IBM

Program Directory for
IBM Automatic Binary Optimizer for z/OS

V01.02.00
Program Number 5697-AB1

FMID: HALF120, JALJ12J

for Use with
z/OS

Document Date: November 2016

GI13-4513-02
Note

Before using this information and the product it supports, be sure to read the general information under 7.0, "Notices" on page 26.

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## Contents

1.0 Introduction .................................................................................. 1  
1.1 Automatic Binary Optimizer Description .................................... 1  
1.2 Automatic Binary Optimizer FMIDS ........................................ 4  

2.0 Program Materials ........................................................................ 5  
2.1 Basic Machine-Readable Material ............................................. 5  
2.2 Optional Machine-Readable Material ....................................... 6  
2.3 Program Publications .................................................................. 6  
2.3.1 Optional Program Publications .......................................... 6  
2.4 Program Source Materials ....................................................... 6  
2.5 Publications Useful During Installation .................................... 7  

3.0 Program Support .......................................................................... 8  
3.1 Program Services ........................................................................ 8  
3.2 Preventive Service Planning ..................................................... 8  
3.3 Statement of Support Procedures ............................................ 9  

4.0 Program and Service Level Information ......................................... 10  
4.1 Program Level Information ...................................................... 10  
4.2 Service Level Information ....................................................... 10  

5.0 Installation Requirements and Considerations ............................... 11  
5.1 Driving System Requirements .................................................. 11  
5.1.1 Machine Requirements .................................................... 11  
5.1.2 Programming Requirements ............................................. 11  
5.2 Target System Requirements ................................................... 12  
5.2.1 Machine Requirements .................................................... 12  
5.2.2 Programming Requirements ............................................. 12  
5.2.2.1 Installation Requisites .................................................. 12  
5.2.2.2 Operational Requisites ................................................ 13  
5.2.2.3 Tolerance/Coexistence Requisites ................................. 14  
5.2.2.4 Incompatibility (Negative) Requisites ............................ 14  
5.2.3 DASD Storage Requirements ............................................ 14  
5.3 FMIDs Deleted .......................................................................... 17  
5.4 Special Considerations ............................................................ 17  

6.0 Installation Instructions ................................................................. 19  
6.1 Installing Automatic Binary Optimizer ....................................... 19  
6.1.1 SMP/E Considerations for Installing Automatic Binary Optimizer ........................................ 19  
6.1.2 SMP/E Options Subentry Values ....................................... 19  
6.1.3 Sample Jobs ................................................................. 19  
6.1.4 Allocate SMP/E CSI and initialize CSI zones (Optional) .............. 21  

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6.1.5 Perform SMP/E RECEIVE ........................................  21
6.1.6 Allocate SMP/E Target and Distribution Libraries .......................  22
6.1.7 Create DDDEF Entries ..........................................  22
6.1.8 Perform SMP/E APPLY .........................................  22
6.1.9 Perform SMP/E ACCEPT ........................................  24
6.1.10 Run REPORT CROSSZONE .....................................  24
6.2 Activating Automatic Binary Optimizer ...................................  25
6.2.1 Product Customization .........................................  25

7.0 Notices ..................................................................  26
7.1 Trademarks ..........................................................  26

Reader's Comments ........................................................  27

Figures

1. Program File Content for Automatic Binary Optimizer ..........................  5
2. Program File Content for Automatic Binary Optimizer (Japanese) ...............  6
3. Basic Material: Unlicensed ..............................................  6
4. Publications Useful During Installation ........................................  7
5. PSP Upgrade and Subset ID .............................................  8
6. Component IDs ................................................................  9
7. Driving System Software Requirements .......................................... 12
8. Target System Mandatory Installation Requisites .................................. 13
9. Target System Mandatory Operational Requisites .................................. 13
10. Target System Conditional Operational Requisites .............................. 14
11. Total DASD Space Required by Automatic Binary Optimizer ................. 15
12. Storage Requirements for Automatic Binary Optimizer Target Libraries ........ 16
13. Storage Requirements for Automatic Binary Optimizer Distribution Libraries 16
14. SMP/E Options Subentry Values ........................................ 19
15. Sample Installation Jobs ................................................... 20
1.0 Introduction

This program directory is intended for system programmers who are responsible for program installation and maintenance. It contains information about the material and procedures associated with the installation of IBM Automatic Binary Optimizer for z/OS. This publication refers to IBM Automatic Binary Optimizer for z/OS as Automatic Binary Optimizer.

The Program Directory contains the following sections:

- **2.0, “Program Materials” on page 5** identifies the basic program materials and documentation for Automatic Binary Optimizer.
- **3.0, “Program Support” on page 8** describes the IBM support available for Automatic Binary Optimizer.
- **4.0, “Program and Service Level Information” on page 10** lists the APARs (program level) and PTFs (service level) that have been incorporated into Automatic Binary Optimizer.
- **5.0, “Installation Requirements and Considerations” on page 11** identifies the resources and considerations that are required for installing and using Automatic Binary Optimizer.
- **6.0, “Installation Instructions” on page 19** provides detailed installation instructions for Automatic Binary Optimizer. It also describes the procedures for activating the functions of Automatic Binary Optimizer, or refers to appropriate publications.

Before installing Automatic Binary Optimizer, read the **CBPDO Memo To Users** and the **CBPDO Memo To Users Extension** that are supplied with this program in softcopy format and this program directory; then keep them for future reference. Section **3.2, “Preventive Service Planning” on page 8** tells you how to find any updates to the information and procedures in this program directory.

Automatic Binary Optimizer is supplied in a Custom-Built Product Delivery Offering (CBPDO, 5751-CS3). The program directory that is provided in softcopy format on the CBPDO tape is identical to the hardcopy format if one was included with your order. All service and HOLDDATA for Automatic Binary Optimizer are included on the CBPDO tape.

