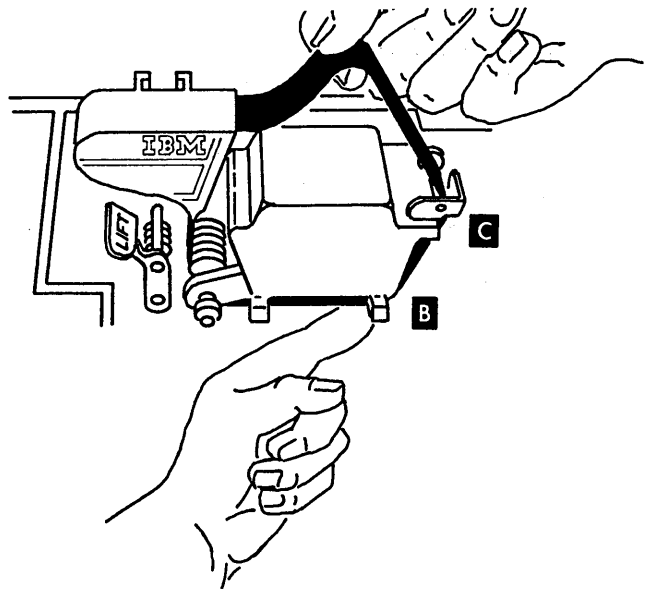
To Install New Ribbon (continued)

7. Press cartridge down until it clicks.
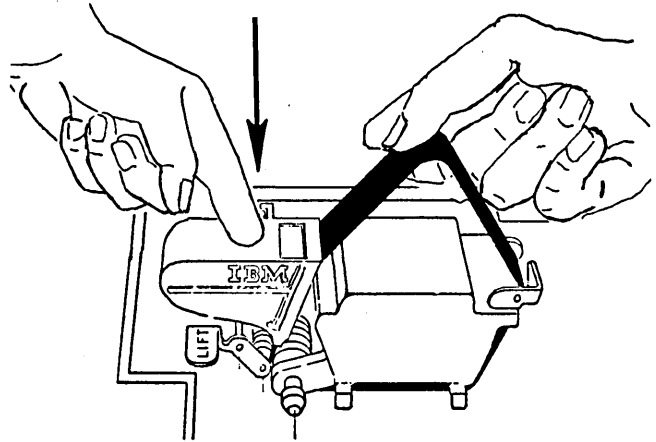
8. While holding cartridge down tightly **D** with thumb, raise lift lever slightly **E** and pull about six inches more of ribbon from bottom of cartridge to clear possible jam.

Jam Area
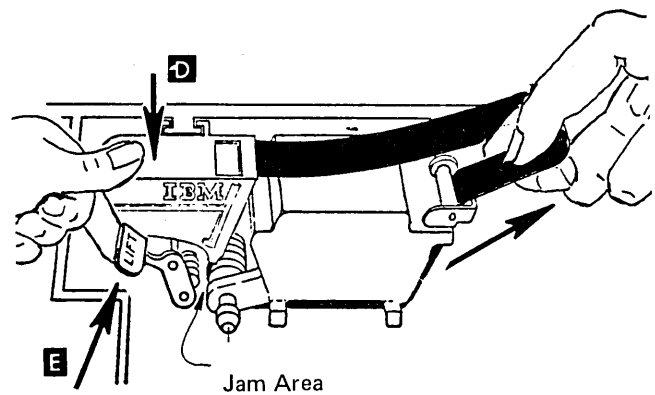
9. Place finger in ribbon as shown.

10. Turn on power switch and gently guide ribbon with finger.

Ribbon Flow
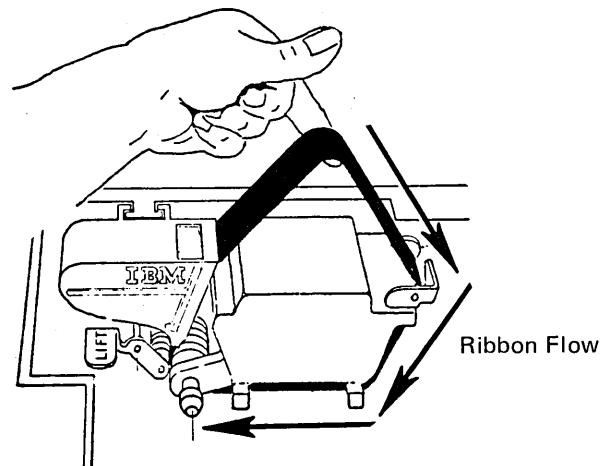
End of Ribbon Installation Procedure

CLEARING A PRINT RIBBON JAM

If the ribbon does not enter cartridge straight, or cartridge is not properly locked in place, the ribbon may be wrapped around the drive roll. To correct this:

1. Lift pressure roll ❶ bracket toward ribbon cartridge to disengage pressure roll.

2. Pull cartridge out of mounting bracket until you can get at the jam. ❷

3. Push ribbon drive shaft knob ❸ in and hold it there. (This allows the drive roll to rotate freely.)

4. Pull ribbon off the drive roll ❹ , and release drive shaft knob.

5. Pull slack ribbon above upper guide ❺ and snap cartridge down in place.

6. Move pressure roll bracket away from ribbon cartridge. (This helps to take up slack.) Make sure ribbon enters cartridge straight so that ribbon is not damaged. If ribbon does not enter the cartridge straight, push pressure roll bracket towards cartridge. This will stop ribbon and allow you to straighten it.
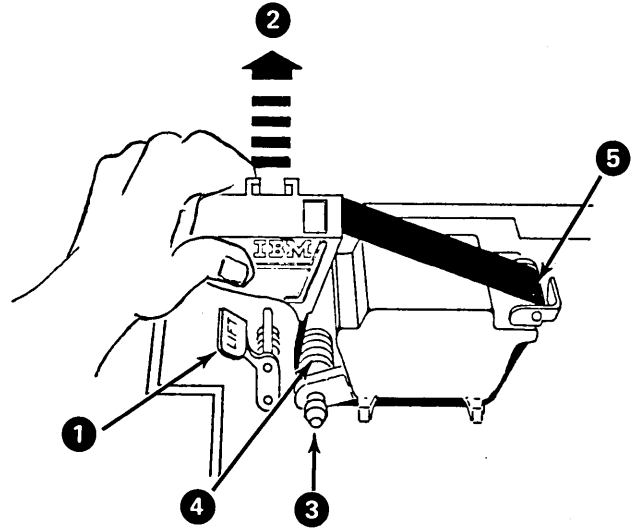
EMPTYING THE DATA RECORDER CHIP BOX

The chip box (Figure 14) is a drawer-like container in the operator's panel that catches the small pieces that are punched out of cards. Look through the window of the chip box periodically to determine when the box is almost full of chips. When necessary, pull the chip box out and empty it.

Chip Box

Figure 14. Data Recorder Chip Box

- Use of the Cathode Ray Tube (CRT)

- Controls and Indicator Lights for the CRT

USE OF THE CATHODE RAY TUBE (CRT)

The CRT is an optional device. It can display up to 960 characters at a time — 15 lines of 64 characters each. You can use the CRT to display:

- Keywords and responses during a conversational OCL prompting cycle

- Card OCL statements and control statements for disk utility programs

- Output data

When the CRT is used to display a conversational OCL prompting cycle, a character position marker or pointer moves across the CRT screen, indicating the next available character position.

Note: When a halt occurs, the customer usage meter continues to run if the log device is the CRT or the CRT is used by the program whose execution has halted. To stop the meter, move the system START/STOP to STOP. This causes the CRT to discontinue its display, but the halt continues to be displayed in the halt code indicator lights on the system console panel. When halt ABCD12345 occurs, the CRT is blank and the usage meter stops.

Character Brightness Control

POWER ON

POWER OFF
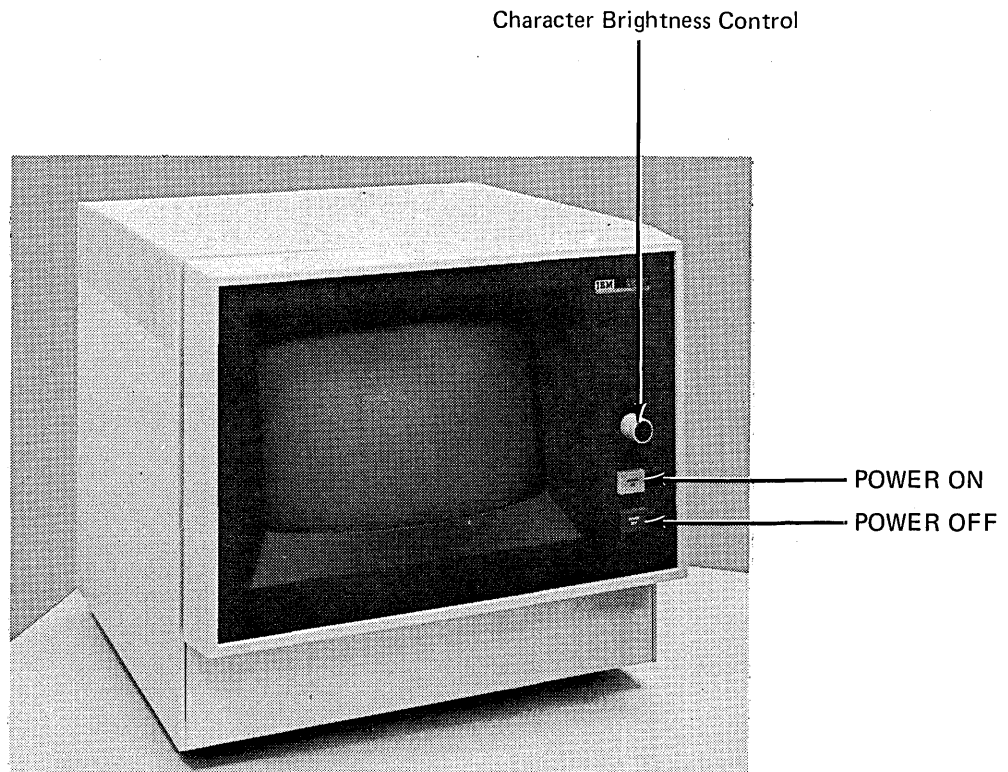
CONTROLS AND INDICATOR LIGHTS FOR THE CRT

Output operations on the CRT are controlled by lights, switches, and keys on the CRT and the system operator's console and keyboard.

CRT

Character Brightness: This knob controls the brightness of the CRT screen. Turn the knob clockwise to make display screen brighter.

POWER ON: Press this key to turn on power to the CRT.

POWER OFF: Press this key to turn off power to the CRT. (The system power switch on the system control panel can also be used to turn off the CRT.)

System Operator's Console

CRT Indicator: This light turns on when the program requests the CRT to perform an operation before you have pressed POWER ON on the CRT. This light remains on until power to the CRT is turned on.

SYSTEM RESET: When this switch is set at ON, information on the CRT is completely erased.

System Operator's Keyboard

The following lists the function keys used when the CRT is used to display the prompting cycle in conversational OCL:

Key	Use
PROG START	Designates the end of a keying operation.
ENTER +	Same as PROG START.
ENTER −	Indicates that you have finished keying a field containing a negative number, or that you have completed certain prompting sequences.
Space bar	Moves the CRT character position marker forward (right) one position.
BKSP (backspace)	Moves the CRT character position marker back (left) one position.
ERASE	Erases characters from the CRT screen, starting with the position where the marker is located and going back to the beginning of the line or start of a data field on the previous line.

- Preparing the System to Run Jobs: Initial Program
  Load Procedure

- Starting a Job

- System-Operator Communication

- Stopping a Job Before It is Completed

- Turning Off System Power

- Using the Machine Covers for Safety
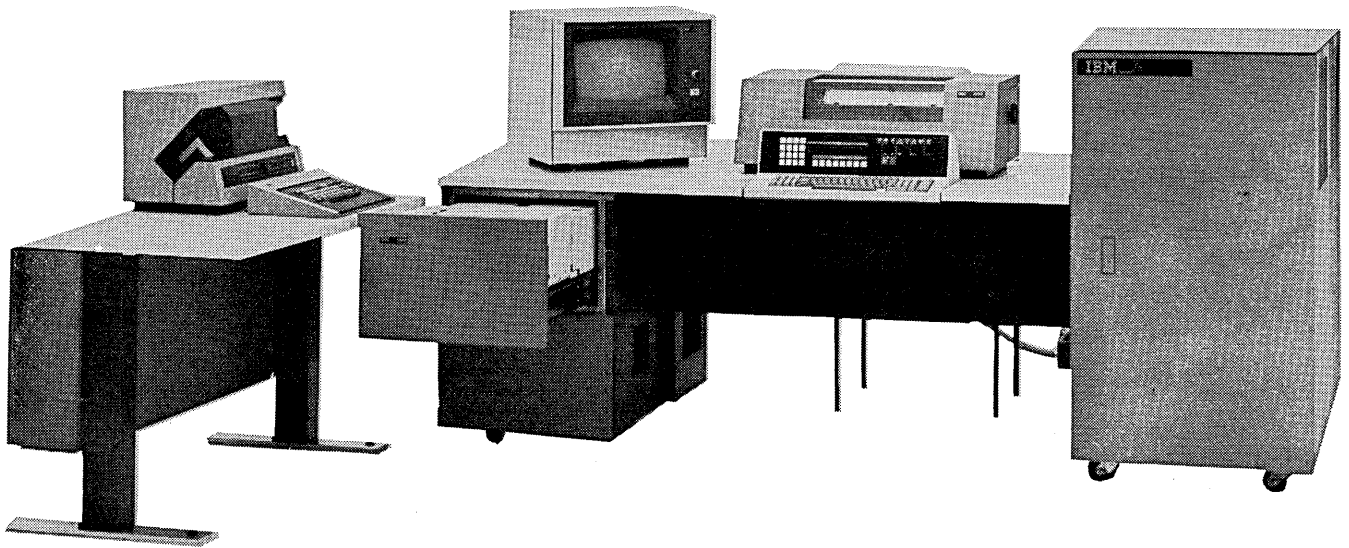
PREPARING THE SYSTEM TO RUN JOBS: INITIAL PROGRAM LOAD PROCEDURE

Before the system can accept and run programs, certain operations must be performed each time power is turned on. These operations are called the initial program load (IPL) procedure. During the IPL procedure, the control program is read into storage from either the removable or fixed disk on disk drive 1. This makes the system ready to run user programs and IBM-supplied programs.

The IPL procedure requires you to perform operations such as turning on system power, loading forms in the printer, and mounting the system disk, if system programs are on a removable disk. (The disk containing the system programs is called the system disk.) When requested by the system, you must also supply a *system date* and specify the device to be used as the *system input device.*

Supplying the System Date

You are requested to supply the system date during each IPL procedure. The system date is used in headings on program listings, in headings on printed reports, and in labels for new disk files. The format of the system date is established during system generation as either:

- mmddyy (month/day/year)

- ddmmyy (day/month/year)

The three elements (month/day/year) can be separated by any non-numeric symbol (except a comma, a quotation mark, or a blank), or they can be run together without any separation.

As an example, in an installation using the mmddyy format, all of the following are valid ways of keying August 26, 1971:

08/26/71

08-26-71

082671

Specifying the System Input Device

The device you use to supply operator control language (OCL) statements and utility control statements is called the system input device. The system input device is normally the keyboard, but could be the IBM 5496 Data Recorder Model 1 if one is installed with the IBM System/3 Model 6 Attachment feature; the IBM 129 Card Data Recorder with Card Input/Output Attachment feature; or the IBM 3741 Data Station Model 1 or 2 with Direct Attach feature or the IBM 3741 Programmable Work Station Model 3 or 4 with Direct Attach feature. If you have both a keyboard and a card input device or 3741, the system will request you to indicate which one is being used as the system input device. The system requests this information by printing READER during the IPL procedure. You respond with:

- KEY and press PROG START, or simply press PROG START if the keyboard is to be the system input device for this job.

- DATA96 if the card input device is to be the system input device for this job.

- 3741 if the 3741 is the system input device.

