



High Level Assembler for z/OS & z/VM & z/VSE V1.5 offers support for new capabilities and increases ease of use

Overview

High Level Assembler Release 5 is a powerful and flexible tool for developing and maintaining all Assembler Language applications. The assembler and its Toolkit feature enhance accuracy and productivity, and improve application reliability, maintainability, and serviceability.

Release 5 supports new hardware and operating system capabilities, provides many usability enhancements, and increases the expressive power of the macro and conditional assembly language.

Among the new features of IBM High Level Assembler and Toolkit Feature R5 are:

- ASCII character constants and literals
- Extensions for Dynamic Link Library modules written in and callable from Assembler Language
- Alignment enhancements for controlling storage alignment
- Support for macros in Unix System Services file system (HFS)
- AMODE instruction extensions for external symbols
- Longer macro arguments and SETC variables
- New option for warning-message suppression
- New diagnostic messages to improve application reliability
- TYPECHECK option, with type-modifier extensions to support new programmer-assigned and assembler types
- Improved Relocation Dictionary, Symbol cross-reference, and USING heading

- Relative-immediate reference to external symbols
- Many new conditional assembly functions
- Simplified, extensible format for SYSADATA records
- New default for SIZE(MAX) option to use storage above the 16 MB line
- MACHINE option as alternative to OPTABLE
- Removal of SYSUT1 utility file to increase performance
- Use of Architecture Level Set-1 instructions by the assembler

Enhancements to the High Level Assembler Release 5 Toolkit Feature include:

- Greatly enhanced Structured Programming Macros
- Additional ASMXREF Cross-Reference utility capabilities
- Many disassembler improvements

Key prerequisites

IBM High Level Assembler for MVS™ & VM & VSE R5 is designed to run on a broad range of processors and operating system families. For specific prerequisites, refer to the **Technical information** section.

Planned availability date

June 11, 2004

At a glance

IBM High Level Assembler for MVS & VM & VSE R5 provides:

- Support for Dynamic Link Libraries (DLLs) to enhance cross-language communication
- New conditional assembly functions and attributes for more powerful macros
- Warning-suppression option to enhance usability
- Macros/COPY files in USS file system for cross-system use
- Improved SYSADATA record layouts for simplified tool integration
- ASCII constants to assist cross-system compatibility
- Longer macro arguments and string variables to simplify macro coding
- New and improved diagnostics to enhance application reliability
- Eight-byte address constants for z/Architecture™ applications in 64-bit mode

For ordering, contact:

Your IBM representative or the Americas Call Centers at

800-IBM-CALL

Reference: LE001

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Description

High Level Assembler Release 5 is a powerful and flexible tool for developing and maintaining all Assembler Language applications, converting symbolic source statements to machine language object code with extensive checks for common coding errors. The assembler and its Toolkit feature enhance programmer accuracy and productivity, and improve application reliability, maintainability, and serviceability.

Release 5 provides extensions supporting new hardware and operating system capabilities, and many usability enhancements. Other new features increase the expressive power of the macro and conditional assembly language, enabling users to create macro instructions that simplify and clarify application coding.

Among the new features of IBM High Level Assembler and Toolkit Feature R5 are:

- Full support for zSeries® instruction set
- Eight-byte address constants of types J, Q, R, and V, supporting development of applications requiring 64-bit addressing mode
- ASCII character constants and literals to enable portability to other environments
- Extensions for Dynamic Link Library modules written in and callable from Assembler Language
- Alignment enhancements: SECTALGN option, ORG statement generalizations, CNOP statement extension, and a quadword-aligned constant type to support new instructions and data types
- Support for macros in Unix System Services file system (HFS)
- AMODE ANY64 support for external symbol definitions and references, thus enabling multiple entry points with differing addressing modes in a single module
- Longer macro arguments and SETC variables, to simplify the creation of more complex and powerful macro instructions
- New option for warning-message suppression to allow you to tailor specific conditions to individual requirements
- TYPECHECK option, with extensions to the EQU instruction and the DC/DS type modifier to support new programmer-assigned and assembler types, enabling much greater flexibility in tailoring macro instructions to specific needs
- Improved listings:
 - Relocation Dictionary contains additional helpful data.
 - Symbol cross-reference includes additional attribute information.
 - USING heading omits default ranges.
- Relative-immediate reference to external symbols allow symbolic linkages without requiring base registers
- Many new conditional assembly functions providing conversions, string manipulation, validation, and mathematical and logical operations
- New internal functions for retrieving symbol attribute values

