SC26-4122-0
File No. S370-34

Program Product

OS PL/I Optimizing Compiler: Installation Guide for CMS

Optimizing Compiler	5734-PL1
Resident Library	5734-LM4
Transient Library	5734-LM5

(These program products are also available as composite package 5734-PL3)

IBM

SC26-4122-0
File No. S370-34

Program Product

OS PL/I Optimizing Compiler: Installation Guide for CMS

Optimizing Compiler	**5734-PL1**
Resident Library	**5734-LM4**
Transient Library	**5734-LM5**

(These program products are also available as composite package 5734-PL3)

Release 5.1

First Edition (September 1985)

This edition applies to Release 5.1 of:

- OS PL/I Optimizing Compiler, Program Product 5734-PL1
- OS PL/I Resident Library, Program Product 5734-LM4
- OS PL/I Transient Library, Program Product 5734-LM5

and to any subsequent releases until otherwise indicated in new editions or technical newsletters.

Changes are periodically made to the information herein; before using this publication in connection with the operation of IBM systems, consult the latest *IBM System/370 and 4300 Processors Bibliography*, GC20-0001, for the editions that are applicable and current.

References in this publication to IBM products, programs, or services do not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM program product in this publication is not intended to state or imply that only IBM's program product may be used. Any functionally equivalent program may be used instead.

Publications are not stocked at the address given below; requests for IBM publications should be made to your IBM representative or to the IBM branch office serving your locality.

A form for readers' comments is provided at the back of this publication. If the form has been removed, comments may be addressed to IBM Corporation, P.O. Box 50020, Programming Publishing, San Jose, California, U.S.A. 95150. IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

Preface

This publication is primarily for readers who are responsible for the installation of the OS PL/I Optimizing Compiler, OS PL/I Resident Library, and OS PL/I Transient Library. The book describes how to install these three products under the Conversational Monitor System (CMS) of the IBM Virtual Machine/System Product (VM/SP). To install this product under the IBM Multiple Virtual Systems (MVS) or Multiple Virtual Systems/Extended Architecture (MVS/XA) Operating System, see *OS PL/I Optimizing Compiler: Installation Guide for MVS*, SC26-4121.

You should already be familiar with the VM system used at your installation, with the publications that describe that system, and with EXEC processing.

How this Book Is Organized

The OS PL/I optimizing compiler, resident library, and transient library function under the control of the IBM VM/SP Operating System to compile and execute programs written in PL/I. This book describes how to install the compiler and the transient and resident libraries under this system using the Conversational Monitor System (CMS). This publication is divided into the following parts:

- Chapter 1 gives details of system requirements, program product distribution, and a summary of the installation procedure for all three program products.
- Chapter 2 through Chapter 5 give information on the installation procedures:
  - Chapter 2 covers the installation of the transient and resident libraries and the compiler, using the composite distribution tape.
  - Chapter 3 covers installation of the transient library.
  - Chapter 4 covers installation of the resident library.
  - Chapter 5 covers installation of the optimizing compiler.
- Chapter 6 describes how to change the IBM-supplied execution-time and compiler option defaults to suit your site's needs.
- The Appendix describes how to use the service EXECs to apply program temporary fixes (PTFs) and/or maintenance to your PL/I products.

Related Publications

For more complete and current information about the actual installation process for the OS PL/I Optimizing Compiler and Libraries, you must use the *Program Directory* shipped with the product distribution tape(s), in conjunction with this book. In addition, you might want to consult the publications listed below.

A number of publications are referred to in this manual by generic names, such as the "Assembler Language publications". In such cases the actual manual you require will depend on your operating system.

The following manuals might be useful during the installation of the optimizing compiler and the libraries under CMS.

OS PL/I books:

OS PL/I Optimizing Compiler: Programmer's Guide, SC33-0006

OS PL/I Optimizing Compiler: Messages, SC33-0027

OS PL/I Optimizing Compiler: CMS User's Guide, SC33-0029

OS and DOS PL/I Language Reference Manual, GC26-3977

VM/SP books:

Virtual Machine/System Product (VM/SP) Installation Guide, SC24-5237

VM/SP: System Messages and Codes, SC19-6204

VM/SP: CMS User's Guide, SC19-6210

VM/SP: CMS Command and Macro Reference, SC19-6209

VM/SP: CP Command Reference for General Users, SC19-6211

Contents

Figures

Chapter 1. General Information

This chapter contains information on the following items:

- A list of the minimum system requirements for installing and using the optimizing compiler, resident library, and transient library under the control of the Conversational Monitor System (CMS) of the IBM Virtual Machine/System Product (VM/SP).
- A summary of the installation process.

This chapter begins by defining the minimum system requirements for using the optimizing compiler, resident library, and transient library under the control of CMS. It describes briefly the programming features introduced with Release 5.1 of the OS PL/I Optimizing Compiler and the execution-time options you can use to implement them. It summarizes the installation process and the preparatory jobs required to install the three products.

Note:

We recommend that you read through the book once before you actually begin the installation process.

Before you can add the compiler and its libraries to a VM/SP system, you must generate that system to meet the minimum system requirements. For information on VM/SP system generation, see *VM/SP Installation Guide.*

Interrelease Compatibility

Different release levels of the optimizing compiler and libraries will produce compatible executions, provided that:

- The release and service level of the transient library is equal to or greater than that of the resident library.
- The release and service level of the resident library is equal to or greater than that of the compiler.

System Requirements

This section summarizes the machine and operating system requirements for the compiler and libraries.

Machine Requirements

The minimum machine requirements for installation of the optimizing compiler and libraries are:

- An IBM System/370, 303x, 308x, or 43xx processor or the equivalent.
- A magnetic tape drive on which you can mount and run the distribution tape(s).

Auxiliary Storage Requirements

The storage estimates for the OS PL/I compiler and libraries are provided in the *Program Directory*.

Operating System Requirements

The OS PL/I optimizing compiler and libraries operate under the IBM Virtual Machine/System Product (VM/SP) Release 3 and all subsequent releases.

OS PL/I also operates under the following IBM systems:

- OS/VS2 (MVS) Version 3 Release 8 with MVS/SP Version 1 Release 3
- MVS/SP Version 2 Release 1, with MVS/XA DFP Version 1 Release 1

If you are installing PL/I under MVS or MVS/XA, use *OS PL/I Optimizing Compiler: Installation Guide for MVS* instead of this book.

If your machine does not support extended floating point, IEAXPSIM must be in the CMS text library named CMSLIB TXTLIB.

If you want to create and/or access PL/I VSAM catalogs, data spaces, and data sets at execution time under CMS, you must install CMS/DOS, CMS/VSAM, and DOS/VSE VSAM. CMS/VSAM support provides OS/VS VSAM facilities and Access Method Services under CMS using the DOS/VSE VSAM. PL/I uses OS/VS VSAM macros. CMS provides an interface between these macros and VSE VSAM. See *VM/SP: CMS User's Guide* for limitations and restrictions.

Program Product Distribution

The machine-readable program materials you need to install the library and compiler program products are distributed in the following ways:

1. The transient library, resident library, and compiler installation material (in that order) are distributed as a composite package, orderable as program product number 5734-PL3.

2. The transient library, resident library, and compiler installation material are distributed as individual products, orderable as follows:

   - Transient Library: 5734-LM5
   - Resident Library: 5734-LM4
   - Optimizing Compiler: 5734-PL1

> **Note:**
>
> You may not install the resident library without the transient library; you may not install the compiler without both transient and resident libraries.
>
> If you are installing the individual products, you *must* install them in the above sequence, that is, transient library first, then resident library, then compiler.

You can obtain your PL/I product(s) as individual tapes or as file groupings stacked, with the other IBM program products you have ordered, on a VM/System Offering tape.

Format of Distributed Materials

The format of the distributed tape(s) will be one of the following:

9-track, 1600 b.p.i.
9-track, 6250 b.p.i.

Whether you order the program products individually or in the composite package, each product is distributed either as a CMS tape or as a file grouping on a VM/System Offering tape. In either case, the distributed materials include:

- Installation EXEC
- VMFPLC2 dump files of product installation materials

You can find a description of the general format of each distribution tape in the corresponding Program Directory.

New Execution-Time Options

Two new execution-time options help to improve PL/I utilization and management of storage:

HEAP
enables you to direct PL/I to isolate storage allocated to CONTROLLED and dynamically allocated BASED variables from all other PL/I storage, and to specify size and location of the heap area.

ISAINC
enables you to specify a minimum size for increments of the ISA over the initial allocation. Use of this option can help decrease the number of GETMAINs performed during execution of a task.

