

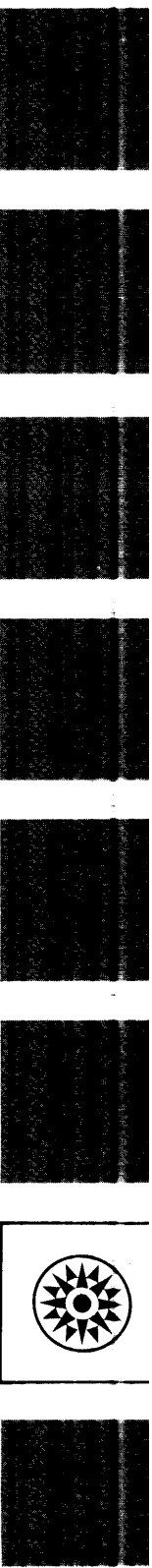
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**IBM System/360 Operating System and
1130 Disk Monitor System:
User's Guide for Job Control
From an IBM 2250 Display Unit
Attached to an IBM 1130 System**

Preliminary Specifications

This publication describes how a person at an IBM 2250 Display Unit attached to an IBM 1130 Computing System can define and initiate jobs to be processed by the IBM System/360 Operating System. The job defined at the display unit can either be processed independently in the System/360 or can be processed in conjunction with a related program in the 1130. The publication discusses the job control operations that are available to the 2250 user and provides supplementary information to assist the user at the display unit. A complete sample job is included with text and illustrations.

The information on job control operations is written for a person who is not familiar with either the IBM System/360 Operating System, the IBM 1130 Computing System, or the IBM 2250 Display Unit.



PREFACE

Job control from the 1130/2250 subsystem is accomplished by a program called the Satellite Graphic Job Processor. This publication describes the job control operations available at a display unit using the Satellite Graphic Job Processor.

The publication is divided into five major sections, appendixes, and a glossary of important terms used in the text.

- The first section provides an introduction to the Satellite Graphic Job Processor and includes a general description of the subsystem, job processing, and the job control operations available at the display unit.
- The second section orients the reader to the display unit as it is used in the Satellite Graphic Job Processor environment.
- The third section provides a detailed description of each job control operation available with the Satellite Graphic Job Processor.
- The fourth section describes a sample job at the display unit.
- The fifth section describes the types of messages that may be returned to the user by the Satellite Graphic Job Processor.

There are no prerequisite readings for this publication. The following publications are recommended if the user wishes to increase his knowledge of the IBM 2250 Display Unit, the IBM 1130 Computing System, or of the IBM System/360 Operating System Job Control Language:

IBM 1130 Computing System Component Description: IBM 2250 Display Unit Model 4, Form A27-2723

IBM 1130 Disk Monitor System, Version 2: Programming and Operator's Guide, Form C26-3717

IBM System/360 Operating System: Job Control Language, Form C28-6539

Information that will assist in planning for use of the Satellite Graphic Job Processor can be found in Appendix D.

First Edition (November 1967)

Specifications contained herein are subject to change from time to time. Any such change will be reported in subsequent revisions or in Technical Newsletters.

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INTRODUCTION. 5

The Satellite Graphic Job Processor 5

System-User Communication 6

System Requirements 9

USER ORIENTATION TO THE IBM 2250 DISPLAY UNIT 10

Features of the Display Unit. 10

Using the Display Unit. 11

 Positioning the Cursor 11

 Entering Alphameric Information. 11

 Selecting Job Control Operations From Select Frames. 11

 Selecting Options From Parameter Frames. 12

 The END Function 12

 The CANCEL Function. 12

JOB CONTROL OPERATIONS. 14

LOG ON. 14

SPECIFY JOB STEP. 15

BEGIN PROCEDURE 17

DESCRIBE DATA 18

BEGIN JOB 21

SPECIFY 1130 PROGRAM. 22

WRITE MESSAGE 23

ENTER DATA. 24

CANCEL JOB. 26

RECALL. 26

LOG OFF 28

A SAMPLE JOB AT THE 1130/2250 SUBSYSTEM 29

Sample Job. 29

MESSAGES. 43

APPENDIX A: RELATION OF FRAME REQUESTS TO JOB CONTROL LANGUAGE
(JCL). 45

APPENDIX B: PRINTED RECORD FORMAT 47

APPENDIX C: PROGRAMMING CONSIDERATIONS FOR THE SATELLITE
GRAPHIC JOB PROCESSOR 48

 Writing Cataloged Procedures to Be Invoked Through SGJP. 48

APPENDIX D: OPERATIONAL CHARACTERISTICS OF THE SATELLITE	
GRAPHIC JOB PROCESSOR	49
Composition of the Satellite Graphic Job Processor	49
Functioning of the Satellite Graphic Job Processor	51
GLCSSARY.	53
INDEX	55

ILLUSTRATIONS

Figure 1. Sample Select Frame	7
Figure 2. Sample Parameter Frame--SPECIFY JOB STEP.	8
Figure 3. LOG ON Frame.	14
Figure 4. SPECIFY JOB STEP Frame.	16
Figure 5. DESCRIBE DATA Frame	18
Figure 6. SPECIFY 1130 PROGRAM Frame.	22
Figure 7. WRITE MESSAGE Frame	23
Figure 8. ENTER DATA Frame.	24
Figure 9. RECALL Frame.	27
Figure 10. General Relationship of Machine and Program Components.	50

The 1130/2250 subsystem (hereafter referred to as a subsystem) consists of an IBM 2250 Display Unit, Model 4, attached to an IBM 1130 Computing System. The subsystem is connected to a System/360. This combination makes it possible for the user of a subsystem to employ the high-speed computational capability and large storage capacity of the System/360. Actual control of a System/360 program (and a related 1130 program, if specified) is accomplished by means of the Satellite Graphic Job Processor.

THE SATELLITE GRAPHIC JOB PROCESSOR

The Satellite Graphic Job Processor (SGJP) is a program that elicits job control information from a user at the display unit, enabling him to process a job exclusively in the System/360 or concurrently in the System/360 and the subsystem. SGJP interprets the job control information entered through the display unit and converts it into a language (Job Control Language) meaningful to the System/360 Operating System (hereafter referred to as the operating system). In this way, the non-programmer user is provided with a convenient and rapid method of initiating and processing his job.

A job is defined as the fundamental unit of work for a computing system as seen by the user. A job may consist of one or more job steps, each of which requests the processing of a program or procedure.

Job control operations provide the job control information necessary to define jobs step-by-step, to describe data characteristics and device requirements related to job steps, and to start the processing of jobs. Job control information is presented to the operating system from the subsystem by means of SGJP.

The job control operations available with SGJP and their functions are listed below. They are discussed fully in the section "Job Control Operations."

<u>Operation</u>	<u>Function</u>
LOG ON	Identifies the user to the operating system.
SPECIFY JOB STEP	Names a program or procedure to be executed in the System/360.
BEGIN PROCEDURE	Causes a named procedure to be processed as a foreground job in the System/360.
DESCRIBE DATA	Identifies data to be used in the specified System/360 job step.
BEGIN JOB	Starts the processing of the defined System/360 job.
SPECIFY 1130 PROGRAM	Names an 1130 program that is to run in conjunction with a program in the System/360.
WRITE MESSAGE	Sends a message to the System/360 operator and handles a reply to the 2250 user.

ENTER DATA	Allows 80-character records to be entered from the display unit or a card reader for use by the System/360 program.
CANCEL JOB	Deletes the job that is currently being defined.
RECALL	Allows the user to re-examine and modify previously completed job control operations.
LOG OFF	Completes user interaction with the display unit and frees it for the next user.

The above operations can be used to describe and start the processing of all types of application jobs (for example a graphic program, an assembly, a service program, etc.) directly from the display unit. A job initiated at the subsystem can be designated to process as either a foreground or background job.

A foreground job is a job processed concurrently within the operating system and the subsystem. Until the job has been processed, the subsystem is not free for further job control operations.

A background job is a job processed exclusively in the operating system; that is, it is not associated with the subsystem. Note that a background job is not processed in the same area of the operating system that is reserved for a foreground job. Once the user has indicated that a background job is to be processed, he receives no further communication from the system regarding the status of that job. He is then free to continue defining jobs at the subsystem, regardless of whether or not the background job has been processed.

SYSTEM-USER COMMUNICATION

To enable the selection and performance of job control operations, SGJP establishes communication between the user at the subsystem and the operating system by means of displayed frames.

The frames are displays that request the entry of job control information from the user. Each information request is indicated by a word or phrase. The entry area related to the individual request is indicated by a short underscore (not the cursor) or a rectangular box where an entry is to be made.

The frames are displayed in a logical sequence (that is, only as they are applicable to the user's job). Through interaction with SGJP, the user's responses to the frames convey the information necessary to process his jobs.

default parameter options (the assumed options if no others are specified) are completely underscored. Parameters are entered in the frame by the user from the alphameric keyboard.

The message area is used to display status information, diagnostic messages, or replies from the system operator.

The key area displays the words END and CANCEL which may be used to perform the END and CANCEL functions with the light pen. Because they perform the same functions as the END and CANCEL keys on the alphameric keyboard, they are referred to as the END key and CANCEL key.

SYSTEM REQUIREMENTS

The following computing devices and programming services are required for use of the Satellite Graphic Job Processor:

- An IBM System/360 Model 40, 50, 65, 67 (operating in 65 mode), or 75. The amount of main storage and disk storage required depends upon the multiprogramming configuration of the System/360 Operating System under which SGJP is operating. SGJP must be used with one of the multiprogramming configurations (MFT II or MVT) of the operating system.
- An IBM 2701 or 2703 Data Adapter capable of supporting Binary Synchronous Communications in half-duplex, point-to-point environment. The data adapter must be designated for use with extended binary-coded-decimal interchange code (EBCDIC) and users of the Dual Control Feature on the 2701 must specify EBCDIC as Code A. Users of the Dual Communications Interface on the 2701 must specify the 1130/2250 subsystem line as Interface A.
- An IBM 1130 Computing System with the following:
 - An IBM 1131 Central Processing Unit, Model 2 or 3 (16K or larger), with the Single (or Multiple) Disk Storage Feature and the Synchronous Communications Adapter.
 - An IBM 1132 Printer or an IBM 1403 Printer (if the PRINTED RECORD option is to be used).
 - An IBM 1142 Card Read/Punch, or an IBM 2501 Card Reader with an IBM 1442 Card Punch.
- In the 1130, the SGJP must operate under the IBM 1130 Disk Monitor, Version 2.
- An IBM 2250 Display Unit, Model 4, equipped with the light pen and alphameric keyboard.

Users who want to employ switched network data sets must perform their own procedures to establish the point-to-point environment necessary for the SGJP data transmission modules. These procedures can be manually implemented by the user's operators or can be performed by user-written library routines.

USER ORIENTATION TO THE IBM 2250 DISPLAY UNIT

This section is provided to familiarize the reader with the features of the display unit. It describes how the user enters information into the display unit by means of the select and parameter frames and explains the use of the END and CANCEL functions.

Throughout this publication, the term display unit is used to refer to the IBM 2250 Display Unit Model 4 attached to an IBM 1130 Computing System.

FEATURES OF THE DISPLAY UNIT

The user should be familiar with the screen, cursor, light pen, and keyboard features of the display unit.

SCREEN A television-like screen upon which the frames created by the SGJP are displayed.

CURSOR A dash appearing on the screen to identify the position at which the next character entered from the alphameric keyboard will be displayed. The cursor is initially positioned above the short underscore or within the box of the first entry area. It is later positioned to other entry areas either automatically by SGJP or manually by the user.

LIGHT PEN A pen-like instrument which, when activated on the screen, can be used to indicate choices or to position the cursor.

ALPHAMERIC KEYBOARD A typewriter-like keyboard which is used to enter alphameric information and perform special functions.