Do not use this program directory if you install Automatic Binary Optimizer with a SystemPac or ServerPac. When you use one of those offerings, use the jobs and documentation supplied with the offering. The offering will point you to specific sections of this program directory as needed.

1.1 Automatic Binary Optimizer Description

**IBM Automatic Binary Optimizer for z/OS, V1.2** optimizes existing COBOL applications without having to recompile from COBOL source code. COBOL programs compiled with earlier COBOL compilers are now supported, in addition to applications compiled with Enterprise COBOL for z/OS and OS/390, V3, and Enterprise COBOL for z/OS, V4. Automatic Binary Optimizer uses leading-edge optimization and code generation technology to improve the performance of applications and to fully exploit IBM z Systems,
which includes the latest z13s and z13 processors. Automatic Binary Optimizer for z/OS is required on all
machines where the optimizer is used and where the optimized applications are deployed and executed.

**Advanced optimization technology**

Automatic Binary Optimizer for z/OS, V1.2 automatically performs high-fidelity, deployment-specific optimizations without the need for source code recompiations. Automatic Binary Optimizer for z/OS increases the performance of business-critical COBOL applications. It does not require source code recompiles nor performance options tuning.

Earlier COBOL compilers generate code at the ARCH(0) level only. Using the Automatic Binary Optimizer for z/OS upgrades these ARCH(0) level COBOL applications to exploit the latest ARCH(10) zEC12/zBC12 and ARCH(11) z13s/z13 systems. Using the Automatic Binary Optimizer on these executables is a 25-year jump forward in the evolution of hardware technology, with access to over 600 new hardware instructions that are already on the z13s, z13, zEC12 and zBC12 machines.

Automatic Binary Optimizer for z/OS, V1.2 supports additional COBOL programs that were compiled with earlier COBOL compilers. Automatic Binary Optimizer for z/OS, V1.1 optimized COBOL programs compiled with:

- Enterprise COBOL for z/OS, V4
- Enterprise COBOL for z/OS and OS/390, V3

Automatic Binary Optimizer for z/OS, V1.2 can be used to also optimize COBOL programs that are compiled with the following earlier IBM compilers:

- COBOL for OS/390, V2
- COBOL for MVS & VM, V1.2
- COBOL/370, V1.1
- VS COBOL II, V1.3 and V1.4 (LE-enabled only)

**Supported key features**

Automatic Binary Optimizer for z/OS supports the following key COBOL features:

- OPTIMIZE(STD | FULL)
- TRUNC
- ARITH
- SSRANGE
- ZWB
- DLL
- THREAD
- RECURSIVE
- XML
- SORT/MERGE
- SQL
- I/O and Debugging Declaratives
- CICS
Automatic Binary Optimizer for z/OS, V1.2 adds support for the following COBOL features:

- CICS HANDLE ABEND
- CICS HANDLE AID

**Performance improvements**

Automatic Binary Optimizer for z/OS, V1.2 delivers additional performance improvements in the generated optimized COBOL programs. Areas of improved performance include:

- Programs that contain COMP and COMP-5 arithmetic.
- Large amounts of linkage section data.
- EVALUATE/WHEN clauses on 1-byte size, 2-byte size, 4-byte size, and 8 byte-sized data items.
- Moves between packed and zoned decimal index variables.
- Many cases of packed and zoned, decimal arithmetic.

**Usability features**

Automatic Binary Optimizer for z/OS, V1.2 is easier to use with the implementation of additional usability features. Additional usability features include:

- Allowing optimization processing to be controlled down to the CSECT level.
- Error processing enhancements to detect user error conditions earlier and to provide more informative messages.
- Generation of the optimized programs is now itself more efficient by using less memory and CPU time than with Automatic Binary Optimizer for z/OS, V1.1. This results in operational cost savings in the optimization phase.
- The generated optimized programs also have additional reductions in CPU time, elapsed time, and service units that are consumed. This results in operational cost savings in the execution environment.

**Tooling support**

Optimized applications created with Automatic Binary Optimizer for z/OS are supported by IBM DevOps Tools, which include IBM Application Delivery Foundation for z Systems family of products:

- Developer for z Systems Enterprise Edition, which includes Debug for z Systems (previously known as Debug Tool for z/OS). Helps examine, monitor, and control the execution of application programs.
- Fault Analyzer for z/OS.
  - Helps developers analyze and fix application and system failures.
  - Gathers information about an application and the surrounding environment.
- Application Performance Analyzer for z/OS. Helps developers in the design, development and maintenance cycles with an non-intrusive application performance analyzer.

Additional information can be found on the Application Delivery Foundation for z Systems website at: http://www-03.ibm.com/software/products/en/ibm-application-delivery-foundation-for-z-systems
Automatic Binary Optimizer for z/OS, V1.2 delivers tooling support enhancements. A listing transform that maps the original offsets and instructions to the new offsets and instructions. The original metadata, which include language ID, timestamps, and information signature bytes, are retained in the optimized programs. Also, new PPA4 sections with information about the optimized modules are available for compiled programs.

**IBM Service and Support**

Automatic Binary Optimizer for z/OS brings with it IBM Service and Support. The IBM Service and Support organization is made up of teams of individuals who work together to provide you with the responsive platform and cross-platform software support that you require. For complex or code-related problems, IBM has specialized, skilled service teams with access to the experts in the development laboratories, as required. Therefore, you have access to the right level of IBM expertise when you need it, no matter where you are located.

### 1.2 Automatic Binary Optimizer FMIDS

Automatic Binary Optimizer consists of the following FMIDs:

- HALF120
- JALJ12J
2.0 Program Materials

An IBM program is identified by a program number. The program number for Automatic Binary Optimizer is 5697-AB1.