Information on specifying these options and establishing default values for them is in Chapter 6, "Changing IBM-Supplied Option Defaults" on page 25. You can find further information on these options and their use in *OS PL/I Optimizing Compiler: Programmer's Guide*.

Preparing for Installation

The distribution tapes for CMS are created using CMS commands. The text files and EXECs needed for PL/I are placed on the installation tapes with CMS VMFPLC2 commands.

You install the transient library, resident library, and compiler by invoking the installation EXEC(s) supplied on the distribution tape(s). The installation EXECs copy the files needed to execute a PL/I program onto a target minidisk. If you are satisfied with the IBM-supplied execution-time and compiler option default values, you will not need to take any further action. If you want to change some of the default values, the EXECs enable you to do so after the product has been installed.

Note:

If, at any time after you have invoked an installation EXEC, you want to *stop* the installation process, you can do so by responding to an EXEC prompt with `QUIT`.

Choosing Components

You can install the transient library, resident library, and compiler at any time after your operating system is initially generated.

First you decide which product(s) your site needs. You can install the:

- Transient library, or

- Transient library and the resident library, or
- Transient library, the resident library, and the compiler.

Choosing a Target Disk and Target Libraries

Then you choose where to install the compiler and libraries. Consult the *Program Directory* for space requirements for your PL/I product. You should ensure that all the required space is available on one minidisk.

You can install your PL/I components on a private minidisk or on the system minidisk ('S' disk). We strongly recommend that, at least initially, you use a private minidisk, for the following reasons:

- If your site now uses an earlier release of OS PL/I, you can keep that release as your active product while installing and verifying the current release.
- If your site is using OS PL/I from a private minidisk when a new VM system minidisk is created or a new release of CMS is installed, the OS PL/I compiler and libraries will not be affected.

We also recommend that, both at installation time and at compile and run time, you have *only one release of the product at a time on an accessed disk*. This includes PLIOPT MODULE, PLILIB TXTLIB, and any files with a filename of IBMBxxxx or IEL0xxxx.

The transient and resident library and the composite product installation EXECs place, by default, the transient and resident library TEXT files into one TXTLIB, named PLILIB. The EXECs offer you the opportunity to place each library into a separate TXTLIB, but we recommend that you use one TXTLIB and that you name it PLILIB, because much of the PL/I documentation refers to this name.

The compiler and composite product installation EXECs will place compiler TEXT files and generated MODULE files on the target disk.

Installing PL/I

After you have chosen a target disk and target libraries, you load from the distribution tape(s) onto disk the installation EXECs and other files for the component(s) you need. Each installation EXEC's name is based on the product number of the product it installs:

Product Name	Product Number	EXEC Name
Transient Library	5734-LM5	I5734LM5
Resident Library	5734-LM4	I5734LM4
Optimizing Compiler	5734-PL1	I5734PL1
Composite Product	5734-PL3	I5734PL3

Note: You should keep the distribution tape(s) and documents prepared by IBM as backup in case the operating system has to be re-created or you want to change

the defaults for the compiler or execution-time options at any time in the future. (The procedures for changing option defaults are described later in this manual.)

Modifying IBM-Supplied Option Defaults

Once you have installed OS PL/I on your system, it is ready for use. IBM has supplied sets of default values for compiler options and for execution-time options. These default values are automatically in effect when you invoke PL/I.

If you want to change the IBM-supplied default values, you can use the installation EXEC, either at the time of installation or later, to modify one or both of the macros included for this purpose with the distribution materials. General users of OS PL/I can override, at compilation or at execution time, either the IBM-supplied default values or those new default values which you have established. Techniques for overriding option defaults are described in *OS PL/I Optimizing Compiler: Programmer's Guide.*

Chapter 2. Installing the Composite Product

This chapter describes the procedure for installing the OS PL/I Transient Library, Resident Library, and Optimizing Compiler, as distributed in the composite package, product number 5734-PL3. If you are installing the composite package, you should read this entire chapter before starting the actual installation process. If you are installing individual product component tapes, you should use the procedures described beginning with Chapter 3, "Installing the Transient Library" on page 13, instead of this chapter.

This chapter describes the contents of the composite product distribution tape files and gives the details of the following installation steps:

1. Selecting your target disk and libraries
2. Obtaining the files you need from the distribution tape
3. Installing the composite product
4. Verifying correct installation

Distribution Tape Contents

The OS PL/I Transient Library, Resident Library, and Optimizing Compiler, are distributed together on a VMFPLC2 format 9-track tape as product number 5734-PL3. The *Program Directory* distributed with the composite product tape describes the files on the tape.

The composite distribution tape files contain the following information:

- The I5734PL3 composite product installation EXEC
- A Memo to Users
- Selected transient library source files, including:
  - The execution-time options file
  - The macro used by the options file (in the form of a MACLIB)
- Transient and resident library TXTLIBs. You can choose between:
  - PLILIB TXTLIB, containing both transient and resident libraries, or
  - TRANSNT TXTLIB and RESIDENT TXTLIB packaged separately

- Selected compiler source files, including:
  - The compiler options file
  - The macro used by the options file (in the form of a MACLIB)
- Compiler generated MODULE files
- Compiler TEXT files
- Installation verification program (IVP) source code used to verify correct installation of the OS PL/I products

Step 1: Selecting a Target Disk and Target Libraries

Before you can continue, you must select a target disk for the product and target libraries for the transient and resident libraries. The target disk for the product can be the system minidisk or a private minidisk. "Preparing for Installation" on page 4 contains more information about system and private minidisks and how to choose a target disk and target libraries. When you have chosen your target disk, make sure it is formatted and linked. We recommend that you format your target disk in 4K blocks.

The installation EXEC installs, by default, the transient and resident libraries into one TXTLIB, named PLILIB TXTLIB. The EXEC allows you to give the library a different name. It also offers you the option of installing the transient and resident libraries in separate target libraries named TRANSNT and RESIDENT, or two other names of your choice. We recommend that you install both your transient and resident libraries into PLILIB TXTLIB.

The installation EXEC places the already built library TXTLIB(s), and compiler TEXT and MODULE files, on the target disk. If you are currently using a previous release of the OS PL/I product, you already have on a disk the following files:

Filename	Filetype
IBMBMAC	MACLIB
PLILIB	TXTLIB
PLICOMP	MACLIB
DMSPLIO	TEXT
SAMPLE	PLIOPT
IEL*	TEXT
IEL*	MODULE
PLIOPT	MODULE

Note:

If you select the disk that contains a previous release of PL/I as your target disk, the installation EXEC will *replace* the old product files with the new ones. We recommend that you use a *different* disk so that you can retain your previous PL/I release until you are certain your new product runs on your production system.

We also recommend that, while you are installing *and/or using* your new release of PL/I, you do not have any disk accessed that contains files from a previous release of the product. This includes any of the files listed in the above table.

Step 2: Obtaining the Files You Need from the Distribution Tape

The composite product distribution materials include the I5734PL3 EXEC, which installs the transient and resident libraries and the compiler. The EXEC contains prompts which guide you through the installation process and help you change the execution-time and compiler option default values supplied by IBM, if you want to change them during the installation process. The process of changing option defaults is described in Chapter 6, "Changing IBM-Supplied Option Defaults" on page 25.

To obtain the files you need, you must perform the following steps:

1. Mount the distribution tape at virtual address 181.
2. If you are installing your PL/I product
   a. as part of a VM/System Offering:
      1) Invoke the VM/SP EXEC INSTFPP. It will list the products on the tape and ask you to select the one you want to install.
      2) Select the OS PL/I Optimizing Compiler and Libraries. INSTFPP will load the Memo to Users and the installation EXEC onto a work disk. It will then print the Memo to Users and invoke the I5734PL3 installation EXEC.
   b. by itself:
      1) Execute the command `VMFPLC2 LOAD * * xn`, where `xn` is the filemode of the target disk. This loads the installation EXEC onto the target disk. *Do not move the tape.*
      2) Invoke the I5734PL3 EXEC.

Step 3: Installing the Distribution Tape

The I5734PL3 installation EXEC contains prompts that guide you through the installation process. If, at any time after invoking the installation EXEC, you want to stop the installation process, you can do so by responding to any prompt with `QUIT`.

The EXEC will ask for the following information:

1. The address of the disk where the product is to be installed
2. The file mode in which the disk is to be accessed
3. The name(s) of the target library(ies) where you want to install your transient and resident libraries, if different from PLILIB TXTLIB

The EXEC will then install the transient and resident library and compiler files in the appropriate libraries on the disk you designated. If you are installing using INSTFPP, the I5734PL3 EXEC will also place a copy of itself on the target disk for future use.