Model 6 Operator IPL Procedures

Set POWER ON/OFF to ON
↓
Load forms in the printer
↓
Ready devices used in first job
↓
Mount the system disk on disk drive 1
↓
Set DISK SELECT to FIXED or REMOVABLE
(indicating which disk contains the system programs)
↓
Set DISK DRIVE 1 ON/OFF at ON to ready
system disk
↓
Move PROGRAM LOAD to ON*
↓
System prints: DATE (system date)
↓
Key system date as mmddyy or ddmmyy (P/S)**
↓
Does the installation have online data recorder or 3741
(in addition to operator keyboard) available for use as
system input device?
↓
(A)

(A)
↓
Yes ◄──► No
↓
System prints:
READER
↓
Respond

KEY
(P/S)
DATA96 (P/S) ◄──► or
Press
3741 (P/S) PROG
(must be START
online)

System halts with display
of ABCD12345
↓
Move SYSTEM START/STOP
to START
↓
System starts to read
OCL statements from
the data recorder or
3741

System prints: READY
↓
Do you want the system
to halt at the end of each
job?

Yes ◄─────────────── No
↓
Enter NOHALT
↓
System prints: READY

Start entering OCL
for first job

---

*If DISK DRIVE 1 on the system console turns on when
you move PROGRAM LOAD to ON, the
disk is not up to the required speed. This light will
only be on for a short while; it will turn off as soon as
the disk is up to speed.

**You must press PROG START (P/S) after
each response.

STARTING A JOB

When you have successfully completed the IPL procedure, the model 6 is ready to run both user programs and IBM-supplied programs.

In the remaining sections of this manual, you are given specific operating procedures for the model 6 system programs. The programmer will provide, by way of the program run sheet, specific operating procedures for user programs and special instructions for each job. The following chart shows general steps the operator performs in preparing the system for operation and loading and running jobs.

General System Operation

Turn on system power
↓
Load forms in printer
↓
Perform IPL procedure
↓
Ready devices to be used in next job
↓
Supply OCL statements, using Operation Control Language Guide
↓
Supply program to be run and data it will process according to instructions on program run sheet
↓
System process job
↓
End-of-job halt occurs
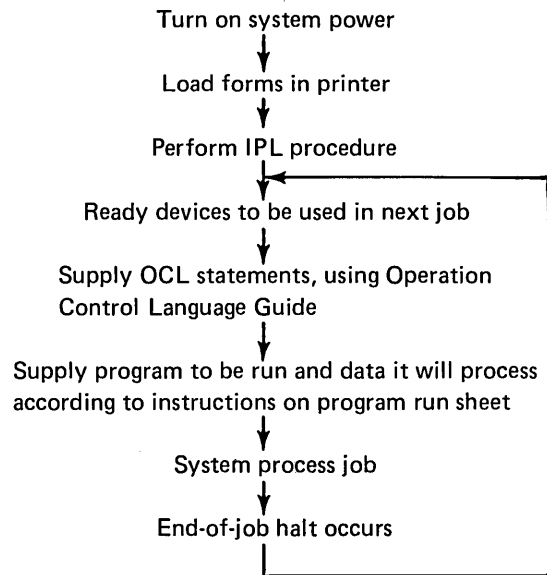
SYSTEM-OPERATOR COMMUNICATION

The model 6 tells you when an error has occurred or when some operator action, such as keying data or pressing command keys, is required. The system signals you by:

- Turning on field lights

- Printing messages

- Turning on I/O attention lights

- Displaying halt codes

Interpreting and Responding to Field Lights

Field lights can be turned on by the program you are processing. When a field light turns on:

1. Perform the operations specified on the program run sheet for that field light.

2. Press PROG START.

The system will then continue processing.

Interpreting and Responding to Messages

At times during system operation, the system prints messages to indicate that errors have occurred, to give special instructions, or to give information about the status of the system or the program. Not all messages require action by you. When messages printed by user programs require action, the appropriate instructions are given to you on the program run sheet.

Clearing I/O Attention Conditions

Indicator lights on the system console turn on when the
device indicated is selected by the program, but is not
ready. These lights (Figure 15) also turn on when the de-
vice requires operator attention. Indicator lights turn off
when the associated device is made ready for operation or
when the required operator action has been performed.
Conditions that cause these indicator lights to turn on and
the recovery procedures for each are listed in the following
chart:

System Indicator Light	I/O Device Indicator	Cause	How To Clear
DISK DRIVE 1	None	DISK DRIVE 1 ON/OFF switch is set to OFF when the system tries to perform a read/write operation.	Set DISK DRIVE 1 ON/OFF at ON.
		Disk is not up to required speed.	Light is turned off as soon as disk is up to speed.
DISK DRIVE 2	None	DISK DRIVE 2 ON/OFF switch is set to OFF when the system tries to perform a read/write operation.	Set DISK DRIVE 2 ON/OFF at ON.
		Disk is not up to required speed.	Light is turned off as soon as disk is up to speed.
DATA RCRDR (Data Recorder)	None	The indicator light is turned on by one of the following conditions:	
		1. The ON LINE/OFF LINE switch is set to OFF LINE.	Set switch at ON LINE.
		2. The data recorder POWER ON/OFF switch is set to OFF when the system tries to perform data recorder operations.	Set data recorder POWER ON/OFF at ON.

Figure 15 (Part 1 of 2). Indicator Lights

System Indicator Light	I/O Device Indicator	Cause	How To Clear
DATA RCRDR (Data Recorder)	FD CHK*	FD CHK is turned on by any of the following conditions:	
		1. The hopper is empty	Place cards in hopper. Load cards face up, left edge first.
		2. Card jam has occurred in hopper.	— Push down on cards in hopper and allow platform to push them back up to top of the hopper. — Press REL on the data recorder keyboard to turn FD CHK off. — Repunch damaged cards using the data recorder offline before you continue.
		3. Card jam has occurred in transport area.	— Swing the cover on the transport area out and up towards the top of the data recorder. — Remove cards that are jammed. — Press the REL on the data recorder keyboard to turn FD CHK off.
DATA RCRDR (Data Recorder)	STKR FL	Stacker is full.	Remove cards from stacker and press REL on the data recorder keyboard to turn STKR FL off.
PRINTR (Printer)	None	The indicator light is turned on by any of the following conditions:	
		1. Printer cover is open or not securely closed.	Close printer cover.
		2. Primary or secondary print unit is out of forms.	Move SYSTEM START/STOP to the START position if you want to print additional lines on the last page. This will cause one line to be printed. Repeat this process for each additional line to be printed. Then load new forms in the print unit which is out of forms.
		3. Line select lever (on the IBM 5213 Printer Models 2 and 3 or the IBM 2222 Printer Models 1 and 2) is set at neutral.	Set the line select lever at 6.
LCD (Ledger Card Device)	None	System is ready to perform a ledger card read or write operation.	Insert appropriate ledger card in the ledger card feed chute.
CRT (Cathode Ray Tube)	None	CRT is not ready.	Press POWER ON on CRT.

*The ON LINE/OFF LINE switch must not be set to OFF LINE when the DATA RCRDR and the FD CHK indicator lights are both on.

Figure 15 (Part 2 of 2). Indicator Lights

Recovering From Programmed Halts

Your system may halt during a run as a result of program errors or machine errors. When a halt occurs, the system displays a halt code on the HALT CODE display on the operator console. Since every halt requires operator action, you must use the halt code to reference the corrective actions listed in the *IBM System/3 Model 6 Halt Guide,* GC21-7541.

If the system halts and displays a code that does not correspond to any of the codes listed in the *IBM System/3 Model 6 Halt Guide,* GC21-7541, you should indicate the problem on the error log sheet.

Using the System/3 Model 6 Error Log Sheet

During system operation, a processor check or unidentifiable halt may occur. To help determine the cause of the error, use the error log sheet (229-8005) to record the conditions that exist on the system at that moment (see Figure 16). After you have filled out the sheet, rerun the program in which the error occurred and proceed as follows according to the appropriate condition:

● *The same error occurs at the same point in the program.* Use the program run sheet to note the condition under which the error occurs and continue other program operations. Return the program run sheet, the error log sheet, and other program documentation to the programmer.

● *The same error occurs at a different point in the program.* Contact your supervisor to determine if a service call is necessary.

● *The error does not reoccur.* Set aside the error log sheet for review by the CE on his next service call. Continue program operations.

Figure 16. System/3 Model 6 Error Log Sheet

STOPPING A JOB BEFORE IT IS COMPLETED

Normally, you run a job on the computer until the job is completed. There are instances, however, when you may want to stop a particular job before it is completed. To do so, move SYSTEM START/STOP to STOP. To restart the system move SYSTEM START/STOP to START. The system will continue processing from the point where it left off.

CAUTION:

If you set the SYSTEM START/STOP switch to STOP and then perform an IPL during a key sort operation that has not reached end of job, the file being processed will be unusable. If you perform an IPL prior to the start of the key sort operation, the file will reflect most updates, but all added records are lost.

RESTORING SYSTEM POWER

System/3 can turn off as a result of internal or external power loss, or an overtemperature condition in the processing unit or printer electronics. To restore power:

1.   Turn the power switch to OFF.

2.   Turn CHECK RESET to ON.

3.   Turn the power switch to ON.

If power cannot be restored, call IBM for service.

TURNING OFF SYSTEM POWER

Perform the following procedure to turn off system power:

1.   Move SYSTEM START/STOP to STOP.

2.   Set disk drive on/off switches to OFF.

3.   Set system POWER at OFF.

USING THE MACHINE COVERS FOR SAFETY

Besides improving appearance, covers of IBM machines are designed to protect you against possible injury during operation. While some hazards, such as moving mechanical parts, are obvious, others are not. Electrical shock and noise are in the latter category.

IBM maintains vigorous attention to safety on all its machines. However, the effectiveness of this effort is lessened when you fail to keep the covers closed while the system is running.

- Operation Control Language (OCL) Statements

- RPG II Compiler Program

- Disk Sort Program

- Conversational Utility Programs

- Disk Utility Programs

OPERATION CONTROL LANGUAGE (OCL) STATEMENTS

Every job you run on the model 6 requires a set of operation control language (OCL) statements. (These statements give the system information about the job to be run, such as what program to use, what files to use, what job date to use.) OCL statements are normally entered from the keyboard, but can be entered from the IBM 5496 Data Recorder Model 1 if one is installed with the IBM System/3 Model 6 Attachment feature or the 129 Card Data Recorder with Card Input/Output Attachment feature. See *Appendix A* for specific instructions on how to enter OCL statements from the data recorder.
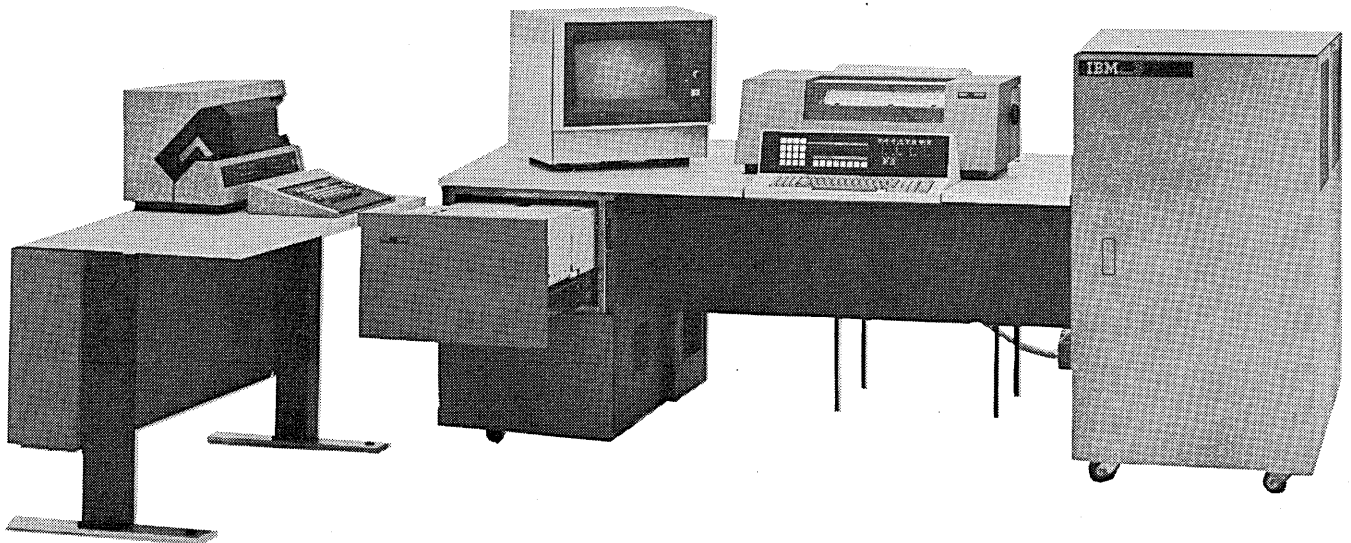
Supplying OCL Statements From the Keyboard: Conversational OCL

Conversational OCL statements can only be entered into the model 6 from the keyboard. In this case, the programmer gives you OCL guidesheets listing the responses to use during OCL prompting for each job. This documentation may be coded on an OCL guidesheet of the programmer's own design or on the preprinted form available from IBM (Figure 17).

Conversational OCL is communication between you and the system. The system prints a word called a keyword; you give a response. The keyword and your response are called a conversational OCL statement.

A keyword can be printed on the printer, just above the keyboard, or displayed on the CRT.

If the keyword applies to the job, you respond by keying the requested information and pressing an end-of-statement key. A complete response to an OCL keyword consists of your typing a response and pressing an end-of-statement key. (Pressing the end-of-statement key tells the system that you are ready to respond to another keyword.)

However, not every keyword the system prints will apply to every job. When the system prints a keyword that does not apply to the job, you do not type a response; you simply press the appropriate end-of-statement key.

There are three end-of-statement keys on the keyboard: ENTER –, ENTER +, and PROG START. Pressing PROG START or ENTER + indicates the end of your response and causes the system to prompt the next keyword. Pressing ENTER – causes the system to skip several keywords before prompting a new keyword. (How many keywords the system will skip depends on what keyword you are responding to by pressing ENTER –.)

IBM®

International Business Machines Corporation

System/3 Model 6

GX21-9126-0
Printed in U.S.A.

Job _____

Date _____ **OPERATION CONTROL LANGUAGE (OCL) GUIDE**

Programmer _____

Keywords		Responses		Considerations	
R E A D Y		B U I L D	OR L O A D		
0 0 0	B U I L D N A M E			Procedure Name	
0 0 1	U N I T			F1, R1, F2 or R2	Other Possible Entry
0 1 0	L O A D N A M E			Columns 75-80 of RPG Control Card or System Program Name	(Lines 020-058)
0 1 1	U N I T			F1, R1, F2 or R2	? for Delayed Response
0 2 0	D A T E			mmddyy or ddmmyy	
0 3 0	S W I T C H			1-On, 0-Off, X-No Change	
0 4 0	F I L E N A M E			Columns 7-14 of RPG File Description Specifications or Predefined Filename	
0 4 1	U N I T			F1, R1, F2 or R2	
0 4 2	P A C K			Disk Name (Assigned by Disk Initialization Program)	
0 4 3	L A B E L			VTOC File Name (if different than response to FILE NAME)	
0 4 4	R E C O R D S			1-999999 (Maximum Number of Records in File)	
0 4 5	T R A C K S			1-398 (Maximum Number of Tracks for this File)	
0 4 6	L O C A T I O N			8-405 Location of First Track of File	
0 4 7	R E T A I N			S-Scratch, T-Temporary, P-Permanent	
0 4 8	D A T E			mmddyy or ddmmyy	
0 5 0	F I L E N A M E			Columns 7-14 of RPG File Description Specifications or Predefined File Name	
0 5 1	U N I T			F1, R1, F2 or R2	
0 5 2	P A C K			Disk Name (Assigned by Disk Initialization Program)	
0 5 3	L A B E L			VTOC File Name (if different than response to FILE NAME)	
0 5 4	R E C O R D S			1-999999 (Maximum Number of Records in File)	
0 5 5	T R A C K S			1-398 (Maximum Number of Tracks for this File)	
0 5 6	L O C A T I O N			8-405 Location of First Track of File	
0 5 7	R E T A I N			S-Scratch, T-Temporary, P-Permanent	
0 5 8	D A T E			mmddyy or ddmmyy	

M O D I F Y				MODIFY OPTIONS
				
				1. Enter RUN
				2. Enter CANCEL
				3. Correct Statement
				    Enter Statement number
				    Retype or delete (,) response
				4. Create new Statement
				    INCLUDE, LOG, FORMS, *(For Comments)	

Figure 17. Operation Control Language Guide

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System-Operator Roles During Keyword Prompting

The system analyzes your response to each keyword. If the response contains an error, the system halts, prints an error message, and then reprompts the same keyword.