For performing special functions, the following additional keys are provided on the alphameric keyboard:

ALTN CODING: When depressed, allows the END or CANCEL function to be performed from the keyboard.

END: When depressed in conjunction with the ALTN CODING key, causes the END function to be performed.

CANCEL: When depressed in conjunction with the ALTN CODING key, causes the CANCEL function to be performed.

JUMP: When depressed, advances the cursor to the next entry area. If the cursor is already in the last entry area of a frame, the cursor returns to the first entry area of the frame.

SPACE BAR: When depressed, advances the cursor one position and enters a blank. If the cursor is at the end of the entry area, a blank is entered but the cursor is not advanced.

ADVANCE: When depressed, advances the cursor one position without entering a blank. If the cursor is at the end of the entry area, the ADVANCE key is not effective.

BACKSPACE: When depressed, backspaces the cursor one position without entering a blank. If the cursor is at the beginning of the entry area, the BACKSPACE key is not effective.

CONTINUE: When depressed, allows continuous automatic use of the space bar, ADVANCE key, BACKSPACE key, or any standard character key.

USING THE DISPLAY UNIT

To respond to the select and parameter frames displayed on the screen, the user must know how to position the cursor, enter alphameric information, and select operations or options. He must also know when and how to perform the END and CANCEL functions. The following paragraphs discuss these procedures.

POSITIONING THE CURSOR

If the cursor is not displayed at the desired entry area, the user positions it with either the alphameric keyboard or the light pen.

- With the keyboard, the user depresses the JUMP key to move the cursor in a forward direction from its present position to the beginning of the next entry area for requested information.
- With the light pen, the user activates the pen on any portion of a displayed request word or phrase to move the cursor to the entry area associated with that request.

Once the cursor is displayed at the desired entry area, the user can position it within the entry area from the alphameric keyboard with the ADVANCE key or the BACKSPACE key.

ENTERING ALPHAMERIC INFORMATION

The user enters textual information on a frame by using the alphameric keyboard. As characters are depressed at the keyboard, they are displayed on the frame in the entry area where the cursor is displayed. The cursor moves forward automatically as characters are entered, indicating the position that the next character may occupy on the frame.

In all cases, a limited number of characters can be entered into an entry area requesting alphameric information. If the user enters more than the specified number, the last character of the entry area is continually overlaid.

NOTE: Typing errors can be corrected by repositioning the cursor to the error and depressing the correct character key.

SELECTING JOB CONTROL OPERATIONS FROM SELECT FRAMES

When the entry area precedes the name of the operation, the user selects a job control operation with either the alphameric keyboard or the light pen.

- With the keyboard, the user depresses the JUMP key to position the cursor to the entry area (underscore) that corresponds with the desired operation, enters any non-blank character from the alphameric keyboard, and then performs the END function to indicate that an operation has been selected.

- With the light pen, the user activates the pen while it is positioned at the desired operation. Selection is recognized immediately without the use of the END function.

When an entry area follows the name of the operation, the user must enter alphameric information to make the selection and then perform the END function.

SELECTING OPTIONS FROM PARAMETER FRAMES

To select an option (other than a default option), the user indicates his selection with the alphameric keyboard or the light pen. A default option (underscored on the screen) is one that is assumed by the operating system if no selection is specified by the user.

- With the keyboard, the user depresses the JUMP key to position the cursor to the entry area that corresponds with the desired option and enters any non-blank character from the alphameric keyboard.
- With the light pen, the user activates the pen while it is positioned at the desired option. To acknowledge the selection, an 'X' will appear in the entry area that precedes the selected option.

If the user wishes to change a selected option, he may do so with the alphameric keyboard or the light pen.

- With the keyboard, the user first positions the cursor to the entry area of the previous selection and erases the displayed character by depressing the space bar. Then he selects a new option as described above.
- With the light pen, the user need only select a new option and the previous selection is ignored.

THE END FUNCTION

The END function is used to signify the completion of a frame. Through it, the user indicates that he has finished entering information. The END function is always performed at the completion of a parameter frame. It is only performed at the completion of a select frame when the alphameric keyboard was used to select the operation.

After the END function is performed, the information specified by the user is processed. If no errors are detected, the next frame is displayed. If errors are detected, the appropriate messages are displayed.

The user performs the END function with the alphameric keyboard or the light pen.

- With the keyboard, the user holds down the ALTN CODING key and then depresses the END key.
- With the light pen, the user activates the pen on any portion of the END key displayed on a parameter frame.

THE CANCEL FUNCTION

The CANCEL function has two uses with SGJP:

1. Before the user has logged on, the CANCEL function activates SGJP and causes the LOG ON frame to be displayed on the screen.

2. While the user is defining a job, the CANCEL function nullifies any information entered on a parameter frame and causes the previous select frame to reappear on the screen.

The user performs the CANCEL function with the alphameric keyboard or the light pen.

- With the keyboard, the user holds down the ALTN CODING key and then depresses the CANCEL key.
- With the light pen, the user activates the pen on any portion of the CANCEL key displayed on a parameter frame.

JOB CONTROL OPERATIONS

Job control information is entered into the subsystem by the user at the display unit. This section describes the job control operations that can be performed with the Satellite Graphic Job Processor and includes illustrations of the parameter frames related to these operations.

LOG ON

The LOG ON operation is the first operation performed at the display unit. It allows the user to identify himself to the operating system and to provide accounting information. LOG ON is accomplished by entering information in the LOG ON frame.

The LOG ON frame is obtained by depressing the CANCEL key on the alphameric keyboard when a display unit is not in use. This frame, shown in Figure 3, is a parameter frame that requests the user's name and account code and permits the inclusion of optional information. It also contains a list of OPERATIONAL HINTS for completing all frames.

LOG ON:

USER'S NAME

ACCOUNT

OTHER

 PRINTED RECORD

 DISCONNECT THE SUBSYSTEM

*****OPERATIONAL HINTS*****

1. USE THE KEYBOARD TO ENTER ALPHAMERIC INFORMATION.
2. ENTRY AREAS ARE INDICATED BY A SHORT UNDERSCORE OR A BOX. BOXED ENTRY AREAS DENOTE REQUIRED INFORMATION.
3. BEFORE ENTERING ALPHAMERIC INFORMATION, POSITION THE CURSOR TO THE ENTRY AREA WITH THE JUMP KEY OR THE LIGHT PEN.
4. DESIGNATE A SELECTION WITH THE LIGHT PEN OR THE KEYBOARD. DEFAULT SELECTIONS ARE UNDERLINED.
5. THE END AND CANCEL KEYS ON THE SCREEN ARE EQUIVALENT TO THE KEYBOARD END AND CANCEL KEYS.
6. USE THE END KEY TO INDICATE FRAME COMPLETION. USE THE CANCEL KEY TO NEGATE A FRAME.

Figure 3. LOG ON Frame

Explanations of the information requested in the LOG ON frame are as follows:

USER'S NAME	A name (1-20 characters including blanks) to identify the user to the operating system. This is required information.
ACCOUNT	A project name or charge code (1-20 characters including blanks) used for accounting purposes. This is required information.
OTHER	Any additional information (1-20 characters including blanks) to be passed to the installation accounting routine. This information is optional.
PRINTED RECORD	An option which, if selected, allows the user to receive a printed list at the 1130 of the job control operations performed at the display unit (see Appendix B for the format of a printed record).
DISCONNECT THE SUBSYSTEM	An option which, if selected, disconnects the subsystem from the operating system, thereby terminating the operation of SGJP.

If the user performs the CANCEL function while the LOG ON frame is being displayed, a select frame appears on the screen. The select frame allows him to indicate whether he wants to proceed with the LOG ON operation or whether he wants to LOG OFF.

When all necessary information has been entered on the LOG ON frame, the user performs the END function to indicate that the frame is complete. If no errors are detected, a select frame is displayed which allows the user to choose a job control operation. The operations available after LOG ON are BEGIN PROCEDURE, SPECIFY JOB STEP, ENTER DATA, LOG OFF, and WRITE MESSAGE (see Figure 1 for an example of a select frame). If an error is detected, a message is displayed in the message area of the LOG ON frame. This message describes the error and allows the user to make corrections. When corrections have been made, the END function is performed again to indicate that the error has been corrected. The select frame then appears.

SPECIFY JOB STEP

The SPECIFY JOB STEP operation allows the user to define the requirements for a System/360 job step. The user performs this operation by entering information in the SPECIFY JOB STEP frame.

To obtain the SPECIFY JOB STEP frame, shown in Figure 4, the user selects SPECIFY JOB STEP from a select frame. The SPECIFY JOB STEP frame is a parameter frame that requests the name of a procedure or program and other optional information related to a job step.

A procedure is a set of job control statements that has been previously recorded in the operating system and which can be invoked by using the name assigned to the procedure. Within the procedure itself, references are made to program names. The name for a program is established by the user when the program is stored in the operating system.

```

SPECIFY JOB STEP:

PROCEDURE NAME 
OR
PROGRAM NAME 
SUBSYSTEM REFERENCE _

      ****OPTIONAL SPECIFICATIONS****

LIBRARY NAME _

PARAMETERS _

_ PROCESS IN BACKGROUND

OTHER _




```

Figure 4. SPECIFY JOB STEP Frame

Explanations of the information requested in the SPECIFY JOB STEP frame are as follows:

- | | |
|---------------------|---|
| PROCEDURE NAME | The name (1-8 characters) of a procedure to be processed in the System/360. Either a procedure name or a program name must be provided in the SPECIFY JOB STEP operation. |
| PROGRAM NAME | The name (1-8 characters) of a program to be processed in the System/360. |
| SUBSYSTEM REFERENCE | The symbolic name (1-17 characters) by which the procedure or program refers to the 1130/2250 subsystem. This information is required for foreground applications. |
| LIBRARY NAME | The name (1-44 characters) of the operating system library in which the <u>program</u> resides. If no name is specified, the standard system library is assumed. LIBRARY NAME is presented only on the first SPECIFY JOB STEP frame of a given job. |
| PARAMETERS | Additional information (1-40 characters) that is to be made available to a System/360 program or to the first step of a procedure. |

PROCESS IN BACKGROUND	An option which, if selected, causes this job to be processed as a background job in the System/360. This option should be selected only when the user wants a System/360 job to be executed independently of the 1130/2250 subsystem. This option is presented only on the first SPECIFY JOB STEP frame of a given job.
OTHER	Allows the entry of additional specifications for job step execution (1-50 characters). This information must be entered in actual Job Control Language format. This option is intended mainly for use by programmers.

When all necessary information has been entered, the user performs the END function to indicate that the frame is complete. If no errors are detected, a select frame is displayed to allow the user to continue job specifications. If an error is detected, a message is displayed in the message area of the SPECIFY JOB STEP frame. This message indicates the error and allows the user to make corrections. When the user has corrected the error, he performs the END function again. A new select frame then appears.

After completing a SPECIFY JOB STEP frame that names a program (rather than a procedure), each data set associated with that job step must be described by performing a separate DESCRIBE DATA operation. After completing a SPECIFY JOB STEP operation for a procedure, a DESCRIBE DATA operation is performed only when it is necessary to add a description of a data set to the procedure, or to override a data set description in the procedure.

BEGIN PROCEDURE

The BEGIN PROCEDURE operation provides a quick way for the user to initiate processing of a procedure as a foreground job. There is no parameter frame associated with this operation.

To perform the BEGIN PROCEDURE operation, the user positions the cursor to the underscore following BEGIN PROCEDURE on the select frame and enters the name of the procedure (1-8 characters) from the alphameric keyboard. He then performs the END function and the message JOB SCHEDULED AS Jxxxxyyy appears in the message area of the frame. (The Jxxxxyyy is the job identification number that SGJP has assigned to the job. See the section "Messages" for an explanation of the "xxxxyyy" portion of the identification number.) After the message appears, the user again performs the END function to initiate processing of the System/360 job. The SPECIFY 1130 PROGRAM frame then appears on the screen.