The compiler TEXT files will be loaded with a filemode of `x1`, where `x` is the filemode letter you chose above, and the MODULE files will be loaded with a filemode of `x2`.

Because already generated MODULE files are provided on the compiler distribution tape, you will need the TEXT files only when you need to regenerate compiler MODULE files after changing the compiler option defaults or applying maintenance to the compiler. You can 'hide' the TEXT files, and thereby save main storage space and access time, by accessing the compiler disk with the command, `ACCESS cuu x/A * * x2`, where x is the filemode letter you usually use to access the compiler during normal production. This allows only the MODULE files to be included in the CMS resident directory.

Step 4: Verifying Your Installation

The composite distribution materials include an installation verification program (IVP) that you can use to verify the success of your installation. The I5734PL3 EXEC will now ask if you want to compile and run this program to make certain your compiler and libraries are correctly installed. You can find more information on the IVP under "sample program" in *OS PL/I Optimizing Compiler: Programmer's Guide.*

The compilation of the IVP generates one error level (E) and several warning level (W) diagnostic messages from the preprocessor and the compiler. These messages are normal and can be ignored. Successful execution of the (IVP) generates the message, `VERIFICATION COMPLETED SUCCESSFULLY`. If the program does not compile or does not run correctly, the EXEC issues the message, `VERIFICATION FAILED`, and explains which step failed. If this happens, review the installation procedure and ensure that you have performed all steps correctly.

Changing IBM-Supplied Option Defaults

Included in the composite product you have just installed are the IBMBXOPT ASSEMBLE file that establishes the IBM-supplied default values for execution-time options, and the IEL0AT ASSEMBLE file that establishes the IBM-supplied default values for compiler options, and the two corresponding TEXT files the assembler generates.

Execution-time option defaults are those values assumed if the application programmer does not supply overriding values in the source program or at the start of execution of the program. Figure 1 on page 27 shows the execution-time options and their IBM-supplied default values.

Compiler option defaults are those values assumed if the application programmer does not supply overriding values in *PROCESS statements in the source program or in the PLIOPT command at the time of compilation of a PL/I program. Figure 3 on page 33 shows the compiler options and their IBM-supplied defaults values.

If you are satisfied with the IBM-supplied execution-time and compiler option defaults, answer, No, when the I5734PL3 EXEC asks if you want to change them. Your installation of the OS PL/I Optimizing Compiler and Libraries is complete.

If you want to change any of the option defaults, answer, `Yes`, when the EXEC asks the question, and turn to Chapter 6, "Changing IBM-Supplied Option Defaults" on page 25.

Chapter 3. Installing the Transient Library

This chapter contains the information you need to prepare and install the OS PL/I Transient Library. If you are installing the individual transient library tape, you should read this entire chapter before starting the actual installation process. If you are installing the composite tape, which contains the transient and resident libraries and the compiler, you should use the procedures described in Chapter 2, "Installing the Composite Product" on page 7 to install the product.

This chapter describes the contents of the transient library distribution tape files and gives the details of the following installation steps:

1. Selecting a target disk
2. Obtaining the files you need from the distribution tape
3. Installing the transient library
4. Verifying correct installation

Distribution Tape Contents

The OS PL/I Transient Library is distributed on a VMFPLC2 format 9-track tape as product number 5734-LM5 or as part of the composite product number 5734-PL3, which contains the transient and resident libraries and the compiler. The *Program Directory* distributed with each product describes the files on the tape.

The Transient Library distribution tape files contain the following information:

- The I5734LM5 transient library installation EXEC
- A Memo to Users
- Selected transient library source files, including:
  - The execution-time options file
  - The macro used by the options file (in the form of a MACLIB)
- Transient library TXTLIB
- The installation verification program (IVP) generated module used to verify correct installation of the transient library

Step 1: Selecting a Target Disk and Target Libraries

The target disk for the transient library can be the system minidisk or a private minidisk. See "Preparing for Installation" on page 4 for more information about system and private minidisks and how to choose a target disk.

When you have selected your target disk, make sure it is formatted and linked. We recommend that you format your target disk in 4K blocks.

The installation EXEC, by default, installs the transient library into a CMS TXTLIB named PLILIB. The resident library EXEC installs the resident library into PLILIB TXTLIB, too. The installation EXEC enables you to specify a target library name other than PLILIB TXTLIB, if you want to, or to specify separate TXTLIBs for transient and resident libraries. We recommend that you install both transient and resident libraries into the one target library named PLILIB TXTLIB.

When you run the EXEC, it will place the already built transient library TXTLIB on the target disk. If you are currently using a previous release of the OS PL/I Transient Library, you already have on a disk the following files:

Filename	Filetype
IBMBMAC	MACLIB
PLILIB	TXTLIB
IBMBxxxx	TEXT

Note:

If you select your old product disk as your target disk, and PLILIB as your target library, the installation EXEC will *replace* the old transient library files with the new ones. We recommend that you use a *different* disk so that you can retain your previous PL/I release until you are certain your new product runs on your production system.

We also recommend that, while you are installing *and/or using* your new release of the PL/I transient library, you do not have any disk accessed that contains files from a previous release of the transient library. This includes any files listed in the above table.

Step 2: Obtaining the Files You Need from the Distribution Tape

The distribution materials include an EXEC which installs the transient library for you. The EXEC contains prompts which guide you through the installation process and help you change the execution-time option default values, if you want to change them during the installation process. The process of changing the execution-time option defaults is described in Chapter 6, "Changing IBM-Supplied Option Defaults" on page 25.

To obtain the files you need to install the transient library, you must perform the following steps:

1. Mount the distribution tape at virtual address 181.

2. If you are installing your PL/I product

   a. as part of a VM/System Offering:

      1) Invoke the VM/SP EXEC INSTFPP. It will list the products on the tape and ask you to select the one you want to install.
      2) Select the OS PL/I Transient Library. INSTFPP will load the Memo to Users and the installation EXEC onto a work disk. It will then print the Memo to Users and invoke the I5734LM5 installation EXEC.

   b. by itself:

      1) Execute the command `VMFPLC2 LOAD * * xn`, where `xn` is the filemode of the target disk. This loads the installation EXEC onto the target disk. *Do not move the tape.*
      2) Invoke the I5734LM5 EXEC.

Step 3: Installing the Distribution Tape

The I5734LM5 installation EXEC contains prompts that guide you through the installation process. If, at any time after invoking the installation EXEC, you want to stop the installation process, you can do so by responding to any prompt with `QUIT`.

The EXEC will ask for the following information:

1. The address of the disk where the transient library is to be installed

2. The file mode in which the disk is to be accessed

3. The name of the target library in which you want to install the transient library, if different from PLILIB TXTLIB

The EXEC will then install the transient library files in PLILIB TXTLIB (or the library you chose) on the disk you designated. If you are installing using INSTFPP, the I5734LM5 EXEC will also place a copy of itself on the target disk for future use.

Step 4: Verifying Your Installation

The transient library distribution materials include a generated module of the installation verification program (IVP) that you can use to verify the success of your installation. The I5734LM5 EXEC will now ask if you want to run this program to make certain your transient library is properly installed. You can find more information on the IVP under "sample program" in *OS PL/I Optimizing Compiler: Programmer's Guide*.

Successful execution of the IVP generates the message, `VERIFICATION COMPLETED SUCCESSFULLY`. If the program does not execute correctly, the EXEC issues the message, `VERIFICATION FAILED`, and explains which step failed. If this happens, review the installation procedure and ensure that you have performed all steps correctly.

Changing Execution-Time Option Defaults

Included with the transient library you have just installed are the IBMBXOPT ASSEMBLE file that establishes the IBM-supplied default values for the OS PL/I execution-time options, and the TEXT file generated by it. Execution-time option defaults are those values assumed if the application programmer does not supply overriding values in the source program or at the start of execution of the program.

The execution-time options and their IBM-supplied defaults are shown in Figure 1 on page 27. If you are satisfied with the IBM-supplied defaults, answer, `No`, when the I5734LM5 EXEC asks if you want to change the defaults. Your installation of the OS PL/I Transient Library is complete.

If you want to change the execution-time option defaults, answer, `Yes`, when the I5734LM5 EXEC asks the question, and turn to Chapter 6, "Changing IBM-Supplied Option Defaults" on page 25.