System prompts keyword

Does OCL guide show a response to be keyed for this keyword? ❶

Yes ◄──────────── ►No

Operator keys response

Operator presses end-of-statement key to indicate end of response

Does response contain errors?

Yes ◄──────────── ►No

System displays error messages

Operator performs necessary error recovery procedures

System prompts next keyword in the cycle
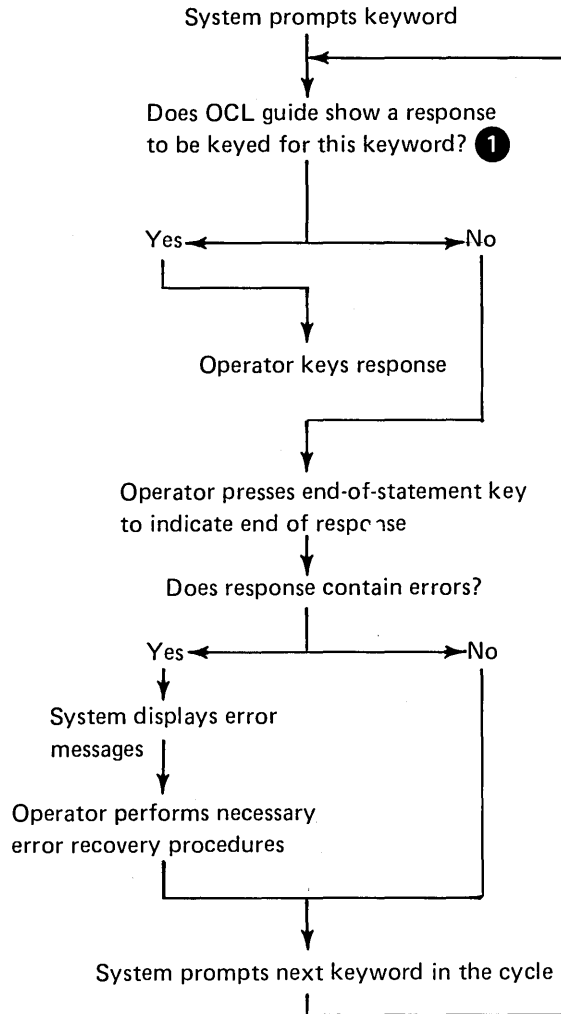
❶ A sample OCL guide is shown in Figure 17.

RPG II COMPILER PROGRAM

You will normally use the keyboard for entering RPG II source programs into the model 6. However, you can also use a data recorder if your installation has one online. See *Appendix A* for specific instructions on how to compile an RPG II source program when the program is read from the data recorder.

Compiling an RPG II Program

The general operations involved in compiling an RPG II program are as follows:

1. After the programmer writes the RPG II source program on coding sheets, he gives them to you to enter the instructions into the system.

2. You do this by writing the source program on disk from the keyboard using the Keyboard Source Entry (KSE) utility program. Each line on the coding sheets is considered one record in the source program. (See *Conversational Utility Programs* under *Program Operation* for a description of how to use the Keyboard Source Entry program.)

3. At this point, however, the RPG II program is not in a form to be processed by the computer. It must be read into storage and translated into a machine-understandable program. This translation is done by the RPG II Compiler program.

4. At the end of this processing run (compilation), the object program is produced, and stored on disk or punched into cards. This object program can be either stored and processed later, or processed immediately after compilation.

Operating Procedures for Compilation

The procedure for compiling an RPG II source program entered from the keyboard is as follows:

1. Ready printer.

2. Check program run sheet to determine if you must mount a disk cartridge.

3. Mount specified disk cartridge.

4. Ready appropriate disk drive.

5. Press PROG START and wait until system prints READY.

6. Key OCL cycle used for this job from OCL guide-sheet.

During compilation, halts can occur. Use the *IBM System/3 Model 6 Halt Guide,* GC21-7541, for error recovery procedures.

Operating Procedures for Object Program Execution

The Procedure for executing an RPG II object program is as follows:

1. Ready printer. (Load special forms if required.)

2. Check program run sheet to determine if you are to mount a disk cartridge.

3. Mount specified disk cartridge.

4. Ready appropriate disk drive.

5. Press PROG START and wait until system prints READY.

6. Key OCL cycle for this job from OCL guidesheet.

During object program execution, halts can occur. Special instructions are provided on the program run sheet for the following halts:

Halt	Indicator
AB245	RPG II indicator H1
ACD124	RPG II indicator H2
AB4	RPG II indicator H3
AB2	RPG II indicator H4
AB5	RPG II indicator H5
ACD12	RPG II indicator H6
AB24	RPG II indicator H7
ACD1345	RPG II indicator H8
AB	RPG II indicator H9
ABC1235	RPG II 1P forms alignment

These halts occur only if the programmer specified them in the RPG II source program. All object program halts are included in the list of programmed halts in the *IBM System/3 Model 6 Halt Guide,* GC21-7541.

DISK SORT PROGRAM

The Disk Sort program is used for sorting data files stored on disk. For every disk sort job you must supply OCL statements followed by sort specifications. (Sort specifications are instructions to the Disk Sort program indicating how a file is to be sorted.) Normally, you supply sort specifications from the keyboard or from disk.

You can also supply OCL statements and sort specifications for a disk sort job from the data recorder (see *Appendix A*).

Operating Procedures for Supplying Sort Specifications from the Keyboard

1. Ready printer.

2. Mount disk cartridge if specified on program run sheet.

3. Ready appropriate disk drive.

4. Press PROG START.

5. Key OCL cycle, using the OCL guidesheet, then wait until Disk Sort program prints ENTER SORT SEQUENCE SPECIFICATIONS.

6. Key sort specifications as coded on the sequence specifications sheets for this job. Consider each line on the coding sheets as one print line.

7. Key // END on the line following the last sort specification. (Start this keyword in print position 1.)

The Disk Sort program does the job indicated by the sort specification. A number of program halts can occur while the program is running. See *IBM System/3 Model 6 Halt Guide,* GC21-7541, for recovery procedures.

Operating Procedures for Supplying Sort Specifications from Disk

1. Ready printer.

2. Mount disk cartridge if specified on program run sheet.

3. Ready appropriate disk drive.

4. Press PROG START, and wait until system prints READY.

5. If your sort specifications are in the source library, you must enter the SOURCE statement as coded on OCL guidesheet.

6. If your OCL and sort sequence specifications are in a procedure, you must enter the following statements:

   // CALL procedure name, unit
   // RUN

The Disk Sort program does the job indicated by the sort specifications. A number of program halts can occur while the program is running. See the *IBM System/3 Model 6 Halt Guide,* GC21-7541, for recovery procedures.

CONVERSATIONAL UTILITY PROGRAMS

Optional programming support for System/3 model 6 includes three conversational utility programs located on disk:

- KSE — Keyboard Source Entry

- KDE — Keyboard Data Entry

- DIU — Data Interchange Utility

The conversational utility programs converse with you by means of printed messages and questions called prompts. You answer each prompt using the keyboard. The keyed answers are called responses. Responses tell the utility program what kind of data is to be processed, where it is located, and what type of processing is to be done.

A prompt and its corresponding response are called a control statement. The series of control statements given at the start of each conversational utility run is used to identify:

- Type of run

- Type of statement to be processed

- Name and unit of source library module or data file to be processed

For each conversational utility job, the programmer gives you instructions indicating the prompts and responses you use during the utility program run.

A prompt-response sequence operates in the following manner:

Conversational Utility Prompting Sequence

Utility program displays a prompting statement

↓

Do operator's instructions show response to prompt?

Yes ◄──────────────► No

Operator keys response data

Operator presses PROG START
to indicate end of response **❶**

Does response data contain errors?

Yes ◄──────────────► No

| System prompts same keyword | Utility program processes response data |
| Operator keys desired response | Utility program prompts next statement in series |

---

❶ Whenever PROG START is specified, you can either
use that key, or ENTER +. Both keys do the same
thing. Since PROG START is usually more con-
venient for you to use, it is specified throughout
this section.

More information about the function of conversational
utility programs and their required OCL and utility control
statements is available in the *IBM System/3 Model 6 Con-
versational Utility Programs Manual,* SC21-7528

Keyboard Source Entry Program

The Keyboard Source Entry (KSE) conversational utility
program is used to create and maintain source library
modules. You enter the input for the KSE program from
the keyboard. The output is written into a source library
module on disk. The input data is also displayed on the
printer to serve as a record of what was entered.

The KSE program has two run sequences:

1.   Create a source library module

2.   Maintain an existing source library module

Keyboard Data Entry Program

The Keyboard Data Entry (KDE) conversational utility
program processes data files. You type the data records on
the keyboard; the KDE program processes the records and
writes the data into a disk file. The input data is also dis-
played on the printer to serve as a record of what was
entered.

The KDE program has two run sequences:

1.   Create a disk data file

2.   Maintain an existing disk data file

Data Interchange Utility Program

The Data Interchange Utility (DIU) program changes the
format of System/3 BASIC data files by creating new data
files that can be used with the disk system management
programs. Data files can also be converted to System/3
BASIC format. This program, therefore, allows program-
mers at installations with System/3 model 6 co-resident
programming systems to convert data files created on one
system to the format required to run on the other.

Note: **DIU does not change the original file.**

DISK UTILITY PROGRAMS

Disk Utility Programs	Function ❶
Disk Initialization	Prepares disks for use.
Alternate Track Assignment	Transfers data from a defective disk track to an alternate track. Every disk has six alternate tracks that can be assigned to replace defective tracks.
Alternate Track Rebuild	Allows you to correct data that could not be transferred correctly to an alternate track.
File and Volume Label Display	• Prints the contents of an area on disk called the volume table of contents (VTOC). This area contains an up-to-date record of the contents of a disk. • Prints information from the volume table of contents for certain data files.
File Delete	• Deletes all files from a disk. • Deletes only certain files from a disk.
Disk Copy/Dump	• Copies entire contents of one disk to another. • Copies a data file from one disk to another, or from one area on a disk to another on the same disk. • Prints all or part of a data file.
Library Maintenance	• Creates (reserves space for), deletes, reorganizes, and changes the sizes of source and object libraries. ❷ • Places entries in, and displays the contents of, libraries. • Deletes library entries. • Changes the names of library entries.

❶ More information about the function of disk utility programs and their required OCL and utility control statements is contained in the *IBM System/3 Model 6 Operation Control Language and Disk Utility Programs Reference Manual*, GC21-7516.

❷ The source library is an area on disk used for storing procedures and source statements. (Procedures are sets of OCL statements used to run programs. Source statements are sets of data, the most common of which are RPG source programs and disk sort sequence specifications.) The object library is an area on disk used for storing object programs. System programs are stored in an object library.

Disk Utility Program Operation

Each disk utility program requires a set of OCL statements and utility control statements. (Utility control statements tell the program what function it is to perform.) The program reads these statements from the system input device.

The system input device for the model 6 is normally the keyboard. However, you can specify the data recorder as the system input device by responding to the OCL keyword READER during initial program load (IPL). If you need specific instructions on how to establish the data recorder as the system input device, see *Preparing the System for Program Operation* under *System Operation*. See, also, *Appendix A* for specific operating procedures for supplying utility control statements from the data recorder.

The following charts summarize the way disk utility programs operate.

Note: The charts and other information in this section assume that the programs are reading OCL and utility control statements from the keyboard.

General Program Operation for all Disk Utility Programs Except Library Maintenance and File Delete

Operator keys OCL cycle using OCL guidesheet

↓

Utility program prints:
ENTER '//' CONTROL STATEMENT

↓

Operator keys control statements for utility program

↓

Utility program prints:
ENTER '//' CONTROL STATEMENT

↓

Are there more jobs to be done using this utility?

Yes ◄─────────────────► No

↓

Operator keys // END

↓

Utility program does the jobs indicated by control statements

↓

Program ends

General Program Operation for Library Maintenance and File Delete
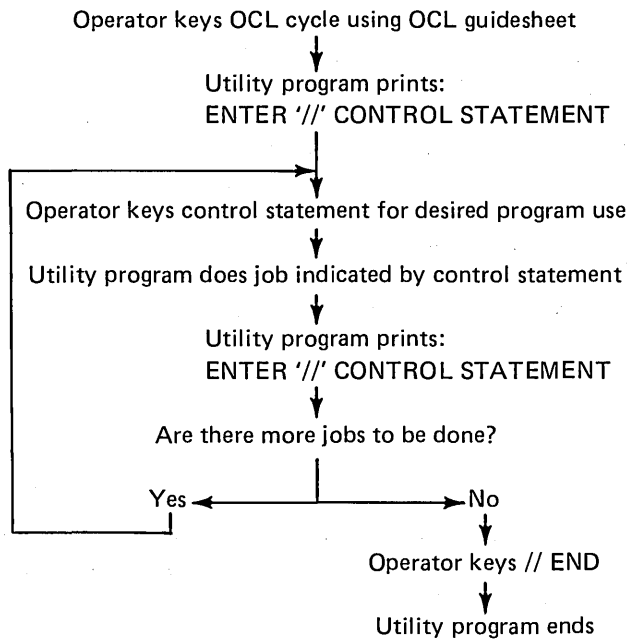
Operator keys OCL cycle using OCL guidesheet

↓

Utility program prints:
ENTER '//' CONTROL STATEMENT

↓

Operator keys control statement for desired program use

↓

Utility program does job indicated by control statement

↓

Utility program prints:
ENTER '//' CONTROL STATEMENT

↓

Are there more jobs to be done?

Yes ◄──────────────► No

↓

Operator keys // END

↓

Utility program ends

Operating Procedures

The following two disk utility programs require individual operating procedures:

● Disk Copy/Dump program when used to copy data from one removable disk to another using one disk drive

● Library Maintenance program

Operating procedures for these two exceptions are presented later in this section. The following operating procedures apply to all other disk utility programs:

1. Ready printer.

2. Mount disk cartridge if specified on program run sheet.

3. Ready appropriate disk drive.

4. Press PROG START and wait until system prints READY.

5. Key OCL cycle for this job from OCL guidesheet and wait until the system prints ENTER '//' CONTROL STATEMENT.

6. Key utility control statements from your instruction sheet.

After the utility program does the job indicated by the utility control statements, the program ends. If any programmed halts occur while the program is running, see the *IBM System/3 Model 6 Halt Guide*, GC21-7541, for recovery procedures.

*Operating Procedures for Disk Copy/Dump Utility Program:
Copying Data from One Removable Disk to Another Using
One Disk Drive*

This operation requires you to mount a different disk
cartridge at various times while the program is running. A
programmed halt indicates when it is time to mount a
different disk.

1. Ready printer.

2. Mount disk cartridge specified on program run sheet
    (the disk the program is copying data from).

3. Ready disk drive.

4. Press PROG START and wait until system prints
    READY.

5. Key OCL cycle for this job from OCL guidesheet and
    wait until system prints ENTER '//' CONTROL
    STATEMENT.

6. Key utility control statements from your instruction
    sheet.

7. When the Disk Copy/Dump program has been running
    for a while, an A123 halt occurs. Remove the disk
    that data is being copied from.

8. Mount disk cartridge specified on the program run
    sheet (the disk that is to contain the copy).

9. Press PROG START. If you mounted the wrong disk
    cartridge, a halt of A25 occurs. To correct this,
    mount the appropriate disk cartridge and press
    PROG START again.

10. When program has been running for some time, an
    A123 halt will occur. This time, mount the disk
    cartridge you removed in step 7 (the disk the program
    is copying data from).

11. Press PROG START.

12. Repeat steps 7 through 11 as many times as necessary
    to copy all data specified to a different removable
    disk cartridge.

When the Disk Copy/Dump program is finished, the system
prints READY to start a new job.

*Operating Procedures for the Library Maintenance
Utility Program*

Unlike other disk utility programs, the Library Maintenance
program allows you to use more than one of its functions
within one program run. Note that in the operating pro-
cedures that follow, steps 1 through 6 are the same as for
other utility programs. Steps 7 through 9 contain addi-
tional procedures to be performed when you want to use
more than one function of the Library Maintenance program.

1. Ready printer.

2. Mount disk cartridge specified on program run sheet.

3. Ready appropriate disk drive.

4. Press PROG START and wait until system prints
    READY.

5. Key OCL cycle for this job from OCL guidesheet and
    wait until the system prints ENTER '//' CONTROL
    STATEMENT.

6. Key utility control statement for desired function of
    Library Maintenance program using your instruction
    sheet.

