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Systems

DOS/VS
System Generation

Release 34

IBM

Seventh Edition (April, 1977)

This edition, as amended by Technical Newsletters GN33-9226 and GN33-9230, applies to Version 5, Release 34, of the IBM Disk Operating System/Virtual Storage, DOS/VS, and to all subsequent versions and releases until otherwise indicated in new editions or Technical Newsletters. Changes are continually made to the information herein. Before using this publication in connection with the operation of IBM systems, consult the latest IBM System/370 Bibliography, GC20-0001, for the editions that are applicable and current.

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Summary of Amendments

Independent Component Release of IBM 3800 Printing Subsystem Support

Technical Newsletter GN33-9230 documents changes to support the IBM 3800 Printing Subsystem under DOS/VS.

Technical Newsletter GN33-9226 corrects errors in the base publication and documents the restoring of DOS/VS to minidisk under VM/370.

Release 34

Edition GC33-5377-6 documents:

- Full support for the IBM 3350 and IBM 3330-11
- Support of the IBM 3277 as operator console
- Support of the IBM 3540 as IPL communication device
- Inclusion of functions of the COPYSERV program into the CORGZ program and the removal of the COPYSERV program from DOS/VS
- Improvement of initial program load through the use of an IPL communication device list
- Integration of support information on System/370 CPU Models 135-3, 138, 145-3, and 148 and on the IBM 3203-4 printer
- Removal of POWER/VS generation information that was provided in Module 2 of earlier editions of this manual; this information is now included in DOS/VS POWER/VS Installation Guide and Reference, GC33-6048
- EREP enhancements for CPU Models 135, 138, and 158

In addition, corrections and editorial changes have been made to improve the manual's usability.

Release 33

Edition GC33-5377-5 documents:

- Installation improvements
- POWER/VS enhancements
- VSAM enhancements
- Access Method Services enhancements
- New utility programs
- Cardless system support
- Minor changes and corrections throughout the manual

Note that Module 1, "Planning and Procedures", has been revised entirely.

Release 32

Edition GC33-5377-4 documents:

- Cross-partition event control
- CIL patch program (PDZAP)
- Highspeed standalone dump
- Fast CCW translation
- Minor changes and corrections throughout the manual

Preface

The information in this publication is of particular interest to anyone responsible for the planning and/or implementation of system generation and maintenance for DOS/VS. This includes installation managers, system analysts, programmers, and machine operators.

Familiarity with the following system programs and facilities is invaluable when using this publication:

- Control programs (supervisor, job control, and IPL)
- System service programs (linkage editor and librarian)
- Input/Output Control System (IOCS) logic modules.

The storage estimates given in this publication are within 15% of actual requirements.

MODULAR ORGANIZATION OF THIS MANUAL

This publication is in a modular format that enables you to discard unwanted modules and to insert system generation modules from program product documents. Thus, you can easily prepare a system generation document for your own installation.

Although the pages are numbered consecutively throughout the book, each module is self-contained. A numbered tab on the right-hand edge of the page indicates the beginning of each new module. If module volume warrants, a Module Outline and Module Index is provided.

The total publication has a General Contents and a General Index. These refer you to the individual module numbers. Figure numbers throughout the publication are in the form: Figure 1-3, where 1 is the module number and 3 is the figure number within the module.

Each module in this publication is a collection of information about a particular component or related topics. The modules, numbered from 1 to 25, are grouped as follows:

- Module 1: Planning and procedures information
- Module 2: POWER/VS
- Module 3: Installation Verification Procedures (IVP)
- Modules 4-6: Emulator Programs
- Modules 7-16: I/O Components
- Module 17: VSAM
- Module 18: Assembler
- Module 19: System aids (OLTEP)
- Module 20: BTAM
- Module 21: QTAM
- Module 22: VTAM
- Module 23: SSS
- Module 24: System Utilities
- Module 25: EREP

Prerequisites for a thorough understanding and effective use of this publication are:

DOS/VS System Management Guide, GC33-5371
DOS/VS System Control Statements, GC33-5376
DOS/VS Supervisor and I/O Macros, GC33-5373
DOS/VS Operating Procedures, GC33-5378
DOS/VS Messages, GC33-5379
DOS/VS System Utilities, GC33-5381
IBM System/370 Subsystem Support Services User's Guide, GC30-3022
Guide to the DOS/VS Assembler, GC33-4024
Moving from Model 20 to DOS/VS, GC33-5386

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Introduction

The object of DOS/VS system generation is to tailor the IBM-supplied system to the requirements of your installation. This tailoring process is accomplished by:

1. Planning system generation

2. Implementing the plan by performing a system generation

3. Testing the results by running the applicable IVP (Installation Verification Procedure) and sample problems.

Detailed planning is essential to efficient system generation. It minimizes the need to modify the system after it is generated. You may want to contact your IBM marketing representative to set up a system generation planning meeting. IBM field engineering would also attend the meeting to discuss the procedure to install the SCP (Systems Control Programming). Planning a system includes:

- Evaluating which of the IBM-supplied supervisors most closely meets your installation's requirements. Considering modifications, such as deleting components from, or adding options to the selected supervisor(s). Estimating the size of the planned supervisor and assessing the effects of some of the major options, such as multiprogramming and POWER/VS, on the operation of your system.

- Tailoring the supervisor to the needs of your installation, which includes planning the options and estimating the size of the supervisor. This entails assessing the implications and effects of some of the major supervisor options, such as multiprogramming and POWER/VS, on the operation of your system.

- Planning the contents, organization, and size of the system and private libraries.

- Generating POWER/VS (optional).

- Planning the Page Data Set.

- Emulator generation (optional).

These major planning considerations are described in detail in the DOS/VS System Management Guide.

IBM supplies DOS/VS on either magnetic tape or on disk. These distributions are discussed under "Distribution of DOS/VS".

DOS/VS is shipped in four libraries:

The source statement library contains macro definitions in edited format. After the desired parameters have been chosen, the macros can be assembled. Any A-library macros carried over from previous releases must be edited before they can be used for assembly.

The relocatable library contains IBM programs that have not been assigned addresses for execution and assembled macros from the source statement library. These assembled macros perform input and output procedures for IBM-supplied programs. They constitute Logical IOCS modules that can also be used by problem programs, whenever applicable.

The core image library contains programs that are ready for execution. System control programs and system service programs are always shipped in the core image library. An assembler program is also provided for system generation and maintenance. The system control programs must always be part of the system. The librarian programs are a key set to the system and should be carefully considered before ever removing them from the system.

The procedure library is designed to contain frequently used sets of job control and linkage editor control statements, as well as control statements for IBM-supplied service programs. **The procedure library as it is shipped on the distribution medium contains the SVA load procedures SDL, RPS, VSAMSVA, and VSAMRPS. The purpose and contents of SDL and RPS are discussed under "SDL Considerations" and "RPS Considerations", respectively; for the purpose and contents of VSAMSVA and VSAMRPS, refer to "Module 17: VSAM". The procedure library also contains procedures for linking and deleting DOS/VS components.**

During system generation, you work with the IBM-supplied system, tailoring it to your individual needs by adding to and deleting from the IBM-supplied and your own private libraries (source statement, relocatable, and core image). Please note that the procedure library can only be a system library; the system does not support private procedure libraries.

PLANNING SUMMARY

The following considerations and decisions should be made before system generation, refer also to Figure 1-1:

- Determine if one of the IBM-supplied supervisors fits your needs. The supervisors are pre-compiled and can therefore save you the lengthy process of defining, assembling, and link-editing. More information on these supervisors is given under "Supervisor Nucleus", for details refer to the "Memorandum to Users".

- Select supervisor options by coding a set of supervisor macro instructions (see "Chapter 3: Planning the System" in DOS/VS System Management Guide).

- Determine the programs that are to be in the core image and relocatable libraries of each operational pack.

- Utilize the serviceability aids recommended in DOS/VS Serviceability Aids and Debugging Procedures, GC33-5380, during system generation, by including applicable aids from the following list in your DOS/VS system (section numbers refer to sections in that manual):

  - Recovery Management Support (including Tape and Disk Error by Volume Statistics -- Section 2-F)

  - Fetch/Load, I/O, GSVC and QTAM traces, and the Transient Dump (Problem Determination Serviceability Aids, PDAIDS -- Section 2-B)

  - DUMPGEN (DOS/VS Standalone DUMP Generator, with formatting DUMP option -- Section 2-A)

  - DOSVSDMP (DOS/VS high-speed Standalone dump program for both formatted and unformatted dump output -- Section 2-A)

  - LVTOC and the Library Display Program (including the Access Method Services Utility Aids -- Section 2-C)

  - Online Terminal Test (Teleprocessing Aids -- Section 2-F)

  - LSERV (Label Cylinder Display Program -- Section 2-C)

  - SDAIDS (System Debugging Aids -- Section 2-B)

- If the system supports private core image libraries (PCIL=YES specified in the FOPT macro), determine which programs are to be placed in the private core image library or libraries. Under such a system, the linkage editor executes in any partition. You can link-edit most IBM-supplied programs for execution in a foreground partition and place them in a private core image library assigned to that partition if enough core storage is available to execute the link-edited program. If desired, the version to execute in the background partition may be retained in the system core image library. It is not necessary to have different versions of a particular program for execution in different partitions, if the supervisor is generated to include the relocating loader.

You must place the supervisor (default name $$A$SUP1) in the system core image library. A supervisor cataloged to a private core image library cannot be used.

The normal search order for loading phases into storage is as follows:

- If the requested phase is a $$R phase (MCAR/CCH transient), the system searches only the system core image directory.
- If the requested phase is a $$A or $$B phase (transient), the system first searches the system core image directory, then, if necessary, it searches the private core image directory assigned to the partition.

For an attention routine command that results in a phase being loaded into virtual storage, DOS/VS searches only the system core image directory. Therefore, phases such buffer-image phases for an FCB or a UCB must be cataloged in the system core image library and not in a private core image library.

If the phase is not found, the system enters the wait state with an error message of X'00000FF4' in bytes 0 through 3 of low storage.

When you request other phases, the system searches both the system and private directories, if necessary. If the phase name starts with $, the system first searches the system core image directory and, if it does not find the phase, it then searches the directory of the private core image library, assigned to the partition. If the requested phase name does not begin with a $, the system first searches the private core image directory, then the system core image directory, unless SYS=YES is specified in the FETCH or LOAD macro, in which case the system directory is always searched first.

To improve the performance of FETCH and LOAD in a multiprogramming system you can build an SDL (System Directory List), containing the names of, and additional fetch/load information on, frequently used transients and phases. The SDL, however, is not searched for phases that are loaded by attention routines. The list is built as a result of the SET SDL=CREATE command and subsequent data statements. These statements can also be provided through an IBM-supplied cataloged procedure.

- Determine which modules are to be deleted from the relocatable library of each operational pack. Deleting from the relocatable library allows for expansion of the system core image library to hold a greater number of components. Refer to the relevant book module for each component for its sizes.
- Also determine if the macro definitions used to build the supervisor and IOCS modules are to be deleted from the source statement library. Retaining the macros in the source statement library facilitates building a new supervisor and new IOCS modules.
- With only one disk drive available you may prefer to maintain only enough room in the relocatable library of the operational pack to contain the modules for building the largest component in the system. This small relocatable library permits temporary insertion of any component in relocatable form. It can then be immediately link-edited into the system core image library and then deleted from the relocatable library. When the relocatable library is subsequently condensed, only the updated core image form of the component remains, thus conserving disk-storage capacity. Reducing the size of the relocatable library allows expansion of the system core image library. The expanded system core image library allows a greater number of programs to be online with a single system volume.
- Copy and restore programs are necessary to transfer the resident system from tape to disk, from disk to tape, from disk to cards, and from cards to disk for maintenance and backup purposes.

- **The procedures for the system configurations presented in this publication assume that the disk packs have been initialized with the VTOC on the cylinder shown below:**

Device used	VTOC on Cylinder	
	For System Packs	For Work Packs
2314/2319	199	0 or 199
3330 Model 1 or 2	403	0 or 403
3330 Model 11	807	0 or 807
3340 (3348/35MB)	347	0 or 347
3340 (3348/70MB)	695	0 or 695
3350	554	0 or 554

MAPS AND LISTINGS PRODUCED DURING SYSTEM GENERATION

All linkage editor output on SYSLST from the system generation procedure and any future updates (including maps produced by the linkage editor) must be retained. These maps provide necessary information on the level of the system and the load address (relocation) of each component. Similarly, all assembly listings produced during system generation, in particular supervisor and POWER/VS listings, should be retained. These maps and listings can be used by the systems programmer and the customer engineer maintaining the system.

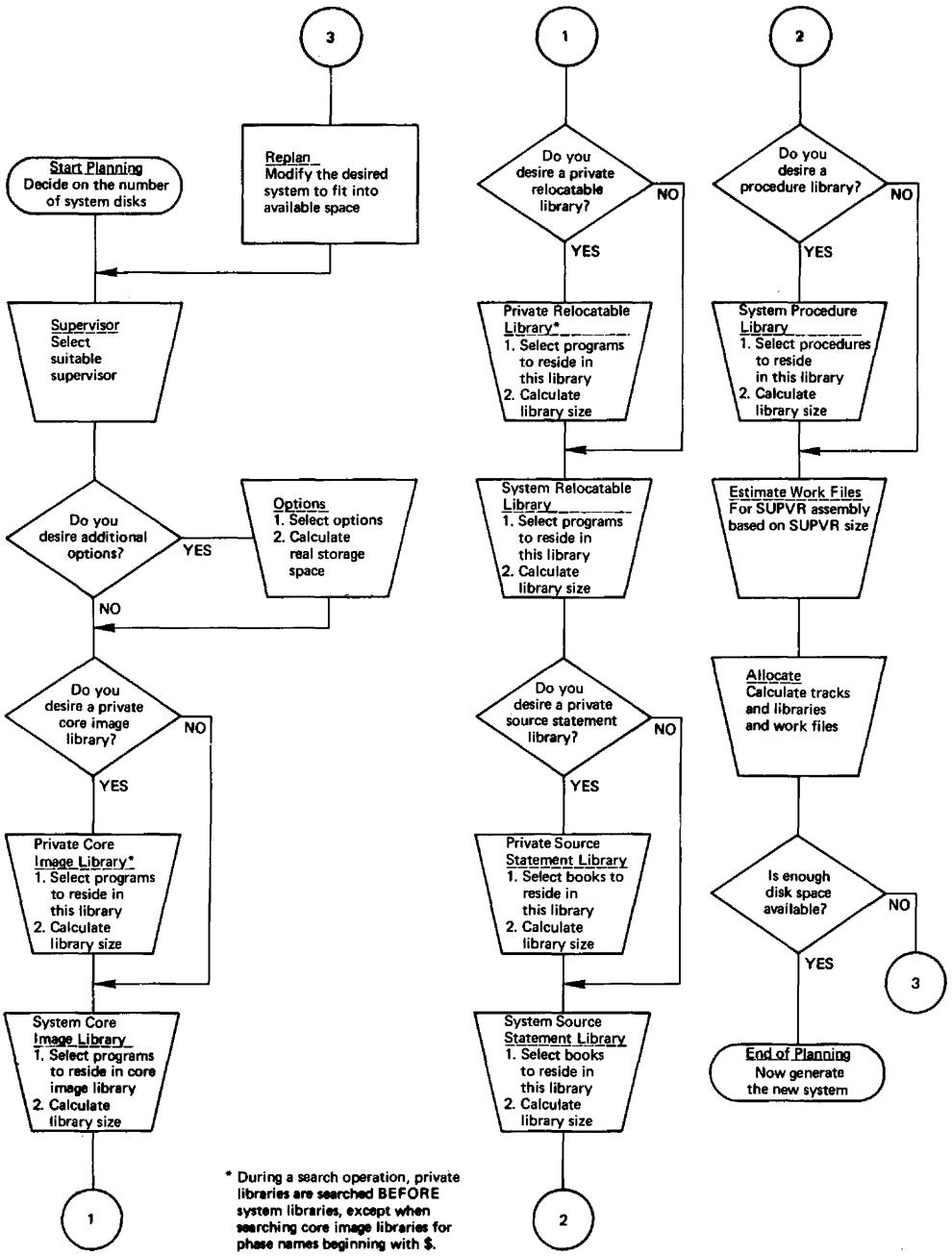


Figure 1-1. INTRODUCTION -- Planning Summary

System Configuration

This section presents the minimum system configuration required to operate DOS/VS. The system control programs and basic IOCS must always be present to execute any other programs. In view of the many different possibilities of attaching I/O units to the CPU models supported, the minimum machine requirements for the Model 115 CPU and the Model 125 CPU are listed separately. The requirements for the CPU Models 135, 138, 145, 148, 155-II, and 158 are listed together.

MINIMUM MACHINE REQUIREMENTS - MODEL 115

A System/370 CPU Model 115.

Standard instruction set (See Note 1).

One Card Reader: 1442**, 2501**, 2520**, 2540**, 2560*, 2596**, 3505**, 3525**, or 5425* (See Note 2 and 3).
One Card Punch : 1442**, 2520**, 2540**, 2560*, 2596**, 3525**, or 5425* (see Note 2 and 3).
One Printer : 1403**, 1443**, 3203* (Model 1 or 2), or 5203* (with or without UCS) (see Note 2).

One Integrated Display Operator Console, optionally with a 5213 Console Printer attached.
One 3340* Model A2 Disk Storage.

* These devices are natively attachable to the Model 115.
** These devices must be attached to the Model 115 via a multiplexer channel.

Notes:

1. Language translators may require extended instruction sets.

2. One 7- or 9-track 3410-3411 or 3420 (Model 3 or 5) series magnetic tape unit, or a disk extent may be substituted for this device. If a 7-track tape unit is used, the data conversion feature is required, except when the unit is substituted for a printer.

3. The IBM 3540 Diskette I/O Unit may substitute for this device. In a cardless system, at least one 3741 or 3742 data entry unit is required to have a record insert feature to support program maintenance requirements.

MINIMUM MACHINE REQUIREMENTS - MODEL 125

A System/370 CPU Model 125.

Standard instruction set (see Note 1).

One Card Reader: 1442**, 2501**, 2520**, 2540**, 2560*, 3504*, 3505**, 3525*, or 5425* (see Note 2 and 3).
One Card Punch : 1442**, 2520**, 2540**, 2560*, 3525*, or 5425* (see Note 2).
One Printer : 1403*, 1443**, or 3203* (Model 1 or 2) (see Note 2).

* These devices are natively attached. Attachment of Card Reader/Punch devices is as follows, either

One 3504, or
One 3504 and one 2560, or
One 3504 and one 3525, or
One 2560, or
One 3525, or
One 3504 and one 5425, or
One 5425.

** This device may either be natively attached, or be attached to a multiplexer channel.

One Model 125 Integrated Display Operator Console, optionally with a 5213 Console Printer attached.
One 3333 Model 1 Disk Storage, natively attached (two disk storage devices), or
One 3340 Model A2 Disk Storage.

Notes:

1. Language translators may require extended instruction sets.
2. One 7- or 9-track 3410-3411 or 3420 (Model 3 or 5) series magnetic tape unit, or a disk extent may be substituted for this device. If a 7-track tape unit is used, the data conversion feature is required, except when substituted for a printer.
3. The IBM 3540 Diskette I/O Unit may substitute for this device. In a cardless system, at least one 3741 or 3742 data entry unit is required to have a record insert feature to support program maintenance requirements.

MINIMUM MACHINE REQUIREMENTS - MODEL 135, 138, 145, 148, 155-II, or 158

A System/370 CPU Model 135, 138, 145, 148, 155-II, or 158.

Standard instruction set (see Note 1).

One Card Reader: 1442, 2501, 2520, 2540, or 3505 (see Note 2).

One Card Punch: 1442, 2520, 2540, or 3525 (see Note 2).

One Printer: 1403, 1443, 3211 (see Note 2), 3203-4 (for Models 138 and 148 only), or 3800.

One 3210/3215 Console Printer Keyboard, attached to the multiplexer channel, or
One 3277 Operator Console for the Model 138 and 148.

One 2314* Direct Access Storage Facility, or

One 2319 Direct Access Storage Facility, natively attached or

One 3333 Disk Storage, Model 1, attached either natively or through a 3830-2 Storage Control Unit (see Note 3), or

One 3330 Disk Storage, Model 1, 2*, or 11, attached through a 3830-1 Storage Control Unit (see Note 3 and 4), or

One 3340 Disk Storage, Model A2, attached through (see Note 4):

a. the IFA (Integrated File Adapter) on the System/370 Model 135, or
b. the ISC (Integrated Storage Control) on the System/370 Model 145, or
c. the 3830-2 Storage Control Unit on the System/370 Models 135 and 145, or

One 3350 Direct Access Storage, attached through:

a. the 3830-2 on the System/370 Model 135 and higher, or
b. the ISC (Integrated Storage Control) on the System/370 Model 145 and higher.

*** The minimum DOS/VS configuration requires two DASD spindles, one of which must be with removable pack, or one DASD spindle and two magnetic tape drives. If the tape units are 7-track, the data conversion feature is required.**

Notes:

1. Language translators may require extended instruction sets.
2. One 7- or 9-track 2400 or 3400 series magnetic tape unit, or a disk extent may be substituted for this device. If a 7-track tape unit is used, the data conversion feature is required, except when substituted for a printer. Neither the tape unit nor the disk extent can be substituted for the card reader as the communication device during system IPL time.

3. **The 3333 Disk Storage (unless natively attached) and the 3330 Disk Storage, Model 1, 2, or 11, require a high-speed selector channel.**

4. Requirements and specifications relating to the 3330 apply also to the 3333 and 3350 in compatibility mode of the 3330-1. Those given for the 3340 apply also to the 3344.

MNOTES DURING SUPERVISOR ASSEMBLY

During supervisor assembly, the assembler may generate MNOTEs. You may choose to ignore some by accepting the assumed values given in the MNOTEs. For others, you may have to interrupt procedures, modify one or more specifications and reassemble the supervisor.

Some general procedures for resolving MNOTEs are:

1. Go to the DIAGNOSTICS section at the end of the supervisor assembly listing; it includes references to the MNOTEs generated during assembly. Each MNOTE reference is in the form

   statement-number IPK216 MNOTE GENERATED

2. Using the statement number, go back into the listing and examine each of the MNOTEs. A severity code precedes the message portion (the higher the code, the more severe the error). Each MNOTE is listed after the macro with which it is associated.

3. Determine the reason for the MNOTE. The MNOTE message indicates the parameter in question and usually provides a clue to the type of discrepancy. Some errors to look for are:

   - Misspelled items or mispunched numbers.
   - Parameters that are incompatible with other parameters in this or another macro.
   - Parameters that are outside the valid limits.

4. Make any necessary changes and reassemble. If you have no changes to make (in other words, the assumed values listed in the MNOTEs are acceptable), continue with the generation procedures. Some errors are so severe, however, that no object deck is generated, and you must correct one or more macros and reassemble before continuing.

CATALOGING THE SUPERVISOR

The Supervisor Select function enables you to select different tailored supervisors, cataloged in the core image library of your operational pack. Cataloging these supervisors can either be accomplished by specifying the ID parameter in the SUPVR macro, which only changes the last character of the supervisor name, or by changing the PHASE statement punched during supervisor assemblies, in which case you are free to select your own 8-character supervisor name. It is recommended to name the most frequently used supervisor $$A$SUP1, since it is the default of the Supervisor Select function. During multiprogramming, the supervisor $$A$SUP1 cannot be cataloged.

You can select the desired supervisor during IPL time by

pressing the LOAD key on the CPU panel; when the system enters the wait state, press the REQUEST/ENTER key on the console. When message 0I03A SPECIFY SUPERVISOR NAME is displayed, type in the name of the desired supervisor or press the END or ENTER key to select the default $$A$SUP1.

Example:

Specify ID=x in the SUPVR macro

Catalog the supervisor. When performing the IPL procedure, specify $$A$SUPx.

The Supervisor Generation Macros

This section defines the macros and their parameters required to generate an installation-tailored supervisor for DOS/VS.

Note that the supervisor must be assembled with ALIGN=YES (assumed default value) in the STDJC macro instruction, because ALIGN=NO causes performance degradation and may result in assembly errors.

RULES FOR USING SUPERVISOR GENERATION MACROS

1. The assumed value default for an omitted parameter is underlined in the following discussion. Wherever an alternate default is possible, both operands are underlined.
2. Braces {} indicate that you must select one of the enclosed values.
3. Bracketed operands are optional, for example, [n].
4. Replace the letter n in a parameter with a decimal number.
5. The name field must be blank. The operation field always contains the mnemonic operation code. The operand field contains the parameters.
6. For any given macro, several parameters may be contained on one line. Separate each parameter with a comma. No embedded blanks are permitted. Continuation cards are permitted (nonblank character in column 72; the continue column is column 16).
7. In the expression X'cuu', replace cuu with the hexadecimal number for channel and unit.
8. The macros must be issued in the following sequence: SUPVR, CONFG, STIDJC, FOPT, PIOCS, VSTAB, ALLOC, ALLOCR, IOTAB, DVCGEN, ASSGN, DPD, SEND.
9. The DVCGEN, ASSGN, ALLOC, ALLOCR, and DPD macros are not required. They are specified if input/output tables (DVCGEN) are being specified, if standard assignments (ASSGN) are being made, if storage is allocated (ALLOC and ALLOCR), or if the page data set (DPD) is defined at system generation time.
10. An END statement and a /* statement must follow the SEND macro instruction.
11. Figure 1-4 shows the device type codes of the DOS/VS supported devices used for system generation.

SUPVR

The (SUPVR) Supervisor macro and its parameters define the system as disk resident with the ability to support certain desired functions, such as multiprogramming, MICR, or teleprocessing.

PARAMETERS FOR SUPVR

AP={NO|YES} Specify if multitasking support is desired. Multitasking allows the execution of more than one program within a partition. Specification of AP=YES is required if TP=VTAM is specified and also if you want to use the ATTACH, DETACH, ENQ, and DEQ macros for your programs. **AP=YES must be specified if support for POWER/VS with RJE,SNA is required.**

WAITM=YES is forced by AP=YES. An invalid specification of AP causes YES to be forced. If AP=YES is specified and NPARTS is omitted or specified as 1, NPARTS=3 is forced.

ASCII={NO|YES}

Specify if supervisor support of ASCII/EBCDIC translation tables is desired. ASCII=YES must be specified if support of ASCII tapes by magnetic tape IOCS is required.

CHAN={NO|YES}

(Models 115 and 125 only)

A specification of CHAN=YES is required if multiplexer channel-attached devices, tape units, or teleprocessing devices are present on your Model 115 or 125 CPU. Software recording is performed for channel-attached devices and for tape units only. If these devices are part of the system, a check is made during IPL to see if RMS error recording support is provided; if it is not, the system enters a hard wait state. RMS=YES overrides a specification **of CHAN; it should be specified if full error recovery is required in addition to error recording. For detail information, refer to DOS/VS Serviceability Aids and Debugging Procedures.**

ERRLOG={RDE|YES}

Specify to include RDE (Reliability Data Extractor) recording in addition to normal RMS error recording. RDE causes recording of "End of Day" via the ROD operator command and of the cause of IPL. This provides additional data for installation and IBM evaluation of system performance. The RDE option does not require any additional real storage.

If RDE recording is desired for a Model 115 or 125 CPU, normal RMS error recording support must be generated by specifying CHAN=YES or RMS=YES.

Note: For reasons of compatibility with earlier DOS releases, ERRLOG=(YES,RDE) may still be specified. Specification of ERRLOG=YES has no effect since error recording is controlled by the MODEL= parameter or, for a Model 115 or 125, by CHAN= and RMS=. Specifying ERRLOG=(YES,RDE) is identical to specifying ERRLOG=RDE.

EU={NO|YES}

Specify EU=YES if you require mixed parity tape processing for the 14xx emulators and the tape preprocessor and tape postprocessor programs. EU=YES need not be specified to run these programs if mixed parity tape processing is not required.

Note: For reasons of compatibility with earlier DOS releases, specification of EU=RELOC is accepted by the assembler as if EU=YES had been specified.

ID={1|c}

Specify this parameter if you plan to use the Supervisor Select option. You can assign a unique name to the supervisor being generated by specifying any alphameric character (A-Z,1-9) in this field. For example, if you specify ID=A, then the supervisor will be named $$A$SUPA when it is placed on the core image library. If this parameter is omitted the supervisor will be named $$A$SUP1.

MCH={YES|NO}

(Models 115 or 125 only)

This is an option for CPU Models 115 and 125 only. Do not specify this parameter for CPU Models 135 and up. For these models, support for the Machine Check Analysis Recorder (MCAR) and Channel Check Handler (CCH) features is standard.

MCH=YES in conjunction with CHAN=YES is equivalent to specifying RMS=YES. In addition to the software recording services generated by specifying CHAN=YES, specification of MCH=YES generates the error recovery (MCAR and CCH) portion of RMS.

MICR={NO / 1419 / 1419D}

Specify if the supervisor is to support magnetic ink character readers or optical reader/sorters. If 1255/1259/1270/1275s are to be supported, indicate 1419. 1419D indicates Dual Address Adapter 1419/1275s only; 1419 support does not provide 1419D support. If 1419s or 1255/1270/1275s are attached to a multiplexer **channel, BMPX=YES should be specified in the PIOCS macro. However,** burst mode and MICR devices cannot run concurrently on the same byte-multiplexer channel. A warning MNOTE to that effect is issued. Please note that 3886 Optical Character Readers do not require MICR support.

NPARTS={1 / 3 / n}

Specify the number of partitions to be supported. The maximum value of n is 5. For reasons of compatibility with earlier DOS releases, MPS=YES, NO, or BJF is also accepted by the assembler.

The default taken is 1 if:

The AP, MPS, POWER, and TP parameters are either not specified, or specified as NO.

The default taken is 3 if any of the following is specified:

AP=YES
MPS=YES
POWER=YES
TP=QTAM

If NPARTS is omitted or is specified as 1, specification of any of these parameters forces NPARTS=3.

PAGEIN={NO / n}

Specify that paging activity is to be controlled by the PAGEIN, RELPAG, and FCEPGOUT macros.

(See DOS/VS Supervisor and I/O Macros, for a complete description of these macros.)

The value n indicates the maximum number of page-in requests that can be queued at any one time for execution. Each PAGEIN macro issued in a program represents a page-in request. To obtain support for the three macros, the values specified for n must be 1 or larger.

PHO={NO / YES}

Specify if page exception handling overlap (PHO) is desired. PHO=YES allows control to be passed to a user routine while a page fault is being handled. Specification of PHO=YES is required if you want to use the SETPFA macro in your programs. (For more details see the DOS/VS System Management Guide.) When PHO=YES is specified, PFIX=YES is forced. PHO=YES is forced if POWER=YES is specified.

POWER={NO / YES}

Specify if support for POWER/VS is desired. If POWER=YES is specified, the following options are forced: PHO=YES and NPARTS=3 (if NPARTS was not specified or if NPARTS=1 was specified) in the SUPVR macro, PFIX=YES and ECPREAL=YES in the FOPT macro.

RMS={NO / YES}

(Models 115 and 125 only)

Specifying RMS=YES is equivalent to specifying both CHAN=YES and MCH=YES. RMS=YES overrides any specification of CHAN and/or MCH. If RMS=NO is specified, or if the parameter is omitted, the generation of RMS support is governed by specifying the CHAN and/or MCH parameters. RMS=YES is required if the string switch feature **is installed. RMS=YES should be specified if a multiple partition system is used. RMS=YES is forced if TP=VTAM.**

TP={NO / VTAM / BTAM[,VTAM] / QTAM[,VTAM] / QTAMn[,VTAM]}

Specify if teleprocessing is desired and, if so, whether Basic (BTAM), Queued (QTAM), or Virtual (VTAM) Access Method is desired. When QTAM is specified, support for BTAM is also included. If BTAM runs in virtual mode, PFIX=YES is required. For QTAMn, n is the maximum number of message processing programs in the system at any one time. n may have any value from 2 to 12. If VTAM is specified and also for multitasking, AP=YES must be specified. If AP=NO and QTAMn are specified, n is forced to 2. If TP=QTAM or TP=VTAM and NPARTS=1 or is omitted, NPARTS=3 is forced.

If both BTAM and VTAM, or both QTAM (or QTAMn) and VTAM are specified, the operands must be placed between parentheses, for example, TP=(BTAM,VTAM).

Specification of VTAM forces AB=YES, ECPREAL=YES, GETVIS=YES, IT=YES, OC=YES, PC=YES, PFIX=YES, RELLDR=YES, TOD=YES, WAITM=YES, and RMS=YES in the case of Models 115 and 125 in the FOPT macro.

If POWER=YES is specified and your version of POWER/VS is to support RJE,SNA, TP=VTAM must be specified.

CONFG

The CONFG (Configuration) macro instruction and its parameters define the system configuration and can specify generation of optional supervisor services.

PARAMETERS FOR CONFG

FP={NO / YES}

Specify only if your CPU has the floating-point feature.

MODEL=modelnumber[-suffix]

Specify the model number of the CPU and the suffix if applicable. Omission of this parameter or an invalid specification causes supervisor generation to be terminated.

Specify:

MODEL=115	for the IBM 3115-0 and 3115-2 CPU
MODEL=125	for the IBM 3125-0 and 3125-2 CPU
MODEL=135	for the IBM 3135 and 3135-3 CPU
MODEL=138	for the IBM 3138 CPU
MODEL=145	for the IBM 3145 and 3145-3 CPU
MODEL=148	for the IBM 3148 CPU
MODEL=155-II	for the IBM 3155-II CPU
MODEL=158	for the IBM 3158 CPU

If MODEL=115 or 125 is specified, the generation of Recovery Management Support (MCAR/CCH and/or RMS error recording) is dependent on the specification of the RMS, CHAN, and MCH parameters of the SUPVR macro. For all other CPU models, RMS-support is standard.

Notes:

For reasons of compatibility with earlier DOS releases, specification of MODEL=155 is accepted by the assembler. Support for the Model 155-II CPU is generated.

When MODEL=125 is specified, support for the 3330 disk is always generated (if not specified otherwise in the DISK=parameter of the PIOCS macro). When MODEL=115 is specified, support for the 3340 disk is always generated.

The storage protection and decimal features have been made standard. The Interval Timer is a standard System/370 hardware feature. If, however, you specify SP=, or DC= (whether the operand is YES or NO), the assembler will accept your specification and merely react by generating an MNOTE, which need to be resolved. TIMER=YES is also acceptable but generates no code.

If you plan to run your generated system on more than one CPU model, you should specify the larger model number.

STDJC

The STDJC (Standard Job Control) macro instruction and its parameters specify the standard settings for job control. If the assumed options are all satisfactory, the only entry required is the STDJC macro instruction itself, without any parameters. These standard options, except LINES and DATE, can be temporarily overridden by an OPTION statement, LINES can be overridden by a SET command, DATE by a // DATE statement.

PARAMETERS FOR STDJC

ALIGN={YES / NO} Specify if the assembler is to align data on halfword or fullword boundaries, according to the type of instruction used. A supervisor must be assembled with option ALIGN=YES to avoid hard waits.

ACANCEL={NO / YES} Specify if Job Control is to cancel jobs automatically (ACANCEL=YES) or to wait for operator intervention (ACANCEL=NO) after an unsuccessful attempt to assign a device. (Please note that the LOG command suppresses the ACANCEL function.)

CHARSET={48C / 60C} Specify either the 48- or 60-character set for PL/I translator input on SYSIPT.

DATE={MDY / DMY} Specify the format of the date MDY=month/day/year. DMY=day/month/year.

DECK={YES / NO} Specify if language translators are to produce object modules on SYSPCH.

DUMP ={YES / NO / PART} Specify if a dump of the registers and virtual storage is to be written on SYSLST in case of an abnormal program end. PART specifies that a dump of the supervisor control blocks and the virtual storage of the partition is to be written on SYSLST.

EDECK={NO / YES} Specify if the assembler is to create and punch edited macros on SYSPCH.

ERRS={YES / NO} Specify if compilers are to summarize all errors in source programs on SYSLST. Assembler and PL/I always assume ERRS=YES.

LINES={56 / nn} Specify the number of lines per page on SYSLST. The minimum is 30; the maximum is 99.

LIST={YES / NO} Specify if language translators are to write source module listings and diagnostics on SYSLST.

LISTX={NO / YES} Specify if compilers are to write hexadecimal object module listings on SYSLST.

LOG={YES / NO} Specify for a listing of all control statements on SYSLST. LOG=NO suppresses the listing of all job control statements on SYSLST. Invalid statements and commands will be listed on SYSLST if it is assigned.

RLD={NO / YES} Specify RLD=YES if the relocation dictionary information is to be printed.

SPARM={NO / YES} Specify if the &SYSPARM assembler system variable symbol is to be supported.

SYM={NO / YES} SYM=YES may be specified if the PL/I compiler is to produce a symbol and offset table listing on SYSLST, or if American National Standard COBOL is to produce a data division glossary.

XREF={YES / NO} Specify if the assembler is to write symbolic cross-reference lists on SYSLST, or if American National Standard COBOL is to produce a cross-reference listing.

FOPT

The FOPT (Optional Features) macro and its parameters specify additional optional features that can be included in the supervisor.

PARAMETERS FOR FOPT

AB={NO / YES} Specify if the abnormal termination exit function is to be supported. The abnormal termination exit, invoked via the STXIT AB macro, allows you to exit to a user's routine before an abnormal end-of-job causes a program to be canceled. Specify YES for American National Standard COBOL I/O error recovery. AB=YES is forced if TP=VTAM is specified in the SUPVR macro.

CBF={NO / n} Specify the number of I/O requests for the operator console to be buffered. Under the following conditions operator console I/O requests will be buffered:

1. The actual record to be written does not exceed 80 characters.
2. Data or command chaining is not performed.
3. The CCB associated with this operation does not indicate the acceptance of unrecoverable I/O errors, posting at device end, or user error routines.
4. The CCB does not request sense information.

CBF=NO is forced if MODEL=115, 125, 138, or 148 is specified together with DOC=125D or 3277.

Console buffering allows overlap of CPU processing with write operations to SYSLOG by satisfying the requestor's WAIT immediately, rather than at I/O completion time. When this option is selected, the number of CHANQ entries should exceed the number of CBF entries so that the buffering process is not bound by the number of CHANQ entries. If the assumed option is taken for CHANQ and CBF is selected, the number of CHANQ entries is assumed to be six more than the CBF entry. Numbers 1 through 50 are valid, and one is assumed if the operand is invalid.

DASDFP={NO / (n¹,n²[,2321])}

Specify if supervisor DASD file protection is desired when n¹,n² indicates the range of channels to which DASDs may be attached. Specification of n¹,n² provides file protection for disk devices. For reasons of compatibility with previous releases, specification for all disk devices are accepted, but are treated as documentation (that is, the parameters are ignored). File protection for the 2321 must be specified and provides protection for all DASD devices. DASDFP prevents writing outside the extents of a file in case of program error. Extents are protected to the nearest cylinder except for 2321, where they are protected to the nearest head bank. This feature does not protect the file from being overwitten.

Notes:

1. No file protection is provided for the IBM 3540 Diskette Input/Output Unit.
2. The IOTAB parameter JIB=n allocates storage for DASDFP extents.
3. If a disk device type is specified by the third operand and this disagrees with the one as specified by the DISK parameter of the PIOCS macro, the value of this parameter will overrule the one specified by the third operand.

DOC= { NO / 125D / 3277 }

Specify if supervisor support for a display operator console (DOC) is to be generated. DOC=125D and DOC=3277 generates the supervisor routines that allow SYSLOG assignment to a 125DOC or a 3277.

If DOC support is generated, support for 3210/3215 console printer keyboards is generated as well. If 125D is specified for a Model 138 or 148, console support is provided in 115/125 DOC emulation mode; for details, see DOS/VS Operating Procedures. The 3277 is supported as operator console on all System/370 models to which it is attachable. Support of the 125DOC and the 3277 as operator console communication device is mutually exclusive. The APL feature with 3277 is not supported.

The default taken depends on the CPU model specified by the MODEL parameter of the CONFG macro. If MODEL=115 or 125, the default is 125D. If MODEL=138 or 148, the default is 3277. For any other MODEL specification, the default is NO.

ECPREAL= { NO / YES }

Specification of this parameter allows use of the VIRTAD macro, the REALAD macro, and of the EXCP macro with the REAL parameter. For good performance of the SORT/VS program, this option (ECPREAL=YES) should be specified. ECPREAL=YES forces PFIX=YES. ECPREAL=YES is forced if POWER=YES or TP=VTAM is specified.

ERRQ= { 5 / 3 / n }

This parameter is optional. It is intended primarily for teleprocessing systems with a large number of communication lines or devices. It specifies the number of entries to be generated for the error queue. The default and minimum number is 5 if the system is generated to support multiprogramming. The default and minimum number is 3 if multiprogramming is not supported. The maximum value of n is 25.

EVA= { NO / (r,w) }

Magnetic tape error volume analysis is supported (may be used with or without TEBV). When the number of temporary read errors that occurred exceeds the value of r, the operator is notified via a message on SYSLOG. The maximum value for r cannot exceed 254. EVA=(r,w) forces TAPE=7.

When the number of temporary write errors that occurred exceeds the value of w, the operator is notified via a message on SYSLOG. The maximum value for w cannot exceed 254.

After the operator message the system resets the temporary error count to zero and continues normal processing.

FASTTR= {NO / YES}

Specify if fast CCW translation is to be supported.

Fast CCW translation attempts to save and reuse any channel programs that have been translated, and to keep the pages containing the I/O areas fixed, providing the paging rate is not seriously affected. Fast translation is attempted for all channel programs except:

1. Those containing non-contiguous CCW strings.
2. Those associated with translation requests from BTAM (BTAM makes special use of CCW translation).

Note that the specification of FASTTR=YES affects the default and minimum values for the BUFSIZE=n parameter in the VSTAB macro.

GETVIS= {NO / YES}

Specify YES if storage management support using the GETVIS and FREEVIS macro instructions is desired. GETVIS=YES is forced if VSAM=YES, RPS=YES, or if TP=VTAM is specified in the SUPVR macro. GETVIS=YES forces RELLDR=YES. For 3800 printer support, GETVIS storage management is required.

Specify YES if your system includes the IBM 3344 or 3350 and the Analysis Program-1 (AP-1) will be invoked.

IDRA= {NO / YES}

Specify IDRA=YES if the IDRA (Independent Directory Read-in Area) is desired. IDRA=YES allows the system to read the directory containing the location of the phase specified in a FETCH or LOAD into the IDRA instead of using the System Error Recovery Procedure transient area. Thus, with the IDRA feature, throughput may increase when an error recovery procedure is in progress. IDRA=YES is valid only if the NPARTS parameter in the SUPVR macro specifies more than one partition.

IT= {NO / YES}

Specify if the interval timer can be handled by problem programs. IT=YES generates timer support for all tasks in all partitions. It allows use of the STXIT IT and SETIME macros. IT=YES is forced if TP=VTAM is specified in the SUPVR macro.

Specify YES if you will invoke the IBM Analysis Program-1 (AP-1) and your system includes 3344s or 3350s.

Note: For reasons of compatibility with earlier DOS releases, specification of IT=BG, F1, or F2 is accepted by the assembler. Timer support for all tasks in all partitions is generated as if IT=YES had been specified.

JA= {NO / YES / (n^1,n^2,n^3,n^4,n^5)}

Specify if DOS/VS Job Accounting Interface is to be supported. JA=YES indicates support of each partition.

JA=(n^1,n^2,n^3,n^4,n^5) specified additional support of SIO count for I/O devices, and JA=YES is generated. The values substituted for n^1,n^2,n^3,n^4, and n^5 indicate the number of I/O devices per partition for which SIOs are to be counted. The maximum value for n for any partition is 255; n^1 always specifies the number for the background partition.

The partitions to which n^2 through n^5 refer depend on the number of partitions in the system, as is shown below:

	n^2	n^3	n^4	n^5
2 partitions	F1			
3 partitions	F2	F1		
4 partitions	F3	F2	F1	
5 partitions	F4	F3	F2	F1

If no SIO count is required for a given partition, no value should be supplied. However, the operand delimiter (comma) must be submitted if other values follow.

For example, if NPARTS=5 and JA=(10,,3) are specified, SIO count is supported for:

10 I/O devices for the background partition
 0 I/O devices for the F4 partition
 3 I/O devices for the F3 partition
 0 I/O devices for the F2 partition
 0 I/O devices for the F1 partition

If you plan to use the job accounting support of POWER/VS, specify either JA=YES or JA=n ,n ,...

JALIOCS= {NO / (s,1)}

Specify for support of user-written job accounting routines containing LIOCS, and LIOCS with label processing. If you specify JALIOCS=(s,l), JA=YES or (n^1,n^2,n^3,n^4,n^5) must be specified as well.

s and l reserve a user save area and a label area equal to their specifications (that is, if s equals 25, then a 25-byte save area is reserved). s can be any decimal number in the range 0-1024. If s is omitted, or if JALIOCS=NO, a 16 byte user save area is still reserved in the supervisor if JA≠NO is specified. l can be any decimal number between 0 and 224.

OC= {NO / YES}

Specify if operator-initiated communication is to be handled by problem programs. Allows use of the STXIT OC macro. If YES is specified, the facility is available to all partitions generated. YES is required if emulator program operator services are to be requested through the interrupt key. If RETAIN=YES, OLTEP=YES, or TP=VTAM is specified, OC=YES is forced.

OLTEP= {YES / NO}

Specify OLTEP=YES if the online testing function is desired. CLTEP=YES allows the online test executive program to execute. If OLTEP=YES, then RELLDR=YES and OC=YES are forced. Specification of RETAIN=YES forces OLTEP=YES to be generated.

PC= {NO / YES}

Specify if user programs may use STXIT PC macro. QTAM, RPG II, FORTRAN IV, COBOL-D, and PL/I require PC=YES. If TP=VTAM is specified in the SUPVR macro instruction, PC=YES is forced.

PCIL= {NO / YES}

Specify if private core image libraries are to be supported. These have the same format as the system core image library on SYSRES. You may assign private core image libraries to any partition. If the linkage editor is to run in a foreground partition, a private core image library must be uniquely assigned to that partition. You may link-edit many IBM-supplied programs to run in a foreground partition and place them in a private core image library to be assigned to that partition. PCIL=NO forces PSLD=NO.

PD= {NO / YES}

The PD parameter must be specified if the problem determination programs (PDAIDS) are desired. PD=YES specifies that a minimum PDAREA or 1,400 bytes is reserved for this function. Any amount between 1,400 (SDAIDs do not need a generated area) and 10,240 bytes may be specified for n.

PFIX= {NO / YES}

Specify if the supervisor is to support the fixing and freeing of pages by means of the PFIX and PFREE macro instructions. PFIX=YES is forced if POWER=YES, PHO=YES, or TP=VTAM is specified

in the SUPVR macro or if ECPREAL=YES is specified. PFIX=YES is required if you plan to execute BTAM programs in virtual mode.

PRTY=
(partition name sequence)

Specify, by means of a partition name sequence, the desired dispatching priority for each partition. The partition specified first has the lowest priority, the partition specified last has the highest priority. Specify all the partitions for which support is generated by means of the NPARTS parameter of the SUPVR macro or by default; do not specify PRTY if NPARTS=1.

The partition default priority is as follows:

Number of partitions	Default priority (low to high)
2	BG,F1
3	BG,F2,F1
4	BG,F3,F2,F1
5	BG,F4,F3,F2,F1

PSLD= {NO / n}

Specify the number of entries in the Private Second Level Directories. A directory is created for each partition, unless PCIL=NO. The minimum value for n is 5. PSLD=NO is assumed if the parameter is omitted or incorrectly specified. For good performance n should be equal to the largest number of actually used directory tracks of a private core image library. PCIL=NO forces PSLD=NO.

RELLDR= {YES / NO}

Specify if the supervisor is to include the relocating loader. This facility allows programs to be loaded into partitions, independent of their link-edited addresses. RELLDR=YES is forced by RPS=YES, VSAM=YES, GETVIS=YES, OLTEP=YES, RETAIN=YES, or TP=VTAM.

Note: If the supervisor is generated to include the relocating loader, the function can be suppressed at link-edit time by means of an 'ACTION NOREL' statement.

RETAIN= {NO / YES}

The RETAIN function is available on the Model 145 in the United States of America and Canada only. RETAIN is an OLTEP function that allows the OLTEP programs initiated from a remote location to be executed. RETAIN is a problem determination tool used by IBM. If this function is to be used, specify RETAIN=YES and include the IBM 2955 Retain Communications Device in the PUB table. External interruptions are required for RETAIN operation; therefore, if RETAIN=YES is specified, OC=YES, OLTEP=YES, and RELLDR=YES are forced.

RPS= {NO / YES}

Specify to include support for the Rotational Position Sensing capability of IBM 3330/3333, 3340, and 3350 Disk Storage devices. RPS support permits the device to disconnect during access are positioning operations, thereby freeing the channel to service requests for other devices on the channel during the latency period. If RPS=YES is specified, GETVIS=YES and RELLDR=YES in the FOPT macro and BLKMPX=YES in the PIOCS macro are forced.

Notes:

1. The RPS support is suppressed if the NPARTS parameter in the SUPVR macro specified support for one partition only (NPARTS=1).

2. Specification of RPS=YES eliminates the need to specify SKSEP=YES for devices that have the RPS feature and block multiplexing support. SKSEP=YES can be specified for DASD devices that do not have the RPS feature or for DASD devices connected to selector channels or IFAs, in order to free the channel during seek operations.

3. **Specification of RPS=YES is required if your system includes DASDs of type 3330-11 or 3350 and you intend to use these devices for processing sequential or direct-access files with programs that were written for accessing these files on other IBM DASD types without recompiling or reassembling these programs.**

SKSEP={NO / YES / n} Specify if SEEKs are to be separated from the remainder of channel programs. Seek separation allows other devices on the channel to be accessed (including other seeks) during the seek. YES indicates support for all DASD type devices specified by the DVCGEN macro at system generation time. n is the number of DASD devices to be supported and cannot be less than the number of DASD devices specified at system generation. The maximum is 254.

Note: If all DASD devices in your configuration have DCC (Disconnect Chaining) capability and if they are attached to block multiplex channels, channel overlap during SEEKs is more efficiently handled by Block Multiplex Channel Support (specify BLKMPX=YES in the PIOCS macro). In a mixed DASD configuration, that is a configuration consisting of DASDs with and without DCC capability, specify either SKSEP, or SKSEP and BLKMPX.

SLD={5 / n} Specify the number of entries in the Second Level Directory. The minimum value for n is 5. This is the default value if the parameter is omitted or incorrectly specified. For good performance n should be equal to the number of actually used directory tracks in the system core image library.

SYNCH={NO / YES} **Specify SYNCH=YES if the use of an IBM-provided program requires the synchronous exit facility (SVC screening).**

SYSFIL={NO / YES / (YES,n_1,n_2)} Specify if system input and system output files (SYSRDR, SYSIPT, SYSLST, SYSPCH) in any partition may be assigned to a disk device or an IBM 3540 Diskette I/O Unit, or, if support for the procedure library is desired. Specification of YES gives support for all disk devices and the IBM 3540 Diskette Input/Output Unit. In a configuration without tape, specification of SYSFIL=YES is required for system maintenance purposes. If the emulator program parameter SYSIO is specified with a value ranging from 200 through 233, a value must be specified for SYSFIL.

n_1 = residual capacity for beginning of operator notification when SYSLST assigned to disk. $100 \leq n_1 \leq 65535$. If n_1 is omitted, 1000 is assumed.

n_2 = residual capacity for beginning of operator notification when SYSPCH assigned to disk. $100 \leq n_2 \leq 65535$. If n_2 is omitted, 1000 is assumed.

Notes:

1. If neither n_1 nor n_2 is specified, the operand need not be placed between parentheses ().
2. Neither n_1 nor n_2 may be specified if the logical units are assigned to an IBM 3540 Diskette Input/Output Unit.

TEB={NO / n} Specify if tape error statistics are to be accumulated and logged for the 2495 Tape Cartridge Reader, where n is the number of tape cartridge readers attached to the system. Choose a value of n that allows for possible future expansion of the system.

TEBV={IR|CR} Specify how tape statistics are to be automatically accumulated in the PUB2 table and logged on the SYSREC file. For all standard labeled tapes, tape statistics are accumulated by volume. For unlabeled or nonstandard labeled tapes two types of error recording are available:

- Combined Recording (CR)
- Individual Recording (IR)

When TEBV=CR is specified, the error statistics for all nonstandard and unlabeled tapes on a specific tape unit are accumulated until a standard labeled tape is mounted and opened on that unit. Then one recording of the statistics for the nonstandard, unlabeled tapes is made and the counters are reset in the PUB2 table.

Specify TEBV=IR to record tape error statistics on the SYSREC file and reset the PUB2 table counters at each OPEN for nonstandard and unlabeled tapes.

TOD={NO|YES} Specify if time-of-day clock support is desired. If YES is specified, GETIME macro support is provided. Every time a GETIME is issued, the date fields in the supervisor communication regions are updated, if necessary. TOD=NO forces ZONE=NO. If TP=VTAM is specified in the SUPVR macro instruction, TOD=YES is forced.

TRKHLD={NO|n} Specify if the track hold function is to be supported. Specification of TRKHLD generates support for the DASD Track Protection macros. When processing sequential disk work files or updates to direct-access files, specify if a hold is to be placed on the track of the record being read. The hold prevents anyone else that is using track hold from accessing that track. The maximum number of tracks that can be held at one time is 255. The default is 10 if n is an invalid parameter (nonnumeric or outside the range 1-255). The NPARTS parameter in the SUPVR macro must specify more than one partition if TRKHLD=n is specified.

Note: The track hold function is not supported for the IBM 3540 Diskette I/O Unit. The track hold function must be specified if VSAM files with the attribute SHAREOPTIONS(4) are processed. For details refer to DOS/VS Access Method Services User's Guide, GC33-5382.

TTIME={NO|partition ID} **Specify if the task timer support is to be generated in the supervisor. The partition-ID (BG, F1, F2, etc.) designates the partition that owns the task timer.**

Support must be generated for the partition that owns the task timer by corresponding specification in the NPARTS parameter of the SUPVR macro. For example, with NPARTS=2 specified, valid partition-ID specifications are BG or F1; if NPARTS=3 is specified, partition-ID, BG, F1, or F2 is valid. If the partition designation does not correspond to the appropriate NPARTS specification, or if the value specified for NPARTS is invalid, an MNOTE is issued.

The task timer requires that the clock comparator (an optional hardware feature) and the CPU timer be installed on the System/370 Models 135 and 145.

USERID=id Specify if you want a supervisor id to be printed as part of the IPL COMPLETE message. id may be up to 16 bytes long. If you specify more than 16 bytes, the id will be truncated on the right. If you specify less than 16 bytes, the id will be padded with blanks on the right (do not place the id within quotes, embedded blanks are not allowed).

The specified id is placed in the 16 byte area that immediately precedes the background communication region. The field contains blanks if the parameter is not specified.

VSAM={NO / YES} Specify if support of VSAM (Virtual Storage Access Method) or of the 3800 Printing Subsystem is desired. YES is forced for GETVIS and RELLDR if VSAM=YES is specified. If NRES is not, or incorrectly, specified in the IOTAB macro, VSAM=YES forces NRES=10. For 3800 support, VSAM=YES is required so that the CDLOAD routines are included in the supervisor. If VSAM support is not wanted, the VSAM phases can be deleted (see "Link-Edit and Delete Procedures").

WAITM={NO / YES} Specify if the multiple wait function is to be supported. This function allows you to use the WAITM macro to wait for one of a number of events to occur. WAITM=YES is forced if AP=YES or if TP=VTAM.

Specify YES if you will invoke the IBM Analysis Program-1 (AP-1) and your system includes 3344s or 3350s.

XECB={NO / YES / n} Specify YES or n if support for Cross-Partition Event Control is desired. If YES is specified, four XECBs (Cross-Partition Event Control Blocks) are generated per partition (as specified in NPARTS).

For n, specify a numeric value; it indicates the number of XECBs for which an entry is to be generated in a supervisor internal table. The minimum number you should specify for n is 4. If you specify less than four, the specification is ignored and XECB=4 is assumed. The maximum number you should specify for n is 8*NPARTS. If you specify a number greater than 8*NPARTS, the specification is ignored and 8*NPARTS is assumed. Cross-Partition Event Control is not supported if NPARTS=1 is specified. XECB support must be specified if SPOOL=YES (in the POWER/VS generation macro POWER) is specified.

Specify YES or n if you plan to utilize the cross-partition support of POWER/VS.

ZONE={NO / (EAST,hh,mm) / (WEST,hh,mm)} For time-of-day clock support, specify the difference between GMT (Greenwich Mean Time) and local time in hours (hh) and minutes (mm). Specify EAST for areas to the east of the meridian of Greenwich, United Kingdom, or for areas whose time is in advance of GMT. Specify WEST for areas to the west of the meridian of Greenwich, United Kingdom, or for areas whose time is behind GMT. The value used in the ZONE parameter is used to obtain the local time of day. If the parameter is not specified, or incorrectly specified, or if TOD=NO is specified, ZONE=NO is forced. If the first operand is incorrectly specified, EAST is assumed.

You can change the zone value (default is GMT) every time you perform the IPL procedure, by specifying any zone value in the ZONE parameter of the SET control statement.

Notes:

1. Information on the macro instructions STXIT, EXIT, SETIME, and TTIMER is contained in the DOS/VS Supervisor and I/O Macros.

2. The PTO (Physical Transient Overlap) feature and command chaining support for retry on I/O operations (CCHAIN), optional in earlier releases of DOS, have been made standard. If, however, you erroneously specify either PTO or CCHAIN (whether the operand is YES or NO), the assembler will accept your specification and react only by generating an MNOTE, which you need not resolve.

PIOCS

The PIOCS (Physical Input/Output Control System) macro instruction and its parameters define the configuration requirements to be supported by physical IOCS. If the assumed options are all satisfactory, the only entry required is the PIOCS macro itself, without any parameters.

PARAMETERS FOR PIOCS

BLKMPX={NO|YES}

Specify if block multiplexing is to be supported. Block multiplexing is useful in a configuration with 3330, 3340, and 3350 Disk Storage devices and the following buffered card and print devices: 2540, 1403, 3211.

Note 1: In a DASD configuration that consists of 3330, 3340, and 3350 Disk Storage devices, there is no need to specify SKSEP=YES or n in the FOPT macro as block multiplexing provides channel overlap during SEEKs in a more efficient way. Moreover, the code generated by a specification of SKSEP=YES is then bypassed if BLKMPX=YES is specified.

Note 2: If your CPU is a Model 3115 or 3125, Block Multiplexing must not be specified in conjunction with the use of the 2311-1/3330, 2311-1/3340, and 2314/3340 Series Compatibility Features.

BMPX={NO|YES}

Specify if burst mode devices are supported on a byte-multiplexer **channel. If overrunnable devices are attached to the byte-multiplexer channel, BMPX=YES should be specified. However, burst mode and MICR devices cannot run concurrently on the same byte-multiplexer channel. Specify BMPX=YES if:**

- **Attached devices operate in burst mode, or**
- **Overrun problems have been experienced.**

Otherwise specify BMPX=NO.

CHANSW={NO|RWTAU|TSWTCH}

Specify if channel switching for tape control units is to be supported. For a 2404 or 2804, enter CHANSW=RWTAU. For a 2816 (with a 2403 or 2803) or a 3803 enter CHANSW=TSWTCH. If CHANSW=RWTAU or TSWTCH is specified and TAPE=NO is specified, TAPE=7 is forced. Channel switching allows a device to be addressed via two adjacent selector or block-multiplexer channels.

DISK={2311|2314|3330|3340|3350|(3330,3340)|(3330,3350)|(3340,3350)|(3330,3340,3350)}

Support for the IBM 2311, 2314/2319. Specification of DISK=33xx gives support for all attachable DASD devices of the type specified. If support for more than one type of DASD device is required, each type must be specified. For example, to provide support for 3330s and 3340s, specify DISK=(3330,3340). This provides no support for 3350s.

Note: DISK=3340 is the only valid specification for the Model 115. Specification of DISK=2311, 2314, or 3350 is not valid for Model 125. If Model=115 and DISK≠3340, DISK=3340 is forced. If MODEL=125 and DISK≠3330 or 3340, DISK=3330 is forced.

MRSLCH={NO|YES}

Specify if MICR device is on the selector channel (can only be specified for the 1419 single address device).

TAPE={7|9|NO}

Specification of TAPE=7 generates support for both 7- and 9-track tape. TAPE=7 is forced by a specification of EVA=(r,w) and by CHANSW=RWTAU or TSWTCH. If MODEL=125 or 115 and TAPE=7, or 9, CHAN=YES must also be specified. In a configuration without tape, specification of SYSFIL=YES is required for system maintenance purposes.

Note 1: Selector channel support is standard in DOS/VS. The parameter SELCH=, used in prior DOS releases, is ignored.

Note 2: A Display Operator Console (DOC) must not be attached to the same selector or block multiplexer channel as SYSRES.

VSTAB

The VSTAB (Virtual Storage Table and Buffer Build) macro instruction and its parameters define the size of the real and virtual address areas and of the SVA (Shared Virtual Area), and specify the number of buffers required for channel program translation. Tables, for mapping the real and virtual address areas, and buffers are generated within the supervisor area. The maximum value you can specify for VSIZE is 16,384K (16,777,216 bytes) minus the size specified for the real address area (RSIZE). Specification of this macro is required. The VSTAB macro is discussed in greater detail in the DOS/VS System Management Guide.

PARAMETERS FOR VSTAB

```
VSTAB RSIZE={96K|nK},VSIZE={NPARTS*64K+SVA_size|nK}[,BUFSIZE=n],SVA={(64K,0K)|(nK,mK)}
```

RSIZE=nK

Specify the size of the real address area, where n must be ≥ 64 and a multiple of 2. If an odd number is specified, a value of 1 is added to it. If the operand is omitted, a value of 96K is assumed. The value specified is used to build the tables that map the real address area and to define the beginning of the virtual address area. (End of real address area = beginning of virtual address area.)

If you select a value for RSIZE that is larger than the amount of real storage in the CPU model used for system generation (with an eye to also using your system on a CPU with larger real storage), the address area between the end of real storage and the beginning of virtual storage will not be used.

If you select a value for RSIZE that is smaller than the actual amount of real storage in the CPU on which your system is to be used, any real storage beyond your RSIZE cannot be used, and a warning message is issued at IPL time (provided that you IPL from the console keyboard), informing you that a part of real storage is not used. If you IPL from the card reader, however, the message is suppressed.

VSIZE= {NPARTS*64K +SVA_size | nK}

Specify the size of the virtual address area (which includes the SVA), where n must be at least 64 times the number of partitions specified by the NPARTS parameter and a multiple of 2, plus the size of the SVA. If an odd number is specified, a value of 1 is added to it. If VSAM is to be used, the partition in which it is to run should have 302K bytes plus sufficient space for buffers and control blocks (see book Module 17: VSAM); if the VSAM phases are to be loaded into the SVA, the latter must have 302K bytes.

If Access Method Services is to be used, it requires up to 450K bytes in the partition in which it is to run, depending on the functions that are to be performed (refer to the section 'Storage Requirements' in book Module 17: VSAM). If the operand is omitted, a value of 64 times the number of partitions specified by the NPARTS parameter is assumed. The value specified is used to build the tables that map the virtual address area, to determine the size of the disk extent for the page data set, and to define the end of the virtual address area.

BUFSIZE=n

Specify the number of copy blocks (buffers with a length of 72 bytes) to be used by the Channel Program Translation routine. Specification of this parameter is optional. For further details, refer to DOS/VS System Management Guide, Chapter 3 under 'Defining the Number of CCW Translation Buffers'.

The following table shows the minimum value that can be specified and the default value that is used if the operand is omitted.

FASTTR=	NPARTS=	BUFSIZE= Default	Minimum
NO	n=1	10	10
NO	n>1	30	10
YES	n=1	30	30
YES	n>1	30+((n-1)*20)	30

The maximum value that may be specified for BUFSIZE is 450. For RPS add 20% more buffers. For teleprocessing terminals supported under BTAM specify three blocks for each locally-attached 2260 or 3270. For remote devices specify three blocks plus one additional block if the DECB extension facility is used, plus one additional block for each BTAM buffer specified for the device. If VSAM=YES is specified, add 40 blocks. VSAM uses these copy blocks only during actual I/O and immediately frees them after use.

If the terminals are attached to multidrop lines, copy block assignment should be by line, not by device. For large teleprocessing network it is sometimes possible to assign fewer buffers. One way to determine if enough buffers have been specified is to use the DUMP command, specifying the begin and end address of the buffer area in the supervisor. If all blocks have been used then probably too few buffers were specified.

SVA= {(64K,0K) / (nK,mK)}

nK specifies the size of the SVA; mK specifies the size of the system GETVIS area in the SVA. n must be at least 64 and a multiple of 2. m must be smaller than n and also a multiple of 2. If the operand is omitted or incorrectly specified, the default value is taken. If the SVA is to be used for VSAM phases, specify SVA=(302K,0K).

The system GETVIS area must be large enough to accommodate all RPS logic module phases that will be dynamically loaded, plus at least 2K more for the LDL used by RPS. A specification of SVA=(nK,40K) is adequate for a typical program. If all the RPS logic modules are to be pre-loaded, as for example when using Checkpoint/Restart, a specification of SVA=((n+88)K,6K) will be adequate.

Note 1: This parameter is only valid if the NPARTS parameter of the SUPVR macro specifies more than one partition (NPARTS>1). The size specified can be changed by the SVA parameter of the SET job control command.

Note 2: If TP=VTAM, the value calculated for the VTAM space requirement in the SVA must be included in the specification of the SVA.

ALLOC

The ALLOC (Allocate) macro instruction defines the partitioning of the virtual address area in a multiprogramming system. Specification of this macro is optional because the operator can also allocate the virtual storage address area. It can only be specified with at least one parameter. Specify the size of the virtual foreground partitions only. The system computes the size of the virtual background partition by subtracting the total amount of virtual storage allocated to the virtual foreground partitions from the virtual address area as specified by the VSIZE parameter. When specifying the ALLOC macro, see to it that the size of the background area does not fall below 64K bytes. If VSAM with Access Method Services is to be used, the partition in which they are to run should have 480K bytes plus enough space for buffers and control blocks. If VSAM phases are loaded into the SVA, the SVA must have 302K bytes and the partition 302K bytes plus enough space for buffers and control blocks. If the macro is omitted, the entire virtual address area is allocated to the virtual background partition and the size of each virtual foreground partition defined is set to zero. The ALLOC macro must not be used if NPARTS=1 is specified.

PARAMETERS FOR ALLOC

ALLOC Fn=mK[,Fn=mK]...

The operands may be specified in any order. m must be a multiple of 2. If an odd number is specified, it is replaced by the next higher even number. The minimum value substituted for m may not be less than 64. A zero specification is accepted, however. Any specification from 1 through 63 is reset to zero. n is the partition number and can range from 1 to NPARTS-1.

If the sum of the sizes specified for all foreground partitions plus the SVA plus 64K exceeds the size as specified by the VSIZE parameter, the ALLOC macro is ignored by the assembler, which issues an MNOTE to that effect.

Areas Used by the System

All partitions contain a partition save area for program name, interrupt status information, and registers, as well as a label save area for label processing if the LBLTYP job control statement is used. Both areas are at the beginning of the partition.

Save area length is 88 bytes, or 120 bytes* if the floating-point feature (FP=YES) was specified in the CONFG macro.

* Please note that no floating-point register save area is created for a one-partition system (NPARTS=1).

Label area length is determined by the system according to the LBLTYP specification:

- TAPE (standard tape labels) = 80 bytes
- NSD (nn) (nonsequential disk) = 84 bytes plus 20 bytes per EXTENT statement
- Omitted = 0 bytes.

The size of each virtual partition must be large enough to contain both the program and the save areas.

ALLOCR

The ALLOCR (Allocate Real Storage) macro instruction allocates available real storage to your partitions (as defined by the NPARTS= parameter of the SUPVR macro).

In a multiprogramming system, available real storage is the real storage size of your CPU as specified by the RSIZE parameter of the VSTAB macro, less the size of your supervisor. In a single partition system (NPARTS=1) specification of the ALLOCR macro is not accepted. All available real storage is always allocated to the background real partition.

The ALLOCR macro instruction is optional, since available real storage can also be allocated or reallocated by means of the ALLOCR command. ALLOCR must be specified with at least one parameter. Specify the size of each real partition you desire (including the background partition). If a partition is omitted, it is allocated a real partition size of zero. All available real storage not allocated to real partitions is allocated to the main page pool. In order to determine the minimum size required for the main page pool, refer to "Planning the System" in Chapter 3 of DOS/VS System Management Guide. Programs executing in virtual mode and using the PFIX macro instruction require an allocated real partition whose size is not less than the maximum number of pages concurrently fixed by PFIX.

All of available real storage may be allocated to real partitions except for a minimum page pool requirement as indicated below:

- If PFIX=NO -- 18K minus the size of the smallest real partition of 0-18K. If SDL is active, the main page pool must be at least 4K.
- If PFIX=YES and AP=NO -- 18K.
- If PFIX=YES and AP=YES -- 20K.
- If phases from the SVA are to be executed and AP=NO -- 18K.
- If phases from the SVA are to be executed and AP=YES -- 20K.

In a single partition system (NPARTS=1), all available real storage is permanently allocated to the background real partition (BGR).

During IPL, the partition allocations of real storage are checked to assure that sufficient storage for the page pool has been reserved. If the allocation exceeds the maximum allowed, all real partitions are set to zero, and a message is issued. The operator can correct the problem with an ALLOCR command.

PARAMETERS FOR ALLOCR

```
ALLOCR BGR=mK[,FnR=mK]...
```

The operands may be specified in random order. m must be a multiple of 2. If an odd number is specified, it is replaced by the next higher even number. For each real partition allocated, the corresponding virtual partition must be allocated too, because the job control program runs in virtual mode.

n is the partition number and can range from 1 to NPARTS-1.

Areas Used by the System

The size of each active real partition must be large enough to contain both the program to be executed and the partition and label save areas (see the description of the ALLOC macro).

IOTAB

The IOTAB (Input/Output Tables) macro instruction and its parameters define the area for the necessary device tables for the system. If the assumed options are all satisfactory, the only entry required is the IOTAB macro itself without any parameters.

PARAMETERS FOR IOTAB

BGPGR={10 / n}
Specify the number of symbolic programmer logical units (SYS000-SYSnnn) assigned to the background partition. The minimum number is **10. The maximum depends on the number of partitions. See the discussion of parameter FnPGR, below.**

BSCLNS={1 / n}
(Models 115 and 125 only)
If the TP parameter in the SUPVR macro indicates BTAM or QTAM teleprocessing support, or if POWER/VS is used for RJE applications, and the MODEL parameter of the CONFG macro specifies 115 or 125, this parameter specifies the number of BSC lines in the system. The value given must be in the range of 0-4 for the Model 115 and 0-6 for the Model 125. (This parameter is not required for VTAM.)

CHANQ={10 / 8 / 6 / n}
Specify the maximum number of entries to be generated for the **channel queue. If the parameter is omitted, a default is taken as follows:**

The value specified by the CBF parameter of the FOPT generation macro plus
6 if NPARTS=3 or less
8 if NPARTS=4
10 if NPARTS=5

The default value is also taken if the specified value is smaller than the default.

The number of entries specified should exceed the total number of I/O requests you wish to accumulate simultaneously. The requests for I/O commands for all channels are stored in this queue and are not released from the queue until the I/O operation has completed. The maximum value generated is 255. (See the DOS/VS System Management Guide, for a detailed discussion of this parameter.)

D2311=n
D2314=n
D2321=n
D2400=n
D3330=n
D3340=n
D3350=n
D3410=n
D3420=n
D3540=n
D3800=n
D3886=n

Specify, for the I/O device types listed at the left and as applicable to the installation configuration, the number of drives (for disk and tape devices) or the number of units installed (for 3540s, 3800s, and 3886s).

If the device is not specified, the system assumes that no devices of that type are attached. However, defaults other than zero are taken depending on the CPU Model specified and (for tape devices) whether PIOCS tape support is generated or not (see table below):

Default	PIOCS	CONFG Macro		
	TAPE={7 / 9}	MODEL=115	MODEL=125	MODEL=135, 138, 145, 148, 155-II, or 158
D2314=2				X
D2400=4	X			X
D3330=2			X	
D3340=2		X		
D3410=2	X	X	X	

The number specified for each device may be more than the actual number attached, but if the total number of devices specified exceeds the number of devices specified in the IODEV parameter, the latter number is upgraded (total number of devices specified by the Dxxxx parameters plus 5 for unit record devices).

FnPGR={5 / m} Specify the number of symbolic programmer units (of the class SYSnnn) for the foreground partition F1. The minimum value for m is 5, and the maximum is 241.

Specify the number of symbolic programmer logical units (of the class SYSnnn) for the remaining foreground partitions. Again, the minimum value for m is 5, while the maximum depends on the number of partitions specified.

The maximum number of programmer logical units is 241 for partition F1; for the remaining partitions, the sum of logical units you can specify is

241 if NPARTS=1
241-14*(n-1)-1 if NPARTS=2 or more.

In the formula, n equals the value specified in the NPARTS parameter.

If the number of foreground programmer logical unit exceeds the number of BG LUBs, SYSnnn in the extent statement will fail in the checking routine when running // OPTION STDLABEL. The user can make the BGPGR equal to the FnPGR or use // OPTION PARSTD in the foreground partition.

IODEV={10 / n} Specify the number of I/O devices attached to the system. The maximum is 254. The minimum value is 4. Each unit requiring a DVCGEN or ADD entry must be included in n.

JIB={5 / n} Specify the number of JIBs (Job Information Blocks) for the system.

Requirements are:

1. One JIB for each logical unit temporarily reassigned by a // ASSGN statement.
2. One JIB for each alternate logical unit assignment.
3. One JIB for each open 2311, 2314, or 2319 extent with the DASD file-protect feature except for system input/output extents.
4. Two JIBs for each open 2321 or 33xx extent with the DASD file-protect feature.

The minimum value generated is 5. The maximum is 255.

NRES={10 / n} Indicates the number of Resource Usage Records (RURs). This parameter is only valid if VSAM was specified in the FOPT macro. n must be a value between 2 and 255. If NRES is not specified and VSAM=YES, NRES=10 will be assumed. To compute the optimal upper limit for n, apply the formula

n=(2*UCAT+NVRLC+1)*P+NVRLC+NUPGS+1

where

UCAT is the number of user catalogs that are open at the same time.