Chapter 4. Installing the Resident Library

This chapter contains the information you need to prepare and install the OS PL/I Resident Library. If you are installing the individual resident library tape, you must first install the individual transient library tape. You should also read this entire chapter before starting the actual installation process for the resident library.

If you are installing the composite tape, which contains the transient and resident libraries and the compiler, you should use the procedures described in Chapter 2, "Installing the Composite Product" on page 7 to install the product.

This chapter describes the contents of the resident library distribution tape files and gives the details of the following installation steps:

1. Selecting a target disk
2. Obtaining the files you need from the distribution tape
3. Installing the resident library
4. Verifying correct installation

Distribution Tape Contents

The OS PL/I Resident Library is distributed on a VMFPLC2 format 9-track tape as product number 5734-LM4 or as part of the composite product number 5734-PL3, which contains the resident and transient libraries and the compiler. The *Program Directory* distributed with each product tape describes the files on the tape. If you are installing the composite product, use the procedure described in Chapter 2, "Installing the Composite Product" on page 7.

The Resident Library distribution tape files contain the following information:

- The I5734LM4 resident library installation EXEC
- A Memo to Users
- Resident library TXTLIB
- Installation verification program (IVP) compiled code to verify correct installation of the transient and resident libraries

Step 1: Selecting a Target Disk and Target Library

The target disk for the resident library can be the system minidisk or a private minidisk. See "Preparing for Installation" on page 4 for more information about system and private minidisks and how to choose a target disk.

The installation EXEC, by default, adds the resident library to the existing CMS TXTLIB named PLILIB. The installation EXEC enables you to specify the target library you chose for the transient library, if not PLILIB, or to choose a separate TXTLIB from the one into which you installed the transient library. We recommend that you add the resident library to PLILIB TXTLIB, or to the target library you chose for the transient library.

If you choose to install your resident library onto a different disk from the one on which you put your transient library, make sure the disk is formatted and linked. We recommend that you format your target disk in 4K blocks.

If you choose to install the resident library into the same TXTLIB in which you installed the transient library, then that TXTLIB must already exist on the target disk. Resident library text decks will be added to the the transient library text decks in the TXTLIB on that disk.

If you are installing your resident library in a different target library from the transient library's, the transient library TXTLIB does not need to be on the target disk. The transient library *must*, however, be on an accessed disk in order for the installation verification program to run successfully.

Note:

We recommend that, while you are installing *and/or using* your new release of the resident library, you do not have any disk accessed that contains any files from a previous release of the resident library. This includes any IBMBxxxx TEXT files.

Step 2: Obtaining the Files You Need from the Distribution Tape

The distribution materials include an EXEC which installs the resident library for you. The EXEC contains prompts which guide you through the installation process.

To obtain the files you need to install the resident library, you must perform the following steps:

1. Mount the distribution tape at virtual address 181.

2. If you are installing your PL/I product

   a. as part of a VM/System Offering:

      1) Invoke the VM/SP EXEC INSTFPP. It will list the products on the tape and ask you to select the one you want to install.
      2) Select the OS PL/I Resident Library. INSTFPP will load the Memo to Users and the installation EXEC onto a work disk. It will then print the Memo to Users and invoke the I5734LM4 installation EXEC.

   b. by itself:

      1) Execute the command `VMFPLC2 LOAD * * xn`, where `xn` is the filemode of the target disk. This loads the installation EXEC onto the target disk. *Do not move the tape.*
      2) Invoke the I5734LM4 EXEC.

Step 3: Installing the Distribution Tape

The I5734LM4 installation EXEC contains prompts that guide you through the installation process. If, at any time after invoking the installation EXEC, you want to stop the installation process, you can do so by responding to any prompt with `QUIT`.

The EXEC will ask for the following information:

1. The address of the disk where the resident library is to be installed

2. The file mode in which the disk is to be accessed

3. Whether you are installing the resident library into the same TXTLIB in which you installed the transient library. If your answer is:

   a. `Yes`, the EXEC asks the name of the transient library TXTLIB, then adds the resident library to it. *This step can take a few minutes.*

   b. `No`, the EXEC asks the name of the resident library's target library. The EXEC will then install the resident library files in the library you chose on the disk you designated.

If you are installing using INSTFPP, the I5734LM4 EXEC will also place a copy of itself on the target disk for future use.

Step 4: Verifying Your Installation

The resident library distribution materials include a compiled copy of the installation verification (IVP) program that you can use to verify the success of your installation. The I5734LM4 EXEC will now ask if you want to run this program to make certain your resident and transient libraries are properly installed. You can find more information on the IVP under "sample program" in *OS PL/I Optimizing Compiler: Programmer's Guide.*

Successful execution of the IVP generates the message, `VERIFICATION COMPLETED SUCCESSFULLY`. If the program does not execute correctly, the EXEC issues the message, `VERIFICATION FAILED`, and explains which step failed. If this happens, review the installation procedure and ensure that you have performed all steps correctly.

Chapter 5. Installing the Optimizing Compiler

This chapter contains the information you need to prepare and install the OS PL/I Optimizing Compiler. If you are installing the individual compiler tape, you must first install the individual transient and resident library tapes. You should also read this entire chapter before starting the actual installation process for the compiler.

If you are installing the composite tape, which contains the transient and resident libraries and the compiler, you should use the procedures described in Chapter 2, "Installing the Composite Product" on page 7 to install the product.

This chapter describes the contents of the compiler distribution tape files and gives the details of the following installation steps:

1. Selecting a target disk
2. Obtaining the files you need from the distribution tape
3. Installing the compiler
4. Verifying correct installation

Distribution Tape Contents

The OS PL/I Optimizing Compiler is distributed on a VMFPLC2 format 9-track tape as product number 5734-PL1 or as part of the composite product number 5734-PL3, which contains the transient and resident libraries and the compiler. The *Program Directory* distributed with each product tape describes the files on the tape. If you are installing the composite product, use the procedure described in Chapter 2, "Installing the Composite Product" on page 7.

The Optimizing Compiler distribution tape files contain the following information:

- The I5734PL1 compiler installation EXEC
- A Memo to Users
- Selected compiler source files, including:
  - The compiler options file
  - The macro used by the options file (in the form of a MACLIB)
- Compiler generated MODULE files

- Compiler TEXT files
- Installation verification program (IVP) source code to verify correct installation of the compiler and libraries

Step 1: Selecting a Target Disk

The target disk for the optimizing compiler can be the system minidisk or a private minidisk. See "Preparing for Installation" on page 4 for more information about system and private minidisks and how to choose a target disk.

The installation EXEC places the compiler TEXT and MODULE files on the target disk. If you have chosen a different target disk from the one where you installed your transient and resident libraries, make sure it is formatted and linked. We recommend that you format your target disk in 4K blocks.

If you are currently using a previous release of the OS PL/I Optimizing Compiler, you already have on a disk the following files:

Filename	Filetype
PLICOMP	MACLIB
DMSPLIO	TEXT
SAMPLE	PLIOPT
IEL*	TEXT
IEL*	MODULE
PLIOPT	MODULE

Note:

If you select the disk that contains a previous release of PL/I as your target disk, the installation EXEC will *replace* the old compiler files with the new ones. We recommend that you use a *different* disk so that you can retain your previous PL/I release until you are certain your new product runs on your production system.

We also recommend that, while you are installing *and/or using* your new release of the optimizing compiler, you do not have any disk accessed that contains files from a previous release of the optimizing compiler. This includes any of the files listed in the above table.

Step 2: Obtaining the Files You Need from the Distribution Tape

The distribution materials include an EXEC which installs the compiler for you. The EXEC contains prompts which guide you through the installation process and help you change the compiler option default values, if you want to change them during the installation process. The process of changing the compiler option defaults is described in Chapter 6, "Changing IBM-Supplied Option Defaults" on page 25.

To obtain the files you need to install the compiler, you must perform the following steps:

1. Mount the distribution tape at virtual address 181.

2. If you are installing your PL/I product

   a. as part of a VM/System Offering:

      1) Invoke the VM/SP EXEC INSTFPP. It will list the products on the tape and ask you to select the one you want to install.
      2) Select the OS PL/I Optimizing Compiler. INSTFPP will load the Memo to Users and the installation EXEC onto a work disk. It will then print the Memo to Users and invoke the I5734PL1 installation EXEC.

   b. by itself:

      1) Execute the command `VMFPLC2 LOAD * * xn`, where `xn` is the filemode of the target disk. This loads the installation EXEC onto the target disk. *Do not move the tape.*
      2) Invoke the I5734PL1 EXEC.