Basic Machine-Readable Materials are materials that are supplied under the base license and are required for the use of the product.

The program announcement material describes the features supported by Automatic Binary Optimizer. Ask your IBM representative for this information if you have not already received a copy.

2.1 Basic Machine-Readable Material

The distribution medium for this program is physical media or downloadable files. This program is in SMP/E RELFILE format and is installed by using SMP/E. See 6.0, “Installation Instructions” on page 19 for more information about how to install the program.

You can find information about the physical media for the basic machine-readable materials for Automatic Binary Optimizer in the CBPDO Memo To Users Extension.

Figure 1 describes the program file content for Automatic Binary Optimizer. You can refer to the CBPDO Memo To Users Extension to see where the files reside on the tape.

Notes:

1. The data set attributes in this table must be used in the JCL of jobs that read the data sets. However, because the data sets are in IEBCOPY unloaded format, their actual attributes might be different.

2. If any RELFILEs are identified as PDSEs, ensure that SMPTLIB data sets are allocated as PDSEs.

<table>
<thead>
<tr>
<th>Name</th>
<th>RECL</th>
<th>LRECL</th>
<th>BLK SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMPMCS</td>
<td>SEQ</td>
<td>FB</td>
<td>80</td>
</tr>
<tr>
<td>IBM.HALF120.F1</td>
<td>PDSE</td>
<td>U</td>
<td>0</td>
</tr>
<tr>
<td>IBM.HALF120.F2</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
</tr>
</tbody>
</table>
2.2 Optional Machine-Readable Material

No optional machine-readable materials are provided for Automatic Binary Optimizer.

2.3 Program Publications

The following sections identify the basic publications for Automatic Binary Optimizer.

Figure 3 identifies the basic unlicensed publications for Automatic Binary Optimizer. Those that are in softcopy format publications can be obtained from the IBM Publications Center website at: http://www.ibm.com/shop/publications/order/

<table>
<thead>
<tr>
<th>Form Number</th>
<th>Media Format</th>
</tr>
</thead>
</table>

2.3.1 Optional Program Publications

No optional publications are provided for Automatic Binary Optimizer.

2.4 Program Source Materials

No program source materials or viewable program listings are provided for Automatic Binary Optimizer.
2.5 Publications Useful During Installation

You might want to use the publications listed in Figure 4 on page 7 during the installation of Automatic Binary Optimizer.

<table>
<thead>
<tr>
<th>Publication Title</th>
<th>Form Number</th>
<th>Media Format</th>
</tr>
</thead>
<tbody>
<tr>
<td>IBM SMP/E for z/OS Messages, Codes, and Diagnosis</td>
<td>GA32-0883</td>
<td><a href="http://www.ibm.com/shop/publications/order/">http://www.ibm.com/shop/publications/order/</a></td>
</tr>
</tbody>
</table>
3.0 Program Support

This section describes the IBM support available for Automatic Binary Optimizer.

3.1 Program Services

Contact your IBM representative for specific information about available program services.

3.2 Preventive Service Planning

Before you install Automatic Binary Optimizer, make sure that you have reviewed the current Preventive Service Planning (PSP) information. Review the PSP Bucket for General Information, Installation Documentation, and the Cross Product Dependencies sections. For the Recommended Service section, instead of reviewing the PSP Bucket, it is recommended you use the IBM.ProductInstall-RequiredService fix category in SMP/E to ensure you have all the recommended service installed. Use the FIXCAT(IBM.ProductInstall-RequiredService) operand on the APPLY CHECK command. See 6.1.8, “Perform SMP/E APPLY” on page 22 for a sample APPLY command.

If you obtained Automatic Binary Optimizer as part of a CBPDO, HOLDDATA is included.

If the CBPDO for Automatic Binary Optimizer is older than two weeks by the time you install the product materials, you can obtain the latest PSP Bucket information by going to the following website:


You can also use S/390 SoftwareXcel or contact the IBM Support Center to obtain the latest PSP Bucket information.

For program support, access the Software Support Website at http://www-01.ibm.com/software/support/.

PSP Buckets are identified by UPGRADEs, which specify product levels; and SUBSETs, which specify the FMIDs for a product level. The UPGRADE and SUBSET values for Automatic Binary Optimizer are included in Figure 5.

<table>
<thead>
<tr>
<th>UPGRADE</th>
<th>SUBSET</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5697AB1</td>
<td>HALF120</td>
<td>Automatic Binary Optimizer</td>
</tr>
<tr>
<td>5697AB1</td>
<td>JALJ12J</td>
<td>Automatic Binary Optimizer Japanese</td>
</tr>
</tbody>
</table>
3.3 Statement of Support Procedures

Report any problems which you feel might be an error in the product materials to your IBM Support Center. You may be asked to gather and submit additional diagnostics to assist the IBM Support Center in their analysis.

Figure 6 on page 9 identifies the component IDs (COMPID) for Automatic Binary Optimizer.

<table>
<thead>
<tr>
<th>FMID</th>
<th>COMPID</th>
<th>Component Name</th>
<th>RETAIN Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>HALF120</td>
<td>5697AB100</td>
<td>Auto Bin Optimizer</td>
<td>120</td>
</tr>
<tr>
<td>JALJ12J</td>
<td>5697AB100</td>
<td>Auto Bin Opt JPN</td>
<td>12J</td>
</tr>
</tbody>
</table>
4.0 Program and Service Level Information

This section identifies the program and relevant service levels of Automatic Binary Optimizer. The program level refers to the APAR fixes that have been incorporated into the program. The service level refers to the PTFs that have been incorporated into the program.

4.1 Program Level Information

The following APAR fixes against previous releases of Automatic Binary Optimizer have been incorporated into this release. They are listed by FMID.