7. After Library Maintenance program performs job
    indicated by utility control statement, program
    again prints ENTER '//' CONTROL STATEMENT.

8. If another library maintenance job is specified on
    your instruction sheet, key control statement speci-
    fied. Repeat steps 7 and 8 until all library mainte-
    nance jobs are done.

9. When all library maintenance jobs have been per-
    formed, key // END.

Besides using the data recorder as an input/output device for data, you can use it to supply:

● OCL statements for a job

● Utility control statements for disk utility jobs

● RPG II source programs to be compiled

● Disk sort specifications needed to run a disk sort job

Before you can supply this information, you must specify the data recorder as the system input device. Do this by keying DATA96 when the system prompts READER during the IPL procedure. For complete instructions on how to establish the data recorder as the system input device, see *Specifying the System Input Device* under *System Operation.*

SUPPLYING OCL STATEMENTS FROM THE DATA RECORDER

The model 6 accepts OCL statements from 96-column cards if your installation has an IBM 5496 Data Recorder Model 1 with the System/3 Model 6 Attachment feature. Punched cards containing OCL statements are given to you by the programmer as a part of his input for the job.

For more information about entering OCL statements on cards and how to code these statements, see the *IBM System/3 Model 6 Operation Control Language and Disk Utility Programs Reference Manual,* GC21-7516.

Operating Procedures for Supplying OCL Statements

1. Ready printer.

2. Remove any cards from hopper and stacker.

3. Place OCL cards in hopper. Load cards face up, left edge first.

4. Ready data recorder.

5. Check program run sheet to determine if you must mount a disk cartridge.

6. Mount specified disk cartridge.

7. Press PROG START.

SUPPLYING DISK UTILITY PROGRAM CONTROL STATEMENTS FROM THE DATA RECORDER

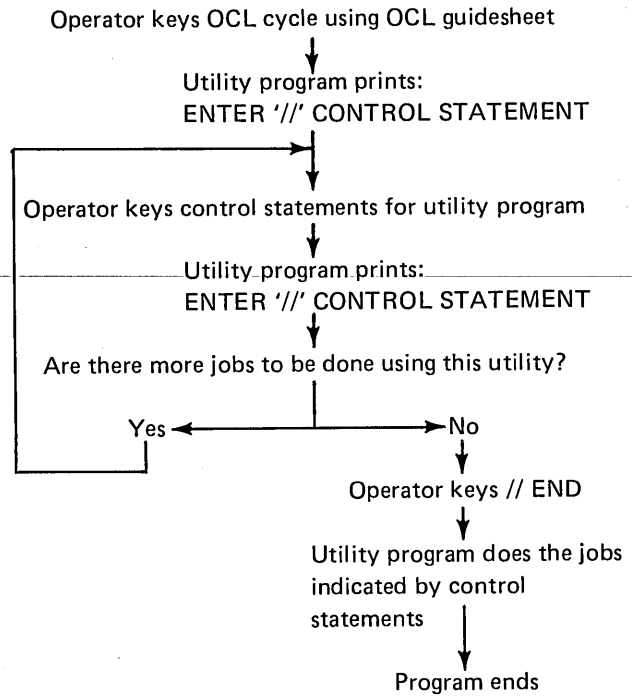You can supply utility control statements from the data recorder to run any of the disk utility programs. Each utility program requires a set of OCL statements and utility control statements. (The utility control statements tell the program what function to perform.)

Punched cards containing OCL and utility control statements are given to you by the programmer as part of his input for the job. Figure 22 shows the order of input for all disk utility programs. For information about the utility programs and the OCL and utility control statements they require, see the *IBM System/3 Model 6 Operation Control Language and Disk Utility Programs Reference Manual,* GC21-7516.

Last card in the set of utility control statements for this job.

// END

Utility Control Statements
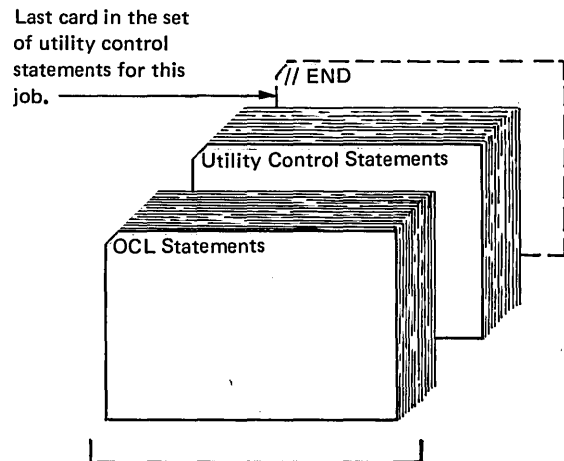
OCL Statements

Note: Data cards or blank cards can be placed after control statements for certain Library Maintenance runs.

Figure 22. Order of Input for All Disk Utility Programs

Operating Procedures

The following two disk utility programs require individual operating procedures:

- Disk Copy/Dump program when used to copy data from one removable disk to another using one disk drive

- Library Maintenance program

Operating procedures for these two exceptions are presented later in this appendix. The following operating procedures apply to all other disk utility programs.

1. Remove any cards from hopper.

2. Place OCL and utility control cards in hopper. Load cards face up, left edge first.

3. Mount the disk cartridge specified on program run sheet.

4. Ready appropriate disk drive.

5. Ready printer.

6. Press PROG START.

If program halts occur while the program is running, see the *IBM System/3 Model 6 Halt Guide,* GC21-7541, for recovery procedures.

Operating Procedures for Disk Copy/Dump Utility Program When Used to Copy Data From One Removable Disk to Another Using One Disk Drive

This operation requires you to mount a different disk cartridge at various times while the program is running. A program halt indicates when it is time to mount a different disk.

1. Remove any cards from hopper.

2. Place OCL and utility control cards in the data recorder hopper. Load cards face up, left edge first.

3. Mount the disk cartridge specified on program run sheet.

4. Ready appropriate disk drive.

5. Ready the printer.

6. Press PROG START.

7. When the Disk Copy/Dump program has been running for a while, an A123 halt occurs. Remove disk that data is being copied from.

8. Mount disk cartridge specified on program run sheet (the disk that is to contain the copy).

9. Press PROG START. If you mounted the wrong disk cartridge, a halt of A25 occurs. To correct this, mount appropriate disk cartridge and press PROG START again.

10. When the program has been running for some time, an A123 halt will occur. This time you must mount the disk cartridge you removed in step 7 (the disk the program is copying data from). Press PROG START.

11. Repeat steps 7 through 10 as many times as necessary to copy all data specified to a different removable disk cartridge.

If a program halt other than A123 and A25 occurs while the Disk Copy/Dump program is running, see the *IBM System/3 Model 6 Halt Guide,* GC21-7541, for recovery procedures. When the program is finished, the system displays an end-of-job halt (ABCD12345), provided you are operating in halt mode.

Operating Procedures for the Library Maintenance Program

Operating procedures for the Library Maintenance program are the same as for other disk utility programs, with two exceptions:

● Library Maintenance can be used to perform more than one job within one program run (Figure 23).

● Input to the Library Maintenance program can include data cards if data is being copied from punched cards to disk (Figure 24) or blank cards if data is being copied from disk to cards (Figure 25).

1. Remove any cards from hopper and stacker.

2. Place OCL utility control cards, and data cards or blank cards (if any) in hopper. Load cards face up, left edge first.

3. Ready data recorder.

4. Mount disk cartridge specified on program run sheet and ready the disk drive.

5. Ready printer.

6. Press PROG START.

7. When the job is completed, the system displays an end-of-job halt (ABCD12345), provided you are operating in halt mode.

8. Remove cards punched by this Library Maintenance program run from stacker.
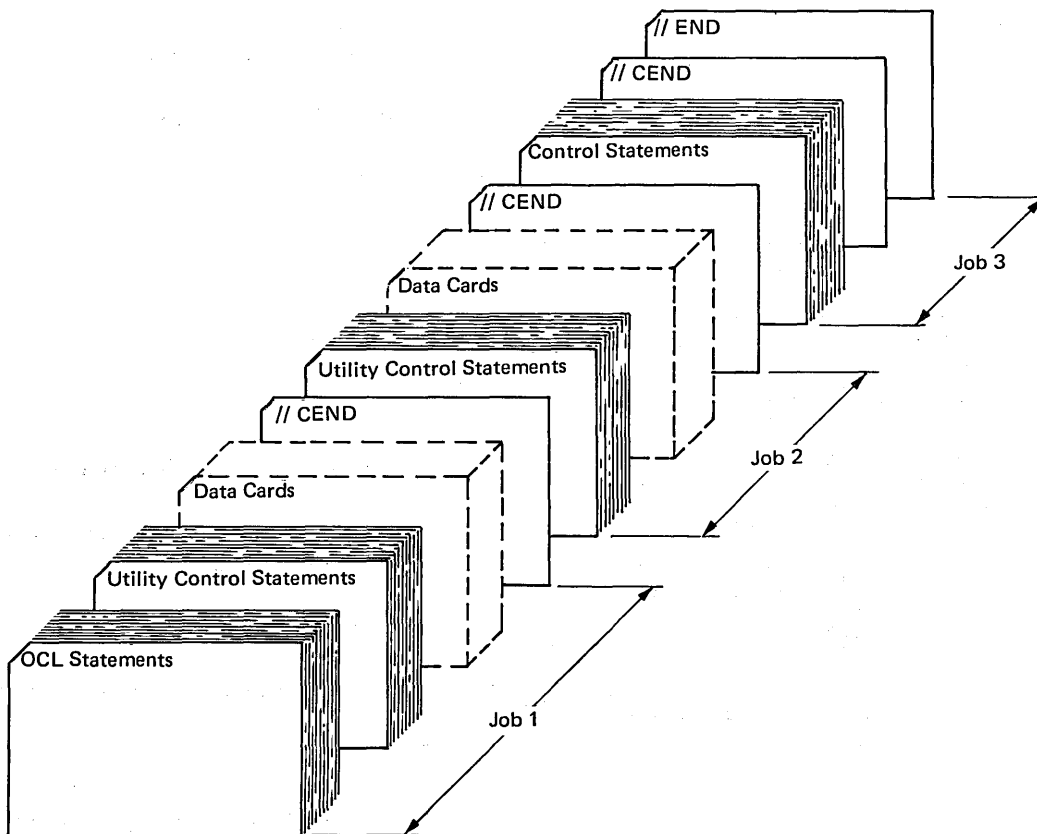
Figure 23. Order of Input to Library Maintenance Program (performing three jobs in one program run)

A number of halts can occur while the program is running; see *IBM System/3 Model 6 Halt Guide,* GC21-7541, for recovery procedures.
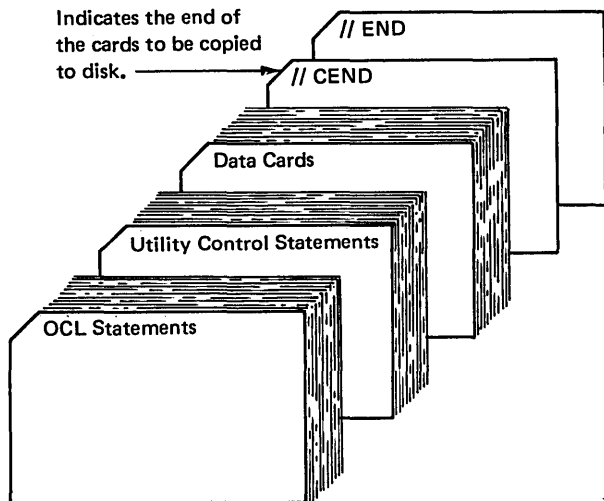
Figure 24. Order of Input for Library Maintenance Run that Copies Data from Cards to Disk.
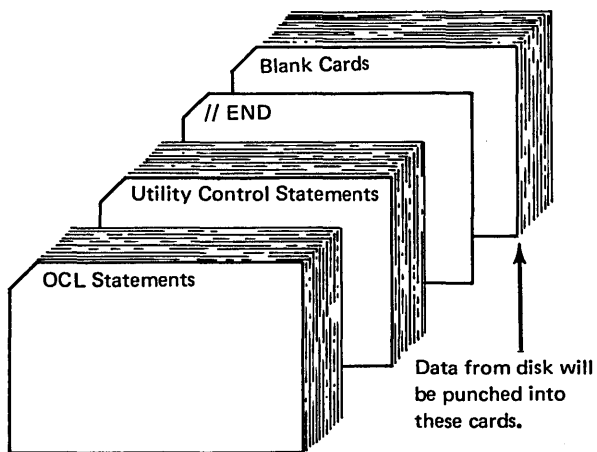
Figure 25. Order of Input for Library Maintenance Utility Run that Copies Data from Disk to Cards

SUPPLYING RPG II PROGRAMS FROM THE DATA RECORDER

This section lists the steps required to compile and execute an RPG II program using input from the data recorder. Compilation halts and object program execution halts are included in the *IBM System/3 Model 6 Halt Guide,* GC21-7541.

Compilation

1. Ready printer.

2. Remove any cards from hopper and stacker.

3. Place OCL cards and RPG II source deck in hopper. Load cards face up, left edge first. If punched output is specified on program run sheet, place blank cards after the RPG II source deck.

4. Ready data recorder.

5. Mount disk cartridge specified on program run sheet.

6. Ready appropriate disk drive.

7. Move SYSTEM START/STOP to START.

During compilation, halts can occur. Use the *IBM System/3 Model 6 Halt Guide,* GC21-7541, for error recover procedures.

Object Program Execution

1. Ready printer.

2. Remove any cards from hopper and stacker.

3. Place OCL cards and object program in hopper. Load cards face up, left edge first.

4. Ready data recorder.

5. Mount disk cartridge specified on program run sheet.

6. Ready appropriate disk drive.

7. Move SYSTEM START/STOP to START.

During the object program execution, halts can occur. If any of the following halts occur, special instruction will be provided on the program run sheet:

Halt	Indicator
AB245	RPG II indicator H1
ACD124	RPG II indicator H2
AB4	RPG II indicator H3
AB2	RPG II indicator H4
AB5	RPG II indicator H5
ACD12	RPG II indicator H6
AB24	RPG II indicator H7
ACD1345	RPG II indicator H8
AB	RPG II indicator H9
ABC1235	RPG II 1P forms alignment

These halts can occur only if the programmer specified them in his RPG II source program. All object program halts are included in the *IBM System/3 Model 6 Halt Guide,* GC21-7541.

SUPPLYING DISK SORT SPECIFICATIONS FROM THE DATA RECORDER

1. Ready printer.

2. Remove any cards from hopper and stacker.

3. Place OCL cards and disk sort specifications in hopper. Load cards face up, left edge first.

4. Ready data recorder.

5. Mount disk cartridge specified on program run sheet.

6. Ready appropriate disk drive.

7. Move SYSTEM START to START. The Disk Sort program does the job indicated by the sort specifications. A number of program halts can occur while the program is running. See the *IBM System/3 Model 6 Halt Guide,* GC21-7541, for recovery procedures.

The customer engineer (CE) panel is behind
the front cover of the processing unit
(Figure 26). Switches, lights, and dials on
this panel are used primarily by the custo-
mer engineer when servicing the system.
You use this panel to record the status of
the system after a processor check or an
unidentifiable halt has occurred. See *Using
the System/3 Model 6 Error Log Sheet*
under *System Operation* for instructions.
Functions of switches, lights, and dials on
the CE panel are described here.
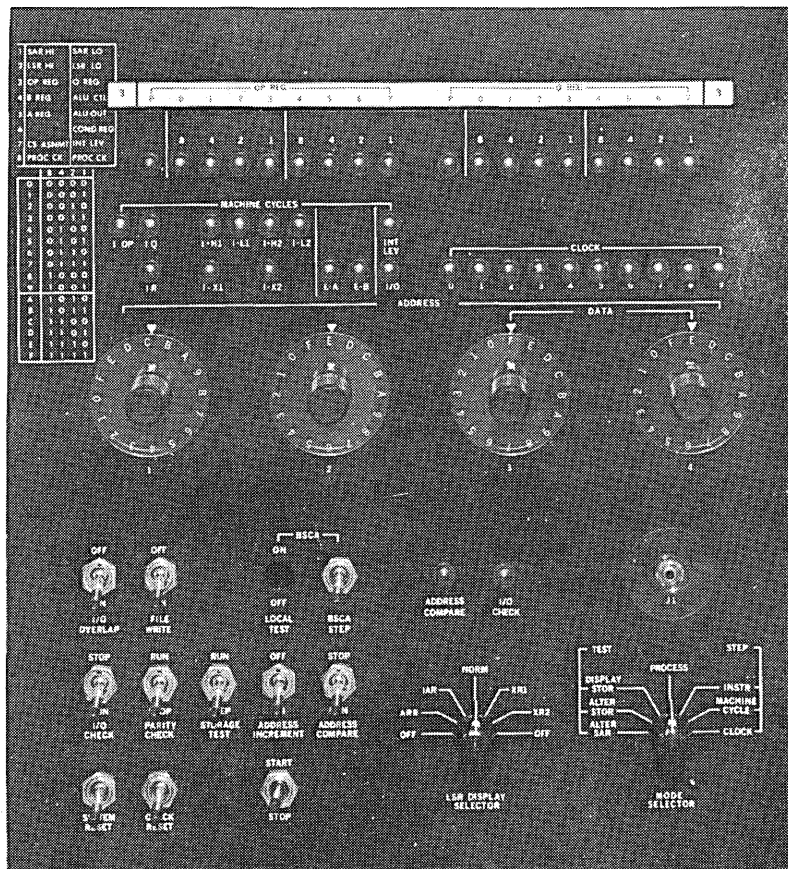
Figure 26. CE Panel

ADDRESS/DATA Switches: These switches indicate an
address or data. Switch settings can be tested by the
program in operation, can be entered into core storage, or
can cause a core storage location to be displayed on the
register display unit.