Step 3: Installing the Distribution Tape

The I5734PL1 installation EXEC contains prompts that guide you through the installation process. If, at any time after invoking the installation EXEC, you want to stop the installation process, you can do so by responding to any prompt with `QUIT`.

The EXEC will ask for the following information:

1. The address of the disk where the compiler is to be installed.

2. The file mode in which the disk is to be accessed.

The EXEC will then install the compiler files on the disk you designated. If you are installing using INSTFPP, the I5734PL1 EXEC will also place a copy of itself on the target disk for future use.

The compiler TEXT files will be loaded with a filemode of `x1`, where `x` is the filemode letter you chose above, and the MODULE files will be loaded with a filemode of `x2`.

Because already generated MODULE files are provided on the compiler distribution tape, you will need the TEXT files only when you need to regenerate compiler MODULE files after changing the compiler option defaults or applying maintenance to the compiler. You can 'hide' the TEXT files, and thereby save main storage space and access time, by accessing the compiler disk with the command, `ACCESS cuu x/A * * x2`, where `x` is the filemode letter you usually use to access the compiler during normal production. This allows only the MODULE files to be included in the CMS resident directory.

Step 4: Verifying Your Installation

The compiler distribution materials include an installation verification (IVP) program that you can use to verify the success of your installation. The I5734PL1 EXEC will now ask if you want to compile and run this program to make certain your compiler and libraries are correctly installed. You can find more information on the IVP under "sample program" in *OS PL/I Optimizing Compiler: Programmer's Guide.*

The compilation of the IVP generates one error level (E) and several warning level (W) diagnostic messages from the preprocessor and the compiler. These messages are normal and can be ignored. Successful execution of the IVP generates the message, `VERIFICATION COMPLETED SUCCESSFULLY`. If the program does not compile or does not run correctly, the EXEC issues the message, `VERIFICATION FAILED`, and explains which step failed. If this happens, review the installation procedure and ensure that you have performed all steps correctly.

Changing Compiler Option Defaults

Included in the compiler you have just installed is the IEL0AT ASSEMBLE file that establishes the IBM-supplied default values for the OS PL/I compiler options, and the TEXT file generated by it. Compiler option defaults are those values assumed if the application programmer does not supply overriding values in *PROCESS statements in the source program or in the PLIOPT command at the time of compilation of a PL/I program.

The compiler options and their IBM-supplied defaults are shown in Figure 3 on page 33. The defaults supplied by IBM are shown in the right-hand column of Figure 3. If you are satisfied with the IBM-supplied compiler option defaults, answer, "No," when the I5734PL1 EXEC asks if you want to change the defaults. Your installation of the OS PL/I Optimizing Compiler is complete.

If you want to change the compiler option defaults, answer, "Yes," when the I5734PL1 EXEC asks the question, and turn to Chapter 6, "Changing IBM-Supplied Option Defaults" on page 25.

Chapter 6. Changing IBM-Supplied Option Defaults

Included with the installation materials for the OS PL/I products are macros that establish defaults values for the OS PL/I execution-time and compiler options. The transient library contains the IBMBXOPT ASSEMBLE file, which establishes execution-time option defaults, and the compiler contains the IEL0AT ASSEMBLE file, which establishes the compiler option defaults.

IBM has provided default values for all of the options; these are in effect immediately when the products are installed. You may, however, at any time after installation, change the IBM-supplied default values to better suit the particular needs of your site.

This chapter provides the following information:

- A figure showing the execution-time options and the default values established for them by IBM.
- Descriptions of the execution-time options used under CMS and all their possible values.
- A discussion of how to code your changes to the execution-time options macro PLTRLIB in source file IBMBXOPT ASSEMBLE.
- A figure showing the compiler options and the default values established for them by IBM.
- Descriptions of the compiler options and all their possible values.
- A discussion of how to code your changes to the compiler options macro PLIXOPC in source file IEL0AT ASSEMBLE.

The installation EXECs shipped with the transient library, compiler, and composite product ask, immediately after installing the products and before the EXECs terminate, if you want to change option defaults. If you have come here at installation time, you have answered `YES` to that question.

If you choose to change option defaults after your product is installed and running, you can use the UPDATE option of an installation EXEC, as shown in the following table:

If you installed the:	Invoke the installation EXEC as follows:	To change defaults for:
Transient Library	I5734LM5 UPDATE	Execution-time options
Optimizing Compiler	I5734PL1 UPDATE	Compiler options
Optimizing Compiler and Libraries	I5734PL3 UPDATE	Execution-time options Compiler options

The following sections describe the options and how to code the macro invocations used to establish them.

Changing Execution-Time Option Defaults

The execution-time options and their IBM-supplied defaults are shown in Figure 1. If you want to change *only* compiler option defaults, go to "Changing Compiler Option Defaults" on page 30.

The EXEC's response is to make a backup copy, named IBMBXOPT ORIGINAL, of the IBMBXOPT ASSEMBLE file. The EXEC then invokes XEDIT and instructs you to modify the IBMBXOPT ASSEMBLE file to suit your site's needs. IBMBXOPT ORIGINAL is kept as an unchanged copy of the IBM-supplied defaults, in case you ever need or want to go back to them.

If you are changing the defaults after you have been using the product for a while, you have invoked the EXEC with the UPDATE option. In this case the EXEC's first response is to search for an IBMBXOPT ORIGINAL file; if it does not find one, it creates one, as described above, and stores it. It then invokes XEDIT and instructs you to modify IBMBXOPT ASSEMBLE.

Modifying the Execution-Time Option Defaults

You can change the execution-time option defaults by editing the PLTRLIB macro operands in the IBMBXOPT ASSEMBLE file. Figure 1 on page 27 gives an example of how the macro might appear in the IBMBXOPT ASSEMBLE file. It also shows the IBM-supplied default values for both the NONTASK option and the TASK option. You need to change only the NONTASK option values, as the TASK option is not supported under CMS and is therefore ignored.

```
Macro    Operands (IBM-supplied defaults)                              Sequence

PLTRLIB NONTASK=(ISASIZE=0,       BEGIN NONTASK PART    DEFAULT   X10000000
        NOREPORT,                                       DEFAULT   X16000000
        SPIE,                                           DEFAULT   X22000000
        STAE,                                           DEFAULT   X29000000
        HEAP=(0,4K,ANYWHERE,KEEP),                      DEFAULT   X36000000
        ISAINC=(0)),              END OF NONTASK LIST   DEFAULT   X43000000
        TASK=(ISASIZE=(8192,8192,20),                   DEFAULT   X50000000
        NOREPORT,                                       DEFAULT   X57000000
        SPIE,                                           DEFAULT   X64000000
        STAE,                                           DEFAULT   X71000000
        HEAP=(0,4K,ANYWHERE,KEEP),                      DEFAULT   X78000000
        TASKHEAP=(0,4K,ANYWHERE,KEEP),                  DEFAULT   X85000000
        ISAINC=(0,0)),                                  DEFAULT   X92000000
        ARCH=STD                                        DEFAULT    95000000
END                                                               99999999
```

Notes:

1. *The PLTRLIB macro is also used by OS PL/I under the IBM MVS and MVS/XA operating systems, where separate options are needed for non-tasking and multitasking environments. The NONTASK operand and its options are the only ones used under CMS, so theirs are the only values you should consider and/or change.*

2. *The ANYWHERE argument of the HEAP option has no effect under CMS, but you must code it or its alternative, BELOW.*

3. *The ARCH option is used only under the MVS and MVS/XA operating systems, and has no effect under CMS. It must remain ARCH=STD; if it is changed, the macro will not assemble.*

Figure 1. Example of PLTRLIB Macro in IBMBXOPT ASSEMBLE File

Coding Conventions

The coding conventions used in the example in Figure 1, and in the PLTRLIB macro invocation in IBMBXOPT ASSEMBLE, and in the following discussion, are as follows:

- Operands are separated by commas.
- Uppercase letters, numbers, and punctuation marks must be coded exactly as shown.
- Brackets [] must never be coded.
- Lowercase letters and words represent variables for which you must substitute specific information.
- Items or groups of items within brackets [] are optional. They may be omitted at your discretion.

Description of PLTRLIB Macro Operands

The following list describes the operands of the PLTRLIB macro. Each operand corresponds to an execution-time option. The list will help you determine which option values are most useful for your site's needs and whether you must change some of the IBM-supplied defaults to meet those needs. Some of these options have an impact on performance; you should consider this when setting the defaults.