Use of the BEGIN PROCEDURE operation is equivalent to providing a procedure name on the SPECIFY JOB STEP frame and then designating the BEGIN JOB operation, with the following differences:

- Use of the BEGIN PROCEDURE operation causes the job to be automatically executed as a foreground job. It does not permit the user to specify that the procedure is to be executed as a background job.
- Use of the BEGIN PROCEDURE operation does not permit the user to specify additional parameters (such as SUBSYSTEM REFERENCE, LIBRARY NAME, etc.) that are available on the SPECIFY JOB STEP frame.

DESCRIBE DATA

The DESCRIBE DATA operation allows the user to supply information to describe a data set required for a System/360 job step. This operation must follow the specification of the job step with which the data set is associated. The user performs this operation by entering information on the DESCRIBE DATA frame.

To obtain the DESCRIBE DATA frame, shown in Figure 5, the user selects DESCRIBE DATA from a select frame. The DESCRIBE DATA frame is a parameter frame that requests the name of a data set, the data set reference, the present status of the data set, the future disposition of the data set, and additional information (if desired).

The information provided through the DESCRIBE DATA frame enables the operating system to locate an existing data set and to make the data set available for processing. If a new data set is to be created during the job step, the information provided by the user indicates the unit or volume on which the data set is to be stored and, for a direct access device, it indicates how much space is to be allocated for the data set. In either case, the frame allows the user to designate a disposition for the data set at the end of the job step.

```
DESCRIBE DATA:
  DATA NAME  _____
  DATA REFERENCE  _____
  INDICATE STATUS:  _ CATALOGED _ OLD
                   _ MOD _ SHARE _ NEW
  *****ADDITIONAL INFORMATION WILL BE REQUESTED FOR OTHER THAN*****
                   CATALOGED STATUS
  OTHER  _
  CHOOSE DISPOSITION:  _ KEEP  _ PASS  _ DELETE
                       _ CATLG  _ PRINT  _ PUNCH
  [ END ] [ CANCEL ]
```

Figure 5. DESCRIBE DATA Frame

Explanations of the information requested in the DESCRIBE DATA frame are as follows:

DATA NAME The name (1-44 characters) that identifies the data set to the user and to the operating system. This is required information.

DATA REFERENCE The name (1-17 characters) by which the System/360 program refers to the data set named above. This is required information.

INDICATE
STATUS The following options are used to describe the present status of the data set with respect to the job step. CATALOGED is a default option and is assumed if no option is selected. Note that the current status options other than CATALOGED are intended mainly for use by programmers.

CATALOGED: Indicates that the data set is available to the operating system and can be located automatically.

 OLD: Indicates that the data set is available to the operating system but cannot be found without additional information.

 MOD: Indicates that the data set is either CATALOGED or OLD and information is to be added to it.

 SHARE: Indicates that more than one user can have access to the data set. A shared data set is either cataloged or old; it must not be modified.

 NEW: Indicates that the data set is neither CATALOGED nor OLD but is to be created during the job step.

Note: When the user specifies a CATALOGED or SHARE (cataloged) data set, no additional information beyond the data name, the data reference, and status is required. The user, however, may want to specify a disposition. When the user specifies an OLD, MOD, SHARE (old), or NEW data set, he will be asked to provide additional information about the data set. The procedures for entering this additional information are discussed following the description of the CHOOSE DISPOSITION options.

OTHER Allows the entry of additional data definition parameters (1-50 characters), other than DATA NAME, DATA REFERENCE, STATUS, or DISPOSITION. This information must be entered in actual Job Control Language format. This option is intended mainly for use by programmers.

CHOOSE
DISPOSITION By designating one of the following dispositions, the user can indicate what is to be done with the data set after the job step is processed. Only one disposition may be selected. If the user does not specify any disposition for the data set, the system will assume the same disposition as the data set had at the beginning of the job step. A NEW data set will be deleted at the end of the job step unless the user specifies a different disposition option.

 KEEP: Indicates that the data set is to be retained.

 PASS: Indicates that the data set is to be referenced and redefined in a later job step of the current job

at which time its disposition may be altered. If the disposition is not altered before the end of the job, the data set is kept unless it was created during the job, in which case it is deleted.

DELETE: Indicates that the space occupied by the data set is to be released at the end of the current job step. This option must not be specified if the data set is to be shared.

CATLG: Indicates that the data set is to be retained and the data set name (DATA NAME) will be placed in the system catalog.

PRINT: Indicates that the data set will be printed at the System/360 and then deleted.

PUNCH: Indicates that the data set will be punched at the System/360 and then deleted.

As indicated on the DESCRIBE DATA frame, additional information is requested if other than CATALOGED status or SHARE (cataloged) status is designated. The procedures for entering this additional information are discussed in the following paragraphs.

If the status specified is OLD, MOD, or SHARE (old), the user must provide information about the current location of the data set. To secure this information, UNIT and VOLUME requests are added to the DESCRIBE DATA frame. They will be displayed immediately below the INDICATE STATUS options in the following format:

UNIT __

VOLUME __

The user then enters the additional information and performs the END function when the frame is complete.

Explanations of the UNIT and VOLUME requests are as follows:

UNIT A device name or number (1-8 characters or digits). This information is required when the data set is not cataloged and VOLUME information is not specified.

VOLUME A name or number (1-6 characters or digits) to specify the volume serial number. This information is required when the data set is not cataloged and UNIT information is not specified.

If the data set status is specified as NEW, the user must provide information on where the data set is to be stored and on the amount of space to be provided for the data set. UNIT and/or VOLUME information (as described above) or DIRECT ACCESS POOL are used to indicate where the data set is to be stored. SYSTEM ALLOCATE or values for TRACKS or CYLINDERS are used to specify the amount of space to be provided for the new data set.

The requests for this information are displayed on the frame immediately below the INDICATE STATUS options in the following format:

UNIT __ __ SYSTEM ALLOCATE

VOLUME __ TRACKS __

__ DIRECT ACCESS POOL CYLINDERS __

The user then enters the additional information and performs the END function when the frame is complete.

Explanations of the additional requests are as follows:

- DIRECT ACCESS POOL** An option which, if selected, causes the operating system to place the data set on a direct access device that has enough space to accommodate it. If this option is selected, values for UNIT or VOLUME must not be supplied.
- SYSTEM ALLOCATE** An option which, if selected, causes the operating system to allocate a predefined number of primary and secondary tracks. Unless changed by an installation, the system allocates 20 primary tracks and 5 secondary tracks (secondary tracks are provided whenever additional space is required). If this option is selected, values for TRACKS and CYLINDERS must not be supplied.
- TRACKS** The number (1-4 digits) of primary tracks to be allocated. If a number (1-4 digits) of secondary tracks is desired, it must be separated from the number of primary tracks by a comma. This information is required if CYLINDERS or SYSTEM ALLOCATE is not specified.
- CYLINDERS** The number (1-3 digits) of primary cylinders to be allocated. If a number (1-3 digits) of secondary cylinders is desired, it must be separated from the number of primary cylinders by a comma. This information is required if TRACKS or SYSTEM ALLOCATE is not specified.

When all desired information has been entered on the DESCRIBE DATA frame, the user performs the END function to indicate that the frame is complete. If no errors are detected, a select frame is displayed to allow the user to continue job specification. If an error is detected, a message is displayed in the message area of the DESCRIBE DATA frame. This message indicates the nature of the error and allows the user to make corrections. When corrections have been made, the END function must be performed again to indicate that the error has been corrected. The select frame then appears.

BEGIN JOB

The BEGIN JOB operation starts the processing of the System/360 job just defined by the user. There is no parameter frame associated with this operation. To perform BEGIN JOB, the user selects this operation from a select frame after he has completed specifications for a job to be processed.

Before processing of the job begins, the message JOB SCHEDULED AS Jxxxxyyy appears in the message area of the frame. (The Jxxxxyyy is the job identification number that SGJP has assigned to the job. See the section "Messages" for an explanation of the "xxxxyyy" portion of the identification number.) After the message appears, the user performs the END function to initiate processing of the System/360 job.

If the job is a background job, a new select frame is displayed that allows the user to continue job control operations required to process additional jobs. If the job is a foreground job, the SPECIFY 1130 PROGRAM frame is displayed.

SPECIFY 1130 PROGRAM

The SPECIFY 1130 PROGRAM operation allows the user to specify an 1130 program that is to run in conjunction with the program or procedure he specified to run in the System/360.

The SPECIFY 1130 PROGRAM frame, shown in Figure 6, is a parameter frame that is displayed only after the user has specified the BEGIN JOB operation for a System/360 foreground job or has specified the BEGIN PROCEDURE operation.

```

    SPECIFY 1130 PROGRAM
    NAME 
    END CANCEL

```

Figure 6. SPECIFY 1130 PROGRAM Frame

The explanation of the information request is as follows:

NAME	The name (1 to 5 characters) of the 1130 program to be run. The user enters the name from the alphameric keyboard and performs the END function to indicate that the frame is complete.
-------------	---

If the user wishes to run his job in the operating system without an associated 1130 program, he performs the END function without naming an 1130 program and the System/360 job begins processing. When the job has been processed, a select frame is displayed to allow the user to continue job control operations.

WRITE MESSAGE

The WRITE MESSAGE operation allows the user to communicate with the System/360 operator and to request a response from him. This operation may be performed any time after LOG ON. The user performs this operation by entering his message on the WRITE MESSAGE frame.

To obtain the WRITE MESSAGE frame, shown in Figure 7, the user selects WRITE MESSAGE from a select frame. The WRITE MESSAGE frame is a parameter frame that requests the text of the message and offers the option for a reply from the system operator.

The diagram shows a rectangular frame with a slightly rounded top. At the top left, the text "WRITE MESSAGE:" is displayed. Below this, there are two input fields: "TEXT =" followed by a blank line, and "_ REPLY" followed by a blank line. At the bottom of the frame, there are two rectangular buttons: "END" on the left and "CANCEL" on the right.

Figure 7. WRITE MESSAGE Frame

Explanations of the information requested in the WRITE MESSAGE frame are as follows:

- | | |
|-------|--|
| TEXT | The text of the message (1-126 characters including blanks) the user wishes to send to the System/360 operator. |
| REPLY | An option which, if selected, informs the System/360 operator that a reply to this message is expected. When the system operator responds, his reply appears in the message area of the WRITE MESSAGE frame. While a reply is pending, the END and CANCEL functions are inoperative. |

When the message is entered, with or without the REPLY option specified,

the user performs the END function to indicate that the frame is complete.

If the REPLY option is not selected, the END function causes a select frame to be displayed. If the REPLY option is selected, the END function does not cause the select frame to be displayed. Instead, the WRITE MESSAGE frame remains until the reply is received. After the reply has been received, another END function acknowledges the reply and causes the select frame to be displayed.

ENTER DATA

The ENTER DATA operation allows the user to enter data for a System/360 program in 80-character records via the card reader or the display unit. The data may consist of information for use in a job step, processor or utility control statements, or actual Job Control Language statements.

To obtain the ENTER DATA frame, shown in Figure 8, the user selects ENTER DATA from a select frame. The ENTER DATA frame is a parameter frame that has four 80-character entry areas. Each entry area is preceded by an asterisk.

```
ENTER DATA:
          ****UP TO 80 CHARACTERS PER RECORD****
= PROCESS IN BACKGROUND
_ CARD READER
*_
*_
*_
*_
_ MORE DATA FOLLOWS

[END] [CANCEL]
```

Figure 8. ENTER DATA Frame

Explanations of the information requested in the ENTER DATA frame are as follows:

PROCESS IN
BACKGROUND

An option which, if selected, causes the job to be processed in the background. This option appears on the frame only if the user has not performed the SPECIFY JOB STEP operation (i.e., if no Job Control Language has been created) for the current job. If this option is selected, it is assumed that the user will provide the first one or more job control statements for the job as 80-character card images (in actual Job Control Language format) via the ENTER DATA operation.

