IBM

Series/1

SC34-0436-1

# Event Driven Executive Installation and System Generation Guide

Version 4.1

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## Second Edition (December 1983)

This is a major revision of, and obsoletes, SC34-0436-0. Technical changes to the text and illustrations are indicated by a vertical line to the left of the changes.

Use this publication only for the purpose stated in the Preface.

Changes are periodically made to the information herein; any such changes will be reported in subsequent revisions or Technical Newsletters.

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## Problem bei System-Generierung 28.6.85

Bei einer System-Generierung konnte der Rechner mit dem neuen Nucleus nicht gebootet werden. Dabei wurde als IPL-Text der Name $EDXNUCT verwendet, so wie der Job-Util-Lauf ihn erzeugt.

Lösung: $EDXNUCT mit $COPYUT1 auf $EDXNUC1 kopieren. IPL-Text auf $EDXNUC1 setzen.

# Summary of Changes for PTF-P02

The following changes have been made to this document. (Changes are indicated by a vertical line in the left of the change.)

- Chapters 2, 3, 4, and 5 have been updated throughout to reflect 4975-01A ASCII printer, $MEMDISK, and 60-megabyte disk support.
- Appendixes A and C have been updated to reflect 4975-01A ASCII printer, $MEMDISK, and 60-megabyte disk support.

# Summary of Changes for Version 4.1

The following changes have been made to this document. (Changes are indicated by a vertical line in the left-hand margin of the affected pages.)

*Chapter 2, Determine If the Starter System Meets Your Needs* has been changed to include starter system support of the DDSK-30 disk and the 4980 Display Station attached via the Multidrop Work Station Attachment. The 5219 Printer attached via the Printer Attachment — 5200 Series is not supported by the starter system and you must create a tailored operating system to support these devices.

*Chapter 3, Install EDX* has been changed as follows:

- The minimum configuration is updated to reflect the addition of the 30-megabyte disk (DDSK-30) and the 4980 Display Station attached via the Multidrop Work Station Attachment.
- Diskette XS4003 now contains two volumes: XS403A and XS403B. The steps to copy the contents of XS4003 have been changed to reflect the two volumes.
- For the CALCDEMO installation verification program, the LINKWORK data set must be allocated with a size of 600 records.

*Chapter 4, Select Your Required Support* has been updated to reflect the following changes:

- The OPTION NOVERLAY control statement can be specified in the link control data set and the generated supervisor will not default to overlay structure.
- The supervisor object modules for disk(ette) and tape support can be moved out of partition 1.

- These supervisor object modules support the 4980 Display Station:
  - PWRAM80
  - EDXTIO
  - IOS4979
  - INIT4980
- These supervisor object modules support the 5219 Printer:
  - EDXTIO
  - IOS4974
- The INITADAP supervisor object module supports the Multidrop Work Station Attachment and the Printer Attachment - 5200 Series.
- You can define an overlay area in your supervisor or allow the linkage editor to define it for you. If you define the overlay area, you no longer need to include the $OVLMGR0 module. The linkage editor automatically includes $OVLMGR0 for you.
- Initialization modules are automatically included in your supervisor as overlay segments or as resident programs.

*Chapter 5, Generate a Tailored Operating System* has been changed as follows:

- The $EDXDEF and $LNKCNTL data set for EDX Version 4.1 are listed.
- The $SUPPREP data set has been changed to show allocating the LINKWORK data set at 600 records.

*Appendix A, System Definition Statements* has been changed as follows:

- The ADAPTER statement supports the Multidrop Work Station Attachment and the Printer Attachment - 5200 Series. The Multidrop Work Station will support up to eight 4980 Display Stations; the Printer Attachment - 5200 Series will support a mix of up to eight 5219s, 5224s, and 5225s.
- The BSCLINE statement is used to define the connection type for an X.21 circuit switched network support.
- The DISK statement is used to define the 30-megabyte disk (DDSK-30).
- The SYSTEM statement has a new operand, MECBLST. This operand specifies the number of event control blocks to be generated for use by the MECB statement.
- The 5219 Printer and 4980 Display Station are defined to your system with the TERMINAL statement.

*Appendix D, Supervisor Module Names (CSECTS)* has been updated to reflect EDX Version 4.1 modules.

*Appendix E, Work Sheets* has been updated as follows:

- Work sheet 1 contains the storage estimates for the 30-megabyte disk (DDSK-30), the 4980 Display Station, and the 5219 Printer.
- Work sheets 2 and 3 parallel the $EDXDEF and $LNKCNTL data sets for EDX Version 4.1.
- Work sheet 4 contains updated estimates for the EDX Version 4.1 supervisor object modules.

# About This Book

This book is a guide for installing the Event Driven Executive on your Series/1 and for generating a tailored operating system to meet your application requirements. It contains step-by-step procedures for installation and system generation tasks.

## Audience

This book is intended for anyone who has to install the Event Driven Executive on an IBM Series/1 and to create an operating system to meet application requirements. Readers should have a basic understanding of computer terminology before using this book.

## How This Book Is Organized

The book is divided into the following 6 chapters and 5 appendixes.

- *Chapter 1, Prepare for Installation and System Generation* contains an overview of the topics covered in this book.
- *Chapter 2, Determine If the Starter System Meets Your Needs* describes the I/O devices and software features supported by the starter system, an IBM-supplied operating system.
- *Chapter 3, Install EDX* provides the step-by-step procedures for installing the Event Driven Executive system on your IBM Series/1.
- *Chapter 4, Select Your Required Support* describes how to select the support (hardware and software features) you need to support your application.

## How This Book Is Organized *(continued)*

- *Chapter 5, Generate a Tailored Operator System* provides the step-by-step procedures for generating a tailored operating system.
- *Chapter 6, Migrate to Version 4* provides the migration procedures used to convert from EDX Version 1 and 2 to EDX Version 4.
- *Appendix A, System Definition Statements* contains the system definition statements used to define I/O devices to your operating system.
- *Appendix B, Customizing Adapters with Hardware Jumpers* contains information about jumper connections on several adapters.
- *Appendix C, 3101 Configuration Information* contains planning information to use in setting up and defining 3101 display terminals to your operating system.
- *Appendix D, Supervisor Module Names (CSECTS)* contains a listing of all supervisor module names and entry point labels.
- *Appendix E, Work Sheets* contains four worksheets. Work sheet 1 estimates your storage requirements and the partition structure of processor storage. Work sheet 2 defines the processor storage characteristics and the I/O devices attached to your Series/1. Work sheet 3 defines the software features you require to support the I/O devices you defined in work sheet 2 and the EDX related products you include in your system. Work sheet 4 estimates the size of supervisor partitions and programs executing in partitions other than partition one so that you can define the structure of processor storage.

## Aids In Using This Book

This book contains the following aids to using the information it presents:

- A table of contents that lists the major headings in this book.
- An index of the topics covered in this book.
- A glossary that defines terms and acronyms used in this book and in other EDX library publications.

In the step-by-step procedures shown in Chapters 3 and 5, several utilities are used and the interactive display screens are shown. Any responses you must make in response to a prompt are shown in red.

## A Guide To The Library

Refer to the *Library Guide and Common Index*, SC34-0441 for information on the design and structure of the Event Driven Executive, Version 4 library, for a bibliography of related publications, and for an index to the entire library.

## Contacting IBM About Problems

You can inform IBM of any inaccuracies or problems you find when using this book by completing and mailing the **Reader's Comment Form** provided in the back of the book.

If you have a problem with the Series/1 Event Driven Executive services, fill out an authorized program analysis report (APAR) form as described in the *IBM Series/1 Software Service Guide*, GC34-0099.

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# Chapter 1. Prepare for Installation and System Generation

This chapter outlines what you need to do to install the Event Driven Executive (EDX) or create a tailored operating system.

EDX is shipped to you on a series of product diskettes and contains a basic supervisor program called the starter system. It supports certain hardware devices and software features. If the hardware devices and software features supported by the starter system match your application needs, you can install the starter system as your operating system.

If you have hardware devices attached to your Series/1 that are not supported by the starter system or that require software features not provided by the starter system, you need to generate a tailored operating system.

## What Do You Need To Do?

Once you receive the Program Directory and the product diskettes, you need to:

- Migrate to Version 4 from Versions 1 and 2 (Chapter 6)
- Determine if the starter system meets your requirements (Chapter 2)
- Install EDX (Chapter 3)
- Select your required support (Chapter 4)
- Generate a tailored operating system (Chapter 5).

## What Do You Need To Do? *(continued)*

### Migrate to Version 4 (Version 1 and 2 Only)

Before installing the EDX Version 4, Version 1 and 2 data sets must be converted in order to be compatible with Version 4 data sets. The conversion procedures to migrate from Version 1 and 2 are described in Chapter 6.

**Note:** If you are a current user of EDX Version 3 or 4.0 and are migrating to EDX Version 4.1, you do not have to perform a special conversion procedure. Version 3 and 4.0 programs and data sets are compatible with Version 4.1. However, we suggest that you create a backup copy of your current system and pertinent data before installing EDX Version 4.1.

### Determine if the Starter System Meets your Requirements

Chapter 2 helps you decide if the starter system (an IBM-supplied operating system) meets your application needs. If it does, you can use it as your operating system. If it does not, you must generate a tailored operating system.

### Install EDX

EDX is supplied to you on the product diskettes. To install EDX on your Series/1, you must copy these these diskettes to your disk. Installation is described in Chapter 3.

You need to perform the following steps to install EDX:

- Migrate to Version 4 (Version 1 and 2 users only).
- IPL the starter system from diskette.
- Allocate and initialize disk volumes.
- Copy the product diskettes to your disk.
- IPL the starter system from disk as your operating system.
- Verify your installation using an IBM-supplied program.

### Select Your Required Support

Chapter 4 helps you select the system features you need to generate a tailored operating system. This task consists of defining the structure of processor storage, defining the I/O devices attached to your Series/1, and selecting the system features required for your application.

## What Do You Need To Do? *(continued)*

To keep track of your selection, four work sheets are provided for you to fill out:

**Work Sheet 1** Estimating the size of your supervisor

**Work Sheet 2** Defining I/O devices to the supervisor

**Work Sheet 3** Selecting software support

**Work Sheet 4** Estimating the size of supervisor portions and programs executing in partitions other than partition one.

After you finish selecting the devices and features and filling out the work sheets, you can take these work sheets and this book to your Series/1. You can then follow the procedures in Chapter 5 for generating a tailored operating system.

### Generate a Tailored Operating System

Chapter 5 provides the steps you need to generate a tailored operating system. This means modifying a copy of the EDX supervisor which is part of the starter system. This process consists of the following tasks:

1. Creating a set of system definition statements reflecting the hardware configuration of the system on which the tailored operating system will run.

2. Selecting the supervisor object modules that are required to support the desired I/O devices and system features.

3. Assembling the system definition statements created in Step 1 above.

4. Link editing the object modules produced by the assembly in Step 3 with the supervisor object modules selected in Step 2 to produce a modified supervisor.

5. Initializing your new supervisor.

6. IPLing your system.

7. Verifying your operating system using an IBM-supplied program.

# Notes

# Chapter 2. Determine If the Starter System Meets Your Needs

This chapter helps you determine if the configuration of the starter system meets your needs as an operating system. You can use this system configuration to define your operating system **only** if the devices you have and the software features you need match the devices and software that are built into the IBM-supplied starter system.

If you have **any** devices that aren't built into the starter system (such as magnetic tape or two 4964 diskette units), you must "tailor" your operating system. You must also "tailor" your operating system if you need **any** software features that aren't built into the starter system (such as floating point, error logging, spooling, or timers).

Tailoring your operating system means building your needs into an operating system. The task of tailoring your operating system involves adding I/O devices and software features that are not supported in the starter system as well as deleting from it the I/O devices and software features that you do not need. The starter-system is one of the tools you need to tailor your own operating system. Because of this, you must install it even if you cannot use it as your operating system.

You use the starter system to install EDX. There are special supervisor object modules included in the starter system so that it can run on any Series/1 with the minimum system configuration. These modules prevent the use of the starter system in a general production environment. Even if the hardware you have attached to your Series/1 matches the starter system definition, you must generate an operating system using the defaults defined for the starter system. To generate an operating system that matches the starter system definition, follow the procedure outlined in Chapter 5, "Generate a Tailored Operating System," on page IS-77.

# Determine If the Starter System Meets Your Needs

## What is the Starter System?

The starter system is an IBM-supplied operating system that supports up to 512K bytes of storage (depending upon your processor) and has eight partitions defined. A maximum of five programs can execute in each partition at the same time. In addition, it supports certain I/O devices and software features.

### Devices You Can Have With the Starter System

The starter system supports the following I/O devices:

**One** 4962, 4963, or 4967 disk storage unit

or

**One** 30-megabyte disk within a 4952, 4954, or 4956 Model 30D processor or within a 4965 storage and I/O expansion unit (model 30D)

or

**One** 60-megabyte disk within a 4954 or 4956 Model 60D processor or within a 4965 storage and I/O expansion unit (model 60D)

**One** 4964 Diskette Storage Unit

**Two** 4965 Diskette Storage Units

**One** 4966 Diskette Storage Unit

**One** 4978, 4979, or 4980 Display Station

**One** Teletypewriter [1] (TTY) device

**One** 4974 Printer

**One** Multifunction Attachment (MFA) - Feature Number #1310

**One** Multidrop Work Station Attachment - Feature Number #1250

**One** 4975-01L AND one 4975-02L Printer attached via the Multifunction Attachment

**One** 3101 Display Terminal (block mode) locally attached at 1200 bits/second via the Multifunction Attachment.

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1 Trademark of Teletype Corporation

# What is the Starter System? *(continued)*

**Notes:**

1. If there is no Multifunction Attachment, the starter system expects a 3101 Display Terminal (block mode) attached point-to-point at 1200 bits per second and range high via adapter #1610. (For information on customizing adapters, see Appendix B, "Customizing Adapters with Hardware Jumpers" on page IS-237.)

2. If there is no #1610 adapter, the starter system expects a 3101 Display Terminal (block mode) attached via adapter #2091/2092.

3. If there is no #2091/2092 adapter, the starter system expects a 3101 display terminal (block mode) attached via adapter #2095/2096.

## Software Features in the Starter System

The starter system provides the following software support:

- Initialization for supported I/O devices
- Relocating program loader
- #1310, 2095/2096, 7850 ACCA/TTY translation
- #1610, 2091/2092 ACCA translation
- A 256-byte supervisor patch area.

# Determine If the Starter System Meets Your Needs

## What is the Starter System? *(continued)*

### Devices Not Supported by the Starter System

The Series/1 devices in the following checklist are ***not*** supported by the basic starter system ($EDXNUC). Use the checklist to indicate the I/O devices attached to your Series/1. If any of these devices are part of your system, you need to generate a tailored operating system.

| Device | Yes | No |
|---|---|---|
| 4968 Magnetic Tape Subsystem | | |
| 4969 Magnetic Tape Subsystem | | |
| 4973 Printer | | |
| 5219 Printer attached via feature #5640 | | |
| 5224 Printer attached via feature #5640 | | |
| 5225 Printer attached via feature #5640 | | |
| 2741 Communications Terminal | | |
| General Purpose Interface Bus | | |
| Binary Synchronous Line | | |
| Synchronous Communications Single-Line Control/High Speed Feature (#2080) | | |
| Series/1-to-Series/1 Attachment (RPQ D02441 or D02242) | | |
| Timer Feature #7840 | | |
| An ASCII terminal attached via feature #1610, #2091/2092, or #2095/2096 | | |
| 4975-01A ASCII Printer | | |
| Integrated I/O Nonisolated Feature (#1560) | | |
| 4982 Sensor I/O Units | | |
| More than two 4965 diskette units | | |
| Virtual Terminal option | | |
| Other I/O devices attached to the Series/1 | | |

## What is the Starter System? *(continued)*

MULTIPLES OF ANY OF THE FOLLOWING DEVICES:

| Device | Yes | No |
|---|---|---|
| 4962 disk | | |
| 4963 disk | | |
| 4967 disk | | |
| 30-megabyte disk | | |
| 60-megabyte disk | | |
| 4964 or 4966 diskette units | | |
| 4978, 4979, or 4980 display terminals | | |
| 3101 display terminal | | |
| TTY | | |

# Determine If the Starter System Meets Your Needs

## What is the Starter System? *(continued)*

### Software Features Not Provided by the Starter System

The software features in the following checklist are ***not*** provided by the starter system (EDXNUC). Use the checklist to indicate the features you require for your application. If you require any of these features, you need to generate a tailored operating system.

| Software Features | Yes | No |
|---|---|---|
| Software support modules for the preceding I/O devices | | |
| 1024 bytes/sector IPL capability and/or I/O support | | |
| EBCDIC/floating-point conversion | | |
| Floating-point arithmetic | | |
| Indexed Access Method QCBs | | |
| Interactive debug | | |
| Interprogram communications via virtual terminals | | |
| Spooling support | | |
| Remote Management Utility | | |
| Timer support for the 4952/4954/4956 processor | | |
| Translation tables for 2741 terminal | | |
| Virtual Terminal option | | |

# Chapter 3. Install EDX

This chapter describes two things. First, it describes what you need to install the Event Driven Executive (EDX) on a Series/1. Second, it describes the step-by-step procedures for installing EDX.

## What Do You Need?

To install EDX, you need the following:

- The Program Directory
- The product diskettes shipped to you from IBM containing the following program library:
  - Basic Supervisor and Emulator (5719-XS4)
  - Any of the following program products depending on your installation requirements:
    - Program Preparation Facility (5719-XX5)
    - EDX Macro Library (5719-LM8)
    - EDX Macro Library/Host (5719-LM5)
- A Series/1 with the following minimum configuration:

  **One** Processor (one of the following):

  - 4952, 4954, 4955, or 4956 processor with 48KB of storage for a production system

## What Do You Need? *(continued)*

or

- 4952, 4954, 4955, or 4956 processor with 96KB of storage for a development system

**One** Disk storage unit (one of the following):

- 4962 Disk Storage Unit
- 4963 Disk Subsystem
- 4967 Disk Subsystem
- 30-megabyte disk storage unit within a 4952, 4954, or 4956 model 30D processor or within a 4965 storage and I/O expansion unit (model 30D)
- 60-megabyte disk storage unit within a 4954 or 4956 model 60D processor or within a 4965 storage and I/O expansion unit (model 60D)

**Note:** The 30-megabyte disk is referred to as the DDSK-30 and the 60-megabyte disk is referred to as the DDSK-60.

**One** 4964 Diskette Unit, 4965 Diskette Drive, or 4966 Diskette Magazine Unit

**One** 4974 Printer or 4975 Printer (attached through the Multifunction Attachment (MFA) Feature #1310)

**One** Operator station (one of the following):

- 4978 or 4979 Display Station.
- 4980 Display Station attached through the Multidrop Work Station Attachment Feature #1250 at 100K bits per second.
- 3101 Display Terminal (character mode) or equivalent device attached through the Teletypewriter Adapter Feature #7850.
- 3101 Display Terminal (block mode) attached point-to-point through Feature #1610, #2091/2092, or #2095/2096 at 1200 bits per second and high speed range.
- 3101 Display Terminal (block mode) attached via a Multifunction Attachment Feature #1310 at 1200 bits per second in RS422 mode.

## What Do You Need? *(continued)*

In addition, these devices must be at the following specified addresses:

| Device | Type | Address (Hex) |
|---|---|---|
| 4962 | Disk Storage Unit | 03 |
| 4963 | Disk Subsystem | 48 |
| 4967 | Disk Subsystem | 48 |
| DDSK-30 | Disk Storage Unit | 44 |
| DDSK-60 | Disk Storage Unit | 44 |
| 4964 | Diskette Unit | 02 |
| 4965 | Diskette Drive | 44[1] |
| 4966 | Diskette Magazine Unit | 22 |
| 4974 | Printer | 01 |
| 4975-01L | Printer (via MFA) | 5A |
| 4975-02L | Printer (via MFA) | 5B |
| 4978 | Display Station | 24 |
| 4979 | Display Station | 04 |
| 4980 | Display Station | 80 |
| #1250 | Multidrop Work Station Attachment | 80 |
| #1610 | Asynchronous Communications Single-Line Adapter | 08[2] |
| #2091/2092 | Asynchronous Communications Multiline Adapter | 60[2] |
| #2095/2096 | Feature-Programmable Communications Adapter | 68[2] |
| #7850 | Teletypewriter Attachment | 00[3] |
| #1310 | Multifunction Attachment (MFA) | 58[4] |
| #1250 | Multidrop Work Station Attachment | 80 |

**Figure 1. Address assignments for minimum Series/1 configuration**

**Notes:**

1. If the diskette unit is part of a 4952 model 30D processor, a 4954 or 4956 model 30D/60D processor, or a 4965 storage and I/O expansion unit (model 30D/60D), the diskette unit must be at address 45.

2. Supports 3101 models 20, 22, 23 in block mode.

3. Supports 3101 models 10, 12, 13, 20, 22, 23 in character mode.

4. Supports 3101 model 23 in block mode at address 59.

# Install EDX

## What Do You Need? *(continued)*

### Preparing to Install EDX

**Note:** This discussion is limited to the Basic Supervisor and Emulator (5719-XS4) and the Program Preparation Facility (5719-XX5). The Macro Library (5719-LM8) and Macro Library/Host (5740-LM5) licensed programs are not addressed.

Before you install EDX, your system must have one of the following disk units:

- 4962 Model 1 or 2
- 4962 Model 1F or 2F
- 4962 Model 3 or 4
- 4963 Model 1
- 4963 Model 1F
- 4963 Model 2
- 4963 Model 2F
- 4967 Model 2
- 4967 Model 4
- DDSK-30
- DDSK-60.

An Event Driven Executive supervisor must reside in a data set named $EDXNUCx (where x equals any alphameric character you wish to specify). As shipped from IBM, diskette XS4001 contains a supervisor called the starter system in a data set named $EDXNUC. The first step in installation requires that you perform an IPL of the starter system from diskette XS4001. Therefore, the Series/1 must have one of the following devices wired as either the Primary or Alternate IPL device:

- 4964 Diskette Unit at hardware address X'02'
- 4965 Diskette Drive at hardware address X'44' or X'45'
- 4966 Diskette Magazine Unit at hardware address X'22'.

**Notes:**

1. If the diskette device is wired as the Primary IPL device, the disk device must be wired as the Alternate IPL device.

2. If a 4966 is the IPL device, you can perform an IPL from diskette slot 1 only.

The object of installation is to copy the programs and utilities supplied on the product diskettes to a disk device. Therefore, the Series/1 on which the starter system is being installed must have one of the following devices wired as the Primary or Alternate IPL device.

- 4962 disk (any model) at hardware address X'03'
- 4963 disk (any model) at hardware address X'48'
- 4967 disk (any model) at hardware address X'48'
- DDSK-30 disk at hardware address X'44'
- DDSK-60 disk at hardware address X'44'.

## What Do You Need? *(continued)*

**Note:** If the disk device is wired as the Primary IPL device, the diskette device must be wired as the Alternate IPL device.

In addition, the starter system assumes that certain terminal devices are attached to the Series/1, and that they have specific address assignments. The Series/1 on which the starter system is being installed must have one of the following:

- TTY device at hardware address X'00'
- 4978 display at hardware address X'24'
- 4979 display at hardware address X'04'
- 4980 display at hardware address X'80'.

Also, the Series/1 can have a 4974 Printer at hardware address X'01' or a 4975 Printer (except the 4975-01A) at hardware address X'5A' or X'5B'.

## Installing EDX

**Note:** The procedures and instructions for installing the Event Driven Executive are documented in the *Program Directory*, which is shipped with the licensed product diskettes. Late changes or updates to the installation process are reflected in the *Program Directory*. Therefore, you should use the *Program Directory* to install the EDX licensed programs. This discussion is limited to the major steps involved in installation.

To copy the product diskettes and install EDX, you must do the following:

**Step 1** Save your existing system (if you are migrating from Versions 1 or 2.

**Note:** If you are a current user of EDX Versions 3 or 4.0, you do not need to perform a special migration procedure. EDX Version 3 and 4.0 programs are compatible with EDX Version 4.1. However, we suggest that you create a backup copy of your current system and pertinent data before installing EDX Version 4.1.

**Step 2** IPL the starter system from diskette XS4001.

**Step 3** Initialize logical volumes EDX002, ASMLIB, EDX003, and FHVOL (for disks with fixed heads).

**Note:** If you are a current user of EDX Versions 3 or 4.0, you may not need to initialize these volumes. They were initialized when you installed your current system and already exist on that system. However, see "Step 3 - Initialize Logical Volumes" on page IS-20 for the recommended volume sizes. If your volumes are not large enough to contain the modules to be copied, you need to reinitialize them.

## Installing EDX *(continued)*

**Step 4** Copy the starter system ($EDXNUC) and basic utilities.

**Step 5** IPL the starter system from disk.

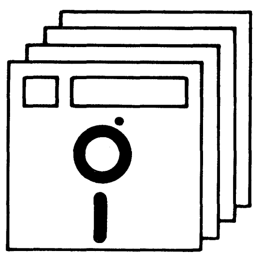
**Step 6** Copy the system support modules and production utilities.

**Step 7** Copy the program preparation modules and utilities (this step is required if the Program Preparation Facility 5719-XX5 is being installed).

**Step 8** Exercise utilities and program preparation facilities.

Before you begin the installation process, you must have the following diskettes:

### 5719-XS4 Basic Supervisor and Emulator



XS4001
through
XS4004

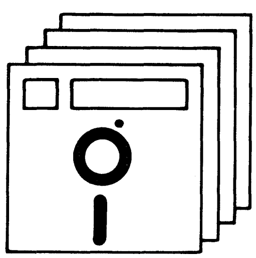
Diskette XS4001 contains the supplied starter system and the necessary utilities to install the product.

Diskette XS4002 contains supervisor object modules used during the system generation process.

Diskette XS4003 is a multivolume diskette containing two volumes: XS403A and XS403B. Volume XS403A contains object modules that support various system functions. Volume XS403B contains utilities that are included with the supervisor.

Diskette XS4004 contains the remaining utilities included with the supervisor.

### 5719-XX5 Program Preparation Facility



XX5001
through
XX5004

Diskette XX5001 contains the EDX program preparation modules.

Diskette XX5002 contains copy modules for inclusion in user application programs.

Diskette XX5003 contains copy modules for inclusion in user application programs.

Diskette XX5004 contains the program preparation utilities and the session manager.

You are now ready to install the Event Driven Executive.

**Note:** Throughout the installation procedures, several utility programs are used. In the examples of using these utilities, two types of messages are shown: a loading message and a prompting message.

- When a utility program is invoked, the following message is displayed:

```
LOADING name      nP, HH.MM.SS, LP= nnnn, PART=x
```

Here, name indicates the utility being loaded. nP indicates that the utility is n number of pages long (256 bytes equals one page). HH.MM.SS equals the time in hours, minutes and seconds. LP= nnnn indicates the load point of the utility. PART=x indicates the partition where the utility is loaded. With the exception of nP, the balance of the message changes depending upon where and when the utility was invoked. Due to these changes, the loading messages shown in the examples are for illustrative purposes only.

- During installation, the utilities prompt you for information. In examples where a response is required, the response is highlighted in red. Enter the responses as shown.

## Step 1 - Migrating from Version 1 or 2

If you are migrating from EDX Version 1 or 2, be sure to follow the procedures outlined in Chapter 6 before proceeding to Step 2.

## Step 2 - IPL the Starter System

**Note:** Before installing EDX, we suggest that current users of EDX Version 3 or Version 4.0 create a backup of their current systems and pertinent data. To save specific data sets, use the $COPYUT1 utility. To save an entire volume or current system, use the $MOVEVOL utility. See *Operation Guide* for information on how to perform these tasks.

### 2(a) Set the IPL Source switch and Mode switch to IPL from the diskette unit.

The IPL Source switch has two positions. The primary position selects the primary IPL device for your system. The alternate position selects the alternate IPL device for your system. Depending on how your diskette drive is wired (Primary or Alternate), set the IPL Source switch as appropriate for your system.

The Mode switch has three positions that allow you to select the mode in which you will operate: Auto IPL, Normal, and Diagnostic. **Set the Mode switch to the Normal position.**

## Installing EDX *(continued)*

In the following example, the diskette unit is the Alternate IPL device. As such, the IPL Source switch is set to Alternate.

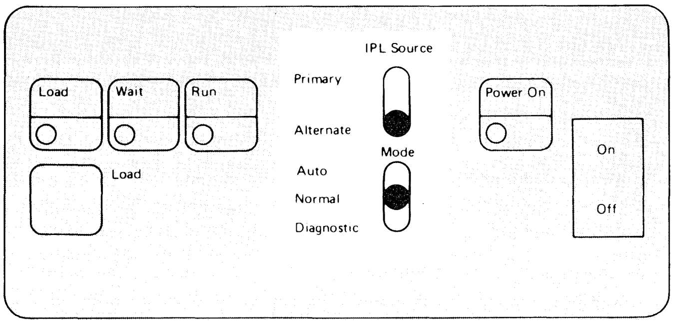
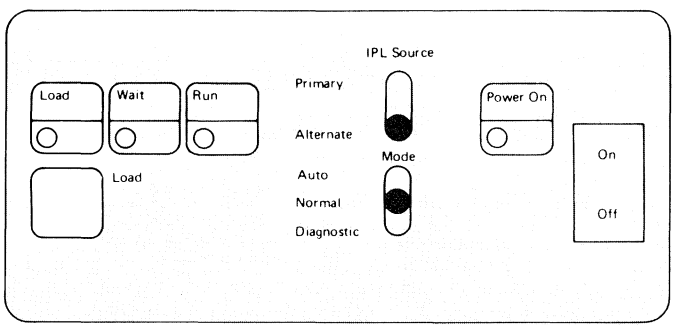



**Figure 2. IPL source and mode switches**

### 2(b) Insert diskette XS4001 into the diskette unit.

**Note:** EDX supports the 4964 and 4965 diskette units and the 4966 diskette subsystem. For instructions on inserting and removing diskettes from these devices, refer to the *Operation Guide*.

### 2(c) Press the LOAD button on the Series/1 console.



When IPL completes, the following system IPL message is displayed on the logging device:

```
*** EVENT DRIVEN EXECUTIVE *** V4.1
***           XPS          ***

IPL = $EDXNUC,XS4001

                 XPS SYSTEM STORAGE MAP
                 ----------------------
       USER   USER   COMMON   SUPV  SUPV   USER  USER TOTAL
PART  START   SIZE    SIZE   START  SIZE  START  SIZE  SIZE
  #   (DEC)  (DEC)   (HEX)   (HEX) (HEX)  (HEX) (HEX) (HEX)
  1   45824 19712      0        0  B300   B300  4D00 10000
  2       0 65536      0        0     0      0 10000 10000
  3       0 65536      0        0     0      0 10000 10000
  4       0 65536      0        0     0      0 10000 10000
TOTAL SIZES (HEX):                 B300        34D00
UNMAPPED STORAGE =      0 (DEC) 2K BLOCKS
EDX INITIALIZATION COMPLETE
```

The IPL message contains 9 columns. An explanation of each column follows.

PART # — Part # indicates the the number of the partition.

USER START — The starting address (in decimal) of the first program loaded for execution within each partition.

USER SIZE — The amount of storage (in decimal) within each partition available for program execution.

COMMON SIZE — The size (in hexadecimal) of the common area within each partition.

SUPV START — The starting address (in hexadecimal) of the supervisor within each partition.

SUPV SIZE — The size (in hexadecimal) of the supervisor within in each partition.

USER START — The starting address (in hexadecimal) of the first program loaded for execution within each partition.

USER SIZE — The amount of storage (in hexadecimal) within each partition available for program execution.

TOTAL SIZE — The total size (in hexadecimal) of each partition.

## Installing EDX *(continued)*

### Step 3 - Initialize Logical Volumes

Before copying any data sets, you must write a volume directory on disk, allocate volumes, and create directories.

You need to allocate and create directories for the following volumes:

- EDX002
- ASMLIB
- EDX003
- FHVOL (if your disk has fixed heads).

**Note:** If you are a current user of EDX Version 3 or Version 4.0, you do not need to initialize these volumes; they already exist on your system. However, you must ensure that they are large enough to install EDX Version 4.1. Use $DISKUT1 utility (LAV command) to check the recommended volume sizes below and, if they are large enough, skip this step.

If they are not large enough, you will need to reinitialize them. Remember to save any pertinent data before initializing the volumes; once the volumes are reinitialized, the data currently on them is no longer accessible.

The recommended size (in records) for each volume is as follows:

| Volume | Size |
|---|---|
| **EDX002** | 10,000 |
| **ASMLIB** | 10,000 |
| **EDX003** | 15,640 |

To allocate and initialize these volumes:

**3(a)** **Press the attention key (or its equivalent) and load the $INITDSK utility, as follows:**

```
> $L $INITDSK
LOADING $INITDSK        79P, LP = 9100, PART=1
$INITDSK - DISK INITIALIZATION UTILITY

COMMAND (?):
```

The $INITDSK utility prompts you for a command. The ID command writes the volume directory on the disk device and then prompts for allocation of volumes.

**Note:** Before installing a product, such as the Multiple Terminal Manager or Indexed Access Method, check the amount of space required for each. Refer to the appropriate program directories.

The following dialog with the $INITDSK utility shows how to initialize and allocate volumes on a 4962 disk with fixed heads at address X'03'. If you are installing on a 4963 or 4967 disk, use address X'48'. If you are installing on a DDSK-30, use address X'44'. If you are allocating volumes on a 4962 disk at address X'03' and have a 4963 disk at address X'48', you must power the 4963 disk off. Respond to the $INITDSK prompts as shown.

## 3(b) Initialize the disk.

```
COMMAND (?): ID 3

      DEVICE ALREADY INITIALIZED
INITIALIZE DEVICE MAY DESTROY ALL DATA
CONTINUE? Y

THERE ARE       54000 RECORDS IN YOUR DEVICE

THE DEFAULT OF THE VOLUME DIRECTORY
FOR THIS DEVICE IS RECORD #    129.
IT NOW EXISTS AT RECORD # 541
DIRECTORY RECORD NUMBER OK? Y

DISK INITIALIZED
```

Now, you can begin allocating volumes on your disk.

## 3(c) Allocate volume EDX002.

```
ALLOCATE A VOLUME (Y/N)? Y
IS THE VOLUME A FIXED HEAD VOLUME? N (Only appears if you have
VOLUME: EDX002                        a disk with fixed heads)
SIZE IN RECORDS: 10000
EDX002 ALLOCATED
INITIALIZE THE VOLUME JUST ALLOCATED? Y
MAXIMUM NUMBER OF DATASETS: 500
DO YOU WANT TO WRITE VERIFY FOR THIS VOLUME? N
ALLOCATE $EDXNUC? Y
VOLUME INITIALIZED
INITIALIZE IPL TEXT? Y
IPL TEXT WRITTEN
```

## 3(d) Allocate volume ASMLIB.

```
ALLOCATE ANOTHER VOLUME? Y
IS THE VOLUME A FIXED HEAD VOLUME? N (Only appears if you have
VOLUME: ASMLIB                         a disk with fixed heads)
SIZE IN RECORDS: 10000
ASMLIB ALLOCATED
INITIALIZE THE VOLUME JUST ALLOCATED? Y
MAXIMUM NUMBER OF DATASETS: 500
DO YOU WANT TO WRITE VERIFY FOR THIS VOLUME? N
ALLOCATE $EDXNUC? N
VOLUME INITIALIZED
```

## 3(e) Allocate volume EDX003.

```
ALLOCATE ANOTHER VOLUME? Y
IS THE VOLUME A FIXED HEAD VOLUME? N (Only appears if you have
VOLUME: EDX003                         a disk with fixed heads)
SIZE IN RECORDS: 15640
EDX003 ALLOCATED
INITIALIZE THE VOLUME JUST ALLOCATED? Y
MAXIMUM NUMBER OF DATASETS: 500
DO YOU WANT TO WRITE VERIFY FOR THIS VOLUME? N
ALLOCATE $EDXNUC? N
VOLUME INITIALIZED
```

## 3(f) Does your disk have fixed heads?

If your disk does not have fixed heads, enter an N in response to the ALLOCATE ANOTHER VOLUME? prompt, end the $INITDSK utility as shown and proceed to Step 4.

```
ALLOCATE ANOTHER VOLUME? N

COMMAND (?): EN

$INITDSK ENDED
```

If your disk has fixed heads (4962-1F, 4962-2F, 4963-23, or 4963-58), enter a Y in response to the ALLOCATE ANOTHER VOLUME? prompt and continue with step 3(g).

```
ALLOCATE ANOTHER VOLUME? Y
```

### 3(g) Allocate volume FHVOL

```
IS THE VOLUME A FIXED HEAD VOLUME? Y  (Only appears if you have
VOLUME: FHVOL                          a disk with fixed heads)
FHVOL ALLOCATED
INITIALIZE THE VOLUME JUST ALLOCATED? Y
MAXIMUM NUMBER OF DATASETS: 50
DO YOU WANT TO WRITE VERIFY FOR THIS VOLUME? N
ALLOCATE $EDXNUC? N
VOLUME INITIALIZED
ALLOCATE ANOTHER VOLUME? N

COMMAND (?): EN

$INITDSK ENDED
```

## Step 4 - Copy the Starter Supervisor, Basic Utilities, and Support Modules

Use the $COPYUT1 utility to copy the starter system $EDXNUC on XS4001 to $EDXNUC on EDX002, along with the basic utilities and support modules.

To copy the starter system, basic utilities, and support modules:

### 4(a) Press the attention key and load $COPYUT1. Respond to the $COPYUT1 prompts as shown.

```
> $L $COPYUT1
LOADING $COPYUT1       52P, LP= 9100, PART=1
$COPYUT1 - DATA SET COPY UTILITY

           ** WARNING **
MEMBERS ON TARGET VOLUME WILL BE DELETED
REALLOCATION AND COPYING OF MEMBERS IS
DEPENDENT ON SUFFICIENT CONTIGUOUS SPACE

THE DEFINED SOURCE VOLUME IS XS4001, OK (Y/N)? Y
THE DEFINED TARGET VOLUME IS XS4001, OK (Y/N)? N EDX002
MEMBER WILL BE COPIED FROM XS4001 TO EDX002  OK (Y/N)? Y

COMMAND (?): ROLLON
```

### 4(b) Copy $EDXNUC to EDX002. Respond as shown.

```
COMMAND (?): CM $EDXNUC *
COPY COMPLETE           400 RECORDS COPIED
```

## Installing EDX *(continued)*

### 4(c) **Copy the basic utilities and support modules. Respond as shown.**

```
COMMAND (?): CALL

COPY FROM BEGINNING (Y/N)? Y
```

$COPYUT1 displays a list of the modules being copied from XS4001 to EDX002.

After all the modules on XS4001 are copied to EDX002, $COPYUT1 displays the COMMAND (?): prompt.

### 4(d) **End the $COPYUT1 utility as shown.**

```
COMMAND (?): EN

$COPYUT1 ENDED
```

If you are a current user of Version 3 or Version 4.0 and did not reinitialize the volumes required to install EDX Version 4.1 (specifically, EDX002, ASMLIB, EDX003, and FHVOL, if applicable), you need to initialize the starter system using the II command of the $INITDSK utility. Complete the following step before proceeding to Step 5.

### 4(e) **Press the attention key and load $INITDSK.** Respond to the $INITDSK prompts as shown.

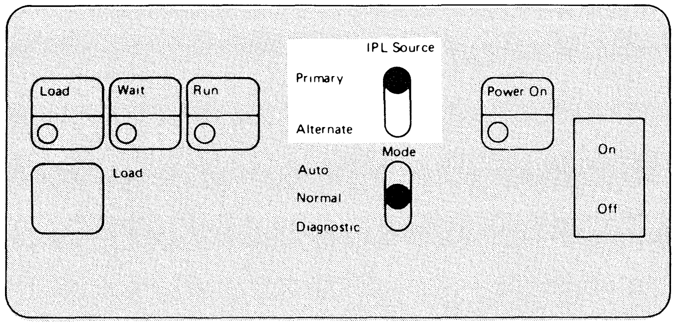
```
> $L $INITDSK
LOADING $INITDSK   83P, LP= 9200, PART= 1

$INITDSK - DISK INITIALIZATION UTILITY

COMMAND (?): II
NUCLEUS:  $EDXNUC
VOLUME: EDX002
IPL TEXT WRITTEN

COMMAND (?): EN
$INITDSK ENDED AT 01:05:16
```

### 4(f) **Remove diskette XS4001 from the diskette unit.**

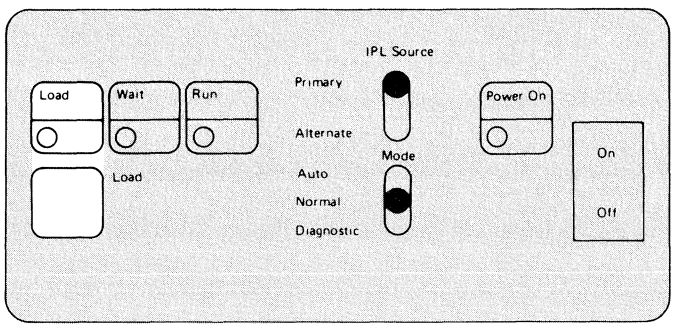
## Step 5 - IPL the Starter Supervisor from Disk

**5(a) Set the IPL Source switch to IPL from the disk unit.**

In this example, the disk is wired as the Primary IPL device. For this reason, the IPL Source switch is set to Primary.




**5(b) Press the LOAD button on the Series/1 console.**



When IPL completes, the system issues the following message indicating that the starter system is successfully installed.

```
*** EVENT DRIVEN EXECUTIVE ***   V4.1
***          XPS             ***

IPL = $EDXNUC,EDX002

                 XPS SYSTEM STORAGE MAP
                 ----------------------
       USER   USER   COMMON   SUPV  SUPV   USER  USER TOTAL
PART  START   SIZE    SIZE   START  SIZE  START  SIZE  SIZE
  #   (DEC)  (DEC)   (HEX)   (HEX) (HEX)  (HEX) (HEX) (HEX)
  1   46080 19456      0        0  B400   B400  4C00 10000
  2       0 65536      0        0     0      0 10000 10000
  3       0 65536      0        0     0      0 10000 10000
  4       0 65536      0        0     0      0 10000 10000
TOTAL (HEX):                       B400        34C00
UNMAPPED STORAGE =      0 (DEC) 2K BLOCKS
EDX INITIALIZATION COMPLETE
```

### Step 6 - Copy the System Support Modules and Production Utilities

To copy the system support modules and the production utilities from XS4003 and XS4004:

**6(a)** **Insert diskette XS4003 into the diskette unit.** Diskette XS4003 contains two volumes: XS403A and XS403B. The procedure for copying XS403A to ASMLIB and XS403B to EDX002 follows.

**Note:** If you are using a 4966 Diskette Magazine Unit, insert the diskette in slot 1 and vary the diskette on line. To do this:

- Press the attention key
- Use the $VARYON command to vary the diskette on line
- Press the enter key.

```
> $VARYON 22,1
XS4003 ONLINE ON SLOT 1
```

**6(b)** **Press the attention key and load $COPYUT1. Respond to the $COPYUT1 prompts as shown.**

```
> $L $COPYUT1
LOADING $COPYUT1       52P, LP= 9100, PART=1
$COPYUT1 - DATA SET COPY UTILITY

           ** WARNING **
MEMBERS ON TARGET VOLUME WILL BE DELETED
REALLOCATION AND COPYING OF MEMBERS IS
DEPENDENT ON SUFFICIENT CONTIGUOUS SPACE

THE DEFINED SOURCE VOLUME IS EDX002, OK (Y/N)? N XS403A
THE DEFINED TARGET VOLUME IS EDX002, OK (Y/N)? N ASMLIB
MEMBER WILL BE COPIED FROM XS403A to ASMLIB OK (Y/N)? Y

COMMAND (?): ROLLON

COMMAND (?): CALL

COPY FROM BEGINNING (Y/N)? Y
```

$COPYUT1 displays a list of the modules being copied from XS403A to ASMLIB.

**6(c)** Change the volume and copy the contents of XS403B. Respond to the $COPYUT1 prompts as shown.

```
COMMAND (?): CV

THE DEFINED SOURCE VOLUME IS XS403A, OK (Y/N)? N XS403B
THE DEFINED TARGET VOLUME IS ASMLIB, OK (Y/N)? N EDX002
MEMBER WILL BE COPIED FROM XS403B to EDX002 OK (Y/N)? Y

COMMAND (?): CALL

COPY FROM BEGINNING (Y/N)? Y
```

$COPYUT1 displays a list of the modules being copied from XS403B to EDX002.

After all the modules on XS4003 are copied to ASMLIB and EDX002, $COPYUT1 displays the COMMAND (?): prompt.

**6(d)** **Replace diskette XS4003 with diskette XS4004 in the diskette unit.**

**Note:** If you are using a 4966 Diskette Magazine Unit, insert the diskette in slot 1 and vary the diskette online. To do this:

- Press the attention key
- Press the enter key
- Use the $VARYON command to vary the diskette online.

```
COMMAND (?):
> $VARYON 22,1
XS4004 ONLINE ON SLOT 1
```

**6(e)** **Change the volume and copy the contents of XS4004. Respond to the $COPYUT1 prompts as shown.**

```
COMMAND (?): CV

THE DEFINED SOURCE VOLUME IS XS403B, OK (Y/N)? N XS4004
THE DEFINED TARGET VOLUME IS EDX002, OK (Y/N)? Y
MEMBER WILL BE COPIED FROM XS4004 TO EDX002 OK (Y/N)? Y

COMMAND (?): CALL

COPY FROM BEGINNING (Y/N)? Y
```

$COPYUT1 displays a list of the system support modules being copied from XS4004 to EDX002.

After the modules from XS4004 are copied to EDX002, $COPYUT1 displays the COMMAND (?): prompt.

**6(f)** **Remove diskette XS4004 from the diskette unit.**

If you are going to develop application programs on your Series/1, you need to copy the Program Preparation modules. Proceed to Step 7. If not, you can end $COPYUT1 as shown and proceed to Step 8.

```
COMMAND (?): EN

$COPYUT1 ENDED
```

## Step 7 - Copy the Program Preparation Modules and Utilities (5719-XX5)

(This step is required only if 5719-XX5 is being installed.)

Now you can copy the program preparation modules and utilities. These modules are required if you are going to develop application programs on your Series/1.

**Note:** Either the Program Preparation Facilities (5719-XX5) or the Series/1 Macro Assembler (5719-ASA) is required if you are going to create a tailored operating system or prepare application programs. To install the Event Driven Executive Macro Assembler, follow the directions in the 5719-ASA Program Directory.

To copy the program preparation modules from XX5001, XX5002, and XX5003 to ASMLIB, and the program preparation utilities and the session manager to EDX002, perform the following steps:

**7(a)** **Insert diskette XX5001 into the diskette unit.**

**Note:** If you are using a 4966 Diskette Magazine Unit, insert the diskette in slot 1 and vary the diskette online. To do this:

- Press the attention key
- Press the enter key
- Use the $VARYON command to vary the diskette online.

```
COMMAND (?):
> $VARYON 22,1
XX5001 ONLINE ON SLOT 1
```

**7(b)** **Change volumes and copy the contents of XX5001. Respond to the $COPYUT1 prompts as shown.**

```
COMMAND (?): CV

THE DEFINED SOURCE VOLUME IS XS4004, OK (Y/N)? N XX5001
THE DEFINED TARGET VOLUME IS EDX002, OK (Y/N)? N ASMLIB
MEMBER WILL BE COPIED FROM XX5001 to ASMLIB OK (Y/N)? Y

COMMAND (?): CALL

COPY FROM BEGINNING (Y/N)? Y
```

$COPYUT1 displays a list of the $EDXASM modules being copied from XX5001 to ASMLIB.

After all the modules are copied from XX5001, $COPYUT1 displays the COMMAND (?): prompt.

**7(c)** **Replace diskette XX5001 with diskette XX5002 in the diskette unit.**

**Note:** If you are using a 4966 Diskette Magazine Unit, insert the diskette in slot 1 and vary the diskette online. To do this:

- Press the attention key
- Press the enter key
- Use the $VARYON command to vary the diskette online.

```
COMMAND (?):
> $VARYON 22,1
XX5002 ONLINE ON SLOT 1
```

**7(d)** **Change the volume and copy the contents of XX5002. Respond to the $COPYUT1 prompts as shown.**

```
COMMAND (?): CV

THE DEFINED SOURCE VOLUME IS XX5001, OK (Y/N)? N XX5002
THE DEFINED TARGET VOLUME IS ASMLIB, OK (Y/N)? Y
MEMBER WILL BE COPIED FROM XX5002 to ASMLIB OK (Y/N)? Y

COMMAND (?): CALL

COPY FROM BEGINNING (Y/N)? Y
```

$COPYUT1 displays a list of the modules being copied from XX5002 to ASMLIB.

After all the modules are copied from XX5002 to ASMLIB, $COPYUT1 displays the COMMAND (?): prompt.

## Installing EDX *(continued)*

**7(e)** **Replace diskette XX5002 with diskette XX5003 in the diskette unit.**

**Note:** If you are using a 4966 Diskette Magazine Unit, insert the diskette in slot 1 and vary the diskette online. To do this:

- Press the attention key
- Press the enter key
- Use the $VARYON command to vary the diskette online.

```
COMMAND (?):
> $VARYON 22,1
XX5003 ONLINE ON SLOT 1
```

**7(f)** **Change the volume and copy the contents of XX5003. Respond to the $COPYUT1 prompts as shown.**

```
COMMAND (?): CV

THE DEFINED SOURCE VOLUME IS XX5002, OK (Y/N)? N XX5003
THE DEFINED TARGET VOLUME IS ASMLIB, OK (Y/N)? Y
MEMBER WILL BE COPIED FROM XX5003 to ASMLIB OK (Y/N)? Y

COMMAND (?): CALL

COPY FROM BEGINNING (Y/N)? Y
```

$COPYUT1 displays a list of the modules being copied from XX5003 to ASMLIB. These modules are the copy code modules required for certain applications.

**7(g)** **Replace diskette XX5003 with diskette XX5004 in the diskette unit.**

**Note:** If you are using a 4966 Diskette Magazine Unit, insert the diskette in slot 1 and vary the diskette online. To do this:

- Press the attention key
- Press the enter key
- Use the $VARYON command to vary the diskette online.

```
COMMAND (?):
> $VARYON 22,1
XX5004 ONLINE ON SLOT 1
```

**7(h)** **Change the volume and copy the contents of XX5004. Respond to the $COPYUT1 prompts as shown.**

```
COMMAND (?): CV

THE DEFINED SOURCE VOLUME IS XX5003, OK (Y/N)? N XX5004
THE DEFINED TARGET VOLUME IS ASMLIB, OK (Y/N)? N EDX002
MEMBER WILL BE COPIED FROM XX5004 to EDX002 OK (Y/N)? Y

COMMAND (?): CALL

COPY FROM BEGINNING (Y/N)? Y
```

$COPYUT1 displays a list of the modules being copied from XX5004 to EDX002. These modules are the program preparation utilities and the session manager.

## Installing EDX *(continued)*

**7(i)** **Remove diskette XX5004 from the diskette unit.**

If you do not wish to install the macro library or the macro assembler, end the $COPYUT1 utility as follows:

```
COMMAND (?): EN

$COPYUT1 ENDED
```

**Note:** If you are going to install the *Series/1 Macro Assembler*, follow the directions in the 5719-ASA program directory. If you are going to install the *Series/1 Macro Library*, follow the directions in the 5719-LM8 program directory.

### Step 8 - Exercise the Utilities and Program Preparation Facilities

This optional step exercises the utilities and program preparation facilities and verifies that you copied them correctly from the product diskettes.

To perform this exercise, you need to allocate four data sets and use the verification program CALCDEMO.

The data sets you need to allocate on EDX002 are:

- EDITWORK - a work data set used by the $FSEDIT utility
- ASMWORK - a work data set used by the $EDXASM compiler
- ASMOBJ - a data set where compiled output from $EDXASM is placed
- LINKWORK - a work data set used by the $EDXLINK linkage editor.

Except for EDITWORK, the data sets are used when you assemble and link-edit CALCSRC. CALCSRC is the source for the CALCDEMO program.

**Note:** By allocating these data sets at this point, you will not need to allocate them later if you generate a tailored operating system or prepare application programs.

**8(a)** **To allocate the data sets, press the attention key and load $DISKUT1. Respond to the $DISKUT1 prompts as shown.** If you load $DISKUT1 and allocate the four data sets successfully, continue.

If you cannot load $DISKUT1, you may have copied XS4001 to the wrong volume. REPEAT STEPS 3 THROUGH 7.

```
> $L $DISKUT1
LOADING $DISKUT1      49P, LP= 9100, PART=1
$DISKUT1 - DATA SET MANAGEMENT UTILITY I

USING VOLUME EDX002

COMMAND (?): AL EDITWORK 200 D
EDITWORK CREATED

COMMAND (?): AL ASMWORK 500 D
ASMWORK CREATED

COMMAND (?): AL ASMOBJ 300 D
ASMOBJ CREATED

COMMAND (?): AL LINKWORK 600 D
LINKWORK CREATED

COMMAND (?): EN

$DISKUT1 ENDED
```

## Installing EDX *(continued)*

**8(b)** **Press the attention key again, load the $EDXASM compiler, and provide the parameters necessary to compile CALCSRC.** If you load $EDXASM and compile CALCDEMO successfully (completion code = -1), continue.

If you cannot load $EDXASM, you may have copied XX5001 through XX5004 to the wrong volumes. REPEAT STEP 7.

```
 > $L $EDXASM,ASMLIB CALCSRC ASMWORK ASMOBJ
LOADING $EDXASM       78P, LP= 9100, PART=1

SELECT OPTIONS (?):  NOLIST END
ASSEMBLY STARTED     4 OVERLAY AREAS ACTIVE

   EDX ASSEMBLER STATISTICS

   SOURCE INPUT    - CALCSRC,EDX002
   WORK DATA SET   - ASMWORK,EDX002
   OBJECT MODULE   - ASMOBJ,EDX002
   STATEMENTS PROCESSED -      66



   NO STATEMENTS FLAGGED
   EXTERNAL/UNDEFINED SYMBOLS

  SVC              WXTRN
  SUPEXIT          WXTRN
  SETBUSY          WXTRN

COMPLETION CODE =   -1

$EDXASM ENDED
```

**8(c)** **Press the attention key, load $EDXLINK and provide the parameters necessary to link edit CALCSRC.** This step produces a listing on the printer designated as $SYSPRTR.

```
> $L $EDXLINK LINKWORK,EDX002
LOADING $EDXLINK      88P, LP= 9100, PART=1
$EDXLINK - EDX LINKAGE EDITOR

PARM(?): *
$EDXLINK INTERACTIVE MODE
DEFAULT VOLUME = EDX002

STMT(?): INCLUDE ASMOBJ

STMT(?): LINK CALCDEMO END

$EDXLINK EXECUTION STARTED
CALCDEMO,EDX002 STORED
PROGRAM DATA SET SIZE = 4 RECORDS
COMPLETION CODE = -1
$EDXLINK ENDED
```

**8(d)** **Press the attention key and load the verification program, CALCDEMO.** Follow its operating instructions until you decide to end the program. When you decide to end the program, enter 'STOP'.

```
> $L CALCDEMO
CALCDEMO      3P, LP= 9100, PART=1
PRESS 'ATTENTION' AND ENTER 'CALC' OR 'STOP'

> CALC

A = 30
B = 6

A + B =              36
A - B =              24
A * B =             180
A / B =               5 REMAINDER =            0
PRESS 'ATTENTION' AND ENTER 'CALC' OR 'STOP'
> STOP
CALCDEMO ENDED
```

Now that EDX is installed, you are ready to either generate a tailored operating system or prepare application programs for execution on your Series/1. To generate a tailored operating system, see Chapter 4, "Select Your Required Support" on page IS-39. For information on preparing programs, refer to the *Event Driven Executive Language Programming Guide.*

## Installing EDX *(continued)*

### Program Function Keys for the 4979 Display Station

If you use the starter system as your operating system and have a 4979 Display Station at address 04, the program function keys operate as follows:

| Key label | Function |
|---|---|
| PF1 | PF1 |
| PF2 | PF3 |
| PF3 | PF5 |
| PF4 | PF2 |
| PF5 | PF4 |
| PF6 | PF6 |

### Terminal Initialization for the Starter System

All terminals are initialized as part of the IPL process. In the starter system, the primary logging terminal to receive/display all exception messages ($SYSLOG) is defined as a 4978 Display Station at hardware address X'04'. If there is no terminal at hardware address X'04', terminal initialization support relocates $SYSLOG to a 4978 Display Station at hardware address X'24'. If there is no terminal at hardware address X'24', terminal initialization support relocates $SYSLOG to a 4980 Display Station at hardware address X'80'.

If an error occurs when writing to $SYSLOG, terminal initialization reverts to the alternate logging device ($SYSLOGA). In the starter system, $SYSLOGA is defined as a teletypewriter at hardware address X'00'.

**Note:** If a TTY attachment exists at address 0 without a terminal attached to it, an error cannot be detected when writing to $SYSLOGA, terminal initialization does not revert to $SYSLOGB, and messages are not displayed on any terminals.

If an error occurs when writing to $SYSLOGA, terminal initialization reverts to the second alternate logging device ($SYSLOGB). In the starter system, $SYSLOGB is defined as a 3101 Display Terminal in block mode at hardware address X'59', connected via a Multifunction Attachment (MFA) at hardware address X'58'. If no MFA exists at hardware address X'58', terminal initialization support relocates $SYSLOGB to a 3101 Display Terminal in block mode, connected to a single line ACCA (#1610) attachment at hardware address X'08'. If no ACCA attachment exists at hardware address X'08', terminal initialization support relocates $SYSLOGB to a 3101 Display Terminal in block mode, connected to a Multiline Terminal Adapter (2091/2092) at hardware address X'60'. If no MLTA attachment exists at hardware address X'60', terminal initialization support relocates $SYSLOGB to a 3101 Display Terminal in block mode connected to a Feature Programmable Communications Adapter (2095/2096) at hardware address X'68'.

# Chapter 4. Select Your Required Support

This chapter helps you select the system features you need for your tailored operating system. System features include defining processor storage characteristics, the I/O devices attached to your Series/1, the software features you require for your application, and the EDX related products you are including as part of your tailored operating system. The steps you perform in designing your operating system are:

**Step 1** Estimate your supervisor's storage requirements

**Step 2** Define your system configuration

**Step 3** Select your software support

**Step 4** Define the structure of your supervisor, if applicable.

**Note:** Be sure to review the program directories for all EDX related products you are installing to determine any special considerations before generating a tailored operating system.

To help you design your operating system, four work sheets are provided in Appendix E for you complete:

- Work Sheet 1 is used to estimate the size of your supervisor.
- Work Sheet 2 is used to define the characteristics and partition structure of processor storage and the I/O devices attached to your Series/1.
- Work Sheet 3 is used to define the software features you require to support the defined I/O devices and the EDX related products you include in your system.

- Work Sheet 4 is used to estimate the amount of storage required by supervisor object modules that are located outside of partition 1 and the amount of storage required by programs to execute within a partition.

If you decide that your supervisor is to be totally located in partition 1, SKIP STEP 4. Complete work sheets 2 and 3 and follow the procedures in Chapter 5, "Generate a Tailored Operating System" on page IS-77.

However, before you can select your required support, you should be familiar with the characteristics of processor storage.

## Processor Storage

Processor storage is divided into partitions. A partition is a contiguous fixed-length area of storage (maximum of 64K or 65536 bytes) that is used for execution of programs. You can define up to eight partitions for the 4955 or 4956, up to four partitions for the 4954, and up to two partitions for the 4952.

The supervisor (or a portion of the supervisor) is always located in partition 1. The storage available in all defined partitions for program execution is limited to 64K bytes minus the number of bytes occupied by the supervisor. Each partition is defined in multiples of 2K bytes and can contain more than one program simultaneously within the limits of the storage assigned to it.

## Sample System

This chapter contains an example of designing a tailored operating system to match specific hardware requirements and software features. When applicable, excerpts from work sheet 2 are shown as examples of how to code a definition statement for a specific I/O device. At the end of the chapter, marked up copies of work sheets 2 and 3 show the definition statements and the software features that define the sample system.

The sample assumes that the hardware and software requirements for the Series/1 are as follows:

*Hardware Requirements:* Our sample Series/1 is a 4956 processor with 512K bytes of storage. The devices supported and their address assignments are:

## Sample System *(continued)*

| Device | Address |
|---|---|
| 4962-1F Disk Storage Unit | 03 |
| 4964 Diskette Unit | 02 |
| 4978 Display Station | 24 |
| 4979 Display Station | 04 |
| 4973 Line Printer | 21 |

The 4979 Display Station is defined as the primary system logging device ($SYSLOG) to receive all exception messages. The 4978 Display Station is defined as the alternate system logging device ($SYSLOGA).

The 4973 Printer is defined as the system printer ($SYSPRTR) to receive the hard-copy output from all system programs.

*Software Support Requirements:* The following software features are required for the sample system:

| Software Features | Requirements |
|---|---|
| Multipartition supervisor | Supervisor code in partitions 1 and 8 |
| Common area | Partitions 2, 4, and 5 |
| Number of partitions and sizes | 5 (0,24,16,20,32) |
| Number of programs per partition | (1,10,10,5,5) |
| Unmapped storage | YES |

Each disk device will have its own task for input/output.

## Step 1 - Estimating Total Supervisor Size

The first step in selecting your required support is to estimate the total size of your supervisor. To do this, use work sheet 1 which contains a list of the I/O devices that can be attached to the Series/1. Along with each device type is the amount of storage required by the supervisor to support each device. Your supervisor can vary in size depending on the devices that you include.

## Step 1 - Estimating Total Supervisor Size *(continued)*

An estimate of 64K (65536 bytes) or greater indicates that you should reduce the size of your supervisor. The ways to reduce the size of your supervisor are discussed under "Step 4 - Defining Supervisor Structure" on page IS-67. However, before performing that step you should first perform steps 2 and 3 in order to be aware of the I/O devices and software support you are including in your operating system.

## Step 2 - Defining Your System Configuration

The second step in selecting your required support is to describe the devices attached to your Series/1. To do this, you must know the configuration of the system on which you intend to run the tailored operating system. When coding the system definition statements (work sheet 2), one of the operands you must specify is the device hardware address. Use the $IOTEST utility (LD command) to find out which devices are installed on your system and what their addresses are. Figure 3 shows the devices and their address assignments for the sample system.

**Note:** In order for $IOTEST to list all the devices attached to your Series/1, the devices must be turned on.

```
> $L $IOTEST
$IOTEST     32P, LP= 8F00

ATTLIST (ALTER) TO STOP LOOPING FUNCTIONS

COMMAND (?): LD

ACTUAL SERIES/1 HARDWARE CONFIGURATION

ADDRESS      ID        DEVICE TYPE

  00        0010       TELETYPEWRITER ADAPTER (TTY)
  03        00CA       4962 DISK MDL 3 OR 4
  04        0406       4979 DISPLAY STATION
  09        1006       SINGLE LINE BISYNC
  12        0106       4964 DISKETTE UNIT
  19        1006       SINGLE LINE BISYNC
  21        0306       4973 PRINTER
  24        040E       4978 DISPLAY STATION
  40        0028       TIMER FEATURE
  41        0028       TIMER FEATURE
  44        5212       4965 DISK SUBSYSTEM
  48        3106       4963 DISK SUBSYSTEM
COMMAND (?):
```

**Figure 3. Actual Series/1 configuration**

In Figure 4, the $IOTEST LS command is used to list the hardware devices supported by the starter supervisor under which $IOTEST is running.

```
COMMAND (?): LS

HARDWARE DEVICES SUPPORTED BY THIS SUPERVISOR

ADDRESS     ID         DEVICE TYPE

  00       0010        TELETYPEWRITER ADAPTER (TTY)
  01       0206        4974 PRINTER
  02       0106        4964 DISKETTE UNIT
  04       040E        4978 DISPLAY STATION
  22       0126        4966 DISKETTE MAGAZINE UNIT
  44       5212        4965 DISKETTE UNIT
  45       5212        4965 DISKETTE UNIT
  48       3116        4967 DISK SUBSYSTEM
  58       70EE        UNIDENTIFIED UNIT
  59       2816        MFA (1310) SINGLE LINE ACCA    MODE = 3101B
  5A       0208        MFA WITH 4975-01L PRINTER
  5B       020A        MFA WITH 4975-02L PRINTER

COMMAND (?):
```

**Figure 4. Hardware devices supported by starter system**

By comparing Figure 3 on page IS-42 and Figure 4 , you can see that the starter system does not support some of the devices in our sample system. If your actual Series/1 configuration is different from the hardware devices supported by the starter system and you want to support these additional devices, you need to define the configuration of your system with the system definition statements in work sheet 2.

### System Definition Statements

The following definition statements are used to describe processor storage and I/O devices to your operating system:

- ADAPTER - Defines a multiline attachment
- BSCLINE - Defines a binary synchronous line
- DISK - Defines direct access storage devices
- EXIODEV - Defines EXIO interface devices
- HOSTCOMM - Defines host communication support
- SENSORIO - Defines sensor I/O devices
- SYSTEM - Defines processor characteristics
- TAPE - Defines tape devices
- TERMINAL - Defines terminals
- TIMER - Defines system timer feature.

A brief description of each of these definition statements is presented in this chapter. A detailed description of the statements, along with the syntax and operand definitions is provided in Appendix A.

## Step 2 - Defining Your System Configuration *(continued)*

The definition statements presented here are in the order of appearance in work sheet 2.

### SYSTEM Statement

The SYSTEM statement defines the partition structure, the storage assigned to each partition for execution of application programs, and the number of programs that can concurrently execute in each partition. This statement must be specified only once.

The MAXPROG= operand specifies the maximum number of concurrently executing programs to be allowed in each partition.

The PARTS= operand specifies the number of 2K (2K=2048 bytes) blocks of storage assigned to each partition. The PARTS= operand also defines the partition structure of your system. The supervisor (or a portion of the supervisor) always resides in partition 1. Parition 1 must be large enough to contain the supervisor. If you only have one partition, this partition must be large enough to contain the entire supervisor and enough space to contain your largest application program. If you have multiple partitions, they must be defined in multiples of 2K bytes of storage and can contain more than one program simultaneously within the limits of the storage assigned to it.

See "SYSTEM - Define Processor Storage" on page IS-162 for a detailed description of this statement.

If you determined in "Step 1 - Estimating Total Supervisor Size" on page IS-41 that your supervisor is 64K or greater or that you want to free up storage in partition 1, you may need to modify the PARTS= and MAXPROG= operands of this statement. After you perform "Step 4 - Defining Supervisor Structure" on page IS-67, you can then decide how to structure your processor storage (number of partitions and their sizes) and the number of programs that can execute in each partition.

The sample system is defined as having five partitions (0,24,16,20,32). For each partition, the maximum number of programs that can concurrently execute are 1, 10, 10, 5, 5, respectively. The SYSTEM statement defined for the sample system is:

```
SYSTEM     MAXPROG=(1,10,10,5,5),PARTS=(0,24,16,20,32),    C
      COMMON=(0,2,0,1,1)
```

## Step 2 - Defining Your System Configuration *(continued)*

The sample system logically and physically maps in storage as follows:

***Logical mapping:***

| | | | |
|---|---|---|---|
| Address space 0 | 22KB supervisor | 14KB user space (partition 1) | Invalid |
| Address space 1 | 4KB common | 48KB user space (partition 2) | Invalid |
| Address space 2 | 32KB user space (partition 3) | Invalid | |
| Address space 3 | 2KB common | 40KB user space (partition 4) | Invalid |
| Address space 4 | 2KB common | 62KB user space (partition 5) | |
| Address space 5 | Invalid (partition 6) | | |
| Address space 6 | Invalid (partition 7) | | |
| Address space 7 | 11KB supervisor | 1KB user space (partition 8) | Invalid |
| | 274KB unmapped storage | | |

***Physical mapping:***

| | | |
|---|---|---|
| 36KB (part #1) | 48KB (part #2) | 32KB (part #3) |
| 40KB (part #4) | 62KB (part #5) | |
| 12KB (part #8) | 274KB unmapped | |

1. Partition 1 is defined to contain supervisor code only (PART=0). The supervisor required 11 blocks (22KB) of storage and the initialization routines required 7 blocks (14KB) of storage at IPL time. After initialization, the 7 blocks of storage required by the initialization routines were given back as user space.

## Step 2 - Defining Your System Configuration *(continued)*

2. Partition 2 required 2 blocks (4KB) to serve as addressing pointers to the COMMON area and has 24 blocks (48KB) of actual storage mapped for user space. The 2 blocks of pointers cannot map actual storage since they are reserved as COMMON area pointers. Partition 2 can execute up to 10 programs concurrently.

3. Partition 3 requires 16 blocks (32KB) of storage for user space and can execute up to 10 programs concurrently.

4. Partition 4 requires 2 blocks (4KB) to serve as addressing pointers to the COMMON area and has 20 blocks (40KB) of actual storage mapped for user space. The 2 blocks of pointers cannot map actual storage since they are reserved as COMMON area pointers. Partition 4 can execute up to 5 programs concurrently.

5. Partition 5 requires 2 blocks (4KB) to serve as addressing pointers to the COMMON area and has 31 blocks (62KB) of actual storage mapped for user space. The 2 blocks of pointers cannot map actual storage since they are reserved as COMMON area pointers. Partition 5 can execute up to 5 programs concurrently.

6. Partition 6 is not defined.

7. Partition 7 is not defined.

8. Partition 8 is not defined on the SYSTEM statement. However, a multipartition supervisor was defined with the PART statement in the $LNKCNTL data set as having supervisor code in partition 8. As a result, partition 8 was automatically defined and 11KB of storage was assigned to the supervisor. In addition, because storage is assigned in 2K blocks, 1KB of storage was assigned as user space for a total of 12KB in partition 8.

9. The size of processor storage is 512KB. Only 238KB of storage was defined leaving 274KB of unmapped storage.

### TAPE Statement

The TAPE statement defines the 4968 and 4969 tape units. One TAPE statement is required for each tape device attached to your Series/1. Group all TAPE and DISK statements together. The last TAPE or DISK statement must specify END=YES (as shown in work sheet 2).

See "TAPE - Define Tape Device" on page IS-179 for a detailed description of this statement.

### DISK Statement

The DISK statement defines disk and diskette devices to the system. One DISK statement is required for each disk or diskette device attached to your Series/1.

The sample system is defined as having a 4962-1F disk and a 4964 diskette unit. These devices are defined on work sheet 2 as follows:

```
         DISK      DEVICE=4962-1F,ADDRESS=03,TASK=YES
         DISK      DEVICE=4964,ADDRESS=02,TASK=YES,END=YES
```

See "DISK - Define Direct Access Storage" on page IS-154 for a detailed description of this statement.

***Disk Considerations:*** You can designate a disk volume as a ***performance volume*** by specifying the VOLNAME operand in the DISK definition statement. As with all volumes, this volume must be allocated and initialized by the $INITDSK utility. However, a performance volume is opened at IPL time making the opening of data sets in a performance volume faster.

Each performance volume requires 46 bytes in the supervisor; this additional storage cannot be reclaimed until you generate a new supervisor. (Deleting a performance volume does not allow the storage to be reused.)

### TIMER Statement

The TIMER statement defines the #7840 Timer Feature as the system timer in the generated system. This statement is used only for defining the #7840 timer. If the system has a native timer (4952, 4954 and 4956 processors) that is used instead of the #7840 timer feature card, it is not necessary to code this statement.

See "TIMER - Define System Timer Features" on page IS-236 for a detailed description of this statement.

### ADAPTER Statement

The ADAPTER statement defines one of the following multiline attachment features:

- Multifunction Attachment Feature #1310
- Printer Attachment - 5200 Series Feature #5640
- Multidrop Work Station Attachment Feature #1250.

One ADAPTER statement is required for each adapter attachment attached to your Series/1. All ADAPTER statements must be grouped together and must precede the definition of the first device attached to a specific attachment. The last ADAPTER statement specified must include END=YES.

See "ADAPTER - Define a Multiline Attachment" on page IS-146 for a detailed description of this statement.

### TERMINAL Statement

The TERMINAL statement defines each EDX terminal to be supported by the operating system. The DEVICE operand of the TERMINAL statement identifies the type of terminal. EDX supports many different terminals; see "TERMINAL - Define Input/Output Terminals" on page IS-181 for a list of the supported terminals. The required operands and defaults of the TERMINAL statement can be different for each device; as such, the TERMINAL statement is presented by device type.

See "TERMINAL - Define Input/Output Terminals" on page IS-181 for a detailed description of this statement.

**Note:** The 3101 Display Terminal is connected to the Series/1 by several EDX support attachment features. For each attachment and type of interface, it is necessary to set the 3101 switches, have the attachment card physically jumpered, connect the cables, and specify the appropriate TERMINAL statement. Before specifying a TERMINAL statement for the 3101, see Appendix C, "3101 Configuration Information" on page IS-243.

Our sample system is defined as having the following terminals:

- a 4973 printer,
- a 4979 display station, and
- a 4978 display station.

The TERMINAL statements that define these I/O devices to our operating system are:

```
$SYSPRTR TERMINAL DEVICE=4973,ADDRESS=21
$SYSLOG   TERMINAL DEVICE=4979,ADDRESS=04,HDCOPY=$SYSPRTR
$SYSLOGA TERMINAL DEVICE=4978,ADDRESS=24,HDCOPY=$SYSPRTR,END=YES
```

### BSCLINE Statement

The BSCLINE statement defines a binary synchronous line. One BSCLINE is required for each line to be referenced by programs using the Binary Synchronous Communications Access Method.