NVRLC is the number of volumes of a recoverable catalog that contain an open VSAM file.

P is the number of partitions.

NUPGS is the number of upgrade sets that are open at the same time.

All these values should reflect the situation that exists at a point in time when NRES assumes its maximum value.

The value for NRES thus calculated will cause sufficient space to be reserved for the variable resources to be used. However, depending on the application, the number of resources actually required most of the time may be much lower.

Note: If the value substituted for n is too small and the pool of named resources gets exhausted, the VSAM partition is canceled with message 0S16I displayed, unless there is a possibility of a resource being freed by another partition.

SSLNS={4|n} (Models 115 and 125 only)

If the TP parameter in the SUPVR macro indicates BTAM or QTAM teleprocessing support and the MODEL parameter of the CONFG macro specifies 115 or 125. This parameter specifies the number of Start/Stop lines in the system. The value given must be in the range 0-8 for the Model 115 and 0-16 for the Model 125. (This parameter is not required for VTAM.)

DVCGEN

The DVCGEN (Device Generation) macro instruction and its parameters define the physical input and output units attached to the system. This macro instruction is optional. The DVCGEN macro is further discussed in the DOS/VS System Management Guide.

PARAMETERS FOR DVCGEN

CHUN=X'cuu',DVCTYP=xxxxxx,CHANSW={NO|YES},MODE=X'ss'

CHUN=X'cuu' Specify the hexadecimal number of the channel and unit for the device. If channel switching is supported, c must indicate the lower channel.

DVCTYP=xxxxxx **Specify the type of device. Figure 1-4 contains the codes for each** IBM-supported device.

CHANSW={NC|YES} Specify if the device is attached to more than one channel on one system, that is

a. Two selector channels
b. Two block multiplexer channels, or
c. One selector channel and one block multiplexer channel.

Note: DOS/VS requires that the channels have consecutive addresses (for instance channels 1 and 2).

This parameter indicates whether the device can be switched (IBM 2816 (with a 2403 or 2803), 3803, 2804 or 2404 is available).

MODE={ X'ss' / X'ssss' / X'ssssss' }

1. 2400T9. MODE specifies the tape mode. X'C0' is the default value. For 800 bpi 9-track single density, specifying X'C8' saves time during tape OPEN.

2. 3410T9. MODE specifies the tape mode. X'C0' is the default value.

3. **3420T9. MODE specifies the tape mode. X'D0' is the default value for both single and dual density tape.**

4. 2400T7 or 3420T7. MODE specifies the tape mode. X'90' is the default value.

5. 2702. MODE designates the SADxxx command.

   X'00' SAD0 (default)
   X'01' SAD1
   X'02' SAD2
   X'03' SAD3

   See Figure 1-13 for other values of ss.

6. 2260 (Local) and 3270 (Local). MODE specifies the 1053, 3284, or 3286 printer when CHUN=X'cuu' refers to a 1053 attached to a 2848, a 3284 attached to a 3272, or a 3286 attached to a 3272, respectively. The operand must be entered as MODE=X'01'. Note: 3270 (local) must be specified as DVCTYP=3277.

7. 1419/1255/1259/1270/1275. MODE designates the external interrupt bit associated with magnetic ink character readers or optical reader/sorters. The mode X'01' - X'20' corresponds to external interrupt PSWs bits 26 - 31, respectively. For dual address adapter 1419, this parameter is needed for both 1419P and 1419S.

   X'01' Device attached to external line 7.
   X'02' Device attached to external line 6.
   X'04' Device attached to external line 5.
   X'08' Device attached to external line 4.
   X'10' Device attached to external line 3.
   X'20' Device attached to external line 2.

8. 1018. MODE specifies whether the error-correction feature is present or not.

   X'00' feature not present (default value).
   X'01' feature is present.

9. 2703. For the IBM Models 115 and 125 with the Integrated Communications Adapter, MODE=x'ss', MODE=X'ssss', or MODE=X'ssssss' specifies the line mode setting for a Start/Stop or BSC line if the TP parameter in the SUPVR macro indicates BTAM or QTAM teleprocessing support, or if POWER/VS is used for RJE applications, and the MODEL parameter in the CONFG macro specifies 115 or 125. If a one or two byte value is specified, the specified value is right-justified and padded with zeros on the left to fill the three bytes. Thus, to specify a single-byte value for a Start/Stop line that requires only one byte, you must supply a three-byte value, the leftmost byte of which contains the requested mode settings. The line mode setting and its default settings are discussed in System/370 Model 125 Functional Characteristics, GA33-1506 and in System/370 Model 115 Functional Characteristics, GA33-1510.

10. 3704/3705. MODE specifies the type of channel adapter. No default is assumed.

    X'01' Type 1 or 4 channel adapter
    X'02' Type 2 or 3 channel adapter

    If the MODE parameter is omitted or incorrectly specified, the assembler issues an MNOTE.

RULES FOR USING DVCGEN

1. A separate DVCGEN macro is required for each device. For a 2314, 2319, 3330, 3340, 3350, or 3540 each individual spindle needs a DVCGEN macro instruction. If one physical spindle contains two or more logical spindles, a DVCGEN macro must be issued for each of these logical spindles.

   Specify 2311 if a 3330 is to be used with the 2311-1/3330 Series Compatibility Feature (8040): also specify 2311 if a 3340 is to be used with the 2311-1/3340 Series Compatibility Series (8060); specify 2314 if a 3340 is used with the 2314/3340 Series Compatibility Feature (8070); specify 3330 if a 3350 is used with the 3330/3350 Compatibility Feature; specify 3330B if a 3350 is used in 3330-11 compatibility mode.

   A separate DVCGEN macro instruction must be made for each quadrant of the 3344 (in 3340 mode). A separate DVCGEN macro instruction must be made for each half of the 3350 (in 3330-1 compatibility mode).

2. The total number must not exceed the total number of devices specified in the IODEV parameter of the IOTAB macro.

3. DVCGEN macros must be specified in ascending channel address sequence.

4. Switchable units attached to more than one channel, that is

   a. Two selector channels
   b. Two block multiplexer channels, or
   c. One selector channel and one block multiplexer channel,

   must be defined only once on the lowest channel by which they are addressable. They cannot be redefined as nonswitchable units on the higher channel.

5. The sequence of the DVCGEN macro instructions determines the position of the devices in the PUB table. SYSRES should be the first DVCGEN macro instruction if it is to have the highest software priority for that channel. Switchable units must be the last devices specified for each channel and must be on consecutive channels.

6. The specifications of these macros can be altered at IPL by ADD and DEL statements.

7. IBM 3210/3215 Console Printer-Keyboards that are not online but were defined by DVCGEN macro instructions must be deleted by DEL statements when performing IPL from the card reader.

8. For Models 115 and 125 with Integrated Communication Adapter, lines are reserved as follows:

   X'02x' for Start/Stop
   X'03x' for BSC.

ASSGN

The (ASSGN) Assign macro instruction and its parameters assign symbolic device names (LUBs) to physical I/O devices (PUBs). A separate macro instruction is required for each symbolic device name with a standard system generation assignment. This macro is optional, however, since the assignments can also be made after IPL. If the assignment is made at system generation time, the system uses it as a default assignment.

PARAMETERS FOR ASSGN

SYSnnn,X'cuu' [,BG / ,Fn] [,H1 / ,H2]

SYSnnn may be any of the following system logical units:

SYSRDR SYSLST SYSREC
SYSIPT SYSLOG SYSRLB
SYSPCH SYSLNK SYSSLB
SYSCAT

or a programmer logical unit (e.g. SYS000, SYS001).

If SYSnnn specifies a programmer logical unit, the range for nnn can be from 000 through to one less than the number of programmer logical units as specified in the corresponding IOTAB parameter.

X'cuu' is the hexadecimal number of the channel and unit to which the symbolic device is attached. (If channel switching is supported, c must be the lower of two channel numbers.) A separate macro is required for each standard assignment desired.

BG, Fn specifies the partition to which the assignment is being made; n can range from 1 to NPARTS-1. The ASSGN macro is ignored if a specification is entered for a partition not defined by the NPARTS parameter of the SUPVR macro, or not defined by default if the NPARTS parameter was not specified. If the parameter is omitted, while the next parameter is specified, indicate the omission by separating the last and the next parameters by means of two commas.

H1 or H2 specifies the desired input hopper to be used for an IBM 2560 or 5425. If both hoppers are to be used, they must be separately assigned to the same partition by means of two ASSGN macros. If the operand is omitted H1 is assumed.

Note: H2 may only be assigned to SYSRDR, SYSIPT, or SYSPCH. If the device is spooled by POWER/VS, SYSPCH cannot be the same physical device as SYSRDR/SYSIPT. If, in a particular partition, spooling is required from a read/punch device, a unique physical device address must be specified for both the read and the punch function (user dummy for at least one of the functions). For example, from a device with the physical address X'00C', you cannot spool both the punch and the read function.

Making a standard foreground assignment at system generation time is equivalent to making a permanent assignment after IPL. When you unbatch a foreground partition, temporary assignments are released.

System I/O units (SYSRDR, SYSIPT, SYSLST, or SYSPCH) that are assigned to a tape, a 3540 Diskette, or DASD when the system is generated are unassigned by IPL. An unassigned device can cause a job to be canceled.

Notes:

- During system generation, conflicting assignments (ASSGN macro specifications made in the supervisor assembly) across partitions are not checked.
- **The device address for SYSLOG is specified explicitly by means of an attention interrupt during the IPL procedure. This causes DOS/VS to automatically assign the interrupting device to SYSLOG and to override the SYSLOG assignment generated in the supervisor.**
- Compile, link-edit, and go in a foreground partition is allowed only if a private core image library is supported and available. Therefore, SYSLNK must be assigned to a foreground partition if PCIL=YES has been specified and NPARTS>1. Note that the assignment can also be made at execution time.
- At IPL time, non-operational DASD devices are indicated as being physically unavailable for system operations (Device Down), thus overriding the permanent assignment.

DPD

The DPD (Define Page Data Set) macro instruction and its parameters define the page data set (SYSVIS) that is to hold the virtual address area. Specification of this macro is optional, since the data set can also be defined after IPL by means of the DPD command. It provides information about the channel and unit number of the paging device, disk starting address of the SYSVIS extent and the volume serial number.

If the macro is omitted or incorrectly specified, the page data set must be defined at IPL time by means of the DPD command (see the DOS/VS System Management Guide). This command can also be used to override the information supplied by the DPD macro, until the next IPL.

The IPL routines open the page data set, check its extent limits, create label information for inclusion in the VTOC, and assign the symbolic name of SYSVIS to the page data set.

Note: The ASSGN statement or command cannot be used to assign or reassign SYSVIS.

PARAMETERS FOR DPD

DPD UNIT=X'cuu',CYL=nnn[,VOLID=xxxxxx]

UNIT=X'cuu' Specify (in hexadecimal notation) the channel and unit number of the device that is to contain the page data set. (If UNIT is specified, then CYL must also be specified.)

CYL=nnn Specify the number of the cylinder where the page data set is to begin. The upper limit of the extent is computed by the system on the basis of the information supplied in the VSIZE parameter of the VSTAB macro. The assembler issues an MNOTE indicating the required number of tracks. (If CYL is specified, UNIT must also be specified.)

VOLID=xxxxxx This parameter is optional. It specifies the volume serial number of the disk pack and is used for label checking. If the parameter is not specified in either the DPD macro or the DPD command, the volume serial number is not checked.

SEND[n]

The SEND (Supervisor End) macro instruction indicates the address of the problem program area (PPBEG). PPBEG is always on a 2K boundary and coincides with the address at the end of the supervisor (EOSSP). Regardless of whether the SEND macro is specified with or without the n parameter, the generated supervisor is always fully storage-protected.

Choose a value for n only if you want to reserve extra space within the supervisor area for future expansion, or for other purposes described below. If a value for n is selected which is larger than the size of the generated code, extra space is reserved. The system will not claim the extra space, not even for additional CCW translation copy buffers. However, if n is not specified, any extra space is used for these buffers. If the space reserved is sufficient for a future expansion of the supervisor, you will thereby avoid having to relink-edit non-relocatable programs, link-edited for the real background partition. In the meantime, you may use the extra space to expand the Problem Program Determination Aids (PDAIDS) area.

If your supervisor includes the relocating loader, no relink-editing is required for programs that were link-edited relocatable for a real partition. Moreover, because the address of the virtual background area is independent of the supervisor end address, expansion of the supervisor never involves relink-editing of programs that are link-edited for a virtual partition.

Note: The DOS/VS assembler requires an END and a /* statement following the SEND macro.

PARAMETERS FOR SEND

n Specify the desired address (PPBEG) of the real address area for use by programs other than the supervisor. Depending on the value selected for n, the assembler takes the following actions:

n specified?	n=multiple of 2048	n≥size of generated supervisor?	Assembler action taken
YES	YES	YES	Specification is accepted.
YES	NO	YES	Address specified is stepped up to next higher 2K boundary.
YES	YES	NO	Address specified replaced by generated supervisor end address (PPBEG).
YES	NO	NO	Address specified replaced by generated supervisor end address (PPBEG).
NO	-	-	Address of PPBEG established on 2K boundary.

Figure 1-2. Supervisor End Address Computation on the Basis of Different SEND Macro Specifications

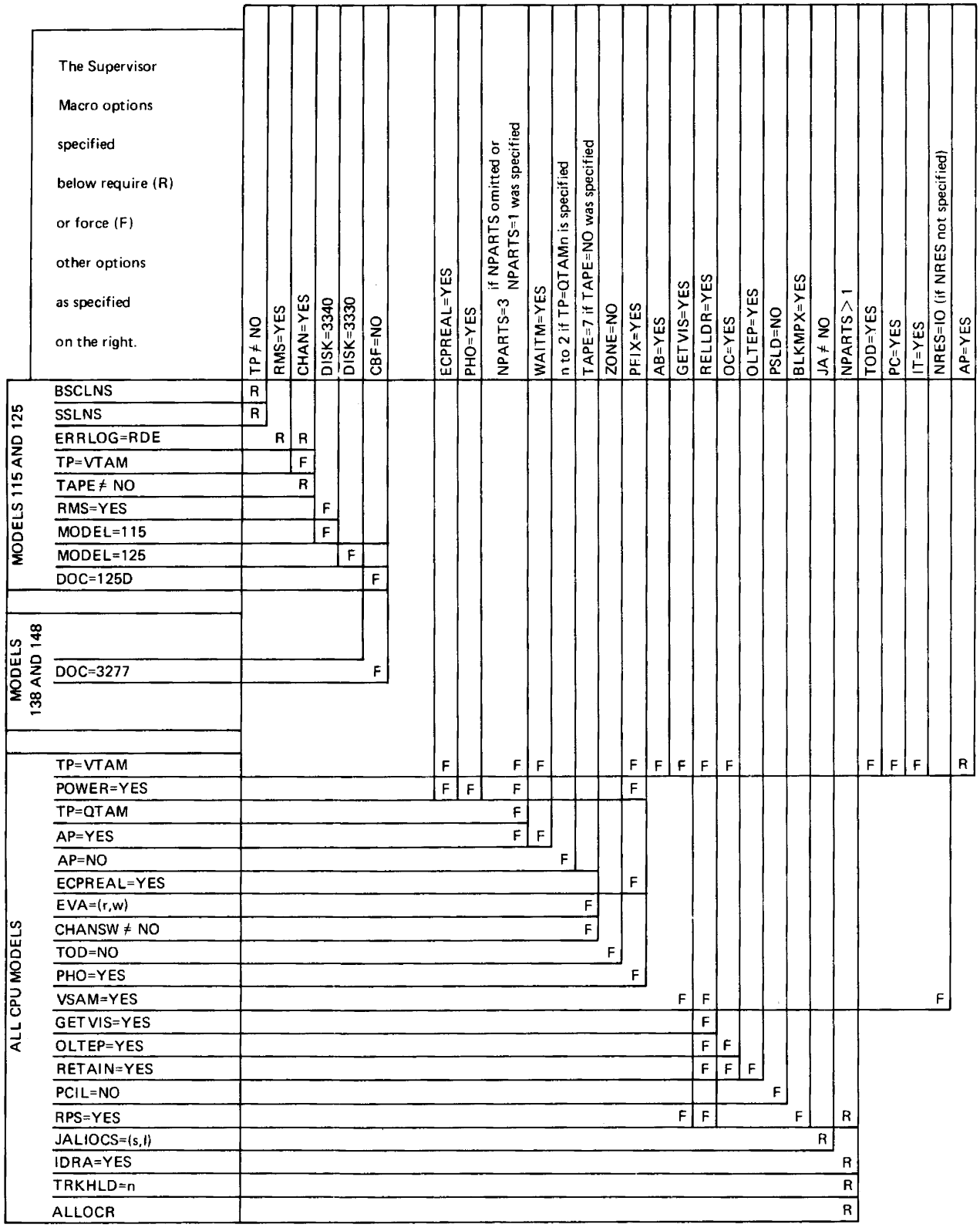


Figure 1-3. SUPERVISOR -- Macro Instructions Related Parameters

Code	Actual IBM Device	Device Type X'nn'	Device Type
7770	7770 Audio Response Unit	D3	Audio Response Units
2501 †	2501 Card Reader	10	Card Readers
2540R	2540 Card Reader	11	
3505	3505 Card Reader	12	
3504	3504 Card Reader	12	
2540P	2540 Card Punch	21	Card Punches
2520B2	2520B2 Card Punch	20	
1442N2	1442N2 Card Punch	22	
2520B3	2520B3 Card Punch	20	
3525P	3525 Card Punch	23	
1442N1 †	1442N1 Card Read Punch	30	Card Read Punches
2520B1 †	2520B1 Card Read Punch	31	
2560 †	2560 Multifunction Card Machine	33	
2596 †	2596 Card Read Punch	30	
3525RP	3525 Card Punch (with optional read feature)	32	
5425	5425 Multifunction Card Unit	34	
2311 †	2311 Disk Storage Device	60	DASD
2314 †	2314 Direct Access Storage Facility	62	
2314 †	2319 Disk Storage Facility	62	
2321 †	2321 Data Cell Drive	61	
3330* †	3330 Disk Storage Model 1 and 2, or 3333-1	63	
3330B*	3330 Disk Storage Model 11	65	
3340* †	3340 Disk Storage (General)	6A	
3340R* †	3340 Disk Storage with RPS feature (with or without 3340 Data Module, Model 35)	69	
3340R* †	3340 Disk Storage with RPS feature (with or without 3340 Data Module, Model 70)	6A	
3340R †	3344 Direct Access Storage		
3340* †	3340 Disk Storage without RPS feature (with or without 3340 Data Module, Model 35)	69	
3340* †	3340 Disk Storage without RPS feature (with or without 3340 Data Module, Model 70)	6A	
3350*	3350 Direct Access Storage	67	
3540 †	3540 Diskette Input/Output Unit	80	Diskette Storage Device
2955	2955 Data Adapter Unit	D7	Data Link for RETAIN
125D	Model 115 or Model 125 Integrated Display Operator Console Model 138/148 console in 115/125 console display emulation mode	B2	Display Operator Console
125DP	Model 115 or Model 125 Integrated Display Operator Console with 5213 Console printer attached 3286-2 in display mode **Note:** Codes are valid for native Alpha-Numeric Replacement (ANR) mode and for 1052 emulation mode. The 1052 mode is not supported with Indirect Data Addressing (IDA).	B2	
3277	3277 Operator Console	B0	
2260	2260 Display Station	C0	Display Stations
3277 (Local 3270)	3277 Display Station; MODE operand need not be entered	B0	
3277B (Local 3270)	3277 Display Station; attached in Burst Mode to a multiplexer channel. MODE operand need not be entered **Note:** A 3277, in order to be used as a display operator console, must not be assigned to the same selector or multiplexer channel as SYSRES.	B0	
2400T9 †	9-track Magnetic Tape Units 2400 - series	50	Magnetic Tape Devices
2400T7 †	7-track Magnetic Tape Units 2400 - series	50	

Specify 2311 if a 3330-1 is used with the 2311-1/3330 Series Compatibility Feature (8040).
Specify 2311 if a 3340 is used with the 2311-1/3340 Series Compatibility Feature (8060).
Specify 2314 if a 3340 is used with the 2314/3340 Series Compatibility Feature (8070).
Specify 3330 if a 3350 is used in 3330 compatibility mode.
Specify 3330B if a 3350 is used in 3330-11 compatibility mode.
† indicates burst-mode devices or overrunable devices that require specification of BMPX=YES in the PIO macro.

Figure 1-4. SUPERVISOR -- Device Code for the DVCGEN Macro Instruction (Part 1 of 2)

Code	Actual IBM Device	Device Type X'nn'	Device Type
3410T9 †	9-track 3410 Magnetic Tape Units	53	Magnetic Tape Devices
3410T7 †	7-track 3410 Magnetic Tape Units	53	
3420T9 †	9-track 3420 Magnetic Tape Units	52	
3420T7 †	7-track 3420 Magnetic Tape Units	52	
1419 †	1255 Magnetic Character Reader	72	MICR - Magnetic Ink Character Recognition Devices
1419 †	1259 Magnetic Character Reader	72	
1419 †	1419 Magnetic Character Reader	72	
1419P †	1419 Dual Address Adapter Primary Control Unit	73	
1419S †	1419 Dual Address Adapter Secondary Control Unit	74	
3895	3895 Document Reader/Inscriber	7D	Reader/Inscriber
1419 †	1270 Optical Reader Sorter	72	Optical Readers
1419P †	1275 Optical Reader Sorter Primary Control Unit	73	
1419S †	1275 Optical Reader Sorter Secondary Control Unit	74	
1287 †	1287 Optical Reader	77	
1288 †	1288 Optical Page Reader	77	
3881	3881 Optical Mark Reader	11	
3886	3886 Optical Character Reader	7C	
1018	1018 Paper Tape Punch with 2826 Control Unit Model 1	79	Paper Tape Punches
1017	1017 Paper Tape Reader with 2826 Control Unit Model 1	78	Paper Tape Readers
2671	2671 Paper Tape Reader	70	
PRT1	3211 or 3203-4 Printer	43	Printers
1403	1403 Printer	40	
1403U	1403 Printer with UCS feature	42	
1443	1443 Printer	41	
2245	2245 Kanji Printer	44	
2260 (Local)	1053 Printer with 2848 Control Unit, MODE operand must be entered as X'01'	C0	
3203	3203 Printer Model 1 and 2	4A	
3211	3211 or 3203-4 Printer	43	
3277 (Local 3270)	3284 or 3286 Printer with 3272 Control Unit, MODE operand must be entered as X'01'	B0	
3277B (Local 3270) †	3284 or 3286 Printer with 3272 Control Unit, attached in Burst Mode to a multiplexer channel. MODE operand must be entered as X'01'	B0	
3800	3800 Printing Subsystem	45	
3800B	3800 Printing Subsystem with optional Burster-Trimmer-Stacker	45	
3800C	3800 Printing Subsystem with additional character generation storage	45	
3800BC	3800 Printing Subsystem with Burster-Trimmer-Stacker and additional character generation storage	45	
5203	5203 Printer	4C	
5203U	5203 Printer with UCS feature	4D	
1050A*	3210, 3215 Console Printer Keyboards 3286-2 in printer keyboard mode	00	Printer Keyboard
2495TC	2495 Tape Cartridge Reader	51	Tape Cartridge Reader
2701	2701/2715 Data Adapter Unit	D0	Teleprocessing lines
2701	Model 135 Integrated Communication Adapter (ICA)	D0	
2701 A/B/C/D	2702 Transmission Control Unit	D1	A=SAD0 command when enabling the line B=SAD1 command when enabling the line C=SAD2 command when enabling the line D=SAD3 command when enabling the line
2703	Model 115 or 125 Integrated Communication Adapter	D2	
3705	3704/3705 Communications Controller	DC	
3791L	3791 Local Communications Controller	DE	
2703	3704/3705 Communications Controller in Emulation Mode	D2	
2703	2703 Transmission Control Unit	D2	
UNSP	Unsupported Device	FF	Unsupported no-burst mode on multiplexer channel
UNSPB †	Unsupported Device	FF	Unsupported with burst mode on multiplexer channel

*Note: Specify code of 125D or 125DP for a Model 115 or Model 125 Integrated Display Operator Console in 1052 emulation mode.

Figure 1-4. SUPERVISOR -- Device Code for the DVCGEN Macro Instruction (Part 2 of 2)

Supervisor Real Storage Requirements

This section contains the data for estimating the size of the supervisor required for a generated system, that is, the amount of real storage needed at object time for the supervisor macro instructions.

The supervisor varies in size from system to system depending on the user-selected options and the machine configuration. All supervisor generation options are described earlier in this module under "The Supervisor Generation Macros".

The size of the supervisor is a determining factor for the amount of real storage available for problem program use. All real storage not allocated to the supervisor is available for use by programs running in virtual mode (the main page pool) and in real mode via specification of real partitions. For more details on the allocation of real partitions refer to the description of the ALLOCR macro instruction.

Figure 1-5 gives the real storage requirements for your supervisor, the size of which is determined by the options you specify (including default specifications) in the supervisor generation macro instructions. The basic supervisor (see sizes on the first line of data of Figure 1-5) is dependent on the number of partitions you require (SUPVR macro NPARTS=); however, it is independent of any other supervisor generation options.

To this basic size you must add the storage requirements for each selected option (see column "Generation Operand" in Figure 1-5). You must be careful to include the values for any options you have selected by default.

You must also include the storage requirements for any option you did not specify but which is forced by another option you did specify (see Figure 1-3 showing which options are forced or required). Thus, for example, the SUPVR macro operand for Page Exception Handling Overlap (PHO=YES) forces the FOPT macro operand PFIX=YES for page fixing. Therefore, if you specify PHO=YES, you must include the storage requirements of both PHO=YES and PFIX=YES.

The comments column of Figure 1-5 indicates when one option forces another option or is forced by another option. Certain options share common code and thus the mixture rather than the individual values must be considered in obtaining the total storage requirement. Thus, for example, the FOPT macro options IT=YES, PC=YES, and OC=YES share common code. Figure 1-5 provides for this by stating storage requirements for each option separately and in all combinations. If you have selected more than one of these options, select the combined requirement from the row which includes your combination.

The SEND macro instruction allows you to reserve additional storage for your supervisor. Refer to the description of the SEND macro instruction for further details.

Because of storage protection, the supervisor must always end on a 2K storage boundary. Supervisor generation always causes the total generated supervisor size to be rounded up to the nearest 2K boundary. Thus, a calculated supervisor end address of, say, 31,120 bytes, is rounded to 32K (32,768 bytes).

Some supervisor macro instructions do not affect your storage requirements because they merely supply information to be placed in storage occupied by other macro instructions. These macro instructions are not included in Figure 1-5. They are:

STDJC (all operands except SPARM=YES)
ALLOC
ALLOCR
DVCGEN
ASSGN
DPD

In summary, to calculate the size of your supervisor, add the values as indicated in Figure 1-5 for:

- Your base (determined by NPARTS=)
- The storage requirements for all options you specifically selected
- The storage requirements for those options you did not specify but that default to YES
- Storage requirements for all options you selected indirectly, that is options that were forced by other, specified, options
- Any additional storage you reserved via the SEND macro instruction.
- For any combination of options not explicitly shown in Figure 1-5, you should add up the individual values.

Supervisor Element	Generation Operand	NPARTS=1	Multiprogramming				Comments
			NPARTS=2	NPARTS=3	NPARTS=4	NPARTS=5	
SUPVR (Required Routines — Basic Size) SVC Interruption Handling System Loader (FETCH and LOAD) Minimum I/O Units Control Tables (LUBs, PUBs, and JIBs) General Entry and Exit Routines System Communication Region Partition Communication Regions Transient Areas End of Job Step Byte Multiplexer and Selector Channel Support Storage Protection CCW Translation Page Management 2311/2314 Disk Error Recovery		23960	29944	30488	31064	31672	Based on MODEL=115 or MODEL=125
Optional Routines							
Multitasking	AP=YES	NA	4680	4442	4216	4000	1. Forces WAITM=YES 2. Forces NPARTS=3 if NPARTS omitted or specified as 1
ASCII/EBCDIC Translation Tables	ASCII=YES	512	512	512	512	512	
RMSR-support for Channel-attached devices, tape units, or TP-devices used with a Model 115 or 125	CHAN=YES	960	1024	1024	1024	1024	If RMS=YES or MCH=YES is also specified, add the value given for RMS instead.
Reliability Data Extractor Error Recording (IPL, EOD)	ERRLOG=RDE	0	0	0	0	0	For Model 115 or 125, CHAN=YES or RMS=YES is required
14xx Emulators	EU=YES	216	216	216	216	216	
Supervisor Select	ID=c	0	0	0	0	0	
Model 115/125 MCAR/CCH support	MCH=YES	3968	3968	3968	3968	3968	If RMS=YES or CHAN=YES is also specified, add the value given for RMS instead.
Magnetic Ink Character Reader Page Exception handling	MICR=1419 (for 1255/1259/1270/1275s see Note 1)	1208	1208	1208	1208	1208	
	MICR=1419D (Dual Address Adapter 1419/1275s)	1080	1080	1080	1080	1080	
Page Handling	PAGE IN=n (n must be ≥1)	1408 + 8n	1592 + 8n	1592 + 8n	1592 + 8n	1592 + 8n	
Page Exception Handling Overlap	PHO=YES	592	640	656	680	696	Forces PFIX=YES; Forced by POWER=YES
POWER/VS	POWER=YES	NA	546	546	546	546	Forces NPARTS=3, if NPARTS omitted or specified as 1; also forces PHO=YES, PFIX=YES, and ECPREAL=YES
RMS support (RMSR plus MCA/CCH) for Model 115 and 125	RMS=YES or CHAN=YES and MCH=YES	4864	4928	4928	4928	4928	Do not include any values for CHAN=YES and for MCH=YES
Teleprocessing (see Note 2)	TP=BTAM	544	872	872	872	872	TP=QTAM or VTAM forces NPARTS=3 if NPARTS is omitted or specified as 1 TP=VTAM forces AB=YES, ECPREAL=YES, GETVIS=YES, IT=YES, OC=YES, PC=YES, PFIX=YES, RELLDR=YES, RMS=YES in the case of Models 115 and 125, and TOD=YES. AP=YES is required.
	TP=QTAM	NA	1400	1400	1400	1400	
	TP=QTAMn	NA	1352	1352	1352	1352	
	TP=VTAM	NA	3020	3012	3004	2996	
	TP=(BTAM,VTAM)	NA	3020	3012	3004	2996	
	TP=(QTAM,VTAM)	NA	3580	3572	3564	3556	
	TP=(QTAMn,VTAM)	NA	3532	3524	3516	3508	

Figure 1-5. Supervisor Real Storage Requirements -- Bytes (Part 1 of 6)

Supervisor Element	Generation Operand	Multiprogramming					
		NPARTS=1	NPARTS=2	NPARTS=3	NPARTS=4	NPARTS=5	
CONFG (Configuration Options)							
Floating Point Feature	FP=YES	0	72	72	72	72	
Model 115	MODEL=115	Log out area = 0					Forces RMS support (see RMS=YES in SUPVR macro)
Model 125	MODEL=125						
Model 135	MODEL=135	Log out area = 120					
Model 138	MODEL=138						
Model 145	MODEL=145	Log out area = 672					
Model 148	MODEL=148						
Model 155-II	MODEL=155-II	Log out area = 992					
Model 158	MODEL=158						
STDJC (Standard Job Control Settings)							
Support of &SYSPARM Assembler System Variable Symbol	SPARM=YES	8	16	24	32	40	other STDJC options require no storage
FOPT (Functional Supervisor Options)							
Abnormal Termination	AB=YES						
	without AP=YES	288	296	304	312	320	Forced by VSAM=YES
	with AP=YES	NA	384	384	384	384	
Console Buffering	CBF=n (see Note 5)	240 + 104n					Does not apply to Models 115 and 125, 138, 148
DASD File Protection	DASDFP=(n1,n2) for 2311/2314	336 + 24(n2−n1)					
	DASDFP=(n1,n2) for 2311/2314, 33xx	400 + 24(n2−n1)					
	DASDFP=(n1,n2,2321) for 2311/2314, 33xx, 2321	464 + 24(n2−n1)					
Display Operator Console	DOC=125D	3392	3392	3392	3392	3392	
	DOC=3277	4864	4864	4864	4864	4864	
Error Queuing	ERRQ=n	44(n−3)	44(n−5)	44(n−5)	44(n−5)	44(n−5)	0 if default used
Error Volume Analysis	EVA=(r,w)	0	0	0	0	0	Forces TAPE=7
Fast CCW translation	FASTTR=YES	2120	1992	2024	2048	2080	Does not include buffer space (see BUFSIZE)
	FASTTR=YES when AP=YES	NA	2296	2296	2296	2296	
Virtual Storage Management Support	GETVIS=YES	1126	1318	1318	1318	1318	Forced by VSAM=YES, and RPS=YES Forces RELLDR=YES
Independent Directory Read/In Area	IDRA=YES	NA	200	200	200	200	Valid only if NPARTS>1 (Add 768 byte if RELLDR=YES)
Interval Timer	IT=YES	432	880	888	912	920	If OC=YES, refer to OC, if PC=YES, refer to PC
Job Accounting Interface	JA=YES	488	672	808	944	1080	
	JA=(n1,n2,n3,n4,n5)	576 + 8(n1)	760 + 8(n1+n2)	896 + 8(n1+n2+n3)	1032 + 8(n1+n2+ n3+n4)	1168 + 8(n1+n2+ n3+n4+n5)	
	JALIOCS=(s,l) (see Note 3)	Value from JA plus (s + l) − 16					

Figure 1-5. Supervisor Real Storage Requirements -- Bytes (Part 2 of 6)

Supervisor Element	Generation Operand	NPARTS=1	Multiprogramming				Comments
			NPARTS=2	NPARTS=3	NPARTS=4	NPARTS=5	
FOPT (continued)							
User Channel Program Translation	ECPREAL=YES	320	320	320	320	320	Forces PFIX=YES; Forced by POWER=YES
Problem Program Handling of External Interruptions	OC=YES	280	288	296	304	312	Forced by RETAIN=YES and OLTEP=YES
	Including IT=YES	572	968	984	1016	1032	
	Including IT=YES when AP=YES	NA	1232	1240	1248	1256	Does not include any AP storage requirements
	Including IT=YES and PC=YES	560	1016	1040	1064	1088	
	Including IT=YES and PC=YES when AP=YES	NA	1408	1416	1424	1432	Does not include any AP storage requirements
Online Testing	OLTEP=YES (default)	248	256	256	256	256	Forces RELLDR=YES and OC=YES Forced by RETAIN=YES
Support of User Program Check Routines	PC=YES	248	264	272	280	288	
	when AP=YES	NA	384	384	384	384	Does not include any AP storage requirements
	Including IT=YES	480	944	952	992	1008	
	Including OC=YES	328	352	368	384	400	
	Including IT=YES when AP=YES	NA	1312	1312	1312	1312	Does not include any AP storage requirements
	Including IT=YES and OC=YES when AP=YES	NA	1408	1416	1424	1432	Does not include any AP storage requirements
Private Core Image Library Support	PCIL=YES	192	224	240	264	280	
Problem Determination Program (PDAIDS)	PD=n	n + 160	n + 200	n + 200	n + 200	n + 200	
	PD=YES	1560	1600	1600	1600	1600	
Page fixing	PFIX=YES	1776	1928	1928	1928	1928	Forced by PHO=YES, ECPREAL=YES and POWER=YES
	PFIX=YES and FASTTR=YES	1984	2136	2136	2136	2136	
Partition Dispatching Priority	PRTY=partition name and sequence	NA	0	0	0	0	
Private Second Level Directories	PSLD=n	8n	16n	24n	32n	40n	
Relocating Loader	RELLDR=YES	448	448	448	448	448	Forced by GETVIS=YES, OLTEP=YES, VSAM=YES, and RPS=YES
RETAIN-Remote Initiation of OLTEP programs	RETAIN=YES	112	112	112	112	112	Forces OC=YES and OLTEP=YES
Rotational Position Sensing	RPS=YES	NA	600	600	600	600	Forces GETVIS=YES, RELLDR=YES, and BLKMPX=YES
Seek Separation	SKSEP=YES, or n (see Note 4)	150 + 5n	150 + 5n	150 + 5n	150 + 5n	150 + 5n	
Second Level Directory	SLD=n	8n	8n	8n	8n	8n	
Disk System Input and Output Files	SYSFIL=YES or YES(n1,n2) and DASDFP=NO	704	720	876	962	1048	
	and DASDFP=(k1,k2,2321)	1088 + 24(k2−k1) + 86(NPARTS−1)					
	and DASDFP=(k1,k2) and DISK=(2311,2314)	960 + 24(k2−k1) + 86(NPARTS−1)					
	and DASDFP=(k1,k2) and DISK=(2311,2314,33xx)	1040 + 24(k2−k1) + 86(NPARTS−1)					

Figure 1-5. Supervisor Real Storage Requirements -- Bytes (Part 3 of 6)

Supervisor Element	Generation Operand	Multiprogramming					Comments
		NPARTS=1	NPARTS=2	NPARTS=3	NPARTS=4	NPARTS=5	
FOPT (Cont.)							
Tape Error Statistics—2495 Tape Cartridge Reader	TEB=n	36+6n	36+6n	36+6n	36+6n	36+6n	
Tape Error Statistics by Volume	TEBV=IR, or CR	0	0	0	0	0	
Time-of-Day Clock Support	TOD=YES	640	640	640	640	640	
Track Hold	TRKHLD=n (see Note 6)	NA	464+ 12n	464+ 12n	464+ 12n	464+ 12n	Valid only if NPARTS>1
Supervisor identification	USERID=id	0	0	0	0	0	Included in basic size whether id is specified or not.
VSAM	VSAM=YES (incl.NRES=10)	1752	984	984	984	984	Forces AB=YES, GETVIS=YES, NRES=10, and RELLDR=YES
Multiple Wait	WAITM=YES	56	56	56	56	56	Forced by AP=YES
Cross-partition Communication	XECB=YES XECB=n	NA NA	884 756+16n	948 756+16n	1012 756+16n	1076 756+16n	
Time Zone for Time of Day Clock Support	ZONE=NO (EAST,hh,mm) (WEST,hh,mm)	0	0	0	0	0	
Task Timer	TTIME=YES and AP=NO TTIME=YES and AP=YES	390 400	390 400	390 400	390 400	390 400	
Synchronous Exit	SYNCH=YES	252	252	252	252	252	
PIOCS (Physical IOCS Support)	BLKMPX=YES	32	32	32	32	32	Forced by RPS=YES
Burst Mode on Byte Multiplexer Channel	BMPX=YES	80	80	80	80	80	
Channel Switching Tape Control	CHANSW=RWTAU or TSWTCH	224	224	224	224	224	Forces TAPE=7
	DISK=2311,or2314	0	0	0	0	0	Not valid if MODEL=115 or 125
	DISK=3330	768	768	768	768	768	Forced for Model 125
	DISK=3340	1344	1344	1344	1344	1344	Forced for Model 115
	DISK=3350	832	832	832	832	832	Not valid if MODEL=115 or 125
	DISK=(3330, 3340)	1600	1600	1600	1600	1600	
	DISK=(3330, 3350)	896	896	896	896	896	
	DISK=(3340, 3350)	1600	1600	1600	1600	1600	
	DISK=(3330, 3340, 3350)	1664	1664	1664	1664	1664	
MICR Device on Selector Channel (1419 Single Address,Device only)	MRSLCH=YES	32	32	32	32	32	
Tape Support	TAPE=7, or 9 (default)	584	584	584	584	584	TAPE=7 is forced by EVA=(r,w) and by CHANSW=RWTAU or TSWTCH. For Model 115 or 125 CHAN=YES is required.
VSTAB (Size of Real and Virtual Address Areas and CCW Translation space)	RSIZE=n_1K VSIZE=n_2K (See Note 8) BUFSIZE=n (Required)	Obtain value from table – Part 5 of this Figure. When PHO=YES or PFIX=YES, add $\frac{n1}{2}$, and subtract the number of bytes included in basic supervisor.			This is for: NPARTS=1 652 2 788 3 856 4 924 5 992		
		72(n–10)	72(n–30)	72(n–30)	72(n–30)	72(n–30)	0 if default used (for FASTTR=NO). If FASTTR=YES, substitute for 'n' the specified or default value.
	SVA=(nk,mk)	0	0	0	0	0	

Figure 1-5. Supervisor Real Storage Requirements -- Bytes (Part 4 of 6)

VSIZE (K bytes)	RSIZE (K bytes)												
	64	96	128	144	160	192	208	240	256	384	512	768	1024
64	456	–	–	–	–	–	–	–	–	–	–	–	–
96	524	652	–	–	–	–	–	–	–	–	–	–	–
128	524	720	848	–	–	–	–	–	–	–	–	–	–
192	592	788	916	1048	1112	1240	–	–	–	–	–	–	–
256	660	856	984	1116	1180	1308	1440	1568	1632	–	–	–	–
320	728	924	1052	1184	1248	1376	1508	1636	1700	–	–	–	–
384	796	992	1120	1252	1316	1444	1576	1704	1768	2416	–	–	–
448	864	1060	1188	1320	1384	1512	1644	1772	1836	2484	–	–	–
512	932	1128	1256	1388	1452	1580	1712	1840	1904	2552	3348	–	–
640	1068	1264	1392	1524	1576	1716	1848	1976	2040	2688	3548	–	–
704	1136	1332	1460	1592	1656	1784	1916	2044	2108	2820	3616	–	–
768	1204	1400	1528	1660	1724	1852	1984	2112	2176	2888	3684	4980	–
832	1272	1468	1596	1728	1792	1920	2116	2244	2308	2956	3752	5048	–
896	1340	1536	1664	1860	1924	2052	2184	2312	2376	3024	3820	5116	–
960	1408	1668	1796	1928	1992	2120	2252	2380	2444	3092	3888	5184	–
1024	1540	1736	1864	1996	2060	2188	2320	2448	2512	3160	3956	5252	6548
1280	1812	2008	2136	2268	2332	2460	2592	2720	2784	3432	4228	5524	6884
1536	2084	2280	2408	2540	2604	2732	2864	2992	3056	3704	4500	5860	7156
1792	2356	2552	2680	2812	2876	3004	3136	3264	3328	4040	4836	6132	7428
2048	2692	2888	3016	3148	3212	3340	3472	3600	3664	4312	5108	6404	7700
2304	2964	3160	3288	3420	3484	3612	3744	3872	3936	4584	5380	6676	8036
2560	3236	3432	3560	3692	3756	3884	4016	4144	4208	4856	5652	7012	8308
2816	3508	3704	3832	3964	4028	4156	4288	4416	4480	5192	5988	7284	8580
3072	3844	4040	4168	4300	4364	4492	4624	4752	4816	5464	6260	7556	8852
4096	4996	5192	5320	5452	5516	5644	5776	5904	5968	6616	7412	8708	10004
5120	6148	6344	6472	6604	6668	6796	6928	7056	7120	7768	8564	9860	11156
6144	7300	7496	7624	7756	7820	7948	8080	8208	8272	8920	9716	11012	12308
7178	8520	8648	8844	8908	8972	9168	9232	9360	9492	10140	10936	12232	13592
8192	9604	9800	9928	10060	10124	10252	10384	10512	10576	11224	12020	13316	14612
9216	10756	10952	11080	11212	11276	11404	11536	11664	11728	12376	13172	14468	15764
10240	11908	12104	12232	12364	12428	12556	12688	12816	12880	13528	15620	15620	16916
11264	13060	13256	13384	13516	13580	13708	13840	13968	14032	14680	15476	16772	18068
12288	14212	14408	14536	14668	14732	14860	14992	15120	15184	15832	16628	17924	19220
13312	15364	15560	15688	15820	15884	16012	16144	16272	16336	16984	17780	19076	20372
14336	16516	16712	16840	16972	17036	17164	17296	17424	17488	18136	18932	20228	21524
15360	17668	17864	17992	18124	18188	18316	18448	18576	18640	19288	20084	21380	22676
16384	18820	19016	19144	19276	19340	19468	19600	19728	19792	20440	21236	22532	23828

Figure 1-5. Supervisor Real Storage Requirements -- Bytes (Part 5 of 6)

Supervisor Element	Generation Operand	NPARTS=1	Multiprogramming NPARTS=2	Multiprogramming NPARTS=3	Multiprogramming NPARTS=4	Multiprogramming NPARTS=5	Comments
IOTAB (Input/Output Tables)							
Number of programmer logical units	BGPGR=n F4PGR=n F3PGR=n F2PGR=n F1PGR=n	2(n−10)	2(n−10) 2(n−5)	2(n−10) 2(n−5) 2(n−5)	2(n−10) 2(n−5) 2(n−5) 2(n−5)	2(n−10) 2(n−5) 2(n−5) 2(n−5) 2(n−5)	0 if default used
Number of Channel Queue Entries	CHANQ=n (see Note 5)	8(n−6)	8(n−6)	8(n−6)	8(n−8)	8(n−10)	
Amount of Extra Space reserved for the PUB Table (required for RMSR recording)	D2311=n_1 D2314=n_2 D2321=n_3 D3330=n_4 D3340=n_5 D3350=n_6 D3400=n_7 D3410=n_8 D3420=n_9 D3540=n_{10} D3800=n_{11} D3836=n_{12} (see Note 7)			$24n_1$ $24n_2$ $24n_3$ $32n_4$ $16n_5$ $32n_6$ $76n_7$ $84n_8$ $84n_9$ $16n_{10}$ $96n_{11}$ $26n_{12}$			For Models 115 or 125, these parameters are ignored if both CHAN=NO and RMS=NO in the SUPVR macro, or if both these parameters are omitted and, therefore, default to NO.
Number of I/O devices on system			10(n−10)				For Models 115 and 125 without CHAN or RMS. 0 if default used for Model 135 and upward and for Model 115 or 125 with CHAN or RMS.
			120 + 22(n−10)				
Number of Job Information Blocks	JIB=N	4(n−5)	4(n−5)	4(n−5)	4(n−5)	4(n−5)	
Number of Start/Stop Lines and Number of BSC Lines (Model 115 and Model 125 ICA Only)	SSLNS=n1, BSCLNS = n2 (when TP = BTAM, or QTAM)		4 + 4(n_1−4) + 4(n_2−1)				
Number of Named Resources in the System	NRES = n			12n			NRES=10 is included in VSAM if VSAM=YES, but NRES is not specified.

Figure 1-5. Supervisor Real Storage Requirements -- Bytes (Part 6 of 6)

Notes:

1. A 1255/1259/1270 is addressed as a single address adapter machine, that is, MICR=1419.

2. NPARTS>1 is required for TP=QTAMn. TP=QTAMn includes BTAM supervisor support. If AP=YES when TP=QTAMn, then the quantity A must be added to the basic storage requirement for TP=QTAMn. A=44+(n-2) 12, where n is the value elected for TP=QTAMn. (For multitasking, AP must equal YES.)

3. If s is omitted or if its specification is invalid, then 16 bytes are reserved. If 1 is omitted or if it is invalid, 0 is assumed.

4. When SKSEP=YES, n (in the formula) equals the number of DASD devices specified at system generation time. When SKSEP=n, n (in the formula) is the number of DASD devices supported as specified, but cannot be less than the number specified at system generation time.

5. The selection of the CBF option results in extra channel queue usage. Consider this when requesting the number of CHANQ entries. Thus, specification of the CBF option and selection of the CHANQ default, results in the number of buffers specified being added to the CHANQ default, for which see below.

   CHANQ default = 6 if NPARTS=3
   CHANQ default = 8 if NPARTS=4
   CHANQ default = 10 if NPARTS=5

   Only if the number of queue entries as specified by the CBF parameter plus the CHANQ default is larger than the number of entries actually specified by the CHANQ parameter, add $8n_2$, where n_2=CHANQ default + CBF specification - CHANQ specification (zero for negative).

   Example 1: CHANQ=30
   CBF=4
   NPARTS=4 (CHANQ default is 8)

   Number of bytes reserved for CBF: 240+104x4+8x0 (n_2=0 because CBF(4)+CHANQ default (8) is less than 30 (CHANQ specification).

   Example 2: CHANQ=10
   CBF=4
   NPARTS=4 (CHANQ default is 8)

   Number of bytes reserved for CBF: 240+104x4+8x2 (n_2=2 because CBF(4)+CHANQ default (8) minus CHANQ (10)=2).

6. Where n equals the maximum number of tracks (1-255) to be held at any given time by the entire system. The default is 10 if n is an invalid parameter (non-numeric or outside the range, 1-255).

7. In addition to the total number of bytes reserved for the devices specified, an extra amount is reserved of 12B bytes, where B equals the number of devices specified by the IODEV parameter minus the total number of devices specified by the Dxxxx parameters. ($B=n-(n_1+n_2+n_3+n_4+n_5+n_6+n_7+n_8+n_9+n_{10}+n_{11}+n_{12})$.

   The minimum value of B is 5, because of the fact that if the total number of devices specified by the Dxxxx parameters exceeds the number of devices specified by the IODEV parameter, the latter number is upgraded to 5 more (for unit record devices) than the number of devices specified by the Dxxxx parameters.

8. Since the table (Part 5 of this figure) does not contain all possible VSIZE values, you may use the nearest larger value without significant error. The exact formula for calculating real storage requirements is as follows, where n1=RSIZE specification and n2=VSIZE specification, both in K bytes.

$$4 \times n1 + 68 \times CEIL + 64 \times \frac{CEIL}{16} + value$$

   If n1>384, "value" equals 148, otherwise "value" equals 0.

   For CEIL substitute the quotient of

$$\frac{n1 + n2}{64}$$

   ; fractions are to be rounded off to the next higher integer.

Computing the Size of a Supervisor

As an example, assume a supervisor is generated using the macros shown in Figure 1-6. The size of this supervisor is determined as follows:

GENERATION OPERAND	REAL STORAGE REQUIREMENT (bytes)	
SUPVR		
NPARTS=4	29,056	
POWER=YES	462	
PHO=YES	680	
TP=BTAM	872	
CONFG		
MODEL=135	5,072	
FP=YES	72	
STDJC	0	
FOPT		
RELLDR=YES	448	
VSAM=YES	984	
IT=YES		
OC=YES	1,096	
PC=YES		
SKSEP=YES	160	
PCIL=YES	264	
PFIX=YES	1,928	
CBF=10	1,280	
TRKHLD=10	584	
SYSFIL=YES		
DASDFP=(1,1,3330)	1,296	
TOD=YES	640	
ZONE=(WEST,5)	0	
GETVIS=YES	1,144	
OLTEP=YES	256	
AB=YES	448	
ECPREAL=YES	320	
PIOCS		
DISK=3330	760	
TAPE=7	584	
VSTAB		
RSIZE=240K	1,240	
VSIZE=702K		
BUFSIZE=48	1,296	
SVA=(302K,0K)	0	
ALLOC	0	
ALLOCR	0	
IOTAB		
BGPGR=20	20	
F1PGR=10	10	
F2PGR=10	10	
F3PGR=10	10	
IODEV=15	**158**	
JIB=45	160	
D3330=2	64	
D3410=4	**336**	
CHANQ=32	192	
NRES=10	0	(included in VSAM)
Total Number of Bytes	**51,902**	

Note: If entry for BGPGR is below minimum requirement, n=10 is assumed. The following MNOTE is obtained for an entry of less than 10.

```
BGPGR SPECIFICATION BELOW MINIMUM - "10" ASSUMED
```

```
// JOB SUPVR
// OPTION DECK
// EXEC ASSEMBLY
         MACRO    } see Note, below
         GENSUPVR
         SUPVR NPARTS=4,POWER=YES,PHO=YES,TP=ETAM
         CONFG MODEL=135,FP=YES
         STDJC LISTX=YES,LINES=46,EDECK=YES
         FOPT RELLDR=YES,IT=YES,VSAM=YES,OC=YES,PC=YES,                X
               SKSEP=YES,PCIL=YES,CBF=10,TRKHLD=10,SYSFIL=YES,         X
               DASDFP=(1,3,3330),TOD=YES,ZONE=(WEST,5),PFIX=YES,       X
               AB=YES,OLTEP=YES,ECPREAL=YES
         PIOCS DISK=3330,TAPE=7
         VSTAB RSIZE=240K,VSIZE=702K,BUFSIZE=48,SVA=(302K,0K)
         ALLOC F1=128K,F2=64K,F3=128K
         ALLOCR BGR=60K,F1R=30K,F2R=30K
         IOTAB BGPGR=20,F1PGR=10,F2PGR=10,F3PGR=10,IODEV=15,JIB=45,    X
               CHANQ=32,D3330=2,D3410=4,NRES=10
         DVCGEN CHUN=X'00C',DVCTYP=2540R
         DVCGEN CHUN=X'00D',DVCTYP=2540P
         DVCGEN CHUN=X'00E',DVCTYP=3211
         DVCGEN CHUN=X'01F',DVCTYP=1050A
         DVCGEN CHUN=X'020',DVCTYP=2703
         DVCGEN CHUN=X'021',DVCTYP=2703
         DVCGEN CHUN=X'022',DVCTYP=2703
         DVCGEN CHUN=X'023',DVCTYP=2703
         DVCGEN CHUN=X'024',DVCTYP=2703
         DVCGEN CHUN=X'160',DVCTYP=3330
         DVCGEN CHUN=X'161',DVCTYP=3330
         DVCGEN CHUN=X'280',DVCTYP=3410T7
         DVCGEN CHUN=X'281',DVCTYP=3410T7
         DVCGEN CHUN=X'282',DVCTYP=3410T9
         DVCGEN CHUN=X'283',DVCTYP=3410T9
         ASSGN SYSRDR,X'00C'
         ASSGN SYSIPT,X'00C'
         ASSGN SYSPCH,X'00D'
         ASSGN SYSLST,X'00E'
         ASSGN SYSLOG,X'01F'
         ASSGN SYSLNK,X'160'
         ASSGN SYS001,X'160'
         ASSGN SYS002,X'160'
         ASSGN SYS003,X'160'
         ASSGN SYSREC,X'160'
         ASSGN SYSCAT,X'161'
         DPD CYL=200,UNIT=X'160',VOLID=SYSRES
         SEND
         MEND     } see Note, below
         GENSUPVR
 END
/*
/&
```

Note: For MACRO, GENSUPVR, and MEND, refer to "Automatic Documentation of Supervisor Generation Macros".

Figure 1-6. SUPERVISOR -- Example for Computing the Size of a Supervisor

Planning an Operational Pack

An operational system is one used in day-to-day operations and contains one or more tailored supervisors, and libraries appropriate to each customer's particular combination of system programs and application programs. A system maintenance volume is one used primarily to facilitate changes to programs supplied by IBM. Application programs can also be added to a maintenance volume for ease of program maintenance. Change Distributions are those changes supplied by IBM to the IBM-shipped volume.

Proper planning is the key to successful system generations. The time spent in planning can save you frustration and valuable time. Planning should reflect the initial, intermediate and ultimate capacity of the core image, relocatable, source statement, and procedure libraries. Enough work file capacity must be available throughout system generation for assemblies and link-edit steps.

The module for each component should be used to determine its storage requirements. Figure 1-18 contains a summary of the library and partition requirements for all components shipped with DOS/VS. Adjust the requirements you derived from this figure for any program products (separately purchased components) you are including. Please also **note that any licensed programs supplied in A-macro format must be edited.**

The IBM-supplied system contains seven preassembled and cataloged supervisors for the 2314/2319, 3330, 3340, and 3350 resident systems. The supervisor $$A$SUP1 is described in "Supervisor Nucleus -- 5745-SC-SUP".

STORAGE REQUIREMENTS FOR IBM-SUPPLIED DOS/VS PROGRAMS

Note that the partition save area is located at the beginning of each partition, thus reducing the partition size by the length of the save area.

Organization of a DOS/VS System Pack

The organization of the system pack is as follows:

Name	Start of Location
IPL Program	Track 0 of cylinder 0.
System Volume Label	Track 0 of cylinder 0.
System Directory	Track 1 of cylinder 0.
Core Image Directory	Track 2 of cylinder 0.
Core Image Library	Beginning of the first available track following the core image directory.
Relocatable Directory, Optional	Track 0 of the first available cylinder following the core image library.
Relocatable Library, Optional	Beginning of the first available track following the relocatable directory.
Source Statement Directory, Optional	Track 0 of the first available cylinder following the previous library.
Source Statement Library, Optional	Beginning of the first available track following the source statement directory.
Procedure Directory, Optional	Track 0 of the first available cylinder following the previous library.
Procedure Library, Optional	Beginning of the first available track following the procedure directory.
Label Information Cylinder(s)	First full cylinder (plus a second cylinder for the 3340) after the last system library. **Figure 1-7 shows the DOS/VS concept of label track allocation, using the 2314/2319 as an example.**
Volume Table of Contents	Location assigned by the user.

Note: The IPL procedure cannot be performed if part of the Supervisor Nucleus in the core image library is located on an alternate track.

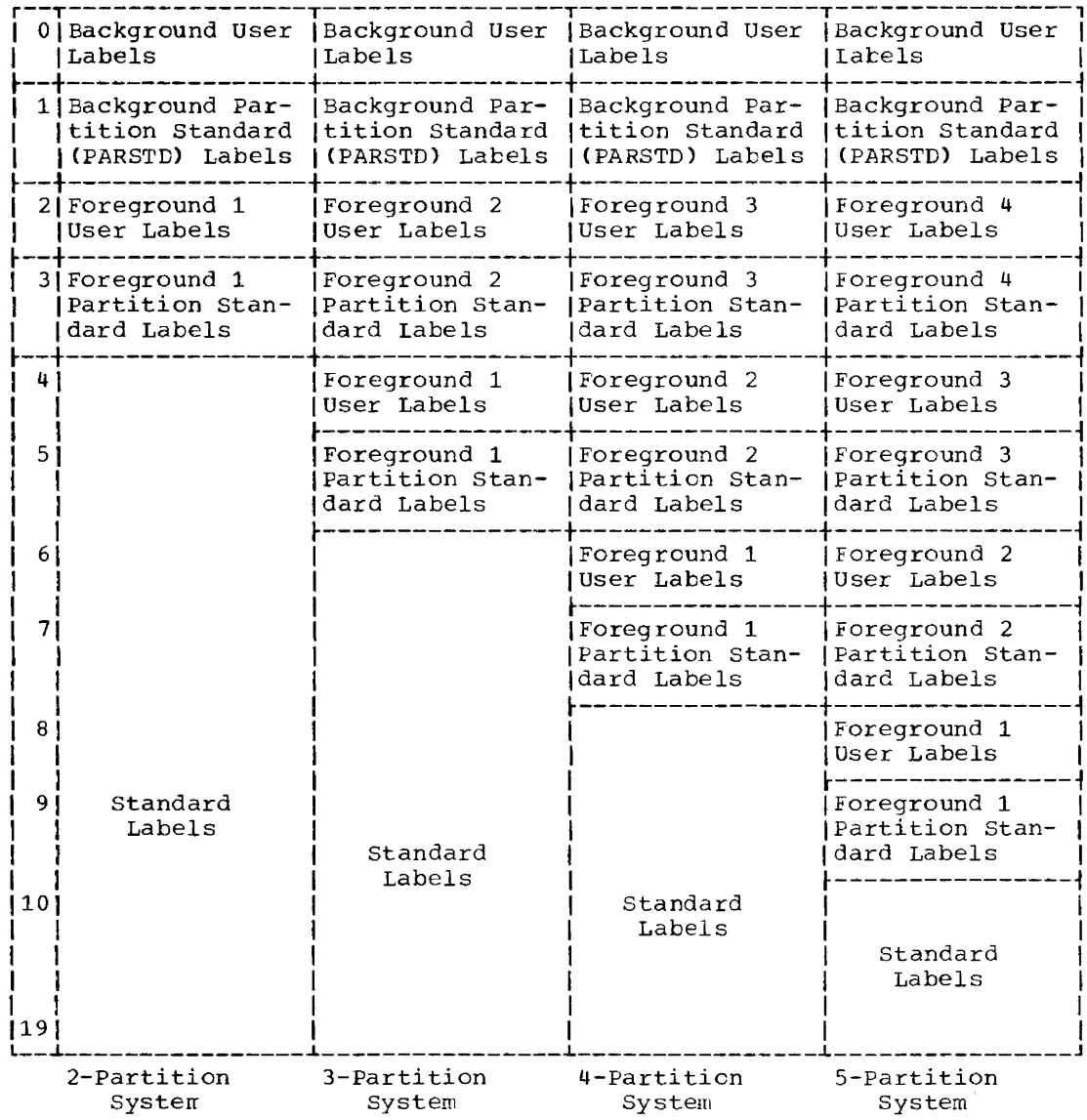


Figure 1-7. Label Cylinder Track Allocations for 2314/2319 Disk-Resident Systems

Allocating Library Sizes

When the size of an existing library is reduced, it may be important to know the minimum size library that can be allocated. Once the minimum size library is calculated, it should be increased to accommodate any problem programs to be included in the library. The size of IBM components can be determined by referring to the storage requirements given in Figure 1-18 and to appropriate documentation for any licensed programs to be included.

The following explanation illustrates how to calculate the number of tracks required for a core image, relocatable, source statement, or procedure library. The formula for computing the size of a library is:

Library (size in tracks) = LBA/nn

where:

library = either core image, relocatable, source statement, or procedure
LBA = the number of LIBRARY BLOCKS ACTIVE for the library of interest and is obtained from a DIRECTORY (SYSTEM or PRIVATE)
nn = LIBRARY LAST AVAILABLE ENTRY in the R (record) column.

Using the sample STATUS REPORT that follows, an example of how to compute a library size is:

Relocatable Library = LBA/nn

where:

LBA = 11,957
nn = 16, thus Relocatable Library = $\frac{11,957}{16}$ = 747.5 tracks

The relocatable library size computed does not include the tracks allocated for the directory. The directory size must be added to the relocatable library size computed. Thus,

Relocatable Library Allocation = Relocatable Library + Directory Allocated Tracks

Therefore,

Relocatable Library Allocation = 747.5+10
= 757.5 Tracks

To find the number of required cylinders, divide the number of required tracks by the number of tracks per cylinder.

For this example,

the Relocatable Library Allocation for a 3330 = $\frac{757.5 \text{ Tracks}}{19}$
= 39.9 or 40 cylinders, rounded high

STATUS REPORT DATE: 10/28/76 TIME: 14.44

		STARTING ADDRESS C H R	NEXT ENTRY C H R E	LAST ENTRY C H R E	DIRECTORY ENTRIES ACTIVE	LIBRARY BLOCKS ALLOCTD	ACTIVE	DELETD	AVAIL	COND. LIMIT BLOCKS	DIR.TRACKS OR LIBRARY CYLINDERS
SYSRES VOL.SER.R29RES											
CORE IMAGE	DIRECTORY	000 02 01	000 10 04	000 11 17	1402						10
	LIBRARY	000 12 01	043 18 06	054 19 06		6528	5201	0	1327	0	55
SYSRES VOL.SER.R29RES											
RELOCATABLE	DIRECTORY	055 00 01	055 04 07 02	055 09 17 19	1477						10
	LIBRARY	055 10 01	092 17 06	096 19 16		13280	11957	0	1323	0	42
SYSRES VOL.SER.R29RES											
SOURCE-STMT	DIRECTORY	097 00 01	097 01 24 05	097 09 27 09	500						10
	LIBRARY	097 10 01	195 07 19	196 19 27		53730	52857	0	873	0	100
SYSRES VOL.SER.R29RES											
PROCEDURE	DIRECTORY	197 00 01	197 00 03 09	197 04 27 09	24						5
	LIBRARY	197 05 01	197 11 38	197 19 40		595	272	0	323	0	1

SYSTEM DIRECTORY AND LIBRARY TRACK CAPACITIES

Figures 1-8 and 1-9 illustrate the DOS/VS system library directory and track capacities.

	Directory Entries Per Track			
Device	Core Image Library (Phases)	Relocatable Library (Modules)	Source Statement Library (Books)	Procedure Library (Procedures)
2311	variable (maximum length 30 bytes per entry)	N.A.	N.A.	N.A.
2314/ 2319		340	270	270
3330		560	440	440
3340		340	260	260
3350		760	550	550

Figure 1-8. LIBRARIES -- System Library Directory Capacities (Entries per Track)

Library	Library Block Size (bytes)	Device	Blocks per Track	Blocks per Cylinder
CORE IMAGE	1024	2311	3	30
		2314/2319	6	120
		3330	11	209
		3340	7	84
		3350	15	150
RELOCATABLE	322	2314/2319	16	310
		3330	28	532
		3340	17	204
		3350	37	1110
SOURCE STATEMENT	160	2314/2319	27	540
		3330	44	836
		3340	26	312
		3350	55	1650
PROCEDURE	80	2314/2319	40	800
		3330	61	1159
		3340	34	408
		3350	72	2160

Figure 1-9. LIBRARIES -- System Library Track Capacities

Creating System Files

THE PAGE DATA SET

SYSVIS is the logical unit name of the data set that holds the virtual address area. It is created at IPL time from information provided by the system generation macro DPD

and/or the IPL DPD command. The user specifies the beginning cylinder address and the system calculates the size of the disk extent which is a function of the VSIZE specification and the disk device type, as follows:

$\frac{VSIZE}{2}$ = number of pages (blocks of 2K bytes)

Disk Device Type	Blocks per Cylinder
2314	60
3330	114
3340	36
3350	240

The allocation requires full cylinders.

RECORDER FILE (SYSREC)

IJSYSRC is the filename of the recorder file that is used exclusively for output from the RMSR (Recovery Management Support Recorder) function. The data contained on IJSYSRC is edited and printed by the EREP program. The recorder file must be defined, using appropriate DLBL and EXTENT statements, after the first IPL procedure has been performed following supervisor replacement and before the first JOB statement is read.

The RMSR function makes several types of recordings on the recorder file, in chronological order. The file is made up of records that contain information relating to:

- MCAR and CCH
- Unit Check
- Counter Overflow
- Tape Volume Statistics
- IPL/EOD
- Miscellaneous Data Recorder (2715 error records, PRT1 buffer error records, 3330/3340/3350 non unit-check records, 3800 internal log buffer)
- POWER/VS RJE logging.

The IJSYSRC file is defined as a disk extent for any DASD supported as SYSRES, and the extent cannot be a split cylinder file. The file should not be defined on an extent which includes a defective or alternate track, because data may be lost. The DLBL and EXTENT statements should be included in the standard label area by specifying STDLABEL to allow recording to proceed at the beginning of each day without operator intervention.

CREATING AND USING THE RECORDER FILE

A minimum of ten tracks is required for the recorder file (SYSREC). The following job stream creates the recorder file and stores the pertinent label information permanently in the standard label area.

```
// OPTION STDLABEL
// DLBL IJSYSRC,'DOS/VS RECORDER FILE'
// EXTENT SYSREC,,,,nnnnn,nnnnn
     .
     .
/*
   ASSGN SYSREC,X'cuu'
   SET RF=CREATE
     .
     .
// JOB FIRST
     .
     .
```

HARD-COPY FILE

(Applicable to all systems that have a display operator console installed and DOC support generated)

IJSYSCN is the filename of the recorder file that is used exclusively for output of information from the message area of the Display Operator Console. The symbolic device address of the hard-copy file is SYSREC.

The IJSYSCN file must be defined as a disk extent for any of the DOS/VS supported disk devices, and cannot be a split-cylinder file. It is to be created after the supervisor has been link-edited and cataloged. The following file definition statements create the hard-copy file:

```
   ASSGN SYSREC,X'cuu'
   SET HC=CREATE
// OPTION STDLABEL
// DLBL IJSYSCN,'DOS/VS HARD COPY FILE'
// EXTENT SYSREC,,,,nnnnn,nnnnn
     .
     .
/*
// JOB FIRST
     .
     .
```

The IPL commands that precede the first // JOB statement are not copied. After the file has been opened, the next available and last available records are determined and the standard IPL message 0I20I IPL COMPLETE FOR DOS/VS REL xx.x ECLEVEL=nn is written to the hard-copy file.

When a new hard-copy file is created at IPL time, the records of the existing file are destroyed.

Distribution of DOS/VS

Figure 1-10 shows how DOS/VS is distributed. The system is shipped as a SYSRES file. This file contains the core image library, the relocatable library, the source statement library, and the procedure library.

DISTRIBUTION OF THE SYSTEM FOR DASD USERS

DASD users receive the system on one or more disk packs. The packs are ready for your system generation procedure. It is recommended that the pack(s) be copied and retained for backup. For label and extent information, refer to the "Memorandum to Users".

DISTRIBUTION OF THE SYSTEM FOR TAPE USERS

Tape users receive the system on a reel of magnetic tape. This distribution tape contains the system as SYSRES file; it must be restored to one or more disk volumes. Refer to "Restoring the Distribution Tape to Disk" later in this chapter. After the tape has been restored, retain it for backup.

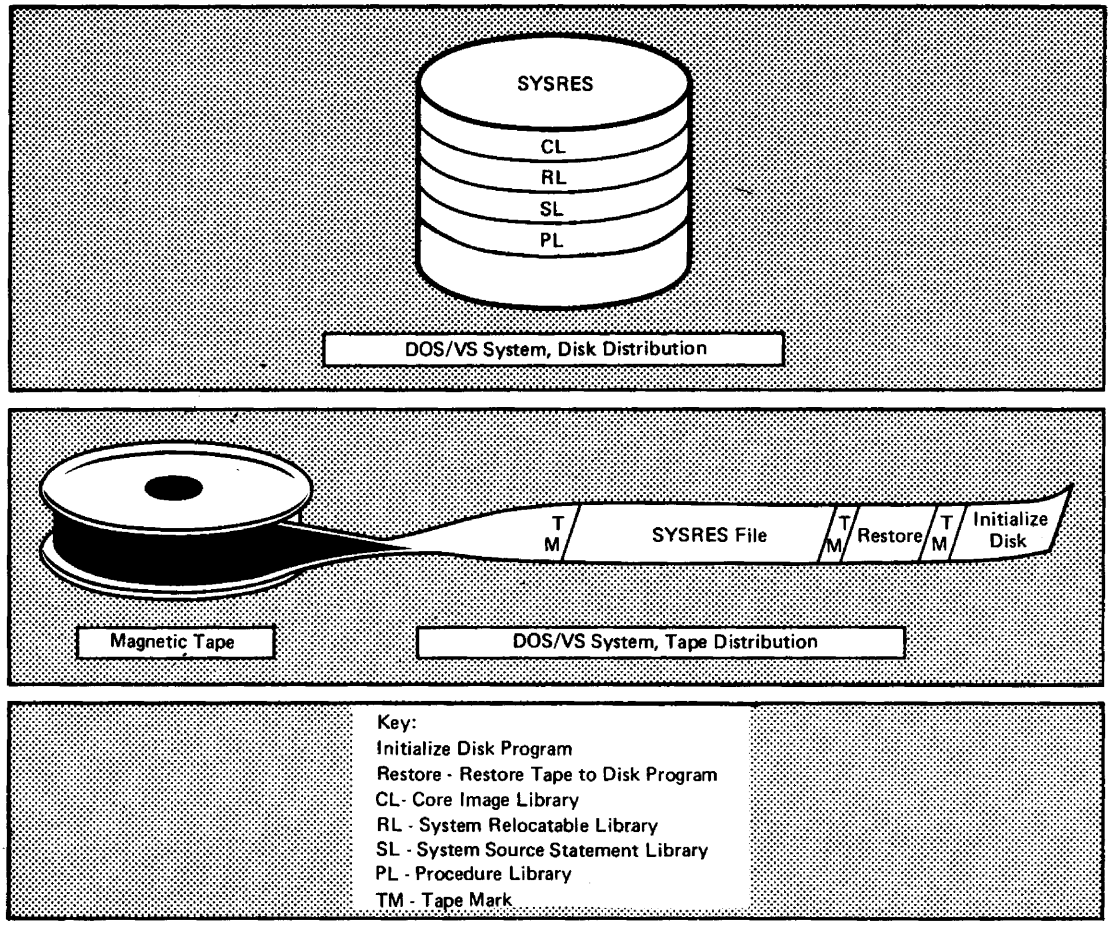


Figure 1-10. How DOS/VS is Distributed

Guidance on how to perform a system generation is given under "System Generation and Maintenance".

System Generation and Maintenance

Each system generation job, that is, tailoring an IBM-supplied system to your individual needs, consists of a number of job steps. The job steps actually necessary and the sequence of their execution depends on the existing installation configuration and the operational packs to be built. Nevertheless, certain activities and their sequence are common to all situations so that a generalized system generation procedure can be followed. This general procedure is shown in Figure 1-11 for online and offline system generation. The various job steps shown are supported by programs which are listed and briefly described in Figure 1-12.

For a more specific application of the generalized procedure, refer to "System Generation Example (Online)" where the job steps are explained in detail.

The procedure that must be followed for processing the distribution tape (generalized in the frame part of Figure 1-11) depends on the availability of an operational DOS/VS.

- Users without an operational DOS/VS must restore the distribution in correspondence with the procedure described under "Processing the Distribution Tape (Standalone)".