Register Display Unit: This display unit consists of a row
of 18 lights and an 8-position rotary switch. The lights dis-
play processing unit status and contents of main registers
(intermediate storage areas). Any of eight different areas
can be selected for display.

Cycle Control Display: The 12 indicator lights labeled
MACHINE CYCLES and the 10 indicator lights labeled
CLOCK identify the processing cycle just completed.

INT LEV (Interrupt Level): This light is turned on when
an interrupt level is being serviced. Some system devices,
such as the keyboard, operate on interrupt levels.

I/O OVERLAP: When this switch is in the normal ON
position, input/output operations are executed in an
overlap mode; that is, several operations can be performed
at the same time. When this switch is OFF, each I/O
operation must be completed before the next one can be
done.

I/O OVERLAP is effective only when the processing unit
START/STOP switch is at STOP.

FILE WRITE: When this switch is at OFF, no writing
operations can be performed on disk.

LOCAL TEST: This switch applies only if your system has the optional BSC feature. More information about the BSC is available in the *IBM System/3 RPG II Telecommunications Programming Reference Manual,* SC21-7507.

BSCA STEP: This switch applies only if your system has the optional BSC feature. More information about the BSC is available in the *IBM System/3 RPG II Telecommunications Programming Reference Manual,* SC21-7507.

ADDRESS COMPARE Light: This light turns on when an address compare occurs (see *ADDRESS COMPARE Switch*).

I/O CHECK Light: This light turns on when certain errors occur in an input or output device. It is turned off when SYSTEM RESET or CHECK RESET is turned on.

I/O CHECK Switch: When this switch is at STOP, the processing unit comes to an immediate stop if an input or output error occurs. The system displays show the status of the system at the time the error occurred. The I/O CHECK switch, however, is normally set at RUN. This means the system will not stop if an input or output error occurs unless instructed to do so by the program in operation. In this case, the system displays do not reflect conditions at the time the error occurred.

PARITY CHECK: This switch is normally set at STOP. When in this position, it causes the processing unit to come to an immediate stop when a parity error is displayed on the Register Display Unit. When the switch is set at RUN, parity errors are detected and displayed, but the system is not stopped.

STORAGE TEST: This switch allows the CE to alter or display core storage.

ADDRESS INCREMENT: This switch is used by the CE to control a counter that increments the storage address register (SAR). This switch is effective only when the system is in the CE test modes of alter or display storage.

ADDRESS COMPARE Switch: The switch allows the CE to stop the program being processed when the contents of the storage address register match the setting of the ADDRESS/DATA switches. The ADDRESS COMPARE light turns on when these addresses match. The MODE SELECTOR switch must be set at PROCESS and the Register Display Unit must be set at 1 SAR HI for the ADDRESS COMPARE switch to be effective.

SYSTEM RESET: When SYSTEM RESET is on, the system enters an idle state. Except for local store registers, all input/output and machine register, controls, and indicators are reset. After a system reset, the CE must perform the IPL procedure and reload the program that was being processed when the system reset occurred. The MODE SELECTOR switch must be set at PROCESS for SYSTEM RESET to be effective.

CHECK RESET: When this switch is on, all current error conditions in the processing unit and input/output devices are cleared. The system resumes normal operation when SYSTEM START/STOP switch is set at START.

START/STOP: When moved to START, this switch causes the system to continue normal operation. When moved to STOP, this switch causes the system to stop after it completes the operation currently in process. The STOP light on the console turns on as soon as processing stops. The CE can restart the system by moving this switch to START.

LSR (Local Store Register) DISPLAY SELECTOR: This rotary switch is used to select the local store register to be displayed by the register display unit.

MODE SELECTOR: This rotary switch can be used to select one of the three processing modes: process, step, or test. Process is the mode for normal operation. In the step mode, one of three settings can be used to control the way a program is executed. The test mode settings are used by the CE to display or alter core storage.

Appendix C. Binary Synchronous Communications Adapter/Local Communications Adapter Panel

The Binary Synchronous Communications Adapter
(BSCA)/Local Communications Adapter (LCA) panel (see
Figure 27) contains the lights and one switch to indicate
and control the status of telecommunication processing.
The panel is on the side of the processing unit, facing the
keyboard.

Switch

RATE SELECT: This switch is present only on systems
installed outside the United States that have the rate
select feature. The switch controls the rate of trans-
mission and reception of data.

Lights

The following is a description of the lights on the panel
that you are concerned with when running a BSCA or LCA
program. For a description of all the lights and their
meanings, see *IBM System/3 Model 6 Components Reference
Manual*, GA34-0001.

BSCA ATTN or LCA ATTN: This light turns on when a
data set is not ready, auto call unit power is off, a data line
is being used, the BSCA or LCA is disabled, or the external
test switch is on and either the BSCA or LCA is disabled
or is not in the test mode. The BSCA or LCA indicator
light on the console is also on whenever BSCA ATTN or
LCA ATTN is on.

DT TERM READY: This light turns on when BSCA or
LCA is enabled and the data terminal is ready for use.

DT SET READY: This light turns on when the data set
ready line from the data set is on and the data set is ready
for use.

TEST MODE: This light turns on when a program places
BSCA or LCA in the test mode of operation. No jobs can
be run while this light is on.

EXT TEST SW: This light turns on when the switch at the
data set end of the medium speed data set cable is in the
test position. For high speed data sets, this light is on when
LOCAL TEST on the CE panel is set at ON. No jobs can be
run while this light is on.

TSM MODE: This light turns on whenever data is being
transmitted.
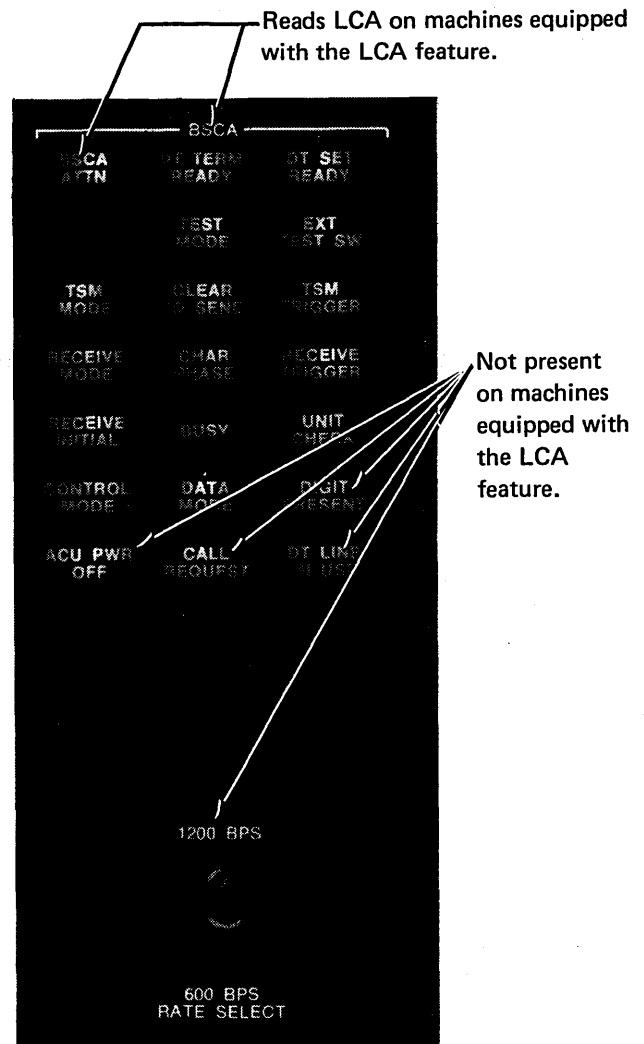
Figure 27. BSCA/LCA Panel

RECEIVE MODE: This light turns on when a receive
operation is taking place.

RECEIVE INITIAL: This light turns on at the initiation
of a receiving operation and turns off at the end of the
initiation operation.

ACU PWR OFF: This light turns on when the power for
the auto call unit is off.

CALL REQUEST: This light turns on when an auto call
operation is being performed.

DT LINE IN USE: This light turns on to indicate that the
data line from the auto call unit is being used.

BSCA PROGRAMS

This section lists the steps required to execute a BSCA program. Any halts that occur are listed in the *IBM System/3 Model 6 Halt Guide,* GC21-7541.

Execution

There are two types of BSCA networks: nonswitched and switched. For nonswitched networks, there is always a direct communication line between the stations. The data phone is never used. Nonswitched networks can be further broken down into point-to-point and multipoint nonswitched networks. For point-to-point nonswitched networks, the communication lines are continuously established between two stations. A multi-point nonswitched network has a central station and several tributary stations. The communication lines are continuously established, but the central station selects the tributary station that can send and receive data at a certain point in time. For switched networks, a direct communication line is not always established. The data phone is used to establish the necessary communication lines. A switched network is point-to-point only, but communication is possible with many different stations.

When executing BSCA object programs over switched and nonswitched, a schedule should be established to ensure that each BSCA station loads its program at the correct time. Receiving stations should start first: a receive program will wait for data, but a transmit program will not wait for the receiving program to be started.

Procedure for Executing BSCA Over Nonswitched Networks

1. Ready printer.

2. Mount disk cartridge specified on program run sheet.

3. Ready appropriate disk drive.

4. Press PROG START, and wait until system prints READY.

5. Key the OCL cycle for this job from OCL guidesheet.

The programs are loaded and transfer of data occurs.

Procedures for Executing BSCA Over Switched Networks

The procedures you perform when your system is on a switched network depends on whether you are initiating the transmission and whether the initiation of the transmission is being made manually or automatically. If you are initiating the call manually, perform the following:

1. Ready printer.

2. Mount disk cartridge specified on program run sheet.

3. Ready appropriate disk drive.

4. Press PROG START, and wait until system prints READY.

5. Key OCL statements for this job from OCL guidesheet.

6. When halt occurs, perform the following:

    a. Press TALK on data phone.

    b. Pick up receiver and dial digits in their proper sequence.

    c. Verbally communicate with the operator on the other system; or if AUTO is pressed on the data phone of the other system, wait for a high pitch tone.

    d. After the connection is made, (either verbally or by the tone) move SYSTEM START/STOP to START.

    e. Wait for BSCA indicator light and BSCA ATTN light to turn on, then press DATA on your phone.

    f. Place receiver back on phone.

If you are initiating the call automatically, perform the following:

1. Ready printer.

2. Mount disk cartridge specified on program run sheet.

3. Ready appropriate disk drive.

4. Press PROG START, and wait until system prints READY.

5. Key OCL statements for this job from OCL guide-sheet.

6. Press AUTO on data phone.

When the operator of the other system answers, transmission of data occurs. If you are receiving the call and will answer manually, perform the following:

1. Ready printer.

2. Mount disk cartridge specified on program run sheet.

3. Ready appropriate disk drive.

4. Press PROG START, and wait until system prints READY.

5. Key OCL statements for this job from OCL guide-sheet.

6. When the halt occurs, perform the following:

   a. Lift up receiver and verbally communicate with the operator of the other system; or wait for a high pitch tone if AUTO is used by the other system.

   b. Move SYSTEM START/STOP to START.

   c. Wait for RECEIVE INITIAL light on BSCA panel to turn on, then press DATA on your phone.

   d. Place receiver back on phone. Transmission of data occurs.

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

1. Ready printer.

2. Mount disk cartridge specified on program run sheet.

3. Ready appropriate disk drive.

4. Press PROG START, and wait until system prints READY.

5. Key OCL statements for this job from OCL guide-sheet.

6. Press AUTO on data phone.

7. Move SYSTEM START/STOP to START. When the connection is made, transmission of data occurs.

DEVICE COUNTER LOGOUT PROGRAM

The primary purpose of the Device Counter Logout program is to report information about errors that were recorded during the execution of a Binary Synchronous Communications (BSC) program, which contained the programming support to update these counters. You should run the Device Counter Logout program immediately following every such BSC program.

The Device Counter Logout program prints the counters for both adapters 1 and 2 (if adapter 2 is available on the system). The contents of the terminal statistics table, MLTERFIL, which is a permanent file on F1 containing counters for multipoint control stations only, is printed following the counters. If MLTERFIL does not contain any entries for an adapter, the following message is printed in place of the contents of MLTERFIL:

   TERMINAL STATISTICS TABLE (MLTERFIL) EMPTY

If MLTERFIL does not exist, the following message is printed:

   TERMINAL STATISTICS TABLE (MLTERFIL) NOT FOUND

Adapter 2 information is printed on a separate page.

The contents of the counters will be displayed on the device assigned as the system LOG.

Operating Procedure

1. Be sure the system LOG is assigned to the device that you want the counters displayed on. (See *IBM System/3 Model 6 Operation Control Language and Disk Utility Programs Reference Manual, GC21-7516* for information about the system LOG.)