See "BSCLINE - Define a Binary Synchronous Line" on page IS-150 for a detailed description of this statement.

### EXIODEV Statement

The EXIODEV statement defines the devices to be supported via the EXIO interface. All EXIODEV statements must be grouped together. The last EXIODEV statement must include an END=YES specification.

An EXIODEV statement must be defined for each System/370 Channel Device attached to your system. For more information on defining channel attach devices, refer to the Program Directory for the Series/1-System/370 Channel Attach (5719-CX1).

An EXIODEV statement must be defined for each physical unit that defines the SDLC line. For more information on defining an SDLC line, refer to the Program Directory for the Series/1 Systems Network Architecture, (5719-SX1).

See "EXIODEV - Define EXIO Interface Device" on page IS-157 for a detailed description of this statement.

### HOSTCOMM Statement

The HOSTCOMM statement defines the device type and address of the device to be used for host communication support. This support only operates with the Host Communications Facility Installed User Program (IUP).

The Host Communications Facility allows an EDL program to communicate with the Host Communication Facility IUP installed on a host IBM S/370. The Host Communications Facility is used to perform file transfers to and from the host and to submit a job stream to the host. A point-to-point nonswitched BSC line must be used to connect the Series/1 and S/370.

See "HOSTCOMM - Define Host Communications Support" on page IS-159 for a detailed description of this statement.

### SENSORIO Statement

The SENSORIO statement defines the sensor I/O devices to be supported. All SENSORIO statements must be grouped together with the last one including an END=YES specification.

See "SENSORIO - Define Sensor I/O Devices" on page IS-160 for a detailed description of this statement.

## Step 2 - Defining Your System Configuration *(continued)*

### System Common Data Area

The system common data area is known by the system global name $SYSCOM. $SYSCOM is a data area in an operating system which can be accessed from applications written in EDL, assembler language, COBOL, FORTRAN, Pascal, and PL/I. It is used for communication and synchronization between programs. If you select this option, you can map the portion of the supervisor containing $SYSCOM in partition 1 to the partitions of your choice. See "SYSTEM - Define Processor Storage" on page IS-162 for a description of coding the system common data area.

The system common data area can be referenced directly from FORTRAN and assembler language programs by referencing global section definitions. The common area must be referenced indirectly from PL/I and EDL programs by using the contents of $SYSCOM as a base address and referencing data elements as displacements from this base. Refer to the appropriate language user's guide for examples of using $SYSCOM and global sections.

As shown in work sheet 2, there is an example of specifying a 128 word area called $EDXPTCH, which can be used as part of $SYSCOM and should be coded as part of your definition statements. In addition, $SYSCOM consists of two queue control blocks (QCBs) and two event control blocks (ECBs). These control blocks can be used as is or you can change them.

## Step 3 - Selecting Your Software Support

The third step in selecting your required support is to choose the software features needed to support your configuration and the EDX related products you are installing as part of your system. Use work sheet 3 to keep track of the support object modules you need.

If you determined in Step 1 that your supervisor is 64K or greater or that you want to free up storage in partition 1, you need to know which support object modules are to be included in your supervisor. This information is required to complete "Step 4 - Defining Supervisor Structure" on page IS-67.

The object modules that provide the software features supported by EDX are explained below. The modules are contained in the $LNKCNTL data set on volume ASMLIB. Work sheet 3 parallels $LNKCNTL which contains the control statements and object modules names used by the linkage editor $XPSLINK. $XPSLINK is a linkage editor that is set up to generate a single or multipartition supervisor and is only used during system generation.

Control statements are the instructions used by $XPSLINK to convert the assembled object modules into an executable load module. Work sheet 3 contains the following control statements in the order shown below.

**OPTION NOVERLAY** An OPTION NOVERLAY statement specifies that the supervisor will not default to overlay structure.

**PART** A PART statement defines the partition number where groupings of supervisor object modules are to be located.

**VOLUME** A VOLUME statement defines the default volume for $XPSLINK control statements.

**OVLAREA** An OVLAREA statement defines an overlay area.

**INCLUDE** An INCLUDE statement identifies an object module to be included in the generated supervisor.

**LINK** A LINK statement causes $XPSLINK to perform a link using the control statements within the data set and to store the resulting executable load module (the supervisor) in a data set named $EDXNUCx where x is any alphanumeric character.

With the exception of the OPTION NOVERLAY and the PART statements, these control statements are explained under the $EDXLINK utility in the *Operator Commands and Utilities Reference*.

## OPTION NOVERLAY Statement

The OPTION NOVERLAY statement is an $XPSLINK statement and is used only during system generation. If this statement is included in the $LNKCNTL data set, the supervisor is built without the overlay structure. Without overlay structure, $XPSLINK automatically includes required initialization routines in your supervisor as resident programs. This means that the required initialization routines are loaded simultaneously in supervisor storage at IPL time. As a result, they increase the amount of storage required by supervisor in partition 1. For further information, see "Including Initialization Routines in Your Supervisor" on page IS-64.

## PART Statement

The PART statement is an $XPSLINK statement and is used only during system generation. A PART statement defines the partition number where supervisor object modules are to be located and is used to create a multipartition supervisor. One PART statement is required for each partition in which you have supervisor object modules.

The number on the PART statement preceeding a group of modules specifies the partition where the modules are to be located. Some groups of supervisor object modules must remain located in partition 1; others can be located outside of partition 1. In work sheet 3, the modules are grouped and a statement preceeding each group indicates if that group of modules can be located outside of partition 1. To locate a group of modules outside partition 1, you must physically move the modules to the area specified on work sheet 3 and in the $LNKCNTL data set. Then enter the number of the partition where you want the group located on the PART statement.

All groups of object modules defined to be in a specific partition must be adjacent to one another. For example, you can specify partitions 1, 1, 2, 2, 3, 4, 4 or 1, 2, 2, 4, 4, 3, 5, 5, 6, 6, 7. You cannot specify partitions 1, 3, 2, 1, 3, 4, 3. This means that if you have already defined a group of modules to be in a specific partition and wish to place another group of modules in that same partition, you must physically move the second group of modules to follow PART statement defining that partition. Also, if you define PART statements, PART 1 must be specified first.

***Syntax:***

```
PART partnumber

Required: partnumber
Default:  none
```

***Example:*** Define specific groups of object modules in partitions 3 and 4.

```
*------------------------------------------------------------
* SUPERVISOR CODE BEING MOVED OUT OF
* PARTITION 1 'MUST' BE MOVED TO HERE
*------------------------------------------------------------
*
*------------------------------------------------------------
* SENSOR INPUT/OUTPUT - MUST BE GROUPED TOGETHER IN ANY PARTITION
*------------------------------------------------------------
PART 3
INCLUDE SBCOM        *15*  BASIC SENSOR I/O SUPPORT
INCLUDE SBAI         *3*   ANALOG INPUT SUPPORT
INCLUDE SBAO         *3*   ANALOG OUTPUT SUPPORT
INCLUDE SBIDO        *3*   DIGITAL INPUT/OUTPUT SUPPORT
INCLUDE SBPI         *3*   PROCESS INTERRUPT SUPPORT
*------------------------------------------------------------
* BISYNC COMMUNICATION _ MAY BE IN ANY PARTITION
*------------------------------------------------------------
PART 4
INCLUDE BSCAM        *7*   BISYNC COMMUNICATION SUPPORT
*------------------------------------------------------------
```

## VOLUME Statement

The VOLUME statement defines the default volume for $XPSLINK control statements.

**XS4002** XS4002 is the default volume for the object modules. This statement is required and must be included in every supervisor.

## OVLAREA Statement

The OVLAREA statement is an optional link control statement used to define an overlay area within the supervisor. This area is used to process initialization routines automatically included by $XPSLINK as overlay segments.

Before including this statement in your link control data set, see "Define an Overlay Area" on page IS-62.

## INCLUDE Statement

The INCLUDE statement identifies each supervisor object module to be included in your generated supervisor.

An explanation of each supervisor object module and the criteria for including a module in your supervisor follows. The modules are shown in the order of appearance in work sheet 3.

### Supervisor Support

These supervisor object modules MUST reside in partition 1.

**EDXSYS** EDXSYS is a required module and must be included in every supervisor. EDXSYS contains the following five tables:

- Reserved storage locations
- Device vector table
- Communications vector table
- Task supervisor work area
- Emulator command table.

**ASMOBJ** ASMOBJ is a required module and must be included in every supervisor. This module will contain the object code resulting from assembling the $EDXDEF data set which contains the system definition statements. You have the option of changing the name of this module or use it as it exists.

**EDXSVCX** EDXSVCX is a required module and must be included in every supervisor. It performs task requests.

## Step 3 - Selecting Your Software Support *(continued)*

**$DBUGNUC** $DBUGNUC must be included if you wish to debug programs using the $DEBUG utility.

**EDXALU** EDXALU is a required module and must be included in every supervisor.

**EDXSTART** EDXSTART is a required module and must be included in every supervisor. EDXSTART includes the system initialization task. It is attached at IPL and initializes the supervisor by calling in EDXINIT which processes the initialization routines. EDXSTART is also used for default exception processing for program, machine, and soft exception checks.

**SWAITM** SWAITM is an optional module and is required if you use the wait on multiple events option. If you include SWAITM, $XPSLINK automatically includes the module WAITMLST.

If you include SWAITM, be sure to code the MECBLIST operand on the SYSTEM statement.

### Timer Support

These supervisor object modules MUST be located in in partition 1.

**EDXTIMER** EDXTIMER must be included if your Series/1 is a 4955 and you defined the #7840 timer feature with the TIMER definition statement. If you include EDXTIMER, $XPSLINK automatically includes the initialization module TIMRINIT.

**EDXTIMR2** EDXTIMR2 must be included if your Series/1 is a 4952, 4954, or 4956 processor with native timer support. If you include EDXTIMR2, $XPSLINK automatically includes the initialization module CLOKINIT.

### EXIO Control Support

This supervisor object module MUST be located in in partition 1.

**IOSEXIO** IOSEXIO is optional and is only required if you intend to attach and control OEM devices or to support standard devices in a nonstandard manner. The device is defined with the EXIODEV definition statement. If you include IOSEXIO, $XPSLINK automatically includes the initialization module EXIOINIT.

**EXIOTRC** EXIOTRC is optional and is only required if you want to trace I/O operations and interrupts for an EXIO device with the $TRACEIO utility. In addition, EXIOTRC enables you to record conditions codes, completion codes, ISB and DCB information, and status words for a device interrupt from a start cycle steal status (SCSS) operation. If you do not include EXIOTRC and include IOSEXIO, $XPSLINK automatically includes NOEXIOTR.

# Step 3 - Selecting Your Software Support *(continued)*

## Error Logging Support

These supervisor object modules MUST be located in partition 1.

**SYSLOG** SYSLOG is required to use the $LOG utility to log errors to a disk or diskette data set. If you do not include SYSLOG, $XPSLINK automatically includes NOSYSLOG.

**CIRCBUFF** CIRCBUFF is required if the storage program check/machine check log is to be kept. CIRCBUFF implements the optional software trace table. This table contains program check, soft exception, and machine check trace data. It also offers information on the types of errors that have been occurring. (Refer to the *Problem Determination Guide* for more information.)

## Optional Function Support

These supervisor object modules MUST be located in partition 1.

**RLOADER** RLOADER is required if you intend to load programs from secondary storage (disk or diskette) with either the $L operator command or the LOAD instruction. If you include RLOADER, $XPSLINK automatically includes LOADINIT If RLOADER is not included, application programs must be link edited with the supervisor to execute (see $PROG1 under "System Initialization Support" on page IS-61 for additional information).

**STORMGR** STORMGR is required to gain access to unmapped storage from an application program or to use the $MEMDSK utility to set up a memory disk volume. The $MEMDSK utility allows you to use all or part of unmapped storage as if it were a single-volume disk. Refer to the *Operator Commands and Utilities Reference* for information on the $MEMDSK utility. If you include STORMGR, $XPSLINK automatically includes STORINIT. If you do not include STORMGR, $XPSLINK automatically includes NOSTGMGR. STORMGR contains support for the Event Driven Language instructions GETSTG, FREESTG, and SWAP, and the STORBLK statement. STORBLK creates an unmapped storage control block, and GETSTG, FREESTG, and SWAP enable application programs to use unmapped areas in the system.

**IAMQCB** IAMQCB is required if the Indexed Access Method Version 2 (5719-AM4) is installed or will be installed in the future.

**PWRAM80** PWRAM80 is an optional module that can be included for the 4980 display station. PWRAM80 automatically loads the control store, image store, and microcode necessary for 4980 display station operation. If you do not include PWRAM80 and you turn off a 4980 display station, you must IPL your system to make the 4980 operational again.

## Host Communication Facility

This supervisor object module MUST be located in partition 1.

# Select Your Required Support

## Step 3 - Selecting Your Software Support *(continued)*

**TPCOM** TPCOM is required if you defined Host Communication Support (communication to a S/370) with the HOSTCOMM definition statement. If you include TPCOM, $XPSLINK automatically includes the initialization module TPINIT.

### Translation Table Support

These supervisor object modules MUST be located in partition 1.

**TRASCII** TRASCII is required if feature numbers #1310, #2095/2096 and #7850 are used to connect ACCA or TTY I/O devices to your Series/1.

**TREBASC** TREBASC is required if feature numbers #1610 and #2091/2092 are used to connect ACCA or TTY I/O devices to your Series/1.

**TREBCD or TRCRSP** Include either of these modules if you defined a 2741 terminal (DEVICE=2741) to the supervisor. A 2741 terminal can use either TREBCD or TRCRSP. Include TREBCD for processor to processor support (DEVICE=PROC).

### Disk(ette) and Tape Support

These supervisor object modules can be placed in ANY partition. However, any modules that you include MUST remain as a group.

**DISKIO** DISKIO must be included if you defined a disk or diskette device using the DISK definition statement. If you include DISKIO, DISKINIT, and DSKINIT2 are automatically included.

**D49624** D49624 is optional and is only required if you defined a 4962 disk and/or 4964 diskette with the DISK definition statement.

**D4963A** D4963A is optional and is required only if you defined a 4963, 4967, DDSK-30 disk, or DDSK-60 disk with the DISK definition statement.

**D4966A** D4966A is optional and is only required if you defined a 4965 and/or 4966 diskette unit with the DISK definition statement.

**D1024** D1024 must be included to use double density diskettes at 1024 bytes per sector on a 4965 or 4966 diskette unit.

Once included, a copy of $IO1024 is loaded automatically for each disk task defined for a 4965 and/or 4966 diskette unit. $IO1024 is loaded into the highest available partition the first time 1024-bytes-per-sector support is required for a particular device. $IO1024 remains in storage until that diskette unit is varied offline or is varied online again with a non-1024 bytes per sector diskette.

**D4969A** D4969A is required if you defined one or more 4968 or 4969 tape units with the TAPE definition statement. If you include D4969A, $EDXLINK automatically includes the initialization module TAPEINIT.

## Step 3 - Selecting Your Software Support *(continued)*

### Terminal Support

These supervisor object modules can be placed in ANY partition. However, any modules that you include MUST remain as a group.

**EDXTIO** EDXTIO must be included if you defined terminals with the TERMINAL definition statement. Terminals include 4973, 4974, 4975, 4978, 4979, 4980, 5219, 5224, 5225, GPIB, Series/1-Series/1, Virtual terminals, ACCA, TTY, 2741, and 4013. If you include EDXTIO, $XPSLINK automatically includes the initialization modules TERMINIT and EDXTERMQ. If you do not include EDXTIO, $XPSLINK automatically includes NOTIO.

**MINMSG** MINMSG must be included if you wish to have only that part of the messages that are resident in storage appear. This means that only the message text is issued; parameters are not issued. If system commands and/or utilities are used, the messages will not contain the parameters and may not be meaningful. For both systems with secondary storage (disk or diskette) and for systems without secondary storage, MINMSG is the only module required for storage resident messages support. If you include MINMSG, do not include FULLMSG.

**FULLMSG** FULLMSG must be included if you wish to have full message data set support. This means that messages (supervisor, initialization, and utility messages) are shown in full (message number and text rather than just message number). FULLMSG should be included if system commands and/or utilities are to be used on your system. If you include FULLMSG, do not include MINMSG.

**IOS3101** IOS3101 is required if you are using a 3101 in block mode (DEVICE=ACCA,MODE=3101B). If you include this module, IOSACCA is also required.

**IOS4974** IOS4974 is optional and is required only if you defined a 4973, 4974, 4975 (except 4975-01A), 5219, 5224, and/or 5225 printer using the TERMINAL definition statement.

**IOS4975A** IOS4975A is optional. Include it only if you defined the 4975-01A ASCII printer using the TERMINAL definition statement. If you include this module, $XPSLINK automatically includes IOSTERM and IOSACCA.

**IOS4979** IOS4979 is optional and is required only if you defined a 4978, 4979, and/or 4980 display station using the TERMINAL definition statement. If you included the OPTION NOVERLAY statement, you must include the initialization modules for the 4978, 4979, and 4980 display stations. For the 4978 and 4979, include INIT4978; for the 4980, include INIT4980.

**IOSACCA** IOSACCA is required if you defined an ACCA type terminal with the TERMINAL definition statement. For terminals defined as ACCA, the appropriate translation tables must be included (see Translation Tables Support).

# Select Your Required Support

## Step 3 - Selecting Your Software Support *(continued)*

**ACCATRC** ACCATRC is optional and is only required if you want to trace I/O operations and interrupts on an ACCA line with the $TRACEIO utility. In addition, ACCATRC enables you to record condition codes, completion codes, ISB and DCB information, and status words for a device interrupt from a start cycle steal status (SCSS) operation. If you do not include ACCATRC and included IOSACCA, $XPSLINK automatically includes NOACCATR.

**IOSTERM** IOSTERM is required if you defined any of the following devices with the TERMINAL definition statement:

- ACCA-type terminal
- 3101 in character mode
- Tektronics 40xx.

**IOSTTY** IOSTTY is optional and provides support for ASR 33/35/3101/3101C TTY devices. Include it only if you defined DEVICE=TTY with the TERMINAL definition statement. $XPSLINK automatically includes IOSTERM with IOSTTY.

**IOS2741** IOS2741 is optional and provides support for 2741 terminals. Include it only if you defined DEVICE=2741 with the TERMINAL definition statement. If you include this module, $XPSLINK automatically includes IOSTERM.

**IOS4013** IOS4013 is optional and provides support for the Tektronix 4000 Series of display terminals. Include it only if you defined DEVICE=4013 with the TERMINAL definition statement. If you include this IOS4013, $XPSLINK automatically includes IOSTERM and the initialization module INIT4013.

**IOSGPIB** IOSGPIB is optional and provides support for the General Purpose Interface Bus. Include it only if you defined DEVICE=GPIB with the TERMINAL definition statement.

**IOSS1S1** IOSS1S1 is optional and provides support for the Series/1-to-Series/1 Attachment. Include it only if you defined DEVICE=S1S1 with the TERMINAL definition statement. If you include IOSS1S1, $XPSLINK automatically includes the initialization module S1S1INIT.

**IOSVIRT** IOSVIRT is optional and provides support for virtual terminal communications. Include it only if you defined DEVICE=VIRT with the TERMINAL definition statement. IOSVIRT must be included if you intend to use the Remote Management Utility with the PASSTHRU function.

**IOSPOOL** IOSPOOL is optional; include it only if you want printer spooling.

**EBFLCVT** EBFLCVT is required for applications that use EBCDIC/floating-point conversion and the GETEDIT, PUTEDIT, FORMAT, FPCONV, CONVTD, or CONVTB instructions. EBFLCVT includes routines that convert EBCDIC values to floating-point and floating-point values to EBCDIC. Include EDXTIO if you include EBFLCVT.

## Step 3 - Selecting Your Software Support *(continued)*

### Error Logging Support

These supervisor object modules MUST be located in partition 1.

**SYSLOG** SYSLOG is required to use the $LOG utility to log errors to a disk or diskette data set. If you do not include SYSLOG, $XPSLINK automatically includes NOSYSLOG.

**CIRCBUFF** CIRCBUFF is required if the storage program check/machine check log is to be kept. CIRCBUFF implements the optional software trace table. This table contains program check, soft exception, and machine check trace data. It also offers information on the types of errors that have been occurring. (Refer to the *Problem Determination Guide* for more information.)

### Optional Function Support

These supervisor object modules MUST be located in in partition 1.

**RLOADER** RLOADER is required if you intend to load programs from secondary storage (disk or diskette) with either the $L operator command or the LOAD instruction. If you include RLOADER, $XPSLINK automatically includes LOADINIT If RLOADER is not included, application programs must be link edited with the supervisor to execute (see $PROG1).

**STORMGR** STORMGR is required if you intend to access unmapped storage. If you include STORMGR, $XPSLINK automatically includes STORINIT. If you do not include STORMGR, $XPSLINK automatically includes NOSTGMGR.

STORMGR, the unmapped storage manager, contains support for the Event Driven Language instructions GETSTG, FREESTG, and SWAP, and the STORBLK statement. STORBLK creates an unmapped storage control block, and GETSTG, FREESTG, and SWAP enable application programs to use unmapped areas in the system.

**IAMQCB** IAMQCB is required if the Indexed Access Method Version 2 (5719-AM4) is installed or will be installed in the future.

**PWRAM80** PWRAM80 is an optional module that can be included for the 4980 display station. PWRAM80 automatically loads the control store, image store, and microcode necessary for 4980 display station operation. If you do not include PWRAM80 and you turn off a 4980 display station, you must IPL your system to make the 4980 operational again.

### Host Communication Facility

This supervisor object module MUST be located in partition 1.

**TPCOM** TPCOM is required if you defined Host Communication Support (communication to a S/370) with the HOSTCOMM definition statement. If you include TPCOM, $XPSLINK automatically includes the initialization module TPINIT.

## Step 3 - Selecting Your Software Support *(continued)*

### Translation Table Support

These supervisor object modules MUST be located in partition 1.

**TRASCII** TRASCII is required if feature numbers #1310, #2095/2096 and #7850 are used to connect ACCA or TTY I/O devices to your Series/1.

**TREBASC** TREBASC is required if feature numbers #1610 and #2091/2092 are used to connect ACCA or TTY I/O devices to your Series/1.

**TREBCD or TRCRSP** Include either of these modules if you defined a 2741 terminal (DEVICE=2741) to the supervisor. A 2741 terminal can use either TREBCD or TRCRSP. Include TREBCD for processor to processor support (DEVICE=PROC).

### Disk(ette) and Tape Support

These supervisor object modules can be placed in ANY partition. However, any modules that you include MUST remain as a group.

**DISKIO** DISKIO must be included if you defined a disk or diskette device using the DISK definition statement. If you include DISKIO, DISKINIT, and DSKINIT2 are automatically included.

**D49624** D49624 is optional and is only required if you defined a 4962 disk and/or 4964 diskette with the DISK definition statement.

**D4963A** D4963A is optional and is only required if you defined a 4963, 4967, or DDSK-30 disk with the DISK definition statement.

**D4966A** D4966A is optional and is only required if you defined a 4965 and/or 4966 diskette unit with the DISK definition statement.

**D1024** D1024 must be included if you intend to use double density diskettes at 1024 bytes per sector on a 4965 or 4966 diskette unit.

Once included, a copy of $IO1024 is automatically loaded for each disk task defined for a 4965 and/or 4966 diskette unit. $IO1024 is loaded into the highest available partition the first time 1024 bytes per sector support is required for a particular device. $IO1024 remains in storage until that diskette unit is varied offline or is varied online again with a non-1024 bytes per sector diskette.

**D4969A** D4969A is required if you defined one or more 4968 or 4969 tape units with the TAPE definition statement. If you include D4969A, $EDXLINK automatically includes the initialization module TAPEINIT.

## Step 3 - Selecting Your Software Support *(continued)*

### Terminal Support

These supervisor object modules can be placed in ANY partition. However, any modules that you include MUST remain as a group.

**EDXTIO** EDXTIO must be included if you defined terminals with the TERMINAL definition statement. Terminals include 4973, 4974, 4975, 4978, 4979, 4980, 5219, 5224, 5225, GPIB, Series/1-Series/1, Virtual terminals, ACCA, TTY, 2741, and 4013. If you include EDXTIO, $XPSLINK automatically includes the initialization module TERMINIT and EDXTERMQ.

**MINMSG** MINMSG must be included if you wish to have only that part of the messages that are resident in storage appear. This means that only the message text is issued; parameters are not issued. If system commands and/or utilities are used, the messages will not contain the parameters and may not be meaningful. For both systems with secondary storage (disk or diskette) and for systems without secondary storage, MINMSG is the only module required for storage resident messages support. If you include MINMSG, do not include FULLMSG.

**FULLMSG** FULLMSG must be included if you wish to have full message data set support. This means that messages (supervisor, initialization, and utility messages) are shown in full (message number and text rather than just message number). FULLMSG should be included if system commands and/or utilities are to be used on your system. If you include FULLMSG, do not include MINMSG.

**IOS3101** IOS3101 is required if you are using a 3101 in block mode (DEVICE=ACCA,MODE=3101B). If you include this module, IOSACCA is also required.

**IOS4979** IOS4979 is optional and is required only if you defined a 4978, 4979, and/or 4980 display station using the TERMINAL definition statement. If you included the OPTION NOVERLAY statement, you must include the initialization modules for the 4978, 4979, and 4980 display stations. For the 4978 and 4979, include INIT4978; for the 4980, include INIT4980.

**IOS4974** IOS4974 is optional and is required only if you defined a 4973, 4974, 4975, 5219, 5224 and/or 5225 printer using the TERMINAL definition statement.

**IOSACCA** IOSACCA is required if you defined an ACCA type terminal with the TERMINAL definition statement. For terminals defined as ACCA, the appropriate translation tables must be included (see Translation Tables Support).

**ACCATRC** ACCATRC is optional and is only required if you want to trace I/O operations and interrupts on an ACCA line with the $TRACEIO utility. In addition, ACCATRC enables you to record condition codes, completion codes, ISB and DCB information, and status words for a device interrupt from a start cycle steal status (SCSS) operation. If you do not include ACCATRC and included IOSACCA, $XPSLINK automatically includes NOACCATR.

## Step 3 - Selecting Your Software Support *(continued)*

**IOSTERM** IOSTERM is required if you defined any of the following devices with the TERMINAL definition statement:

- ACCA-type terminal
- 3101 in character mode
- Tektronics 40xx.

**IOSTTY** IOSTTY is optional and provide support for ASR 33/35/3101/3101C TTY devices. Include it only if you defined DEVICE=TTY with the TERMINAL definition statement. If you include this module, $XPSLINK automatically includes IOSTERM.

**IOS2741** IOS2741 is optional and provides support for 2741 terminals. Include it only if you defined DEVICE=2741 with the TERMINAL definition statement. If you include this module, $XPSLINK automatically includes IOSTERM.

**IOS4013** IOS4013 is optional and provides support for the Tektronix 4000 Series of display terminals. Include it only if you defined DEVICE=4013 with the TERMINAL definition statement. If you include this IOS4013, $XPSLINK automatically includes IOSTERM and the initialization module INIT4013.

**IOSGPIB** IOSGPIB is optional and provides support for the General Purpose Interface Bus. Include it only if you defined DEVICE=GPIB with the TERMINAL definition statement.

**IOSS1S1** IOSS1S1 is optional and provides support for the Series/1-to-Series/1 Attachment. Include it only if you defined DEVICE=S1S1 with the TERMINAL definition statement. If you include IOSS1S1, $XPSLINK automatically includes the initialization module S1S1INIT.

**IOSVIRT** IOSVIRT is optional and provides support for virtual terminal communications. Include it only if you defined DEVICE=VIRT with the TERMINAL definition statement. IOSVIRT must be included if you intend to use the Remote Management Utility with the PASSTHRU function.

**IOSPOOL** IOSPOOL is optional and only needs to be included if printer spooling is to be used.

**EBFLCVT** EBFLCVT is required for applications that use EBCDIC/floating-point conversion and the GETEDIT, PUTEDIT, FORMAT, FPCONV, CONVTD, or CONVTB instructions. EBFLCVT includes the routines that convert EBCDIC values to floating-point values and floating-point values to EBCDIC values. If you include this module, include EDXTIO.

### Floating Point Support

This supervisor object module can be placed in ANY partition.

**EDXFLOAT** EDXFLOAT is required for applications using floating point data manipulation instructions in FORTRAN, Pascal, PL/I or EDL. EDXFLOAT processes the Event Driven Language floating-point arithmetic instructions. These instructions require the floating-point hardware feature.

If you do not include EDXFLOAT, $XPSLINK automatically includes NOFLOAT. NOFLOAT causes an exception condition if a program attempts to execute a floating-point instruction.

### Queue I/O Support

This module can be placed in ANY partition.

**QUEUEIO** QUEUEIO is required for queueing operations; that is, applications that use the FIRSTQ, NEXTQ, LASTQ, and DEFINEQ statements.

### Binary Synchronous Communications Support

These supervisor object modules can be placed in ANY partition.

**BSCAM** BSCAM is required if you defined a binary synchronous communication line using the BSCLINE definition statement. If you include BSCAM, $XPSLINK automatically includes the initialization module BSCINIT.

**BSCX21** BSCX21 is required to support the X.21 switched network support with binary synchronous communication support. To specify retries and delay time, you must also include timer support in your supervisor.

### Sensor I/O Support

These supervisor object modules can be placed in any partition. However, if they are left in partition 1, performance is improved.

**SBCOM** SBCOM is required to support sensor I/O devices (AI, AO, DI, DO, or PI) defined with the SENSORIO definition statment. If you include SBCOM, $XPSLINK automatically includes IOLOADER and the initialization module SBIOINIT.

**SBAI** SBAI is optional and is required if you defined analog input support with the SENSORIO definition statement.

**SBAO** SBAO is optional and is required if you defined analog output support with the SENSORIO definition statement.

**SBDIDO** SBDIDO is optional and is required if you defined digital input/output support with the SENSORIO definition statement.

## Step 3 - Selecting Your Software Support *(continued)*

**SBPI** SBPI is optional and is required if you defined process interrupt support with the SENSORIO definition statement.

### System Initialization Support

These supervisor object modules MUST be located in partition 1.

**$PROG1** $PROG1 is required if you intend to link edit a single application program with the supervisor to form a single load module. By doing this, the application program will always be resident in storage and will automatically be started after the system and user-written initialization is complete. Using $PROG1 can be useful if your system does not have disk or diskette devices to load program from. Refer to the *Customization Guide* for information on writing a program using $PROG1.

To remove the execution of disk(ette) resident program feature from your supervisor, do not include RLOADER. If the system resident disk or diskette volume (normally EDX002) exists on the system, delete the transient loader ($LOADER) from it.

**IO1024** IO1024 is optional and is required only if you intend to IPL your system from a 1024 byte/sector diskette. It must be included before EDXINIT.

### System Support - Initialization

These modules MUST be located in partition 1.

**EDXINIT** EDXINIT is a required module and must be included in every supervisor. It must appear in this location.

EDXINIT is the system initialization routine and executes all the initialization modules.

**Note:** If you intend to add your own operator command, user attention list, or device support, the INCLUDE statement and module name must be placed before EDXINIT. For information on adding your own operator command, see *Customization Guide.*

**RW4963ID** RW4963ID is required to initialize a 4963 disk with fixed head support and defined with the DISK definition statement. Include this module only if you specify OPTION NOVERLAY.

**INITADAP** INITADAP is required to initialize the Printer Attachment - 5200 Series (feature #5640) and the Multidrop Work Station Attachment (feature #1250) defined with the ADAPTER statement. Include this module only if you specify OPTION NOVERLAY.

**INITMFA** INITMFA is required to initialize a Multifunction Attachment Feature #1310 defined with the ADAPTER definition statement. Include this module only if you specify OPTION NOVERLAY.

**INIT4978** INIT4978 is required to initialize the 4978 and 4979 display terminals defined with the TERMINAL definition statement. Include this module only if you specify OPTION NOVERLAY.

**INIT4980** INIT4980 is required to initialize the 4980 display station defined with the TERMINAL definition statement. Include this module only if you specify OPTION NOVERLAY.

### User Initialization Modules

You may want to write your own device initialization routines. If you do, you can include them at this location or preceding the EDXINIT module. However, if you include them preceding the EDXINIT module, the initialization routines will remain resident in your supervisor. For information on writing your own initialization routines, see the *Customization Guide*.

In addition, you have the option of defining your own device initialization routines as overlay segments. An overlay segment consists of an OVERLAY statement and the INCLUDE statements associated with it. Each segment is ended by the next OVERLAY statement or PART statement. Generally, each initialization routine is a separate overlay segment (one OVERLAY statement and one INCLUDE statement). However, you can define multiple routines in one overlay segment if you wish. See the $EDXLINK utility in the *Operator Commands and Utilities Reference* for an explanation of the OVERLAY statement.

If you do not want to define your device initialization routines as overlay segments, specify only the INCLUDE statements for each initialization routine.

### Object Modules to be Located Outside of Partition 1

If you are going to generate a multipartition supervisor, you must locate object modules outside of partition 1. The PART statement preceeding a group of modules specifies the partition where the modules are to be located. Each group of modules to be located outside of partition 1 must be physically moved in the $LNKCNTL data set to this location.

## LINK Statement

The LINK statement is a required link control statement used to define the name of the data set where the generated supervisor is to be stored. The name of the data set is $EDXNUCT in the $LNKCNTL data set. As shown in work sheet 3, the name of the supervisor is part of the $XPSLINK LINK statement and MUST be specified. The generated supervisor will be stored on EDX002. The REPLACE option causes the linkage editor to replace any program on the same volume with the same name as the one specified in the LINK statement. The END option terminates the linkage editor upon completion of LINK.

The $EDXNUCT data set is automatically allocated by $XPSLINK. You may wish to change this name to $EDXNUCx (x = any alphameric character) to save different supervisor versions in individual data sets. However, if you do change the data set name, be sure the supervisor name starts with the seven characters $EDXNUC and that the name is different from the name of the current supervisor.

## Step 3 - Selecting Your Software Support *(continued)*

### Define an Overlay Area

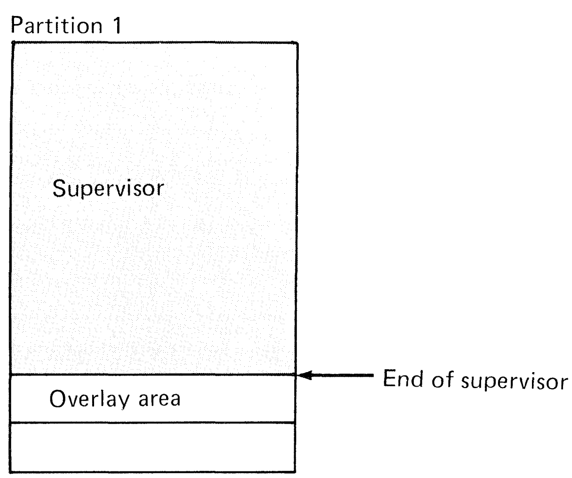
An overlay area is an area in storage that is used to execute overlay segments. There are two ways to create an overlay area in your operating system:

1. You can allow the supervisor to create the overlay area for you. The supervisor creates the overlay area in partition 1 directly after itself.

   *Example:* The supervisor program creates the overlay area. In the link control data set, the OPTION NOVERLAY and OVLAREA statements must be commented out with an asterisk (*).

```
*OPTION NOVERLAY        *25*  NO OVERLAY STRUCTURE
*------------------------------------------------------------------
*SUPERVISOR SUPPORT       -- MUST BE FIRST AND IN PARTITION 1
*------------------------------------------------------------------
 PART1
 VOLUME XS4002                DEFAULT VOLUME FOR INCLUDE MODULES
*OVLAREA OVLSTART OVLEND *23* USER DEFINED OVERLAY AREA
 INCLUDE EDXSYS          *1*  SYSTEM TABLES AND WORK AREAS
     .
     .
*******************************************************************
* SYSTEM SUPPORT -- INITIALIZATION
*******************************************************************
 INCLUDE EDXINIT         *24* SUPERVISOR INITIALIZATION
*
*******************************************************************
```

   The overlay area created by the supervisor appears in storage as follows:



2. You can define the overlay area by including the OVLAREA statement in the link control data set.

   The OVLAREA statement defines the overlay area within the storage in partition 1 occupied by the supervisor. OVLSTART indicates the starting address of the overlay area. OVLSTART is a pointer to the beginning of the SEGINIT module which is equated to DISKBUFR+12 bytes. OVLEND indicates the end of the overlay area. OVLEND is a pointer to the end of the DISKINIT module.

   You can define any starting and ending entries to define the start of the overlay area. However, the size of the overlay area must be larger than the largest overlay segment included. If the overlay area is not large enough, $XPSLINK issues the following message:

```
OVERLAY AREA IS TOO SMALL, SIZE REQUIRED IS xxxx HEX
```

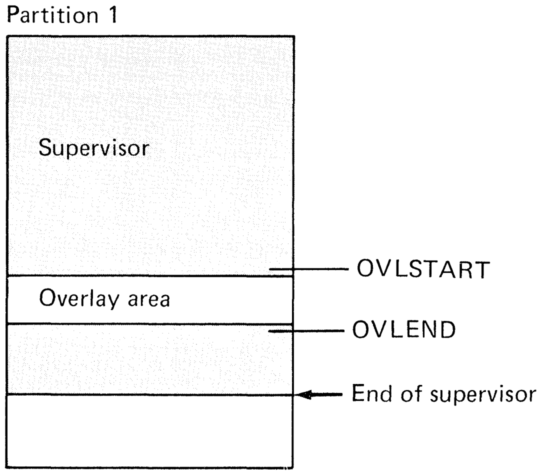
   where xxxx indicates the required size of the overlay area in hexadecimal. Redefine the starting and ending points of the overlay area and link-edit the definition statements with the link control data set.

   **Example:** Define the overlay area to be within the storage in partition 1 occupied by the supervisor. In this case, remove the asterisk (*) from the OVLAREA statement and leave the asterisk (*) on the OPTION NOVERLAY statement.

```
*OPTION NOVERLAY        *25*  NO OVERLAY STRUCTURE
*-----------------------------------------------------------------
*SUPERVISOR SUPPORT       - MUST BE FIRST AND IN PARTITION 1
*-----------------------------------------------------------------
 PART1
 VOLUME XS4002                DEFAULT VOLUME FOR INCLUDE MODULES
 OVLAREA OVLSTART OVLEND *23* USER DEFINED OVERLAY AREA
 INCLUDE EDXSYS          *1*  SYSTEM TABLES AND WORK AREAS
     .
     .
*****************************************************************
* SYSTEM SUPPORT -- INITIALIZATION
*****************************************************************
 INCLUDE EDXINIT         *24* SUPERVISOR INITIALIZATION
*
*****************************************************************
```

## Step 3 - Selecting Your Software Support *(continued)*

The overlay area appears in storage as follows:




In both cases, an area of storage in partition 1 is defined as an overlay area. The overlay area is large enough to contain the largest initialization routine.

### Including Initialization Routines in Your Supervisor

Initialization routines are supervisor object modules that prepare I/O devices for operation. The linkage editor, $XPSLINK, automatically includes the intitialization routines required for your system configuration in your supervisor. However, by excluding or including certain statements in the link control data set, initialization routines are treated either as overlay segments or as resident programs.

#### Initialization Routines as Overlay Segments

To include initialization routines as overlay segments, you do not need to include any statements in the link control data set. The linkage editor builds the supervisor to default to an overlay structure. As a result, $XPSLINK includes the required initialization routines as overlay segments. This means that each initialization routine is executed one at a time in the storage defined as the overlay area.

#### Initialization Routines as Resident Programs

To include initialization routines as resident programs, you must include the OPTION NOVERLAY statement. The linkage editor builds the supervisor without an overlay structure and automatically includes the initialization routines required for your system configuration as resident programs. In this case, the required initialization routines are simultaneously loaded in supervisor storage at IPL time. As a result, the initialization routines increase the amount of storage required by supervisor in partition 1.

If you include the OPTION NOVERLAY statement, there are five initialization routines that are not automatically included by the linkage editor. They are:

- RW4963ID
- INITMFA
- INITADAP
- INIT4978
- INIT4980

You must specifically include each of the above modules if you require them as part of the supervisor.

The RW4963ID, INITMFA, INITADAP, INIT4978, and INIT4980 modules do not appear in the link control data set, but do appear in work sheet 3. You must add them to the link control data set directly following the EDXINIT module.

*Example:* Including the OPTION NOVERLAY statement and the initialization modules that are not automatically included by the linkage editor.

```
 OPTION NOVERLAY        *25*  NO OVERLAY STRUCTURE
*------------------------------------------------------------------
*SUPERVISOR SUPPORT       - MUST BE FIRST AND IN PARTITION 1
*------------------------------------------------------------------
 PART1
 VOLUME XS4002                DEFAULT VOLUME FOR INCLUDE MODULES
*OVLAREA OVLSTART OVLEND *23* USER DEFINED OVERLAY AREA
 INCLUDE EDXSYS         *1*   SYSTEM TABLES AND WORK AREAS
      .
      .
*******************************************************************
* SYSTEM SUPPORT -- INITIALIZATION
*******************************************************************
 INCLUDE EDXINIT        *24*  SUPERVISOR INITIALIZATION
 INCLUDE RW4963ID       *3*   4963 FIXED HEAD REFRESH SUPPORT
 INCLUDE INITMFA        *3*   MFA INITIALIZATION
 INCLUDE INITADAP       *3*   ALPA & SMIO INITIALIZATION
 INCLUDE INIT4978       *3*   4978 DISPLAY INITIALIZATION
 INCLUDE INIT4980       *3*   4980 DISPLAY INITIALIZATION
*
*******************************************************************
```

## Step 3 - Selecting Your Software Support *(continued)*

### Initialization Modules

The following is a list of the initialization modules that are included in your supervisor, if required, by the linkage editor, along with an explanation of each. This list is provided for information only as the initialization module names may appear in the link map when you generate your system.

| Module | Description |
|---|---|
| **DSKINIT2** | DSKINIT2 is required to initialize fixed-head disk device(s) defined with the DISK definition statement, set attention for 1024-bytes-per-sector diskettes, and issues the IPL volume message. |
| **RW4963ID** | RW4963ID is required to initialize a 4963 disk with fixed head support and defined with the DISK statement. |
| **TAPEINIT** | TAPEINIT is required to initialize a 4968 or 4969 tape unit defined with the TAPE definition statement. |
| **LOADINIT** | LOADINIT is required if programs are to be loaded from disk or diskette. |
| **INITMFA** | INITMFA is required to initialize the Multifunction Attachment Feature #1310 (MFA) defined with the ADAPTER definition statement. |
| **INITADAP** | INITADAP is required to initialize the Printer Attachment Feature #5640 and the Multidrop Work Station Attachment Feature #1250 defined with the ADAPTER definition statement. |
| **TERMINIT** | TERMINIT is required to initialize any terminals defined with the TERMINAL definition statement. |
| **S1S1INIT** | S1S1INIT is required to initialize the Series/1 to Series/1 attachment defined with the TERMINAL definition statement. IOSS1S1 must be included (see Terminal Support). |
| **INIT4978** | INIT4978 is required to initialize 4978 and 4979 display terminals defined with the TERMINAL defintion statement. |
| **INIT4980** | INIT4980 is required to initialize 4980 display terminals defined with the TERMINAL defintion statement. |
| **INIT4013** | INIT4013 is required to initialize a Tektronics 4013 Graphics Terminal defined with the TERMINAL statement. |
| **BSCINIT** | BSCINIT is required to initialize a binary synchronous line defined with the BSCLINE definition statement. |

**TPINIT** TPINIT is required to initialize the Host Communications Facility defined with the HOSTCOMM definition statement.

**TIMRINIT** TIMRINIT is required to initialize the #7840 timer on the 4955 processor.

**CLOKINIT** CLOKINIT is required to initialize the native timer on the 4952, 4954, or 4956 processors.

**SBIOINIT** SBIOINIT is required to initialize sensor based I/O devices defined with the SENSORIO definition statement.

**EXIOINIT** EXIOINIT is required to initialize I/O devices defined with the EXIODEV definition statement.

**STORINIT** STORINIT is required to initialize the unmapped storage tables in your system if you have defined unmapped storage.

## Step 4 - Defining Supervisor Structure

In "Step 1 - Estimating Total Supervisor Size" on page IS-41, you estimated the total size of your supervisor. If your supervisor size is 64K or greater or you want to free up storage in partition 1 in order to have space available for additional I/O devices or program execution, you need to reduce the size of the supervisor in partition 1.

### Reducing the Size of Your Supervisor

There are three ways to reduce the size of your supervisor:

1. The first way is to minimize the amount of storage in partition 1 used by the initialization routines by treating them as overlay segments. An initialization routine is an EDX program used to set up the necessary internal controls to make a device active. An overlay segment is a portion of a program that is read from disk, executed, and released.

   To do this, an area of storage within partition 1 is defined as an overlay area and is large enough to contain the largest initialization routine. At IPL time, each initialization routine is brought into storage one at a time in the same storage area thereby reducing the amount of storage required.

2. The second way is to break your supervisor into several parts. Your supervisor is a program that is made up of many smaller programs called object modules. Some of these modules can be moved in partitions other than partition 1. If you move part of the supervisor to another partition, you reduce the size of the supervisor remaining in partition 1. For example, if your supervisor is approximately 48K bytes in size and you move several parts that equal 8K bytes in size, the size of the supervisor remaining in partition 1 is 40K (48K - 8K = 40K).

## Step 4 - Defining Supervisor Structure *(continued)*

By locating the supervisor in more than one partition, you need less storage for it in partition 1. This leaves more storage available in partition 1 for support of additional I/O devices or to execute application programs within partition 1. However, by placing parts of the supervisor in other partitions, the amount of storage within those partitions available for program execution is reduced.

3. The third way is a combination of (1) and (2) above; that is, to treat initialization routines as overlay segments and spread the supervisor across more than one partition.

Any storage within each partition not containing part of the supervisor is available for execution of application programs, program products, and utility programs. Depending upon your processor type, your supervisor can support processor storage sizes from 64K bytes (1K = 1024 bytes) to 1024K bytes with unmapped storage support.

In the SYSTEM definition statement, you define the partition structure and the amount of storage assigned to each partition through the PART= operand. You also define the number of programs that can concurrently execute in each partition through the MAXPROG= operand. In order to define these characteristics, you need to make a couple of decisions:

1. What portion of each partition will be used by the supervisor.

2. How much storage is left within each partition for the execution of programs.

To help you make these decisions, use work sheet 4 in Appendix E. Work sheet 4 is made up of two parts: A and B.

### Part A - Estimate Storage Needed by Supervisor Object Modules

Part A lists the approximate sizes (in bytes) of the supervisor object modules. Under 'PARTITION ONE' is a list of modules that MUST reside in partition one. Under 'PARTITION ANY' are the names of modules that can be placed in partitions 2 through 8 (depending upon your processor). However, some of these modules MUST be grouped together. These subgroupings are shown on the work sheet.

By determining which modules you want to place in partitions 2 through 8, you can estimate how much storage these modules will occupy in a partition. The storage remaining in each partition is available for other programs. In addition, by totaling the number of bytes of these modules, you can estimate the reduction in size of that part of the supervisor remaining in partition 1.

### Part B - Estimate Storage Needed by Other Programs

Part B lists the amount of storage required by the supervisor to support program products, application programs, and utility programs. These programs, although not part of your supervisor, use storage within the partition where they are loaded. To determine how many programs you can concurrently execute within a partition, you need to know how much storage is required by each program. An estimate of more than 64K or 65536 bytes for a specific program indicates that it will not be able to execute within one specific partition.

The approximate size (in bytes) of each system utility program is shown. You may or may not use all of the utility programs. However, you should make sure that your partitions are large enough to hold the largest utility program you plan to use along with other programs.

After you determine which object modules you are moving out of partition 1, the amount of storage left in each partition for program execution, and the maximum number of programs you can execute within each partition, you may need to redefine the following:

**Work Sheet 2** The PARTS= and MAXPROG= operands of the SYSTEM definition statement.

**Work Sheet 3** The PART link control statement indicating which modules are being moved from partition 1 and the partition where they will be located.

# Select Your Required Support

## Work Sheets for the Sample System

Following are samples of work sheets 2 and 3 that reflect the hardware and software features of the sample system defined in the beginning of the chapter.

"Work Sheet 2 for Sample System" on page IS-71 shows the definition statements defining the devices and "Work Sheet 3 for Sample System" on page IS-73 shows the software support selected.

IBM Series/1 Event Driven Executive

# Work Sheet 2—Installation and System Generation

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Storage definition** | | | | |
| blank | SYSTEM | MAXPROG= | ( 1, 10, 10, 5, | Optional-defaults to 10 |
| | | | 5, ___, ___, ___), | |
| | | PARTS= | ( 0, 24, 16, 20, | Optional-defaults to 32K |
| | | | 32, ___, ___, ___), | |
| | | DATEFMT= | ___, | Optional-defaults to MMDDYY |
| | | IABUF= | ___, | Optional-defaults to 20 |
| | | XPSSTK= | ___, | Optional-defaults to 20 |
| | | COMMON= | ( 0, 5, 0, 2, | Optional-defaults to EDXSYS |
| | | | 3, ___, ___, ___), | |
| | | INITPRT= | ___, | Optional-defaults to 1 |
| | | INITMOD= | ( ___, ___, ___, ___) | Optional |
| | | MECBLST | ___ | Optional |

| | | | | |
|---|---|---|---|---|
| **Disk(ette) definition** | | | | |
| blank | DISK | DEVICE=4962, -1F | | Required |
| | | ADDRESS= | 03, | Required |
| | | VOLNAME= | ( ___, ___, ___, ___), | Optional |
| | | TASK= | YES, | Optional-defaults to NO |
| | | END= | ___ | Optional-defaults to NO |

| | | | | |
|---|---|---|---|---|
| blank | DISK | DEVICE=4964, | | Required |
| | | ADDRESS= | 02, | Required |
| | | TASK= | YES, | Optional-defaults to NO |
| | | END= | YES | Optional-defaults to NO |

| | | | | |
|---|---|---|---|---|
| **4973/4974 Printers** | | | | |
| ~~label~~ $SYSPRTR | TERMINAL | DEVICE= | 4973, | Required (specify 4973 or 4974) |
| | | ADDRESS= | 21, | Required |
| | | PAGSIZE= | ___, | Optional |
| | | LINSIZE= | ___, | Optional |
| | | TOPM= | ___, | Optional |
| | | BOTM= | ___, | Optional |
| | | LEFTM= | ___, | Optional |
| | | RIGHTM= | ___, | Optional |
| | | OVFLINE= | ___, | Optional-defaults to NO |
| | | SPOOL= | ___, | Optional-defaults to NO |
| | | END= | ___ | Optional-defaults to NO (Specify YES if last TERMINAL statement) |

## Work Sheets for the Sample System *(continued)*

4978/4979 Terminals

| | | | | |
|---|---|---|---|---|
| ~~label~~ $SYSLOG | TERMINAL | DEVICE= | 4979 | Required (specify 4978 or 4979) |
| | | ADDRESS= | 04, | Required |
| | | PAGSIZE= | ______, | Optional |
| | | LINSIZE= | ______, | Optional |
| | | TOPM= | ______, | Optional |
| | | BOTM= | ______, | Optional |
| | | NHIST= | ______, | Optional |
| | | LEFTM= | ______, | Optional |
| | | RIGHTM= | ______, | Optional |
| | | OVFLINE= | ______, | Optional-defaults to NO |
| | | HDCOPY= | $SYSPRTR, | Optional |
| | | ATTN= | ______, | Optional-defaults to YES |
| | | PF1= | ______, | Optional-(2 digit hex char) |
| | | SCREEN= | ______, | Optional-(YES/NO/STATIC) |
| | | PART= | ______, | Optional-defaults to partition 1 |
| | | SPOOL= | ______, | Optional-defaults to NO |
| | | END= | ______ | Optional-defaults to NO (Specify YES if last TERMINAL statement) |

2ND 4979

$SYSLOGA TERMINAL DEVICE=4979,
ADDRESS=24,
HDCOPY=$SYSPRTR,
END=YES

**System common**

| | | | |
|---|---|---|---|
| $SYSCOM | CSECT | | |
| | ~~QCB~~ | NONE DEFINED | |
| | ~~QCB~~ | | |
| | ~~ECB~~ | | |
| | ~~ECB~~ | | |
| | ENTRY | $EDXPTCH | |
| $EDXPTCH | DATA | 128F'0' | System Patch Area |

## Work Sheets for the Sample System *(continued)*

### Work Sheet 3 for Sample System

# IBM Series/1 Event Driven Executive

## Work Sheet 3—Installation and System Generation

To include a supervisor object module in your operating system, leave Column One blank. To exclude a module, place an asterisk (*) in Column One.

| Column one | Supervisor object modules | Notes | Purpose of module |
|---|---|---|---|
| * | OPTION NOVERLAY | *25* | No overlay structure |
| Supervisor support—must be first and in partition 1 | | | |
| | PART 1 | | |
| | VOLUME SX4002 | | Default volume for include modules |
| * | OVLAREA OVLSTART OVLEND | *23* | User defined overlay area |
| | INCLUDE EDXSYS | *1* | System tables and work area |
| | INCLUDE ASMOBJ,EDX002 | *1* | Output from user system generation |
| | INCLUDE EDXSVCX | *1* | Task supervisor |
| * | INCLUDE $DEBUGNUC | *2* | Resident $DEBUG support |
| | INCLUDE EDXALU | *1* | EDL instruction emulator |
| | INCLUDE EDXSTART | *1* | Initialization & error handler |
| * | INCLUDE SWAITM | *3* | Wait on multiple events |
| Timer support—must be in partition 1 | | | |
| * | INCLUDE EDXTIMER | *12* | 4955 timer (7840) support |
| * | INCLUDE EDXTIMR2 | *12* | 4952/4954/4956 timer support |
| EXIO support—must be in partition 1 | | | |
| * | INCLUDE IOSEXIO | *3* | EXIO device control support |
| * | INCLUDE EXIOTRC | *3* | EXIO trace option |
| Error logging—must be in partition 1 | | | |
| * | INCLUDE SYSLOG | *3* | I/O error logging |
| * | INCLUDE CIRCBUFF | *16* | Program/machine check logging |
| Optional function support—must be in partition 1 | | | |
| * | INCLUDE RLOADER | *17* | Relocating program loader |
| * | INCLUDE STORMGR | *3* | Unmapped storage manager support |
| * | INCLUDE IAMQCB | *20* | IAMQCB needed for IAM support |
| * | INCLUDE PWRAM80 | *26* | 4980 Power on RAM |
| Host communications support—must be in partition 1 | | | |
| * | INCLUDE TPCOM | *14* | Host communication support |
| Translation tables—must be in partition 1 | | | |
| * | INCLUDE TRASCII | *10* | 1310,2095/2096,7850 ACCA/TTY translation |
| * | INCLUDE TREBASC | *10* | 1610,2091/2092 ACCA translation |
| * | INCLUDE TREBCD | *11* | 2741,PROC EBDC translation |
| * | INCLUDE TRCRSP | *11* | 2741 correspondence translation |
| Disk(ette) and tape support—must be grouped together in any partition | | | |
| | PART 1 | | |
| | INCLUDE DISKIO | *3* | Basic disk(ette) support |
| | INCLUDE D49624 | *3* | 4962/4964 disk(ette) support |
| * | INCLUDE D4963A | *3* | 4963/4967/DDSK-30 subsystem support |
| * | INCLUDE D4966A | *3* | 4965/4966 disk(ette) support |
| * | INCLUDE D1024 | *3,21* | 1024 bytes/sector IO support |
| * | INCLUDE D4969A | *3* | Basic tape support |
| Terminal—must be grouped together in any partition | | | |
| | PART ~~1~~ 8 | | |
| | INCLUDE EDXTIO | *4* | Basic terminal support |
| * | INCLUDE MINMSG | *5* | Message ID only support |
| | INCLUDE FULLMSG | *5* | Message data set support |
| * | INCLUDE IOS3101 | *7* | ACCA 3101B support |
| | INCLUDE IOS4979 | *3* | 4978/4979/4980 display support |

## Work Sheets for the Sample System *(continued)*

# IBM Series/1 Event Driven Executive

## Work Sheet 3—Installation and System Generation (cont.)

| Column one | Supervisor object modules | Notes | Purpose of module |
|---|---|---|---|
| | INCLUDE IOS4974 | *3* | 4973/4974/4975/5219/5224/5225 printer support |
| * | INCLUDE IOSACCA | *4* | ACCA device handler |
| * | INCLUDE ACCATRC | *3* | ACCA trace option |
| * | INCLUDE IOSTERM | *A,6* | ACCA/TTY/2741/4013 support |
| * | INCLUDE IOSTTY | *3* | ASR 33/35/3101/3101C TTY support |
| * | INCLUDE IOS2741 | *3* | 2741 terminal support |
| * | INCLUDE IOS4013 | *3* | Digital I/O terminal support |
| * | INCLUDE IOSGPIB | *3* | GPIB support |
| * | INCLUDE IOSS1S1 | *3* | Series/1 - Series/1 support |
| * | INCLUDE IOSVIRT | *3,9* | Virtual terminal support |
| * | INCLUDE IOSPOOL | *3* | Spooling support |
| * | INCLUDE EBFLCVT | *18* | EBCDIC/floating point conversion |
| Floating point—may be in any partition | | | |
| * | PART 1 | | |
| * | INCLUDE EDXFLOAT | *3* | Floating point arithmetic |
| Queue I/O—may be in any partition | | | |
| * | PART 1 | | |
| * | INCLUDE QUEUEIO | *19* | Queue processing support |
| Bisync communications—may be in any partition | | | |
| * | PART 1 | | |
| * | INCLUDE BSCAM | *13* | Bisync communication support |
| * | INCLUDE BSCX21 | *27* | Bisync communication support for X.21 |
| Sensor input/output—must be grouped together in any partition | | | |
| * | PART 1 | | |
| * | INCLUDE SBCOM | *15* | Basic sensor I/O support |
| * | INCLUDE SBAI | *3* | Analog input support |
| * | INCLUDE SBAO | *3* | Analog output support |
| * | INCLUDE SBDIDO | *3* | Digital input/output support |
| * | INCLUDE SBPI | *3* | Process interrupt support |
| System initialization—must be in partition 1 | | | |
| * | INCLUDE $PROG1 | *22* | User module included in nucleus gen |
| * | INCLUDE IO1024 | *21* | 1024 IPL support |
| System support -- initialization—must be in partition 1 | | | |
| | INCLUDE EDXINIT | *24* | Supervisor initialization |
| * | INCLUDE RW4963ID | *3* | 4963 fixed head refresh support |
| * | INCLUDE INITMFA | *3* | MFA attachment initialization |
| * | INCLUDE INITADAP | *3* | ALPA and SMIO initialization |
| * | INCLUDE INIT4978 | *3* | 4978/4979 terminal initialization |
| * | INCLUDE INIT4980 | *3* | 4980 display initialization |

## IBM Series/1 Event Driven Executive

### Work Sheet 3—Installation and System Generation (cont.)

| Column one | Supervisor object modules | Notes | Purpose of module |
|---|---|---|---|
| Insert user initialization modules here | | | |
| | | | |
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NOT REQUIRED

## Work Sheets for the Sample System *(continued)*

### IBM Series/1 Event Driven Executive

### Work Sheet 3—Installation and System Generation (cont.)

| Column one | Supervisor object modules | Notes | Purpose of module |
|---|---|---|---|
| Supervisor code being moved out of partition 1 must be moved to here | | | |
| | PART 8 | | |
| | INCLUDE EDXTIO | *4* | BASIC TERMINAL SUPPORT |
| | INCLUDE FULLMSG | *5* | FULL MESSAGE SUPPORT |
| | INCLUDE IOS4979 | *3* | 4978/4979 DISPLAY SUPPORT |
| | INCLUDE IOS4974 | *3* | 4973/4974/4975 PRINTER SUPPORT |

Location ~~of supervisor~~ → $EDXNUC2

LINK $EDXNUCT,EDX002 REPLACE END

# Chapter 5. Generate a Tailored Operating System

This chapter provides the step-by-step procedures for generating a tailored operating system. In order to generate an operating system, you should have completed work sheet 2 and work sheet 3. Work sheet 2 contains the system definition statements that define processor storage and the devices attached to your Series/1. Work sheet 3 defines the software features (object modules) to be included in your supervisor to support the I/O devices defined.

**Note:** Before you generate a tailored operating system, EDX must be installed.

The following is a summary of the steps you must perform to generate a tailored operating system:

**Step 1** IPL the starter system from disk

**Step 2** Allocate required data sets

**Step 3** Edit $EDXDEF on volume ASMLIB to specify the system definition statements to match your hardware requirements

**Step 4** Edit $LNKCNTL on volume ASMLIB to specify which object modules are to be included in your supervisor

**Step 5** Edit $JOBUTIL procedure file ($SUPPREP on volume ASMLIB) to use the data sets allocated in Step 2

# Generate a Tailored Operating System

**Step 6** Use the $JOBUTIL utility and the job stream procedure created in Step 5 to:

- Compile the system definition statements created in Step 3.
- Link edit the resulting object module, using the link edit control data set created in Step 4.
- Store your tailored operating system in a data set named $EDXNUCx on EDX002.

**Step 7** Test your tailored operating system.

**Step 8** Verify the system generation process (optional).

To perform these steps, you need the following utilities:

**$DISKUT1** $DISKUT1 is used to allocate the data sets required in Step 2.

**$FSEDIT** $FSEDIT is used to edit various data sets and to enter definition statements.

**$INITDSK** $INITDSK is used to initialize devices and tailored supervisors and to allocate and initialize volumes.

**$JOBUTIL** $JOBUTIL is used to execute the procedure data set.

**$EDXASM** $EDXASM is used to compile the supervisor definition data set (invoked by the procedure data set).

**$XPSLINK** $XPSLINK is used to link edit and format the supervisor (invoked by the procedure data set).

## Step 1 - IPL the Starter System from Disk

The first step in generating your tailored operating system is to IPL the starter system you previously installed on disk in Chapter 3, "Install EDX" on page IS-11. To IPL, press the LOAD button on the system console. Once your system is up and running, you can begin generating your tailored operating system.

## Step 2 - Allocate Required Data Sets

With the completion of the starter supervisor installation, the system programs are installed. The system generation process requires the use of several system utility/program preparation programs. These programs require data sets for use as work areas or input/output data sets. You must allocate the four data sets on volume EDX002 before system generation can proceed. Use $DISKUT1 to allocate the data sets.

**Note:** In Chapter 3, "Install EDX" on page IS-11, it is suggested in Step 8 that you assemble the sample program CALCSRC to verify starter supervisor installation. If you performed that step, EDITWORK, ASMOBJ, ASMWORK, and LINKWORK have already been allocated and need not be allocated here. Proceed to Step 3.

The recommended size and required organization type of each data set is shown below.

| Data set name | Size (number of records) | Organization type |
|---|---|---|
| EDITWORK | 200 | D (data) |
| ASMWORK | 500 | D (data) |
| ASMOBJ | 300 | D (data) |
| LINKWORK | 600 | D (data) |

**Figure 5. Required data sets for system generation**

**Notes:**

1. The size of ASMOBJ depends on the size of the supervisor being generated. To determine the size (in records) of ASMOBJ, divide the estimated supervisor size (in bytes) by 256 to get the number of records required.

2. LINKWORK must be at least 600 records. If an end of file (EOF) occurs, the data set is too small. You then must delete and reallocate the data set specifying a larger size.

3. See $DISKUT1 in *Operator Commands and Utilities Reference* or *Operation Guide* for an explanation of organization types and instructions for allocating data sets.

To allocate the data sets, press the attention key and load $DISKUT1. Respond to the $DISKUT1 prompts as shown.

## Step 2 - Allocate Required Data Sets *(continued)*

```
   > $L $DISKUT1
   LOADING $DISKUT1     49P, LP= 9100, PART=1
   $DISKUT1 - DATA SET MGMT. UTILITY I

   USING VOLUME EDX002

1  COMMAND (?):  AL EDITWORK 200 D
   EDITWORK CREATED

2  COMMAND (?):  AL ASMWORK 500 D
   ASMWORK CREATED

2  COMMAND (?):  AL ASMOBJ 300 D
   ASMOBJ CREATED

3  COMMAND (?):  AL LINKWORK 600 D
   LINKWORK CREATED

   COMMAND (?):  EN

   $DISKUT1 ENDED
```

1 EDITWORK is the name of a work data set that is required by the $FSEDIT text editing utility.

2 These data sets are used by the $EDXASM compiler. ASMOBJ is the data set in which the object module output of the compiler will be stored. ASMWORK is an assembler work data set.

3 LINKWORK is the $XPSLINK linkage editor work data set.

If you plan to use the $EDIT1N utility to edit $EDXDEF and $LNKCNTL, you must allocate data sets $EDXDEFS (20 records), LINKCNTL (111 records), and SUPPREPS (15 records) on volume EDX002.

## Step 3 - Edit $EDXDEF to Match Hardware Configuration

Work Sheet 2 contains the system definitions statements that define the characteristics of processor storage and the I/O devices attached to your Series/1. During the installation procedure, a data set containing the definition statements used in generating the starter system was copied to disk. The data set is $EDXDEF on volume ASMLIB You must modify data set $EDXDEF to match your system definition statements.

To edit $EDXDEF:

**3(a)** **Press the attention key and load the $FSEDIT utility.** Respond to the $FSEDIT prompts as shown.

```
> $L $FSEDIT
WORKFILE(NAME,VOLUME): EDITWORK,EDX002
LOADING $FSEDIT     31P, LP= 9200, PART= 1

DS1 HAS NOT PREVIOUSLY BEEN USED AS A WORK DATA SET
IS IT OK TO USE IT NOW? YES
```

**Note:** The first time you use EDITWORK as a work file for the text editor, $FSEDIT, you are asked if you can use the EDITWORK data set as a work data set; respond YES and continue.

Once loaded, $FSEDIT displays the primary option menu.

```
$FSEDIT PRIMARY OPTION MENU -----------------------STATUS =
                                                  PRESS PF3 TO EXIT
OPTION ===>

DATASET NAME =========>                      (CURRENTLY IN WORK FILE)
VOLUME NAME ==========>

HOST DATASET =========>

ENTER A VOLUME NAME AND PRESS ENTER FOR A DIRECTORY MEMBER LIST

   1 .... BROWSE
   2 .... EDIT
   3 .... READ (HOST/NATIVE)
   4 .... WRITE (HOST/NATIVE)
   5 .... SUBMIT BATCH JOB TO HOST SYSTEM
   6 .... PRINT
   7 .... MERGE
   8 .... END
   9 .... HELP
```

## Step 3 - Edit $EDXDEF to Match Hardware Configuration *(continued)*

**3(b)** **Read the $EDXDEF data set into the work data set.** Enter a 3 on the COMMAND line and the data set and volume name as shown.

```
$FSEDIT PRIMARY OPTION MENU -----------------------STATUS =
                                                  PRESS PF3 TO EXIT
OPTION ===> 3

DATASET NAME =========> $EDXDEF          (CURRENTLY IN WORK FILE)
VOLUME NAME ==========> ASMLIB
```

Press the enter key. $FSEDIT reads the requested data set into the work data set and issues the following message:

```
92   LINES READ FROM   $EDXDEF,ASMLIB
```

**3(c)** **Select option 2 (EDIT) to edit $EDXDEF.** Enter a 2 on the OPTION line.

```
$FSEDIT PRIMARY OPTION MENU -----------------------STATUS =
                                                  PRESS PF3 TO EXIT
OPTION ===> 2

DATASET NAME =========> $EDXDEF          (CURRENTLY IN WORK FILE)
VOLUME NAME ==========> ASMLIB
```

Press the enter key. $FSEDIT displays the $EDXDEF data set, as follows:

```
$EDXDEF  CSECT
         $ID
*                            XPS
* EVENT DRIVEN EXECUTIVE - VERSION 4, MODIFICATION LEVEL 1
*
* THE FOLLOWING DEFINES THE STARTER SUPERVISOR AS SHIPPED ON THE
* DISKETTE LABELED XS4001.  FOR COMPLETE DESCRIPTIONS OF THESE
* STATEMENTS OR ANY OTHER SYSTEM DEFINITION STATEMENTS, REFER TO
* THE INSTALLATION AND SYSTEM GENERATION GUIDE, SC34-0436.
*
* ONLY STATEMENTS WITHOUT AN ASTERISK (*) IN COLUMN 1 ARE ASSEMBLED.
*
*----------------------------------------------------------------------
* BASIC STORAGE DEFINITIONS
*----------------------------------------------------------------------
         SYSTEM MAXPROG=(5,5,5,5,5,5,5,5),                            C
               PARTS=(32,32,32,32,32,32,32,32)
*----------------------------------------------------------------------
* BASIC DEFINITION FOR A 4969 TAPE
*----------------------------------------------------------------------
*        TAPE   DEVICE=4969,ADDRESS=4C,ID=TAPE01,                     C
*              DENSITY=1600,LABEL=SL,TASK=YES
*----------------------------------------------------------------------
* BASIC DEFINITION FOR A 4962-1 OR -2 DISK         (9.3 MB)
*----------------------------------------------------------------------
*        DISK   DEVICE=4962-1F,ADDRESS=03
*----------------------------------------------------------------------
* BASIC DEFINITION FOR A 4963-23 DISK               (23 MB)
*----------------------------------------------------------------------
         DISK   DEVICE=4963-23,ADDRESS=48
*----------------------------------------------------------------------
* BASIC DEFINITION FOR A 4967-2 OR -4 DISK         (200 MB)
*----------------------------------------------------------------------
*        DISK   DEVICE=4967-2,ADDRESS=48
*----------------------------------------------------------------------
* BASIC DEFINITION FOR A DDSK-30 DISK               (30 MB)
*----------------------------------------------------------------------
*        DISK   DEVICE=DDSK-30,ADDRESS=44
*----------------------------------------------------------------------
* DISKETTE DEFINITIONS
*----------------------------------------------------------------------
         DISK   DEVICE=4964,ADDRESS=02
         DISK   DEVICE=4965,ADDRESS=44
         DISK   DEVICE=4965,ADDRESS=45
         DISK   DEVICE=4966,ADDRESS=22,END=YES
```

**Figure 6 (Part 1 of 3). $EDXDEF data set**

## Step 3 - Edit $EDXDEF to Match Hardware Configuration *(continued)*

```
*-------------------------------------------------------------------
* TIMER DEFINITION
*-------------------------------------------------------------------
*        TIMER   ADDRESS=40
*-------------------------------------------------------------------
* ADAPTER DEFINITIONS
*-------------------------------------------------------------------
SMI004   ADAPTER   TYPE=SMIO,ADDRESS=80,                              C
               DEVICES=($SYSLOG)
MFA58    ADAPTER   TYPE=MFA,ADDRESS=58,                               C
               DEVICES=($SYSLOGB,MPRTR1,MPRTR2),END=YES
*ALPACO  ADAPTER   TYPE=ALPA,ADDRESS=CO,                              C
*              DEVICES=(MPRTR3),END=YES
*-------------------------------------------------------------------
* VIRTUAL TERMINAL DEFINITIONS
*-------------------------------------------------------------------
*CDRVTA   TERMINAL  DEVICE=VIRT,ADDRESS=CDRVTB,SYNC=YES
*CDRVTB   TERMINAL  DEVICE=VIRT,ADDRESS=CDRVTA,SYNC=NO
*-------------------------------------------------------------------
* SERIES/1 TO SERIES/1 TERMINAL DEFINITION
*-------------------------------------------------------------------
*S1S1     TERMINAL  DEVICE=S1S1,ADDRESS=25
*-------------------------------------------------------------------
* GENERAL PURPOSE INTERFACE BUS TERMINAL DEFINITION
*-------------------------------------------------------------------
*GPIB     TERMINAL  DEVICE=GPIB,ADDRESS=25
*-------------------------------------------------------------------
* TERMINAL DEFINITIONS
*-------------------------------------------------------------------
*$SYSLOG  TERMINAL  DEVICE=4979,ADDRESS=04,HDCOPY=$SYSPRTR,PART=2
*$SYSLOG  TERMINAL  DEVICE=4978,ADDRESS=24,HDCOPY=$SYSPRTR,PART=2
$SYSLOG  TERMINAL  DEVICE=4980,ADDRESS=80,HDCOPY=$SYSPRTR,PART=2,     C
              PORT=0,SECADDR=AA,ADAPTER=SMIO
$SYSLOGA TERMINAL  DEVICE=TTY,ADDRESS=00,CRDELAY=4,PAGSIZE=24,        C
              BOTM=23,SCREEN=YES,PART=2
$SYSLOGB TERMINAL  DEVICE=ACCA,ADDRESS=59,MODE=3101B,                 C
              ADAPTER=MFA,LMODE=RS422,PART=2
$SYSPRTR TERMINAL  DEVICE=4974,ADDRESS=01
MPRTR1   TERMINAL  DEVICE=4975-01L,ADDRESS=5A,ADAPTER=MFA,            C
              CHARSET=USCA
MPRTR2   TERMINAL  DEVICE=4975-02L,ADDRESS=5B,ADAPTER=MFA,            C
              CHARSET=USCA,END=YES
*MPRTR3  TERMINAL  DEVICE=5219,ADDRESS=CO,ADAPTER=ALPA,               C
*             PORT=0,SECADDR=00
```

**Figure 6 (Part 2 of 3). $EDXDEF data set**

```
*MPRTR3  TERMINAL  DEVICE=5224,ADDRESS=C0,ADAPTER=ALPA,                C
*               PORT=0,SECADDR=00
*MPRTR3  TERMINAL  DEVICE=5225,ADDRESS=C0,ADAPTER=ALPA,                C
*               PORT=0,SECADDR=00,END=YES
*----------------------------------------------------------------------
* COMMUNICATION LINE DEFINITION
*----------------------------------------------------------------------
*         BSCLINE ADDRESS=09,END=YES
*----------------------------------------------------------------------
* SYSTEM  COMMON
*----------------------------------------------------------------------
$SYSCOM  CSECT
         QCB
         QCB
         ECB
         ECB
         ENTRY     $EDXPTCH
$EDXPTCH DATA      128F'0'              SYSTEM PATCH AREA
         END
```

**Figure 6 (Part 3 of 3). $EDXDEF data set**

## Step 3 - Edit $EDXDEF to Match Hardware Configuration *(continued)*

### 3(d) Edit $EDXDEF

Use $FSEDIT to add to, modify, or delete from the contents of $EDXDEF to create the set of system definition statement you prepared when filling out Work Sheet 2. For information on editing a data set, see $FSEDIT in the *Operator Commands and Utilities Reference*.