- **If an operational DOS/VS is available, the above mentioned standalone procedure may be used. However, it is recommended to follow the online procedure shown in the "System Generation Example", because it requires no standalone machine time.**

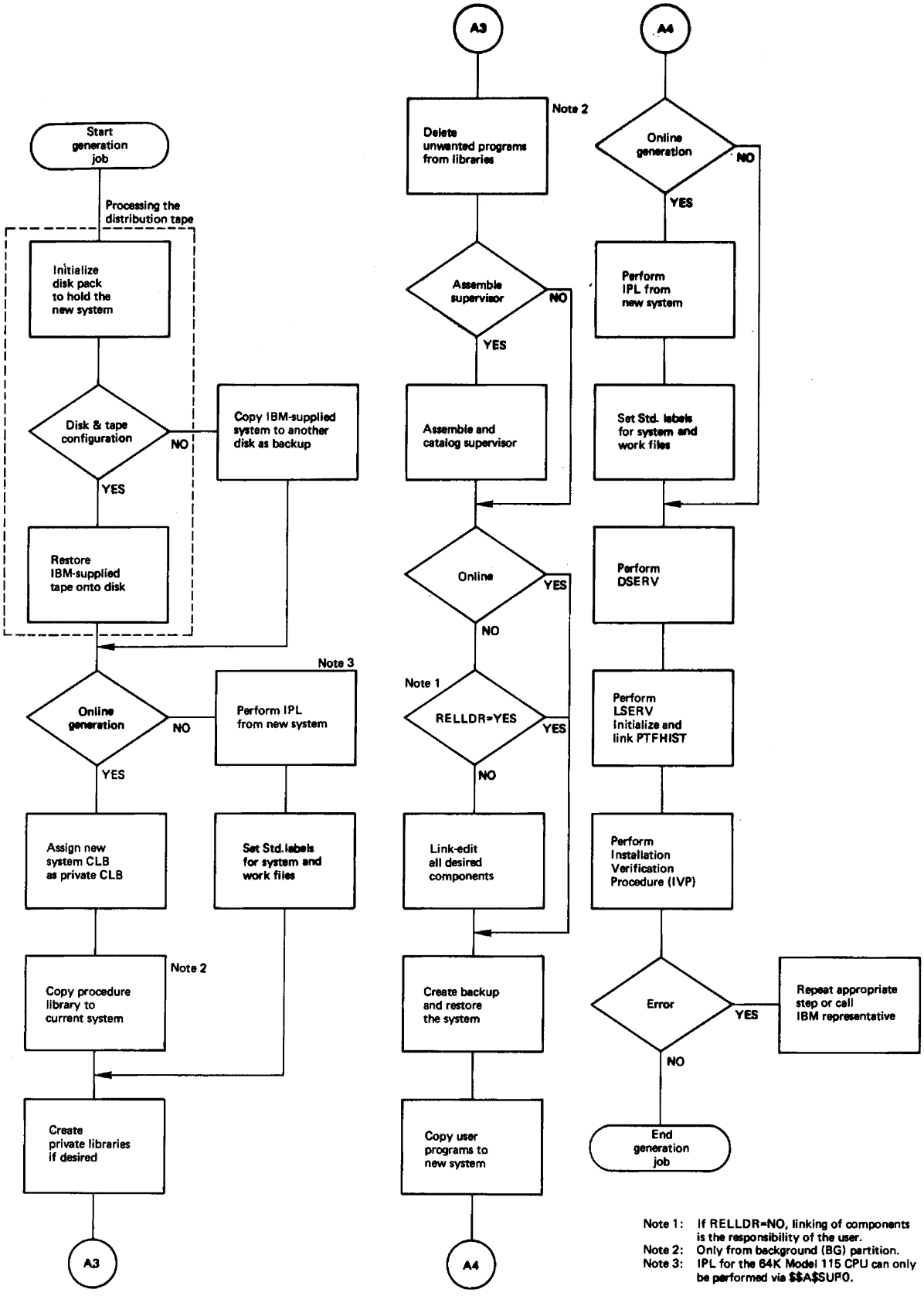


Figure 1-11. General Procedure for System Generation (Online and Offline)

Name	Program Description/Function
CSERV	(core image library service) to punch out (or write on magnetic tape, disk, or diskette) programs from the core image library.
SSERV	(source statement library service) to punch out (or write on magnetic tape, disk, or diskette) macro definitions from the source statement library.
RSERV	(relocatable library service) to punch out (or write on magnetic tape, disk, or diskette) the relocatable modules used to build IBM-supplied processor programs.
PSERV	(procedure library service) to display on SYSLST or to punch out (or write on magnetic tape, disk, or diskette) procedures from the procedure library.
DSERV	(directory service) to display on SYSLST the current contents of one or more library directories and their remaining library capacities. The directory display may be either an alphabetically sorted listing or a listing of the entries in the order they appear in the directory.
LSERV	(label cylinder display) to display on SYSLST the label cylinders located on SYSRES. SYSLST may be assigned to disk, tape, printer, or diskette.
ESERV	(de-editor program) to de-edit pre-edited macros from the E-sublibrary. It provides SYSLST and SYSPCH output of the original macros. It also provides an update facility for one macro per job step.
MAINT	(library maintenance) to delete and/or catalog library elements, and also to condense and reallocate library extents.
BACKUP	to create a backup of the system on tape and/or to create a backup of private libraries on tape. The tape is suitable as input for the Restore program. See Note below.
RESTORE	to restore the DOS/VS Distribution Tape in a partition of a current release of DOS/VS. The program may be executed by statements from SYSIPT or SYSLOG.
CORGZ	**(copy or merge) to copy all or to copy selectively and merge elements from one library to another. CORGZ allows larger or smaller allocations for each library of the SYSRES that is being created.**
Note: Backup and Restore programs can be used efficiently to condense libraries and also to migrate libraries from one DASD type to another.	

Figure 1-12. Overview of Programs for System Generation and Maintenance

For more details on these programs, refer to DOS/VS System Control Statements and DOS/VS System Utilities.

Processing the Distribution Tape (Standalone)

The following processing steps to initialize the disk pack to which the distribution tape is to be restored and to restore the distribution tape to the disk apply to installations that are without an operational DOS/VS. Machine configurations with and without card reader availability are covered.

If your disk pack has not been initialized, follow the processing steps given under "Initializing the Disk".

If your disk pack is already initialized, commence with the processing steps given under "Bypassing Disk Initialization".

INITIALIZING THE DISK

- **Initialize the disk pack with a volume label and a volume table of contents (VTOC). For the recommended addresses, refer to "Planning Summary" earlier in this manual.**
- Mount the distribution tape.
- Ensure that the disk pack or data module is set for read and write operations:

  For the 3330 or 3350, set the write protection switch to R/W
  For the 3340, use a read/write data module
- IPL from the tape unit that contains the distribution tape volume.
- When the wait state is entered:
  - For machine configurations that include a card reader, place "Job Steam A" in the card reader and press START and EOF on the card reader.
  - For machine configurations that do not include a card reader, press ENTER on the DOC keyboard and when the signal sounds, type in "Job Stream A" via the DOC keyboard. Press ENTER key at the end of each statement; lowercase is converted to uppercase.

    Applicable to both types of machine configurations (with or without card reader availability):

    If messages S328I and S328A appear on SYSLOG, type DELETE, hit END or ENTER depending on device type, and press INTERRUPT to delete unexpired files, one by one. To delete all unexpired files at once, type in DELETE ALL.

    The message S371I INITIALIZE DISK FUNCTIONS COMPLETED appears on SYSLOG when initialization is completed.

On completion of initialization, the system automatically initiates the restore function. You can now continue with the steps given under "Restoring the Tape to Disk".

BYPASSING DISK INITIALIZATION

If the disk pack to which the tape is to be restored is already initialized, proceed as follows:

- Mount the distribution tape.
- Ensure that the disk pack or data module is set for read and write operations:

  For the 3330 or 3350, set the write protection switch to R/W
  for the 3340, use a read/write data module

- IPL from the tape unit that contains the distribution tape volume.
- When the wait state is entered:
  - For machine configurations that include a card reader, place "Job Stream B" in the card reader and press START and EOF on the card reader.
  - For machine configurations that do not include a card reader, press ENTER on the DOC keyboard and when the signal sounds, type in "Job Stream B" via the DOC keyboard. Press ENTER at the end of each statement; lowercase is converted to uppercase.

On completion of these steps, the system automatically initiates the restore function and you can now continue with the steps given under "Restoring the Tape to Disk".

Job Stream A

```
// JOB INTDSK
// ASSGN SYSLOG,X'cuu',dc
// DATE mm/dd/yy
// ASSGN SYSOPT,X'cuu',dc              disk, see Note 1
// ASSGN SYS00n,X'cuu',dc              disk, see Note 2
// LOG
// ASSGN SYSLST,X'cuu',dc              optional, see Note 6
// EXEC
// UID nn                              see Note 3
// VTOC STRTADR=(ccchhh),EXTENT=(yy)   see Note 4
VOL1nnnnnn                             see Note 5
// END
// JOB DISRST
// ASSGN SYS005,X'cuu',dc              system residence file to be created
// ASSGN SYS006,X'cuu',dc,X'ss'        distribution tape
// ASSGN SYS007,X'cuu',dc              if PVTCLB is to be built
// ASSGN SYS008,X'cuu',dc              if PVTRLB is to be built
// ASSGN SYS009,X'cuu',dc              if PVTSLB is to be built
// EXEC
```

Job Stream B

```
// JOB INTDSK
// ASSGN SYSLOG,X'cuu',dc
// LOG
// DATE mm/dd/yy
// FILES SYSIPT,1
// JOB DISRST
// ASSGN SYS005,X'cuu',dc              system residence file to be created
// ASSGN SYS006,X'cuu',dc,X'ss'        distribution tape
// ASSGN SYS007,X'cuu',dc              if PVTCLB is to be built
// ASSGN SYS008,X'cuu',dc              if PVTRLB is to be built
// ASSGN SYS009,X'cuu',dc              if PVTSLB is to be built
// ASSGN SYSLST,X'cuu',dc        optional, see Note 6
// EXEC
```

In Job Stream A and B, the job names INTDSK and DISRST must be used as shown.
For a description of the cuu, mm, dc, yy, and ss fields see Figure 1-13.

```
// DATE mm/dd/yy        mm = 01-12
                        dd = 01-31
                        yy = 00-99
```

```
// ASSGN SYSxxx,X'cuu',dc[,X'ss']
   xxx = logical unit
   cuu = channel and unit of device

   • The channels used by the distribution program supervisor are:

      Multiplexer (channel 0)
      Selector (1 through 6)

      dc = one of the following device type codes:

           C1-3210/3215 Console Printer-Keyboard
           CR-Display Operator Console

           D3-2314/2319 Disk Drive
           D4-3330 Disk Storage Models 1 and 2, or 3333 Disk Storage, or 3350 Direct
                   Access Storage in 3330-1 compatibility mode
           D5-3340 Disk Storage (35 megabyte data module)
           D6-3340 Disk Storage (70 megabyte data module), or 3344 Direct Access
                   Storage
           D7-3330 Disk Storage Model 11
           D8-3350 Disk Storage

           L1-1403/1404 Printer*
           L2-1443/1445 Printer*
           L3-3203, 3211, or 5203 Printer*
           L4-3800 Printing Subsystem

           R1-2540 Card Read-Punch (reading only)
           R2-2540 Using Punch-Read-Feed feature
           R3-1442 Card Read-Punch
           R4-2501 Card Reader
           R5-2520 Card Read-Punch
           R6-3505/3504 Card Reader
           R7-2560 MFCM or 5425 MFCU (read hopper 1)

           T1-2400 or 3400 7-track Tape
           T2-2400 or 3400 9-track Tape

           The Restore program does not use this dd specification.  Instead, the
           program determines the device type from the Format-4 label of the disk
           volume on the specified physical device.

      ss = 90 for 7-track tape unit
           C0 for 9-track tape 1600 bpi
           C8 for 9-track tape 800 bpi
   *For printers 1403, 3203, 3211, and 5203:

      ss = 7E - sense data checks
         = 73 - (default) block data checks (ignore)
```

```
// VTOC STRTADR=(ccccchhh),EXTENT=(yy)
   ccccchhh = cylinder and head number of starting address
   yy       = number of tracks allotted to VTOC in decimal (1-30)
```

```
VOL1nnnnnn     nnnnnn = Volume Serial Number
```

Figure 1-13. Coding Specifications for // ASSGN Statements within the Distribution Program Job Control

(Refer to the preceding text "Processing the Distribution Tape".)

Notes to Job Streams A and B

1. Assign SYSOPT to the disk that is to be initialized.

2. n = 2, 3, 4, or 5. SYS002 through SYS005 are optional to specify additional disk devices to be initialized. These disk devices must be of the same device type as SYSOPT.

3. Refer to DOS/VS System Utilities, for a complete description of the UID control statement.

   For 2314/2319, nn=

   IR Previously flagged tracks are to retain their flags without surface analysis, or

   IA Denctes surface analysis on all tracks. Generation of home address (HA) and R0 records, preformatting of IPL records, writing of volume label and VTOC, or

   IS For packs that have already been initialized this entry can be used to change the volume label(s) and the VTOC location.

   For the 3330, 3340, or 3350 Disk Storage, nn=

   IQ Quick initialization. No surface analysis. No home address generation, only standard R0 generation. IPL records are preformatted, volume labels and VTOC are written, or

   IS Same as IS for 2314/2319.

4. For 2314/2319: ccccchhh = 0199000 yy = 20
   For 3330: ccccchhh = 0403000 yy = 19
   For 3330-11: ccccchhh = 0807000 yy = 19
   For 3348/35MB: ccccchhh = 0347000 yy = 12
   For 3348/70MB: ccccchhh = 0695000 yy = 12
   For 3350: ccccchhh = 0554000 yy = 30

   For each output disk specified (maximum 5) a set of

   ```
   // VTOC STRTADR=(ccccchhh),EXTENT=(yy)
   VOL1nnnnnn
   ```

   statements are to be added.

5. nnnnnn = Volume serial number (trailing blanks only should be used).

   The IBM-supplied supervisors and standard label procedures assume nnnnnn=SYSRES for the system residence volume.

   Columns 42-51 are reserved for user's identification. A label control set consisting of a VTOC control statement and a VOL1 control statement is required for each pack assigned. The label control sets apply to the assignments in the order as specified in the job stream and not in strict numerical sequence.

6. If SYSLST is assigned, all messages and other output from the initialize disk phases to the communications device are also printed on SYSLST.

RESTORING THE TAPE TO DISK

After completing the processing steps given under 'Initializing the Disk', or 'Bypassing Disk Initialization', the restore distribution tape to disk procedure is performed immediately.

The system issues the following two-part message:

```
SR01D ***GIVE SYSTEM LIBRARY ALLOCATIONS***
CL=
```

Type in the required allocation for the system core image library, using the format shown under 'Allocations', below, and press the END or ENTER key depending on device type in use.

The system will now prompt you for your allocations for the system relocatable library, the system source statement library, and the procedure library, using the message RL=, SL=, and PL=, respectively.

After these allocations have been entered, the two-part message:

```
SR32D TYPE DESIRED LABEL FOR LIBRARY
LABEL=
```

is issued. Type in the desired label to be entered in the VTOC for the system residence file (44 characters maximum) and press the END or ENTER key. If you do not type in a label, but respond with END or ENTER, the label will be DOS.SYSRES.FILE. The system now issues the message:

```
SR09D TYPE GO IF ALLOCATIONS IS CORRECT
```

Type in GO and press the END or ENTER key. If you want to change the allocations, just press the key without typing in GO, whereupon the system issues again the message SR01D. If you type in GO and press the END or ENTER key, the system successively issues the following procedural messages, provided no faults are encountered:

```
SR10I  FILE ID=xxx...xx (44x)
SR11I  EXTENT=CYL xxxTRKxx-CYLxxx TRKxx
SR12I  RESTORE OF SYSTEM CORE IMAGE LIBRARY IN PROGRESS
SR17I  RESTORE HAS BEEN SUCCESSFUL
SR12I  RESTORE OF SYSTEM RELOCATABLE LIBRARY IN PROGRESS
SR17I  RESTORE HAS BEEN SUCCESSFUL
SR12I  RESTORE OF SYSTEM SOURCE STATEMENT LIBRARY IN PROGRESS
SR17I  RESTORE HAS BEEN SUCCESSFUL
SR12I  RESTORE OF SYSTEM PROCEDURE LIBRARY IN PROGRESS
SR17I  RESTORE HAS BEEN SUCCESSFUL
SR14I  *** RESTORE COMPLETE ***
```

Besides procedural messages, error messages may be issued in the course of the library allocation procedure, refer to DOS/VS Messages.

Allocations:

The basic allocation format is ccc(tt), where ccc is the number of cylinders to be allocated to the library and tt is the number of tracks within these cylinders which are to be reserved for the directory.

If an allocation of 0(0) is specified for any library, this library will not be restored. If you reply with EOB when prompted for the allocation, the default allocations from the distribution tape are used.

Note that these default values are the minimum library and directory space required. Therefore, you should always specify the values you actually need. The default values cannot be used when restoring the system to a 2314 or 3340 Model 35 because the storage capacity of these devices is too small for all system libraries. In such cases, one or more of the system libraries must be restored as private libraries. Further details on this procedure and default values are contained in the 'Memorandum to Users'.

If Eccc(tt) is specified (this is only possible for RL, PL, and SL), the requested amount of space will be allocated, but no entries will be made. This results in generation of an empty library.

It is possible to restore system libraries (CL, RL, SL), as private libraries if you wish, by specifying CL=PVT when prompted for the system library allocations. In this case, the allocations must be given for the corresponding private libraries, and the system will prompt you accordingly. For details refer to 'Backup and Restore' in DOS/VS System Utilities.

Link-Edit and Delete Procedures

The IBM-supplied system includes cataloged procedure to perform system generation link-edit and delete functions for IBM-supplied system programs; the system components are pre-linked in the distributed system.

The full name of the procedure to be link-edited or deleted must be formed by concatenating:

Prefix+Keyword+[Suffix]

The prefix is always LINK for link-edit functions, and is always DELE for delete functions. Select the keyword and the suffix from Figure 1-14 according to the function desired; do not use the suffix for link-edit functions.

Example 1: To link-edit assembler and ESERV programs to the core image library, the necessary statement is

```
// EXEC PROC=LINKASM
```

Example 2: To delete BTAM from the core image library, the necessary statement is

```
// EXEC PROC=DELEBTMC
```

To delete a given component contained in different libraries, a separate procedure must be executed for each library. The suffix CRS (to cover all three libraries) is not valid. The statement // EXEC PROC=DELEBTMCRS, for example, would be invalid and not result in a deletion of BTAM from the libraries (core image, relocatable, source statement) designated by the suffix.

Users who specifies RELLDR=NO must re-link all desired components after IPLing a new supervisor.

It is recommended to retain the link-edit and delete procedures for use after system generation time. The procedures can be useful for linking specific system programs to a private library, or for deleting programs no longer required from a private library.

Keyword of Procedure	Suffix CLB	RLB	SLB	PLB	Link	Description of Component that is to be Linked or Deleted
ADC	C	R			X	Assign Alternate Track Data Cell Utility
APC	C	R			X	Analysis Program-1
ASM	C	R			X	Assembler and ESERV Programs
ATD	C	R			X	ASSGN Alternate Track Disk Utility
BTM	C	R	S			BTAM
CDC	C	R			X	Clear Data Cell Utility
CDD	C	R			X	Restore Card to Disk Utility
CDK	C	R			X	Clear Disk Utility
CD1		R				IOCS Modules for IBM 1442
CD2		R				IOCS Modules for IBM 2501
CD3		R				IOCS Modules for IBM 2520
CD4		R				IOCS Modules for IBM 2540
CD5		R				IOCS Modules for IBM 2560
CD6		R				IOCS Modules for IBM 3505
CD7		R				IOCS Modules for IBM 3525
CD8		R				IOCS Modules for IBM 5425
CRD	C	R			X	Copy and Restore Diskette Utility
DAM	C	R	S			Direct Access IOCS
DDC	C	R			X	Copy Disk or Data Cell to Tape Utility
DEL				P		Delete all Delete Procedures
DGN	C	R			X	Dump Generator
DIO	C	R	S			Diskette IOCS
DKC	C	R			X	Copy Disk to Card Utility
DKD	C	R			X	Copy Disk to Disk Utility
DOC	C		S			Display Operator Console Support
DSK			S			Sequential Disk IOCS Macros
DST	C	R			X	Deblock Utility
ERP	C	R			X	EREP
E20	C	R	S			Model 20 Emulator Program and Data Interchange Function
FCY	C	R	S		X	Fast Copy Disk Volume Utility
HSD	C	R			X	Highspeed Standalone Dump
IDC	C	R			X	Initialize Data Cell Utility
IJB		R				System Control Modules
IND	C	R			X	Initialize Disk Utility
INT	C	R			X	Initialize Tape Utility
ISM	C	R	S			Index Sequential Disk IOCS
IVP			S			Installation Verification Procedures
JBA		R			X	Job Accounting
JCL					X	Job Control
KJI	C					Kanji Printer Support
LBR	C				X	Librarian Programs
LNK				P		Delete all Link Procedures
MCR	C		S			Magnetic Character Reader Support
OBJ	C	R			X	Copy File and Maintain Object Module Utility
OCR	C		S			Optical Character Reader Support
OLT	C	R			X	OLTEP
PDA	C	R			X	Problem Determination Aids
PDS	C	R			X	Page Data Set Dump Utility
PLG	C	R			X	Print the Hard-Copy File
PLI		R				PL/I Optimizing Compiler IOCS Modules
PRT	C				X	Buffer Load for 3203, 3211, and 5203 Printer (optional print patterns must be link-edited later)
PTP	C		S			Paper Tape IOCS

Figure 1-14. Keywords and Suffixes for Link-Edit and Delete Functions (Part 1 of 2)

Keyword of Procedure	Suffix CLB	RLB	SLB	PLB	Link	Description of Component that is to be Linked or Deleted
PWR			S			POWER/VS
QTM	C	R	S			QTAM
RPG		R				RPG II Compiler IOCS Modules
RPS	C					Rotational Position Sensing
RST	C	R			X	Backup and Restore Utility
SAP			S			Sample Programs
SDA	C	R			X	SDAIDs
STD	C	R			X	Standard System Dump
SUP			S			Supervisor Generation Macros
TAP	C	R	S			Magnetic Tape IOCS
TDC	C	R			X	Restore Tape to Disk or Data Cell Utility
TP1	C					Transients for Type 1 Programs
TRD	C	R			X	Translating System Dump
UTS					X	Maintain System History Utility Program
VSM	C	R	S		X	VSAM and Access Method Services
VTC	C	R			X	VTOC Display Utility
VTM	C	R	S		X	VTAM and TOLTEP
VTS			S			VSAM and VTAM Common Macros
ZAP	C	R			X	CIL Patch Program (PDZAP)

Note: The procedures DELEDELP and DELELNKP are for documentation, they cannot be executed via the procedure library. For execution, these two procedures have to be punched out and entered via SYSIN.

Figure 1-14. Keywords and Suffixes for Link-Edit and Delete Functions (Part 2 of 2)

VOLUME SERIAL NUMBERS AND LABELS

If the IBM-supplied system is on disk, the serial number of that disk pack is SYSRES. If the system is shipped on tape, the disk pack to which the tape will be restored is assigned a volume serial number during the initialize disk run.

For both types of IBM-shipped systems (tape and disk), the standard labels defined by the DLBL and EXTENT statements are adequate for system generation, but the EXTENT **statements must be adjusted to reflect the volume serial number chosen for the disk volume to which the tape is to be restored. To use the standard labels for configurations with two disks, SYSLNK, SYS001, SYS002, and SYS003 can be assigned to the second disk. IBM supplies procedures LABELS30, LABELS40, and LABELS50. These procedures load standard labels for the 3330, the 3340 Model 70, and the 3350, respectively if default sizes for the libraries are used when the system is restored.**

Standard labels (OPTION STDLABEL) are not defined for any file on the system distributed by IBM. A reply of "delete" to the message

4444A OVERLAP ON UNEXPIRED FILE

destroys the system residence file unless it is encountered during a MAINT reallocation run.

COMPILATION OF IOCS MODULES

To use some compilers, a number of IOCS modules must be cataloged in the relocatable library of each operational pack. IBM supplies these modules preassembled in the relocatable library for the compilers that use them. These IOCS modules are link-edited into compiler generated object programs as required. These modules are generated using the following macro definitions supplied by IBM:

CDMOD	Card Reader/Punch - 3881 Optical Mark Reader
PRMOD	Printer
MTMOD	Magnetic Tape
SDMODxx	Sequential DASD. SDMOD consists of ten similar macro definitions: SDMODFI for sequential disk with fixed input, SDMODFO for sequential disk with fixed output, and so on. A complete description of SDMODxx is contained in DOS/VS Supervisor and I/O Macros.
ISMOD	Index Sequential Access Method, DASD
DAMOD	Direct Access Method, DASD
DIMOD	Device Independent Module

With assembler language you can, if you wish, assemble these IOCS functions separately and catalog them into the relocatable library. Separate assembly of IOCS modules requires no additional real storage or additional execution overhead. Those modules, shipped preassembled for IBM components, can also be used by any other program, if applicable. A separate assembly is preferable because:

- Program assembly and reassembly time is minimized.
- IBM-supplied IOCS modules used by compilers may also be used by your application programs. Use of these modules reduces the assembly time of your application programs.

- Use of preassembled IOCS modules facilitates program maintenance and standardization.
- The xxMOD macro definitions just cited require a substantial number of cylinders in the source statement library.

  The corresponding generated modules ordinarily require fewer cylinders in the relocatable library. Thus, you may prefer to retain xxMOD macro defintions only on the system backup volume, cataloging a selection of generated modules onto each operational volume.

Support of the RPS feature of IBM 33xx disk storage devices is provided in SAM and DAM, and Device Independent Access Method by preassembled and link-edited versions of the logic modules that reside in the core image library and are subsequently loaded into the SVA. This support is also provided in ISAM for IBM 3330 Model 1 or 2, 3333, or 3340. The modules are linked to the problem program during execution of problem programs and process the DTF requests. RPS modules are usable by DASD DTFs in your system. Only one copy is in the SVA if pre-loaded during IPL, otherwise multiple copies in the system GETVIS area can occur. If RPS support is not used, these modules can be deleted from the core image library.

AVOIDING LOSS OF SYSTEM LIBRARIES

During each system generation and maintenance procedure, system libraries should be copied periodically on magnetic-tape reels or disks to provide backup in case of subsequent specification errors or machine errors.

The programs Backup or FASTCOPY can be used for copying from disk to tape; the CORGZ or FASTCOPY programs can be used for copying from disk to disk. Using Backup and Restore together, or the program CORGZ, your libraries will be condensed. For details of these programs refer to DOS/VS System Control Statements and DOS/VS System Utilities.

OBTAINING LIBRARY STATUS INFORMATION

Perform a DSERV, or check a system directory printout to determine the contents and sizes of the system libraries during system generation to determine that enough blocks remain for link-edit and catalog procedures. A DSERV run requires the following control statements:

```
// JOB DSERV
// EXEC DSERV
   DSPLYS ALL
/*
/&
```

A printout of the library status is provided automatically following a linkage edit with an OPTION CATAL specified or any // EXEC MAINT.

USING SYSRES LIBRARIES AS PRIVATE LIBRARIES

Before changes can be made to one of the system core image, system relocatable, and system source statement libraries of a non-IPLed system, the respective library must be declared as private. To do so, it is required that DLBL and EXTENT statements defining the exact library size are included into any job stream making use of the libraries. The following examples show the required job control statements:

For a system core image library:

```
// DLBL IJSYSCL,'DOS.SYSRES.FILE'
// EXTENT SYSCLB,SYSRES,1,0,2,1978
ASSGN SYSCLB,X'161'
```

For a system relocatable library:

```
// DLBL IJSYSRL,'DOS.SYSRES.FILE'
// EXTENT SYSRLB,SYSRES,1,0,1980,2040
// ASSGN SYSRLB,X'161'
```

For a system source statement library:

```
// DLBL IJSYSSL,'DOS.SYSRES.FILE'
// EXTENT SYSSLB,SYSRES,1,0,4020,2820
// ASSGN SYSSLB,X'161'
```

AUTOMATIC DOCUMENTATION OF SUPERVISOR GENERATION MACROS

Normally, when examining a supervisor listing, it is difficult to determine which supervisor generation macros were used for the assembly. If, however, the supervisor generation macros are invoked by means of an outer user macro (which in turn calls the required generation macros) then the assembler will list the outer macro before assembling the supervisor, and thus all the generation macros used are listed together. All that is required to use this technique is the insertion of the four macro instructions labeled ① through ④ below (refer also to Figure 1-6):

```
// EXEC ASSEMBLY
      MACRO                          ①
      GENSUPVR                       ②
        .
        .                            normal supervisor generation job
        .                            stream without the END statement
      MEND
                                     ③
      GENSUPVR                       ④
      END
/*
```

UTILIZATION OF THE MAINTAIN SYSTEM HISTORY (PTFHIST) PROGRAM

To have a history of system updates available is a prerequisite for efficient system service, it helps to reduce system down-time. Therefore, whenever a new release of DOS/VS is installed, the PTFHIST program should be initialized and linked to the core image library of your DOS/VS.

When a system update (by APAR fix or by installation of one or more PTFs) is performed, this should be done only with the PTFHIST program.

Linking the program and using PTFHIST for system update are the prerequisites for automatic maintenance of the system update by DOS/VS.

The system generation example given later in this module shows how to initialize the program and link it to your system core image library. Refer to DOS/VS System Utilities for information on how to use the program.

Another important tool for efficient system service is the IBM-provided List System History (HISTLIST) utility program. This program produces system history listings that are helpful when the system service level needs to be established. Refer to DOS/VS System Utilities for information on how to use the program

Library Maintenance

DOS/VS libraries can be maintained by using the MERGE function of the CORGZ librarian program. The MERGE function allows to merge complete libraries or selective library entries into existing libraries. Before using the MERGE function, ensure that the library to which new entries are to be merged contains sufficient space for the new entries. The following discussions apply to all libraries. For further information refer to DOS/VS System Control Statements.

REPLACING IDENTICAL ENTRIES USING THE MERGE FUNCTION

When transferring entries that have names identical to those of existing library entries, the old entry (name of phase, module, book, or procedure) is deleted from the library's directory, and the new entry is added to the end of the library's directory. The phase, module, book, or procedure is added to the end of the library.

ADDING UNIQUE ENTRIES USING THE MERGE FUNCTION

When uniquely named phases are transferred to an existing core image library, the names of the entries are inserted in the directory in alphabetical sequence for modules, books, or procedures, the entries are inserted at the end of the directory. The actual phase, module, book, or procedure is added to the end of the library.

COPYING SELECTIVELY TO MERGE LIBRARIES

If two libraries are to be merged, it is faster to selectively copy (MERGE) to the library containing the greatest number of desired entries because the number of entries transferred and directory searches made are kept to a minimum. If there is insufficient space in a library to accommodate additional entries, unwanted entries can be deleted, the library can be condensed, and the new entries can then be added to the library.

DELETING UNWANTED ENTRIES AND MERGING AN ENTIRE LIBRARY WITH ANOTHER LIBRARY

A second technique is to use the IBM-supplied delete procedures to delete all unwanted entries from a library and copy the entire library to another library, thus merging the two libraries. Using this technique requires that the receiving library contains enough space to accommodate the entire library being copied. If there is insufficient space, the receiving library must be condensed or reallocated.

COPYING SELECTIVELY FROM TWO LIBRARIES TO CREATE A THIRD LIBRARY

If there is insufficient space to accommodate a merge of two libraries, a third library can be created to contain selected entries from the two libraries that are to be contained in the merged library. This technique eliminates the need for condensing or reallocating an existing library. Note that this technique can be applied by using only two disk drives.

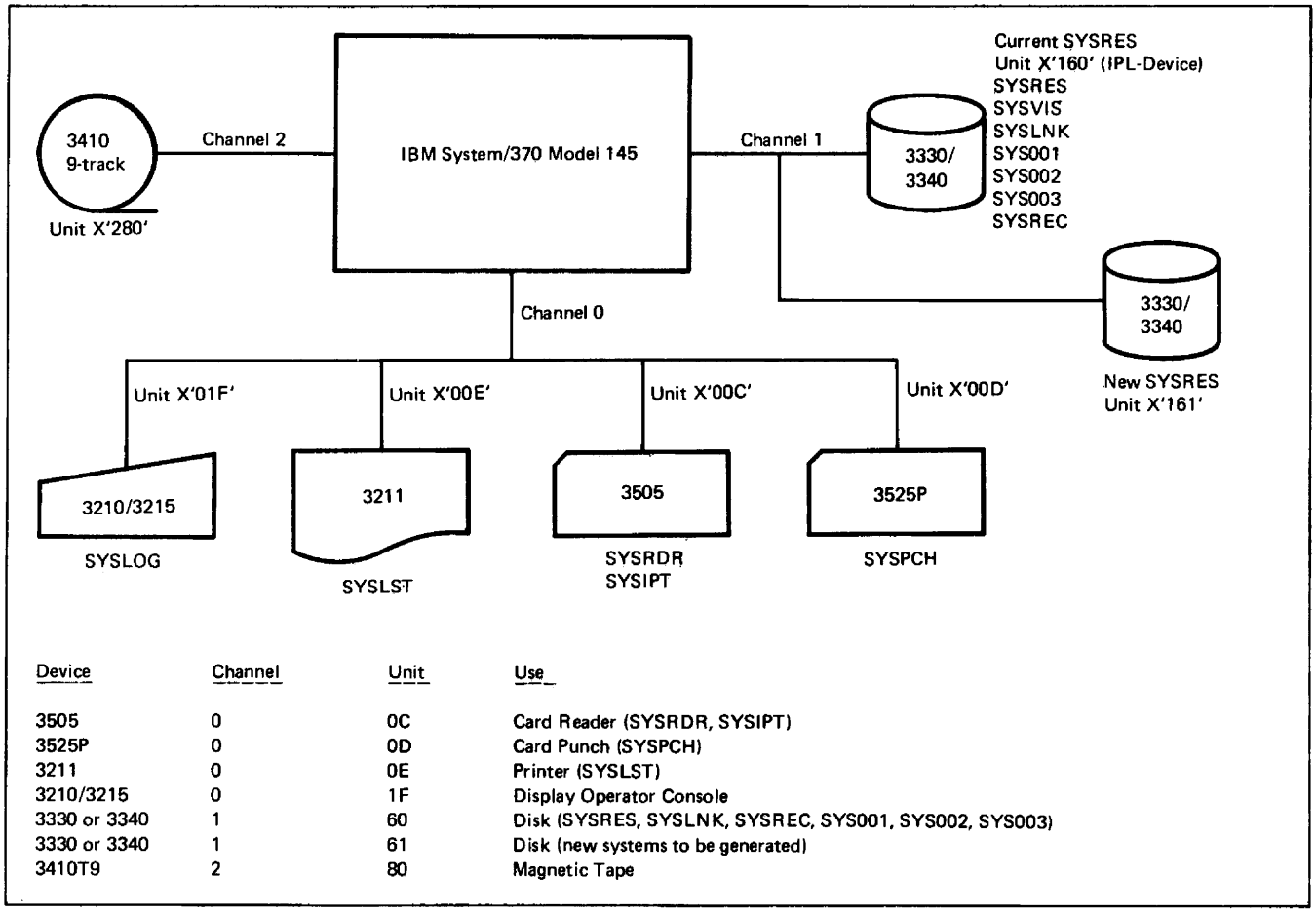
DELETING UNWANTED ENTRIES FROM TWO LIBRARIES AND MERGING BOTH LIBRARIES TO CREATE A THIRD LIBRARY

Another technique for merging two libraries is to delete unwanted entries from the two existing libraries, and merge the two libraries, in their entirety, by copying them to create a third library. Note that this technique can be applied by using only two disk drives.

System Generation Example (Online)

The following illustrates an online system generation job with a system and I/O device configuration as shown in Figure 1-15. The job steps required for this generation are illustrated in Figure 1-16 with accompanying text explaining the steps in detail.

The example applies to both the tape and the disk distributed systems. Prerequisite is an operational DOS/VS. Users without an operational DOS/VS are referred to "Processing the Distribution Tape" in the preceding text, before commencing with the generation job.



Device	Channel	Unit	Use
3505	0	0C	Card Reader (SYSRDR, SYSIPT)
3525P	0	0D	Card Punch (SYSPCH)
3211	0	0E	Printer (SYSLST)
3210/3215	0	1F	Display Operator Console
3330 or 3340	1	60	Disk (SYSRES, SYSLNK, SYSREC, SYS001, SYS002, SYS003)
3330 or 3340	1	61	Disk (new systems to be generated)
3410T9	2	80	Magnetic Tape

Figure 1-15. Example of System and I/O Device Configuration

Results of System Generation

When system generation is completed, the operational system pack of the installation contains user selected components and programs in its core image library, together with an IBM-supplied or the installation's tailored supervisor and the job control, linkage editor, and librarian programs. The core image, relocatable, and source statement and procedure libraries are condensed, and IOCS modules are assembled and cataloged to the relocatable library.

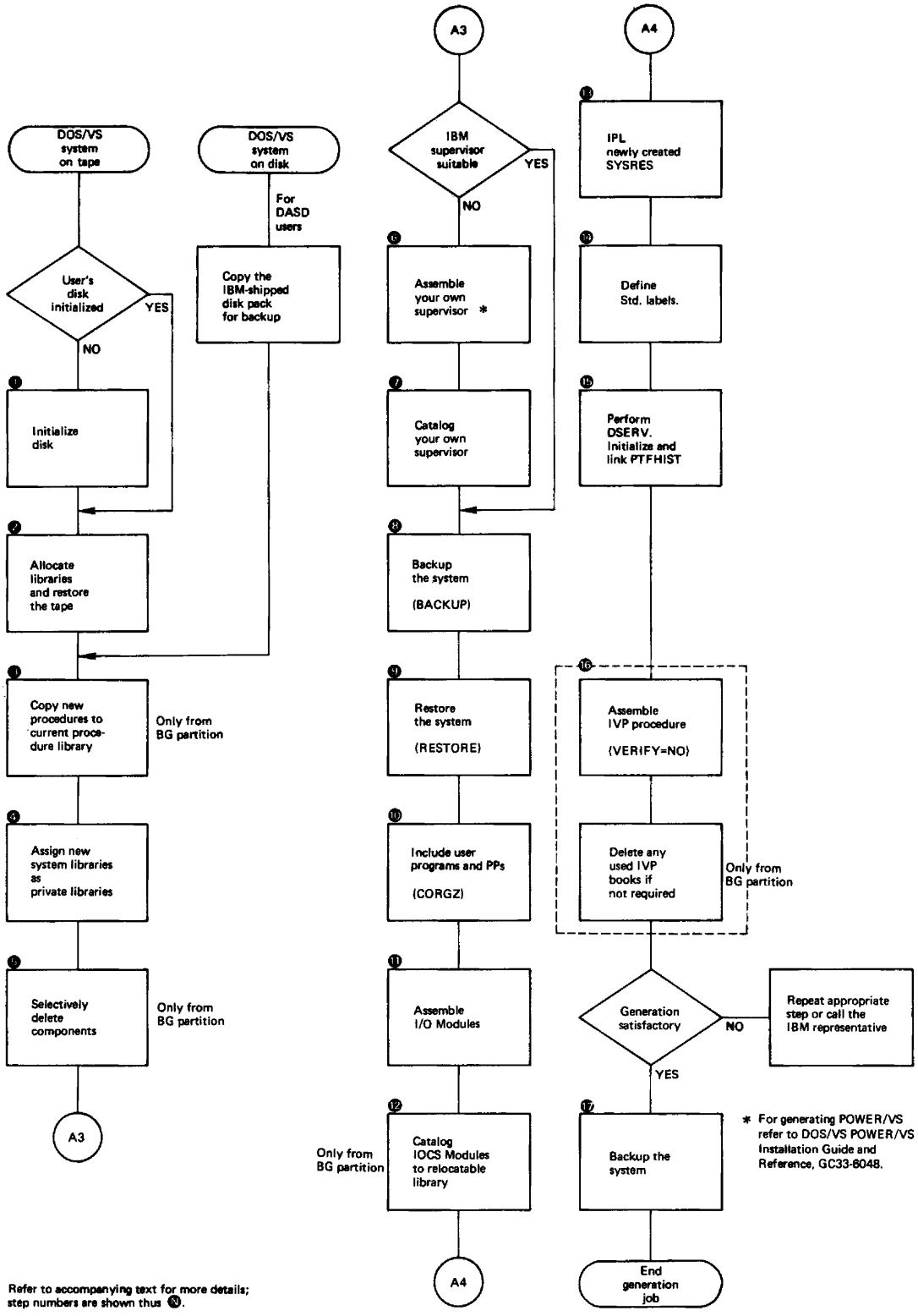


Figure 1-16. Job Steps of Online System Generation

DESCRIPTION OF JOB STEPS

Users receive the IBM-shipped system according to their installation's device configuration.

Tape users receive DOS/VS on a self-loading reel of magnetic tape which is capable of being restored onto disk. The tape contains the entire SYSRES file. The generation example assumes an operational DOS/VS. To commence the generation job, mount the IBM-supplied tape and proceed to Step 1 of the example.

Users without an operational DOS/VS must first complete the procedures described previously under 'Processing the Distribution Tape (Standalone)' and only then can they commence the generation job, starting with Step 13 and continuing in the following step sequence: 14, 5 through 12 followed by Steps 15, 16, and 17.

DASD users receive DOS/VS on a disk (data module) containing a core image, relocatable, source statement, and a procedure library. To commence system generation, mount the IBM-supplied volume and proceed to Step 3 of the example.

As indicated in Figure 1-16, some of the steps may be performed only from the background (BG) partition.

Step ❶ Initialize the Disk

Users of VM/370 restoring DOS/VS to minidisk(s) must initialize such disk(s) by means of the initialize disk utility IBCDASD (available with VM/370) and specify the number of cylinders required. Then, the OS work pack must be converted into a work pack suitable for DOS/VS. To do so, specify // UID IS in the utility modifier statement of the DOS/VS Initialize Disk Utility (see DOS/VS System Utilities).

Mount the distribution tape, if you plan to use a removable disk pack for system residence, and the disk that is to contain the system. For details refer to DOS/VS System Utilities. If the disk is not yet initialized, run the Initialize Disk Utility.

Given below is a sample job stream for system residence on a 3348 data module, model 70:

```
// JOB      INIT 3348 MOD 70
// ASSGN    SYS000,X'161'
// EXEC     INTDK
// UID      IQ
// VTOC     STRTADR=(0695000),EXTENT=(12)
VOL1SYSRES
// END
/&
```

For other disk volumes, the values to be specified for parameters STRTADR and EXTENT are as follows:

```
STRTADR=(0403000) for a 3336 disk pack; (0807000) for a model 11 disk pack
STRTADR=(0199000) for a 2316 disk pack
STRTADR=(0347000) for a 3348 data module, model 35
STRTADR=(0695000) for a 3348 data module, model 70
STRTADR=(0554000) for a 3350

EXTENT=(19) for a 3336 disk pack, all models
EXTENT=(20) for a 2316 disk pack
EXTENT=(12) for a 3348 data module, model 35
EXTENT=(12) for a 3348 data module, model 70
EXTENT=(30) for a 3350
```

Step ❷ Restore the Disk

For details see 'Backup and Restore System' in DOS/VS System Utilities.

For 3348 data module, model 70

```
// JOB RESTORE TO DISK
// ASSGN SYS005,X'161'                          new system residence pack
// DLBL IJSYSRS,'DOS.SYSRES.FILE',99/365
// EXTENT SYS005,,1,0,1,2887                    (see Note 1)
// ASSGN SYS006,X'280'                          distribution tape
// EXEC RESTORE
   ALLOC CL=25(6),RL=36(6),SL=87(4),PL=3(3)     (see Note 1)
/*
   MTC RUN,SYS006
/&
```

Note 1: Extents and allocations are a sample for a 3348 data module. For further details on extents, refer to the 'Memorandum to Users.'

For 3348 data module, model 35 and 2316 disk pack, the system as distributed is too large for a single pack. The following job stream should be used for restore:

```
// JOB RESTORE DISTRIBUTION TAPE TO TWO PACKS 3348-35
// ASSGN SYS005,X'161'                          new system residence pack
// DLBL IJSYSRS,'DOS.SYSRES.FILE',99/365
// EXTENT SYS005,,1,0,2051                      (see Note 2)
// ASSGN SYS006,X'280'                          distribution tape
// EXEC RESTORE
   ALLOC CL=59(9),RL=94(8),SL=E8(2),PL=8(3)     (see Note 2)
/*
   MTC REW,SYS006
// PAUSE
// ASSGN SYS009,X'161'                          private library on X'161'
// DLBL IJSYSSL,'DOS.SYSSLB.FILE',99/365        private source statement library
// EXTENT SYS009,,1,0,12,2784
// EXEC RESTORE
   ALLOC CL=PVT,PS=23(4)                        (see Note 2)
/*
   MTC RUN,SYS006
/&
```

Note 2: Extents and allccations are a sample for 3348-35. For further details on extents, refer to the 'Memorandum to Users'.

The Restore program can be used online under control of a previous DOS/VS release. However, the program must be cataloged to the current system before it can be executed. To catalog the program, invoke the job stream contained on the fourth file of the distributed tape from the console as follows:

1. Enter commands

   ```
   ASSGN SYSIN,X'280'        (distribution tape)
   MTC FSF,SYSIN,3           (for a 1600 bpi tape; for an 800 bpi
                             tape enter MTC FSF,SYSIN,1 for the second
                             volume)
   ```

2. Press END/ENTER (causes the Restore program to be cataloged)

3. Enter commands

   ```
   MTC REW,SYSIN
   ASSGN SYSIN,X'cuu'        (input reader)
   ```

Note: If a phase with the name RESTORE is already present in the current system, ensure that it is not overwritten. This can be done by either of the following:

- Catalog the new RESTORE phase into a private core image library, or
- Rename the current phase before executing the above job stream.

Step ❸ Copy the New Procedure Library to the Current System

This step can only be executed in the background partition of the system.

To copy the new system procedure library to the current system procedure library, use the following job stream.

```
// JOB COPY
// ASSGN SYS002,X'161'
// DLBL IJSYSRS,'DOS.SYSRES.FILE'
// EXTENT SYS002,SYSRES
// EXEC CORGZ
   MERGE NRS,RES
   COPYP ALL
/*
/&
```

Note: When copying the new library to the current system procedure library, procedures having the same name will be overwritten. Also, ensure that the current procedure library has sufficient space to accommodate the new procedure library.

Step ❹ Use System Libraries as Private Libraries

System libraries supplied by IBM can be used as private libraries of an existing DOS/VS if that system's supervisor was assembled with PCIL=YES specified in the FOPT generation macro. This approach requires that DLBL and EXTENT statements as shown are included in the pertinent job stream for each of the three system libraries:

```
// DLBL IJSYSxL,'DOS.SYSRES.FILE'
// EXTENT SYSxLB,SYSRES,1,0,trackaddress,no. of tracks
```

where x = C for core image library
R for relocatable library
S for source statement library

trackaddress = 2 for private core image library; for the remaining two libraries, this address has to be computed by adding the length of the preceding library (including its directory) to the address of that library.

no. of tracks= length of the library in number of tracks.

Step ❺ Delete Unwanted Components

This step can only be executed in the background partition of the system.

Delete unwanted components by executing the appropriate procedures. Declare new libraries as private libraries. Example for a core image library:

```
// DLBL IJSYSCL,'DOS.SYSRES.FILE'
// EXTENT SYSCLB,SYSRES,1,0,2,1978  system core image library portion
ASSGN SYSCLB,X'161'
```

Step ❻ Assemble Your Own Supervisor

To access the new system release while under control of the current system, the **new libraries must be defined as private libraries; refer to "Use System Libraries as Private Libraries", above.**

In this step, decide whether to use one of the IBM-supplied supervisors or to assemble your own supervisor. Display the source (contained in the source statement library) of the IBM-supplied supervisors (contained in the core image library) by executing:

```
// JOB DSPLY
// DLBL IJSYSSL,'DOS.SYSRES.FILE'
// EXTENT SYSSLB,SYSRES,1,0,4020,2880
// ASSGN SYSSLB,X'161'
// EXEC SSERV
  DSPLY A.SUP0,A.SUP1,...,A.SUP6
/*
/&
```

If one of the IBM-supplied supervisors suits your requirements, continue with Step 8. Otherwise, assemble your own supervisor using DLBL and EXTENT statements as in the **following example for a new source statement library (see also Figure 1-6):**

```
// DLBL IJSYSSL,'DOS.SYSRES.FILE'
// EXTENT SYSSLB,SYSRES,1,0,4020,2880
// ASSGN SYSSLB,X'161'
```

For 64K Model 115 CPU configurations, either select $$A$SUP0 or assemble a supervisor whose storage requirements do not exceed 44K bytes. $$A$SUP0 provides for a single partition, includes RELLDR=YES, but does not support POWER/VS. Device assignments are identical to those for $$A$SUP1 (see Figure 1-24).

Step ❼ Catalog Your Supervisor

Catalog the assembled supervisor (object module from Step 6) to the core image library. Alsc catalog printer form-control buffer and the universal character buffer images as required (see "Buffer Load" later in this module).

```
// JOB CATALSUP
// DLBL IJSYSCL,'DOS.SYSRES.FILE'
// EXTENT SYSCLB,SYSRES,1,0,2,1978
ASSGN SYSCLB,X'161'
// OPTION CATAL
 ACTION CLEAR
 INCLUDE
 Supervisor object deck here
/*
// EXEC LNKEDT
/&
```

Step ❽ Backup Libraries

The following job stream may be used to create a backup of your system and/or private **libraries on tape. The backup is suitable as input to the Restore program. For the Restore JCL, refer to Step 2.**

```
// JOB BACKUP SYSTEM AND/OR PRIVATE LIBRARIES
// ASSGN SYS005,X'cuu'  system library disk, if system backup desired
// ASSGN SYS006,X'cuu'  tape where backup is to be written to
// ASSGN SYS007,X'cuu'  private CLB, if backup is desired
// ASSGN SYS008,X'cuu'  private RLB, if backup is desired
// ASSGN SYS009,X'cuu'  private SLB, if backup is desired
* Unassign any library that is not to be backed up
// ASSGN SYS004,UA      if standalone tape is not to be produced (see Note)
// DLBL IJSYSRS,'DOS.SYSRES.FILE'
// EXTENT SYS005
// DLBL IJSYSCL,'DOS.PVT.CIB.FILE'
// EXTENT SYS007
// DLBL IJSYSRL,'DOS.PVT.RLB.FILE'
// EXTENT SYS008
// DLBL IJSYSSL,'DOS.PVT.SLB.FILE'
// EXTENT SYS009
  MTC REW,SYS006        backup does not rewind at OPEN or CLOSE
// EXEC BACKUP
/&
```

Note: For the description of the standalone backup and restore, refer to DOS/VS System Utilities.

If several private libraries are to be backed up, you may execute BACKUP several times to place these libraries on the same tape. These libraries may be restored with RESTORE **which must be executed the same number of times as BACKUP was executed. If you use the standalone Restore program, you must forward space the tape two files to bypass one execution of BACKUP.**

Figure 1-17 shows (1) the library identifiers to be used in the ALLOC statements for a later restore run and (2) the associated logical units and file names.

Identifier	Library	Logical Unit	File Name
CL	System Core Image Library	SYS005	IJSYSRS
RL	System Relocatable Library	SYS005	IJSYSRS
SL	System Source Statement Library	SYS005	IJSYSRS
PL	System Procedure Library	SYS005	IJSYSRS
PC	Private Core Image Library	SYS007	IJSYSCL
PR	Private Relocatable Library	SYS008	IJSYSRL
PS	Private Source Statement Library	SYS009	IJSYSSL

Figure 1-17. Library Identifiers, File Names, and Logical Units for the BACKUP and RESTORE Utility

Step ❾ Restore the System

To restore the system and also your private libraries, use the job stream given in Step 2. On completion of the job, all libraries are condensed.

Step ❿ Merging User Programs

Use the CORGZ program to merge the contents of an existing system residence disk pack with the contents of a new system residence disk pack, retaining the existing members of the destination library if duplicates occur. The control statements needed for this operation are:

```
// JOB MERGE
// DLBL IJSYSRS,'DOS.SYSRES.FILE'          new SYSRES
// EXTENT SYS002
// ASSGN SYS002,X'161'                     device for new SYSRES
// EXEC CORGZ
MERGE RES,NRS
COPYC NEW                                  Provide COPYx statements as required.
COPYS NEW                                  At least one COPYx
COPYR NEW                                  statement must be given.
COPYP NEW
```

For further information on the CORGZ program, refer to DOS/VS System Control Statements.

Note: Phases $$A$SUPx, if contained in the current CIL directory, will not be merged to the new CIL directory. Such phases are assumed to be supervisors and must be compiled again on the new system. Phases $$BFCBxx, $$BUCBxx, $JOBACCT, and $SYSOPEN, if found in the current directory, are merged to the new CIL directory even if they are present already.

Step ⓫ Assemble I/O Modules

Perform all other necessary assemblies. A-library macros such as, for instance, licensed programs supplied in A-macro format, must be edited before they can be assembled. The component assemblies should be performed as separate jobs.

For the information required to assemble Emulator Programs, refer to the Emulator Program manual listed in the Preface.

Assemble all your required IOCS modules. By assigning SYSPCH to a tape unit, disk extent, or diskette extent, the IOCS modules can be cataloged to the relocatable library without punching them in cards. The IOCS modules required by compilers, as defined in "Module 7: Compiler IOCS Modules", are contained in the IBM-supplied relocatable library.

Close the tape assigned to SYSPCH and reassign SYSPCH to its permanent assignment by using the CLOSE command. The assembly listings should be checked for errors before proceeding.

Note: Do not include a START statement in your assembly.

Given below is a sample job stream for the assembly of a CDMOD and MTMOD I/O module.

```
// JOB ASSEM
// OPTION DECK,LIST,LOG,NOXREF
// ASSGN SYSPCH,X'280'
// EXEC ASSEMBLY
   PRINT NOGEN
   CDMOD RECFORM=FIXUNB,CTLCHR=ASA,TYPEFLE=OUTPUT,IOAREA2=YES,        X
                 DEVICE=3525,SEPASMB=YES
 END
/*
// EXEC ASSEMBLY
   PRINT NOGEN
   MTMOD RECFORM=FIXBLK,READ=FORWARD,SEPASMB=YES
END
/*
CLOSE SYSPCH,X'00D'
/&
*Check assembly listings for errors.  Reload 280 with same tape.
// PAUSE      if correct press end to continue
```

The multipart forms of the linkage editor maps and the supervisor listing will be required by your IBM customer engineer for maintenance purposes.

Before the next step is performed, check the linkage editor listings, and make all necessary corrections.

Step ⓬ Catalog IOCS Modules

This step can only be executed in the background partition of the system.

Reload the tape that was assigned to SYSPCH in Step 11 and assign it to SYSIPT. With this tape the MAINT program catalogs the IOCS modules to the relocatable library.

```
// JOB CATALRLB
// ASSGN SYSIPT,X'280'
* CATALOG MODULES TO RELOCATABLE LIBRARY
// EXEC MAINT
/&
```

The basic SYSGEN is complete. You may set new standard labels, reallocate library sizes by using the copy function (CORGZ), condense the libraries, and set condense limits if required. Copy the operational pack for backup.

Step ⓭ IPL New SYSRES

Perform IPL and format your new page data set using the IPL DPD command including TYPE=F. To improve system performance, set up an SVA and build an SDL. You may use one of the IBM-provided procedures for this purpose (see "Introduction" in this module), or specify the phases whose names are to be included in the SDL by submitting a SET SDL=CREATE command (see the example below). If you do not wish to retain a procedure library, you should punch out the procedure, using the PSERV program, and include it in your set of IPL commands.

Example:

```
ADD commands   (optional)
SET DATE etc.
DPD options
SET SDL=CREATE
phase name
   .
   .
/*
ASSGN commands
SET RF=CREATE
```

The IBM-provided procedure (or the command SET SDL=CREATE) must precede job control commands such as ASSGN. These procedures can be executed only in a multiprogramming environment (NPARTS>1).

When IPL is complete, enter the SET job control command to create the recorder file. If your CPU is equipped with a display operator console, include HC=CREATE in the command to cause the creation of a hard copy file. For more information on these procedures, refer to DOS/VS System Management Guide.

Step ⓮ Standard Labels and Hardcopy File

Define label information for SYSRES, SYSLNK, SYSREC, SYS001, SYS002, and SYS003. In addition you may include any label information required for your installation. If your system resides on a 3330, 3340 Model 70, or 3350 you may use the provided procedure LABELS30, LABELS40, or LABELS50 respectively, to load the default standard labels, or you may define your own standard labels as follows:

```
// OPTION STDLABEL
// DLBL IJSYSRS,'DOS SYSRES.FILE',99/365,SD
// EXTENT SYSRES,nnnnnn,1,n,0001,nnnn
// DLBL IJSYSLN,'SYSTEM WORK FILE NO. 0',99/365,SD
// EXTENT SYSLNK,nnnnnn,1,n,nnnn,nnnn
// DLBL IJSYS01,'SYSTEM WORK FILE NO. 1',99/365,SD
// EXTENT SYS001,nnnnnn,1,n,nnnn,nnnn
// DLBL IJSYS02,'SYSTEM WORK FILE NO. 2',99/365,SD
// EXTENT SYS002,nnnnnn,1,n,nnnn,nnnn
// DLBL IJSYS03,'SYSTEM WORK FILE NO. 3',99/365,SD
// EXTENT SYS003,nnnnnn,1,n,nnnn,nnnn
// DLBL IJSYSRC,'DOS RECORDER FILE',99/365,SD  recorder file
// EXTENT SYSREC,nnnnnn,1,n,nnnn,nnnn
// DLBL IJSYSCN,'HARDCOPY FILE',99/365,SD      hard copy file
// EXTENT SYSREC,nnnnnn,1,n,nnnn,nnnn
// DLBL IJSYSIN,'DTTEPTF',,DU    SYSIN labels for
// EXTENT SYSIN                  diskette PTF for
// EXTENT SYSIN                  cardless systems
// EXTENT SYSIN                  only
/&
```

In addition, you may now perform an LSERV and an LVTOC to obtain a listing of the labels stored on the label cylinder(s) and in the VTOC.

```
// JOB DISPLY
// EXEC LSERV
// ASSGN SYS004,X'160'     for your system residence pack
// ASSGN SYS005,X'00E'     for the printer
// EXEC LVTOC
/&
```

Step ⓯ **DSERV and Link PTFHIST**

Perform a sorted DSERV to display the directories for later reference using the following statements:

```
// JOB DSERV
// EXEC DSERV
 DSPLYS ALL
/&
```

Initialize and link the Maintain System History (PTFHIST) Utility (see also section "Utilization of the Maintain System History (PTFHIST) Program" earlier in this module) using the following statements:

```
// JOB PTFHIST
// OPTION DECK
// EXEC ASSEMBLY
    HIST            for parameters, see "HIST Macro Description"
    END             in "Module 24: System Utilities".
/*
/&
```

Execute the job stream generated on SYSPCH.

Step ⓰ Assemble IVP

Perform an assembly of the Installation Verification Procedure. The output consists of a job stream to execute the selected IVP functions. Output is on SYSPCH which can be a card punch, a tape drive, a disk drive, or a diskette. You can also generate a job that deletes the IVP books that were used in the assembly. If you choose to do this, however, bear in mind that it will be impossible to do a reassembly of the IVPGEN macro during this system generation.

Refer to "Module 3: Installation Verification Procedure" for a comprehensive description of the operating instructions for IVP.

```
// JOB IVP GENERATION
// EXEC ASSEMBLY
 IVPGEN VERIFY=NO,[DELUSED=YES,]   selected IVPGEN parameters
 END
/*
// PAUSE     the output on SYSPCH must now be read on SYSIN
/&
```

Step ⓱ Backup Libraries

Now you should take a backup by using the Backup or FASTCOPY programs as shown in Step 8 of this example.

Unsuccessful Generation

If the generation proved unsuccessful, repeat the appropriate job step or call your IBM representative.

DOS/VS System Program Sizes and Component Storage Requirements

Component	IBM Program Number 5745-SC	Core Image Library		Relocatable Library			Source Statement Library	
		Phases	Blocks	Prefix Modules		Blocks	Books	Blocks
Attention Routines, Initiators, Terminators & Dumps	AIT (Note 1)							
Standard System Dump		11*	13	IJB	12	70		
Translating System Dump		11*	13	IJB	12	71		
Attention Routines, Initiators, Terminators		33*	38					
Assembler & ESERV Programs	ASM						2 (IVP)	44
Assembler	(Note 2)	19	122	IPKA	38	609		
ESERV		7	41	IPKV	10	218		
BTAM	BTM (Note 2)	52 29*	52 37	IJL	65	179	66	8620
Checkpoint/ Restart	CKR (Note 1)	14*	22				1	26
Direct Access (Disk) IOCS	DAM** (Note 2)	11*	12	IJI	28	246	3	1273
Diskette I/O Unit	DIO	19*	19				3	503
Disk ERP	DKE (Note 1)	6*	6				1	411
Display Operator Console Support (PRINTLOG)	DOC (Note 1)	31* 1	31 5	IJB	1	20	6	407
Sequential Disk IOCS	DSK** (Note 2)	30*	30	IJG	55	344	11	6848
Emulators								
1401/1440/1460 Emulator	5747-CC3							
1410/7010 Emulator	(Note 2)							
Model 20 Emulator	E20 (Note 2)	25* 7	40 7	IIS	73	506	23	2471
Environmental Recording, Editing, and Printing (EREP)	ERP (Note 2)	1* 131	1 344	IJB	127	1632		

Figure 1-18. Library Requirements (Part 1 of 4)

Component	IBM Program Number 5745-SC	Core Image Library		Relocatable Library			Source Statement Library	
		Phases	Blocks	Prefix	Modules	Blocks	Books	Blocks
Compiler IOCS Modules	IOM (Note 2)	32*	108		226	1388		
ANS*** COBOL		Note: This program consists of a group of various preassembled IOCS modules used by American National Standard COBOL, PL/I, and COBOL. The digits given here represent the number of modules used and the number of library blocks required by the various combinations of compilers desired.			148	991		
ANS*** COBOL & CCBOL					163	1181		
ANS*** COBOL & PL/I					169	1100		
ANS*** COBOL, COBOL, and PL/I					341	1272		
COBOL					77	578		
COBOL and PL/I					107	698		
PL/I					70	412		
RPGII					161	876		
Required IOCS Modules					27	100		
IOCS (See Note 2)	IOX**	60*	61					
Card (Reader/Punch)				IJC	64	154	2	851
Console							1	127
Device Independent (DTFDI)				IJJ	6	31	2	331
Printers				IJD	22	50	2	535
Serial Devices	(Note 1)						1	66
PIOCS (DTFPH)							1	66
DTFBG							1	2
DTFEN							1	24
Imperative Macros							28	428
Rotational Position Sensing	RPS	34	110					
IPL and Buffer Load	IPL (Note 1)	12* 6	12 24	IJB	20	161	1	22
Index Sequential Disk IOCS	ISM** (Note 2)	26*	34	IJH	45	902	6	2717
Job Control	JCL (Note 1)	3* 13	4 70	IJB	11	310	3	245
Librarian	LBR							
CORGZ		9	43	IJB	10	162		
MAINT		11	63	IJB	19	305		
CSERV	(Note 1)	1	6	IJB	1	24		
DSERV (sorted)		6	13	IJB	2	61		
RSERV		1	7	IJB	2	29		
SSERV		1	8	IJB	2	37		
PSERV		1	6	IJB	1	25		
Linkage Editor	LNK (Note 1)	1	20	IJB	1	87		
Magnetic Character Reader IOCS	MCR** (Note 2)	8*	8				6	278

Figure 1-18. Library Requirements (Part 2 of 4)

Component	IBM Program Number 5745-SC	Core Image Library		Relocatable Library			Source Statement Library	
		Phases	Blocks	Prefix	Modules	Blocks	Books	Blocks
Optical Character Reader IOCS	OCR**							
1287		2*	2				5	722
3886	(Note 2)	2*	2				6	382
OLTEP	OLT	2*	2	IJZ	50	410		
	(Note 2)	48	91					
Configuration Data Sets			(Note 3)					
Online Tests (OLTs)			(Note 4)					
Problem Determination Aids	PDA							
PDAID		15	21	IJB	2	45		
		6*	8					
DUMPGEN		1	24	IJB	1	93		
LSERV	(Note 1)	1	9	IJB	1	20		
SDAID		4	25	IJB	4	64		
		2*	4					
Page Data Set Dump (PDSDM)		1	12	IJB	1	41		
DOSVSDMP		1	32	IJB	3	138		
		1*	1					
PDZAP		1	2	IJB	1	28		
Paper Tape IOCS	PTP** (Note 2)	3*	4				2	593
POWER/VS	PWR	45	231				13	753
	(Note 2)	1*	1					
QTAM	QTM (Note 2)	22*	34	IJL	109	393	79	2013
Recovery Management Support	RMS							
MCAR/CCH		23	23					
	(Note 1)							
Supervisor Macros	SUP (Note 1)	1*	34					
Communication Macros							50	525
Generation Macros								
Basic							35	11,608
TP							2	290
DOC							2	146
Magnetic Tape IOCS	TAP** (Note 2)	19*	34	IJF	18	77	2	994
Tape ERP	TPE	1	4	IJB	1	17		
	(Note 1)	10*	10					

Figure 1-18. Library Requirements (Part 3 of 4)

Component	IBM Program Number 5745-SC	Core Image Library		Relocatable Library			Source Statement Library	
		Phases	Blocks	Prefix	Modules	Blocks	Books	Blocks
VSAM	VSM	15*	17	$$B	15	53	26	1602
	(Note 2)	31	321	IGG	57	754		
				IKQ	92	949		
Access Method Services		81	496	IDC	104	2275		
VTAM (incl. TOLTEP)	VTM	181	796	IJB	491	4552	44	4680
		15*	16	IST				
System Utility Programs	UTL (Note 2)	42	302	IJW	60	1122		
Assign Alternate Track Disk		5	41	IJW	6	90		
Assign Alternate Track Data Cell		5	26	IJW	6	69		
BACKUP		1	7	IJW	1	29	1	482
Clear Disk		3	8	IJW	4	35		
Clear Data Cell		3	7	IJW	4	32		
Copy Disk to Card		2	11	IJW	3	53		
Copy Disk to Disk		2	13	IJW	3	61		
Copy Disk or Data Cell to Tape		2	11	IJW	3	54		
Copy and Restore Diskette		1	19	IJW	1	72		
Copy File and Maintain Object Module		1	48	IJW	1	120		
Deblock Utility		1	17	IJW	2	67		
Fast Copy Disk Vol.		3	18	IJW	5	59	2	522
Initialize Disk		4	28	IJW	5	122		
Initialize Data Cell		4	15	IJW	5	69		
Initialize Tape		1	5	IJW	2	23		
RESTORE		1	16	IJW	1	63		
Restore Card to Disk		1	7	IJW	2	33		
Restore Tape to Disk or Data Cell		1	8	IJW	2	35		
VTOC Display		1	6	IJW	4	34		
Transients		1	1					
Distribution Program Supervisor (8K)	(Note 1)							
Maintain System History	UTS	2	56	IKR	3	128	3	85
List System History		1	12	IKR	1	63		
3800 Printer Support								
IEBIMAGE	5748-C1-IMP	1	29	IEB	4	111		
GRF1xxxx		15	35	GRF1	15	131		
XTB1xxxx		47	47	XTB1	47	188		
SETPRT	5748-C1-PRT	1	14	IJV	6	70	3	275
Analysis Program-1	APC	1	19	IAQ	4	94		

* Transients
** See "Compiler IOCS Modules" for the preassembled module names and usage.
*** American National Standard

Figure 1-18. Library Requirements (Part 4 of 4)

Notes:

1. See subsequent sections for further information on this component.
2. See the relevant separate book module for further information on this component.
3. This is the formula to calculate the number of core image library blocks needed for the configuration data sets:

   $$\frac{\text{number of devices on system} + 1}{6} = \text{number of blocks}$$

4. The number of core image library blocks required for the Online Tests (OLTs) depends on the number of device types on the system and the number and size of the tests needed for these devices. This information is in the description that accompanies the tests.

Component Requirements

IOCS Routines

SOURCE STATEMENT LIBRARY

The following macros are shipped in the source statement library.

Note: "Module 7: Compiler IOCS Modules", contains a list of preassembled modules required by system programs.

File Definition Macros

E.CDMOD	E.DTFCN	E.DTFPR
E.DIMOD	E.DTFDI	E.DTFPT
E.DTFBG	E.DTFEN	E.DTFSR
E.DTFCD	E.DTFPH	E.PRMOD

Imperative Macros

	Storage Bytes		
	Basic	For Literals (Note 1)	For Variables
E.CCB	16-24		
E.CHECK	8	+4	Note 2.
E.CLOSE	10	+8	Note 3.
E.CLOSER	14+10 if any register is specified	+8	Note 4.
E.CNTRL	10-18	+4	
E.ERET			
E.EXCP	2-6	+0-4	
E.FEOV	8-12	+4	
E.FEOVD			
E.FREE	8-12	+0-4	
E.GET	8	+4 per symbolic name	Note 2.
E.LBRET	2		+2
E.NOTE	12	+4	
E.OPEN	10	+8	Note 3.
E.OPENR	14+10 if any register is specified	+8	Note 4.
E.POINTR	8	+4 per symbolic name	Note 2.
E.POINTS	8-12	+4	
E.POINTW	8	+4 per symbolic name	Note 2.
E.PRTOV	8	+4 per symbolic name	Note 2.
E.PUT	8-12	+4	Note 2.
E.READ	8-36 Note 5.	+4 per symbolic name	Note 6.
E.RELEASE			
E.RELSE	8	+4 per symbolic name	
E.SECTVAL	10	+4 per symbolic	
E.SEOV	10	+8	+3
E.TRUNC	8-12	+0-4	
E.WAITF	8-12	+0-4	Note 3.
E.WRITE	8-26 Note 5.	+0-4	

Notes:
1. Include the storage requirement for literals only once if the literal is used by more than one macro instruction.
2. +4 per symbolic name, +2 per ordinary register notation, or +0 per special register notation.
3. +4 per filename or +8 per register.
4. +14 per filename or +8 per register.
5. 20 bytes are required for BTAM.
6. +38 No operands coded in register notation.

IOCS Macro Storage Requirements

The storage required by the imperative macros may be determined by using the preceding figures with Figures 1-19 through 1-23.

Note: Read-only modules are recommended for virtual programs (RDONLY=YES).

CDMOD (CARD MODULE)

			TYPEFLE								
			INPUT		OUTPUT					CMBND	
RECFORM	IOAREA2	WORKA	1442 2520 2540 2501 2596 3505 3525 3881	2560* 5425	1442 2596	2520	2540 3525	2560* or 5425 For Punch File	2560* or 5425 For Punch Interpret File	1442	2520 2540
FIXUNB	-	-	104	154	74	80	40	104	96	126	198
FIXUNB	-	YES	106	160	116	122	84	134	122	154	226
FIXUNB	YES	-	136	176	118	124	82	140	-	126	198
FIXUNB	YES	YES	138	186	132	138	96	150	-	154	226
UNDEF	-	-	-	-	112	110	73	125	-	-	-
UNDEF	-	YES	-	-	124	132	92	142	-	-	-
UNDEF	YES	-	-	-	128	130	90	148	-	-	-
UNDEF	YES	YES	-	-	140	146	104	154	-	-	-
VARUNB	-	-	-	-	126	132	94	142	-	-	-
VARUNB	-	YES	-	-	140	146	108	164	-	-	-
VARUNB	YES	-	-	-	154	160	118	166	-	-	-
VARUNB	YES	YES	-	-	156	162	120	176	-	-	-

*Additional space required for associated files:

FUNC=	TYPFLE	
	INPUT	OUTPUT
RP	48	56
RW	56	-
PW	-	48
RPW	92	64

Figure 1-19. CONTROL -- CDMCD Storage Requirements (Part 1 of 3)

Notes:

1. CTLCHR=YES or ASA; depending upon record format, number of I/O areas, and/or work area specifications:

   For YES, a minimum of 8 to a maximum of 36 additional bytes are required.

   For ASA, a minimum of 28 to a maximum of 65 additional bytes are required.

2. RDONLY=YES changes the size of the modules -50 to +50 bytes. In addition, the user's program must provide a 72-byte save area each time the module is reentered.

3. Parts 2 and 3 of Figure 1-19 show the requirements for the other CDMOD options. The values selected must be added to the TYPEFLE value to determine the amount of storage needed.

CRDERR=RETRY	2520	2540
without IOAREA2 or WORKA	+73	+123
with either or both	+69	+119

Figure 1-19. CONTROL -- CDMOD Storage Requirements (Part 2 of 3)

CONTROL=YES	1442	2540	2520	2560* or 5425	3505/3525**
INPUT	+26	+82	+30	+44	+94
OUTPUT without WORKA	+24	+20	+12	+36	+26
OUTPUT with WORKA	+24	+32	+12	+20	+38
CMBND without WORKA	+24	+20	+12	--	--
CMBND with WORKA	+32	+32	+12	--	--

*CONTROL may not be specified for input files associated with punch files on the 2560 or 5425.

**CONTROL may not be specified for input files used as associated files on the 3525.

Figure 1-19. CONTROL -- CDMOD Storage Requirements (Part 3 of 3)

DTFCD (DEFINE THE FILE CARD)

TYPEFLE=INPUT requires 50 bytes. (72 bytes for single file for a 2560 or 5425, 56 bytes if ERROPT is specified for a 3505 or 3525, 82 bytes plus the length of the card buffer if ASOCFLE is specified for a 2560 or 5425, 60 bytes if ASOCFLE is specified for a 3525.)

TYPEFLE=CMBND requires 84 bytes.

TYPEFLE=OUTPUT requires 48 bytes (64 bytes for single file for a 2560 or 5425, 69 bytes plus the length of the card buffer if ASOCFLE is specified for a 2560 or 5425, 52 bytes if ASOCFLE is specified for a 3525, 152 bytes if FUNC=I is specified for a 2560 or 5425, 128 bytes if FUNC=I is specified for a 3525).

CRDERR=RETRY (2540 only) requires an additional 88 bytes.

DEVICE=2520 requires 8 additional bytes.

DIMOD (DEVICE INDEPENDENT SYSTEM UNITS MODULES)

TYPEFLE=	Basic Module	IOAREA2=YES	RPS Version of Logic Module
INPUT	454	+112	534
OUTPUT	903	+152	1021

RDONLY=YES changes the size of the module -70 to +70 bytes. In addition, the user's program must provide a 72-byte save area each time the module is reentered. RPS versions of the logic models support all other options for each TYPFLE. Specifying TRC=YES adds another 256 bytes to the size of the module.

Figure 1-20. DIMOD Storage Requirements

DTFDI (DEFINE THE FILE DEVICE INDEPENDENT SYSTEM UNITS)

The table requirement is 240 bytes.

PRMOD (PRINTER MODULE)

RECFORM=	BASIC MODULE (2)	WORKA=YES	IOAREA2=YES	PRINTOV (3)	CTLCHR= ASA	CTLCHR= YES	CONTROL=YES (4)	ERROPT=YES (1)
FIXUNB	72	+6	+24	+34	+128		+40	+68
UNDEF	102	+22	+12	+34	+132	+4	+40	+68
VARUNB	136	+14	+12	+34	+124	-4	+40	+68

Note: RDONLY=YES changes the size of the module -50 to +50 bytes. In addition, the user's program must provide a 72-byte save area each time the module is reentered. Specifying TRC=YES increases the size of the module by an additional 102 to 158 bytes, depending on the options chosen.