- FMID HALF110

<table>
<thead>
<tr>
<th>FMID</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PI52352</td>
<td></td>
</tr>
<tr>
<td>PI53013</td>
<td></td>
</tr>
<tr>
<td>PI53034</td>
<td></td>
</tr>
<tr>
<td>PI55869</td>
<td></td>
</tr>
<tr>
<td>PI55913</td>
<td></td>
</tr>
<tr>
<td>PI56658</td>
<td></td>
</tr>
<tr>
<td>PI56665</td>
<td></td>
</tr>
<tr>
<td>PI56936</td>
<td></td>
</tr>
<tr>
<td>PI56940</td>
<td></td>
</tr>
<tr>
<td>PI63945</td>
<td></td>
</tr>
<tr>
<td>PI63947</td>
<td></td>
</tr>
</tbody>
</table>

4.2 Service Level Information

No PTFs against this release of Automatic Binary Optimizer have been incorporated into the product package.

Frequently check the Automatic Binary Optimizer PSP Bucket for HIPER and SPECIAL attention PTFs against all FMIDs that you must install. You can also receive the latest HOLDDATA, then add the FIXCAT(IBM.PRODUCTINSTALL-REQUIRdSERVICE) operand on your APPLY CHECK command. This will allow you to review the recommended and critical service that should be installed with your FMIDs.
5.0 Installation Requirements and Considerations

The following sections identify the system requirements for installing and activating Automatic Binary Optimizer. The following terminology is used:

- **Driving system**: the system on which SMP/E is executed to install the program.
  
  The program might have specific operating system or product level requirements for using processes, such as binder or assembly utilities during the installation.

- **Target system**: the system on which the program is configured and run.
  
  The program might have specific product level requirements, such as needing access to the library of another product for link-edits. These requirements, either mandatory or optional, might directly affect the element during the installation or in its basic or enhanced operation.

In many cases, you can use a system as both a driving system and a target system. However, you can make a separate IPL-able clone of the running system to use as a target system. The clone must include copies of all system libraries that SMP/E updates, copies of the SMP/E CSI data sets that describe the system libraries, and your PARMLIB and PROCLIB.

Use separate driving and target systems in the following situations:

- When you install a new level of a product that is already installed, the new level of the product will replace the old one. By installing the new level onto a separate target system, you can test the new level and keep the old one in production at the same time.

- When you install a product that shares libraries or load modules with other products, the installation can disrupt the other products. By installing the product onto a separate target system, you can assess these impacts without disrupting your production system.

5.1 Driving System Requirements

This section describes the environment of the driving system required to install Automatic Binary Optimizer.

5.1.1 Machine Requirements

The driving system can run in any hardware environment that supports the required software.

5.1.2 Programming Requirements
5.2 Target System Requirements

This section describes the environment of the target system required to install and use Automatic Binary Optimizer.

Automatic Binary Optimizer installs in the z/OS (Z038) SREL.

5.2.1 Machine Requirements

Automatic Binary Optimizer runs on the following IBM z Servers:

- IBM z13
- IBM z13s
- IBM zEnterprise EC12
- IBM zEnterprise BC12

5.2.2 Programming Requirements

5.2.2.1 Installation Requisites: Installation requisites identify products that are required and must be present on the system or products that are not required but should be present on the system for the successful installation of this product.

Mandatory installation requisites identify products that are required on the system for the successful installation of this product.
Note: Installation might require migration to new z/OS releases to be service supported. See http://www-03.ibm.com/systems/z/os/zos/support/zos_eos_dates.html.

Conditional installation requisites identify products that are not required for successful installation of this product but can resolve such things as certain warning messages at installation time.

Automatic Binary Optimizer has no conditional installation requisites.

5.2.2.2 Operational Requisites: Operational requisites are products that are required and must be present on the system or products that are not required but should be present on the system for this product to operate all or part of its functions.

Mandatory operational requisites identify products that are required for this product to operate its basic functions.

<table>
<thead>
<tr>
<th>Program Number</th>
<th>Product Name and Minimum VRM/Service Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>5650-ZOS</td>
<td>z/OS V02.01.00 *</td>
</tr>
<tr>
<td>5650-ZOS</td>
<td>z/OS V02.02.00 **</td>
</tr>
</tbody>
</table>

Note: * With following APARs/PTFs applied or higher,
- OA49419/UA90987 (Binder)
- OA50460/UA82868 (Binder)
- PI55281/UI34924 (Language Environment Automatic Binary Optimizer Runtime Engine)
- PI54804/UI34935 (Language Environment Automatic Binary Optimizer Runtime Engine)
- PI55010/UI34414 (Language Environment CICS system definition sample update)

Note: ** With following APARs/PTFs applied or higher,
- OA47829/UA78084 (Binder)
- OA50640/UA82866 (Binder)
- OA47689/UA90982 (IEFOPZxx SYS1.PARMLIB support)
- PI52354/UI33525 (Language Environment Automatic Binary Optimizer Runtime Engine)
- PI51546/UI33445 (Language Environment Automatic Binary Optimizer Runtime Engine)
Conditional operational requisites identify products that are *not* required for this product to operate its basic functions but are required at run time for this product to operate specific functions.