When editing $EDXDEF, be sure that:

- Continuation indicators in column 72 are not removed.
- If required, a continuation character is placed in column 72 and the statement is continued in column 16 of the next line.
- A system definition statement does not extend beyond column 72.

After you modify the $EDXDEF data set to match the system definition statement specified in Work Sheet 2, you need to save the changes.

### 3(e) Enter MENU on the COMMAND INPUT line to end the EDIT mode as shown.

```
EDIT --- $EDXDEF,ASMLIB     88 ( 543)---------COLUMNS 001 072
COMMAND INPUT ===> MENU                       SCROLL ===>HALF
***** ***** TOP OF DATA *************************************
$EDXDEF  CSECT
         $ID
*
* EVENT DRIVEN EXECUTIVE - VERSION 4, MODIFICATION LEVEL 0
*
* THE FOLLOWING DEFINES THE STARTER SUPERVISOR AS SHIPPED ON THE
* DISKETTE LABELED XS4001.  FOR COMPLETE DESCRIPTIONS OF THESE
* STATEMENTS OR ANY OTHER SYSTEM DEFINITION STATEMENTS, REFER TO
* THE INSTALLATION AND SYSTEM GENERATION GUIDE, SC34-0436.
* ONLY STATEMENTS WITHOUT '*' IN COLUMN 1 ARE USED.
*
*************************************************************
* BASIC STORAGE DEFINITIONS                                 *
*************************************************************
         SYSTEM MAXPROG=(5,5,5,5,5,5,5,5),                  C
               PARTS=(32,32,32,32,32,32,32,32)
```

Press the enter key. $FSEDIT returns to the primary option menu.

**3(f)** **Select option 4 (WRITE) to save the changes made to $EDXDEF.** Enter a 4 on the OPTION line and the name of the data set and volume where you want to save the changes; in this case, $EDXDEFS on volume EDX002. Respond as shown.

```
$FSEDIT PRIMARY OPTION MENU ---------------------STATUS = MODIFIED
                                                 PRESS PF3 TO EXIT
OPTION ===> 4

DATASET NAME =========> $EDXDEFS         (CURRENTLY IN WORK FILE)
VOLUME NAME ==========> EDX002

    .
    .

WRITE TO $EDXDEFS ON EDX002 (Y/N)? Y
```

Press the enter key. $FSEDIT saves the contents of the work data set in the data set specified and issues the following message:

```
nn LINES WRITTEN TO $EDXDEFS,EDX002
```

where nn indicates the number of lines in the data set.

You may want to maintain more than one supervisor. For example, you may need one system for development and one for production. It is recommended that you save the definition statements that are unique for each supervisor in a separate data set. The name assigned to the data set should be named $EDXDEFx, where x is any alphanumeric character.

## Step 3 - Edit $EDXDEF to Match Hardware Configuration *(continued)*

***Example:*** Here is an example of the $EDXDEFS data set showing the system definition statements for the sample system.

```
$EDXDEF  CSECT
         $ID
*
* EVENT DRIVEN EXECUTIVE - VERSION 4, MODIFICATION LEVEL 0
*
*
*--------------------------------------------------------------
* BASIC STORAGE DEFINITIONS
*--------------------------------------------------------------
         SYSTEM MAXPROG=(1,10,10,5,5),PARTS=(0,24,16,20,32),   C
               COMMON=(0,5,0,2,3)
*--------------------------------------------------------------
* BASIC DEFINITION FOR A 4962-1 OR -2 DISK     (9.3 MB)
*--------------------------------------------------------------
         DISK   DEVICE=4962-1F,ADDRESS=03,TASK=YES
*--------------------------------------------------------------
* DISKETTE DEFINITIONS
*--------------------------------------------------------------
         DISK    DEVICE=4964,ADDRESS=02,TASK=YES,END=YES
*--------------------------------------------------------------
* TERMINAL DEFINITIONS
*--------------------------------------------------------------
$SYSPRTR TERMINAL DEVICE=4973,ADDRESS=21
$SYSLOG  TERMINAL DEVICE=4979,ADDRESS=04,HDCOPY=$SYSPRTR
$SYSLOGA TERMINAL DEVICE=4979,ADDRESS=24,HDCOPY=$SYSPRTR,END=YES
*--------------------------------------------------------------
* SYSTEM COMMON
*--------------------------------------------------------------
$SYSCOM  CSECT
*
* NONE DEFINED
*
          ENTRY     $EDXPTCH
$EDXPTCH  DATA      128F'0'       SYSTEM PATCH AREA
          END
```

**Figure 7. Edited $EDXDEFS data set**

## Step 4 - Edit $LNKCNTL to Include Software Support

The $LNKCNTL data set contains all the supervisor object modules needed to generate an operating system.

To edit $LNKCNTL:

**4(a)** **Read the $LNKCNTL data set into the work data set EDITWORK.** Enter a 3 on the OPTION line and the data set and volume name as shown.

```
$FSEDIT PRIMARY OPTION MENU -----------------------STATUS =
                                                  PRESS PF3 TO EXIT
OPTION ===> 3

DATASET NAME =========> $LNKCNTL        (CURRENTLY IN WORK FILE)
VOLUME NAME ==========> ASMLIB
```

Press the enter key. $FSEDIT reads the requested data set into the EDITWORK data set and issues the following message:

```
236   LINES READ FROM   $LNKCNTL,ASMLIB
```

**4(b)** **Select option 2 (EDIT) to edit $LNKCNTL.** Enter a 2 on the OPTION line.

```
$FSEDIT PRIMARY OPTION MENU -----------------------STATUS =
                                                  PRESS PF3 TO EXIT
OPTION ===> 2

DATASET NAME =========> $LNKCNTL       (CURRENTLY IN WORK FILE)
VOLUME NAME ==========> ASMLIB
```

Press the enter key. $FSEDIT displays the $LNKCNTL data set, as follows:

## Step 4 - Edit $LNKCNTL to Include Software Support *(continued)*

```
*                           STARTER SYSTEM
*                       EVENT DRIVEN EXECUTIVE
*                XPS - VERSION 4, MODIFICATION LEVEL 1
*
*        COMMENTS MAY BE INCLUDED BY AN '*' IN COLUMN 1
*        USE THIS TECHNIQUE TO OMIT UNNEEDED MODULES
*
*OPTION NOVERLAY         *25*  NO OVERLAY STRUCTURE
*----------------------------------------------------------------------
*  SUPERVISOR SUPPORT    - MUST BE FIRST AND IN PARTITION 1
*----------------------------------------------------------------------
 PART 1
 VOLUME  XS4002                 DEFAULT VOLUME FOR INCLUDE MODULES
*OVLAREA OVLSTART OVLEND *23*  USER DEFINED OVERLAY AREA
 INCLUDE EDXSYS           *1*   SYSTEM TABLES AND WORK AREAS
 INCLUDE ASMOBJ,EDX002    *1*   OUTPUT FROM USER SYSTEM GENERATION
 INCLUDE EDXSVCX          *1*   TASK SUPERVISOR
*INCLUDE $DBUGNUC         *2*   RESIDENT $DEBUG SUPPORT
 INCLUDE EDXALU           *1*   EDL INSTRUCTION EMULATOR
 INCLUDE EDXSTART         *1*   INITIALIZATION & ERROR HANDLER
*INCLUDE SWAITM           *3*   WAIT ON MULTIPLE EVENTS
*
*----------------------------------------------------------------------
*  TIMER SUPPORT         - MUST BE IN PARTITION 1
*----------------------------------------------------------------------
*INCLUDE EDXTIMER         *12*  4955 TIMER SUPPORT (7840)
*INCLUDE EDXTIMR2         *12*  4952/4954/4956 TIMER SUPPORT
*
*----------------------------------------------------------------------
*  EXIO SUPPORT          - MUST BE IN PARTITION 1
*----------------------------------------------------------------------
*INCLUDE IOSEXIO           *3*   EXIO DEVICE CONTROL SUPPORT
*INCLUDE EXIOTRC           *3*   EXIO TRACE OPTION
*
*----------------------------------------------------------------------
*  ERROR LOGGING         - MUST BE IN PARTITION 1
*----------------------------------------------------------------------
*INCLUDE SYSLOG            *3*   I/O ERROR LOGGING
*INCLUDE CIRCBUFF         *16*  PROGRAM/MACHINE CHECK LOGGING
*
*----------------------------------------------------------------------
*  OPTIONAL FUNCTION SUPPORT - MUST BE IN PARTITION 1
*----------------------------------------------------------------------
 INCLUDE RLOADER          *17*  RELOCATING PROGRAM LOADER
*INCLUDE STORMGR           *3*   UNMAPPED STORAGE MANAGER SUPPORT
*INCLUDE IAMQCB           *20*  IAM QCB NEEDED FOR IAM SUPPORT
 INCLUDE PWRAM80          *26*  4980 POWER ON RAM
*
```

**Figure 8 (Part 1 of 5). $LNKCNTL data set**

# Step 4 - Edit $LNKCNTL to Include Software Support *(continued)*

```
*-------------------------------------------------------------------
*  HOST COMMUNICATIONS SUPPORT - MUST BE IN PARTITION 1
*-------------------------------------------------------------------
*INCLUDE TPCOM          *14*  HOST COMMUNICATION SUPPORT
*
*-------------------------------------------------------------------
*  TRANSLATION TABLES     - MUST BE IN PARTITION 1
*-------------------------------------------------------------------
 INCLUDE TRASCII        *10*  1310,2095/2096,7850 ACCA/TTY TRANSLATION
 INCLUDE TREBASC        *10*  1610, 2091/2092 ACCA TRANSLATION
*INCLUDE TREBCD         *11*  2741, PROC EBDC TRANSLATION
*INCLUDE TRCRSP         *11*  2741 CORRESPONDENCE TRANSLATION
*
*-------------------------------------------------------------------
*  DISK(ETTE) SUPPORT     - MUST BE GROUPED TOGETHER IN ANY PARTITION
*-------------------------------------------------------------------
 PART1
 INCLUDE DISKIO          *3*   BASIC DISK(ETTE) SUPPORT
 INCLUDE D49624          *3*   4962/4964 DISK(ETTE) SUPPORT
 INCLUDE D4963A          *3*   4963/4967/DDSK DISK SUPPORT
 INCLUDE D4966A          *3*   4965/4966 DISKETTE SUPPORT
*INCLUDE D1024        *3,21*   1024 BYTES/SECTOR DISKETTE SUPPORT
*INCLUDE D4969A          *3*   BASIC TAPE SUPPORT
*
*-------------------------------------------------------------------
*  TERMINALS              - MUST BE GROUPED TOGETHER IN ANY PARTITION
*-------------------------------------------------------------------
 PART 1
 INCLUDE EDXTIO          *4*   BASIC TERMINAL SUPPORT
*INCLUDE MINMSG          *5*   MINIMUM MESSAGE SUPPORT
 INCLUDE FULLMSG         *5*   FULL MESSAGE SUPPORT
 INCLUDE IOS3101         *7*   ACCA 3101B SUPPORT
 INCLUDE IOS4979         *3*   4978/4979/4980 DISPLAY SUPPORT
 INCLUDE IOS4974         *3*   4973/4974/4975/5219/5224/5225 SUPPORT
*INCLUDE IOS4975A        *3*   4975-01A PRINTER SUPPORT
 INCLUDE IOSACCA         *4*   ACCA DEVICE HANDLER
*INCLUDE ACCATRC         *3*   ACCA TRACE OPTION
 INCLUDE IOSTERM       *A,6*   ACCA/TTY/2741/4013 SUPPORT
 INCLUDE IOSTTY          *3*   ASR 33/35/3101/3101C TTY SUPPORT
*INCLUDE IOS2741         *3*   2741 TERMINAL SUPPORT
*INCLUDE IOS4013         *3*   DIGITAL I/O TERMINAL SUPPORT
*INCLUDE IOSGPIB         *3*   GPIB SUPPORT
*INCLUDE IOSS1S1         *3*   SERIES/1 - SERIES/1 SUPPORT
*INCLUDE IOSVIRT       *3,9*   VIRTUAL TERMINAL SUPPORT
*INCLUDE IOSPOOL         *3*   SPOOLING SUPPORT
*INCLUDE EBFLCVT        *18*   EBCDIC/FLOATING POINT CONV.
*
```

**Figure 8 (Part 2 of 5). $LNKCNTL data set contents**

# Generate a Tailored Operating System

## Step 4 - Edit $LNKCNTL to Include Software Support *(continued)*

```
*-----------------------------------------------------------------------
*  FLOATING POINT        - MAY BE IN ANY PARTITION
*-----------------------------------------------------------------------
*PART 1
*INCLUDE EDXFLOAT          *3*   FLOATING POINT ARITHMETIC
*
*-----------------------------------------------------------------------
*  QUEUE I/O             - MAY BE IN ANY PARTITION
*-----------------------------------------------------------------------
*PART 1
*INCLUDE QUEUEIO          *19*   QUEUE PROCESSING SUPPORT
*
*-----------------------------------------------------------------------
*  BISYNC COMMUNICATIONS - MAY BE IN ANY PARTITION
*-----------------------------------------------------------------------
*PART 1
*INCLUDE BSCAM            *13*   BISYNC COMMUNICATION SUPPORT
*INCLUDE BSCX21           *27*   BISYNC COMMUNICATION SUPPORT FOR X.21
*
*-----------------------------------------------------------------------
*  SENSOR INPUT/OUTPUT   - MUST BE GROUPED TOGETHER IN ANY PARTITION
*-----------------------------------------------------------------------
*PART 1
*INCLUDE SBCOM            *15*   BASIC SENSOR I/O SUPPORT
*INCLUDE SBAI              *3*   ANALOG INPUT SUPPORT
*INCLUDE SBAO              *3*   ANALOG OUTPUT SUPPORT
*INCLUDE SBDIDO            *3*   DIGITAL INPUT/OUTPUT SUPPORT
*INCLUDE SBPI              *3*   PROCESS INTERRUPT SUPPORT
*
*-----------------------------------------------------------------------
*  SYSTEM INITIALIZATION - MUST BE IN PARTITION 1
*-----------------------------------------------------------------------
*INCLUDE $PROG1           *22*   USER MODULE INCLUDED IN NUCLEUS GEN
*INCLUDE IO1024           *21*   1024 IPL SUPPORT
*
*-----------------------------------------------------------------------
*  SYSTEM SUPPORT -- INITIALIZATION - MUST BE IN PARTITION 1
*-----------------------------------------------------------------------
 INCLUDE EDXINIT          *24*   SUPERVISOR INITIALIZATION
*
```

**Figure 8 (Part 3 of 5). $LNKCNTL data set contents**

```
*-----------------------------------------------------------------
*  INSERT USER INITIALIZATION MODULES HERE
*-----------------------------------------------------------------
*
*-----------------------------------------------------------------
*  SUPERVISOR CODE BEING MOVED OUT OF
*  PARTITION 1 MUST BE MOVED TO HERE
*-----------------------------------------------------------------
*
*------------------------------------------------------------
LINK $EDXNUCT,EDX002 REPLACE END
*------------------------------------------------------------
*
*------------------------------------------------------------
*  PROGRAMMING NOTES                                         *
*------------------------------------------------------------
*1*  MUST BE INCLUDED FIRST AND IN THIS ORDER
*2*  REQUIRED FOR PROGRAM DEBUGGING ($DEBUG)
*3*  OPTIONAL MODULE;  REQUIRED IF THE DEVICE OR FEATURE IS USED
*4*  REQUIRED IF ANY TERMINALS ARE INSTALLED, INCLUDING 4973,4974,4975,
*    5219, 5224, 5225, 4978, 4979, 4980, GPIB, S/1-S/1, ACCA, TTY,
*    2741, 3101, 4013, ETC.
*5*  MUTUALLY EXCLUSIVE MODULES; ONE, BUT NOT BOTH, IS REQUIRED.
*6*  IOSTERM IS REQUIRED IF IOSTTY, IOS2741 AND/OR IOS4013 ARE INCLUDED.
*    IOSTERM MUST ALSO BE INCLUDED WHERE USING NON-3101B ACCA TERMINALS.
*    SEE NOTES 7, 8, 10, 11.
*7*  IOS3101 IS REQUIRED IF A 3101 TERMINAL IS TO BE USED IN BLOCK MODE
*    (DEVICE=ACCA,MODE=3101B). IOSACCA MUST ALSO BE INCLUDED.
     SEE NOTES 6, 8, 10, 11.
*8*  IOSACCA IS REQUIRED IF DEVICE=ACCA WAS SPECIFIED IN THE SYSGEN.
*    APPROPRIATE TRANSLATION TABLE(S) MUST BE INCLUDED.
     SEE NOTES 6, 7, 10, 11.
*9*  REQUIRED IF USING REMOTE MANAGEMENT UTILITY WITH PASSTHRU FUNCTION
*10* TRASCII AND/OR TREBASC ARE REQUIRED IF AN ACCA OR TTY TYPE ATTACH-
*    MENT CARD IS USED. FEATURE CARDS #1310, #2095/2096 AND #7850
*    REQUIRE TRASCII TRANSLATION TABLES. #1610 AND #2091/2092 REQUIRE
*    TREBASC TRANSLATION TABLES.
*11* TREBCD AND/OR TRCRSP  ARE REQUIRED IF IOS2741 IS INCLUDED. 2741
*    TERMINALS MAY USE EITHER TREBCD OR TRCRSP.
*    DEVICE=PROC NORMALLY USES TREBCD.
*12* ATTACHED TIMERS (FEATURE 7840) AND THE 4952/4954/4956 NATIVE TIMER
*    ARE MUTUALLY EXCLUSIVE.  SELECT THE TIMER SUPPORT REQUIRED FOR
*    YOUR CONFIGURATION OR NONE IF NO TIMER SUPPORT IS REQUIRED.
*13* REQUIRED FOR BINARY SYNCHRONOUS COMMUNICATION USING BSCREAD/
*    BSCWRITE OR REMOTE MANAGEMENT UTILITY SUPPORT.
```

**Figure 8 (Part 4 of 5). $LNKCNTL data set**

## Step 4 - Edit $LNKCNTL to Include Software Support *(continued)*

```
*14* REQUIRED FOR COMMUNICATION TO A S/370 WITH THE EDX HOST
*    COMMUNICATION FACILITY
*15* REQUIRED IF ANY SENSOR I/O SUPPORT IS TO BE USED
*    (AI,AO,DI,DO, OR PI)
*16* REQUIRED IF THE IN STORAGE PROGRAM CHECK/MACHINE CHECK LOG
*    IS TO BE KEPT
*17* REQUIRED IF PROGRAMS ARE TO BE LOADED FROM DISK(ETTE).
*    IF NOT INCLUDED, AN APPLICATION PROGRAM MUST BE LINK EDITED
*    WITH THE SUPERVISOR.
*18* REQUIRED FOR DATA FORMATTING OPERATIONS (GETEDIT, PUTEDIT, FORMAT)
*19* REQUIRED FOR QUEUEING OPERATIONS (FIRSTQ, NEXTQ, LASTQ, DEFINEQ)
*20* ONLY NEEDED IF IAM (5719-AM4) IS EVER TO BE INSTALLED.
*21* OPTIONAL MODULE;  REQUIRED IF THE SYSTEM IS TO BE IPLED
*    FROM A 1024 BYTE/SECTOR DISKETTE. INCLUDE BEFORE EDXINIT.
*22* USER PROGRAM $PROG1, LINKED WITH THE SUPERVISOR, MUST
*    PRECEED EDXINIT.  THE VOLUME NAME SHOULD REFLECT THE VOLUME
*    WHERE THIS OBJECT MODULE RESIDES.
*23* OPTIONAL LINK CONTROL STATEMENT TO DEFINE THE OVERLAY AREA
*    DISKBUFR IS EQUATED TO THE START OF SEGINIT, THE START OF THE
*    OVERLAY AREA (IN THIS CASE, OVLSTART) IS EQUATED TO DISKBUFR+512,
*    AND THE END OF THE OVERLAY AREA IS EQUATED TO THE END OF DISKINIT
*    (OVLEND).  THE USER MAY DEFINE ANY ENTRIES FOR THE START AND THE
*    END OF THE OVERLAY AREA, BUT THE SIZE MUST BE LARGER THAN THE
*    LARGEST OVERLAY INCLUDED OR USER WILL GET A LINK ERROR.
*24* REQUIRED, AND MUST FOLLOW ALL OF THE PREVIOUSLY LISTED MODULES.
*    ALL OTHER INITIALIZATION MODULES MUST FOLLOW EDXINIT.  AFTER
*    INITIALIZATION IS COMPLETE, ALL STORAGE AFTER EDXINIT IS GIVEN
*    BACK TO THE USER AT THE FIRST PAGE BOUNDARY.
*25* INCLUDE ONLY IF USER WISHES TO SYSGEN SUPERVISOR IN A NON-OVERLAY
*    INITIALIZATION STRUCTURE (OR TAILORED INITIALIZATION STRUCTURE).
*    IF THIS OPTION IS CHOSEN THEN IT IS THE USER'S RESPONSIBILITY
*    TO INCLUDE MODULES THAT CANNOT BE INCLUDED BY THE PREPROCESSOR
*    (I.E., RW4963ID, INITMFA, INITADAP, INIT4978, INIT4980).
*26*  INCLUDE ONLY IF USER WISHES TO RE-RAM TERMINALS, IN CASE OF
*     POWER ON/OFF, WITHOUT RE-IPLING THE SYSTEM.
*27*  REQUIRED FOR X.21 SWITCHED NETWORK SUPPORT WITH BISYNC
*     COMMUNICATION SUPPORT.
 *A*  WILL BE INCLUDED AUTOMATICALLY ONLY IF ONE OF THE FOLLOWING IS
 *    INCLUDED : IOSTTY, IOS2741 AND/OR IOS4013
 *    (SEE NOTE 6 TO DETERMINE IF THE USER MUST INCLUDE THIS MODULE
 *     I.E. THE CASE WHERE IOS3101 IS REQUIRED IS NOT AUTOMATIC.)
```

**Figure 8 (Part 5 of 5). $LNKCNTL data set**

## 4(c) Edit $LNKCNTL

Work sheet 3 contains the names of the supervisor object modules you selected to provide the software support for the I/O devices attached to your Series/1. Match the link control data set to the work sheet, inserting asterisks to omit modules or removing asterisks to include the appropriate modules.

**Note:** Instead of deleting undesired statements, it is preferable to insert an asterisk in column one. The asterisk causes the linkage editor $XPSLINK to treat the statement as a comment rather than a control statement. In addition, by not deleting undesired statements, you have a record of the support you decided to leave out, which can be helpful if problems develop with the generated operating system.

The number on the PART statement preceeding a group of modules specifies the partition where the modules are to be located. Some groups of supervisor object modules must remain located in partition 1; others can be located outside of partition 1. If you are generating a single partition supervisor, you do not have to change the PART statements as shown in the $LNKCNTL data set. If you are generating a multipartition supervisor, you should have indicated the number of the partition where you want to locate a specific group of modules on work sheet 3. In editing the $LNKCNTL data to match your requirements for a multipartition supervisor, you must physically move any group of modules being located outside of partition 1 to the location specified on work sheet 3 and in the $LNKCNTL data set.

All groups of object modules defined to be in a specific partition must be adjacent to one another. For example, you can specify partitions 1, 2, 2, 3, 3, 4, 4 or 1, 2, 2, 4, 3, 3, 5, 5. You cannot specify partitions 1, 1, 2, 1, 3, 4, 3. This means that if you have already defined a group of modules to be in a specific partition and wish to place another group of modules in that same partition, you must physically move the second group of modules to follow PART statement defining that partition.

If you are going to include your own initialization routines, enter the module names following the area specified as INSERT USER INITIALIZATION MODULES HERE If the initialization routines are to be treated as overlay segments, be sure each module or group of modules is preceded by an OVERLAY statement. In addition, the initialization modules must be preceded by a PART statement specifying partition 1.

Be sure that the name of the supervisor you are generating is different from the name of the current supervisor.

## Step 4 - Edit $LNKCNTL to Include Software Support *(continued)*

***Example:*** Define a supervisor without default overlay structure, and two groups of object modules to be located outside of partition 1.

```
 OPTION NOVERLAY        *25* NO OVERLAY STRUCTURE
*-------------------------------------------------------------
* SYSTEM SUPPORT -- INITIALIZATION
*-------------------------------------------------------------
 INCLUDE EDXINIT        *24* SUPERVISOR INITIALIZATION
*INCLUDE RW4963ID       *3*  4963 FIXED HEAD REFRESH SUPPORT
 INCLUDE INITMFA        *3*  MFA INITIALIZATION
 INCLUDE INITADAP       *3*  ALPA & SMIO INITIALIZATION
 INCLUDE INIT4978       *3*  4978 TERMINAL INITIALIZATION
 INCLUDE INIT4980       *3*  4980 TERMINAL INITIALIZATION
*-------------------------------------------------------------
* INSERT USER INITIALIZATION MODULES HERE
*-------------------------------------------------------------
 PART 1
 INCLUDE SAMPLE1              SAMPLE1 INITIALIZATION
 INCLUDE SAMPLE2              SAMPLE2 INITIALIZATION
 INCLUDE SAMPLE3              SAMPLE3 INITIALIZATION
*-------------------------------------------------------------
* SUPERVISOR CODE BEING MOVED OUT OF
* PARTITION 1 'MUST' BE MOVED TO HERE
*-------------------------------------------------------------
* SENSOR INPUT/OUTPUT - MUST BE GROUPED TOGETHER IN ANY PARTITION
*-------------------------------------------------------------
 PART 3
 INCLUDE SBCOM         *15*  BASIC SENSOR I/O SUPPORT
 INCLUDE SBAI          *3*   ANALOG INPUT SUPPORT
 INCLUDE SBAO          *3*   ANALOG OUTPUT SUPPORT
 INCLUDE SBIDO         *3*   DIGITAL INPUT/OUTPUT SUPPORT
 INCLUDE SBPI          *3*   PROCESS INTERRUPT SUPPORT
*-------------------------------------------------------------
* BISYNC COMMUNICATION _ MAY BE IN ANY PARTITION
*-------------------------------------------------------------
 PART 4
 INCLUDE BSCAM         *7*   BISYNC COMMUNICATION SUPPORT
*-------------------------------------------------------------
```

After you modify the $LNKCNTL data set to match work sheet 3, you need to save the changes. You may wish to delete the notes at the end of the $LNKCNTL data set. By deleting the notes, you will reduce the time for listing the output generated by $XPSLINK processing.

## Step 4 - Edit $LNKCNTL to Include Software Support *(continued)*

**4(d)** **Enter MENU on the COMMAND INPUT line to end the EDIT mode as shown.**

```
EDIT --- $LNKCNTL,ASMLIB    236 ( 543)-------------------COLUMNS 001 072
COMMAND INPUT ===> MENU                                  SCROLL ===>HALF
***** ***** TOP OF DATA ***********************************************
*
*
* EVENT DRIVEN EXECUTIVE - VERSION 4, MODIFICATION LEVEL 0
*
***************************************************************
*  TO INCLUDE A SUPERVISOR OBJECT MODULE IN YOUR OPERATING    *
*  SYSTEM, LEAVE COLUMN 1 BLANK.  TO EXCLUDE A MODULE,        *
*  PLACE AN '*' IN COLUMN 1.                                  *
***************************************************************
*
***************************************************************
*  SUPERVISOR SUPPORT                                         *
***************************************************************
*
 INCLUDE EDXSYS,XS4002     *1*   SYSTEM TABLES AND WORK AREA
```

Press the enter key. $FSEDIT returns to the primary command menu.

**4(e)** **Select option 4 (WRITE) to save the changes made to the link control data set.** Enter a 4 on the OPTION line and the data set and volume where you want to save the changes; in this case, LINKCNTL on volume EDX002.

```
$FSEDIT PRIMARY OPTION MENU ------------------------STATUS = MODIFIED
                                                     PRESS PF3 TO EXIT
OPTION ===> 4

DATASET NAME =========> LINKCNTL         (CURRENTLY IN WORK FILE)
VOLUME NAME ==========> EDX002

    .
    .

WRITE TO LINKCNTL ON EDX002 (Y/N)? Y
```

## Step 4 - Edit $LNKCNTL to Include Software Support *(continued)*

Press the enter key. $FSEDIT issues the following message:

```
nn LINES WRITTEN TO LINKCNTL,EDX002
```

where nn indicates the number of lines in the data set.

You may want to maintain more than one supervisor. For example, you may need one system for development and one for production. It is recommended that you save the link control data set that is unique for each supervisor in a separate data set. The name assigned to the data set should be named LINKCTLx, where x is any alphanumeric character.

***Example:*** Here is an example of the LINKCNTL data set for the sample system. Only the modules without an asterisk in column one are included in the supervisor.

```
*OPTION NOVERLAY        *25* NO OVERLAY STRUCTURE
*-------------------------------------------------------------------
*  SUPERVISOR SUPPORT     - MUST BE FIRST AND IN PARTITION 1
*-------------------------------------------------------------------
 PART 1
 VOLUME  XS4002                DEFAULT VOLUME FOR INCLUDE MODULES
*OVLAREA OVLSTART OVLEND *23*  USER DEFINED OVERLAY AREA
 INCLUDE EDXSYS          *1*   SYSTEM TABLES AND WORK AREAS
 INCLUDE ASMOBJ,EDX002   *1*   OUTPUT FROM USER SYSTEM GENERATION
 INCLUDE EDXSVCX         *1*   TASK SUPERVISOR
 INCLUDE EDXALU          *1*   EDL INSTRUCTION EMULATOR
 INCLUDE EDXSTART        *1*   INITIALIZATION & ERROR HANDLER
*INCLUDE SWAITM          *3*   WAIT ON MULTIPLE EVENTS
*-------------------------------------------------------------------
*  OPTIONAL FUNCTION SUPPORT - MUST BE IN PARTITION 1
*-------------------------------------------------------------------
 INCLUDE RLOADER         *17*  RELOCATING PROGRAM LOADER
*-------------------------------------------------------------------
*  DISK(ETTE) SUPPORT     - MUST BE GROUPED TOGETHER IN ANY PARTITION
*-------------------------------------------------------------------
 PART 1
 INCLUDE DISKIO          *3*   BASIC DISK(ETTE) SUPPORT
 INCLUDE D49624          *3*   4962/4964 DISK(ETTE) SUPPORT
*-------------------------------------------------------------------
*  SYSTEM INITIALIZATION - MUST BE IN PARTITION 1
*-------------------------------------------------------------------
 INCLUDE EDXINIT         *24*  SUPERVISOR INITIALIZATION
*-------------------------------------------------------------------
*  SUPERVISOR CODE BEING MOVED OUT OF
*  PARTITION 1 "MUST" BE MOVED TO HERE
*-------------------------------------------------------------------
*
*-------------------------------------------------------------------
*  TERMINALS              - MUST BE GROUPED TOGETHER IN ANY PARTITION
*-------------------------------------------------------------------
 PART 8
 INCLUDE EDXTIO           *4*   BASIC TERMINAL SUPPORT
 INCLUDE FULLMSG          *5*   FULL MESSAGE SUPPORT
 INCLUDE IOS4979          *3*   4978/4979 DISPLAY SUPPORT
 INCLUDE IOS4974          *3*   4973/4974/4975 PRINTER SUPPORT
*-----------------------------------------------------------
 LINK $EDXNUC2,EDX002 REPLACE END
*-----------------------------------------------------------
*
```

**Figure 9. LINKCNTL data set for the sample system**

## Step 5 - Edit $JOBUTIL Procedure File

You are now ready to assemble the system definition statements and link edit the resulting object module with the supervisor support object modules specified in LINKCNTL.

The assemble and link edit steps are performed under control of the job stream processing utility $JOBUTIL. You could load the assembler $EDXASM, provide the data set names required, and do the assembly. Then you could do the same for $XPSLINK. But, by using $JOBUTIL, the two steps can be accomplished with a single entry.

The $JOBUTIL operation is controlled by a series of job control statements. For system generation, a data set called $SUPPREP is supplied on volume ASMLIB.

If, when you allocated the four required data sets (EDITWORK, ASMWORK, ASMOBJ, and LINKWORK) in Step 2, you did not change the recommended names and sizes of the data sets, you do not need to edit $SUPPREP. However, we recommend saving the $SUPPREP data set to a data set called SUPPREPS on volume EDX002 for future system generations. To do this, follow the procedure outlined under steps 5(a), 5(d), and 5(e). Skip steps 5(b) and 5(c). Once you copy $SUPPREP to SUPPREPS on EDX002, proceed to Step 6.

If you did change the data set names and sizes of the four required data sets, you need to edit $SUPPREP.

**Note:** For example, if you called the assembler work data set ASMOBJ1 instead of ASMOBJ and increased its size, you would have to change the name and record size in statement 140 and the name in DS statement 220. See Figure 10 on page IS-101 which shows the $SUPPREP data set.

To edit $SUPPREP:

**5(a)** **Read the $SUPPREP data set into the work data set.** Enter a 3 on the OPTION line and the data set and volume name as shown.

```
$FSEDIT PRIMARY OPTION MENU -----------------------STATUS =
                                                   PRESS PF3 TO EXIT
OPTION ===> 3

DATASET NAME =========> $SUPPREP        (CURRENTLY IN WORK FILE)
VOLUME NAME ==========> ASMLIB
```

Press the enter key. $FSEDIT reads the requested data set into the EDITWORK data set and issues the following message:

```
32   LINES READ FROM   $SUPPREP,ASMLIB
```

## Step 5 - Edit $JOBUTIL Procedure File *(continued)*

**5(b)** **Select option 2 (EDIT) to edit $SUPPREP.** Enter a 2 on the OPTION line and the data set name and volume as shown.

```
$FSEDIT PRIMARY OPTION MENU -----------------------STATUS =
                                                   PRESS PF3 TO EXIT
OPTION ===> 2

DATASET NAME =========> $SUPPREP        (CURRENTLY IN WORK FILE)
VOLUME NAME ==========> ASMLIB
```

Press the enter key. $FSEDIT displays the $SUPPREP data set.

```
EDIT --- $SUPPREP,ASMLIB    30 ( 543)------------------COLUMNS 001 072
COMMAND INPUT ===>                                      SCROLL ===>HALF
***** ***** TOP OF DATA ***********************************************
00010 *
00020 *                    EVENT DRIVEN EXECUTIVE
00030 *                VERSION 4, MODIFICATION LEVEL 1
00040 *
00050 LOG       $SYSPRTR
00060 JOB       $SUPPREP
00070 REMARK    ** ENTER -GO- AFTER -XS4002- HAS BEEN VARIED ONLINE **
00080 REMARK    ** EXECUTION PRODUCES $EDXNUCT ON EDX002 **
00090 PAUSE
00100 *         DELETE WORK DATA SETS AND REALLOCATE (OR ALLOCATE)
00110 DE        ASMWORK,EDX002
00120 AL        ASMWORK,EDX002 500 D
00130 DE        ASMOBJ,EDX002
00140 AL        ASMOBJ,EDX002 300 D
00150 DE        LINKWORK,EDX002
00160 AL        LINKWORK,EDX002 600 D
00170 PROGRAM   $EDXASM,ASMLIB
00180 NOMSG
00190 PARM      OVERLAY 4 EN
00200 DS        $EDXDEFS,EDX002
00210 DS        ASMWORK,EDX002
00220 DS        ASMOBJ,EDX002
00230 EXEC
00240 JUMP      ENDJOB,NE,-1
00250 PROGRAM   $XPSLINK,EDX002
00260 NOMSG
00270 PARM      $SYSPRTR YES
00280 DS        LINKWORK,EDX002
00290 DS        LINKCNTL,EDX002
00300 EXEC
00310 LABEL     ENDJOB
00320 EOJ
```

Edit the data set names and sizes where appropriate. After changes are made, you need to save the changes.

## Step 5 - Edit $JOBUTIL Procedure File *(continued)*

**Note:** If you changed the names of the data sets containing the definition statements ($EDXDEFx) and the link control data set (LINKCTLx), be sure to change the appropriate statements in $SUPPREP.

**5(c)** **Enter MENU in the COMMAND INPUT line to end the EDIT mode.**

```
EDIT --- $SUPPREP,ASMLIB    30 ( 543)------------------COLUMNS 001 072
COMMAND INPUT ===> MENU                                  SCROLL ===>HALF
***** ***** TOP OF DATA ************************************************
00010 *
00020 * EVENT DRIVEN EXECUTIVE - VERSION 4, MODIFICATION LEVEL 0
```

Press the enter key. $FSEDIT returns to the primary option menu.

**5(d)** **Select option 4 (WRITE) to save the changes made to $SUPPREP.** Enter a 4 on the OPTION line and the data set name and volume; in this case, SUPPREPS,EDX002.

```
$FSEDIT PRIMARY OPTION MENU ---------------------- STATUS = MODIFIED
                                                    PRESS PF3 TO EXIT
OPTION ===> 4

DATASET NAME =========> SUPPREPS          (CURRENTLY IN WORK FILE)
VOLUME NAME ==========> EDX002

     .
     .
WRITE TO SUPPREPS ON EDX002 (Y/N)? Y
```

Press the enter key. $FSEDIT issues the following message:

```
nn LINES WRITTEN TO SUPPREPS,EDX002
```

where nn indicates the number of lines in the data set.

You may want to keep the $JOBUTIL procedure file used to create different supervisors. To do this, assign a unique name to the data set. The name assigned to the data set should be named SUPPREPx, where x is any alphanumeric character.

## Step 5 - Edit $JOBUTIL Procedure File *(continued)*

### 5(e) **Select option 8 (END) to end the $FSEDIT utility.**

```
$FSEDIT PRIMARY OPTION MENU ---------------------- STATUS = MODIFIED
                                                     PRESS PF3 TO EXIT
OPTION ===> 8

DATASET NAME =========> SUPPREPS       (CURRENTLY IN WORK FILE)
VOLUME NAME ==========> EDX002
```

$FSEDIT responds as follows:

```
$FSEDIT  ENDED
```

## Step 6 - Execute $XPSLINK

To create a tailored supervisor, you need to link edit the supervisor object modules in LINKCNTL, and convert the results to an executable program using $XPSLINK. $XPSLINK is a link editor set up for generating operating systems. There are two ways to do execute $XPSLINK and execute the procedure in SUPPREPS. You can use either the session manager option 2.8 or 2.13 or the $JOBUTIL job stream processor.

To use the session manager, you must have installed the program preparation modules (5719-XX5). For general information on how to use the session manager, see the *Operation Guide*.

The procedure described here uses the $JOBUTIL job stream processor to execute the procedure in SUPPREPS.

## Step 6 - Execute $XPSLINK *(continued)*

**6(a)** **Press the attention key and load the $JOBUTIL utility.** Respond to the $JOBUTIL prompts as shown.

```
> $L $JOBUTIL
DS1 (NAME,VOLUME): SUPPREPS,EDX002
LOADING $JOBUTIL      4P,00:51:57, LP= 9200, PART= 1
REMARK   ** ENTER -GO- AFTER -XS4002- HAS BEEN VARIED ONLINE **
REMARK   ** PRODUCES $EDXNUCT ON EDX002 **

PAUSE-*-ATTN:GO/ENTER/ABORT

PAUSE
```

**6(b)** **Insert diskette XS4002 into your diskette unit.**

Diskette XS4002 contains the supervisor object modules which are accessed only during the system generation process.

**Note:** If you are using a 4966 Diskette Magazine Unit, insert the diskette in slot 1 and vary the diskette online. To do this:

- Press the attention key
- Press the enter key
- Use $VARYON to vary the diskette online.

```
> $VARYON 22,1
XS4002 ONLINE IN SLOT 1
```

**6(c)** **Then press the attention key and enter GO in response to the PAUSE prompt.**

```
> GO
   .
   .
   .
$JOBUTIL ENDED
```

The procedure file has specified $SYSPRTR as the log device. The first thing that happens is that the procedure file statements controlling the assembly operation print out on the $SYSPRTR. $JOBUTIL then loads the compiler, $EDXASM, which assembles your system definition source file, $EDXDEFS.

The resulting object module is stored in data set ASMOBJ on volume EDX002, which you created. The listing produced as a result of the assembly prints out on the $SYSPRTR, preceded by assembler statistics.

Next, $JOBUTIL loads the linkage editor, $XPSLINK. $XPSLINK is a special linkage editor set up to generate operating systems. It loads three programs, in the following order: $XPSPRE, $EDXLINK, and $XPSPOST. Each of these programs performs its function as follows:

***$XPSPRE:*** $XPSPRE scans the link control data set for supervisor object modules to be located outside of partition 1. When it finds such a module, it builds separate link control statements for each supervisor partition specified by the PART statement in the LINKCNTL data set. In addition, $XPSPRE includes a 'root' module in partition 1 that corresponds to the supervisor object module being located outside of partition 1. The 'root' segment provides the connection between the supervisor object module and the system control blocks located in partition 1.

The listing of the LINKCNTL data set produced as a result of processing $XPSPRE prints on the $SYSPRTR or the terminal you specify. A completion code of -1 indicates success.

***$EDXLINK:*** Using the object module from the assembly (ASMOBJ) and the link control statements stored in LINKCNTL, the $EDXLINK program link edits each group of link control statements created by $XPSPRE with the system control blocks generated by the assembly (ASMOBJ object modules). $EDXLINK creates separate output data sets for each group of modules specified with a PART statement. These data sets are called XPSSEG1x through XPSSEG8x where x is the last character of the name of the nucleus specified on the LINK statement.

$EDXLINK prints out each data set and any unresolved references resulting from the link edit on the $SYSPRTR or the terminal you specify. There will be several unresolved weak external references (WXTRN) for supervisor support modules you did not want to include, but no unresolved EXTRN messages should appear. Following the EXTRN messages, it lists whether or not the data set containing the supervisor modules was stored, the size (in records) of the data set, and a completion code.

In addition, it prints out the modules you included, the modules $XPSLINK automatically included, and the names of the root segments for each partition. At the end of this list is a total for the LNTH column. This figure is the size of the supervisor within that partition.

***$XPSPOST:*** After $EDXLINK link edits the data sets that make up the supervisor, $XPSLINK calls $XPSPOST. $XPSPOST merges the entry point addresses for the supervisor object modules together to form a table in partition 1. This table resides in partition 1 and contains the locations of all the supervisor modules in the system. $XPSPOST also relocates the addresses of the supervisor modules outside partition 1 to allow them to be loaded at IPL time.

The formatted load module is placed in $EDXNUCx, a supervisor data set allocated automatically by $XPSLINK. $XPSLINK ends and $JOBUTIL completes.

## Step 6 - Execute $XPSLINK *(continued)*

When $JOBUTIL completes, examine the output printed on $SYSPRTR for errors. Errors are usually caused by incorrect editing of $EDXDEF, $LNKCNTL or $SUPPREP. If errors are found, examine your system definition statements and link edit control statements. Then correct $EDXDEFS, LINKCNTL, or SUPPREPS as necessary using the $FSEDIT utility.

**Notes:**

1. If you receive undefined label messages, you may have forgotten the continuation character in column 72.

2. Unresolved WXTRN messages resulting from the execution of $XPSLINK can occur. A WXTRN message lists modules that may or may not be required in your supervisor. Your supervisor is generated with or without these modules. Examine the message to determine whether the referenced names refer to the modules that you require in your operating system.

3. An unresolved WXTRN of $PROG1 normally occurs unless you link edit an application program with the supervisor, as described under Step 3 in Chapter 4, "Select Your Required Support" on page IS-39.

4. Unresolved EXTRN messages should not occur if a valid operating system has been generated. An EXTRN message lists modules that MUST be included in your supervisor. A complete listing of all supervisor module names and entry points is included in Appendix D, "Supervisor Module Names (CSECTS)" on page IS-267. If you have not included the module listed, edit LINKCNTL to include the missing module.

5. Your supervisor may have exceeded 64K within a specific partition. If it does, the following is printed following link control statements:

```
XPSSEG1x,volume NOT STORED
COMPLETION CODE =  12
```

   The total of the LNTH column following the list of modules included in the supervisor contains the amount by which the 64K was exceeded. You must reduce the size of the supervisor by at least this amount. For information on making your supervisor smaller, see "Reducing the Size of Your Supervisor" on page IS-67.

After you correct the errors, execute $XPSLINK again through the $JOBUTIL procedure or the session manager option 2.8.

You should save the system definition statements ($EDXDEFS), the link control statements (LINKCNTL), and the listings printed as a result of the system generation process. They provide you with a record which can be helpful if problems develop with the generated operating system.

## Step 7 - Using the Generated Operating System

Before you can use the new operating system, it must be designated as the one to be loaded at IPL time. To do this, you must load $INITDSK and initialize $EDXNUCx as the new operating system. In response to the NUCLEUS prompt, enter the name of your supervisor as specified on the LINK statement in the LINKCNTL data set. If you enter a supervisor name that does not exist, $INITDSK issues the following message and ends the II command.

```
INVALID NUCLEUS NAME
```

$INITDSK issues the COMMAND (?): prompt again. Enter the II command again and reenter the name of your supervisor.

In this example, the name of the supervisor is $EDXNUC2 on EDX002.

**7(a)** **Press the attention key and load the $INITDSK utility.** Respond to the $INITDSK prompts as shown.

```
> $L $INITDSK
LOADING $INITDSK     83P, LP= 9200, PART= 1

$INITDSK - DISK INITIALIZATION UTILITY

COMMAND (?): II
NUCLEUS:  $EDXNUC2
VOLUME: EDX002
IPL TEXT WRITTEN

COMMAND (?): EN
$INITDSK ENDED AT 01:05:16
```

Once $EDXNUCx is designated as the new supervisor, you can use it.

**7(b)** **Press the LOAD button on the Series/1 console and IPL the new supervisor.**

If the new operating system fails to operate correctly, you must restore the starter system by IPLing from diskette XS4001. Then use the II command to redirect the IPL text to point to the operating system that you specify (in this case, $EDXNUC on EDX002). Repeat steps 2 through 6 to correct any errors.

If the IPL is successful, the IPL message is displayed. Following is the IPL message for the sample system:

```
*** EVENT DRIVEN EXECUTIVE *** V4.1
***          XPS           ***

IPL=$EDXNUC2,EDX002

                XPS SYSTEM STORAGE MAP
                ----------------------
       USER    USER  COMMON    SUPV  SUPV   USER    USER  TOTAL
PART  START    SIZE   SIZE    START  SIZE  START    SIZE   SIZE
  #   (DEC)   (DEC)  (HEX)    (HEX) (HEX)  (HEX)   (HEX)  (HEX)
  1   22272   14592      0        0  5700   5700    3900   9000
  2    4096   49152   1000     1000     0   1000    C000   D000
  3       0   32768      0        0     0      0    8000   8000
  4    2048   40960   0800     0800     0   0800    A000   A800
  5    2048   63488   0800     0800     0   0800    F800  10000
  8   11264    1024      0        0  2C00   2C00    0400   3000
TOTAL(HEX):                          8300          31500
UNMAPPED STORAGE =    137 (DEC) 2K BLOCKS
```

## Step 7 - Using the Generated Operating System *(continued)*

The IPL message contains 9 columns. An explanation of each column follows.

| | |
|---|---|
| **PART #** | Part # indicates the the number of the partition. |
| **USER START** | The starting address (in decimal) of the first program loaded for execution within each partition. |
| **USER SIZE** | The amount of storage (in decimal) within each partition available for program execution. |
| **COMMON SIZE** | The size (in hexadecimal) of the common area within each partition. |
| **SUPV START** | The starting address (in hexadecimal) of the supervisor within each partition. |
| **SUPV SIZE** | The size (in hexadecimal) of the supervisor within in each partition. |
| **USER START** | The starting address (in hexadecimal) of the first program loaded for execution within each partition. |
| **USER SIZE** | The amount of storage (in hexadecimal) within each partition available for program execution. |
| **TOTAL SIZE** | The total size (in hexadecimal) of each partition. |

You may now execute programs under the tailored operating system. Load and execute utility programs that exercise the various supervisor components (such as disk I/O, sensor I/O, etc.).

If you want your supervisor named by the standard nucleus name ($EDXNUC), follow steps 7(c) and 7(d), thereby always having $EDXNUC as your current supervisor. If you want to maintain multiple supervisors, leave your supervisor named $EDXNUCx where x is a unique alphanumeric character and proceed to Step 8.

**Note:** For information on maintaining more than one supervisor, see "Maintaining Multiple Supervisors" on page IS-113.

**7(c)** **Press the attention key and load the $COPYUT1 utility.** Respond to the $COPYUT1 prompts as shown.

```
> $L $COPYUT1
LOADING $COPYUT1     55P, LP= 9200, PART= 1

$COPYUT1 - DATA SET COPY UTILITY


MEMBERS ON TARGET VOLUME WILL BE DELETED
REALLOCATION AND COPYING OF MEMBERS IS
DEPENDENT ON SUFFICIENT CONTIGUOUS SPACE

THE DEFINED SOURCE VOLUME IS EDX002, OK (Y/N)? Y
THE DEFINED TARGET VOLUME IS EDX002, OK (Y/N)? Y
MEMBER WILL BE COPIED FROM EDX002 TO EDX002 OK (Y/N)? Y

COMMAND (?): CM
ENTER FROM(SOURCE) MEMBER: $EDXNUC2
ENTER TO (TARGET) MEMBER OR * FOR SAME NAME AS SOURCE: $EDXNUC
COPY COMPLETE             257 RECORDS COPIED

COMMAND (?): EN
$COPYUT1 ENDED AT 00:26:07
```

**7(d)** **Press the attention key and load $INITDSK.** Respond to the $INITDSK prompts as shown.

```
> $L $INITDSK
LOADING $INITDSK    83P, LP= 9200, PART= 1

$INITDSK - DISK INITIALIZATION UTILITY

COMMAND (?): II
NUCLEUS:  $EDXNUC
VOLUME: EDX002

COMMAND (?): EN
$INITDSK ENDED AT 01:05:16
```

The II command initializes the new supervisor (in this case, $EDXNUC2 on EDX002), thereby always having $EDXNUC as your current supervisor.

## Step 8 - Verify the System Generation Process (Optional)

To verify that system generation has performed correctly, assemble and execute the sample program CALCSRC on EDX002.

**8(a)** **Press the attention key, load the $EDXASM compiler, and provide the parameters necessary to assemble CALCSRC, as follows:**

```
> $L $EDXASM,ASMLIB CALCSRC ASMWORK ASMOBJ
LOADING $EDXASM      78P, LP= 9100, PART=1

SELECT OPTIONS (?): NOLIST END
ASSEMBLY STARTED

   1 OVERLAY AREA ACTIVE
   EDX ASSEMBLER STATISTICS

   SOURCE INPUT    - CALCSRC,EDX002
   WORK DATA SET   - ASMWORK,EDX002
   OBJECT MODULE   - ASMOBJ,EDX002
   STATEMENTS PROCESSED -      66



   NO STATEMENTS FLAGGED
   EXTERNAL/UNDEFINED SYMBOLS

  SVC              WXTRN
  SUPEXIT          WXTRN
  SETBUSY          WXTRN

COMPLETION CODE =   -1

$EDXASM ENDED
```

If you assemble CALCDEMO successfully (completion code = -1), continue. If you receive a completion code other -1, see the *Messages and Codes* for its meaning, correct the problem, and reassemble CALCDEMO.

## Step 8 - Verify the System Generation Process (Optional) *(continued)*

**8(b)** **Press the attention key, load $EDXLINK and provide the parameters necessary to link edit CALCSRC.** This step produces a listing on the printer designated as $SYSPRTR.

```
> $L $EDXLINK
LINKWORK(NAME,VOLUME): LINKWORK,EDX002
LOADING $EDXLINK     88P, LP= 9100, PART=1
$EDXLINK - EDX LINKAGE EDITOR

PARM(?): *
$EDXLINK INTERACTIVE MODE
DEFAULT VOLUME - EDX002

STMT(?): INCLUDE ASMOBJ

STMT(?): LINK CALCDEMO END

$EDXLINK EXECUTION STARTED
 CALCDEMO,EDX002 STORED
PROGRAM DATA SET SIZE = 4 RECORDS
COMPLETION CODE = -1
$EDXLINK ENDED
```

If you receive a completion code of -1, continue. If you receive a completion code other than -1, see the $EDXLINK completion codes in *Messages and Codes* for an explanation of the code received. Correct the error and relink CALSRC.

**8(c)** **Press the attention key and load the verification program, CALCDEMO.** Follow its operating instructions until you decide to end the program. When you decide to end the program, enter 'STOP'.

```
> $L CALCDEMO
CALCDEMO     3P, LP= 9100, PART=1
PRESS 'ATTENTION' AND ENTER 'CALC' OR 'STOP'

> CALC

A = 30
B = 6

A + B =            36
A - B =            24
A * B =           180
A / B =             5 REMAINDER =           0
PRESS 'ATTENTION' AND ENTER 'CALC' OR 'STOP'
> STOP
CALCDEMO ENDED
```

Successful program execution indicates that your operating system is also executing correctly.

Use the LS command of the $IOTEST utility to list the I/O devices supported by the generated supervisor. With this list, you can verify that the supervisor does indeed support all the devices you intended it to support.

## Maintaining Multiple Supervisors

You may want to maintain more than one supervisor. For example, you may need one system for development and one for production. The II command (initialize IPL text) of the $INITDSK utility allows you to use any supervisor on any disk(ette) volume. The II command initializes the supervisor that you specify.

We recommend that you keep your supervisor programs on the IPL volume EDX002. When your supervisor resides on a volume other than EDX002, it searches that volume for the system utilities. However, the system utilities reside on volume EDX002. Each time you access the system utilities, you will need to indicate the volume they reside on; in this case, EDX002.

The following example points the IPL text to $EDXNUC1 on volume EDX002.

```
COMMAND (?):  II
NUCLEUS:  $EDXNUC1
VOLUME:  EDX002
IPL TEXT WRITTEN
```

The supervisor you are using *MUST* be named $EDXNUCX, where x is any alphanumeric character.

## Generating an Operating System for a Diskless System

For Series/1 systems that do not have a fixed disk or the Program Preparation Facility, generating an operating system requires the following steps:

1. Compile and link edit the supervisor for the target Series/1 on a system that supports program preparation.
2. Compile the application programs for the target Series/1.
3. Use the $INITDSK utility to initialize one or more diskettes with program space for the supervisor program, utilities, additional products and application programs.
4. Transfer the supervisor to $EDXNUC on the IPL volume of the diskette with the $COPYUT1 utility. Use $INITDSK to write IPL text for $EDXNUC on the diskette.

# Generate a Tailored Operating System

## Generating an Operating System for a Diskless System *(continued)*

5. Along with your application programs, copy the following support modules and utilities onto the IPL volume with the $COPYUT1 utility:

| | |
|---|---|
| **Support modules** | $LOADER, $4978CS0, $4978IS0, $4980CS0, $4980R01, $4980IS0, $MFARAM, $ACCARAM, $FPCARAM, $RAMSEC, $SMIOR01 |
| **Utilities** | $DISKUT1, $DISKUT2, $COPYUT1, $DASDI, $INITDSK, $TERMUT1, $TERMUT2, $TERMUT3, $IOTEST |

**Notes:**

a. If you are going to support 1024 byte/sector diskettes copy $IO1024.

b. If you copy $DISKUT2, then copy $LOGUT00.

c. If you copy $DASDI, then copy $IDSKETT.

d. If you copy $IMAGE, then use $COPYUT1 and copy generic (CG) for $IM.

e. If you copy $FSEDIT, then use $COPYUT1 and copy generic (CG) for $FS.

f. For specific application programs, you may need modules. Refer to the appropriate program directories for these requirements.

g. For Pascal applications, the diskette must be initialized as a multivolume type if the Pascal runtime error messages are desired. The PCSMSG data set resides on the volume PASCAL.

h. If you copy $TERMUT1, then use $COPYUT1 and copy generic (CG) for $TERM.

6. Install the diskette(s) on the target machine for execution.

For each unique Series/1 supervisor that you create, save the associated system definition statements ($EDXDEFX), the link control statements (LINKCNTL) with different names, and the listing printed as a result of the system generation process. They provide you with a record which can be helpful if problems develop with the generated operating system.

## Multifunction Attachment Random Access Memory

The random access memory module for the Multifunction Attachment (MFA) Feature #1310 is provided with the Event Driven Executive system (EDX) and with a Program Temporary Fix (PTF), if necessary. The module ($MFARAM) on volume EDX002 is a 45-record data set containing three 15-record random access memory load modules, one for each engineering level of the MFA card. EDX loads the appropriate module when you IPL your system.

# Multifunction Attachment Random Access Memory *(continued)*

If the microprocessor within the MFA is changed because of an engineering change, an updated random access memory module ($$EDXLIB,MFA) is included on the Customer Service Representative's initializer diskette. Use the $COPY utility to copy the 15-record module ($$EDXLIB,MFA) to one of the three 15-record segments of $MFARAM on EDX002 as determined by the engineering level of the MFA card.

To copy the MFA initializer diskette:

1. Insert the initializer diskette (volume MFA) into the diskette unit and close the door.

2. Use the $VARYON command to vary the initializer diskette unit online.

3. IPL your system.

4. Load the $COPY utility and use the CD command to copy the updated module from the initializer diskette to the appropriate 15 records of $MFARAM on EDX002.

The following examples show using $COPY (CD command) to copy the initializer diskette. Respond as shown when copying the diskette.

***Example 1:*** Copy the first 15 records to $MFARAM,EDX002.

```
> $L $COPY

COMMAND (?):  CD $$EDXLIB,MFA
FIRST RECORD:  1
LAST RECORD:  15
TARGET(NAME,VOLUME):  $MFARAM,EDX002
FIRST RECORD:  1
ARE ALL PARAMETERS CORRECT (Y/N)?  Y
COPY COMPLETE
          15 RECORDS COPIED

COMMAND (?):
```

***Example 2:*** Copy the second group of 15 records to $MFARAM,EDX002.

```
> $L $COPY

COMMAND (?):  CD $$EDXLIB,MFA
FIRST RECORD:  1
LAST RECORD:  15
TARGET(NAME,VOLUME):  $MFARAM,EDX002
FIRST RECORD:  16
ARE ALL PARAMETERS CORRECT (Y/N)?  Y
COPY COMPLETE
          15 RECORDS COPIED

COMMAND (?):
```

# Generate a Tailored Operating System

## Multifunction Attachment Random Access Memory *(continued)*

***Example 3:*** Copy the third group of 15 records to $MFARAM,EDX002.

```
> $L $COPY

COMMAND (?): CD $$EDXLIB,MFA
FIRST RECORD: 1
LAST RECORD: 15
TARGET(NAME,VOLUME): $MFARAM,EDX002
FIRST RECORD: 31
ARE ALL PARAMETERS CORRECT (Y/N)? Y
COPY COMPLETE
          15 RECORDS COPIED

COMMAND (?):
```

# Chapter 6. Migrate to Version 4

This chapter describes what you must do to convert from Version 1 or 2 to Version 4. Both programs and data must be converted before Version 4 can become operational.

## Conversion of Programs

Before you can use EDX Version 4, you must recompile or reassemble all EDX Version 1 or 2 programs. The source code must be modified if the Version 4 function is to be utilized or if the program references system control blocks.

In Version 4, the parameter area contained in the program header (defined by the PARM= operand of the PROGRAM statement) is smaller than the Version 2 parameter area. In Version 4 it is 980 bytes, less 66 bytes for each data set name or overlay name specified on the PROGRAM statement.

If an EDL program was used with 4978 or 4979 Display Terminals and will now be used with 3101 Display Terminals, then you should read the Version 4 *Language Reference* if you wish to make coding changes to the program.

## Conversion of Programs *(continued)*

### Conversion Requirements

The program conversion requirements are as follows:

- FORTRAN, COBOL, and PL/I applications:

  Compile the applications using the current compiler level for EDX Version 4; link-edit against the application. After the data conversion is completed, the application is ready for execution. Data sets in the new format can be accessed in either sequential or direct mode.

- EDL and assembler language applications:

  Source code changes are required if the application:

  - Uses direct access or uses NOTE or POINT in sequential access and will access data records whose relative record number is greater than 32767.
  - References fields in the DSCB, other than $DSCBNAM, $DSCBVOL, and the return code word (the label on the DSCB). Most of the fields in the DSCB have new labels and certain fields have become two words long.
  - Uses $DISKUT3. Word 3 of the request block is a doubleword in Version 4. If the rename function is being requested, the address of the new name is right adjusted in this 2-word field.
  - Accesses or modifies supervisor control blocks.

  If the application does not do any of the above, only recompilation or reassembly is required.

The new diskette sector size and the disk resident table of contents do not affect existing applications.

## Conversion of Data

The directory format on disk and diskette is different in Version 4 than it was in Versions 1 and 2. This difference in directory format requires that data sets on disk and diskette written by Version 1 or 2 be converted to Version 4 format before they may be accessed by data management facilities. Three conversion aids ($MIGAID, $MIGRATE, and $MIGCOPY) and a diskette formatting program ($SSINIT) perform the conversion.

$MIGAID, executing on a Version 1 or 2 system, captures the contents of a disk volume on a series of diskettes called a ***save set***. A save set produced by $MIGAID may be used as input to either $MIGRATE (to convert the saved data sets to Version 4 format) or to $MIGAID (to restore the data sets to their original Version 1 or 2 format).

**Note:** To ensure data integrity when migrating from EDX Version 1 or 2 to EDX Version 4, an updated copy of $MIGAID must be applied to the EDX system. The updated copy of $MIGAID can be obtained through your local IBM Systems Engineer. In Version 1, it runs on V1.3 PTF Level A (Version 1 Modification level 3) or later. In Version 2, it runs on V2.1 PTF Level 7. If you are currently running on Version 3 or are not converting to Version 4 from a previous version, you will not need this program.

A diskette initialization utility, $SSINIT, also included on the PTF diskette, initializes and verifies the diskettes that $MIGAID uses.

$MIGRATE, executing on a Version 4 system, reads the diskettes of the ***save set*** and produces, on disk, the Version 4 equivalents of the original data-type data sets captured by $MIGAID when it created the save set. Its input is a $MIGAID save set.

$MIGRATE will not convert program-type data sets since, except in special cases, Version 1 or 2 programs will not execute on Version 4 unless they are recompiled.

$MIGCOPY, executing on a Version 4 system, converts data sets on Version 1 or 2 diskettes to Version 4 data sets on either disk or diskette. $MIGCOPY uses many of the commands that $COPYUT1 uses and functions in much the same way. $MIGCOPY will not process program-type data sets. $MIGCOPY has an 'LA' command to list the contents of Version 1 or 2 format diskettes.

To convert to the EDX Version 4 data management environment:

1. Create an IPLable diskette containing the Version 1 or 2 $EDXNUC and starter utilities.

2. Create a save set from the Version 1 or 2 disk (4962 or 4963) environment with $MIGAID.

3. After installing EDX Version 4, recover the relevant data sets from the save set with $MIGRATE.

4. Convert Version 1 or 2 format diskettes as the need arises using $MIGCOPY.

You may use $TAPEUT1 to accomplish the migration if you have a 4969 tape unit. This procedure is described in "Disk Conversion Procedure Using Tape" on page IS-124.

The $MIGAID save set and the IPLable diskettes are also the means for returning to the original environment, should that need arise.

### Disk Conversion Procedure Using Diskettes Produced by $MIGAID

Use this procedure only if:

1. You have installed a replacement $MIGAID module from a diskette dated October, 1983 or later. This diskette can be obtained from your IBM Systems Engineer.

2. The system you are migrating from is at EDX Version 1 Modification Level 3, PTF P0A or EDX Version 2 Modification Level 1, PTF P07.

If these conditions cannot be satisfied, an alternate procedure using $COPYUT1, $COPY, and $MIGCOPY is described later in this chapter.

The procedure to follow, to ensure that you can return to Version 1 or 2 as well as to proceed to Version 4, is:

1. Make an IPLable Version 1 or 2 diskette with the minimum starter utilities. If you have two diskette drives, you may use $COPYUT1 to copy the distributed starter system diskette (UT3001 or UT4001). If not, you will need to construct a diskette containing the minimum starter utilities.

   In either case, proceed as follows:

   a. Use $VARYON to vary the diskette online.

   b. Use $INITDSK to initialize the diskette you will be using.

      1) Use the ID command to write the volume label and the owner id with names of your choice.
      2) Allocate a directory of 60 records.
      3) Allocate a 64K $EDXNUC.
      4) Write IPL text.

   c. Use $DISKUT1 (LA command) to list all supervisor programs. You may maintain multiple supervisor programs and need to decide which versions you want to save.

   d. Use $COPYUT1 to copy your $EDXNUCx on disk to diskette.

   If you have two diskette drives, use the $COPYUT1 CALL command to copy all the data sets on the starter system diskette to the diskette you are constructing.

   If you have only one diskette unit, use the $COPYUT1 CM command to individually copy the following from the IPL volume on disk to the diskette:

## Conversion of Data *(continued)*

```
$4978ISO     $IOTEST
$4978CSO     $INITDSK
$4978CS1     $LOADER
$COPYUT1     $LOGUTOO
$DASDI       $I4962
$DISKUT1     $I4963
$DISKUT2     $TERMUT1
$IDSKETT
```

2. Copy $MIGAID to this diskette.

3. To ensure that you can reconstruct your system, IPL from this diskette.

4. **Save this diskette**! This is your only vehicle for rebuilding your current disks.

5. IPL the disk and allocate the $MIGAID work file (see example, below). Do *not* allocate your work file in the volume you are going to save.

6. Use $SSINIT to initialize the diskettes for use by $MIGAID. The number of diskettes required to save the contents of a volume depends upon the amount of data allocated on that volume.

7. Use $MIGAID to save the contents of your volumes on diskettes.

8. Install the Event Driven Executive using the procedures outlined in the Version 4.1 Program Directories.

9. Run $MIGRATE to copy the diskettes to your Version 4 disks.

Examples of this procedure are given below.

To return to the Version 1 or 2 environment, proceed as follows:

1. IPL the diskette you built in steps 1, 2, and 3, above.
2. Execute $INITDSK to initialize your volumes on disk.
3. Allocate the $MIGAID work file on disk.
4. Load $MIGAID and execute the restore (RE) function.

You may remove the IPL diskette at this time; insert the saved diskettes as prompted by $MIGAID.

### Disk Conversion Procedure Using Diskettes Produced by $COPYUT1 or $COPY

The procedure to follow, to ensure that you can return to Version 1 or 2 as well as to proceed to Version 4, is:

1. Make an IPLable Version 1 or 2 diskette with the minimum starter utilities. If you have two diskette drives, you may use $COPYUT1 to copy the distributed starter system diskette

(UT3001 or UT4001). If not, you will need to construct a diskette containing the minimum starter utilities.

In either case, proceed as follows:

a. Use $VARYON to vary the diskette online.

b. Use $INITDSK to initialize the diskette you will be using.

   1) Use the ID command to write the volume label and the owner id with names of your choice.
   2) Allocate a directory of 60 records.
   3) Allocate a 64K $EDXNUC.
   4) Write IPL text.

c. Use $DISKUT1 (LA command) to list all supervisor programs. You may maintain multiple supervisor programs and need to decide which versions you want to save.

d. Use $COPYUT1 to copy your $EDXNUCx on disk to diskette.

If you have two diskette drives, use the $COPYUT1 CALL command to copy all the data sets on the starter system diskette to the diskette you are constructing.

If you have only one diskette unit, use the $COPYUT1 CM command to individually copy the following from the IPL volume on disk to the diskette:

```
$4978ISO     $IOTEST
$4978CSO     $INITDSK
$4978CS1     $LOADER
$COPYUT1     $LOGUT00
$DASDI       $I4962
$DISKUT1     $I4963
$DISKUT2     $TERMUT1
$IDSKETT     $COPY
```

2. To ensure that you can reconstruct your system, IPL from this diskette.

3. **Save this diskette!** This is your only vehicle for rebuilding your current disks.

4. IPL the disk.

5. Use $DISKUT1 (LA command) to list the names and sizes (in 256 byte records) of all the data sets on each volume on your disk. You may want to refer to this list so obtain a hard copy of it.

6. Use the $INITDSK and DASDI utilities to prepare a supply of diskettes to hold the data included for conversion. Use a systematic sequence of volume names to assist you in keeping the diskettes in order.

7. Use $COPYUT1 to copy each data set from disk to diskette (in Version 1 or 2 format). If any data sets are too large to fit on a diskette, keep a record of its name, and continue the copy process.

8. To copy a data set that is too large to be copied in the previous step, break the data set into portions and copy each portion to a diskette using the $COPY utility. To do this:

   - Use $INITDSK to initialize each diskette with a directory for one data set.

   - Use $DISKUT1 to allocate the largest possible data set on each diskette prior to copying the data set. If you are using a Diskette 1, the largest data set you can allocate is 946 records; for a Diskette 2, the largest data set is 1921 records.

   - Keep track of the number of records you copy to each diskette. In addition, keep track of the order and number of diskettes you used to copy to each data set. You will need this information when the data set is copied and reassembled into one data set on the target system.

9. Install the Event Driven Executive using the procedures outlined in the EDX Version 4.1 Program Directory.

10. Run $MIGCOPY to copy your Version 1 or 2 diskettes to your Version 4 disk.

11. Consider copying the fragmented data sets that were created by $COPY first. To do this:

    a. Use $MIGCOPY to copy all diskette portions of a data set to disk.

    b. Allocate a disk data set of the original name and size.

    c. Use $COPY to reassemble the data set by record numbers.

    d. Delete the data set portions from disk, leaving the assembled data set.

    e. Repeat steps 1 through 4 for each fragmented data set.

12. To return to the Version 1 or 2 environment:

    a. IPL the diskette built in steps 1 and 2 above.

    b. Initialize your volumes on disk using $INITDSK.

    c. Copy your Version 1 or 2 diskettes back to your Version 1 or 2 disk using $COPYUT1. (This procedure is identical to step 10, above, except that $COPYUT1 is used to copy data set instead of $MIGCOPY).

## Conversion of Data *(continued)*

### Disk Conversion Procedure Using Tape

To use tape as your conversion medium, proceed as follows:

1. Save the Version 2 disks for backup:

   a. Create a diskette that you can IPL by using the initialize device command (ID) of the $INITDSK utility. Then use the copy member command (CM) of $COPYUT1 to copy $LOADER and the copy generic command (CG) to copy the $TAPExx members. $INITDSK and $COPYUT1 are described in the *Operator Commands and Utilities Reference.*

   b. Use the save tape (ST) function of $TAPEUT1 to save the contents of each disk device.

   If you need to restore your Version 2 system, IPL the diskette created in Step 1.a, then use the tapes created in Step 1.b to re-create the Version 2 disks. The $TAPEUT1 restore tape (RT) command is used to restore from tape to disk.

2. Save selected data sets for use with Version 4:

   a. Use the copy data set (CD) function of $TAPEUT1 to copy the data sets to tapes that you wish to use (or have available for use) in your Version 4 system.

   b. After you have installed Version 4, use the Version 4 $TAPEUT1 copy data set (CD) command to copy the data sets from tape to disk, using the tapes created in Step 2.a.

Of course, you must use $MIGCOPY to convert diskettes.

### Diskette Conversion Procedure

To convert diskettes:

1. After you install Version 4, use $INITDSK to allocate and initialize a 2000-record disk work volume.

2. Use $MIGCOPY to copy the diskette to be converted to the work volume.

3. Save the diskette (see Note on the following page).

4. Initialize a different diskette, using $INITDSK.

5. Use the copy all (CALL) function of $COPYUT1 to copy the contents of the work volume to the diskette created in Step 4.

6. Use $INITDSK to delete the work volume.

## Conversion of Data *(continued)*

If your system has two diskette devices, you may copy from diskette to diskette by following this procedure:

1. Use $INITDSK to initialize a diskette.

2. Use $MIGCOPY to copy from your diskette to the new diskette.

**Note:** You should not destroy the Version 1 or 2 diskettes or the diskettes built by $MIGAID until you are satisfied that you have:

- Finished migrating all data.

- Completed conversion from Version 1 or 2 to Version 4.

Once these diskettes are reused, you have lost your ability to recover data or to return to the Version 1 or 2 operating environment.

## Conversion Utilities

Three conversion aids ($MIGAID, $MIGRATE, and $MIGCOPY) and a diskette formatting program ($SSINIT) perform the conversion. A description of each follows.

### $MIGAID and $SSINIT

$MIGAID captures the contents of each Version 1 or 2 volume you elect to migrate by writing them to diskettes. $SSINIT initializes these diskettes. With these diskettes, you can either restore your current environment or place selected contents of the diskettes on your Version 4 disks.