2. Use the following prompting sequence to run the Device Counter Logout program:

System Prompts	Operator Responds
READY	LOAD
LOAD NAME	$$BSDL
UNIT	R1 or F1 (whichever contains your tailored system)
MODIFY	RUN

The device counters will be displayed as in Figure 28.

```
            BSCA  LOG  03/03/72

                ADAPTER  1


        ******************************* ******** ********
              COUNTER  DESCRIPTION        TOTAL   LAST JOB
        ******************************* ******** ********

        TEXT  BLOCKS  SENT                  34         0
        TEXT  BLOCKS  RECEIVED              76         0
        NAKS  RECEIVED                       4         0
        DATA  CHECKS                         0         0
        FOREWARD  ABORTS                     0         0
        ABORTS                               1         0
        ADAPTER  CHECKS  ON  TRANSMIT        0         0
        ADAPTER  CHECKS  ON  RECEIVE         0         0
        INVALID  REPLIES                    13         0
        ENQS  RECEIVED                       0         0
        LOST  DATA  COUNT                    3         0
        DISCONNECT  TIMEOUTS                 0         0
        TIMEOUTS  DURING  RECEIVE  DATA     12         0



        **************** **************** ****************
            TERMINAL       UNSUCCESSFUL      SUCCESSFUL
            ADDRESS       I/O OPERATIONS    I/O OPERATIONS
        **************** **************** ****************

        E2E2                          1              269
        C1C2C3                        2            65536
        C6C6C6C6C6C6C6                0          4194304
        81                        65535            61440
        C1C1C1C1C1C1C1                1              100
        C2C2C2C2C2C2C2                2              200
        C3C3C3C3C3C3C3                3              300
        C4C4C4C4C4C4C4                4             3840
        D1D1D1D1D1D1D1               10               17
        D2D3D2D3D2D3D2               28          1048832
        E260E260E260E2              256            65536
        8181818181818181            512           131072
        40404040404040              768           196608
        E9E9E9E8E8E8E7             1024           262144
        0102030405060 7            1280           327680
        E1E1E0E0E1E1E1             1536           393216
        60616262616060             1792           458752
        D1                          222             2222
```

Figure 28 (Part 1 of 2). BSCA Log

ADAPTER 2

```
***************************** ******** ********
      COUNTER DESCRIPTION       TOTAL   LAST JOB
***************************** ******** ********

TEXT BLOCKS SENT                  0        0
TEXT BLOCKS RECEIVED              0        0
NAKS RECEIVED                     0        0
DATA CHECKS                       0        0
FOREWARD ABORTS                   0        0
ABORTS                            0        0
ADAPTER CHECKS ON TRANSMIT        0        0
ADAPTER CHECKS ON RECEIVE         0        0
INVALID REPLIES                   0        0
ENQS RECEIVED                     0        0
LOST DATA COUNT                   0        0
DISCONNECT TIMEOUTS               0        0
TIMEOUTS DURING RECEIVE DATA      0        0


**************   **************   **************
   TERMINAL      UNSUCCESSFUL       SUCCESSFUL
   ADDRESS       I/O OPERATIONS   I/O OPERATIONS
**************   **************   **************

D1                    222             2222
```

Figure 28 (Part 2 of 2). BSCA Log

Counter Description	Explanation
BSCA LOG	— Heading to identify the printout.
mm/dd/yy	— Date stored in the System Communication area.
ADAPTER	— Identifies adapter being used.
TEXT BLOCKS SENT	— Number of blocks of data transmitted successfully from this terminal to a remote terminal.
TEXT BLOCKS RECEIVED	— Number of blocks of data received successfully by this terminal from a remote terminal.
NAKS RECEIVED	— Number of negative responses received by this terminal in response to data transmitted by this terminal.
DATA CHECKS	— Number of text blocks received with invalid error check bits.
FORWARD ABORTS	— Number of times a remote terminal has terminated transmission abnormally while transmitting data.
ABORTS	— Number of times a remote terminal has terminated transmission abnormally while receiving data.
ADAPTER CHECKS ON TRANSMIT	— Number of times the following errors occurred while the terminal was transmitting data: 1. Parity check within the adapter. 2. Cycle steal overrun. 3. Local storage register or control register check.
ADAPTER CHECKS ON RECEIVE	— Number of times the following errors occurred while the terminal was receiving data: 1. Parity check within the adapter. 2. Cycle steal overrun. 3. Local storage register or control register check.
INVALID REPLIES	— Number of abnormal responses (including no responses) from the remote terminal.
ENQ'S RECEIVED	— Number of requests for retransmission of this terminal's last acknowledgement after the acknowledgement has already been sent.
LOST DATA COUNT	— Number of text blocks received which do not fit into the receive area.
DISCONNECT TIMEOUTS	— Number of times the data set has dropped ready status after that status was set on.
TIMEOUTS DURING RECEIVE DATA	— Number of times this terminal expected to receive text but did not receive anything for 3.25 seconds.

To determine a malfunctioning device or program and who should correct it, you can follow a prescribed procedure called *problem determination.* Problem determination does not give you the precise cause of a malfunction nor correct it, but it can reduce the amount of system down time if performed prior to calling IBM.

PERFORMING PROBLEM DETERMINATION

I he following pages tell you how to do problem determination. The meanings of indicators that show various types of failures are included. Also, when possible, you are told whether the failure is the result of a machine or user error.

Halts

Halts displayed by the halt code display lights indicate incorrect program operation, machine errors, or in some cases, information or instructions. If the log option is used, error codes are printed on the logging device. Whenever a programmed halt occurs, take the appropriate action indicated in the *IBM System/3 Model 6 Halt Guide,* GC21-7541.

Processor Checks

PROC CHECK on the system display panel indicates that an abnormal condition has occurred in the processing unit and the system is stopped. Processor checks commonly caused by programming malfunctions are: invalid address, invalid op code, and invalid Q byte. All other processor checks indicate hardware malfunctions. If a combination of lights is on, such as invalid op code and invalid Q byte, you should suspect a hardware malfunction. The system stops with PROC CHECK on and the type of check is indicated in position 8 (PROC CK) on the register display unit.

If a hardware malfunction is not indicated, examine the program closely to determine the cause of the processor check. If the system stops with a processor check, certain information needed for problem determination is retained in the system: type of check, contents of the local storage registers (LSRs), and contents of main storage. See Figures 33 and 34 for the procedure to follow to obtain this information.

START

Set register
display unit to
position 8
(PROC CK) and
record type of check

Check
indicates
programming
error

No

Hardware
failure.
Retry the job.

Yes

Record the
LSRs. See
Figure 34.

If error
persists,
contact IBM
for assistance.

Execute a
storage dump.
See note.
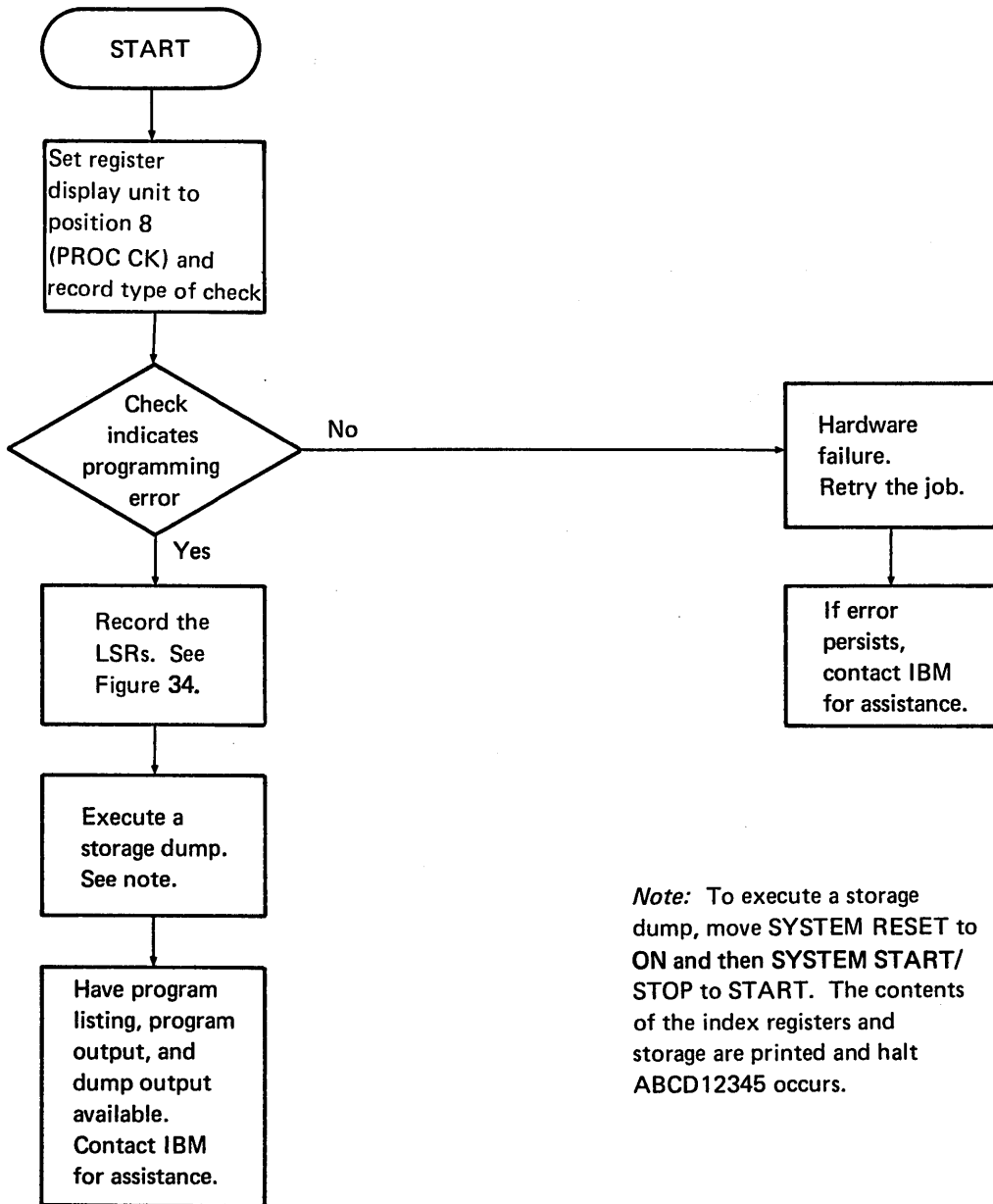
Note: To execute a storage
dump, move SYSTEM RESET to
ON and then SYSTEM START/
STOP to START. The contents
of the index registers and
storage are printed and halt
ABCD12345 occurs.

Have program
listing, program
output, and
dump output
available.
Contact IBM
for assistance.

Figure 33. Operator Procedures for Processor Check

```
       ┌─────────────┐
      (    START      )
       └─────────────┘
             │
   ┌───────────────────┐
   │ Switch START/     │
   │ STOP on CE        │
   │ panel to STOP.    │
   └───────────────────┘
             │
   ┌───────────────────┐
   │ Perform lamp      │
   │ test to ensure    │
   │ all lamps         │
   │ light.            │
   └───────────────────┘
             │
   ┌───────────────────┐
   │ Set register      │
   │ display unit to   │
   │ position 2 (LSR   │
   │ HI/LSR LO).       │
   └───────────────────┘
             │
   ┌───────────────────┐
   │ On CE panel, set  │
   │ LSR display se-   │
   │ lector to ARR.    │
   └───────────────────┘
             │
   ┌───────────────────┐
   │ Record the lights │
   │ in the display    │
   │ unit on the       │
   │ error log sheet.  │
   └───────────────────┘
             │
   ┌───────────────────┐
   │ Set LSR display   │
   │ selector to IAR.  │
   └───────────────────┘
             │
   ┌───────────────────┐
   │ Record the lights │
   │ in the display    │
   │ unit on the error │
   │ log sheet.        │
   └───────────────────┘
             │
   ┌───────────────────┐
   │ Set LSR display   │
   │ selector to       │
   │ NORM.             │
   └───────────────────┘
             │
       ┌─────────────┐
      (  Return to    )
      ( previous figure)
      ( (Figure 33 or  )
      (  35).          )
       └─────────────┘
```
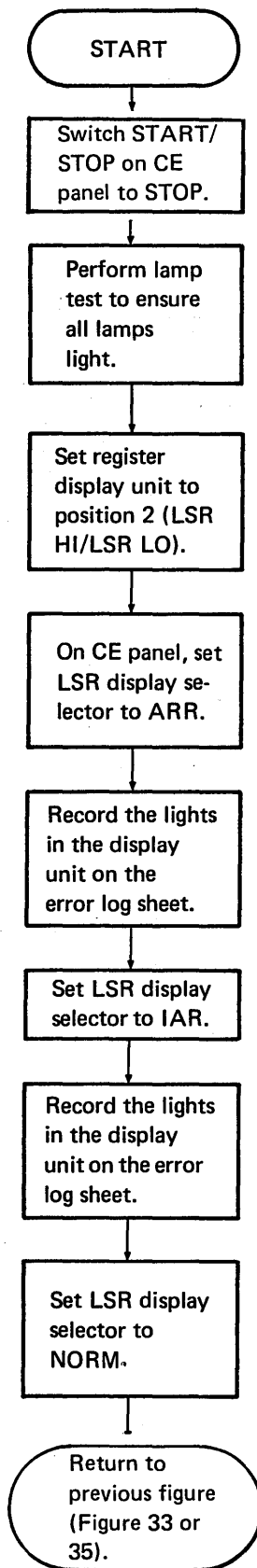
Figure 34. Procedure for Displaying Local Store Registers

System Loops

A loop in a system is the repetitive execution of a sequence of instructions. A loop can be recognized in several ways.

● A steady flow in the lights of the processing unit display panel when the STOP light is off.

● A rhythmic pattern in the lights of the processing unit display panel.

● A pointless recurrence of input/output activity.

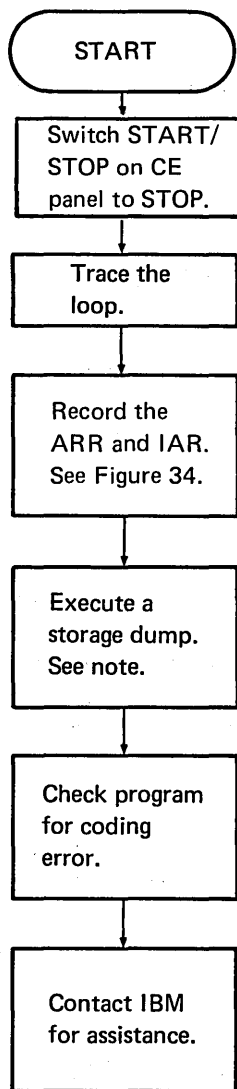● A job that does not change status for a long period of time.

Loops can be caused by:

● Deliberate coding by a programmer as a debugging aid.

● A logic or coding error by a programmer.

● An incorrect setup by the operator.

● A hardware malfunction.

When a loop occurs, it continues until the operator intervenes and cancels the job. (See Figure 35 for operator-programmer action for a loop.) The operator's main responsibility when a loop occurs is to gather pertinent information as follows:

1. Determine whether the job is set up correctly. If it is not, correct it and rerun the job. If the job is set up correctly, follow the procedures in Figure 35.

2. If the loop is a long one, try to get random addresses in the loop. Set the CE panel mode selector to PROCESS, switch to START, then STOP, and record the address. By repeating this procedure, you can obtain a random list of addresses in the loop.

3. Have the loop addresses, program listing, and storage dump available for the programmer.

It is the programmer's responsibility to determine the cause of a program loop. He should thoroughly examine the logic of his program to make sure he did not code a loop. If his program appears to be coded correctly, he should have the information supplied by the operator available and contact IBM for assistance.

```
        ┌─────────────┐
        │    START    │
        └─────────────┘
               │
        ┌─────────────┐
        │ Switch START/│
        │ STOP on CE   │
        │ panel to STOP.│
        └─────────────┘
               │
        ┌─────────────┐
        │ Trace the   │
        │ loop.       │
        └─────────────┘
               │
        ┌─────────────┐
        │ Record the  │
        │ ARR and IAR.│
        │ See Figure 34.│
        └─────────────┘
               │
        ┌─────────────┐
        │ Execute a   │
        │ storage dump.│
        │ See note.   │
        └─────────────┘
               │
        ┌─────────────┐
        │ Check program│
        │ for coding  │
        │ error.      │
        └─────────────┘
               │
        ┌─────────────┐
        │ Contact IBM │
        │ for assistance.│
        └─────────────┘
```

Note: To execute a storage
dump, switch SYSTEM RESET
to ON and then CE panel START/
STOP to START. The contents
of the index registers and
storage are printed and halt
ABCD12345 occurs.

Figure 35. Operator and Programmer Action
for a System Loop

Incorrect Output

If output is incorrect after a job has apparently been completed successfully, the incorrect output falls into the following categories:

● Missing records.

● Duplicate records.

● Invalid data containing sequence errors, incorrect values, format errors, or meaningless information.

To perform problem determination for errors of this type:

1. Isolate the failing program.

2. Check for a possible hardware error. (Do other programs fail in the same way?)

3. Perform the appropriate data collection procedure in Figure 36.

If several programs are involved in a failure, locate the program that you know has correct input, but incorrect output. The fastest method of analyzing a series of programs is to check the output of one of the programs in the middle of the job stream, then repeat the check for the remaining programs until one has been isolated. After that, use Figure 36 to complete problem determination.