- Monotonic numeric version/release indicator in exit and function interfaces and in ADATA records
- Simplified, extensible format for SYSADATA records, plus an optional reformatting exit to generate old-format records
- New default for SIZE(MAX) option to use storage above the 16 MB line, thus reducing pressure on virtual storage “below the line”
- Optimized code generated by CNOP
- Re-Init call for user I/O exits to support BATCH processing, allowing you to process multiple assemblies efficiently
- MACHINE option as alternative to OPTABLE, for more intuitive specification of desired instruction sets
- Unified opcode table and disassembly module (ASMADOP)
- Removal of SYSUT1 utility file to increase performance, internal flexibility, and table sizes
- Use of Architecture Level Set-1 instructions internally to improve assembler performance

Product positioning

IBM High Level Assembler and Toolkit Feature R5 are the flagship ESA/390 and zSeries assembler products.

Hardware and software support services

SmoothStart™/Installation Services

IBM SmoothStart or Installation Services will not be provided for IBM High Level Assembler and Toolkit Feature R5.

Reference information

- Software Announcement 292-244, dated May 5, 1992, IBM High Level Assembler/MVS & VM & VSE, Release 1
- Marketing Announcement 394-070, dated April 5, 1994, Price Changes: High Level Assembler
- Marketing Announcement 394-205, dated September 13, 1994, Price Changes: Low-End System/390® Software
- Software Announcement 295-006, dated January 26, 1995, IBM High Level Assembler for MVS & VM & VSE, Release 2
- Software Announcement 295-498, dated December 12, 1995, IBM High Level Assembler for MVS & VM & VSE Toolkit Feature
- Marketing Announcement 397-189, dated October 7, 1997, Price Changes: System/390 Products — 1-2 MSU Prices
- Software Announcement 298-271, dated July 28, 1998, High Level Assembler for MVS & VM & VSE Release 3
- Withdrawal Announcement 998-294, dated September 29, 1998, Withdrawal of One-Time Charge Option

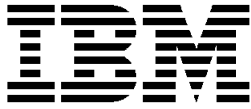
- Withdrawal Announcement 900-039, dated February 29, 2000, Withdrawal of service for High Level Assembler Release 2 (VSE)
- Withdrawal Announcement 900-040, dated March 7, 2000, Withdrawal of service for High Level Assembler Release 2 (MVS and VM)
- Software Announcement 200-217, dated July 11, 2000, High Level Assembler for MVS & VM & VSE Release 4

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IBM US Announcement Supplemental Information

June 8, 2004

Technical information

Specified operating environment

Hardware requirements: IBM High Level Assembler for MVS™ & VM & VSE R5 requires processors supporting Architecture Level Set 1 (ALS-1). These include the following (and later systems):

- S/390® MP2000 (or compatible server)
- 9672-G3/G4 processors (or compatible servers)
- S/390 Multiprise® 3000 (or compatible server)
- S/390 Parallel Enterprise — G5, G6 (or compatible server)
- IBM @server zSeries® servers (or compatible)

For details, refer to

<http://www.ibm.com/S390/os390/plug1.html>

The assembler requires at least 800 KB virtual storage, and possibly more depending on the application being assembled. Because R5 uses no external utility file, large assemblies may require more central storage than previous releases.

The Program Understanding tool (ASMPUT) component of IBM High Level Assembler Toolkit Feature R5 requires a workstation capable of running OS/2®, Windows 95, Windows NT™, or Windows™ XP with a minimum of 32 MB memory (64 MB recommended) and at least 20 MB of available hard-drive space, an SVGA display configured for at least 256 colors, and a host-system connection or other means of transferring host files to the workstation.