CARD READER

An option which, if selected, allows the user to enter data from a card reader attached to the subsystem. If this option is selected, the null or delimiter card (// or /*) will perform the END function automatically and a select frame will be displayed. There is no limit on the number of cards that may be read. (Note to Programmer: Actual job control statements can be entered through the card reader.)

MORE DATA
FOLLOWS

An option which, if specified, causes another ENTER DATA frame to be displayed allowing the user to enter additional data records.

If the CARD READER option is not selected, the user must enter each data record from the alphanumeric keyboard. After each entry has been completed, another entry may be made by positioning the cursor to the next entry area. A maximum of four data records may be entered in one frame. All data, except a JOB statement, is accepted exactly as entered. A JOB statement is not accepted as valid input. It is automatically deleted and a message stating this fact is displayed.

If the user wants to enter no more than four data records, he completes the desired number of records and performs the END function. A select frame will be displayed.

If the user enters four data records and wants to enter more records, he designates the MORE DATA FOLLOWS option and performs the END function. Another ENTER DATA frame is displayed to allow further data records to be entered. Additional ENTER DATA frames can be acquired in this manner until the user has entered all of his data records. He then performs the END function (without designating MORE DATA FOLLOWS) to obtain the select frame.

A history number is assigned to each 80-character record entered on the frame or through the card reader. In the history area, the word DATA precedes the first record, but does not precede subsequent records entered during the operation.

In certain cases in which the frame contains blank records, a message is displayed asking the user to confirm that he wants the blank records accepted. The cases in which this occurs are:

- All records on the frame are blank.
- One or more blank records appear between non-blank records.
- The blank records are the last records on the frame and the user has designated the MORE DATA FOLLOWS option.

In these cases, the blank records are accepted if the user again performs the END function. If the user does not want the blank records, he should change the records before performing the END function.

CANCEL JOB

The CANCEL JOB operation allows the user to nullify the job control operations performed since the last LOG ON, BEGIN JOB, BEGIN PROCEDURE CANCEL JOB, or RECALL operation. Any job that is still being defined can thus be terminated before it is processed. There is no parameter frame associated with this operation.

To perform CANCEL JOB, the user selects this operation from a select frame. Another select frame is then displayed.

RECALL

The RECALL operation allows the user to re-examine all previously completed operations in the current job and to accept, omit, insert, or modify these operations as he desires.

This operation is useful when the user realizes that he wants to change information in a previous operation in the job currently being defined, or that he has omitted an operation from the job. The option is also useful when a user wants to rerun the current job with or without altering operations in the job.

With RECALL, the user is able to return to the first operation in the job and re-examine each operation in the job. A job begins with the first operation after a LOG ON, BEGIN JOB, BEGIN PROCEDURE, CANCEL JOB, or RECALL operation. The first operation the user re-examines is either:

- The first operation in the job currently being defined (i.e., the user has not yet performed a BEGIN JOB or BEGIN PROCEDURE operation for the job), or
- The first operation in the job just run (i.e., the user has just performed a BEGIN JOB or BEGIN PROCEDURE operation).

In effect, the user returns to the point at which he was about to perform the first operation in the job. He then moves from one operation to the next, making changes as required. As he accepts, modifies, and inserts operations, he is defining a new job.

To obtain the RECALL frame shown in Figure 9, the user selects RECALL from a select frame. The fact that the user has selected RECALL is reflected by a RECALL entry in the history area of the frame. The particular operation the user is currently re-examining is indicated by an entry that follows the words "CURRENT ITEM". The RECALL frame provides options to accept, modify, or omit the indicated operation or to insert an operation. The user selects one of the options to designate the action he wants to take with respect to the indicated operation.

Explanations of the options on the RECALL frame are as follows:

ACCEPT

Signifies that the user wants to include the indicated operation in the new job. The RECALL frame remains on the screen, but the next operation is shown after "CURRENT ITEM". ACCEPT is a default option and is assumed if no option is selected.

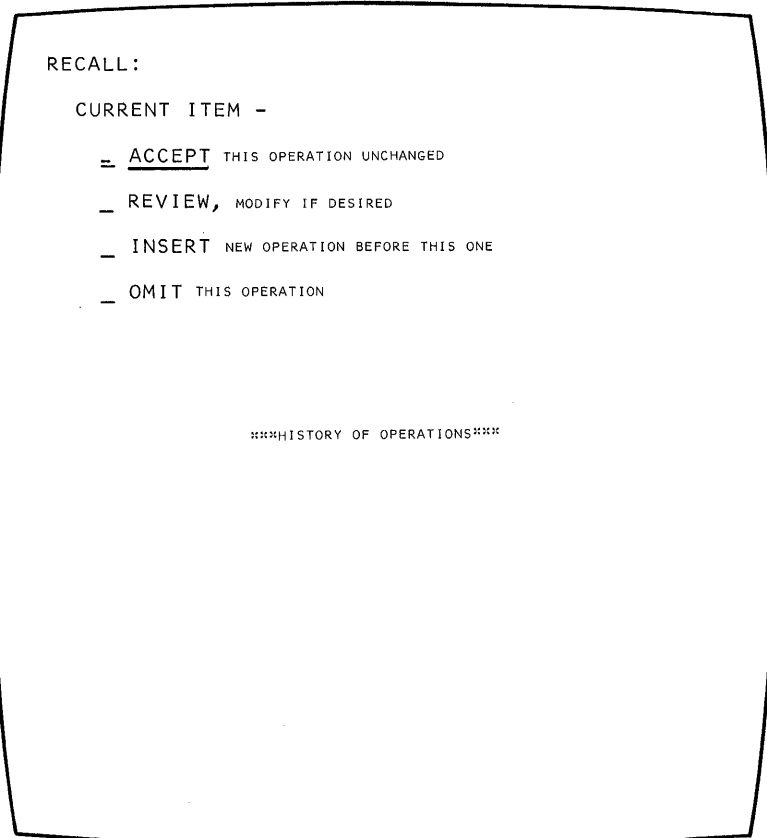


Figure 9. RECALL Frame

REVIEW, MODIFY Signifies that the user wants to review and possibly change parameter information in the indicated operation before including it in the new job. The original parameter frame for the operation appears on the screen. The parameter frame contains all of the user-supplied information as it appeared upon completion of the frame in the current job. The user modifies parameters in the frame, if desired, and performs the END function. The RECALL frame reappears on the screen, and the next operation is shown after "CURRENT ITEM".

INSERT Signifies that the user wants to insert an operation preceding the indicated operation. A select frame appears on the screen. The user selects an operation, completes the parameter frame, and performs the END function. The RECALL frame reappears on the screen; the indicated operation remains the same.

OMIT Signifies that the user wants the indicated operation omitted from the new job. The RECALL frame remains on the screen and the next operation is shown after "CURRENT ITEM".

As the user completes each operation, an entry for that operation is placed in the history area. The entries are numbered sequentially after the entry for the RECALL operation itself. Operations accepted without change are assigned new history numbers according to the point at which they appear in the sequence of operations for the new job.

When the user recalls an ENTER DATA operation, one 80-character record at a time is recalled and presented to the user. The user can accept, modify, omit, or insert records as he desires.

The user should note that selection of ACCEPT when the indicated operation is a BEGIN JOB operation causes the new job to be executed. Thus, if a user wants to rerun a job without changing it, he can repeatedly select ACCEPT for each operation up to and including the BEGIN JOB operation, and the job will be re-executed.

If, while the user is recalling operations, he decides that he does not want to process the job, the user can select the INSERT option and then designate the CANCEL JOB operation on the select frame that appears. This action terminates the RECALL operation and avoids processing of the job.

LOG OFF

The LOG OFF operation allows the user to halt the activity of SGJP when he has completed his operations at the subsystem. There is no parameter frame associated with this operation.

To perform LOG OFF, the user selects this operation from a select frame. This results in a blank screen at the display unit. Another user can then obtain the LOG ON frame by performing the CANCEL function from the keyboard.

This section provides a sample job that is initiated and processed by a non-programmer user at the subsystem. Illustrations of the frames that accompany the job control operations at the display unit are included. A printed record of this job is shown in Appendix B.

For detailed discussions on how to enter alphanumeric information from the keyboard, select operations or options, position the cursor, and perform the END or CANCEL functions, refer to the section entitled "Using the Display Unit." Detailed explanations of each job control operation available with the Satellite Graphic Job Processor are contained in the section "Job Control Operations."

SAMPLE JOB

John Doe, a user, is sitting at a display unit that is not in use. He wishes to process a job to design a lens at the display unit. This job consists of one System/360 job step that is executed in conjunction with a related 1130 program.

The System/360 job step calls for execution of a program named LENSDESN which will perform the calculations for the lens display. LENSDESN uses a previously created data set named LENSSAVE. The subsystem is referenced as DEVICE1 by the program. The data set is referenced as OUTPUT and is to be retained at the end of the job step.

The 1130 program, named LENS, operates in the subsystem in conjunction with the System/360 program. LENS contains the specifications for a "thin lens" design, except for two user-supplied parameters that specify the aperture and focal length of the lens. During processing, LENS accepts data entered from the 2250 display unit and transmits it to the System/360 program where computations for the lens display are performed. When the System/360 program has completed the calculations, it transfers the results to LENS. LENS then displays the results on the 2250 screen.

The procedures for defining the job control operations for this job are described on the following pages.

Note that, during definition of the job, the user recognizes an error in a job control operation he has already completed and uses the RECALL operation to correct the error. He then completes the definition of the job and starts processing.

The first thing the user must do is identify himself to the operating system and provide his account number of JS0361984. By performing the CANCEL function from the keyboard he obtains the LOG ON frame. First, he enters his name in the frame from the alphameric keyboard. Then, he positions the cursor on the screen to ACCOUNT and enters his account identification from the keyboard. To obtain a list of the job control operations that he performs, he also selects the PRINTED RECORD option. An example of this record can be found in Appendix B.

LOG ON:

USER'S NAME

ACCOUNT

OTHER _

X_PRINTED RECORD

_ DISCONNECT THE SUBSYSTEM

****OPERATIONAL HINTS****

1. USE THE KEYBOARD TO ENTER ALPHAMERIC INFORMATION.
2. ENTRY AREAS ARE INDICATED BY A SHORT UNDERSCORE OR A BOX.
BOXED ENTRY AREAS DENOTE REQUIRED INFORMATION.
3. BEFORE ENTERING ALPHAMERIC INFORMATION, POSITION THE CURSOR TO THE ENTRY AREA WITH THE JUMP KEY OR THE LIGHT PEN.
4. DESIGNATE A SELECTION WITH THE LIGHT PEN OR THE KEYBOARD. DEFAULT SELECTIONS ARE UNDERLINED.
5. THE END AND CANCEL KEYS ON THE SCREEN ARE EQUIVALENT TO THE KEYBOARD END AND CANCEL KEYS.
6. USE THE END KEY TO INDICATE FRAME COMPLETION. USE THE CANCEL KEY TO NEGATE A FRAME.

At this point, the user has completed the LOG ON operation. He performs the END function to indicate that he has finished entering information on the LOG ON frame.

A select frame now appears on the screen. Displayed in this frame are the various job control operations the user can perform at this time. The first entry in the history area of the frame reflects the LOG ON operation he has just completed. The user now selects SPECIFY JOB STEP in order to define the System/360 program.

```
SELECT:
  BEGIN PROCEDURE _
  X_SPECIFY JOB STEP
  _ ENTER DATA
  _ WRITE MESSAGE
  _ LOG OFF

      ****HISTORY OF OPERATIONS****
001 LOGON      JOHN DOE
```

The SPECIFY JOB STEP frame now appears on the screen. This frame requests certain information about a job step, such as the name of the procedure or program, subsystem reference, and other optional specifications.