Note: The following blocks say to check something (a control card, changes, logic); these are suggestions or examples, and are not meant to be all-inclusive.
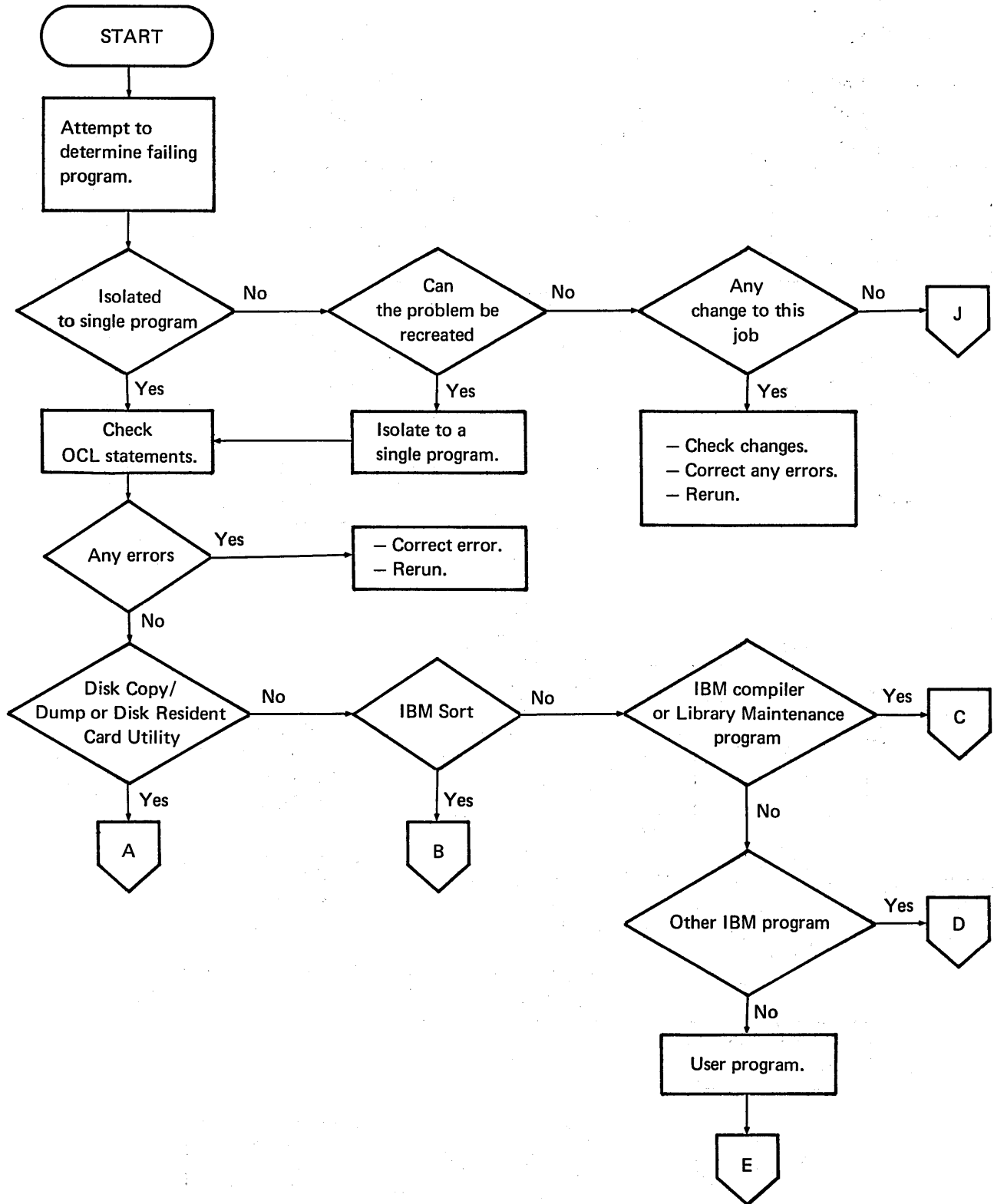

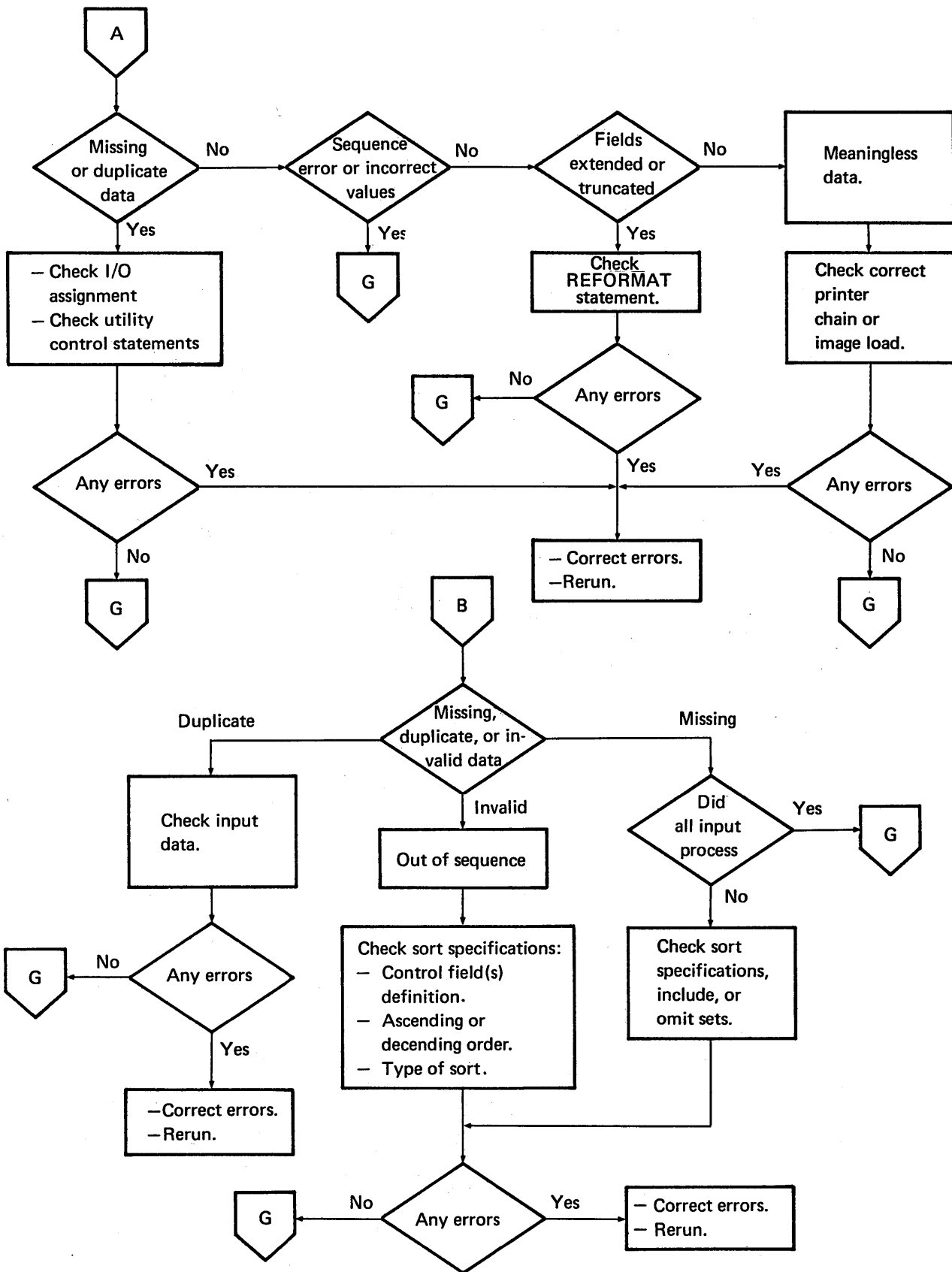Figure 36 (Part 1 of 7). Operating Procedures for Incorrect Output

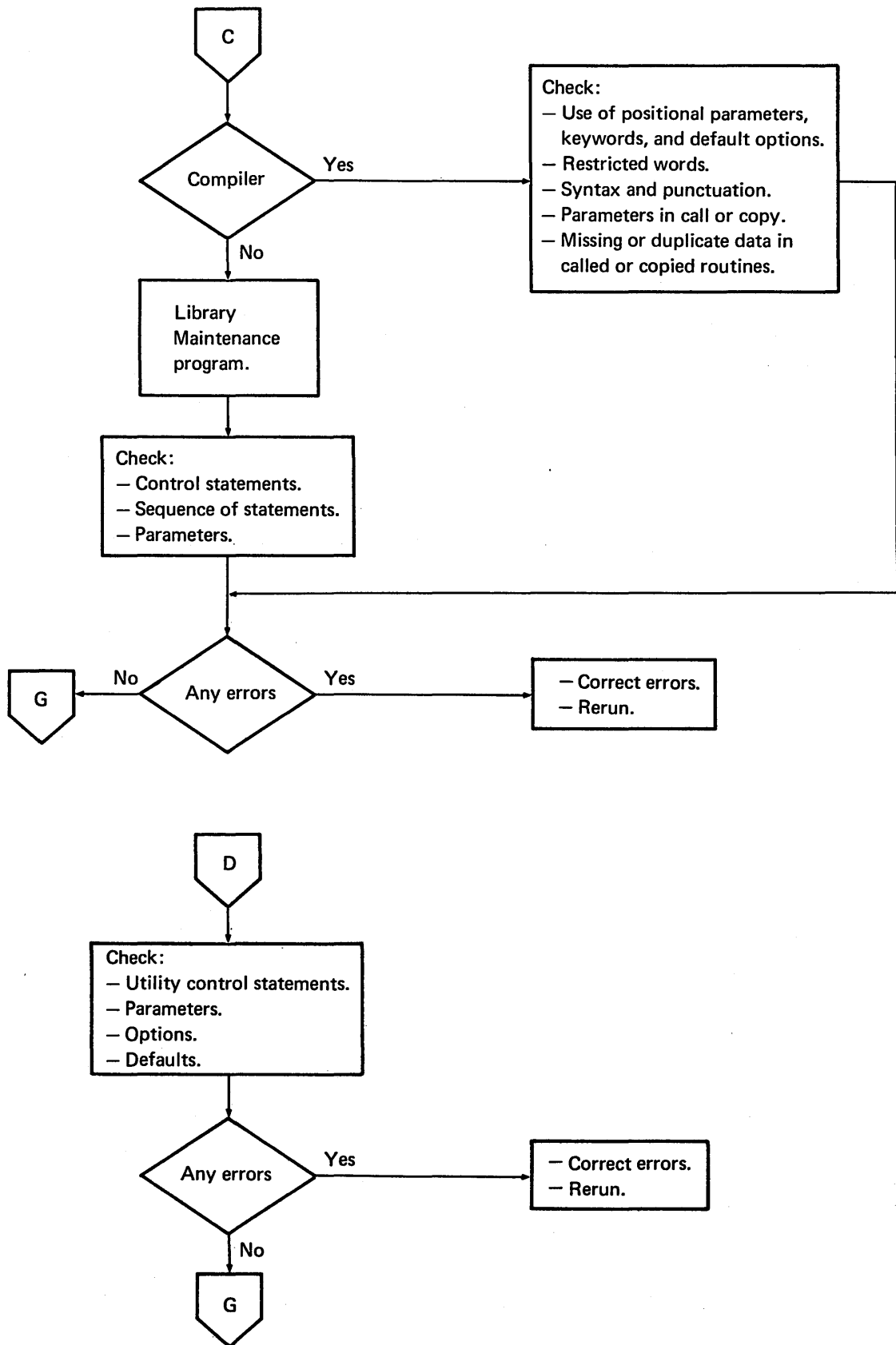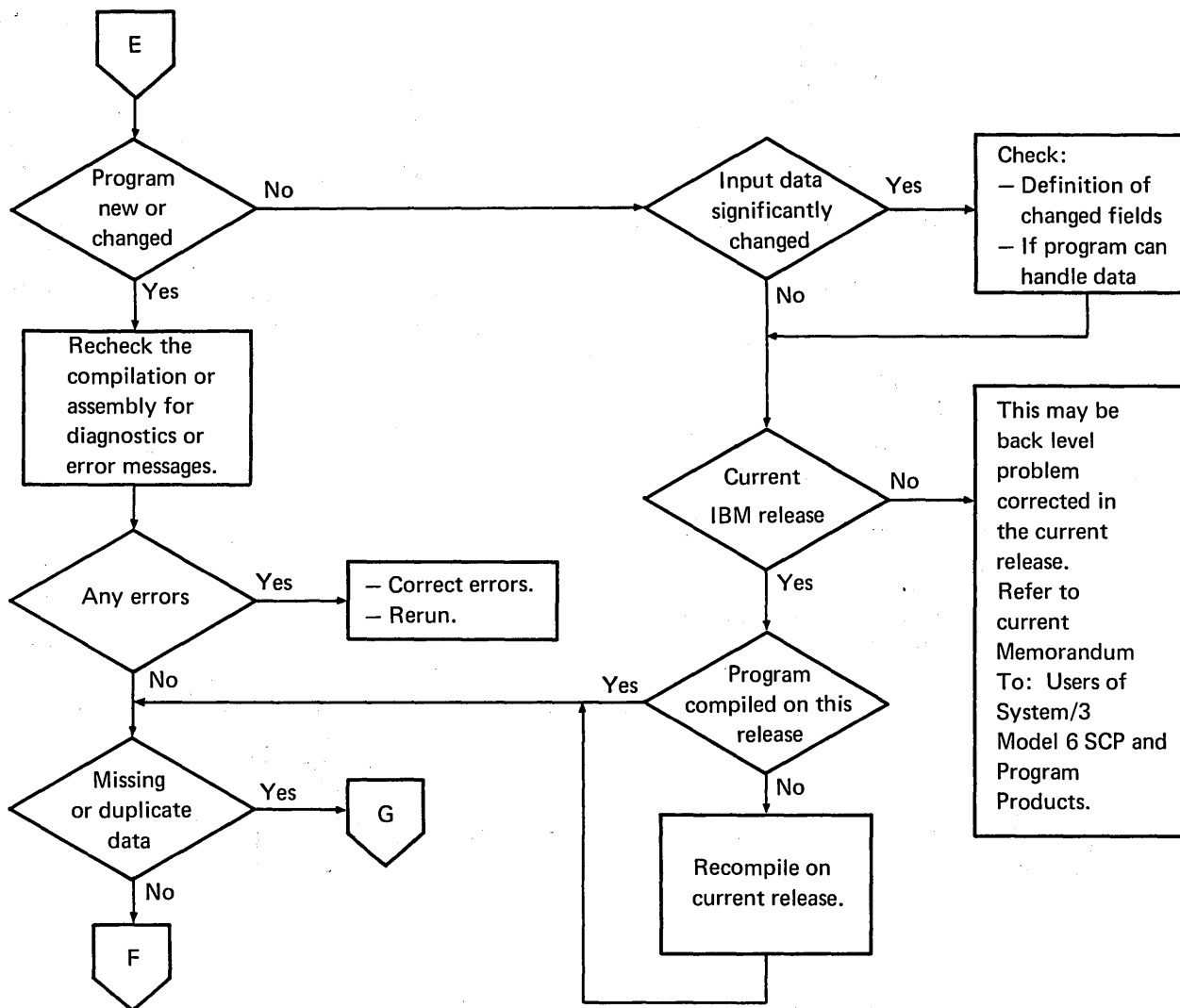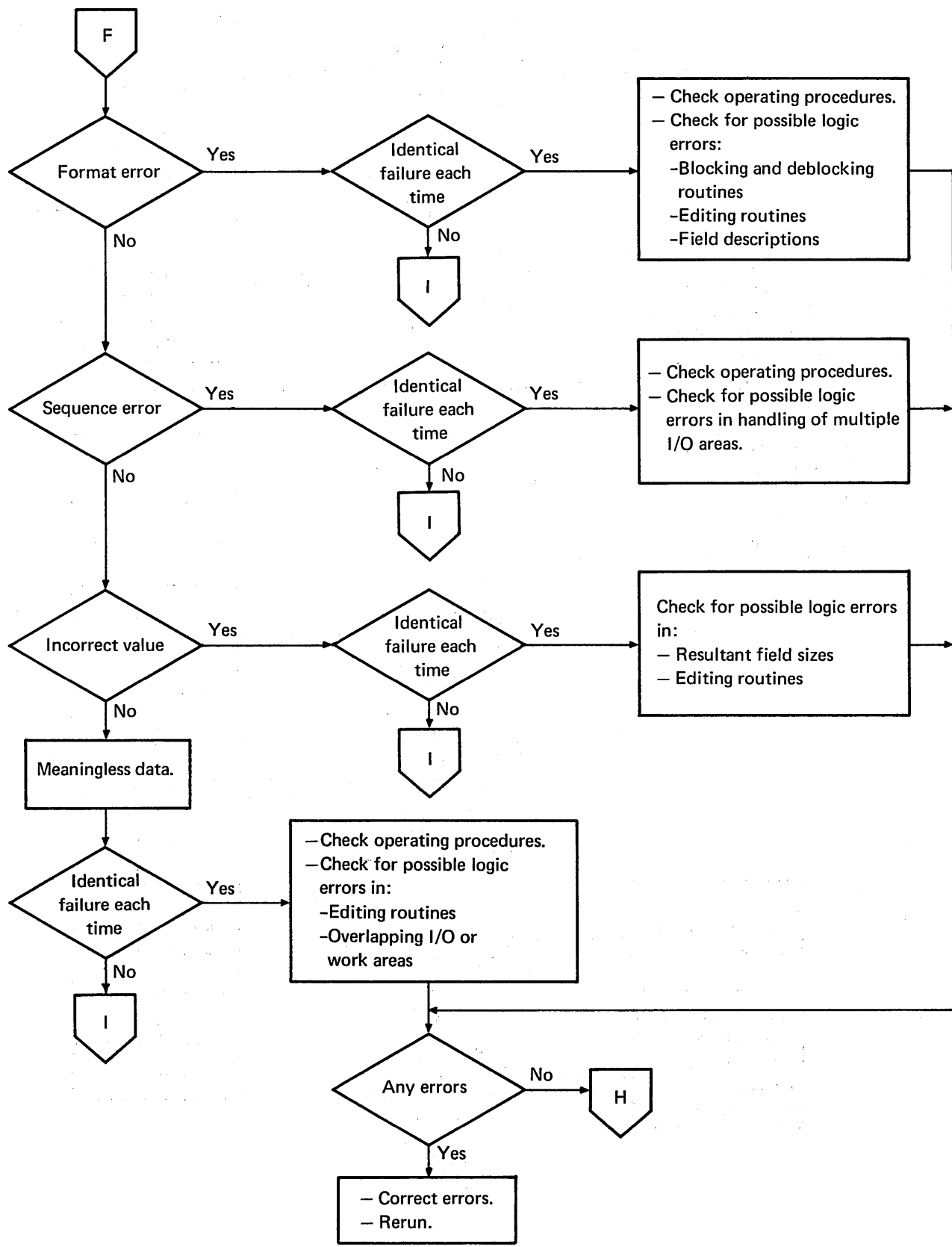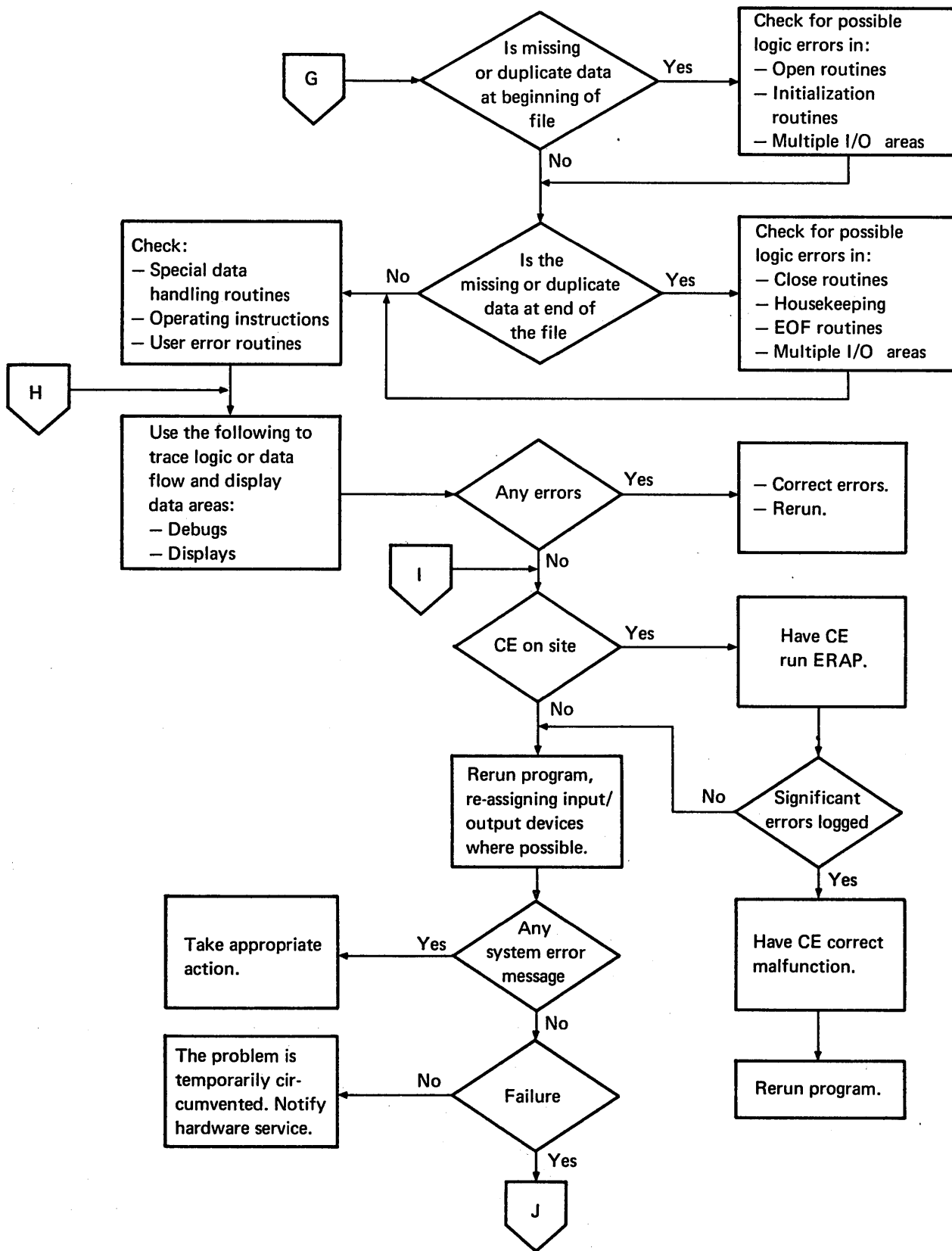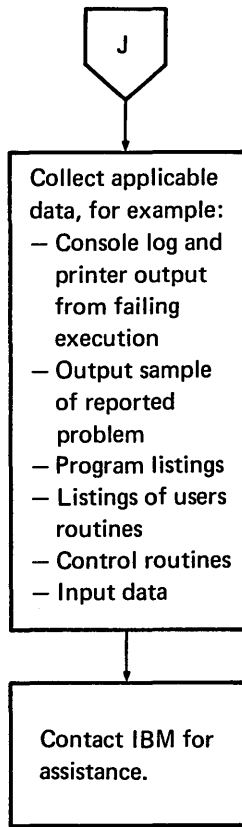Figure 36 (Part 2 of 7). Operating Procedures for Incorrect Output

```
            ┌───┐
            │ C │
            └─┬─┘
              │                              ┌──────────────────────────────┐
              ▼                              │ Check:                       │
            ╱─────╲          Yes             │ — Use of positional parameters,│
          ╱         ╲ ────────────────────▶  │   keywords, and default options.│
         ╱ Compiler  ╲                       │ — Restricted words.          │
          ╲         ╱                        │ — Syntax and punctuation.    │
            ╲─────╱                          │ — Parameters in call or copy.│
              │ No                           │ — Missing or duplicate data in│
              ▼                              │   called or copied routines. │
        ┌──────────────┐                     └──────────────────────────────┘
        │ Library      │
        │ Maintenance  │
        │ program.     │
        └──────┬───────┘
               │
               ▼
     ┌─────────────────────┐
     │ Check:              │
     │ — Control statements.│
     │ — Sequence of statements.│
     │ — Parameters.       │
     └──────────┬──────────┘
                │
                ▼
┌───┐   No    ╱─────╲     Yes          ┌──────────────────┐
│ G │ ◀────── │ Any errors │ ──────────▶ │ — Correct errors. │
└───┘          ╲─────╱                   │ — Rerun.          │
                                          └──────────────────┘
```

```
            ┌───┐
            │ D │
            └─┬─┘
              ▼
     ┌──────────────────────────┐
     │ Check:                   │
     │ — Utility control statements.│
     │ — Parameters.            │
     │ — Options.               │
     │ — Defaults.              │
     └────────────┬─────────────┘
                  │
                  ▼
              ╱─────╲      Yes           ┌──────────────────┐
            ╱         ╲ ───────────────▶ │ — Correct errors. │
           ╱ Any errors ╲                │ — Rerun.          │
            ╲         ╱                  └──────────────────┘
              ╲─────╱
                │ No
                ▼
              ┌───┐
              │ G │
              └───┘
```