NONTASK=([HEAP=(*size*,*increment*,ANYWHERE | BELOW,KEEP | FREE)]
[,ISAINC=*size*]
[,ISASIZE=*size*]
[,REPORT | NOREPORT]
[,SPIE | NOSPIE]
[,STAE | NOSTAE])
specifies the execution-time options used under CMS.

HEAP=(*size*,*increment*,ANYWHERE | BELOW,KEEP | FREE)
isolates storage for allocated (that is, CONTROLLED and dynamically allocated BASED) variables from all other PL/I storage and specifies how that storage is to be handled.

size
optional. If specified, it determines the minimum initial size of HEAP storage, and is specified in bytes or as nnnK or as nnM. If not specified, no HEAP area is used. The IBM-supplied default is HEAP=0, that is, the HEAP option is *not* in effect.

increment
optional. If specified, it determines the minimum size of any subsequent increment to the HEAP area. The IBM-supplied default value for the HEAP increment is 4K.

ANYWHERE
In CMS, use of ANYWHERE has no effect.

BELOW
In CMS, use of BELOW has no effect.

Note: ANYWHERE and BELOW operate in an MVS environment, only, but one or the other *must* be specified under CMS.

KEEP
specifies that storage allocated to a HEAP increment will *not* be released when a FREE statement in the program deallocates the last variable stored there. This is the IBM-supplied default.

FREE
specifies that storage allocated to a HEAP increment will be released when the variable occupying it is FREEd.

ISAINC=*size*
specifies the minimum size of an increment to the ISA.

If ISAINC is not specified, when the storage currently allocated to the ISA is not large enough to handle all of a program's storage requests, only that amount of storage needed at the time of the request is obtained. When ISAINC is used, the amount of storage allocated when the ISA is too small for the current request is the *larger* of the ISAINC size or the requested size. Thus the use of the ISAINC option can save the increased execution time caused by frequent GETMAINs of small amounts of storage.

size

specifies the minimum amount by which the ISA will be incremented, and is specified in bytes or as nnnk or nnM. The IBM-supplied default is ISAINC=0.

ISASIZE=*size*

specifies the length of the initial storage area.

size

specified in bytes or as nnnK or nnM. It can be preceded by a minus sign. The storage will be contiguous.

A size of '0' causes PL/I to issue a GETMAIN request for the largest block of contiguous storage in the user program area; PL/I then returns half of that block to the system and retains the other half as its ISA. ISASIZE=0 is the IBM-supplied default in a CMS environment.

The minus sign is used when stating the amount of storage in the user program area that must be left outside the resident load module and the ISA. A value '-0' should not be specified unless the largest possible ISA is required and no files, including SYSPRINT, will be used. Otherwise an ABEND may occur because of lack of system storage.

REPORT

specifies that a program management report is required.

NOREPORT

specifies that no program management report is required. This is the IBM-supplied default.

SPIE

specifies that when a program interrupt occurs, the PL/I error handler is to be used. Under certain circumstances the ERROR condition will be raised. This is the IBM-supplied default.

NOSPIE

specifies that on program initialization, PL/I will not issue the SPIE or ESPIE macro to request control after a program check. Do not use NOSPIE when extended precision variables are used in the PL/I source program.

STAE
: specifies that when an abend occurs, the PL/I library routines are to attempt to raise the ERROR condition or to produce a diagnostic message and a PLIDUMP. This is the IBM-supplied default.

NOSTAE
: specifies that on program initialization, PL/I will not issue the STAE or ESTAE macro to request control after an abend.

When you have modified IBMBXOPT ASSEMBLE to suit your site's needs, file it. The EXEC will automatically reASSEMBLE the updated IBMBXOPT file. If an error is found, a message describing the error will be issued and you will be asked if you want to edit IBMBXOPT ASSEMBLE again. Correct the errors in IBMBXOPT ASSEMBLE and file it again.

When you have finished modifying the IBMBXOPT ASSEMBLE file and have filed it, the EXEC will assemble it and produce an IBMBXOPT TEXT file. The EXEC will add the updated TEXT file to the transient library.

You can run the installation verification program again by issuing the command, `I5734LM5 VERIFY`, or `I5734PL3 VERIFY`. If the EXEC is I5734PL3, which installs the composite product, it will ask if you want to alter the compiler option defaults.

Changing Compiler Option Defaults

The compiler options and their IBM-supplied defaults, as specified by IBM in the PLIXOPC macro, are shown in Figure 2 on page 31.

The EXEC's response is to make a backup copy, named IEL0AT ORIGINAL, of the IEL0AT ASSEMBLE file. The EXEC then invokes XEDIT and instructs you to modify the IEL0AT ASSEMBLE file to suit your site's needs. IEL0AT ORIGINAL is kept as an unchanged copy of the IBM-supplied defaults, in case you ever need or want to go back to them.

If you are changing the defaults after you have been using the product for a while, you have invoked the EXEC with the UPDATE option. In this case, the EXEC's first response is to search for an IEL0AT ORIGINAL file; if it does not find one, it creates one, as described above, and stores it. It then invokes XEDIT and instructs you to modify IEL0AT ASSEMBLE.

Modifying the Compiler Options Module

You can change the compiler option defaults by editing the PLIXOPC macro invocation operands in the IEL0AT ASSEMBLE file. Figure 2 on page 31 shows the macro invocation as it appears in the IBM-supplied IEL0AT ASSEMBLE file.

```
Macro    Operands (IBM-supplied defaults)                                  Sequence

PLIXOPC AGGREGA=NO,                                    DEFAULT      X00010000
        ATTRIBU=NO,                                    DEFAULT      X00020000
        CHARSET=(EBCDIC,60),                           DEFAULT      X00030000
        COMPILE=NOS,                                   DEFAULT      X00040000
        CONTROL='OPTIMIZE',                            DEFAULT      X00050000
        COUNT=NO,                                      DEFAULT      X00060000
        DECK=NO,                                       DEFAULT      X00070000
        ESD=NO,                                        DEFAULT      X00080000
        FLAG=W,                                        DEFAULT      X00090000
        FLOW=(NO,25,10),                               DEFAULT      X00100000
        FMARGIN=(2,72),                                DEFAULT      X00110000
        FSEQUEN=(73,80),                               DEFAULT      X00120000
        GONUMBE=NO,                                    DEFAULT      X00130000
        GOSTMT=NO,                                     DEFAULT      X00140000
        GRAPHIC=(4040,427D,42C7,0E,0F),                DEFAULT      X00150000
        IMPRECI=NO,                                    DEFAULT      X00160000
        INCLUDE=NO,                                    DEFAULT      X00170000
        INSOURC=NO,                                    DEFAULT      X00180000
        INTERRU=NO,                                    DEFAULT      X00190000
        LINECOU=55,                                    DEFAULT      X00200000
        LIST=NO,                                       DEFAULT      X00210000
        LMESSAG=YES,                                   DEFAULT      X00220000
        MACRO=NO,                                      DEFAULT      X00230000
        MAP=NO,                                        DEFAULT      X00240000
        MARGINI=NO,                                    DEFAULT      X00250000
        MDECK=NO,                                      DEFAULT      X00260000
        NEST=NO,                                       DEFAULT      X00270000
        NUMBER=YES,                                    DEFAULT      X00280000
        OBJECT=YES,                                    DEFAULT      X00290000
        OFFSET=NO,                                     DEFAULT      X00300000
        OPTIMIZ=NO,                                    DEFAULT      X00310000
        OPTIONS=NO,                                    DEFAULT      X00320000
        SIZE=MAX,                                      DEFAULT      X00330000
        SOURCE=NO,                                     DEFAULT      X00340000
        STMT=NO,                                       DEFAULT      X00350000
        STORAGE=NO,                                    DEFAULT      X00360000
        SYNTAX=NOS,                                    DEFAULT      X00370000
        TERMINA=YES,                                   DEFAULT      X00380000
        TSTAMP=NO,                                     DEFAULT      X00390000
        VMARGIN=(10,100),                              DEFAULT      X00400000
        VSEQUEN=(1,8),                                 DEFAULT      X00410000
        XREF=(NO,F)                                    DEFAULT       00420000
*       DELETE=( , , , , , )                           DEFAULT       00430000
 END                                                                  00440000
```

Notes:

1. *The actual macro coded in the IEL0AT source module on your distribution tape may have changed since this book was written, so you must look at that module before you attempt to make changes with your USERMOD.*

2. *Default values will always be used at compilation time for any options specified in the DELETE option. If you plan to use the DELETE option, you must make some changes to IEL0AT before assembling it. You must remove the asterisk from column one of the DELETE line, add a comma after the XREF specification, and add a continuation character in column 72 of the XREF line.*

Figure 2. Example of PLIXOPC Macro Invocation in IEL0AT ASSEMBLE File

The following section discusses the compiler options, describes those that can be used only at installation time, and explains how to code your changes to the macro invocation.