### Figure 10. Target System Conditional Operational Requisites

<table>
<thead>
<tr>
<th>Program Number</th>
<th>Product Name and Minimum VRM/Service Level</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>5655-AC5</td>
<td>IBM Developer for z Systems EE V14.0</td>
<td>Application development tools</td>
</tr>
<tr>
<td>5655-AC6</td>
<td>IBM Application Delivery Foundation</td>
<td>Integrated development solutions</td>
</tr>
<tr>
<td>5655-Q11</td>
<td>IBM Fault Analyzer for z/OS V13.1 with PI52289/UI32893 applied or higher</td>
<td>Analyze and fix application and system failures</td>
</tr>
<tr>
<td>5655-AC6</td>
<td>IBM Application Delivery Foundation</td>
<td>Integrated development solutions</td>
</tr>
<tr>
<td>5655-Q49</td>
<td>IBM Application Performance Analyzer for z/OS V14.0</td>
<td>Identifies z/OS application performance and response time problems</td>
</tr>
<tr>
<td>5655-AC6</td>
<td>IBM Application Delivery Foundation</td>
<td>Integrated development solutions</td>
</tr>
</tbody>
</table>

#### 5.2.2.3 Tolerance/Coexistence Requisites:*

Tolerance/coexistence requisites identify products that must be present on sharing systems. These systems can be other systems in a multisystem environment (not necessarily sysplex), a shared DASD environment (such as test and production), or systems that reuse the same DASD environment at different time intervals.

Automatic Binary Optimizer has no tolerance/coexistence requisites.

#### 5.2.2.4 Incompatibility (Negative) Requisites:*

Negative requisites identify products that must *not* be installed on the same system as this product.

Automatic Binary Optimizer has no negative requisites.

#### 5.2.3 DASD Storage Requirements

Automatic Binary Optimizer libraries can reside on all supported DASD types.

Figure 11 lists the total space that is required for each type of library.
Notes:

1. For non-RECFM U data sets, IBM recommends using system-determined block sizes for efficient DASD utilization. For RECFM U data sets, IBM recommends using a block size of 32760, which is most efficient from the performance and DASD utilization perspective.

2. Abbreviations used for data set types are shown as follows.

   - **U**: Unique data set, allocated by this product and used by only this product. This table provides all the required information to determine the correct storage for this data set. You do not need to refer to other tables or program directories for the data set size.

   - **S**: Shared data set, allocated by this product and used by this product and other products. To determine the correct storage needed for this data set, add the storage size given in this table to those given in other tables (perhaps in other program directories). If the data set already exists, it must have enough free space to accommodate the storage size given in this table.

   - **E**: Existing shared data set, used by this product and other products. This data set is not allocated by this product. To determine the correct storage for this data set, add the storage size given in this table to those given in other tables (perhaps in other program directories). If the data set already exists, it must have enough free space to accommodate the storage size given in this table.

If you currently have a previous release of this product installed in these libraries, the installation of this release will delete the old release and reclaim the space that was used by the old release and any service that had been installed. You can determine whether these libraries have enough space by deleting the old release with a dummy function, compressing the libraries, and comparing the space requirements with the free space in the libraries.

For more information about the names and sizes of the required data sets, see 6.1.6, “Allocate SMP/E Target and Distribution Libraries” on page 22.

3. All target and distribution libraries listed have the following attributes:
   - The default name of the data set can be changed.
   - The default block size of the data set can be changed.
   - The data set can be merged with another data set that has equivalent characteristics.
   - The data set can be either a PDS or a PDSE, except for SBOZMOD1, and ABOZMOD1, which must be PDSEs.

4. All target libraries listed have the following attributes:
   - These data sets can be SMS-managed, but they are not required to be SMS-managed.
   - These data sets are not required to reside on the IPL volume.
The values in the "Member Type" column are not necessarily the actual SMP/E element types that are identified in the SMPMCS.

5. All target libraries that are listed and contain load modules have the following attributes:
   - These data sets can be in the LPA, but they are not required to be in the LPA.
   - These data sets can be in the LNKLST.
   - These data sets are not required to be APF-authorized.
   - Automatic Binary Optimizer requires that the SMPLTS data set must be a PDSE. If your existing SMPLTS is a PDS, you will need to allocate a new PDSE and copy your existing SMPLTS into it and then change the SMPLTS DDDEF entry to indicate the new PDSE data set.

The following figures describe the target and distribution libraries required to install Automatic Binary Optimizer. The storage requirements of Automatic Binary Optimizer must be added to the storage required by other programs that have data in the same library.

Note: Use the data in these tables to determine which libraries can be merged into common data sets. In addition, since some ALIAS names may not be unique, ensure that no naming conflicts will be introduced before merging libraries.

<table>
<thead>
<tr>
<th>Library DDNAME</th>
<th>Member Type</th>
<th>Target Volume</th>
<th>Type</th>
<th>Element</th>
<th>Record</th>
<th>Record</th>
<th>No. of 3390 Trks</th>
<th>No. of DIR Blks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBOZJCL</td>
<td>SAMP</td>
<td>ANY</td>
<td>P</td>
<td>OS</td>
<td>E</td>
<td>R</td>
<td>80</td>
<td>25</td>
</tr>
<tr>
<td>SBOZMOD1</td>
<td>LMOD</td>
<td>ANY</td>
<td>P</td>
<td>RS</td>
<td>C</td>
<td>E</td>
<td>0</td>
<td>1850</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Library DDNAME</th>
<th>Type</th>
<th>Element</th>
<th>Record</th>
<th>Record</th>
<th>No. of 3390 Trks</th>
<th>No. of DIR Blks</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABOZMOD1</td>
<td>U</td>
<td>PDSE</td>
<td>U</td>
<td>0</td>
<td>1850</td>
<td>n/a</td>
</tr>
<tr>
<td>ABOZSRC1</td>
<td>U</td>
<td>PDS</td>
<td>FB</td>
<td>80</td>
<td>25</td>
<td>3</td>
</tr>
</tbody>
</table>
5.3 FMIDs Deleted

Installing Automatic Binary Optimizer might result in the deletion of other FMIDs. To see which FMIDs will be deleted, examine the ++VER statement in the SMPMCS of the product.