Software requirements: IBM High Level Assembler for MVS & VM & VSE R5 executes on:

- OS/390® 2.10.0 (5647-A01)
- z/OS® 1.2.0 (5694-A01) and higher
- z/VM® 3.1.0 (5654-A17) and higher
- VSE/ESA™ 2.6 (5690-VSE) and higher
(**Note:** If you plan to use High Level Assembler R5 on a VSE/ESA 2.6 system, note the hardware requirements listed above.)

The Program Understanding tool (ASMPUT) component of IBM High Level Assembler Toolkit Feature R5 requires one of:

- Windows 98
- Windows NT Version 4.0 with Service Pack 3 or higher (Intel™ platforms)
- A program capable of downloading binary files from a host system running OS/390, MVS/ESA™, VM/ESA®, or VSE/ESA

Note: Under Windows 9x, NT, or XP, using the online help system requires that Microsoft™ Internet Explorer 4.0 or higher be installed.

A recommended host-connection software package is eNetwork Personal Communications Version 4.2 or higher (8H8735), which supports OS/2 and Windows.

Compatibility: IBM High Level Assembler and Toolkit Feature R5 are upward compatible with previous releases of IBM High Level Assembler for MVS & VM & VSE and the Toolkit Feature. New instruction mnemonics may conflict with existing customer macro names, but specifying an appropriate OPTABLE option will allow existing programs to assemble as before.

Additional storage may be required for large assemblies, and a processor supporting Architecture Level Set 1 (ALS-1) is required.

Performance considerations: IBM High Level Assembler for MVS & VM & VSE R5 is designed to utilize storage efficiently; large regions are required for very large programs. New language features can speed assembler processing of large macro-based programs.

User group requirements: This announcement satisfies or partially satisfies at least 61 requirements from one or more of the worldwide user group communities. Groups include COMMON, COMMON Europe, Guide Share Europe (GSE), InterAction (Australia/New Zealand), Japan Guide Share (JGS), SHARE Inc., and other sources. Requirements satisfied include:

- ASCII character constants and literals
- Parts with text for DLL support
- Alignment enhancements: MR0711016658
- USS support for macros in HFS
- New option for warning-message suppression: PASR R057313, MR1025005463, REQ73391
- New diagnostic messages
- Type checking enhancements: SALANG91364, SALANG91633, SDADTS86035, REQ32802, SEAS REQ33838
- Improved listings
- Support for relative-immediate reference to external symbols
- New conditional assembly functions
- Monotonic numeric version/release indicator in exit/function interfaces
- New format for ADATA file records
- Improved external-function parameter list
- AMODE ANY64 support for external LD, ER, PR items
- Longer macro arguments and SETC variables

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- Removal of SYSUT1, all assemblies done entirely in storage: MR0311032139
- Improved code generated by CNOP
- Re-Init call for user I/O exits

Planning information

Customer responsibilities: Detailed planning information is included in the *IBM High Level Assembler and Toolkit Feature R5 Installation and Customization Guide*. The changes from previous releases are minimal.

Packaging: All IBM High Level Assembler and Toolkit Feature R5 components are shipped as host files, on 3480 Data Cartridge.

Security, auditability, and control

The announced program uses the security and auditability features of the host operating system. The customer is responsible for evaluation, selection, and implementation of security features, administrative procedures, and appropriate controls in application systems and communication facilities.

Ordering information

Ordering z/OS through the Internet

ShopzSeries provides an easy way to plan and order your z/OS ServerPac or CBPDO. It will analyze your current installation, determine the correct product migration, and present your new configuration based on z/OS. Additional products can also be added to your order (including determination of whether all product requisites are satisfied). ShopzSeries is available in the U.S. and several countries in Europe. In countries where ShopzSeries is not available yet, contact your IBM representative (or Business Partner) to handle your order via the traditional IBM ordering process. For more details and availability, visit the ShopzSeries Web site at

<http://www14.software.ibm.com/webapp/ShopzSeries/ShopzSeries.jsp>

Order VM SDO and VSE SIPO through the Internet

ShopzSeries provides an easy way to plan and order zSeries software upgrades. This now includes VM and VSE! Using ShopzSeries, customers can quickly generate orders for VM SDOs and VSE SIPOs. Additionally, ShopzSeries will ensure your order is technically correct (that is, ensures any coreq or prereq or incompatibility conditions are resolved to ensure timely order placement and processing). ShopzSeries is available in the United States and several countries in Europe. In countries where ShopzSeries is not available yet, contact your IBM representative (or Business Partner) to handle your order via the traditional IBM ordering process. For more details and availability, visit the ShopzSeries Web site at

<http://www.ibm.com/software/ShopzSeries>

Current licensees

Current licensees of IBM High Level Assembler and Toolkit Feature will be sent a program reorder form that can be returned directly to IBM Software Delivery and Fulfillment.

