## Table of Contents





# Notices

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# Introduction

ASMA is somewhat behind in instruction implementation. This document describes the plan for the immediate future and generally going beyond that. Over time this document will be updated with the implementation status and next set of planned changes.

**In general, ASMA supports all machine instructions for all mainframe architectures starting with S/360 models through the systems defined by the SA22-7832-11 version of the *IBM® z/Architecture® Principles of Operation* released in September, 2017.**

Extended Mnemonics are more restrictive. See below where within the plan extended mnemonics using any bits of the instruction beyond bit 15 are addressed. Any missing extended mnemonic using only bits 8-15 should be reported as a bug.

Because ASMA instructions are defined by the MSL files (see the `asma/msl` directory), this is largely a plan for MSL. The last features implemented in `s390x-inst.msl` are those instructions added by the PoO manual SA22-7832-11, released in September, 2017.

The next version of the PoO manual was -12, released in September, 2019. The latest PoO manual, -13, was released in May, 2022. This makes ASMA instruction support three years behind. Most, but not all, new instructions are in the area of new floating point instructions and vector instructions. Of most interest by the users of ASMA are support for new

instructions that are of more general use. “General use” includes privileged instructions for bare-metal programs.

This table documents the general status of instruction development for the -11, -12, and -13 PoO manuals by chapter.

| Instructions | Chapter | -11 Status | -12 Status | -13 Status |
|---|---|---|---|---|
| General | 7 | Implemented | ? | ? |
| Decimal | 8 | No change | ? | ? |
| Control | 10 | Implemented | ? | ? |
| I/O | 14 | No change | ? | ? |
| Vector FP | 24 | Researched | ? | ? |

Following implementation of the new instructions, the Machine Specification Language enhancements required for many of the new extended mnemonics using bits beyond 15 will be made. The **plan** for the actual extended mnemonics and the implementation of the new floating point and vector instructions will be addressed in the future.

In the tables in the following sections, instructions, MSL formats, and programming notes in **bold** text require implementation. As implementation occurs, the bold text font will be changed to normal text font.

## Change History

| Change | Date | Description |
|---|---|---|
| 1 | 4 Sep 2022 | Initial release. |
| 2 | | -11 PoO fully supported with addition of two instructions that rename instructions released in the -10 PoO, chapter 24. |

# SA22-7832-11 – September, 2017

No new decimal instructions, Chapter 8, nor new I/O Instructions, Chapter 14, were added. Instructions that operate upon decimal floating point data, Chapter 20, and decimal data acted upon by vector instructions, Chapter 25 *were* added. Those additions are planned for a later implementation.

New vector instructions were added as documented in Chapters 21-25.

Upon inspection of the actual MSL files, nearly all new instructions **WERE** already added to the MSL files for the -11 version of the PoO manual except for the mnemonic change for two instructions in Chapter 24.

By incorporating the mnemonic name changes, ASMA is current with the -11 version of the PoO manual for machine instructions. At this point ASMA is now requiring enhancements for -12, released in September, 2019 and -13, released in May, 2022. ASMA is now three years behind.

## New General Instructions – Chapter 7

| Mnemonic | Page # | Prog. Notes | MSL Format | Implemented | Other Notes |
|---|---|---|---|---|---|
| AGH | 7-28 | 31 | RXYA | yes | |
| BIC | 7-39 | 31 | RXYB | yes | **Research Extended Mnemonics** |
| KMA | 7-78 | 33 | RRFB3 | yes | |
| CLT | 7-155 | 26 | RSYB | yes | |
| CLGT | 7-155 | 26 | RSYB | yes | |
| LGG | 7-274 | 32 | RXYA | yes | |
| LGSC | 7-275 | 32 | RXYA | yes | |
| LLGFSG | 7-274 | 32 | RXYA | yes | |
| MG | 7-304 | 31 | RXYA | yes | |
| MGRK | 7-304 | 31 | RRFA1 | yes | |
| MGH | 7-305 | 31 | RXYA | yes | |
| MSC | 7-307 | 31 | RXYA | yes | |
| MSRKC | 7-307 | 31 | RRFA1 | yes | |
| MSGC | 7-307 | 31 | RXYA | yes | |
| MSGRKC | 7-307 | 31 | RRFA1 | yes | |
| PRNO | 7-346 | 29 | RRE | yes | |
| RISBGN | 7-363 | 26 | RIEF | yes | |
| STGSC | 7-383 | 32 | RXYA | yes | |
| SGH | 7-388 | 31 | RXYA | yes | |

**Programming Notes**

| Note # | Description |
|---|---|
| 26 | Miscellaneous-Instruction Extensions Facility 1 |
| 29 | Message-Security-Assist Extension 5 |

| Note # | Description |
|---|---|
| 31 | Miscellaneous-Instruction Extensions Facility 2 |
| 32 | Guarded Storage Facility |
| 33 | Message-Security-Assist Extension 8 |

# New Control Instructions – Chapter 10

| Mnemonic | Page # | Prog. Notes | MSL Format | Implemented | Notes |
|---|---|---|---|---|---|
| IRBM | 10-30 | 11 | RRE | yes | |
| TPEI | 10-169 | 12 | RRE | yes | |

### Programming Notes

| Note # | Description |
|---|---|
| 11 | Insert-Reference-Bits-Multiple Facility |
| 12 | Test Pending External Interruption Facility |

# New Vector Floating Point Instructions – Chapter 24

| Mnemonic | Page # | Prog. Notes | MSL Format | Implemented | Notes |
|---|---|---|---|---|---|
| VFLL | 24-25 | | VRRA4 | yes | Changed Mnemonic from VLDE |
| VFLR | 24-26 | | VRRA | yes | Changed Mnemonic from VLED |