(1) If ERROPT=YES is specified, then DEVICE=3211 must also be specified. For a 3525 add 22 bytes, instead of 68, for ERROPT.

(2) For the 2560 and 5425, the sizes are 166 bytes for FIXUNB, 190 bytes for UNDEF, 206 bytes for VARUNB. For the 3525, add from 52 to 72 bytes to the size of the basic module, depending on the type of associated file specified.

(3) For the 3525 add from 34 to 58 bytes.

(4) For the 3525 add from 40 to 160 bytes.

Figure 1-21. CONTROL -- PRMOD Storage Requirements

DTFPR (DEFINE THE FILE PRINTER)

The table requirement is 48 bytes or 52 bytes if ERROPT is specified for the 3211 printer or, if ASOCFLE is specified, for the 3525 card punch. For the 2560 the requirement is 72 bytes for a single file or 64 bytes for an associated file; for the 5425 the requirement is 56 bytes for either a single or an associated file.

DTFPH (DEFINE THE PHYSICAL IOCS)

Device	Size
Tape	104
DASD MOUNTED=ALL	40
DASD MOUNTED=SINGLE	84
3540 MOUNTED=SINGLE	84
No module is required for this macro instruction.	

Figure 1-22. CONTROL -- DTFPH Storage Requirements

DTFCN (DEFINE THE FILE CONSOLE)

		TYPEFLE=		
RECFORM=	WORKA=	INPUT/OUTPUT	OUTPUT only	CMBND
FIXUNB	-	94	60	144
FIXUNB	YES	150	90	252
UNDEF	-	156	114	-
UNDEF	YES	262	168	-
No module is required for this macro instruction.				

Figure 1-23. CONTROL -- DTFCN Storage Requirements

DTFSR (DEFINE THE FILE SERIAL DEVICE)

When a DTFSR is assembled, it generates both a table and a module. For example, if DTFSR is used for a printer, a table and a module are generated just as though DTFPR and PRMOD were used. To determine the storage requirements for DTFSR, add the table and the module requirements for the appropriate device type, such as 48 bytes (DTFPR) and n bytes (PRMOD) for a printer.

System Directory List and SVA Loading

The system procedure library contains the procedures SDL, RPS, VSAMSVA, and VSAMRPS to build system directory lists and to load IBM-supplied phases into the SVA.

- SDL loads a set of selected system phases, but no RPS or VSAM phases.
- RPS loads the same phases as procedure SDL plus RPS phases.
- VSAMSVA loads the same phases as procedure SDL plus VSAM phases.
- VSAMRPS loads the same phases as procedure SDL plus RPS and VSAM.

The statements that make up procedures SDL and RPS are listed under "SDL Considerations" and "RPS Considerations", respectively, below. Those of VSAMSVA and VSAMRPS are listed in Module 17 of this manual, under "Loading VSAM phases into the SVA".

If a 3800 Printing Subsystem is to be used, names IJVSPRDV and IJDPR3 must be added to the SDL. They are not in any of the IBM-supplied lists.

SDL Considerations

Procedure SDL builds a system directory list for systems generated without VSAM and RPS support. It consists of the following transients, phases, and statements:

```
SET SDL=CREATE
$$BCLOSE
$$BCLOS2
$$BCLOS3
$$BCLOS4
$$BEOJ
$$BEOJS1
$$BEOJ4
$$BEOJ7
$$BOCP01
$$BOCP03
$$BOFLPT
$$BOPEN
$$BOPEND
$$BOPENR
$$BOPEN0
$$BOPEN1
$$BOPEN3
$$BOPEN4
$$BOPEN5
$$BOPEN6
$$BOPIGN
$$BOSDC1
$$BOSDC3
$$BOSDI1
$$BOSDI2
$$BOSDI4
$$BOSDO1
$$BOSDO2
$$BOSDO3
$$BOSDO4
$$BOSDO8
$$BOSDO9
$$BOSDW1
$$BOSDW2
$$BOSD00
$$BOSD01
$$BOSD02
$$BOSD03
$$BOSD04
$$BOSD05
$$BOSD06
$$BOSIGN
$$BSETL
$$BSETL1
$$BSETL2
$JOBCTLA
$JOBCTLE
$JOBCTLN
$JOBACCT,SVA
$JOBEXIT,SVA
$LIBSTAT,SVA
$MAINDIR,SVA
/*
/+
```

RPS Considerations

Procedure RPS builds a system directory list for systems generated with RPS support. This procedure consists of the statements given under "SDL Considerations" (excluding the /* and /+) plus the following:

```
IJGCYCMB,SVA
IJGCYCWB,SVA
IJGFWCMB,SVA
IJGFWCWB,SVA
IJGFXCMB,SVA
IJGFXCWB,SVA
IJGPYCWB,SVA
IJGQWCWB,SVA
IJGQXCWB,SVA
IJGRYCWB,SVA
IJGSYCWB,SVA
IJGTWNCT,SVA
IJGUWCWB,SVA
IJGUXCWB,SVA
IJGVWCWB,SVA
IJGVXCWB,SVA
IJHAVBBF,SVA
IJHAVBBS,SVA
IJHAVBCF,SVA
IJHAVBCS,SVA
IJHAVGBF,SVA
IJHAVGBS,SVA
IJHAVGCF,SVA
IJHAVGCS,SVA
IJHZXGZS,SVA
IJIBWEHW,SVA
IJIFWEHW,SVA
IJISWEHW,SVA
IJIVWEHW,SVA
IJJCVA1N,SVA
IJJCVDV,SVA
IJJCVDO,SVA
IJJFVBIC,SVA
IJJFVIIC,SVA
/*
/+
```

DELETION OF RPS SUPPORT

If RPS support will never be used in any supervisor, the following core image library phases may be deleted:

```
IJGCYCMB
IJGCYCWB
IJGFWCMB
IJGFWCWB
IJGFXCMB
IJGFXCWB
IJGPYCWB
IJGQWCWB
IJGVXCWB
IJGRYCWB
IJGSYCWB
IJGTWNCT
IJGUWCWB
IJGUXCWB
IJGVWCWB
IJGQXCWB
IJHAVBBF
IJHAVBBS
IJHAVBCF
IJHAVBCS
IJHAVGBF
IJHAVGBS
IJHAVGCF
IJHAVGCS
IJHZXGZS
IJIBWEHW
IJIFWEHW
IJISWEHW
IJIVWEHW
IJJCVA1N
IJJCVDV
IJJCVDO
IJJFVBIC
IJJFVIIC
```

PRE-LOADING MODULES IN THE SVA

Any or all of the following modules may be pre-loaded into the SVA to improve performance. When checkpointing with RPS in the system it is a requirement that any RPS logic module phases that will be used by the program be pre-loaded. Any access method may be used when all of the following phases are pre-loaded. For information on reserving storage for RPS, refer to the DOS/VS System Management Guide.

Phase Name	Access Method	Function	Number of Bytes
IJGCYCMB	Sequential Disk	Fixed length, update, TRUNCS	1550
IJGCYCWB		Fixed length, update	1406
IJGFWCMB		Fixed length, input, TRUNCS	1078
IJGFWCWB		Fixed length, input	904
IJGFXCMB		Fixed length, output, TRUNCS	1252
IJGFXCWB		Fixed length, output	1032
IJGPYCWB		Spanned record, update	3302
IJGQWCWB		Spanned record, input	1428
IJGQXCWB		Spanned record, output	2790
IJGRYCWB		Undefined, update	1518
IJGSYCWB		Variable length, update, hold	1778
IJGTWNCT		Work file	1992
IJGUWCWB		Undefined, input	928
IJGUXCWB		Undefined, output	1090
IJGVWCWB		Variable length, input	998
IJGVXCWB		Variable length, output	1568
IJHAVBBF	ISAM	HOLD, CORDATA	7744
IJHAVBBS		HOLD, no CORDATA	7234
IJHAVBCF		No HOLD, CORDATA	7330
IJHAVBCS		No HOLD, no CORDATA	6812
IJHAVGBF		Two I/O areas, HOLD, CORDATA	7336
IJHAVGBS		Two I/O areas, HOLD, no CORDATA	6822
IJHAVGCF		Two I/O areas, no HOLD, CORDATA	6976
IJHAVGCS		Two I/O areas, no HOLD, no CORDATA	6462
IJHZXGZS		Load	1556
IJIBWEHW	Direct Accesss	Undefined record	2202
IJIFWEHW		Fixed length	1994
IJISWEHW		Spanned record	5110
IJIVWEHW		Variable length	2140
IJJCVA1N	Device Independent	ASCII	887
IJJCVDV	(System)	I/O pointer	751
IJJCVDO		Fixed area I/O	847
IJJFVBIC	Device Independent	Output	1029
IJJFVIIC	(User)	Input	550

Phases that are not used by the checkpointing program do not have to be pre-loaded into the SVA.

Examples:

1. If the program does not use ISAM, none of the nine ISAM phases needs to be pre-loaded.

2. If ASCII=YES is not specified in the SUPVR macro at system generation time, IJJCVA1N need not be pre-loaded.

IPL and Buffer Load

IPL

CORE IMAGE LIBRARY

Transients

$$A$CDL0 (optinal provided by the user)
$$A$IPL1
$$A$IPL2

Phases

$IPLRT2
$IPLRT3
$IPLRT4
$IPLRT5

RELOCATABLE LIBRARY

Module

IJBIPL

Link-Edit Statements

```
   INCLUDE IJBIPL
// EXEC LNKEDT
```

Buffer Load (1403U Printer)

CORE IMAGE LIERARY

It is your responsibility to link-edit into the core image library the modules required for later use in LUCB and UCB job control statements.

RELOCATABLE LIBRARY

Modules

IJBTRAN
IJBTRGN
IJBTRONA
IJBTRPAN
IJBTRPHN
IJBTRPN
IJBTRQNC
IJBTRQN
IJBTRRN
IJBTRSN
IJBTRTN
IJBTRYN
IJBTRALA

Link-Edit Statements

```
   PHASE phasename,+0
   INCLUDE IJBTRxxx
// EXEC LNKEDT
```

where xxx is a two or three character identifier of the train type on your 1403U.

Buffer Load (3203 Printer Model 1 and 2)

CORE IMAGE LIBRARY

Transients (Required for IPL)

$$BFCB3
$$BUCB3
$$BUFLDR
$$BUFLD1
$$BUFLD2

Phases

SYSBUFLD
SYSBUFF1

RELOCATABLE LIBRARY

Modules

IJBSBUFF
IJBSBUF1
IJBTRAN
IJBTRGN
IJBTRONA
IJBTRPAN
IJBTRPHN
IJBTRPN
IJBTRQNC
IJBTRQN
IJBTRRN
IJBTRSN
IJBTRTN
IJBTRYN
IJBTRALA

Link-Edit Statements

```
   PHASE $$BUCB3,+0
   INCLUDE IJBTRxxx
// EXEC LNKEDT
```

where xxx is a two or three character identifier of the train type on your 3203 printer other than the AN supplied in the core image library.

```
   PHASE SYSBUFLD,+0
   INCLUDE IJBSBUFF
   PHASE SYSBUFF1,+0
   INCLUDE IJBSBUF1
// EXEC LNKEDT
```

Buffer Load (3203-4 Printer)

CORE IMAGE LIBRARY

Transients (Required for IPL)

```
$$BFCB00
$$BUCB00
$$BUFLDR
$$BUFLD1
$$BUFLD2
```

Phases

```
SYSBUFLD
SYSBUFF1
```

RELOCATABLE LIBRARY

Modules

```
IJBSBUFF
IJBSBUF1
IJBTVAN
IJBTVGN
IJBTVOAA
IJBTVOAB
IJBTVODA
IJBTVONA
IJBTVPAN
IJBTVPHN
IJBTVPN
IJBTVQNC
IJBTVQN
IJBTVRN
IJBTVSN
IJBTVTN
IJBTVYN
IJBTVALA
```

Link-Edit Statements

```
   PHASE $$BUCB00,+0
   INCLUDE IJBTVxxx
// EXEC LNKEDT
```

where xxx is a two or three character identifier of the train type on your 3203-4 printer other than the AN supplied in the core image library.

```
   PHASE SYSBUFLD,+0
   INCLUDE IJBSBUFF
   PHASE SYSBUFF1,+0
   INCLUDE IJBSBUF1
// EXEC LNKEDT
```

Buffer Load (3211 Printer)

CORE IMAGE LIBRARY

Transients (Required for IPL if 3211 is present)

```
$$BFCB
$$BUCB
$$BUFLDR
$$BUFLD1
$$BUFLD2
```

RELOCATABLE LIBRARY

Modules

```
IJBSBUFF
IJBSBUF1
IJBTRA11
IJBTRG11
IJBTRH11
IJBTRP11
IJBTRT11
```

Link-Edit Statements

```
   PHASE $$BUCB,+0
   INCLUDE IJBTRxnn
// EXEC LNKEDT
```

where xnn is the train on your 3211 printer other than the A11 supplied in the core image library (transient $$BUCB).

```
   PHASE SYSBUFLD,+0
   INCLUDE IJESBUFF
   PHASE SYSBUFF1,+0
   INCLUDE IJBSBUF1
// EXEC LNKEDT
```

Buffer Load (5203 Printer)

CORE IMAGE LIBRARY

Transients (Required for IPL)

```
$$BFCB5
$$BUCB5 (see Note)
$$BUFLDR
$$BUFLD1
$$BUFLD2
```

Note: This transient is not required for IPL when the UCS feature is not present.

Phases

```
SYSBUFLD
SYSBUFF1
```

RELOCATABLE LIBRARY

Modules

IJBSBUFF
IJBSBUF1
IJBTRAN
IJBTRGN
IJBTRPN

Link-Edit Statements

```
   PHASE $$BUCB5,+0
   INCLUDE IJBTRxx
// EXEC LNKEDT
```

where xx is the train type on your 5203U printer other than the AN supplied in the core image library.

```
   PHASE SYSBUFLD,+0
   INCLUDE IJBSBUFF
   PHASE SYSBUFF1,+0
   INCLUDE IJBSBUF1
// EXEC LNKEDT
```

3800 Printing Subsystem Support

SETPRT (SET 3800 PRINTING SUBSYSTEM PARAMETERS)

CORE IMAGE LIBRARY

Transients

$$BUFLDR
$$BUFLD1
$$BUFLD2

Phase (Required if 3800 is present)

IJVSPRDV

RELOCATABLE LIBRARY

Modules

IJVSPRCM
IJVSPRDV
IJVSPRIO
IJVSPR01
IJVSPR02
IJVSPR03

Source Statement Library

E.QSETPRT
E.SETPRT
E.SPLIST

Link-Edit Statements

For a list of the link-edit statements that are a part of the DOS/VS IBM 3800 Printing Subsystem Independent Component Release (ICR), see the link book in the "Program Directory" that comes with the ICR.

IEBIMAGE (UTILITY FOR THE 3800)

CORE IMAGE LIBRARY

Phase

IEBIMAGE

RELOCATABLE LIBRARY

Modules

IEBIMAGE
IEBIMSGS
IEBIOBJT
IEBISCAN

GRF1xxxx (IBM-SUPPLIED GRAPHIC CHARACTER MODIFICATION PHASES)

CORE IMAGE LIBRARY

Phases

GRF1IGSC
GRF1IGS0
GRF1IGS2
GRF1IGS5
GRF1IGUC
GRF1IGU0
GRF1IGU2
GRF1IGU5
GRF1IOSA
GRF1IOSB
GRF1ISP1
GRF1ITS1
GRF1ITS2
GRF1ITU1
GRF1ITU2

RELOCATABLE LIBRARY

Modules

The module names of the GRF1xxxx modules are identical to the 15 phase names shown.

XTB1xxxx (IBM-SUPPLIED CHARACTER ARRANGEMENT TABLES)

CORE IMAGE LIBRARY

Phases

XTB1AN
XTB1AOA
XTB1AOD
XTB1AON
XTB1A11
XTB1BOA
XTB1BON
XTB1FM10
XTB1FM12

XTB1FM15
XTB1GFC
XTB1GF10
XTB1GF12
XTB1GF15
XTB1GN
XTB1GSC
XTB1GS10
XTB1GS12
XTB1GS15
XTB1GUC
XTB1GU10
XTB1GU12
XTB1GU15
XTB1G11
XTB1HN
XTB1H11
XTB1KN1
XTB1OAA
XTB1OAB
XTB1ODA
XTB1ONA
XTB1ONB
XTB1PCAN
XTB1PCHN
XTB1PN
XTB1P11
XTB1QN
XTB1QNC
XTB1RN
XTB1SN
XTB1TN
XTB1TU10
XTB1T11
XTB1XN
XTB1YN
XTB12773
XTB12774

RELOCATABLE LIBRARY

Modules

The module names of the XTB1xxxx modules are identical to the 47 phase names shown.

Job Control

CORE IMAGE LIBRARY

Transients

$$BJCOPT
$$BJCOP1
$$BLSTIO

Phases

$JOBACCT *
$JOBCTLA
$JOBCTLB
$JOBCTLD
$JOBCTLE
$JOBCTLF
$JOBCTLG
$JOBCTLJ
$JOBCTLK
$JOBCTLM
$JOBCTLN *
$JOBEXIT
$SYSOPEN **

* Required for Job Accounting Interface
**Only present in core image library. Not part of JCL proper.

RELOCATABLE LIBRARY

Modules

$JOBACCT
IJBJC
IJBJCB
IJBJC1
IJBJC2
IJBJC3
IJBJC4
IJBJC5
IJBJC6
IJBJC7
IJBJC8 (Job Accounting Interface)
IJBJC9

Link-Edit Statements

```
   INCLUDE IJBJC
// EXEC LNKEDT
   INCLUDE $JOBACCT
// EXEC LNKEDT
```

Linkage Editor

CORE IMAGE LIBRARY

Phases

$LNKEDT

RELOCATABLE LIBRARY

Modules

IJBLE1

Link-Edit Statements

```
   INCLUDE IJBLE1
// EXEC LNKEDT
```

WORK FILE REQUIREMENTS FOR LINKAGE EDITOR

This section contains information for determining the work file requirements for the linkage editor and assembler when the **work file is on an IBM DASD other than 2311.**

IJBMDS
IJBMDU
IJBMIN
IJBMIO
IJBMUP
IJBSL2

Link-Edit Statements

```
   INLCUDE IJBSL2
// EXEC LNKEDT
   INCLUDE IJBLBIO
// EXEC LNKEDT
   INCLUDE IJBLBI1
// EXEC LNKEDT
```

CSERV

Core Image Library

Phase

CSERV

Relocatable Library

Module

IJBLBP

Link-Edit Statements

```
   INCLUDE IJBLBP
// EXEC LNKEDT
```

DSERV

Core Image Library

Phases

DSERV
DSERV1
DSERV2
DSERV3
DSERV4
DSERV5
DSERV6

Relocatable Library

Modules

IJBSL1

Link-Edit Statements

```
   INCLUDE IJBSL1
// EXEC LNKEDT
```

PSERV

Core Image Library

Phase

PSERV

Relocatable Library

Module

IJBSL6

Link-Edit Statements

```
   INCLUDE IJBSL6
// EXEC LNKEDT
```

RSERV

Core Image Library

Phase

RSERV

Relocatable Library

Modules

IJBLBC
IJBSL3

Link-Edit Statements

```
   INCLUDE IJBSL3
// EXEC LNKEDT
```

SSERV

Core Image Library

Phase

SSERV

Relocatable Library

Modules

IJBLBC
IJBSL4

Link-Edit Statements

```
   INCLUDE IJBSL4
// EXEC LNKEDT
```

CORE IMAGE LIBRARY

Phase Name	Number of Phases	Number of Library Blocks	Remarks
$$A$SUP0	1	34	Required for system generation 64K Model 115 CPU
$$A$SUP1	1	48	Standard Supervisor
$$A$SUP2	1	52	
$$A$SUP3	1	70	
$$A$SUP4	1	70	
$$A$SUP5	1	82	
$$A$SUP6	1	96	

CONFIGURATION OF SUPERVISOR $$A$SUP1

Figure 1-24 represents the parameters and their specification of the standard default supervisor for the 3330 resident system (generated devices can be adjusted at IPL-time using ADD and DELETE commands).

```
MACRO
GENSUPVR
  $$A$SUP1 = POWER/VS SUPERVISOR, WITH RELLDR, VSIZE=512


      TITLE 'DOS/VS SUPERVISOR 1,SYSRES=3330,MOD=125,NPARTS=2'
      SUPVR NPARTS=2,POWER=YES,CHAN=YES,RMS=YES,PHO=YES,ID=1
      CONFG MODEL=125
      STDJC
      FOPT  OLTEP=NO,SYSFIL=YES,RELLDR=YES,ECPREAL=YES,                *
            PFIX=YES
      PIOCS BMPX=YES,TAPE=7,DISK=(3330,3340,3350)
      VSTAB RSIZE=256K,VSIZE=512K,SVA=(64K,0K)
      ALLOC F1=152K
      ALLOCR F1R=16K
      IOTAB JIB=20,BGPGR=40,F1PGR=10,D3420=2,D2314=2,D3330=2,          *
            D3340=2,D3410=2,D3520=2,IODEV=20
      DVCGEN CHUN=X'00D',DVCTYP=2560
      DVCGEN CHUN=X'00E',DVCTYP=3203
      DVCGEN CHUN=X'01F',DVCTYP=125D
      DVCGEN CHUN=X'04C',DVCTYP=3505
      DVCGEN CHUN=X'04D',DVCTYP=3525P
      DVCGEN CHUN=X'160',DVCTYP=3340
      DVCGEN CHUN=X'161',DVCTYP=3340
      DVCGEN CHUN=X'162',DVCTYP=3340
      DVCGEN CHUN=X'163',DVCTYP=3340
      DVCGEN CHUN=X'280',DVCTYP=3410T9
      DVCGEN CHUN=X'281',DVCTYP=3410T9
      ASSGN SYSLOG,X'01F'
      ASSGN SYSREC,X'160'
      ASSGN SYSRDR,X'04C'
      ASSGN SYSIPT,X'04C'
      ASSGN SYSPCH,X'04D'
      ASSGN SYSLST,X'00E'
      ASSGN SYSLNK,X'161',BG
      ASSGN SYS001,X'161',BG
      ASSGN SYS002,X'161',BG
      ASSGN SYS003,X'161',BG
      ASSGN SYS004,X'161',BG
      DPD UNIT=X'160',VOLID=SYSRES,CYL=605
      SEND
MEND
GENSUPVR
END
/*
/&
```

Figure 1-24. Supervisor $$A$SUP1--Supplied by IBM as Standard Default Supervisor for DOS/VS

HOW TO DISPLAY AND COMPILE SUPERVISORS

All source coding of the IBM-supplied supervisors is contained in the A.Sublibrary of the system source statement library under the names SUP0 through SUP6. To obtain a printout, execute:

```
// JOB SSERV
// EXEC SSERV
  DSPLY A.SUP0,A.SUP1,....,A.SUP6
/*
/&
```

To change the contents (in order to tailor a given supervisor) use the program MAINT. To compile the tailored supervisor, use:

```
// JOB ASSEMELE
// OPTION DECK
// EXEC ASSEMELY
  COPY SUPx
  END
/*
/&
```

Supervisor Generation Macros (Basic)

E.ALLOC
E.ALLOCR
E.ASSGN
E.BDYBOX
E.CONFG
E.DISP
E.DPD
E.DVCGEN
E.FOPT
E.IOINTER
E.IOTAB
E.ISTAVT
E.MAPCOMR
E.MAPERPIB
E.MCRAS
E.MAPLOWC
E.MAPPUB2
E.PIOCS
E.SEND
E.SGAM
E.SGCCWT
E.SGDFCH
E.SGDSK
E.SGEND
E.SGPMAIN
E.SGPOPT
E.SGPSUB
E.SGSCVRT
E.SGSVC
E.SGSVCX
E.SMICR
E.STDJC
E.SUPVR
E.SYSIO
E.VSTAB

For a detailed description of storage requirements, refer to "Supervisor Storage Requirements".

Teleprocessing

E.IJLQDSCT
E.IJLQTSVC

Note: These macros are part of the QTAM program but are required to generate a QTAM supervisor.

Display Operator Console Support

E.CRTGEN
E.CRTSAV

Note: These macros are required to generate a supervisor with Display Operator Console support.

POWER/VS

Macros

E.IPW$DPA
E.IPW$DPD
E.IPW$DDE

These macros are part of the POWER/VS program. They are required to generate a supervisor with support of POWER/VS (POWER=YES specified in the SUPVR macro instruction).

MCAR/CCH (RMS)

CORE IMAGE LIBRARY

Transients

$$ABERA1
$$ABERA2
$$ABERA3
$$ABERA4 } RMSR
$$ABERA5
$$ABERA6
$$ABERA7
$$ABERRJ Statistical counter update (non-tape)
$$ABERRP 3211 RMSR
$$ABERRQ 3211 RMSR
$$BCCHHR t scans CI-directory for all $$RASTnn phases
$$RAST00 CCH and Initial MCAR analysis
$$RAST01 Channel and machine check record builder and recorder
$$RAST02 Channel check analysis
$$RAST03 EFL and MCAR analysis
$$RAST04 Unit record channel check ERP
$$RAST05 Unit record channel check ERP
$$RAST06 3505 and 3525 channel check handler ERP
$$RAST08 Machine check and channel check record writer
$$RAST09 Partition reallocation
$$RAST10 ERP message writer
$$RAST11 Message writer
$$RAST13 Partition reallocation

DEVICE ERROR ROUTINES AND OPEN/CLOSE PHASES FOR DOS/VS

The following is a list of required system control and common IOCS transients. Type A transient routines (device error routines) have the prefix $$A. ($ is an alphabetic character in System/370.) Type B transient routines (OPEN, CLOSE, CHKPT, and so on) have the prefix $$B.

$$A$SUP1	Supervisor
$$ABERAA	Statistical counter update (tape)
$$ABERAB	Tape ERP
$$ABERAC	Tape ERP
$$ABERAD	Tape ERP
$$ABERAE	Tape ERP
$$ABERAF	Tape ERP
$$ABERAG	Tape ERP
$$ABERAH	Tape ERP
$$ABERAI	Tape ERP
$$ABERAN	3886 OCR ERP
$$ABERAO	3895 ERP Phase 1
$$ABERAP	3895 ERP Phase 2
$$ABERAQ	3895 OBR record builder
$$ABERAR	3895 MDR record builder
$$ABERA1-$$ABERA7	RMSR
$$ABERBA	3800 error recovery
$$ABERBC	3800 MDR record writer
$$ABERBD	3800 OBR record writer
$$ABERP1-$$ABERP9	BTAM ERP
$$ABERRA	Error recovery monitor
$$ABERRB	Disk ERP
$$ABERRC	Setup 2560 restart information
$$ABERRD	2560/5425 ERP repositioning
$$ABERRE	Setup 5425 restart information
$$ABERRF	PRT1 ERP
$$ABERRG	3504/3505 Card reader and 3525 card punch ERP
$$ABERRH	2245 ERP (Kanji printer support)
$$ABERRI	2495 tape cartridge reader ERP
$$ABERRJ	Statistical counter update (non-tape)
$$ABERRK	RMSR message writer
$$ABERRL	ERP message writer
$$ABERRM	ERP message writer
$$ABERRN	ERP message writer
$$ABERRO	ERP message writer
$$ABERRP	PRT1 RMSR
$$ABERRQ	PRT1 RMSR
$$ABERRR	2560 ERP
$$ABERRS	MICR ERP
$$ABERRT	1287/1288 OCR ERP
$$ABERRU	1017/1018 Paper tape ERP
$$ABERRV	2671 Paper tape ERP
$$ABERRW	1052 Console printer keyboard ERP
$$ABERRX	Unit record error recovery
$$ABERRY	Unit record ERP
$$ABERRZ	Physical attention routine
$$ABERR1	2311 Data cell ERP
$$ABERR2	2321 Data cell ERP
$$ABERR3	2321 Data cell ERP
$$ABERR4	2321 Data cell ERP
$$ABERR5	2321 Data cell ERP
$$ABERR7	3540 Diskette ERP
$$ABERZ1	Physical attention routine
$$ABERZ2	Physical attention routine
$$BATTF0	FCB load initiation (macro invoked)
$$BATTF1	LFCB Command processor 2
$$BATTF2	LFCB Macro execution (PRT1)
$$BATTF3	LFCB Macro execution (non-PRT1 printers with FCB, excluding the 3800)
$$BATTF4	FCB Load execution (non-PRT1 printers with FCB, excluding the 3800)
$$BATTF5	FCB Load execution (PRT1)

$$BATTNA	Supervisor, program terminator
$$BATTNB	Supervisor, program terminator
$$BATTNC	Supervisor, initiator
$$BATTND	Supervisor, nonresident attention routine
$$BATTNE	Supervisor, nonresident attention routine
$$BATTNF	Supervisor, nonresident attention routine
$$BATTNG	Supervisor, nonresident attention routine
$$BATTNH	Supervisor, nonresident attention routine
$$BATTNQ	Supervisor, nonresident attention routine
$$BATTNR	Supervisor, nonresident attention routine
$$BATTNS	Supervisor, nonresident attention routine
$$BATTNT	Process ALTER statement
$$BATTNU	Process DSPLY statement
$$BATTNV	DUMP command processor
$$BATTNW	DUMP command processor
$$BATTNX	DUMP command print routine
$$BATTNY	Supervisor, nonresident attention routine
$$BATTNZ	Supervisor, nonresident attention routine
$$BATTN2	Display and change dispatching priority
$$BATTN3	SDAID termination routine
$$BATTN5	Storage dump of part of storage specified by two addresses
$$BATTN8	LFCB Command processor 1
$$BATTN9	LUCB Command processor 1
$$BATTU1	LUCB Command processor 2
$$BATTU2	UCB Load execution
$$BCCPT1	System required tape open
$$BCEOV1	Monitor-EOV/EOF
$$BCHKPD	Disk-checkpoint
$$BCHKPE	Disk-checkpoint
$$BCHKPF	Disk-checkpoint
$$BCHKPG	Disk-checkpoint, 3800 record processing
$$BCHKPT	Tape-checkpoint
$$BCHKP2	Tape-checkpoint
$$BCHKP3	Tape-checkpoint, 3800 record processing
$$BCHK3G	Erase gap for logical files
$$BCIS0A	ISAM - CLOSE
$$BCLOSE	Close monitor
$$BCLOSP	Punch file close
$$BCLOS2	Close
$$BCLOS3	Close monitor
$$BCLOS4	Close monitor
$$BCLRPS	Close RPS
$$BCMT01	Tape EOF/EOV input-forward
$$BCMT02	Tape CLOSE-alternate switching
$$BCMT03	Tape CLOSE input-backward
$$BCMT04	Tape EOV output-forward
$$BCMT05	Tape CLOSE
$$BCMT06	Tape CLOSE - work files
$$BCMT07	Tape-alternate switching
$$BCMT08	Tape CLOSE - without work files
$$BDMPBC	Supervisor, program termination and system dump on tape/printer (part 2)
$$BDMPDC	Supervisor, program terminator, and system dump on disk (part 2)
$$BDMPPD	Format supervisor block, disk output
$$BDMPPT	Format supervisor block, tape/printer output
$$BDMPVA	Supervisor, program terminator, and SVA dump
$$BDUMP	Supervisor, program terminator, and system dump monitor
$$BDUMPB	Supervisor, program terminator, and system dump on tape/printer (part 1)
$$BDUMPD	Supervisor, program terminator, and system dump on disk (part 1)
$$BENDFF	ISAM - ENDFL (Load phase 2)
$$BENDFL	ISAM - ENDFL (Load phase 1)
$$BENDQB	Blocks B-transient area for ENQB/DEQB function
$$BEOJ	Supervisor, program terminator
$$BEOJ1	Supervisor, program terminator
$$BEOJ2	Supervisor, program terminator
$$BEOJ2A	Supervisor, program terminator
$$BEOJ3	Supervisor, program terminator
$$BEOJ3A	Supervisor, program terminator
$$BEOJ4	Supervisor, program terminator
$$BEOJ5	Supervisor, program terminator

$$BEOJ7	Supervisor, program terminator
$$BERRTN	System required error recovery
$$BFCB	3211 FCB standard load
$$BFCB00	**3203-4 FCB standard load**
$$BFCB3	3203 FCB standard load
$$BFCB5	5203 FCB standard load
$$BILSVC	Supervisor, program terminator
$$BINDEX	Cylinder index in core (ISAM)
$$BJCOPT	Job Control, OPEN Tape routine
$$BJCOP1	Job Control, OPEN Tape routine
$$BJDUMP	JDUMP indicator
$$BLVTOC	List VTOC (2311, 2314/19, 3330, and 3340)
$$BLSTIO	System control
$$BMSGWR	Tape open/close
$$BMSGW1	Tape open/close
$$BMVKEY	Printlog utility status modifier
$$BOCPM1	System required message writer
$$BOCPM2	System required message writer
$$BOCPRP	System required OPEN for RPS DASD
$$BOCPT1	System required OPEN for input tape (Phase 1)
$$BOCPT2	System required OPEN for unlabeled output tape
$$BOCPT3	System required OPEN for labeled cutput tape
$$BOCPT4	System required OPEN for input tape (Phase 2)
$$BOCP01	System required table, disk DTFs, OPEN Version II
$$BOCP02	System required table, nondisk DTFs, OPEN Version II
$$BOCP03	System required table, unit record, OPEN Version II
$$BOCP11	System required table, tape or disk system DTFs, OPEN Version I
$$BOCP12	System required table, tape system DTFs
$$BOCRTA	CRT task initialization, activation, and deactivation
$$BOCRTB	Hard-copy disk ERP
$$BOCRTC	Message analysis and message transfer to screen buffer
$$BOCRTD	Multiline message transfer to screen buffer
$$BOCRTE	CRT ERP, part 1
$$BOCRTF	CRT ERP, part 2
$$BOCRTG	Redefine message status; output from buffer to screen
$$BOCRTH	Message writer screen to hard-copy file
$$BOCRTK	CRT task activator and operator input check routine
$$BOCRTL	Message deletion by means of K command
$$BOCRTM	Message deletion by means of cursor
$$BOCRTN	K-command handler status definition
$$BOCRTO	Screen line-number handler
$$BOCRTP	Restore function for release
$$BOCRTQ	Screen update
$$BOCRTR	Initialize read
$$BOCRTS	Read/command
$$BOCRTT	Move data
$$BOCRTU	Updating of wraparound pointer in hard-copy file
$$BOCRTV	Cursor positioning in case of error
$$BOCRTW	Message writer
$$BOCRTX	Conversation handler
$$BOCRTY	Multiline message handler
$$BOCRTZ	CRT root phase
$$BOCRT1	Redisplay - supervisor interface
$$BOCRT2	Redisplay - command analysis
$$BOCRT3	Redisplay - read messages from hard-copy file
$$BOCRT4	Redisplay - write to screen
$$BOCRT5	Redisplay - save/restore screen image
$$BOCRT6	Redisplay - command checking

Note: The DOC-support transients ($$BOCRTn) are automatically generated if MODEL=115 or 125 is specified in the CONFG macro. If DOC support is not desired, a DELET statement is required for each transient. If DOC support is required but one or more of the DOC-support transients have been deleted, the system enters a hard wait state.

$$BODACL	Close Routine-DA
$$BODAIM	Overlay phase for ODAIN
$$BODAIN	Direct access input-OPEN (Input)
$$BODAI1	Open input-DA

$$BODAO1	Direct access-OPEN output Phase 1
$$BODAO2	Direct access-OPEN output Phase 2
$$BODAO3	Direct access OPEN-output Phase 3
$$BODAO4	Direct access OPEN-output Phase 4
$$BODARP	Direct access-OPEN RPS Phase 1
$$BODARS	Direct access-OPEN RPS Phase 2
$$BODAU1	Direct access-OPEN
$$BODIO1	Diskette OPEN-input Phase 1
$$BODIO2	Diskette OPEN-output Phase 3
$$BODIO3	Diskette OPEN-output Phase 4
$$BODIO4	Diskette CLOSE-input/output
$$BODIO5	Diskette OPEN-input Phase 3
$$BODIO6	Diskette OPEN-input Phase 4
$$BODIO7	Diskette OPEN-output Phase 5
$$BODIO8	Diskette OPEN-output Phase 6
$$BODMSG	Diskette Message Writer Phase 1
$$BODMS2	Diskette Message Writer Phase 2
$$BODQUE	Dequeue JIBs
$$BODSMO	Diskette security message writer
$$BODSMW	Message writer
$$BODSPQ	Diskette VTOC Display Phase 2
$$BODSPV	Disk VTOC display routine
$$BODSPW	Disk VTOC display routine
$$BODUCP	Diskette DTFCP/DTFDI OPEN
$$BOFLPT	DASD file protect
$$BOISRP	ISAM - OPEN RPS phase
$$BOIS01	ISAM - OPEN I/O Phase 1
$$BOIS02	ISAM - OPEN I/O Phase 2
$$BOIS03	ISAM - OPEN I/O Phase 3
$$BOIS04	ISAM - OPEN I/O Phase 4
$$BOIS05	ISAM - OPEN I/O Phase 5
$$BOIS06	ISAM - OPEN I/O Phase 6
$$BOIS07	ISAM - OPEN I/O Phase 7
$$BOIS08	ISAM - OPEN I/O Phase 8
$$BOIS09	Indexed sequential independent overflow area integrity
$$BOIS10	ISFMS - OPEN
$$BOIS11	ISAM - OPEN
$$BOMRCE	OPEN for OMR and RCE
$$BOMSG1	Message writer - non-abort types
$$BOMSG2	Message writer - abort types
$$BOMSG3-$$BOMSG8	Message writer
$$BOMT0M	Tape OPEN message
$$BOMT0W	Tape OPEN message
$$BOMT01	Tape OPEN input-forward-standard labels (Phase 1)
$$BOMT02	Tape OPEN input-backward-standard labels
$$BOMT03	Tape OPEN output forward-standard label
$$BOMT04	Tape OPEN output-standard labels
$$BOMT05	Tape OPEN I/O-forward/backward nonstandard/unlabeled
$$BOMT06	Tape OPEN work files
$$BOMT07	Tape OPEN input-forward-standard labels (Phase 2)
$$BONVOL	Tape rewriting
$$BOPEN	RMSR tape processor
$$BOPENC	OPENC
$$BOPEND	Disk OPEN volume ID handler
$$BOPENR	Relocation Phase 1
$$BOPENS	Common RPS OPEN initialization routine
$$BOPEN0	3340 DTF device type update phase
$$BOPEN1	Open monitor
$$BOPEN2	Open monitor
$$BOPEN3	Open monitor
$$BOPEN4	Open monitor
$$BOPIGN	Open monitor
$$BOPNLB	Locates system source statement library (for assembler, COBOL, MAINT, and SSERV) or procedure library (for PSERV)
$$BOPNR2	Relocation Phase 2
$$BOPNR3	Relocation Phase 3
$$BOPR3	Open processing for 3800 printer
$$BORTV1	ISAM Open
$$BORTV2	ISAM Open
$$BOSDB1	Support for DLBL blocksize

$$BOSDC1	Sequential disk I/O - CLOSE
$$BOSDC2	Sequential disk-close
$$BOSDC3	Sequential disk-close Part 2
$$BOSDEV	DTFDA and DTFSD Forced End of Volume
$$BOSDI1	Sequential disk input - OPEN
$$BOSDI2	Sequential disk input - OPEN
$$BOSDI3	Sequential disk input - OPEN
$$BOSDI4	Sequential disk input - OPEN
$$BOSDI5	Sequential disk OPEN - update phase
$$BOSDO1	Sequential disk output Phase 1 - OPEN
$$BOSDO2	Sequential disk output Phase 2 - OPEN
$$BOSDO3	Sequential disk output Phase 3 - OPEN
$$BOSDO4	Sequential disk output Phase 4 - OPEN
$$BOSDO5	Sequential disk output Phase 5 - OPEN
$$BOSDO6	Sequential disk open - Phase 6
$$BOSDO7	Sequential disk output - OPEN
$$BOSDO8	Sequential disk output - OPEN
$$BOSDO9	Sequential disk output - OPEN
$$BOSDRP	Sequential disk OPEN-RPS Phase 1
$$BOSDRR	Sequential disk OPEN-RPS Phase 2
$$BOSDRS	Sequential disk OPEN-RPS Phase 3
$$BOSDW1	Sequential disk work files Phase 1 - OPEN
$$BOSDW2	Sequential disk work files Phase 2 - OPEN
$$BOSDW3	Sequential work file Phase 3 - OPEN
$$BOSD00	Sequential disk OPEN - output Phase 0
$$BOSD01	Sequential disk OPEN - output Phase 1
$$BOSD02	Sequential disk OPEN - DLBL extents for 3340
$$BOSD03	Sequential disk OPEN - Output Phase 1
$$BOSIGN	System open
$$BOUR01	Unit record-OPEN routine
$$BOVDMP	Disk VTOC dump
$$BOWDMP	Disk VTOC dump
$$BO2321	OPEN data cell
$$BPCHK	Supervisor - program terminator
$$BPCLOS	Automatic Close for 3800 printer
$$BPDAID	Problem Determination
$$BPDUMP	PDUMP on SYSLST (part 1)
$$BPDMPC	PDUMP on SYSLST (part 2)
$$BPSW	Supervisor - program terminator
$$BRELSE	Device release
$$BRMSG1	Message writer CHKPT-RSTRT
$$BRMSG2	CHECKPOINT-RESTART message writer
$$BRSTRB	Tape Restart
$$BRSTRT	RESTART message writer - Phase 2
$$BRSTR2	Tape and DASD verify for restart
$$BRSTR3	DASD verify for restart
$$BRSTR4	Tape Reposition
$$BSDRUP	Suppress writing on recorder file
$$BSETFF	ISAM load Phase 2 of SETFL
$$BSETFG	ISAM load Phase 3 of SETFL
$$BSETFH	ISAM load Phase 4 of SETFL
$$BSETFI	ISAM Phase of SETFL
$$BSETFL	ISAM load Phase 1 of SETFL
$$BSETL	ISMOD - SETL
$$BSETL1	ISMOD - SETL
$$BSETL2	ISMOD - SETL
$$BSYSWR	Supervisor, nonresident attention
$$BTERM	Supervisor, program terminator
$$BUCB	3211 UCSB standard load
$$BUCB00	3203-4 UCSB standard load
$$BUCB3	3203 UCSB standard load
$$BUCB5	5203 UCSB standard load
$$BUFLDR	3203, PRT1, 5203, and 3800 FCB and UCSB IPL loader
$$BUFLD1	3203, PRT1, 5203, and 3800 FCB IPL loader
$$BUFLD2	FCB and UCSB IPL loader error routine
$$BVSDMP	Highspeed dump
$$B3540I	Diskette OPEN-input Phase 1
$$B3540O	Diskette OPEN-output Phase 1
$$B35400	Diskette OPEN-Phase 0
$$BPDZAP	I/O for PDZAP
$$VOPENT	Common RPS OPEN SVA loading routine

Attention Routines, Initiators, Terminators, and Dumps (AIT)

Standard System Dump

CORE IMAGE LIBRARY

Transients

```
$$BDMPBC
$$BDMPDC
$$BDMPPD
$$BDMPPT
$$BDMPVA
$$BDUMP
$$BDUMPB
$$BDUMPD
$$BJDUMP
$$BPDMPC
$$BPDUMP
```

RELOCATABLE LIBRARY

Modules

```
IJBDMB *
IJBDMBST
IJBDMD *
IJBDMDST
IJBDMPMO *
IJBDMPPD *
IJBDMPPT *
IJBDMPVA *
IJBDUMPS
IJBJDMP *
IJBPDPMO *
IJBPDPST
```

*Modules common to Standard System Dump and Translating System Dump.

Link-Edit Statements

```
   INCLUDE IJBDUMPS
// EXEC LNKEDT
```

Translating System Dump

CORE IMAGE LIBRARY

Transients

```
$$BDMPBC
$$BDMPDC
$$BDMPPD
$$BDMPPT
$$BDMPVA
$$BDUMP
$$BDUMPB
$$BDUMPD
$$BJDUMP
$$BPDMPC
$$BPDUMP
```

RELOCATABLE LIBRARY

Modules

```
IJBDMB *
IJBDMBTR
IJBDMD *
IJBDMDTR
IJBDMPMO *
IJBDMPPD *
IJBDMPPT *
IJBDMPVA *
IJBDUMPT
IJBJDMP *
IJBPDPMO *
IJBPDPTR
```

*Modules common to Standard System Dump and Translating System Dump.

Link-Edit Statements

```
   INCLUDE IJBDUMPT
// EXEC LNKEDT
```

Attention Routines, Initiators, Terminators

CORE IMAGE LIBRARY

Transients

```
$$ABERRZ
$$ABERZ1
$$ABERZ2
$$BATTNA
$$BATTNB
$$BATTNC
$$BATTND
$$BATTNE
$$BATTNF
$$BATTNG
$$BATTNH
$$BATTNQ
$$BATTNR
$$BATTNS
$$BATTNY
$$BATTNZ
$$BATTN2
$$BATTN3
$$BEOJ
$$BEOJS1
$$BEOJS2
$$BEOJ1
$$BEOJ2
$$BEOJ2A
$$BEOJ3
$$BEOJ3A
$$BEOJ4
$$BEOJ5
$$BEOJ7
$$BILSVC
$$BPCHK
$$BPSW
$$BSYSWR
$$BTERM
```

Checkpoint/Restart

CORE IMAGE LIBRARY

Transients

$$BCHKPD
$$BCHKPE
$$BCHKPF
$$BCHKPT
$$BCHKP2
$$BCHK3G
$$BRMSG1
$$BRMSG2
$$BRSTRT
$$BRSTR2
$$BRSTR3
$$BRSTR4

SOURCE STATEMENT LIBRARY

Macro

CHKPT

If RPS is supported see section "RPS Considerations".

Disk Error Recovery Procedures (DKE)

CORE IMAGE LIBRARY

Transients

$$ABERRB
$$ABERR1
$$ABERR2
$$ABERR3
$$ABERR4
$$ABERR5

SOURCE STATEMENT LIBRARY

Macro

SGDSK

Display Operator Console Support (DOC)

CORE IMAGE LIBRARY

Transients

$$BMVKEY
$$BOCRTA
$$BOCRTB
$$BOCRTC
$$BOCRTD
$$BOCRTE
$$BOCRTF
$$BOCRTG
$$BOCRTH
$$BOCRTK
$$BOCRTL
$$BOCRTM
$$BOCRTN
$$BOCRTO
$$BOCRTP
$$BOCRTQ
$$BOCRTR
$$BOCRTS
$$BOCRTT
$$BOCRTU
$$BOCRTV
$$BOCRTW
$$BOCRTX
$$BOCRTY
$$BOCRTZ
$$BOCRT1
$$BOCRT2
$$BOCRT3
$$BOCRT4
$$BOCRT5
$$BOCRT6

SOURCE STATEMENT LIBRARY

Macros

CRTAEX
CRTAWT
CRTGEN
CRTIO
CRTSAV
PUTR

PRINTLOG (Print the Hard-Copy File)

CORE IMAGE LIBRARY

Phases	1
Blocks	5

Phase

PRINTLOG

RELOCATABLE LIBRARY

Modules	1
Blocks	20

Module

IJBPRT

Link-Edit Statements

```
   INCLUDE IJBPRT
// EXEC LNKEDT
```

Tape Error Recovery Procedures (TPE)

CORE IMAGE LIBRARY

Transients

```
$$ABERAB
$$ABERAC
$$ABERAD
$$ABERAE
$$ABERAF
$$ABERAG
$$ABERAH
$$ABERAI
$$RAST07
$$RAST12
```

Phase

```
ESTVUT
```

RELOCATABLE LIBRARY

Module

```
IJBTESUT
```

Link-Edit Statements

```
   INCLUDE IJBTESUT
// EXEC LNKEDT
```

Problem Determination Aids (PDA)

PDAID

CORE IMAGE LIBRARY

Phases

```
PDAIDFTT*
PDAIDFTP*
PDAIDFTW*
PDAIDGTT*
PDAIDGTP*
PDAIDGTW*
PDAIDITT*
PDAIDITP*
PDAIDITW*
PDAIDQTT*
PDAIDQTW*
PDAIDTDP*
PDAIDTDT*
PDAIDVTT*
PDAIDVTW*
```

*Only present in core-image library.

Transients

```
$$BATTNT
$$BATTNU
$$BATTNV
$$BATTNW
$$BATTNX
$$BPDAID
```

RELOCATABLE LIBRARY

Modules

```
IJBPDAID
IJBPDLST
```

Link-Edit Statements

```
// JOB
// OPTION CATAL
   INCLUDE IJBPDAID
// EXEC LNKEDT
   INCLUDE IJBPDLST
// EXEC LNKEDT
/&
```

DUMPGEN

CORE IMAGE LIBRARY

Phase

```
DUMPGEN
```

RELOCATABLE LIBRARY

Module

```
IJBDMPGN
```

Link-Edit Statements

```
   INCLUDE IJBDMPGN
/*
// EXEC LNKEDT
```

SDAID

CORE IMAGE LIBRARY

Phases

```
SDAID
SDAID2
SDPAR
ENDSD
```

Transients

```
$$BSDAID
$$BATIN5
```

RELOCATABLE LIBRARY

Modules

IJBSDAD1
IJBSDAD2
IJBSDEND
IJBSDPAR

Link-Edit Statements

```
// JOB
// OPTION CATAL
   INCLUDE IJBSDLNK
/*
// EXEC LNKEDT
/&
```

LSERV

CORE IMAGE LIBRARY

Phase

LSERV

RELOCATABLE LIBRARY

Module

IJBLSERV

Link-Edit Statements

```
   INCLUDE IJBLSERV
/*
// EXEC LNKEDT
```

CIL Patch Program (PDZAP)

CORE IMAGE LIBRARY

Phase

PDZAP

Transient

$$BPDZAP

RELOCATABLE LIBRARY

Module

IJBPDZAP

Link-Edit Statements

```
// JOB
// OPTION CATAL
   INCLUDE IJBPDZAP
/*
// EXEC LNKEDT
/&
```

Highspeed Standalone Dump

CORE IMAGE LIBRARY

Phase

DOSVSDMP

Transient

$$BVSDMP

RELOCATABLE LIBRARY

Modules

IJBDMPER
IJBDMPHS
IJBDMPMS

Link-Edit Statements

```
// JOB
// OPTION CATAL
   INCLUDE IJBDMPHS
// EXEC LNKEDT
/&
```

Page Data Set Dump

CORE IMAGE LIBRARY

Phase

PDSDM

RELOCATABLE LIBRARY

Module

IJBPDSDM

Link-Edit Statements

```
   INCLUDE IJBPDSDM
/*
// LBLTYP TAPE (see Note)
// EXEC LNKEDT
```

Note: Required only if tape is to be used for intermediate storage of the page data set dump.

Module 2: POWER/VS -- 5745-SC-PWR

2

The information previously provided in this module of the manual has been removed and is now contained in DOS/VS POWER/VS Installation Guide and Reference, GC33-6048.

Module 3: Installation Verification Procedure

3

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Introduction

DOS/VS provides Installation Verification Procedures to enable you to verify the generation of system components. IVP verifies components such as the emulators, which are user-assembled, and system utilities.

The IVP consists of a set of macros (containing the verification procedures) which are distributed, along with the DOS/VS system, on the IBM-supplied distribution medium. Towards the end of system generation, after having deleted any unwanted DOS/VS system components and having generated the components you require for verification, you should perform the installation verification procedure.

The verification procedures are generated by assembling the IVPGEN macro. A number of parameters specify the optional SCP functions selected for verification, in addition to the standard functions which are included automatically. The standard functions are not included if you are running the program again to verify one or more functions only (indicated by the parameter RERUN=YES in the IVPGEN macro). For a complete description of the parameters of the IVPGEN macro refer to the section entitled "IVPGEN Parameters".

The Standard SCP Functions

ABD - The ABEND Dump (part of program 5745-SC-AIT)
ASL - The assembler librarian Edit/De-Edit routines (part of the assembler program 5745-SC-ASM)
UTL - The system utilities Disk-Only functions. Card, tape, and data cell functions are configuration dependent and optional (part of program 5745-SC-UTL).

The Optional SCP Functions

CAP - Cataloged procedures
EMA - System/370 Emulator for IBM 1401/1440/1460 } Available only as
EMB - System/370 Emulator for IBM 1410/7010 } independent release
E20 - System/360 Model 20 Emulator
OLT - OLTEP
PWR - POWER/VS

IVP Books

The separate parts that make up each verification procedure are contained in one or more pre-edited source statement library macro books.

IVPGEN-Stage I -- Assembly

IVPGEN is a two-stage process. In stage I, the IVPGEN macro calls in the control books of the standard and selected SCP functions. The generated job stream (input for stage II) is SYSPCH output. **You may assign SYSPCH to a card punch, a magnetic tape unit, a disk extent, or a diskette. If, however, parameters UTL=YES and PCHADDR are both specified, you may assign SYSPCH to a card punch only. For cardless systems, do not specify PCHADDR if you specify UTL=YES.**

If SYSPCH is assigned to a card punch, you must remove the punched deck (output of stage I) from the stacker and put it in a card reader as input to stage II (IVP execution). The last card (an object END card) of the deck must be removed.

If SYSPCH is assigned to either tape, disk, or diskette there is an automatic transition from stage I to stage II provided that the required job control statements are punched (see Figure 3-1).

At the very beginning of system generation, you can assemble the IVPGEN macro with the option VERIFY=YES, under control of the IBM-supplied supervisor. This will provide you with a diagnostic of the specified parameters. It also provides you (if specified in the IVPGEN assembly) with a job stream to delete the unused IVP books.

This job can be run to free up space in the source statement library. The advantage of specifying VERIFY=YES is that you have ample time to correct any specification errors before the IVP procedure is actually performed at the end of system generation.

IVPGEN-Stage II -- Execution

Before it actually starts executing the verification, stage II successively performs

- LISTIO ALL to display (on SYSLST) all the devices that are supported
- MAP to display (on SYSLOG) the sizes of the partitions assigned
- DSERV of all the assigned libraries to display in alphabetical order (on SYSLST) the names of all the transients, phases, modules, macros, and (optionally) procedures, that the system comprises.

IVPGEN Parameters

A. Component Dependent

ABD={YES / NO}	The ABEND dump IVP is always automatically generated (YES is forced) unless RERUN=YES is specified in which case ABD=NO is the default
ASL={YES / NO}	The display, verify, replace, and delete capabilities of the ESERV program are automatically verified (YES is forced) unless RERUN=YES is specified, in which case the default for ASL is NO.
CAP={NO / YES}	Specify if Cataloged Procedures Support is to be verified.
EMA={NO / YES}	Specify if the DOS/VS 1401/1440/1460 Emulator program is to be verified.
EMANAME=name	Specify the phase name of the user-generated 1401/1440/1460 emulator program.
EMATA=cuu	Device address of the tape unit assigned to 1400 tape unit 1. Specify only if tape functions are to be verified.
EMATSN=SYSnnn	Name of the logical unit assigned to 1400 tape unit 1. Specify only if tape functions are to be verified.
EMATYPE={1401 / 1401G / 1440}	Specify the type of verification procedure to be selected. Refer to the section entitled "EMA-1401/1440/1460 Emulator" for a detailed description of the EMATYPE operands.
EMACCS={NO / YES}	Specify if CS control cards support is required in the user-generated 1401/1440/1460 emulator program (CTLCARD=CS in the emulator EMSUP macro instruction).
EMP={NO / YES}	Specify if the DOS/VS 1410/7010 Emulator program is to be verified.
EMPNAME=name	Specify the phase name of the user-generated 1410/7010 emulator program.
EMPTA=cuu	Device address of the tape unit assigned to 1400 tape unit 1, channel 1. Specify only if tape functions are to be verified.
EMBTSN=SYSnnn	Name of the logical unit assigned to 1400 tape unit 1, channel 1. Specify only if tape functions are to be verified.
E20={NO / YES}	Specify if the System/360 Model 20 Emulator program generation is to be verified.
E20NAME=name	Specify the phase name of the user-generated System/360 Model 20 Emulator program.
OLT={NO / YES}	Specify if the IVP job for OLTEP is to be generated.

A. Component Dependent (continued)

PWR={NO / YES}	Specify if the IVP job for POWER/VS is to be generated.
UTL={YES / NO}	The disk functions of the system utilities are automatically verified (YES is forced) unless RERUN=YES is specified in which case the default for UTL is NO.
UTLDA=(cuu,cuu)	Specify the disk device addresses of two work disks for use by the disk functions of the system utilities.
UTLDRT=nnnn	Disk extent relative track number of a one-track work space on the disk work volumes.
UTLDT={3330 / nnnn}	Specify the device type of the two work disks.
UTLDV=(nnnnnn,mmmmmm)	Specify the volume serial numbers of the two work disks in the same order as specified by the UTLDA parameter.
UTLT={NO / YES}	Specify if the tape functions of the system utilities are to be verified.
UTLTA=cuu	Specify the device address of the tape drive on which a work tape is to be mounted.
UTLTM={C0 / mm}	Specify the tape device mode. If this parameter is omitted, a 9-track, 1,600 BPI tape is assumed.
UTLZ={NO / YES}	Specify if the data cell functions of the system utilities are to be verified.
UTLZA=cuu	Specify the device address of the data cell drive that contains a work cell to be used by the Installation Verification Program.
UTLZCN=n	Specify the number of the work data cell.
UTLZRT=nnnn	Specify the data cell extent relative track number of a one-track work space on the data cell work volume.

B. Component Independent

DELUNSD={YES / NO}	Specify if a delete job is to be generated for those IVP books that are not used in this assembly of the IVPGEN macro.
DELUSED={NO / YES}	Specify if a delete job is to be generated for all the IVP books that are used in this assembly of the IVPGEN macro.
IPTADDR={00C / cuu}	Device address of the system input device. SYSRDR and SYSIPT will be reset to this address after completion of IVP stage II.
LSTADDR={00E / cuu}	Device address of the system printer during the execution of IVP stage II.
PCHADDR=cuu	Device address of the system card punch during the execution of IVP stage II. If no verification of disk-to-card functions of the system utilities is desired, this parameter should not be specified. For cardless systems, PCHADDR must be omitted.
RERUN={NO / YES}	Specify YES if this IVP is a rerun. A rerun can be performed if one or more SCP functions are to be verified again. If RERUN=YES is specified, a default of NO is taken for ABD, ASL, and UTL.
VERIFY={NO / YES}	Specification of YES causes a diagnostic to be made without generation of an IVP stage II job stream. In this case, the only job that is generated is the delete job for the unused IVP books (if DELUNSD=YES).

IVP STAGE I INPUT -- CREATION OF IVP STAGE II JOBSTREAM

In cards

```
// JOB IVPSTG1
   LOG
// OPTION DECK
// EXEC ASSEMBLY
   IVPGEN selected parameters
   END
/*
/&
```

On tape

```
// JOB IVPSTG1
   LOG
// PAUSE "OPERATOR PLEASE MOUNT A SCRATCH TAPE ON UNIT X'cuu'"
   MTC REW,X'cuu'
ASSGN SYSPCH,X'cuu' Assign SYSPCH to tape
// OPTION DECK
// EXEC ASSEMBLY
   IVPGEN selected parameters
   END
/*
CLOSE SYSPCH,X'00D' Close SYSPCH and reset to standard assignment
// PAUSE OPERATOR PLEASE MOUNT TAPE ON UNIT X'cuu' AGAIN
ASSGN SYSIN,X'cuu' Set to address of tape unit
/&
```

On disk or diskette

```
// JOB IVPSTG1
   LOG
// DLBL IJSYSPH,'IVP STAGE II JOBSTREAM'     Stage 1 output
// EXTENT SYSPCH,nnnnnn,,,nnnn,nnnn          (see Note)
// DLBL IJSYSIN,'IVP STAGE II JOBSTREAM'     Stage 2 input
// EXTENT SYSIN,nnnnnn,,,nnnn,nnnn           (see  Note)
ASSGN SYSPCH,X'cuu' Assign SYSPCH to disk
// OPTION DECK
// EXEC ASSEMBLY
   IVPGEN selected parameters
   END
/*
CLOSE SYSPCH,X'00D' Close SYSPCH and reset to standard assignment
ASSGN SYSIN,X'cuu' Set to disk address
/&
```

Note: The extent information and volume sequence numbers in the two EXTENT statements must be identical.

Figure 3-1. Example of IVP Stage I Job Control Statements

PREPARING THE IVP JOB STREAM

Setup Requirements

SYS001, SYS002, SYS003, and SYSLNK must be assigned to disk work extents.

If SYSPCH is assigned to a disk device, the allocated extent must be at least 4 cylinders on a 2316 disk pack, 3 cylinders on a 3336 disk pack, 7 cylinders on a 3348 data module, or 2 cylinders on the disk pack of a 3350 direct access storage.

A minimum of 14K bytes of real storage must be allocated to the partition in which the IVP jobs are to be executed. If POWER/VS functions are to be verified at the same time, add the storage requirements for POWER/VS to the allocated real and virtual storage. These requirements are given in DOS/VS POWER/VS Installation Guide and Reference GC33-6048.

Operating Instructions

Prepare the following job control statements:

Step 1

```
// JOB ASSEMBLE IVPGEN
// ASSGN SYSPCH,X'cuu' (can be card, tape, disk, or diskette)
// ASSGN SYS001,X'cuu' work file
// ASSGN SYS002,X'cuu' work file
// ASSGN SYS003,X'cuu' work file
// EXEC ASSEMBLY
   IVPGEN (selected parameters)
   END
/*
/&
```

Step 2

If SYSPCH is assigned to a card punch, remove the last card from the deck. This is the (object) END statement, which cannot be processed by Job Control. Put the remaining cards in the hopper of the reader, assigned to SYSIN. Press START and EOF. IVP stage II will now be executed.

Step 3

If SYSPCH is assigned to tape, disk, or diskette, close SYSPCH (if SYSPCH was assigned to tape, ready the tape device again) and assign SYSIN to the same tape, disk or diskette device. This will start the execution of IVP stage II.

Stage II successively executes a:

```
LISTIO ALL        to display (on SYSLST) all the devices supported.
MAP               to display (on SYSLOG) the partition sizes assigned.
DSERV DSPLYS ALL  to provide a sorted printout of the library directories.
```

Furthermore, stage II performs the standard IVP functions that is verification of the ABEND dump, of the Assembler and Utility Programs, and of all optional functions selected. It also produces the delete jobs for used and/or unused IVP books (if specified).

ABD - The ABEND Dump

The ABD function forces an abnormal end-of-job condition. A real storage dump is printed on SYSLST.

ASL

This IVP function verifies the display and update capabilities of the ESERV program.

Example of SYSLOG Output

```
BG // JOB IVPASL    TEST ESERV
   DATE 11/04/73, CLOCK 07/22/56
BG * ************************************************************************
BG * IDENTIFICATION : ESERV PROGRAM
BG * PURPOSE : TO SHOW THE DISPLAY AND UPDATE CAPABILITYS OF ESERV
BG * FUNCTIONS TESTED : DISPLAY, VERIFY, REPLACE, DELETE
BG * SET UP REQUIREMENTS : SYS002 MUST BE ASSIGNED
BG *                       TO DISK, SYSLST MUST BE ASSIGNED
BG * NORMAL COMPLETION MESSAGES : * IVPASL COMPLETED ++++++++++++++++++++
BG *                               LISTING CONTAINS INSTRUCTIONS ON HOW TO
BG *                               CHECK FOR SUCCESSFUL EXECUTION
BG * MODULES TESTED/USED : IPKAD, IPKVA, IPKVD, IPKVE, IPKVF,
BG *                       IPKVG, IPKVI, IPKVK, IPKVM
BG * INPUT DESCRIPTION : TWO DSPLY CONTROL CARDS, THE SECOND
BG *                     FOLLOWED BY ) COL., ) VER, ) REP, ) DEL
BG *                     AND ) END CARDS, AN EDITED MACRO
BG *                     ( IVPASLS ) IN THE E SUBLIBRARY
BG * OUTPUT DESCRIPTION : A DISPLAY OF IVPASLS, A DISPLAY OF IVPASLS,
BG *                       UPDATED BY THE ) REP CARDS, AN UPDATE SURVEY
BG *  ************************************************************************
BG * IVPASL COMPLETED ++++++++++++++++++++++++
BG EOJ IVPASL
   DATE 11/04/73, CLOCK 07/24/59, DURATION 00/02/02
BG 1C00A ATTN. 0 0C.
BG
```

Example of SYSLST Output

```
// JOB IVPASL      TEST ESERV                              DATE 11/04/73,CLOCK 07/22/56
* ************************************************************************************
* IDENTIFICATION: ESERV PROGRAM
* PURPOSE: TO SHOW THE DISPLAY AND UPDATE CAPABILITYS OF ESERV
* FUNCTIONS TESTED: DISPLAY, VERIFY, REPLACE, DELETE
* SET UP REQUIREMENTS: SYS001, SYS002 MUST BE ASSIGNED
*                      TO DISK, SYSLST MUST BE ASSIGNED
* NORMAL COMPLETION MESSAGES: * IVPASL COMPLETED ++++++++++++++++++++
*                             LISTING CONTAINS INSTRUCTIONS ON HOW TO
*                             CHECK FOR SUCCESSFUL EXECUTION
* MODULES TESTED/USED: IPKAD,IPKVA,IPKVD,IPKVE,IPKVF,
*                      IPKVG,IPKVI,IPKVK,IPKVM
* INPUT DESCRIPTION: TWO DSPLY CONTROL CARDS, THE SECOND
*                    FOLLOWED BY ) COL, ) VER, ) REP, ) DEL
*                    AND ) END CARDS, AN EDITED MACRO
*                    (IVPASLS) IN THE E SUBLIBRARY
* OUTPUT DESCRIPTION: A DISPLAY OF IVPASLS, A DISPLAY OF IVPASLS,
*                     UPDATED BY THE ) REP CARDS, AN UPDATE SURVEY
* ************************************************************************************
// EXEC ESERV
```

DSPLY F.IVPASLS

E.IVPASLS 75/01/06

```
          CATALS A.IVPASLS
1         MACRO                                                          00000000
2  IVPASLS &PP1,&PP2,&PP3,&PP4,&PP5,&PP6,                               X
3                &KW1=,&KW2=,&KW3=
4  * DISK OPERATING SYSTEM                                              00250000
5  * IVPASLS  -  5745-SC-ASM  -  RELEASE 28.0                           00300000
6  * /* START OF SPECIFICATIONS *********************************      00310000
7  *                                                                    00320000
8  *01* MODULE-NAME = IVPASLS                                          00330000
9  *                                                                    00340000
10 *01* DESCRIPTIVE NAME = INSTALLATION VERIFICATION PROCEDURE          00342000
11 *                       TEST PROGRAM FOR ESERV PROGRAM              00344000
12 *                       -SOURCE BOOK-                               00346000
13 *                                                                   00348000
14 *01* FUNCTION = AS FOLLOWS.                                         00348100
15 *    THIS MACRO IS USED AS INPUT TO THE ESERV PROGRAM IN THE        00348200
16 *    INSTALLATION VERIFICATION PROCEDURE (IVP). TO CHECK THAT       00348600
17 *    THE IVP WAS SUCCESSFUL, COMPARE THE TWO DISPLAYS OF THIS       00349000
18 *    MACRO THE IVP PRINTS. THEY OUGHT TO BE EQUAL, EXCEPT           00349100
19 *    FOR TWO STATEMENTS. THE STATEMENT NUMBER 007500                00349200
20 *             AIF   (T'&PP2 EQ '0').TWO                             00350900
21 *    IN THE FIRST DISPLAY WILL BE CHANGED TO -                      00352900
22 *             AIF   (T'&PP2 EQ '0').THREE                           00355000
23 *    IN THE SECOND DISPLAY. THE STATEMENT NUMBER 014000             00356800
24 *             MNOTE ' VALUE OF &&PP5 IS &PP6'                       00357200
25 *    IN THE FIRST DISPLAY WILL BE DELETED IN THE SECOND DISPLAY     00357600
26 *                                                                   00360900
27 *01* NOTES = CHANGE ACTIVITY                                        00361500
28 *    @ DENOTES CHANGE ACTIVITY FLAGS. D IS SYSTEM IDENTIFIER        00361900
29 *    FOR DOS. MEANING OF THE THIRD CHARACTER IS: A = APAR,          00364000
30 *    M = PTM, L = NEW DEVELOPMENT. ALL OTHER CHARACTERS ARE         00366100
31 *    FOR IBM INTERNAL USE.                                          00368200
32 *                                                                   00370300
33 *01* CHANGE ACTIVITY = AS FOLLOWS.                                  00372400
34 *    CHANGE DESCRIPTIONS.                                           00374500
35 *    NEW MODULE - FIRST RELEASE 28.                    @DL28301     00376600
36 *                                                                   00378600
37 * /* END OF SPECIFICATIONS ***********************************      00380600
38  GBLA &GBLA
39  GBLB &GBLB
40  GBLC &GBLC
41  LCLA &LCLA
42  LCLB &LCLB
43  LCLC &LCLC
44 .ONE    ANOP
45         AIF   (T'&PP1 EQ '0').TWO                                   00650000
46 &GBLA   SETA  &PP1                                                  00700000
47 .TWO    ANOP
48         AIF   (T'&PP2 EQ '0').TWO                                   00750000
49 &GBLB   SETB  (1)                                                   00800000
50 .THREE  ANOP
51         AIF   (T'&PP3 EQ '0').FOUR                                  00850000
52 &GBLC   SETC  '&PP3'                                                00900000
```

E.IVPASLS 75/01/06

```
53 .FOUR   ANOP
54         AIF   (T'&KW1 EQ '0').FIVE                                  00950000
55 &LCLA   SETA  &KW1                                                  01000000
56 .FIVE   ANOP
57         AIF   (T'&KW2 EQ '0').SIX                                   01050000
58 &LCLB   SETB  (1)                                                   01100000
59 .SIX    ANOP
60         AIF   (T'&KW3 EQ '0').SEVEN                                 01150000
61 &LCLC   SETC  '&KW3'                                                01200000
62 .SEVEN  ANOP
63         AIF   (T'&PP4 EQ '0').EIGHT                                 01250000
64         MNOTE ' VALUE OF &&PP4 IS &PP4'                             01300000
65 .EIGHT  ANOP
66         AIF   (T'&PP5 EQ '0').NINE                                  01350000
67         MNOTE ' VALUE OF &&PP5 IS &PP5'                             01360000
68 .NINE   ANOP
69         AIF   (T'&PP6 EQ '0').TEN                                   01370000
70         MNOTE ' VALUE OF &&PP5 IS &PP6' THIS STATEMENT WILL BE DELETED 01400000
71         MNOTE ' VALUE OF &&PP6 IS &PP6'                             01450000
72 .TEN    ANOP
73         AIF   (NOT &GBLB AND NOT &LCLB).ELEVEN                      01500000
74         MNOTE ' VALUE OF &&PP2+&&KW2 IS &PP2+&KW2'                  01550000
75 .ELEVEN ANOP
76         MNOTE ' &&PP2 AND/OR &&KW2 NOT SPECIFIED'                   01600000
77         MEND                                                        01750000
```

DSPLY F.IVPASLS

E.IVPASLS 75/01/06

```
          CATALS A.IVPASLS
 1        MACRO                                                          00000000
 2  IVPASLS &PP1,&PP2,&PP3,&PP4,&PP5,&PP6,                              X
 3                &KW1=,&KW2=,&KW3=
 4 * DISK OPERATING SYSTEM                                              00250000
 5 * IVPASLS  -  5745-SC-ASM  -  RELEASE 28.0                           00300000
 6 * /* START OF SPECIFICATIONS **********************************      00310000
 7 *                                                                    00320000
 8 *01* MODULE-NAME = IVPASLS                                           00330000
 9 *                                                                    00340000
10 *01* DESCRIPTIVE NAME = INSTALLATION VERIFICATION PROCEDURE          00342000
11 *                       TEST PROGRAM FOR ESERV PROGRAM               00344000
12 *                       -SOURCE BOOK-                                00346000
13 *                                                                    00348000
14 *01* FUNCTION = AS FOLLOWS.                                          00348100
15 *    THIS MACRO IS USED AS INPUT TO THE ESERV PROGRAM IN THE         00348200
16 *    INSTALLATION VERIFICATION PROCEDURE (IVP). TO CHECK THAT        00348600
17 *    THE IVP WAS SUCCESSFUL, COMPARE THE TWO DISPLAYS OF THIS        00349000
18 *    MACRO THE IVP PRINTS. THEY OUGHT TO BE EQUAL, EXCEPT            00349130
19 *    FOR TWO STATEMENTS. THE STATEMENT NUMBER 007500                 00349200
20 *            AIF   (T'&PP2 EQ 'O').TWO                               00350900
21 *    IN THE FIRST DISPLAY WILL BE CHANGED TO -                       00352900
22 *            AIF   (T'&PP2 EQ 'O').THREE                             00355000
23 *    IN THE SECOND DISPLAY. THE STATEMENT NUMBER 014000              00356800
24 *            MNOTE ' VALUE OF &&PP5 IS &PP6'                         00357200
25 *    IN THE FIRST DISPLAY WILL BE DELETED IN THE SECOND DISPLAY      00357600
26 *                                                                    00360900
27 *01* NOTES = CHANGE ACTIVITY                                         00361500
28 *    @ DENOTES CHANGE ACTIVITY FLAGS. D IS SYSTEM IDENTIFIER         00361900
29 *    FOR DOS. MEANING OF THE THIRD CHARACTER IS: A = APAR,           00364000
30 *    M = PTM, L = NEW DEVELOPMENT. ALL OTHER CHARACTERS ARE          00366100
31 *    FOR IBM INTERNAL USE.                                           00368200
32 *                                                                    00370300
33 *01* CHANGE ACTIVITY = AS FOLLOWS.                                   00372400
34 *    CHANGE DESCRIPTIONS.                                            00374500
35 *    NEW MODULE - FIRST RELEASE 28.                    @DL28301      00376600
36 *                                                                    00378600
37 * /* END OF SPECIFICATIONS **********************************       00380600
38  GBLA &GBLA
39  GBLB &GBLB
40  GBLC &GBLC
41  LCLA &LCLA
42  LCLB &LCLB
43  LCLC &LCLC
44 .ONE     ANOP
45          AIF   (T'&PP1 EQ 'O').TWO                                   00650000
46 &GBLA    SETA  &PP1                                                  00700000
47 .TWO     ANOP
48          AIF   (T'&PP2 EQ 'O').THREE
49 &GBLB    SETB  (1)                                                   00800000
50 .THREE   ANOP
51          AIF   (T'&PP3 EQ 'O').FOUR                                  00850000
52 &GBLC    SETC  '&PP3'                                                00900000
```

E.IVPASLS 75/01/06

```
53 .FOUR    ANOP
54          AIF   (T'&KW1 EQ 'O').FIVE                                  00950000
55 &LCLA    SETA  &KW1                                                  01000000
56 .FIVE    ANOP
57          AIF   (T'&KW2 EQ 'O').SIX                                   01050000
58 &LCLB    SETB  (1)                                                   01100000
59 .SIX     ANOP
60          AIF   (T'&KW3 EQ 'O').SEVEN                                 01150000
61 &LCLC    SETC  '&KW3'                                                01200000
62 .SEVEN   ANOP
63          AIF   (T'&PP4 EQ 'O').EIGHT                                 01250000
64          MNOTE ' VALUE OF &&PP4 IS &PP4'                             01300000
65 .EIGHT   ANOP
66          AIF   (T'&PP5 EQ 'O').NINE                                  01350000
67          MNOTE ' VALUE OF &&PP5 IS &PP5'                             01360000
68 .NINE    ANOP
69          AIF   (T'&PP6 EQ 'O').TEN                                   01370000
70          MNOTE ' VALUE OF &&PP6 IS &PP6'                             01450000
71 .TEN     ANOP
72          AIF   (NOT &GBLB AND NOT &LCLB).ELEVEN                      01500000
73          MNOTE ' VALUE OF &&PP2+&&KW2 IS &PP2+&KW2'                  01550000
74 .ELEVEN  ANOP
75          MNOTE ' &&PP2 AND/OR &&KW2 NOT SPECIFIED'                   01600000
76          MEND                                                        01750000
```

```
E.IVPASLS                                                                                                    75/01/06

UPDATE SURVEY
) COL 73,6
) VER 003000
* IVPASLS  -  5745-SC-ASM  -  RELEASE 28.0                                                    ....VERIFY CARD
* IVPASLS  -  5745-SC-ASM  -  RELEASE 28.0                                  00300000          ....ACTUAL STMT
) VER 007000+1,8
.TWO                                                                                         ....VERIFY CARD
.TWO     ANOP                                                                                ....ACTUAL STMT
) REP 007500
         AIF   (T'&PP2 EQ 'O').TWO                                         00750000          ....DELETED
         AIF   (T'&PP2 EQ 'O').THREE                                                         ....ADDED
) DEL 014000
         MNOTE ' VALUE OF &&PP5 IS &PP6' THIS STATEMENT WILL BE DELETED 01400000          ....DELETED
) END

END OF UPDATE SURVEY



               /*

THIS TERMINATES THE ESERV PROCESSING



* IVPASL COMPLETED +++++++++++++++          DATE 11/04/73,CLOCK 07/24/59,DURATION 00/02/02
EOJ IVPASL



STOP
```

CAP - Cataloged Procedures

This function verifies the cataloging of a prccedure into the procedure library and its subsequent execution.