If you do not want to delete these FMIDs at this time, install Automatic Binary Optimizer into separate SMP/E target and distribution zones.

**Note:** These FMIDs are not automatically deleted from the Global Zone. If you want to delete these FMIDs from the Global Zone, use the SMP/E REJECT NOFMID DELETEFMID command. See the SMP/E Commands book for details.

5.4 Special Considerations

**Operational Maintenance Requirements**

Automatic Binary Optimizer requires some PTFs to be applied on the systems where Automatic Binary Optimizer is installed and running. Other PTFs are required on systems where the Automatic Binary Optimizer produced optimized modules will be running, even if Automatic Binary Optimizer is not installed on these systems. Note that one APAR/PTF (OA47689/UA90982), that is available for z/OS 2.2 only, is required on systems where either Automatic Binary Optimizer or the Automatic Binary Optimizer produced modules are running.

- These PTFs are required on systems where Automatic Binary Optimizer is running:
  - z/OS V2.1
    - OA49419/UA90987 (Binder)
    - OA50460/UA82868 (Binder)
  - z/OS V2.2
    - OA47829/UA78084 (Binder)
    - OA50640/UA82866 (Binder)
    - OA47689/UA90982 (IEFOPZxx SYS1.PARMLIB support)
- These PTFs are required on systems where Automatic Binary Optimizer optimized modules are running:
  - z/OS V2.1
    - PI55281/UI34924 (Language Environment Automatic Binary Optimizer Runtime Engine)
    - PI54804/UI34935 (Language Environment Automatic Binary Optimizer Runtime Engine)
    - PI55010/UI34414 (Language Environment CICS system definition sample update)
  - z/OS V2.2
    - PI52354/UI33525 (Language Environment Automatic Binary Optimizer Runtime Engine)
    - PI51546/UI33445 (Language Environment Automatic Binary Optimizer Runtime Engine)
    - PI51802/UI32944 (Language Environment CICS system definition sample update)
Note: If the same system is going to be used to both run Automatic Binary Optimizer and run the Automatic Binary Optimizer optimized modules, then all the PTFs listed above per z/OS version must be installed on this system.

Automatic Binary Optimizer and Automatic Binary Optimizer Trial Co-existence:

Automatic Binary Optimizer and Automatic Binary Optimizer Trial, cannot be installed in the same CSI zone, or share the same target and distribution data set names.

PDSE Considerations:

Automatic Binary Optimizer uses the "partitioned data set extended" or PDSE format for the SBOZMOD1 target library. There are some operational differences between PDS and PDSE data sets. The PDS format may be shared by more than one z/OS system and no special precautions are necessary. However the PDSE format may only be shared by z/OS systems which are part of a sysplex or which are connected using Global Resource Serialization (are in a GRS complex). If z/OS systems share use of a PDSE data set outside of a sysplex or GRS environment, you may experience severe problems when the data set is updated. This is due to the fact that PDSE directory information is cached in storage, and when the data set is updated from one system the other system(s) have no knowledge of the update, and their cached directory information will be incorrect.

You must take care not to share the SBOZMOD1 data set between z/OS systems unless they are in a sysplex or are connected in a GRS complex. If you need to share the content of the SBOZMOD1 data set, a separate copy must be created for each z/OS system.
6.0 Installation Instructions

This chapter describes the installation method and the step-by-step procedures to install and to activate the functions of Automatic Binary Optimizer.

Please note the following points:

- If you want to install Automatic Binary Optimizer into its own SMP/E environment, consult the SMP/E manuals for instructions on creating and initializing the SMPCSI and the SMP/E control data sets.
- You can use the sample jobs that are provided to perform part or all of the installation tasks. The SMP/E jobs assume that all DDDEF entries that are required for SMP/E execution have been defined in appropriate zones.
- You can use the SMP/E dialogs instead of the sample jobs to accomplish the SMP/E installation steps.

6.1 Installing Automatic Binary Optimizer

6.1.1 SMP/E Considerations for Installing Automatic Binary Optimizer

Use the SMP/E RECEIVE, APPLY, and ACCEPT commands to install this release of Automatic Binary Optimizer.

6.1.2 SMP/E Options Subentry Values

The recommended values for certain SMP/E CSI subentries are shown in Figure 14. Using values lower than the recommended values can result in failures in the installation. DSSPACE is a subentry in the GLOBAL options entry. PEMAX is a subentry of the GENERAL entry in the GLOBAL options entry. See the SMP/E manuals for instructions on updating the global zone.

<table>
<thead>
<tr>
<th>Subentry</th>
<th>Value</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>DSSPACE</td>
<td>(500,500,500)</td>
<td>3390 DASD tracks</td>
</tr>
<tr>
<td>PEMAX</td>
<td>SMP/E Default</td>
<td>IBM recommends using the SMP/E default for PEMAX.</td>
</tr>
</tbody>
</table>

6.1.3 Sample Jobs

The following sample installation jobs are provided as part of the product to help you install Automatic Binary Optimizer:
You can access the sample installation jobs by performing an SMP/E RECEIVE (refer to 6.1.5, “Perform SMP/E RECEIVE” on page 21) then copy the jobs from the RELFILES to a work data set for editing and submission. See Figure 15 on page 19 to find the appropriate relfile data set.