**Note:** Use $MIGAID and $SSINIT on your EDX Version 1 or 2 system only if:

1. You have installed a replacement $MIGAID module from a diskette dated October, 1983 or later. This diskette can be obtained from your IBM System Engineer.

2. The system you are migrating from is at EDX Version 1 Modification Level 3, PTF P0A or EDX Modification Level 1, PTF P07.

The $MIGAID save function (SA) requires a work data set that must be at least one record larger than the directory of the volume to be processed. The restore (RE) function also requires a work data set of the same size. To determine the size of the work data set, proceed as follows:

1. Load $DISKUT1.
2. Change volume (CV) to the volume to which you are migrating.
3. Issue an LS command (the directory size is displayed on your terminal).
4. Reply N to the list prompt.
5. End the utility.

## Conversion Utilities *(continued)*

For example, to obtain the directory size of EDX003:

```
> $L $DISKUT1
$DISKUT1      30P,13:05:58,    LP=0000

USING VOLUME EDX002

COMMAND (?): CV EDX003

COMMAND (?): LS

USING VOLUME EDX003

LIBRARY
  AT RECORD       1
  SIZE        32640 RECORDS
  UNUSED      17736 RECORDS

DIRECTORY
  SIZE         60 RECORDS
  UNUSED    11520 BYTES

NO. MEMBERS -    118

NO. FREE SPACE ENTRIES -    8

LIST FREE SPACE CHAIN?  N
```

You have found that your work data set must be 61 records (directory size 60, plus one).

Proceed now to allocate and clear the data set, using $DISKUT1,AL and $DISKUT2,CD. *Do not* allocate this work data set on the volume you are going to process. For example, allocate MIGWORK on EDX002:

```
USING VOLUME EDX002

COMMAND (?): AL MIGWORK 61 Y
MIGWORK CREATED

COMMAND (?): EN

$DISKUT1 ENDED AT 13:15:57
```

To clear the data set:

```
>$L $DISKUT2
$DISKUT2      43P,13:19:11,     LP= 0000

USING VOLUME EDX002

COMMAND (?): CD MIGWORK
CLEAR ENTIRE DATASET? Y

ARE ALL PARAMETERS CORRECT? Y
CLEAR COMPLETED

COMMAND (?): EN

$DISKUT2 ENDED AT 13:19:38
```

You are now ready to load $MIGAID; it will prompt for your work file name and volume. For example:

```
>$L $MIGAID
WORKFILE(NAME,VOLUME): MIGWORK,EDX002
$MIGAID     44P,14:05:07,  LP= 0000
COMMAND (?):
```

*Do not delete or clear* this work file until you have completely processed an entire volume. $MIGAID records in the work file the data sets that have been processed and other internal information, allowing you to stop the process and resume without having to restart from the beginning.

You are now ready to start the save (SA) process. For obvious reasons (data integrity, completeness, and accuracy) $MIGAID must be the only active program in your system.

## Conversion Utilities *(continued)*

### Displaying $MIGAID Commands

To display the $MIGAID commands at your terminal, enter a question mark (?) in response to the prompting message COMMAND (?):.

```
COMMAND (?): ?
$MIGAID -- MIGRATION AID UTILITY

$MIGAID ACCEPTS THE FOLLOWING COMMANDS:

?  -- HELP. PRINTS THE FOLLOWING LIST OF COMMANDS
      AND EXPLANATIONS.
EN -- END. COMMAND TO END $MIGAID.
PR -- PRINTER. NAME THE LOGICAL PRINTER TO WHICH
      LOGS SHOULD GO. "PR *" MEANS THE CURRENT
      TERMINAL. DEFAULT: "PR $SYSPRTR"
RE -- RESTORE. RESTORE DATA SAVED WITH THE
      "SA" COMMAND TO A VERSION 1 or 2 SYSTEM.
SA -- SAVE. SAVE DATA FROM A VERSION 1 or 2 DISK
      VOLUME ON DISKETTE(S) FOR LATER TRANSFER
      OR RESTORE

IN ADDITION $MIGAID HAS THE FOLLOWING
'ATTENTION' COMMANDS:

STOP -- STOP A SAVE OR RESTORE THAT IS IN PROCESS
GO   -- CAUSE $MIGAID TO START AGAIN WHEN IT HAS
        PAUSED FOR MORE DISKETTES.
```

You can use these commands to perform the following functions:

**EN** End $MIGAID. Use EN to terminate $MIGAID. EN can be entered any time the COMMAND (?): prompt appears.

**PR** Assign printer. Use PR to select the device used for printing the log. The default is $SYSPRTR; entering PR * causes the log to print on your terminal. It is recommended that a hard-copy device be used because the log records the name of each data set copied, the number of records copied, and shows the contents of each diskette.

**RE** Use RE to restore from diskette to disk. Restore (RE) copies data sets previously saved with the $MIGAID SA command from diskette and places them on a Version 1 or 2 disk.

**SA** Use SA to save from disk to diskette. Save (SA) copies data sets from disk to diskette. SA also calculates and tells you the number of diskettes required to contain the specified volume. Since it saves data sets, it prints the log on the device you specified (or defaulted) in the PR command.

$MIGAID also has two attention commands. You can enter these commands after you have pressed the ATTN key, or its equivalent, and have received the > prompt. The attention commands are:

**STOP** Directs $MIGAID to stop processing when it reaches the end of the data set it is copying, whether the operation is an SA or an RE. When $MIGAID stops, the log is printed to show where you terminated the operation.

**GO** Directs $MIGAID to resume processing. Use GO when you have mounted the required diskettes.

***Example 1 - Preparing to Create a Save Set:*** This example shows how to determine the number of diskettes required to contain LIB002, and how to initialize these diskettes.

```
COMMAND (?): SA
NAME OF VOLUME TO MIGRATE: LIB002
SAVE SET NAME (1-4 CHARS): X

MIGASDV - SAVE THE DATA FROM VOLUME LIB002
          ON SAVE SET X
MIGANDR - THIS SAVE REQUIRES 5 TWO SIDED DISKETTES.
          THE DISKETTES SHOULD BE FORMATTED FOR
          EDX BY $SSINIT AND HAVE A DIRECTORY
          120 RECORDS IN SIZE.  THEY SHOULD NOT
          HAVE SPACE FOR A NUCLEUS RESERVED.
          THE VOLUME LABELS SHOULD BE X01
          THROUGH X05.  THE SAVE WILL START WITH
          DISKETTE X01
MIGALDI - LOG WILL GO TO $SYSPRTR

 ***** DATA ON THE DISKETTES WILL BE OVERWRITTEN *****
MIGAACQ - CONTINUE (Y/N): N
COMMAND (?): EN
```

Five diskettes are required to contain LIB002. Load $SSINIT to initialize the five diskettes.

$SSINIT prompts you for:

- The number of diskettes in the save set
- The volume label to be used
- The owner identification characters
- The device address.

When you have completed these replies, $SSINIT prompts you to insert a diskette. After inserting the diskette, press the enter key. Four information messages will appear, followed by the prompt for another diskette. This process is repeated until the save set initialization and verification is completed.

## Conversion Utilities *(continued)*

As you process a diskette, $SSINIT appends a sequence number to the volume prefix you entered to create a volume label for the diskette. ***Remember to write this volume label on the external label of the diskette.*** These volume labels are your identification for these diskettes.

*Do not* use the EDX $VARYON/$VARYOFF commands when changing diskettes.

If you are using a 4966, each diskette must be in address slot one, as specified in the prompt message.

In this example, X01 through X05 are the volume labels of the diskette. The example shows how to initialize these diskettes:

```
> $L $SSINIT
$SSINIT     23P,07:44:31,   LP= 2900

ENTER NO. OF DISKETTES IN SAVE SET: 5

ENTER VOLUME LABEL FOR SAVE SET (1-4 CHARS): X
ENTER OWNER ID (1-14 CHARACTERS): SAVE DISKETTES

ENTER DEVICE ADDRESS IN HEX: 2
X01   INITIALIZATION STARTED

X01   DIRECTORY INITIALIZED

X01   DISKETTE VERIFICATION STARTED

X01     1924 RECORDS CHECKED
INSERT NEW DISKETTE AT IODA = 0002
THEN PRESS ENTER TO CONTINUE
   .
   .
   .
INSERT NEW DISKETTE AT IODA = 0002
THEN PRESS ENTER TO CONTINUE
X05   INITIALIZATION STARTED

X05   DIRECTORY INITIALIZED

X05   DISKETTE VERIFICATION STARTED

X05   1924 RECORDS CHECKED

DO YOU HAVE ANOTHER SAVE SET TO INITIALIZE? N
```

The process of initializing and verifying these five diskettes should take approximately five minutes.

When the save set initialization is complete, you are ready to start the save process.

If an I/O error occurs while processing a diskette, the following messages appear on your terminal:

```
ERROR      5 AT RECORD    222
X01        195 RECORDS CHECKED

CONTINUE WITH INITIALIZATION OF THIS SAVE SET?
```

In this example, the READ/WRITE return code is 5, and the failure occurred at record 222 on the X01 diskette.

$SSINIT allows you to either continue or end the save set initialization. To end, reply with an N; to continue reply with a Y. The following example shows the continue option.

```
INSERT NEW DISKETTE AT IODA   =  0002
THEN PRESS ENTER TO CONTINUE

X01  INITIALIZATION STARTED

X01  DIRECTORY INITIALIZED

X01  DISKETTE VERIFICATION STARTED

X01  1924 RECORDS CHECKED
```

$SSINIT resumes with the failing volume label.

***Example 2 - Create a Save Set:*** This example shows the sequence of events necessary to actually carry out the save prepared for in example 1. It then examines the log produced during the operation. The example begins with the save (SA) command of $MIGAID.

```
COMMAND (?): SA
VOLUME TO MIGRATE ("*" FOR CURRENT DEFINITION): *
This prompt not the same as the one in Example 1

MIGASDV - SAVE THE DATA FROM VOLUME LIB002 ON SAVE
          SET X
MIGANDR - THIS SAVE REQUIRES 5 TWO SIDED DISKETTES.
          THE DISKETTES SHOULD BE FORMATTED FOR EDX
          BY $SSINIT AND HAVE A DIRECTORY 120 RECORDS
          IN SIZE. THEY SHOULD NOT HAVE SPACE FOR A
          NUCLEUS RESERVED. THE VOLUME LABELS SHOULD
          BE X01 THROUGH X05.  THE SAVE WILL START
          WITH DISKETTE X01
MIGALDI - LOG WILL GO TO $SYSPRTR

 ***** DATA ON THE DISKETTES WILL BE OVERWRITTEN *****
MIGAACQ - CONTINUE? (Y/N): Y
MIGAOSC - OPERATION SUCCESSFULLY COMPLETED.
COMMAND (?):
```

## Conversion Utilities *(continued)*

In this example, the save set name used is X. Since $MIGAID has determined that five diskettes are required, diskettes labeled X01 through X05 will be required. This save requires approximately 12 minutes.

The log below shows the name and size of each data set. In this example, the diskettes were mounted in the A magazine of a 4966, so there is no manual intervention required to change diskettes.

The contents of the log ($SYSPRTR) are:

```
MIGASHM - LOG OF SAVE FROM VOLUME LIB002
MIGACDS - DATASETS COPIED FROM LIB002 TO X01
  DLETEMP1(PART)
MIGACDS - DATASETS COPIED FROM LIB002 TO X02
  DLETEMP1  1805    DLETEMP    1803
MIGACDS - DATASETS COPIED FROM LIB002 TO X03
  DLETEMP2(PART)
MIGACDS - DATASETS COPIED FROM LIB002 TO X04
  DLETEMP2  1806    DLETEMP3    1802
MIGACDS - DATASETS COPIED FROM LIB002 TO X05
  DMINTRFS 273  DMINTRFO 60 $MIGAID 64 $MIGAIDO 100
  $MIGAIDL 150  $MIGAIDC  2 TSTUT3  42 $MIGAIDS 679

MIGADSC - OPERATION SUCCESSFULLY COMPLETED.
```

The above log means:

- The first part of DLETEMP1 is on diskette X01.
- The remainder of DLETEMP1 and DLETEMP are on diskette X02.
- The first part of DLETEMP2 is on diskette X03.
- The remainder of DLETEMP2 and DLETEMP3 are on diskette X04.
- Diskette X05 contains eight data sets.

The $MIGAID restore (RE) command will rebuild the split data sets DLETEMP1 and DLETEMP2 in their proper form, as will $MIGRATE.

***Example 3 - Restoring a Volume:*** The following example of the restore (RE) function shows a restore of EDX003 from save set MJG. The diskettes were read from a 4964 diskette unit. This example takes approximately five minutes, including the time to replace ($VARYON) the diskette.

```
> $L $MIGAID
WORKFILE(NAME,VOLUME): MIGWORK
$MIGAID     53P,00:44:39, LP= 0000

COMMAND (?): RE
VOLUME TO MIGRATE ("*" FOR CURRENT DEFINITION): EDX003
SAVE SET NAME (1-4 CHARS): MJG
MIGARDV - RESTORE THE DATA TO VOLUME EDX003 FROM
          SAVESET MJG THE RESTORE WILL START WITH
          DISKETTE 1
MIGALDI - LOG WILL GO TO $SYSPRTR
MIGAACQ - CONTINUE? (Y/N): Y
MIGAPMV - MOUNT VOLUME MJG01 AND VARY IT ONLINE
          TYPE 'ATTN GO' WHEN READY
          OR 'ATTN STOP' TO ABORT MOUNT
> $VARYON 2
MJG01 ONLINE
> GO
MIGAPMV - MOUNT VOLUME MJG02 AND VARY IT ONLINE
          TYPE 'ATTN GO' WHEN READY
          OR 'ATTN STOP' TO ABORT MOUNT
> $VARYON 2
MJG02 ONLINE
> GO
MIGAOSC - OPERATION SUCCESSFULLY COMPLETED
COMMAND (?):
```

The contents of the log ($SYSPRTR) are:

```
MIGARHM - LOG OF RESTORE TO VOLUME EDX003

MIGACDS - DATA SETS COPIED FROM MJG01 TO EDX003
$SM2GRIZ 400 $SM3GRIZ 250 $SMPJEFF  30 $SM1GRIZ 400
$SMPGRIZ  30 $SMWGRIZ  30 $SMEGRIZ 400 MJGPO1     5
MJGSRC1   50 MJGEDIT   50 MJGWRK   100 MJGAOBJ  500
MJGP02     4 SCREEN03   3

MIGACDS - DATA SETS COPIED FROM MJG02 TO EDX003
SCREEN02   3 SCREEN01   3 DEMO1     39 DEJOBS   100
DEMAPS   100
```

Save set MJG was two diskettes, MJG01 and MJG02. Diskette MJG01 contained 14 data sets. Diskette MJG02 contained five data sets.

## Conversion Utilities *(continued)*

### Error Handling during $MIGAID Processing

Errors may occur during $MIGAID processing. The utility handles the following error conditions:

- A disk or diskette unit fails.
- The system fails and you must IPL again.
- You decide to have $MIGAID suspend the operation in progress.
- You specify an invalid volume for the save (SA) or restore (RE).
- You mount the wrong diskette in response to a volume mount request, or you do not have the requested volume.

***Example 1 - Disk or Diskette Unit Failure:*** If the output device fails while writing data, the following appears on your terminal:

```
MIGAWDF - WRITE DATA FAILED FOR FILENAME DISKIO RC=x
          ERROR OCCURRED ACCESSING BLOCKS mmmmm - nnnnn
MIGACFA - COPY OF THIS FILE ABANDONED
```

where x is the READ/WRITE return code and mmmmm - nnnnn is the record range in the data set in which the failure occurred.

Following a disk read failure, $MIGAID attempts to continue saving or restoring the next data set. If $MIGAID encounters a read error on diskette, it attempts error recovery. Error recovery is signaled by the message:

```
MIGAERS - ERROR RECOVERY PROCEDURE STARTED
```

If the error recovery is successful $MIGAID displays the message:

```
MIGASER - ERROR RECOVERY SUCCESSFUL
```

and processing continues normally.

If error recovery is not successful, $MIGAID displays:

```
MIGABNR - BLOCK nnnnnn OF dsname1 ON volnm1 NOT RESTORED
          BECAUSE OF READ ERROR AT BLOCK mmmmmm
          OF dsname2 ON volnm2 DISKIO RC= iiiiii
MIGAUER - ERROR RECOVERY UNSUCCESSFUL
```

This error indicates that block nnnnnn on the disk data set (dsname1,volnm1) was not correctly restored because block mmmmmm on the diskette data set (dsname2,volnm2) could not be read. $MIGAID has placed whatever data the diskette unit was able to read from the input block into the output block. Since the read did not complete without error, block mmmmmm of the disk data set may contain incorrect information. You should check carefully any block that $MIGAID was unable to recover. Whenever $MIGAID is not able to recover from a diskette read error, it prompts:

```
MIGAATF - ABANDON THIS FILE? (Y/N):
```

If you reply 'Y' to this prompt, $MIGAID ceases to process the data set that had the error and starts processing the next one. A reply of 'N' causes $MIGAID to continue processing the file. Any unsuccessful error recoveries are noted in the log. If an I/O error occurs during access to a disk or diskette directory, the following message appears on your terminal:

```
MIGAIED - I/O ERROR READING DIRECTORY ON VOLUME
          DISKIO RC=x
MIGACOA - OPERATION ABANDONED
```

where **x** is the READ/WRITE return code.

This message indicates that $MIGAID has encountered an error so serious that it cannot continue until the problem is corrected. $MIGAID then returns to command input mode. The work file contains the correct status to continue the operation after the problem has been corrected. $MIGAID may be shut down completely (with the EN command) while the corrections are made without loss of restart information.

After correcting a problem, you can resume $MIGAID by entering an * in response to the following prompt:

```
VOLUME TO MIGRATE ("*" FOR CURRENT DEFINITION):
```

or by entering **SA** * to the COMMAND (?): prompt.

Either of these responses directs $MIGAID to use the status in the work file to resume the save process. A similar procedure, using the RE command, can be used to resume an aborted restore process. Note that when the message:

```
MIGACFA - COPY OF THIS FILE ABANDONED
```

is issued, the data set has not been properly saved (or restored) and its contents are undefined. The log will then contain a note that there was an error in the processing of the data set.

***Example 2 - System Failure:*** To recover from a system failure, IPL again, load $MIGAID, and respond:

```
COMMAND (?): SA *
```

if you are resuming a save or

```
COMMAND (?): RE *
```

if you are resuming a restore. $MIGAID resumes processing, using its work file status.

In a system failure, the report on the log device may not show as many as three data sets. Use the $DISKUT1 (LA) command to get a complete list of the diskette data sets.

An example of restart:

```
> $L $MIGAID,LIB002
WORKFILE(NAME,VOLUME): $SM3DLE,EDX003
$MIGAID      53P,16:13:42,  LP= 0000
COMMAND (?): SA *
MIGASDV - SAVE THE DATA FROM VOLUME LIB002 ON SAVE SET X
MIGANDR - THIS SAVE REQUIRES 5 TWO SIDED DISKETTES.
          THE DISKETTES SHOULD BE FORMATTED FOR EDX BY
          $SSINIT AND HAVE A DIRECTORY 120 RECORDS IN
          SIZE. THEY SHOULD NOT HAVE SPACE FOR A NUCLEUS
          RESERVED.  THE VOLUME LABELS SHOULD BE X01
          THROUGH X05.
          THE SAVE WILL START WITH DISKETTE X04
MIGALDI - LOG WILL GO TO $SYSPRTR

 ***** DATA ON THE DISKETTES WILL BE OVERWRITTEN *****

  MIGAACQ - CONTINUE? (Y/N): Y
```

As you can see from this example, $MIGAID will resume processing where it left off.

The log from the restart looks like:

```
MIGASHM - LOG OF SAVE FROM VOLUME LIB002

MIGACDS - DATASETS COPIED FROM LIB002 TO X04
   DLETEMP3   1802
MIGACDS - DATASETS COPIED FROM LIB002 TO X05
  DMINTRFS  273  DMINTRFO 60 $MIGAID 64 $MIGAIDO 100
  $MIGAIDL  150  $MIGAIDC  2 TSTUT3  42 $MIGAIDS 679

  MIGADSC - OPERATION SUCCESSFULLY COMPLETED.
```

***Example 3 - Suspend an Operation:*** To cause $MIGAID to suspend an operation in progress, press the attention key (or its equivalent), and enter **STOP**.

Your terminal will look like this after $MIGAID stops:

```
> STOP
MIGAMSD - $MIGAID SHUTTING DOWN SHORTLY
MIGASBU - OPERATION SUSPENDED BY USER
COMMAND (?):
```

$MIGAID completes processing the current data set, prints the log, and issues the command prompt.

In this case, the log and the work file reflect the correct status. Use SA * or RE * to resume, when you are ready.

***Example 4 - Invalid Volume Name:*** If you respond with an invalid name, $MIGAID reissues the prompt:

```
COMMAND (?): SA XYZZY X
MIGACOL - CAN'T OPEN LIBRARY ON XYZZY
          (LIBRARY NOT FOUND)
COMMAND (?):
```

***Example 5 - Wrong Diskette Inserted:*** If you insert the wrong diskette, $MIGAID reissues the message:

```
MIGAPMV - MOUNT VOLUME volname AND VARY IT ONLINE
          PRESS "ATTN" AND TYPE "GO" WHEN READY
          OR "STOP" TO ABORT MOUNT
```

At this point you may mount the correct diskette and proceed normally. If you do not have the requested diskette, you may abort the mount request by pressing the attention key and typing STOP, as directed. If you choose to abort the mount request, $MIGAID will type the following on your terminal:

```
> STOP
MIGAMSD - $MIGAID SHUTTING DOWN SHORTLY
MIGAVMA - VOLUME MOUNT ABORTED
MIGACOA - OPERATION ABANDONED
COMMAND (?):
```

### $MIGRATE

$MIGRATE, part of Version 4, converts $MIGAID output to Version 4 format. If you are not converting to Version 4 from a previous version of EDX, you do not need this program.

**Note:** $MIGRATE (on EDX Version 4) can be used successfully only if the diskettes being read were created under the following circumstances:

1. The $MIGAID program on the Version 1 or 2 system was obtained from a diskette dated October, 1983 or later. This diskette can be obtained from your IBM Systems Engineer.

2. The EDX system producing the diskettes was at either EDX Version 1 Modification Level 3 PFT P0A or EDX Version 2 Modification Level 1 PTF P07.

$MIGRATE uses a work data set which you must allocate with $DISKUT1 and clear with $DISKUT2 before you invoke $MIGRATE for the first time. The $MIGRATE work data set must be at least 121 records in size. When converting a $MIGAID save set, $MIGRATE keeps checkpoint and other internal information in its work file, allowing $MIGRATE to recover from power or other system failure. Do not delete or clear a $MIGRATE work data set until $MIGRATE has successfully completed a restore operation. Do not allocate the $MIGRATE work file on the disk volume that is being restored (the target volume) since, if there is a data set of the same name on the save set, the work file would be replaced with the saved data.

#### $MIGRATE Commands

$MIGRATE accepts the following commands:

| | |
|---|---|
| **?** | Help. Prints the following list of commands and explanations. |
| **EN** | End. Command to end $MIGRATE. |
| **PR** | Printer. Names the logical printer to which logs should go. 'PR *' means the current terminal. Default: PR $SYSPRTR |
| **RE** | Restore. Restores all data members saved with the Version 1 or 2 utility $MIGAID to a Version 4 disk. |
| **RG** | Restore generic. Similar to RE but restores only data members having names starting with the generic text you supply. |
| **RN** | Restore nongeneric. Similar to RG but restores only data members having names that do not start with the generic text you supply. |

In addition $MIGRATE has the following attention commands:

| | |
|---|---|
| **STOP** | Stops a restore that is in process. |
| **GO** | Causes $MIGRATE to start again when it has paused for more diskettes. |

$MIGRATE is much like the restore portion of its Version 1 and 2 counterpart, $MIGAID, with the addition of the ability to restore only those data sets that match (or do not match) a given generic string. Error recovery procedures and error message sequences for $MIGRATE are identical to those for $MIGAID.

## $MIGCOPY

The $MIGCOPY program copies data sets on diskette in Version 1 or 2 format to either disk or diskette in Version 4 format. If you do not have any Version 1 or 2 format diskettes, you do not need this program.

$MIGCOPY operates very much like $COPYUT1 with the following exceptions:

- Its input (source) data set format is Version 1 or 2.
- Its output (target) data set format is Version 4.
- It does not copy program-type data sets (Version 1 or 2 programs will not run on Version 4 unless they are recompiled).
- It has a $DISKUT1-like "LA" command to list the contents of the Version 1 or 2 source diskette.

### $MIGCOPY Commands

$MIGCOPY accepts the following commands:

| | |
|---|---|
| **?** | Help. Prints the following list of commands and their explanations. |
| **EN** | End. Command to end $MIGCOPY. |
| **CM** | Copy Member. Copies a specific data member from the Version 1 or 2 source volume to the Version 4 target volume. |
| **CALL** | Copy All. Copies all data members from the Version 1 or 2 source volume to the Version 4 target volume. |
| **CG** | Copy Generic. Similar to CALL but copies only data members having names starting with the generic text you supply. |
| **CNG** | Copy nongeneric. Similar to CG but copies only data members having names that do not start with the generic text you supply. |
| **CV** | Change volume. Changes the source and target volumes that will be used. |
| **LA** | Lists all members on source volume. |
| **SQ** | Turns question mode on for all multiple copy operations. |

## Conversion Utilities *(continued)*

**NQ** Turns question mode off. (This is the default.)

In addition, $MIGCOPY has the following attention commands:

**STOP** Stop an in-process multiple copy.

**GO** Cause $MIGCOPY to start again when it has paused for a volume mount.

STOP and GO are entered to get $MIGCOPY's attention when it is doing a multiple copy operation or when it has paused for you to mount a diskette. To enter an attention command, press the attention key (or its equivalent). The system responds with ">", indicating its readiness to accept an attention command. Type the command and press the enter key.

During a multiple copy command, the STOP command causes $MIGCOPY to stop after it has finished processing the data set it is copying.

If $MIGCOPY needs a diskette that is not mounted, it pauses and asks you to mount it. The GO attention command is used to inform $MIGCOPY that the requested diskette is mounted.

***Example 1 - Loading $MIGCOPY:*** After $MIGCOPY is loaded, it prompts you for the names of the source (input) diskette volume and the target (output) volume. The source volume must be in Version 1 or 2 format and the target in Version 4 format. For example:

```
> $L $MIGCOPY
$MIGCOPY 49P,01:00:08, LP= 0000
SOURCE VOLUME: RECOVR
TARGET VOLUME: DLE
```

The source and target volumes may be changed later by using the CV command.

***Example 2 - Using the List All (LA) Command:*** The LA command may be used to list the names of the data sets on the source volume. $DISKUT1, which is usually used to list volume contents, executes only on Version 4 format diskettes. To list Version 1 or 2 diskettes, use the $MIGCOPY LA command. For example:

```
COMMAND(?): LA
MIGCLDO - LISTING OF DATA SETS ON RECOVR
NAME      TYPE        SIZE

$EDXNUC    PGM         257
$SMMLOG   DATA           2
$SMMPRIM  DATA           2
$SMM0203  DATA           4
$SMP01    DATA           8
$SMM02    DATA           6
$SMM0201  DATA           4
$SMM0202  DATA           4
$SMP0401  DATA          11
$SMM0204  DATA           4
$SMM0205  DATA           2
$SMM0206  DATA           2
$SMM0207  DATA           2
$SMM0208  DATA           2
$SMM0209  DATA           4
$SMP02    DATA          11
$SMP0203  DATA          23
$SMP0202  DATA          19
$SMP0209  DATA          28
$SMPPRIM  DATA          31
            .
            .
            .
$LOGUT00   PGM           6
$SMCTL     PGM          44
$TERMUT1   PGM          14
$SMLOG     PGM          33
$MIGAID    PGM          77
$SSINIT    PGM          25
```

Note that although the LA command lists all data sets on the diskette, the copy commands will copy only data-type members.

## Conversion Utilities *(continued)*

***Example 3 - Using the Copy Commands:*** The CM command copies a single data set from the source volume to the target volume. For example:

```
COMMAND(?): CM
SOURCE (FROM) MEMBER NAME: CALCSRC
TARGET (TO) MEMBER NAME
   (ENTER * FOR SAME NAME AS SOURCE MEMBER): *

MIGCHRC - MEMBER CALCSRC COPIED.    33 BLOCKS PROCESSED
```

Like all $MIGCOPY copy commands, the CM command automatically allocates the target data set. If a data set of the same name already exists on the target volume, it will be deleted before the allocation takes place.

The CALL command copies all data-type data sets from the source volume to the target volume. The data sets will have the same names on the target that they had on the source. For example:

```
COMMAND(?): CALL
MIGCHRC - MEMBER $SMMLOG  COPIED.    2 BLOCKS PROCESSED
MIGCHRC - MEMBER $SMMPRIM COPIED.    2 BLOCKS PROCESSED
MIGCHRC - MEMBER $SMM0203 COPIED.    4 BLOCKS PROCESSED
MIGCHRC - MEMBER $SMP01   COPIED.    8 BLOCKS PROCESSED
                   .
                   .
                   .
```

The CG and CNG commands, like the CALL command, copies multiple data sets with a single command, but they each have an additional parameter, the "generic text" that allows selective copying. Before each data set is copied, its name is compared with the generic text you supply. If the name begins with the same characters as the generic text, the CG command copies that data set. The CNG command works in just the opposite way. If the name does *not* match the generic text, the data set will be copied.

For example, to copy all data sets whose name begins with the characters "$4":

```
COMMAND(?): CG $4
MIGCHRC - MEMBER $4978IS0 COPIED.    8 BLOCKS PROCESSED
MIGCHRC - MEMBER $4978CS0 COPIED.   16 BLOCKS PROCESSED
MIGCHRC - MEMBER $4978CS1 COPIED.   16 BLOCKS PROCESSED
MIGCHRC - MEMBER $4978IS1 COPIED.    8 BLOCKS PROCESSED
```

The following example copies all data sets whose names do not begin with the character "$":

```
COMMAND(?): CNG $
MIGCHRC - MEMBER CALCSRC COPIED.    33 BLOCKS PROCESSED
```

Only one data set is copied - CALCSRC.

***Example 4 - Controlling Prompting:*** Besides the ability to selectively copy using generic text match, the commands SQ and NQ allow you to turn on or off a mode in which you are prompted before each data set is copied. At that time you tell $MIGCOPY whether or not to copy that particular data set. The SQ command turns the mode on; the NQ command turns if off. If on, it is effective for all multiple data set copy commands:

```
COMMAND(?): SQ
COMMAND(?): CG $
RESTORE $SMMLOG ? (Y/N): N
RESTORE $SMMPRIM? (Y/N): N
RESTORE $SMM0203? (Y/N): N
RESTORE $SMP01  ? (Y/N): Y
MIGCHRC - MEMBER $SMP01    COPIED.     8 BLOCKS PROCESSED
RESTORE $SMM02  ? (Y/N): Y
MIGCHRC - MEMBER $SMP02    COPIED.     6 BLOCKS PROCESSED
RESTORE $SMM0201? (Y/N): N
RESTORE $SMM0202? (Y/N): N
           .
           .
           .
```

***Example 5 - Using the Change Volume (CV) Command:*** The CV command allows you to change the source and target volume assignments. For example, to change the target volume to EDX002:

```
COMMAND(?): CV
MIGCSVI - SOURCE VOLUME IS RECOVR. OK? (Y/N): Y
MIGCTVI - TARGET VOLUME IS DLE   . OK? (Y/N): N EDX002
```

# Notes

# Appendix A. System Definition Statements

This appendix describes the definition statements used to define to your supervisor the I/O devices attached to your Series/1. The following definition statements are used to describe your system:

- ADAPTER - Defines a multiline attachment
- BSCLINE - Defines a binary synchronous line
- DISK - Defines direct access storage devices
- EXIODEV - Defines EXIO interface devices
- HOSTCOMM - Defines host communication support
- SENSORIO - Defines sensor I/O devices
- SYSTEM - Defines processor characteristics
- TAPE - Defines tape device
- TERMINAL - Defines terminals
- TIMER - Defines system timer feature.

These statements are used in the system generation process only which is described in Chapter 5, "Generate a Tailored Operating System" on page IS-77.

For an explanation of the format and syntax rules for coding definition statements, refer to the *Language Reference*.

# ADAPTER

## ADAPTER - Define a Multiline Attachment

ADAPTER defines the following attachments to be supported in your generated system:

- Multifunction Attachment Feature #1310 (MFA)
- Printer Attachment - 5200 Series Feature #5640 (ALPA)
- Multidrop Work Station Attachment Feature #1250 (SMIO).

One ADAPTER statement is required for each attachment. All ADAPTER statements must be grouped together and must precede the definition of the first device attached to a specific attachment. The last ADAPTER statement specified must include an END=YES specification.

For the Multifunction Attachment (MFA), each ADAPTER statement provides the attachment base address (the lowest device address in the attachment's range of up to four device addresses) and the names of the devices attached to the system through the attachment.

For the Printer Attachment - 5200 Series (ALPA), each ADAPTER statement provides the attachment base address (the lowest device address in the attachment's range of up to eight device addresses) and the names of the devices attached to the system through the attachment. You can attach up to eight printers through the ALPA attachment.

For the Multidrop Work Station Attachment (SMIO), each ADAPTER statement provides the attachment base address (the lowest address in the attachment's range of up to eight device addresses) and the names of the devices attached to the system through the attachment. You can attach up to eight 4980 display stations through the SMIO attachment.

**Notes:**

1. Each device to be connected through the MFA should be defined exclusively with either the TERMINAL and BSCLINE statements or the EXIODEV statement. A combination of system-supported and user-supported devices connected through a common attachment can produce unpredictable results.

2. Each device you are connecting through the ALPA and SMIO attachments must be defined by a separate TERMINAL definition statement.

3. Modem support for MFA (1310) is half-duplex only.

## ADAPTER - Define a Multiline Attachment *(continued)*

***Syntax:***

| | | |
|---|---|---|
| label | ADAPTER | ADDRESS=,TYPE=,DEVICES=(list),END= |
| Required: | label,ADDRESS=,TYPE=,DEVICES= | |
| Default: | END=NO | |

| ***Operand*** | ***Description*** |
|---|---|
| **label** | A 1- to 8-character label beginning with a letter or one of the following special characters: $, #, or @. Required for each ADAPTER statement. |
| **ADDRESS=** | The base address (two hexadecimal digits) of the attachment. For the MFA, this address must be divisible by four. For the ALPA and SMIO, this address must be divisible by eight. |
| **TYPE=** | One of the following:<br>**MFA** Defines the Multifunction Attachment (#1310)<br>**ALPA** Defines the Printer Attachment - 5200 Series (#5640)<br>**SMIO** Defines the Multidrop Work Station Attachment (#1250) |
| **DEVICES=** | A list of one to eight labels depending on the type of attachment:<br>• For an MFA, a list of one to four labels on the BSCLINE and TERMINAL definition statements that define the devices attached to the attachment.<br>• For an ALPA attachment, a list of one to eight labels on the TERMINAL definition statement that defines the devices attached to the attachment.<br>• For an SMIO attachment, a list of one to eight labels on the TERMINAL definition statement that defines the devices attached to the attachment. |
| **END=** | YES, for the last ADAPTER statement in the system definition module. The default is END=NO. |

## ADAPTER - Define a Multiline Attachment *(continued)*

***Example 1:*** A Multifunction Attachment with one line and three devices attached:

- One BSCLINE at address 58
- Two 3101 Model 23s in block mode at addresses 59 and 5A
- One 4975-02L printer at address 5B.

```
MFA01     ADAPTER    ADDRESS=58,TYPE=MFA,                              C
                DEVICES=(BSC1,$SYSLOG,$SYSLOGA,$SYSPRTR),END=YES

BSC1      BSCLINE    ADDRESS=58,ADAPTER=MFA,END=YES

$SYSLOG   TERMINAL   DEVICE=ACCA,ADAPTER=MFA,ADDRESS=59,               C
                MODE=3101B,LMODE=RS422

$SYSLOGA TERMINAL   DEVICE=ACCA,ADAPTER=MFA,ADDRESS=5A,               C
                MODE=3101B,LMODE=RS422

$SYSPRTR TERMINAL   DEVICE=4975-02L,ADAPTER=MFA,ADDRESS=5B,           C
                END=YES
```

***Example 2:*** A Printer Attachment - 5200 Series (ALPA) at address 58 with two devices attached.

- One 5219 printer at address 58
- One 5219 printer at address 59.

**Note:** In this example, the address of the attachment and the first device are the same. This is valid.

```
ALPA01    ADAPTER    ADDRESS=58,TYPE=ALPA,                             C
                DEVICES=($SYSLOG,$SYSLOGA),END=YES

$SYSLOG   TERMINAL   DEVICE=5219,ADAPTER=ALPA,ADDRESS=58,              C
                SECADDR=01,PORT=0

$SYSLOGA TERMINAL   DEVICE=5219,ADAPTER=ALPA,ADDRESS=59,              C
                SECADDR=02,PORT=0
```

## ADAPTER - Define a Multiline Attachment *(continued)*

***Example 3:*** A Multidrop Work Station Attachment (SMIO) at address 80 with two devices attached.

- One 4980 display station at address 80
- One 4980 display station at address 81

**Note:** In this example, the address of the attachment and the first device are the same. This is valid.

```
SMIO01    ADAPTER    ADDRESS=80,TYPE=SMIO,                            C
                DEVICES=(TERM1,TERM2),END=YES

TERM1     TERMINAL   DEVICE=4980,ADAPTER=SMIO,ADDRESS=80,             C
                SECADDR=01,PORT=0

TERM2     TERMINAL   DEVICE=4980,ADAPTER=SMIO,ADDRESS=81,             C
                SECADDR=02,PORT=0
```

## BSCLINE - Define a Binary Synchronous Line

BSCLINE defines a binary synchronous line to be supported in the generated system. One BSCLINE statement is required for each line to be referenced by programs using the Binary Synchronous Communications Access Method. (Refer to the *Communications Guide* for a description of the Binary Synchronous Communications Access Method.)

**Notes:**

1. Code a BSCLINE statement if you use the Remote Management Utility or the X.21 Circuit Switched Network support.

2. Group all BSCLINE statements together with the last BSCLINE statement including an END=YES specification.

***Syntax:***

```
label       BSCLINE ADDRESS=,TYPE=,RETRIES=,MC=,ADAPTER=,
            POLL=(list),END=

Required:   label if ADAPTER=MFA

Defaults:   ADDRESS=09,TYPE=PT,RETRIES=6,MC=NO,END=NO
```

| ***Operand*** | ***Description*** |
|---|---|
| **label** | A 1–8 alphanumeric character label beginning with a letter or one of the following special characters: $, #, or @.<br><br>Optional unless ADAPTER=MFA. If ADAPTER=MFA, this label must correspond to the label in the DEVICE= list on the ADAPTER definition statement. |
| **ADDRESS=** | The hardware address (in hexadecimal) of the line. The default is ADDRESS=09. For the X21 Circuit Switched Network support, you must specify an even address. |
| **TYPE=** | PT (the default) — The line is a point-to-point (nonswitched) line with a single remote station. The adapter should be jumpered with DTR permanently enabled. The MFA does not have the DTR jumper.<br><br>**Note:** Do not use the PT option with the X.21 Circuit Switched Network.<br><br>AC (auto-call) — The line is a point-to-point switched line. The IBM 2080 Synchronous Communication Single-Line Control/High Speed Feature should be jumpered for switched line operation and binary synchronous communications. Auto call is established through the EDX X.21 support. For information on using the auto-call option, see the *Communications Guide*. |

## BSCLINE - Define a Binary Synchronous Line *(continued)*

DC (direct-call) — The line is predefined direct on a point-to-point (switched) line. The IBM 2080 Synchronous Communication Single-Line Control/High Speed Feature should be jumpered for switched line operation and binary synchronous communications. Direct call is established through the EDX X.21 support. For information on using the direct-call option, see the *Communications Guide*.

SM — The line is on a switched network and connection will be established manually by the operator. The adapter should be jumpered for switched line operation and DTR should not be permanently enabled. The MFA does not have the switched line operation and DTR jumpers.

**Note:** If you use the SM option with the X.21 Circuit Switched Network, it defaults to auto call.

SA — The line is on a switched network and calls should be answered automatically by the BSC Access Method (during BSCOPEN). The adapter should be jumpered for switched line operation and DTR should not be permanently enabled. The MFA does not have the switched line operation and DTR jumpers.

**Note:** If you use the SA option with the X.21 Circuit Switched Network, it defaults to auto answer.

MC — The Series/1 is the controlling station on a multipoint line. The adapter should be jumpered with DTR permanently enabled and multipoint line should not be jumpered. The MFA does not have the DTR and multipoint line jumpers.

**Note:** Do not use the MC option with the X.21 Circuit Switched Network.

MT — The Series/1 is a tributary station on a multipoint line. The adapter should be jumpered for multipoint tributary operation with DTR permanently enabled. The MFA does have the multipoint tributary operation jumpers; it does not have the DTR jumpers. However, the physical jumpers are used only prior to initialization time. The logical jumpering and random access memory load override the physical jumpering after initialization.

**Note:** Do not use the MT option with the X.21 Circuit Switched Network.

**RETRIES=** The number of attempts which should be made to recover from common error conditions before posting a permanent error. The default is RETRIES=6.

**MC=** NO (the default) — The binary synchronous adapter located at the address specified in the ADDRESS= operand is either a medium speed, single line feature card, a high speed, single line feature card, an X.21 card jumpered to a run as a leased Bisync card, or an MFA (#1310).

## BSCLINE - Define a Binary Synchronous Line *(continued)*

YES — The binary synchronous adapter located at the address specified in the ADDRESS= operand is part of a multiline controller feature configuration. When generating supervisors using multiline controller attachments, note the following:

- The character string YES must be specified. Any other character string will be equivalent to NO.
- All multiline feature cards must start at a base address ending with either X'0' or X'8'. A BSCLINE statement must exist for the line at this base address if any of the other lines of the multiline attachment are to be used.

**Note:** Do not use the MC operand with the X.21 Circuit Switched Network.

**ADAPTER=** MFA — the line is on a Multifunction Attachment (MFA)

**Notes:**

1. If a bisync line is used with the MFA, it must be on the MFA base address.
2. Do not use the ADAPTER operand with the X.21 Circuit Switched Network.

**POLL=** A list of 1 to 4 poll/select addresses (two digit hexadecimal) that the line should respond to. Applies only if ADAPTER=MFA and TYPE=MT.

**Note:** Do not use the POLL operand with the X.21 Circuit Switched Network.

**END=** YES, for the last BSCLINE statement in the system definition module. The default is END=NO.

***Example 1:*** A point-to-point nonswitched binary synchronous line located at address 28 that is not part of a multiline controller configuration.

```
         BSCLINE ADDRESS=28,TYPE=PT,RETRIES=10,MC=NO
```

***Example 2:*** A multipoint binary synchronous line at address 58, attached to a Series/1 through an MFA. A list of three poll/select address is specified.

```
BSC1     BSCLINE ADDRESS=58,ADAPTER=MFA,TYPE=MT,POLL=(C0,C1,C2)
```

## BSCLINE - Define a Binary Synchronous Line *(continued)*

***Example 3:*** A binary synchronous line at address 30, on a switched network. An operator will establish this line connection manually.

```
BSCLINE ADDRESS=30,TYPE=SM,RETRIES=2,MC=YES,END=YES
```

***Example 4:*** A point-to-point binary synchronous line at address 30, on a switched network.

```
BSCLINE ADDRESS=30,TYPE=AC,RETRIES=2,END=YES
```

# DISK

## DISK - Define Direct Access Storage

DISK defines the direct access storage devices to be supported in the generated system. You must group all DISK statements together with the TAPE statements. The last DISK OR TAPE statement must include an END=YES specification.

**Note:** We recommend placing the DISK statements that represent disk devices in front of those representing diskette devices. This ensures that disks are still accessible if a defective diskette is encountered. If you define all your disks before your diskettes, you will get better performance.

***Syntax:***

```
blank        DISK          DEVICE=,ADDRESS=,VOLNAME=(namelist),
                           TASK=,END=

Required:    DEVICE=,ADDRESS=
Defaults:    END=NO,TASK=NO
```

| *Operand* | *Description* |
|---|---|
| **DEVICE=** | One of the following device types: |

| Type | Description |
|---|---|
| **4964** | 4964 Diskette Unit |
| **4965** | 4965 Diskette Unit within the 4952 Model C or 30D processor, the 4954 or 4956 Model 30D or 60D processors, or the 4965 Storage and I/O Expansion Unit |
| **4966** | 4966 Diskette Magazine Unit |
| **4962-1** | 4962-1 Disk (9.3-megabyte unit) |
| **4962-1F** | 4962-1F Disk (9.3-megabyte unit with fixed heads) |
| **4962-2** | 4962-2 Disk (9.3-megabyte unit with a diskette unit) |
| **4962-2F** | 4962-2F Disk (9.3-megabyte unit with fixed heads and a diskette unit) |
| **4962-3** | 4962-3 Disk (13.9-megabyte unit) |
| **4962-4** | 4962-4 Disk (13.9-megabyte unit with a diskette unit) |
| **4963-29** | 4963-29 Disk (29-megabyte unit) |
| **4963-23** | 4963-23 Disk (23-megabyte unit with fixed heads) |

## DISK - Define Direct Access Storage *(continued)*

**4963-64** 4963-64 Disk (64-megabyte unit)

**4963-58** 4963-58 Disk (58-megabyte unit with fixed heads)

**4967-2** 4967-2 Disk (one or two 200 megabyte units)

**4967-4** 4967-4 Disk (one to four 200 megabyte units)

**DDSK-30** 30-megabyte Disk within the 4952, 4954, or 4956 Model 30D processors or the 4965 storage and I/O expansion unit (model 30D)

**DDSK-60** 60-megabyte Disk within the 4954 or 4956 Model 60D processors or the 4965 storage and I/O expansion unit (model 60D)

**ADDRESS=** The hexadecimal address of the unit.

**Notes:**

1. If you have a 4965 diskette unit within the 4952 model 30D processor, the 4954 or 4956 Model 30D/60D processors, or within the 4965 storage and I/O expansion unit, use a separate DISK statement to define the unit. The address of the diskette unit must be one greater than the DDSK-30 or DDSK-60. For example, if the disk is defined at address X'44', then the diskette unit must be address X'45'.

2. If you have a 4965 diskette unit, use a separate DISK statement for each diskette slot within the unit. The address of the second diskette slot must equal the address of the first diskette slot plus 1.

**VOLNAME=** A list of volume names (1 to 6 characters) that will be located on the device. These volumes are designated as performance volumes. The system finds the disk addresses of the specified volumes at IPL time.

See "Disk Considerations" on page IS-47 for an explanation of performance volumes.

Each volume you specify requires 46 bytes of storage.

**Notes:**

a. You cannot designate performance volumes on a diskette. As a result, this operand is ignored if DEVICE=4964, 4965, or 4966.

b. This parameter is optional; you must allocate the volumes with the $INITDSK utility.

c. Volume names, tape IDS, and TERMINAL statement labels must be unique. No tape ID or TERMINAL statement label can match a volume name.

## DISK - Define Direct Access Storage *(continued)*

**TASK=** NO, or omit, if a new task is not required (the default). An I/O task is automatically generated; specify NO to prevent generation of an additional task.

YES, to cause the system to generate a new I/O task. This task is used to service I/O requests for this and subsequent devices until the system encounters a new DISK statement with TASK=YES.

Specifying TASK=YES on a DISK statement allocates a task control block that is used in servicing READ and WRITE requests for the group of devices being defined. The effect is to allow READ and WRITE requests to proceed in parallel with requests to other groups of devices. With the exception of the 4963 disk, the resulting overlap may improve performance significantly when concurrent requests to different groups of devices occur. To achieve maximum flexibility and performance, you should specify TASK=YES on each DISK statement. Each TASK=YES requires 128 bytes of additional storage.

**END=** YES, for the last DISK or TAPE statement in the system definition module. The default is END=NO.

***Example 1:*** One I/O task that is shared by all direct access drives.

```
DISK   DEVICE=4962-1F,ADDRESS=03
DISK   DEVICE=4963-23,VOLNAME=(EDX002,ASMLIB),ADDRESS=48
DISK   DEVICE=4964,ADDRESS=02
DISK   DEVICE=4965,ADDRESS=44,END=YES
```

**Note:** END=YES is required only once for the DISK/TAPE definition statements.

***Example 2:*** Each disk has an I/O task. One I/O task for the two 4964s and a second I/O task for the 4962.

```
DISK   DEVICE=4964,ADDRESS=02,TASK=YES
DISK   DEVICE=4964,ADDRESS=12,TASK=YES
DISK   DEVICE=4962-1F,ADDRESS=03,TASK=YES,END=YES
```

***Example 3:*** DISK definition statement defining the 60-megabyte disk and an optional 4965 diskette unit.

```
DISK   DEVICE=DDSK-60,ADDRESS=44
DISK   DEVICE=4965,ADDRESS=45,END=YES
```

## EXIODEV - Define EXIO Interface Device

EXIODEV defines the devices to be supported via the EXIO interface in the generated system. All EXIODEV statements must be grouped together. The last EXIODEV statement must include an END=YES specification.

An EXIODEV statement must be defined for each:

- System/370 Channel Device attached to your system
- Physical unit that defines an SDLC line for the Series/1 Systems Network Architecture.

For more information on defining channel attach devices, refer to the Program Directory for the Series/1-System/370 Channel Attach (5719-CX1). For more information on defining an SDLC line, refer to the Program Directory for the Series/1 Systems Network Architecture (5719-SX1).

**Notes:**

1. Any device defined via EXIODEV should not be defined on any other statement such as DISK or BSCLINE. Doubly-defined devices will cause unpredictable results when accessed by a combination of READ/WRITE and EXIO. The system does not initialize any device you define with EXIODEV. You must load any control store that is required by the device.

2. If you define devices connected through a multiple-device feature (controller), the devices should be either defined exclusively with the EXIODEV statement or the TERMINAL or BSCLINE statements. A combination of system supported and user-supported devices connected through a common attachment can produce unpredictable results.

### *Syntax:*

```
blank        EXIODEV      ADDRESS=,END=,MAXDCB=,RSB=

Required:    ADDRESS=
Defaults:    MAXDCB=0,RSB=0,END=NO
```

***Operand*** ***Description***

**ADDRESS=** The device address (two hexadecimal digits). For a system with SNA support, this address must match the address specified for the ADDRESS= operand of the SNAPU definition statement.

**MAXDCB=** The maximum number of chained DCBs which will be used for this device. Must be eight or less. The default is MAXDCB=0.

**Note:** If the device you define is an OEM or IBM device (nonstandard support), refer to the device description manual for that device for MAXDCB count.

## EXIODEV - Define EXIO Interface Device *(continued)*

For a system with SNA support, the value specified must be 2–8. This value must be equal to the value specified on the DCBNO= operand on the SNAPU definition statement and one greater than the value specified for the MAXOUT parameter of the network control program (NCP).

For a system with one System/370 Channel Attach device, specify MAXDCB=2.

For a system with more than one System/370 Channel Attach device, specify MAXDCB=2 on one EXIODEV statement and MAXDCB=1 on the others.

For a system with a Data Collection Interactive RPQ, specify MAXDCB=1.

**RSB=** The number of residual status bytes the device will transfer. Enter zero or an even decimal number between 4 and 16 inclusive. The default is RSB=0.

**Note:** If the device you define is an OEM or IBM device (nonstandard support), refer to the device description manual for that device for RSB count.

For a system with SNA support, specify RSB=4.

For a System/370 Channel Attach device, specify RSB=6.

For a system with a Data Collection Interactive RPQ, specify RSB=4.

**END=** Specify YES for the last EXIODEV statement in the system definition module. The default is END=NO.

***Examples:***

```
EXIODEV  ADDRESS=00

EXIODEV  ADDRESS=E0,RSB=12,MAXDCB=2

EXIODEV  ADDRESS=10,RSB=6,MAXDCB=2

EXIODEV  ADDRESS=11,RSB=6,MAXDCB=1,END=YES
```

# HOSTCOMM - Define Host Communications Support

HOSTCOMM defines the device type and address to be used for host communication support in the generated system. This support operates with the Host Communications Facility Installed User Program (IUP).

### *Syntax:*

```
blank        HOSTCOMM   DEVICE=,ADDRESS=

Required:    DEVICE=,ADDRESS=
Defaults:    None
```

| *Operand* | *Description* |
|---|---|
| **DEVICE=** | BSCA, for Binary Synchronous Communications Adapter support. This is the only device supported and must be a single line BSC adapter (feature 2074 or 2075). Only one is allowed. |
| **ADDRESS=** | The hexadecimal address of the adapter. |

### *Example:*

```
         HOSTCOMM  DEVICE=BSCA,ADDRESS=09
```

## SENSORIO - Define Sensor I/O Devices

SENSORIO defines the sensor I/O devices to be supported in the generated system. All SENSORIO statements must be grouped together with the last one including an END=YES specification.

***Syntax:***

```
blank       SENSORIO     ADDRESS=,DEVICE=,AI=,AO=,DI=,DO=,PI=,AITYPE=,
                         LEVEL=,END=

Required:   DEVICE=,ADDRESS=
Defaults:   AITYPE=RELAY,LEVEL=1,END=NO
```

***Operand*** ***Description***

**ADDRESS=** The base address of the device (in hexadecimal). This is the only required address if DEVICE=IDIO unless PI is needed on this unit.

**DEVICE=** One of the following device types:

**IDIO** The integrated digital I/O nonisolated feature (feature #1560)

**4982** The sensor I/O unit

**AI=** The address or list of addresses of the analog input multiplexor feature(s) on this device.

**AO=** The address or list of addresses of the analog output point(s) on this device.

**DI=** The address or list of addresses of the digital input group(s) on this device.

**DO=** The address or list of addresses of the digital output group(s) on this device. PI can be read as DI.

**PI=** The address or list of addresses of the digital input group(s) to be used as process interrupt.

**Note:** For the AI, AO, DI, DO and PI operands, multiple addresses must be included in parentheses.

**AITYPE=** The type of AI multiplexer(s). Valid entries are:

- RR or RELAY - for relay (the default)
- SS or SOLID - for solid state

**Note:** The names have a one-to-one relationship with addresses on the AI operand. Multiple entries must be included in parentheses.

## SENSORIO - Define Sensor I/O Devices *(continued)*

**LEVEL=** A number (from 0-3) to assign the hardware interrupt level to the device. The default is LEVEL=1.

**Note:** This assignment is for all features on that device.

**END=** YES, for the last SENSORIO statement in the system definition module. The default is END=NO.

***Examples:***

```
SENSORIO  DEVICE=IDIO,ADDRESS=68

SENSORIO  DEVICE=4982,ADDRESS=60,AO=65,DO=62,DI=64,        C
      PI=63,AI=61,AITYPE=SS

SENSORIO  DEVICE=4982,ADDRESS=70,DI=(70,71)

SENSORIO  DEVICE=4982,ADDRESS=60,AI=(62,63),               C
      AITYPE=(RELAY,SOLID),AO=64,DI=(65,66),DO=67

SENSORIO  DEVICE=IDIO,ADDRESS=68,PI=68,END=YES
```

## SYSTEM - Define Processor Storage

SYSTEM defines the characteristics of the processor storage, including the partition structure, the storage assigned to each partition for execution of application programs, and the number of programs that can concurrently execute in each partition. This statement must be specified once.

**Note:** You need only define the number of partitions required for program execution. If you generate a multipartition supervisor and place supervisor code in a partition that you have not defined on the SYSTEM statement, the partition is automatically defined. However, this partition will only contain supervisor code and cannot be used for execution of application programs.

The Event Driven Executive supports two types of storage: mapped and unmapped. Mapped storage is the storage you define with the PART= operand. Unmapped storage is any storage not defined with the PART= operand or any storage above 512K. The system acquires unmapped storage through the unmapped storage instructions. See the *Language Reference* for a description of these instructions. For an explanation of using unmapped storage for application programs, see the *Event Driven Executive Language Programming Guide*.

### *Syntax:*

```
blank       SYSTEM      MAXPROG=,PARTS=,DATEFMT=,IABUF=,
                        XPSSTK=,COMMON=,INITPRT=,INITMOD=,MECBLST=

Required:   None
Defaults:   MAXPROG=10,PARTS=32,DATEFMT=MMDDYY
            IABUF=20,XPSSTK=20,COMMON=EDXSYS,INITPRT=ANY
```

| *Operand* | *Description* |
|---|---|
| **MAXPROG=** | The maximum number of concurrently executing programs to be allowed in a partition. Add 1 to your calculated number for each occurrence of $JOBUTIL in that partition. Add 2 for each occurrence of the session manager in that partition. Four words of storage are required in the nucleus for each program specified. The default is MAXPROG=10. |
| | You must specify a list of the maximum number of concurrently executing programs allowed in each partition. The number of programs that can run concurrently in a system varies with each installation depending on the size of your processor storage and programs and your processor time requirements. |
| | If your system has unmapped storage, you need to specify a greater number of programs because unmapped storage generally uses more storage within a partition. For example, if you would normally define five (5) programs, specify seven (7) instead. |
| **PARTS=** | The number of 2K (1K=1024 bytes) blocks of storage to be assigned to each partition for execution of application programs. You can specify up to 32 2K |

## SYSTEM - Define Processor Storage *(continued)*

blocks of storage or up to a total of 64K for each partition. Depending on the size of your supervisor, you may not receive the amount of user space anticipated because of the amount of storage taken up by supervisor code within a partition. Enter a list showing the maximum size of each partition. You can define up to eight 64K partitions for the 4955 and 4956, up to four 64K partitions for the 4954, and up to two 64K partitions for the 4952. The list must contain the same number of entries as the list coded for MAXPROG=. The default is PARTS=32.

The user partitions (1–8) must fit in corresponding address spaces or map areas that are respectively numbered 0–7 and can contain 64KB of designated storage.

The amount of storage available in any partition is the smaller of:

- The size you define in the PARTS= parameter
- 64K minus the size of the supervisor.

(Refer to Chapter 4, "Select Your Required Support" on page IS-39 for information on how to estimate supervisor size.)

The maximum value that can be specified is 32; the minimum is 2. When you specify the size to be assigned to partition 1 and you wish partition 1 to have all storage not used by the supervisor, code 32 rather than calculating the value. Otherwise, you must calculate the size of partition 1.

To define unmapped storage, specify less than thirty-two 2K blocks of storage for each partition. For example, if you have three partitions in a 192K processor and only define PARTS=(32,16,16), you only map 128K of processor storage. The balance of thirty-two 2K blocks is unmapped storage.

(To determine the storage required by licensed programs such as the Indexed Access Method and the Multiple Terminal Manager, refer to work sheet 4 in Appendix E.)

**DATEFMT=** The format to be used when the date is displayed (PRINDATE or $W) or when entering the date via $T. A return code is set in response to a GETTIME request with the DATE option.

Specify MMDDYY for a date format of month.day.year. Specify DDMMYY for a date format of day.month.year. MMDDYY is the default.

**Note:** You must include timer support in your supervisor to have date support.

## SYSTEM - Define Processor Storage *(continued)*

**IABUF=** The maximum number of interrupts that can be buffered by the task supervisor. You must code a value between 10 and 100. The default is 20 and is adequate for most systems. The value should be increased if the system could be overloaded by a large number of interrupts. (The system will stop or enter a continuous run loop.) Each increment increases the supervisor storage requirements by eight bytes.

**Note:** Use the $STGUT1 utility (MX command) to monitor the number of interrupts buffered by the task supervisor.

**XPSSTK=** The size of the cross partition stack in 6-byte entries. This stack contains the return address and partition numbers that the supervisor refers to when branching between partition one and supervisor portions in other partitions. You must code a value between 10 and 128. The default size is 20. This default is usually sufficient for your programming needs.

**Note:** Use the $STGUT1 utility (MX command) to monitor the number of entries in the cross partition stack.

**COMMON=** A partition 1 supervisor address or the size of the supervisor data area. Code up to eight labels or numbers. The labels represent a partition 1 (address space 0) supervisor address. The numbers represent the size (in 2K blocks) of a partition 1 (address space 0) supervisor data area. The valid numbers are 0 to 31. The syntax of the COMMON= operand is as follows:

```
COMMON=(__,__,__,__,__,__,__,__)
```

Whether you specify labels or numbers, you can map the area as common in all partitions or in specific partitions. The syntax of the operand is such that each entry (a maximum of eight) corresponds to address spaces 0 through 7. If you do not want to map the common area into a specific partition, code the COMMON= operand as follows. In this example, the supervisor data areas are mapped into partitions 2, 3, and 5.

```
COMMON=(EDXSVCX,1,1,0,1)
```

The size of the common area will be rounded upward automatically to a 2K byte boundary.

To map the entire resident supervisor, specify COMMON=EDXSTART. To map only the supervisor data areas, specify COMMON=EDXSVCX. The default, COMMON=EDXSYS, implies no mapping.

## SYSTEM - Define Processor Storage *(continued)*

**INITPRT=** The partition into which $INITIAL is loaded after system initialization. If you specify a partition and there is not enough storage in that partition to contain $INITIAL, the system cannot load it and issues a LOAD instruction return code of 70. If you do not specify a partition number and allow INITPRT to default, the system attempts to load $INITIAL into the first partition it finds with enough storage to contain $INITIAL. The default is INITPRT=ANY.

**INITMOD=** A list of entry-point names in modules to be executed during system initialization. The modules must be link edited with the supervisor and may not execute LOAD instructions. Each module must return to the entry point INITEXIT. Each module must begin execution in Event Driven Language. Control is passed to the module using a GOTO instruction.

**MECBLST=** The maximum number (in decimal) of event control blocks (ECBs) allowed in the system at any given time. The MECB statement is used in conjunction with the WAITM instruction to permit a program to wait on the occurrence of multiple events. You can specify from 1 to 64 ECBs. The system generates an ECB consisting of two words to be used as address pointers. For example, if you specify 64, the system generates 128 words.

***Example 1:*** Define a three-partition system on a 96K-byte 4955.

```
SYSTEM   MAXPROG=(3,2,3),PARTS=(32,6,10)
```

The system logically and physically maps in storage as follows:

***Logical mapping:***

| | | |
|---|---|---|
| Address space 0 | 28KB supervisor | 36KB user space (partition 1) |
| Address space 1 | 12KB user space (partition 2) | Invalid |
| Address space 2 | 20KB user space (partition 3) | Invalid |

***Physical mapping:***

| | | |
|---|---|---|
| 64KB | 12KB | 20KB |

1. Partition 1 requires 14 blocks (28KB) for the supervisor and has 18 blocks (36KB) left for user space. Partition 1 can execute up to three programs concurrently.

## SYSTEM - Define Processor Storage *(continued)*

Partition 1 is defined as 9 blocks (18KB) of storage. The supervisor required 14 blocks (28KB) and the initialization routines required 9 blocks (18KB) of storage at IPL time. After initialization, the 9 blocks of storage required by the initialization routines were given back as user space.

2. Partition 2 requires 12 blocks (24KB) of storage for user space. Partition 2 can execute up to two programs concurrently.
3. Partition 3 requires 10 blocks (20KB) of storage for user space. Partition 3 can execute up to three program concurrently.
4. There is no unmapped storage.

**Note:** The 28KB supervisor size is used for illustrative purposes only.

***Example 2:*** Define a single-partition (64K) system.

```
         SYSTEM    MAXPROG=5
```

The system logically and physically maps in storage as follows:

*Logical mapping:*

| Address space 0 | 28KB supervisor | 36KB user space (partition 1) |
|---|---|---|

*Physical mapping:*

| 64KB |
|---|

The supervisor requires 14 blocks (28KB) for the supervisor and has 18 blocks (36KB) left for user space. Up to five programs can execute concurrently.

**Note:** The 28KB supervisor size is used for illustrative purposes only.

***Example 3:*** Define a six-partition system on a 196K-byte 4955.

```
         SYSTEM    MAXPROG=(1,2,1,3,4,1),                  C
               PARTS=(9,12,7,4,20,23),INITPRT=2
```

## SYSTEM - Define Processor Storage *(continued)*

The system logically and physically maps in storage as follows:

***Logical mapping:***

| | | |
|---|---|---|
| Address space 0 | 28KB supervisor | 36KB user space (partition 1) |
| Address space 1 | 24KB user space (partition 2) | Invalid |
| Address space 2 | 14KB user space (partition 3) | Invalid |
| Address space 3 | 8KB user space (partition 4) | Invalid |
| Address space 4 | 40KB user space (partition 5) | Invalid |
| Address space 5 | 46KB user space (partition 6) | Invalid |

***Physical mapping:***

| | | | | |
|---|---|---|---|---|
| 64KB | 24KB | 14KB | 8KB | 40KB |
| 46KB | | | | |

1. Partition 1 requires 14 blocks (28KB) for the supervisor and has 18 blocks (36KB) left for user space. Partition 1 can execute one program at a time.

   Partition 1 is defined as 9 blocks (18KB) of storage. The supervisor required 14 blocks (28KB) and the initialization routines required 9 blocks (18KB) of storage at IPL time. After initialization, the 9 blocks of storage required by the initialization routines were given back as user space.

2. Partition 2 requires 12 blocks (24KB) of storage and can execute up to two program concurrently.

3. Partition 3 requires 7 blocks (14KB) of storage and can execute one program at a time.

4. Partition 4 requires 4 blocks (8KB) of storage and can execute up to three programs concurrently.

5. Partition 5 requires 20 blocks (40KB) of storage and can execute up to four programs concurrently.

## SYSTEM - Define Processor Storage *(continued)*

6. Partition 6 requires 23 blocks (46KB) of storage and can execute one program at a time.

7. $INITIAL, if it exists, will be loaded into partition 2 if there is enough space.

**Note:** The 28KB supervisor size is used for illustrative purposes only.

***Example 4:*** Define a three-partition system on a 128K-byte 4955.

```
SYSTEM   MAXPROG=(10,10,10),                        C
         PARTS=(27,9,23),INITMOD=(CSXINIT)
```

The system logically and physically maps as follows:

***Logical mapping:***

| | | |
|---|---|---|
| Address space 0 | 28KB supervisor | 36KB user space (partition 1) |
| Address space 1 | 18KB user space (partition 2) | Invalid |
| Address space 2 | 46KB user space (partition 3) | Invalid |

***Physical mapping:***

| | | |
|---|---|---|
| 64KB | 18KB | 46KB |

1. Partition 1 requires 14 blocks (28KB) for the supervisor and has 18 blocks (36KB) left for user space. Partition 1 can execute one program at a time.

   Partition 1 is defined as 27 blocks (54KB) of storage. The supervisor required 14 blocks (28KB) and the initialization routines required 9 blocks (18KB) of storage at IPL time. After initialization, the 9 blocks of storage required by the initialization routines were given back as user space. Although partition 1 was defined as 54KB of user space, the supervisor required 28KB of storage leaving only 36KB of available user space.

## SYSTEM - Define Processor Storage *(continued)*

2. Partition 2 requires 9 blocks (18KB) of storage and can execute up to 10 programs concurrently.

3. Partition 3 requires 23 blocks (46KB) of storage and can execute up to 10 programs concurrently.

4. The module with entry point name of CSXINIT will be activated during initialization.

**Note:** The 28KB supervisor size is used for illustrative purposes only.

***Example 5:*** Define a two-partition system on a 128K-byte 4952.

```
SYSTEM    MAXPROG=(3,6),PARTS=(32,32),              C
          COMMON=EDXSVCX,DATEFMT=MMDDYY
```

The system logically and physically maps as follows:

***Logical mapping:***

| | | | |
|---|---|---|---|
| Address space 0 | 4KB control block | 28KB supervisor | 32KB space (partition 1) |
| Address space 1 | 4KB control block | 60KB user space (partition 2) | 4KB unmapped |

***Physical mapping:***

| | | |
|---|---|---|
| 64KB | 60KB | 4KB |

1. Partition 1 is 32KB and can execute up to three programs concurrently.

2. Partition 2 is 60KB and can execute up to six programs concurrently. The programs all have direct addressability to supervisor control blocks (for example, the CVT (communications vector table) and DVT (device vector table) because of the COMMON=EDXSVCX parameter.

3. Total storage used: 4KB + 28KB + 32KB + 60KB = 124KB. The size of process storage is 128KB leaving 4KB of unmapped storage.

**Note:** The 28KB supervisor size and the 4KB control block size are used for illustrative purposes only.

## SYSTEM - Define Processor Storage *(continued)*

***Example 6:*** Define a two-partition system on a 128K-byte 4952.

```
        SYSTEM   MAXPROG=(4,4),PARTS=(32,32),          C
               DATEFMT=MMDDYY
```

The system logically and physically maps as follows:

***Logical mapping:***

| | | |
|---|---|---|
| Address space 0 | 30KB supervisor | 34KB user space (partition 1) |
| Address space 1 | 64KB user space (partition 2) | |

***Physical mapping:***

| | |
|---|---|
| 64KB | 64KB |

1. Partition 1 requires 15 blocks (30KB) of storage for the supervisor and has 17 blocks (34KB) of storage left for user space. Partition 1 can execute up to four programs concurrently.

2. Partition 2 requires 32 blocks (64KB) of storage and can execute up to four programs concurrently.

3. When the date is displayed, it will be in month, day, and year format.

**Note:** The 30KB supervisor size is used for illustrative purposes only.

## SYSTEM - Define Processor Storage *(continued)*

***Example 7:*** Define an eight-partition system on a 256K-byte 4955.

```
        SYSTEM    MAXPROG=(3,1,5,2,2,1,1,4),                C
                PARTS=(15,4,21,13,17,11,8,23)
```

The system logically and physically maps as follows:

***Logical mapping:***

| | | | |
|---|---|---|---|
| Address space 0 | 32KB supervisor | 30KB user space (partition 1) | Invalid |
| Address space 1 | 8KB user space (partition 2) | Invalid | |
| Address space 2 | 42KB user space (partition 3) | Invalid | |
| Address space 3 | 26KB user space (partition 4) | Invalid | |
| Address space 4 | 34KB user space (partition 5) | Invalid | |
| Address space 5 | 22KB user space (partition 6) | Invalid | |
| Address space 6 | 16KB user space (partition 7) | Invalid | |
| Address space 7 | 46KB user space (partition 8) | Invalid | |

## SYSTEM - Define Processor Storage *(continued)*

***Physical mapping:***

| | | | |
|---|---|---|---|
| 62KB | 8KB | 42KB | 26KB |
| 34KB | 22KB | 16KB | 46KB |

1. Partition 1 requires 16 blocks (32KB) of storage for the supervisor and has 15 blocks (30KB) of storage left for user space. Partition 1 can execute up to three programs concurrently.

2. Partition 2 requires 4 blocks (8KB) of storage for user space and can execute one program at a time.

3. Partition 3 requires 21 blocks (42KB) of storage for user space and can execute up to five programs concurrently.

4. Partition 4 requires 13 blocks (26KB) of storage for user space and can execute up to two programs concurrently.

5. Partition 5 requires 17 blocks (34KB) of storage for user space and can execute up to two programs concurrently.

6. Partition 6 requires 11 blocks (22KB) of storage for user space and can execute one program at a time.

7. Partition 7 requires 8 blocks (16KB) of storage for user space and can execute one program at a time.

8. Partition 8 requires 23 blocks (46KB) of storage for user space and can execute up to four programs concurrently.

**Note:** The 32KB supervisor size is used for illustrative purposes only.

## SYSTEM - Define Processor Storage *(continued)*

***Example 8:*** Define a two-partition system on a 96K-byte 4952.

```
         SYSTEM    MAXPROG=(3,4),PARTS=(16,18),                 C
                COMMON=EDXSTART
```

The system logically and physically maps as follows:

***Logical mapping:***

| | | | |
|---|---|---|---|
| Address space 0 | 28KB supervisor | 32KB user space (partition 1) | Invalid |
| Address space 1 | 28KB supervisor | 36KB user space (partition 2) | |

***Physical mapping:***

| | |
|---|---|
| 60KB | 36KB |

1. Because COMMON=EDXSTART was specified, the supervisor is mapped in both partition 1 and partition 2, providing direct addressability to the supervisor for all programs that execute on this system.

2. Partition 1 requires 14 blocks (28KB) of storage for the supervisor and has 16 blocks (32KB) of storage left for user space. Partition 1 can execute up to three programs concurrently.

3. Partition 2 requires 14 blocks (28KB) of storage for the supervisor and has 18 blocks (36KB) of storage left for user space. Partition 2 can execute up to four programs concurrently.

4. Total storage used: 28KB + 32KB + 36KB = 96KB

**Note:** The 28KB supervisor size is used for illustrative purposes only.

## SYSTEM - Define Processor Storage *(continued)*

***Example 9:*** Define a five-partition system on a 256-byte 4955.

```
SYSTEM   MAXPROG=(10,10,10,10,10),                              C
         PARTS=(26,26,26,26,26),COMMON=USRMAP
```

The supervisor requires 42K bytes of storage and the COMMON area requires 12K bytes of storage. The system logically and physically maps as follows:

***Logical mapping:***

| | | |
|---|---|---|
| Address space 0 | 42KB supervisor | 22KB user space (partition 1) |
| Address space 1 | 12KB common | 52KB user space (partition 2) |
| Address space 2 | 12KB common | 52KB user space (partition 3) |
| Address space 3 | 12KB common | 52KB user space (partition 4) |
| Address space 4 | 12KB common | 52KB user space (partition 5) |

***Physical mapping:***

| | | |
|---|---|---|
| 64KB | 52KB | 52KB |
| 52KB | 36KB | |

1. Partition 1 requires 21 blocks (42KB) for the supervisor and has 11 blocks (22KB) left for user space. Partition 1 can execute up to 10 programs concurrently.