Coding Conventions

The coding conventions used in coding the compiler options in the PLIXOPC macro in Figure 2 on page 31 and in IEL0AT ASSEMBLE, in Figure 3 on page 33, and in the following discussion, are as follows:

- Operands are separated by commas.
- Uppercase letters, numbers, and punctuation marks must be coded exactly as shown.
- Brackets [], and braces {}, must never be coded.
- Lowercase letters and words represent variables for which you must substitute specific information.
- Groups of items within braces {} are related. One of the items must be coded.
- Items or groups of items within brackets [] are optional. They may be omitted at your discretion.

Description of PLIXOPC Macro Operands

The PLIXOPC macro operands, all their possible values, and their IBM-supplied default values, are shown in Figure 3 on page 33.

Some PLIXOPC operands can be used only at installation time. These are indicated by an asterisk (*) in Figure 3, and are described in "Compiler Options Whose Use is Restricted" on page 34.

All the other PLIXOPC operands correspond to compiler options used for application programming. Detailed descriptions of these options are provided in *OS PL/I Optimizing Compiler: Programmer's Guide.*

Allowing for Compiler Option Interdependencies

Some compiler options, such as STMT, GOSTMT, and NUMBER, are interdependent at compile-time. If, for example, you specify STMT at compile-time to override the IBM-supplied default of NOSTMT (STMT=NO), the compiler automatically performs the compilation as if you had also specified GOSTMT and NONUMBER, even if you did not. These interdependencies are described fully in *OS PL/I Optimizing Compiler: Programmer's Guide.*

The automatic adjustment of one compiler option based on the setting of another compiler option does *not* take place at installation time. If you change the IBM-supplied default value for STMT from STMT=NO to STMT=YES, you must also change the defaults for NUMBER and GOSTMT.

Compiler Option	IBM-Supplied Defaults
AGGREGA={YES|NO}	NO
ATTRIBU={YES|NO}	NO
CHARSET=([{EBCDIC|BCD}][,{48|60}])	(EBCDIC,60)
COMPILE={YES|NO|NOW|NOE|NOS}	NOS
CONTROL='charstring'	OPTIMIZE
COUNT={YES|NO}	NO
DECK={YES|NO}	NO
ESD={YES|NO}	NO
FLAG={I|W|E|S}	W
FLOW=({YES|NO}[,n,p])	(NO,25,10)
*FMARGIN=({m,n}[,c])	(2,72)
*FSEQUEN={(m,n)|NO}	(73,80)
GONUMBE={YES|NO}	NO
GOSTMT={YES|NO}	NO
*GRAPHIC=(pad,quote,g,ld,rd)	(4040,427D,42C7,0E,0F)
IMPRECI={YES|NO}	NO
INCLUDE={YES|NO}	NO
INSOURC={YES|NO}	NO
INTERRU={YES|NO}	NO
LINECOU=n	55
LIST={YES|NO}	NO
LMESSAG={YES|NO}	YES
MACRO={YES|NO}	NO
MAP={YES|NO}	NO
MARGINI={NO|'character'}	NO
MDECK={YES|NO}	NO
NEST={YES|NO}	NO
NUMBER={YES|NO}	YES
OBJECT={YES|NO}	YES
OFFSET={YES|NO}	NO
OPTIMIZ=[{NO|TIME}]|[{0|2}]	NO|0
OPTIONS={YES|NO}	NO
SIZE={n|nk|MAX}	MAX
SOURCE={YES|NO}	NO
STMT={YES|NO}	NO
STORAGE={YES|NO}	NO
SYNTAX={YES|NO|NOW|NOE|NOS}	NOS
TERMINA={YES|NO|(option list**)}	YES
*TSTAMP={YES|NO}	NO
*VMARGIN={(m,n}[,c])	(10,100)
*VSEQUEN={(m,n)|NO}	(1,8)
XREF={YES|NO}|({YES|NO}[,...]])	(NO,F)
*DELETE=(item[,item[,...])	-

* Options used at installation time only. These options are not available to the application programmer.

** See *OS PI/I Optimizing Compiler: Programmer's Guide* for a list of valid options.

Figure 3. Compiler Options and Their IBM-Supplied Defaults

Compiler Options Whose Use is Restricted

Some compiler options, marked with an asterisk (*) in Figure 3, cannot be used by the application programmer; they are used at the time of installation, only. These are described below.

GRAPHIC=(pad,quote,g,ld,rd)

used to replace IBM defaults for the graphic padding, left delimiter, right delimiter, graphic quotation mark, and the graphic "G" for graphic string data. An example of specifying the GRAPHIC operand is:

```
GRAPHIC=(4040,427D,42C7,0E,0F)
```

pad

specifies the hexadecimal padding. The first byte of the padding must be the same as the second byte. For example, X'5050' is valid, but X'5060' is not. The IBM-supplied default is X'4040'.

quote

is the hexadecimal representative of the graphic quotation mark. The IBM-supplied default is X'427D'.

g

is the hexadecimal representation of the graphic "G". The IBM-supplied default is X'42C7'.

Note: If the preprocessor is used, you may not specify X'00' through X'06' in either byte of the graphic quotation mark ("quote" option) or graphic "G" ("g" option).

ld

specifies the hexadecimal left delimiter. The IBM-supplied default is X'0E'. You must use X'0E' for the left delimiter, since this is an IBM hardware-generated character.

rd

specifies the hexadecimal right delimiter. The IBM-supplied default is X'0F'. You must use X'0F' for the right delimiter, since this is an IBM hardware-generated character.

Note: If the preprocessor is used, you may not specify values X'00' through X'06' in the left or right delimiter ("ld" or "rd" options). The left or right delimiter also may not be set to any character in the 60-character set described in *OS and DOS PL/I Language Reference Manual.*

FMARGIN=(*m*,*n*[,*c*])

specifies that MARGINS(m,n,c) will be the default when the source is read from fixed length records. The IBM-supplied default for this option is (2,72).

VMARGIN=(*m*,*n*[,*c*])
specifies that MARGINS(m,n,c) will be the compiler option default when the source is read from variable or undefined length records.

The IBM-supplied default for this option is (10,100).

FSEQUEN=NO | (*m*,*n*)
specifies defaults for the SEQUENCE compiler option if the source input file is F-format.

NO
specifies that NOSEQUENCE will be the compiler option default for F-format input records.

(*m*,*n*)
specifies that SEQUENCE (m,n) will be the compiler option default.

The IBM-supplied default for this option is (73,80).

VSEQUEN=NO | (*m*,*n*)
specifies defaults for the SEQUENCE compiler options if the first source input file is V- or U-format.

NO
specifies that NOSEQUENCE will be the compiler option default for V- or U-format input records.

(*m*,*n*)
specifies that SEQUENCE (m,n) will be the compiler option default.

The IBM-supplied default for this option is (1,8).

TSTAMP=YES | NO
specifies whether or not the compiler is to place the time and date of compilation in the STATIC INTERNAL CSECT, in a location indicated by the first word in the STATIC INTERNAL CSECT. This provides a time-stamping facility if you prefer not to use the COMPILETIME preprocessor function in all your programs.

YES
specifies that the time and date of compilation is to be placed in the STATIC INTERNAL CSECT.

NO
specifies that the time and date of compilation is not to be placed in the STATIC INTERNAL CSECT. This is the IBM-supplied default.

DELETE=(*item*[,*item*[,...])

specifies that the options in the list cannot be used at compilation time in the *PROCESS statement or on the PLIOPT command to override the default options established by the PLIXOPC macro instruction, unless the CONTROL option is also specified with the correct password. One or more of the following options can be specified. All but DUMP, which cannot be used at installation time, are shown in Figure 2 on page 31.

AGGREGA	FLOW	INTERRU	NEST	STMT
ATTRIBU	FMARGIN	LINECOU	NUMBER	STORAGE
CHARSET	FSEQUEN	LIST	OBJECT	SYNTAX
COMPILE	GONUMBE	LMESSAG	OFFSET	TERMINA
COUNT	GOSTMT	MACRO	OPTIMIZ	VMARGIN
DECK	GRAPHIC	MAP	OPTIONS	VSEQUEN
DUMP	IMPRECI	MARGINI	SIZE	XREF
ESD	INCLUDE	MDECK	SOURCE	
FLAG	INSOURCE			

When you have modified IEL0AT ASSEMBLE to suit your site's needs, file it. The EXEC will automatically reASSEMBLE the updated IEL0AT file.