Figure 36 (Part 3 of 7). Operating Procedures for Incorrect Output

```
        ┌────────┐
        │   E    │
        └────┬───┘
             │
     ┌───────▼───────┐                                    ┌──────────────────┐          ┌──────────────────────┐
     │   Program     │        No                          │   Input data     │   Yes    │ Check:               │
    ◄   new or       ►──────────────────────────────────►◄ significantly    ►─────────►│ – Definition of      │
     │   changed     │                                    │   changed        │          │   changed fields     │
     └───────┬───────┘                                    └────────┬─────────┘          │ – If program can     │
             │ Yes                                                 │ No                 │   handle data        │
     ┌───────▼───────┐                                             │                    └──────────────────────┘
     │ Recheck the   │                                             │◄───────────────────────────┘
     │ compilation or│                                             │
     │ assembly for  │                                             │
     │ diagnostics or│                                             │                    ┌──────────────────────┐
     │ error messages.│                                            │                    │ This may be          │
     └───────┬───────┘                                    ┌────────▼─────────┐   No     │ back level           │
             │                                            │    Current       │          │ problem              │
             │                                           ◄    IBM release    ►─────────►│ corrected in         │
     ┌───────▼───────┐      Yes      ┌──────────────────┐└────────┬─────────┘          │ the current          │
    ◄   Any errors   ►─────────────►│ – Correct errors. │         │ Yes                │ release.             │
     └───────┬───────┘              │ – Rerun.          │         │                    │ Refer to             │
             │ No                   └──────────────────┘         │                    │ current              │
             │◄─────────────────────────────────────Yes─┌────────▼─────────┐          │ Memorandum           │
             │                                           │    Program       │          │ To: Users of         │
     ┌───────▼───────┐                                  ◄ compiled on this ►           │ System/3             │
    ◄   Missing      ►   Yes    ┌────────┐               │    release       │          │ Model 6 SCP and      │
     │ or duplicate  ►─────────►│   G    │               └────────┬─────────┘          │ Program              │
     │   data        │          └────────┘                        │ No                 │ Products.            │
     └───────┬───────┘                                            │                    └──────────────────────┘
             │ No                                        ┌────────▼─────────┐
        ┌────▼───┐                                       │ Recompile on     │
        │   F    │                                       │ current release. │
        └────────┘                                       └──────────────────┘
```

Figure 36 (Part 4 of 7). Operating Procedures for Incorrect Output

```
     ┌───┐
     │ F │
     └─┬─┘
       │
       ▼
   ╱ Format ╲  Yes    ╱ Identical ╲  Yes     ┌──────────────────────────────┐
  ╱  error    ╲─────▶ ╱ failure each ╲──────▶ │ — Check operating procedures.│
  ╲          ╱        ╲   time      ╱         │ — Check for possible logic   │
   ╲        ╱          ╲          ╱           │   errors:                    │
       │ No                 │ No             │   -Blocking and deblocking   │
       │                    ▼                │    routines                  │
       │               ┌───────┐             │   -Editing routines          │
       │               │   I   │             │   -Field descriptions        │
       │               └───────┘             └──────────────────────────────┘
       ▼
   ╱ Sequence ╲ Yes    ╱ Identical ╲  Yes     ┌──────────────────────────────┐
  ╱  error     ╲─────▶ ╱ failure each ╲──────▶ │ — Check operating procedures.│
  ╲           ╱        ╲   time      ╱         │ — Check for possible logic   │
   ╲         ╱          ╲          ╱           │   errors in handling of      │
       │ No                 │ No              │   multiple I/O areas.         │
       │                    ▼                 └──────────────────────────────┘
       │               ┌───────┐
       │               │   I   │
       │               └───────┘
       ▼
   ╱ Incorrect ╲ Yes   ╱ Identical ╲  Yes     ┌──────────────────────────────┐
  ╱  value      ╲────▶ ╱ failure each ╲──────▶ │ Check for possible logic     │
  ╲            ╱       ╲   time      ╱         │ errors in:                   │
   ╲          ╱         ╲          ╱           │ — Resultant field sizes      │
       │ No                 │ No              │ — Editing routines           │
       ▼                    ▼                 └──────────────────────────────┘
 ┌──────────────┐      ┌───────┐
 │ Meaningless  │      │   I   │
 │ data.        │      └───────┘
 └──────┬───────┘
        │
        ▼
   ╱ Identical ╲ Yes   ┌──────────────────────────────┐
  ╱ failure each ╲────▶│ —Check operating procedures. │
  ╲   time      ╱      │ —Check for possible logic    │
   ╲          ╱        │   errors in:                 │
       │ No           │   -Editing routines          │
       ▼              │   -Overlapping I/O or        │
  ┌───────┐           │    work areas                │
  │   I   │           └──────────────┬───────────────┘
  └───────┘                          │
                                     ▼
                              ╱ Any errors ╲  No    ┌───────┐
                             ╱              ╲──────▶ │   H   │
                             ╲              ╱        └───────┘
                                  │ Yes
                                  ▼
                           ┌──────────────────┐
                           │ — Correct errors.│
                           │ — Rerun.         │
                           └──────────────────┘
```

Figure 36 (Part 5 of 7). Operating Procedures for Incorrect Output

Figure 36 (Part 6 of 7). Operating Procedures for Incorrect Output

```
         ┌───────┐
         │   J   │
         └───┬───┘
             │
             ▼
┌─────────────────────────┐
│ Collect applicable      │
│ data, for example:      │
│ — Console log and       │
│   printer output        │
│   from failing          │
│   execution             │
│ — Output sample         │
│   of reported           │
│   problem               │
│ — Program listings      │
│ — Listings of users     │
│   routines              │
│ — Control routines      │
│ — Input data            │
└────────────┬────────────┘
             │
             ▼
┌─────────────────────────┐
│                         │
│ Contact IBM for         │
│ assistance.             │
│                         │
└─────────────────────────┘
```

Figure 36 (Part 7 of 7). Operating Procedures for Incorrect Output

Sometimes it is necessary to modify programs be-
tween regular maintenance releases of the system.
Such program modifications are made available in
the form of PTFs (program temporary fixes). PTFs
are distributed on a disk pack and are accompanied
by a cover letter which identifies the contents of the
pack.

PTF application can be divided into two parts:

1.   Verification of PTF pack contents.

2.   PTF application.

Verification of PTF Contents

The system containing the Library Maintenance pro-
gram ($MAINT) msut reside on F1. The programs
and modules to which PTFs are to be applied must
be in the F1 object library or copied there before
starting this procedure.

Mount PTF pack on R1

Perform IPL from F1 (see *Model
6 Operator IPL Procedures*)

List PTF pack directory using
the following prompting sequence.

System Prompts	Operator Responds
READY	CALL
CALL NAME	PTFLST
UNIT	R1
MODIFY	RUN

Each directory entry includes the PTF order number,
related program number, version and modification
level of the related program, related APAR (author-
ized program analysis report) number, and name of
the procedure that applies the PTF (PTFnnn).

You should list each PTF and read the comments to
be certain that this is the correct PTF. Sometimes a
PTF is dependent upon another PTF having already
been applied; you can get this information by reading
the cover letter and the listing.

List each PTF using the
following prompting sequence.

System Prompts	Operator Responds
READY	LOAD
LOAD NAME	$MAINT (This procedure loads $MAINT which will list PTFnnn.)
UNIT	F1
MODIFY	RUN
ENTER '//'	// COPY FROM-R1, TO-
CONTROL STATEMENT	PRINT, LIBRARY-P, NAME-PTFnnn (The 3-digit number, nnn, identifies the specific PTF requested and is obtained from the cover letter that arrives with the pack. The procedure PTFnnn applies the PTF to programs on F1.
ENTER '//'	// END
CONTROL STATEMENT	

Examine the contents of each PTF
before applying.

Applying the PTF

Perform PTF pack verification

Use the following prompting sequence
to apply the required PTF.

System Prompts	Operator Responds
READY	CALL
CALL NAME	PTFnnn
UNIT	R1
MODIFY	RUN

Are there more PTFs to apply?

Yes ◄   ► No

PTF application is com-
plete and you are ready
to copy the updated pro-
grams and modules to
other libraries on user
packs mounted on R1, as
required. Use the Library
Maintenance program
($MAINT) to do the
copying.

READER'S COMMENT FORM

IBM System/3   GC21-7501-3
Model 6
Operator's Guide

YOUR COMMENTS, PLEASE . . .

Your comments assist us in improving the usefulness of our publications; they are an important
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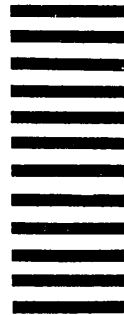   ● Thank you for your cooperation. No postage necessary if mailed in the U.S.A.

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