The user begins SPECIFY JOB STEP by entering the name of the program (LENSESN) from the alphameric keyboard. To indicate that his job step is a program, he enters the name after the PROGRAM NAME option. Then, since this program will process the System/360 program in conjunction with an 1130 program (LENS), he enters the subsystem reference, DEVICE1, from the alphameric keyboard. The subsystem reference is a symbolic name by which the user's System/360 program refers to the subsystem. The user then enters from the keyboard the parameters (aperture of 5.0 and focal length of +4.2) necessary for his program. The frame now appears as follows:

```

SPECIFY JOB STEP:

PROCEDURE NAME 
OR
PROGRAM NAME 

SUBSYSTEM REFERENCE DVICE1

          *
      ****OPTIONAL SPECIFICATIONS****

LIBRARY NAME _

PARAMETERS APERT=05.00,FOCLEN=+4.20

_ PROCESS IN BACKGROUND
OTHER _




```

Since all information necessary for his job has been entered in the frame, the user performs the END function to indicate that the SPECIFY JOB STEP operation is complete.

A second select frame appears on the screen displaying the job control operations now available to the user. The second entry in the history area reflects the SPECIFY JOB STEP operation. To describe his data set, the user selects DESCRIBE DATA.

```
SELECT:
  BEGIN PROCEDURE _
  _ SPECIFY JOB STEP  X_DESCRIBE DATA
  _ ENTER DATA      _ BEGIN JOB
  _ WRITE MESSAGE    _ CANCEL JOB
  _ LOG OFF
  _ RECALL

          ****HISTORY OF OPERATIONS****
001 LOGON      JOHN DOE
002 JOB STEP   LENSDESN
```

The DESCRIBE DATA frame now appears on the screen. This frame requests the information necessary for the user to identify his data set, such as the data set name, the data reference by which the System/360 program refers to the data set, and other specifications.

The user begins the DESCRIBE DATA operation by entering the name of his data set, LENS SAVE, from the alphanumeric keyboard. Then, he positions the cursor to DATA REFERENCE and enters the name OUTPUT from the alphanumeric keyboard. Options for status and disposition can now be specified. The user knows that the data set is CATALOGED, i.e., it already exists and can be found automatically by the operating system. The user does not have to specify CATALOGED, however, because it is a default option (note underscore on frame). Furthermore, the user does not have to specify a disposition since he wishes to retain the data set and the operating system (if he specifies no option) will assume the disposition already assigned to the data set (KEEP).

```
DESCRIBE DATA:
  DATA NAME  LENS SAVE
  DATA REFERENCE  OUTPUT
  INDICATE STATUS:  _ CATALOGED  _ OLD
                   _ MOD  _ SHARE  _ NEW
  ****ADDITIONAL INFORMATION WILL BE REQUESTED FOR OTHER THAN****
                   CATALOGED STATUS
  OTHER  _
  CHOOSE DISPOSITION:  _ KEEP  _ PASS  _ DELETE
                      _ CATLG  _ PRINT  _ PUNCH
  END  CANCEL
```

The user now performs the END function to indicate that the DESCRIBE DATA frame has been completed.

A third select frame is now displayed on the screen. At this point, however, the user suddenly realizes that he meant to specify a focal length of 4.02 (instead of 4.20) as the parameter for his lens specification in the SPECIFY JOB STEP operation. The user decides to correct the operation in which he provided the focal length parameter. To re-examine the operations in his job, he selects RECALL on the select frame.

```
SELECT:

  BEGIN PROCEDURE _
  _ SPECIFY JOB STEP _ DESCRIBE DATA
  _ ENTER DATA      _ BEGIN JOB
  _ WRITE MESSAGE    _ CANCEL JOB
  _ LOG OFF
  X-RECALL

                                     ****HISTORY OF OPERATIONS****
001 LOGON      JOHN DOE
002 JOB STEP   LENSDESH
003 DESCRIBE   LENS SAVE
```

The RECALL frame appears on the screen with the first operation in the job (after LOG ON) indicated after "CURRENT ITEM". Because it was during this operation (SPECIFY JOB STEP) that the user specified the parameter that he now wishes to change, he selects the MODIFY option. The RECALL frame appears as follows:

```
RECALL:

CURRENT ITEM - 002 JOB STEP LENSDESN

  _ ACCEPT THIS OPERATION UNCHANGED
  X_REVIEW,  MODIFY IF DESIRED
  _ INSERT NEW OPERATION BEFORE THIS ONE
  _ OMIT THIS OPERATION

                                     *****
                                     HISTORY OF OPERATIONS*****
001 LOGON      JOHN DOE
002 JOB STEP LENSDESN
003 DESCRIBE LENS SAVE
004 RECALL
```

He performs the END function and the SPECIFY JOB STEP frame is now displayed as it appeared when the user had completed this operation earlier in his job.

The user positions the cursor to the entry area following PARAMETERS on the frame. He uses the ADVANCE key to position the cursor to the desired point of change and enters 02 in place of the previous 20. The frame now appears as follows:

```
SPECIFY JOB STEP:

PROCEDURE NAME 
OR
PROGRAM NAME 

DISPLAY UNIT REFERENCE DEVICE1

      ***OPTIONAL SPECIFICATIONS***

LIBRARY NAME _

PARAMETERS APERT=05.00,FOCLEN=+4.02

_ PROCESS IN BACKGROUND
OTHER _



```

Since this was the only change he wished to make, he performs the END function and the RECALL frame is displayed again.

The next operation (DESCRIBE DATA) is shown after "CURRENT ITEM" and the SPECIFY JOB STEP has been added to the history area of the frame. The frame appears as follows:

```
RECALL:

CURRENT ITEM - 003 DESCRIBE LENSSAVE

  _ ACCEPT THIS OPERATION UNCHANGED
  _ REVIEW,  MODIFY IF DESIRED
  _ INSERT  NEW OPERATION BEFORE THIS ONE
  _ OMIT   THIS OPERATION

                                     ****HISTORY OF OPERATIONS****
001 LOGON      JOHN DOE
002 JOB STEP  LENSDESN
003 DESCRIBE  LENSSAVE
004 RECALL
005 JOB STEP  LENSDESN
```

Since the user has no changes to make in the DESCRIBE DATA operation, he performs the END function. The system assumes he wishes to retain the operation since ACCEPT is the default option. Because this was the last operation in the history area that could be recalled, a select frame appears on the screen so that the user can continue defining his job.

At this point, the user has completed all specifications needed for his job. Therefore, he selects BEGIN JOB to indicate that his job is ready to start processing.

```
SELECT:

  BEGIN PROCEDURE _
    _ SPECIFY JOB STEP _ DESCRIBE DATA
    _ ENTER DATA      X_BEGIN JOB
    _ WRITE MESSAGE    _ CANCEL JOB
    _ LOG OFF
    _ RECALL

          ****HISTORY OF OPERATIONS****
001 LOGON      JOHN DOE
002 JOB STEP  LENSDESJ
003 DESCRIBE  LENS SAVE
004 RECALL
005 JOB STEP  LENSDESJ
006 DESCRIBE  LENS SAVE
```

A message containing an identification number given to the job by the system is displayed in the message area of the above select frame. In this sample the message returned is:

"JOB SCHEDULED AS J03E0004"

The user performs an END function to acknowledge the message.

The SPECIFY 1130 PROGRAM parameter frame now appears on the screen and the user enters the name of his 1130 program (LENS) from the alphameric keyboard.

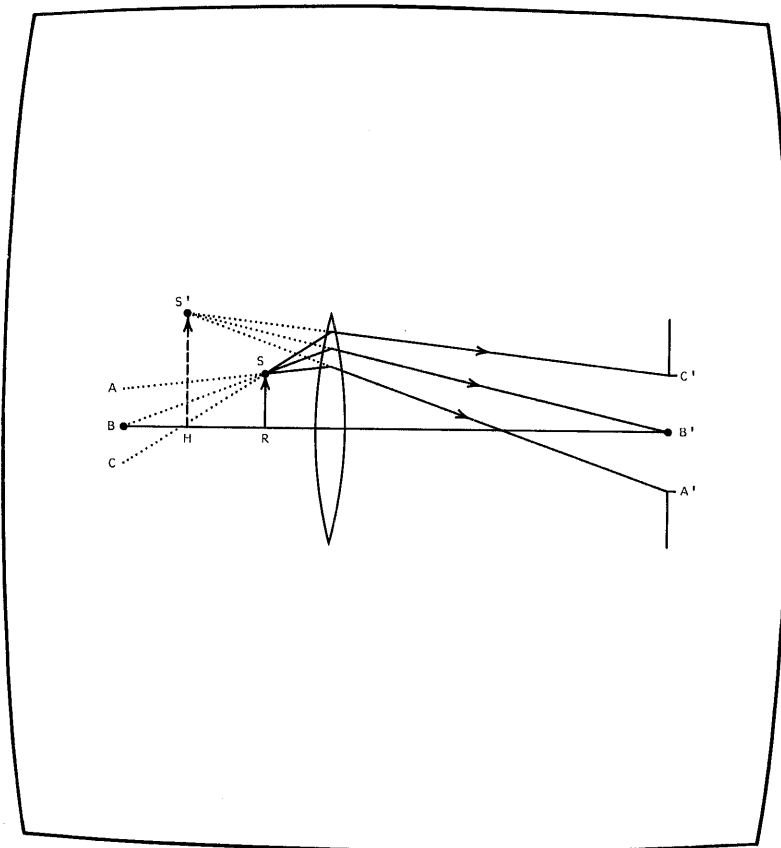
SPECIFY 1130 PROGRAM

NAME [LENS_]

[END] [CANCEL]

The user now performs the END function to indicate the frame is complete and his job begins processing.

Using the aperture and focal length parameters provided as part of the SPECIFY JOB STEP operation, the System/360 program performs calculations and transmits data to the 1130 necessary to display an image, such as the one that follows:



The 1130 program is designed to accept additional information entered from the alphameric keyboard or with the light pen. This data is transmitted to the System/360 where new calculations are performed and information needed to modify the lens display is returned to the 1130.

By providing new data and manipulating his display, the user designs a lens that meets his requirements. When the user has completed designing the lens, he terminates his program in a manner specified by the installation.

When the job has completed processing, a select frame automatically appears on the screen with a message indicating that the job has been completed. Since the user had only this one job to process, he selects LOG OFF.

```
SELECT:

  BEGIN PROCEDURE _
  _ SPECIFY JOB STEP
  _ ENTER DATA
  _ WRITE MESSAGE
  X LOG OFF
  _ RECALL

          ****HISTORY OF OPERATIONS****

001 LOGON      JOHN DOE
002 JOB STEP  LENSDESJ
003 DESCRIBE  LENSJAVE
004 RECALL
005 JOB STEP  LENSDESJ
006 DESCRIBE  LENSJAVE
007 BEGIN     J03E0004
008 SPECIFY   1130 LENS

          JOB J03E0004 COMPLETED
```

The screen now goes blank. If there had been additional jobs to process, the user could have continued by selecting further job control operations.

The LOG ON frame is made available to another user when the CANCEL key is depressed at the keyboard.

The SGJP relays four types of messages to the user at a display unit: Job Description Messages, Job Initiation Messages, Job Termination Messages, and Job Information Messages. These messages inform the user of various status and error conditions and allow him to make corrections during job control operations. The messages appear in the message area of a frame.

The types of messages are discussed in the following paragraphs and examples of each type are provided. Phrases preceded by an asterisk indicate the condition that is causing the displayed message. Phrases preceded by a hyphen indicate the corrective action to be taken by the user.

JOB DESCRIPTION MESSAGES pertain to information entered by the user on a frame. These messages are identified by the introductory statement, JOB DESCRIPTION ERROR. Errors must be corrected before the user can proceed. Examples of Job Description Messages are as follows:

JOB DESCRIPTION ERROR:

NAME PARAMETER: 5ENSDEN

-START NAME WITH ALPHABETIC CHARACTER

JOB DESCRIPTION ERROR:

CYLINDERS: 1050

-SHORTEN NUMBER TO THREE DIGITS

JOB INITIATION MESSAGES pertain to a foreground job that did not start processing in the System/360. If this occurs, the Job Initiation Message is not displayed on the 2250 screen until the 1130 problem program has relinquished control and SGJP has been restarted in the 1130.