You can also copy the sample installation jobs from the tape or product files by submitting the following job. Depending on your distribution medium, use either the //TAPEIN or the //FILEIN DD statement and comment out or delete the other statement. Before you submit the job, add a job card and change the lowercase parameters to uppercase values to meet the requirements of your site.

```plaintext
//STEP1 EXEC PGM=IEBCOPY
//SYSPRINT DD SYSOUT=/c5197
///c5197 Make the //TAPEIN DD statement below active if you install
///c5197 from a CBPDO tape by uncommenting the DD statement below. /
///c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197 ... 97/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197
///c5197TAPEIN DD DSN=IBM.HALF12/zerodot.F2,UNIT=tunit,
///c5197 VOL=SER=volser,LABEL=(x,SL),
///c5197 DISP=(OLD,KEEP)
///c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197 ... 97/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197
///c5197 Make the //TAPEIN DD statement below active if you install
///c5197 from a product tape received outside the CBPDO process /c5197
///c5197 (using the optional SMP/E RECEIVE job) by uncommenting /c5197
///c5197 the DD statement below. /c5197
///c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197 ... 97/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197
///c5197TAPEIN DD DSN=IBM.HALF12/zerodot.F2,UNIT=tunit,
///c5197 VOL=SER=ALF12/zerodot,LABEL=(3,SL),
///c5197 DISP=(OLD,KEEP)
///c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197 ... 97/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197
///c5197 Make the //FILEIN DD statement below active for /c5197
///c5197 downloaded DASD files. /c5197
///c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197 ... 97/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197/c5197
///c5197FILEIN DD DSN=IBM.HALF12/zerodot.F2,UNIT=SYSALLDA,DISP=SHR,

---

**Figure 15. Sample Installation Jobs**

<table>
<thead>
<tr>
<th>Job Name</th>
<th>Job Type</th>
<th>Description</th>
<th>RELFILE</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOZSMPE</td>
<td>SMP/E</td>
<td>Sample job to allocate and initialize a new SMP/E CSI data set and allocate SMP/E data sets <strong>(Optional)</strong></td>
<td>IBM.HALF120.F2</td>
</tr>
<tr>
<td>BOZRECV</td>
<td>RECEIVE</td>
<td>Sample RECEIVE job</td>
<td>IBM.HALF120.F2</td>
</tr>
<tr>
<td>BOZRECV1</td>
<td>RECEIVE</td>
<td>Sample RECEIVE job</td>
<td>IBM.HALF120.F2</td>
</tr>
<tr>
<td>BOZALLOC</td>
<td>ALLOCATE</td>
<td>Sample job to allocate target and distribution libraries</td>
<td>IBM.HALF120.F2</td>
</tr>
<tr>
<td>BOZDDDEF</td>
<td>DDDEF</td>
<td>Sample job to define SMP/E DDDEFs</td>
<td>IBM.HALF120.F2</td>
</tr>
<tr>
<td>BOZAPPLY</td>
<td>APPLY</td>
<td>Sample APPLY job</td>
<td>IBM.HALF120.F2</td>
</tr>
<tr>
<td>BOZACCEP</td>
<td>ACCEPT</td>
<td>Sample ACCEPT job</td>
<td>IBM.HALF120.F2</td>
</tr>
</tbody>
</table>
See the following information to update the statements in the previous sample:

**TAPEIN:**
- **tunit** is the unit value that matches the product package.
- **volser** is the volume serial that matches the product package.
- **x** is the tape file number that indicates the location of the data set name on the tape.
See the documentation that is provided by CBPDO for the location of IBM.HALF120.F2 on the tape.

**FILEIN:**
- **filevol** is the volume serial of the DASD device where the downloaded files reside.

**OUT:**
- **jcl-library-name** is the name of the output data set where the sample jobs are stored.
- **dasdvol** is the volume serial of the DASD device where the output data set resides.

**SYSIN:**
- xxxxIN is either TAPEIN or FILEIN depending on your input DD statement.

### 6.1.4 Allocate SMP/E CSI and initialize CSI zones (Optional)

If you are using an existing CSI, do not execute this job.

If you are allocating a new SMP/E data set for this install, edit and submit sample job BOZSMPE to allocate the SMP/E data set to initialize SMP/E zones for Automatic Binary Optimizer. Consult the instructions in the sample job for more information.

**Expected Return Codes and Messages:** You will receive a return code of 0 if this job runs correctly.

### 6.1.5 Perform SMP/E RECEIVE

If you have obtained Automatic Binary Optimizer as part of a CBPDO, use the RCVPDO job in the CBPDO RIMLIB data set to receive the Automatic Binary Optimizer FMIDs, service, and HOLDDATA that are included on the CBPDO package. For more information, see the documentation that is included in the CBPDO.

You can also choose to edit and submit sample job BOZRECV to perform the SMP/E RECEIVE for Automatic Binary Optimizer. Consult the instructions in the sample job for more information.
Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

You can also choose to edit and submit sample job BOZRECV1 to perform the SMP/E RECEIVE for Automatic Binary Optimizer Japanese Messages. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

6.1.6 Allocate SMP/E Target and Distribution Libraries

Edit and submit sample job BOZALLOC to allocate the SMP/E target and distribution libraries for Automatic Binary Optimizer. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

6.1.7 Create DDDEF Entries

Edit and submit sample job BOZDDDEF to create DDDEF entries for the SMP/E target and distribution libraries for Automatic Binary Optimizer. Consult the instructions in the sample job for more information.

Expected Return Codes and Messages: You will receive a return code of 0 if this job runs correctly.

6.1.8 Perform SMP/E APPLY

1. Ensure that you have the latest HOLDDATA; then edit and submit sample job BOZAPPLY to perform an SMP/E APPLY CHECK for Automatic Binary Optimizer. Consult the instructions in the sample job for more information.

The latest HOLDDATA is available through several different portals, including http://service.software.ibm.com/holdata/390holddata.html. The latest HOLDDATA may identify HIPER and FIXCAT APARs for the FMIDs you will be installing. An APPLY CHECK will help you determine if any HIPER or FIXCAT APARs are applicable to the FMIDs you are installing. If there are any applicable HIPER or FIXCAT APARs, the APPLY CHECK will also identify fixing PTFs that will resolve the APARs, if a fixing PTF is available.

You should install the FMIDs regardless of the status of unresolved HIPER or FIXCAT APARs. However, do not deploy the software until the unresolved HIPER and FIXCAT APARs have been analyzed to determine their applicability. That is, before deploying the software either ensure fixing PTFs are applied to resolve all HIPER or FIXCAT APARs, or ensure the problems reported by all HIPER or FIXCAT APARs are not applicable to your environment.

To receive the full benefit of the SMP/E Causer SYSMOD Summary Report, do not bypass the PRE, ID, REQ, and IFREQ on the APPLY CHECK. The SMP/E root cause analysis identifies the cause only of errors and not of warnings (SMP/E treats bypassed PRE, ID, REQ, and IFREQ conditions as warnings, instead of errors).

Here are sample APPLY commands:
a. To ensure that all recommended and critical service is installed with the FMIDs, receive the latest HOLDDATA and use the APPLY CHECK command as follows