Setup Requirements

A procedure library must be allocated. Eight or more unused blocks must be available in the member space.

Example of SYSLOG Output

```
BG // JOB IVPCAP1
   DATE 11/04/73, CLOCK 07/14/36
BG * ************************************************************
BG * IDENTIFICATION :  IVPCAP1
BG * PURPOSE :  CATALOGING OF A PROCEDURE
BG * FUNCTIONS TESTED : CATALP
BG * SET UP REQUIREMENTS : SYSTEM WITH PROCEDURE
BG * LIBRARY WITH MORE THEN SIX UNUSED BLOCKS IN MEMBER SPACE
BG * MODULES TESTED :  MAINT
BG * OUTPUT DESCRIPTION : SYSTEM STATUS REPORT PRODUCED
BG * BY $LIBSTAT
BG * ************************************************************
BG EOJ IVPCAP1
   DATE 11/04/73, CLOCK 07/16/20, DURATION 00/01/43
BG // JOB IVPCAP2
   DATE 11/04/73, CLOCK 07/16/28
BG * ************************************************************
BG * IDENTIFICATION : IVPCAP2
BG * PURPOSE : EXECUTION OF A CATALOGUED PROCEDURE
BG * FUNCTIONS TESTED : EXECUTION OF CATALOGUED PROCEDURE IVPCAP1
BG * WHEREBY AN ASSEMBLED PROGRAM IS ASSEMBLED,
BG * LINK EDITED, TEMPORARILY CATALOGUED INTO
BG * THE CORE IMAGE LIBRARY AND EXECUTED
BG * SET UP REQUIREMENTS : SYSLNK, SYS001, SYS002, SYS003 MUST BE
BG * ASSIGNED
BG * MODULES TESTED : JOB CONTROL
BG * OUTPUT DESCRIPTION : PRINTING OF DATA LIST
BG * ************************************************************
BG * BEGIN OF PROCEDURE
BG * END OF PROCEDURE
BG EOP IVPCAP1
BG IVPCAP1  STARTED ++++++++++++++++++++++
BG IVPCAP1 COMPLETED SUCCESSFULLY ++++++++++++++++++++++++
BG EOJ IVPCAP2
   DATE 11/04/73, CLOCK 07/20/29, DURATION 00/03/59
BG // JOB IVPCAP3
   DATE 11/04/73, CLOCK 07/20/36
BG * DELETE IVPCAP1 FROM PROCEDURE LIBRARY
BG EOJ IVPCAP3
   DATE 11/04/73, CLOCK 07/21/17, DURATION 00/00/41
BG 1C00A ATTN. 0 0C.
BG
```

Example of SYSLST Output

```
// JOB IVPCAP1                                                     DATE 04/19/74,CLOCK 09/28/22
* ***********************************************************
* IDENTIFICATION: IVPCAP1
* PURPOSE: CATALOGING OF A PROCEDURE
* FUNCTIONS TESTED: CATALP
* SET UP REQUIREMENTS: SYSTEM WITH PROCEDURE
* LIBRARY WITH MORE THAN SIX UNUSED BLOCKS IN MEMBER SPACE
* MODULES TESTED: MAINT
* OUTPUT DESCRIPTION: SYSTEM STATUS REPORT PRODUCED
* BY $LIBSTAT
* ***********************************************************
// EXEC MAINT


   CATALP IVPCAP1

STATUS REPORT                          DATE: 10/28/76                    TIME: 14.44
                        STARTING      NEXT          LAST      DIRECTORY        LIBRARY BLOCKS         COND.  DIR.TRACKS
                        ADDRESS       ENTRY         ENTRY     ENTRIES                                 LIMIT  OR LIBRARY
                        C  H  R     C  H  R  E    C  H  R  E   ACTIVE  ALLOCTD ACTIVE DELETD AVAIL   BLOCKS CYLINDERS


SYSRES VOL.SER.111111
PROCEDURE   DIRECTORY   194 00 01   194 00 11 08   194 04 44 09   103                                                 5
            LIBRARY     194 05 01   195 01 20      197 18 61                4326     929      0   3397       0        4


// EXEC PSERV


IVPCAP1     VERSION 0.0        7      BLOCKS      PROCEDURE LIBRARY

            *  BEGIN OF PROCEDURE
            // OPTION LINK
            // EXEC ASSEMBLY
             ENTRY
            // EXEC LNKEDT
            *  END OF PROCEDURE
            /+


EOJ IVPCAP1                                                       DATE 04/19/74,CLOCK 09/28/35,DURATION 00/00/13




// JOB IVPCAP2                                                      DATE 04/19/74,CLOCK 09/28/37
* ***********************************************************
* IDENTIFICATION: IVPCAP2
* PURPOSE: EXECUTION OF A CATALOGUED PROCEDURE
* FUNCTIONS TESTED: EXECUTION OF CATALOGUED PROCEDURE IVPCAP1
* WHEREBY AN ASSEMBLER PROGRAM IS ASSEMBLED,
* LINK EDITED, TEMPORARILY CATALOGUED INTO
* THE CORE IMAGE LIBRARY AND EXECUTED
* SET UP REQUIREMENTS: SYSLNK,SYS001,SYS002,SYS003 MUST BE
* ASSIGNED
* MODULES TESTED: JOB CONTROL
* OUTPUT DESCRIPTION: PRINTING OF DATA LIST
* ***********************************************************
// EXEC PROC=IVPCAP1
*  BEGIN OF PROCEDURE
// OPTION LINK
// EXEC ASSEMBLY
```

```
SYMBOL    TYPE          ID  ADDR   LENGTH LD-ID

TEST      SD (CSECT)    01 007D00 0001C0
IJDFZZZZ  ER (EXTRN)    02
IJDFZZZZ  SD (CSECT)    03 000000 000028
IJCFZIZ0  ER (EXTRN)    04
```

DUMMY SECTION DICTIONARY

```
SYMBOL    ID LENGTH

IJDPD012  FF 000030
```



```
  LOC  OBJECT CODE    ADDR1 ADDR2  STMT   SOURCE STATEMENT                    DOS/VS ASSEMBLER REL 30.0 09.29 74-04-19

007D00                            1 TEST     START  32000
                                  2          IVPCAPS
                                  3** IVPCAPS  -  5754-SC-LBR  -  RELEASE 28.0                                  04000028
                                  4**                                                                           05000028
                                  5** /* START OF SPECIFICATIONS ***************************************** 06000028
                                  6**                                                                           07000028
                                  7**01* MODULE-NAME=IVPCAPS                                                    08000028
                                  8**                                                                           09000028
                                  9**01* DESCRIPTIVE-NAME=INSTALLATION VERIFICATION PROCEDURE                    10000028
                                 10**                      TEST FOR CATALOGUED PROCEDURES                     11000028
                                 11**                                                                         12000028
                                 12**01* NOTES = CHANGE ACTIVITY                                              13000028
                                 13**    @ DENOTES CHANGE ACTIVITY FLAG. D IS SYSTEM  IDENTIFIER FOR DOS.     14000028
                                 14**    MEANING OF THE THIRD CHARACTER IS  - A=APAR,M=PTM, I=NEW             15000028
                                 15**    DEVELOPMENT. OTHER CHARACTERS ARE FOR IBM INTERNAL USE.              16000028
                                 16**                                                                         17000028
                                 17**01* CHANGE ACTIVITY = AS FOLLOWS                                         18000028
                                 18**    CHANGE DESCRIPTIONS                                                  19000028
                                 19**    NEW MODULE - FIRST RELEASE 28                                        20000028
                                 20**    WRONG SEARCH IN PCIL                                                 21000028
                                 21**                                                                         22000028
                                 22**** END OF SPECIFICATIONS *****************************************/    23000028
007D00 05A0                      23+START   BALR  10,0                                                        24000028
                         07D02   24+        USING *,10                                                        25000028
007D02 41B0 A0D8         07DDA   25+        LA    REG,TYPECCB                                                 26000028
                                 26** SUPVR COMMN MACOS - EXCP - 5745-SC-SUP - REL. 28.0                      15050028
007D06 181B                      27+        LR    1,REG                                                       50000025
007D08 0A0C                      28+        SVC   0                                                        EM 55010028
                                 29** SUPERVISOR - WAIT - 5745-SC-SUP - REL. 28.0                             12000028
007D0A 181B                      30+        LR    1,REG                                                       39000025
007D0C 9180 1002         00002   31+        TM    2(1),X'80'                                                  54000025
007D10 4710 A014         07D16   32+        BO    **+6                                                        57000025
007D14 0A07                      33+        SVC   7                                                           60000025
                                 34** IOCS - OPEN - 5745-SC-IOX - REL 28.0                                   12000028
007D16 0700                      35+        CNOP  0,4                                                         20000025
007D18                           36+        DC    0F'0'                                                       22000025
007D18 4110 A1A6         07EA8   37+        LA    1,=C'$$BOPEN '                                              46000025
007D1C 4500 A026         07D28   38+IJJ00004    BAL 0,**4+4*(3-1)                                           54000025
007D20 00007DA8                  39+        DC    A(INPUT)                                                    64000025
007D24 00007D78                  40+        DC    A(OUTPUT)                                                   64000025
007D28 0A02                      41+        SVC   2                                                           74000025


                                 43** IOCS - GET - 5745-SC-IOX - REL 29.0                                    12000029
007D2A 5810 A1B6         07EB8   44+LABEL   L     1,=A(INPUT)              GET DTF TABLE ADDRESS            42000025
007D2E 58F1 0010         00010   45+        L     15,16(1)                 GET LOGIC MODULE ADDRESS         75000025
007D32 45EF 0008         00008   46+        BAL   14,8(15)                 BRANCH TO GET ROUTINE            78000025
                                 47** IOCS AND DEVICE INDEPENDENT I/O - PUT - 5745-SC-IOX - REL. 29.0        05000029
007D36 5810 A1EA         07EBC   48+        L     1,=A(OUTPUT)             GET DTF TABLE ADDRESS            15000025
007D3A 58F1 0010         00010   49+        L     15,16(1)                 GET LOGIC MODULE ADDRESS    3-5  54000025
007D3E 45EF 000C         0000C   50+        BAL   14,12(15)                BRANCH TO PUT ROUTINE       3-5  55000025
```

```
 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    DOS/VS ASSEMBLER REL 30.0 09.29 74-04-19

007D42 47F0 A028       07D2A          51+          B     LABEL                                                    33000028
                                      52+* IOCS AND DEVICE INDEPENDANT I/O - CLOSE - 5745-SC-IOX - REL. 28.0      08100028
007D46 0700                           53+          CNOP  0,4                                                      20000025
007D48                                54+END       DC    0F'0'                                                    22000025
007D48 411C A1AE             07EB0    55+          LA    1,=C'$$BCLOSE'                                           46000025
007D4C 4500 A056             07D58    56+IJJC0007    BAL 0,*+4+4*(3-1)                                          54000025
007D50 00007DA8                       57+          DC    A(INPUT)                                                 64000025
007D54 00007D78                       58+          DC    A(OUTPUT)                                                64000025
007D58 0A02                           59+          SVC   2                                                        74000025
007D5A 41B0 A0F6             07DF8    60+          LA    REG,TYPNCCW                                              35000028
007D5E 50B0 A0E0             07DE2    61+          ST    REG,TYPECCB+8                                            36000028
         *** ERROR ***
007D62 41B0 A0D8             07DDA    62+          LA    REG,TYPECCB                                              36050028
                                      63+* SUPVR COMMN MACOS - EXCP - 5745-SC-SUP - REL. 28.0                     15050028
007D66 181B                           64+          LR    1,REG                                                    50000025
007D68 0A00                           65+          SVC   0                                                     EM 55010028
                                      66+* SUPERVISOR - WAIT - 5745-SC-SUP - REL. 28.0                           12000028
007D6A 181B                           67+          LR    1,REG                                                    39000025
007D6C 9180 1002       00002          68+          TM    2(1),X'80'                                               54000025
007D70 4710 AC74       07D76          69+          BO    *+6                                                      57000025
007D74 0A07                           70+          SVC   7                                                        60000025
                                      71+* SUPVR COMMN MACROS - EOJ - 5745-SC-SUP - REL. 28.0                    40000028
007D76 0A0E                           72+          SVC   14                                                       50000025


                                      74+* IOCS AND DEVICE INDEPENDANT I/O - DTFPR - 5745-SC-IOX - REL. 30.0      02870030
007D78                                75+          DC    0D'0'                                                    60000025
007D78 000080C00000                   76+OUTPLT    DC    X'000080000000'          RES. CCUNT, COM. BYTES BTS  JJ 61510028
007D7E 00                             77+          DC    AL1(0)                   LOGICAL UNIT CLASS              70000025
007D7F 03                             78+          DC    AL1(3)                   LOGICAL UNIT                    70200028
007D80 00007DA0                       79+          DC    A(*+32)                  CCW  ADDR.                   JJ 71000028
007D84 00000000                       80+          DC    4X'00'                   CCB-ST BYTE,CSW CCW ADDRESS  JJ 71200028
007D88 00                             81+          DC    AL1(0)                   SWITCH 3                   4-0 71750027
007D89 000000                         82+          DC    VL3(IJDFZZZZ)                    ADDR OF LOGIC MODUL3-8 76800025
007D8C 08                             83+          DC    X'08'                    DTF TYPE  (PRINTER)          JJ 77580028
007D8D 10                             84+          DC    AL1(16)                  SWITCHES                        77600025
007D8E 09                             85+          DC    AL1(9)                    NORMAL  COMM. CODE        4-0 78000027
007D8F 09                             86+          DC    AL1(9)                    CONTROL COMM. CODE        4-0 78400027
007D90 00007E58                       87+          DC     A(IN+0)                 ADDRESS OF DATA IN IOAREA1       78800025
007D94 0000C000                       88+          DC    4X'00'                    BUCKET                    3-5 84000025
007D98 0700                           89+          NOPR  0                        PUT LENGTH IN REG12 (ONLY UNDEF. 84800025
007D9A 470C 0000       00000          90+          NOP   0                        LOAD USER POINTER REG            86400025
007D9E 0000                           91+          DC    2X'00'                    NOT USED                  3-5 89600025
007DA0 09007E5820000050               92+           CCW   9,IN+0,X'20',80-0                                  4-0 91200027
                             07DA8    93+IJJZ0011    EQU *                                                      92000025
                                      94+* IOCS AND DEVICE INDEPENDANT I/O - PRMOD - 5745-SC-IOX - REL. 29.0     01290029
000000                                95+IJDPD012  DSECT                                                        16200025
000000                                96+IJDP0012  DS    CL2                   RESIDUAL COUNT                   16400025
000002                                97+IJDP1012  DS    CL1                   COMMUNICATION BYTE 1             16600025
000003                                98+IJDP2012  DS    CL1                   COMMUNICATION BYTE 2             16800025
000004                                99+IJDP0012  DS    CL2                   CSW STATUS BYTES                 17000025
```

```
 LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    DOS/VS ASSEMBLER REL 30.0 09.29 74-04-19

000006                            100+IJDP3012  DS    CL2                   LOGICAL UNIT ADDRESS                17200025
000008                            101+          DS    CL1                   NOT USED                            17400025
000009                            102+IJDP4012  DS    CL3                   ADDRESS OF CCW                      17600025
00000C                            103+          DS    CL1                   STATUS BYTE                         17800025
00000D                            104+          DS    CL3                   CSW CCW ADDR.                       18000025
000010                            105+IJDM1012  DS    CL4                        ADDRESS OF LOGIC MODULE 4-0    18050027
000014                            106+IJDP5012  DS    CL1                   DTF TYPE                            18400025
000015                            107+IJDP6012  DS    CL1                   SWITCHES                            18600025
000016                            108+IJDP9012  DS    CL1                   NORMAL COMMAND CODE                 18800025
000017                            109+IJDPA012  DS    CL1                   CONTROL COMMAND CODE                19000025
000018                            110+IJDP7012  DS    CL4                   ADDRESS OF  IOAREA 1                19200025
00001C                            111+IJDP8012  DS    CL4                   BUCKET                              19400025
000020                            112+IJDPE012  DS    CL2                   L 12,&RECSIZE                       19600025
000022                            113+IJDPC012  DS    CL4                   LA &IOREG,0(14)                     19800025
000026                            114+IJDPE012  DS    CL1                   BUCKET FOR PRTOV IF ASA CH 9        20000025
000027                            115+IJDPF012  DS    CL1                   BUCKET FOR PRTOV IF ASA CH 12       20200025
000028                            116+IJDPG012  DS    CL1                   COMMAND CODE                        21000025
000029                            117+IJDPH012  DS    CL3                   ADDRESS IOAREA 2                    21200025
00002C                            118+IJDPI012  DS    CL1                   FLAGS =X'20'                        21400025
00002D                            119+          DS    CL1                   NOT USED                            21600025
00002E                            120+IJDPJ012  DS    CL2                   COUNT                               21800025
00000C                            121+IJDFZZZZ  CSECT                                                           22000025
                           00000  122+          USING IJDP0012,1                                              24800025
                           00000  123+          USING *,15                                                    25000025
000000 0A32                       124+          SVC   IJDL6012              CONTROL  ERROR                      26000025
000002 0000                       125+          DC    1H'0'                                                   26200025
000004 0A32                       126+          SVC   IJDL6012              PRTOV  ERROR                        27000025
000006 0000                       127+          DC    1H'0'                                                   27200025
000008 0A32                       128+          SVC   IJDL6012              GET ERROR                           27400025
00000A 000C                       129+          DC    1H'0'                                                   27600025
00000C 47F0 F01A      0001A       130+          B     IJDPR012              BRANCH TO PUT                       27800025
000010 C9D1C4C6E9E9E9E9           131+          DC    CL8'IJDFZZZZ'         MODULE NAME                  4-0    28000027
000018 2800                       132+          DC    X'2800'     MODULE CHANGE LEVEL                @DM01457 28050028
                           0001A  133+IJDPR012  EQU   *                                                       28400025
00001A 0A00                       134+          SVC   IJDL7012              EXCP                                58800025
00001C 9180 1C02      00002       135+          TM    IJDP1012,IJDL8012     WAIT CHANNEL END             4-0    59400027
000020 4710 F026      00026       136+          BO    *+6                                                     59600025
000024 0A07                       137+          SVC   7                                                       59800025
000026 07FE                       138+          BR    IJDL4012          BACK TO USER                        3-9  60250026
                           0000B  139+IJDL1012  EQU   11                  REG 11                              3-3  69E00025
                           0000C  140+IJDL2012  EQU   12                  REG 12                                   70000025
                           0000D  141+IJDL3012  EQU   13                  REG 13                                   70200025
                           0000E  142+IJDL4012  EQU   14                  REG 14                                   70400025
                           0000F  143+IJDL5012  EQU   15                  REG 15                                   70600025
                           00032  144+IJDL6012  EQU   50                  ABEOJ                                    70800025
                           00000  145+IJDL7012  EQU   0                   EXCP                                     71000025
                           00080  146+IJDL8012  EQU   X'80'                                                     71200025
                           00040  147+IJDL9012  EQU   X'40'                                                     71400025
                           00020  148+IJDLA012  EQU   X'20'                                                     71600025
                           00008  149+IJDLB012  EQU   X'08'                                                     71800025
                           00010  150+IJDLC012  EQU   X'10'                                                     72000025
```

```
LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    DOS/VS ASSEMBLER REL 30.0 09.29 74-04-19

                           00004   151+IJDLLC012  EQU   X'04'                                                    72200025
                           00006   152+IJDLLE012  EQU   X'06'                                                    7240C025
                           00001   153+IJDLLF012  EQU   X'01'                                                    72600025
                           00002   154+IJDLLG012  EQU   X'02'                                                    72800025
                           0008B   155+IJDLLH012  EQU   X'8B'                                                    73000025
                           000FE   156+IJDLLI012  EQU   X'FE'                                                    73200025
                           0000B   157+IJDLLJ012  EQU   X'0B'                                                    7340C025
                           000BF   158+IJDLLK012  EQU   X'BF'                                                    73600025
                           000F8   159+IJDLLL012  EQU   X'F8'          CCB+3  ERROR PASSBACK BITS          3-9  73650026
                           00040   160+IJDLLM012  EQU   X'40'          CCB+2  ERROR PASSBACK BITS          3-9  73700026
                           00001   161+IJDLLN012  EQU   1              REG 1                               3-9  73750026
                           00015   162+IJDM6012   EQU   X'15'                 DISP FOR SWITCHES            4-0  73750527
                           00038   163+IJDM8012   EQU   56                    ASOCFLE DISP IN DTF          4-0  73751027
                           00023   164+IJDJM012   EQU   X'23'                 FD,SS COMMAND                4-0  73751527
                           00005   165+IJD05012   EQU   X'05'                 LINE POSITION ZERO FOR 3525  4-0  73752027
                           0008D   166+IJD8D012   EQU   X'8D'                 TEST FOR CHANNEL 9           4-0  73752527
                           000BD   167+IJDBD012   EQU   X'BD'                 TEST FOR CHANNEL 12          4-0  73753027
                           0001D   168+IJD1D012   EQU   X'1D'                 LINE 3                       4-0  73753527
                           0000D   169+IJD0D012   EQU   X'0D'                 LINE 1                       4-0  73754027
                           000CD   170+IJDCD012   EQU   X'CD'                 LINE 25                      4-0  73754527
                           00030   171+IJDV2012   EQU   48                    DISP IN PUNCH DTF            4-0  73755027
007DA8                             172+TEST       CSECT                                                        75800025
                                   173+* IOCS AND DEVICE INDEPENDANT I/O - DTFCD - 5745-SC-IOX - REL. 30.0      01220030
007DA8                             174+           DC     0D'0'                                                 44800025
007DA8 0C0080000000                175+INPUT      DC     X'000080000000'       RES. COUNT, COM. BYTES STATUJJ  45200028
007DAE 00                          176+           DC     AL1(0)                LOGICAL UNIT CLASS            49800025
007DAF 01                          177+           DC     AL1(1)                LOGICAL UNIT                  50000025
007DB0 00007DC8                    178+           DC     A(IJCX0013)           CCW ADDRESS          @DL2994J 50400029
007DB4 00000000                    179+           DC     4X'00'                CCB-ST BYTE,CSW CCW ADDR.      51C00025
007DB8 00                          180+           DC     AL1(0)          SWITCH 3                     4-0  51200027
007DB9 000000                      181+           DC     VL3(IJCFZIZ0)           ADDRESS OF LOGIC MODULE 3-3  53600025
007DBC 02                          182+           DC     X'02'                 DTF TYPE (READER)          JJ   53940028
007DBD 00                          183+           DC     AL1(0)                SWITCHES                      55200025
007DBE 02                          184+           DC     AL1(2)                NORMAL COMM.CODE              5940C025
007DBF 02                          185+           DC     AL1(2)                CNTROL CCMM.CODE              59600025
007DC0 00007E58                    186+           DC     A(IN)                 ADDR. OF IOAREA1              60000025
007DC4 00                          187+           DC     AL1(0)                                         JJ   60600028
007DC5 007D48                      188+           DC     AL3(END)        EOF ADDRESS                    JJ   60800028
007DC8 02007E582C000050            189+IJCX0013   CCW    2,IN,X'20',80                                       62600025
007DD0 4700 0000      C0000        190+           NOP    0                     LOAD USER POINTER REG.        63000025
007DD4 4700 0000      00000        191+           NOP    0                     MOVE IOAREA TO WORKA          63800025
007DD8 0000                        192+           DC     X'0000'                                             64000025
                           07DDA   193+IJJZ0013   EQU *                                                       85800025
                                   194+* SUPVR COMMN MACROS - CCB - 5745-SC-SUP - REL. 28.0                   07100028
007DDA 0000                        195+TYPECCB    DC     XL2'0'  .       RESIDUAL COUNT                      49000028
007DDC 0000                        196+           DC     XL2'0'      .     COMMUNICATICNS BYTES              50000028
007DDE 0000                        197+           DC     XL2'0'  .       CSW STATUS BYTES                  51000028
007DE0 0C                          198+           DC     AL1(0)      .         LOGICAL UNIT CLASS            52000028
007DE1 04                          199+           DC     AL1(4)    .           LOGICAL UNIT                  53000028
007DE2 00                          200+           DC     XL1'0'                                              5400CC28
007DE3 007DF0                      201+           DC     AL3(TYPECCW) .    CCW ADDRESS                       55000028
```

```
  LOC  OBJECT CODE     ADDR1 ADDR2  STMT   SOURCE STATEMENT                    DOS/VS ASSEMBLER REL 30.0 09.29 74-04-19

007DE6 00                          202+          DC    B'00000000'      .       STATUS BYTE                          56000028
007DE7 000000                      203+          DC    AL3(0) .           CSW CCW ADDRESS                            57000028
007DEA 0000C00C0000
007DF0 09007E0C00000025            204+TYPECCW   CCW   9,MSGST,0,L'MSGST                                             45000028
007DF8 09007E2500000033            205+TYPNCCW   CCW   9,MSGEN,0,L'MSGEN                                             46000028
007E00 C9E5D7C3C1D74040            206+MSGST     DC    C'IVPCAP   STARTED ++++++++++++++++++++'                     47000028
007E25 C9E5D7C3C1D74040            207+MSGEN     DC    C'IVPCAP  COMPLETED SUCCESSFULLY ++++++++++++++++++++'      48000028
                           0000B   208+REG       EQU   11                                                          49000028
007E58                             209+IN        DS CL80                                                           50000028
                           07D00   210           END     START
007EA8 5B5BC2D6C7C5D540            211                   =C'$$BOPEN '
007EB0 5B5BC2C3D3D6E2C5            212                   =C'$$BCLOSE'
007EB8 00007DA8                    213                   =A(INPUT)
007EBC 00007D78                    214                   =A(OUTPUT)
```

RELOCATION DICTIONARY

ESDID FOR ADDR CON	ESDID FOR REF SYMBOL	TYPE	LENGTH	ADDRESS
01	+01	A	4	007D20
01	+01	A	4	007D24
01	+01	A	4	007D50
01	+01	A	4	007D54
01	+01	A	4	007D80
01	+02	V	3	007D89
01	+01	A	4	007D90
01	+01	CCW	3	007DA1
01	+01	A	4	007DB0
01	+04	V	3	007DB9
01	+01	A	4	007DC0
01	+01	A	3	007DC5
01	+01	CCW	3	007DC9
01	+01	A	3	007DE3
01	+01	CCW	3	007DF1
01	+01	CCW	3	007DF9
01	+01	A	4	007EB8
01	+01	A	4	007EBC

SYMBOL	LEN	ID	VALUE	DEFN	REFERENCES		
END	00004	01	007D48	00054	0188		
IJCX0013	0000E	C1	007DCE	00189	017E		
IJDBD012	0C001		0000BD	00167			
IJDCD012	00001		0000CD	00170			
IJDFZZZZ	00001	03	0000C0	00121			
IJDJM012	00001		000023	00164			
IJDLA012	00001		0C0020	00148			
IJDLB012	00001		000008	00149			
IJDLC012	0C001		000010	00150			
IJDLD012	00001		000004	00151			
IJDLE012	00001		000006	00152			
IJDLF012	00001		000001	00153			
IJDLG012	00001		000002	00154			
IJDLH012	00001		00008B	00155			
IJDLI012	00001		0000FE	00156			
IJDLJ012	00001		00000B	00157			
IJDLK012	00001		0000BF	00158			
IJDLL012	00001		0000F8	00159			
IJDLM012	00001		000040	00160			
IJDLN012	00001		000001	00161			
IJDL1012	00001		00000B	00139			
IJDL2012	00001		00000C	00140			
IJDL3012	00001		00000D	00141			
IJDL4012	00001		00000E	00142	013E		
IJDL5012	00001		00000F	00143			
IJDL6012	00001		0000C2	00144	0124	0126	0128
IJDL7012	00001		000000	00145	0134		
IJDL8012	00001		000080	00146	013S		
IJDL9012	00001		000040	00147			
IJDM1012	00004	FF	000010	00105			
IJDM6012	0C001		000015	00162			
IJDM8012	00001		000038	00163			
IJDPA012	00001	FF	000017	00109			
IJDPB012	00002	FF	000020	00112			
IJDPC012	00004	FF	000022	00113			
IJDPD012	00001	FF	0000C0	00095			
IJDPE012	00001	FF	000026	00114			
IJDPF012	00001	FF	000027	00115			
IJDPG012	00001	FF	000028	00116			
IJDPH012	0C003	FF	000029	00117			
IJDPI012	00001	FF	00002C	00118			
IJDPJ012	0C002	FF	00002E	00120			
IJDPO012	00002	FF	000004	00099			
IJDPR012	0C001	03	00001A	00133	0130		
IJDP0012	00002	FF	000000	00096	0122		
IJDP1012	00001	FF	000002	00097	013S		
IJDP2012	00001	FF	000003	00098			
IJDP3012	00002	FF	0000C6	00100			
IJDP4012	00003	FF	0000C9	00102			
IJDP5012	0C001	FF	000014	00106			
IJDP6012	00001	FF	000015	00107			

```
SYMBOL    LEN   ID VALUE  DEFN     REFERENCES

IJDP7012 00004 FF 000018 00110
IJDP8012 00004 FF 00001C 00111
IJDP9012 00001 FF 000016 00108
IJDV2012 00001    000030 00171
IJD0D012 00001    00000D 00169
IJD05012 00001    000005 00165
IJD1D012 00001    00001D 00168
IJD8D012 00001    00008D 00166
IJJC0007 00004 01 007D4C 00056
IJJD0004 00C04 C1 007D1C 00038
IJJZ0011 00001 01 007DA8 00093
IJJZ0013 00001 01 007DDA 00193
IN       00C80 01 007E58 00209  0087  0092  0186  0189
INPUT    00006 01 007DA8 00175  0039  0057  C213
LABEL    00004 01 007D2A 00044  0051
MSGEN    00051 01 007E25 00207  0205  0205
MSGST    00037 01 007E00 00206  0204  0204
OUTPUT   00C06 C1 007D78 00076  0040  0058  0214
REG      00001    00000B 00208  0025  0027  0030  0060  0061  0062  0064  0067
START    00002 01 007DC0 00023  0210
TEST     00001 01 007DC0 00001  0172
TYPECCB  00002 01 007DDA 00195  0025  0061  C062
TYPECCW  00008 01 007DF0 00204  0201
TYPNCCW  00008 01 007DFB 00205  0060
=A(INPUT)
         00004 C1 007EB8 00213  0044
=A(OUTPUT)
         00004 01 007EBC 00214  0048
=C'$$BOPEN '
         00008 01 007EA8 00211  0037
=C'$$BCLOSE'
         00C08 01 007EBC 00212  0055
```

```
                     DIAGNOSTICS AND STATISTICS                                                          PAGE    10

  STMNT ERROR NO.  MESSAGE                                                                              74-04-19

    61   IPK182    ALIGNMENT ERROR IN OPERAND 2


THE FOLLOWING MACRO NAMES HAVE BEEN FOUND IN MACRO INSTRUCTIONS
   IVPCAPS  EXCP     WAIT     OPEN     GET      PUT      CLOSE    EOJ      DTFPR    PRMOD    DTFCD    CCB      BTWAIT

OPTIONS FOR THIS ASSEMBLY - ALIGN, LIST, XREF, LINK, DECK, EDECK

THE ASSEMBLER WAS RUN IN 135048 BYTES
END OF ASSEMBLY



 ENTRY
// EXEC LNKEDT



JOB  IVPCAP2   04/19/74    DOS LINKAGE EDITOR DIAGNOSTIC OF INPUT

ACTION TAKEN  MAP REL
LIST   AUTOLINK   IJCFZIZ0
LIST   ENTRY



04/19/74   PHASE   XFR-AD  LOCORE  HICORE  DSK-AD     ESD TYPE  LABEL     LOADED  REL-FR

        PHASE***   040078  040078  0402CB  019 0D 09  CSECT     TEST      040078  038378  RELOCATABLE

                                                      CSECT     IJDFZZZZ  040238  040238

                                                      CSECT     IJCFZIZ0  040260  040260



*  END OF PROCEDURE
EOP IVPCAP1
// EXEC
1
12
123
1234
12345
123456
1234567
12345678
123456789



EOJ IVPCAP2                                                    DATE 04/19/74,CLOCK 09/30/28,DURATION 00/01/51



// JOB IVPCAP3                                                  DATE 04/19/74,CLOCK 09/30/30
* DELETE IVPCAP1 FROM PROCEDURE LIBRARY
// EXEC MAINT



 DELETP IVPCAP1
```

```
 STATUS REPORT                          DATE: 10/28/76                        TIME: 14.44
                             STARTING        NEXT          LAST      DIRECTORY        LIBRARY BLOCKS           COND.  DIR.TRACKS
                              ADDRESS       ENTRY          ENTRY      ENTRIES                                  LIMIT   OR LIBRARY
                              C  H  R     C  H  R  E     C  H  R  E   ACTIVE  ALLOCTD ACTIVE DELETD  AVAIL    BLOCKS CYLINDERS


SYSRES VOL.SER.111111
PROCEDURE    DIRECTORY       194 00 01   194 0C 11 08   194 04 44 09     102                                                      5
             LIBRARY         194 05 01   195 01 20      197 18 61               4326     922      7   3397          0             4


EOJ IVPCAP3                                                    DATE 04/19/74,CLOCK 09/30/35,DURATION 00/00/05
```

EMA - 1401/1440/1460 Emulator

Functions Tested

Three verification procedures are provided with the emulator:

- One to be used with an emulator generated for a 1401 or a 1460, with the following options: advanced programming, sense switches, and 1400 console.
- One to be used with an emulator generated for a 1401 or a 1401G or a 1460 without the above options.
- One to be used with an emulator generated for a 1440 with the options advanced programming and sense switches.

IVPGEN MACRO OPTIONS

EMA={NO / YES} Specify if the DOS/VS 1401/1440/1460 Emulator program is to be verified.

Required Parameters

EMATYPE={1401 / 1440 / 1401G} Specify the required verification procedure.

1401 : Verification procedure for a 1401/1460 emulator with options.
1440 : Verification procedure for a 1440 emulator.
1401G: Verification procedure for a 1410/1460 emulator without options, or verification procedure for a 1401G emulator.

EMANAME=X Specify the phasename under which the emulator is cataloged in the core image library.

Optional Parameters

EMACCS={NO / YES} Specify if CS control cards support is required in the user-generated 1401/1440/1460 emulator program (CTLCARD=CS specified in the EMSUP macro instruction).

Specify the following two parameters only if you want to verify the tape functions.

EMATSN=SYSnnn Specify the logical name of the tape device assigned to the 1400 tape unit 1. This unit must have been defined in an EMTAPE emulator macro instruction. Do not specify this parameter if spanned tape format has been specified (TPSUP=SPANNED in the EMSUP emulator macro instruction), or if the emulator does not emulate the tapes (TPSUP=NCNE in the EMSUP macro instruction).

EMATA=cuu Device address of the tape drive. Specify only if EMATSN=SYSnnn is also specified.

Note that only one emulator program can be executed during one IVP run and that, conversely, this emulator can execute only one of the verification procedures.

In addition to testing the 1400 CPU functions and the operator communication functions, the verification procedures:

- Read data from the System/370 device assigned as 1400 card reader.
- Punch data on the System/370 device assigned as 1400 card punch.
- Print the data read from the 1400 card reader on the System/370 device assigned as 1400 printer.

If the System/370 configuration includes a tape unit, the verification procedures (except those for the 1401G or the 1401/1460 without options) optionally write on and read from tape in 1400 format (TPSUP=ORIGINAL or MIXED in the EMSUP emulator macro instruction).

The verification procedures contain 1400 object programs and data as well as the DOS/VS control cards required to execute the emulator. You can perform the verification procedures with the emulator generated in accordance with your specifications and cataloged to the core image library.

However, the verification procedures cannot be used with an emulator generated to handle:

- column binary data
- card image data
- 51-column cards.

A 1401/1440/1460 emulator must emulate real storage of a size of at least 4,000 bytes.

A 1401G emulator must emulate real storage of a size of at least 4,000 bytes.

SOFTWARE REQUIREMENTS

Emulator Macro Options

The following emulator instructions generate a minimum emulator to execute the verification procedures (does not apply to the 1401G emulator):

```
EMULATOR      CPU=xxxx,CORE=4,ADVPROG=YES,SENSESW=YES,MODEL=145
EMSUP         EMNAME=EMSPL01,CCRDR=SYSRDR,                          X
              TPSUP=ORIGINAL,CONSOLE=YES
EMRDR         TODEV=2540
EMPNCH        FROMDEV=1402,TODEV=2540
EMPTR         FROMDEV=1403,TODEV=1403
EMTAPE        DEVADDR=SYS001,UNIT=1,                                X
              TYPEFLE=OUTPUT,RECFM=ORIGINAL,BLKSIZE=80
EMEND
END
```

Notes

1. xxxx in the EMULATOR macro can be either 1401,1440, or 1460.

2. The EMTAPE macro specification is not required if no tape functions are to be verified.

For a 1401G the minimum emulator is generated as follows:

```
EMULATOR      CPU=1401G,CORE=4,ADVPROG=YES,SENSESW=YES,MODEL=145
EMSUP         EMNAME=EMSPL01,CCRDR=SYSRDR
EMRDR         TODEV=2540
EMPNCH        FROMDEV=1402,TODEV=2540
EMPTR         FROMDEV=1403,TODEV=1403
EMEND
END
```

The logical names of the System/370 devices assigned as 1400 reader, punch, and printer are by default SYSIPT, SYSPCH, and SYSLST. If you specified logical names in the form DEVADDR=SYSnnn, be sure that these devices relate to the same devices as SYSIPT, SYSPCH, and SYSLST.

HARDWARE REQUIREMENTS

A Central Processing Unit equipped with:

- The IBM Compatibility Feature 4457 for Models 125 and 135
- The IBM Compatibility Feature 4457 or 4458 for Model 145
- Standard instruction set
- One tape drive, if the tape functions are to be verified

STORAGE REQUIREMENTS

The amount of storage required depends on what you specify when generating your emulator. The emulator described in the section "Software Requirements" takes up approximately 27,500 bytes of storage.

OPERATING INSTRUCTIONS

1. Setup Requirements

   None, if tape functions are not to be verified. Otherwise, mount a scratch tape on the tape unit assigned to 1400 tape unit 1.

2. Operating Instructions

   Type in START in response to message

   EN021D IVPEMA HALT IAR=nnnnnn
   AAR=00001/2 BAR=00001/2

EMB - 1410/7010 Emulator

Functions Tested

- 1410/7010 CPU functions
- Operator communication functions
- Console operations
- Tape functions - 1400 format (optional)

IVPGEN MACRO OPTIONS

EMB={NO / YES} Specify if the DOS/VS 1410/7010 Emulator program is to be verified.

Required Parameter

EMBNAME=x Specify the phase name under which the emulator is cataloged in the core image library.

Optional Parameters

EMBTSN=SYSnnn Specify the logical name of the System/370 tape device assigned to 1400 tape unit 1, channel 1.

EMBTA=cuu Device address of the tape drive. Specify only if EMATSN=SYSnnn is also specified.

In addition to testing the 1410/7010 CPU functions and the operator communication functions, the verification procedures:

- Read data from the System/370 device assigned as 1400 card reader.
- Punch data on the System/370 device assigned as 1400 card punch.
- Print the data read from the 1400 card reader on the System/370 device assigned as 1400 printer.

If the System/370 configuration includes a tape unit the verification procedures optionally write on and read from tape in 1400 format (TPSUP=ORIGINAL or MIXED in the EMSUP emulator macro instruction).

The verification procedure comprises a 1400 object program and data as well as the DOS/VS control cards required to execute the emulator program. You can perform the verification procedures with an emulator generated in accordance with your specifications and cataloged to the core image library.

The minimum amount of storage that can be handled by a 1410/7010 emulator is 40,000 bytes.

For a 1410 emulator the EMULATOR macro instruction must specify URCHAN=1 and OVERLAP=YES, in addition to the selected parameters.

SOFTWARE REQUIREMENTS

The following instructions will generate a minimum size emulator to execute the verification procedures:

```
EMULATOR  CPU=xxxx,CORE=40,CHAN=1,URCHAN=1,OVERLAP=YES,MODEL=145
EMSUP     EMNAME=EMSPL10,CCRDR=SYSRDR,                          X
          TPSUP=CRIGINAL
EMRDR     TODEV=2540
EMPNCH    TODEV=2540
EMPTR     TODEV=1403
EMTAPE    DEVADDR=SYS001,UNIT=11,                               X
          TYPEFLE=OUTPUT,RECFM=ORIGINAL,BLKSIZE=80
EMCNSL
EMEND
          END
```

Notes:

1. xxxx in the EMULATOR macro can be either 1410 or 7010.
2. Do not specify OVERLAP=YES if CPU=7010 is specified,

The logical names of the System/370 devices assigned as 1400 reader, punch, and printer are by default SYSIPT, SYSPCH and SYSIST. If you specified logical names in the form DEVADDR=SYSnnn, be sure that these devices relate to the same devices as SYSIPT, SYSPCH, and SYSLST.

HARDWARE REQUIREMENTS

A Central Prccessing Unit equipped with:

- The IBM Compatibility Feature 4458 for Models 145
- Standard instruction set
- One tape drive, if tape functions are to be verified.

STORAGE REQUIREMENTS

The amount of storage required is dependent on what you specify when generating your emulator. The emulator described in the section "Software Requirements" takes up approximately 27,500 bytes of storage.

OPERATING INSTRUCTIONS

1. Setup Requirements

   None, if tape functions are not to be verified. Otherwise, mount a scratch tape on the tape unit assigned to 1400 unit 1, channel 1.

2. Operating Instructions

   On display of message

   EP022D IVPEME HALT/BRANCH IAR=nnnnn AAR=xxxxx BAR=xxxxx DMOD=1

   - Type in START if nnnnn=06106.
   - Type in ECJ if nnnnn is not 06106.

E20 - System/370 Model 20 Emulator

Functions Tested

The Installation Verification Procedure for the System/360 Model 20 emulator tests the following Model 20 functions:

- CPU instructions.
- Interrupt capability.
- CPU data and address checking.
- Operator communications.
- I/O operations for each type of device the emulator program supports.

Note: If the E20 verification procedure makes use of a read/punch device (2520 or 2560) it can be used for only one run. For a following run it is necessary to assemble the IVPGEN macro again.

IVPGEN MACRO OPTIONS

E20={NO / YES} Specify if the DOS/VS System/360 Model 20 Emulator program generation is to be verified.

Required Parameter

E20NAME=xxxx Specify the phase name under which the emulator is cataloged in the core image library. Length of the phase name may be from four to seven characters.

HARDWARE REQUIREMENTS

- A Central Processing Unit equipped with the IBM Compatibility Feature 7520 for Models 125 and 135 and a standard instruction set.
- One physical device for each Model 20 device emulated.

If the System/360 configuration comprises an MFCM, note that the emulation can either be performed on a System/370 MFCM or on the combination of a 3504/3505 and a 3525. The MFCM is emulated at DOS/VS level by two physical devices, therefore, enter two ASSGN commands.

OPERATING INSTRUCTIONS

1. Setup Requirements

   The system printer must be provided with a carriage control tape with punches in (at least) channels 1, 9, and 12.

2. Operating Instructions

   In response to message

   ```
   E201D 01 STOP UL=99,PSW=0100062C,ESTR=OFFF
   ```

   type in EOJ to pass control to DOS/VS job control.

Example of SYSLOG Output

```
BG // JOB IVPE20
   DATE 11/04/73, CLOCK 23/33/07
BG * INSTALLATION VERIFICATION PROCEDURE FOR MODEL 20 EMULATOR ON S/370
BG * YOU MUST ASSIGN EACH LOGICAL UNIT USED IN THE EMULATOR GENERATION TO
BG * A VALID S/370 PHYSICAL DEVICE
BG * FOR EXAMPLE M20 2501 CARD READER HAS BEEN GENERATED ON SYS004
BG * YOU MUST ENTER THE FOLLOWING DOS COMMAND
BG *       // ASSGN SYS004,X'00C'
BG * ASSUMING THAT 00C IS A VALID CARD READER TYPE FOR EMULATION
BG * YOU MUST DO THAT FOR M20 2501 2520/2560 1442 1403/2203 AND TAPES
BG // PAUSE  PLEASE ENTER YOUR ASSGN COMMANDS NOW
BG // ASSGN SYS004,X'00C'
BG // ASSGN SYS010,X'080'
BG // ASSGN SYS011,X'081'
BG
BG // PAUSE IT IS YOUR LAST CHANGE FOR ENTERING ASSGN COMMANDS
BG
BG // EXEC EMUL3
BG E220D ENTER 'DI ON' COMMAND FOR DEVICE INDEPENDENCE, IF NOT 'DI OFF'
BG DI OFF
BG E201D 01 STOP UL=99,PSW=000001F8,ESTR=0000
BG S
BG E201D 01 STOP UL=99,PSW=1000047E,ESTR=0001
BG CF.S
BG  TAPES 081=SYS011  080=SYS010
BG  DISKS 002=AAAAAA    002=BBBBBB
BG  UR    2501=SYS004  1442=SYSPCH 1403/2203=SYSLST
BG E201D 01 STOP UL=99,PSW=10000482,ESTR=0386
BG S
BG E201D 01 STOP UL=99,PSW:010004A6,ESTR=2501
BG S
BG E201D 01 STOP UL=99,PSW=010004EE,ESTR=1442
BG S
BG E201D 01 STOP UL=99,PSW=0100050E,ESTR=1403
BG S
BG E201D 01 STOP UL=99,PSW=0100051E,ESTR=0070
BG S
BG E201D 01 STOP UL=99,PSW=31000542,ESTR=0002
BG S
BG E202D MOD20 PROGRAMMING ERROR UL=FA,I=07,PSW=010005F2
BG CS SD=X'5F2'
BG 5F2   FA440B820B82488006204A80068C4B80
BG CS SD=X'B82'
BG B82   00000000000000000000000000000000
BG CS SA=(X'B82',X'000000001C').S
BG E202D MOD20 PROGRAMMING ERROR UL=4A,I=08,PSW=11000612
BG HELP
BG E2121 CONSULT 'UL' AND 'PSW' WHICH SPECIFY ERROR TYPE AND ADDRESS -
BG E2121  - OF INSTRUCTION IN ERROR
BG E2121 USE 'CS' COMMAND, FOLLOWED BY 'S' TO CORRECT THE ERROR
BG E2121 IF THE ERROR PERSISTS, ENTER 'DF ED,TD,EDJ' TO CANCEL EMULATOR RUN
BG CS RA=(8,X'0').S
BG E202D MOD20 PROGRAMMING ERROR UL=1A,I=08,PSW=1100061A
BG CS RA=(8,X'0').S
BG E201D 01 STOP UL=99,PSW=01000628,ESTR=0003
BG S
BG E201D 01 STOP UL=99,PSW=0100062C,ESTR=OFFF
BG S
BG E201D 01 STOP UL=99,PSW=0100062C,ESTR=OFFF
BG EOJ
BG * IVPE20 IS FINISHED
BG EOJ IVPE20
   DATE 11/04/73,CLOCK 23'40'08,DURATION 00'07'00
```

Example of SYSLST Output

```
// JOB IVPE20                                                    DATE 11/04/73,CLOCK 23/33/07
* INSTALLATION VERIFICATION PROCEDURE FOR MODEL 20 EMULATOR ON S/370
* YOU MUST ASSIGN EACH LOGICAL UNIT USED IN THE EMULATOR GENERATION TO
* A VALID S/370 PHYSICAL DEVICE
* FOR EXAMPLE  M20 2501 CARD READER HAS BEEN GENERATED ON SYS004
* YOU MUST ENTER THE FOLLOWING DOS COMMAND
*       // ASSGN SYS004,X'00C'
* ASSUMING THAT 00C IS A VALID CARD READER TYPE FOR EMULATION
* YOU MUST DO THAT FOR M20 2501 2520/2540 1442 1403/2203 AND TAPES
// PAUSE  PLEASE ENTER YOUR ASSGN COMMANDS NOW
// ASSGN SYS00C,X'00C'
// ASSGN SYS010,X'080'
// ASSGN SYS011,X'081'
// PAUSE IT IS YOUR LAST CHANCE FOR ENTERING ASSGN COMMANDS
// EXEC EMUL3
DI OFF
EC DC='//LC'
LD

SAMPLE OUTPUT DATA
SAMPLE OUTPUT DATA                          THE 18 FIRST CHARACTERS OF THIS LINE ARE THE
                                            SAME AS THOSE OF THE PREVIOUS LINE

SAMPLE OUTPUT DATA
NOW SKIP TO CHANNEL 1


NOW SKIP TO CHANNEL 12



NOW SKIP TO CHANNEL 09



YOU HAVE GENERATED THE FOLLOWING MODEL 20 CONFIGURATION

     2501 CARD READER

     1442 CARD PUNCH

     1403/2203 PRINTER

YOUR TAPE UNIT ADDRESSES ARE =  80 81

YOU HAVE GENERATED STORAGE CONTROL FEATURE



* IVPE20 IS FINISHED
EOJ IVPE20                                  DATE 11/04/73,CLOCK 23/40/08,DURATION 00/07/00
```

OLT - OLTEP

Function Tested

- The possibility of initializing online testing.

OPERATING INSTRUCTIONS

Action Messages

```
01E105D ENTER-DEV/TEST/OPT/
```

Reply by typing in

```
R 01,'CANCEL'
```

to terminate the execution of the OLTEP verification procedure.

PWR - POWER/VS

Function Tested

The test checks that the generated version of POWER/VS functions in accordance with the specifications.

SOFTWARE REQUIREMENTS

POWER=YES must have been specified as a SUPVR macro parameter when assembling the supervisor. POWER/VS must be running while the test is being performed.

Make sure that only POWER/VS jobs are in the input stream. When a reader task is started, all reader input is read in and put into the POWER/VS files.

UTL - System Utilities

Functions Tested

Standard

CLRDK	Clear Disk
CDKCD	Copy disk to card
CDKDK	Copy disk to disk
RCDDK	Restore card to disk
LVTOC	VTOC display

Note: If the PCHADDR parameter is not specified, CDKCD and RCDDK will not be verified. For cardless systems, PCHADDR must be omitted.

Optional

- If UTLT=YES is specified in the IVPGEN macro:

```
INTTP      Initialize tape
CDKTP      Copy disk to tape
RTPDK      Restore tape to disk
```

- If UTLZ=YES is specified in the IVPGEN macro:

```
CLRDC      Clear data cell
CDKTP      Copy data cell to tape   (only if UTLT=YES is specified)
RTPDK      Restore tape to data cell
```

HARDWARE REQUIREMENTS

```
Required:  2 direct-access devices
           1 printer.

Optional:  1 tape drive
           1 data cell drive
           1 card reader
           1 card punch
           1 diskette I/O unit.
```

Module 4: 1401/1440/1460 DOS/VS Emulator on System/370 -- 5747-CC3

4

The 1401/1440/1460 Emulator Program for the IBM System/370, available as separate programming package, consists of a group of macro instructions and object and load modules that are shipped in source statement, relocatable, and core image libraries. Two sample programs that test the working of a 1401/1460 program, of a 1440 program, and of a 1401G program under the emulator are contained in the source statement library under the name Z.EMSPL01. The source cards of this program are cataloged under the name Z.EMSPL01S.

For detailed installation procedures, refer to 1401/1440/1460 DOS/VS Emulator on System/370 Reference, GC33-5384.

Module 5: 1410/7010 DOS/VS Emulator on System/370 -- 5747-CC3

5

The 1410/7010 Emulator Program, available as separate programming package, consists of a group of macro instructions and object and load modules that are shipped in source statement, relocatable, and core image libraries. A sample program that tests the working of a 1410 and 7010 program under the emulator is contained in the source statement library under the name Z.EMSPL10. The source cards of this program are cataloged under the name Z.EMSPL10S.

For detailed installation procedures, refer to 1410/7010 DOS/VS Emulator on System/370 Reference, GC33-5385.

Module 6: Emulating the /360 Model 20 on Models 115, 125, 135, and 138--5745-SC-E20

6

MODEL 20 EMULATOR UNDER DOS/VS

The Model 20 Emulator Program consists of a group of macro instructions and object and load modules that are shipped in the source statement, relocatable, and core image libraries. An installation verification program for postgeneration use is contained in the source statement library under the name Z.IISIVP20. In addition to the emulator, a data interchange function is supplied with the generation macro E.EMUDI.

PARTITION SIZE

For further information, refer to the Model 20 emulator publication.

SOURCE STATEMENT LIBRARY

Number of Macros	Number of Library Blocks (Physical Records)
22	2,284

Macros

E.EM1403
E.EM1442
E.EM20CHK
E.EM20CONV
E.EM20CPU
E.EM20DI
E.EM20END
E.EM20MESS
E.EM20PRHD
E.EM20SYS
E.EM20VRIF
E.EM2152
E.EM2203
E.EM2311
E.EM2400
E.EM2501
E.EM2520
E.EM2560
E.IISCR
E.IISDC
E.IISEDB
E.IVPE20C

Delete Statements

```
DELETS E.EM1403
DELETS E.EM1442
DELETS E.EM20CHK
   .
   .
   .
DELETS E.IISEDB
```

RELOCATABLE LIBRARY

Number of Modules	Number of Library Blocks (Physical Records)
28	206

Module Name	Bytes of Storage
IISCM	1165
IISCMS	1117
IISCP	936
IISCPS	254
IISDB	928
IISDD	1168
IISDE	340
IISDF	3328
IISDFED	1771
IISDI	1334
IISDK	3072
IISD1	342
IISD2	466
IISD3	470
IISD4	622
IISED	5896
IISHC	424
IISHF1	2804
IISHF2	3204
IISID	284
IISIN	1304
IISMD2	1487
IISMF	1060
IISPD2	348
IISTD	752
IISTP	1848
IISTPH	1161
IISTR	432

Link-Edit Statements

The ACTION CLEAR, PHASE, and INCLUDE statements are generated automatically, in accordance with your specifications, when the E.EM20END macro is assembled. For more detailed information on the link-edit statements, refer to the Model 20 emulator publication.

Delete Statements

IIS is the identifier for both the basic Model 20 Emulator and the associated data interchange function. The statement DELETR IIS.ALL causes both the emulator and its data interchange function to be deleted. Unless this is desired, delete the modules one by one:

```
DELETR IISCM
DELETR IISCMS
   .
   .
   .
DELETR IISTR
```

CORE IMAGE LIBRARY

Number of Transients	Number of Library Blocks (Physical Records)
19	32

Transients

$$BIISAL
$$BIISAS
$$BIISA2
$$BIISCC
$$BIISCD
$$BIISCF
$$BIISCS
$$BIISDI
$$BIISDP
$$BIISLE
$$BIISM1
$$BIISM2
$$BIISM3
$$BIISM4
$$BIISPR
$$BIISRL
$$BIISTD
$$BIISTS
$$BIISUR

Delete Statements

```
DELETC $$BIISAL
DELETC $$BIISAS
   .
   .
   .
DELETC $$BIISUR
```

DATA INTERCHANGE FUNCTION

The Model 20 Data Interchange Function is generated as part of the Model 20 Emulator, under macro E.EMUDI.

PARTITION SIZE

For further information, refer to the Model 20 emulator publication.

SOURCE STATEMENT LIBRARY

Number of Macros	Number of Library Blocks (Physical Records)
1	187

Macro

E.EMUDI

Delete Statement

DELETS E.EMUDI

RELOCATABLE LIBRARY

Number of Modules	Number of Library Blocks (Physical Records)
45	300

Modules

IISCA
IISDA
IISDS
IISEQ
IISF1
IISF2
IISF3
IISF4
IISIB
IISIF
IISIL1
IISIL2
IISIL3
IISIL4
IISIR1
IISIR2
IISIR3
IISIR4
IISMD
IISMI
IISML
IISMO
IISMR
IISMS
IISMSG
IISSC
IISSCI
IISSCV
IISSQ
IISS1
IISS2
IISS3
IISS4
IISTK
IISTKC
IISTKE
IISTKI
IIST1
IIST2
IIST3
IIST4
IISV1
IISV2
IISV3
IISV4

Link-Edit Statements

The link-edit statements are generated automatically, in accordance with your specifications, when the E.EMUDI macro is assembled. For more detailed information, refer to the Model 20 emulator publication.

Delete Statements

IIS is the module identifier for both the Model 20 Emulator and the associated data interchange function. The statement DELETR IIS.ALL causes both the emulator and the data interchange function to be deleted. Data interchange modules must therefore be deleted individually:

```
DELETR IISCA
DELETR IISDA
   .
   .
   .
DELETR IISV4
```

CORE IMAGE LIBRARY

		Number of Library Blocks (Physical Records)
Transients	6	8
Phases	7	7

Transients

```
$$BIISUC
$$BIISUM
$$BIISBI
$$BIISBS
$$BIISEX
$$BIISFM
```

Phases

```
IISMTA
IISMTB
IISMTC
IISMTD
IISMTE
IISMTF
IISMTG
```

Delete Statements

```
DELETC $$BIISUC
DELETC $$BIISUM
   .
   .
   .
DELETC $$BIISFM

DELETC IISMTA
DELETC IISMTB
   .
   .
   .
DELETC IISMTG
```

Module 7: Compiler IOCS Modules -- 5745-SC-IOM

7

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# TRANSIENTS	CIL BLOCKS
20	22

CORE IMAGE LIBRARY

Transients

$$BCBLIS $$BCBLOP $$BCBODA $$BCBUSR $$BCBUSW	COBCL D
$$BCOBER $$BCOBR1 $$BFCMUL	ANS/COBOL
$$BPLOSE $IJKS00 $IJKS10 $IJKS20 $IJKS30 $IJKS40 $IJKS50 $IJKS60 $IJKS70	PL/I
$$BMU100 $$BMU200 $$BMU300	MPS Utilities

Module 7 lists the names of the preassembled modules shipped by IBM in the relocatable library, their external storage requirements in library blocks, and the compilers that create linkage for their use. The size of these modules, if this should be needed to determine virtual storage requirements, may be calculated based on the module names (which give an indication of the specified parameters) and the values given under "Component Requirements - IOCS Routines" in Module 1 of this manual.

No IOCS modules are required for FORTRAN.

An x in a column headed by a compiler indicates that the particular module may be linked by that compiler to the problem program. For example, an x in the columns headed by COBOL and PL/I indicates that COBOL and PL/I link the module so identified. For assembler language programs, the user can preassemble IOCS modules as described in DOS/VS Supervisor and I/O Macros. Note that separate modules are not assembled for DTFCN or DTFSR.

The preassembled modules named in this module can be used by any other problem program whenever applicable.

	Modules	Blocks
American National Standard COBOL	223	1247
American National Standard COBOL and COBOL	148	991
American National Standard COBOL and PL/I	163	1100
American National Standard COBOL, COBOL and PL/I	169	1181
COBOL	341	1272
COBOL and PL/I	77	578
PL/I	107	698
PL/I Optimizing Compiler	70	412
RPG II	161	876
Required IOCS Modules	32	108

Note: Certain preassembled IOCS modules are required when cataloging IBM components to the core image library. Do not delete these modules from the relocatable library until after all the IBM components you desire have been cataloged to the core image library. The modules are found in "Required IOCS Modules".

Relocatable Module Naming Conventions

Each module name begins with a 3-character prefix and consists of a 5-character field corresponding to the option permitted in generation of the module. The following 3-character prefixes identify the preassembled IOCS modules shipped by IBM:

IJC I/O Card (CDMOD) and 3881 Optical Mark Reader
IJD I/O Printer (PRMOD)
IJF I/O Magnetic Tape (MTMOD)
IJG Sequential Direct Access (SDMOD)
IJH Index Sequential Direct Access (ISMOD)
IJI Direct Access Method (DAMOD)
IJJ Device Independent Access Method (DIMOD)
IJN I/O Diskette (DUMOD)

CDMOD

CDMOD name = IJCabcde

a = F RECFORM=FIXUNB (always for INPUT and CMBND files)
= U RECFORM=UNDEF
= V RECFORM=VARUNB

b = A CTLCHR=ASA (not specified CMBND)
= C CONTROL=YES
= Y CTLCHR=YES
= Z neither CTLCHR nor CONTROL is specified

c = B RDONLY=YES and TYPEFLE=CMBND
= C TYPEFLE=CMBND
= H RDONLY=YES and TYPEFLE=INPUT
= I TYPEFLE=INPUT
= N RDONLY=YES and TYPEFLE=OUTPUT
= O TYPEFLE=OUTPUT

d = B WORKA=YES and IOAREA2=YES
= I IOAREA2=YES
= W WORKA=YES
= Z neither WORKA nor IOAREA2 is specified
(for CMBND files: WORKA is not specified)

e = 0 DEVICE=2540 or DEVICE=3881
= 1 DEVICE=1442 or DEVICE=2596
= 2 DEVICE=2520
= 3 DEVICE=2501
= 4 DEVICE=2540 and CRDERR is specified
= 5 DEVICE=2520 and CRDERR is specified
= 6 DEVICE=3505
= 7 DEVICE=3525 and FUNC omitted, FUNC=R or FUNC=P
= 8 DEVICE=2560 and FUNC omitted, FUNC=R or FUNC=P
= 9 DEVICE=5425 and FUNC omitted, FUNC=R or FUNC=P
= A DEVICE=3525 and FUNC=RP
= B DEVICE=3525 and FUNC=RW
= C DEVICE=3525 and FUNC=PW
= D DEVICE=3525 and FUNC=I
= E DEVICE=3525 and FUNC=RPW
= F DEVICE=2560 and FUNC=RP
= G DEVICE=2560 and FUNC=RW
= H DEVICE=2560 and FUNC=PW
= I DEVICE=2560 and FUNC=I
= J DEVICE=2560 and FUNC=RPW
= K DEVICE=5425 and FUNC=RP
= L DEVICE=5425 and FUNC=RW
= M DEVICE=5425 and FUNC=PW
= N DEVICE=5425 and FUNC=I
= O DEVICE=5425 and FUNC=RPW

CDMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJCFAOID				x	
IJCFAOI0					
IJCFAOI1	x	x		x	x
IJCFAOI2	x	x			
IJCFAOI4	x	x		x	x
IJCFAOI5	x			x	x
IJCFAOI7	x			x	
IJCFAOI8	x			x	
IJCFAOI9				x	
IJCFAOZA	x			x	
IJCFAOZC	x			x	
IJCFAOZD				x	
IJCFAOZE	x			x	
IJCFAOZ0					
IJCFAOZ1	x	x		x	x
IJCFAOZ2		x			
IJCFAOZ4	x	x		x	x
IJCFAOZ5	x			x	x
IJCFAOZ7	x			x	
IJCFAOZ8	x			x	
IJCFAOZ9				x	
IJCFCCZ0			x		
IJCFCCZ1			x		
IJCFCCZ2			x		
IJCFCIWB			x		
IJCFCIWG			x		
IJCFCIWL			x		
IJCFCIZ0	x		x		
IJCFCIZ1	x		x		
IJCFCIZ2	x		x		
IJCFCIZ6	x		x	x	

CDMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJCFCIZ7			x		
IJCFCIZ8			x		
IJCFCIZ9			x		
IJCFCOI1			x		
IJCFCOI4			x		
IJCFCOI5			x		
IJCFCOWA			x		
IJCFCOWC			x		
IJCFCOWE			x		
IJCFCOWF			x		
IJCFCOWH			x		
IJCFCOWJ			x		
IJCFCOWK			x		
IJCFCOWM			x		
IJCFCOWO			x		
IJCFCOZ1			x		
IJCFCOZ4			x		
IJCFCOZ5			x		
IJCFCOZ7			x		
IJCFCOZ8			x		
IJCFCOZ9			x		
IJCFYOID				x	
IJCFYOI0	x				
IJCFYOI1		x	x	x	
IJCFYOI2		x			
IJCFYOI4		x	x	x	
IJCFYOI5			x	x	
IJCFYOI7	x			x	
IJCFYOI8				x	
IJCFYOI9				x	
IJCFYOZA				x	

CDMOD Names	COEOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOI
IJCFYOZC				x	
IJCFYOZD				x	
IJCFYOZE				x	
IJCFYOZ0					
IJCFYOZ1		x	x	x	
IJCFYOZ2		x			
IJCFYOZ4		x	x	x	
IJCFYOZ5			x	x	
IJCFYOZ7				x	
IJCFYOZ8				x	
IJCFYOZ9				x	
IJCFZII0	x	x	x	x	x
IJCFZII1	x	x	x	x	x
IJCFZII2	x	x	x	x	x
IJCFZII3	x	x	x	x	x
IJCFZII6	x		x	x	
IJCFZII7	x		x	x	
IJCFZII8	x		x	x	
IJCFZII9			x	x	
IJCFZIWA			x		
IJCFZIWB			x		
IJCFZIWE			x		
IJCFZIWF			x		
IJCFZIWG			x		
IJCFZIWJ			x		
IJCFZIWK			x		
IJCFZIWL			x		
IJCFZIWO			x		
IJCFZIZA	x			x	
IJCFZIZB	x			x	
IJCFZIZE	x			x	

CDMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJCFZIZ0	x	x	x	x	x
IJCFZIZ1	x	x	x	x	x
IJCFZIZ2	x	x	x	x	x
IJCFZIZ3	x	x	x	x	x
IJCFZIZ6	x		x	x	
IJCFZIZ7	x		x	x	
IJCFZIZ8	x		x	x	
IJCFZIZ9			x	x	
IJCFZOID	x			x	
IJCFZOI1	x	x		x	x
IJCFZOI2		x			
IJCFZOI4	x	x	x	x	x
IJCFZOI5	x			x	x
IJCFZOI7	x		x	x	
IJCFZOI8	x		x	x	
IJCFZOI9			x	x	
IJCFZOWA			x		
IJCFZOWC			x		
IJCFZOWE			x		
IJCFZOWF			x		
IJCFZOWH			x		
IJCFZOWJ			x		
IJCFZOWK			x		
IJCFZOWM			x		
IJCFZOWO			x		
IJCFZOZA	x			x	
IJCFZOZC	x			x	
IJCFZOZD	x			x	
IJCFZOZE	x			x	
IJCFZOZ1	x	x		x	x
IJCFZOZ2		x			

CDMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJCFZOZ4	x	x	x	x	x
IJCFZOZ5	x			x	x
IJCFZOZ7	x		x	x	
IJCFZOZ8	x		x	x	
IJCFZOZ9			x	x	
IJCUAOI1				x	x
IJCUAOI4	x			x	x
IJCUAOI5	x			x	x
IJCUAOI7				x	
IJCUAOI8	x			x	
IJCUAOI9				x	
IJCUAOZA				x	
IJCUAOZC				x	
IJCUAOZE				x	
IJCUAOZ1	x			x	x
IJCUAOZ4	x			x	x
IJCUAOZ5	x			x	x
IJCUAOZ7				x	
IJCUAOZ8	x			x	
IJCUAOZ9				x	
IJCUYOI1				x	
IJCUYOI4				x	
IJCUYOI5				x	
IJCUYOI7				x	
IJCUYOI8				x	
IJCUYOI9				x	
IJCUYOZA				x	
IJCUYOZC				x	
IJCUYOZE				x	
IJCUYOZ1				x	
IJCUYOZ4				x	

CDMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJCUYOZ5				x	
IJCUYOZ7				x	
IJCUYOZ8				x	
IJCUYOZ9				x	
IJCUZOI1	x			x	x
IJCUZOI4	x			x	x
IJCUZOI5	x			x	x
IJCUZOI7	x			x	
IJCUZOI8	x			x	
IJCUZOI9				x	
IJCUZOZA				x	
IJCUZOZC				x	
IJCUZOZE				x	
IJCUZOZ1	x			x	x
IJCUZOZ4	x			x	x
IJCUZOZ5	x			x	x
IJCUZOZ7	x			x	
IJCUZOZ8	x			x	
IJCUZOZ9				x	
IJCVAOI1	x			x	x
IJCVAOI4	x			x	x
IJCVAOI5	x			x	x
IJCVAOI7				x	
IJCVAOI8	x			x	
IJCVAOI9				x	
IJCVAOZA				x	
IJCVAOZC				x	
IJCVAOZE				x	
IJCVAOZ1	x			x	x
IJCVAOZ4	x			x	x
IJCVAOZ5	x			x	x

CDMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJCVAOZ7				x	
IJCVAOZ8	x			x	
IJCVAOZ9				x	
IJCVYOI1				x	
IJCVYOI4				x	
IJCVYOI5				x	
IJCVYOI7				x	
IJCVYOI8				x	
IJCVYOI9				x	
IJCVYOZA				x	
IJCVYOZC				x	
IJCVYOZE				x	
IJCVYOZ1				x	
IJCVYOZ4				x	
IJCVYOZ5				x	
IJCVYOZ7				x	
IJCVYOZ8				x	
IJCVYOZ9				x	
IJCVZOI1	x			x	x
IJCVZOI4	x			x	x
IJCVZOI5	x			x	x
IJCVZOI7	x			x	
IJCVZOI8	x			x	
IJCVZOI9				x	
IJCVZOZA				x	
IJCVZOZC				x	
IJCVZOZE				x	

CDMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJCVZOZ1	x			x	x
IJCVZOZ4	x			x	x
IJCVZOZ5	x			x	x
IJCVZOZ7	x			x	
IJCVZOZ8	x			x	
IJCVZOZ9				x	

DAMOD

DAMOD name = IJIabcde

a = B RECFORM=UNDEF (handles both UNDEF and FIXUNB)
  = F RECFORM=FIXUNB
  = S RECFORM=SPNUNB
  = V RECFORM=VARUNB

b = A AFTER=YES
  = W RPS version of module
  = Z AFTER is not specified

c = E IDLOC=YES and FEOVD=YES
  = I IDLOC=YES
  = R FEOVD=YES
  = Z neither is specified

d = H ERREXT=YES and RELTRK=YES
  = P ERREXT=YES
  = R RELTRK=YES
  = Z neither is specified

e = W HOLD=YES and RDONLY=YES
  = X HOLD=YES
  = Y RDONLY=YES
  = Z neither is specified

DAMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJIBAIRZ	x				x
IJIBAIZZ	x				x
IJIBAZHZ				x	
IJIBAZRZ	x				x
IJIBAZZZ	x				x
IJIBWEHW					
IJIBZIRZ	x				x
IJIBZIZZ	x				x
IJIBZZHZ				x	
IJIBZZRZ	x				x
IJIBZZZZ	x		x		x
IJIFAIRZ	x				x
IJIFAIZZ	x				x
IJIFAZHZ				x	
IJIFAZRZ	x				x
IJIFAZZZ	x	x			x

DAMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJIFWEHW					
IJIFZIRZ	x				x
IJIFZIZZ	x				x
IJIFZZHZ				x	
IJIFZZRZ	x				x
IJIFZZZZ	x	x	x		x
IJISAIRZ	x				x
IJISAIZZ	x				x
IJISAZRZ	x				x
IJISAZZZ	x				x
IJISWEHW					
IJISZIRZ	x				x
IJISZIZZ	x				x
IJISZZRZ	x				x
IJISZZZZ	x				x
IJIVWEHW					

DIMOD

DIMOD name = IJJabcde

Note: See "Required IOCS Modules" before deleting modules with the IJJ prefix.

a = F RECFORM=FIXUNB
b = C non-RPS version of module
  = V RPS data set
c = B TYPEFLE=OUTPUT (processes both input and output)
  = I TYPEFLE=INPUT
d = I IOAREA2=YES
  = Z IOAREA2 is not specified
e = C RDONLY=YES
  = D RDONLY is not specified

DIMOD Names	PL/I	RPG II	PL/I Optimizing Compiler
IJJFCBID*	x	x	x
IJJFCBZD*	x		x
IJJFCIID	x		x
IJJFCIZD	x		x
IJJFVBIC*			
IJJFVIIC			

*Note: To obtain support for the TRC parameter for the 3800 printer when extended printer buffering is not being used, reassemble the modules that include B in the module name (that is, those for which TYPEFLE=OUTPUT has been specified). Specify TRC=YES on the DIMOD macro when reassembling.