These messages are identified by the introductory statement, JOB NOT STARTED BECAUSE. The number preceded by the letters IEF is a message identification code. This code can be used to refer to the "Job Scheduler" section of the publication IBM System/360 Operating System: Messages, Completion Codes, and Storage Dumps, Form C28-6631, for additional information.

There may be more than one reason for the job not starting and more than one corrective action to be taken. Examples of Job Initiation Messages are as follows:

IEF210I JOB NOT STARTED BECAUSE:

DATA REFERENCE 'OUTPUT'

*UNIT PARAMETER INVALID

-CORRECT UNIT NAME BEFORE RERUNNING

IEF241I JOB NOT STARTED BECAUSE:
 *SPECIFIED UNIT UNAVAILABLE
 -RESPECIFY UNIT BEFORE RERUNNING
 -NOTIFY OPERATOR TO READY UNIT BEFORE RERUNNING

Note: Additional Job Initiation Messages may be displayed in an abbreviated format. When such a message occurs, the message identification code can be used to reference Form C28-6631 for an explanation.

JOB TERMINATION MESSAGES pertain to a foreground job that was abnormally ended in the System/360. These messages are not displayed on the 2250 screen until the 1130 problem program has relinquished control and SGJP has been restarted in the 1130.

These messages are identified by the introductory statement, JOB ABNORMALLY ENDED BECAUSE. The number to the left of the introductory statement is a completion code. This number can be used to refer to the "Completion Code" section of the publication IBM System/360 Operating System: Messages, Completion Codes, and Storage Dumps, Form C28-6631, for additional information.

There may be more than one reason for the abnormal job end and more than one corrective action to be taken. Examples of Job Termination Messages are as follows:

D37 JOB ABNORMALLY ENDED BECAUSE:
 *INSUFFICIENT SPACE SPECIFIED
 -SPECIFY SECONDARY QUANTITY IN TRACKS OR CYLINDERS

813 JOB ABNORMALLY ENDED BECAUSE:
 *VOLUME PARAMETER INCORRECT - CHECK VOLUME
 *DATA NAME INCORRECT - CHECK NAME
 *VOLUME NOT MOUNTED
 -NOTIFY OPERATOR TO MOUNT BEFORE RERUNNING

JOB INFORMATION MESSAGES pertain to the status of events or progress of a user's foreground job. A short informative phrase is displayed on the screen in the message area. Examples of a Job Information Message are as follows:

JOB SCHEDULED AS Jxxxxyyyy

JOB Jxxxxyyyy COMPLETED

where Jxxxxyyyy is the job identification number that SGJP has assigned to the job. The "xxx" is the unit address of the 1130/2250 subsystem from which the job was defined, and "yyyy" is a job count that is incremented by one for each job defined through SGJP.

APPENDIX A: RELATION OF FRAME REQUESTS TO JOB CONTROL LANGUAGE (JCL)

This chart shows the relationship between the information requested on select and parameter frames and actual Job Control Language parameters. For a detailed discussion of specific JCL formats, refer to the publication IBM System/360 Operating System: Job Control Language, Form C28-6539.

SELECT OR PARAMETER FRAME INFORMATION REQUEST	EQUIVALENT JCL PARAMETER	TYPE (See Notes)	APPLICABLE JCL STATEMENT
<u>SELECT</u>			
BEGIN PROCEDURE	procname	P	EXEC
<u>LOG ON</u>			
USER'S NAME	programmer's name	P	JOB
ACCOUNT	account number	P	JOB
OTHER	other accounting information	P	JOB
PRINTED RECORD	MSGLEVEL=1	K	JOB
<u>SPECIFY JOB STEP</u>			
PROCEDURE NAME	PROC=procname (or) procname	K,P	EXEC
PROGRAM NAME	PGM=progname	K	EXEC
SUBSYSTEM REFERENCE	ddname for DD statement defining the subsystem.	N	DD
LIERARY NAME	DSNAME	K	//JOB LIB DD
PARAMETERS	PARM	K	EXEC
PROCESS IN BACKGROUND	GROUP or PRIORITY	K	JOB
OTHER	Any EXEC parameter that is not a default option or required information on the SPECIFY JOB STEP frame. These parameters must be entered in actual JCL format.	K	EXEC
<u>DESCRIBE DATA</u>			
DATA NAME	DSNAME	K	DD
DATA REFERENCE	ddname	N	DD
INDICATE STATUS:			
CATALOGED	DISP=OLD	K	DD
OLD	DISP=OLD	K	DD
MOD	DISP=MOD	K	DD
SHARE	DISP=SHR	K	DD
NEW	DISP=NEW	K	DD
UNIT	UNIT	K	DD
VOLUME	VOLUME=SER=	K	DD

Notes:
 N = name in Name Field.
 K = keyword parameter.
 P = positional parameter.

(continued)

(continued)

SELECT OR PARAMETER FRAME INFORMATION REQUEST	EQUIVALENT JCL PARAMETER	TYPE (See Notes)	APPLICABLE JCL STATEMENT
DIRECT ACCESS POOL	UNIT=SYSDA	K	DD
SYSTEM ALLOCATE	SPACE=(TRK,(,)) ¹	K	DD
TRACKS	SPACE=(TRK,(,))	K	DD
CYLINDERS	SPACE=(CYL,(,))	K	DD
OTHER	Any DD parameter that is not a default option or required information on the DESCRIBE DATA frame. These parameters must be entered in actual JCL format.	K	DD
CHOOSE DISPOSITION:			
CATLG	DISP=(,CATLG)	K	DD
DELETE	DISP=(,DELETE)	K	DD
KEEP	DISP=(,KEEP)	K	DD
PASS	DISP=(,PASS)	K	DD
PRINT	SYSOUT=(print class)	K	DD
PUNCH	SYSOUT=(punch class)	K	DD

Notes:

N = name in Name Field.

K = keyword parameter.

P = positional parameter.

¹ = Primary and secondary track values for SYSTEM ALLOCATE are established by the installation during system generations.

The job identification number in the form Jxxxxyyy which is generated by SGJP before a System/360 job is initiated is equivalent to the job name in the name field of a JOB statement. The "xxx" represents the unit address of the 1130/2250 subsystem from which the job was defined, and "yyy" is a job count that is incremented by one for each job defined through SGJP.

1130 Parameter Equivalent

The name provided for the NAME parameter request in the SPECIFY 1130 PROGRAM frame is equivalent to the program name provided in columns 8-12 of the XEQ control record used with the 1130 Disk Monitor.

APPENDIX B: PRINTED RECORD FORMAT

The following is the printed record obtained by selecting the PRINTED RECORD option on the LOG ON frame for the job described in the section, "A Sample Job at the 1130/2250 Subsystem," of this publication. The record lists the job control operations performed at the display unit, the Job Control Language (JCL) generated by the SGJP, and the messages from the operating system.

```
001 LOGON      JOHN DOE  JS0361984  RECORD
002 JOB STEP  LENSDESN  DEVICE1
003 DESCRIBE  LENS SAVE OUTPUT CATALOGED
004 RECALL
005 JOB STEP  LENSDESN
006 DESCRIBE  LENS SAVE OUTPUT CATALOGED
007 BEGIN     J03E0004
008 SPECIFY 1130 LENS
```

```
//J03E0004 JOB JS0361984,'JOHNDOE',MSGLEVEL=1,MSGCLASS=Z          SGJP001
//          EXEC PGM=LENSDESN                                     SGJP001
//DEVICE1 DD UNIT=03E                                           SGJP001
//SYSABEND DD SYSOUT=A                                          SGJP001
//OUTPUT DD DSNAME=LENS SAVE,DISP=(CID,KEEP)                   SGJP002
IEF236I ALLOC. FOR J03E0004 LENSDESN
IEF237I DEVICE1 ON 03E
IEF237I SYSABEND ON 00E
IEF237I OUTPUT ON 190
IEF285I LENS SAVE                                               KEPT
IEF285I VOL SER NOS= X3180

JOB J03E0004 COMPLETED
```

APPENDIX C: PROGRAMMING CONSIDERATIONS FOR THE
SATELLITE GRAPHIC JOB PROCESSOR

WRITING CATALOGED PROCEDURES TO BE INVOKED THROUGH SGJP

The System/360 Operating System treats an 1130/2250 subsystem as a data set. A problem program that refers to the subsystem either contains a DCE macro instruction for the subsystem, or the data control block is generated as a result of statements written in a higher-level language. In addition, the operating system requires that a DD statement for the subsystem be included in the job control statements for each job step associated with the subsystem.

In writing cataloged procedures to be invoked through SGJP, the programmer should include DD statements for the subsystem in the procedure as follows:

For a Single-Step Procedure: It is recommended that the programmer include a DD statement containing the parameter UNIT=1130. In producing the final job control statement, SGJP replaces the unit name 1130 with the 3-digit unit address of the subsystem at which the user is located.

If the user specifies the 3-digit address of a particular subsystem in the DD statement, SGJP does not override the address. If the address in the DD statement differs from the address of the unit at which the user is located, the user will not receive the problem program communications at his unit.

If the programmer fails to provide a DD statement for the subsystem in a single-step procedure, SGJP creates a DD statement for the unit and inserts the 3-digit address of the subsystem at which the user is located. The name field of the DD statement will contain a name in the form stepname.ddname where ddname is the default parameter for the subsystem reference that was provided during system generation.

For a Multi-Step Procedure: It is recommended that the programmer include a DD statement for the subsystem in each step of the procedure. The DD statement in the first step should include the parameter UNIT=1130. The DD statement for the subsystem in each succeeding step of the procedure should refer back to the statement in the first step by means of the DSNAME=*.stepname.ddname parameter.

This makes it easier for the user to override the subsystem DD statements in the procedure. To override the subsystem DD statements in all steps of the procedure, the user need only override the subsystem DD statement in the first step of the procedure. However, if the user wants to override the subsystem DD statement in the second or a succeeding step of the procedure, he can employ the appropriate stepname.ddname combination in the name field of the statement.

The programmer should note that, if he fails to provide subsystem DD statements in a multi-step procedure, SGJP creates such a statement for the first step of the procedure only. This statement will contain the 3-digit address of the subsystem at which the user is located. The name field of the statement will contain a name in the form stepname.ddname where ddname is the default parameter for the subsystem reference that was provided during system generation.

For additional information on overriding statements in cataloged procedures, see the publication IBM System/360 Operating System: Job Control Language, Form C28-6539.

APPENDIX D: OPERATIONAL CHARACTERISTICS OF THE
SATELLITE GRAPHIC JOB PROCESSOR

This appendix discusses operational characteristics of the Satellite Graphic Job Processor. The information is intended to aid installation personnel and programmers in understanding the nature of the program, the manner in which it functions in the System/360 Operating System and the 1130 Disk Monitor System, and the manner in which the user has control over its operations.

The reader of this appendix is assumed to be familiar with the basic characteristics of: (1) a multiprogramming configuration (MFT II or MVT) of the System/360 Operating System, and (2) the 1130 Disk Monitor System.

The minimum machine requirements for use of the Satellite Graphic Job Processor are listed in the "Introduction" to this publication. Up to 14 remote 1130/2250 subsystems can be attached to a System/360 for SGJP operations. If both SGJP and the Graphic Job Processor (which supports graphic job control operations from 2250s attached directly to the System/360) are being used concurrently, the number of directly attached 2250s (for GJP operations) plus the number of 1130/2250 subsystems (for SGJP operations) must not exceed 14. The Graphic Job Processor is described in the publication IBM System/360 Operating System: User's Guide for Job Control From the IBM 2250 Display Unit, Form C27-6933.