These reorder forms are scheduled to be mailed by June 13, 2004. Returned reorder forms will be processed within 10 workdays of receipt.

New licensees

Orders for new licenses can be placed now.

Shipment will begin on the planned availability date.

- Orders entered after the planned availability date will be assigned a schedule date for the week following order entry.

New users of IBM High Level Assembler and Toolkit Feature should specify:

Type	Model
5696	234

Basic license: Refer to the announcements listed under **Reference information** for prices and ordering information for IBM High Level Assembler for MVS & VM & VSE R5.

Entry Support License (ESL): To order an ESL, specify the program number, feature number 9001 for asset registration, and the applicable ESL OTC feature number. Also specify the feature number of the desired distribution medium.

ESL machines can be determined by referring to the IBM Entry End User/390 Attachment (Z125-4379).

Basic machine-readable material: There are no changes to ordering information for basic machine-readable material for IBM High Level Assembler and Toolkit Feature R5. Refer to the announcements listed under **Reference information** for information.

Customization options: Order customization options are unchanged from previous releases. Refer to the announcements listed in **Reference information**.

Optional machine-readable material: To order, select the feature number for the desired distribution medium.

This information is unchanged from previous releases. Refer to the announcements listed under **Reference information** for prices and ordering information for IBM High Level Assembler for MVS & VM & VSE R5.

Unlicensed documentation: There are no changes to the unlicensed documentation from previous releases. Refer to the announcements listed under **Reference information**.

Displayable softcopy publications: IBM High Level Assembler and Toolkit Feature R5 publications are offered in displayable softcopy form. All unlicensed manuals are included.

These displayable manuals can be used with the BookManager® READ licensed programs in any of the supported environments, and with the Adobe Acrobat Reader. Terms and conditions for use of the machine-readable files are shipped with the files.

Licensed documentation: Subsequent updates (technical newsletters or revisions between releases) to the publications shipped with the product will be distributed to the user of record for as long as a license for this software remains in effect. A separate publication order or subscription is not needed.

Customized offerings

Most product media are shipped only via Customized Offerings (that is, CBPDO, ServerPac, Systempac®). Noncustomized items (CDs, diskettes, source media, media kits) will continue to be shipped via the stand-alone product.

Terms and conditions

The terms for IBM High Level Assembler and Toolkit Feature R5, as previously announced in Software Announcement 292-244, dated May 5, 1992, and as modified in Marketing Announcement 394-070, dated April 5, 1994, Marketing Announcement 394-205, dated September 13, 1994, Marketing Announcement 397-189, dated October 7, 1997, Software Announcement 295-006, dated January 26, 1995, Software Announcement 295-498, dated December 12, 1995, and Software Announcement 200-217, dated July 11, 2000, licensed under the IBM Customer Agreement, are unaffected by this announcement.

Program currency: IBM High Level Assembler and Toolkit Feature R5 (5696-234) — available until discontinued with 12 months' written notice.

IBM Operational Support Services — Support Line: No

Prices

Refer to the announcements listed under **Reference information** for price and charging information for IBM High Level Assembler for MVS & VM & VSE R5.

OTC: Customers who pay an OTC for a licensed program receive enhancements and future releases, if any, at no additional charge. Significant new function may be offered as an optional feature and charged for separately. If a replacement program is announced and the customer elects to license the replacement program for an OTC and replace the prior program, an upgrade charge may apply.

Entry Support License OTC: An OTC authorizes use only on IBM Entry End User/390 machines.

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Note: Shipments will begin after the planned availability date.

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