```
APPLY S(fmid,fmid,...) CHECK
FORFMID(fmid,fmid,...)
SOURCEID(RSU*)
FIX_CAT(IBM.ProductInstall-RequiredService)
GROUP_EXTEND.
```

Some HIPER APARs might not have fixing PTFs available yet. You should analyze the symptom flags for the unresolved HIPER APARs to determine if the reported problem is applicable to your environment and if you should bypass the specific ERROR HOLDs in order to continue the installation of the FMIDs.

This method requires more initial research, but can provide resolution for all HIPERs that have fixing PTFs available and are not in a PE chain. Unresolved PEs or HIPERs might still exist and require the use of BYPASS.

b. To install the FMIDs without regard for unresolved HIPER APARs, you can add the BYPASS(HOLDCLASS(HIPER)) operand to the APPLY CHECK command. This will allow you to install FMIDs even though one or more unresolved HIPER APARs exist. After the FMIDs are installed, use the SMP/E REPORT ERRSYSMODS command to identify unresolved HIPER APARs and any fixing PTFs.

```
APPLY S(fmid,fmid,...) CHECK
FORFMID(fmid,fmid,...)
SOURCEID(RSU*)
FIX_CAT(IBM.ProductInstall-RequiredService)
GROUP_EXTEND
BYPASS(HOLDCLASS(HIPER),HOLDFIXCAT).
```

This method is quicker, but requires subsequent review of the Exception SYSMOD report produced by the REPORT ERRSYSMODS command to investigate any unresolved HIPERs. If you have received the latest HOLDDATA, you can also choose to use the REPORT MISSINGFIX command and specify Fix Category IBM.ProductInstall-RequiredService to investigate missing recommended service.

If you bypass HOLDs during the installation of the FMIDs because fixing PTFs are not yet available, you can be notified when the fixing PTFs are available by using the APAR Status Tracking (AST) function of ServiceLink or the APAR Tracking function of ResourceLink.

2. After you take actions that are indicated by the APPLY CHECK, remove the CHECK operand and run the job again to perform the APPLY.

**Note:** The GROUP_EXTEND operand indicates that SMP/E applies all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

**Expected Return Codes and Messages from APPLY CHECK:** You will receive a return code of 0 if this job runs correctly.
6.1.9 **Perform SMP/E ACCEPT**

Edit and submit sample job BOZACCEP to perform an SMP/E ACCEPT CHECK for Automatic Binary Optimizer. Consult the instructions in the sample job for more information.

To receive the full benefit of the SMP/E Causer SYSMOD Summary Report, do not bypass the PRE, ID, REQ, and IFREQ on the ACCEPT CHECK. The SMP/E root cause analysis identifies the cause of errors but not warnings (SMP/E treats bypassed PRE, ID, REQ, and IFREQ conditions as warnings rather than errors).

Before you use SMP/E to load new distribution libraries, it is recommended that you set the ACCJCLIN indicator in the distribution zone. In this way, you can save the entries that are produced from JCLIN in the distribution zone whenever a SYSMOD that contains inline JCLIN is accepted. For more information about the ACCJCLIN indicator, see the description of inline JCLIN in the SMP/E Commands book for details.

After you take actions that are indicated by the ACCEPT CHECK, remove the CHECK operand and run the job again to perform the ACCEPT.

**Note:** The GROUPEXTEND operand indicates that SMP/E accepts all requisite SYSMODs. The requisite SYSMODS might be applicable to other functions.

**Expected Return Codes and Messages from ACCEPT CHECK:** You will receive a return code of 0 if this job runs correctly.

If PTFs that contain replacement modules are accepted, SMP/E ACCEPT processing will link-edit or bind the modules into the distribution libraries. During this processing, the Linkage Editor or Binder might issue messages that indicate unresolved external references, which will result in a return code of 4 during the ACCEPT phase. You can ignore these messages, because the distribution libraries are not executable and the unresolved external references do not affect the executable system libraries.

**Expected Return Codes and Messages from ACCEPT:** You will receive a return code of 0 if this job runs correctly.

6.1.10 **Run REPORT CROSSZONE**

The SMP/E REPORT CROSSZONE command identifies requisites for products that are installed in separate zones. This command also creates APPLY and ACCEPT commands in the SMPPUNCH data set. You can use the APPLY and ACCEPT commands to install those cross-zone requisites that the SMP/E REPORT CROSSZONE command identifies.

After you install Automatic Binary Optimizer, it is recommended that you run REPORT CROSSZONE against the new or updated target and distribution zones. REPORT CROSSZONE requires a global zone with ZONEINDEX entries that describe all the target and distribution libraries to be reported on.
For more information about REPORT CROSSZONE, see the SMP/E manuals.

6.2 Activating Automatic Binary Optimizer

6.2.1 Product Customization

7.0 Notices

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