COMPOSITION OF THE SATELLITE GRAPHIC JOB PROCESSOR

The Satellite Graphic Job Processor consists of three major program subcomponents, as follows:

- A resident interface task that occupies a writer partition or region in the System/360. This task starts satellite graphic job control operations from each 1130/2250 subsystem, causes a System/360 job defined by the user to be executed, and passes system messages regarding foreground jobs to the proper 1130/2250 subsystem.
- A set of SGJP routines that function in a problem program partition or region in the System/360. A separate problem program partition or region must be provided for each 1130/2250 subsystem that is to perform satellite graphic job control operations. In general, each set of SGJP routines in the System/360 converts user input from the 1130 into actual Job Control Language statements and places these statements in a disk queue to await job initiation.
- A set of SGJP routines that function as a problem program in the 1130. In general, these routines generate select and parameter frames, extract user input from the frames, place the input in a record format suitable for System/360 processing, and transmit the records to the System/360. These routines also display messages on the 2250 screen.

Transmission of data between the 1130 and the System/360 is accomplished by IBM-provided data transmission subroutines. These subroutines are also available for use by the user's problem program. The external characteristics of these subroutines are described in the publication IBM System/360 Operating System and 1130 Disk Monitor System: FORTRAN IV Subroutines for Data Transmission Between a System/360 and an 1130 System, Form C27-6937.

The data transmission subroutines in the System/360 use the binary synchronous communications services of the Basic Telecommunications Access Method (BTAM) to accomplish the actual data transmission and reception. Thus, the BTAM access method must be available in an operating system in which the Satellite Graphic Job Processor is to function.

In the 1130, a specialized synchronous communications adapter subroutine is used to accomplish the actual data transmission and reception.

The general relationship of the machine and program components are shown in Figure 10.

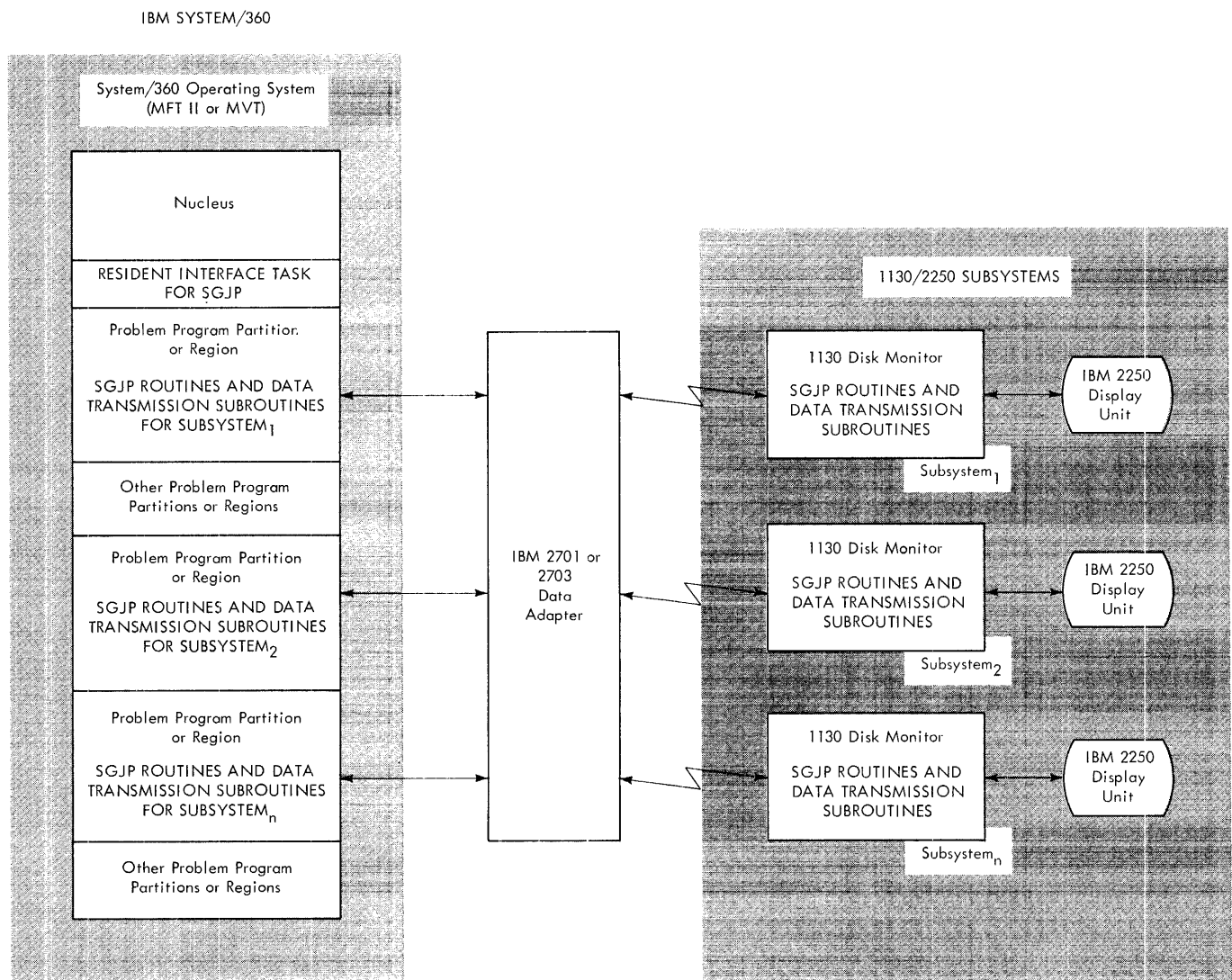


Figure 10. General Relationship of Machine and Program Components

FUNCTIONING OF THE SATELLITE GRAPHIC JOB PROCESSOR

Before satellite graphic job control operations can be started, the SGJP components must be available in both systems.

Inclusion of the SGJP routines in the System/360 Operating System is specified by means of a system generation macro instruction. This macro instruction enables the user to specify default parameters and other control options that will apply to the job control operations performed at all 1130/2250 subsystems.

In each 1130, the SGJP routines must be available on disk, preferably in core image format.

Initiating SGJP in the System/360: To initiate SGJP in the System/360, the system operator enters a START command from the operator's console. This command causes the resident interface task to be initiated in a writer partition or region. The system operator then uses a command to inform the resident task of those 1130 subsystems from which job control operations can be performed. Once the resident task has received this information, it is ready to establish communication with any of the designated subsystems.

Initiating SGJP in an 1130 Subsystem: The 1130 operator uses the XEQ monitor control record to initiate execution of the SGJP routines in the 1130.

Initialization of the Communication Link: The SGJP routines in the System/360 and the 1130 then attempt to initialize the communications link between the two systems. If the initialization attempt fails, the SGJP routines in the 1130 notify the 2250 user by displaying a message on the screen. The user can then request the 1130 operator to take corrective action. The 1130 operator receives a diagnostic message regarding the initialization failure.

If the communications link is successfully initialized, the SGJP routines await the initial CANCEL key attention from the display unit. When the attention is received, the LOG ON frame is displayed on the 2250 screen and the user can proceed to log on and define a job. While the user is defining his job, records containing job control information are transmitted to the System/360 where the information is used to create actual Job Control Language statements needed to schedule the desired job. The user signals completion of his job definition by selecting the BEGIN JOB or BEGIN PROCEDURE operation. Selection of either of these operations causes the SGJP routines to take action to have the job scheduled in the System/360.

If the job is a background job, it is scheduled to execute in a partition or region other than the one associated with the 1130/2250 subsystem from which the job was defined. Another select frame appears on the screen and the 2250 user can either define another job or log off.

If the job is a foreground job, the SGJP routines in the System/360 problem program partition or region associated with 1130/2250 subsystem are replaced with the problem program named in the first step of the job. Meanwhile, a SPECIFY 1130 PROGRAM frame is displayed at the 2250. This frame is used to define and initiate the 1130 program that is to be executed in conjunction with the System/360 job.

Restoring SGJP Routines to a System/360 Partition or Region: When the System/360 foreground job terminates, the SGJP routines are automatically restored to the partition or region in which the problem program

was executing. These routines take action to transmit to the 1130 any System/360 messages resulting from the problem program termination.

Restoring SGJP Routines in the 1130: At the completion of the 1130 problem program, the SGJP routines can be restored in either of two ways: (1) by inserting another XEQ monitor control record in the card reader at the 1130, or (2) by using a LINK statement at the end of the problem program.

When the SGJP routines have been restored in both systems, any messages resulting from termination of the System/360 job are displayed at the 2250.

Terminating Job Control Operations at the 1130: At any point, the System/360 operator can use a command to inform the resident interface task that job control operations from a particular 1130/2250 subsystem are to be terminated.

Terminating SGJP in the System/360: The System/360 operator can also use a STOP command to terminate all SGJP activity in the System/360. This command causes SGJP routines to be terminated in the problem program partitions or regions, and causes the resident task to be removed from the writer partition or region.

abnormal termination: A premature end to the processing of a foreground or background job.

alphameric information: Textual information formed from the letters, numerals, and special characters on the alphameric keyboard.

assembly: The process of translating a symbolic language program into a machine language program so the program can be executed on a computer.

background job: A System/360 job whose processing activities are not associated with the 1130/2250 subsystem.

cataloged data set: A data set that has an index entry in the operating system catalog for the purpose of locating the data set.

cataloged procedure: A predefined collection of job control information contained in the operating system. The information invokes the execution of one or more programs.

data set: A named collection of related data records.

data set disposition: The manner in which a data set is treated when a job step using the data set is terminated.

data set status: The manner in which a data set is handled before and during the processing of a job step.

default option: The option that automatically goes into effect when no option is selected.

device: Any piece of equipment utilized to input or output data, such as a disk storage drive or a magnetic tape drive.

entry area: A portion of a frame where user-supplied information may be inserted. The first position of an entry area is denoted by a short underscore (not the cursor) or the entire entry area is enclosed in a rectangular box.

foreground job: A System/360 job whose processing activities are associated with the 1130/2250 subsystem.

frame: A 2250 display that requests the entry of job control information or data.

graphic application: A job that contains programs which produce displays on the screen of a display unit.

information request: A word or phrase, associated with an entry area on a frame, which requests the entry of job control information.

job: The fundamental unit of work for a computing system as seen by the user. A job may consist of one or more job steps.

job control information: The information necessary to describe a job and to define the requirements for processing that job.

Job Control Language (JCL): A language of special format to enter job control information directly to the System/360 Operating System.

job control operations: The facilities that enable a user to enter job control information from a display unit.

job step: A subdivision of a job that requests the processing of a program or cataloged procedure.

operating system: The control and processing programs that govern the operation of the computer.

operation: See job control operations.

parameter: A variable that is assigned a value for a specific purpose or process.

parameter frame: A frame that requests the user to supply the job control information, necessary to describe a selected operation.

program: A sequence of coded instructions for a computer.

procedure: See cataloged procedure.

Satellite Graphic Job Processor: A program that elicits job control information from a user at a display unit to initiate and control the processing of jobs.

select frame: A frame that requests the user to choose a job control operation from a list of available operations.

subsystem: The 1130/2250 system when connected to a System/360.

system: See operating system.

system catalog: A group of indexes used by the operating system to locate a data set for which index entries were previously established.

system operator: The person at the main console of a computing system.

user: The direct user of a computing system; in this publication, anyone using the system from a display unit.

volume: A physically removable part of a device, such as a disk pack or a reel of tape.

Where more than one reference is given, the first page number indicates the major reference.