2. Partition 2 requires 6 blocks (12KB) to serve as addressing pointers to the COMMON area and has 26 blocks (52KB of actual storage mapped for user space. The 6 blocks of pointers cannot map actual storage since they are reserved as COMMON area pointers. Partition 2 can execute up to 10 programs concurrently.

3. Partitions 3 and 4 are the same as Partition 2.

4. Partition 5 maps all of the actual storage not previously mapped. The six 2KB blocks of storage from partitions 2, 3, and 4 equal 36KB mapped into the last partition. Partition 5 can execute up to 10 programs concurrently.

## SYSTEM - Define Processor Storage *(continued)*

***Example 10:*** Define a five-partition system on a 512-byte 4956. A multipartition supervisor was generated for this system with 24K of supervisor code in partition 1, 14K in partition 3, and 13K in partition 8.

```
         SYSTEM    MAXPROG=(1,5,5,5,5),PARTS=(32,32,32,16,32)    C
                   COMMON=(0,8,10)
```

The system logically and physically maps as follows:

***Logical mapping:***

| | | | |
|---|---|---|---|
| Address space 0 | 24KB supervisor | 40KB user space (partition 1) | |
| Address space 1 | 16KB common | 48KB user space (partition 2) | |
| Address space 2 | 20KB common | 14KB supervisor | 30KB user space (partition 3) |
| Address space 3 | 32KB user space (partition 4) | Invalid | |
| Address space 4 | 64KB user space (partition 5) | | |
| Address space 5 | Invalid | | |
| Address space 6 | Invalid | | |
| Address space 7 | 13KB supervisor | 1KB user space | Invalid |
| | 246KB unmapped storage | | |

## SYSTEM - Define Processor Storage *(continued)*

***Physical mapping:***

| | | | | |
|---|---|---|---|---|
| 64KB | 48KB | | 44KB | 32KB |
| 64KB | 14KB | 246KB unmapped | | |

1. Partition 1 requires 12 blocks (24KB) for the supervisor and has 20 blocks (40KB) left for user space. Partition 1 can execute up to 10 programs concurrently.

2. Partition 2 requires 8 blocks (16KB) to serve as addressing pointers to the COMMON area and has 24 blocks (48KB) of actual storage mapped for user space. The 8 blocks of pointers cannot map actual storage since they are reserved as COMMON area pointers. Partition 2 can execute up to 10 programs concurrently.

3. Partition 3 requires 10 blocks (20KB) to serve as addressing pointers to the COMMON area and has 7 blocks (14KB) for the supervisor and 15 blocks (30KB) left for user space even though the user requested 64KB of user space. Partition 3 can execute up to 10 programs concurrently.

4. Partition 4 requires 16 blocks (32KB) of storage for user space.

5. Partition 5 is not defined.

6. Partition 6 is not defined.

7. Partition 7 was not defined on the SYSTEM statement, however, a multipartition supervisor was defined with the PART= statement in the $LNKCNTL data set as having 13KB of supervisor code in partition 8. As a result, partition 8 was automatically defined and 13KB of storage was assigned to the supervisor. In addition, because storage is assigned in 2K blocks, 1KB of storage is assigned as user space for a total of 14KB in partition 8.

8. The size of process storage is 512KB. Only 266KB of storage was defined leaving 246KB of unmapped storage.

***Example 11:*** Define a three-partition system on a 512-byte 4956. A multipartition supervisor was generated for this system with 50K of supervisor code in partition 1, 17K in partition 6, and 15K in partition 8.

```
SYSTEM    MAXPROG=(1,10,1),PARTS=(2,16,16),            C
          COMMON=(0,LABEL,8)
```

In this example, LABEL is at address X'8000' of the supervisor in partition 1.

## SYSTEM - Define Processor Storage *(continued)*

The system logically and physically maps as follows:

***Logical mapping:***

| | | | |
|---|---|---|---|
| Address space 0 | 40KB supervisor | 14KB user space (partition 1) | Invalid |
| Address space 1 | 32KB common | 32KB user space (partition 2) | |
| Address space 2 | 16KB common | 32KB user space (partition 3) | Invalid |
| Address space 3 | Invalid (partition 4) | | |
| Address space 4 | Invalid (partition 5) | | |
| Address space 5 | 17KB supervisor | 1KB user space (partition 6) | Invalid |
| Address space 6 | Invalid (partition 7) | | |
| Address space 7 | 15KB supervisor | 1KB user space (partition 8) | Invalid |
| | 360KB unmapped storage | | |

***Physical mapping:***

| | | |
|---|---|---|
| 54KB | 32KB | 32KB |
| 18KB | 16KB | 360KB unmapped |

1. Partition 1 requires 20 blocks (40KB) for the supervisor and has 7 blocks (14KB) left for user space. Partition 1 can execute one program. After initialization, the 5 blocks (10KB) of storage required by the initialization routines were given back as user space.

2. Partition 2 requires 16 blocks (32KB) to serve as addressing pointers to the COMMON area and has 16 blocks (32KB) of actual storage mapped for user space. The 16 blocks of pointers cannot map actual storage since they are reserved as COMMON area pointers. Partition 2 can execute up to 10 programs concurrently.

3. Partition 3 requires 8 blocks (16KB) to serve as addressing pointers to the COMMON area and has 16 blocks (32KB) for the supervisor and 15 blocks (30KB) for user space. Partition 3 can execute up to 10 programs concurrently.

## SYSTEM - Define Processor Storage *(continued)*

4. Partition 4 is not defined.

5. Partition 5 is not defined.

6. Partition 6 was not defined on the SYSTEM statement, however, a multipartition supervisor was defined with the PART= statement in the $LNKCNTL data set as having 17KB of supervisor code in partition 6. As a result, partition 6 was automatically defined and 17KB of storage was assigned to the supervisor. In addition, because storage is assigned in 2K blocks, 1KB of storage is assigned as user space for a total of 18KB in partition 6.

7. Partition 7 is not defined.

8. Partition 8 was not defined on the SYSTEM statement, however, a multipartition supervisor was defined with the PART= statement in the $LNKCNTL data set as having 15KB of supervisor code in partition 8. As a result, partition 8 was automatically defined and 15KB of storage was assigned to the supervisor. In addition, because storage is assigned in 2K blocks, 1KB of storage is assigned as user space for a total of 16KB in partition 8.

9. The size of process storage is 512KB. Only 152KB of storage was defined leaving 360KB of unmapped storage.

# TAPE - Define Tape Device

TAPE defines tape devices. One TAPE statement is required for each tape device on the system. Group all DISK and TAPE statements together. The last TAPE or DISK statement must specify END=YES.

### *Syntax:*

```
blank        TAPE DEVICE=,ADDRESS=,DENSITY=,LABEL=,ID=,
                   TASK=,END=

Required:    DEVICE=,ADDRESS=,ID=
Defaults:    DENSITY=1600,LABEL=SL,TASK=NO,END=NO
```

| *Operand* | *Description* |
|---|---|
| **DEVICE=** | Required if 4968; otherwise, defaults to 4969.<br><br>**4968** 4968 tape unit<br><br>**4969** 4969 tape unit |
| **ADDRESS=** | A two-digit hexadecimal number specifying the address assigned to the unit. |
| **DENSITY=** | Tape density to be used for this device.<br><br>For the 4968 tape unit, the valid densities are 1600, 3200, and DUAL. When DUAL is coded, density defaults to 1600 BPI.<br><br>For the 4969 tape unit, the valid densities are 800, 1600, and DUAL. When DUAL is coded, density defaults to 1600 BPI.<br><br>**Note:** A 4968 density selection of 3200 BPI is not ANSI standard and is only compatible with other 4968 tape units. |
| **LABEL=** | Type of processing to be done on this device. Standard label (SL), nonlabel (NL), and bypass label processing (BLP) are the only types supported. The default is LABEL=SL. |
| **ID=** | A one- to six-character name that is associated with the device. This operand is used primarily for specifying the drive when NL or BLP is used.<br><br>**Note:** Tape IDS, volume names (see the DISK definition statement), and the labels associated with TERMINAL definition statements must be unique. No volume name or TERMINAL definition statement label can match a tape ID. |

## TAPE - Define Tape Device *(continued)*

**TASK=** YES, causes a new I/O task to be generated. This task is used to service I/O request for this and subsequent tapes until a new TAPE statement with TASK=YES is encountered. For best performance, specify TASK=YES for each tape unit that has a controller. The default is TASK=NO; one task is received.

Additional storage required for each TASK=YES is 128 bytes.

**END=** YES, for the last statement in the DISK/TAPE sequence. The default is END=NO.

***Example:*** Define a 4969 tape unit at address 4C. The tape is a standard label tape set at a density of 1600. The name associated with the tape unit is $TAPE1.

```
         TAPE   DEVICE=4969,ADDRESS=4C,DENSITY=1600,LABEL=SL,        C
                ID=$TAPE1,TASK=YES,END=YES
```

**Note:** END=YES is required only once for the DISK and TAPE definition statements.

# TERMINAL - Define Input/Output Terminals

TERMINAL defines each EDX terminal to be supported in the generated system. It is coded in your source statements for system generation, and is assembled with DISK, SYSTEM, and other supervisor definition statements. The DEVICE= operand of the TERMINAL statement identifies the type of terminal.

EDX terminals include a wide variety of devices such as keyboard/displays, printers, other processors, plotters and lab equipment. The operands of the TERMINAL definition statement define many of the characteristics of a particular terminal. The first operand usually coded is DEVICE= and its value determines which operands to code and their values. One such operand whose inclusion and value depends upon the value of the DEVICE operand is the CODTYPE operand. The devices supported and the feature code used to connect the device to the Series/1 are shown in Figure 10 .

| Terminal | Feature number | DEVICE operand of TERMINAL | CODTYPE operand |
|---|---|---|---|
| IBM 3101 Display Terminal, all models | #1310, #2095 with #2096, 2095 with RPQ D02350 | ACCA | ASCII |
| IBM 3101 Display Terminal, all models | #1610, #2091 with #2092 | ACCA | EBASC |
| IBM 3101 Display Terminal, models 10, 12, and 13 | #7850 | TTY[2] | ASCII |
| IBM 4978 Display Station | RPQ D02038 | 4978 | N/A |
| IBM 4979 Display Station | #3585 | 4979 | N/A |
| IBM 4980 Display Station | #1250 | 4980 | N/A |
| Teletype[2] ASR 33/35 (TTY) or equivalent | #7850 | TTY | ASCII |
| ASCII Terminal | #2095 with #2096 | ACCA | ASCII |
| ASCII Terminal | #1610, #2091 with #2092 | ACCA | EBASC |
| IBM 2741 Communication Terminal | #1610 | 2741 | CRSP or EBCD |
| IBM 4973 Line Printer | #5630 | 4973 | N/A |
| IBM 4974 Matrix Printer | #5620 | 4974 | N/A |

**Figure 10 (Part 1 of 2). Supported EDX terminals and DEVICE/CODTYPE operands**

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# TERMINAL - Define Input/Output Terminals *(continued)*

| Terminal | Feature number | DEVICE operand of TERMINAL | CODTYPE operand |
|---|---|---|---|
| IBM 4975 Printer (all models except 01A) | #1310 | 4975-01R<br>4975-01L<br>4975-02R<br>4975-02L | N/A |
| IBM 4975-01A Printer | #1310 or #2095/2096 | ACCA | ASCII |
| IBM 5219 Line Printer | #5640 | 5219 | N/A |
| IBM 5224 Matrix Printer | #5640 | 5224 | N/A |
| IBM 5225 Matrix Printer | #5640 | 5225 | N/A |
| IBM Series/1 | #1610, RPQs D02241 and D02242 | PROC | N/A |
| General Purpose Interface Bus (GPIB) | RPQ D02118 | GPIB | ASCII |
| Textronics 40xx Graphics Terminal | #1560 | 4013 | ASCII |

**Figure 10 (Part 2 of 2). Supported EDX terminals and DEVICE/CODTYPE operands**

## ASCII Transmission Codes

Terminals and other devices equivalent to the Teletype ASR 33/35 are referred to as ASCII terminals. Depending upon the feature number used to connect these terminals to the Series/1, the transmission code is either ASCII or EBASC (mirror-image ASCII). The CODTYPE operand specifies the transmission code to be used by the terminal and defines the internal representation of characters. (See the *Communications Guide* for a list of transmission codes.)

The ASCII transmission code, in which the characters appear in main storage in ASCII code, is used by features #1310, #7850, #2095, and #2096.

The other transmission code is EBASC (mirror-image ASCII) and is used by the 1610 and 2091 controllers and the 2092 adapter. EBASC is the mirror image within a ***byte*** of the ASCII representation; the bits appear swapped end-for-end within each byte. For example, the character "1" internally would look as follows:

| | Hexadecimal | Binary |
|---|---|---|
| ASCII | X'31' | 0 0 1 1 0 0 0 1 |
| EBASC (mirror-image ASCII) | X'8C' | 1 0 0 0 1 1 0 0 |

Note that the bit representation of a character appearing at the terminal is the same for all attachments and the bit representation for all characters in the Series/1 is ASCII. However, depending upon the attachment, ASCII or EBASC is used as the transmission code.

## TERMINAL - Define Input/Output Terminals *(continued)*

Note also that EDX supports "no parity" only, but some ASCII terminals use even or odd parity. For information on the parity of a particular terminal, refer to the associated hardware manual. If you require even or odd parity, use the EXIO facility.

A terminal can be attached directly (RS422 or LOCAL) to the Series/1 or attached through a modem (remote). A remote terminal is connected to the Series/1 by an asynchronous (start/stop) communications line. The line can be point-to-point switched (SWITCHED) or point-to-point nonswitched (PTTOPT). The TERMCTRL instruction has operands that are used to control the modem; see the *Language Reference* for more information.

Before preparing TERMINAL definition statements, you need to know the characteristics of your terminals, the way they will be attached to your Series/1, and how you plan to use them in your application. (Review the appropriate hardware manuals, and refer to the *Language Reference* and the *Communications Guide*.)

### Symbolic Reference to Terminals

The label on the TERMINAL definition statement assigns a name to the device for purposes of reference by the application program. Four such names have special meaning to the supervisor and should be assigned to the appropriate device:

**$SYSLOG** Names the system logging device or operator station, and must be defined in every system. The starter supervisor defines $SYSLOG as a 4978 display station. $SYSLOG is the primary device to receive/display all exception messages.

**$SYSLOGA** Names the alternate system logging device. If unrecoverable errors prevent use of $SYSLOG, the system will use the $SYSLOGA terminal as the system logging device/operator station. If defined, this device should be a terminal with keyboard capability, not just a printer. The starter supervisor defines the $SYSLOGA terminal as a teletypewriter device.

**$SYSLOGB** Names the second alternate system logging device. If unrecoverable errors prevent use of $SYSLOG, the system will use the $SYSLOGA terminal as the system logging device/operator station. If no $SYSLOGA terminal is defined or unrecoverable errors prevent the use of $SYSLOGA, the system will use the $SYSLOGB terminal as the system logging device/operator station. If defined, this device should be a terminal with keyboard capability, not just a printer. The starter supervisor defines the $SYSLOGB terminal as a 3101 Display Terminal in block mode.

**$SYSPRTR** Names the system printer. If defined, the hard copy output from all system programs are directed to this device. The starter supervisor defines a 4974 matrix printer as the $SYSPRTR device.

## TERMINAL - Define Input/Output Terminals *(continued)*

Assignment of a name to a terminal designates that terminal as a global resource to be accessed by any application program through use of the ENQT and IOCB instructions described in the *Language Reference*.

### Coding the TERMINAL Statement

In the following matrix, the DEVICE operand is listed across the top of the matrix. The operand that can be specified for a particular device as determined by the DEVICE operand are indicated by an **X**.

Following the matrix, the syntax and operands for each supported device are described by device type.

**Notes:**

1. All TERMINAL definition statements must be grouped together with the last statement including an END=YES specification.
2. Specify TYPE=DSECT on the TERMINAL definition statement to include the EDL/copy code when assembling under $S1ASM and using the Macro Library.
3. Labels on TERMINAL definition statements, tape IDs (see the TAPE definition statement), an volume names (see the DISK definition statement must be unique. Volume names or tape ID must not match the label on a TERMINAL statement.
4. The maximum LINSIZE is device dependent but can never by greater than 254.

If you use the Remote Management Utility and need the PASSTHRU function, two virtual terminals are required. (See "Examples and Defaults" on page IS-231 for a sample configuration.) (For a detailed description of the PASSTHRU function, see the Remote Management Utility chapter in the *Communications Guide*.)

# TERMINAL - Define Input/Output Terminals *(continued)*

| Parameter | Device operand of TERMINAL statement | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2741 | 4013 | 4973 | 4974 | 4975 | 5219 | 5225 | 5224 | 4978 | 4979 | 4980 | ACCA | TTY | PROC | VIRT | GPIB | S1S1 |
| ADAPTER | X | | | | X | X | X | X | | | X | X | | | | | |
| ADDRESS | X | | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| ATTN | | | | | | | | | X | X | X | X | X | | | X | |
| BITRATE | X | | | | X | | | | | | X | X | | X | | | |
| BOTM | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| CHARDEL | X | X | | | | | | | | | | X | X | | | | |
| CHARSET | | | | | X | X | X | X | | | | | | | | | |
| CHKSUM | | | | | | | | | | | | | | | | | X |
| COD | | | | | | | | | | | | X | | | | | |
| CODTYPE | X | X | | | | | | | | | | X | X | X | | X | |
| CR | X | X | | | | | | | | | | X | X | X | | | |
| CRDELAY | X | X | | | | | | | | | | X | X | X | | | |
| DI/DO/PI | | X | | | | | | | | | | | | | | | |
| ECHO | X | X | | | | | | | | | | | X | | | | |
| END | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) | (1) |
| HDCOPY | | | | | | | | | X | X | X | | | | | | |
| LEFTM | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| LF | X | X | | | | | | | | | | X | X | X | | | |
| LINEDEL | X | X | | | | | | | | | | X | X | | | | |
| LINSIZE | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| LMODE | | | | | X | | | | | | | X | | | | | |
| MODE | | | | | | | | | | | | X | X | | | | |
| NHIST | | | | | | | | | X | X | X | X | | | | | |
| OVFLINE | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| PAGSIZE | X | X | X | X | X | X | X | X | | | | X | X | | | | |
| PART | X | X | | | | | | | X | X | X | X | X | | | X | |
| PF1 | | | | | | | | | X | X | X | X | X | | | | |
| PORT | | | | | | X | X | X | | | X | | | | | | |
| RANGE | | | | | | | | | | | | X | | X | | | |
| RIGHTM | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| SCREEN | X | X | | | | | | | X | X | X | X | X | | | X | |
| SECADDR | | | | | | X | X | X | | | X | | | | | | |
| SPOOL | X | | X | X | X | X | X | X | X | X | X | X | X | | | X | |
| SYNC | | | | | | | | | | | | | | | X | | |
| TIMERS | | | | | | | | | | | | X | | | | | |
| TOPM | X | X | X | X | X | X | X | X | X | X | X | X | X | | | | |
| TYPE | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) | (2) |

**Figure 11. Device-dependent operands**

## 2741 Terminal

A TERMINAL definition statement with DEVICE=2741 defines a 2741 communications terminal attached via 1610 controller.

***Syntax:***

```
label       TERMINAL    DEVICE=,ADDRESS=,PAGSIZE=,LINSIZE=,CODTYPE=,
                        TOPM=,BOTM=,LEFTM=,RIGHTM=,OVFLINE=,
                        LINEDEL=,CHARDEL=,CRDELAY=,ECHO=,BITRATE=,
                        ADAPTER=,CR=,LF=,SCREEN=,PART=,SPOOL=,END=

Required:   DEVICE=,ADDRESS=
Defaults:   PAGSIZE=66,LINSIZE=130,CODTYPE=EBCD,TOPM=0,BOTM=65,
            LEFTM=0,RIGHTM=129,SCREEN=NO,OVFLINE=NO,LINEDEL=AO,
            CHARDEL=5D,CRDELAY=0,ECHO=YES,CR=5B,LF=5B,BITRATE=134,
            ADAPTER=SINGLE,PART=1,SPOOL=NO,END=NO
```

| *Operand* | *Description* |
|---|---|
| **DEVICE=** | 2741 communications terminal attached via 1610 controller. |
| **ADDRESS=** | The address (in hexadecimal) of the device. |
| **PAGSIZE=** | The physical page size (form length) of the I/O medium. Specify a decimal number between 1 and the maximum value which is meaningful for the device. The default is PAGSIZE=66. |
| **LINSIZE=** | The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate, but the value cannot be increased dynamically. The default is LINSIZE=130. |
| **CODTYPE=** | The transmission code used by the terminal. Specify either EBCD (PTTC/EBCD) or CRSP (PTTC/correspondence). The default is CODTYPE=EBCD. |
| **TOPM=** | The top margin (a decimal number between zero and PAGSIZE-1) to indicate the top of the logical page within the physical page for the device. The default is TOPM=0. |
| **BOTM=** | The bottom margin, the last usable line on a page. Its value must be between TOPM+NHIST and PAGSIZE-1. If an output instruction would cause the line number to increase beyond this value, then a page eject, or wrap to line zero, is performed before the operation is continued. The default is BOTM=65. |
| **LEFTM=** | The left margin, the character position at which input or output will begin. Specify a decimal value between zero and LINSIZE-1. The default is LEFTM=0. |

## 2741 Terminal *(continued)*

**RIGHTM=** A value (between LEFTM and LINSIZE-1) that determines the last usable character position within a line. Position numbering begins at zero. The default is RIGHTM=129.

**OVFLINE=** YES, if output lines which exceed the right margin are to be continued on the next line. The default is OVFLINE=NO.

The overflow condition occurs when the system buffer (or a buffer in an application program) becomes full and the application program has taken no action to write the buffer to the device.

**LINEDEL=** A two-digit hexadecimal character that defines the character to be entered to restart an input line. In some cases, input of this character causes a repeat of the previous output message. The default is LINEDEL=AO.

**CHARDEL=** A two-digit hexadecimal character which indicates deletion of the previous input character. It is meaningful only for devices whose mode of transmission is one character at a time, as described in the LINEDEL operand. The default is CHARDEL=5D.

**Note:** When CHARDEL= and LINEDEL= values are equal, no translation and editing will occur.

**CRDELAY=** The number of idle times required for a carriage return to complete for teletypewriter devices. If printing occurs during the carriage return, CRDELAY is too small. The default is CRDELAY=0.

**ECHO=** NO, for devices that do not require input characters to be written back (echoed) by the processor for printing.

YES (the default) is appropriate for most devices connected through the teletypewriter adapter.

**BITRATE=** The rate (in bits per second) that this terminal will be operating. The default is 134 bits per second.

**ADAPTER=** SINGLE, for the single-line controller (the default). For 2741, only SINGLE is allowed. This operand should match the jumpers on the 1610 controller card. (Refer to *Communications Guide* for hardware considerations.)

**CR=** The character the system tests in order to determine if a new line function is to be performed. The default is CR=5B.

**LF=** The character the system send to the terminal when a new line function is to be performed. If the same value is coded for LF= as was coded (or defaulted) for CR= then the CR character which terminates an input operation will not be echoed to the terminal; the terminal is assumed to be an auto line-feed device. The default is LF=5B.

## 2741 Terminal *(continued)*

**SCREEN=** YES or ROLL, for screens which are to be operated similar to a typewriter.

NO (the default), for hardcopy devices.

**PART=** The partition (1–8) with which the terminal is normally associated. The default is partition 1.

**SPOOL=** YES, to define the terminal as a valid spoolable device.

NO (the default), to specify that the terminal is not a valid spoolable device. However, the spoolable characteristics of the terminal can be redefined at a later time using the $TERMUT1 utility.

**END=** YES, for the last TERMINAL statement in a system definition module. The default is END=NO.

### Examples and Defaults

In the following example, the default assignments for DEVICE=2741 are shown as if they were explicitly coded in the TERMINAL statement. If a operand is not shown, then it is not relevant for the device. Address assignment is for illustration only.

***Example:*** IBM 2741 terminal TERMINAL statement.

```
label     TERMINAL  DEVICE=2741,ADDRESS=08
```

is equivalent to:

```
label     TERMINAL  DEVICE=2741,ADDRESS=08,PAGSIZE=66,LINSIZE=130,  C
                CODTYPE=EBCD,TOPM=0,BOTM=65,LEFTM=0,RIGHTM=129,     C
                SCREEN=NO,OVFLINE=NO,LINEDEL=AO,CHARDEL=5D,         C
                CRDELAY=0,ECHO=YES,CR=5B,LF=5B,BITRATE=134,         C
                ADAPTER=SINGLE,PART=1,SPOOL=NO,END=NO
```

## 4013 Terminal

A TERMINAL definition statement with DEVICE=4013 defines a Tektronix 4013 graphics terminal or similar device attached via 1560 adapter.

Terminal support is provided for digital I/O devices such as the Tektronix 4000 Series of Display Terminals equipped with the General Purpose Parallel Interface (Tektronix Custom Feature Number CM021-0109-03) or terminals having equivalent hardware interfaces. (Refer to the *Communications Guide.*)

***Syntax:***

```
 label       TERMINAL     DEVICE=,PAGSIZE=,LINSIZE=,CODTYPE=,
                          TOPM=,BOTM=,LEFTM=,RIGHTM=,OVFLINE=,
                          LINEDEL=,CHARDEL=,CRDELAY=,ECHO=,
                          CR=,LF=,SCREEN=,PART=,DI=,DO=,PI=,
                          END=

 Required:   DEVICE= ,and DI=,DO=, or PI=
 Defaults:   PAGSIZE=35,LINSIZE=72,CODTYPE=ASCII,TOPM=0,BOTM=34,
             LEFTM=0,RIGHTM=71,SCREEN=NO,OVFLINE=NO,LINEDEL=7F,
             CHARDEL=08,CRDELAY=0,ECHO=YES,CR=0D,LF=0A,PART=1,END=NO
```

| ***Operand*** | ***Description*** |
|---|---|
| **DEVICE=** | 4013 (or other 4000 Series) graphics terminal attached via 1560 adapter. |
| **PAGSIZE=** | The physical page size (form length) of the I/O medium. Specify a decimal number between 1 and the maximum value which is meaningful for the device. For screen devices, specify the size of the screen in lines. The default is PAGSIZE=35. |
| **CODTYPE=** | The transmission code used by the terminal; in this case, ASCII. |
| **LINSIZE=** | The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate (for example, 80 for the 4013 graphics terminal), but the value cannot be increased dynamically. The default is LINSIZE=72. |
| **TOPM=** | The top margin (a decimal number between zero and PAGSIZE-1) to indicate the top of the logical page within the physical page for the device. The default is TOPM=0. |
| **BOTM=** | The bottom margin, the last usable line on a page. Its value must be between TOPM+NHIST and PAGSIZE-1. If an output instruction would cause the line number to increase beyond this value, then a page eject, or wrap to line zero, is performed before the operation is continued. The default is BOTM=34. |

## 4013 Terminal *(continued)*

**LEFTM=** The left margin, the character position at which input or output will begin. Specify a decimal value between zero and LINSIZE-1. The default is LEFTM=0.

**RIGHTM=** A value (between LEFTM and LINSIZE-1) that determines the last usable character position within a line. Position numbering begins at zero. The default is RIGHTM=71.

**OVFLINE=** YES, if output lines which exceed the right margin are to be continued on the next line. The default is OVFLINE=NO.

The overflow condition occurs when the system buffer (or a buffer in an application program) becomes full and the application program has taken no action to write the buffer to the device.

**LINEDEL=** A two-digit hexadecimal character that defines the character to be entered to restart an input line. In some cases, input of this character causes a repeat of the previous output message. The default is LINEDEL=7F.

For information on how to code this operand for ASCII terminals, refer to "ASCII Transmission Codes" on page IS-182.

**CHARDEL=** A two-digit hexadecimal character which indicates deletion of the previous input character. It is meaningful only for devices whose mode of transmission is one character at a time, as described in the LINEDEL operand. The default is CHARDEL=08.

**Note:** When CHARDEL= and LINEDEL= values are equal, no translation or editing will occur.

**CRDELAY=** The number of idle times required for a carriage return to complete for teletypewriter devices. If printing occurs during the carriage return, CRDELAY is too small. The default is CRDELAY=0.

**ECHO=** NO, for devices that do not require input characters to be written back (echoed) by the processor for printing.

YES (the default) is appropriate for most devices connected through the teletypewriter adapter. See the LF parameter description regarding suppression of the echo of the CR character.

**CR=** The character to be tested to determine if a new line function is to be performed. The default is CR=0D.

For further information on how to code this operand for ASCII terminals, refer to "ASCII Transmission Codes" on page IS-182.

**LF=** The character to be sent to the terminal when a new line function is to be performed. If the same value is coded for LF= as was coded (or defaulted) for

## 4013 Terminal *(continued)*

CR= then the CR character which terminates an input operation will not be echoed to the terminal; the terminal is assumed to be an auto line-feed device. The default is LF=0A.

For further information on how to code this operand for ASCII terminals, refer to "ASCII Transmission Codes" on page IS-182.

**SCREEN=** YES or ROLL, for screens which are to be operated like a typewriter.

NO (the default), for hard-copy devices.

**DI=(address,termaddr)** address - The digital input group address

or

termaddr - The hardware subaddress (0–7) of the terminal defining the value used to select the terminal for digital input

**DO=(address,termaddr)** address - The digital output group address.

or

termaddr - The hardware subaddress (0-7) to define the digital output subaddress of the terminal.

**PI=(address,bit)** address - The process interrupt group address.

or

bit - The bit (0–15) to define the particular interrupting point assigned to the terminal.

**PART=** The partition (1–8) with which the terminal is normally associated. The default is partition 1.

You can change the partition assignment at execution time with the $CP operator command described in *Operation Guide*.

**END=** YES, for the last TERMINAL statement in a system definition module. The default is END=NO.

## 4013 Terminal *(continued)*

### Example and Defaults

In the following example, the default assignments for DEVICE=4013 are shown as if they were explicitly coded in the TERMINAL statement. If an operand is not shown, then it is not relevant for the device. Address assignment is for illustration only.

***Example:*** Tektronix 4013 (DI/DO parallel interface). TERMINAL Statement

```
label     TERMINAL   DEVICE=4013,DI=(80,01),DO=(87,01),PI=(84,04)
```

is equivalent to:

```
label     TERMINAL   DEVICE=4013,DI=(80,01),DO=(87,01),               C
                PI=(84,04),PAGSIZE=35,LINSIZE=72,                      C
                CODTYPE=ASCII,TOPM=0,BOTM=34,LEFTM=0,                  C
                RIGHTM=71,SCREEN=NO,OVFLINE=NO,                        C
                LINEDEL=7F,CHARDEL=08,CRDELAY=0,ECHO=YES,              C
                CR=0D,LF=0A,PART=1,END=NO
```

## 4973/4974 Printers

A TERMINAL definition statement with DEVICE=4973 (or 4974) defines a 4973 line printer attached via 5630 adapter or a 4974 matrix printer attached via 5620 adapter.

***Syntax:***

```
label       TERMINAL    DEVICE=,ADDRESS=,PAGSIZE=,LINSIZE=,TOPM=,
                        BOTM=,LEFTM=,RIGHTM=,OVFLINE=,SPOOL=,END=

Required:   DEVICE=,ADDRESS=
Defaults:   PAGSIZE=66,LINSIZE=132,TOPM=3,BOTM=63,LEFTM=0,
            RIGHTM=131,OVFLINE=NO,SPOOL=YES,END=NO
```

| *Operand* | *Description* |
|---|---|
| **DEVICE=** | One of the following device types:<br>**4973** 4973 line printer attached via 5630 Adapter<br>**4974** 4974 matrix printer attached via 5620 Adapter |
| **ADDRESS=** | The address (in hexadecimal) of the device. |
| **PAGSIZE=** | The physical page size (form length) of the I/O medium. Specify a decimal number between 1 and the maximum value which is meaningful for the device. For printers, specify the number of lines per page. The default is PAGSIZE=66. |
| **LINSIZE=** | The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate (for example, 132 for the 4973 and 4974 printers), but the value cannot be increased dynamically. The default is LINSIZE=132. |
| **TOPM=** | The top margin (a decimal number between zero and PAGSIZE-1) to indicate the top of the logical page within the physical page for the device. The default is TOPM=3. |
| **BOTM=** | The bottom margin, the last usable line on a page. Its value must be between TOPM+NHIST and PAGSIZE-1. If an output instruction would cause the line number to increase beyond this value, then a page eject, or wrap to line zero, is performed before the operation is continued. The default is BOTM=63. |
| **LEFTM=** | The left margin, the character position at which input or output will begin. Specify a decimal value between zero and LINSIZE-1. The default is LEFTM=0. |
| **RIGHTM=** | A value (between LEFTM and LINSIZE-1) that determines the last usable character position within a line. Position numbering begins at zero. The default is RIGHTM=131. |

## 4973/4974 Printers *(continued)*

**OVFLINE=** YES, if output lines which exceed the right margin are to be continued on the next line. The default is OVFLINE=NO.

The overflow condition occurs when the system buffer (or a buffer in an application program) becomes full and the application program has taken no action to write the buffer to the device.

**SPOOL=** YES (the default), to define terminal as a valid spoolable device.

NO, to specify terminal is not a valid spoolable device. However the spoolable characteristics of the terminal can be redefined at a later time using the $TERMUT1 utility.

**END=** YES, for the last TERMINAL statement in a system definition module. The default is END=NO.

### Example and Defaults

In the following example, the default assignments for DEVICE=4973 (or 4974) are shown as if they were explicitly coded in the TERMINAL statement. If an operand is not shown, then it is not relevant for the device. Address assignment is for illustration only.

***Example:*** 4974 matrix printer TERMINAL statement.

```
label     TERMINAL  DEVICE=4974,ADDRESS=01
```

is equivalent to:

```
label     TERMINAL  DEVICE=4974,ADDRESS=01,PAGSIZE=66,              C
                LINSIZE=132,TOPM=3,BOTM=63,LEFTM=0,                 C
                RIGHTM=131,OVFLINE=NO,SPOOL=YES,END=NO
```

## 4975 Printer

A TERMINAL definition statement with DEVICE=4975 defines a 4975 matrix printer (connected locally or remotely) via a Multifunction Attachment Feature #1310 (MFA).

**Note:** For the 4975-01A Printer, see the section headed TERMINAL - ACCA.

***Syntax:***

```
label        TERMINAL     DEVICE=,ADDRESS=,PAGSIZE=,LINSIZE=,CHARSET=,
                          TOPM=,BOTM=,LEFTM=,RIGHTM=,OVFLINE=,
                          BITRATE=,LMODE=,ADAPTER=,SPOOL=,END=

Required:    DEVICE=,ADDRESS=
Defaults:    PAGSIZE=66,LINSIZE=132,CHARSET=USCA,TOPM=3,BOTM=63,
             LEFTM=0,RIGHTM=131,OVFLINE=NO,BITRATE=1200,LMODE=LOCAL,
             ADAPTER=MFA,SPOOL=YES,END=NO
```

**label** Required if ADAPTER=MFA; otherwise optional

***Operand*** ***Description***

**DEVICE=** One of the following device types:

**4975-01L or -02L** 4975 matrix printer locally attached via #1310 (MFA) Adapter

**4975-01R or -02R** 4975 matrix printer remotely attached via #1310 (MFA) Adapter

**ADDRESS=** The address (in hexadecimal) of the device.

**PAGSIZE=** The physical page size (form length) of the I/O medium. Specify a decimal number between 1 and the maximum value which is meaningful for the device. For printers, specify the number of lines per page. The default is PAGSIZE=66.

**LINSIZE=** The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate, but the value cannot be increased dynamically. The default is LINSIZE=132.

For the 4975, the maximum number of characters contained on a line depends on the print density you specify with the TERMCTRL instruction or the $TERMUT1 utility. For 4975 maximum line widths, see the PDEN= operand of the TERMCTRL instruction in the *Language Reference*.

**CHARSET=** Select the character set for the device. Specify one of the following character sets:

| | |
|---|---|
| **AUGE** | Austrian and German |
| **BELG** | Belgian |
| **BRZL** | Brazilian |
| **DNNR** | Danish and Norwegian |
| **FRAN** | French (France) |
| **FRCA** | French (Canada) |
| **INTL** | International (multinational) |
| **ITAL** | Italian |
| **JAEN** | Japanese/English |
| **PORT** | Portugese |
| **SPAN** | Spanish (Spain) |
| **SPNS** | Spanish (countries other than Spain) |
| **SWFI** | Swedish and Finnish |
| **UKIN** | English (United Kingdom) |
| **USCA** | English (United States and Canada) |

The default character set is USCA. In addition, the characters per inch and the print mode for the 4975 are automatically set as follows:

**Model 1** 10 characters per inch

**Model 2** 10 characters per inch (draft mode)

These values remain in effect until you change them using either the TERMCTRL instruction or the $TERMUT1 utility.

**TOPM=** The top margin (a decimal number between zero and PAGSIZE-1) to indicate the top of the logical page within the physical page for the device. The default is TOPM=3.

**BOTM=** The bottom margin, the last usable line on a page. Its value must be between TOPM+NHIST and PAGSIZE-1. If an output instruction would cause the line number to increase beyond this value, then a page eject, or wrap to line zero, is performed before the operation is continued. The default is BOTM=63.

**LEFTM=** The left margin, the character position at which input or output will begin. Specify a decimal value between zero and LINSIZE-1. The default is LEFTM=0.

**RIGHTM=** A value (between LEFTM and LINSIZE-1) that determines the last usable character position within a line. Position numbering begins at zero. The default is RIGHTM=131.

**OVFLINE=** YES, if output lines which exceed the right margin are to be continued on the next line. The default is OVFLINE=NO.

The overflow condition occurs when the system buffer (or a buffer in an application program) becomes full and the application program has taken no action to write the buffer to the device.

## 4975 Printer *(continued)*

**BITRATE=** The rate (in bits per second) that this terminal will be operating. The BITRATE parameter is valid only for remotely attached 4975 Models 01R and 02R and is not used for a locally attached 4975 Models 01L or 02L.

**1200** The default for printers directly connected (LMODE=LOCAL) or running on asynchronous modems. This is the only bit rate allowed for the 4975 Model 01R.

**2400** For the 4975 Model 02R set to 2400 bits per second either directly attached or running on asynchronous modems.

**4800** For the 4975 Model 02R set to 4800 bits per second either directly attached or running on asynchronous modems.

**EXT** For the 4975 Model 02R that is running on a synchronous modem.

**Note:** 4975 internal clocking bit rates are determined by the switch settings on the printer.

**LMODE=** For 4975 R (RS232) support connected via the #1310 attachment, there are two options: LOCAL and PTTOPT. The default is LMODE=LOCAL.

LOCAL means a 4975 R model is directly connected to a Series/1 with no modems. PTTOPT means a 4975 R model connected to a Series/1 on a leased line with internal (1200 BPS) or external (1200, 2400, or 4800 BPS) modems.

This parameter is not valid for 4975 L (RS422) support.

**ADAPTER=** MFA, for a Multifunction Attachment Feature #1310. (The 1310 Multifunction Attachment is defined with the ADAPTER definition statement.)

**SPOOL=** YES (the default), to define terminal as a valid spoolable device.

NO, to specify terminal is not a valid spoolable device. However, the spoolable characteristics of the terminal can be redefined at a later time using the $TERMUT1 utility.

**END=** YES, for the last TERMINAL statement in a system definition module. The default is END=NO.

## 4975 Printer *(continued)*

### Examples and Defaults

In the following examples, the default assignments for DEVICE=4975 (local and remote) are shown as if they were explicitly coded in the TERMINAL statement. If an operand is not shown, then it is not relevant for the device. Address assignments are for illustration only.

***Example 1:*** 4975-01R matrix printer TERMINAL statement (remotely attached).

```
label     TERMINAL   DEVICE=4975-01R,ADDRESS=4C,                        C
                LMODE=PTTOPT
```

is equivalent to:

```
label     TERMINAL   DEVICE=4975-01R,ADDRESS=4C,                         C
                PAGSIZE=66,LINSIZE=132,CHARSET=USCA,TOPM=3,              C
                BOTM=63,LEFTM=0,RIGHTM=131,OVFLINE=NO,                   C
                BITRATE=1200,LMODE=PTTOPT,SPOOL=YES,END=NO
```

**Note:** For remote attachment, you must specify LMODE=PTTOPT as shown, in which case the BITRATE defaults to 1200. Other valid bit rates for the 4975 Models 01R and 02R are 2400 and 4800 bits per second.

***Example 2:*** 4975-02L matrix printer TERMINAL statement (locally attached).

```
label     TERMINAL   DEVICE=4975-02L,ADDRESS=4D
```

is equivalent to:

```
label     TERMINAL   DEVICE=4975-02L,ADDRESS=4D,                          C
                PAGSIZE=66,LINSIZE=132,CHARSET=USCA,TOPM=3,               C
                BOTM=63,LEFTM=0,RIGHTM=131,OVFLINE=NO,SPOOL=YES
```

**Note:** The BITRATE and LMODE operands are not used for local models of the 4975 because LMODE= will always be local and BITRATE=2400 for the 4975-01L and BITRATE=4800 for the 4975-02L.

## 4978/4979 Display Terminals

A TERMINAL definition statement with DEVICE=4978 4. (or 4979) defines a 4978 display station attached via RPQ D02038 or a 4979 display station attached via 3585 adapter.

***Syntax:***

```
label      TERMINAL    DEVICE=,ADDRESS=,LINSIZE=,TOPM=,BOTM=,
                       NHIST=,LEFTM=,RIGHTM=,OVFLINE=,HDCOPY=,
                       ATTN=,PF1=,SCREEN=,PART=,SPOOL=,END=

 Required:  DEVICE=,ADDRESS=
 Defaults:  LINSIZE=80,TOPM=0,NHIST=12,BOTM=23,
            LEFTM=0,RIGHTM=79,SCREEN=ROLL,OVFLINE=NO,ATTN=YES,
            PF1=02,HDCOPY=$SYSPRTR,PART=1,SPOOL=NO,END=NO
```

| *Operand* | *Description* |
|---|---|
| **DEVICE=** | One of the following device types: |
| | **4979** 4979 display station attached via 3585 Adapter |
| | **4978** 4978 display station attached via RPQ D02038 |
| **ADDRESS=** | The address (in hexadecimal) of the device. |
| **LINSIZE=** | The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate (for example, 80 for the 4978/4979 display station), but the value cannot be increased dynamically. The default is LINSIZE=80. |
| **TOPM=** | The top margin (a decimal number between zero and the page size (24) minus 1) to indicate the top of the logical page within the physical page for the device. The default is TOPM=0. |
| **NHIST=** | The number of history lines to be retained when a page eject is performed. The line at TOPM+NHIST corresponds to logical line zero for purposes of the terminal I/O instructions. When a page eject (LINE=0) is performed, the screen area from TOPM to TOPM+NHIST-1 will contain lines from the previous page. (See the discussion of the SCREEN operand which follows.) The default is NHIST=12. |
| | **Note:** This operand is meaningful for roll screens only. |
| **BOTM=** | The bottom margin, the last usable line on a page. Its value must be between TOPM+NHIST and the page size which is 24. If an output instruction would cause the line number to increase beyond this value, then a page eject, or wrap to line zero, is performed before the operation is continued. The default is BOTM=23. |

## 4978/4979 Display Terminals *(continued)*

**LEFTM=** The left margin, the character position at which input or output will begin. Specify a decimal value between zero and LINSIZE-1. The default is LEFTM=0.

**RIGHTM=** A value (between LEFTM and LINSIZE-1) that determines the last usable character position within a line. Position numbering begins at zero. The default is RIGHTM=79.

**OVFLINE=** YES, if output lines which exceed the right margin are to be continued on the next line. The default is OVFLINE=NO.

The overflow condition occurs when the system buffer (or a buffer in an application program) becomes full and the application program has taken no action to write the buffer to the device.

**HDCOPY=** The name of the terminal to which the contents of the screen can be printed. The default is HDCOPY=$SYSPRTR.

```
HDCOPY=(terminal name,key)
```

terminal name — The symbolic name of the terminal to which the hard-copy contents will be directed.

key — The code of the program function key which is to invoke the function. For example, HDCOPY=($SYSPRTR,4) designates $SYSPRTR as the hardcopy device and PF4 as the activating key. If the hardcopy terminal name alone is specified, for example HDCOPY=$SYSPRTR, then the default is PF6.

**Notes:**

1. The terminal specified (terminal name) must not be defined with ATTN=NO.
2. If a terminal error occurs, for example, the printer is not turned on, your output may be lost.

**ATTN=** NO, if the attention key and the PF keys are to be disabled for the terminal. Such disabling is then permanent for the generated system. If you do not specify ATTN=, the default is ATTN=YES.

YES or ALL, if all attention functions are to be enabled for the terminal.

LOCAL, to limit the attention functions to those defined by ATTNLISTs within programs loaded from the terminal.

NOSYS, to exclude only the system functions ($L, $C, etc.).

## 4978/4979 Display Terminals *(continued)*

NOGLOB, to exclude only the global ATTNLIST functions. (GLOBAL is the ATTNLIST of all programs in the same partition at one time.)

**Note:** This operand can also be entered with a two-digit hexadecimal character for the attention key if the system default is not desired.

The attention key can be redefined with a two-digit hexadecimal character.

(For more information on modifying the default attention key, refer to the description of $TERMUT2 utility in *Operator Commands and Utilities Reference*.)

**Note:** If the terminal being defined is specified in the HDCOPY= parameter of another terminal, do not code ATTN=NO.

**PF1=** The two-digit hexadecimal character which you want the system to interpret as PF key 1. The system interprets successive values as PF2 and PF3. The default is PF1=02.

**SCREEN=** YES or ROLL (the default), for screens which are to be operated like a typewriter. Output pause when screen is full.

NO, for hard-copy devices. For 4978 or 4979 display devices, NO inhibits the pause when the screen fills up (the screen acts as a roll screen).

STATIC, for a full-screen mode of operation, if full-screen mode is supported for the device.

**Note:** The initial terminal definition should be STATIC only if the terminal is reserved for data display and data entry operations. Normal system operations, such as those directed to $SYSLOG or those involving the utility programs, assume a roll screen configuration. The application program can define the static screen configuration by means of the ENQT and IOCB instructions described in the *Language Reference*.

**PART=** The partition (1–8) with which the terminal is normally associated. The default is partition 1.

You can change the partition assignment at execution time with the $CP operator command described in the *Operation Guide*.

**SPOOL=** YES, to define terminal as a valid spoolable device.

NO (the default), to specify terminal is not a valid spoolable device. However, the spoolable characteristics of the terminal can redefined at a later time using the $TERMUT1 utility.

**END=** YES, for the last TERMINAL statement in a system definition module. The default is END=NO.

## 4978/4979 Display Terminals *(continued)*

### Example and Defaults

In the following example, the default assignments for the 4978/4979 display stations are shown as if they were explicitly coded in the TERMINAL statement. If an operand is not shown, then it is not relevant for the device. Address assignment is for illustration only.

***Example:*** 4978 display terminal TERMINAL statement.

```
label     TERMINAL  DEVICE=4978,ADDRESS=04
```

is equivalent to:

```
label     TERMINAL  DEVICE=4978,ADDRESS=04,LINSIZE=80,          C
                TOPM=0,NHIST=12,BOTM=23,LEFTM=0,RIGHTM=79,      C
                SCREEN=ROLL,OVFLINE=NO,ATTN=YES,PF1=02          C
                HDCOPY=$SYSPRTR,PART=1,SPOOL=NO,END=NO
```

## 4980 Display Station

A TERMINAL definition statement with DEVICE=4980 defines a 4980 display station attached via the Multidrop Work Station Attachment Feature (#1250).

***Syntax:***

```
label          TERMINAL     DEVICE=,ADDRESS=,LINSIZE=,TOPM=,BOTM=,
                            NHIST=,BITRATE=,LEFTM=,RIGHTM=,OVFLINE=,
                            HDCOPY=,ATTN=,PF1=,SCREEN=,PART=,SPOOL=,
                            ADAPTER=,PORT=,SECADDR=,END=

Required:      DEVICE=,ADDRESS=,ADAPTER=,PORT=,SECADDR=
Defaults:      LINSIZE=80,TOPM=0,BOTM=23,NHIST=12,BITRATE=100,
               LEFTM=0,RIGHTM=79,OVFLINE=NO,HDCOPY=$SYSPRTR,
               ATTN=YES,PF1=02,SCREEN=ROLL,PART=1,SPOOL=NO,END=NO
```

| Operand | Description |
|---|---|
| **label** | A 1–8 alphanumeric character label beginning with a letter or one of the following special characters: $, #, or @. |
| **DEVICE=** | 4980, for the 4980 display station. |
| **ADDRESS=** | The address (in hexadecimal) of the device. |
| **LINSIZE=** | The maximum length of an input or output line for the device. The value of this operand can be less than the maximum that the device can accommodate, but the value cannot be increased dynamically. The default is LINSIZE=80. |
| **TOPM=** | The top margin (a decimal number between zero and 23; that is, the page size minus 1) to indicate the top of the logical page within the physical page for the device. The default is TOPM=0. |
| **NHIST=** | The number of history lines to be retained when a page eject is performed. The line at TOPM+NHIST corresponds to logical line zero for purposes of the terminal I/O instructions. When a page eject (LINE=0) is performed, the screen area from TOPM to TOPM+NHIST-1 will contain pages from the previous page. (See the discussion of the SCREEN operand which follows.) The default is NHIST=12.<br><br>**Note:** This operand is meaningful for roll screens only. |
| **BITRATE=** | The line speed (in K bits per second) at which the 4980 operates. The default is 100K bits per second. The valid line speeds are 100, 250, and 500. All terminals on one port must be the same line speed and must match the line speed set on the back of the terminal. See the *4980 Display Station Description and Reference Manual*, GA21-9296, for switch settings. |

## 4980 Display Station *(continued)*

**BOTM=** The bottom margin, the last usable line on a page. Its value must be between TOPM+NHIST and the page size which is 24. If an output instruction causes the line number to increase beyond this value, then a page eject occurs before the operation is continued. The default is BOTM=23.

**LEFTM=** The left margin, the character position at which input or output will begin. Specify a decimal value between zero and LINSIZE-1. The default is LEFTM=0.

**RIGHTM=** A value (between LEFTM and LINSIZE-1) that determines the last usable character position within a line. Position numbering begins at zero. The default is RIGHTM=79.

**OVFLINE=** YES, if output lines which exceed the right margin are to be continued on the next line. The default is OVFLINE=NO.

The overflow condition occurs when the system buffer (or a buffer in an application program) becomes full and the application program has taken no action to write the buffer to the device.

**HDCOPY=** The name of the terminal to which the contents of the screen can be printed. The default is HDCOPY=$SYSPRTR.

```
HDCOPY=(terminal name,key)
```

terminal name — The symbolic name of the terminal to which the hard-copy contents will be directed.

key — The code of the program function key which is to invoke the function. For example, HDCOPY=($SYSPRTR,4) designates $SYSPRTR as the hard-copy device and PF4 as the activating key. If you specify the name of the hard-copy terminal alone (for example HDCOPY=$SYSPRTR), then the default is PF6.

**Notes:**

1. The terminal specified (terminal name) must not be defined with ATTN=NO.
2. If a terminal error occurs (for example, if the printer is not turned on), your output may be lost.

**ATTN=** NO, if the attention key and the PF keys are to be disabled for the terminal. Such disabling is then permanent for the generated system.

YES (the default) or ALL, if all attention functions are to be enabled for the terminal.

## 4980 Display Station *(continued)*

LOCAL, to limit the attention functions to those defined by ATTNLISTs within programs loaded from the terminal.

NOSYS, to exclude only the system functions (such as ($L, OR $C).

NOGLOB, to exclude only the global ATTNLIST functions. (GLOBAL is the ATTNLIST of all programs in the same partition at one time.)

**Note:** You can also enter this operand with a two-digit hexadecimal character for the attention key if the system default is not desired.

You can redefine the attention key with a two-digit hexadecimal character.

(For more information on modifying the default attention key, refer to the description of $TERMUT2 utility in *Operator Commands and Utilities Reference.*)

**Note:** If the terminal being defined is specified in the HDCOPY= parameter of another terminal, do not code ATTN=NO.

**PF1=** The two-digit hexadecimal character that you want the system to interpret as PF key 1. The system interprets successive values as PF2 and PF3. The default is PF1=02.

**SCREEN=** YES or ROLL (the default), for screens that are to be operated similar to a typewriter. When the screen is full, you must press the enter key for the output to continue.

NO, for hard-copy devices. For the 4980 display station, NO inhibits the pause when the screen fills up (the screen acts as a roll screen).

STATIC, for a full-screen, if full-screen is supported for the device.

**Note:** The initial terminal definition should be STATIC only if you reserve the terminal for data display and data entry operations. Normal system operations, such as those directed to $SYSLOG or those involving the utility programs, assume a roll screen configuration. The application program can define the static screen configuration by means of the ENQT and IOCB instructions described in the *Language Reference.*

**PART=** The partition (1–8) with which the terminal is normally associated. The default is partition 1.

You can change the partition assignment at execution time with the $CP operator command described in *Operation Guide.*

**SPOOL=** YES, to define terminal as a spoolable device.

## 4980 Display Station *(continued)*

NO (the default), to specify terminal is not a spoolable device. However, you can redefine the spoolable characteristics of the terminal at a later time using the $TERMUT1 utility.

**ADAPTER=** SMIO, for the Multidrop Work Station Attachment Feature #1250.

**PORT=** The physical port on the Multidrop Work Station Attachment where the cable is connected. Its value can be 0 or 1.

**SECADDR=** The address set by the switches on the back of the 4980. Each terminal connected through the same port on the SMIO must have a unique secondary address. Its value must be between 01 and FE (hex). See the *4980 Display Station Description and Reference Manual*, GA21-9296, for switch settings.

**END=** YES, for the last TERMINAL statement in a system definition module. The default is END=NO.

### Example and Defaults

In the following example, the default assignments for the 4980 display station are shown as if they were explicitly coded in the TERMINAL statement. If an operand is not shown, then it is not relevant for the device. Address assignment is for illustration only.

***Example:*** 4980 Display Station TERMINAL statement.

```
label     TERMINAL  DEVICE=4980,ADDRESS=80,ADAPTER=SMIO,          C
                PORT=0,SECADDR=01

is equivalent to:

label     TERMINAL  DEVICE=4980,ADDRESS=80,ADAPTER=SMIO,          C
                 PORT=0,SECADDR=01,TOPM=0,NHIST=12,BITRATE=100,   C
                 BOTM=23,LEFTM=0,RIGHTM=79,SCREEN=ROLL,           C
                 OVFLINE=NO,ATTN=YES,PF1=02,PART=1,               C
                 HDCOPY=$SYSPRTR,SPOOL=NO,END=NO
```

## 5219/5224/5225 Printers

A TERMINAL definition statement with DEVICE=5219/5224/5225 defines one of the following printers:

- 5219 printer
- 5224 printer
- 5225 printer

connected to the Series/1 via the Printer Attachment - Series 5200 (#5640).

***Syntax:***

```
label        TERMINAL    DEVICE=,ADDRESS=,PAGSIZE=,LINSIZE=,CHARSET=,
                         TOPM=,BOTM=,LEFTM=,RIGHTM=,OVFLINE=,
                         ADAPTER=,SPOOL=,PORT=,SECADDR=,END=

Required:  DEVICE=,ADDRESS=,ADAPTER=,PORT=,SECADDR=
Defaults:  PAGSIZE=66,LINSIZE=132,CHARSET=USCA,TOPM=3,BOTM=63,
           LEFTM=0,RIGHTM=131,OVFLINE=NO,SPOOL=YES,END=NO
```

**label** Required

***Operand*** ***Description***

**DEVICE=** One of the following device types:

**5219** 5219 printer locally attached via the Printer Attachment - 5200 Series

**5224** 5224 printer locally attached via the Printer Attachment - 5200 Series

**5225** 5225 printer locally attached via the Printer Attachment - 5200 Series

**ADDRESS=** The address (in hexadecimal) of the device.

**PAGSIZE=** The physical page size (form length) of the I/O medium. Specify a decimal number between 1 and the maximum value which is meaningful for the device. For printers, specify the number of lines per page. The default is PAGSIZE=66.

**LINSIZE=** The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate, but the value cannot be increased dynamically. The length of an input or output line can be set at either 132 or 198. The default is LINSIZE=132.

## 5219/5224/5225 Printers *(continued)*

**CHARSET=** Select the character set for the device. Specify one of the following character sets:

| | |
|---|---|
| **AUGE** | Austria and Germany |
| **BELG** | Belgium |
| **BRZL** | Brazil |
| **DNNR** | Denmark and Norway |
| **FRAN** | France |
| **FRCA** | French Canadian |
| **INTL** | International (multinational) |
| **ITAL** | Italy |
| **JAEN** | Japan English |
| **PORT** | Portugal |
| **SPAN** | Spain |
| **SPNS** | Spanish speaking; other than Spain |
| **SWFI** | Sweden and Finland |
| **UKIN** | United Kingdom |
| **USCA** | United States and Canada |

The default character set is USCA.

In addition, the characters per inch for the printers (all models) are automatically set at 10 character per inch.

These values remain in effect until you change them using either the TERMCTRL instruction or the $TERMUT1 utility.

**TOPM=** The top margin (a decimal number between zero and PAGSIZE-1) to indicate the top of the logical page within the physical page for the device. The default is TOPM=3.

**BOTM=** The bottom margin, the last usable line on a page. Its value must be between TOPM+NHIST and PAGSIZE-1. If an output instruction would cause the line number to increase beyond this value, then a page eject, or wrap to line zero, is performed before the operation is continued. The default is BOTM=63.

**LEFTM=** The left margin, the character position at which input or output will begin. Specify a decimal value between zero and LINSIZE-1. The default is LEFTM=0.

**RIGHTM=** A value (between LEFTM and LINSIZE-1) that determines the last usable character position within a line. Position numbering begins at zero. The default is RIGHTM=131.

**OVFLINE=** YES, if output lines which exceed the right margin are to be continued on the next line. The default is OVFLINE=NO.

## 5219/5224/5225 Printers *(continued)*

The overflow condition occurs when the system buffer (or a buffer in an application program) becomes full and the application program has taken no action to write the buffer to the device.

**ADAPTER=** ALPA, for the Printer Attachment - 5200 Series (#5640). (The Printer Attachment - 5200 Series is defined with the ADAPTER definition statement.)

**SPOOL=** YES, to define terminal as a valid spoolable device.

NO, to specify terminal is not a valid spoolable device. However, the spoolable characteristics of the terminal can be redefined at a later time using the $TERMUT1 utility.

**PORT=** 0 for the first port, 1 for the second port.

**SECADDR=** If you specify PORT=0, the second address must be 00 through 06. If you specify PORT=1, the second address must also be 00 through 06. For the 5219, this address must correspond to the address set by the switches on the back of the 5219 printer.

**END=** YES for the last TERMINAL statement in a system definition module. The default is END=YES.

### Examples and Defaults

In the following examples, the default assignments for DEVICE=5219/5224/5225 are shown as if they were explicitly coded in the TERMINAL statement. If an operand is not shown, then it is not relevant for the device. Address assignments are for illustration only.

***Example 1:*** 5224 printer TERMINAL statement.

```
label     TERMINAL   DEVICE=5224,ADDRESS=58,                    C
                ADAPTER=ALPA,PORT=0,SECADDR=01
```

is equivalent to:

```
label     TERMINAL   DEVICE=5224,ADDRESS=58,ADAPTER=ALPA         C
                PAGSIZE=66,LINSIZE=132,CHARSET=USCA,TOPM=3,     C
                BOTM=63,LEFTM=0,RIGHTM=131,OVFLINE=NO,          C
                PORT=0,SECADDR=01,SPOOL=YES,END=NO
```

## 5219/5224/5225 Printers *(continued)*

***Example 2:*** 5225 printer TERMINAL statement (locally attached).

```
label     TERMINAL   DEVICE=5225,ADDRESS=58,                    C
               ADAPTER=ALPA,PORT=0,SECADDR=06
```

is equivalent to:

```
label     TERMINAL   DEVICE=5225,ADDRESS=58,ADAPTER=ALPA          C
                PAGSIZE=66,LINSIZE=132,CHARSET=USCA,TOPM=3,       C
                BOTM=63,LEFTM=0,RIGHTM=131,OVFLINE=NO,SPOOL=YES   C
                PORT=0,SECADDR=06,END=YES
```

***Example 3:*** 5219 printer TERMINAL statement (locally attached).

```
label     TERMINAL   DEVICE=5219,ADDRESS=58,                    C
               ADAPTER=ALPA,PORT=0,SECADDR=01
```

is equivalent to:

```
label     TERMINAL   DEVICE=5219,ADDRESS=58,ADAPTER=ALPA          C
                PAGSIZE=66,LINSIZE=132,CHARSET=USCA,TOPM=3,       C
                BOTM=63,LEFTM=0,RIGHTM=131,OVFLINE=NO,            C
                SPOOL=YES,PORT=0,SECADDR=01,END=YES
```

## ACCA-Type Terminals

A TERMINAL definition statement with DEVICE=ACCA means that the terminal is connected to the Series/1 using an asynchronous communications control adapter (ACCA). ACCA adapters, by feature number, are #1310, #1610, #2091 with #2092, and #2095 with #2096 or with RPQ D02350. Except for #2095 with RPQ D02350, which supports only locally attached 3101s, these adapters support both locally-attached and remote terminals.

***Syntax:***

```
label        TERMINAL     DEVICE=,ADDRESS=,MODE=,PAGSIZE=,
                          LINSIZE=,CODTYPE=,TOPM=,BOTM=,NHIST=,
                          LEFTM=,RIGHTM=,OVFLINE=,LINEDEL=,
                          CHARDEL=,CRDELAY=,COD=,BITRATE=,
                          RANGE=,LMODE=,ADAPTER=,CR=,LF=,ATTN=,
                          PF1=,SCREEN=,PART=,TIMERS=,SPOOL=,END=

 Required:   DEVICE=,ADDRESS=
 Defaults:   PART=1,END=NO,OVFLINE=NO,ATTN=YES,SPOOL=NO
```

**label** Required if ADAPTER=MFA; otherwise optional

| ***Operand*** | ***Description*** |
|---|---|
| **DEVICE=** | ACCA, for an ASCII terminal attached via a 1610 controller, a 2091 controller with 2092 adapter, a 2095 controller with a 2096 adapter, or a 4975-01A ASCII Printer attached via a #2095/2096 or a #1310<br><br>or<br><br>ACCA, for a 3101 Display Terminal in either block or character mode attached via any of the methods above or via the 1310 adapter. |
| **ADDRESS=** | The address (in hexadecimal) of the device. |
| **MODE=** | 3101C, for a 3101 Display Terminal that operates in character mode.<br><br>3101B, for a 3101 Display Terminal that operates in block mode.<br><br>4975-01A, for a 4975-01A ASCII Printer. |
| **PAGSIZE=** | The physical page size (form length) of the I/O medium. Specify a decimal number between 1 and the maximum value which is meaningful for the device. For printers, specify the number of lines per page. For screen devices, specify the size of the screen in lines. This operand is not required for the 3101 Display Terminal in block mode; the system sets PAGSIZE to 24 regardless of your specification. |

# TERMINAL - ACCA

## ACCA-Type Terminals *(continued)*

**CODTYPE=** The transmission code used by the terminal. Specify either ASCII or EBASC (8-bit data interchange code) as in the following table:

| Adapter | | | |
|---|---|---|---|
| 1610 | 2091/2092 | 2095/2096 | 1310 (MFA) |
| EBASC | EBASC | ASCII | ASCII |

For example, if DEVICE=ACCA and the device is connected with a 2095 eight-line controller and a 2096 adapter, specify CODTYPE=ASCII.

Specify ASCII for a 3101 Display Terminal in either block mode or character mode or for a 4975-01A Printer.

**LINSIZE=** The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate (for example, 80 for the 3101 display station in character mode), but the value cannot be increased dynamically.

This operand is not required for the 3101 Display Terminal in block mode; the system sets LINSIZE to 80 regardless of your specification.

**TOPM=** The top margin (a decimal number between zero and PAGSIZE-1) to indicate the top of the logical page within the physical page for the device.

This operand is not required for the 3101 Display Terminal in block mode; the system sets TOPM to 0 regardless of your specification.

**NHIST=** This operand is not required for the 3101 Display Terminal in block mode; the system sets NHIST to 0 regardless of your specification.

**Note:** This operand is meaningful for roll screens only.

**BOTM=** The bottom margin, the last usable line on a page. Its value must be between TOPM+NHIST and PAGSIZE-1. If an output instruction causes the line number to increase beyond this value, then a page eject occurs before the operation is continued.

This operand is not required for the 3101 Display Terminal in block mode; the system sets BOTM to 23 regardless of your specification.

**LEFTM=** The left margin, the character position at which input or output will begin. Specify a decimal value between zero and LINSIZE-1.

This operand is not required for the 3101 Display Terminal in block mode; the system sets LEFTM to 0 regardless of your specification.

## ACCA-Type Terminals *(continued)*

**RIGHTM=** A value (between LEFTM and LINSIZE-1) that determines the last usable character position within a line. Position numbering begins at zero.

This operand is not required for the 3101 Display Terminal in block mode; the system sets RIGHTM to 79 regardless of your specification.

**OVFLINE=** YES, if output lines which exceed the right margin are to be continued on the next line. The default is OVFLINE=NO.

The overflow condition occurs when the system buffer (or a buffer in an application program) becomes full and the application program has taken no action to write the buffer to the device.

**LINEDEL=** A two-digit hexadecimal character that defines the character the operator will enter when he wishes to restart an input line. In some cases, input of this character causes a repeat of the previous output message.

This operand is usually not meaningful for the 3101 Display Terminal in block mode; editing is done by the device with keys such as DELETE and BACKSPACE before the edited characters are sent to the Series/1.

For ACCA terminals attached via the 1610 or 2091 controllers and the 2092 adapter, code in mirror image. For information on how to code this operand for ASCII terminals, refer to "ASCII Transmission Codes" on page IS-182.

**CHARDEL=** A two-digit hexadecimal character which indicates deletion of the previous input character. It is meaningful only for devices whose mode of transmission is one character at a time, as described in the LINEDEL operand.

For ACCA terminals attached via the 1610 or 2091 controllers and the 2092 adapter, enter in mirror image. For further information on how to code this operand for ASCII terminals, refer to "ASCII Transmission Codes" on page IS-182.

**Note:** When CHARDEL= and LINEDEL= values are equal, no translation or editing will occur.

**CRDELAY=** The number of idle times required for a carriage return to complete for teletypewriter devices. If printing occurs during the carriage return, CRDELAY is too small.

**BITRATE=** The rate (in bits per second) that this terminal will be operating. For terminals with switch-selectable speed settings, BITRATE must match the switch setting on the terminal. (Refer to the *IBM 3101 Display Terminal Description*, GA18-2033 for information on switch settings). For best performance on the 3101 in block mode, specify 9600 if you do not use modems or the maximum speed capacity of the modem in use.

# TERMINAL - ACCA

## ACCA-Type Terminals *(continued)*

For the 4975-01A ASCII Printer attached via a Feature Programmable Attachment Card (#2095/2096), specify BITRATE=1200 or 4800. If you attach the printer via a Multifunction Attachment Feature #1310, specify BITRATE=1200 only.

For ACCA terminals, BITRATE=0 may be specified. This bit rate should only be specified if the terminal is attached via the #2095 controller and the #2096 adapter and uses the external clock.

**Note:** The MFA can run only at 1200 bits per second for the 4975-01A ASCII Printer and 1200, 2400, and 9600 bits per second for other terminals.

Default BITRATE is 300 bits per second; the default for MFA is 1200 bits per second.

**RANGE=** Enter HIGH or LOW to match hardware jumper that is installed on the adapter card. The Multifunction Attachment does not have a speed range jumper.

On the 3101 Display Terminal in block mode, specify HIGH for best performance.

Default RANGE is HIGH.

**LMODE=** For ACCA devices, four options are available: RS-422, LOCAL, SWITCHED, or PTTOPT.

**RS-422** For a terminal directly attached to any port of the Multifunction Attachment Feature #1310.

**LOCAL** For a terminal directly attached. For the Multifunction Attachment Feature #1310, the terminal must be attached on the base address only.

**SWITCHED** For a connection that is point-to-point switched. For the Multifunction Attachment Feature #1310, the terminal must be attached on the base address only.

**PTTOPT** For a connection that is point-to-point nonswitched. For the Multifunction Attachment Feature #1310, the terminal must be attached on the base address only.

The LMODE specified should match the jumpers on the controller cards. The Multifunction Attachment does not have jumpers. (See Appendix B, "Customizing Adapters with Hardware Jumpers," on page IS-237 for hardware considerations.)

## ACCA-Type Terminals *(continued)*

**ADAPTER=** One of the following to indicate the ACCA type:

**SINGLE** For an single-line controller (the default)

**TWO** For an eight-line controller with up to two lines active

**FOUR** For an eight-line controller with up to four lines active

**SIX** For an eight-line controller with up to six lines active

**EIGHT** For an eight-line controller with up to eight lines active

**MFA** For a Multifunction Attachment Feature #1310

All multiple-line asynchronous controller/adapter cards (2091/2092 or 2095/2096) must start at a base address ending with X'0' or X'8'. A terminal statement with DEVICE=ACCA must exist for the line at the base address. Furthermore, the terminal defined as the base address must be specified as the first terminal for the multiline controller. The remaining terminals defined on the multiline controller (***if any***) must immediately follow the base address terminal and should be in ascending order by address.

All 3101 terminals attached via the Multifunction Attachment (1310) must specify ADAPTER=MFA.

**COD=** Additional characters, other than the CR=, ATTN=, and LINEDEL= values, that will terminate a READ operation. (COD means change of direction, for example, READ to WRITE.) Code in ASCII mirror image as follows (depending upon device type):

```
COD=11
or
COD=(12,B6,42,B3,..)
```

From one to four COD characters may be entered.

**CR=** The character to be tested to determine if a new line function is to be performed. (Code in mirror image for ACCA terminals attached via the 1610 or 2091 controllers with the 2092 adapter.)

Default CR is B0 for EBASC and 0D for ASCII.

## ACCA-Type Terminals *(continued)*

**LF=** The character to be sent to the terminal when a new line function is to be performed. Code in mirror image for ACCA terminals attached via the 1610 or 2091 controllers with the 2092 adapter. If the same value is coded for LF= as was coded (or defaulted) for CR= then the CR character which terminates an input operation will not be echoed to the terminal; the terminal is assumed to be an auto line-feed device.

Default LF is 50 for EBASC and 0A for ASCII.

**ATTN=** NO, if the attention key and the PF keys are to be disabled for the terminal. Such disabling is then permanent for the generated system.

YES (the default) or ALL, if all attention functions are to be enabled for the terminal.

LOCAL, to limit the attention functions to those defined by ATTNLISTs within programs loaded from the terminal.

NOSYS, to exclude only the system functions ($L, $C, etc.).

NOGLOB, to exclude only the global ATTNLIST functions. (GLOBAL is the ATTNLIST of all programs in the same partition at one time.)

**Note:** This operand can also be entered with a two-digit hexadecimal character for the attention key if the system default is not desired.

The attention key can be redefined with a two-digit hexadecimal character for ASCII terminals.

For terminals attached via the 1610 or 2091 controllers and the 2092 adapter, use mirror image.

For the 3101 Display Terminal in either character or block mode, the system defines the PF8 key as the default attention key. If you do not want the system default, specify two characters (four hexadecimal digits) representing the first and second characters of a 3101 PF key sequence. If only one character (two hexadecimal digits) is coded, the second character defaults to binary zeroes.

(For information on 3101 PF key sequences, refer to *IBM 3101 Display Terminal Description*, GA18-2033.)

For terminals other than the 3101 Display Terminal, the ASCII default is X'1B' (the ESC key). The EBASC default is X'D8'.

## ACCA-Type Terminals *(continued)*

**PF1=** The two-digit hexadecimal character which you want the system to interpret as PF key 1. The system interprets successive values as PF2 and PF3.

For the 3101 Display Terminal, defaults are listed in "Examples and Defaults" on page IS-218.

For the 3101 Display Terminal in either character or block mode, the system defines the PF1 key as the default PF1 key. If you do not want the system default, specify two characters (four hexadecimal digits) representing the first and second characters of a 3101 PF key sequence. The system interprets successive characters as PF2, PF3, .... PF8. If you code only one character (two hexadecimal digits), the system makes the second character binary zeroes.

For a 3101 Display Terminal attached via a 1610 controller or a 2091 controller with a 2092 adapter, use mirror image.

The PF1 ASCII default is 1B61; the EBASC default is D886.

**SCREEN=** YES or ROLL, for screens which are to be operated like a typewriter. For screen devices which are attached through the teletypewriter adapter, YES OR ROLL indicates that the system will pause when a screen-full condition occurs during continuous output.

NO, for hard-copy devices. For 3101 display devices, NO inhibits the pause when the screen fills up (the screen acts as a roll screen).

STATIC, for a full-screen mode of operation. STATIC is valid only for the 3101 Display Terminal in block mode.