ISMOD

ISMOD name = IJHabcde

a = A RECFORM=BOTH and IOROUT=ADD or ADDRTR
  = B RECFORM=FIXBLK and IOROUT=ADD or ADDRTR
  = U RECFORM=FIXUNB and IOROUT=ADD or ADDRTR
  = Z RECFORM is not specified and IOROUT=LOAD or RETRVE

b = A IOROUT=ADDRTR (non-RPS version of module)
  = I IOROUT=ADD
  = L IOROUT=LOAD (non-RPS version of module)
  = R IOROUT=RETRVE
  = V IOROUT=ADDRTR (RPS version of module)
  = X IOROUT=LOAD (RPS version of module)

c = B TYPEFLE=RANSEQ
  = G IOAREA2=YES and TYPEFLE=SEQNTL or IOROUT=LOAD
  = R TYPEFLE=RANDOM
  = S TYPEFLE=SEQNTL
  = Z neither is specified and IOROUT=LOAD or ADD

d = B CORINDX=YES and HOLD=YES
  = C CORINDX=YES
  = O HOLD=YES
  = Z neither specified

e = F CORDATA=YES, ERREXT=YES, and RDONLY=YES
  = G CORDATA=YES and ERREXT=YES
  = O CORDATA=YES and RDONLY=YES
  = P CORDATA=YES
  = S ERREXT=YES and RDONLY=YES
  = T ERREXT=YES
  = Y RDONLY=YES
  = Z nothing is specified

ISMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJHAABCP					x
IJHAABCZ			x		x
IJHAABZP					x
IJHAABZZ	x		x		
IJHAARCG				x	
IJHAARCP	x	x			x
IJHAARCT				x	
IJHAARCZ	x	x	x		x
IJHAARZG				x	
IJHAARZP	x	x			x
IJHAARZT				x	
IJHAARZZ	x	x	x		x

ISMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJHAASZZ	x			x	
IJHAIZCZ			x		
IJHAIZZZ	x		x		
IJHAVBBF					
IJHAVBBS					
IJHAVBCF					
IJHAVBCS					
IJHAVGBF					
IJHAVGBS					
IJHAVGCF					
IJHAVGCS					
IJHEABCP	x				x
IJHBABCZ	x		x		x
IJHEABZP	x				x
IJHBABZZ	x		x		x
IJHEARCP	x	x			x
IJHBARCZ	x	x	x		x
IJHEARZP	x	x			x
IJHBARZZ	x	x	x		x
IJHBASZZ	x		x		
IJBIZCZ			x		
IJHBIZZZ	x		x		
IJHUABCP	x				x
IJHUABCZ	x		x		x
IJHUABZP	x				x
IJHUABZZ	x		x		x
IJHUARCP	x	x			x
IJHUARCZ	x	x	x		x
IJHUARZP	x	x			x

ISMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJHUARZZ	x	x	x		x
IJHUASZZ	x		x		
IJHUIZCZ			x		
IJHUIZZZ	x		x		
IJHZLGZT				x	
IJHZLGZZ	x		x		
IJHZLZZT				x	
IJHZLZZZ	x	x	x		x
IJHZRBCZ	x		x		x
IJHZRBZZ	x		x		x
IJHZRGZT				x	
IJHZRGZZ	x		x		
IJHZRRCT				x	
IJHZRRCZ	x	x	x		x
IJHZRRZT				x	
IJHZRRZZ	x	x	x	x	x
IJHZRSZT				x	
IJHZRSZZ	x	x	x	x	x
IJHZXGZS					

MTMOD

MTMOD name = IJFabcde

a = F RECFORM=FIXUNB or FIXBLK
  = S RECFORM=SPNUNB or SPNBLK
  = U RECFORM=UNDEF
  = V RECFORM=VARUNB or VARBLK

  = N RECFORM=UNDEF and ASCII=YES
  = R RECFORM=VARUNB or VARBLK, and ASCII=YES
  = X RECFORM=FIXUNB or FIXBLK, and ASCII=YES

b = B READ=BACK
  = Z READ=FORWARD, or READ is not specified

c = C CKPTREC=YES
  = Z CKPTREC is not specified

d = W WORKA=YES is specified
  = Z WORKA is not specified

e = M ERREXT=YES and RDONLY=YES
  = N ERREXT=YES
  = Y RDONLY=YES
  = Z neither is specified

MTMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJFFBCZN				x	
IJFFBCZZ	x				
IJFFBZZN	x			x	x
IJFFBZZZ		x			
IJFFZCZN			x	x	
IJFFZCZZ	x		x		x
IJFFZZZN			x	x	
IJFFZZZZ	x	x	x		x
IJFNBZZN				x	
IJFNZZZN				x	
IJFRZZWN			x		
IJFRZZWZ			x		
IJFRZZZN				x	
IJFRZZZZ			x		
IJFSZCWN			x		
IJFSZCWZ			x		
IJFSZZWN	x		x		x

MTMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJFSZZWZ			x		
IJFUBCZN				x	
IJFUBCZZ	x				
IJFUBZZN				x	
IJFUBZZZ		x			
IJFUZCZN				x	
IJFUZZZN	x			x	x
IJFUZZZZ	x	x			x
IJFVBCWZ	x				
IJFVBCZZ	x				
IJFVZCWN			x		
IJFVZCWZ			x		
IJFVZCZN				x	
IJFVZZWZ			x		
IJFVZZZN	x			x	x
IJFVZZZZ	x	x			x
IJFWEZZN				x	
IJFXBZZN				x	
IJFXZZZN			x	x	
IJFXZZZZ			x		

Name list for work file type modules (TYPEFLE=WORK):

MTMOD name = IJFabcde

a = W always

b = E ERROPT=YES
  = Z ERROPT is not specified

c = N NOTEPNT=YES
  = S NOTEPNT=POINTS
  = Z NOTEPNT is not specified

d = Z always

e = M ERREXT=YES and RDONLY=YES
  = N ERREXT=YES
  = Y RDONLY=YES
  = Z neither is specified

System I/O Modules

IJFWEZZZ
IJFWZNZZ
IJFWZZZZ

Note: See "Required IOCS Modules" before deleting modules with the IJF prefix.

PRMOD

PRMOD name = IJDabcde

a = F RECFORM=FIXUNB
  = V RECFORM=VARUNB
  = U RECFORM=UNDEF

b = A CTLCHR=ASA
  = Y CTLCHR=YES
  = C CONTROL=YES
  = S STLIST=YES
  = Z neither CTLCHR nor CONTROL nor STLIST is specified
  = U DEVICE=2560
  = V DEVICE=5425
  = T DEVICE=3525 with 2-line printer, and FUNC=XXT

c = B ERROPT=YES (ERROPT=name in DTFPR) and PRINTOV=YES
  = P PRINTOV=YES, DEVICE is not a 3525, and ERROPT is not specified (ERROPT=RETRY or omitted in DTFPR)
  = I PRINTOV=YES, DEVICE=3525, and FUNC=WT or omitted
  = F PRINTOV=YES, DEVICE=3525, and FUNC=RWT
  = C PRINTOV=YES, DEVICE=3525, and FUNC=PWT
  = D PRINTOV=YES, DEVICE=3525, and FUNC=RPWT
  = Z neither ERROPT (ERROPT=RETRY or omitted in DTFPR) nor PRINTOV is specified, and DEVICE is not a 3525
  = O PRINTOV=YES is not specified, DEVICE=3525 and FUNC=WT or omitted
  = R PRINTOV=YES is not specified, DEVICE=3525 and FUNC=RWT
  = S PRINTOV=YES is not specified, DEVICE=3525 and FUNC=PWT
  = T PRINTOV=YES is not specified, DEVICE=3525 and FUNC=RPWT
  = E ERROPT=YES (ERROPT=name in DTFPR) and PRINTOV=YES is not specified
  = U DEVICE=2560 or 5425 and FUNC=W or omitted
  = V DEVICE=2560 or 5425 and FUNC=RW
  = W DEVICE=2560 or 5425 and FUNC=PW
  = X DEVICE=2560 or 5425 and FUNC=RPW

d = I IOAREA2=YES
  = Z IOAREA2 is not specified

e = V RDONLY=YES and WORKA=YES
  = W WORKA=YES
  = Y RDONLY=YES
  = Z neither is specified

Note: To obtain support for the TRC parameter for the 3800 printer when extended printer buffering is not being used, reassemble the required logic modules with TRC=YES specified.

PRMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJDFAOIZ	x			x	
IJDFAOZZ	x			x	
IJDFAPIZ	x				x
IJDFAPZZ	x				x
IJDFARIZ	x			x	
IJDFARZZ	x			x	
IJDFASIZ	x			x	
IJDFASZZ	x			x	
IJDFATIZ	x			x	
IJDFATZZ	x			x	
IJDFAZIZ		x		x	
IJDFAZZZ		x		x	
IJDFTOIZ				x	
IJDFTOZZ				x	
IJDFTRIZ				x	
IJDFTRZZ				x	
IJDFTSIZ				x	
IJDFTSZZ				x	
IJDFTTIZ				x	
IJDFTTZZ				x	
IJDFUUIZ	x			x	
IJDFUUZW			x		
IJDFUUZZ	x			x	
IJDFUVZW			x		
IJDFUWZW			x		
IJDFUXZW			x		
IJDFVUIZ				x	
IJDFVUZW			x		
IJDFVUZZ				x	
IJDFVVZW			x		

PRMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJDFVWZW			x		
IJDFVXZW			x		
IJDFYOIZ				x	
IJDFYOZW			x		
IJDFYOZZ				x	
IJDFYPZW					
IJDFYRIZ				x	
IJDFYRZW			x		
IJDFYRZZ				x	
IJDFYSIZ				x	
IJDFYSZW			x		
IJDFYSZZ				x	
IJDFYTIZ				x	
IJDFYTZW			x		
IJDFYTZZ				x	
IJDFYPIZ					x
IJDFYPZZ	x				x
IJDFYZIZ		x		x	
IJDFYZZZ		x		x	
IJDFZOIZ	x			x	
IJDFZOZZ	x			x	
IJDFZPIZ	x	x			x
IJDFZPZZ	x	x			x
IJDFZRIZ	x			x	
IJDFZRZZ	x			x	
IJDFZSIZ	x			x	
IJDFZSZZ	x			x	
IJDFZTIZ	x			x	
IJDFZTZZ	x			x	
IJDFZZIZ				x	
IJDFZZZZ				x	

PRMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJDUAOIZ	x			x	
IJDUAOZZ	x			x	
IJDUAPIZ	x				x
IJDUAPZZ	x				x
IJDUARIZ	x			x	
IJDUARZZ	x			x	
IJDUASIZ	x			x	
IJDUASZZ	x			x	
IJDUATIZ	x			x	
IJDUATZZ	x			x	
IJDUAZIZ				x	
IJDUAZZZ				x	
IJDUTOIZ				x	
IJDUTOZZ				x	
IJDUTRIZ				x	
IJDUTRZZ				x	
IJDUTSIZ				x	
IJDUTSZZ				x	
IJDUTTIZ				x	
IJDUTTZZ				x	
IJDUUUIZ	x			x	
IJDUUUZZ	x			x	
IJDUVUIZ				x	
IJDUVUZZ				x	
IJDUYOIZ				x	
IJDUYOZZ				x	
IJDUYPIZ	x				x
IJDUYPZZ	x				x
IJDUYRIZ				x	
IJDUYRZZ				x	
IJDUYSIZ				x	

PRMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJDUYSZZ				x	
IJDUYTIZ				x	
IJDUYTZZ				x	
IJDUYZIZ				x	
IJDUYZZZ				x	
IJDUZOIZ	x			x	
IJDUZOZZ	x			x	
IJDUZPIZ	x				x
IJDUZPZZ	x				x
IJDUZRIZ	x			x	
IJDUZRZZ	x			x	
IJDUZSIZ	x			x	
IJDUZSZZ	x			x	
IJDUZTIZ	x			x	
IJDUZTZZ	x			x	
IJDUZZIZ				x	
IJDUZZZZ				x	
IJDVAOIZ	x			x	
IJDVAOZZ	x			x	
IJDVAPIZ	x				x
IJDVAPZZ	x				x
IJDVARIZ	x			x	
IJDVARZZ	x			x	
IJDVASIZ	x			x	
IJDVASZZ	x			x	
IJDVATIZ	x			x	
IJDVATZZ	x			x	
IJDVAZIZ				x	
IJDVAZZZ				x	
IJDVTOIZ				x	

PRMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJDVIOZZ				x	
IJDVIRIZ				x	
IJDVIRZZ				x	
IJDVISIZ				x	
IJDVISZZ				x	
IJDVIIIZ				x	
IJDVIIZZ				x	
IJDVUUIZ				x	
IJDVUUZZ	x			x	
IJDVVUIZ	x			x	
IJDVVUZZ				x	
IJDVYOIZ				x	
IJDVYOZZ				x	
IJDVYPIZ	x				x
IJDVYPZZ	x				x
IJDVYRIZ				x	
IJDVYRZZ				x	
IJDVYSIZ				x	
IJDVYSZZ				x	
IJDVYIIZ				x	
IJDVYIZZ				x	
IJDVYZIZ				x	
IJDVYZZZ				x	
IJDVZOIZ	x			x	
IJDVZOZZ	x			x	
IJDVZPIZ	x				x
IJDVZPZZ	x				x
IJDVZRIZ	x			x	
IJDVZRZZ	x			x	
IJDVZSIZ	x			x	

PRMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJDVZSZZ	x			x	
IJDVZTIZ	x			x	
IJDVZTZZ	x			x	
IJDVZZIZ				x	
IJDVZZZZ				x	

SDMOD

SDMODxx name = IJGabcde

a = C RECFORM=FIXUNB or FIXBLK and HOLD=YES
  = F RECFORM=FIXUNB or FIXBLK and HOLD is not specified
  = P RECFORM=SPNUNB or SPNBLK and HOLD=YES
  = Q RECFORM=SPNUNB or SPNBLK and HOLD is not specified
  = R RECFORM=UNDEF and HOLD=YES
  = S RECFORM=VARUNB or VARBLK and HOLD=YES
  = U RECFORM=UNDEF and HOLD is not specified
  = V RECFORM=VARUNB or VARBLK and HOLD is not specified

b = I SDMODxI (non-RPS version of module)
  = O SDMODxO (non-RPS version of module)
  = U SDMODxU (non-RPS version of module)
  = W SDMODxI (RPS input data set)
  = X SDMODxO (RPS output data set)
  = Y SDMODxU (RPS update data set)

c = C ERROPT=YES and ERREXT=YES
  = E ERROPT=YES
  = Z neither is specified

d = M TRUNCS=YES and FEOVD=YES
  = T TRUNCS=YES
  = W FEOVD=YES
  = Z neither is specified

e = B CONTROL=YES and RDONLY=YES
  = C CONTROL=YES
  = Y RDONLY=YES
  = Z neither is specified

SDMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJGCYCMB					
IJGCYCWB					
IJGFICZZ			x	x	
IJGFIEIZ	x	x			
IJGFIEWZ	x				x
IJGFIEZZ	x	x			
IJGFIZZZ	x		x		
IJGFOCZZ			x	x	
IJGFOEWZ	x				x
IJGFOEZZ		x			
IJGFOZZZ	x		x		
IJGFUCZZ			x	x	
IJGFUEIZ		x			
IJGFUEWZ	x				x
IJGFUEZZ		x			
IJGFUZZZ	x		x		
IJGFWCMB					
IJGFWCWB					
IJGFXCMB					
IJGFXCWB					
IJGPYCWB					
IJGQICZZ			x		
IJGQIEWZ	x				x
IJGQIEZZ					x
IJGQIZZZ			x		
IJGQOCZZ			x		
IJGQOEWZ	x				x
IJGQOEZZ					x
IJGQOZZZ			x		
IJGQUCZZ			x		
IJGQUEWZ	x				x

SDMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJGQUCZZ			x		
IJGQUEZZ					x
IJGQUZZZ			x		
IJGQWCWB					
IJGQXCWB					
IJGRYCWB					
IJGSYCWB					
IJGUICZZ				x	
IJGUIEWZ	x				x
IJGUIEZZ	x	x			
IJGUIZZZ	x				
IJGUOCZZ				x	
IJGUOEWZ	x				x
IJGUOEZZ		x			
IJGUOZZZ	x				
IJGUUCZZ				x	
IJGUUEWZ	x				x
IJGUUEZZ		x			
IJGUUZZZ	x				
IJGUWCWB					
IJGUXCWB					
IJGVIEWZ	x				x
IJGVICZZ			x	x	
IJGVIEZZ	x	x			
IJGVIZZZ	x		x		
IJGVOCZZ			x	x	
IJGVOEWZ	x				x
IJGVOEZZ		x			
IJGVOZZZ	x		x		
IJGVUCZZ			x	x	
IJGVUEWZ	x				x

SDMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJGVUEZZ		x			
IJGVUZZZ	x		x		
IJGVWCWB					
IJGVXCWB					
IJGWCZZU				x	
IJGWCZZZ				x	

NAME LIST FOR WORK FILE TYPE MODULES (TYPEFLE=WORK)

SDMODxx name = IJGabcde

a = T SDMODW specifies HOLD=YES
  = W SDMODW does not specify HOLD=YES

b = C ERROPT=YES and ERREXT=YES
  = E ERROPT=YES
  = W RPS version of module
  = Z neither is specified

c = N NOTEPNT=YES
  = R NOTEPNT=POINTRW
  = Z NOTEPNT is not specified

d = C CONTROL=YES
  = Z CONTROL is not specified

e = T RDONLY=YES and UPDATE=YES
  = U UPDATE=YES
  = Y RDONLY=YES
  = Z neither is specified

System I/O Modules

IJGTWNCT
IJGWEZZU
IJGWEZZZ
IJGWZNZZ
IJGWZRZZ

Note: See "Required IOCS Modules" before deleting modules with the IJG prefix.

DUMOD

```
DUMODFx name = IJNabcde

a = D

b = I  DUMODFI
  = O  DUMODFO

c = C  ERROPT=YES and ERREXT=YES
  = E  ERROPT=YES
  = Z  neither is specified

d = Z

e = Y  RDONLY=YES
  = Z  RDONLY not specified
```

DUMOD Names	COBOL	PL/I	RPGII	PL/I Optimizing Compiler	American National Standard COBOL
IJNDICZZ			x	x	
IJNDIZZZ			x		
IJNDOCZZ			x	x	
IJNDOZZZ			x		

Required IOCS Modules

The following preassembled IOCS modules are required when cataloging and/or link-editing IBM components to the core image library.

Module Names	Bytes of Storage
IJFFZZWN	960
IJFWEZZZ	280
IJFWZNZZ	424
IJFWZZZZ	232
IJGFIEIZ	746
IJGWEZZU	868
IJGWEZZZ	796
IJGWZNZZ	902
IJGWZRZZ	840
IJJCPA1N	838
IJJCPDV	750
IJJCPDV1	694
IJJCPDV2	358
IJJCPD0	854
IJJCPD0N	798
IJJCPD1	718
IJJCPD1N	762
IJJCPD2	478
IJJCPD3	350
IJJCPV	343
IJJCPV1	271
IJJCPV2	68
IJJCP0	389
IJJCP0N	317
IJJCP1	311
IJJCP1N	239
IJJCP2	128
IJJCP3	58
IJNDIEZZ	868

Module 8: Direct Access -- 5745-SC-DAM

8

Number of Transients	Core Image Library Blocks
11	12

Transients

$$BODACL
$$BODAIM
$$BODAIN
$$BODAI1
$$BODAO1
$$BODAO2
$$BODAO3
$$BODAO4
$$BODARP
$$BODARS
$$BODAU1

Number of Macros	Source Statement Library Blocks
3	1,268

SOURCE STATEMENT LIBRARY

File Definition Macros

E.DAMOD
E.DAMODV
E.DTFDA

Storage Requirements

Figure 8-1 defines the storage requirements for DAMOD. The following are the storage requirements for DTFDA.

DTFDA (Define The File: Direct-Access Device) Table Requirements

RECFORM=FIXUNB requires 205-225 bytes, depending upon imperative macros used in the DTF.

VERIFY=YES requires 40-80 bytes, depending upon imperative macros used in the DTF.

AFTER=YES requires 80 additional bytes.

Support for RPS requires 512 bytes for each open DTFDA to be available in the GETVIS area of the partition. This area is allocated during open; it is used to generate RPS channel programs.

RECFORM=SPNUNB requires 282-378 bytes, depending upon the imperative macros used in the DTF.

VERIFY=YES requires 64-72 additional bytes, depending upon the imperative macros used in the DTF.

AFTER=YES requires 88 additional bytes.

RECFORM=UNDEF requires 265-285 bytes, depending upon the imperative macro used in the DTF.

VERIFY=YES requires 40-80 additional bytes, depending upon the imperative macros used in the DTF.

AFTER=YES requires 16 additional bytes.

RECFORM=VARUNB requires 216-330 bytes, depending upon the imperative macros used in the DTF.

VERIFY=YES requires 64-72 additional bytes, depending upon the imperative macros used in the DTF.

AFTER=YES requires 88 additional bytes.

Relative addressing increases the size of the DTF 60-80 bytes plus 8 bytes per extent. (See DOS/VS Supervisor and I/O Macros listed on the front cover of this manual.)

DAMOD (Direct-Access Device Module)

			Formatting Module					
RECFORM=	Basic Module	IDLOC	AFTER	AFTER and IDLOC	RELTRK	HOLD	ERREXT	RPS Version of Logic Module
FIXUNB	636	+180	+304	+484	+212	+84	+28	1948
UNDEF	796	+208	+216	+426	+208	+88	+28	2152
VARUNB	686	+210	+298	+508	+226	+84	+34	2084
SPNUNB	2320	+316	+1004	+1320	---	+104	+32	4096

Figure 8-1. DAMOD -- Storage Requirements

Notes:

1. Basic Module includes coding to handle either FIXUNB or UNDEF records and the WRITEKY, READKEY, READID, WRITEID, SRCHM, VERIFY, and CONTROL functions.

2. AFTER includes coding to create the file and to handle the RZERO option.

3. IDLOC includes coding to return the record identifier to the user in a location he specifies.

4. Specification of trailer label processing in the DTF increases the size of each module by 50 ± 20 bytes.

5. RDONLY=YES changes the size of the module -50 to +50 bytes. In addition, the user's program must provide a 72-byte save area each time the module is reentered.

6. RELTRK may be specified for SPNUNB records. This specification requires no additional bytes.

7. RPS versions of the logic modules include support for all other valid options for each record format.

Module 9: 3540 Diskette I/O Unit IOCS -- 5745-SC-DIO

9

Libraries			
Core Image		Source Statement	
Transients	Blocks	Macros	Blocks
19	19	3	503

CORE IMAGE LIBRARY

Transients

$$ABERR7
$$BODIO1
$$BODIO2
$$BODIO3
$$BODIO4
$$BODIO5
$$BODIO6
$$BODIO7
$$BODIO8
$$BODMSG
$$BODMS2
$$BODSMO
$$BODSPO
$$BODUCP
$$BOVDMO
$$BOWDMO
$$B3540I
$$B3540O
$$B35400

SOURCE STATEMENT LIBRARY

File Definition Macros

E.DTFDU
E.DUMODFI
E.DUMODFO

Storage Requirements

Figures 9-1 and 9-2 specify the storage required by DTFDU and DUMOD.

DTFDU (Define The File Diskette Unit)

	CMDCHN			
TYPEFLE	1	2	13	26
INPUT	152	160	248	352
OUTPUT	160	168	256	360

Figure 9-1. DTFDU -- Storage Requirements

DUMOD (Diskette Unit Module)

Module Name	Basic Module	RDONLY	ERROPT	ERROPT RDONLY	ERROPT ERREXT	ERROPT ERREXT RDONLY[1]
DUMODFI	788	776	868	848	924	902
DUMODFO	632	594	696	642	1078	1024

[1]For RDONLY=YES, the user's program must provide a 72-byte save area each time the module is reentered.

Figure 9-2. DUMOD -- Storage Requirements

Module 10: Indexed Sequential Access Method -- 5745-SC-ISM

10

Number of Transients	Core Image Library Blocks
26	34

Transients

$$BCIS0A
$$BENDFF
$$BENDFL
$$BINDEX
$$BOISRP
$$BOIS01
$$BOIS02
$$BOIS03
$$BOIS04
$$BOIS05
$$BOIS06
$$BOIS07
$$BOIS08
$$BOIS09
$$BOIS10
$$BOIS11
$$BORIV1
$$BORIV2
$$BSETFF
$$BSETFG
$$BSETFH
$$BSETFI
$$BSETFL
$$BSETL
$$BSETL1
$$BSETL2

Number of Macros	Source Statement Library Blocks
6	2,717

SOURCE STATEMENT LIBRARY

Macros

FILE DEFINITION

E.DTFIS
E.ISMOD

IMPERATIVE

E.ENDFL
E.ESETL
E.SETFL
E.SETL

Storage Requirements

Figure 10-1 defines the storage requirements for ISMOD. The storage requirements for DTFIS are:

DTFIS (Define the File Indexed Sequential) Table Requirements:

1. IOROUT=LOAD requires 248 bytes plus 4 bytes per disk extent specified, plus 8 bytes for IOAREA2.

2. IOROUT=ADD requires 530 bytes plus 4 bytes per disk extent specified plus KL (the length of the key).

3. IOROUT=RETRVE requires 276 bytes plus 4 bytes per disk extent specified, when TYPEFLE=SEQNTL.

4. IOROUT=RETRVE requires 292 bytes plus 4 bytes per disk extent specified when TYPEFLE=RANDOM or RANSEQ.

5. IOROUT=ADDRTR requires 548 bytes plus 4 bytes per disk extent specified plus KL (the length of the key).

6. IOROUT=ADDRTR, TYPEFLE=RANDOM, INDAREA=name, and INDSIZE=n require 572 bytes plus 4 bytes per disk extent.

7. Support for RPS requires 384 bytes for each open DTFIS to be available in the GETVIS area of the partition. This area is allocated during open; it is used to generate RPS channel programs.

ISMOD (Indexed Sequential Module)

	IOROUT=									
	LOAD				ADD					
		ERREXT	IOAREA2	ERREXT IOAREA2		CORDATA	ERREXT	HOLD	CORDATA ERREXT	HOLD CORDATA ERREXT
RECFORM=										
FIXUNB					2608	+184	+476	+194	+660	+854
FIXBLK					2822	+272	+498	+186	+770	+956
BOTH	823	+224	+212	+436	3068	+246	+428	+210	+674	+884

Figure 10-1. ISMOD Storage Requirements (Part 1 of 5)

	IOROUT=RETRVE									
	TYPEFLE=									
	RANDOM			SEQNTL				RANSEQ		
		ERREXT	HOLD		ERREXT	IOAREA2	HOLD		ERREXT	HOLD
RECFORM=										
FIXUNB										
FIXBLK										
BOTH	1304	+302	+156	1326	+246	+836	+104	2186	+332	+236

Figure 10-1. ISMOD Storage Requirements (Part 2 of 5)

	IOROUT=ADDRTR									
	TYPEFLE=									
	RANDOM					SEQNTL				
		CORDATA	ERREXT	CORDATA ERREXT	HOLD		CORDATA	IOAREA2	HOLD	ERREXT
RECFORM=										
FIXUNB	3252	+320	+534	+718	+304	3502	+94	+386	+278	+510
FIXBLK	3468	+376	+554	+826	+304	3716	+272	+386	+278	+528
BOTH	3712	+372	+588	+834	+320	3962	+274	+386	+294	+558

Figure 10-1. ISMOD Storage Requirements (Part 3 of 5)

	IOROUT=ADDRTR				
	TYPEFLE=RANSEQ				
		CORDATA	ERREXT	CORDATA ERREXT	HOLD
RECFORM=					
FIXUMB	4266	+316	+556	+750	+384
FIXBLK	4494	+372	+584	+856	+384
BOTH	4726	+248	+616	+864	+400

Figure 10-1. ISMOD Storage Requirements (Part 4 of 5)

RPS Version of Module								
	IOROUT=							
LOAD	ADDRTR							
	IOAREA2=							
	NO				YES			
				HOLD				HOLD
	HOLD	CORDATA	CORDATA		HOLD	CORDATA	CORDATA	
1540	6828	+428	+428	+852	6478	+340	+426	+766

Figure 10-1. ISMOD Storage Requirements (Part 5 of 5)

Notes:

1. When RECFORM=BOTH is specified, the module processes FIXUNB and FIXBLK records.
2. For CORINDX=YES, add 212 bytes.
3. RDONLY=YES changes the module size by ±50 bytes with the following exceptions. When IOROUT=ADD or IOROUT=ADDRTR, the module changes in size +60 to +100 bytes. In addition, the user's program must provide a 72-byte save area each time the module is reentered, regardless of function.
4. RPS versions of the ISAM modules include support for all other valid options.

Module 11: Magnetic Character Reader IOCS -- 5745-SC-MCR

11

Libraries			
Core Image		Source Statement	
Transients	Blocks	Macros	Blocks
8	8	6	278

CORE IMAGE LIBRARY

Transients

$$ABERAO 3895 ERP Phase 1
$$ABERAP 3895 ERP Phase 2
$$ABERAQ 3895 OBR record builder
$$ABERAR 3895 MDR record builder
$$ABERRS Error Recovery Procedure
$$BCMR01 CLOSE
$$BMMR20 Message Writer
$$BOMR01 OPEN

SOURCE STATEMENT LIBRARY

Macros

FILE DEFINITION

E.DTFMR
E.MRMOD

IMPERATIVE

E.DISEN
E.LITE

SAMPLE PROBLEMS

Z.MCR1
Z.MCR2

STORAGE REQUIREMENTS

DTFMR (Define The File Magnetic Character Reader) Table Requirements:

If ADDRESS=DUAL is specified, the table requires 264 bytes.

If ADDRESS=DUAL is not specified, the table requires 250 bytes.

MRMOD (Magnetic Character Reader Module)

If ADDRESS=DUAL is specified, the module requires 1,050 bytes.

If ADDRESS=DUAL is not specified, the module requires 946 bytes.

Sample Problems

	Disk Extent Number			
Phase	1	2	3	4
ASSEMBLE	SYSLNK	SYS001	SYS002	SYS003
LINKEDIT	SYSLNK	SYS001	-	-
EXECUTE	-	-	-	-

Figure 11-1. MICR -- Sample Problem File Requirements

Cards Retrieved	Card Cols. 73-76	Card Cols. 77-80
CATALS Z.MCR1 BKEND Z.MCR1 MCR1 Source Deck (71 Cards) BKEND	$477	0001-0071
CATALS Z.MCR2 BKEND Z.MCR2 MCR2 Source Deck (115 Cards) BKEND	$477	0001-0115

Figure 11-2. MICR -- Sample Problem Card Decks

SAMPLE PROBLEM SUMMARY

Figure 11-1 defines the files required for the MICR sample problems. Figure 11-2 shows the sample problem card decks retrieved from the source statement library.

The first 1419 Magnetic Character Reader sample problem processes 500 documents from one magnetic character reader using GET logic. The documents are read into pocket 3 in groups of approximately 50. After each group is read, the 1419 Magnetic Character Reader is disengaged, the batch number is updated, and the pocket light is turned on. All documents are listed on the printer. If the Selective Tape List feature is present on the printer, the documents are listed on the leftmost tape. The controls on the magnetic character reader that must be pressed, if present, are: BATCH NUMBER ON, PROG SORT, and at least one field for the VALIDITY CHECK AND READ OUT control.

The second 1419 Magnetic Character Reader sample problem processes 250 documents from each of two magnetic character readers (both of the same type: both with a single address adapter or both with a dual address adapter), using READ, CHECK and WAITF logic. The only controls that must be pressed are PROG SORT and at least one field for the VALIDITY CHECK AND READ OUT control. Documents from one reader are selected into pockets one or zero depending on whether or not the selected field is present. Documents read in error are rejected, and all data is listed on a printer. If the Selective Tape List feature is present on the printer, data is printed on the leftmost tape.

Documents from the second reader are selected according to a digit in the field read and printed on SYSLST. If manual intervention is required on the second reader, a message is printed on SYSLOG. This message is:

INTERVENTION REQUIRED ON FILE2

The program names are Z.MCR1 and Z.MCR2. The 1419 sample problems support the 1255/1259.

Instructions show how to remove the following optional features:

1. Dual addressing adapter feature.
2. Batch numbering.
3. Pocket lights.
4. Selective tape list feature (printer).

SYSLOG Output

```
BG // JOB MCR SAMPLE PROBLEMS
BG // PAUSE END OF MCR1 SAMPLE PROBLEM
BG
BG INTERVENTION REQUIRED ON FILE2
BG ECJ MCR
BG // PAUSE END OF MCR SAMPLE PROBLEMS
```

SYSLST Output Summary

- Job control cards
- External symbol dictionary
- Source program listing
- Relocation dictionary
- Linkage editor input diagnostics
- Linkage editor storage map
- Document data listings.

Module 12: Magnetic Tape IOCS -- 5745-SC-TAP

12

Libraries			
Core Image		Source Statement	
Transients	Blocks	Macros	Blocks
19	34	2	994

CORE IMAGE LIBRARY

Transients

$$BCEOV1 Monitor EOV/EOF
$$BCMT01 Tape EOF/EOV input-forward
$$BCMT02 Tape CLOSE-alternate switching
$$BCMT03 Tape CLOSE input-backward
$$BCMT04 Tape EOV output-forward
$$BCMT05 Tape CLOSE
$$BCMT06 Tape CLOSE-work files
$$BCMT07 Tape-alternate switching
$$BCMT08 Tape CLOSE-excluding work files
$$BOMT0M Tape OPEN message
$$BOMT0W Tape OPEN message
$$BOMT01 Tape OPEN input-forward-standard labels (Phase 1)
$$BOMT02 Tape OPEN input-backward-standard labels
$$BOMT03 Tape OPEN output forward-standard label
$$BOMT04 Tape OPEN output-standard labels
$$BOMT05 Tape OPEN I/O forward/backward nonstandard/unlabeled
$$BOMT06 Tape OPEN work files
$$BOMT07 Tape OPEN input-forward-standard labels (Phase 2)
$$BONVOL Tape rewriting

File Definition Macros

E.DTFMT
E.MTMOD

Storage Requirements

Figures 12-1 and 12-2 define the storage requirements for DTFMT and MTMOD.

DTFMT (Define The File: Magnetic Tape) Table Requirements

TYPEFLE=WORK requires 48 bytes per work file.

The table requirements for INPUT and OUTPUT files are:

TYPEFLE=	RECFORM=	Basic Size Without STDLABELS	ERROPT, ERREXT (Without STDLABELS)	Basic Size With STDLABELS	ERROPT, ERREXT (With STDLABELS)
INPUT	FIXUNB or FIXBLK	96	*	112	*
	VARUNB or VARBLK	109	*	128	*
	UNDEF	92	*	108	*
	SPNUNB	132	*	132	*
OUTPUT	FIXUNB or FIXBLK	86	+10	104	+4
	VARUNB or VARBLK	98	+10	116	+4
	UNDEF	84	+4	100	+4
	SPNUNB	132	*	132	*

* Included in basic Size of Module.

Figure 12-1. DTFMT -- Table Requirements

MTMOD (Magnetic Tape Module)

EBCDIC MAGNETIC TAPE MODULE					
		INDEPENDENT OPTIONS			
RECFORM=	BASIC MODULE	WORKA= YES	CKPRTEC= YES	READ= BACK	ERREXT
FIXUNB/FIXBLK	688	+80	+112	+96	+96
VARUNB/VARBLK	824	+112	+108	+84	+96
UNDEF	560	+80	+120	+16	+96
SPNUNB/SPNBLK	1808	-	+260	+300	+252

Figure 12-2. MTMOD -- Storage Requirements (Part 1 of 3)

Notes:

1. Only one module is required for processing all files having a common RECFORM. This module can be generated with the options charted above. To determine the size of the module with the options, the number of option bytes specified in the chart must be added to the basic module.

2. RDONLY=YES, changes the size of the module -50 to +50 bytes. In addition, the user's program must provide a 72-byte save area each time the module is reentered.

WORK FILE MODULE			
		NOTEPNT=	
TYPEFLE=WORK	without NOTEPNT	YES	POINTS
without ERROPT	232	424	286
with ERROPT	280	540	380
with ERROPT and ERREXT	436	654	494

Figure 12-2. MTMOD -- Storage Requirements (Part 2 of 3)

ASCII MAGNETIC TAPE MODULE					
		INDEPENDENT OPTIONS			
RECFORM=	BASIC MODULE	WORKA= YES	CKPREC= YES	READ= BACK	ERREXT
FIXUNB/FIXBLK	824	+92		+128	+120
VARUNB/VARBLK	968	+112		+56	+96
UNDEF	656	+80		+8	+96

Figure 12-2. MTMOD -- Storage Requirements (Part 3 of 3)

Module 13: IBM 1287 Optical Character Reader IOCS -- 5745-SC-OCR

13

Libraries			
Core Image		Source Statement	
Transients	Blocks	Macros	Blocks
2	2	5	722

CORE IMAGE LIBRARY

Transients

$$ABERRT Error Recovery Procedure
$$BOOR01 OPEN

SOURCE STATEMENT LIBRARY

Macros

FILE DEFINITION

E.DTFOR
E.ORMOD

IMPERATIVE

E.DSPLY
E.RDLNE
E.RESCN

STORAGE REQUIREMENTS

Figure 13-1 defines the storage requirements for ORMOD.

ORMOD (Optical Reader Module -- Except for the 3881 Optical Mark Reader)

			INDEPENDENT OPTIONS			
DEVICE=	RECFORM=	Basic Module	CONTROL= YES	IOAREA2= YES	WORKA= YES	IOAREA2= YES and WORKA=YES
1287T/	FIXUNB	892	+220	+76	+60	+96
	FIXBLK	1256	+264	+56	+28	+84
	UNDEF	848	+224	+56	+64	+88
	UNDEF BLKFAC=YES	1180	+268	+56	+24	+80
1287D or 1288	FIXUNB	1360	+184	---	---	---
	UNDEF	1256	+188	---	---	---

Figure 13-1. OPTICAL READER -- ORMOD Storage Requirements

DTFOR (Define The File: 1287 Optical Reader) Table Requirements

1. RECFORM=FIXUNB requires 136 bytes.

2. RECFORM=FIXBLK varies as a function of blocking.

   Size = 136 + (16 x blocking factor x number of I/O areas)

3. RECFORM=UNDEF requires 136 bytes.

Sample Problem Summary

The 1288 sample problem is obtained by retrieving the sample problem for the 1287 journal tape mode of operation (Z.CRJT) and changing the cards with the sequence numbers 1058 and 1071 as follows: For both cards change the parameter DEVICE=1287T to DEVICE=1287D. (Refer to the listing containing the source statements for the sample test program for journal tape processing). Figure 13-2 illustrates the files used by both problems, and Figure 13-3 illustrates the card decks that are punched when the sample problem is retrieved.

The sample problem illustrating document processing for the 1287 or 1288 optical reader (Z.ORDC) reads documents for data input into an input area, and then prints this data on SYSLST. Whenever the 1287 or 1288 document hopper empties, press end-of-file or replenish the stack.

Any approved document type may be used because the reference mark and data field coordinates are entered at program execution time. However, the data field chosen to be read may not exceed six characters in length.

Figure 13-4 is a sample input document. The listing contains examples of keyed-in error corrections identified by comments.

Note: When using this program on a 1288, remove the RESCN and DSPLY macro statements within sequence numbers 0091 and 0109.

The sample problem illustrating journal tape mode processing for the 1287 optical reader reads undefined records from the 1287 optical reader into a work area from two I/O areas, and then prints these records on SYSLST.

Any journal tape with a maximum record size of 38 characters is suitable for this sample problem.

Figure 13-5 is a portion of a sample input journal tape.

Disk Extent Number				
Phase	1	2	3	4
Assemble	SYSLNK	SYS001	SYS002	SYS003
Link Edit	SYSLNK	SYS001	-	-
Execute	-	-	-	-

Figure 13-2. OPTICAL READER -- Sample Problem

Cards Retrieved	Card Cols. 73-76	Card Cols. 77-80
CATALS Z. CRDC		
BKEND Z.ORDC	$478	0001-0179
Document Mode Source Deck (179 Cards)		
BKEND		
CATALS Z.CRJT		
BKEND Z.ORJT	$478	1001-1081
Journal Tape Source Deck (81 Cards)		
BKEND		

Figure 13-3. OPTICAL READER -- Sample Problem Card Deck

SYSLOG Output:

```
// JOB OPTICAL READER SAMPLE PROBLEM
EOJ OPTICAL
// PAUSE END OF OPTICAL READER SAMPLE PROBLEM
```

SYSLST Output Summary

- Job control cards
- External symbol dictionary
- Source program listing
- Relocation dictionary
- Linkage editor input diagnostics
- Linkage editor storage map
- List of fields read from:
  for document sample problem, or
  for journal tape sample problem.

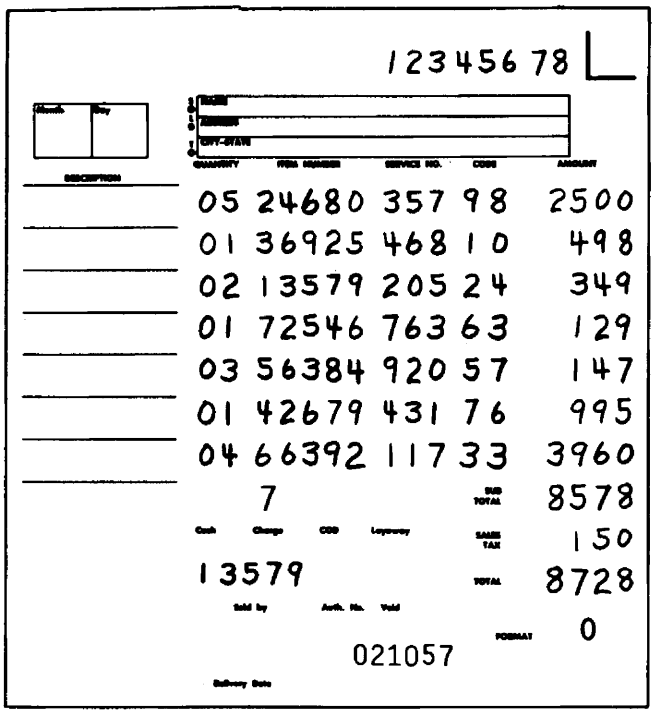

Figure 13-4. OPTICAL READER -- Sample Input Document for Document Mode Processing

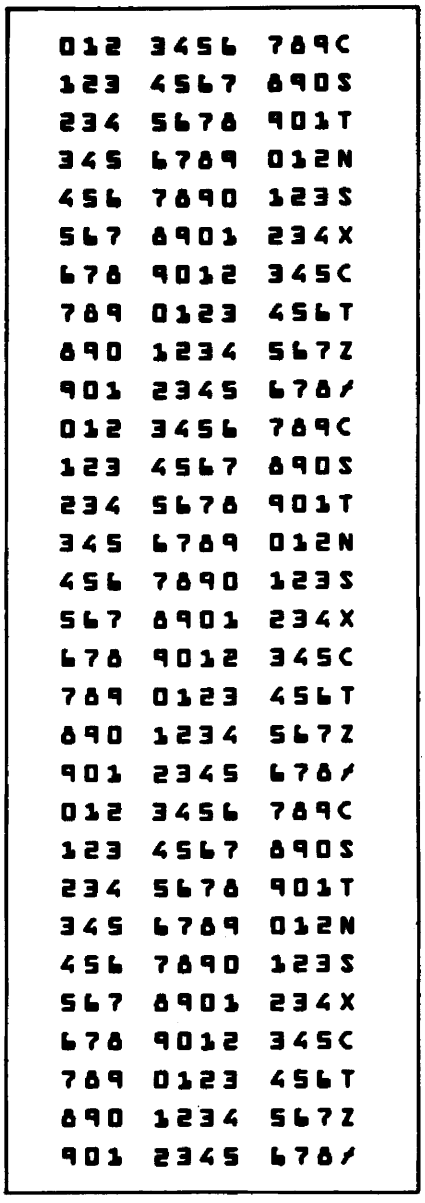

Figure 13-5. OPTICAL READER -- Sample Input for Journal Tape Mode Processing

Module 14: IBM 3886 Optical Character Reader IOCS -- 5745-SC-OCR

14

Libraries			
Core Image		Source Statement	
Transients	Blocks	Macros	Blocks
2	2	6	382

CORE IMAGE LIBRARY

Transients

$$ABERAN Error Recovery Procedure
$$BOOR01 OPEN

SOURCE STATEMENT LIBRARY

DRMOD (3886 Optical Character Reader Module)

Macros

1. Format Definition

   E.DFR
   E.DLINT
   E.DLINTIN (Inner macro, used only by the DLINT macro)

2. File Definition

   E.DTFDR
   E.DRMOD

3. Imperative

   E.SETDEV

STORAGE REQUIREMENTS

DRMOD:

(Basic Size = 443 bytes)

Basic + RDONLY=395

Basic + SETDEV=773

Basic + RDONLY + SETDEV=773

DTFDR Table Requirements

Size = 124+BLKSIZE+FRSIZE

Module 15: Paper Tape IOCS -- 5745-SC-PTP

15

Libraries			
Core Image		Source Statement	
Transients	Blocks	Macros	Blocks
3	4	2	593

CORE IMAGE LIBRARY

Transients

$$ABERRU Error Recovery Procedure (ERP)
$$ABERRV ERP
$$BERPTP ERP - 1018 with error correction feature

SOURCE STATEMENT LIBRARY

File Definition Macros

E.DTFPT
E.PTMOD

STORAGE REQUIREMENTS

DTFPT (Define The File: Paper Tape) Table Requirements

INPUT FILE

The possible table specifications and sizes are:

1. No translations, no shifts, and no deletes require 72 bytes.
2. TRANS=name with no shifts and no deletes requires 76 bytes.
3. TRANS=name, SCAN=name, RECFORM=FIXUNB require 110 bytes.
4. TRANS=name, SCAN=name, RECFORM=UNDEF require 94 bytes.

OUTPUT FILE

The possible table specifications and sizes are:

1. No shifts require 69 bytes.
2. Shifts require 83 bytes.

PTMOD (Paper Tape Module)

The module specifications and sizes are specified in Figure 15-1.

	INPUT		OUTPUT
	2671	1017	1018
1. No parameters specified (no translation, no shifts and no deletes)	244	288	
2. TRANS=YES with no shifts and no deletes	310	354	
3. TRANS=YES, SCAN=YES, RECFORM=FIXUNB	536	570	
4. TRANS=YES, SCAN=YES, RECFORM=UNDEF	436	474	
5. No shifts			352
6. Shifts			570

Note: If module 2 is used, all records require translation.

Figure 15-1. PTMOD -- Storage Requirements

Module 16: Sequential Disk IOCS -- 5745-SC-DSK

16

Libraries			
Core Image		Source Statement	
Transients	Blocks	Macros	Blocks
30	30	11	6,848

CORE IMAGE LIBRARY

Transients

$$BOSDB1
$$BOSDC1
$$BOSDC2
$$BOSDC3
$$BOSDEV
$$BOSDI1
$$BOSDI2
$$BOSDI3
$$BOSDI4
$$BOSDI5
$$BOSDO1
$$BOSDO2
$$BOSDO3
$$BOSDO4
$$BOSDO5
$$BOSDO6
$$BOSDO7
$$BOSDO8
$$BOSDO9
$$BOSDRP
$$BOSDRR
$$BOSDRS
$$BOSDW1
$$BOSDW2
$$BOSDW3
$$BOSD00
$$BOSD01
$$BOSD02
$$BOSD03
$$BO2321

SOURCE STATEMENT LIBRARY

File Definition Macros

E.DTFSD
E.SDMODFI
E.SDMODFO
E.SDMODFU
E.SDMODUI
E.SDMODUO
E.SDMODUU
E.SDMODVI
E.SDMODVO
E.SDMODVU
E.SDMODW

STORAGE REQUIREMENTS

Figures 16-1, 16-2, and 16-3 specify the storage required by DTFSD and SDMOD.

DTFSD (Define The File: Sequential DASD)

	TYPEFLE					
	INPUT		OUTPUT	WORK		
RECFORM=	with UPDATE	without UPDATE		with UPDATE	without UPDATE	CONTROL = YES
FIXBLK or FIXUNB	176	152	160	152	152	+24
VARBLK or VARUNB	192	152	170	---	---	+24
SPNBLK or SPNUNB	240	188	244	---	---	+24
UNDEF	192	152	162	152	152	+24

Figure 16-1. DTFSD -- Storage Requirements

Support for RPS requires 256 bytes for each open DTFSD to be available in the GETVIS area of the partition. This area is allocated during open; it is used to generate RPS channel programs.

SDMOD (SEQUENTIAL DASD MODULE)

Module Name	Basic Module	TRUNCS	CONTROL	ERROPT	HOLD	ERROPT ERREXT	RECFORM=SPNBLK RECFORM=SPNUNB
SDMODFI	462	+80	+28	+144	*	+228	--
SDMODFO	546	+136	+28	+64	*	+200	--
SDMODFU	798	+88	+28	+164	+96	+252	--
SDMODUI	533		+28	+100	*	+171	--
SDMODUO	653		+28	+68	*	+116	--
SDMODUU	941		+28	+148	+40	+248	--
SDMODVI	729		+28	+104	*	+188	300-400
SDMODVO	1045		+28	+68	*	+120	1050-1150
SDMODVU	1086		+28	+176	+76	+296	1500
SDMODW	572		+22	+148	+10	+246	--

*The HOLD function does not apply to these modules.

Notes:

1. For SDMODW, NOTEPNT=YES requires 206 additional bytes: NOTEPNT=POINTRW requires 144 additional bytes, UPDATE=YES requires 40 additional bytes.

2. RDONLY=YES changes the size of the module -50 to +50 bytes. In addition, the user's program must provide a 72-byte save area each time the module is reentered.

Figure 16-2. SDMOD -- Storage Requirements - Non-RPS Version Module Sizes

Module Name	Basic Module	TRUNCS	RECFORM=SPNBLK RECFORM=SPNUNB
SDMODFI	884	+174	--
SDMODFO	1020	+142	--
SDMODFU	1394	+142	--
SDMODUI	908	--	--
SDMODUO	1050	--	--
SDMODUU	1496	--	--
SDMODVI	986	--	+436
SDMODVO	1522	--	+1224
SDMODVU	1762	--	+1524
SDMODW	1934	--	--

Note: Each RPS version of the module supports all other valid options.

Figure 16-3. SDMOD -- Storage Requirements - RPS Version Module Sizes

Module 17: VSAM -- 5745-SC-VSM

17

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General Considerations

This section discusses the three elements necessary to run VSAM: VSAM itself, its utilities (Access Method Services), and the ISAM Interface program. VSAM may run by itself or with either or both of the other two programs.

VSAM Data Management Modules

CORE IMAGE LIBRARY

Transients	15
Blocks	17
Phases	31
Blocks	321

Transients

$$BACLOS
$$BCLCRA
$$BCVSAM
$$BCVS02
$$BCVS03
$$BCVS04
$$BENDQB
$$BJIBFF
$$BJIB00
$$BODADE
$$BODADS
$$BOVSAM
$$BOVS01
$$BOVS03
$$BTCLOS

SVA-eligible phases (see section "Loading VSAM Phases into the SVA")

IKQVBRP
IKQVCAT
IKQVCLC
IKQVCLOC
IKQVCLOS
IKQVCLOV
IKQVDNT
IKQVDRP
IKQVDTPE
IKQVEDX
IKQVEOV
IKQVGEN
IKQVJIBS
IKQVLAB
IKQVLASM
IKQVMSG
IKQVNEX
IKQVOPEN
IKQVPBF
IKQVRBA
IKQVRM
IKQVSTM
IKQVTMS

Non-SVA-eligible phases:

IKQVDCN
IKQVDU
IKQVDUMP
IKQVEDA
IKQVLASF
IKQVRT
IKQVSCAT

RELOCATABLE LIBRARY

Number of Modules	Number of Blocks
164	1,756

Modules

$$BACLOS
$$BCLCRA
$$BCVSAM
$$BCVS02
$$BCVS03
$$BCVS04
$$BENDQB
$$BJIBFF
$$BJIB00
$$BODADE
$$BODADS
$$BOVSAM
$$BOVS01
$$BOVS03
$$BTCLOS
IGG0CLAB
IGG0CLAC
IGG0CLAD
IGG0CLAE
IGG0CLAF
IGG0CLAG
IGG0CLAH
IGG0CLAJ
IGG0CLAK
IGG0CLAL
IGG0CLAN
IGG0CLAP
IGG0CLAQ
IGG0CLAR
IGG0CLAS
IGG0CLAT
IGG0CLAU
IGG0CLAV
IGG0CLAW
IGG0CLAX
IGG0CLAY
IGG0CLAZ
IGG0CLA6
IGG0CLA7
IGG0CLA8
IGG0CLBA
IGG0CLBB
IGG0CLBC
IGG0CLBD
IGG0CLBE
IGG0CLBF
IGG0CLBG
IGG0CLBH
IGG0CLBL

```
IGG0CLBM
IGG0CLBN
IGG0CLBQ
IGG0CLBR
IGG0CLBS
IGG0CLBT
IGG0CLBU
IGG0CLBW
IGG0CLBX
IGG0CLBY
IGG0CLB8
IGG0CLCA
IGG0CLCB
IGG0CLCD
IGG0CLCG
IGG0CLCL
IGG0CLCO
IGG0CLCP
IGG0CLCR
IGG0CLCS
IGG0CLCX
IGG0CLCY
IGG0CLC9
IKQAIX
IKQALL00
IKQBFA
IKQBFB
IKQBFC
IKQBLD
IKQBRP
IKQCAS
IKQCIR
IKQCIS
IKQCLCAT
IKQCLEAN
IKQCLNLK
IKQCLOCL
IKQCLOVY
IKQCLO
IKQCOV00
IKQDCN
IKQDNT
IKQDRP
IKQDUMP
IKQDUMPC
IKQEDX
IKQEOV
IKQERH
IKQERX
IKQGEN
IKQGNX
IKQGPT
IKQINT
IKQIOA
IKQIOB
IKQIXE
IKQIXF
IKQIXS
IKQJIBSM
IKQJRN
IKQKRD
IKQLAB
IKQLASFT
IKQLASMD
IKQLCD
IKQLCN
IKQLCP
IKQMDY
IKQNCA
IKQNEX
IKQOCMSG
IKQOPN
IKQOPNAI
IKQOPNCT
IKQOPNDO
IKQOPNHC
IKQOPNNC
IKQOPNOV
IKQOPNRD
IKQOPNRP
IKQOPNUC
IKQOPNUS
IKQPBF
IKQPFO
IKQPOP00
IKQRBA
IKQRCL
IKQRDS00
IKQREN00
IKQRQA
IKQRQB
IKQRQC
IKQRRP
IKQRTV
IKQSCAT
IKQSCN
IKQSCR00
IKQSFT
IKQSPM
IKQSRG
IKQSRT
IKQSRU
IKQSTM
IKQTMSD
IKQTMSF
IKQUPD
IKQUPG
IKQVDTPE
IKQVEDA
IKQVFY
IKQVRT
IKQVSM
IKQVSMLK
IKQVTC00
IKQWDS00
```

Link-Edit Statements

```
// OPTION CATAL
  INCLUDE IKQVSMLK
// EXEC LNKEDT
```

Ignore notice "CONTROL SECTIONS OF ZERO LENGTH IN INPUT" given by the linkage editor at the end of the partition storage map.

SOURCE STATEMENT LIBRARY

Number of Macros	Number of Blocks
26	1,602

Macros (Edited)

```
ACB*
BLDVRP
DEOB
DLVRP
```

ENDREQ
ENQB
ERASE
EXLST*
GENCB*
IKQACB*
IKQACBG
IKQCB1*
IKQCB2*
IKQERMAC*
IKQEXLG
IKQEXLST*
IKQRPL*
IKQRPLG
MODCB*
POINT
RPL*
SHOWCAT
SHOWCB*
TCLOSE
TESTCB*
WRTBFR

***These macros are also required by VTAM.**

LOADING VSAM AND RPS PHASES INTO THE SVA

The system procedure library contains procedures VSAMSVA and VSAMRPS to load IBM-supplied phases into the SVA.

- **Procedure VSAMSVA loads a set of selected system phases plus VSAM phases - but no RPS phases.**
- **Procedure VSAMRPS loads a set of selected system phases plus VSAM and RPS phases.**

Loading the SVA-eligible VSAM phases into the SVA offers the following advantages:

- you save virtual and real storage space in the partitions if the phases are to be shared between several partitions;
- you save load time per job step. The phases always remain in the SVA; even the IPL procedure may use a warm start copy;
- the phases are protected against destruction by user program errors.

Note: The SVA-GETVIS area is not used for VSAM.

Procedure VSAMSVA consists of statements and phase names as follows:

```
SET SDL=CREATE
$$BCLOSE
$$BCLOS2
$$BCLOS3
$$BCLOS4
$$BEOJ
$$BEOJS1
$$BEOJ4
$$BEOJ7
$$BOCP01
$$BOCP03
$$BOFLPT
$$BOPEN
$$BOPEND
$$BOPENR
$$BOPEN0
$$BOPEN1
$$BOPEN3
$$BOPEN4
$$BOPEN5
$$BOPEN6
$$BOPIGN
$$BOSDC1
$$BOSDC3
$$BOSDI1
$$BOSDI2
$$BOSDI4
$$BOSDO1
$$BOSDO2
$$BOSDO3
$$BOSDO4
$$BOSDO8
$$BOSDO9
$$BOSDW1
$$BOSDW2
$$BOSD00
$$BOSD01
$$BOSD02
$$BOSD03
$$BOSD04
$$BOSD05
$$BOSD06
$$BOSIGN
$$BSETL
$$BSETL1
$$BSETL2
$JOBCTLA
$JOBCTLE
$JOBCTLN
$JOBACCT,SVA
$JOBEXIT,SVA
$LIBSTAT,SVA
$MAINDIR,SVA
      $$BACLOS The following are VSAM
      $$BCLCRA phases
      $$BCVSAM
      $$BCVS02
      $$BCVS03
      $$BJIBFF
      $$BJIB00
      $$BODADE
      $$BODADS
      $$BOVSAM
      $$BOVS01
      $$BOVS03
      $$BTCLOS
      IKQVBRP,SVA
      IKQVCAT,SVA
      IKQVCLC,SVA
      IKQVCLOC,SVA
      IKQVCLOS,SVA
      IKQVCLOV,SVA
      IKQVDCN
      IKQVDNT,SVA
      IKQVDRP,SVA
      IKQVDTPE,SVA
      IKQVDUMP
      IKQVEDX,SVA
      IKQVEOV,SVA
```

```
IKQVGEN,SVA
IKQVJIBS,SVA
IKQVLAB,SVA
IKQVLASF
IKQVLASM,SVA
IKQVMSG,SVA
IKQVNEX,SVA
IKQVOPEN,SVA
IKQVPBF,SVA
IKQVRBA,SVA
IKQVRM,SVA
IKQVRT
IKQVSCAT
IKQVSTM,SVA
IKQVTMS,SVA
/*
/+
```

Procedure VSAMRPS consists of the transients, phases, and statements given for VSAMSVA (excluding the /* and /+) plus the following:

```
IJGCYCMB,SVA
IJGCYCWB,SVA
IJGFWCMB,SVA
IJGFWCWB,SVA
IJGFXCMB,SVA
IJGFXCWB,SVA
IJGPYCWB,SVA
IJGQWCWB,SVA
IJGQXCWB,SVA
IJGRYCWB,SVA
IJGSYCWB,SVA
IJGTWNCT,SVA
IJGUWCWB,SVA
IJGUXCWB,SVA
IJGVWCWB,SVA
IJGVXCWB,SVA
IJHAVBBF,SVA
IJHAVBBS,SVA
IJHAVBCF,SVA
IJHAVBCS,SVA
IJHAVGBF,SVA
IJHAVGBS,SVA
IJHAVGCF,SVA
IJHAVGCS,SVA
IJHZXGZS,SVA
IJIBWEHW,SVA
IJIFWEHW,SVA
IJISWEHW,SVA
IJIVWEHN,SVA
IJJCVAIN,SVA
IJJCVDV,SVA
IJJCVDO,SVA
IJJFVBIC,SVA
IJJFVIIC,SVA
/*
/+
```

Note: The $$B-transients and the $-phases **are not part of VSAM and DOS/VS only includes their names in the system directory list (SDL)*. However, as building the SDL can only be done concurrently with loading the SVA, the names of these transients and phases are also included in procedure VSAMSVA. If VSAM is not to run in the SVA, you can use the IBM-supplied procedure SDL to include the non-VSAM phases and transients in the system directory list.**

*** $JOBEXIT, $LIBSTAT, and $MAINDIR are loaded into the SVA to improve performance.**

* $JOBACCT should be included if using the IBM-supplied default.

The SVA-eligible VSAM phases can be divided into two distinct groups, that is the root phases that are to be loaded whenever you want to use VSAM at all, and the optional phases that are loaded only if certain conditions are encountered in VSAM processing. The latter phases remain in virtual storage until the job step is finished.

VSAM Root Phases

Function	Phase	Size (bytes)
Record management routines	IKQVRM	51,350
Open routines	IKQVOPEN	22,600
Close routines	IKQVCLOS	2,800
Label processing routines	IKQVLAB	2,200
Catalog routines	IKQVCAT	163,900
File table routines	IKQVLASM	1,200
Message routine	IKQVMSG	2,100
Total		246,150

When certain other conditions are encountered in VSAM processing, other phases will be loaded into the virtual address area. These phases remain in the virtual address area with the originally

loaded phases until the job step is ended. The following additional phases can be loaded:

Condition	Phase	Size (bytes)
I/O forced to completion (during Close, for example)	IKQVPBF	700
Share option 4 used and (1) a control area must be split or (2) the file is extended	IKQVRBA	1,100
A new extent is needed when file is extended	IKQVNEX	3,700
GENCB macro is used by the processing program	IKQVGEN	2,400
MODCB, SHOWCB, or TESTCB macro is used by the processing program	IKQVTMS	9,600
A non-contiguous range of RBAs is encountered	IKQVEDX	2,500
Non-VSAM file entry in VSAM catalog is processed	IKQVDNT	300
A new volume must be mounted	IKQVEOV	1,100
DASD file protection option is included in DOS/VS	IKQVJIBS	1,000
VSAM Close or Record Management routines must update the VSAM catalog	IKQVCLC	2,500
Device type must be determined	IKQVDTPE	600
Alternate index structure must be closed	IKQVCLOV	600
Control blocks for alternate index structure must be released	IKQVCLOC	500
Build VSAM resource pool	IKQVBRP	2,048
Delete VSAM resource pool	IKQVDRB	650
SHOWCAT	IKQVSCAT	1,500
VSAM storage manager control block reallocation	IKQVSTM	2,000
Total		32,798

If you do not need all the optional phases, you can save SVA space by using your own procedure that should have the following format:

```
// SET SVA=(...K,0K)
// SET SDL=CREATE
   (non-VSAM phase names)
   (the 7 VSAM root phase names),SVA
   (the optional VSAM phase names you will
   require), SVA
/*
/+
```

The size of the SVA can be computed as follows:

- 34 bytes for each SDL entry (the maximum number of entries is 934, which take up 32K bytes).
- 2K bytes for the SVA directory.
- 12K bytes if you want to load $JOBEXIT and $MAINDIR into the SVA.
- 227.7K bytes for the VSAM root phases.*
- The total size of the optional VSAM phases you selected.*

* Totalling the sizes of the VSAM root phases and of the optional phases does not give you the exact size of the SVA, as these pages are normally loaded on page boundaries, with the exception of small phases, two or more of which fit a single page.

  Also, since the phases are entered in alphabetical sequence, what extra space is required depends on which optional phases you include in your procedure. If you include all of the optional phases, add 10K bytes to the total size of the root phases and the optional phases. For the same reasons, the size of the SVA in procedure VSAMSVA is set to 302K bytes.

ISAM Interface Program

CORE IMAGE LIBRARY

Phases	5
Blocks	9

Transient

$$BOCISC

Phases

IIPCLOSE
IIPOPEN
IIPPROC
IIPAMDTF

RELOCATABLE LIBRARY

Modules	7
Blocks	44

Modules

IIPBMR00
IIPCLS00
IIPIIP00
IIPOPN00
IIPPRCPR
IIPPRCMR
IIPAMT00

Link-Edit Statements

```
// OPTION CATAL
  INCLUDE IIPIIP00
// EXEC LNKEDT
```

Access Method Services

CORE IMAGE LIBRARY

Phases	81
Blocks	496

Phases

IDCAL01
IDCAMS
IDCBI01
IDCCDAL
IDCCDBI
IDCCDDE
IDCCDDL
IDCCDLC
IDCCDLR
IDCCDMP
IDCCDPM
IDCCDPR
IDCCDRC
IDCCDRM
IDCCDRP
IDCCDRS
IDCCDVY
IDCCDXP
IDCDB01
IDCDB02
IDCDE01
IDCDI01
IDCDI02
IDCDI03
IDCDI04
IDCDI05
IDCDI06
IDCDI07
IDCDI08
IDCDI09
IDCDI10
IDCDI11
IDCDI12
IDCDI13
IDCDI14
IDCDI15
IDCDI20
IDCDL01
IDCEX02
IDCEX03
IDCIO02
IDCIO03
IDCLC01
IDCLR01
IDCMP01
IDCPM01
IDCPR01
IDCRC01
IDCRIKT
IDCRILT
IDCRI01
IDCRM01
IDCRP01
IDCRS01
IDCSA04
IDCSA05
IDCTP04
IDCTP05
IDCTP06
IDCTSAL0
IDCTSBI0
IDCTSDE0
IDCTSDL0
IDCTSEX0
IDCTSIO0
IDCTSLC0
IDCTSLC1
IDCTSLR0
IDCTSLR1
IDCTSMP0
IDCTSPP6
IDCTSPR0
IDCTSRC0
IDCTSRI0
IDCTSRS0
IDCTSTP0
IDCTSTP1
IDCTSUV0
IDCTSXP0
IDCVY01
IDCXP01

RELOCATABLE LIBRARY

Number of Modules	Number of Blocks
104	2,275

Modules

IDCAL01
IDCBI01
IDCCDAL
IDCCDBI
IDCCDDE
IDCCDDL
IDCCDLC
IDCCDLR
IDCCDMP
IDCCDPM
IDCCDPR
IDCCDRC
IDCCDRM
IDCCDRP
IDCCDRS
IDCCDVY
IDCCDXP
IDCCMZ1
IDCCMZ2
IDCDB01
IDCDB02
IDCDE01
IDCDE02
IDCDE03
IDCDI01
IDCDI02
IDCDI03
IDCDI04
IDCDI05
IDCDI06
IDCDI07
IDCDI08
IDCDI09
IDCDI10
IDCDI11
IDCDI12
IDCDI13
IDCDI14
IDCDI15
IDCDI20
IDCDL01
IDCEX01
IDCEX02
IDCEX03
IDCIO01
IDCIO02
IDCIO03
IDCLC01
IDCLC02
IDCLR01
IDCLR02
IDCMP01
IDCPM01
IDCPR01
IDCRC01
IDCRC02
IDCRC03
IDCRC04
IDCRIKT
IDCRILT
IDCRI01
IDCRI02
IDCRI03
IDCRM01
IDCRP01
IDCRS01
IDCRS02
IDCRS03
IDCRS04
IDCRS05
IDCRS06
IDCRS07
IDCSA01
IDCSA02
IDCSA03
IDCSA04
IDCSA05
IDCSA08
IDCTP01
IDCTP04
IDCTP05
IDCTP06
IDCTSAL0
IDCTSBI0
IDCTSDE0
IDCTSDL0
IDCTSEX0
IDCTSIO0
IDCTSLC0
IDCTSLC1
IDCTSLR0
IDCTSLR1
IDCTSMP0
IDCTSPR0
IDCTSRC0
IDCTSRI0
IDCTSRS0
IDCTSTP0
IDCTSTP1
IDCTSTP6
IDCTSUV0
IDCTSXP0
IDCVY01
IDCXP01

Link-Edit Statements

```
// OPTION CATAL
   INCLUDE IDCCMZ1
// EXEC LNKEDT
// OPTION CATAL
   INCLUDE IDCCMZ2
// EXEC LNKEDT
```

STORAGE REQUIREMENTS

Real Storage for VSAM

To avoid excessive paging, an amount of real storage should be available in the page pool which approximately matches the VSAM working set.

The working set requirements for processing a VSAM file are as follows:

- For frequently used modules of VSAM record management (phase IKQVRM): 11 pages per partition. During loading or extension of a file, or whenever many control interval splits take place, up to 13 pages may be needed.

- For (external and internal) control blocks: 1 page (minimum) per file.

- For the channel program area used by VSAM: 1 page per file.

- VSAM buffers - an amount of storage that depends on the control interval size and the number of buffers used for the file.

Minimum Working Set for a Single File

Provided all the conditions listed in Figure 17-1 are met, the minimum working set size for a single VSAM key-sequenced, or entry-sequenced, or relative-record file can be calculated as follows:

- IKQVRM		11 pages*
- Control blocks		1 page
- Channel program area		1 page
	=	13 pages
	+	Buffers

* or 13 pages when the file is loaded or extended.

The conditions for using a minimum working set are:

- The file must not have key ranges associated with it.
- The file must not have more than one extent for data.
- The file must not have SHAREOPTIONS(4). The length of the key field is assumed to be four bytes.
- The file must not have more than one extent for the sequence set and for the higher-level index.
- The number of data buffers must be 2; the number of index buffers must be 1 if the file is a key-sequenced file.
- The ACB and RPL must be created via GENCB, leaving the space allocation up to VSAM and in the sequence

  GENCB ACB
  GENCB RPL

- The file must be opened for one string only (STRNC=1).

Figure 17-1. Minimum Working Set Conditions

For each additional file in the partition the following has to be added to the minimum working set size:

- 1 page for control blocks (miminum)
- 1 page for the channel program area
- n pages for buffers

Working Set for Alternate Index Processing

If an alternate index is processed as an end-use object, that is, without its related base cluster, it is treated as a key-sequenced file and, therefore, has the same working set requirements as a key-sequenced file.

If a path is establisned between an alternate index and its base cluster, the working set requirements for processing the base cluster via this alternate-index path (path entry) are as follows:

- For frequently used modules of VSAM record management (phase IKQVRM): 14 pages per partition.

- For external and internal blocks:

  1 page (minimum) for the path entry
  2 page (minimum) for the base cluster
  1 page (minimum) for each alternate index in the upgrade set in addition to the path entry.

- For the channel program areas:

  1 page for the path entry
  1 page for the base cluster
  1 page for the upgrade set

- VSAM buffers for:

  - the base cluster
  - the alternate index path (path entry)
  - for an UPDATE path only:
    a minimum of two data buffers and one index buffer for any alternate index(es) in the upgrade set (in addition to the alternate index of the path entry). Note that all the alternate indexes of an upgrade set (except that of the path entry) share a common set of buffers whose size is that of the largest buffers specified.

Note: For a NOUPDATE path, the alternate indexes which are members of the upgrade set are not opened. Therefore, only space for the path entry and the base cluster has to be provided. If a base cluster is not processed via a path, but has an upgrade set assigned to it, space for the base cluster itself and for the upgrade set members has to be provided.

Working Set for VSAM Files Sharing a Resource Pool

VSAM files with MACRF(LSR) in the ACB have the following working set requirements:

- For frequently used modules of VSAM record management (phase IKQVRM): 12 pages per partition.
- For external and internal control blocks: 1 page (minimum) per file.
- For the VSAM resource pool: an amount of storage that depends on the parameters specified in the BLDVRP macro.

For Access Method Services: To operate efficiently, the Access Method Services working set requires approximately 64K bytes of real storage.

Virtual Storage

For VSAM: VSAM routines reside in pageable virtual storage. The recommended allocation is 302K bytes in any partition in which VSAM will execute, or 302K bytes in the SVA. This basic allocation also covers any space requirements for ISAM Interface Program (IIP) phases to be loaded when a VSAM file is processed by an ISAM program. (For a more precise storage requirement calculation use the table as **shown in the section "Loading VSAM and RPS Phases Into the SVA".**)

If VSAM runs in the SVA, a certain amount of storage must still be allocated to VSAM in the partition for buffers and control blocks. This amount can be approximated as follows:

1. Compute for each file as a minimum:

   2 x the data control interval size;

   1 x the index control interval size (for a key-sequenced file or alternate index);

   2K bytes for control blocks.

2. Total the results and add a basic requirement of 30K bytes.

Note: Control interval size and the minimum amount of buffer space for a file are specified when the file is defined. You can allocate more than the minimum amount of buffer space when the file is processed. Refer to DOS/VS Supervisor and I/O Macros for the ACB macro, and to DOS/VS System Control Statements for the DLBL job control statement.

For Access Method Services: In addition to the 302K byte basic allocation for VSAM (or 302K bytes in the SVA), Access Method Services requires up to 450K bytes of virtual storage in the partition in which it is to run. Unlike VSAM phases, the Access Method Services modules cannot be loaded into the SVA.

The root modules, comprising 26K bytes, are loaded into the virtual address area when the user wants to perform any of the following functions. In addition to the root modules, the remaining Access Method Services substructure modules plus their required dynamic work areas are required to perform any function. The total virtual storage requirement for the substructure (including the root modules) is 114K. In addition, you must provide virtual storage for the specific Access Method Services commands to be processed. If you know what your functional mix is in the job stream, you can calculate a more precise virtual size from the table below.