- abnormal termination, definition of 53
- ACCEPT option on the RECALL frame 26-27,38
- accepting a BEGIN JOB operation 28
- Access Method, Basic Telecommunications (BTAM) 50
- ACCOUNT parameter on the LOG ON frame 15,14,30,45
- additional information to define a data set 20-21
- ADVANCE key 10
- allocating space for a data set 20-21
- alphanumeric information
 - definition of 53
 - entering at display unit 11
- alphanumeric keyboard
 - definition of 10
 - entering information through 11
 - keys on 10-11
 - performing END and CANCEL functions from 12,13
 - positioning the cursor with 11
 - selecting operations with 11
 - selecting options with 12
- assembly, definition of 53

- background job
 - absence of status information for 6
 - definition of 6,53
 - scheduling of 51
 - specifying execution of 17,25
- BACKSPACE key 11
- Basic Telecommunications Access Method (BTAM) 50
- BEGIN JOB operation 21
- BEGIN PROCEDURE operation 17
- binary synchronous communications 9,50
- blank records on the ENTER DATA frame 25

- CANCEL function
 - definition of 12-13
 - performance of 12-13
 - uses of 12-13
- CANCEL key
 - definition of 10
 - on a parameter frame 9,11
 - used to obtain LOG ON frame 14
 - used to nullify parameter frame 13
- CANCEL key attention, processing of initial 51
- CANCEL JOB operation
 - insertion to end RECALL operation 28
 - use of 26
- CARD READER option on the ENTER DATA frame 25
- cataloged data set
 - definition of 53,19,20
 - disposition of 20
 - status of 19-20
 - writing for execution with SGJP 48
- cataloged procedure
 - definition of 15,53
 - specifying execution of 17,16
- CATALOGED status of a data set 19,45
- CATLG disposition of a data set 20,46
- CHOOSE DISPOSITION parameter on the DESCRIBE DATA frame 19-20,46
- Code A, need for specifying 9
- communications link, initialization of 51
- CONTINUE key 11
- core image format for SGJP routines in 1130 51
- CURRENT ITEM indicator on the RECALL frame 27
- current location of a data set 20
- current status of a data set 19
- cursor
 - definition of 10
 - positioning on screen 11
- cylinders for a data set 20,21,46
- CYLINDERS parameter on the DESCRIBE DATA frame 20,21,46

- DATA NAME parameter on the DESCRIBE DATA frame 19,18,45
- data records
 - action for blank ones 25
 - entering from alphanumeric keyboard 25
 - entering from card reader 25
- DATA REFERENCE parameter on the DESCRIBE DATA frame 19,18,45
- data set, definition of 53
- data set disposition
 - definition of 53
 - specification of 19-20,18,46,34
- data set status, definition of 53
- data transmission
 - code and interface for 9
 - in binary synchronous communications mode 9
 - subroutines for 49,50
- DD statement for an 1130/2250 subsystem 48
- default option
 - definition of 53,12
 - effect of 12
- DELETE disposition of a data set 20,18,46
- DESCRIBE DATA frame
 - format of 18
 - obtaining the 18
 - sample use of 34
 - using the 18-21
- DESCRIBE DATA operation 18-21
- describing (defining) a data set 18-21
- describing the location of a data set 19
- description area in a parameter frame 8
- device, definition of 53
- DIRECT ACCESS POOL parameter on the DESCRIBE DATA frame 21,20,46
- DISCONNECT THE SUBSYSTEM option on the LOG ON frame 15
- Disk Monitor (1130) 49,9,46

display unit
 definition of 10
 features of 10-11
 screen 10
 use of 10-13

END function
 definition of 12
 performing the 12
 used to indicate completion of
 frame 12,14
 used to indicate correction of
 error 15,17,21
 used with BEGIN JOB 21
 used with BEGIN PROCEDURE 17
 used with RECALL 27

END key
 on a keyboard 10
 on a parameter frame 9,12

ENTER DATA frame
 format of 24
 obtaining the 24
 use of 24-25

ENTER DATA operation 24-25

ENTER DATA records
 history numbers assigned to 25
 recalled one by one 28
 entering control statements via the ENTER
 DATA frame 24

entry area in a parameter frame
 definition of 6,53
 description of 8

foreground job, definition of 6,53

FORTRAN IV subroutines for data transmis-
 sion between a System/360 and an 1130
 system 49

frames
 definition of 6,53
 entry area on 6,8
 parameter frame 8-9
 select frame 6-7
 types of 6-9

graphic application, definition of 53

Graphic Job Processor
 definition of 49
 limit on units for combined GJP and SGJP
 operations 49
 use in conjunction with SGJP 49

history area in a select frame 7-8

history number
 definition of 8
 effect of RECALL operations on 27,36-39
 for ENTER DATA records 25

HISTORY OF OPERATIONS, samples of history
 number 31,33,35,36,38,39,42,47

INDICATE STATUS parameter on the DESCRIBE
 DATA frame 19,18,45

information request
 definition of 53
 on a parameter frame 8,45-46

INSERT option on the RECALL frame 26,27

Interface A, need for specifying 9

job
 background job 6
 definition of 5,53
 foreground job 6
 processed exclusively in System/360 5
 scheduling in System/360 51
 job control information 5,53
 Job Control Language (JCL)
 conversion of user information to 5
 definition of 53
 entering job control statements
 directly 24
 formation in System/360. 51
 parameters equivalent to select and par-
 ameter frame items 45-46
 job control operations
 BEGIN JOB 21,5
 BEGIN PROCEDURE 17,5
 CANCEL JOB 26,6
 DESCRIBE DATA 18-21,5
 ENTER DATA 24-25,6
 LOG OFF 28,6
 LOG ON 14-15,5
 RECALL 26-28,6
 SPECIFY JOB STEP 15-17,5
 SPECIFY 1130 PROGRAM 22,5
 WRITE MESSAGE 23-24,5
 job control session at a subsystem, sample
 of 29-42,47
 job count in job identification
 number 44,46
 job description messages 43
 job identification number 44,17,21,46,39
 job information messages 44
 job initiation messages 43-44
 job name 46
 JOB statement
 appearance in PRINTED RECORD 47
 parameters used to create 45,46
 job step, definition of 53
 job termination messages 44
 JUMP key 10,11

KEEP disposition of a data set 19,46,34
 key area in a parameter frame 9

LIBRARY NAME parameter on the SPECIFY JOB
 STEP frame 16,45

light pen
 definition of 10
 performing END and CANCEL functions
 with 9,12,13
 positioning the cursor with 11
 selecting operations with 12
 selecting options with 13

LINK statement 52

LOG OFF operation 28

LOG ON frame
 format of 14
 obtaining the 14,51
 operational hints on 14
 sample use of 30
 using the 14-15

LOG ON operation 14-15

machine requirements 9,49

message area
 in a parameter frame 9
 in a select frame 8

messages
 display of 43-44,8,9,17,21,49
 passing to subsystem 49
 regarding failure to initialize communi-
 cations link 51
 regarding initiation of System/360
 job 43-44
 regarding termination of System/360
 job 44,52
 types of 43-44
 MFT II (multiprogramming with a fixed num-
 ber of tasks) 9,49
 MODIFY option on the RECALL frame 27
 sample use of 36
 MOD status of a data set 19,45
 MORE DATA FOLLOWS option on the ENTER DATA
 frame 25
 MVT (multiprogramming with a variable num-
 ber of tasks) 9,49

 NAME parameter on the SPECIFY 1130 PROGRAM
 frame 22,46
 NEW status of a data set 19,20,45

 OLD status of a data set 19-20,45
 OMIT option on the RECALL frame 27
 operating system
 definition of 54
 multiprogramming
 configuration of 9,49
 OPERATIONAL HINTS on the LOG ON frame 14
 OTHER parameter
 in the DESCRIBE DATA frame 19,46
 in the LOG ON frame 15,45
 in the SPECIFY JOB STEP frame 17,45

 parameter, definition of 7,54
 parameter frame
 areas in 8-9
 changing a selected option on 12
 definition of 7,54
 generation in 1130 49
 relation to job control statements 45,46
 selecting options from 12
 PARAMETERS option on the SPECIFY JOB STEP
 frame 16,45
 sample use of 32,37
 partition 49,51
 PASS disposition of a data set 19-20,46
 point-to-point environment 9
 primary tracks for a data set 21
 PRINT disposition of a data set 20,46
 PRINTED RECORD
 format of 47
 parameter on LOG ON frame 15,45,30
 procedure (cataloged procedure), definition
 of 15,53
 PROCEDURE NAME parameter in the SPECIFY JOB
 STEP frame 16,45
 procedure name in the BEGIN PROCEDURE
 operation 17
 PROCESS IN BACKGROUND option
 on the ENTER DATA frame 25
 on the SPECIFY JOB STEP frame 17,45
 program, definition of 54
 PROGRAM NAME parameter on the SPECIFY JOB
 STEP frame 16,45

 sample use of 32
 PUNCH disposition of a data set 20,46

 RECALL frame
 format of 27
 obtaining the 26
 sample use of 35-38
 using the 26-28
 RECALL operation 26-28
 region 49,51
 REPLY option on the WRITE MESSAGE
 frame 23-24
 resident interface task 49,51

 Satellite Graphic Job Processor (SGJP)
 composition of 49-50
 data transmission for 49,50,9
 definition of 2,5,53
 function of 5
 general relation of machine and program
 components for 50,49,9
 inclusion in System/360 Operating
 System 50
 inclusion in 1130 Disk Monitor System 51
 initiation in System/360 51
 initiation in 1130 subsystem 51
 internal functioning of 51-52
 operational characteristics of 49-52
 resident interface task for 49
 routines in System/360 49
 routines in 1130 49
 system generation for 51
 termination of 52
 writing cataloged procedures to be
 invoked by 48
 secondary tracks for a data set 21
 select frame
 areas in 7-8
 definition of 7-8,54
 generation in 1130 49
 sample of 7
 sample use of 31,33,35,39,42
 selecting job control operations
 on 11-12
 selection area in a select frame 7
 SHARE status of a data set 19,45
 space bar 10
 SPECIFY JOB STEP frame
 format of 16
 obtaining the 15
 sample use of 32,37
 using the 15-17
 SPECIFY JOB STEP operation 15-17
 SPECIFY 1130 PROGRAM frame
 format of 22
 sample use of 40
 using the 22
 when displayed 22
 SPECIFY 1130 PROGRAM operation 22
 START command, to start SGJP 51
 STOP command, to stop SGJP 52
 subroutines for data transmission 49
 subsystem
 definition of 5,53
 specifying in cataloged procedure
 unit address in job identification
 number 46
 SUBSYSTEM REFERENCE on the SPECIFY JOB STEP

frame 16,45,32
switched network data sets, restriction on
use of 9
synchronous communications adapter subrou-
tine in 1130 50
system, definition of 54
system generation 51
SYSTEM ALLOCATE parameter on the DESCRIBE
DATA frame 21,46
system catalog, definition of 54
system operator
definition of 54
initiating SGJP 51
terminating SGJP 52

TEXT parameter on the WRITE MESSAGE
frame 23
tracks for a data set 21
TRACKS parameter on the DESCRIBE DATA
frame 21,46
transmitting data between a System/360 and
an 1130 49
typing errors, correction of 11

UNIT parameter
on the DESCRIBE DATA frame 24,45
for subsystems in cataloged
procedures 48

unit address in job identification
number 44,46
user, definition of 54
USER'S NAME parameter in the LOG ON
frame 15,45,30

volume, definition of 54
VOLUME parameter on the DESCRIBE DATA
frame 20,45

WRITE MESSAGE frame
format of 23
obtaining the 23
using the 23-24

XEQ monitor control record
program name in 46
used to initiate SGJP in the 1130 51,52

1130 Computing System 9
1130 Disk Monitor System 49,9,46
1130 program
execution in conjunction with a
System/360 program 5,22
name of 22
running a System/360 program independent
of the 1130 22
2250 Display Unit, Model 4 9,10
2701 or 2703 Data Adapter 49,9,46

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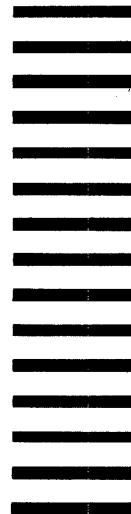
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