**Note:** The initial terminal definition should be STATIC only if the terminal is reserved for data display and data entry operations. Normal system operations, such as those directed to $SYSLOG or those involving the utility programs, assume a roll screen configuration. The application program can define the static screen configuration by means of the ENQT and IOCB instructions described in the *Language Reference*.

**PART=** The partition (1–8) with which the terminal is normally associated. The default is partition 1.

You can change the partition assignment at execution time with the $CP operator command described in the *Operation Guide*.

# TERMINAL - ACCA

## ACCA-Type Terminals *(continued)*

**TIMERS=** The ACCA T1 and T2 values for receive and transmit operations in a sublist format. The timer defaults depend on the LMODE specified. For LOCAL and RS422, the defaults are 1,1,1,1. For PTTOPT, the defaults are 2,2,10,2 and for SWITCHED, they are 2,2,10,300. For example, TIMERS=(4,5,6,7) specifies:

Receive T1 = 4

Receive T2 = 5

Transmit T1 = 6

Transmit T2 = 7

**SPOOL=** YES, to define terminal as a valid spoolable device.

NO (the default), to specify terminal is not a valid spoolable device. However, the spoolable characteristics of the terminal can be redefined at a later time using the $TERMUT1 utility.

**END=** YES, for the last TERMINAL definition statement in a system definition module. The default is END=NO.

### Examples and Defaults

Default values for optional parameters on the TERMINAL definition statement vary with the device type. In the following examples, the default assignments for each device support are shown as if they were explicitly coded in the TERMINAL definition statement. If an operand is not shown, then it is not relevant for the device. Address assignments are for illustration only.

***Example 1:*** ASCII terminal via 1610 controller TERMINAL definition statement.

```
label     TERMINAL  DEVICE=ACCA,ADDRESS=70,PAGSIZE=35,        C
                LINSIZE=80,CODTYPE=EBASC,TOPM=0,BOTM=34,      C
                LEFTM=0,RIGHTM=79,SCREEN=NO,OVFLINE=NO,       C
                CRDELAY=0,BITRATE=300,RANGE=HIGH,             C
                LMODE=PTTOPT,ATTN=YES,ADAPTER=SINGLE,LF=50,   C
                CHARDEL=10,LINEDEL=FE,CR=B0,PART=1,           C
                TIMERS=(2,2,10,2),SPOOL=NO,END=NO
```

The following examples contain the required operands and the default values for defining the 3101 Display Terminal. Address assignments are for illustration only. The default values require that you set space parity in the parity bit selection setup switches. (Refer to Appendix C, "3101 Configuration Information" on page IS-243 and *IBM 3101 Display Terminal Description*, GA18-2033 information on switch settings.)

## ACCA-Type Terminals *(continued)*

***Example 2:*** IBM 3101 in character mode (connected with 1610 single-line controller or 2091 eight-line controller with 2092 four-line adapter).

```
label     TERMINAL   DEVICE=ACCA,ADDRESS=08,MODE=3101C
```

is equivalent to:

```
label    TERMINAL  DEVICE=ACCA,ADDRESS=08,MODE=3101C,           C
               PAGSIZE=35,LINSIZE=80,CODTYPE=EBASC,TOPM=0,      C
               BOTM=34,LEFTM=0,RIGHTM=79,SCREEN=NO,NHIST=0,     C
               OVFLINE=NO,CRDELAY=0,BITRATE=300,RANGE=HIGH,     C
               LMODE=PTTOPT,ATTN=D816,ADAPTER=SINGLE,LF=50,     C
               CHARDEL=10,LINEDEL=FE,CR=B0,PF1=D886,            C
               TIMERS=(2,2,10,2),SPOOL=NO
```

***Example 3:*** IBM 3101 in block mode (connected with 1610 single-line controller or 2091 eight-line controller with 2092 four-line adapter).

```
label    TERMINAL  DEVICE=ACCA,ADDRESS=68,MODE=3101B
```

is equivalent to:

```
label    TERMINAL  DEVICE=ACCA,ADDRESS=68,MODE=3101B,PAGSIZE=24, C
               LINSIZE=80,CODTYPE=EBASC,TOPM=0,BOTM=23,LEFTM=0,  C
               RIGHTM=79,SCREEN=ROLL,NHIST=0,OVFLINE=NO,         C
               CRDELAY=0,BITRATE=300,RANGE=HIGH,LMODE=PTTOPT,    C
               ATTN=D816,ADAPTER=SINGLE,LF=50,CR=B0,PF1=D886,    C
               TIMERS=(2,2,10,2),SPOOL=NO
```

**Note:** When DEVICE=ACCA and you code the MODE operand, the system assumes additional defaults relevant to the 3101 Display Terminal.

The following two examples contain sample values for defining the 3101 Display Terminal when it is connected with the 2095 controller and 2096 adapter. These examples are intended to guide you in coding your TERMINAL definition statements.

The values shown require that you set space parity in the parity bit selection setup switches (refer to the *IBM 3101 Display Terminal Description*, GA18-2033, for information on switch settings). See Appendix C, "3101 Configuration Information" on page IS-243 for recommended switch settings for the 3101 Display Terminal. Address assignments are for illustration only.

# TERMINAL - ACCA

## ACCA-Type Terminals *(continued)*

***Example 4:*** IBM 3101 in character mode (connected with 2095 eight-line controller and 2096 four-line adapter).

```
label     TERMINAL  DEVICE=ACCA,ADDRESS=60,MODE=3101C,               C
                PAGSIZE=35,LINSIZE=80,CODTYPE=ASCII,TOPM=0,          C
                BOTM=34,LEFTM=0,RIGHTM=79,SCREEN=NO,NHIST=0,         C
                OVFLINE=NO,CRDELAY=0,BITRATE=300,RANGE=HIGH,         C
                LMODE=PTTOPT,ATTN=1B68,ADAPTER=FOUR,LF=0A,           C
                CHARDEL=08,LINEDEL=7F,CR=0D,PF1=1B61,                C
                TIMERS=(2,2,10,2),SPOOL=NO
```

***Example 5:*** IBM 3101 in block mode (connected with 2095 eight-line controller and 2096 four-line adapter).

```
label     TERMINAL  DEVICE=ACCA,ADDRESS=61,MODE=3101B,               C
                PAGSIZE=24,LINSIZE=80,CODTYPE=ASCII,                 C
                TOPM=0,BOTM=23,LEFTM=0,RIGHTM=79,                    C
                SCREEN=ROLL,NHIST=0,OVFLINE=NO,CRDELAY=0,            C
                BITRATE=300,RANGE=HIGH,LMODE=PTTOPT,                 C
                ATTN=1B68,ADAPTER=FOUR,LF=0A,CR=0D,PF1=1B61,         C
                TIMERS=(2,2,10,2),SPOOL=NO
```

The following two examples contain sample values for defining the 3101 Display Terminal when it is connected with the #1310 adapter. These examples are intended to guide you in coding your TERMINAL definition statement.

***Example 6:*** IBM 3101 in character mode (connected to a #1310 base address).

```
label     TERMINAL  DEVICE=ACCA,ADDRESS=58,MODE=3101C,               C
                PAGSIZE=35,LINSIZE=80,CODTYPE=ASCII,                 C
                TOPM=0,BOTM=34,LEFTM=0,RIGHTM=79,                    C
                SCREEN=ROLL,NHIST=0,OVFLINE=NO,CRDELAY=0,            C
                BITRATE=1200,LMODE=PTTOPT,ATTN=1B68,LF=0A,           C
                CHARDEL=08,LINEDEL=7F,CR=0D,PF1=1B61,                C
                ADAPTER=MFA,PART=1,TIMERS=(2,2,10,2),                C
                SPOOL=NO,END=NO
```

## ACCA-Type Terminals *(continued)*

***Example 7:*** IBM 3101 in block mode (connected to a #1310 that is not the base address).

```
label     TERMINAL  DEVICE=ACCA,ADDRESS=59,MODE=3101B,             C
                PAGSIZE=24,LINSIZE=80,CODTYPE=ASCII,               C
                TOPM=0,BOTM=23,LEFTM=0,RIGHTM=79,                  C
                SCREEN=ROLL,NHIST=0,OVFLINE=NO,CRDELAY=0,          C
                BITRATE=1200,LMODE=RS422,ATTN=1B68,LF=0A,          C
                CR=0D,PF1=1B61,ADAPTER=MFA,                        C
                TIMERS=(1,1,1,1),SPOOL=NO,END=NO
```

***Example 8:*** The following example contains sample values for defining the 4975-01A Printer when it is connected via the Feature Programmable Attachment (#2095/2096). You must code ADAPTER=MFA if you use an MFA to attach a 4975-01A ASCII Printer.

```
label     TERMINAL  DEVICE=ACCA,ADDRESS=61,BITRATE=1200,           C
                LMODE=PTTOPT,ADAPTER=FOUR,TOPM=3,BOTM=62,          C
                LINSIZE=132,RANGE=HIGH,CODTYPE=ASCII,              C
                PAGSIZE=66,MODE=4975-01A,COD=(11,13,1B),           C
                TIMERS=(12,2,5,2)
```

## TTY-Type Terminals

A TERMINAL definition statement with DEVICE=TTY locally attaches teletypewriter terminals and IBM 3101 Display Terminals to the Series/1 through the Teletypewriter Attachment (feature #7850). Its most frequent use is in transferring ASCII character strings between the Series/1 and a teletypewriter terminal. The most common types of such terminals are keyboard/printer and keyboard/CRT devices.

Devices that may be compatible with the physical transmission methods of the Series/1 Teletypewriter Adapter are available from many vendors; these include Isolated Contact sense, TTL, and EIA. Such devices include terminals that transmit only, or receive only, or transmit only in response to being polled. The devices may not have keyboards for input but may acquire data from bar code scanners or analog or digital input features within the device. The transmission code used by these devices can be alphameric ASCII or any of the 256 possible 8-bit character combinations.

***Syntax:***

```
label      TERMINAL    DEVICE=,ADDRESS=,MODE=,PAGSIZE=,CODTYPE=,
                       LINSIZE=,TOPM=,BOTM=,LEFTM,RIGHTM=,OVFLINE=,
                       LINEDEL=,CHARDEL=,CRDELAY=,ECHO=,CR=,
                       LF=,ATTN=,PF1=,SCREEN=,PART=,SPOOL=,END=

Required:  DEVICE=,ADDRESS=
Defaults:  OVFLINE=NO,ECHO=YES,CR=0D,LF=0A,ATTN=YES,
           SPOOL=NO,PART=1,END=NO
```

| ***Operand*** | ***Description*** |
|---|---|
| **DEVICE=** | TTY, a 3101 Display Terminal in character mode or another ASCII Terminal attached via Teletypewriter Adapter (7850) |
| **ADDRESS=** | The address (in hexadecimal) of the device. |
| **MODE=** | 3101C, for a 3101 Display Terminal that operates in character mode. |
| **PAGSIZE=** | The physical page size (form length) of the I/O medium. Specify a decimal number between 1 and the maximum value which is meaningful for the device. |
| **CODTYPE=** | The transmission code used by the terminal; in this case, CODTYPE= must equal ASCII. |
| **LINSIZE=** | The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate, but the value cannot be increased dynamically. |
| **TOPM=** | The top margin (a decimal number between zero and PAGSIZE-1) to indicate the top of the logical page within the physical page for the device. |

## TTY-Type Terminals *(continued)*

**BOTM=** The bottom margin, the last usable line on a page. Its value must be between TOPM+NHIST and PAGSIZE-1. If an output instruction would cause the line number to increase beyond this value, then a page eject, or wrap to line zero, is performed before the operation is continued.

**LEFTM=** The left margin, the character position at which input or output will begin. Specify a decimal value between zero and LINSIZE-1.

**RIGHTM=** A value (between LEFTM and LINSIZE-1) that determines the last usable character position within a line. Position numbering begins at zero.

**OVFLINE=** YES, if output lines which exceed the right margin are to be continued on the next line. The default is OVFLINE=NO.

The overflow condition occurs when the system buffer (or a buffer in an application program) becomes full and the application program has taken no action to write the buffer to the device.

**LINEDEL=** A two-digit hexadecimal character that defines the character the operator will enter when he wishes to restart an input line. In some cases, input of this character causes a repeat of the previous output message. Refer to "ASCII Transmission Codes" on page IS-182.

**CHARDEL=** A two-digit hexadecimal character which indicates deletion of the previous input character. It is meaningful only for devices whose mode of transmission is one character at a time, as described in the LINEDEL operand.

For further information on how to code this operand for ASCII terminals, refer to "ASCII Transmission Codes" on page IS-182.

**Note:** When CHARDEL= and LINEDEL= values are equal, no translation or editing will occur.

**CRDELAY=** The number of idle times required for a carriage return to complete for teletypewriter devices. If printing occurs during the carriage return, CRDELAY is too small.

**ECHO=** NO, for devices that do not require input characters to be written back (echoed) by the processor for printing.

YES (the default) is appropriate for most devices connected through the teletypewriter adapter. See the LF parameter description regarding suppression of the echo of the CR character.

**CR=** The character to be tested to determine if a new line function is to be performed. The default is CR=0D.

# TERMINAL - TTY

## TTY-Type Terminals *(continued)*

For further information on how to code this operand for ASCII terminals, refer to "ASCII Transmission Codes" on page IS-182.

**LF=** The character to be sent to the terminal when a new line function is to be performed. If the same value is coded for LF= as was coded (or defaulted) for CR= then the CR character which terminates an input operation will not be echoed to the terminal; the terminal is assumed to be an auto line-feed device. The default is LF=0A.

For further information on how to code this operand for ASCII terminals, refer to "ASCII Transmission Codes" on page IS-182.

**ATTN=** NO, if the attention key and the PF keys are to be disabled for the terminal. Such disabling is then permanent for the generated system.

YES (the default) or ALL, if all attention functions are to be enabled for the terminal.

LOCAL, to limit the attention functions to those defined by ATTNLISTs within programs loaded from the terminal.

NOSYS, to exclude only the system functions ($L, $C, etc.).

NOGLOB, to exclude only the global ATTNLIST functions. (GLOBAL is the ATTNLIST of all programs in the same partition at one time.)

**Note:** This operand can also be entered with a two-digit hexadecimal character for the attention key if the system default is not desired.

The attention key can be redefined with a two-digit hexadecimal character for ASCII terminals.

For the 3101 Display Terminal in character mode, the system defines the PF8 key as the default attention key. If you do not want the system default, specify two characters (four hexadecimal digits) representing the first and second characters of a 3101 PF key sequence. If only one character (two hexadecimal digits) is coded, the second character defaults to binary zeroes.

**Note:** The attention key must be uniquely defined so that the hexadecimal digits cannot be returned as the response to a READTEXT statement. If the key is not uniquely defined, the attention routine is entered erroneously.

(For more information on modifying the default attention key, refer to the description of $TERMUT2 utility in *Operator Commands and Utilities Reference.*) (For information on 3101 PF key sequences, refer to *IBM 3101 Display Terminal Description*, GA18-2033.)

## TTY-Type Terminals *(continued)*

**PF1=** The two-digit hexadecimal character which you want the system to interpret as PF key 1. The system interprets successive values as PF2 and PF3.

For the 3101 Display Terminal, defaults are listed in "Examples and Defaults."

For the 3101 Display Terminal in character mode, the system defines the PF1 key as the default PF1 key. If you do not want the system default, specify two characters (four hexadecimal digits) representing the first and second characters of a 3101 PF key sequence. The system interprets successive characters as PF2, PF3, .... PF8. If you code only one character (two hexadecimal digits), the system makes the second character binary zeroes.

**SCREEN=** YES or ROLL, for screens which are to be operated like a typewriter. For screen devices which are attached through the teletypewriter adapter, YES or ROLL indicates that the system will pause when a screen-full condition occurs during continuous output.

NO, for 3101 display devices, will inhibit the pause when the screen fills up (the screen acts as a roll screen).

**PART=** The partition (1–8) with which the terminal is normally associated. The default is partition 1.

You can change the partition assignment at execution time with the $CP operator command described in *Operation Guide*.

**SPOOL=** YES, to define terminal as a valid spoolable device.

NO (the default), to specify terminal is not a valid spoolable device. However, the spoolable characteristics of the terminal can be redefined at a later time using the $TERMUT1 utility.

**END=** YES, for the last TERMINAL statement in a system definition module. The default is END=NO.

### Examples and Defaults

In the following examples, the default assignments for DEVICE=TTY are shown as if they were explicitly coded in the TERMINAL statement. If an operand is not shown, then it is not relevant for the device. Address assignments are for illustration only.

***Example 1:*** ASCII terminal via 7850 adapter TERMINAL statement.

```
label    TERMINAL  DEVICE=TTY,ADDRESS=00,PAGSIZE=35,LINSIZE=80,  C
               CODTYPE=ASCII,TOPM=0,BOTM=34,LEFTM=0,RIGHTM=79,   C
               SCREEN=NO,OVFLINE=NO,LINEDEL=7F,CHARDEL=08,       C
               CRDELAY=0,ECHO=YES,ATTN=YES,CR=0D,LF=0A,SPOOL=NO
```

## TTY-Type Terminals *(continued)*

The following example contains the required operands and the default values for defining the 3101 Display Terminal in character mode. The default values require that you set space parity in the parity bit selection setup switches. (Refer to *IBM 3101 Display Terminal Description*, GA18-2033 and Appendix C, "3101 Configuration Information" on page IS-243 for information on switch settings.)

***Example 2:*** IBM 3101 in character mode (connected with 7850 teletypewriter adapter).

```
label     TERMINAL  DEVICE=TTY,ADDRESS=00,MODE=3101C
```

is equivalent to:

```
label     TERMINAL  DEVICE=TTY,ADDRESS=00,MODE=3101C,PAGSIZE=35,  C
                LINSIZE=80,CODTYPE=ASCII,TOPM=0,BOTM=34,          C
                LEFTM=0,RIGHTM=79,SCREEN=NO,NHIST=0,OVFLINE=NO,   C
                LINEDEL=7F,CHARDEL=08,CRDELAY=0,ECHO=YES,         C
                ATTN=1B68,CR=0D,LF=0A,PF1=1B61,SPOOL=NO
```

**Note:** When DEVICE=TTY, if you code the MODE operand, the system assumes additional defaults relevant to the 3101 Display Terminal.

## Processor-to-Processor

A TERMINAL definition statement with DEVICE=PROC is used when the Series/1 is to communicate with another processor. The Asynchronous Communication Single Line Controller (feature #1610) is the feature used. This allows connecting Series/1-to-Series/1, or Series/1 to any other processor capable of handling the required protocols. As with terminals, ATTENTION signals can be transmitted.

If CODTYPE=EBCDIC is defined on the TERMINAL statement, arbitrary binary data can be transmitted. Set the BITRATE and RANGE parameters in accordance with the hardware jumpers, matching the setting in the other processor. Also, the LINSIZE parameter must have the same value in both processors.

The transmission protocol can be modified to satisfy special requirements by assigning the appropriate values to the CRDELAY and CODTYPE operands.

***Syntax:***

```
label        TERMINAL     DEVICE=,ADDRESS=,CODTYPE=,
                          LINSIZE=,CRDELAY=,BITRATE=,
                          CR=,LF=,RANGE=,END=

Required:    DEVICE=,ADDRESS=
Defaults:    CODTYPE=EBCDIC,LINSIZE=130,CRDELAY=(PROMPT,30000),
             BITRATE=9600,RANGE=HIGH,CR=5B,LF=5B,END=NO
```

***Operand*** ***Description***

**DEVICE=** PROC, processor-to-processor communication.

**ADDRESS=** The address (in hexadecimal) of the device.

**CODTYPE=** The transmission code used by the terminal. Specify either CRSP, EBCD, or EBCDIC as follows. The default is CODTYPE=EBCDIC.

**CRSP** With this option, the #1610 controller is set to PTTC mode (see *Communications Feature Description*) and messages are translated using the CRSP conversion table (PTTC/correspondence code). The communication is restricted to characters, as PTTC mode allows only the transmission of bytes with the seven low-order bits of odd parity. Therefore, XLATE=NO should not be specified on PRINTEXT or READTEXT instructions.

**EBCD** The effect of coding this option is similar to CRSP, except that the EBCD conversion table is used. The EBCD option is recommended for connection to an IBM 5100 or 5110 computer. The 6-bit code must be selected with the Serial I/O feature.

## Processor-to-Processor *(continued)*

**EBCDIC** This option sets the #1610 controller to Eight Bit Coded Data Interchange mode with all change of direction codes equal to X'FF' (see the *Communications Feature Description*). Special protocol provides for transparent exchange of arbitrary binary data. As there are no parity restrictions and only the code X'FF' is recognized as change of direction (indicating EOT, NL or EOSR), all bytes (especially all EBCDIC characters) other than X'FF' are transmitted "as is." Before a message or record is sent, it is scanned for a byte code (other than X'FF') not contained in it. This special code is sent as EOA and every occurring X'FF' in the message or record is replaced by it. On the receiving side, every EOA code is replaced by X'FF'. If a record is larger than 128 bytes, it is divided into appropriate subrecords (length < 128 bytes) to which the procedure can be applied.

**LINSIZE=** The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate, but the value cannot be increased dynamically. The default is LINSIZE=130.

**CRDELAY=** The number of idle times required for a carriage return to complete for teletypewriter devices. If printing occurs during the carriage return, CRDELAY is too small. The default is CRDELAY=PROMPT,30000.

**PROMPT,n** The device support waits before every record (and subrecord) for the EOT prompt character. The time limit is n times 3.33 milliseconds, starting at the end of the previous operation. In response to the EOT, and also at the beginning of every record (and subrecord), an EOA character is sent.

**SP5100,n** The effect of coding this option is identical to the PROMPT mode except that at End of Record, the two characters Line Feed and New Line (X'3B5B') are sent. This is necessary for communication with the IBM 5100 or 5110 running APL or BASIC and using the Serial I/O feature.

**DELAY,n** At the beginning of a message, the device support waits a maximum of one second for the EOT character(s). After each record, a delay of n times 3.33 milliseconds is inserted. This mode might be used to simulate an 2741-like terminal for another processor.

**Note:** When CHARDEL= and LINEDEL= values are equal, no translation or editing will occur.

**BITRATE=** The rate (in bits per second) that this terminal will be operating. The default is BITRATE=9600.

**RANGE=** Enter HIGH or LOW to match hardware jumper that is installed on the adapter card. The default is RANGE=HIGH.

## Processor-to-Processor *(continued)*

**CR=** The character to be tested to determine if a new line function is to be performed.

The default is CR=5B.

**LF=** The character to be sent to the terminal when a new line function is to be performed. If the same value is coded for LF= as was coded (or defaulted) for CR= then the CR character which terminates an input operation will not be echoed to the terminal; the terminal is assumed to be an auto line-feed device.

The default is LF=5B.

**END=** YES, for the last TERMINAL definition statement in a system definition module. The default is END=NO.

### Example and Defaults

In the following example, the default assignments for DEVICE=PROC are shown as if they were explicitly coded in the TERMINAL definition statement. If an operand is not shown, then it is not relevant for this support. Address assignment is for illustration only.

***Example:*** Defining processor to processor communications through the 1610 controller.

```
label     TERMINAL   DEVICE=PROC,ADDRESS=7F
```

is equivalent to:

```
label     TERMINAL   DEVICE=PROC,ADDRESS=7F,CODTYPE=EBCDIC,          C
                 LINSIZE=130,CRDELAY=(PROMPT,30000),BITRATE=9600,    C
                 RANGE=HIGH,CR=5B,LF=5B,END=NO
```

# TERMINAL - Virtual Terminal

## Interprogram Communication - Virtual Terminals

A TERMINAL definition statement with DEVICE=VIRT defines interprogram communication. Refer to the *Event Driven Executive Language Programming Guide* for a description of virtual terminals.

***Syntax:***

```
label        TERMINAL      DEVICE=,ADDRESS=,LINSIZE=,
                           SYNC=,END=

Required:    DEVICE=,ADDRESS=
Defaults:    LINSIZE=80,SYNC=NO,END=NO
```

| ***Operand*** | ***Description*** |
|---|---|
| **DEVICE=** | VIRT for interprogram communication. |
| **ADDRESS=** | The label of the other virtual terminal. |
| **LINSIZE=** | The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate, but the value cannot be increased dynamically. The default is LINSIZE=80. |
| **SYNC=** | YES, if synchronization events will be posted to this virtual terminal. Attempted actions over the virtual channel are indicated in the task control word. YES allows two terminals to synchronize their actions so that when one terminal is writing, the other is reading.<br><br>NO, if you do not want synchronization events posted. NO is the default. |
| **END=** | YES, for the last TERMINAL definition statement in a system definition module. The default is END=NO. |

## Interprogram Communication - Virtual Terminals *(continued)*

### Examples and Defaults

In the following examples, the default assignments for DEVICE=VIRT are shown as if they were explicitly coded in the TERMINAL definition statement. If a parameter is not shown, then it is not relevant for the device. Address assignments are for illustration only.

***Example 1:*** Remote Management Utility using the PASSTHRU function - TERMINAL definition statements.

**Note:** This example shows a line size of 80. The maximum line size value is 254. The names CDRVTA and CDRVTB are required.

```
CDRVTA    TERMINAL   DEVICE=VIRT,ADDRESS=CDRVTB,SYNC=YES

CDRVTB    TERMINAL   DEVICE=VIRT,ADDRESS=CDRVTA

is equivalent to:

CDRVTA    TERMINAL   DEVICE=VIRT,ADDRESS=CDRVTB,SYNC=YES,     C
                LINSIZE=80,END=NO

CDRVTB    TERMINAL   DEVICE=VIRT,ADDRESS=CDRVTA,SYNC=NO,      C
                LINSIZE=80,END=NO
```

***Example 2:*** Virtual terminal TERMINAL definition statements.

```
AAA        TERMINAL   DEVICE=VIRT,ADDRESS=BBB,SYNC=YES

BBB        TERMINAL   DEVICE=VIRT,ADDRESS=AAA

is equivalent to:

AAA        TERMINAL   DEVICE=VIRT,ADDRESS=BBB,LINSIZE=80,     C
                SYNC=YES,END=NO

BBB        TERMINAL   DEVICE=VIRT,ADDRESS=AAA,LINSIZE=80,     C
                SYNC=NO,END=NO
```

# TERMINAL - GPIB

## General Purpose Interface Bus

A TERMINAL definition statement with DEVICE=GPIB defines a General Purpose Interface Bus (GPIB). Refer to the *Communications Guide* for a description of GPIB.

***Syntax:***

```
label      TERMINAL     DEVICE=,ADDRESS=,LINSIZE=,CODTYPE=,
                        ATTN=,SCREEN=,PART=,SPOOL=,END=

Required:  DEVICE=,ADDRESS=
Defaults:  CODTYPE=ASCII,LINSIZE=80,ATTN=YES,SCREEN=NO,
           PART=1,SPOOL=NO,END=NO
```

| ***Operand*** | ***Description*** |
|---|---|
| **DEVICE=** | GPIB, General Purpose Interface Bus (GPIB). |
| **ADDRESS=** | The address (in hexadecimal) of the device. |
| **CODTYPE=** | The transmission code used by the terminal. In this case, specify ASCII. |
| **LINSIZE=** | The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate, but the value cannot be increased dynamically. The default is LINSIZE=80. |
| **ATTN=** | NO, if the attention key and the PF keys are to be disabled for the terminal. Such disabling is then permanent for the generated system. If you do not specify ATTN=, the default is ATTN=YES.<br><br>YES or ALL, if all attention functions are to be enabled for the terminal.<br><br>LOCAL, to limit the attention functions to those defined by ATTNLISTs within programs loaded from the terminal.<br><br>NOSYS, to exclude only the system functions ($L, $C, and so on).<br><br>NOGLOB, to exclude only the global ATTNLIST functions. (GLOBAL is the ATTNLIST of all programs in the same partition at one time.)<br><br>**Note:** This operand can also be entered with a two-digit hexadecimal character for the attention key if the system default is not desired.<br><br>The attention key can be redefined with a two-digit hexadecimal character for ASCII terminals.<br><br>For ASCII terminals other than the 3101 Display Terminal, the default is ASCII X'1B' (the ESC key). The mirror image of X'1B' is X'D8'. |

## General Purpose Interface Bus *(continued)*

**Note:** If the terminal being defined is specified in the HDCOPY= parameter of another terminal, do not code ATTN=NO.

**SCREEN=** YES or ROLL, for screens which are to be operated like a typewriter. For screen devices which are attached through the teletypewriter adapter, YES or ROLL indicates that the system will pause when a screen-full condition occurs during continuous output.

NO (the default), for hard-copy devices.

**PART=** The partition (1–8) with which the terminal is normally associated. The default is partition 1.

You can change the partition assignment at execution time with the $CP operator command described in *Operation Guide*.

**SPOOL=** YES, to define terminal as a valid spoolable device.

NO (the default), to specify terminal is not a valid spoolable device. However, the spoolable characteristics of the terminal can be redefined at a later time using the $TERMUT1 utility.

**END=** YES, for the last TERMINAL statement in a system definition module. The default is END=NO.

### Example and Defaults

In the following example, the default assignments for DEVICE=GPIB are shown as if they were explicitly coded in the TERMINAL statement. If an operand is not shown, then it is not relevant for the device. Address assignment is for illustration only.

***Example:*** General Purpose Interface Bus (GPIB) TERMINAL statement.

```
label    TERMINAL  DEVICE=GPIB,ADDRESS=25
```

is equivalent to:

```
label    TERMINAL  DEVICE=GPIB,ADDRESS=25,LINSIZE=80,       C
               CODTYPE=ASCII,SCREEN=NO,ATTN=YES,PART=1,     C
               SPOOL=NO,END=NO
```

## Series/1-to-Series/1

A TERMINAL definition statement with DEVICE=S1S1 defines the Series/1-to-Series/1 Attachment (RPQ D02241 or D02242). Refer to *Communications Guide* for a description of the attachment.

***Syntax:***

```
label        TERMINAL      DEVICE=,ADDRESS=,LINSIZE=,
                           CHKSUM=,END=

Required:    DEVICE=,ADDRESS=
Defaults:    LINSIZE=80,CHKSUM=16,END=NO
```

| ***Operand*** | ***Description*** |
|---|---|
| **DEVICE=** | S1S1, Series/1-to-Series/1 Attachment (RPQ D02241 or D02242). |
| **ADDRESS=** | The address (in hexadecimal) of the device. |
| **LINSIZE=** | The maximum length of an input or output line for the device. The value of this operand can be less than the maximum which the device can accommodate, but the value cannot be increased dynamically. The default is LINSIZE=80. |
| **CHKSUM=** | The number of data bytes from which you wish the system to generate a checksum total when the Series/1-to-Series/1 Attachment performs data transfer. Specify 0 if you do not want the system to perform error detection. Specify 2, 4, 8, 16, or 32 if you want error detection.<br><br>The default is CHKSUM=16.<br><br>**Note:** If you specify error detection, the data transfer rate is affected. |
| **END=** | YES, for the last TERMINAL statement in a system definition module. The default is END=NO. |

## Series/1-to-Series/1 *(continued)*

### Example and Defaults

In the following example, the default assignments for DEVICE=S1S1 are shown as if they were explicitly coded in the TERMINAL statement. If an operand is not shown, then it is not relevant for the device. Address assignment is for illustration only.

***Example:*** Series/1-to-Series/1 TERMINAL statement.

```
label     TERMINAL   DEVICE=S1S1,ADDRESS=25
```

is equivalent to:

```
label     TERMINAL   DEVICE=S1S1,ADDRESS=25,LINSIZE=80,     C
                CHKSUM=16,END=NO
```

## TIMER - Define System Timer Features

TIMER defines the #7840 Timer Feature to be used as the system timers in the generated system. There are two timers on the #7840 Timer feature card. One is used for time of day recording and the other is used for interval timing. Only one TIMER statement is required to define both timers. When you list out the devices supported by your operating system using $IOTEST (LS), two timers are shown.

This statement is used only for defining the #7840 timer. If the system has a native timer (4952, 4954, and 4956 processors) that is used instead of the #7840 timer feature card, it is not necessary to use this or any other statement. The native timer and the #7840 timer are mutually exclusive.

***Syntax:***

```
blank          TIMER          ADDRESS=

 Required:     ADDRESS=
 Defaults:     None
```

| *Operand* | *Description* |
|---|---|
| **ADDRESS=** | The hexadecimal address of the #7840 Timer Feature. |

***Example:*** Both timers are defined by a single TIMER definition statement.

```
         TIMER     ADDRESS=40
```

# Appendix B. Customizing Adapters with Hardware Jumpers

Each hardware feature has hardware jumpers that are used to customize it. You need to become familiar with these jumpers in order to correctly configure the hardware for your system. Before actual connection of terminals and modems, also refer to *IBM Series/1 Communications Feature Description*, GA34-0028. If your terminal configuration includes the IBM 3101 Display Terminal, see both Appendix C, "3101 Configuration Information" on page IS-243 and *IBM 3101 Display Terminal Description*, GA18-2033.

After the hardware features have been properly customized, you must define the terminals to the Event Driven Executive system using the TERMINAL statement; see Appendix A, "System Definition Statements" on page IS-145.

## ACCA Adapters

Each ACCA adapter feature has hardware jumpers that are used to customize it. Be sure the hardware is configured correctly prior to defining the software interface.

For information on customizing adapters for use with the 3101 Display Terminal, see Appendix C, "3101 Configuration Information."

## ACCA Adapters *(continued)*

Some general rules for hardware jumpers are:

- For direct connect terminals:
  - Data Terminal Ready (DTR) is usually jumpered
  - Request to Send (RTS) is usually jumpered
  - Carrier Detect (CD); jumper only when Request to Send (RTS) is provided by the terminal
- For leased lines using modems:
  - Data Terminal Ready (DTR); jumper only when Event Driven Executive application programs do not control the modem
  - Request to Send (RTS); jumper only if the modem provides a steady Clear to Send (CTS) signal
  - Carrier Detect (CD); jumper only if the modem supports this feature
- For switched lines using modems:
  - Data Terminal Ready (DTR); jumper only when Event Driven Executive application programs do not control the modem
  - Request to Send (RTS); jumper only if the modem provides a steady Clear to Send (CTS) signal
  - Carrier Detect (CD); jumper only if the modem supports this feature

Speed range jumpers should be installed in accordance with instructions in the *Communications Feature Description*.

The Multifunction Attachment (#1310) does not contain hardware jumpers for speed range, DTR, RTS or CD. Required connections are made internally at IPL time according to the configuration for the TERMINAL statement for the device.

## Interprocessor Communications using #1610 Controller

In addition to defining the #1610 controller to the Event Driven Executive with the TERMINAL statement, you should set the hardware jumpers on the attachment according to the *IBM Series/1 Communications Feature Description*, GA34-0028.

For a direct processor interconnection:

- Data Terminal Ready (DTR) is jumpered
- Request To Send (RTS) is jumpered
- Low or High speed range is jumpered depending on the bit rate chosen (100 to 9600 baud).

Be sure to use the right cables for the type of attachments being interconnected. For a direct Series/1 to Series/1 connection, one side should use the Local Communication Cable (feature #2056) and the other should use the EIA Data Set cable (feature #2057) in order to interchange the Receive/Transmit lines: Data Set Ready (DSR)/Data Terminal Ready (DTR) and Request To Send (RTS)/Clear To Send (CTS). The #2056 cable allows attachment to a modem (male 25-pin type D connector); the #2057 cable allows attachment to a terminal (female 25-pin type D connector).

If only one cable type is available, the following lines of the 25-pin type D connectors have to be crossed:

| Pin number (connector 1) | to | Pin number (connector 2) |
|---|---|---|
| 1 | Protective Ground XMT | 1 |
| 2 | Transmit Data (X or T) | 3 |
| 3 | Receive Data (REC) | 2 |
| 4 | Request to Send (RTS) | 5 |
| 5 | Clear to Send (CTS) | 4 |
| 6 | Data Set Ready (DSR) | 20 |
| 7 | Signal Ground | 7 |
| 20 | Data Terminal Ready (DTR) | 6 |

For a Series/1 to IBM 5100 connection, the #2056 cable may be used.

## Terminals Connected Using Digital I/O #1560

Terminal support is provided for digital I/O devices such as the Tektronix[3] 4010 series of display terminals equipped with the General Purpose Parallel Interface (Tektronix Custom Feature Number CM021-0109-03; with cable: CM012-0541-00) or terminals having equivalent hardware interfaces. The software provides addressing logic enabling up to eight terminals to be shared on

[3] Trademark of Tektronix, Inc.

## Terminals Connected Using Digital I/O #1560 *(continued)*

one digital input group and one digital output group, with one process interrupt bit for each terminal.

The parallel interface is intended to connect directly to the integrated digital input/output feature (#1560) or the 4982 nonisolated digital input/output features. This interface consists of a driver and a receiver card, each of which has several selectable options. These options allow you to customize the interface to your requirements. You must refer to the manufacturer's manuals for detailed installation procedures.

The following description is intended only to supplement the manufacturer's manuals and as a guide you in the use of the Event Driven Executive terminal support on the Series/1. The following options should be selected:

| *Receiver Card* | |
|---|---|
| INTR (interrupt) | PROG |
| ADDRESS | 000(0)-111(7) to match TERMINAL definition |
| PERM ADD | OFF |
| PARITY | EVEN |
| DELAY | 3.5-18 (depends on distance) |
| LOGIC SENSE (3) | Set all to LOW<br>HANDSHAKE<br>CONTROL<br>DATA |
| THRESHOLD | +2 volts |
| MASTER OPTION | None |

| *Driver Card* | |
|---|---|
| LOGIC SENSE (4) | Set as shown<br>STATUS HIGH<br>HANDSHAKE HIGH<br>INTERRUPT LOW<br>DATA HIGH |
| INTERRUPT CHANNEL | Use INTR |
| AUX TSUP | OUT |
| ECHO | OUT |
| PARITY | EVEN, BIT 8 IN<br>AB to A, CD to D |

Before the terminal can be used with the computer, some other considerations are necessary. As noted above, the common interrupt line (INTR) must be used. Select the interrupt line (0 – 7) corresponding to the terminal address. If less than eight terminals are attached, some of the interrupt lines will not be used. All digital input and process interrupt lines must be terminated for proper operation. If only one terminal is used, the DI terminations may have been installed by the manufacturer. With multiple terminals, all DI lines and PI lines should be terminated at the computer. A 1000-ohm resistor across the DI and PI inputs is recommended. The BAUD Rate Selection Switch must be in the "stand by" position and the J261 Connector Switch set to "interface".

When the terminal is powered on, it may be necessary to reset the terminal. o reset the terminal, put the LOCAL/LINE switch in LOCAL, back to LINE, and simultaneously press the SHIFT and RESET keys. If the terminal does not respond during normal operation, it may be necessary to perform this sequence to reset the internal circuits.

Since all Event Driven Executive terminal input/output is done with upper case ASCII character codes, the TTY LOCK key should be activated when using the terminal with the Series/1.

The last items which merit special discussion are the GIN mode and the PAGE FULL BREAK strap options on the terminal control card (TC-2). The GIN termination should be set to NONE. Thus, when GIN mode is used, you must press the appropriate key followed by carriage return (CR). The PAGE FULL BREAK termination may be set to either OUT or IN, depending on your preference. If it is IN, the terminal will always stop when a full page condition is reached. You must press the PAGE RESET key in order to continue. If it is OUT, the terminal will automatically go to the home address and continue printing without erasing the screen.

## Multifunction Attachment (#1310)

The Multifunction Attachment (MFA) is supported by both the EDX terminal support I/O instructions and the EDX BSCAM.

The MFA card has four ports for connecting data communications equipment. The #1310 adapter can be connected to the following devices:

- 3101C or 3101B display terminals
- 4975 printers
- a binary synchronous communications line.

The use of the RS-232 interface with the 3101, 4975 or a BSC line requires that the line be connected to Port 0. Port 0 of the MFA can operate in either RS-232 or RS-422 interface mode. Ports 1, 2 and 3 are limited to operations via the RS-422 interface.

The #1310 adapter may be substituted for other asynchronous adapters subject to the limitations on the interface requirements and supported terminal types stated above.

# Notes

# Appendix C. 3101 Configuration Information

The IBM 3101 Display Terminal is supported under the Event Driven Executive in both character and block mode. This appendix presents information to aid you in planning the link between the Series/1 and the 3101.

The 3101 is connected to the Series/1 by the attachment features supported by the Event Driven Executive Version 4. For each attachment and type of interface, it is necessary to set the 3101 switches, have the attachment card physically jumpered, connect the cables, and specify the appropriate TERMINAL statement (if applicable).

With the exception of the #7850 Teletypewriter Adapter, the attachment features can be used with the 3101 in either character or block mode as follows:

| Feature | Feature number | Character mode | Block mode |
|---|---|---|---|
| Teletypewriter Adapter | 7850 | Yes | No |
| Multifunction Attachment | 1310 | Yes | Yes |
| Asynchronous Communications Single Line Controller | 1610 | Yes | Yes |
| Asynchronous Communications 8 Line Controller with 4 Line Adapter | 2091/ 2092 | Yes | Yes |
| Feature Programmable 8 Line Controller with 4 Line Adapter | 2095/ 2096 | Yes | Yes |

**Figure 12. 3101 attachment features**

For each of these attachment features, there are many 3101 configurations available. Refer to "Configuring Your 3101" on page IS-251 for sample configurations for each attachment card option, the cable connections, the 3101 switch settings, and the TERMINAL statements for each interface/attachment.

## Connecting the 3101 to the Series/1

### 3101 Display Terminal in Character Mode

The IBM 3101 Display Terminal (in character mode) can be connected to the Series/1 through five attachment features:

- #7850 teletypewriter adapter
- #1310 adapter
- #1610 controller
- #2091 controller with #2092 adapter
- #2095 controller with #2096 adapter.

In the following discussion, all connections are direct with no intervening modem. For a discussion of leased and switched lines using modems, refer to Appendix B, "Customizing Adapters with Hardware Jumpers" on page IS-237.

#### Attachment via the #7850 Teletypewriter Adapter

***Switch settings:*** For attachment via the #7850 adapter with an EIA interface, the 3101 setup switches may be set as follows:

| Group 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | | | X | | | | X | |
| off | X | X | | X | X | X | | X |

| Group 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | | | | | | | | |
| off | X | X | X | X | X | X | X | X |

| Group 3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | X | | X | X | | | | |
| off | | X | | | X | X | X | X |

| Group 4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | X | | | X | X | | | X |
| off | | X | X | | | X | X | |

***Attachment options:*** The input selection jumpers for the #7850 with an EIA interface should be set to 010 indicating EIA with input interpreted as minus=data mark. In the switch settings above, the Group 4 3101 setup switch settings indicate a speed of 9600 bps. The #7850 rate selection jumpers must be set to 1111 to indicate the same speed to the adapter.

The switch settings and attachment options correspond to the configurations numbered 1 and 2 in Figure 17 on page IS-254.

## Connecting the 3101 to the Series/1 *(continued)*

***Cable connections:*** Figure 13 shows the 3101 (character mode) attachment with the #7850 teletypewriter adapter.

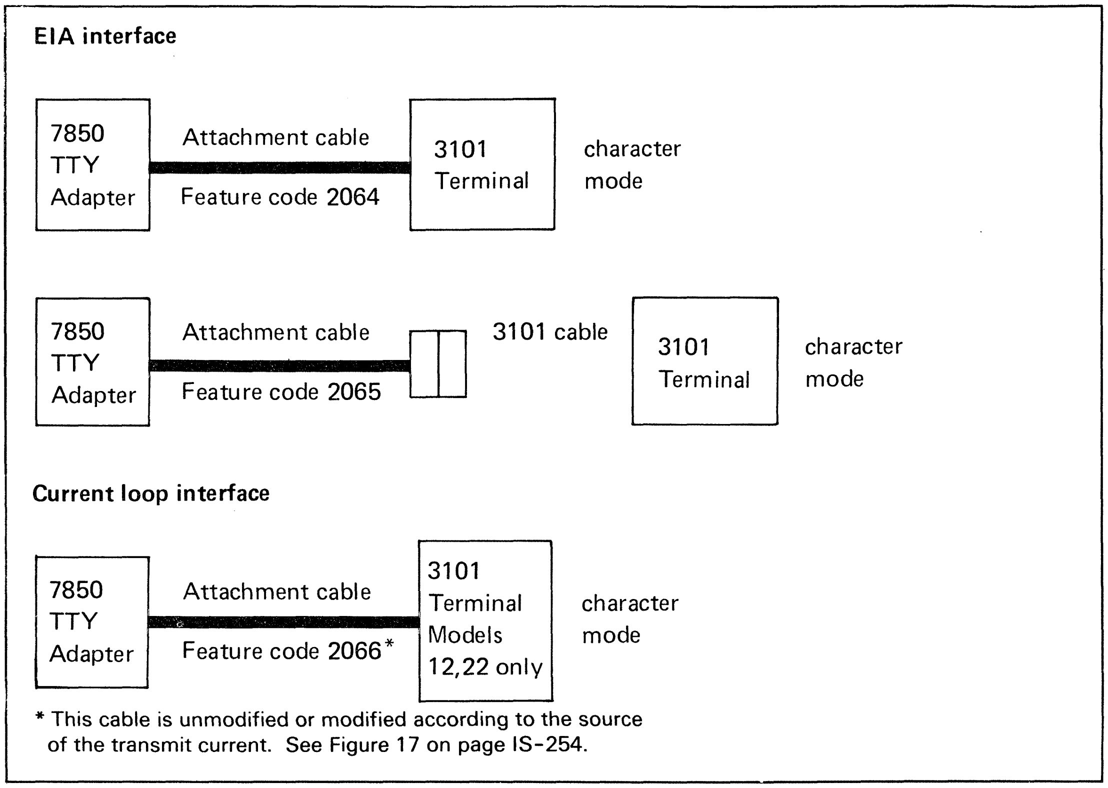


**Figure 13. 3101 terminal with #7850 adapter**

### Attachment via #1310, #1610, #2091 with #2092, or #2095 with #2096

***Switch settings:*** For attachment via the #1610 controller, the #2091 controller with #2092 adapter, or the #2095 controller with #2096 adapter, the 3101 setup switches may be set as follows:

| Group 1 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | | X | X | X | | | X | |
| off | X | | | | X | X | | X |

| Group 2 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | | | | | | | | |
| off | X | X | X | X | X | X | X | X |

| Group 3 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | X | | X | X | | | | |
| off | | X | | | X | X | X | X |

| Group 4 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | X | | | X | X | | | X |
| off | | X | X | | | X | X | |

These switch settings and "Attachment options:" on page IS-246 correspond to the configurations numbered 4, 5, and 6 in Figure 17 on page IS-254.

The switch settings for the #1310 are the same except that switch 3 of group 1 must be in the "off" (RS-422) position if the 3101 terminal is not connected to Port 0. A 3101 attached to Port 0 of a #1310 can operate via either the RS-232 or RS-422A interface. Only 3101 model 23 supports both block mode and the RS-422A interface. Model 13 supports the RS-422A interface but not block mode.

The following points should be considered when setting the 3101 setup switches for direct connect character mode operation:

| | |
|---|---|
| Group 1, switch 1 | Set for character mode operation |
| Group 1, switch 4 | Set for PRTS (permanent request to send) |
| Group 1, switch 6 & 7 | Set for CR (carriage return) as the line turnaround character; the system uses CR as a default line turnaround character for ACCA devices |
| Group 1, switch 8 | Set for mono case. User application programs may use dual case if desired. |
| Group 2, switch 1 | Set for two stop bits for the Event Driven Executive |
| Group 2, switch 2 & 3 | Set for space parity; the system uses space parity for default control characters for ACCA devices |

***Attachment options:*** The jumpers for the #1610 controller, the #2091 controller with #2092 adapter, and the #2095 controller with #2096 should have Carrier Detect, Data Terminal Ready, and Request to Send jumpered on. Also, the HIGH or LOW speed option must be jumpered to reflect the speed set in the 3101 setup switches. In the switch settings above, the speed is 9600 bps. The RANGE and BITRATE operands on the TERMINAL definition statement must also be compatible with the jumpers and 3101 setup switches.

In addition, for the #2095/#2096 the EIA/TTY jumpers must be properly set to reflect your physical configuration as either an RS-232C (EIA) or current loop (TTY) interface.

The #1310 adapter does not have speed range, DTR RTS or CD jumpers. However, the BITRATE operand on the TERMINAL configuration statement must be compatible with the 3101 setup switches.

***Cable connections:*** See Figure 15 on page IS-249 when your 3101 is attached through the #1610 or #2091/2092.

### Operator Input and Internal Code Considerations

Special considerations that must be given to operator input and internal code representation are summarized in Figure 14 on page IS-247 .

| Operator function | Key on 3101 in character mode | Characters received in the Series/1 with Space Parity set in the 3101 setup switches | | |
|---|---|---|---|---|
| | | Device=ACCA | | Device=TTY |
| | | #1610 or #2091 with #2092 | #2095 with #2096 | #7850 |
| | | EBASC | ASCII | ASCII |
| ATTENTION | PF8 | X'D816B0' | X'1B680D' | X'1B680D' |
| ENTER | ↵ (Key above SEND key) | X'B0' | X'0D' | X'0D' |
| BACKSPACE (character delete) | ← (top row, not bottom row) | X'10' | X'08' | X'08' |
| LINE DELETE | DEL | X'FE' | X'7F' | X'7F' |

The ECHO=NO or PROTECT=YES operands on the READTEXT instruction (for suppression of input text) has no effect when the 3101 is attached via the #1310 adapter, the #1610 controller, the #2091 controller with #2092 adapter, or the #2095 controller with #2096 adapter.

### Special Considerations for 3101C Use with Half Duplex Modems

While the majority of the 3101 set-up switches remain unchanged when using half duplex modems, there are some special requirements for these configurations. The PRTS/CRTS switch must be in the CRTS (controlled request to send) or OFF position. The ESC key will no longer function as the attention key; instead, any PF key may be used as the attention key.

These differences are necessary to allow the 3101 to adhere to the line turnaround protocol observed by half duplex modems.

## Connecting the 3101 to the Series/1 *(continued)*

### 3101 Display Terminal in Block Mode

The IBM 3101 Display Terminal (in block mode) can be connected to the Series/1 via four attachments:

- the #1310 adapter
- the #1610 controller
- the #2091 controller with #2092 adapter
- the #2095 controller with #2096 adapter

#### Switch Settings

For attachment of the 3101 through these attachment features, the 3101 setup switches may be set as follows:

Group 1

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | X | X | X | X | | | X | |
| off | | | | | X | X | | X |

Group 2

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | | | | X | | | | |
| off | X | X | X | | X | X | X | X |

Group 3

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | X | | | | | | | |
| off | | X | X | X | X | X | X | X |

Group 4

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| on | X | | | X | X | | | X |
| off | | X | X | | | X | X | |

These switch settings and "Attachment Options" on page IS-249 correspond to the configurations numbered 23, 25, and 26 in Figure 18 on page IS-258.

The switch settings for the #1310 are the same except that switch 3 of group 1 must be in the "off" (RS-422) position if the 3101 terminal is not connected to Port 0. A 3101 model 13 or 23 attached to Port 0 of a #1310 can operate via either the RS-232 or RS-422A interface. Only 3101 model 23 supports both block mode and the RS-422A interface.

The following points should be taken into consideration when setting the 3101 setup switches for block mode operation:

| | |
|---|---|
| Group 1, switch 1 | Set for block mode operation. |
| Group 1, switch 4 | Set for PRTS (permanent request to send) for full duplex modem. |
| Group 1, switch 6 & 7 | Set for CR (carriage return) as the line turnaround character; the system uses CR as a default line turnaround character for ACCA devices. |
| Group 1, switch 8 | Set for mono case. Most IBM system utility programs require the mono case switch setting. User application programs may use dual case if desired. |
| Group 2, switch 1 | Set for two stop bits for the Event Driven Executive. |
| Group 2, switch 2 & 3 | Set for space parity; the system uses space parity for default control characters for ACCA devices. |

Group 2, switch 4 — Set for Send Line Option so that pressing the SEND key activates the Send Line function. With this switch setting, the system defines the SEND key as the enter key for the 3101 in block mode.

Group 2, switch 6 — Set for Null Suppress Off so that input fields are always of a known length.

### Attachment Options

The jumpers for the #1610 controller, the #2091 controller with #2092 adapter, and the #2095 controller with #2096 adapter should have Carrier Detect, Data Terminal Ready, and Request to Send jumpered on unless the configuration uses a modem. Also, the HIGH or LOW speed option must be jumpered to reflect the speed set in the 3101 setup switches. In the switch settings above, the speed is 9600 bps. The RANGE and BITRATE operands on the TERMINAL definition statement must also be compatible with the jumpers and 3101 setup switches.

In addition, for the #2095/2096, EIA/TTY should be jumpered for either an EIA interface or a current loop (TTY) interface.

The #1310 does not have speed range, DTR, RTS, or CD jumpers. However, the BITRATE operand of the TERMINAL definition statement must be compatible with the 3101 setup switches.

### Cable Connections

Figure 15 shows the 3101 (character or block mode) attachment with the #1610 controller or the #2091 controller and the #2092 adapter. Figure 16 on page IS-250 shows the 3101 (character or block mode) attachment with the #1310, #2095 controller with the #2096 adapter (EIA interface), and the #2095 with RPQ D02350.

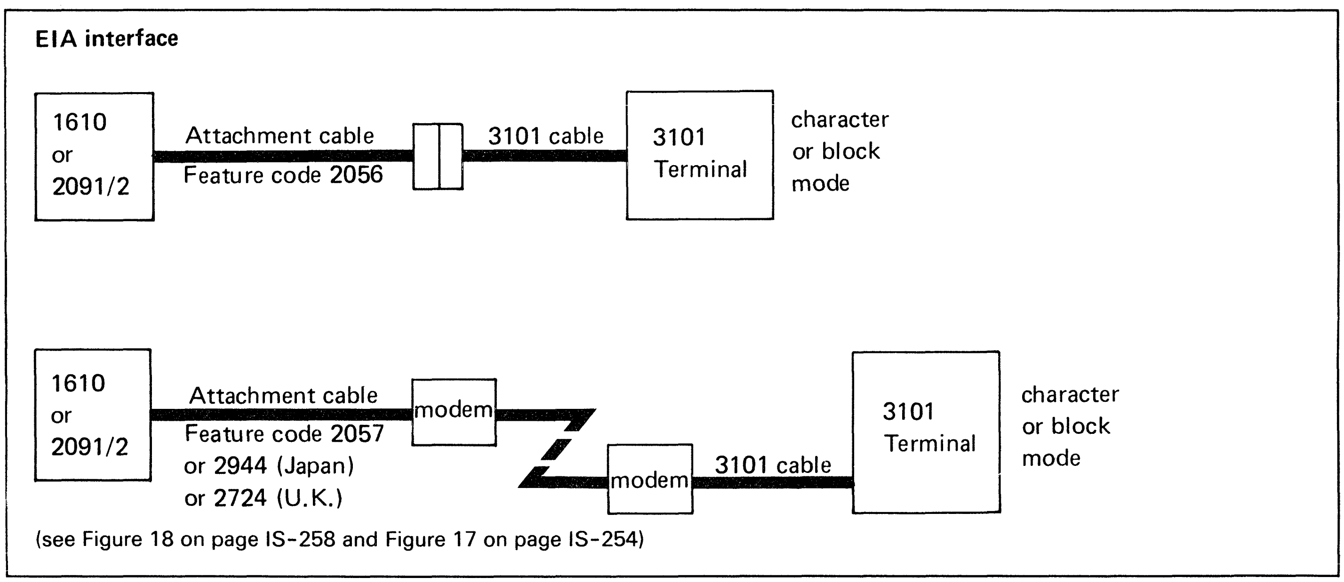


**Figure 15. 3101 terminal with #1610 or #2091/#2092**

# 3101 Configuration Information

## Connecting the 3101 to the Series/1 *(continued)*

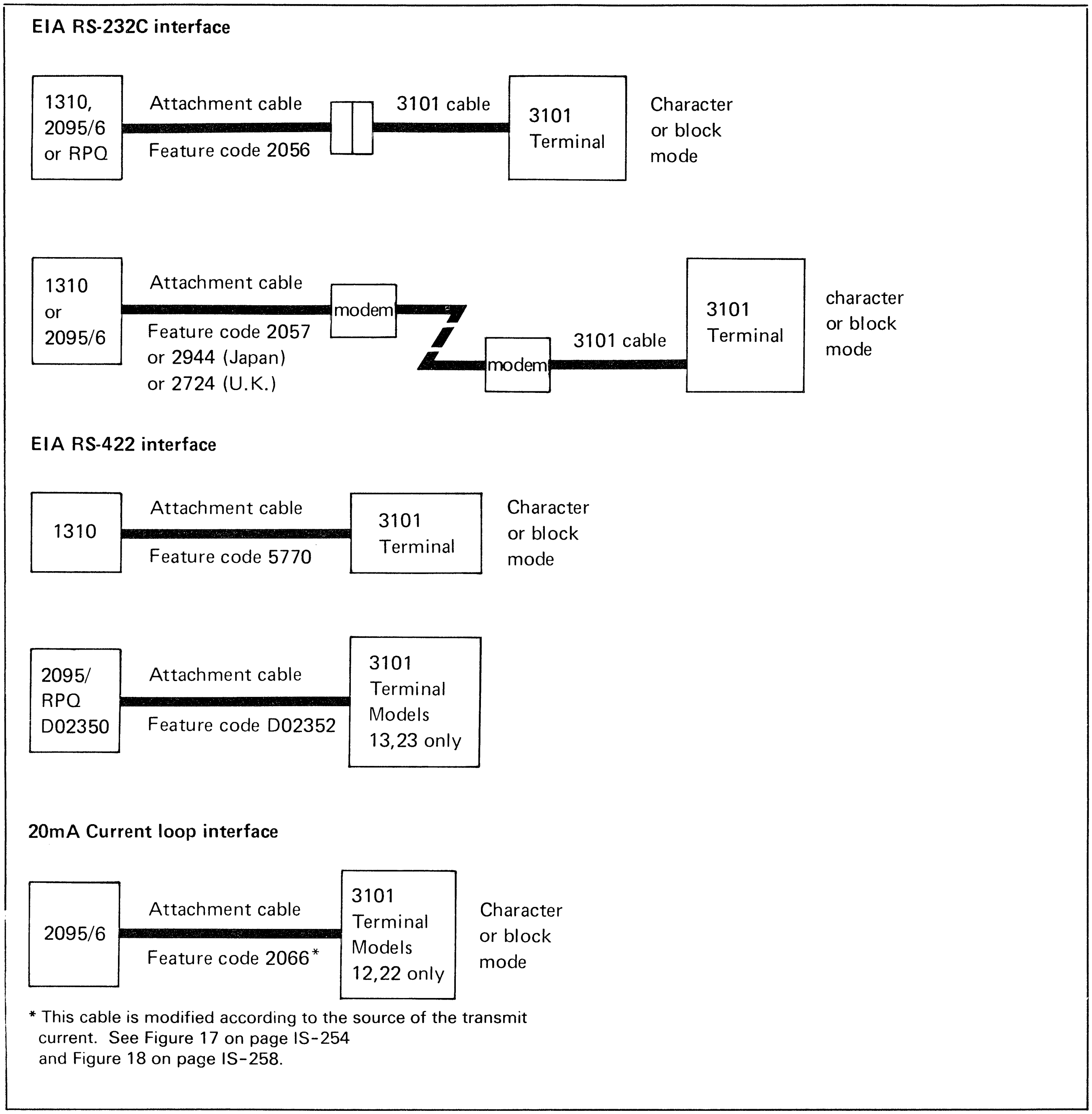


**Figure 16. 3101 terminal with #1310, #2095/#2096 and #2095/RPQ D02350**

### Operator Input and Internal Code Considerations

For the 3101 Display Terminal in block mode, the system defines the SEND key as the enter key (with the Send Line Option setup switch set so that the SEND key acts as the Send Line key). In addition, the system default for the Attention key is the PF8 key.

When the 3101 is connected via the #2095/#2096 attachment, pressing the PF8 key places the value X'1B68' into Series/1 storage (with space parity set, and with CR set as the line turnaround character in the setup switches).

When the 3101 is connected via the #1610 or #2091/#2092 attachment, pressing the PF8 key places the value X'D816' into Series/1 storage (with space parity set, and with CR set as the line turnaround character in the setup switches).

## Configuring Your 3101

To aid you in configuring your 3101, two figures are presented. Figure 17 on page IS-254 shows 22 configurations for the 3101 in character mode; Figure 18 on page IS-258 shows 17 configurations for the 3101 in block mode.

The individual configurations are sequentially numbered starting with the first configuration in Figure 17 and concluding with the configurations in Figure 18. The configuration numbers appear in the left margin on the even numbered page and in the right margin on the odd numbered page of the charts. These numbers can be used when referring to a particular configuration.

Select the appropriate figure based upon the transmission mode (character or block) of your 3101. Locate the appropriate entry in the figure based upon the type of interface and the Series/1 attachment feature. You can now read across the figure to find the:

- Series/1 attachment feature used for a specific interface
- Attachment options of the attachment feature
- Feature code and part number of the Series/1 cable
- Part number of the 3101 cable
- 3101 models supported by a specific configuration
- 3101 switch setting for a specific configuration
- TERMINAL definition statements specified at system generation corresponding to a specific configuration.

## Configuring Your 3101 *(continued)*

Determine the type of interface and the attachment feature installed in your system. Communicate the attachment options required to your IBM Customer Engineer during Series/1 or attachment feature installation. He will install the appropriate options on the attachment feature card. You specify the appropriate TERMINAL definition statement and set the 3101 setup switches according to the type of configuration.

While the configurations shown in Figure 17 and Figure 18 are typical, they have been chosen for illustrative purposes only. There may be other 3101 configurations depending on the attachment feature and type of interface appropriate for your particular application.

Be sure to consider the numbered notes indicated in the column headings of each chart. These numbers correspond to the list of notes immediately following the charts.

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## Configuring Your 3101 *(continued)*

| | Type of interface | | Series/1 attachment features | Attachment options (jumpers): Typical device address | Range (bitrate for 7850) | Request to send | Data terminal ready | Carrier detect | TTY-EIA | Input select | Isolated non-isolated | Attachment cable: Feature code | Part number or equivalent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Notes 1-3 | Notes 2-3 | Note 3 | | | | | | Note 4 | |
| (1) | Local | EIA RS232C | 7850 TTY | 00 | 9600 (Jumper= 1111) | – | – | – | – | EIA-Minus =Data Mark (Jumper= 010) | Not used | 2064 | 1632924 |
| (2) | | | 7850 TTY | 00 | 9600 (Jumper= 1111) | – | – | – | – | EIA-Minus =Data Mark (Jumper= 010) | Not used | 2065 | 4411751 |
| (3) | | | 1310 MFA | 58 | – | – | – | – | – | – | | 2056 | 1632211 |
| (4) | | | 1610 Single line control ACCA | 08 | High (Jumper= Medium) | On | On | On | – | – | – | 2056 | 1632211 |
| (5) | | | 2091/2092 Multi-line ACCA | 60 | High | On | On | On | – | – | – | 2056 | 1632211 |
| (6) | | | 2095/2096 Feature programmable multi-line | 68 | High | On | On | – | EIA | – | – | 2056 | 1632211 |
| (7) | | EIA 422 | 1310 MFA | 58 | – | – | – | – | – | – | – | 5770 | 6844552 |
| (8) | | | 2095 with RPQ D02350 | 68 | High | On | On | On | – | – | – | D02352 | 6844552 |
| (9) | | Current loop (3101 supplied current) | 7850 TTY | 00 | 9600 (Jumper= 1111) | – | – | – | – | Contact sense closed =data mark (Jumper= 000) | Isolated no jumper (Jumper= 0) | 2066 Un-modified | 6839455 Pins: A07-17 A03-18,B05-07 A01-25, 15-23 24-1 |
| (10) | | | 2095/2096 Feature programmable multi-line | 68 | High | On | On | On | TTY | – | – | 2066 Modified | 6839455 Pins: A04-17,A01-B01 B05-18,A03-B03 B04-25,A05-07 15-23, 1-24 |
| (11) | | Current loop (attachment supplied current) | 7850 TTY | 00 | 9600 (Jumper= 1111) | – | – | – | – | Contact sense closed =data mark (Jumper= 000) | Non-ilosated (Jumper= 1) | 2066 Modified | 6839455 Pins: A02-15,A03-24 B01-25,B05-17 |
| (12) | | | 2095/2096 Feature programmable multi-line | 68 | High | On | On | On | TTY | – | – | 2066 Modified | 6839455 Pins: B06-25,A07-A04 B05-24,B07-B04 A06-17,A01-B01 A05-15,A03-B03 |
| (13) | | Current loop (3101 and attachment both supply current) | 7850 TTY | 00 | 9600 (Jumper= 1111) | – | – | – | – | Contact sense closed =data mark (Jumper =000) | Isolated no jumper (Jumper =0) | 2066 Modified | 6839455 Pins: A01-25,A02-15 A03-18,B05-17 1-24 |
| (14) | | | 2095/2096 Feature programmable multi-line | 68 | High | On | On | On | TTY | – | – | 2066 Modified | 6839455 Pins: A06-17,A04-A07 A05-15,A01-B01 B05-18,A03-B03 B04-25, 1-24 |

**Figure 17 (Part 1 of 4). Configuration matrix for 3101 in character mode**

| Direct attach or modem | 3101 Cable part number | 3101 Model supported | 3101 Switch settings corresponding to type of configuration (1 = On, 0 = Off) | | | | Terminal configuration statements corresponding to the type of configuration | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Group 1 | Group 2 | Group 3 | Group 4 | | | |
| | Note 5 | Note 6 | Note 7 | | | | Note 8 | | |
| Direct | – | 10,12,13<br>20,22,23 | 0010 0010 | 0000 0000 | 1011 0000 | 1001 1001 | TERMINAL | DEVICE=TTY,ADDRESS=00,MODE=3101C | (1) |
| Direct | 5640736 | 10,12,13<br>20,22,23 | 0010 0010 | 0000 0000 | 1011 0000 | 1001 1001 | TERMINAL | DEVICE=TTY,ADDRESS=00,MODE=3101C | (2) |
| Direct | 5640736 | 10,12,13<br>20,22,23 | 0111 0010 | 0000 0000 | 1011 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=58,ADAPTER=MFA, C<br>BITRATE=9600,LMODE=LOCAL,MODE=3101C | (3) |
| Direct | 5640736 | 10,12,13<br>20,22,23 | 0111 0010 | 0000 0000 | 1011 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=08,MODE=3101C, C<br>BITRATE=9600,RANGE=HIGH | (4) |
| Direct | 5640736 | 10,12,13<br>20,22,23 | 0111 0010 | 0000 0000 | 1011 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=60,MODE=3101C, C<br>BITRATE=2400,ADAPTER=FOUR, C<br>RANGE=HIGH | (5) |
| Direct | 5640736 | 10,12,13<br>20,22,23 | 0111 0010 | 0000 0000 | 1011 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,MODE=3101C, C<br>CODTYPE=ASCII,BITRATE=9600,ATTN =1B68, C<br>LF=OA,CR=0D,PF1=1B61,ADAPTER=FOUR, C<br>RANGE=HIGH | (6) |
| Direct | – | 13,23 | 0101 0010 | 0000 0000 | 1011 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=58,ADAPTER=MFA, C<br>BITRATE=9600,LMODE-RS422,MODE=3101C | (7) |
| Direct | – | 13,23 | 0101 0010 | 0000 0000 | 1011 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,ADAPTER=EIGHT, C<br>CODTYPE=ASCII,BITRATE=9600, C<br>LMODE=LOCAL,MODE=3101C | (8) |
| Direct | – | 12,22 | 0000 0010 | 0000 0000 | 1011 0000 | 1001 1001 | TERMINAL | DEVICE=TTY,ADDRESS=00,MODE=3101C | (9) |
| Direct | – | 12,22 | 0101 0010 | 0000 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,MODE=3101C, C<br>CODTYPE=ASCII,BITRATE=9600,ATTN=1B68, C<br>LF=0A,CR=0D,PF1=1B61,ADAPTER=FOUR, C<br>RANGE=HIGH | (10) |
| Direct | – | 12,22 | 0000 0010 | 0000 0000 | 1011 0000 | 1001 1001 | TERMINAL | DEVICE=TTY,ADDRESS=00,MODE=3101C | (11) |
| Direct | – | 12,22 | 0101 0010 | 0000 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,MODE=3101C, C<br>CODTYPE=ASCII,BITRATE=9600,ATTN=1B68, C<br>LF=0A,CR=0D,PF1=1B61,ADAPTER=FOUR, C<br>RANGE=HIGH | (12) |
| Direct | – | 12,22 | 0000 0010 | 0000 0000 | 1011 0000 | 1001 1001 | TERMINAL | DEVICE=TTY,ADDRESS=00,MODE=3101C | (13) |
| Direct | – | 12,22 | 0101 0010 | 0000 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,MODE=3101C, C<br>CODTYPE=ASCII,BITRATE=9600,ATTN=1B68, C<br>LF=0A,CR=0D,PF1=1B61,ADAPTER=FOUR, C<br>RANGE=HIGH | (14) |

**Figure 17 (Part 2 of 4). Configuration matrix for 3101 in character mode**

# 3101 Configuration Information

## Configuring Your 3101 *(continued)*

| | Type of interface | | Series/1 attachment features | Attachment options (jumpers): Typical device address | Range (bitrate for 7850) | Request to send | Data terminal ready | Carrier detect | TTY-EIA | Input select | Isolated non-isolated | Attachment cable: Feature code | Part Number or equivalent |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Notes 1-3 | Notes 2-3 | Note 3 | | | | | | Note 4 | |
| (15) | **Remote** | **EIA RS232C (Full duplex modem non-switched)** | 1610 Single line control ACCA | 08 | High (Jumper= medium) | On | On | On | – | – | – | 2057 or<br>2944 (Japan)<br>2724 (U.K.) | 1632208<br>1632919<br>1727744 |
| (16) | **Remote** | **EIA RS232C (Full duplex modem non-switched)** | 2091/2092 Multi-line ACCA | 60 | High | On | On | On | – | – | – | 2057 or<br>2944 (Japan)<br>2724 (U.K.) | 1632208<br>1632919<br>1727744 |
| (17) | **Remote** | **EIA RS232C (Full duplex modem non-switched)** | 2095/2096 Feature programmable multi-line | 68 | High | On | On | On | EIA | – | – | 2057 or<br>2944 (Japan)<br>2724 (U.K.) | 1632208<br>1632919<br>1727744 |
| (18) | **Remote** | Half-duplex only | 1310 MFA | 58 | – | – | – | – | – | – | – | 2057 or<br>2944 (Japan)<br>2724 (U.K.) | 1632208<br>1632919<br>1727744 |
| (19) | **Remote** | **EIA RS232C (Full duplex modem switched)** | 1610 Single line control ACCA | 08 | High (Jumper= medium) | Off | Off | Off | – | – | – | 2057 or<br>2944 (Japan)<br>2724 (U.K.) | 1632208<br>1632919<br>1727744 |
| (20) | **Remote** | **EIA RS232C (Full duplex modem switched)** | 2091/2092 Multi-line ACCA | 60 | High | Off | Off | Off | – | – | – | 2057 or<br>2944 (Japan)<br>2724 (U.K.) | 1632208<br>1632919<br>1727744 |
| (21) | **Remote** | **EIA RS232C (Full duplex modem switched)** | 2095/2096 Feature programmable multi-line | 68 | High | Off | Off | Off | EIA | – | – | 2057 or<br>2944 (Japan)<br>2724 (U.K.) | 1632208<br>1632919<br>1727744 |
| (22) | **Remote** | Half-duplex only | 1310 MFA | 58 | – | – | – | – | – | – | – | 2057 or<br>2944 (Japan)<br>2724 (U.K.) | 1632208<br>1632919<br>1727744 |

**Figure 17 (Part 3 of 4). Configuration matrix for 3101 in character mode**

# Configuring Your 3101 *(continued)*

| Direct attach or modem | 3101 Cable part number | 3101 Model supported | 3101 Switch settings corresponding to type of configuration (1 = On, 0 = Off) | | | | Terminal configuration statements corresponding to the type of configuration | |
|---|---|---|---|---|---|---|---|---|
| | | | Group 1 | Group 2 | Group 3 | Group 4 | | |
| | Note 5 | Note 6 | Note 7 | | | | Note 8 | |
| Modem | 5640736 | 10,12,13<br>20,22,23 | 0111 0010 | 0000 0000 | 1011 0000 | 0101 1001 | TERMINAL DEVICE=ACCA,ADDRESS=08,MODE=3101C, C<br>BITRATE=1200,RANGE=HIGH | (15) |
| Modem | 5640736 | 10,12,13<br>20,22,23 | 0111 0010 | 0000 0000 | 1011 0000 | 0101 1001 | TERMINAL DEVICE=ACCA,ADDRESS=60,MODE=3101C, C<br>BITRATE=1200,ADAPTER=FOUR, C<br>RANGE=HIGH | (16) |
| Modem | 5640736 | 10,12,13,<br>20,22,23, | 0111 0010 | 0000 0000 | 1011 0000 | 0101 1001 | TERMINAL DEVICE=ACCA,ADDRESS=68,MODE=3101C C<br>CODTYPE=ASCII,BITRATE=1200,ATTN=1B68, C<br>LF=0A,CR=0D,PF1=1B61,ADAPTER=FOUR,<br>RANGE=HIGH | (17) |
| Modem | 5640736 | 10,12,13<br>20,22,23 | 0111 0010 | 0000 0000 | 1011 0000 | 0101 1001 | TERMINAL DEVICE=ACCA,ADDRESS=58, C<br>ADAPTER=MFA,MODE=3101C | (18) |
| Modem | 5640736 | 10,12,13<br>20,22,23 | 0111 0010 | 0000 0000 | 1011 0000 | 0101 1001 | TERMINAL DEVICE=ACCA,ADDRESS=08,MODE=3101C, C<br>BIRATE=1200,LMODE=SWITCHED, C<br>RANGE=HIGH | (19) |
| Modem | 5640736 | 10,12,13<br>20,22,23 | 0111 0010 | 0000 0000 | 1011 0000 | 0101 1001 | TERMINAL DEVICE=ACCA,ADDRESS=60,MODE=3101C, C<br>BITRATE=1200,LMODE=SWITCHED, C<br>ADAPTER=FOUR,RANGE=HIGH | (20) |
| Modem | 5640736 | 10,12,13<br>20,22,23 | 0111 0010 | 0000 0000 | 1011 0000 | 0101 1001 | TERMINAL DEVICE=ACCA,ADDRESS=68,MODE=3101C, C<br>CODTYPE=ASCII,BITRATE=1200,ATTN=1B68, C<br>LF=0A,CR=0D,PF1=1B61,ADAPTER=FOUR, C<br>RANGE=HIGH,LMODE=SWITCHED | (21) |
| Modem | 5640736 | 10,12,13<br>20,22,23 | 0111 0010 | 0000 0000 | 1011 0000 | 0101 1001 | TERMINAL DEVICE=ACCA,ADDRESS=58,MODE=3101C, C<br>LMODE=SWITCHED,ADAPTER=MFA | (22) |

**Figure 17 (Part 4 of 4). Configuration matrix for 3101 in character mode**

## Configuring Your 3101 *(continued)*

| | Type of interface | | Series/1 attachment features | Attachment options (jumpers) | | | | | | | | Attachment cable | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Typical device address | Range (bitrate for 7850) | Request to send | Data terminal ready | Data carrier detect | TTY-EIA | Input select | Isolated non-isloated | Feature code | Part Number or equivalent |
| | | | | Notes 1-3 | Notes 2-3 | Note 3 | | | | | | Note 4 | |
| (23) | Local | EIA RS232C | 1610 Single line control ACCA | 08 | High (Jumper= medium) | On | On | On | – | – | – | 2056 | 1632211 |
| (24) | | | 1310 MFA | 58 | – | – | – | – | – | – | – | 2056 | 1632211 |
| (25) | | | 2091/2092 Multi-line ACCA | 60 | High | On | On | On | – | – | – | 2056 | 1632211 |
| (26) | | | 2095/2096 Feature programmable multi-line | 68 | High | On | On | On | EIA | – | – | 2056 | 1632211 |
| (27) | | EIA RS422 | 1310 MFA | 58 | – | – | – | – | – | – | – | 5770 | 6844552 |
| (28) | | | 2095 with RPQ D02350 | 68 | High | On | On | On | EIA | – | – | D02352 | 6844552 |
| (29) | | Current loop (3101 supplied current) | 2095/2096 Feature programmable multi-line | 68 | High | On | On | On | TTY | – | – | 2066 Modified | 6839455 Pins: A04-17,A01-B01 B05-18,A03-B03 A05-7, 15-23 B04-25, 1-24 |
| (30) | | Current loop (attachment supplied current) | 2095/2096 Feature programmable multi-line | 68 | High | On | On | On | TTY | – | – | 2066 Modified | 6839455 Pins: B06-25,A07-A04 B05-24,B07-B04 A06-17,A01-B01 A05-15,A03-B03 |
| (31) | | Current loop (3101 and attachment both supply current) | 2095/2096 Feature programmable multi-line | 68 | High | On | On | On | TTY | – | – | 2066 Modified | 6839455 Pins: A06-17,A04-A07 A05-15,A01-B01 B05-18,A03-B03 B04-25, 1-24 |

**Figure 18 (Part 1 of 4). Configuration matrix for 3101 in block mode**

| Direct attach or modem | 3101 Cable part number | 3101 Model supported | 3101 Switch settings corresponding to type of configuration (1 = On, 0 = Off) | | | | Terminal configuration statements corresponding to the type of configuration | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Group 1 | Group 2 | Group 3 | Group 4 | | | |
| | Note 5 | Note 6 | Note 7 | | | | Note 8 | | |
| Direct | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=08,MODE=3101B, C<br>BITRATE=9600,RANGE=HIGH | (23) |
| Direct | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=58,MODE=3101B, C<br>BITRATE=9600,ADAPTER=MFA,LMODE=LOCAL | (24) |
| Direct | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=60,MODE=3101B, C<br>BITRATE=2400,ADAPTER=FOUR, C<br>RANGE=HIGH | (25) |
| Direct | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,MODE=3101B, C<br>CODTYPE=ASCII,BITRATE=9600,ATTN=1B68, C<br>LF=0A,CR=0D,PF1=1B61,ADAPTER=FOUR, C<br>RANGE=HIGH | (26) |
| Direct | – | 13,23 | 1101 0010 | 0001 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=58,MODE=3101B, C<br>BITRATE=9600,ADAPTER=MFA, C<br>LMODE=RS422 | (27) |
| Direct | – | 13,23 | 1101 0010 | 0001 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,MODE=3101B, C<br>BITRATE=9600,ADAPTER=EIGHT, C<br>LMODE=LOCAL,CODTYPE=ASCII | (28) |
| Direct | – | 22 | 1101 0010 | 0001 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,MODE=3101B, C<br>CODTYPE=ASCII,BITRATE=9600,ATTN=1B68, C<br>LF=0A,CR=0D,PF1=1B61,ADAPTER=FOUR, C<br>RANGE=HIGH | (29) |
| Direct | – | 22 | 1101 0010 | 0001 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,MODE=3101B, C<br>CODTYPE=ASCII,BITRATE=9600,ATTN=1B68, C<br>LF=0A,CR=0D,PF1=1B61,ADAPTER=FOUR, C<br>RANGE=HIGH | (30) |
| Direct | – | 22 | 1101 0010 | 0001 0000 | 1000 0000 | 1001 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,MODE=3101B, C<br>CODTYPE=ASCII,BITRATE=9600,ATTN=1B68, C<br>LF=0A,CR=0D,PF1=1B61,ADAPTER=FOUR, C<br>RANGE=HIGH | (31) |

**Figure 18 (Part 2 of 4). Configuration matrix for 3101 in block mode**

# 3101 Configuration Information

## Configuring Your 3101 *(continued)*

| | Type of interface | | Series/1 attachment features | Attachment options (jumpers) | | | | | | | | Attachment cable | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Typical device address | Range (bitrate for 7850) | Request to send | Data terminal ready | Data carrier detect | TTY-EIA | Input select | Isolated non-isolated | Feature code | Part Number or equivalent |
| | | | | Notes 1-3 | Notes 2-3 | Note 3 | | | | | | Note 4 | |
| (32) | **Remote** | **EIA RS232C (Full duplex modem non-switched)** | 1610 Single line control | 08 | High (Jumper= medium) | On | On | On | – | – | – | 2057 or 2944 (Japan) 2724 (U.K.) | 1632208 1632919 1727744 |
| (33) | | Half-duplex only | 1310 MFA | 58 | – | – | – | – | – | – | – | 2057 or 2944 (Japan) 2724 (U.K.) | 1632208 1632919 1727744 |
| (34) | | | 2091/2092 Multi-line ACCA | 60 | High | On | On | On | – | – | – | 2057 or 2944 (Japan) 2724 (U.K.) | 1632208 1632919 1727744 |
| (35) | | | 2095/2096 Feature programmable multi-line | 68 | High | On | On | On | EIA | – | – | 2057 or 2944 (Japan) 2724 (U.K.) | 1632208 1632919 1727744 |
| (36) | | **EIA RS232C (Full duplex modem switched)** | 1610 Single line control | 08 | High (Jumper= medium) | Off | Off | Off | – | – | – | 2057 or 2944 (Japan) 2724 (U.K.) | 1632208 1632919 1727744 |
| (37) | | Half-duplex only | 1310 MFA | 58 | – | – | – | – | – | – | – | 2057 or 2944 (Japan) 2724 (U.K.) | 1632208 1632919 1727744 |
| (38) | | | 2091/2092 Multi-line ACCA | 60 | High | Off | Off | Off | – | – | – | 2057 or 2944 (Japan) 2724 (U.K.) | 1632208 1632919 1727744 |
| (39) | | | 2095/2096 Feature programmable multi-line | 68 | High | Off | Off | Off | EIA | – | – | 2057 or 2944 (Japan) 2724 (U.K.) | 1632208 1632919 1727744 |

**Figure 18 (Part 3 of 4). Configuration matrix for 3101 in block mode**

# Configuring Your 3101 *(continued)*

| Direct attach or modem | 3101 Cable part number | 3101 Model supported | 3101 Switch settings corresponding to type of configuration (1 = On, 0 = Off) | | | | Terminal configuration statements corresponding to the type of configuration | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Group 1 | Group 2 | Group 3 | Group 4 | | | | |
| | Note 5 | Note 6 | Note 7 | | | | Note 8 | | | |
| Modem | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 0101 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=08,MODE=3101B,<br>BITRATE=1200,RANGE=HIGH | C | (32) |
| Modem | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 0101 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=58,MODE=3101B,<br>ADAPTER=MFA | C | (33) |
| Modem | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 0101 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=60,MODE=3101B,<br>BITRATE=1200,ADAPTER=FOUR,<br>RANGE=HIGH | C<br>C | (34) |
| Modem | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 0101 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,MODE=3101B,<br>CODTYPE=ASCII,BITRATE=1200,ATTN=1B68,<br>LF=0A,CR=0D,PF1=1B61,ADAPTER=FOUR,<br>RANGE=HIGH | C<br>C<br>C | (35) |
| Modem | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 0101 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=08,MODE=3101B,<br>BITRATE=1200,LMODE=SWITCHED,<br>RANGE=HIGH | C<br>C | (36) |
| Modem | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 0101 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=58,MODE=3101B,<br>LMODE=SWITCHED,ADAPTER=MFA | C | (37) |
| Modem | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 0101 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=60,MODE=3101B,<br>BITRATE=1200,LMODE=SWITCHED,<br>ADAPTER=FOUR,RANGE=HIGH | C<br>C | (38) |
| Modem | 5640736 | 20,22,23 | 1111 0010 | 0001 0000 | 1000 0000 | 0101 1001 | TERMINAL | DEVICE=ACCA,ADDRESS=68,MODE=3101B,<br>CODTYPE=ASCII,BITRATE=1200,<br>LMODE=SWITCHED,ATTN-1B68,LF=0A,<br>CR=0D,PF1-1B61,ADAPTER=FOUR,<br>RANGE=HIGH | C<br>C<br>C<br>C | (39) |

**Figure 18 (Part 4 of 4). Configuration matrix for 3101 in block mode**

## Configuration Matrix Notes

1. The device addresses shown in Figure 17 on page IS-254 and Figure 18 on page IS-258 are typical. For additional information on device addresses, see the *IBM Series/1 Configurator*, GA34-0042.