Function	Size (bytes)
ALTER	23,000
BLDINDEX	24,000*
DEFINE	52,000
DELETE	10,000
EXPORT	23,000
EXPORTRA	45,000**
IMPORT	29,000
IMPORTRA	33,000
LISTCAT	42,000
LISTCRA	39,000
PRINT	8,000
REPRO	17,000
RESETCAT	124,000
VERIFY	2,000
Total	471,000

* This does not include the storage required for sorting records. Refer to DOS/VS Access Method Services User's Guide, GC33-5382.

**This does not include the 255,000 bytes required for the EXPORTRA command table.

Module 18: Assembler -- 5745-SC-ASM

18

CORE IMAGE LIBRARY

	Phase	Blocks
Assembler	19	122
ESERV	7	41

Pnases

Assembler

ASSECA
ASSEDA
ASSEEA
ASSEFA
ASSEGA
ASSEHA
ASSEIA
ASSEJA
ASSEKA
ASSELA
ASSEMA
ASSEMBLY
ASSEOA
ASSEQA
ASSERA
ASSERB
ASSERC
ASSESA
ASSETA

ESERV

ESERV
ESERVB
ESERVD
ESERVE
ESERVF
ESERVG
ESERVI

RELOCATABLE LIBRARY

	Modules	Blocks
Assembler	38	609
ESERV	10	218

Modules

Assembler

IPKAA
IPKAB
IPKAC
IPKAD
IPKAE
IPKAF
IPKAG
IPKAH
IPKAI
IPKAJ
IPKBA
IPKCA
IPKCB
IPKCC
IPKCD
IPKDA
IPKDB
IPKEA
IPKFA
IPKGA
IPKHA
IPKIA
IPKIC
IPKJA
IPKKA
IPKLA
IPKLINK
IPKMA
IPKNA
IPKOA
IPKPA
IPKQA
IPKRA
IPKRB
IPKRC
IPKSA
IPKSB
IPKTA

Link-Edit Statements

```
  INCLUDE IPKLINK
/*
// EXEC LNKEDT
```

ESERV

IPKESERV
IPKVA
IPKVB
IPKVD
IPKVE
IPKVF
IPKVG
IPKVI
IPKVK
IPKVM

Link-Edit Statements

```
  INCLUDE IPKESERV
/*
// EXEC LNKEDT
```

Note: When link-editing the ESERV program, the Link-Edit Map will contain one unresolved address constant (IPKAB103). This is a symbol used in the Assembler only.

SOURCE STATEMENT LIBRARY

Number of Macros	Source Statement Library Blocks
2	44

Macros

E.IVPASLC
E.IVPASLS

Work Files

To determine the number of bytes required for the assembler work files, use the following formulas:

SYS001: Whichever is the larger of

60(ITXT+SM)

and

60(SM+LM)

SYS002: Whichever is the larger of

60(ITXT+SM)

and

40.ETXT

SYS003: If option NOXREF is in effect:

60.OTXT

If option XREF is in effect:

100.OTXT

SYSLNK: 15.ETXT

where

ITXT = Total number of statements on SYSIPT.

OTXT = Total number of statements on SYSLST.

SM = Number of statements in source macro definitions.

ETXT = OTXT minus SM minus number of comment statements.

LM = Number of statements in library macro definitions called by the program.

The approximate number of tracks can be computed by dividing the number of bytes by 6000 for a 2314/2319 file, by 12000 for a 3330 file, and by 7000 for a 3340 file.

Module 19: OLTEP -- 5745-SC-OLT

19

PARTITION SIZE

The program requires a background real allocation of 16K bytes, 20K bytes with RETAIN active.

CORE IMAGE LIBRARY

	Phases	Blocks
OLTEP	48	91
B-Transients	2	2

Phases

IJZACEOM
IJZACOMP
IJZACONV
IJZADO00
IJZADO02
IJZADO03
IJZADO07
IJZADO10
IJZADO11
IJZADO16
IJZADO21
IJZADO22
IJZADO24
IJZADO26
IJZADO28
IJZADO31
IJZADO32
IJZADO33
IJZADO35
IJZADO36
IJZADO37
IJZADO39
IJZADO40
IJZADO41
IJZADO42
IJZADO43
IJZADO44
IJZADO45
IJZADO47
IJZADO49
IJZADO52
IJZADO56
IJZADO57
IJZADO62
IJZADO64
IJZADO70
IJZADO71
IJZADO76
IJZADO77
IJZADO78
IJZADO98
IJZADOAA
IJZADOAB
IJZADOAJ
IJZADOLD
IJZADOLI
IJZAOPUT
IJZARATA

B-Transients

$$BOLTEP
$$BTOLTP

Note: The B-transients are cataloged into the core image library along with the OLTEP component.

CONFIGURATION DATA SET

A CDS (Configuration Data Set) is required in the core image library for each device on the system and one for the CPU. This is the formula for calculating the block requirements:

$$\frac{\text{devices on system} + 1}{6} = \text{library blocks}$$

ONLINE TESTS (OLTS)

The number of core image library blocks required for the OLTs (Online Tests) is **dependent on the number of types of devices on the system, and the number and size of the OLTs needed to test these devices. This information can be found in the writeup that accompanies the OLTs.**

GENERATING THE OLT/CDS LIBRARY

The PID (Program Information Department) supplies a master tape or disk (if the system has no tape drives) to the Customer Engineer. This tape contains OLTSEP, SOSP, **and OLTs. The EDITDOS function of SOSP (Standalone Service and Online Test Support) is used to create OLT and CDS input for the DOS/VS Linkage Editor. This input can be created on disk or tape.**

The Job Control statements required to link the OLTs and CDSs into the core image library are as follows:

Tape Input

```
// JOB    XXXXXXXX
```

assign work files for the Linkage Editor, if necessary

```
// ASSGN SYSIN,X'cuu'
```

where cuu is the address of the tape drive.

Disk Input

```
// JOB    XXXXXXXX

assign work files for the Linkage Editor,
if necessary

// DLBL IJSYSIN,'EDITPACK'
// ASSGN SYSIN,X'cuu'

where cuu is the address of the disk drive.
```

The OLTs and CDSs are required to run tests under OLTEP. The customer engineer will create the library using the specified procedure. This procedure is also used to add new OLTs and/or CDSs when devices are added to the system.

RELOCATABLE LIBRARY

Modules	Blocks
50	410

Modules

```
IJZABOOK
IJZACEOM
IJZACOMP
IJZACONV
IJZADO00
IJZADO02
IJZADO03
IJZADO07
IJZADO10
IJZADO11
IJZADO16
IJZADO21
IJZADO22
IJZADO24
IJZADO26
IJZADO28
IJZADO31
IJZADO32
IJZADO33
IJZADO35
IJZADO36
IJZADO37
IJZADO39
IJZADO40
IJZADO41
IJZADO42
IJZADO43
IJZADO44
IJZADO45
IJZADO47
IJZADO49
IJZADO52
IJZADO56
IJZADO57
IJZADO62
IJZADO64
IJZADO70
IJZADO71
IJZADO76
IJZADO77
IJZADO78
IJZADOAA
IJZADOAB
IJZADOAJ
IJZADOLD
IJZADOLT
IJZAOLTP
IJZAOPUT
IJZARATA
IJZATOLT
```

Link-Edit Statements

```
   INCLUDE IJZABOOK
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJZ.ALL
```

Module 20: BTAM -- 5745-SC-BTM

20

Module Outline

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R

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T

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W

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CORE IMAGE LIBRARY

	Phases	Blocks
BTAM Online Terminal Test Patterns:	52	52
Transients	8	14
BTAM Transient Routines (other than Test Patterns)	21	23

BTAM Online Terminal Test Pattern Phase Identification

Phase Names	Test Patterns for Online Terminal Tests
IJLBOT02	Transparent EBCDIC Message
IJLBOT03	USASCII Transparency Message
IJLBOT04	Normal EBCDIC Message
IJLBOT05	Normal USASCII Message
IJLBOT06	Alpnameric USASCII Message
IJLBOT07	USASCII Printer Message
IJLBOT08	USASCII Punch Message
IJLBOT09	TRANSCODE Printer Message
IJLBOT10	TRANSCODE Punch Message
IJLBOT11	TRANSCODE Multipoint Message
IJLBOT12	EBCDIC Printer Message
IJLBOT13	EBCDIC Punch Message
IJLBOT14	EBCDIC Alpnameric Message
IJLBOT15	EBCDIC Weak Pattern Message for Switched Line
IJLBOT16	EBCDIC Weak Pattern Message for Leased Line
IJLBOT17	TRANSCODE Weak Pattern Message for Switched Line
IJLBOT18	TRANSCODE Weak Pattern Message for Leased Line
IJLBOT19	EBCDIC Weak Pattern for OLE SYN Insertion
IJLBOT20	EBCDIC 80-Character Transparent Message
IJLBOT21	EBCDIC 120-Character Transparent Message
IJLBOT22	EBCDIC 144-Character Transparent Message
IJLBOT23	3270 Basic EBCDIC Test Pattern
IJLBOT24	3270 Model 1 Align EBCDIC Test Pattern
IJLBOT25	3270 Model 2 Align EBCDIC Test Pattern
IJLBOT26	3270 Orders EBCDIC Test Pattern
IJLBOT27	3270 Universal Character Set Test Pattern
IJLBOT28	3270 NL/EOM Printer EBCDIC Test Pattern
IJLBOT29	3270 Basic ASCII Test Pattern
IJLBOT30	3270 Model 1 Align ASCII Test Pattern
IJLBOT31	3270 Model 2 Align ASCII Test Pattern
IJLBOT32	3270 Orders ASCII Test Pattern
IJLBOT33	3270 Universal Character Set Test Pattern
IJLBOT34	3270 NL/EOM Printer ASCII Test Pattern
IJLT2ALC	All Character Test for IBM 2848
IJLT2ROT	Rotate Test for IBM 2848
IJLT2TLT	Tilt Test for IBM 2848
IJLT2TWS	Twist Test for IBM 2848
IJLT3ALC	All Character Test for IBM 1030
IJLT3ROT	Rotate Test for IBM 1030
IJLT3SLA	Analyzer Test for IBM 1030 (SELECTRIC)
IJLT3TLT	Tilt Test for IBM 1030
IJLT3TWS	Twist Test for IBM 1030
IJLT5ALC	All Character Test for IBM 1050 or 2740
IJLT5ROT	Rotate Test for IBM 1050 or 2740
IJLT5SLA	SELECTRIC Analyzer Test for IBM 1050 or 2740

Phase Names	Test Patterns for Online Terminal Tests
IJLT5TLT	Tilt Test for IBM 1050 or 2740
IJLT5TWS	Twist Test for IBM 1050 or 2740
IJLT6ALC	All Character Test for IBM 1060
IJLT6ROT	Rotate Test for IBM 1060
IJLT6SLA	SELECTRIC Analyzer Test for IBM 1060
IJLT6TLT	Tilt Test for IBM 1060
IJLT6TWS	Twist Test for IBM 1060

BTAM Transients

$$ABERP1	Control handler for BTAM special message writer and error statistics recorder
$$ABERP2	BSC online test message writer
$$ABERP3	Console special message writer
$$ABERP4	Remote 3270 status/sense error recorder
$$ABERP5	Error recovery message writer, phase 1
$$ABERP6	Error recovery message writer, phase 2
$$ABERP7	Error recovery message writer, phase 3
$$ABERP8	RMSR record builder
$$ABERP9	Free areas from real storage
$$BBT3SC	OLTEP device assignment
$$BBT3SI	OLTEP device assignment initiation
$$BCTC01	CLOSE routine
$$BETPRT	Error threshold message
$$BHDRCK	Terminal test request validation and comparison
$$BLEPRT	Line error print routine
$$BLOPEN	OPEN routine
$$BOTC01	OPEN routine
$$BOTC02	OPEN for local devices routine
$$BOTC03	OPEN logic processor
$$BOTC1A	OPEN logic module, phase 3, for non-local devices
$$BRESPL	Reset Polling Lines
$$BTCNCL	Cancel routine
$$BTMEBG	Terminal test request - IBM 1030 Manual Entry and Badge Reader
$$BT1030	Terminal test module - IBM 1030
$$BT1050	Terminal test module - IBM 1050
$$BT1060	Terminal test module - IBM 1060
$$BT2260	Terminal test module - IBM 2260
$$BT2740	Terminal test module - IBM 2740
$$BT2848	Terminal test module - IBM 2848

RELOCATABLE LIBRARY

Modules	Blocks
65	179

Modules

Module Name	Description	Bytes of Storage
CONCURRENT OLTEP		
BT3270SC	Concurrent OLTEP Setup	2535
IJLZSCAN		5796
CHANNEL PROGRAM		
(For start/stop, the modules include a table of special characters.)		
IJL0EZ	WTTA	124
IJL00Y	IBM 7770	76
IJL01J	IBM 1030 (Auto Poll)	187
IJL01Z	IBM 1030	139
IJL02J	IBM 1060 (Auto Poll)	175
IJL02Z	IBM 1060	127
IJL03Z	IBM 2848 Remote	209
IJL04Z	AT&T 83B3	78
IJL05Z	Western Union 115A	72
IJL06Z	Table Generation for 2260 Local Channel Program	16
IJL07J	IBM 1050 Nonswitched (Auto Poll)	132
IJL07Y	IBM 1050 Switched	202
IJL07Z	IBM 1050 Nonswitched	124
IJL08H	IBM 2740 with Station Control (Auto Poll)	97
IJL08M	IBM 2740 with Dial, Transmit Control, and Checking	176
IJL08P	IBM 2740 with Station Control and Checking	132
IJL08Q	IBM 2740 with Dial and Checking	172
IJL08R	IBM 2740 with Checking	141
IJL08U	IBM 2740 with Dial and Transmit Control	122
IJL08X	IBM 2740 with Station Control	92
IJL08Y	IBM 2740 with Dial	114
IJL08Z	IBM 2740 Basic	93
IJL081	IBM 2740 and OIU with Dial and Checking	246
IJL082	IBM 2740 and OIU with Checking	181
IJL089	IBM 2740 with Station Control and Checking (Auto Poll)	145
IJL09Y	TWX 33	110
IJL10Y	IBM 7772	76
WTTA SUBROUTINE		
IJLWTZ	WTTA Subroutines	1223
LOCAL 3270 TABLE OF COMMAND CODES		
IJL0HZ	3277L table of command codes	30

Module Name	Description	Bytes of Storage
CHANNEL PROGRAM MODULES FOR BSC		
The following relocatable modules are BSC channel program modules for switched lines using ID verification (CPU-to-CPU). The correspondence between relocatable module name and the codes that appear in the FEATURE operand sublist in the DTFBT macro instruction is indicated.		
IJL0BY	For switched lines	415
IJL0BZ	For nonswitched lines	281
IJL0DY	IBM 2780 switched point to point	212
IJL0DZ	IBM 2780 nonswitched point to point	148
IJL1BZ	BSC Multipoint Lines	253
IJL2DZ	IBM 2780 Multipoint for TRANSCODE	136
IJLEDIT3	Logic, TP EDIT Macro	2090
BSC TABLES OF SPECIAL CHARACTERS		
IJLASC	In ASCII for BSC	85
IJLEBD	In EBCDIC for BSC	85
IJLTCD	In 6-bit TRANSCODE for BSC	69
TRANSLATION TABLES		
IJLRASA	For USASCII to EBCDIC for BCS	256
IJLRCTW	For ITA2 to EBCDIC (World Trade Teletype)	256
IJLRCT1	From BAUDOT to EBCDIC	256
IJLRCT2	From TWX to EBCDIC	256
IJLRCT3	From ZSC3 to EBCDIC (World Trade Teletype)	256
IJLRC30	From 1080 to EBCDIC	256
IJLRC40	From 2740 to EBCDIC (lowercase)	256
IJLRC50	From 1050 to EBCDIC (lowercase)	256
IJLRC60	From 1060 to EBCDIC	256
IJLRC80	From 6-bit TRANSCODE to EBCDIC	256
IJLRF40	From 2740 to EBCDIC (uppercase)	256
IJLRF50	From 1050 to EBCDIC (uppercase)	256
IJLRSCI	From USASCII to EBCDIC with 2848 attached to 2701 via IBM Terminal Control Type III	256
IJLSASA	From EBCDIC to USASCII for BSC	256
IJLSCTW	From EBCDIC to ITA2 (World Trade Teletype)	256
IJLSCT1	From EBCDIC to BAUDOT	256
IJLSCT2	From EBCDIC to TWX	256
IJLSCT3	From EBCDIC to ZSC3 (World Trade Teletype)	256
IJLSD30	From EBCDIC to 1030	256
IJLSD40	From EBCDIC to 2740	256
IJLSD50	From EBCDIC to 1050	256
IJLSD60	From EBCDIC to 1060	256
IJLSD80	From EBCDIC to 6-bit TRANSCODE	256
IJLSSCI	From EBCDIC to USASCII with 2848 attached to 2701 via IBM Terminal Control Type III	256

Delete Statements

To delete the BTAM phases from the core image library, the BTAM modules from the relocatable library, and the BTAM books from the source statement library, you must supply the DELET statement for the appropriate library and the name of the phase, module, or book to be deleted. For example:

```
// JOB DELETE
// EXEC MAINT
   DELETE $$BCT01,$$BETPRT,etc.
   DELETE IJLI2ALC,IJLI2ROT,etc.
   DELETR IJL00Y,IJL01Z,IJL02Z,etc.
   DELETS E.CONTROL,E.LERB,etc.
/&
```

To delete both BTAM and QTAM from the core image, relocatable and source statement libraries, the DELET statement for the appropriate library and the following entries must be made: For the core image transients, you must supply the DELETC statement with a separate entry for each transient (QTAM and BTAM) to be deleted. For the core image phase names, enter the delete statement as follows:

```
   DELETC $$BCTC01,$$B00003,$$BETPRT,etc.
   DELETC IJLB.ALL
   DELETC IJLI.ALL
```

To delete both BTAM and QTAM from the relocatable library, enter:

```
   DELETR IJL.ALL
```

To delete the BTAM and QTAM books from the source statement library, enter the DELETS statement with a separate entry for each book to be deleted. The following example shows the required delete statements and type of entries to be made in those cards:

```
// JOB DELETE
// EXEC MAINT
   DELETS E.CONTROL,E.CANCELM,etc.
/&
```

SOURCE STATEMENT LIBRARY

Macros	Blocks
66	8,620

	Storage Bytes	
	Storage Bytes	
	Basic	For Variables
E.AS		
E.ASCTR		
E.ASLIST		
E.BTBONLI (inner macro in BTMOD)		
E.BTBTEIH (inner macro in BTMOD)		
E.BTBTFIX (inner macro in BTMOD)		
E.BTBTFREE (inner macro in BTMOD)		
E.BTBTROD (inner macro in BTMOD)		
E.BTBTRSCH		
E.BTCEMODE (inner macro in BTMOD)		
E.BTCKID (inner macro in BTMOD)		
E.BTCONST		
E.BTCSE (inner macro in BTMOD)		
E.BTCIUPT (inner macro in BTMOD)		
E.BTMOD		
E.BTMODIH1 (inner macro in BTMOD)		
E.BTMODIH2 (inner macro in BTMOD)		
E.BTNCKID (inner macro in BTMOD)		
E.BTOLTCMP		
E.BTOLTIH (inner macro in BTMOD)		
E.BTONLAP (inner macro in BTMOD)		
E.BTONLOA (inner macro in BTMOD)		
E.BTRD		
E.BTRLBF (inner macro in BTMOD)		
E.BTRQBF (inner macro in BTMOD)		
E.BTRWC		
E.BTTRANS (inner macro in BTMOD)		
E.BTWAIT		
E.CHGNTRY	20 (Start-stop)	+6 (Note 2)
	72 (BCS)	
	20 (Start-stop Auto Poll)	+72 (Note 2)
	22 (2260 Local)	+4 (Note 2)
E.CONFIGUR		
E.CONTROL	20	+38 (Note 2)
E.CTRGROUP		
E.CTRLIST		
E.CTRSCHED		
E.DEVLIST		
E.DISPGUID		
E.DFTRMLST		
E.DTFBT		
E.GDUAS		
E.GDULIST		
E.GDUTRANS		
E.LERB	20	
E.LERPRT	14	+8 (Note 2)
E.LOPEN	8	+2 (Note 2)
E.MAPPUB2 (Note 5)		
E.ONLTST		
E.PARAMNUM		
E.PARMLIST		
E.RELBUF	14	+4 (Note 3)
E.REQBUF	12	+8 (Note 4)
E.RESETPL	12	+4 (Note 2)
E.RMSRTAB		

	Storage Bytes	
	Storage Bytes	
	Basic	For Variables
Z.SAMP327L		
Z.SAMP327R		
E.SCANREQ		
E.SDRTAB		
E.STEND		
E.TGROUP		
E.TPEDIT		
E.TRLIST		
E.TRANSLAT		
E.TRNSLATE	26	+16 (Note 2)
E.TRSRCTW	256	
E.TRSRCT3	256	
E.TRSSCTW	256	
E.TRSSCT3	256	
E.TWAIT	24	+20 (Note 4)

Notes:

1. n=number of different operands coded.
2. No operands coded in register notation.
3. First operand not coded in register notation.
4. All possible operands not coded in register notation.
5. This is a supervisor generation macro that is also used by BTAM.

Storage Requirements

DTFBT (DEFINE THE FILE: BTAM)

TABLE REQUIREMENTS
Size = 64 + N (40 + 8x) + BUFCB + BUFNO (BUFL + f) + y + z
(+ 32N for BSC only)

where:
N = number of lines in the line group (or, for a local 2260 and local 3270**, the number of devices attached to the control unit)
x = number of CCWs in the largest channel program available for the device, given in Figure 20-1
*BUFCB = 8 if a buffer pool is used
= 0 if a buffer is not used
*BUFNO = number of buffers in the pool
*BUFL = length of each buffer
f = number of bytes required to extend each buffer to a multiple of 8
y = size of the model channel program table for the line group, given in Figure 20-1. If two or more DTFBTs use the same model channel program and are linkage edited together, include the value only once.
Z = Size of the table of special characters given in Figure 20-1. For BSC only, if two or more DTFBTs use the same transmission code, include the value only once.

* If the buffer pool is shared by two or more DTFBTs, include the value only once.
** For a local 3270, at least one DTFBT is required for each control unit.

Device	x		y	z
	without start/stop	with Auto Poll		
1030	7	9	84	23
1050NS	7	9	68	16
1050S	11		136	34
1060	6	9	80	15
2260L	1		Not applicable	Not applicable
2260R	7		136	20
2740	4		24	21
2740C	4		68	33
2740DC0	8		207	30
2740C0	8		155	24
2740D	6		52	18
2740DC	7		100	32
2740DI	8		68	22
2740DIC	8		116	36
2740S	6	9	48	12
2740SC	7	9	84	24
3277L	3		28	Not applicable
115A	4		36	4
83B3	5		40	6
TWX 33/35	7		56	18
WTTA	5		52	36
BSC1; also 1130, 2780, and 2020 nonswitched point to point	8		248	53
BSC2; also 1130, 2780, and 2020 switched point to point	8		372	53
BSC3; also 1130, 2780, 2020, and 2972 multipoint.	8		252	53
2780 transcode, nonswitched point to point.	8		111	53
2780 transcode, switched point to point	8		175	53
2780 multipoint	8		123	53

Figure 20-1. BTAM -- Parameters for DTFBT Table Requirements Formula

DTFBTND (Define The File End: BTAM)

This macro instruction does not require storage at execution time.

DTFTRMLST (Define The Terminal List: BTAM)

Table Requirements for OPENLST and WRAPLST

Size = n (m + 1) + 2

where: n = number of list entries
m = number of polling/addressing characters -- a function of the device, as shown in Figure 20-2.

Device	m
1030	1
1050NS	2
1050S	2
1060	2
2260L	Not applicable
2260R	2
2740	Not applicable
2740C	Not applicable
2740D	Not applicable
2740DC	Not applicable
2740DT	Not applicable
2740DTC	Not applicable
2740S	1
2740SC	1
2740DC0	Not applicable
2740C0	Not applicable
3277R	5
115A	2
83B3	2
1130	2
2780	3
WTTA	Not applicable

Figure 20-2. BTAM -- Number of Polling/Addressing Characters

Table Requirements for DIALST

Size = n(m + 1) + 1 + q + p + i

where: n = number of list entries
m = values specified in Figure 20-2
q = 2 if the list includes entries for polling or addressing
= 0 otherwise
p = number of dial digits
i = 3 if the in-list operand is coded (BSC)
= 0 otherwise.

Table Requirements for IDLST

Size of TWX calling list = d + 5 + 2b
Size of TWX answering list = 5 + b
Size of BSC IDLST only = 3 + d + 2r + s + i

where: d = number of dial digits
b = number of TWX ID characters
= 0 otherwise
r = number of ID characters expected to be received (BSC only)
s = number of ID characters to be sent (BSC)
i = 3 if the in-list operand is coded (BSC)
= 0 otherwise.

Table Requirements for SSLAST/SSAWLST

Size = n(m + 1) + 6

where: n = number of list entries
m = values specified in Figure 20-2.

Table Requirements for AUTOLST/AUTOWLST

Size = n(m + 2) + 819

where: n = number of list entries
m = values specified in Figure 20-2.

Table Requirements for WTTALST

1. When the WRU feature is present in DTFBT:

   Size = 3 + 2r + s

2. When the IAM feature is present, and WRU is not present in DTFBT:

   Size = 2 + s

where: r = number of ID characters expected to be received
s = number of ID characters to be sent.

BTMOD (BTAM Logic Module)

The size of the BTAM module varies with the options selected as shown in Figure 20-3. When all operands are omitted or the standard (default) options are coded, the resulting basic module requires 7811 bytes of main storage.

BTAM DATA EVENT CONTROL BLOCK TABLE REQUIREMENTS

Size = 40 bytes

When the MF operand of a READ or WRITE macro is coded MF=L, or when the MF operand is omitted, a DECB (Data Event Control Block) is reserved. One DECB should be reserved per line.

SCANREQ DECB REQUIREMENTS

Size of each DACA = 24 bytes

When the MF operand of a SCANREQ macro is coded MF=L, or when the MF operand is omitted, a DACA (Display Alphameric Control Area) is reserved. One DACA should be reserved per device.

Operand	Option	Number of bytes added to basic module
ERLOGIC=*	N	-2237
	C	+ 351
	NC	-1942
SWITCH	YES	+ 712 (If BUFFER=NO, BSCTEST=NO)
		+2813 (If BUFFER=YES, BSC=YES, BSCTEST=NO)
		+4340 (If BUFFER=YES, BSCTEST=YES)
	NEWID	+1034 (If BUFFER=NO, BSCTEST=NO)
		+3135 (If BUFFER=YES, BSCTEST=NO)
		+4662 (If BUFFER=YES, BSC=YES, BSCTEST=YES)
AUDIO	YES	+ 468 (SWITCH must equal YES)
BUFFER=	YES	+2077 (If L2260=NO and L3277=NO)
		+1835 (If L2260=YES or L3277=YES)
	REQREL	+ 681 (If L2260=NO and L3277=NO)
		+ 781 (If L2260=YES or L3277=YES)
TERMTST=	YES	+1028
L2260= L3277	YES	- 616 (If ERLOGIC=N)
		-2964 (If SS=NO)
		+1917 (If ERLOGIC=E)
		-2720 (If SS=NO)
	NO	+2268 (If ERLOGIC=C)
		-2595 (If SS=NO)
		- 321 (If ERLOGIC=NC)
		-2899 (If SS=NO)

* Use the ERLOGIC storage estimate only if neither L2260, nor L3277, nor SSAPL is specified.

Figure 20-3. BTAM -- Storage Requirements (Part 1 of 3)

Operand	Option	Number of bytes added to basic module
		+ 860 (If ERLOGIC=N)
L2260	NO	-1299 (If SS=NO) +4057 (If ERLOGIC=E) - 705 (If SS=NO)
L3277	YES	+4404 (If ERLOGIC=C) - 580 (If SS=NO) +1529 (If ERLOGIC=NC) -1174 (If SS=NO)
L2260	YES	+1745 (If ERLOGIC=N) - 700 (If SS=NO)
L3277	YES	+4864 (If ERLOGIC=E) + 190 (If SS=NO) +5215 (If ERLOGIC=C) + 315 (If SS=NO) +2040 (If ERLOGIC=NC) - 575 (If SS=NO)
TST3277	YES	+ 978 (nL3277 must equal YES)
TRANSL=	YES	+ 170
BSCS=	YES	+12066 (If SWITCH=YES and BUFFER=YES) +6068 (If SS=NO) +8949 (If SWITCH=YES and BUFFER=NO) +5128 (If SS=NO) +6435 (If SWITCH=NO and BUFFER=NO) +2934 (If SS=NO) +9389 (If SWITCH=NO and BUFFER=YES) +5795 (If SS=NO) +10257 (If SWITCH=NEWID and BUFFER=NO) +7212 (If SS=NO) +13390 (If SWITCH=NEWID and BUFFER=YES) +10335 (If SS=NO)

Figure 20-3. BTAM -- Storage Requirements (Part 2 of 3)

Operand	Option	Number of bytes added to basic module
SSAPL=	YES	-1151 (If ERLOGIC=N)
		+1622 (If ERLOGIC=E)
		- 856 (If ERLOGIC=NC)
		+1981 (If ERLOGIC=C)
BSCMPT=	YES	+1190 (BSCS must equal YES)
WTTA	YES	+ 360
BSCTEST	YES	+4122 (BSCS must equal YES)
DECBEXT	YES	- 50 (BSCS must equal YES)
RMSR=	YES	+1474 (If L2260=NO and L3277=NO)
		+1714 (If L2260=YES and L3277=NO)
		+1494 (If L2260=NO and L3277=YES)
		+ 1966 (If L2260=YES and L3277=YES)
RESETPL	NO	- 128

Figure 20-3. BTAM -- Storage Requirements (Part 3 of 3)

Module 21: QTAM -- 5745-SC-QTM

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CORE IMAGE LIBRARY

Transients	Blocks
23	35

Transients

$$BCQC01	Close Phase 1
$$BCQC02	Close Phase 2
$$BCQC03	Close Phase 3
$$BCQC04	Close Phase 4
$$BOQO01	Open Monitor/DASD Message Queues, Phase 1
$$BOQO02	Open Line Group and Main Storage Process/Destination Queues
$$BOQO03	Open Checkpoint/Restart, Phase 1
$$BOQO04	Open Checkpoint/Restart, Phase 2
$$BOQO06	Open Main Storage Process/Destination Queues
$$BOQO07	Open Phase 7
$$BOQO08	Open Audio Line Group and Output Queue
$$BQCNCL	Cancel
$$BQCNCM	Cancel
$$BQHDCK	Terminal Test Header Analysis
$$BQWTRA	ARU Message Writer
$$BQWTR1	Message Writer, Phase 1
$$BQWTR2	Message Writer, Phase 2
$$BQWTR3	Message Writer, Phase 3
$$BQ1030	Terminal Test Module for IBM 1030
$$BQ1050	Terminal Test Module for IBM 1050
$$BQ1060	Terminal Test Module for IBM 1060
$$BQ2260	Terminal Test Module for IBM 2260
$$BQ2740	Terminal Test Module for IBM 2740

RELOCATABLE LIBRARY

Modules	Blocks
109	393

Modules

BASIC QTAM LOGIC MODULES: Basic QTAM logic modules are identified by one asterisk (*) preceding the listed module.

QTAM DEVICE I/O MODULES: QTAM device I/O modules are identified by two asterisks (**) preceding the listed module. Include the storage requirements for a particular device I/O module only once, and only if the terminal type is present in the system.

Module Name	Description	Bytes of Storage
IJLQAA	Audio line appendage	2386
	Note: Required if the QTAM audio support is selected.	
IJLQAD	Audio 7772 disk appendage	2898
IJLQBO	Breakoff (BREAKOFF)	212
*IJLQCK	Checkpoint	1208
	Note: Required if the Checkpoint/Restart facility is selected in the DTFQT.	
IJLQCL	Change line (STARTLN and STOPLN)	557
IJLQCM	Cancel message (CANCELM)	160
IJLQCP	Change polling list entry (CHNGP)	146
IJLQCR	Checkpoint request (CKREQ)	98
IJLQCT	Change terminal table entry (CHNGT)	250

Module Name	Description	Bytes of Storage
*IJLQDA	Disk I/O module	1372
	Note: Not required when the system contains only audio devices.	
IJLQDC	Copy counters (COPYC)	280
IJLQDE	Copy terminal table entry (COPYT)	120
IJLQDL	Distribution list	156
IJLQDP	Copy polling list entry (COPYP)	104
IJLQDQ	Copy queue control block status (COPYQ)	98
IJLQDT	Insert date in message header (DATESTMP)	60
IJLQEA	End-of-Address (EOA)	100
IJLQEB	End-of-Block (EOB)	132
IJLQEC	End-of-Block and line correction (EOBLC)	396
ILQER	Error message (ERRMSG)	292
IJLQEX	Expand message header	70
IJLQFL	DTF locator	78
IJLQGA	Get audio message	324
IJLQGB	Get audio or nonaudio message	732
IJLQGC	Get audio message or nonaudio message record (GET)	760
IJLQGD	Get audio message or nonaudio message segment (GET)	714
IJLQGM	Get complete message (GET)	472
IJLQGR	Get message record (GET)	500
IJLQGS	Get message segment (GET)	454
*IJLQIP	QTAM implementation	3692
IJLQIT	Intercept message (INTERCPT, permanent queueing)	140
*IJLQLA	Line appendage and ERP module PCI and program	4152
	Note: Not required when the system contains only audio devices.	
*IJLQLC	Line appendage for PCI and program check module	630
	Note: Not required when the system contains only audio devices.	
IJLQLG	Audio input message logging (LOGSEG)	304
IJLQLK	Lookup terminal table entry (DIRECT)	104
*IJLQLO	IBM 2260 local appendage	1288
	Note: Required if the IBM 2260 local device is used.	
IJLQMC	Conversational mode (MODE)	384
IJLQMI	Initiate mode (MODE)	18
IJLQMM	Message-mode interface (MODE)	44
IJLQMP	Priority mode (MODE)	36
IJLQMT	Compare message type (MSGTYPE)	60
*IJLQMW	Error recovery procedures message writer subtask	1359
**IJLQM0	Model channel program for IBM 1030 terminals	194
**IJLQM1	Model channel program for IBM 1060 terminals	168
**IJLQM2	Model channel program for IBM 2260 terminals	206
**IJLQM3	Model channel program for AT&T 83B3 terminals	102
**IJLQM4	Model channel program for Western Union Plan 115A terminals	91
**IJLQM5	Model channel program for IBM 1050 switched and nonswitched terminals	207
**IJLQM6	Model channel program for IBM 1050 nonswitched terminals	194
**IJLQM8	Model channel program for AT&T TWX terminals (Models 33 and 35)	113
**IJLQM9	Model channel program for IBM 2260 local terminals	75
**IJLQN0	Model channel program for IBM 2740 basic terminals	99
**IJLQN1	Model channel program for IBM 2740 basic dial terminals	166
**IJLQN2	Model channel program for IBM 2740 terminals with station control	172
**IJLQN3	Model channel program for IBM 2740 terminals with station control checking	221
**IJLQN4	Model channel program for IBM 2740 dial terminals with transient control and checking	198
**IJLQN5	Model channel program for IBM 2740 terminals with checking	128
**IJLQN6	Model channel program for IBM 2740 dial terminals with checking	192
**IJLQN7	Model channel program for IBM 2740 dial terminals with transmit control	156
**IJLQN8	Model channel program for World Trade Telegraph terminals (WTTA)	356
IJLQOA	Operator awareness	1380
IJLQOB	SDR counter incrementer	2576
IJLQOC	Operator control (OPCTL)	3530
IJLQPA	Put audio message (PUT)	370

Module Name	Description	Bytes of Storage
IJLQPL	Polling limit control (POLLIMIT)	120
IJLQPM	Put complete message (PUT)	480
IJLQPR	Put message record (PUT)	544
IJLQPS	Put message segment (PUT)	520
IJLQPZ	Pause-transmit idle characters (PAUSE)	360
IJLQQT	Close message control (CLOSEMC)	474
IJLQRA	Translate table RCVARU: ARU code to EBCDIC	266
IJLQRB	Translation table RCVITA2 (EBCDIC to International Telegraph Alphabet No. 2)	266
IJLQRC	Translation table RCVZ-RCVZC3 (EBCDIC to figure-protected code ZSC3)	266
IJLQRD	Retrieve message segment by DASD address (RETRIEVE)	124
IJLQRG	Route message (ROUTE)	48
IJLQRM	Release message (RELEASEM)	234
IJLQRR	Reroute message (REROUTE)	72
IJLQRS	Retrieve message header by sequence number (RETRIEVE)	380
*IJLQRW	Physical input/output control Note: Not required when the system contains only audio devices.	1569
IJLQR1	Translate table RCV1030: 1030 to EBCDIC	266
IJLQR2	Translate table RCV1050: 1050 to EBCDIC	266
IJLQR3	Translate table RCV1050F: 1050 to monocase EBCDIC	266
IJLQR4	Translate table RCV1060: 1060 to EBCDIC	266
IJLQR5	Translate table RCV2260 to EBCDIC	266
IJLQR6	Translate tables RCV83B3 or RCV115A: AT&T 83B3 or WU plan 115A to EBCDIC	266
IJLQR7	Translate table RCVTWX: AT&T models 33/35 (TWX) to EBCDIC)	266
IJLQR8	Translate table RCV2740: 2740 to EBCDIC	266
IJLQR9	Translate table RCV2740F: 2740 to EBCDIC	266
IJLQSB	Translation table SNDITA2 (International Telegraph Alphabet No. 2 to EBCDIC)	266
IJLQSC	Translation table SNDZSC3 (figure-protected code ZSC3 to EBCDIC	266
IJLQSH	Scan message header	104
IJLQSI	Sequence-in number verification (SEQIN)	140
IJLQSK	Skip-through character (SKIP)	76
IJLQSO	Insert sequence-out number in message header (SEQOUT)	68
IJLQSR	Source terminal name verification (SOURCE)	128
IJLQSS	Change audio line (STARTARU and STOPARU)	300
IJLQST	Skip-on count (SKIP)	48
IJLQS1	Translate table SND1030: EBCDIC to 1030	266
IJLQS2	Translate table SND1050: EBCDIC to 1050	266
IJLQS4	Translate table SND1060: EBCDIC to 1060	266
IJLQS5	Translate table SND2260: EBCDIC to 2260	266
IJLQS6	Translate tables SND83B3 or SND115A EBCDIC to AT&T 83B3 or WU plan 115A	266
IJLQS7	Translate table SNDTWXE: EBCDIC to AT&T models 33/35 -- TWX (even parity)	266
IJLQS8	Translate table SND2740: EBCDIC to 2740	266
IJLQS9	Translate table SNDTWXO: EBCDIC to AT&T models 33/35 -- TWX (nonparity)	266
*IJLQTA	World Trade Telegraph terminals (WTTA) line appendage Note: Required if World Trade Telegraph support is selected.	1406
IJLQTR	Code translation used in conjunction with QTAM or user-provided translate table (TRANS) Note: T = number of translation tables.	114+ 226T
IJLQTS	Insert time of day in message header (TIMESTMP)	198
*IJLQTT	Terminal test recognition (LPSTART) Note: Not required when the system contains only audio devices.	1394

Delete Statements

To delete the QTAM phases from the core image library, the QTAM modules from the relocatable library, and the QTAM books from the source statement library, the DELET statement for the appropriate library and the name of the phase, module or book to be deleted must be supplied. For example:

```
// JOB DELETE
// EXEC MAINT
   DELETC $$BCQC01,$$BQWTR1,etc.
   DELETR IJLQBO,IJLQCL,IJLQCM,etc.
   DELETS E.BREAKOFF,E.BUFFER,E.CANCELM,etc.
/&
```

To delete both BTAM and QTAM from the core image, relocatable and source statement libraries, the DELET statement for the appropriate library and the following entries must be made: For the core image transients, you must supply the DELETC, card with a separate entry for each transient (QTAM and BTAM) to be deleted. For the core image phase names, enter the delete statement as follows:

```
DELETC $$BCTC01,$$BCOO03,$$BETPRT, etc.
DELETC IJLB.ALL
DELETC IJLT.ALL
```

To delete both BTAM and QTAM from the relocatable library, enter:

```
   DELETR IJL.ALL
```

To delete the BTAM and QTAM books from the source statement library, enter the DELETS statement with a separate entry for each book to be deleted. The following example shows the required delete statements and type of entries to be made:

```
// JOB DELETE
// EXEC MAINT
   DELETS E.CONTROL,E.CANCELM, etc.
/&
```

SOURCE STATEMENT LIBRARY

Macros	Blocks
79	2013

Macros

Basic

E.ARUMGTYP
E.BREAKOFF
E.BUFARU
E.BUFFER
E.CANCELM
E.CHECKARU
E.CHNGP
E.CHNGT
E.CKREQ
E.CLOSEMC
E.COPYC
E.COPYP
E.COPYQ
E.COPYT
E.COUNTER
E.CTLTBL
E.DATESTMP
E.DIRECT
E.DTFQT
E.ENDRCV
E.ENDREADY
E.ENDSEND
E.EOA
E.EOB
E.EOBLC
E.ERRMSG
E.INTERCPT
E.LCBD
E.LINE
E.LINETBL
E.LIST
E.LOGSEG
E.LPSTART
E.MODE
E.MSGTYPE
E.OPCTL
E.OPTION
E.PAUSE
E.POLL
E.POLLIMIT
E.POSTARU
E.POSTRCV
E.POSTSEND
E.PREFIXD
E.PROCESS
E.QCBD
E.RCVHDR
E.RCVITA2
E.RCVSEG
E.RCVZSC3
E.RELEASEM
E.REPEAT
E.REROUTE
E.RETRIEVE
E.ROUTE
E.SENDHDR
E.SENDSEG
E.SEQIN
E.SEQOUT
E.SKIP
E.SNDITA2
E.SNDZSC3
E.SOURCE
E.STARTARU
E.STARTLN
E.STCBD
E.STOPARU
E.STOPLN
E.TERM
E.TERMTBL
E.TERMTBLD
E.TIMESTMP
E.TRANS
E.WORD
E.WORDTBL
E.WRU

System Generation

E.IJLQDSCT
E.IJLQTSVC
E.IJLQDEQU

QTAM STORAGE REQUIREMENTS

The storage requirements for QTAM depend to a great extent on the configuration of your teleprocessing installation and the nature of your applications. Storage requirements increase proportionately as the number of communication lines, terminals, and QTAM-provided processing functions increase. These requirements can be estimated from formulas and tables presented in this module.

To determine the storage requirements for the Basic QTAM Logic modules and the QTAM Device I/O modules, refer to "Relocatable Library".

DTFQT (Define The File: QTAM)

Seven types of DTF tables may be generated by a DTFQT macro instruction. The storage estimates for each follow.

DASD Message Queues Files

Size = 315 bytes

Communication Line Group File

For Nonaudio Line Group

$$\text{Size} = 48 + (128 + 8x)N$$

For Audio Line Group

$$\text{Size} = 64 + (161 + L_1 + L_2 + G + x\text{-}z)N$$

where: N = number of lines in the line group
x = a function of the device, given in Figure 21-1
L_1 = length of input buffers
L_2 = length of address chain buffers
G = 9 when using time stamping option, otherwise = 0
z = 17 when information mode is used

Device	x
1030	8
1050NS	8
1050S	10
1060	7
2260 Remote	8
2260 Local	5
274A	4
274B	6
274C	6
274D	7
274E	7
274F	4
274G	6
274H	7
115A	8
83B3	7
TWX33/35	6
7770	0
WTTA	8

Figure 21-1. QTAM -- Values for Communication Line Group Table

Real Storage Process Queue

Size = 84 + 12x

where: x = 0 for nonmixed application, and
1 for mixed application

Real Storage Destination Queue

Size = 80 bytes

Checkpoint Records File

Size = 220+L

where: L = length of the checkpoint record specified by the SOWA keyword operand.

Audio Output Queue

Size = 76 bytes

CONTROL INFORMATION

The storage estimates for required control information are shown in Figure 21-2.

Control Blocks and Information	Storage Requirements (in bytes)
Terminal table TERMTBL macro instruction	12
OPTION macro instruction	No storage is reserved for this macro; it defines user areas that are included in the expansion of the TERM macro instruction (U parameter)
TERM macro instruction[1]	9 + I + U + D + 44F where: (I + U + D)≤243
LIST macro instruction[1]	12 + L + 2N + 140[2] where: (3 + L +2N)≤243
PROCESS macro instruction[1]	13 + A for audio process program entry 9 + Y for nonaudio process program entry
Polling list POLL macro instruction[3]	4 + 3N for autopolled terminals except IBM 1030 4 + 2N for nonswitched terminals or autopolled IBM 1030 5 for switched IBM terminals 3 + I for IWX 4 + I for WTTA terminals
Queue Control Block for Process Queues and Destination Queues	32X
Audio Line Table LINETBL macro instruction[1]	4
LINE macro instruction[1]	5 + Z
Audio Word Table WORDTBL macro instruction[1]	4
WORD macro instruction[1]	8 + W

Figure 21-2. QTAM -- Storage Requirements for Control Information (Part 1 of 2)

where:
N = number of terminals I = number of bytes in terminal ID U = number of bytes in optional area D = number of bytes in device address area; size depends on contents:
For nonswitched terminal -- addressing and polling characters (1 byte/character)
For IBM switched terminal -- field telling the number of dial digits (1 byte) + dial digits (1 byte/digit) + addressing characters (1 byte/character)
For TWX -- field telling the number of dial characters (1 byte) + dial digits (1 byte/digit) + field telling the number of ID characters (1 byte) + ID characters (2 bytes/character)
For WTTA terminals -- 1 byte + field telling the number of ID characters (1 byte) + ID characters (2 bytes/character)
For IBM 2260 Local -- a field of 6 fullwords consisting of a CCB and other control information
L = number of bytes in name of the distribution list entry in terminal table (1-8) A = number of bytes in name of the audio process entry in the terminal table. Because the following field in the entry must be aligned to a fullword boundary, this field must be either three, seven or eleven bytes long. X = number of lines or terminals (depending on queueing techniques) and the number of process queues Y = number of bytes in name of the process entry in terminal table (1-8) Z = number of bytes in name of the line entry in line table (1-8) W = number of bytes of the selected word F = 1 for IBM 2740 Model 2 terminals with the Buffer Receiver Option; 0 for other terminals T = number of bytes in the CPU identification (WTTA terminals)
Notes:
1. Add the number of bytes necessary for fullword boundary.
2. This number (140) is the number of bytes in the Distribution List module (IJLQDL). This number is included in the storage requirements only once if the LIST macro is used more than once.
3. Add the number of bytes necessary for halfword boundary.

Figure 21-2. QTAM -- Storage Requirements for Control Information (Part 2 of 2)

Buffers

For Nonaudio Applications:

$$\text{Buffer Pool Size} = 8+(x+16)N + 24M$$

N = number of buffers specified
X = size of each buffer
M = number of CCWs QTAM generates for data insertion by the PAUSE macro.

QTAM Macro Instructions

Figure 21-3 gives the storage requirements for all other QTAM macro instructions.

Much QTAM logic consists of modules introduced by the use of certain QTAM macro instructions in the user's program. These macro instructions expand into inline coding that establishes the linkage to, and parameters for, the QTAM modules. Often a module so introduced into the system itself introduces another module, a process termed a second level routine.

Column two of Figure 21-3 shows the extent of the coding produced by the expansion of the macro instruction in column one. If the coding links to QTAM module, the module is presented in column three; if that module links to other modules, they are presented in column four.

Storage requirements for a sharable module, or for a second level routine that is linked to more than once in the same partition are included only once. For example, the macro instructions DIRECT, EOA, and ROUTE all link to the same module, IJLQLK. If two or more of these macro instructions are used in the same message control program, the module is included only once. Similarly, if the same macro instruction is used more than once in the same program, storage is required for only the additional linkage because the module is included just once.

Macro Instruction	Inline Linkage or Code (Note 5)	Second Level Sharable Modules		Routine	
		Name	Size	Name	Size
ARUMGTYP	16				
BREAKOFF	8	IJLQBO	212		
CANCELM	8	IJLQCM	160		
CHECKARU	70+ message text				
CHNGP	42	IJLQCP	146	IJLQFL	78
CHNGT	26	IJLQCT	250		
CKREQ	10	IJLQCR	98		
CLOSEMC	6	IJLQQT	474	IJLQCL	549
COPYC	24	IJLQDC	504		
COPYP	34	IJLQDP	104	IJLQFL	78
COPYQ	34	IJLQDQ	98		
COPYT	30	IJLQDE	120		
COUNTER	12				
DATESTMP	8	IJLQDT	60	IJLQEX	70
DIRECT	12	IJLQLK	104		
ENDRCV	10	Note 1			
ENDRCV (WTTA)	16	IJLQEB	132		
ENDREADY	80	Note 1			
ENDSEND	10	Note 1			
EOA	28	IJLQEA	100	IJLQSH IJLQSK IJLQRG IJLQMT IJLQLK	104 76 48 60 104 Note 2

Figure 21-3. QTAM -- Storage Requirements for Other Macro Instructions (Part 1 of 5)

Macro Instruction	Inline Linkage or Code (Note 5)	Sharable Modules		Second Level Routine	
		Name	Size	Name	Size
EOB	6	IJLQEB	132	Note 1	
EOBLC	6	IJLQEC	380	Note 1	
ERRMSG	32+ message text	IJLQER Note 1	292	IJLQLK	104
GET					
Segment		IJLQGS	454		
Message		IJLQGM	472		
Record		IJLQGR	500		
GET (AUDIO)					
Audio message		IJLQGA	324		
Audio and non-audio messages		IJLQGB	732		
Audio message and nonaudio record		IJLQGC	760		
Audio message and nonaudio segment		IJLQGD	714		
INTERCPT	12	IJLQIT	140		
LOGSEG	32		Note 3		
LOGSEG (ARU)	26	IJLQLG	304		
LPSTART	28	Note 1			
MODE (C)	14	MODE (U) module & IJLQMM	44	IJLQSH	104
MODE (U)					
INITIATE	10	IJLQMI	18		
PRIORITY	10	IJLQMP	36	IJLQSH	104
CONVERSE	10	IJLQMC Note 1	384		
MOD2260	4				
MSGTYPE (C)	19	IJLQMT	60	IJLQSH	104
MSGTYPE (U)	4				
OPCTL	56	IJLQOC	3610	IJLQLK IJLQSH IJLQCL Note 1	104 104 549

Figure 21-3. QTAM -- Storage Requirements for Other Macro Instructions (Part 2 of 5)

Macro Instruction	Inline Linkage or Code (Note 5)	Sharable Modules		Second Level Routine	
		Name	Size	Name	Size
PAUSE	13 + insert chars.	IJLQPZ	360	Note 1	
POLIIMIT	12	IJLQPL	120		
POSTARU	6		Note 1		
POSTRCV	6	Note 1			
POSTSEND	12	Note 1			
PUT Segment		IJLQPS	520		
Message		IJLQPM	480		
Record		IJLQPR	544		
PUT (AUDIO)		IJLQPA	370		
RCVHDR	8				
RCVSEG Note 4	0				
RELEASEM	12	IJLQRM	230		
REPEAT	34		Note 1		
REROUTE	26	IJLQRR Note 1	72	IJLQLK	104
RETRIEVE DASD address	14	IJLQRD	124		
By sequence number	26	IJLQRS	380	IJLQRD	124
ROUTE	8	IJLQRG	48	IJLQLK IJLQSH	104 104
SENDHDR	16				
SENDSEG Note 4	4				
SEQIN	8	IJLQSI	140	IJLQSH	104
SEQOUT	8	IJLQSO	68	IJLQEX	70
SKIP (CT)	8	IJLQST	48	IJLQSH	104

Figure 21-3. QTAM -- Storage Requirements for Other Macro Instructions (Part 3 of 5)

Macro Instruction	Inline Linkage or Code (Note 5)	Sharable Modules		Second Level Routine	
		Name	Size	Name	Size
SKIP (S)	8 + no. to be skipped	IJLQSK	76	IJLQSH	104
SOURCE	8	IJLQSR	128	IJLQSH	104
STARTARU	42	IJLQSS	300	IJLQFL	78
STARTIN	12	IJLQCL	512	IJLQFL	78
STOPARU	42	IJLQSS	300	IJLQFL	78
STOPLN	12	IJLQCL	512	IJLQFL	78
TIMESTMP	8	IJLQTS	198	IJLQEX	70
TRANS	10	IJLQTR	114+ 266*T		
WRU	0				

C = character operand specified (conditional)
U = character operand null (unconditional)
S = skip to and include designated character configuration
CT = skip designated count of nonblank characters
T = number of translation tables.

Translation tables are: RCV1030, RCV1050, RCV1050F, RCV1060, RCV2260, RCV2740, RCV2740F, RCVARU, RCV83B3, RCV115A, RCVTWX, RCVITA2, RCVZSC3, SND1030, SND1050, SND1060, SND2260, SNDITA2, SNDZSC3, SND2740, SND83B3, SND115A, SNDTWXE, and SNDTWXO

Figure 21-3. QTAM -- Storage Requirements for Other Macro Instructions (Part 4 of 5)

Notes:

1. These delimiters or modules cause linkages to QTAM routines included in "Basic QTAM Logic Modules" listed earlier in this module under "Relocatable Library".

2. If the macro instruction MSGTYPE, ROUTE, or SKIP (S) is used in the program, the storage estimate for IJLQMT, IJLORG, or IJLQSK, respectively, is not included in the storage estimate for EOA.

3. Because the user defines his own DTFxx and xxMOD macros for his message log file, the size requirements cannot be specified here. Information to determine the storage requirements for the specific logging medium is given under the pertinent DTF and Module, that is, DTFMT and MTMOD for Tape. Modules 7-18 contain storage requirements for declarative macros.

4. Identifies entry point for RCVSEG and SENDSEG subgroups of LPS.

5. The linkage requirements for OPEN, CLOSE, GET, and PUT are given in Module 1.

Figure 21-3. QTAM -- Storage Requirements for Other Macro Instructions (Part 5 of 5)

Module 22: VTAM -- 5745-SC-VTM

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Introduction

This section of the manual presents a method for estimating the amount of storage required to run VTAM level 2 (referred to as VTAM) under DOS/VS. For further details, refer to DOS/VS VTAM Concepts and Planning, GC27-6998. Information on library requirements, VTAM phases, modules and transients, and link-edit statements is given under "VTAM Components".

Storage Estimates for VTAM

This chapter discusses the method for estimating the amount of virtual, real, and auxiliary storage required to run VTAM under DOS/VS. It also shows how to calculate the VTAM storage pool parameters. A sample calculation for the ALLOC and ALLOCR macro instructions is given in Figures 22-4 and 22-5.

The results of the estimates are used during system generation and VTAM initialization. The virtual and real partition size values are to be specified in the ALLOC and ALLOCR job control commands, the storage pool parameters during the starting of VTAM, and the value for the SIZE parameter is to be specified in the EXEC job control statement or the job control command.

The method for estimating the amount of storage required for VTAM and for calculating the VTAM storage pool parameters is based on a series of work sheets (WS.) that allow the user to define and calculate the requirements step-by-step. As in all telecommunications systems, many variables affect the actual storage requirements. Many of the variables are precisely defined by the selection of options and functions, and of the network configuration. Other variables, however, are related to the user's specific applications, and as such, are affected by dynamic changes that occur during the execution of the application program. Thus, in the work sheets, where precise values are not available, guidelines are provided to allow to analyze the requirements and select values applicable to the specific installation. The storage and buffer pool calculations found in the work sheets represent starting values which can be changed by using the VTAM storage pool trace facility.

The calculations for the virtual and real partition size have to cover the various functional components of VTAM. It will be easier to understand the structure of the necessary calculations by referring to Figures 22-1 and 22-2; they show the composition of the virtual and real partitions of VTAM. Figure 22-1 maps all the VTAM components contained in virtual storage. Similarly, Figure 22-2 maps all the components that reside in real storage.

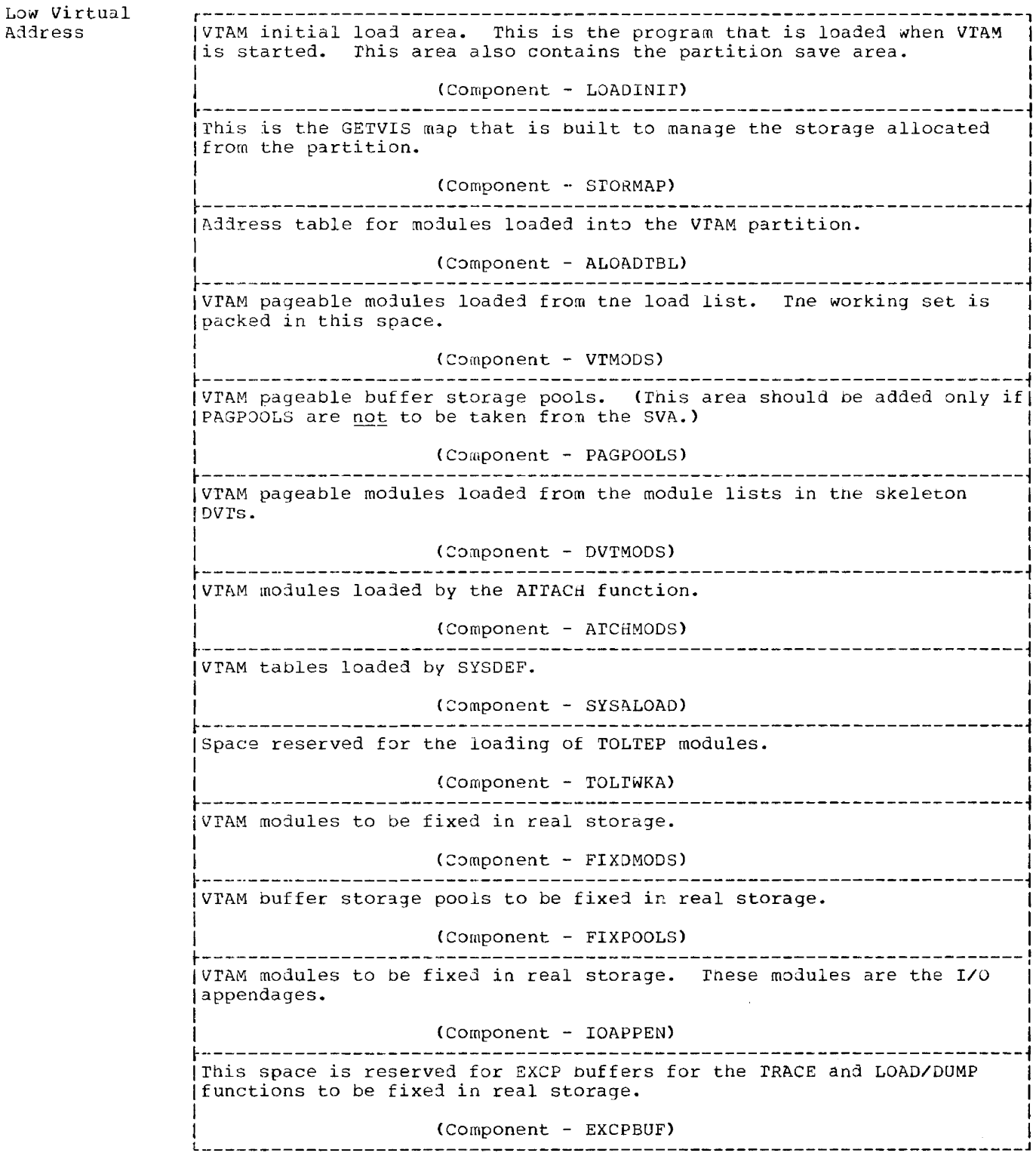

Figure 22-1. VTAM Virtual Partition Map

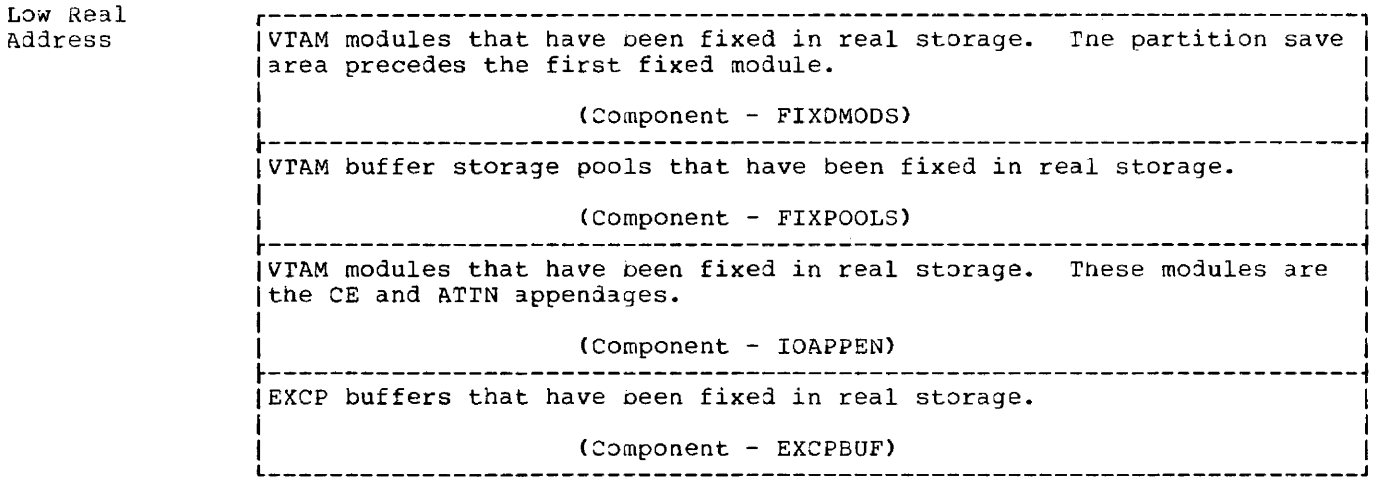

Figure 22-2. VTAM Real Partition Map

Figure 22-3 shows the calculation subject and the related work sheet identifier (A through D7). Most important, it shows the hierarchical structure of the calculations. The structure in some cases is such, that a string of lower-level calculations must be completed before the desired value can actually be calculated. For example, the calculation for "RDT" (identified by D2) can only be started when the results of D2.1 through D2.5 have been calculated, because these results are required as part of the "RDT" calculation. It will be helpful to become familiar with the calculation structure by reading the individual work sheets and relating them to Figure 22-3. Note that, for reason of context, Work Sheet C3 is included after Work Sheet D7. All calculations on the work sheets are performed in bytes, except where noted.

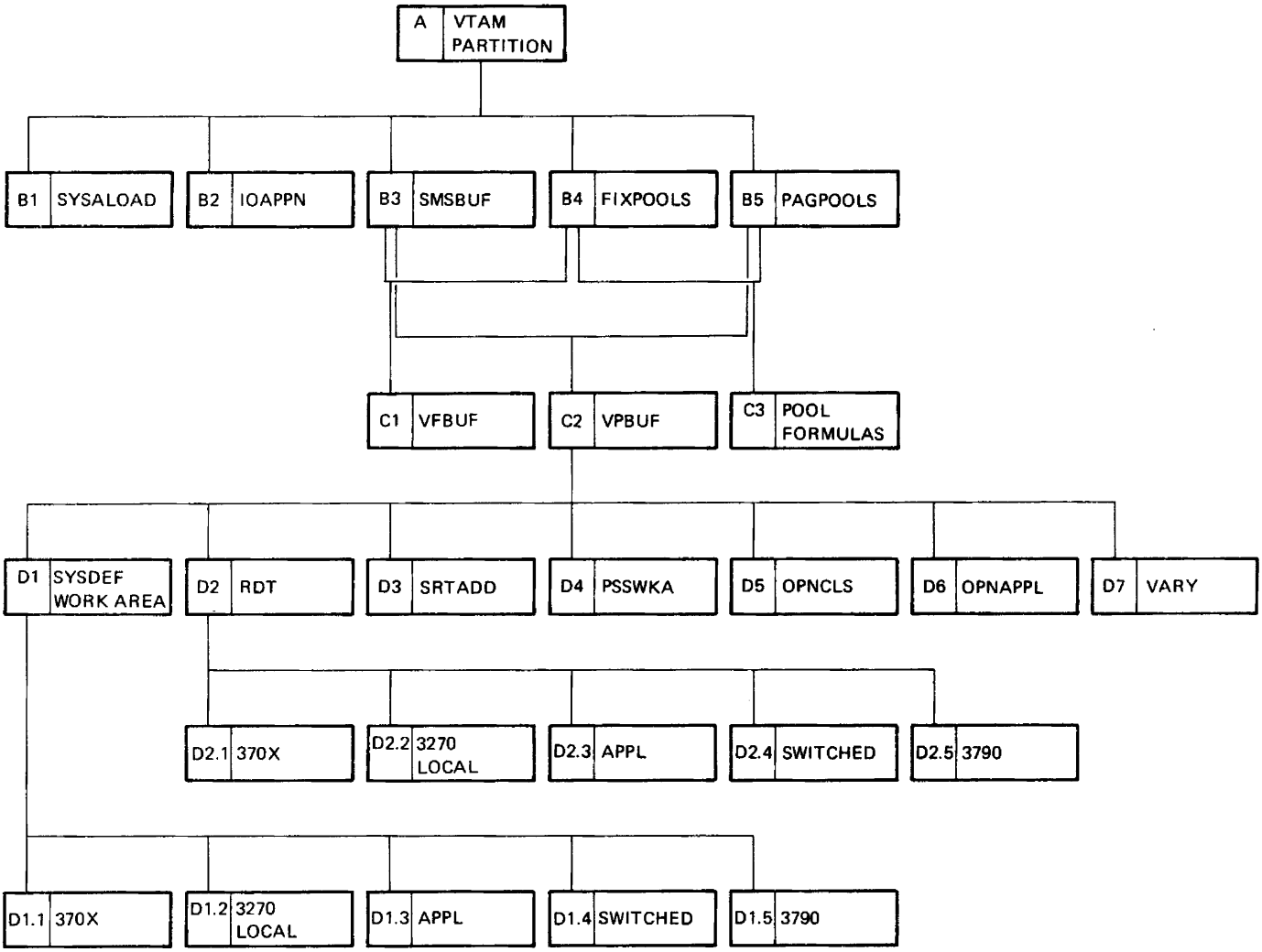

Figure 22-3. Hierarchical Structure of VTAM Storage Calculations

Identifiers A, B1, and so on, relate to the work sheet (WS.)

To accurately determine VTAM storage requirements, it is necessary to have information about the installation in which VTAM will be operating. An outline of the information required is as follows:

1. TP hardware configuration (as determined by all NCPGEN decks and all LOCAL build decks).

   a. Number and types of terminals

      (1) BASIC devices
      (2) Terminal components (for example, 1050 card reader)
      (3) 3270 devices, local and remote

   b. Logical units - remote and local

   c. Number and type of lines

      (1) Dial lines and number of dial digits and size of ID verification data
      (2) Non-Dial lines and number of poll characters

d. Number and types of cluster controllers

   (1) SNA Controllers
   (2) Remote 3270 Controllers

e. Message sizes

2. Host system characteristics

a. Is Network Solicitor included?
b. Types and numbers of operator commands
c. Number of application programs with OPEN ACBs
d. Types of VTAM support for I/O

   (1) BASIC support
   (2) RECORD support
   (3) 3270 local and remote
   (4) User exits.

e. Number of concurrent TOLTEP users

f. Number of messages arriving at host each second

Work Sheet A - VTAM Partition

Calculations of sums A, B, C, and D below will enable you to determine the values to specify for the VTAM partition size (in the ALLOC and ALLOCR statements or commands and in the SIZE=parameter of the EXEC statement).

Constant requirement for fixed storage 14,336

SUM A= 14,336

ISTPATCH (if module ISTPATCH has been compiled with a patch area different from the IBM-supplied patch area, enter the size rounded up to a multiple of 128; if ISTPATCH has not been modified, enter 128). _____

FIXPOOLS (from WS.B4) _____

IOAPPN (from WS.B2) _____

Preliminary SUM B= _____

After rounding preliminary SUM B up to 2048, SUM B= _____

Constant requirement for pageable storage 684,032

If SSS is to be run as a subtask, add the size indicated for the appropriate interactive or batch phase given under Module 23: SSS _____

If BTP is to be run as a subtask, add the size required for BTP (see the BTP User's Guide) _____

If NETSOL=YES, enter 8192; if NO, enter 0 _____

Preliminary SUM C= _____

After rounding the preliminary SUM C up to a multiple of 2048, SUM C= _____

TOLTWKA (maximum number of current TOLTEP users x 34,816; see Note) _____

SYSALOAD (from WS.B1) _____

SMSBUF (from WS.B3) _____

PAGPOOLS (from WS.B5) _____

Preliminary SUM D= _____

By rounding preliminary SUM D up to a multiple of 2048, SUM D= _____

Calculation for ALLOC

(SUM A + SUM B + SUM C + SUM D)/1024= _____

Calculation for ALLOCR

(SUM A + SUM B)/1024= _____

Calculation for SIZE parameter in EXEC statement

(SUM A + SUM C)/1024= _____

Note: The maximum number of concurrent TOLTEP users is equal to the maximum number of terminals requiring online diagnostic testing at one time. For small networks, this number will be small, probably 1. As the network grows in size, the number of terminals requiring concurrent online testing will increase to 2 or more.

Work Sheet B1 - Calculation of SYSALOAD

This area is where SYSDEF loads certain tables to be used in building RDTs. The input for the variables in the calculations should be taken from all Network Control Program generation decks, and all LOCAL and APPL statement decks for the VTAM system.

Enter the total number of names specified in the name fields of the following macros:

PCCU macros				
GROUP macros				
LINE macros (both dial and non-dial)				
TERMINAL macros except for 2980s with two addresses specified				
TERMINAL macros for 2980s with two addresses specified (multiply by 2)				
COMP macros				
CLUSTER and PU macros				
INNODE macros				
DIALSET macros				
LU macros				
LOCAL statements				
APPL statements				
Value specified in LUPOOL macro				
TERMINAL macros followed by a COMP macro				
TERMINAL macros with CTERM=YES				
VBUILD statements				
LBUILD statements	+			
	SUM A =		x 12 =	

If any SDLC devices are in the Network Control Program generation deck, enter 10; otherwise, 0

	+	10
	SUM B =	

SUM B rounded up to a multiple of 128 =

Enter sum of the sizes of all unique user-specified MODTABs

Enter sum of the sizes of all unique user-specified USSTABs

Enter sum of the sizes of all unique user-specified interpret tables +

(Tables referenced more than once are counted only once. Derive the sum by rounding each table size up to a multiple of 128 and then sum up the rounded sizes.)

SUM C =

Enter number BHSET macros in Network Control Program generation decks

	x	9
	SUM D =	

SUM D rounded up to a multiple of 128 = +

SYSALOAD =

Work Sheet B2 - Calculation of IOAPPN

This area is for the VTAM fixed I/O appendage.

If there will be an activated Network Control Program in the VTAM system, enter 5760 _____

If there will be a local device activated in the VTAM system, enter 4992 + _____

IOAPPN value = _____

Work Sheet B3 - Calculation of SMSBUF

This area is needed by VTAM storage management to maintain the variable storage pools.

Enter the following:

VPBUF (from WS.C2) divided by 2048

+ _____1
x _____4
+ ____72
SUM A = _____

SUM A rounded up to a multiple of 128 _____

VFBUF (from WS.C1) divided by 2048 =

+ _____1
x _____4
+ ____72
SUM B = _____

SUM B rounded up to a multiple of 128 + _____

SMSBUF = _____

Work Sheet B4 - Calculation of FIXPOOLS

This area comprises the VTAM fixed buffer pools from which all fixed VTAM control blocks and I/O buffers are allocated.

Enter bsz = (from WS.C3)
LF + ____24

Enter bno = (from WS.C3)
LF x _____
SUM A = _____

LFBUF = SUM A rounded up to a multiple of 128 _____

SFBUF ___128

Enter VFBUF (from WS.C1) _____

FIXPOOLS= _____

Work Sheet B5 - Calculation of PAGPOOLS

bno, bsz, and vbsz are calculated in Work Sheet C3. Each pool size total should be rounded up to a multiple of 128.

VPBUF = vbsz = (from WS.C2) _____
VP

LPBUF = (bsz + 8) x bno = (from WS.C3) _____
LP LP

SPBUF = (bsz + 8) x bno = (from WS.C3) _____
SP SP

APBUF = (bsz + 8) x bno = (from WS.C3) _____
AP AP

WPBUF = (bsz + 8) x bno = (from WS.C3) _____
WP WP

NPBUF = (bsz + 8) x bno = (from WS.C3) _____
NP NP

PPBUF = (bsz +24) x bno = (from WS.C3) _____
PP PP

SUM A = _____

PAGPOOLS = SUM A rounded up to a multiple
of 2048 = _____

Work Sheet C1 - Calculation of VFBUF

This area is the VTAM variable fixed pool (VFBUF).

Enter the total number of names specified in the name field of the following macros:

For all 370x subareas -

DIALSET macros	_____
GROUP macros	_____
LINE macros (dial and non-dial)	_____
TERMINAL macros (all kinds)	_____
VTERM macros	_____
COMP macros	_____
Value specified in LUPOOL macro	_____
INNODE macros	_____
LU macros	_____
CLUSTER and PU macros	_____
	+ 2
	= _____ x 8 = _____
	+ 16
SUM A =	_____

SNT value = SUM A rounded up to a multiple of 2048 if SUM A is greater than 2048; otherwise, it is SUM A _____

For all local subareas -

LOCAL macros _____

	+ 2
	= _____ x 8 = _____
	+ 16
SUM B =	_____

SNT value = SUM B rounded up to a multiple of 2048 if SUM B is greater than 2048; otherwise, it is SUM B _____

For all switched subareas -

PU macros	_____
LU macros	_____
	+ 2
	_____ x 8 = _____
	+ 16
SUM C =	_____

SNT value = SUM C rounded up to a multiple of 2048 if SUM C is greater than 2048; otherwise, it is SUM C _____

For all 3790 local subareas -

PU macros ______ x 2 = ______
LU macros ______
+ 2
______ x 8 = ______
+ 16
SUM D = ______

SNT value = SUM D rounded up to a multiple of 2048 if SUM D is greater than 2048; otherwise, it is SUM D ______

SNT = SUM A + SUM B + SUM C + SUM D = ______

Maximum number of application tasks ______
If NETSOL=YES, enter 1; otherwise, enter 0 ______
+ 3
______ x 48 = ______

Maximum number of concurrently active Network Control Programs plus locally attached 3790 clusters ______ x 528 = ______

Maximum number of concurrently active 3270 LOCAL devices ______ x 160 = ______

MAXSUBA parameter on the BUILD macro in the Network Control Program generation deck rounded up to a power of 2 ______ x 8 = ______
+ 16
SUM E = ______

VFBUF=SUM E rounded up to a multiple of 2048 =
vbsz=VF SUM F = ______

Work Sheet C2 - Calculation of VPBUF

This area is the VTAM variable pageable buffer pool (VPBUF).