If an error is found, a message describing the error will be issued and you will be asked if you want to edit IEL0AT ASSEMBLE again. Remember that some of the compiler options are interdependent, as explained in "Allowing for Compiler Option Interdependencies" on page 32. If you changed the IBM-supplied default value for one option without changing those that relate to it, an IELnnnn error message will explain the inconsistency in the option settings. You must change the noted option defaults accordingly.

Correct the errors in the IEL0AT ASSEMBLE file and file it again. The EXEC will assemble it and produce an IEL0AT TEXT file. The EXEC will then add the updated TEXT file to the compiler.

You can run the installation verification program again by issuing the command I5734PL1 VERIFY or I5734PL3 VERIFY.

Appendix. Applying Service to PL/I

This section summarizes how to apply service to your OS PL/I product(s). It describes the different formats in which service is distributed, and explains how to install the service as provided in each format.

Service Distribution Formats

Service updates are distributed periodically by IBM in response to problems encountered in IBM program products. Two formats are used for distribution of service updates: PUT tapes and PTFs.

PUT, or program update, tapes are distributed several times a year to provide you with all the new fixes to problems in IBM program products that operate under your operating system. The VM PUT tape is distributed in VMFPLC2 format, and the files on the tape are organized as follows:

File 1: VMSERV EXEC
File 2: Memos to Users for all program products represented on this PUT
File 3: First product's service EXEC
File 4: First product's service files
File 5: Second product's service EXEC
•
•
•
File n: Last product's service EXEC
File n+1: Last product's service files

A PTF, or program temporary fix, is a correction for a single known problem in a particular product. As soon as a new problem is identified and the solution is established, a PTF is created and made available on tape. You can request a cumulative tape on which all the PTFs you need for your site are stacked. The PTF tape is distributed in VMFPLC2 format. It contains *only* the TEXT file or files required for the particular PTFs you have requested.

PL/I PTF tapes do not include service EXECs, but if you have previously installed PL/I service from a PUT tape, you can use the PL/I service EXECs that were provided on the PUT tape. If you do not have the PL/I service EXECs at your site, and you need assistance installing a PTF tape, you should contact your IBM software support center.

For the OS PL/I Optimizing Compiler and Libraries, there are three service EXECs. Each EXEC is named for the particular PL/I product component to which it applies service, as shown in the following table:

EXEC Name	Product Name
5734PL1A	OS PL/I Optimizing Compiler
5734LM5A	OS PL/I Transient Library
5734LM4A	OS PL/I Resident Library

Installing PL/I Service from a PUT Tape

If you are installing a PUT tape, the service EXECs are included on the tape, and are invoked by VMSERV. To apply PL/I fixes distributed on a PUT tape, you must perform the following steps:

1. Make a copy of your current PL/I product on another disk. (If something goes wrong while you are applying the service, this ensures that you have a clean, working version of your current product.) Make sure one of these two product disks is *not* accessed while you are installing the PUT tape. Access the other disk as your **target** disk, with a filemode of **B**.

2. Choose a second disk to be used as a **staging** disk. The service EXEC will later access this disk with a filemode of **A**.

3. Choose a third disk to contain the VMSERV EXEC. Access this disk with a filemode of **C**.

4. Mount the PUT tape at virtual address 181.

5. Issue the command `VMFPLC2 LOAD * * C` to load the VMSERV EXEC onto the C disk.

6. Issue `VMSERV`. The VMSERV EXEC asks if you want to print the Memos to Users. If you answer yes, the EXEC issues the print command and then terminates.

7. Read the Memo(s) to Users for the PL/I service file(s). They contain more specific and detailed instructions for installing this service. When you have read the Memo(s) to Users, issue `VMSERV` again, and answer "No" to the Memos to Users prompt.

8. The VMSERV EXEC now asks if you want to install service.

9. Answer "Yes" to this prompt. VMSERV now loads the first service EXEC, advances the tape to the beginning of the first service file, and invokes the service EXEC to install the first service file.

10. The service EXEC asks for the address of the staging disk you have chosen. If you do not provide an address, the service EXEC defines a temporary minidisk at virtual address 002 and accesses it with a filemode of **A**.

11. The service EXEC then loads the service file(s) onto the A disk and installs the service from the A disk onto the target B disk. If an error occurs, VMSERV issues an error message and either terminates or indicates what you should do next.

When all the PL/I service has been installed, VMSERV will apply service for the remaining products on the tape or allow you to exit.

Installing PL/I PTFs

PL/I PTF tapes do not include service EXECs, but if you have saved the service EXECs from a previous PUT tape, you can use those EXECs to install the PTFs, using the following procedure:

1. Make a copy of your current PL/I product on another disk. (If something goes wrong while you are applying the service, this ensures that you have a clean, working version of your current product.) Make sure one of these two product disks is *not* accessed while you are installing the PTF(s). Access the other disk as your **target** disk, with a filemode of **B**.

2. Choose a second disk to be used as a **staging** disk. The service EXEC will later access this disk with a filemode of **A**.

3. Access the disk containing the service EXECs with a filemode of **C**.

4. Mount the PTF tape at virtual address 181.

5. Determine to which product component the first file grouping applies (that is, Optimizing Compiler, Resident Library, or Transient Library), and position the tape at the beginning of that file. If you need assistance, contact your IBM software support center.

6. Invoke the appropriate service EXEC (5734PL1A, 5734LM4A, or 5734LM5A).

7. The service EXEC asks for the address of the staging disk you have chosen. If you do not provide an address, the service EXEC defines a temporary minidisk at virtual address 002 and accesses it with a filemode of **A**.

8. The service EXEC then loads the service file(s) onto the A disk and installs the service from the A disk onto the target B disk.

9. If there are more PL/I PTFs on the tape, make sure the tape is positioned at the beginning of the next PL/I service file and repeat the process, invoking the appropriate PL/I component's service EXEC.

Verifying Your Service Installation

When all the files on the PUT or PTF tape have been applied, run the installation verification program (IVP) to ensure that the product functions properly. You can run the IVP by invoking, with the option `VERIFY`, the EXEC used to install the product, as follows:

If you installed service to the:	Invoke the installation EXEC as follows:
Optimizing Compiler	I5734PL1 VERIFY
Resident Library	I5734LM4 VERIFY
Transient Library	I5734LM5 VERIFY
Composite Product	I5734PL3 VERIFY

It is a good idea to keep the copy you made of your PL/I product before you applied the service, until you have run the updated version of the product for a few days and are confident that it runs smoothly.

Index

L

M

X

Reader's Comment Form

OS PL/I Optimizing Compiler:
Installation Guide for CMS
SC26-4122-0

This manual is part of a library that serves as a reference source for systems analysts, programmers, and operators of IBM systems. You may use this form to communicate your comments about this publication, its organization, or subject matter, with the understanding that IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you.

Your comments will be sent to the author's department for whatever review and action, if any, are deemed appropriate.

Note: *Copies of IBM publications are not stocked at the location to which this form is addressed. Please direct any requests for copies of publications, or for assistance in using your IBM system, to your IBM representative or to the IBM branch office serving your locality.*

Note: Staples can cause problems with automated mail sorting equipment. Please use pressure sensitive or other gummed tape to seal this form.

List TNLs here:

If you have applied any technical newsletters (TNLs) to this book, please list them here:

Last TNL _____

Previous TNL _____

Previous TNL _____

Fold on two lines, tape, and mail. No postage stamp necessary if mailed in the U.S.A. (Elsewhere, an IBM office or representative will be happy to forward your comments or you may mail directly to the address in the Edition Notice on the back of the title page.) Thank you for your cooperation.

SC26-4122-0

Reader's Comment Form

Fold and tape | Please do not staple | Fold and tape

NO POSTAGE NECESSARY IF MAILED IN THE UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 40 ARMONK, N.Y.

POSTAGE WILL BE PAID BY ADDRESSEE

IBM Corporation
P.O. Box 50020
Programming Publishing
San Jose, California 95150

Fold and tape | Please do not staple | Fold and tape

IBM

OS PL/I Optimizing Compiler: Installation Guide for CMS (File No. S370-34) Printed in U.S.A. SC26-4122-0

SC26-4122-0

OS PL/I Optimizing Compiler: Installation Guide for CMS (File No. S370-34) Printed in U.S.A. SC26-4122-0

IBM

SC26-4122-00