   **Note:** The attachment feature device address jumpered on the attachment card must agree with the ADDRESS= parameter of the TERMINAL definition statement specified during system generation. For a description of the TERMINAL definition statement, see Appendix A, "System Definition Statements" on page IS-145.

2. Speed range adapter jumpers differ between attachment features. The following figure shows the speed range options that must be jumpered for a specific attachment feature. In the figure, N/A = no medium speed jumper on the #2092 and #2096; no high speed jumper on the #1610; no speed jumpers on the #1310.

| Feature | Speed range (bits/second) | Low speed jumper | Medium speed jumper | High speed jumper |
|---|---|---|---|---|
| #7850 Teletypewriter Adapter | Bitrate of 110-9600 | - | - | - |
| #1610 Asynchronous Communications Single Line Controller | 110-1200<br>300-9600 | Yes<br>- | -<br>Yes | N/A<br>N/A |
| #2092 Asynchronous Communications Four Line Adapter | 110-1200<br>300-2400 | Yes<br>- | N/A<br>N/A | -<br>Yes |
| #2096 Feature Programmable Four Line Adapter | 110-1200<br>300-9600 | Yes<br>- | N/A<br>N/A | -<br>Yes |
| #1310 Multifunction Attachment | 1200-9600 | N/A | N/A | N/A |

**Figure 19. Speed range jumper options**

3. The following information refers to the attachment options:

   a. The #7850 TTY attachment feature card does not require speed range selection. However, a specific rate selection (BITRATE) between 110 and 9600 bits per second (bps) must be selected by the use of jumpers on this card.

b. In all cases where speed range is selectable, the adapter range jumpered must correspond to the RANGE= parameter specified in the TERMINAL definition statement. Note, however, that the #1310 does not have physical speed (BITRATE) jumpers. Refer to the *Machine Logic Diagrams* for specific adapter requirements.

Total system throughput is dependent on the system configuration as follows:

a. The #1610 Asynchronous Communications Single-Line Controller feature can control one line per feature with speeds ranging from 110 to 9600 bps.

b. The #2091 Asynchronous Communications 8-Line Controller feature controls one or two 2092 Asynchronous Communications 4-Line Adapter feature (up to four lines per feature). Speeds from 110 to 2400 bps are supported by the Event Driven Executive with a maximum of 2400 bps on all eight lines.

c. The #2095 Feature-Programmable 8-Line Communications Controller feature supports up to two #2096 Feature-Programmable 4-Line Communication Adapter features (up to four line per feature). Speeds from 110 to 9600 bps are supported by the Event Driven Executive. Aggregate throughput is 64000 bps at 12 bits per character.

For additional information on speed settings for the above mentioned attachment features, see the *IBM Series/1 Customer Site Preparation Manual*, GA34-0050.

4. For additional information regarding adapter jumper requirements, see the *Machine Logic Diagrams* or the *IBM Series/1 Communication Features Theory Diagrams*, SY34-0059.

5. The cable part numbers referenced in Figure 45 and Figure 46 are engineering change sensitive and are subject to to revision. Refer to the *IBM Series/1 Customer Site Preparation Manual*, GA34-0050, for additional cabling information.

6. Cable bill of material (B/M) 5640736 can be ordered with the 3101 Models 10 (AAS110) and 20 (AAS210). For Models 12, 13, 22, and 23, you must order this cable separately.

7. For additional information regarding attachments and configuration requirements of the 3101, see the *Event Driven Executive Language Programming Guide*.

## Configuration Matrix Notes *(continued)*

8. The 3101 Group 4 switch settings will vary with different communication line speeds (baud rates). The following table lists the Group 4 switch settings for the baud rates supported by the 3101.

| Baud rate | Group 4 |
|---|---|
| 100 | 0000 0000 |
| 150 | 0001 0001 |
| 200 | 0010 0010 |
| 300 | 0011 0011 |
| 600 | 0100 0100 |
| 1200 | 0101 0101 |
| 1800 | 0110 0110 |
| 2400 | 0111 0111 |
| 4800 | 1000 1000 |
| 9600 | 1001 1001 |

**Figure 20. 3101 supported baud rates and group 4 switch settings**

For additional information regarding the 3101 setup switches and interface support provided for the 3101, see the *IBM 3101 Display Terminal Description*, GA18-2033.

9. For a description of the TERMINAL definition statement, see the Appendix A, "System Definition Statements" on page IS-145.

    a. For illustrative purposes, the RANGE= parameter in the 3101 configuration matrices is coded as HIGH to emphasize that the RANGE= parameter must equal the SPEED RANGE option jumper on the attachment feature. When specifying your TERMINAL definition statement, RANGE=HIGH does not need to be coded as it is the default.

    b. For DEVICE=ACCA, you can modify the timer values at sysgen time by using the TIMERS parameter of the TERMINAL statement and a list of 4 hexidecimal numbers set to the value desired.

    c. If you have specified LMODE=SWITCHED on the TERMINAL configuration statement for your 3101 Display Terminal, or specified (or defaulted) LMODE=PTTOPT for a leased line connection with modems, you may need to modify the pre and post transmit timers in the DCB that is contained in the CCB for this terminal.

For LMODE=SWITCHED, the generated value of the timer 2 transmit word is X'012C'; for LMODE=PTTOPT, the generated value of the timer 2 transmit word is X'0002'. You can obtain the address of the CCB from the link edit map of your generated system. The timer 2 transmit word can be located by subtracting X'005E' from the CCB address.

Depending on the modem and line speed (bit rate) selected, you may have to patch the timer 2 transmit word to a higher value. If you do not know the proper value for your modem and line speed, try a high value and then successively lower values for the timer 2 transmit word.

## Configuration Matrix Notes *(continued)*

Following is an example of patching the timer 2 transmit word of the DCB in the CCB of an ACCA terminal. In this example, the entry point address of the CCB of the terminal named ACCA08 is X'18E6' as shown in the following sample link edit map.

```
    .
    .
ENTRY    $SYSLOG      0F06
ENTRY    $SYSLOGA     10E0
ENTRY    $SYSPRTR     12C4
ENTRY    MPRINTER     14DC
ENTRY    TTY00        16D4
ENTRY    ACCA08       18E6
ENTRY    ACCA18       1BB8
ENTRY    MLTA60       1DB8
ENTRY    MLTA61       1FCA
    .
    .
```

The timer 2 transmit word is located at address X'18E6' minus X'005E' or X'1888' in the generated system.

The following is a sample of the assembled object code containing the timer 2 transmit word to be altered.

```
  .
  .
  .
1872    2004 0000 0000 0000 0000
187C    0000 0002 1460 0002 0002
1886    000A 012C 0000 0000 0000
1890    0000 001D 1FFE B0B0 B0B0
  .
  .
  .
```

## Configuration Matrix Notes *(continued)*

Use $DISKUT2 to patch the timer 2 transmit word from X'012C' to X'0200' as follows:

```
> $L $DISKUT2
$DISKUT2      46P,00:00:00, LP= 8F00

USING VOLUME GD3101

COMMAND (?): PA
PGM OR DS NAME: $EDXNUC
$EDXNUC IS A PROGRAM OF HEX SIZE 00003B7E
ADDRESS:  1888
HOW MANY WORDS? 1
(D)EC, (E)BCDIC OR (H)EX? H

NOW IS:
 1888     012C                |.....)      |

ENTER DATA: 0200

NEW DATA:
 1888     0200                |.....¬       |

OK? Y
PATCH COMPLETE
ANOTHER PATCH? N

COMMAND (?): N
$DISKUT2 ENDED
```

After completing the previous procedure, the timer 2 transmit word is as follows:

```
   .
   .
   .
 1872    2004 0000 0000 0000 0000
 187C    0000 0002 1460 0002 0002
 1886    000A 0200 0000 0000 0000
 1890    0000 001D 1FFE B0B0 B0B0
   .
   .
   .
```

For additional information about the DCB and the timer 2 transmit word, see Asynchronous Communications in the *IBM Series/1 Communications Features Description*, GA34-0028.

# Appendix D. Supervisor Module Names (CSECTS)

This appendix contains the names of all the object modules you can include in your supervisor. The first column lists the names of entry points into specific object modules. The second column lists the names of the object module to which the entry point is associated. Each entry point can be referenced by other object modules within your supervisor.

After you generate your supervisor, check the $XPSLINK link map to see if you have any unresolved EXTRNs. An unresolved EXTRN is caused by a supervisor object module referencing an entry point within another supervisor object module that is not included in your supervisor. Locate the entry point that corresponds to the unresolved EXTRN. The associated module name indicates whether or not you must modify the EDXDEFS or LINKCNTL data set. A module name of $EDXDEF signifies that you must correct an existing definition statement or that you failed to code a required definition statement in the EDXDEFS data set. All other module names signify which supervisor object module must be included in the LINKCNTL data set. Modify the appropriate data set and run the $JOBUTIL procedure again to regenerate your supervisor.

**Note:** Following each occurrence of $EDXDEF is the name of the definition statement that is either in error or missing.

# Supervisor Module Names (CSECTS)

| Entry Point | Object Module |
|---|---|
| $$EXIT | DISKINIT |
| $A | RLOADER |
| $ACLOSE | D4969A |
| $ACTIVE | RLOADER |
| $ADPINIT | INITMODS |
| $ADPOPEN | INITMODS |
| $ATT1024 | $D1024 |
| $AUTOINT | INITMODS |
| $BITS | EDXALU |
| $BLOCKCT | $EDXDEF (SYSTEM) |
| $BONOFF | EDXALU |
| $BSCADDR | EDXSYS |
| $BSCADS | XPSPART |
| $BSCAINT | INITMODS |
| $BSCFDDB | $EDXDEF (BSCLINE) |
| $BUFF | $EDXTIO |
| $CANCEL | RLOADER |
| $CFATTN | $EDXTIO |
| $CFINIT1 | INITMODS |
| $CFINIT2 | INITMODS |
| $CFPARM | EDXSYS |
| $CN | RLOADER |
| $COMPADR | EDXALU |
| $COMPCNT | EDXALU |
| $COMPE | EDXALU |
| $COMPNE | EDXALU |
| $CP | EDXSVCX |
| $CVTADS | XPSPART |
| $DDBC | $EDXDEF |
| $DISKADS | XPSPART |
| $DISKINT | INITMODS |
| $DMDDB | EDXSYS |
| $DMVOL | EDXSYS |
| $DPEND | $EDXTIO |
| $DSBIODA | DISKINIT |
| $DSBLIB | DISKINIT |
| $DSBVOL | DISKINIT |
| $DSDCEA | DISKINIT |
| $DSIOERR | DISKINIT |
| $DSKINT1 | INITMODS |
| $DSKINT2 | INITMODS |
| $DSKPOST | $DISKIO$ |
| $DSNFND | DISKINIT |
| $DSNVTOC | DISKINIT |
| $D49624A | $D49624 |
| $EDXINIT | EDXINIT1 |
| $EDXPTCH | $EDXDEF (SYSTEM) |
| $EXEC | EDXALU |
| $EXIODDB | $EDXDEF (EXIO) |
| $EXIOINT | INITMODS |
| $FINDE | EDXALU |
| $FINDNE | EDXALU |
| $FLTADS | XPSPART |
| $FRSTACB | EDXSYS |
| $HOSTINT | INITMODS |
| $IAMQCB | EDXSYS |
| $INITMOD | $EDXDEF (SYSTEM) |

| Entry Point | Object Module |
|---|---|
| $INITPRT | $EDXDEF (SYSTEM) |
| $IOUS | $EDXDEF (SYSTEM) |
| $IPLHOOK | EDXSYS |
| $IPLVOL | EDXSYS |
| $LOADINT | INITMODS |
| $LOADIN2 | INITMODS |
| $LOGIA | SYSLOG |
| $LOGIA | NOSYSLOG |
| $LOGPARM | EDXSYS |
| $LOGTSK | SYSLOG |
| $LOGTSK | NOSYSLOG |
| $MAPAREA | $EDXDEF (SYSTEM) |
| $MEMSIZE | $EDXDEF (SYSTEM) |
| $MFAINIT | INITMODS |
| $MFAOPEN | INITMODS |
| $MSGBUF | FULLMSG |
| $MSGBUF | MINMSG |
| $NUMPART | $EDXDEF (SYSTEM) |
| $PARTSZE | $EDXDEF (SYSTEM) |
| $PGMCINT | INITMODS |
| $PHYSTG | $EDXDEF (SYSTEM) |
| $PRINT2 | $EDXTIO |
| $QIOADS | XPSPART |
| $SBIOADS | XPSPART |
| $SBIOINT | INITMODS |
| $SBPITAB | EDXSYS |
| $SEGINIT | EDXINIT1 |
| $SFLIST | EDXSYS |
| $SLOGIA | SYSLOG |
| $SLOGIA | NOSYSLOG |
| $SLOGPRM | SYSLOG |
| $SLOGPRM | NOSYSLOG |
| $SLOGTSK | SYSLOG |
| $SLOGTSK | NOSYSLOG |
| $START | EDXSYS |
| $STORAGE | $EDXDEF (SYSTEM) |
| $STORINT | INITMODS |
| $SVCBCTL | EDXSYS |
| $SVCIBUF | $EDXDEF (SYSTEM) |
| $SVCLSB | EDXSVCX |
| $SVCSIA | EDXSVCX |
| $SVCSTOP | EDXSVCX |
| $SYSCOM | $EDXDEF (SYSTEM) |
| $SYSLOG | $EDXDEF (TERMINAL) |
| $SYSLOGA | $EDXDEF (TERMINAL) |
| $SYSLOGB | $EDXDEF (TERMINAL) |
| $SYSPRTR | $EDXDEF (TERMINAL) |
| $TAPEINT | INITMODS |
| $TESTADR | EDXSYS |
| $TESTCOM | $DBUGNUC |
| $TIMEINT | INITMODS |
| $TIMRTBL | EDXSYS |
| $TIOADS | XPSPART |
| $TPDDB | EDXSYS |
| $TPDDB1 | TPCOM |
| $TPDVADR | $EDXDEF |
| $TPIA | TPCOM |

| | |
|---|---|
| $TRCLSB | EDXSTART |
| $TRCSIA | $DBUGNUC |
| $TRMINIT | INITMODS |
| $TRMOPEN | INITMODS |
| $USRATT1 | $EDXTIO |
| $USRATT2 | $EDXTIO |
| $USRATT3 | $EDXTIO |
| $XPSBCTL | EDXSYS |
| $XPSHEAD | EDXSYS |
| $XPSINIT | EDXINIT1 |
| $XPSTABL | EDXSYS |
| $XTSK | X21CMD |
| $X21IA | $X21IA |
| $4013INT | INITMODS |
| $4978INT | INITMODS |
| $4980INIT | INITMODS |
| $4980INT | INITMODS |
| $4980OPN | INITMODS |
| $4980OPN | INITMODS |
| ##ZERO## | EDXSYS |
| ##ZERO## | XPSSYS |
| #ACLOSE | D4969A |
| #ATTN10 | D49624 |
| #ATTN10A | D4963A |
| #ATTN35 | D49624 |
| #ATTN40 | D49624 |
| #ATTN50 | D4966A |
| #ATTN51 | D4966A |
| #ATTN55A | D4966A |
| #ATT1024 | $D1024 |
| #BSCENTR | #BSCAM |
| #BSCIA | #BSCAM |
| #BSCIORT | #BSCAM |
| #BSCSTRT | #BSCAM |
| #CMDSETU | EDXALU |
| #CMDSTUP | EDXALU |
| #CTLXFER | EDXTIO |
| #CURCTL | EDXTIO |
| #DELRT | DISKIO |
| #DEQBSC | #BSCAM |
| #DEQT | EDXTERMQ |
| #DISKCHN | DISKIO |
| #DISKRW | DISKIO |
| #DISKTBL | DISKTBL |
| #DQTERMS | EDXTERMQ |
| #DQTERMS | NOTIO |
| #DQTRMIN | EDXTERMQ |
| #DQTRMIN | NOTIO |
| #DSKCAC | D4963A |
| #DSKER13 | DISKIO |
| #DSKIO00 | DISKIO |
| #DSKIO99 | $DISKIO |
| #DSKPOST | $DISKIO |
| #D69ATTN | D4969A |
| #D69ERR | D4969A |
| #EBBICVT | EDXTIO |
| #ENDATTN | EDXTIO |
| #ENQT | EDXTERMQ |
| #FLIHPST | $D4969A |
| #FLIH04 | $DISKIO$ |
| #FLIH36A | D49624 |
| #FLIH54 | D49624 |
| #GETVAL2 | EDXTIO |
| #GETVAL4 | EDXTIO |
| #IAVIRT | #IOSVIRT |
| #IFB | EDXALU |
| #IFDW | EDXALU |
| #IFTEST | EDXALU |
| #IFTEST1 | EDXALU |
| #IFW | EDXALU |
| #IOGPIB | #IOSGPIB |
| #IOSPEND | #IOSPOOL |
| #IOSPWR | #IOSPOOL |
| #IOSTERM | EDXTERMQ |
| #IOSTERM | #IOSTERM |
| #IOVIRT | #IOSVIRT |
| #IO4973 | IOS4974 |
| #IO4974 | IOS4974 |
| #IO4975 | IOS4974 |
| #IO4978 | IOS4979 |
| #IO4979 | IOS4979 |
| #IO5219 | IOS4974 |
| #IO5224 | IOS4974 |
| #IO5225 | IOS4974 |
| #KBTASK | EDXTIO |
| #MESSAGE | FULLMSG |
| #MESSAGE | MINMSG |
| #MSGBUF | FULLMSG |
| #NOP | EDXALU |
| #NXTCMDA | $EDXTIO |
| #OPNCLS | D4969A |
| #PRSKSP | EDXTIO |
| #PRTEXT | EDXTIO |
| #PRTNUM2 | EDXTIO |
| #PRTNUM4 | EDXTIO |
| #PWRAM80 | PWRM80 |
| #QUESTON | EDXTIO |
| #QUEUEIO | #QUEUEIO |
| #QUTRMIN | EDXTERMQ |
| #RDGPIB | #IOSGPIB |
| #RDTEXT | EDXTIO |
| #RDTEXTL | EDXTIO |
| #SAI | #SBAI |
| #SAIA | #SBAI |
| #SAIS | #SBAI |
| #SAIX | #SBAI |
| #SAO | #SBAO |
| #SAOA | #SBAO |
| #SAOX | #SBAO |
| #SBCOM | SBCOM$ |
| #SBPI | #SBPI |
| #SDI | #SBDIDO |
| #SDIA | #SBDIDO |
| #SDIS | #SBDIDO |
| #SDIX | #SBDIDO |
| #SDO | #SBDIDO |
| #SDOA | #SBDIDO |
| #SDOP | #SBDIDO |
| #SDOS | #SBDIDO |
| #SDOX | #SBDIDO |

# Supervisor Module Names (CSECTS)

| | |
|---|---|
| #SLOGTSK | SYSLOG |
| #STATS78 | IOS4979 |
| #TAPEEND | $D4969A |
| #TERMINT | EDXTIO |
| #TERMINT | NOTIO |
| #TERMOUT | EDXTIO |
| #TERMOUT | NOTIO |
| #TPEIO00 | D4969A |
| #TSOPEN | D4969A |
| #WRGPIB | #IOSGPIB |
| #4966B | D4966A |
| #624ATTN | D49624 |
| #624DCB | D49624 |
| #624ERP | D49624 |
| #624INIT | D49624 |
| #63ADCB | D4963A |
| #63ATTN | D4963A |
| #63ERP | D4963A |
| #63INIT | D4963A |
| #66ADCB | D4966A |
| #66AERP | D4966A |
| #66ATTN | D4966A |
| #66DCB | D4966A |
| #66ERP | D4966A |
| #69ATTN | D4969A |
| #69ERP | D4969A |
| #69ERP8 | D4969A |
| ACCACTL | IOSACCA |
| ACLOSE | D4969A |
| ACLOSE | $D69AXPS |
| ACLOSERT | RLOADER |
| AIIA | SBAI |
| ALPOSTED | EDXSVCX |
| AND1 | EDXALU |
| AND1XX | EDXALU |
| AND2 | EDXALU |
| AND2XX | EDXALU |
| AND4 | EDXALU |
| AND4XX | EDXALU |
| ASMDEBUG | EDXINIT1 |
| ATTACH | EDXSVCX |
| ATTACHX | EDXSVCX |
| BDCDWORD | EDXTIO |
| BDCWORD | EDXTIO |
| BFRCK | EDXALU |
| BFRCK | XPSSYS |
| BHXWORD | EDXTIO |
| BRACKN | $EDXTIO |
| BRANCH | EDXALU |
| BSCENTRY | BSCAM |
| BSCIA | BSCAM |
| BSCINIT | BSCINIT |
| BSCRETER | #BSCAM |
| CCBFIXA | EDXINIT |
| CDRVTA | $EDXDEF (TERMINAL) |
| CDRVTB | $EDXDEF (TERMINAL) |
| CGOTO | EDXALU |
| CIRCNT | CIRCBUFF |
| CIREND | CIRCBUFF |
| CIRESIZ | CIRCBUFF |
| CIRESTR | CIRCBUFF |
| CIRIN | CIRCBUFF |
| CIRSTR | CIRCBUFF |
| CKEXIT | SBCOM$ |
| CKEXITO | SBCOM |
| CMDSETUP | EDXALU |
| CMDSETUP | XPSSYS |
| CMDTABLE | EDXSYS |
| CNTEND | D4963A |
| CNTLBUSY | D4963A |
| CNTLEND | D4963A |
| CONINSIA | EDXSTART |
| CTLXFER | $EDXTIO |
| CTLXFER | NOTIO |
| CURCTL | $EDXTIO |
| CURCTL | NOTIO |
| DATEFMT | $EDXDEF (TIMER) |
| DATTN00 | D49624 |
| DATTN10 | $D624XPS |
| DATTN10 | D49624 |
| DATTN10A | $D63AXPS |
| DATTN10A | D4963A |
| DATT1024 | $D1024 |
| DATTN35 | $D624XPS |
| DATTN35 | D49624 |
| DATTN40 | $D624XPS |
| DATTN40 | D49624 |
| DATTN50 | D4966A |
| DATTN50A | D4966A |
| DATTN51 | $D66AXPS |
| DATTN51 | D4966A |
| DATTN55A | $D66AXPS |
| DATTN55A | D4966A |
| DATT1024 | DSKXPS |
| DCBDWORD | EDXTIO |
| DCBRETRN | DISKIO |
| DCBWORD | EDXTIO |
| DEBUGIT | #BSCAM |
| DECSCAN | EDXTIO |
| DELRT | $DSKXPS |
| DELRT | DISKIO |
| DEQ | EDXSVCX |
| DEQBSC | BSCAM |
| DEQHOST | TPCOM |
| DEQT | $EDXTIO |
| DEQT | NOTIO |
| DETACH | EDXSVCX |
| DFLIH04 | DISKIO |
| DFLIH04 | $DISKIO$ |
| DFLIH04 | DSKXPS |
| DFLIH36A | $D624XPS |
| DFLIH36A | D49624 |
| DFLIH40 | D4963A |
| DFLIH50 | D49624 |
| DFLIH54 | D49624 |
| DIAG | EDXSVCX |
| DIIA | SBDIDO |
| DINITDS1 | DISKINIT |
| DINITDS1 | EDXINIT1 |
| DISKATTN | D49624 |

| | | | |
|---|---|---|---|
| DISKBUFR | SEGINIT | DSKINIT1 | DSKINIT1 |
| DISKBUFX | DISKINIT | DSKPREP2 | DISKINIT |
| DISKBUF4 | DISKINIT | DSKXRET1 | DISKIO |
| DISKCHN | DISKIO | DSKXRET2 | DISKIO |
| DISKERR1 | $DISKIO$ | DSKXRET3 | DISKIO |
| DISKERR1 | DSKXPS | DSOPEN | DISKINIT |
| DISKERR2 | $DISKIO$ | D1024ATN | D1024 |
| DISKERR2 | DSKXPS | D1024FLG | D1024 |
| DISKERR3 | $DISKIO$ | D1024R | D1024 |
| DISKERR3 | DSKXPS | D1024RET | D1024 |
| DISKERR5 | $DISKIO$ | D1024V1 | D1024 |
| DISKERR5 | DSKXPS | D1024V1 | $D1024 |
| DISKERR7 | $DISKIO$ | D4962IH1 | D49624 |
| DISKERR7 | DSKXPS | D49624AT | D49624 |
| DISKER13 | DISKIO | D4963AT | D4963A |
| DISKER13 | $DSKXPS | D4963AT | $D4963A |
| DISKER17 | $DISKIO$ | D4963ATN | D4963A |
| DISKER17 | DSKXPS | D4963AT1 | D4963A |
| DISKER18 | $DISKIO$ | D4963IH1 | D4963A |
| DISKER18 | DSKXPS | D4966AT | D4966A |
| DISKER5A | $DISKIO$ | D4966AT | $D4966A |
| DISKER5A | DSKXPS | D4966ATN | D4966A |
| DISKER5B | $DISKIO$ | D4966B | D4966A |
| DISKER6B | $DISKIO$ | D4966B | $D66AXPS |
| DISKER6B | DSKXPS | D624ATTN | $D624XPS |
| DISKFLIH | $DISKIO$ | D624ATTN | D49624 |
| DISKFLIH | DSKXPS | D624ERP | $D624XPS |
| DISKINIT1 | DISKINIT1 | D624ERP | D49624 |
| DISKINTX | DSKINIT2 | D624INIT | $D624XPS |
| DISKIO | $DSKXPS | D624INIT | D49624 |
| DISKIO00 | DISKIO | D63ATTN | $D63AXPS |
| DISKIO00 | $DSKXPS | D63ATTN | D4963A |
| DISKIO32 | D4966A | D63ERP | $D63AXPS |
| DISKIO40 | D4966A | D63ERP | D4963A |
| DISKPOST | $DISKIO$ | D63INIT | $D63AXPS |
| DISKPOST | $DISKIO$ | D63INIT | D4963A |
| DISKPOST | DSKXPS | D66AERP | $D66AXPS |
| DISKPREP | DISKINIT | D66AERP | D4966A |
| DISKRET | DISKIO | D66ATTN | $D66AXPS |
| DISKRET2 | DISKIO | D66ATTN | D4966A |
| DISKRW | DISKIO | D66INIT | DISKINIT |
| DISKRW | $DSKXPS | D69ATTN | $D69AXPS |
| DISKRW05 | DISKIO | D69ATTN | D4969A |
| DISKTBL | #DISKTBL | D69DHPT | D4969A |
| DISKXRET2 | DISKIO | D69DHPT | $D4969A |
| DISKXRET3 | DISKIO | D69ERP | $D69AXPS |
| DKSCAC | $D63AXPS | D69ERP | D4969A |
| DMDDB | $EDXDEF (DISK) | D69ERP8 | D4969A |
| DMIPL | $EDXDEF (DISK) | D69FLIH | $D4969A |
| DMVOL | $EDXDEF (DISK) | D69FLIH | $D4969A |
| DMXTNT | $DISKIO | EBBICVT | $EDXTIO |
| DMXTNT3 | $DISKIO | EBBICVT | NOTIO |
| DOIA | SBDIDO | EBBIE | EDXTIO |
| DQTERM | EDXTERMQ | EBFLDBL | EBFLCVT |
| DQTERMB | EDXTERMQ | EBFLPTCH | EBFLCVT |
| DQTERMS | EDXTERMQ | EBFLSTD | EBFLCVT |
| DQTRMIN | EDXTERMQ | EDXDEBUG | EDXINIT1 |
| DS$ | DISKINIT | EDXFLAGS | EDXSYS |
| DSKCAC | D4963A | EDXFLEND | EDXFLOAT |
| DSKINITX | DSKINIT2 | EDXINITP | EDXINIT1 |

# Supervisor Module Names (CSECTS)

| | |
|---|---|
| EDXLOOP | EDXALU |
| EDXLOOP2 | EDXALU |
| ENABLED | EDXINIT1 |
| ENDATTN | $EDXTIO |
| ENDCODE | RLOADER |
| ENDINIT | EDXSTART |
| ENQ | EDXSVCX |
| ENQT | $EDXTIO |
| ENQT | NOTIO |
| EOR1 | EDXALU |
| EOR1XX | EDXALU |
| EOR2 | EDXALU |
| EOR2XX | EDXALU |
| EOR4 | EDXALU |
| EOR4XX | EDXALU |
| ERREXIT3 | RLOADER |
| ERRORLOG | DISKIO |
| EXCLOSE | IOSEXIO |
| EXFLIH | IOSEXIO |
| EXIO | IOSEXIO |
| EXIOCLEN | IOSEXIO |
| EXIOINIT | EXIOINIT |
| EXOPEN | IOSEXIO |
| FADD000 | EDXFLOAT |
| FADD000 | NOFLOAT |
| FADD001 | EDXFLOAT |
| FADD001 | NOFLOAT |
| FADD010 | EDXFLOAT |
| FADD010 | NOFLOAT |
| FADD011 | EDXFLOAT |
| FADD011 | NOFLOAT |
| FADD100 | EDXFLOAT |
| FADD100 | NOFLOAT |
| FADD101 | EDXFLOAT |
| FADD101 | NOFLOAT |
| FADD110 | EDXFLOAT |
| FADD110 | NOFLOAT |
| FADD111 | EDXFLOAT |
| FADD111 | NOFLOAT |
| FDIV000 | EDXFLOAT |
| FDIV000 | NOFLOAT |
| FDIV001 | EDXFLOAT |
| FDIV001 | NOFLOAT |
| FDIV010 | EDXFLOAT |
| FDIV010 | NOFLOAT |
| FDIV011 | EDXFLOAT |
| FDIV011 | NOFLOAT |
| FDIV100 | EDXFLOAT |
| FDIV100 | NOFLOAT |
| FDIV101 | EDXFLOAT |
| FDIV101 | NOFLOAT |
| FDIV110 | EDXFLOAT |
| FDIV110 | NOFLOAT |
| FDIV111 | EDXFLOAT |
| FDIV111 | NOFLOAT |
| FH4963CT | RW4963ID |
| FIRSTACB | $EDXDEF (ADAPTER) |
| FIRSTBSC | $EDXDEF (BSCLINE) |
| FIRSTCCB | $EDXDEF (TERMINAL) |
| FLDCLEAR | EDXTIO |
| FLEBDBL | EBFLCVT |
| FLEBSTD | EBFLCVT |
| FLIHPOST | $D4969A |
| FLIHPOST | DSKXPS |
| FLIHPOST | $D4969A |
| FLOATERR | EDXFLOAT |
| FLOATERR | NOFLOAT |
| FLRND | EBFLCVT |
| FLTCONV | EDXFLOAT |
| FLTCONV | NOFLOAT |
| FLTPATCH | #EDXFLOA |
| FMPY000 | EDXFLOAT |
| FMPY000 | NOFLOAT |
| FMPY001 | EDXFLOAT |
| FMPY001 | NOFLOAT |
| FMPY010 | EDXFLOAT |
| FMPY010 | NOFLOAT |
| FMPY011 | EDXFLOAT |
| FMPY011 | NOFLOAT |
| FMPY100 | EDXFLOAT |
| FMPY100 | NOFLOAT |
| FMPY101 | EDXFLOAT |
| FMPY101 | NOFLOAT |
| FMPY110 | EDXFLOAT |
| FMPY110 | NOFLOAT |
| FMPY111 | EDXFLOAT |
| FMPY111 | NOFLOAT |
| FREEMAIN | RLOADER |
| FREERETN | STORMGR |
| FREESTGC | STORMGR |
| FSUB000 | EDXFLOAT |
| FSUB000 | NOFLOAT |
| FSUB001 | EDXFLOAT |
| FSUB001 | NOFLOAT |
| FSUB010 | EDXFLOAT |
| FSUB010 | NOFLOAT |
| FSUB011 | EDXFLOAT |
| FSUB011 | NOFLOAT |
| FSUB100 | EDXFLOAT |
| FSUB100 | NOFLOAT |
| FSUB101 | EDXFLOAT |
| FSUB101 | NOFLOAT |
| FSUB110 | EDXFLOAT |
| FSUB110 | NOFLOAT |
| FSUB111 | EDXFLOAT |
| FSUB111 | NOFLOAT |
| GETCNT | EDXALU |
| GETDDB | SBCOM$ |
| GETMAIN | RLOADER |
| GETPAR3 | EDXALU |
| GETPAR3 | XPSSYS |
| GETRETF | STORMGR |
| GETRETN | STORMGR |
| GETVAL2 | $EDXTIO |
| GSTVAL2 | NOTIO |
| GETVAL4 | $EDXTIO |
| GSTVAL4 | NOTIO |
| GETVOL | DISKINIT |
| GFQCB | RLOADER |
| GOTOTABL | RLOADER |

| | | | |
|---|---|---|---|
| GPIB | $EDXDEF | IOR1XX | EDXALU |
| GTIMDATE | EDXTIMER | IOR2 | EDXALU |
| GTIMDATE | EDXTIMR2 | IOR2XX | EDXALU |
| IAACCA | $IOSACCA | IOR4 | EDXALU |
| IAACCATR | $ACCATRC | IOR4XX | EDXALU |
| IACEND | $IOSACCA | IOSPCLOS | #IOSPOOL |
| IACHKCC | $IOSACCA | IOSPCMD | IOSPOOL |
| IACPOST | ACCATRC | IOSPDQT | #IOSPOOL |
| IADELAY | $IOSACCA | IOSPEND | IOSPOOL |
| IAEXIOTR | EXIOTRC | IOSPNQT | #IOSPOOL |
| IAGPIB | IOSGPIB | IOSPTBL | IOSPOOL |
| IAMQCB | CDIDQCB | IOSPWR | #IOSPOOL |
| IAPROC | IOS2741 | IOSRETN | IOSACCA |
| IASCII | $IO4975A | IOSTABLE | IOSTBLE |
| IAS1S1 | $IOSS1S1 | IOSTRT | IOSACCA |
| IATTY | $IOSTTY | IOS1S1 | #IOSS1S1 |
| IA2741 | IOS2741 | IOS3101D | #IOS3101 |
| IA4013 | $IOS4013 | IOS4979M | IOS4979 |
| IA4973 | $IOS4974 | IOUNLOAD | IOLOADER |
| IA4974 | $IOS4974 | IOWRTCON | IOSACCA |
| IA4975 | $IOS4974 | IO1024I | IO1024 |
| IA4978 | $IOS4979 | IO1024RT | DISKINIT |
| IA4979 | $IOS4979 | IO3101 | #IOS3101 |
| IA4980 | $IOS4979 | IO4974 | $EDXTIO |
| IA5219 | $IOS4974 | IO4979 | $EDXTIO |
| IA5224 | $IOS4974 | IPLENDED | EDXSTART |
| IA5225 | $IOS4974 | IPLMSG | DISKINIT |
| IDCBRES | TPCOM | IPLMSG | EDXINIT1 |
| IDCBSCSS | TPCOM | KBTASK | $EDXTIO |
| IDCBSIO | TPCOM | LCB | SYSLOG |
| IDSKIO99 | $DISKIO$ | LCBA | EDXSYS |
| IDSKIO99 | DSKXPS | LCMDKEY | RLOADER |
| IDSKIO99 | $DISKIO$ | LCMDTGT | RLOADER |
| IDSKPOST | $DISKIO$ | LOADEXIT | RLOADER |
| IDSKPOST | DSKXPS | LOADFHFL | RLOADER |
| ID4963IH | RW4963ID | LOADINIT | LOADINIT |
| IFFLOAT | EDXFLOAT | LOADINIT2 | LOADINIT2 |
| IFFLOAT | NOFLOAT | LOADORG | RLOADER |
| IFFLOATL | EDXFLOAT | LOADPGM | RLOADER |
| IFFLOATL | NOFLOAT | LOADPGM0 | RLOADER |
| INITEXIT | EDXINIT1 | LOADQCB | RLOADER |
| INITFEAT | EDXINIT1 | LOADTERM | PWRM80 |
| INITTASK | EDXSTART | LPGMXPA | RLOADER |
| INIT4013 | INIT4013 | LPGMXPB | RLOADER |
| INIT4978 | INIT4978 | LPRINTER | $EDXDEF (TERMINAL) |
| INTIME | EDXTIMER | LP0 | RLOADER |
| INTIME | EDXTIMR2 | MAPEND | $EDXDEF (SYSTEM) |
| INTIMEX | EDXTIMER | MECBLST | $EDXDEF (SYSTEM) |
| INTIMEX | EDXTIMR2 | MESSAGE | $EDXTIO |
| IOACPOST | NOACCATR | MESSAGE | NOTIO |
| IOACPRE | NOACCATR | MFARMU | $EDXDEF (ADAPTER) |
| IOACPRE | ACCATRC | MINMSG | MINMSG |
| IOERROR | IOSACCA | MOVEXP | EDXALU |
| IOEXPOST | NOEXIOTR | MOVFP4 | EDXFLOAT |
| IOEXPOST | EXIOTRC | MOVFP4 | NOFLOAT |
| IOEXPRE | NOEXIOTR | MOVFP8 | EDXFLOAT |
| IOEXPRE | EXIOTRC | MOVFP8 | NOFLOAT |
| IOGPIB | IOSGPIB | MOV1 | EDXALU |
| IOLOAD | IOLOADER | MOV1C | EDXALU |
| IOR1 | EDXALU | MOV2 | EDXALU |

# Supervisor Module Names (CSECTS)

| | | |
|---|---|---|
| MOV2C | EDXALU | |
| MOV4 | EDXALU | |
| MOV4C | EDXALU | |
| MPRTR1 | $EDXDEF | (TERMINAL) |
| MPRTR2 | $EDXDEF | (TERMINAL) |
| MSGBUF | FULLMSG | |
| MSGBUFR | EDXSTART | |
| MSGMOD | FULLMSG | |
| MSGMOD | MINMSG | |
| NAKMSG | $EDXTIO | |
| NEXTERM | TERMINIT | |
| NOTDEF | $EDXTIO | |
| NOTPWRON | $IOS4979 | |
| NXTCOMD | EDXTIO | |
| OPENADAP | OPENADAP | |
| OPENMFA | OPENMFA | |
| OPEN4980 | OPEN4980 | |
| OPNCLS | D4969A | |
| OPNCLS | $D69AXPS | |
| OVLAREA0 | SEGINIT | |
| OVLEND | DISKINIT | |
| OVLSTART | SEGINIT | |
| PASS#2 | EDXINIT1 | |
| PCHKIIP | EDXSTART | |
| PCHKLSB | EDXSTART | |
| PCHKSIA | EDXSTART | |
| PGMCHECK | EDXINIT1 | |
| PGMCHK | XPSSYS | |
| PIIABIT | SBPI | |
| PIIAG17 | SBPI | |
| PIIALEX | SBPI | |
| PNTREND | EDXSVCX | |
| POST | EDXSVCX | |
| POSTWTM | SWAITM | |
| PREPIDCB | DISKINIT | |
| PRINTIME | EDXTIMER | |
| PRINTIME | EDXTIMR2 | |
| PRSKSP | $EDXTIO | |
| PRSKSP | NOTIO | |
| PRTEXT | $EDXTIO | |
| PRTEXT | NOTIO | |
| PRTNUM2 | $EDXTIO | |
| PRTNUM2 | NOTIO | |
| PRTNUM2S | EDXTIO | |
| PRTNUM4 | $EDXTIO | |
| PRTNUM4 | NOTIO | |
| PRTNUM4S | EDXTIO | |
| PSTUSER | DISKIO | |
| PWRAM80 | PWRM80 | |
| PWRTEST | PWRM80 | |
| QIO | QIO | |
| QUESTION | $EDXTIO | |
| QUESTION | NOTIO | |
| QUTERM | EDXTERMQ | |
| QUTERMIN | EDXTERMQ | |
| RDACCA | IOSACCA | |
| RDGPIB | IOSGPIB | |
| RDS1S1 | #IOSS1S1 | |
| RDTEXT | $EDXTIO | |
| RDTEXT | NOTIO | |
| RDTEXTL | $EDXTIO | |
| RDTEXTL | NOTIO | |
| RDTTY | IOSTTY | |
| RD2741 | #IOS2741 | |
| RD4013 | IOS4013 | |
| RETURN | EDXSYS | |
| SAI | SBAI | |
| SAIA | SBAI | |
| SAIS | SBAI | |
| SAIX | SBAI | |
| SAO | SBAO | |
| SAOA | SBAO | |
| SAOX | SBAO | |
| SATTACH | EDXSVCX | |
| SAVERET | EDXSVCX | |
| SAVEXIT | EDXSVCX | |
| SAV222CR | EDXALU | |
| SAV224CR | EDXALU | |
| SAV424CR | EDXALU | |
| SAV444CR | EDXALU | |
| SAX222 | EDXALU | |
| SA222 | EDXALU | |
| SA222C | EDXALU | |
| SA424 | EDXALU | |
| SA424C | EDXALU | |
| SBERR | SBCOM$ | |
| SBERR | SBCOM$ | |
| SBIODDB | $EDXDEF | (SENSORIO) |
| SBIOINIT | SBIOINIT | |
| SCALL | EDXALU | |
| SCONTINU | EDXALU | |
| SCWAIT | EDXSVCX | |
| SDEQ | EDXSVCX | |
| SDETACH | EDXSVCX | |
| SDI | SBDIDO | |
| SDIA | SBDIDO | |
| SDIS | SBDIDO | |
| SDIX | SBDIDO | |
| SDO | SBDIDO | |
| SDOA | SBDIDO | |
| SDOLOOP | EDXALU | |
| SDOP | SBDIDO | |
| SDOS | SBDIDO | |
| SDOX | SBDIDO | |
| SD222 | EDXALU | |
| SD222C | EDXALU | |
| SD422CR | EDXALU | |
| SD422R | EDXALU | |
| SD424 | EDXALU | |
| SD424C | EDXALU | |
| SEGREGE | STORMGR | |
| SELB01 | EDXSVCX | |
| SENQ | EDXSVCX | |
| SETBUSY | EDXSVCX | |
| SETBUSY | XPSSYS | |
| SETCLOCK | EDXTIMER | |
| SETCLOCK | EDXTIMR2 | |
| SETIMER | EDXTIMER | |
| SETIMER | EDXTIMR2 | |
| SETREADY | EDXSVCX | |

| | |
|---|---|
| SFLIST | $EDXTIO |
| SFTKSIA | EDXSTART |
| SHL1 | EDXALU |
| SHL1XX | EDXALU |
| SHL2 | EDXALU |
| SHL2XX | EDXALU |
| SHL4 | EDXALU |
| SHL4XX | EDXALU |
| SHR1 | EDXALU |
| SHR1XX | EDXALU |
| SHR2 | EDXALU |
| SHR2XX | EDXALU |
| SHR4 | EDXALU |
| SHR4XX | EDXALU |
| SM222 | EDXALU |
| SM222C | EDXALU |
| SM424 | EDXALU |
| SM424C | EDXALU |
| SPOST | EDXSVCX |
| SRESETEV | EDXSVCX |
| SRETURN | EDXALU |
| SSX222 | EDXALU |
| SS222 | EDXALU |
| SS222C | EDXALU |
| SS424 | EDXALU |
| SS424C | EDXALU |
| START | EDXINIT |
| STARTFLG | EDXINIT |
| STARTPGM | EDXSTART |
| START1 | EDXINIT1 |
| STATUS | IOSACCA |
| STESTIN | $DBUGNUC |
| STESTIN1 | $DBUGNUC |
| STESTOUT | $DBUGNUC |
| STKINIT | SEGINIT |
| STMTBLE | STORMGR |
| STOP | RLOADER |
| STOPC5 | BSCINIT |
| STOPDA | INIT4980 |
| STOPDB | INITMFA |
| STOPDC | INITMFA |
| STOPDD | INITMFA |
| STOPDE | INITMFA |
| STOPDF | INITMFA |
| STOPEB | INIT4980 |
| STOPEC | INITADAP |
| STOPED | INITADAP |
| STOPEE | INITADAP |
| STOPEF | INITADAP |
| STOPFB | EDXSVCX |
| STOPFC | EDXSVCX |
| STOPFD | EDXSVCX |
| STOPFE | EDXSVCX |
| STOPFF | EDXALU |
| STOPF0 | SEGINIT |
| STOPF1 | XPSINIT |
| STOPF2 | XPSINIT |
| STOPF3 | XPSINIT |
| STOPF4 | XPSINIT |
| STOPF5 | XPSINIT |

| | | |
|---|---|---|
| STOPF6 | XPSINIT | |
| STOPF7 | XPSINIT | |
| STOPF8 | XPSINIT | |
| STOPF9 | XPSINIT | |
| STOPTASK | RLOADER | |
| STOREMAP | $EDXDEF | |
| STORINIT | STORINIT | |
| STP | TPCOM | |
| STPTASK1 | EDXSVCX | |
| STPTASK2 | EDXSVCX | |
| SUPEXIT | EDXSVCX | |
| SUPEXIT | XPSSYS | |
| SUPEXTRL | EDXSVCX | |
| SUPLEX | EDXSVCX | |
| SUPLVLX0 | EDXSVCX | |
| SUPTBL | EDXSVCX | |
| SVC | EDXSVCX | |
| SVC | XPSSYS | |
| SVCA | EDXSVCX | |
| SVCAKR | EDXSYS | |
| SVCBF | $EDXDEF | (SYSTEM) |
| SVCBFEND | $EDXDEF | (SYSTEM) |
| SVCBFIN | EDXSYS | |
| SVCBFOUT | EDXSYS | |
| SVCBOTH | EDXSVCX | |
| SVCFLAGS | EDXSYS | |
| SVCHNDLR | EDXSVCX | |
| SVCI | EDXSVCX | |
| SVCIAKR | EDXSYS | |
| SVCIAR | EDXSYS | |
| SVCIBFOF | EDXSVCX | |
| SVCIIAR | EDXSYS | |
| SVCILSB | EDXSYS | |
| SVCILSR | EDXSYS | |
| SVCIR0 | EDXSYS | |
| SVCIR1 | EDXSYS | |
| SVCIR2 | EDXSYS | |
| SVCIR3 | EDXSYS | |
| SVCIR4 | EDXSYS | |
| SVCIR5 | EDXSYS | |
| SVCIR6 | EDXSYS | |
| SVCIR7 | EDXSYS | |
| SVCLSB | EDXSYS | |
| SVCLSR | EDXSYS | |
| SVCLT | EDXSYS | |
| SVCL1 | EDXSYS | |
| SVCL2 | EDXSYS | |
| SVCL3 | EDXSYS | |
| SVCPARMS | EDXSYS | |
| SVCRTRN | EDXSYS | |
| SVCR0 | EDXSYS | |
| SVCR1 | EDXSYS | |
| SVCR2 | EDXSYS | |
| SVCR3 | EDXSYS | |
| SVCR4 | EDXSYS | |
| SVCR5 | EDXSYS | |
| SVCR6 | EDXSYS | |
| SVCR7 | EDXSYS | |
| SVC0 | EDXSVCX | |
| SVC1 | EDXSVCX | |

# Supervisor Module Names (CSECTS)

| | | | |
|---|---|---|---|
| SVC2 | EDXSVCX | USERPOST | DISKIO |
| SWAIT | EDXSVCX | VARYDSCB | DISKIO |
| SX224CR | EDXALU | VARYDSCB | $DISKIO$ |
| SX224R | EDXALU | VARYEXIT | DISKIO |
| SX444 | EDXALU | VARYEXIT | $DISKIO$ |
| SX444C | EDXALU | VARYOFF | DISKIO |
| SYSCOM | EDXSYS | VARYOFF | $DISKIO$ |
| S1S1 | $EDXDEF (TERMINAL) | VARYON | DISKIO |
| S1S1DIAG | S1S1INIT | VARYON | $DISKIO$ |
| TAPEEND | $D4969A | VARYQCB | DISKIO |
| TAPEEND | DSKXPS | VARYQCB | $DISKIO$ |
| TAPEEND | $D4969A | VARYWORD | DISKIO |
| TAPEINIT | TAPEINIT | VARYWORD | $DISKIO$ |
| TAPEIO | D4969A | VCTBL | IOSTBLE |
| TAPEIO00 | D4969A | VRY4966 | $D4966A |
| TAPEIO00 | $D69AXPS | VRY4966 | D4966A |
| TAPEIO99 | DSKXPS | VRY4969 | D4969A |
| TAPE060 | DISKIO | VRY4969 | $D4969A |
| TASKWD | EDXSTART | WAIT | EDXSVCX |
| TERMDEFS | $EDXDEF (TERMINAL) | WAITIMER | EDXTIMER |
| TERMERRX | TERMINIT | WAITIMER | EDXTIMR2 |
| TERMINID | TERMINIT | WAITM | SWAITM |
| TERMINT | EDXTIO | WAITMR | SWAITM |
| TERMOPEN | TERMOPEN | WHATIME | EDXTIMER |
| TERMOUT | EDXTIO | WHATIME | EDXTIMR2 |
| TIMERDDB | $EDXDEF (TIMER) | WHATMSG | $EDXTIO |
| TIMER0 | $EDXDEF (TIMER) | WRACCA | IOSACCA |
| TIMER0 | EDXTIMR2 | WRGPIB | IOSGPIB |
| TIMER0IA | EDXTIMER | WRS1S1 | #IOSS1S1 |
| TIMER0IA | EDXTIMR2 | WRTTY | IOSTTY |
| TIMER1 | $EDXDEF (TIMER) | WR2741 | #IOS2741 |
| TIMER1IA | EDXTIMER | WR4013 | IOS4013 |
| TIMRINIT | TIMRINIT | WTMERCD | EDXSVCX |
| TIMRINIT | CLOKINIT | XPSBAL1 | EDXSVCX |
| TIMRLSB | EDXTIMR2 | XPSBAL6 | EDXSVCX |
| TLSB | EDXSVCX | XPSBAL7 | EDXSVCX |
| TPIABUSY | $D4969A | XPSBR | EDXSVCX |
| TPIABUSY | DSKXPS | XPSDEBUG | EDXSVCX |
| TPIABUSY | $D4969A | XPSHEADR | SEGINIT |
| TPINIT | TPINIT | XPSINITX | XPSINIT |
| TPSTATS | TPCOM | XPSRET2 | EDXSVCX |
| TRASCII | ASCIITAB | XPSRET3 | EDXSVCX |
| TRCRSP | CRSPTAB | XPSSTK | $EDXDEF (SYSTEM) |
| TREBASC | EBASCII | XPSSTKE | $EDXDEF (SYSTEM) |
| TREBCD | EBCDTAB | XPSSVCI | XPSSYS |
| TSOPEN | D4969A | XPSSVCI | EDXSVCX |
| TSOPEN | $D69AXPS | XPSSVCIX | EDXSVCX |
| UNCHAIN | XPSSYS | XPSTABLE | XPSTABLX |
| UNCHAIN | EDXSVCX | XPSTBL | XPSTABLX |
| UNCHAKR1 | EDXSYS | XPSTSIZE | XPSTABLX |
| UNCHSAV6 | EDXSYS | X21CLR | BSCX21 |
| USER | EDXALU | X21CON | BSCX21 |
| USERFLAG | INITMODS | | |
| USERMOD | INITMODS | | |

# Appendix E. Work Sheets

This appendix contains the work sheets you need in selecting the required support for your operating system.

- WORK SHEET 1 is used to estimate the overall size of your supervisor. Use work sheet 4 to estimate the size of portions of your supervisor.
- WORK SHEET 2 is used to define the characteristics and partition structure of processor storage and the I/O devices attached to your Series/1.
- WORK SHEET 3 is used to define the software features you require to support the defined I/O devices and the EDX related products you include in your system.
- WORK SHEET 4 is used to estimate the size of those portions of the supervisor that are placed in partitions other than partition one and the amount of storage required by programs to execute within a partition.

The work sheets are provided for you to use with Chapter 4, "Select Your Required Support" on page IS-39. Tear out or copy the work sheets you require and complete them as you select the system features you need for your system. We recommend making a copy of each work sheet so that you will have the originals should you need to generate a system in the future.

# Work Sheets

## Work Sheet 1

To estimate the overall size of your supervisor, use work sheet 1. Work sheet 1 contains three columns: Support, Resident and Initialization.

### Support

This column lists the I/O devices that can be attached to the Series/1. Read down the list and choose the specific devices you are attaching to your Series/1; cross out the devices that are not part of your system, along with the corresponding storage amounts. The Resident column and the Initialization column, if applicable, show the amount of storage required by the supervisor to support a specific device.

### Resident

This column contains the amount of storage the supervisor requires to support each device. These numbers are the resident program sizes and are expressed in the number of decimal bytes.

### Initialization

This column contains the amount of storage that is required at IPL time by the initialization routine for a specific device. These numbers are expressed in the number of decimal bytes.

## Supervisor Size

To estimate the size of your supervisor, total the Resident column and round this total to the next multiple of 256. The resulting figure is the estimated size of your supervisor program that will reside in storage during system execution. Allow from three to five per cent more storage to provide for error correction. This estimate will be reasonably close to your actual configuration; to get the actual size, perform a system generation of your supervisor. The actual size is the address (in hexadecimal) of EDXINIT in the $XPSLINK output.

## Work Sheet 1 *(continued)*

| Support | Resident | Initialization |
|---|---|---|
| Basic supervisor | | |
| with address translator | 8058 | 614 |
| (sum of MAXPROG values) * 8 + 32 | (    ) | |
| + #IABUF (defaults to 20) * 8 | (    ) | |
| + #XPSSTK (defaults to 20) * 6 | (    ) | |
| + #MECBLST (defaults to 20) * 2 | (    ) | |
| Disk, diskette, or tape | | |
| Disk(ette) basic | 1912 | 3420 |
| +200 per unit | (    ) | |
| + 47 per performance volume | (    ) | |
| +128 per I/O task defined | (    ) | |
| 4962/4964 | 1466 | |
| 4963/4967/DDSK-30 | 692 | |
| 4963 with fixed-head | | 526 |
| +178 per unit | (    ) | |
| 4965/4966 | 1652 | |
| 1024 Byte/Sector Support | 428 | |
| 1024 Byte/Sector IPL Support | 2596 | |
| 4968/4969 | 4920 | 1706 |
| +130 per unit | (    ) | |
| +128 per I/O task defined | (    ) | |
| Terminals | | |
| Basic | 5664 | 1182 |
| MFA (feature 1310) | | 1036 |
| +50 per adapter | (    ) | |
| ALPA (feature 1250) | | 2478 |
| +50 per adapter | (    ) | |
| SMIO (feature 5640) | | 2478 |
| +50 per adapter | (    ) | |
| 4979/4978/4980 | 2640 | 1812 |
| +488 per 4978/4979/4980 | (    ) | |
| 4973/4974/4975/5219/5224/5225 | 744 | |
| +550 per 4973 or 4974 | (    ) | |
| +562 per 4975 | (    ) | |
| +562 per 5219 | (    ) | |
| +562 per 5224 | (    ) | |
| +562 per 5225 | (    ) | |
| 4013 type devices | 506 | 182 |
| +458 per device | (    ) | |

**Figure 21 (Part 1 of 3). Supervisor storage requirements.**

## Work Sheet 1 *(continued)*

| Support | Resident | Initialization |
|---|---|---|
| Virtual terminals | 650 | |
| +470 per terminal | ( ) | |
| Series/1 to Series/1 | 1264 | 274 |
| +624 per device | ( ) | |
| GPIB | 734 | |
| +574 per adapter | ( ) | |
| Basic for | | |
| any TTY, 2741/PROC, non-3101B, ACCA | 648 | |
| +514 if ASCII/EBCDIC conversion | ( ) | |
| +514 if mirror image ASCII/EBCDIC conversion | ( ) | |
| Teletypewriter | 740 | |
| +470 per teletypewriter | ( ) | |
| 2741/PROC | 1524 | |
| +594 per 2741/PROC | ( ) | |
| +532 if correspondence code | ( ) | |
| +522 if EBCD code | ( ) | |
| ACCA ASCII Terminals no MFA | 1848 | |
| +530 per terminal | ( ) | |
| 3101 (block mode) | 2250 | |
| +724 per device | ( ) | |
| Spool | | |
| Basic (in supervisor) | 2104 | |
| +(460*max active jobs)+32 | ( ) | |
| Basic (in user partition) | 5120 | |
| +Y+Z | ( ) | |
| where: | | |
| Y=264*max active jobs | | |
| Z=(34*max jobs) | | |
| +(2*no. of sectors/100 | | |
| +(20*no. of writers) | | |
| Each output writer (in user partition) | 3840 | |
| Timers | | |
| 4955 | 1308 | 354 |
| 4952/4954/4956 | 1264 | 188 |

**Figure 21 (Part 2 of 3). Supervisor storage requirements.**

| Support | Resident | Initialization |
|---|---|---|
| Binary synchronous access method | | |
| Any BSC device | 3884 | 430 |
| In addition: | | |
| + 22 per multi-line feature | (    ) | |
| +136 per line | (    ) | |
| X.21 Facility | 1760 | |
| Host Communication Facility | 2238 | 364 |
| Sensor-based input/output | | |
| Basic | 144 | 180 |
| Analog input | 702 | |
| +48 for first AI group | (    ) | |
| +16 for each additional group | (    ) | |
| Analog output | 90 | |
| +16 per AO | (    ) | |
| Digital input and output | 1014 | |
| +38 per DI group | (    ) | |
| +16 per DO group in 4982 | (    ) | |
| +38 per DO group in IDIO | (    ) | |
| Process interrupt | 168 | |
| +156 per PI group | (    ) | |
| EXIO control | | |
| Basic | 830 | 66 |
| +(32+x(16+n)) per device | (    ) | |
| where: x=maximum number of DCBs; n=number of residual status bytes transferred | | |
| Error logging | | |
| included | 362 | |
| not included | 26 | |
| Program/machine check log | 252 | |
| Relocating loader | 4044 | 1986 |
| Floating point | | |
| included | 772 | |
| not included | 6 | |
| Support of GETEDIT/PUTEDIT | 1628 | |
| Queue processing | 326 | |
| $DEBUG | 522 | |
| Supervisor patch area | 256 | |

**Figure 21 (Part 3 of 3). Supervisor storage requirements.**

**Notes:**

1. The above numbers include 128 bytes per terminal for the optional keyboard task (ATTN=YES).

2. Basic ASCII support is required for teletypewriter, ACCA, 2741, and 4013 terminals.

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## Work Sheet 2

Work sheet 2 helps you define your processor storage and I/O devices. The system definition statements used in this step are contained in the work sheet. Each definition statement is presented in the form:

```
label       STATEMENT     OPERAND
blank       SYSTEM        MAXPROG=(__,__,__,__,__,__,__,__),
                          PARTS=(__,__,__,__,__,__,__,__),
                          DATEFMT=____,
                          IABUF=____,
                          XPSSTAK=__,
                          COMMON=(__,__,__,__,__,__,__,__),
                          INITPRT=____,
                          INITMOD=(___,___,___,___),
                          MECBLST=___
```

In addition, specific definition statements can be used to define different devices. Depending upon the device being defined, different operands are required. A sample statement is shown for each device type.

The right-hand column contains a key that indicates if an operand is required or optional and specifies the default. A detailed description of the statements, along with the syntax and operand definitions is provided in Appendix A, "System Definition Statements" on page IS-145.