SYSDEF work area size	(from WS.D1)	_____
SYSDEF RDT size	(from WS.D2)	_____
SRTADD size	(from WS.D3)	_____
PSSWKA size	(from WS.D4)	_____
EPTDVT size		14336
OPNCLS size	(from WS.D5)	_____
OPNAPPL size	(from WS.D6)	_____
VARYSIZE	(from WS.D7)	_____
	+	320
	SUM A =	_____
SUM B = SUM A x 1.10 =		_____

VPBUF = SUM B rounded up to a multiple of 2048 = vbsz=VP _____

Work Sheet D1 - Calculation of SYSDEF Work Area

This area is the part of VPBUF needed for the system definition (SYSDEF) work area.

For a 370x, enter the largest value calculated for a 370x subarea of a SYSDEF work area (from WS.D1.1).

Otherwise, enter the largest of the following values:

- the largest value calculated for a SYSDEF work area for a 3270 LOCAL subarea (from WS.D1.2)
- the largest value calculated for a SYSDEF work area for an APPL subarea (from WS.D1.3)
- the largest value calculated for a SYSDEF work area for a switched subarea (from WS.D1.4)
- the largest value calculated for a SYSDEF work area for a 3790 LOCAL subarea (from WS.D1.5)

SYSDEF work area size = _____

Work Sheet D1.1 - Calculation of SYSDEF Work Area for a 370x

This calculation must be done for each Network Control Program that will be active in a 370x in the VTAM network. The input for the variables in the calculations should be taken from the Network Control Program generation deck.

Network Control Program symbolic name = _____

Enter the number of the following:

PCCU macro	1	x 256	=	256
DIALSET macros	_____	x 80	= +	_____
		SUM A	=	_____

Subtotal A = SUM A rounded up to 2048 = _____

Enter the total number of the following:

GROUP macros	_____	x 92	=	_____
LINE macros with DIAL=NO	_____	x 116	=	_____
LINE macros with DIAL=YES	_____	x 160	=	_____
TERMINAL macros not followed by a COMP macro (not a 2980)	_____	x 424	=	_____
TERMINAL macros followed by a COMP macro	_____	x 424	=	_____
TERMINAL macros for a 2980	_____	x 212	=	_____
VTERM macros	_____	x 212	=	_____
COMP macros	_____	x 212	=	_____
LU macros	_____	x 176	=	_____
CLUSTER and PU macros for clusters on non-SDLC lines	_____	x 96	=	_____
CLUSTER and PU macros for clusters on SDLC lines	_____	x 148	=	_____
Value specified in LUPOOL macro	_____	x 84	=	_____
PU macros on SDLC dial lines	_____	x 84	=	_____
Innode macros	_____	x 160	=	_____
		SUM B	=	_____

Subtotal B = SUM B divided by 1881 (rounded up to a whole number) x 2048 = _____

Enter the total number of the following:

Unique VIDLIST macros referred to by a VIDSEQ parameter on a GROUP, LINE, or TERMINAL macro	_____	x 8	=	_____
VIDSEQ parameters on every referenced VIDLST macro	_____	x 5	=	_____
TERMINAL macros that specify DIALNO= that are on a GROUP or LINE macro that specifies DIAL=YES and DIALSET=	_____	x 4	=	_____
Unique LCTYPE parameters for every MTALIST macro referenced on a GROUP or LINE macro + 1	_____	x 5	=	_____
Poll characters specified in the POLL parameter of all TERMINAL and COMP macros, and the GPOLL parameter of the CLUSTER macros				_____
Dial digits specified on the DIALNO parameter of all TERMINAL macros where the LINE or GROUP macro specified CALL=OUT or INOUT				_____
BHSET macros	_____	x 9	= +	_____
		SUM C	=	_____

Enter the number of the following:

VIDSEQ parameters for the VIDLIST macro with the largest number of VIDSEQ parameters x 5 _____

\+ 8

SUM C1= _____

LCTYPE parameters for the MTALIST macro with the largest number of LCTYPE parameters x 5 _____

\+ 5

SUM C2= _____

Enter calculated value of:

Poll characters from above	SUM C3= _____
Dial digits from above	SUM C4= _____
BHSET macros from above	SUM C5= _____

SUM D = 2024 - the largest of SUM C1, C2, C3, C4, or C5 SUM D = _____

Subtotal C = SUM C divided by SUM D (rounded up to a whole number) x 2048 = _____

Enter the total number of the following:

VIDLIST macros	_____	x 36 =	_____	
VIDSEQ parameters on all VIDLIST macros	_____	x 44 =	_____	
MTALIST macros	_____	x 52 =	_____	
MTALCST macros	_____	x 20 =	+ _____	
		SUM E =	_____	

Subtotal D (rounded up to a multiple of 2048) = _____

\+ 10240

SYSDEF work area for a 370x subarea = _____

Work Sheet D1.2 - Calculation of SYSDEF Work Area for a 3270 LOCAL Subarea

This calculation must be done for every LOCAL subarea that will be active in the VTAM network. The input for the variables in the calculations should be taken from its definition statement deck.

Enter the number of LOCAL statements _____ x 296 = _____

+ 136

SUM A = _____

Subtotal A = SUM A divided by 1813 (rounded up to a whole number) x 2048 = _____

+ 12288

SYSDEF work area for a LOCAL subarea = _____

Work Sheet D1.3 - Calculation of SYSDEF Work Area for an APPL Subarea

This calculation must be done for every APPL subarea that will be active in the VTAM network. The input for the variables in the calculations should be taken from the APPL statement decks.

Enter the number of APPL statements _____ x 120 = _____

+ 136

SUM A = _____

Subtotal A = SUM A divided by 1905 (rounded up to a whole number) x 2048 = _____

+ 12288

SYSDEF work area for an APPL subarea = _____

Work Sheet D1.4 - Calculation of SYSDEF Work Area for a Switched Subarea

This calculation must be done for every switched subarea that will be active in the VTAM network. The input for the variables in the calculations should be taken from its definition deck.

Enter the number of:

VBUILD statements _____ x 156 = _____
PU macros _____ x 148 = _____
LU macros _____ x 176 = _____

+ 136

SUM A = _____

Subtotal A = SUM A divided by 1849 (rounded up to a whole number) x 2048 =

+ 10240

SYSDEF work area for a switched subarea _____

Work Sheet D1.5 - Calculation of SYSDEF Work Area for a 3790 LOCAL Subarea

This calculation must be done for every 3790 subarea that will be active in the VTAM network. The input for the variables in the calculations should be taken from its definition deck.

Enter the number of:

VBUILD statements	_____	x 144 =	_____
PU macros	_____	x 236 =	_____
LU macros	_____	x 176 =	_____
			+ 136
		SUM A =	_____

Subtotal A = SUM A divided by 1850 (rounded up to a whole number) x 2048

+ 10240

SYSDEF work area for a 3790 subarea = _____

Work Sheet D2 - Calculation of SYSDEF RDT Size

This area is the part of the VPBUF needed for Resource Definition Tables (RDTs) tnat are built by SYSDEF for the subareas - 370x, APPL, 3270s LOCAL, 3790s LOCAL, and switched.

Enter the sum of the sizes of all the RDTs for:

370x subareas (from WS.D2.1)	_____
3270 LOCAL subareas (from WS.D2.2)	_____
APPL subareas (from WS.D2.3)	_____
Switched subareas (from WS.D2.4)	_____
3790 LOCAL subareas (from WS.D2.5)	+ _____
SYSDEF RDT size =	_____

Work Sheet D2.1 - Calculation of the RDT for a 370x Subarea

This calculation must be done for every Network Control Program that will be active in a 370x in the VTAM network. The input for the variables in the calculations should be taken from the Network Control Program generation deck. However, most of the variables can be taken from Work Sheet D1.1.

Network Control Program symbolic name = _____

Enter the total number of:

PCCU macro	1	x 256 =	256
DIALSET macros	_____	x 80 =	_____
GROUP macros	_____	x 92 =	_____
LINE macros with DIAL=NO	_____	x 116 =	_____
LINE macros with DIAL=YES	_____	x 160 =	_____
TERMINAL macros not followed by a COMP macro (not a 2980)	_____	x 212 =	_____
TERMINAL macros followed by a COMP macro	_____	x 424 =	_____
TERMINAL macros for a 2980	_____	x 424 =	_____
VTERM macros	_____	x 212 =	_____
COMP macros	_____	x 212 =	_____
INNODE macros	_____	x 160 =	_____
LU macros	_____	x 176 =	_____
CLUSTER macros for clusters on non-SDLC lines	_____	x 96 =	_____
CLUSTER macros for clusters on SDLC lines	_____	x 148 =	_____
Value specified in LUPOOL macro	_____	x 84 =	_____
PU macros on SDLC dial lines	_____	x 84 =	_____
Unique VIDLIST macros referred to by a VIDSEQ parameter on a GROUP, LINE, or TERMINAL macro	_____	x 8 =	_____
VIDSEQ parameters specified on all referenced VIDLIST macros	_____	x 5 =	_____
TERMINAL macros that specify DIALNO= and that are on a GROUP or LINE macro that specified DIAL=YES and DIALSET=	_____	x 4 =	_____
LCTYPE parameters specified on all unique MTALIST macros referenced by a GROUP or LINE macro + 1	_____	x 5 =	_____
Poll characters specified on the POLL parameter of all TERMINAL and COMP macros and the GPOLL parameter of the CLUSTER macro			_____
Dial digits specified on the DIALNO parameter of all TERMINAL macros where the LINE or GROUP macro specified CALL=OUT or INOUT			_____
BHSET macros	_____	x 9 =	_____
			+ _____
		SUM A =	_____

RDT size for 370x subarea = SUM A rounded up to a multiple of 2048 if SUM A is greater than 2048; otherwise, enter SUM A _____

Work Sheet D2.2 - Calculation of the RDT for a 3270 LOCAL Subarea

This calculation must be done for every 3270 LOCAL subarea that will be activated in the VTAM network. The variable was determined for Work Sheet D1.2.

Symbolic name = _____

Enter number of LOCAL statements	_____	x 296 =	_____
			+___152
		SUM A =	_____

RDT value for LOCAL subarea = SUM A rounded up to a multiple of 2048 if SUM A is greater than 2048; otherwise, enter SUM A _____

Work Sheet D2.3 - Calculation of the RDT for an APPL Subarea

This calculation must be done for every APPL subarea that will be active in the VTAM network. The variable can be taken from Work Sheet D1.3.

Enter number of APPL statements	_____	x 120 =	_____
			+___152
		SUM A =	_____

RDT value for APPL node = SUM A rounded up to a multiple of 2048 if SUM A is greater than 2048; otherwise, enter SUM A _____

Work Sheet D2.4 - Calculation of the RDT for a Switched Subarea

This calculation must be done for every switched subarea that will be activated in the VTAM network. The variables for this calculation can be taken from Work Sheet D1.4.

Enter the number of:

Unique MAXNOs	_____	x 33 =	_____
Unique MAXGRPs	_____	x 8 =	_____
VBUILD macros	_____	x 156 =	_____
PU macros	_____	x 148 =	_____
LU macros	_____	x 176 =	_____
PATH macros	_____	x 8 =	_____
			+___152
		SUM A =	_____

RDT value for a switched subarea = SUM A rounded up to a multiple of 2048 if SUM A is greater than 2048; otherwise, enter SUM A _____

Work Sheet D2.5 - Calculation of the RDT for a 3790 LOCAL Subarea

This calculation must be done for every 3790 subarea that will be activated in the VTAM network. The variable can be taken from Work Sheet D1.5.

Enter the number of:

VBUILD macros	_____	x 144 =	_____
PU macros	_____	x 236 =	_____
LU macros	_____	x 176 =	_____
			+ 152
		SUM A =	_____

RDT value for a 3790 subarea = SUM A rounded up to a multiple of 2048 if SUM A is greater than 2048; otherwise, enter SUM A _____

Work Sheet D3 - Calculation of SRTADD

This area is the part of VPBUF needed for the symbol resolution table (SRT) directory and the SRT entries. The information needed for this work sheet can be taken from Work Sheets D1.1 through D1.5.

Enter the total number of names specified in the name fields of the following macros:

PCCU macros	_____	
DIALSET macros	_____	
GROUP macros	_____	
LINE macros (both dial and non-dial lines)	_____	
TERMINAL macros (all types of terminals)	_____	
VTERM macros	_____	
COMP macros	_____	
INNODE macros	_____	
LU macros	_____	
CLUSTER and PU macros	_____	
BHSET macros	_____	
LOCAL statements	_____	
APPL statements	_____	
VBUILD statements	_____	
LBUILD statements	_____	
SUM A =		+ _____
		x 48
		+ 6144

SRTADD size = _____

Work Sheet D4 - Calculation for PSSWKA

This area is the part of VPBUF needed for PSS control blocks.

Enter maximum number of concurrent application tasks _____

If NETSOL=YES is specified, enter 1; otherwise, 0 _____

\+ 3

x 912

PSSWKA size = _____

Work Sheet D5 - Calculation of OPNCLS

This area is the part of VPBUF needed for VTAM control blocks to support OPNDST processing. Estimate a worst case condition for the number of concurrent OPNDSTs (that is, a combination of various types of OPNDSTs that requires the most storage). Using the worst case estimate will allow adequate VPBUF space for processing of any combination of OPNDST macro instructions.

Enter the maximum of concurrent OPNDST macros _____ x 912 = _____

Of the concurrent OPNDST macros, enter:

Number of NIB list entries if there is more than one NIB in the list _____ x 16 = _____

\+ 16

SUM B = _____

Of the concurrent OPNDST macros, enter total size of LOGON data _____

Of the concurrent OPNDST macros, enter number of logical units (LUs) _____ x 56 = _____

\+10648

OPNCLS size = _____

Work Sheet D6 - Calculation for OPNAPPL

This area is the part of VPBUF needed for VTAM control blocks to support application programs.

Enter maximum number of OPEN ACBs that will be in the VTAM system _____

If NETSOL=YES is specified, enter 1; otherwise, 0 _____

\+ 2

SUM A = _____

x 608

\+ 376

OPNAPPL size = _____

Work Sheet D7 - Calculation for VARY

Enter number of PU statements with ISTATUS=ACTIVE _____ x 4656 = _____

Work Sheet C3 - DOS/VS Storage Pool Formulas for bth, bno, and bsz

- Formulas for bth calculation

  APBUF: NLU+NSSTERM+NBSCTERM+NLOC3270+5

  LPBUF1: NPORT+(2*NSDLCCLUS)+(2*NLOC3790+ NCOMMANDS+NLOC3270 +NBSCCLUS

  NPBUF: N370X+NPORT+NLU+NBSCCLUS+NLOC3270+ NSDLCCLUS+NLOC3790
  (See Note 1)

  PPBUF2: (NLU+NSSTERM+NBSCTERM+NLOC3270)*2
  (See Note 2)

  SPBUF: NPORT+(2*NSSTERM)+(3*NBSCTERM)+ (2*NLOC3270)+NBSCCLUS+(2*NLU)+
  (4*NTRANX)+NTOLTEP+NSDLCCLUS+ NLOC3790+NACB+NCOMMANDS

  WPBUF: NLU+NSSTERM+NBSCTERM+NLOC3270+(2*NTRACE)

  SFBUF: 1

  LFBUF: $\left(\underset{L3270}{NTRANX*NBUFMSG}\right)+\left(\underset{L3790}{NTRANX*MAXBFRU}\ \underset{L3790}{+\Sigma MAXBFRU}\right)+\left(\underset{L370x}{NTRANX*MAXBFRU}\ \underset{L370x}{+\Sigma MAXBFRU}\right)+1$

- Formulas for bno and bsz Calculation

	AP	LP	NP	PP	SP	WP	SF	LF
bno	bth	bth	bth	bth	$\frac{bth}{.90}$	bth	1	$bth+2*\left(\underset{L370x}{\Sigma MAXBFRU}\ \underset{L3790}{+\Sigma MAXBFRU}+NBUFMSG\right)$
bsz	48	608	264	LFBUF bsz	104	264	-	see "Formulas for LBBUF bsz Calculation"

Variables for Formulas

NBSCTERM - Number of remotely attached terminals on BSC lines (number of TERMINAL and COMPONENT macros associated with BSC lines).

NBSCCLUS - Number of remotely attached 3271, 3275, and 2972 clusters on BSC lines.

NLOC3270 - Number of locally attached 3270 terminals (count each printer and display station separately).

NLU - Number of logical units (number of LU macros).

NPORT - Number of dial-up switched lines.

MAXBFRU - Parameter specified on 370x and 3790 definition decks. ΣMAXBFRU means the sum of all values if there is more than one local 370x or 3790 active.

NBUFMSG - Number of elements required to read the full screen of a 3277 display station. Use LFBUF bsz value (from Work Sheet D1.1) to select NBUFMSG from one of the following two tables. Index into the table to the bsz value closest to the LFBUF bsz.

Read Full, 3277 Model 1		Read Full, 3277 Model 2	
bsz value	NBUFMSG	bsz value	NBUFMSG
104	4	96	16
256	2	216	8
632	1	632	4
		960	2
		1952	1

If both Models 1 and 2 are attached, use the Model 2 table.

NSDLCCLUS- Number of remotely attached cluster controllers on SDLC lines.

NSSTERM - Number of remotely attached terminals on start-stop lines (number of TERMINAL and COMPONENT macros associated with start-stop lines).

NTOLTEP - Number of concurrent TOLTEP users.

NTRANX - Number of transactions per second (where a transaction is one inbound message and one outbound message) - between the host and the involved devices.

N370x - Number of IBM 3704 and 3705 locally or remotely attached communications controllers.

NETSOL - 1 if NETSOL=YES, otherwise 0.

NTRACE - Number of terminals or LUs for which a VTAM buffer trace (TYPE=BUF) will be started.

NLOC3790 - Number of channels for locally attached 3790 (PU macros for 3790s).

NACB - Number of OPEN ACBs.

NCOMMANDS- Number of concurrent operator commands.

Note 1 - There could be hidden levels as in a vary act, the NCP which also activates all devices with ISTATUS ACTIVE.

Note 2 - Two represents the default BUFLIM, BUFACT product. For batch this number could be low. The formula can be replaced by the sum of all the BUFACT * BUFLIM products.

Formulas for LFBUF bsz Calculation

Depending on the installation's device usage, choose an initial bsz from the following overview.

bsz =
LF

Device Support	bsz Calculation
Local 3270	If the installation contains only local 3270s, calculate bsz as the average message length for 3277 display stations.
370x	bsz must equal the UNITSZ operand on the NCP HOST macro. If multiple NCPs are active concurrently, UNITSZ must have the same value for each NCP.
3790 local only. Large batch transmission only.	bsz = 1978 MAXBFRU = 1 3790L
3790 local only. Normal transmission.	bsz = 288 MAXBFRU = 1 3290L
If priority is assigned to a 370x which is used with a 3790 local. With 370x given priority, 3790 large batch performance may be less efficient because of multiple buffer usage, and the 3790 may use more storage than necessary because of the priority been given to the 370x.	bsz = 370x bsz MAXBFRU = 1 for normal transmission 3790L MAXBFRU = 1978 divided by (bsz -28) 3790L rounded up to a whole number for large batch transmission.
If priority is assigned to a 3790 local which is used with a 370x. With a 3790 local given priority, 370x buffers may not optimize storage.	bsz = 1978 for large batch transmission. bsz = 288 for normal transmission. MAXBFRU = 1 3790L

Constant requirement		698368
NETSOL (NETSOL=NO)		0
SYSALOAD (from WS.B1)		256
SMSBUF (from WS.B3)		384
TOLIWKA (zero TOLTEP users)		0
ISTPATCH (IBM-supplied patch area was not modified)		128
FIXPOOLS (from WS.B4)		2944
IOAPPN (from WS.B2)		5760
PAGPOOLS (from WS.B5)		69632
VTAM Virtual Partition Size	SUM A =	777472
ALLOC = SUM A divided by 1024, rounded up		760K

Figure 22-4. Sample Calculation for ALLOC Macro Instruction

Constant requirement		14336
ISTPATCH (IBM-supplied patch area was not modified)		128
FIXPOOLS (from WS.B4)		2944
IOAPPN (from WS.B2)		5760
VTAM Real Partition Size	SUM A =	23168
(rounded up to a multiple of 2048)	SUM B =	24576
ALLOCR = SUM B divided by 1024, rounded up		24K

Figure 22-5. Sample Calculation for ALLOCR Macro Instruction

VTAM Components

Core Image Library Requirements

Phases	Blocks
181	796
15*	16

* transients

Phases

ISTAICIR
ISTAICPI
ISTAICTN
ISTAICST
ISTAPC33
ISTAPC35
ISTAPC36
ISTAUCAG
ISTAUCAI
ISTCRCRU
ISTCSCMR
ISTDCC00
ISTDCC02
ISTDCC10
ISTDCC11
ISTDCC12
ISTDCC13
ISTDCC20
ISTDCC21
ISTDCC22
ISTDCC23
ISTDCC24
ISTDCC25
ISTDCC30
ISTDCC31
ISTDCC32
ISTDCC35
ISTDCC40
ISTDCC41
ISTDCC42
ISTDCC50
ISTDCC51
ISTDCC60
ISTDCC61
ISTDCC80
ISTDCC81
ISTDCC85
ISTDVCBA
ISTDVCRC
ISTESC01
ISTESC02
ISTINCDP
ISTINCDT
ISTINCFE
ISTINCF0
ISTINCF1
ISTINCIP
ISTINCLM
ISTINCMS
ISTINCN2
ISTINCVI
ISTINCXM
ISTINCZ1
ISTINCZ2
ISTMMCHS
ISTNMCCA
ISTNMCCB
ISTNMCCF
ISTNMCCI
ISTNMCCO
ISTNMCCR
ISTNMCCS
ISTNMCCT
ISTNMCCZ
ISTNMC1S
ISTNMC2S
ISTNMC3S
ISTNMC4P
ISTNMC4S
ISTNMC5P
ISTNMC5S
ISTNMC6P
ISTNMC6S
ISTNMC7P
ISTNMC7S
ISTNMC8P
ISTNMC9P
ISTNSC00
ISTOCCCA
ISTOCCCB
ISTOCCCD
ISTOCCDF
ISTOCCOA
ISTOCCOB
ISTOCCRI
ISTOCCSA
ISTOLIEP
ISTORCBP
ISTORCGS
ISTPATCH
ISTPICBA
ISTPICCE
ISTPICCF
ISTPICCI
ISTPICCO
ISTPICCS
ISTPICCI
ISTPICCU
ISTPICDD
ISTPICDR
ISTPICGI
ISTPICGP
ISTPICGR
ISTPICIN
ISTPICII
ISTPICLA
ISTPICLC
ISTPICLI
ISTPICMA
ISTPICQP
ISTPICSC
ISTPICSO
ISTPICSS
ISTPICSI
ISTPICSU
ISTPICTF
ISTPICTH
ISTPICTO
ISTPICTR
ISTPICXA

ISTPICXF
ISTPICXI
ISTPICXL
ISTPICX0
ISTPICX1
ISTPICX2
ISTPICX8
ISTPIEBI
ISTPIEBO
ISTPIECP
ISTPIEIF
ISTPIEIR
ISTPIEIS
ISTPIELF
ISTPIELO
ISTPIELS
ISTPIEPA
ISTPIEPB
ISTPIERC
ISTPIERF
ISTPIERO
ISTPIESA
ISTPIESG
ISTPIESI
ISTRACCA
ISTRACCR
ISTRACTB
ISTRACTM
ISTRAELG
ISTRCCY0
ISTRCC21
ISTRCC22
ISTRCC23
ISTRCC26
ISTRCC30
ISTRCC51
ISTRCC52
ISTRCC53
ISTRCC54
ISTRCC63
ISTRCC65
ISTRCC80
ISTRCC81
ISTSC034
ISTSDCAL
ISTSDCCA
ISTSDCCD
ISTSDCCF
ISTSDCCN
ISTSDCCR
ISTSDCOD
ISTSEC01
ISTSEC10
ISTSEC21
ISTSEC30
ISTSEC40
ISTSEC51
ISTYCLUS
ISTYCONT
ISTYPSOL
ISTYSSCP

VTAM Trace

PDAIDVTT
PDAIDVTW

Transients

$$ABERV1
$$ABERV2
$$ABERV3
$$ABERV4
$$ABERV5
$$ABERV6
$$ABERV7
$$BCST01
$$BCST02
$$BOST01
$$BOST02
$$BSTCNL
$$BSTCN1
$$RAST14
$$RAST15

Relocatable Library Requirements

Modules	Blocks
504	4,636

Module Name	Descriptions
IJBESMRN	Summarize 3705 MDR Records
IJBEVRN5	Edit and Print 3705 MDR Records
IJBE3705	Edit and Print Page Header for 3705 MDC Records
ISTAICCK	API Check Routine
ISTAICIR	API Interface Routine
ISTAICPT	User Completion
ISTAPCAS	PSS Scheduler
ISTAPCSH	PSS Macro Services Routine
ISTAPCST	PSS-TPIO Specifics - asynchronous process routine
ISTAPC33	PSS TPUNLOCK
ISTAPC35	PSS TPLOCK - Shared
ISTAPC36	PSS TPLOCK - Exclusive
ISTAUCAG	Accounting Exit Routine
ISTAUCAT	Authorization Exit Routine
ISTCC010	TOLTEP - OLT Scheduler
ISTCC011	TOLTEP - Message I/O
ISTCC012	TOLTEP - Trace Return Code Handler
ISTCC013	TOLTEP - Loader
ISTCC014	TOLTEP - Resource Manager
ISTCC015	TOLTEP - Table Search Routine
ISTCC016	TOLTEP - READ/WRITE Exit
ISTCFCCE	System Writer Channel Appendage
ISTCFCCS	Operator Control Command Processor
ISTCFCDP	CTLPT - Display Command
ISTCFCIN	Operator Control Initialization
ISTCFCMM	Message CSECT
ISTCFCPC	POI Termination Routine
ISTCFCPO	POI Initialization Routine
ISTCFCRP	POI Reply Processor
ISTCFCR1	RCVCMD Processor
ISTCFCR2	POI Message Build and Purge Routine
ISTCFCSS	System Writer SVC
ISTCFCSW	System Writer I/O Process
ISTCFCS1	SENDCMD Router
ISTCFCS2	POI Vary, Display, and Modify Processor
ISTCFCTM	TPMSG Macro Handler
ISTCFCXS	STXIT OC for System Writer
ISTCRCR4	Feedback Routine
ISTCSCAC	Accept
ISTCSCAQ	Acquire
ISTCSCCL	Cancel
ISTCSCLG	Logon
ISTCSCMR	Master Router
ISTCSCPS	Pass
ISTCSCRL	Release
ISTDCC00	Request Start
ISTDCC02	Request Finish
ISTDCC10	Solicit LDO Request Processor
ISTDCC11	Read LDO Request Processor
ISTDCC12	Write LDO Request Processor
ISTDCC13	Reset LDO Request Processor
ISTDCC20	Solicit Macro Request Processor
ISTDCC21	Receive Macro Request Processor
ISTDCC22	Write Macro Request Processor
ISTDCC23	Reset Macro Request Processor

Module Name	Descriptions
ISTDCC24	Solicit All Macro Request Processors
ISTDCC25	Read Any Macro Processor
ISTDCC30	Feedback Start
ISTDCC31	Analyzer
ISTDCC32	Feedback Finish
ISTDCC35	Pageable Extension of Feedback Start
ISTDCC40	Solicit and Read LDO Feedback
ISTDCC41	Write LDO Feedback
ISTDCC42	Reset LDO Feedback
ISTDCC50	Solicit, Read, Write Feedback
ISTDCC51	Reset Feedback
ISTDCC60	Input Buffer Move
ISTDCC61	Fixed to Pageable Move
ISTDCC80	Purge Outbound
ISTDCC81	Purge Inbound
ISTDCC85	Read Any Purge
ISTDVCBA	Skeleton DVT for Basic
ISTDVCRC	Skeleton DVT for Record
ISTEC000	TOLTEP - End of TOLTEP
ISTEC123	TOLTEP Message Text (100-399)
ISTEC456	TOLTEP Message Text (400-699)
ISTEC789	TOLTEP Message Text (700-999)
ISTESC01	Execution Sequence Controller
ISTESC02	DVT Name Resolution
ISTIC000	TOLTEP - Resident Exit Initialize
ISTIC001	TOLTEP - Test Initialize
ISTIC002	TOLTEP - Communication Interval
ISTIC003	TOLTEP - Device Decode
ISTIC004	TOLTEP - Test Decode
ISTIC005	TOLTEP - Option Decode
ISTINCAD	ADELETE Service Routine
ISTINCAL	ALOAD Service
ISTINCAV	Allocate/Deallocate Subroutine
ISTINCAW	VTAM Task Control
ISTINCA0	Subtask ATTACH
ISTINCBL	BLDL Routine
ISTINCBS	SVC Bootstrap Routine
ISTINCCC	Start Command Processor
ISTINCCF	Loading Routine
ISTINCCL	Error Recovery Processor
ISTINCDL	Dump/Load Restart
ISTINCDP	Dump/Load Subtask
ISTINCDT	Default USS Definition Table
ISTINCDU	DVT Unload
ISTINCD0	Subtask Detach
ISTINCD1	Dial Out Processor
ISTINCD2	Dial Failed Processor
ISTINCD3	Offhook 1
ISTINCD4	Select Path
ISTINCD5	Dial Link Start
ISTINCD6	Dial Allocate
ISTINCD7	Dial Deallocate
ISTINCD8	Dial Post
ISTINCD9	Offhook 2
ISTINCE0	Dial Out Start
ISTINCE1	Link Restart I/O
ISTINCE2	PAB Switch I/O
ISTINCE3	PU Cleanup
ISTINCE4	Link Restart
ISTINCE5	Dial Give Resources
ISTINCE6	Dial Hangup
ISTINCE7	Inop Processor
ISTINCE8	Dial Link Completion
ISTINCE9	Potential Failure

Module Name	Descriptions
ISTINCFE	Front End Processor
ISTINCFM	FSS Function Manager
ISTINCFS	Segment Deletion
ISTINCF0	Fixed Module Linkage
ISTINCF1	FSS Request/Response Construction
ISTINCF3	Init SELF Processor
ISTINCF4	TERM SELF Processor
ISTINCF5	Stop, Modify CIB Processor
ISTINCF9	Stop/Modify Processor
ISTINCHA	Host Attachment Routine
ISTINCHT	Halt Command Processor
ISTINCIB	STAE Routine
ISTINCIO	I/O Command Scheduler
ISTINCIP	SCP Inbound Processor
ISTINCIT	Initialization Control
ISTINCLF	Logon Processor
ISTINCLM	Default Logon Mode Table
ISTINCL0	Activate Direct Attachment Node
ISTINCL1	Activate PU - Local Subarea
ISTINCL2	Local Attach - Dial Start
ISTINCL3	Local Attach - Offhook 1
ISTINCL4	Local Attach - Offhook 2
ISTINCL5	Local Attach - Dial Failed
ISTINCL6	Local PU Cleanup
ISTINCL7	Local Abandon Connection
ISTINCL8	Deactivate Direct Attachment Node
ISTINCMD	Modify Router
ISTINCMR	Master Router
ISTINCMS	TOLTEP/VTAM Interface
ISTINCMY	OSS Portion of SSCP Master Router
ISTINCNS	Network Solicitor Attach
ISTINCN0	DTF Builder
ISTINCN2	Device Allocation SVC
ISTINCN8	Activate Reserved
ISTINCOC	TERM...NOP
ISTINCOE	Operator Termination
ISTINCOI	Operator Task Initialization
ISTINCOQ	Operator Query
ISTINCOS	Optional Services Routine
ISTINCPD	Buffer Pool Initialization
ISTINCPH	Parameter Handling
ISTINCQB	QAB Initialization
ISTINCQE	Quiesce
ISTINCRD	Parameter Read Routine
ISTINCRF	Modify Command Router
ISTINCRP	Communications Controller ERP Reload
ISTINCRR	Resource Release
ISTINCRS	Read Record
ISTINCR1	Configuration Restart Control
ISTINCR2	Configuration Restart/Vary Interface
ISTINCR3	NCP Configuration Reset
ISTINCR4	VSAM I/O C/R Data Set
ISTINCR5	Interface to DLR
ISTINCR6	VSAM I/O-Active NODELST Data Set
ISTINCSD	Task Communication Routine
ISTINCSH	Search Logon Mode Table
ISTINCSM	SSCP Session Monitor
ISTINCS1	Status Feedback Router
ISTINCTE	TPEND Exit Scheduler
ISTINCTM	Timer Routine
ISTINCTR	Trace Control
ISTINCUA	Verb and Keyword Processor II
ISTINCUB	Verb and Keyword Processor III
ISTINCUM	USS Function Manager

Module Name	Descriptions
ISTINCUQ	USS Quote Deletion
ISTINCU0	Input Media Control
ISTINCU1	SCS Input Media Control
ISTINCU2	USS Character String Translation
ISTINCU3	Verb and Keyword Processor I
ISTINCU4	USS Logon Processor
ISTINCU5	USS Logoff Processor
ISTINCU6	USS Status Feedback Processor
ISTINCU7	3270 Output Media Control
ISTINCU8	USS Output Media Control Processor
ISTINCVA	Vary Activate
ISTINCVI	Vary Deactivate
ISTINCVN	RNAME/CUA Processor
ISTINCVO	Vary Session Initialization
ISTINCVP	Vary Deactivate Phase II
ISTINCVS	Vary Activate Extension
ISTINCVX	Vary Deactivate
ISTINCV1	VTAMRP Task
ISTINCV2	Answer Mode Handler
ISTINCV3	VARY INOP Command Processor
ISTINCV4	Activate PU Switched Subarea
ISTINCV5	Activate LU Switched Subarea
ISTINCV6	SEND/SEND FMD Processor
ISTINCV8	IPL/DUMP Processor
ISTINCV9	Contact/Discontact Processor
ISTINCWT	VTAM Thread Dispatcher
ISTINCW0	OPNDST Processor
ISTINCW1	TOLTEP Attach and NETSOL Delete
ISTINCW2	Hang-up I/O
ISTINCW3	Obtain/Free NCSPL
ISTINCW4	Contact Processor
ISTINCW5	Discontact Processor
ISTINCW6	Vary Pending Cleanup
ISTINCW7	Build PABs
ISTINCW8	Activate PU and LU
ISTINCW9	VARY Path Processor
ISTINCXM	3704/3705 Dump I/O Routine
ISTINCX0	Deactivate Switched SDLC Links
ISTINCX1	Deactivate Switched and Local PU
ISTINCX2	Break Connections
ISTINCX3	Switched/Local Header Deactivation
ISTINCX6	Dial Fail Notify
ISTINCX7	DACTPU Handler
ISTINCX8	PAB Purge
ISTINCX9	CLSDST Handler
ISTINCY0	APUNS Command Processor
ISTINCY1	APUNS Transmission Services I/O Executor
ISTINCY3	APUNS Command Completion Processor
ISTINCY4	RTGOH Request Processor
ISTINCY5	Disconnection Processor
ISTINCZ1	DTFSF
ISTINCZ2	DTFDA
ISTINC01	Load Utility Message and End
ISTINC02	DVT Preload Routine
ISTINC03	Communications Controller Load Input
ISTINC05	Communications Controller Load Initialization
ISTINC06	Load Utility Common Storage Area
ISTINC07	Communications Controller Load Output
ISTINC32	Communications Controller Load Output

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ISTINEXI	
ISTLINK1	Link Scripts
ISTLINK2	
ISTLINK3	
ISTLINK4	
ISTLINK5	
ISTLINK6	
ISTLINK7	**Network Control Program**
ISTLINK8	
ISTMMCHS	Control Block Manipulation Routine
ISTNMCCA	Start Control Outbound
ISTNMCCB	Start Control Inbound
ISTNMCCF	Start Control Failure
ISTNMCCI	Cluster Solicitor Inbound Router
ISTNMCCO	Cluster Solicitor Outbound Router
ISTNMCCR	Redrive Outbound
ISTNMCCS	Redrive Inbound
ISTNMCCT	Start Control Redrive
ISTNMCCZ	End Control Outbound
ISTNMC1S	Connection Complete
ISTNMC2S	Redrive PSOP
ISTNMC3S	DIAL Disconnect
ISTNMC4P	PSOP Router
ISTNMC4S	Purge
ISTNMC5P	Start Control
ISTNMC5S	Port Solicitor
ISTNMC6P	Reset and Control Redrive
ISTNMC6S	Initial Contact Retry
ISTNMC7P	Start Input
ISTNMC7S	PSOP End Control
ISTNMC8P	Purge Outbound
ISTNMC9P	PSIP Router
ISTNSC00	Network Solicitor
ISTOCCCA	Close ACB Phase I
ISTOCCCB	Close ACB Phase II
ISTOCCCC	Close ACB Phase III
ISTOCCCD	Closed DEB Interface Routine
ISTOCCCH	Change
ISTOCCCL	Close Destination Part I
ISTOCCCM	Close Destination Part II
ISTOCCCN	Close Destination Part III
ISTOCCDF	SRT Delete/Find
ISTOCCFB	Control Block Building
ISTOCCFD	Function Distribution
ISTOCCFO	Function Obtain
ISTOCCFR	Control Block Removal
ISTOCCLD	Logon Data Handler
ISTOCCMD	Master DVT Builder
ISTOCCNV	OPNDST - NIB Copy/Merge
ISTOCCOA	OPEN ACB Phase I
ISTOCCOB	OPEN ACB Phase II
ISTOCCOC	OPEN ACB Phase III
ISTOCCOD	OPENDST and SIMLOGON Phase I
ISTOCCOE	OPNDST Phase 2
ISTOCCOF	OPNDST and SIMLOGON Final Phase
ISTOCCQU	SETLOGON
ISTOCCRD	Real DVT Builder
ISTOCCRL	Function Release
ISTOCCRT	Routing
ISTOCCSA	SRT Add
ISTOCCSD	Skeleton DVT Reader
ISTOCCSL	Function Select
ISTOCCUR	Routing End
ISTORCBP	Build Pool Routine

Module Name	Descriptions
ISTORCGS	Request/Release Storage
ISTORCRQ	Request Buffers
ISTORCRT	Return Storage
ISTPATCH	VTAM Patch Area
ISTPICBA	Dial-in Analyzer
ISTPICCA	ATTN/READ Handler (Local 3270)
ISTPICCE	Local 3270 Analyzer
ISTPICCF	Control Command Analyzer
ISTPICCI	Channel End Appendage (Local 3270)
ISTPICCO	Control Command Interpreter
ISTPICCS	Command Scheduler
ISTPICCT	Remote Command Updater
ISTPICCU	Remote 3270 Command Updater
ISTPICDD	Disconnect Handler
ISTPICDR	BTU Analyzer
ISTPICEI	ERP/VARY Interface
ISTPICES	Error Statistics Collection (Local Devices)
ISTPICFI	Feedback Initiation
ISTPICGI	General Interpreter
ISTPICGP	General Poll Analyzer
ISTPICGR	General Response Interpreter
ISTPICIN	BTU Builder
ISTPICIT	Remote 3270 Command Interpreter
ISTPICLA	Local 3270 TEST Command Analyzer
ISTPICLC	Local 3270 TEST Command Analyzer
ISTPICLI	Local Control Command Interpreter
ISTPICMA	Dial-in Analyzer (Start-Stop)
ISTPICNR	Unsolicited BTU Handler
ISTPICQP	Queue Purger
ISTPICRI	FSB Build
ISTPICRP	READ Channel Program Build
ISTPICSC	Remote 3270
ISTPICSO	Switched Outbound Scheduler
ISTPICSS	Session Scheduler
ISTPICST	I/O Session Completion Processing
ISTPICSU	Session Update
ISTPICTF	Trace Handler (Feedback)
ISTPICTH	TOLTEP TRM Handler
ISTPICTO	Trace Handler (Outbound)
ISTPICTR	LCCW to CCW Translator (Local 3270)
ISTPICXA	Extension to ISTPIEGR
ISTPICXF	Extension to ISTPIEGP
ISTPICXI	CC Channel Program Initialization
ISTPICXL	Local 3270 Channel Program Initiation
ISTPICXP	Channel Program Initiation
ISTPICX0	Extension to ISTIEG1
ISTPICX1	Extension to ISTIET
ISTPICX2	Extension to ISTPIECS
ISTPICX8	Extension to ISTPIEDR
ISTPIEBI	**Buffer Trace Inbound Router**
ISTPIEBO	**Buffer Trace Outbound Router**
ISTPIECP	Unsolicited Input
ISTPIEIF	DOS/VS Transmission Services Inbound Interface
ISTPIEIR	First Outbound FID1
ISTPIEIS	SETL Outbound FID1
ISTPIELF	Local 3270 SR Feedback Processor
ISTPIELO	Local 3270 SEND/RECEIVE Channel Program
ISTPIELS	Local 3270 SR Session Control Interpreter
ISTPIEPA	First Inbound FID1
ISTPIEPB	PIU Builder FID1
ISTPIERC	**Record Mode Request Checker**
ISTPIERF	3270 Record Mode Response Analysis
ISTPIERO	3270 Record Mode RU Builder
ISTPIESA	SCTL Inbound FID1

Module Name	Descriptions
ISTPIESG	**Inbound Segment Processor**
ISTPIESI	3270 Record System Control Interface
ISTPIETT	TRACE Interface
ISTRACCA	Add Service Routine
ISTRACCR	Remove Service Routine
ISTRACTB	Buffer Trace Routine
ISTRACTE	Trace Edit Control
ISTRACTM	Main Trace Routine
ISTRACTO	I/O Buffer Edit
ISTRACTS	Trace Edit Scan
ISTRACTW	Trace Writer
ISTRAELG	Trace Log Module
ISTRCCY0	**Control Layer RPL Direct Post Routine**
ISTRCC21	Receive Macro Request Processor
ISTRCC22	SEND Macro Request Processor
ISTRCC23	RESETSR Macro Request Processor
ISTRCC26	Send Response
ISTRCC30	Record Feedback Start
ISTRCC51	RECEIVE 1 Feedback
ISTRCC52	RECEIVE 2 Feedback
ISTRCC53	SEND Feedback
ISTRCC54	Asynchronous Feedback
ISTRCC63	House Any Queues
ISTRCC65	SET RPL
ISTRCC80	Clear Outbound Processor
ISTRCC81	Clear Inbound
ISTSC02A	TOLTEP GRAB
ISTSC02B	TOLTEP LETGO
ISTSC02C	TOLTEP MORECORE
ISTSC02D	TOLTEP PLINK
ISTSC02E	TOLTEP ROUTINE
ISTSC02F	TOLTEP WAIT10
ISTSC020	TOLTEP-CECOM
ISTSC021	TOLTEP CONVERT
ISTSC022	TOLTEP $CUTEST
ISTSC023	TOLTEP $DDATE
ISTSC024	TOLTEP DPRINT
ISTSC025	TOLTEP SEND
ISTSC026	TOLTEP $DTIME
ISTSC027	TOLTEP EX10
ISTSC028	TOLTEP FREECORE
ISTSC029	TOLTEP GETCONFG
ISTSC030	TOLTEP acquisition
ISTSC031	TOLTEP Release
ISTSC032	TOLTEP DIO
ISTSC033	TOLTEP Receive
ISTSC034	TOLTEP MS Inbound Process
ISTSDCAL	ALERT Macro Handler
ISTSDCAP	Application RDT
ISTSDCBU	BUILD Macro Handler
ISTSDCCA	CIDADD Macro Handler
ISTSDCCB	Control Block Definition
ISTSDCCD	CIDDEL Macro Handler
ISTSDCCF	CIDFND Macro Handler
ISTSDCCL	CLUSTER Macro Handler
ISTSDCCN	FIND NCB Macro Handler
ISTSDCCR	CID, FINISH Macro
ISTSDCC1	System Definition Area Handler
ISTSDCC2	Error Message Formatter
ISTSDCC3	Macro Type Interpreter
ISTSDCC4	EBCDIC/Hex Conversion
ISTSDCC5	ADDBITS Routine
ISTSDCC7	Work Area Handler
ISTSDCDS	DIALSET Macro Handler

Module Name	Descriptions
ISTSDCD1	SRT Delete
ISTSDCD2	SNT Delete
ISTSDCD3	Interpret Table Load
ISTSDCGE	GENEND Macro Handler
ISTSDCGP	Group Macro Handler
ISTSDCHS	Host Macro Handler
ISTSDCIN	INNODE Macro Handler
ISTSDCLM	Task Switching Routine
ISTSDCLN	LINE Macro Handler
ISTSDCLP	LUPOOL Macro Handler
ISTSDCLU	LU Macro Handler
ISTSDCML	MTALIST Macro Handler
ISTSDCMT	MTALIST Macro Handler
ISTSDCOD	Device Type Table
ISTSDCPA	**Path Macro Handler**
ISTSDCPC	PCCU Macro Handler
ISTSDCPU	**PU Macro Handler**
ISTSDCP1	MTALIST Parameter Handler
ISTSDCP2	LIST Parameter Handler
ISTSDCP3	VIDSEQ Parameter Handler
ISTSDCP4	TERM Parameter Handler
ISTSDCP5	DIALSET Parameter Handler
ISTSDCP6	VPACING Parameter
ISTSDCRC	System Definition Mainline
ISTSDCRN	CC RDT Build
ISTSDCRS	Shift/Default Entry Builder
ISTSDCSB	STARTBH Macro Handler
ISTSDCSC	SYSCNTRL Macro Handler
ISTSDCTM	Terminal Macro Handler
ISTSDCVB	**VSBUILD Macro Handler**
ISTSDCVG	**Switched/Local Skeleton Build**
ISTSDCVI	VIDLIST Macro Handler
ISTSEC01	Session Control Outbound Start
ISTSEC10	Session Control Outbound Processing
ISTSEC21	Session Control Feedback Processing
ISTSEC30	Session Control Inbound Request Processing
ISTSEC40	Session Control Auto Response
ISTSEC51	Session Control Queue Purge
ISTSQC0A	**Inquire TOP Logon Processor**
ISTSQC0B	**Inquire SESPARM Processor**
ISTSQC00	Inquire Parameter Validation
ISTSQC01	Logon Data Routine
ISTSQC02	Device Characteristics Routine
ISTSQC03	Active Count Routine
ISTSQC04	Terminal Routine
ISTSQC05	Application Status Routine
ISTSQC06	Display Station Routine
ISTSQC07	Communications Controller Name Routine
ISTSQC08	CID Translation Routine
ISTSQC09	Terminal Identification Routine
ISTSTC00	Interpret Processor
ISTTC035	TOLTEP - DTERM
ISTTC037	TOLTEP - DUMP
ISTVTCON	Storage for Configuration List
ISTVTCVT	Storage for DVT
ISTVTLOD	Module Load List
ISTYCLOS	Skeleton DVT for VARY (non-SDLC Devices)
ISTYCONT	Skeleton DVT for VARY (non-SDLC Devices)
ISTYPSOL	Skeleton DVT for Port Solicitor
ISTYSSCP	Skeleton DVT for SSCP

Transients

$$ABERV1	SDR Counter Update
$$ABERV2	OBR Record Builder
$$ABERV3	3705 ERP First Transient Load
$$ABERV4	Local 3270 ERP First Transient Load
$$ABERV5	**3791 Error Recovery Procedure**
$$ABERV6	Local 3270 ERP Second Load
$$ABERV7	**3791 Statistical Data Recorder Extension**
$$BCST01	Close ACB Transient
$$BCST02	Close ACB Transient, Return Linkage Routine
$$BOST01	Open ACB Transient
$$BOST02	Open ACB Transient, Return Linkage Routine
$$BSTCNL	EOJ Transient
$$BSTCN1	EOJ Transient, Return Linkage Routine
$$RAST14	3705 Channel Check ERP
$$RAST15	Local 3270 Channel Check ERP

LINKING VTAM

VTAM link-edit books ISTLINK1 and ISTLINK8 require operator response to // PAUSE statements when procedure LINKVTM is executed. ISTLINK1 may require a // LBLTYP NSD(xx) statement when it is included at link-edit time (this statement reserves label processing area space at the beginning of the VTAM partition for the direct-access-formatted Network Control Program dump files).

If your VTAM network does not include a 3705 (Network Control Program), an EOB operator response is all that is required. If, however, 3705 (Network Control Program) support is required, the // LBLTYP statement must be entered at the console, in which case "xx" is to be replaced by a numeric value indicating the maximum number of disk file extents for a given Network Control Program dump file.

If 3705 support is included later in your VTAM network, ISTLINK1 must be relink-edited to reflect this change. ISTLINK8 must be cataloged into the system core image library; hence, the operator must ensure that SYSCLB is unassigned when ISTLINK8 is included. This link-edit book includes VTAM modules and transients which may be fetched for a user partition whenever VTAM is operative in the system.

Link-Edit Statements (VTAM proper)

```
// OPTION CATAL
   INCLUDE ISTLINK1
// EXEC LNKEDT
   INCLUDE ISTLINK2
// EXEC LNKEDT
   INCLUDE ISTLINK3
// EXEC LNKEDT
   INCLUDE ISTLINK4
// EXEC LNKEDT
   INCLUDE ISTLINK5
// EXEC LNKEDT
   INCLUDE ISTLINK6
// EXEC LNKEDT
   INCLUDE ISTLINK8     Ensure that no
// EXEC LNKEDT          private core image
                        library is assigned
```

Link-Edit Statements (Network Control Program)

```
// OPTION CATAL
   INCLUDE ISTLINK7
// EXEC LNKEDT
```

Source Statement Library Requirements

Macros	Blocks
52	5,492

Macro Names

E.CHANGE	E.ISTRDWRA
E.CLSDST	E.ISTRPL
E.DO	E.ISTRPLG
E.ENDINTAB	E.ISTUSFBC
E.EXECRPL	E.LDO
E.IFGACB	E.LOGCHAR
E.IFGEXLST	E.MODEEND
E.IFGRPL	E.MODEENT
E.IHBRDWRA	E.MODETAB
E.INQUIRE	E.NETSOL
E.INTAB	E.NIB
E.INTRPRET	E.OPNDST
E.ISTACB	**E.RCVCMD**
E.ISTACBG	E.RECEIVE
E.ISTAVT	E.RESET
E.ISTBLDO	E.RESETSR
E.ISTCBMTB	**E.SENDCMD**
E.ISTCB1	E.SESSIONC
E.ISTCB2	E.SETLOGON
E.ISTDBIND	E.SIMLOGON
E.ISTDNIB	E.SOLICIT
E.ISTDPOHD	E.USSCMD
E.ISTDPROC	E.USSEND
E.ISTDVCHR	E.USSMSG
E.ISTEXLG	E.USSPARM
E.ISTEXLST	E.USSTAB

RPL Oriented Macro Instruction Storage

VTAM RPL oriented macro instructions call an inner macro instruction IHBRDWRA to expand code to modify RPLs. The parameters listed below show the minimum and maximum expansions. All parameters, except the RPL parameter, are optional.

Parameter	Minimum Expansion (bytes)	Maximum Expansion (bytes)
RPL	0	12
(If additional parameters are coded, include 8 bytes)	8	8
ACB	4	8
AREA	4	8
AREALEN	4	16
RECLEN	4	16
AAREA	4	8
AAREALN	4	16
ARECLEN	4	16
ECB*	16	20
EXIT*	16	20
ARG**	8	8
NIB**	12	12
OPTCD	14	48
SYN or ASY subparameters	4	4
SEQNO	4	14
BRANCH	4	4
IBSQVAL	4	14
OBSQVAL	4	14
RESPOND	4	12
CHAIN	8	8
CONTROL	10	10
CHNGDIR	4	8
BRACKET	4	8
SSENSEO	4	4
USENSEO	4	14
SSENSMO	4	4
RTYPE	4	16
STYPE	4	4
TBSQAC	4	4
OBSQAC	4	4
POST	4	4
Macro exit code	14	14
Space lost due to CNOP alignment	0	2

* Mutually exclusive ** Mutually exclusive

Since all parameters except the RPL parameter are optional, the minimum expansion for any RPL oriented macro instruction is 14 bytes. The maximum size of any RPL oriented macro instruction is 354 bytes. However, most macro instructions can be expected to use a subset of these parameters. Thus, as an aid to estimating the size of these macro instructions in the user's partition, the following representative maximum expansion sizes are provided:

Macro Instruction	Representative Maximum Expansion Sizes (bytes)
CHANGE	104
CLSDST	156
DO	132
INQUIRE	152
INTRPRET	176
OPNDST	128
RECEIVE	168
RESET	124
RESETSR	100
SESSIONC	94
SETLOGON	116
SIMLOGON	132
SOLICIT	128

Control Block Storage

The following are the sizes of VTAM control blocks that are built in the user's partition:

Control Block Name	Size (bytes)
ACB	52
NIB	64
RPL	100
EXLST	15 to 80 (depending on which exits are specified)

Manipulative Macro Instruction Storage

VTAM manipulative macro instructions may be used to generate VTAM control blocks or to modify various fields in these control blocks. When the manipulative macro instructions are used, the user's application program partition must allow a 4K (4096 byte) area to load the processing module, while allowing sufficient storage for the expansion of the manipulative macro instructions. The following list shows the minimum expansion sizes and a representative average expansion size of the manipulative macro instructions for each type of VTAM control block.

Macro Instruction	Type of Control Block	Minimum Expansion (bytes)	Representative Average Expansion Size (bytes)
GENCB	ACB	54	94
	EXLST	54	118
	NIB	54	78
	RPL	54	100
MODCB	ACB	60	102
	EXLST	66	98
	NIB	66	90
	RPL	60	100
SHOWCB	ACB	66	104
	EXLST	66	126
	NIB	66	96
	RPL	66	166
TESTCB	ACB	66	66
	EXLST	70	70
	NIB	70	92
	RPL	66	70

Module 23: Subsystem Support Services -- 5747-CC6

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SUBSYSTEM SUPPORT SERVICES

IBM Subsystem Support Services (SSS) must be included in the relocatable library. The generation of active load modules for SSS does not take place with the DOS/VS system generation process. Instead, SSS is generated in a separate process, concurrent with the generation of any of the following industry systems:

IBM 3600 Finance Communication System
IBM 3650 Retail Store System
IBM 3660 Supermarket System
IBM 3790 Communication System

This generation process and the virtual storage estimates for SSS in DOS/VS are documented in the IBM System/370 Subsystem Support Services User's Guide, GC30-3022.

Module 24: System Utilities – 5745-SC-UTL – 5745-SC-UTS – 5745-SC-APC

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General

System utilities are supplied prelinked in the core image library except the following:

Maintain System History
Assign Alternate Track Data Cell
Clear Data Cell
Initialize Data Cell and
Print the Hard-Copy File

For details on number of phases (modules, books) and number of blocks per library, refer to "Library Requirements" in Module 1 of this manual.

Instead of the link-edit and delete statements given in this module of the manual, the IBM-supplied cataloged procedures may be used; refer to "Link-Edit and Delete Procedures" in Module 1.

PARTITION SIZE

Between 6K and 64K of real storage depending on utility. Refer to DOS/VS System Utilities for details.

Delete Statements

```
DELETR IAQMAP
DELETR IAQMAP1
DELETR IAQMAP2
DELETR IAQMAP3
```

Analysis Program-1

CORE IMAGE LIBRARY

Phase

AP1

RELOCATABLE LIBRARY

Modules

IAQMAP
IAQMAP1
IAQMAP2
IAQMAP3

Link-Edit Statements

```
   INCLUDE IAQMAP
// EXEC LNKEDT
```

Assign Alternate Track Disk

CORE IMAGE LIBRARY

Phases

ALTDK
ALTDK2
ALTDK3
ALTDK4
ALTDK5

RELOCATABLE LIBRARY

Modules

IJWATD
IJWATD1
IJWATD2
IJWATD3
IJWATD4
IJWATD5

Link-Edit Statements

```
   INCLUDE IJWATD
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWATD
DELETR IJWATD1
DELETR IJWATD2
DELETR IJWATD3
DELETR IJWATD4
DELETR IJWATD5
```

Assign Alternate Track Data Cell

CORE IMAGE LIBRARY

Phases

```
ALTDC
ALTDC2
ALTDC3
ALTDC4
ALTDC5
```

RELOCATABLE LIBRARY

Modules

```
IJWATM
IJWATM1
IJWATM2
IJWATM3
IJWATM4
IJWATM5
```

Link-Edit Statements

```
   INCLUDE IJWATM
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWATM
DELETR IJWATM1
DELETR IJWATM2
DELETR IJWATM3
DELETR IJWATM4
DELETR IJWATM5
```

Clear Disk

CORE IMAGE LIBRARY

Phases

```
CLRDK
CLRDK2
CLRDK3
```

RELOCATABLE LIBRARY

Modules

```
IJWCCD
IJWCCD1
IJWCCD2
IJWCCD3
```

Link-Edit Statements

```
   INCLUDE IJWCCD
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWCCD
DELETR IJWCCD1
DELETR IJWCCD2
DELETR IJWCCD3
```

Clear Data Cell

CORE IMAGE LIBRARY

Phases

```
CLRDC
CLRDC2
CLRDC3
```

RELOCATABLE LIBRARY

Modules

```
IJWCCM
IJWCCM1
IJWCCM2
IJWCCM3
```

Link-Edit Statements

```
   INCLUDE IJWCCM
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWCCM
DELETR IJWCCM1
DELETR IJWCCM2
DELETR IJWCCM3
```

Copy Disk to Card

CORE IMAGE LIBRARY

Phases

```
CDKCD
CDKCD2
```

```
RELOCATABLE LIBRARY

Modules

IJWCDC
IJWCDC1
IJWCDC2

Link-Edit Statements

   INCLUDE IJWCDC
// LBLTYP NSD(nn)
// EXEC LNKEDT

Delete Statements

DELETR IJWCDC
DELETR IJWCDC1
DELETR IJWCDC2
```

Copy Disk to Disk

```
CORE IMAGE LIBRARY

Phases

CDKDK
CDKDK2


RELOCATABLE LIBRARY

Modules

IJWCDD
IJWCDD1
IJWCDD2

Link-Edit Statements

   INCLUDE IJWCDD
// LBLTYP NSD(nn)
// EXEC LNKEDT

Delete Statements

DELETR IJWCDD
DELETR IJWCDD1
DELETR IJWCDD2
```

Copy Disk or Data Cell to Tape

```
CORE IMAGE LIBRARY

Phases

CDKTP
CDKTP2


RELOCATABLE LIBRARY

Modules

IJWCDT
IJWCDT1
IJWCDT2

Link-Edit Statements

   INCLUDE IJWCDT
// LBLTYP NSD(nn)
// EXEC LNKEDT

Delete Statements

DELETR IJWCDT
DELETR IJWCDT1
DELETR IJWCDT2
```

Copy and Restore Diskette

```
CORE IMAGE LIBRARY

Phase

CRDR


RELOCATABLE LIBRARY

Module

IJWCRD

Link-Edit Statements

   PHASE CRDR,S
   INCLUDE IJWCRD
// EXEC LNKEDT

Delete Statements

DELETR IJWCRD
```

Deblock Utility

```
CORE IMAGE LIBRARY

Phase

DSTRB


RELOCATABLE LIBRARY

Modules

IJWDST
IJWDST1
```

Link-Edit Statements

```
   INCLUDE IJWDST
// LBLTYP TAPE
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWDST
DELETR IJWDST1
```

Fast Copy Disk Volume

CORE IMAGE LIBRARY

Phases (Integrated Version)

```
FCOPY
FCOPY2
```

Phase (Standalone Diskette Version)

```
DKTTIPL
```

RELOCATABLE LIBRARY

Modules (Integrated Version)

```
IJWDFC
IJWDFC1
IJWDFC2
```

Module (Standalone Diskette Version)

```
IJWDFCD
```

Link-Edit Statements (Integrated Version)

```
// OPTION CATAL
   INCLUDE IJWDFC
// LBLTYP TAPE
// EXEC LNKEDT
```

Link-Edit Statements (Standalone Diskette Version)

```
// OPTION CATAL
   INCLUDE IJWDFCD
// LBLTYP TAPE
// EXEC LNKEDT
```

SOURCE STATEMENT LIBRARY (STANDALONE VERSIONS)

Macro

```
Z.FASTCOPY (Card Version)
Z.FASTCOPD (Diskette Version)
```

Statements to Obtain Standalone Card Deck Version

```
// EXEC SSERV
   PUNCH Z.FASTCOPY
/*
```

Statements to Obtain Standalone Diskette Version

```
// DLBL IJSYSPH
// EXTENT
// ASSGN SYS006,X'cuu'
// EXEC DKTTIPL
ASSGN SYSPCH,X'cuu' same diskette unit
// EXEC SSERV
PUNCH Z.FASTCOPD
/*
CLOSE SYSPCH,UA
/&
```

Delete Statements

```
DELETC DKTTIPL
DELETR IJWDFCD
DELETR IJWDFC
DELETR IJWDFC1
DELETR IJWDFC2
DELETS Z.FASTCOPY
DELETS Z.FASTCOPD
```

Initialize Disk

CORE IMAGE LIBRARY

Phases

```
INITDK
INITDK2
INITDK3
INITDK4
```

RELOCATABLE LIBRARY

Modules

```
IJWIND
IJWIND1
IJWIND2
IJWIND3
IJWIND4
```

Link-Edit Statements

```
   INCLUDE IJWIND
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWIND
DELETR IJWIND1
DELETR IJWIND2
DELETR IJWIND3
DELETR IJWIND4
```

Initialize Data Cell

CORE IMAGE LIBRARY

Phases

```
INTDC
INTDC2
INTDC3
INTDC4
```

RELOCATABLE LIBRARY

Modules

```
IJWINM
IJWINM1
IJWINM2
IJWINM3
IJWINM4
```

Link-Edit Statements

```
   INCLUDE IJWINM
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWINM
DELETR IJWINM1
DELETR IJWINM2
DELETR IJWINM3
DELETR IJWINM4
```

Initialize Tape

CORE IMAGE LIBRARY

Phase

```
INITP
```

RELOCATABLE LIBRARY

Modules

```
IJWINT
IJWINT1
```

Link-Edit Statements

```
   INCLUDE IJWINT
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWINT
DELETR IJWINT1
```

Copy File and Maintain Object Module

CORE IMAGE LIBRARY

Phase

```
OBJMAINT
```

RELOCATABLE LIBRARY

Module

```
IJWOBJM
```

Link-Edit Statements

```
   INCLUDE IJWOBJM
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWOBJM
```

Restore Program

CORE IMAGE LIBRARY

Phase

```
RESTORE
```

RELOCATABLE LIBRARY

Module

```
IJWSARST
```

Link-Edit Statements

```
   INCLUDE IJWSARST
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWSARST
```

Backup Program

CORE IMAGE LIBRARY

Phase

```
BACKUP
```

RELOCATABLE LIBRARY

Module

IJWSABK

Link-Edit Statements

```
   INCLUDE IJWSABK
// EXEC LNKEDT
```

Delete Statements

DELETR IJWSABK

SOURCE STATEMENT LIBRARY

Z.BPSFILES

Maintain System History

CORE IMAGE LIBRARY

Phases

PTFHIST
PTFREPRO

RELOCATABLE LIBRARY

Modules

IKRSMP1
IKRSMP2
IKRSMP3 (generated by HIST macro)

Link-Edit Statements

Link-edit will be generated by HIST macro assembly.

Delete Statements

DELETR IKRSMP1
DELETR IKRSMP2
DELETR IKRSMP3

SOURCE STATEMENT LIBRARY

Macros

E.HIST
Y.PTFSCP
Y.PTFPP 4S2

HIST Macro Description

```
HIST REL='release',CUST='name'

     [,ADDR='address'][,PHONE='number']
     [,PROG='programmer']
     [,ENV='environment']
     [,SCPHIST=SYSTEM|PRIVATE]
     [,PPHIST=PRIVATE|SYSTEM]
```

'release' Specifies the SCP release to which this history belongs. A character string up to 8 bytes long, enclosed in apostrophes.

'name' The customer's name (and number, if applicable). A character string of up to 40 bytes, enclosed in apostrophes.

'address' The customer's address. A character string of up to 40 bytes, enclosed in apostrophes.

'number' The customer's telephone number. A character string of up to 40 bytes, enclosed in apostrophes.

'programmer'
The name of the system programmer. A character string of up to 40 bytes, enclosed in apostrophes.

'environment'
The hardware/software environment. A character string of up to 40 bytes, enclosed in apostrophes.

CPHIST=SYSTEM|PRIVATE
The source statement library in which the SCP history Y.PTFSCP is cataloged. If this operand is omitted, the default is SYSTEM.

PPHIST=PRIVATE|SYSTEM
The source statement library in which the PP history Y.PTFPP is cataloged. If this operand is omitted, the default is PRIVATE.

The output resulting from the HIST macro consists of job control statements for three steps:

1. A step to update the history headers with the customer information provided in the macro.

2. A step which catalogs an assembled module into the relocatable library. This module then becomes part of the DOS/VS PTFHIST and contains information indicating where the history books are cataloged.

3. A final step which catalogs the DOS/VS PTFHIST into the core image library.

Generation Example

```
// JOB PTFHIST INSTALLATION
// OPTION DECK
// EXEC ASSEMBLY
     HIST REL='33.0',                          *
          CUST='EVA CORPORATION',              *
          ADDR='2 MAIN STREET, ANYWHERE',      *
          PHONE='017-723-977',                 *
          PROG='TOM SMITH',                    *
          PPHIST=SYSTEM
     END
/*
/&
```

Previous entries in books Y.PTFSCP and Y.PTFPP, except customer information, are retained.

List System History

Core Image Library

Phase

HISLIST

RELOCATABLE LIBRARY

Module

IKRHIST

Link-Edit Statements

```
   INCLUDE IKRHIST
// EXEC LNKEDT
```

Delete Statements

```
DELETR IKRHIST
```

Restore Card to Disk

CORE IMAGE LIBRARY

Phase

RCDDK

RELOCATABLE LIBRARY

Modules

IJWRCD
IJWRCD1

Link-Edit Statements

```
   INCLUDE IJWRCD
// LBLTYP NSD(nn)
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWRCD
DELETR IJWRCD1
```

Restore Tape to Disk or Data Cell

CORE IMAGE LIBRARY

Phase

RTPDK

RELOCATABLE LIBRARY

Modules

IJWRTD
IJWRTD1

Link-Edit Statements

```
   INCLUDE IJWRTD
// LBLTYP NSD(10)
// EXEC LNKEDT
```

Delete Statements

```
DELETR IJWRTD
DELETR IJWRTD1
```

VTOC Display

CORE IMAGE LIBRARY

Phase

LVTOC

Transient

$$BLVTOC

Note: $$BLVTOC is cataloged into the core image library along with the VTOC program.

RELOCATABLE LIBRARY

Modules (BJS)

IJWLTVB
IJWLTVT
IJWLTV1

Link-Edit Statements, Non-Multiprogramming System

```
   INCLUDE IJWLTVB
// LBLTYP TAPE
// EXEC LNKEDT
```

Delete Statements, Non-Multiprogramming System

```
DELETR  IJWLTVB
DELETR  IJWLTVM
```

Modules (MPS)

IJWLTVM
IJWLTVT
IJWLTV1

Link-Edit Statements, Multiprogramming System

```
   INCLUDE IJWLTVM
// EXEC LNKEDT
```

Delete Statements, Multiprogramming System

```
DELETR  IJWLTVM
DELETR  IJWLTVB
```

Module 25: EREP -- 5745-SC-ERP

25

PARTITION SIZE

The program requires a real partition allocation of 10K bytes.

CORE IMAGE LIBRARY

	Phases	Blocks
Transients	1	1
Phases	131	344

Transients

$$BSDRUP

Phases

EREP
EREPADPT
EREPASTA
EREPCCH
EREPCCHC
EREPC125
EREPC135
EREPC145
EREPDOLD
EREPEDCP
EREPEDCR
EREPEDCU
EREPEDC1
EREPEDC2
EREPEDC3
EREPEDDA
EREPEDDK
EREPEDD1
EREPEDES
EREPEDIT
EREPEDRN
EREPEDTD
EREPEDTP
EREPEDTR
EREPEDT1
EREPEDUR
EREPEDU1
EREPEDU2
EREPEDVT
EREPEDX1
EREPEOD
EREPESPT
EREPESTR
EREPESWK
EREPHIST
EREPIPL
EREPMCAR
EREPMCRC
EREPMICR
EREPMNTR
EREPM145
EREPM158
EREPRDE
EREPRETV
EREPSHRT
EREPSHRU
EREPSMCP
EREPSMCR
EREPSMCU
EREPSMC1
EREPSMC3
EREPSMDA
EREPSMDK
EREPSMD1
EREPSMES
EREPSMRN
EREPSMTD
EREPSMTP
EREPSMTR
EREPSMT1
EREPSMUR
EREPSMU1
EREPSMVT
EREPSPCL
EREPTES
EREPTPE1
EREPUCCM
EREPUNIT
EREPUOLD
EREPVRN0
EREPVRN1
EREPVRN2
EREPVRN3
EREPVRN4
EREPVRN5
EREPVTAM
EREP145A
EREP145B
EREP145C
EREP145D
EREP158A
EREP158B
EREP158C
EREP158D
EREP158E
EREP158F
EREP158G
EREP158H
EREP158J
EREP158K
EREP158L
EREP158M
EREP158N
EREP158P
EREP158Q
EREP2400
EREP2715
EREP320X
EREP3203
EREP3211
EREP333W
EREP333X
EREP333Y
EREP333Z
EREP3330
EREP3340
EREP334W
EREP334X
EREP334Y
EREP334Z
EREP335Y
EREP335Z
EREP3350

EREP3410
EREP3420
EREP3500
EREP3540
EREP3705
EREP3800
EREP3801
EREP3802
EREP3803
EREP3804
EREP3805
EREP3806
EREP3807
EREP380X
EREP389M
EREP389N
EREP389X
EREP3895

RELOCATABLE LIBRARY

Modules	Blocks
127	1,632

Modules
IJBEADPT
IJBEASTA
IJBECALA
IJBECALB
IJBECALC
IJBECALD
IJBECCH
IJBECCHC
IJBEC125
IJBEC135
IJBEC145
IJBEDOLD
IJBEEDCP
IJBEEDCR
IJBEEDCU
IJBEEDC1
IJBEEDC2
IJBEEDC3
IJBEEDDA
IJBEEDDK
IJBEEDD1
IJBEEDES
IJBEEDIT
IJBEEDRN
IJBEEDTD
IJBEEDTP
IJBEEDTR
IJBEEDT1
IJBEEDUR
IJBEEDU1
IJBEEDU2
IJBEEDVT
IJBEEDX1
IJBEEOD
IJBEESPT
IJBEESTR
IJBEESWK
IJBEHIST
IJBEIPL
IJBEMCAR
IJBEMCRC
IJBEMICR
IJBEMNTR
IJBEM145
IJBEM158
IJBERDE
IJBEREP
IJBERETV
IJBESHRT
IJBESHRU
IJBESMCP
IJBESMCR
IJBESMCU
IJBESMC1
IJBESMC3
IJBESMDA
IJBESMDK
IJBESMD1
IJBESMES
IJBESMRN
IJBESMTD
IJBESMTP
IJBESMTR
IJBESMT1
IJBESMUR
IJBESMU1
IJBESMVT
IJBESPCL
IJBETES
IJBETPE1
IJBEUCCM
IJBEUNIT
IJBEUOLD
IJBEVRN0
IJBEVRN1
IJBEVRN2
IJBEVRN3
IJBEVRN4
IJBEVRN5
IJBEVTAM
IJBE145A
IJBE145B
IJBE145C
IJBE145D

IJBE158A
IJBE158B
IJBE158C
IJBE158D
IJBE158E
IJBE158F
IJBE158G
IJBE158H
IJBE158J
IJBE158K
IJBE158L
IJBE158M
IJBE158N
IJBE158P
IJBE158O
IJBE2400
IJBE2715
IJBE320X
IJBE3203
IJBE3211
IJBE333Z
IJBE3330
IJBE334Z
IJBE3340
IJBE335Y
IJBE335Z
IJBE3350
IJBE3410
IJBE3420
IJBE3500
IJBE3540
IJBE3705
IJBE3800
IJBE3801
IJBE3802
IJBE3803
IJBE3804
IJBE3805
IJBE3806
IJBE3807
IJBE380X
IJBE389M
IJBE3895

Link-Edit Statements

```
    INCLUDE IJBECALA    (Monitor)
// EXEC LNKEDT
    INCLUDE IJBECALB    (Edit/Select
    Retrieval)
// EXEC LNKEDT
    INCLUDE IJBECALC    (Summary)
// EXEC LNKEDT
    INCLUDE IJBECALD    (Tape Error
    Statistics)
// EXEC LNKEDT
    INCLUDE IJBERDE     (RDE Summary**)
// EXEC LNKEDT
```

* 80 byte area reserved for tape label processing. This procedure does away with the necessity of including a // LBLTYP card.

** The summary function will supply meaningful information only if ERRLOG=RDE is specified during system generation.

Delete Statements

```
DELETR IJBEREP,IJBEADPT,IJBEASTA,etc.
```

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D3420 1

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A technical change to the text or to an illustration is indicated by a vertical line to the left of the change. Editorial changes are not indicated.

Summary of Amendments

This Technical Newsletter corrects errors in the base publication and documents the restoring of DOS/VS to minidisk under VM/370.

Note: *Please insert this page in your publication to provide a record of changes.*

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This Technical Newsletter, a part of the independent component release (ICR) of support for the IBM 3800 Printing Subsystem under Release 34 of the IBM Disk Operating System/Virtual Storage, DOS/VS, provides replacement pages for your publication. Information contained on these pages applies only if the ICR is installed on your system. You need not insert the pages if it is not installed. These replacement pages remain in effect for subsequent DOS/VS releases unless specifically altered. Pages to be replaced are:

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Summary of Amendments

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For a complete list of publications that support the DOS/VS IBM 3800 Printing Subsystem ICR, see the *DOS/VS IBM 3800 Printing Subsystem Programmer's Guide,* GC26-3900.

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