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# Work Sheet 2—Installation and System Generation

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Storage definition** | | | | |
| blank | SYSTEM | MAXPROG= | ( ____, ____, ____, ____, ____, ____, ____, ____), | Optional-defaults to 10 |
| | | PARTS= | ( ____, ____, ____, ____, ____, ____, ____, ____), | Optional-defaults to 32K |
| | | DATEFMT= | ____, | Optional-defaults to MMDDYY |
| | | IABUF= | ____, | Optional-defaults to 20 |
| | | XPSSTK= | ____, | Optional-defaults to 20 |
| | | COMMON= | ( ____, ____, ____, ____, ____, ____, ____, ____), | Optional-defaults to EDXSYS |
| | | INITPRT= | ____, | Optional-defaults to 1 |
| | | INITMOD= | ( ____, ____, ____, ____) | Optional |
| | | MECBLST= | ____ | Optional |
| **Tape definition** | | | | |
| blank | TAPE | DEVICE=**4969,** | | Required |
| | | ADDRESS= | ____, | Required |
| | | DENSITY= | ____, | Optional-defaults to 1600 |
| | | LABEL= | ____, | Optional-defaults to SL |
| | | ID= | ____, | Required |
| | | TASK= | ____, | Optional-defaults to NO |
| | | END= | ____ | Optional-defaults to NO |
| blank | TAPE | DEVICE=**4968,** | | Required |
| | | ADDRESS= | ____, | Required |
| | | DENSITY= | ____, | Optional-defaults to 1600 |
| | | LABEL= | ____, | Optional-defaults to SL |
| | | ID= | ____, | Required |
| | | TASK= | ____, | Optional-defaults to NO |
| | | END= | ____ | Optional-defaults to NO |
| **Disk(ette) definition** | | | | |
| blank | DISK | DEVICE=**4962,** | | Required |
| | | ADDRESS= | ____, | Required |
| | | VOLNAME= | ( ____, ____, ____, ____), | Optional |
| | | TASK= | ____, | Optional-defaults to NO |
| | | END= | ____ | Optional-defaults to NO |

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## Work Sheet 2—Installation and System Generation (continued)

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Disk(ette) definition (continued)** | | | | |
| blank | DISK | DEVICE=**4963,** | | Required |
| | | ADDRESS= | ______, | Required |
| | | VOLNAME= | (______, ______, ______, ______), | Optional |
| | | TASK= | ______, | Optional-defaults to NO |
| | | END= | ______ | Optional-defaults to NO |
| blank | DISK | DEVICE= **4967,** | | Required |
| | | ADDRESS= | ______, | Required. |
| | | VOLNAME= | (______, ______, ______, ______), | Optional |
| | | TASK= | ______, | Optional-defaults to NO |
| | | END= | ______ | Optional-defaults to NO |
| blank | DISK | DEVICE=**DDSK-30** | | Required |
| | | ADDRESS= | ______, | Required |
| | | VOLNAME= | (______, ______, ______, ______), | Optional |
| | | TASK= | ______, | Optional-defaults to NO |
| | | END= | ______ | Optional-defaults to NO |
| | | | ______, | (Specify YES if last TAPE |
| | | | ______, | or DISK statement) |
| blank | DISK | DEVICE=**4964** | | Required |
| | | ADDRESS= | ______, | Required |
| | | TASK= | ______, | Optional-defaults to NO |
| | | END= | ______ | Optional-defaults to NO |
| blank | DISK | DEVICE=**4965** | | Required |
| | | ADDRESS= | ______, | Required |
| | | TASK= | ______, | Optional-defaults to NO |
| | | END= | ______ | Optional-defaults to NO |
| blank | DISK | DEVICE=**4966** | | Required |
| | | ADDRESS= | ______, | Required |
| | | TASK= | ______, | Optional-defaults to NO |
| | | END= | ______ | Optional-defaults to NO |

# Work Sheet 2—Installation and System Generation (continued)

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Timer definition** | | | | |
| blank | TIMER | ADDRESS= | ______ | Required |
| **Adapter definition** | | | | |
| label | ADAPTER | ADDRESS= | ______ | Required |
| | | TYPE=**MFA,** | | Required |
| | | DEVICES= | (______, ______, ______, ______), | Required |
| | | END= | ______ | Optional-defaults to NO |
| label | ADAPTER | ADDRESS= | ______ | Required |
| | | TYPE=**ALPA,** | | Required |
| | | DEVICES= | (______, ______, ______, ______, | Required |
| | | | ______, ______, ______, ______), | |
| | | END= | ______ | Optional-defaults to NO |
| label | ADAPTER | ADDRESS= | ______ | Required |
| | | TYPE=**SMIO,** | | Required |
| | | DEVICES= | (______, ______, ______, ______, | Required |
| | | | ______, ______, ______, ______), | |
| | | END= | ______ | Optional-defaults to NO (Specify YES if last ADAPTER statement) |
| | | | ______, | |
| **Terminal definition** | | | | |
| Virtual Terminals | | | | |
| label | TERMINAL | ADDRESS=**VIRT** | | Required |
| | | ADDRESS= | ______, | Required-enter label of other virtual terminal |
| | | LINSIZE= | ______, | Optional-defaults to 132 |
| | | SYNC= | ______, | Optional-defaults to NO |
| | | END= | ______ | Optional-defaults to NO |

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## Work Sheet 2—Installation and System Generation (continued)

**SYSTEM DEFINITION STATEMENTS** — **REQUIRED/OPTIONAL/DEFAULTS**

**Terminal definition (continued)**

Virtual Terminals (continued)

| | | |
|---|---|---|
| label TERMINAL ADDRESS=**VIRT** | | Required |
| ADDRESS= | ______, | Required-enter label of other virtual terminal |
| LINSIZE | ______, | Optional-defaults to 132 |
| SYNC= | ______, | Optional-defaults to NO |
| END= | ______ | Optional-defaults to NO (Specify YES is last TERMINAL statement) |

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| | | |
|---|---|---|
| label TERMINAL DEVICE=**S1S1** | | Required |
| ADDRESS= | ______, | Required |
| LINSIZE= | ______, | Optional-defaults to 80 |
| CHKSUM= | ______, | Optional-defaults to 16 |
| END= | ______, | Optional-defaults to NO (Specify YES is last TERMINAL statement) |

GPIB (General Purpose Interface Bus)

| | | |
|---|---|---|
| label TERMINAL DEVICE=**GPIB** | | Required |
| ADDRESS= | ______, | Required |
| CODTYPE= | ______, | Optional-defaults to ASCII |
| LINSIZE= | ______, | Optional-defaults to 80 |
| ATTN= | ______, | Optional-defaults to YES |
| SCREEN= | ______, | Optional-defaults to NO (YES/ROLL or NO) |
| PART= | ______, | Optional-defaults to partition 1 |
| SPOOL= | ______, | Optional-defaults to NO |
| END= | ______, | Optional-defaults to NO (Specify YES if last TERMINAL statement) |

# Work Sheet 2—Installation and System Generation (continued)

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Terminal definition (continued)** | | | | |
| Processor to Processor Communications | | | | |
| label | TERMINAL | DEVICE=**PROC** | | Required |
| | | ADDRESS= | ______, | Required (in hexadecimal) |
| | | CODTYPE= | ______, | Optional-defaults to EBCDIC (DRSP/EBCD)EBCDIC) |
| | | LINSIZE= | ______, | Optional-defaults to 130 |
| | | CRDELAY= | ______, | Optional-defaults to (PROMPT,300000) (PROMPT,n/SP5100,n/DELAY,n) |
| | | BITRATE= | ______, | Optional-defaults to 9600 |
| | | RANGE= | ______, | Optional-HIGH/LOW-defaults to HIGH |
| | | CR= | ______, | Optional-defaults to 5B |
| | | LF= | ______, | Optional-defaults to 5B |
| | | END= | ______, | Optional-defaults to NO (Specify YES if last TERMINAL statement) |

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## Work Sheet 2—Installation and System Generation (continued)

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Terminal definition (continued)** | | | | |
| 2741 Terminal | | | | |
| label | TERMINAL | DEVICE=**2741,** | | Required |
| | | ADDRESS= | ______, | Required |
| | | PAGSIZE= | ______, | Optional-defaults to 66 |
| | | LINSIZE= | ______, | Optional-defaults to 130 |
| | | CODTYPE= | ______, | Optional-defaults to EBCD (EBCD/CRSP) |
| | | TOPM= | ______, | Optional-defaults to 0 |
| | | BOTM= | ______, | Optional-defaults to 65 |
| | | LEFTM= | ______, | Optional-defaults to 0 |
| | | RIGHTM= | ______, | Optional-defaults to 129 |
| | | OVFLINE= | ______, | Optional-defaults to NO |
| | | LINEDEL= | ______, | Optional-(2 digit hex char)-defaults to A0 |
| | | CHARDEL= | ______, | Optional-(2 digit hex char)-defaults to 5D |
| | | CRDELAY= | ______, | Optional-defaults to 0 |
| | | ECHO= | ______, | Optional-defaults to YES |
| | | BITRATE= | ______, | Optional-defaults to 134 bps |
| | | ADAPTER= | ______, | Optional-(specify SINGLE) |
| | | CR= | ______, | Optional-defaults to 5B |
| | | LF= | ______, | Optional-defaults to 5B |
| | | SCREEN= | ______, | Optional-defaults to NO (YES or ROLL/NO) |
| | | PART= | ______ | Optional-defaults to partition 1 |
| | | SPOOL= | | Optional-defaults to NO |
| | | END= | | Optional-defaults to NO (Specify YES if last TERMINAL statement |

# Work Sheet 2—Installation and System Generation (continued)

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Terminal definition (continued)** | | | | |
| 4013 Graphics Terminal | | | | |
| label | TERMINAL | DEVICE=**4013,** | | Required |
| | | PAGSIZE= | ______, | Optional-defaults to 35 |
| | | LINSIZE= | ______, | Optional-defaults to 72 |
| | | CODTYPE= | ______, | Optional-specify ASCII |
| | | TOPM= | ______, | Optional-defaults to 0 |
| | | BOTM= | ______, | Optional-defaults to 34 |
| | | LEFTM= | ______, | Optional-defaults to 0 |
| | | RIGHTM= | ______, | Optional-defaults to 71 |
| | | OVFLINE= | ______, | Optional-defaults to NO |
| | | LINEDEL= | ______, | Optional-(2 digit hex char)-defaults to 7F |
| | | CHARDEL= | ______, | Optional-(2 digit hex char)-defaults to 08 |
| | | CRDELAY= | ______, | Optional-defaults to 0 |
| | | ECHO= | ______, | Optional-defaults to YES |
| | | CR= | ______, | Optional-defaults to 0D |
| | | LF= | ______, | Optional-defaults to 0A |
| | | SCREEN= | ______, | Optional-defaults to NO (YES/ROLL or NO) |
| | | DI= / DO= / PI= | ______, | Required (one of the three) |
| | | PART= | ______, | Optional-defaults to partition 1 |
| | | END= | ______ | Optional-defaults to NO (Specify YES if last TERMINAL statement) |

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## Work Sheet 2—Installation and System Generation (continued)

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Terminal definition (continued)** | | | | |
| 4973/4974 Printers | | | | |
| label | TERMINAL | DEVICE= | ________, | Required (specify 4973 or 4974) |
| | | ADDRESS | ________, | Required |
| | | PAGSIZE= | ________, | Optional-defaults to 66 |
| | | LINSIZE= | ________, | Optional-defaults to 132 |
| | | TOPM= | ________, | Optional-defaults to 3 |
| | | BOTM= | ________, | Optional-defaults to 63 |
| | | LEFTM= | ________, | Optional-defaults to 0 |
| | | RIGHTM= | ________, | Optional-defaults to 131 |
| | | OVFLINE= | ________, | Optional-defaults to NO |
| | | SPOOL= | ________, | Optional-defaults to NO |
| | | END= | ________, | Optional-defaults to NO (Specify YES if last TERMINAL statement) |
| 4975 Printer | | | | |
| label | TERMINAL | DEVICE=**4975** | | Required |
| | | ADDRESS= | ________, | Required |
| | | PAGSIZE= | ________, | Optional-defaults to 66 |
| | | LINSIZE= | ________, | Optional-defaults to 132 |
| | | CHARSET= | ________, | Optional-defaults to USCA |
| | | TOPM= | ________, | Optional-defaults to 3 |
| | | BOTM= | ________, | Optional-defaults to 63 |
| | | LEFTM= | ________, | Optional-defaults to 0 |
| | | RIGHTM= | ________, | Optional-defaults to 131 |
| | | OVFLINE= | ________, | Optional-defaults to NO |
| | | BITRATE= | ________, | Optional-defaults to 1200 bps |
| | | LMODE= | ________, | Optional-defaults to LOCAL |
| | | ADAPTER=**MFA** | | Required |
| | | SPOOL= | ________, | Optional-defaults to YES |
| | | END= | ________, | Optional-defaults to NO (Specify YES if last TERMINAL statement) |

# Work Sheet 2—Installation and System Generation (continued)

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Terminal definition (continued)** | | | | |
| 4978/4979 Terminals | | | | |
| label | TERMINAL | DEVICE= | ________ , | Required (specify 4978 or 4979) |
| | | ADDRESS= | ________ , | Required |
| | | LINSIZE= | ________ , | Optional-defaults to 80 |
| | | TOPM= | ________ , | Optional-defaults to 0 |
| | | BOTM= | ________ , | Optional-defaults to 23 |
| | | NHIST= | ________ , | Optional-defaults to 12 |
| | | LEFTM= | ________ , | Optional-defaults to 0 |
| | | RIGHTM= | ________ , | Optional-defaults to 79 |
| | | OVFLINE= | ________ , | Optional-defaults to NO |
| | | HDCOPY= | ________ , | Optional-defaults to $SYSPRTR |
| | | ATTN= | ________ , | Optional-defaults to YES |
| | | PF1= | ________ , | Optional-(2 digit hex char)-defaults to 02 |
| | | SCREEN= | ________ , | Optional-defaults to ROLL (YES/NO/STATIC) |
| | | PART= | ________ , | Optional-defaults to partition 1 |
| | | SPOOL= | ________ , | Optional-defaults to NO |
| | | END= | ________ | Optional-defaults to NO (Specify YES if last TERMINAL statement) |

# Work Sheet 2—Installation and System Generation (continued)

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Terminal definition (continued)** | | | | |
| 4980 Terminals | | | | |
| label | TERMINAL | DEVICE=**4980**, | | Required |
| | | ADDRESS= | ______ , | Required |
| | | LINSIZE= | ______ , | Optional-defaults to 80 |
| | | TOPM= | ______ , | Optional-defaults to 0 |
| | | BOTM= | ______ , | Optional-defaults to 23 |
| | | NHIST= | ______ , | Optional-defaults to 12 |
| | | BITRATE= | ______ , | Required-defaults to 100K bps |
| | | LEFTM= | ______ , | Optional-defaults to 0 |
| | | RIGHTM= | ______ , | Optional-defaults to 79 |
| | | OVFLINE= | ______ , | Optional-defaults to NO |
| | | HDCOPY= | ______ , | Optional-defaults to $SYSPRTR |
| | | ATTN= | ______ , | Optional-defaults to YES |
| | | PF1= | ______ , | Optional-(2 digit hex char)-defaults to 02 |
| | | SCREEN= | ______ , | Optional-defaults to ROLL (YES/ROLL, STATIC or NO) |
| | | PART= | ______ , | Optional-defaults to partition 1 |
| | | SPOOL= | ______ , | Optional-defaults to NO |
| | | ADAPTER=**SMIO**, | | Required |
| | | PORT= | ______, | Required-specify 0 or 1 |
| | | SECADDR= | ______, | Required-specify 00 through FE |
| | | END= | ______ | Optional-defaults to NO (Specify YES if last TERMINAL statement) |

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# Work Sheet 2—Installation and System Generation (continued)

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Terminal definition (continued)** | | | | |
| 5219/5224/5225 | | | | |
| label | TERMINAL | DEVICE= | ______, | Required (specify 5219, 5224, or 5225) |
| | | ADDRESS= | ______, | Required |
| | | PAGSIZE | ______, | Optional-defaults to 66 |
| | | LINSIZE= | ______, | Optional-defaults to 132 |
| | | CHARSET= | ______, | Optional-defaults to USCA |
| | | TOPM= | ______, | Optional-defaults to 3 |
| | | BOTM= | ______, | Optional-defaults to 63 |
| | | LEFTM= | ______, | Optional-defaults to 0 |
| | | RIGHTM= | ______, | Optional-defaults to 131 |
| | | OVFLINE= | ______, | Optional-defaults to NO |
| | | LMODE= | ______, | Optional-defaults to LOCAL |
| | | ADAPTER=ALPA, | | Required |
| | | SPOOL= | ______, | Optional-defaults to YES |
| | | PORT= | ______, | Required-specify 0 or 1 |
| | | SECADDR= | ______, | Required-specify 00 through 06 |
| | | END= | ______, | Optional-defaults to NO (Specify YES if last TERMINAL statement) |

# IBM Series/1 Event Driven Executive

## Work Sheet 2—Installation and System Generation (continued)

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **Terminal definition (continued)** | | | | |
| ACCA-type Terminals | | | | |
| label | TERMINAL | DEVICE= | ________, | Required (specify ACCA or 3101) |
| | | ADDRESS= | ________, | Required |
| | | MODE= | ________, | Required-(3101C/3101B) |
| | | PAGSIZE= | ________, | Optional |
| | | CODTYPE= | ________, | Optional-(ASCII/EBASC) |
| | | LINSIZE= | ________, | Optional |
| | | TOPM= | ________, | Optional |
| | | NHIST= | ________, | Optional |
| | | BOTM= | ________, | Optional |
| | | LEFTM= | ________, | Optional |
| | | RIGHTM= | ________, | Optional |
| | | OVFLINE= | ________, | Optional-defaults to NO |
| | | LINEDEL= | ________, | Optional-(2 digit hex char) |
| | | CHARDEL= | ________, | Optional-(2 digit hex char) |
| | | CRDELAY= | ________, | Optional |
| | | BITRATE= | ________, | Optional-defaults to 300 bps; for MFA, defaults to 1200 bps |
| | | RANGE= | ________, | Optional-defaults to HIGH |
| | | LMODE= | ________, | Optional-(RS422/LOCAL/SWITCHED/PTTOPT) |
| | | ADAPTER | ________, | Optional-(SINGLE/TWO/FOUR SIX/EIGHT/MFA) |
| | | COD= | ________, | Optional |
| | | CR= | ________, | Optional-defaults to B0 for EBASC; defaults to 0D for ASCII |
| | | LF= | ________, | Optional-defaults to 50 for EBASC; defaults to 0A for ASCII |
| | | ATTN= | ________, | Optional-defaults to YES (NO/YES/LOCAL/NOSYS/NOGLOB) |
| | | PF1= | ________, | Optional-(2 digit hex char)-defaults to 1B61 for ASCII and D886 for EBASC |
| | | SCREEN= | ________, | Optional-(YES/NO/STATIC) |
| | | PART= | ________, | Optional-defaults to partition 1 |
| | | TIMERS= | ________, | Optional |
| | | SPOOL= | ________, | Optional-defaults to NO |
| | | END= | ________ | Optional-defaults to NO (Specify YES if last TERMINAL statement) |

# Work Sheet 2—Installation and System Generation (continued)

**SYSTEM DEFINITION STATEMENTS** — **REQUIRED/OPTIONAL/DEFAULTS**

**Terminal definition (continued)**

TTY Terminals

| | | | | |
|---|---|---|---|---|
| label | TERMINAL | DEVICE=**TTY**, | | Required |
| | | ADDRESS= | ______ , | Required |
| | | MODE= | ______ , | Optional-specify 3101C |
| | | PAGSIZE | ______ , | Optional |
| | | CODTYPE=ASCII, | | Required |
| | | LINSIZE= | ______ , | Optional |
| | | TOPM= | ______ , | Optional |
| | | BOTM= | ______ , | Optional |
| | | LEFTM= | ______ , | Optional |
| | | RIGHTM= | ______ , | Optional |
| | | OVFLINE= | ______ , | Optional |
| | | LINEDEL= | ______ , | Optional-(2 digit hex char) |
| | | CHARDEL= | ______ , | Optional-(2 digit hex char) |
| | | CRDELAY= | ______ , | Optional |
| | | ECHO= | ______ , | Optional-defaults to YES |
| | | CR= | ______ , | Optional-defaults to 0D |
| | | LF= | ______ , | Optional-defaults to 0A |
| | | ATTN= | ______ , | Optional-defaults to YES (NO/YES/ALL/LOCAL/NOSYS/NOGLOB) |
| | | PF1= | ______ , | Optional-(2 digit hex char) |
| | | SCREEN= | ______ , | Optional-(YES or ROLL/NO) |
| | | PART= | ______ , | Optional-defaults to partition 1 |
| | | SPOOL= | ______ , | Optional-defaults to NO |
| | | END= | ______ | Optional-defaults to NO (Specify YES if last TERMINAL statement) |

**Binary Synchronous line definition**

| | | | | |
|---|---|---|---|---|
| label | BSCLINE | ADDRESS= | ______ , | Optional-defaults to 09 |
| | | TYPE= | ______ , | Optional-defaults to PT (AC/DC/PT/SM/SA/MC/MT) |
| | | RETRIES= | ______ , | Optional-defaults to 6 |
| | | MC= | ______ , | Optional-defaults to NO |
| | | ADAPTER= | ______ , | Optional-specify MFA |
| | | POLL= | (______ , ______ , ______ , ______), | Optional-applies only if ADAPTER=MFA and TYPE=MT |
| | | END= | ______ | Optional-defaults to NO (Specify YES if last BSCLINE statement) |

# Series/1 Event Driven Executive

## Work Sheet 2—Installation and System Generation (continued)

| SYSTEM DEFINITION STATEMENTS | | | | REQUIRED/OPTIONAL/DEFAULTS |
|---|---|---|---|---|
| **EXIO device interface definition** | | | | |
| blank | EXIODEV | ADDRESS= | ________ , | Required |
| | | MAXDCB= | ________ , | Optional-defaults to 0 |
| | | RSB= | ________ , | Optional-defaults to 0 |
| | | END= | ________ | Optional-defaults to NO (Specify YES if last EXIODEV statement) |
| **Host communication support** | | | | |
| blank | HOSTCOMM | DEVICE=**BSCA,** | | Required |
| | | ADDRESS= | ________ | Required |
| **Sensorio device definition** | | | | |
| blank | SENSORIO | DEVICE= | ________ , | Required-specify IDIO or 4982 |
| | | ADDRESS= | ________ , | Required |
| | | AI= | ________ , | Optional |
| | | AO= | ________ , | Optional |
| | | DI | ________ , | Optional |
| | | DO= | ________ , | Optional |
| | | PI= | ________ , | Optional |
| | | AITYPE= | ________ , | Optional-defaults to RELAY |
| | | LEVEL= | ________ , | Optional-defaults to 1 |
| | | END= | ________ | Optional-defaults to NO (Specify YES if last SENSORIO statement) |
| **System common** | | | | |
| | $SYSCOM | CSECT | | |
| | | QCB | | |
| | | QCB | | |
| | | ECB | | |
| | | ECB | | |
| | | ENTRY | $EDXPTCH | |
| | $EDXPTCH | DATA | 128F'0' | System Patch Area |

# Work Sheet 3

Work sheet 3 helps you select the software features you need to support your configuration and the EDX-related products you are installing as part of your system.

Work sheet 3 contains the following four columns:

## Column One

This column is used to indicate the modules you do not wish to include in your supervisor.

Enter an asterisk (*) in column one for each link control statement (OPTION, PART, OVLAREA,, or INCLUDE) that is NOT required to create your supervisor. The asterisk makes the statement a comment and the object module with the asterisk is not included in your supervisor. Be sure that you include the object modules required to support the processor storage characteristics and I/O devices that you defined in work sheet 2.

## Supervisor Object Modules

Each entry in this column contains:

- A link control statement (OPTION, PART, VOLUME, OVLAREA, INCLUDE,, or LINK)
- Object module name

See Step 3 in Chapter 4, "Select Your Required Support" on page IS-39 for an explanation of each link control statement and object module

## Notes

This column contains numbered notes. Each number refers to a note provided at the end of the $LNKCNTL data set. The notes provide a brief explanation for including a specific module.

## Purpose of Module

This column briefly describes the purpose of each module.

## Work Sheet 3 *(continued)*

This page intentionally left blank

IBM Series/1 Event Driven Executive

# Work Sheet 3—Installation and System Generation

To include a supervisor object module in your operating system, leave Column One blank. To exclude a module, place an asterisk (*) in Column One.

| Column one | Supervisor object modules | Notes | Purpose of module |
|---|---|---|---|
| | OPTION NOVERLAY | *25* | No overlay structure |
| Supervisor support—must be first and in partition 1 | | | |
| | PART 1 | | |
| | VOLUME SX4002 | | Default volume for include modules |
| | OVLAREA OVLSTART OVLEND | *23* | User defined overlay area |
| | INCLUDE EDXSYS | *1* | System tables and work area |
| | INCLUDE ASMOBJ,EDX002 | *1* | Output from user system generation |
| | INCLUDE EDXSVCX | *1* | Task supervisor |
| | INCLUDE $DEBUGNUC | *2* | Resident $DEBUG support |
| | INCLUDE EDXALU | *1* | EDL instruction emulator |
| | INCLUDE EDXSTART | *1* | Initialization & error handler |
| | INCLUDE SWAITM | *3* | Wait on multiple events |
| Timer support—must be in partition 1 | | | |
| | INCLUDE EDXTIMER | *12* | 4955 timer (7840) support |
| | INCLUDE EDXTIMR2 | *12* | 4952/4954/4956 timer support |
| EXIO support—must be in partition 1 | | | |
| | INCLUDE IOSEXIO | *3* | EXIO device control support |
| | INCLUDE EXIOTRC | *3* | EXIO trace option |
| Error logging—must be in partition 1 | | | |
| | INCLUDE SYSLOG | *3* | I/O error logging |
| | INCLUDE CIRCBUFF | *16* | Program/machine check logging |
| Optional function support—must be in partition 1 | | | |
| | INCLUDE RLOADER | *17* | Relocating program loader |
| | INCLUDE STORMGR | *3* | Unmapped storage manager support |
| | INCLUDE IAMQCB | *20* | IAMQCB needed for IAM support |
| | INCLUDE PWRAM80 | *26* | 4980 Power on RAM |
| Host communications support—must be in partition 1 | | | |
| | INCLUDE TPCOM | *14* | Host communication support |
| Translation tables—must be in partition 1 | | | |
| | INCLUDE TRASCII | *10* | 1310,2095/2096,7850 ACCA/TTY translation |
| | INCLUDE TREBASC | *10* | 1610,2091/2092 ACCA translation |
| | INCLUDE TREBCD | *11* | 2741,PROC EBDC translation |
| | INCLUDE TRCRSP | *11* | 2741 correspondence translation |
| Disk(ette) and tape support—must be grouped together in any partition | | | |
| | PART 1 | | |
| | INCLUDE DISKIO | *3* | Basic disk(ette) support |
| | INCLUDE D49624 | *3* | 4962/4964 disk(ette) support |
| | INCLUDE D4963A | *3* | 4963/4967/DDSK-30 subsystem support |
| | INCLUDE D4966A | *3* | 4965/4966 disk(ette) support |
| | INCLUDE D1024 | *3,21* | 1024 bytes/sector IO support |
| | INCLUDE D4969A | *3* | Basic tape support |
| Terminal—must be grouped together in any partition | | | |
| | PART 1 | | |
| | INCLUDE EDXTIO | *4* | Basic terminal support |
| | INCLUDE MINMSG | *5* | Message ID only support |
| | INCLUDE FULLMSG | *5* | Message data set support |
| | INCLUDE IOS3101 | *7* | ACCA 3101B support |
| | INCLUDE IOS4979 | *3* | 4978/4979/4980 display support |

**Figure 23. Work sheet 3**

# Work Sheet 3—Installation and System Generation (cont.)

| Column one | Supervisor object modules | Notes | Purpose of module |
|---|---|---|---|
| | INCLUDE IOS4974 | *3* | 4973/4974/4975/5219/5224/5225 printer support |
| | INCLUDE IOSACCA | *4* | ACCA device handler |
| | INCLUDE ACCATRC | *3* | ACCA trace option |
| | INCLUDE IOSTERM | *A,6* | ACCA/TTY/2741/4013 support |
| | INCLUDE IOSTTY | *3* | ASR 33/35/3101/3101C TTY support |
| | INCLUDE IOS2741 | *3* | 2741 terminal support |
| | INCLUDE IOS4013 | *3* | Digital I/O terminal support |
| | INCLUDE IOSGPIB | *3* | GPIB support |
| | INCLUDE IOSS1S1 | *3* | Series/1 - Series/1 support |
| | INCLUDE IOSVIRT | *3,9* | Virtual terminal support |
| | INCLUDE IOSPOOL | *3* | Spooling support |
| | INCLUDE EBFLCVT | *18* | EBCDIC/floating point conversion |
| Floating point—may be in any partition | | | |
| | PART 1 | | |
| | INCLUDE EDXFLOAT | *3* | Floating point arithmetic |
| Queue I/O—may be in any partition | | | |
| | PART 1 | | |
| | INCLUDE QUEUEIO | *19* | Queue processing support |
| Bisync communications—may be in any partition | | | |
| | PART 1 | | |
| | INCLUDE BSCAM | *13* | Bisync communication support |
| | INCLUDE BSCX21 | *27* | Bisync communication support for X.21 |
| Sensor input/output—must be grouped together in any partition | | | |
| | PART 1 | | |
| | INCLUDE SBCOM | *15* | Basic sensor I/O support |
| | INCLUDE SBAI | *3* | Analog input support |
| | INCLUDE SBAO | *3* | Analog output support |
| | INCLUDE SBDIDO | *3* | Digital input/output support |
| | INCLUDE SBPI | *3* | Process interrupt support |
| System initialization—must be in partition 1 | | | |
| | INCLUDE $PROG1 | *22* | User module included in nucleus gen |
| | INCLUDE IO1024 | *21* | 1024 IPL support |
| System support -- initialization—must be in partition 1 | | | |
| | INCLUDE EDXINIT | *24* | Supervisor initialization |
| | INCLUDE RW4963ID | *3* | 4963 fixed head refresh support |
| | INCLUDE INITMFA | *3* | MFA attachment initialization |
| | INCLUDE INITADAP | *3* | ALPA and SMIO initialization |
| | INCLUDE INIT4978 | *3* | 4978/4979 terminal initialization |
| | INCLUDE INIT4980 | *3* | 4980 display initialization |

# Work Sheet 3—Installation and System Generation (cont.)

| Column one | Supervisor object modules | Notes | Purpose of module |
|---|---|---|---|
| Insert user initialization modules here | | | |
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# Work Sheet 3—Installation and System Generation (cont.)

| Column one | Supervisor object modules | Notes | Purpose of module |
|---|---|---|---|
| Supervisor code being moved out of partition 1 must be moved to here | | | |
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| | | | |
| Location of supervisor | | | |
| LINK $EDXNUCT,EDX002 REPLACE END | | | |

# Work Sheet 4

Work sheet 4 helps you estimate the size of those portions of the supervisor that are relocated to partitions other than partition one and the amount of storage required by programs to execute within a partition.

Work sheet 4 is made up of two parts: A and B.

**Part A** Lists the approximate sizes (in bytes) of the supervisor object modules that make up the supervisor. This part is used to estimate what portion of each partition will be used by the supervisor.

**Part B** List the approximate amount of storage required by the supervisor to support program products and utility programs. In addition, application programs require a certain amount of storage within a partition to execute. The algorithms to estimate these storage requirements are provided.

## PART A

### Supervisor Object Modules

Each supervisor object module included in your supervisor requires processor storage. Some of these modules MUST remain in partition 1; others can be located outside of partition 1.

Under "Partition One:" on page IS-306 is a list of object modules that must remain in partition 1 and their approximate sizes (in bytes). Under "Partition Any:" on page IS-307 are the names of object modules that can be located outside of partition 1, the names of the root segment that is left in partition 1 if a module is located outside of partition 1, and their approximate sizes (in bytes).

## Work Sheet 4 *(continued)*

***Partition One:*** The following supervisor object modules must be located in partition 1. Compare this list against work sheet 3 and select the object modules that you are including in your system. Cross out the modules you are not including, along with their corresponding sizes.

Total the SIZE column and round the total upward to the next multiple of 256. The resulting figure represents the amount of storage required by the supervisor to support these modules.

| MODULE NAME | SIZE (IN BYTES) |
|---|---|
| EDXSYS | 1406 |
| EDXSVCX | 3542 |
| $DBUGNUC | 550 |
| EDXALU | 2350 |
| EDXSTART | 1658 |
| SWAITM | 852 |
| EDXTIMER | 1322 |
| EDXTIMR2 | 1270 |
| IOSEXIO | 1044 |
| EXIOTRC | 740 |
| SYSLOG | 362 |
| CIRCBUFF | 252 |
| RLOADER | 6048 |
| STORMGR | 1352 |
| IAMQCB | 26 |
| PWRAM80 | 356 |
| TPCOM | 2238 |
| TRASCII | 514 |
| TREBASC | 514 |
| TREBCD | 514 |
| TRCRSP | 514 |
| IOI024 | 2596 |
| EDXINIT | 688 |
| RW4963ID | 526 |
| INITMFA | 1326 |
| INITADAP | 2478 |
| INIT4978 | 2352 |
| INIT4980 | 2272 |
| User initialization modules | |

Figure 24. Supervisor modules required in partition 1

The linkage editor, $XPSLINK, automatically includes the following initialization modules in your supervisor. They are included as overlay segments if you default to overlay structure or as resident programs if you include the OPTION NOVERLAY statement. If $XPSLINK includes them as resident programs, the initialization modules required for your system are loaded simultaneously in supervisor storage. As a result, they increase the amount of storage required by the supervisor in partition 1.

To determine how much additional storage is required, select the initialization modules you require to support the I/O devices attached to your Series/1. Cross out the modules you do not need, along with their corresponding sizes. Total the SIZE column; add the resulting figure to the total of the SIZE column in Figure 24 on page IS-306 .

| MODULE NAME | SIZE (IN BYTES) |
|---|---|
| BSCINIT | 578 |
| CLOKINIT | 188 |
| DISKINIT | 2802 |
| DSKINIT2 | 1194 |
| EXIOINIT | 66 |
| INIT4013 | 182 |
| LOADINIT | 3688 |
| SBIOINIT | 180 |
| S1S1INIT | 274 |
| STORINIT | 444 |
| TAPEINIT | 1706 |
| TERMINIT | 1692 |
| TIMRINIT | 354 |
| TPINIT | 364 |

***Partition Any:*** The following supervisor object modules can be located in partition 2 through 8 (depending upon your processor). Compare this list against work sheet 3 and select the object modules that you are including in your system. Cross out the modules you are not including, along with their corresponding sizes.

If you are generating a single-partition supervisor and leave these modules located in partition 1, cross out the modules you do not need, along with their corresponding sizes. Total the SIZE column and add the resulting figure to the total of the SIZE column in Figure 24 on page IS-306.

## Work Sheet 4 *(continued)*

If you are generating a multi-partition supervisor and move any of these modules into partitions 2 through 8, you can estimate the amount of storage required within a specific partition by the size shown in the SIZE column. As indicated by the horizontal rule, some of these modules MUST be grouped together. If you move a group of modules outside of partition 1, add up the number of bytes for the entire group (excluding those not included).

In addition, $XPSLINK includes a 'root' segment in partition 1 that corresponds to each supervisor object module being located outside of partition 1. Each root segment requires an amount of storage within the supervisor in partition 1. For each object module that you locate outside of partition 1, add the amount shown in the ROOT SEGMENT column to the total of the SIZE column in Figure 24 on page IS-306.

| MODULE NAME | SIZE (IN BYTES) | ROOT SEGMENT |
|---|---|---|
| DISKIO | 1294 | 744 |
| D49624 | 1524 | 22 |
| D4963A | 624 | 18 |
| D4966A | 988 | 644 |
| D1024 | 290 | 158 |
| D4969A | 3744 | 1280 |
| EDXTIO | 4852 | 990 |
| MINMSG | 236 | 0 |
| FULLMSG | 1614 | 0 |
| IOS3101 | 2188 | 0 |
| IOS4979 | 2534 | 292 |
| IOS4974 | 988 | 86 |
| IOSTERM | 652 | 0 |
| IOSACCA | 1048 | 392 |
| ACCATRC | 516 | 368 |
| IOSTTY | 172 | 492 |
| IOS2741 | 846 | 678 |
| IOS4013 | 282 | 310 |
| IOSGPIB | 608 | 134 |
| IOSS1S1 | 906 | 344 |
| IOSVIRT | 704 | 0 |
| IOSPOOL | 2042 | 206 |
| EBFLCVT | 1576 | 0 |
| EDXFLOAT | 470 | 56 |
| QUEUEIO | 312 | 14 |
| BSCAM | 3944 | 98 |
| BSCX21 | 1660 | 100 |
| SBCOM | 132 | 12 |
| SBAI | 640 | 62 |
| SBAO | 76 | 14 |
| SBDIDO | 826 | 188 |
| SBPI | 2 | 166 |

**Figure 25. Supervisor modules not required in partition one**

## Work Sheet 4 *(continued)*

### PART B

#### Program Products

The following list of products are not part of the supervisor but use storage in partition one if included in your system. Read down the list and cross out the products you are not including in your system. Total the RESIDENT column and round the total upward to the next multiple of 256. The resulting figure represents the amount of storage required by supervisor to support these products.

| Support | Resident |
|---|---|
| Data set open (DSOPEN) | 1550 |
| 5230 Data Collection | |
| Interactive | |
| 1 to 31 entry units | 16384 |
| 31 to 63 entry units | 18432 |
| System/370 Channel Attach | |
| $CAPGM (in a partition) | 7500 |
| link module (in a program) | 3000 |
| $CHANUT1 (in a partition) | 5400 |
| +900 per device | ( ) |
| Multiple Terminal Manager | 13312 |
| +522 if indexed support | ( ) |
| +552 if 3101 basic | ( ) |
| +terminal servers | |
| (rounded to next 256-byte block) | |
| 834*no. of 4978/4979 | ( ) |
| 1452*no. of 3101 in block mode | ( ) |
| 876*no. of ASR 33/35 | ( ) |
| Support of 1024 bytes per 2200 sector diskette | |
| Indexed Access Method | (3400) |
| Version 1 | |
| +625*no. of data sets | ( ) |
| +250*no. of application programs | ( ) |

The Indexed Access Method Version 2 is supplied as four different packages. You install the package you require based on storage function and requirements. Storage requirements vary from a minimum of 15K bytes to a maximum of 27K bytes. Additional storage is required for control blocks, buffers and work areas. Refer to the Indexed Access Method Version 2 Programming Directory for further information.

## Work Sheet 4 *(continued)*

### Utility Programs

The following is a list of the approximate sizes of each EDX system utility. In planning your system, you need to ensure that the partition in which you plan to use a specific utility is large enough. To ensure that there is enough storage in a partition to execute a utility, you need to take into account the size of the largest utility you intend to use and consider its size along with program products and applications programs you execute within a specific partition.

The approximate size in bytes (rounded up to the next 256-byte increment) required by each utility is as follows:

| UTILITY | SIZE | |
|---|---|---|
| $BSCTRCE | 2560 | |
| $BSCUT1 | 7680 | |
| $BSCUT2 | 24046 | |
| $COMPRES | 12800 | |
| $COPY | 13824 | |
| $COPYUT1 | 16128 | |
| $DASDI | 25600 | |
| $DEBUG | 12032 | |
| $DICOMP | 15872 | |
| $DIINTR | 13056 | |
| $DIRECT | 12544 | |
| $DISKUT1 | 20224 | |
| $DISKUT2 | 18432 | (+1280 if printing error log) |
| $DISKUT3 | 11008 | |
| $DIUTIL | 13568 | |
| $DUMP | 10764 | |
| $EDIT1 | 13824 | |
| $EDIT1N | 17920 | |
| $EDXASM | 19712 | (+5632 if assembling TERMINAL statements) |
| $EDXLINK | 38912 | |
| $EDXLIST | 13056 | |
| $FONT | 20736 | |
| $FSEDIT | 22528 | |
| $GPIBUT1 | 15104 | |
| $HCFUT1 | 3328 | |
| $HXUT1 | 23808 | |
| $IAMUT1 | 19712 | (used for Indexed Access Method Versions 1 and 2) |
| $IMAGE | 12288 | |
| $INITDSK | 30208 | |
| $IOTEST | 14336 | |
| $JOBQUT | 7680 | |
| $JOBUTIL | 1280 | |
| $LOG | 7680 | |
| $MOVEVOL | 5120 | |
| $MSGUT1 | 28416 | |

| UTILITY | SIZE |
|---|---|
| $PDS | 2816 |
| $PFMAP | 768 |
| $PREFIND | 8704 |
| $PRT2780 | 3072 |
| $PRT3780 | 3328 |
| $RJE2780 | 14080 |
| $RJE3780 | 14848 |
| $RMU | 3584 |
| $SPLUT1 | 5120 |
| $S1S1UT1 | 11520 |
| $STGUT1 | 7424 |
| $SUBMIT | 8960 |
| $TAPEUT1 | 29110 |
| $TERMUT1 | 11520 |
| $TERMUT2 | 12288 |
| $TERMUT3 | 1280 |
| $TRACEIO | 14848 |
| $TRAP | 7424 |
| $UPDATE | 13056 |
| $UPDATEH | 9728 |
| $XPSLINK | 23702 |

## Application Programs

### Programs Written in Event Driven Language

Estimate the storage required for an EDL program by totaling the following:

Program Name: ______________ Date:________ Filled Out By: ___________________

| | | |
|---|---|---|
| 1. | Number of source statements * 10 | = (        ) |
| 2. | Size of large tables and buffers | = (        ) |
| 3. | Graphics subroutines | = (        ) |
| 4. | Formatting subroutines | = (        ) |
| 5. | Formatting instructions | = (        ) |
| 6. | Formatted screen image subroutines | = (        ) |
| 7. | Programs using assembler language code | = (        ) |
| 8. | Extra task control block (for ATTNLIST) | = (        ) |
| 9. | DSOPEN subroutine | = ( 1550) |
| 10. | SETEOD subroutine | = ( 280) |
| 11. | $DISKUT3 data management utility | = ( 5200) |
| 12. | $LOADER transient program loader | = ( 5704) |
| 13. | $UPCASE | = ( 150) |
| 14. | $4975 | = ( 300) |
| | TOTAL | = (        ) |

The following notes supply additional information on how to determine these storage items:

## Work Sheet 4 *(continued)*

**Notes:**

1. The number of source statements includes operation code and instruction parameters plus incidental tables and buffers.

2. The number of words coded for tables and buffers.

3. Graphics instructions cause subroutines to be added to your program. Add the following for the first occurrence of each instruction:

```
MODULE              SIZE (BYTES)
CONCAT                 304
GIN                    176
PLOTCB                  16
PLOTGIN                204  (+GIN if not already used)
SCREEN                 492
XYPLOT                 368  (+SCREEN and CONCAT if
                            not already used)
YTPLOT                 368  (+SCREEN if not already used)

TOTAL                (____)
```

4. If you use data formatting instructions, the compiler includes FORMATTING SUBROUTINES in your program. Add the number indicated for each first occurrence of the following specifications included in FORMAT statements referenced by instructions.

| Instruction | Specification | Bytes |
|---|---|---|
| GETEDIT,PUTEDIT or FORMAT | any | 1014 |
| GETEDIT | alphameric | 202 |
| GETEDIT | float.pt. F or E | 96 |
| GETEDIT | integer | 90 |
| PUTEDIT | alphameric | 36 |
| PUTEDIT | float.pt. F | 82 |
| PUTEDIT | float.pt. E | 82 |
| PUTEDIT | integer | 76 |
| GETEDIT or PUTEDIT | any parenthetical expression | 22 |

5. If you use data FORMATTING INSTRUCTIONS, the compiler inserts data areas into your program. Add B bytes for each occurrence of the following instructions:

```
GETEDIT
  B=16+(4*V)+A
  where V=the number of variables in list
        A=6 if ACTION=IO, else A=0
```

## Work Sheet 4 *(continued)*

```
PUTEDIT
  B=16+(4*V)+A
  where V=number of variables in list
        A=4 if ACTION=IO, else A=0
```

```
FORMAT
  B=24+(4*L)
  where L=number of elements in FORMAT list
```

6. When you include the formatted screen image subroutines, the size of your program increases by the amount shown for each subroutine included:

| MODULE | SIZE (BYTES) |
|---|---|
| $IMOPEN | 2600 |
| $PACK | 112 |
| $UNPACK | 64 |
| $IMDTYPE | 116 |
| $IMGEN (includes $IMDEFN, $IMPROT, $IMDATA) | 3626 |
| $IMGEN31 | 2060 |
| $IMGEN49 | 1194 |
| $IMGEN3X | 3310 |
| TOTAL | (______) |

7. Programs containing assembler language code require that one or more of the following subroutines be included. Add the number of bytes shown for EACH OCCURRENCE of the following instructions:

| MODULE | SIZE (BYTES) | X | OCCURRENCE | | |
|---|---|---|---|---|---|
| $$RETURN (entry point RETURN) | 56 | X | ______ | = | ______ |
| $$SVC (entry point SVC) | 20 | X | ______ | = | ______ |
| $EDXATSR (entry points) - SETBUSY, SUPEXIT | 58 | X | ______ | = | ______ |
| TOTAL | | | | | (______) |

8. When a local or a global (or both) ATTNLIST is coded, an extra 128-byte TCB is generated.

9. When DSOPEN is used in a program, the size of the program increases by 1500 bytes.

10. When SETEOD is used in a program, the size of the program increases by 280 bytes.

11. When $DISKUT3 is used in a program, 4600 additional bytes of storage are required.

## Work Sheet 4 *(continued)*

12. The transient program loader ($LOADER) requires an area of 4900 bytes which is overlaid when the program is loaded.

13. When $UPCASE is used in a program, 150 additional bytes of storage are required.

14. When $4975 is used in a program, 300 additional bytes of storage are required.

### Application Program Storage Estimating

#### Programs Written in COBOL

Estimate the storage required for a COBOL program by adding the following:

1. 11,000 bytes.
2. Number of PROCEDURE DIVISION statements times 12.
3. Space used by items in DATA DIVISION as indicated on compiler listing if MAP was specified.
4. Block size of each file times 2.

#### Programs Written in PL/I

Estimate the storage required for a PL/I program by adding the following:

1. 20,000 bytes.
2. Number of statements times 52.

#### Programs Written in FORTRAN

Estimate the storage required for a FORTRAN program by adding the following:

1. 11,000 bytes.

2. Sum of the number of bytes shown in TOTAL PROGRAM REQUIREMENTS at the end of the compiler listing for each routine.

3. Space used by EDL driver program.

#### Programs Written in Pascal

Estimate the storage required for a Pascal program by adding the following:

1. 15,000 bytes.

2. The number of bytes shown in TOTAL PROGRAM REQUIREMENTS at the end of the compiler listing for each module.

# Glossary of Terms and Abbreviations

This glossary defines terms and abbreviations used in the Series/1 Event Driven Executive software publications. All software and hardware terms pertain to EDX. This glossary also serves as a supplement to the *IBM Data Processing Glossary*, GC20-1699.

**$SYSLOGA, $SYSLOGB.** The name of the alternate system logging device. This device is optional but, if defined, should be a terminal with keyboard capability, not just a printer.

**$SYSLOG.** The name of the system logging device or operator station; must be defined for every system. It should be a terminal with keyboard capability, not just a printer.

**$SYSPRTR.** The name of the system printer.

**abend.** Abnormal end-of-task. Termination of a task prior to its completion because of an error condition that cannot be resolved by recovery facilities while the task is executing.

**ACCA.** See asynchronous communications control adapter.

**address key.** Identifies a set of Series/1 segmentation registers and represents an address space. It is one less than the partition number.

**address space.** The logical storage identified by an address key. An address space is the storage for a partition.

**application program manager.** The component of the Multiple Terminal Manager that provides the program management facilities required to process user requests. It controls the contents of a program area and the execution of programs within the area.

**application program stub.** A collection of subroutines that are appended to a program by the linkage editor to provide the link from the application program to the Multiple Terminal Manager facilities.

**asynchronous communications control adapter.** An ASCII terminal attached via #1610, #2091 with #2092, or #2095 with #2096 adapters.

**attention key.** The key on the display terminal keyboard that, if pressed, tells the operating system that you are entering a command.

**attention list.** A series of pairs of 1 to 8 byte EBCDIC strings and addresses pointing to EDL instructions. When the attention key is pressed on the terminal, the operator can enter one of the strings to cause the associated EDL instructions to be executed.

**backup.** A copy of data to be used in the event the original data is lost or damaged.

**base record slots.** Space in an indexed file that is reserved for based records to be placed.

**base records.** Records are placed into an indexed file while in load mode or inserted in process mode with a new high key.

**basic exchange format.** A standard format for exchanging data on diskettes between systems or devices.

**binary synchronous device data block (BSCDDB).** A control block that provides the information to control one Series/1 Binary Synchronous Adapter. It determines the line characteristics and provides dedicated storage for that line.

# Glossary of Terms and Abbreviations

**block.** (1) See data block or index block. (2) In the Indexed Method, the unit of space used by the access method to contain indexes and data.

**block mode.** The transmission mode in which the 3101 Display Station transmits a data data stream, which has been edited and stored, when the SEND key is pressed.

**BSCAM.** See binary synchronous communications access method.

**binary synchronous communications access method.** A form of binary synchronous I/O control used by the Series/1 to perform data communications between local or remote stations.

**BSCDDB.** See binary synchronous device data block.

**buffer.** An area of storage that is temporarily reserved for use in performing an input/output operation, into which data is read or from which data is written. See input buffer and output buffer.

**bypass label processing.** Access of a tape without any label processing support.

**CCB.** See terminal control block.

**central buffer.** The buffer used by the Indexed Access Method for all transfers of information between main storage and indexed files.

**character image.** An alphabetic, numeric, or special character defined for an IBM 4978 Display Station. Each character image is defined by a dot matrix that is coded into eight bytes.

**character image table.** An area containing the 256 character images that can be defined for an IBM 4978 Display Station. Each character image is coded into eight bytes, the entire table of codes requiring 2048 bytes of storage.

**character mode.** The transmission mode in which the 3101 Display Station immediately sends a character when a keyboard key is pressed.

**cluster.** In an indexed file, a group of data blocks that is pointed to from the same primary-level index block, and includes the primary-level index block. The data records and blocks contained in a cluster are logically contiguous, but are not necessarily physically contiguous.

**COD (change of direction).** A character used with ACCA terminal to indicate a reverse in the direction of data movement.

**cold start.** Starting the spool facility by erasing any spooled jobs remaining in the spool data set from any previous spool session.

**command.** A character string from a source external to the system that represents a request for action by the system.

**common area.** A user-defined data area that is mapped into the partitions specified on the SYSTEM definition statement. It can be used to contain control blocks or data that will be accessed by more than one program.

**completion code.** An indicator that reflects the status of the execution of a program. The completion code is displayed or printed on the program's output device.

**constant.** A value or address that remains unchanged thoughout program execution.

**controller.** A device that has the capability of configuring the GPIB bus by designating which devices are active, which devices are listeners, and which device is the talker. In Series/1 GPIB implementation, the Series/1 is always the controller.

**conversion.** See update.

**control station.** In BSCAM communications, the station that supervises a multipoint connection, and performs polling and selection of its tributary stations. The status of control station is assigned to a BSC line during system generation.

**cross-partition service.** A function that accesses data in two partitions.

**cross-partition supervisor.** A supervisor in which one or more supervisor modules reside outside of partition 1 (address space 0).

**data block.** In an indexed file, an area that contains control information and data records. These blocks are a multiple of 256 bytes.

**data record.** In an indexed file, the records containing customer data.

**data set.** A group of records within a volume pointed to by a directory member entry in the directory for the volume.

**data set control block (DSCB).** A control block that provides the information required to access a data set, volume or directory using READ and WRITE.

**data set shut down.** An indexed data set that has been marked (in main storage only) as unusable due to an error.

**DCE.** See directory control entry.

**device data block (DDB).** A control block that describes a disk or diskette volume.

**direct access.** (1) The access method used to READ or WRITE records on a disk or diskette device by specifying their location relative the beginning of the data set or volume. (2) In the Indexed Access Method, locating any record via its key without respect to the previous operation. (3) A condition in terminal I/O where a READTEXT or a PRINTEXT is directed to a buffer which was previously enqueued upon by an IOCB.

**directory.** (1) A series of contiguous records in a volume that describe the contents in terms of allocated data sets and free space. (2) A series of contiguous records on a device that describe the contents in terms of allocated volumes and free space. (3) For the Indexed Access Method Version 2, a data set that defines the relationship between primary and secondary indexed files (secondary index support).

**directory control entry (DCE).** The first 32 bytes of the first record of a directory in which a description of the directory is stored.

**directory member entry (DME).** A 32-byte directory entry describing an allocated data set or volume.

**display station.** An IBM 4978, 4979, or 3101 display terminal or similar terminal with a keyboard and a video display.

**DME.** See directory member entry.

**DSCB.** See data set control block.

**dynamic storage.** An increment of storage that is appended to a program when it is loaded.

**end-of-data indicator.** A code that signals that the last record of a data set has been read or written. End-of-data is determined by an end-of-data pointer in the DME or by the physical end of the data set.

**ECB.** See event control block.

**EDL.** See Event Driven Language.

**emulator.** The portion of the Event Driven Executive supervisor that interprets EDL instructions and performs the function specified by each EDL statement.

**end-of-tape (EOT).** A reflective marker placed near the end of a tape and sensed during output. The marker signals that the tape is nearly full.

**enter key.** The key on the display terminal keyboard that, if pressed, tells the operating system to read the information you entered.

**event control block (ECB).** A control block used to record the status (occurred or not occurred) of an event; often used to synchronize the execution of tasks. ECBs are used in conjunction with the WAIT and POST instructions.

**Event Driven Language (EDL).** The language for input to the Event Driven Executive compiler ($EDXASM), or the Macro and Host assemblers in conjunction with the Event Driven Executive macro libraries. The output is interpreted by the Event Driven Executive emulator.

**EXIO (execute input or output).** An EDL facility that provides user controlled access to Series/1 input/output devices.

**external label.** A label attached to the outside of a tape that identifies the tape visually. It usually contains items of identification such as file name and number, creation data, number of volumes, department number, and so on.

**external name (EXTRN).** The 1- to 8-character symbolic EBCDIC name for an entry point or data field that is not defined within the module that references the name.

**FCA.** See file control area.

**FCB.** See file control block.

**file.** A set of related records treated as a logical unit. Although file is often used interchangeably with data set, it usually refers to an indexed or a sequential data set.

**file control area (FCA).** A Multiple Terminal Manager data area that describes a file access request.

**file control block (FCB).** The first block of an indexed file. It contains descriptive information about the data contained in the file.

**file control block extension.** The second block of an indexed file. It contains the file definition parameters used to define the file.

**file manager.** A collection of subroutines contained within the program manager of the Multiple Terminal Manager that provides common support for all disk data transfer operations as needed for transaction-oriented application programs. It supports indexed and direct files under the control of a single callable function.

**floating point.** A positive or negative number that can have a decimal point.

**formatted screen image.** A collection of display elements or display groups (such as operator prompts and field input names and areas) that are presented together at one time on a display device.

**free pool.** In an indexed data set, a group of blocks that can be used for either data blocks or index blocks. These differ from other free blocks in that these are not initially assigned to specific logical positions in the file.

**free space.** In an indexed file, records blocks that do not currently contain data, and are available for use.

**free space entry (FSE).** An 8-byte directory entry defining an area of free space within a volume or a device.

**FSE.** See free space entry.

**general purpose interface bus.** The IEEE Standard 488-1975 that allows various interconnected devices to be attached to the GPIB adapter (RPQ D02118).

# Glossary of Terms and Abbreviations

**GPIB.** See general purpose interface bus.

**group.** A unit of 100 records in the spool data set allocated to a spool job.

**H exchange format.** A standard format for exchanging data on diskettes between systems or devices.

**host assembler.** The assembler licensed program that executes in a 370 (host) system and produces object output for the Series/1. The source input to the host assembler is coded in Event Driven Language or Series/1 assembler language. The host assembler refers to the System/370 Program Preparation Facility (5798-NNQ).

**host system.** Any system whose resources are used to perform services such as program preparation for a Series/1. It can be connected to a Series/1 by a communications link.

**IACB.** See indexed access control block.

**IAR.** See instruction address register.

**ICB.** See indexed access control block.

**IIB.** See interrupt information byte.

**image store.** The area in a 4978 that contains the character image table.

**immediate data.** A self-defining term used as the operand of an instruction. It consists of numbers, messages or values which are processed directly by the computer and which do not serve as addresses or pointers to other data in storage.

**index.** In an indexed file, an ordered collection of pairs of keys and pointers, used to sequence and locate records.

**index block.** In an indexed file, an area that contains control information and index entries. These blocks are a multiple of 256 bytes.

**indexed access control block (IACB/ICB).** The control block that relates an application program to an indexed file.

**indexed access method.** An access method for direct or sequential processing of fixed-length records by use of a record's key.

**indexed data set.** Synonym for indexed file.

**indexed file.** A file specifically created, formatted and used by the Indexed Access Method. An indexed file is sometimes called an indexed data set.

**index entry.** In an indexed file, a key-pointer pair, where the pointer is used to locate a lower-level index block or a data block.

**index register (#1, #2).** Two words defined in EDL and contained in the task control block for each task. They are used to contain data or for address computation.

**input buffer.** (1) See buffer. (2) In the Multiple Terminal Manager, an area for terminal input and output.

**input output control block (IOCB).** A control block containing information about a terminal such as the symbolic name, size and shape of screen, the size of the forms in a printer, or an optional reference to a user provided buffer.

**instruction address register (IAR).** The pointer that identifies the machine instruction currently being executed. The Series/1 maintains a hardware IAR to determine the Series/1 assembler instruction being executed. It is located in the level status block (LSB).

**integer.** A positive or negative number that has no decimal point.

**interactive.** The mode in which a program conducts a continuous dialogue between the user and the system.

**internal label.** An area on tape used to record identifying information (similar to the identifying information placed on an external label). Internal labels are checked by the system to ensure that the correct volume is mounted.

**interrupt information byte (IIB).** In the Multiple Terminal Manager, a word containing the status of a previous input/output request to or from a terminal.

**invoke.** To load and activate a program, utility, procedure, or subroutine into storage so it can run.

**job.** A collection of related program execution requests presented in the form of job control statements, identified to the jobstream processor by a JOB statement.

**job control statement.** A statement in a job that specifies requests for program execution, program parameters, data set definitions, sequence of execution, and, in general, describes the environment required to execute the program.

**job stream processor.** The job processing facility that reads job control statements and processes the requests made by these statements. The Event Driven Executive job stream processor is $JOBUTIL.

**jumper.** (1) A wire or pair of wires which are used for the arbitrary connection between two circuits or pins in an attachment card. (2) To connect wire(s) to an attachment card or to connect two circuits.

**key.** In the Indexed Access Method, one or more consecutive characters used to identify a record and establish its order with respect to other records. See also key field.

**key field.** A field, located in the same position in each record of an indexed file, whose content is used for the key of a record.

**level status block (LSB).** A Series/1 hardware data area that contains processor status. This area is eleven words in length.

**library.** A set of contiguous records within a volume. It contains a directory, data sets and/or available space.

**line.** A string of characters accepted by the system as a single input from a terminal; for example, all characters entered before the carriage return on the teletypewriter or the ENTER key on the display station is pressed.

**link edit.** The process of resolving external symbols in one or more object modules. A link edit is performed with $EDXLINK whose output is a loadable program.

**listener.** A controller or active device on a GPIB bus that is configured to accept information from the bus.

**load mode.** In the Indexed Access Method, the mode in which records are loaded into base record slots in an indexed file.

**load module.** A single module having cross references resolved and prepared for loading into storage for execution. The module is the output of the $UPDATE or $UPDATEH utility.

**load point.** (1) Address in the partition where a program is loaded. (2) A reflective marker placed near the beginning of a tape to indicate where the first record is written.

**lock.** In the Indexed Access Method, a method of indicating that a record or block is in use and is not available for another request.

**logical screen.** A screen defined by margin settings, such as the TOPM, BOTM, LEFTM and RIGHTM parameters of the TERMINAL or IOCB statement.

**LSB.** See level status block.

**mapped storage.** The processor storage that you defined on the SYSTEM statement during system generation.

**member.** A term used to identify a named portion of a partitioned data set (PDS). Sometimes member is also used as a synonym for a data set. See data set.

**menu.** A formatted screen image containing a list of options. The user selects an option to invoke a program.

**menu-driven.** The mode of processing in which input consists of the responses to prompting from an option menu.

**message.** In data communications, the data sent from one station to another in a single transmission. Stations communication with a series of exchanged messages.

**multifile volume.** A unit of recording media, such as tape reel or disk pack, that contains more than one data file.

**multiple terminal manager.** An Event Driven Executive licensed program that provides support for transaction-oriented applications on a Series/1. It provides the capability to define transactions and manage the programs that support those transactions. It also manages multiple terminals as needed to support these transactions.

**multivolume file.** A data file that, due to its size, requires more than one unit of recording media (such as tape reel or disk pack) to contain the entire file.

**new high key.** A key higher than any other key in an indexed file.

**nonlabeled tapes.** Tapes that do not contain identifying labels (as in standard labeled tapes) and contain only files separated by tapemarks.

**null character.** A user-defined character used to define the unprotected fields of a formatted screen.

**option selection menu.** A full screen display used by the Session Manager to point to other menus or system functions, one of which is to be selected by the operator. (See primary option menu and secondary option menu.)

**output buffer.** (1) See buffer. (2) In the Multiple Terminal Manager, an area used for screen output and to pass data to subsequent transaction programs.

**overlay.** The technique of reusing a single storage area allocated to a program during execution. The storage area can be reused by loading it with overlay programs that have been specified in the PROGRAM statement of the program or by calling overlay segments that have been specified in the OVERLAY statement of $EDXLINK.

**overlay area.** A storage area within a program reserved for overlay programs specified in the PROGRAM statement or overlay segments specified in the OVERLAY statement in $EDXLINK.

**overlay program.** A program in which certain control sections can use the same storage location at different times during execution. An overlay program can execute concurrently as an asynchronous task with other programs and is specified in the EDL PROGRAM statement in the main program.

**overlay segment.** A self-contained portion of a program that is called and sequentially executes as a synchronous task. The entire program that calls the overlay segment need not be maintained in storage while the overlay segment is executing. An overlay segment is specified in the OVERLAY statement of $EDXLINK or $XPSLINK (for initialization modules).

**overlay segment area.** A storage area within a program or supervisor reserved for overlay segments. An overlay segment area is specified with the OVLAREA statement of $EDXLINK.

# Glossary of Terms and Abbreviations

**parameter selection menu.** A full screen display used by the Session Manager to indicate the parameters to be passed to a program.

**partition.** A contiguous fixed-sized area of storage. Each partition is a separate address space.

**performance volume.** A volume whose name is specified on the DISK definition statement so that its address is found during IPL, increasing system performance when a program accesses the volume.

**physical timer.** Synonym for timer (hardware).

**polling.** In data communications, the process by which a multipoint control station asks a tributary if it can receive messages.

**precision.** The number of words in storage needed to contain a value in an operation.

**prefind.** To locate the data sets or overlay programs to be used by a program and to store the necessary information so that the time required to load the prefound items is reduced.

**primary file.** An indexed file containing the data records and primary index.

**primary file entry.** For the Indexed Access Method Version 2, an entry in the directory describing a primary file.

**primary index.** The index portion of a primary file. This is used to access data records when the primary key is specified.

**primary key.** In an indexed file, the key used to uniquely identify a data record.

**primary-level index block.** In an indexed file, the lowest level index block. It contains the relative block numbers (RBNs) and high keys of several data blocks. See cluster.

**primary menu.** The program selection screen displayed by the Multiple Terminal Manager.

**primary option menu.** The first full screen display provided by the Session Manager.

**primary station.** In a Series/1 to Series/1 attachment, the processor that control communication between the two computers. Contrast with secondary station.

**primary task.** The first task executed by the supervisor when a program is loaded into storage. It is identified by the PROGRAM statement.

**priority.** A combination of hardware interrupt level priority and a software ranking within a level. Both primary and secondary tasks will execute asynchronously within the system according to the priority assigned to them.

**process mode.** In the Indexed Access Method, the mode in which records can be retrieved, updated, inserted or deleted.

**processor status word (PSW).** A 16-bit register used to (1) record error or exception conditions that may prevent further processing and (2) hold certain flags that aid in error recovery.

**program.** A disk- or diskette-resident collection of one or more tasks defined by a PROGRAM statement; the unit that is loaded into storage. (See primary task and secondary task.)

**program header.** The control block found at the beginning of a program that identifies the primary task, data sets, storage requirements and other resources required by a program.

**program/storage manager.** A component of the Multiple Terminal Manager that controls the execution and flow of application programs within a single program area and contains the support needed to allow multiple operations and sharing of the program area.

**protected field.** A field in which the operator cannot use the keyboard to enter, modify, or erase data.

**PSW.** See processor status word.

**QCB.** See queue control block.

**QD.** See queue descriptor.

**QE.** See queue element.

**queue control block (QCB).** A data area used to serialize access to resources that cannot be shared. See serially reusable resource.

**queue descriptor (QD).** A control block describing a queue built by the DEFINEQ instruction.

**queue element (QE).** An entry in the queue defined by the queue descriptor.

**quiesce.** To bring a device or a system to a halt by rejection of new requests for work.

**quiesce protocol.** A method of communication in one direction at a time. When sending node wants to receive, it releases the other node from its quiesced state.

**record.** (1) The smallest unit of direct access storage that can be accessed by an application program on a disk or diskette using READ and WRITE. Records are 256 bytes in length. (2) In the Indexed Access Method, the logical unit that is transferred between $IAM and the user's buffer. The length of the buffer is defined by the user. (3) In BSCAM communications, the portions of data transmitted in a message. Record length (and, therefore, message length) can be variable.

**recovery.** The use of backup data to recreate data that has been lost or damaged.

**reflective marker.** A small adhesive marker attached to the reverse (nonrecording) surface of a reel of magnetic tape. Normally, two reflective markers are used on each reel of tape. One indicates the beginning of the recording area on the tape (load point), and the other indicates the proximity to the end of the recording area (EOT) on the reel.

**relative block address (RBA).** The location of a block of data on a 4967 disk relative to the start of the device.

**relative record number.** An integer value identifying the position of a record in a data set relative to the beginning of the data set. The first record of a data set is record one, the second is record two, the third is record three.

**relocation dictionary (RLD).** The part of an object module or load module that is used to identify address and name constants that must be adjusted by the relocating loader.

**remote management utility control block (RCB).** A control block that provides information for the execution of remote management utility functions.

**reorganize.** The process of copying the data in an indexed file to another indexed file in a manner that rearranges the data for more optimum processing and free space distribution.

**restart.** Starting the spool facility w the spool data set contains jobs from a previous session. The jobs in the spool data set can be either deleted or printed when the spool facility is restarted.

**return code.** An indicator that reflects the results of the execution of an instruction or subroutine. The return code is usually placed in the task code word (at the beginning of the task control block).

**roll screen.** A display screen which is logically segmented into an optional history area and a work area. Output directed to the screen starts display at the beginning of the work area and continues on down in a line-by-line sequence. When the work area gets full, the operator presses ENTER/SEND and its contents are shifted into the optional history area and the work area itself is erased. Output now starts again at the beginning of the work area.

**SBIOCB.** See sensor based I/O control block.

**second-level index block.** In an indexed data set, the second-lowest level index block. It contains the addresses and high keys of several primary-level index blocks.

**secondary file.** See secondary index.

**secondary index.** For the Indexed Access Method Version 2, an indexed file used to access data records by their secondary keys. Sometimes called a secondary file.

**secondary index entry.** For the Indexed Access Method Version 2, this an an entry in the directory describing a secondary index.

**secondary key.** For the Indexed Access Method Version 2, the key used to uniquely identify a data record.

**secondary option menu.** In the Session Manager, the second in a series of predefined procedures grouped together in a hierarchical structure of menus. Secondary option menus provide a breakdown of the functions available under the session manager as specified on the primary option menu.

**secondary task.** Any task other than the primary task. A secondary task must be attached by a primary task or another secondary task.

**secondary station.** In a Series/1 to Series/1 attachment, the processor that is under the control of the primary station.

**sector.** The smallest addressable unit of storage on a disk or diskette. A sector on a 4962 or 4963 disk is equivalent to an Event Driven Executive record. On a 4964 or 4966 diskette, two sectors are equivalent to an Event Driven Executive record.

**selection.** In data communications, the process by which the multipoint control station asks a tributary station if it is ready to send messages.

**self-defining term.** A decimal, integer, or character that the computer treats as a decimal, integer, or character and not as an address or pointer to data in storage.

**sensor based I/O control block (SBIOCB).** A control block containing information related to sensor I/O operations.

**sequential access.** The processing of a data set in order of occurrence of the records in the data set. (1) In the Indexed Access Method, the processing of records in ascending collating sequence order of the keys. (2) When using READ/WRITE, the processing of records in ascending relative record number sequence.

**serially reusable resource (SRR).** A resource that can only be accessed by one task at a time. Serially reusable resources are usually managed via (1) a QCB and ENQ/DEQ statements or (2) an ECB and WAIT/POST statements.

**service request.** A device generated signal used to inform the GPIB controller that service is required by the issuing device.

**session manager.** A series of predefined procedures grouped together as a hierarchical structure of menus from which you select the utility functions, program preparation facilities, and language processors needed to prepare and execute application programs. The menus consist of a primary option menu that displays functional groupings and secondary option menus that display a breakdown of these functional groupings.

**shared resource.** A resource that can be used by more than one task at the same time.

**shut down.** See data set shut down.

**source module/program.** A collection of instructions and statements that constitute the input to a compiler or assembler. Statements may be created or modified using one of the text editing facilities.

**spool job.** The set of print records generated by a program (including any overlays) while engueued to a printer designated as a spool device.

**spool session.** An invocation and termination of the spool facility.

**spooling.** The reading of input data streams and the writing of output data streams on storage devices, concurrently with job execution, in a format convenient for later processing or output operations.

**SRQ.** See service request.

**stand-alone dump.** An image of processor storage written to a diskette.

**stand-alone dump diskette.** A diskette supplied by IBM or created by the $DASDI utility.

**standard labels.** Fixed length 80-character records on tape containing specific fields of information (a volume label identifying the tape volume, a header label preceding the data records, and a trailer label following the data records).

**static screen.** A display screen formatted with predetermined protected and unprotected areas. Areas defined as operator prompts or input field names are protected to prevent accidental overlay by input data. Areas defined as input areas are not protected and are usually filled in by an operator. The entire screen is treated as a page of information.

**station.** In BSCAM communications, a BSC line attached to the Series/1 and functioning in a point-to-point or multipoint connection. Also, any other terminal or processor with which the Series/1 communicates.

**subroutine.** A sequence of instructions that may be accessed from one or more points in a program.

**supervisor.** The component of the Event Driven Executive capable of controlling execution of both system and application programs.

**system configuration.** The process of defining devices and features attached to the Series/1.

**SYSGEN.** See system generation.

**system generation.** The processing of defining I/O devices and selecting software options to create a supervisor tailored to the needs of a specific Series/1 hardware configuration and application.

**system partition.** The partition that contains the root segment of the supervisor (partition number 1, address space 0).

**talker.** A controller or active device on a GPIB bus that is configured to be the source of information (the sender) on the bus.

**tape device data block (TDB).** A resident supervisor control block which describes a tape volume.

**tapemark.** A control character recorded on tape used to separate files.

**task.** The basic executable unit of work for the supervisor. Each task is assigned its own priority and processor time is allocated according to this priority. Tasks run independently of each other and compete for the system resources. The first task of a program is the primary task. All tasks attached by the primary task are secondary tasks.

**task code word.** The first two words (32 bits) of a task's TCB; used by the emulator to pass information from system to task regarding the outcome of various operations, such as event completion or arithmetic operations.

**task control block (TCB).** A control block that contains information for a task. The information consists of pointers, save areas, work areas, and indicators required by the supervisor for controlling execution of a task.

**task supervisor.** The portion of the Event Driven Executive that manages the dispatching and switching of tasks.

**TCB.** See task control block.

**terminal.** A physical device defined to the EDX system using the TERMINAL configuration statement. EDX terminals include directly attached IBM displays, printers and devices that communicate with the Series/1 in an asynchronous manner.

**terminal control block (CCB).** A control block that defines the device characteristics, provides temporary storage, and contains links to other system control blocks for a particular terminal.

**terminal environment block (TEB).** A control block that contains information on a terminal's attributes and the program manager operating under the Multiple Terminal Manager. It is used for processing requests between the terminal servers and the program manager.

**terminal screen manager.** The component of the Multiple Terminal Manager that controls the presentation of screens and communications between terminals and transaction programs.

**terminal server.** A group of programs that perform all the input/output and interrupt handling functions for terminal devices under control of the Multiple Terminal Manager.

**terminal support.** The support provided by EDX to manage and control terminals. See terminal.

**timer.** The timer features available with the Series/1 processors. Specifically, the 7840 Timer Feature card (4955 only) or the native timer (4952, 4954, and 4956). Only one or the other is supported by the Event Driven Executive.

**trace range.** A specified number of instruction addresses within which the flow of execution can be traced.

**transaction oriented applications.** Program execution driven by operator actions, such as responses to prompts from the system. Specifically, applications executed under control of the Multiple Terminal Manager.

**transaction program.** See transaction-oriented applications.

**transaction selection menu.** A Multiple Terminal Manager display screen (menu) offering the user a choice of functions, such as reading from a data file, displaying data on a terminal, or waiting for a response. Based upon the choice of option, the application program performs the requested processing operation.

**tributary station.** In BSCAM communications, the stations under the supervision of a control station in a multipoint connection. They respond to the control station's polling and selection.

**unmapped storage.** The processor storage in your processor that you did not define on the SYSTEM statement during system generation.

**unprotected field.** A field in which the operator can use the keyboard to enter, modify or erase data. Also called non-protected field.

**update.** (1) To alter the contents of storage or a data set. (2) To convert object modules, produced as the output of an assembly or compilation, or the output of the linkage editor, into a form that can be loaded into storage for program execution and to update the directory of the volume on which the loadable program is stored.

**user exit.** (1) Assembly language instructions included as part of an EDL program and invoked via the USER instruction. (2) A point in an IBM-supplied program where a user written routine can be given control.

**variable.** An area in storage, referred to by a label, that can contain any value during program execution.

**vary offline.** (1) To change the status of a device from online to offline. When a device is offline, no data set can be accessed on that device. (2) To place a disk or diskette in a state where it is unknown by the system.

**vary online.** To place a device in a state where it is available for use by the system.

**vector.** An ordered set or string of numbers.

**volume.** A disk, diskette, or tape subdivision defined using $INITDSK or $TAPEUT1.

**volume descriptor entry (VDE).** A resident supervisor control block that describes a volume on a disk or diskette.

**volume label.** A label that uniquely identifies a single unit of storage media.

# Index

The following index contains entries for this book only. See the *Library Guide and Common Index* for a Common Index to all Event Driven Executive books.

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# IBM Technical Newsletter

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|---|---|
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**IBM Series/1**
**Event Driven Executive**
**Installation and System Generation Guide**
**Program Numbers: 5719-XS4, 5719-XX5**



This Technical Newsletter, a part of PTF-P02 to Version 4.1 of the Event Driven Executive, provides replacement pages for the subject publication. These replacement pages remain in effect for subsequent levels unless specifically altered. Pages to be inserted and/or removed are:

ii.1, ii.2 (added)
IS-5 through IS-16
IS-55 through IS-58
IS-91, IS-92
IS-113 through IS-116
IS-145 through IS-148
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IS-217 through IS-222
IS-229 through IS-232
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IS-259, IS-260
IS-269 through IS-276

Technical changes to the text or to illustrations are indicated by a vertical line to the left of the change.

**Summary of Amendments**

This Technical Newsletter contains the following additions or modifications to the text:

- Chapters 2, 3, 4, and 5 have been updated throughout to reflect 60-megabyte disk, $MEMDISK, and 4975-01A Printer support.

- Appendixes A and C have been updated to reflect 60-megabyte disk, $MEMDISK, and 4975-01A Printer support.

**Note**: Please file this cover letter at the back of the manual to provide a record of changes.

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SC34-0436-1

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Version 4.1

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IS

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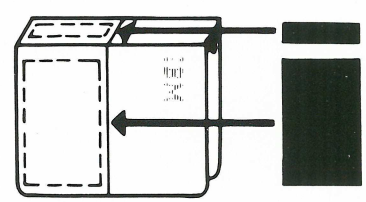

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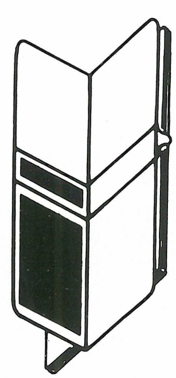

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