

No Overriding ASMAOPT Parameters  
Overriding Parameters- ASA,TEST,US(WARN(11))  
No Process Statements

Options for this Assembly

```

NOADATA
ALIGN
3 PARM/OPTION ASA
ASCII(00819)
BATCH
CA(LOCAL)
CE(LOCAL)
CODEPAGE(01148)
NOCOMPAT
CU(LOCAL)
NODATAMAP
NODBCS
NODECK
DXREF
EBCDIC(00037)
ESD
NOEXIT
FAIL(NOMSG,NOMNOTE,MAXERRS(500))
FLAG(0,ALIGN,CONT,EXLITW,NOIMPLEN,NOLONGER,NOPAGE0,PUSH,RECORD,RENT,NOSIGNED,NOSUBSTR,NOTRUNC,
USING0)
NOFOLD
NOGOFF
ILMA
NOINFO
LANGUAGE(EN)
NOLIBMAC
LINECOUNT(60)
LIST(121)
MACHINE(,NOLIST)
MXREF(SOURCE)
OBJECT
OPTABLE(UNI,NOLIST)
NOPCONTROL
NOPESTOP
NOPROFILE
NORA2
NORENT
RLD
RXREF
SECTALGN(8)
SIZE(MAX)
NOSUPRWARN
SYSPARM()
3 PARM/OPTION TEST
THREAD
NOTRANSLATE
TYPECHECK(MAGNITUDE,REGISTER,SIGNED)
UNICODE(01200)

```

採用されたアセンブル・オプション (利用者が選択したか省略時解釈)

```

3 PARM/OPTION USING(NOLIMIT,MAP,WARN(11))
NOWORKFILE
XREF(SHORT,UNREFS)

```

No Overriding DD Names

| Symbol   | Type | Id       | Address  | Length   | Owner | Id | Flags | Alias-of                   |
|----------|------|----------|----------|----------|-------|----|-------|----------------------------|
| MAINPROG | SD   | 00000001 | 00000000 | 00000290 |       |    | 00    | External Symbol Dictionary |

プログラム・モジュールの大きさ

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Active Usings: None

Loc Object Code Addr1 Addr2 Stmt Source Statement HLASM R6.0 2024/03/06 01.21

ここ以降が実務的な部分 (デバッグ時に必要)

プログラム冒頭の部分は入口点の処理。リンケージ規約というOSが決めたルールに基づいて記述されている。(COBOLやPL/Iなどではコンパイラが生成してくれるが、アセンブラーでは自分で書かねばならない)

CSECT先頭からの変位 (プログラム内オフセット) を示す値

機械命令コード

ここ以降が、プログラムとしての具体的な処理。

```

1 *****
2 * z/Architecture & z/OS Assembler Learning Program *
3 * ===== *
4 * Program member name GO is fixed. That is created by *
5 * ASMCL/ASMCLG HLASM Standard Procedure. *
*****
* ----- *
* HOUSE-KEEPING PROCEDURE *
* ----- *
000000 00000 00290 10 MAINPROG CSECT , DEFINE CONTROL SECTION
R:C 00000 11 USING *,R12 DEFINE OUR BASE REGISTER=12
12 SAVE (14,12),, SAVE CALLER REGISTERS +
'MAINPROG(ALP:z/OS Assembler Learning Program)BUILD:&SYS+
DATE-&SYSTIME'
000000 47F0 F046 00046 14+ B 70(0,15) BRANCH AROUND ID 01-SAVE
000004 41 15+ DC AL1(65) LENGTH OF IDENTIFIER 01-SAVE
000005 D4C1C9D5D7D9D6C7 16+ DC CL32'MAINPROG(ALP:z/OS Assembler Lear' IDENTIFIER 01-SAVE
000025 9589958740D79996 17+ DC CL32'ning Program)BUILD:03/06/24-01.2' IDENTIFIER 01-SAVE
000045 F1 18+ DC CL1'1' IDENTIFIER 01-SAVE
000046 90EC D00C 0000C 19+ STM 14,12,12(13) SAVE REGISTERS 01-SAVE
00004A 18CF 20 LR R12,R15 GR12 ---> OUR BASE ADDRESS
00004C 18FD 21 LR R15,R13 COPY CALLER SAVEAREA ADDRESS
00004E 41D0 C0CC 000CC 22 LA R13,GPRSAVEA LOAD OUR RSA(SAVEAREA) ADDRESS
000052 50F0 D004 00004 23 ST R15,4(,R13) SAVE CALLER'S SAVEAREA ADDRESS +
INTO OUR SAVEAREA
000056 50D0 F008 00008 24 ST R13,8(,R15) CHAIN OUR RSA INTO CALLER'S +
SAVEAREA FOR SA TRACE
00005A 5810 1000 00000 25 L R1,0(,R1) LOAD EXEC PARM FIELD ADDRESS
00005E 4800 1000 00000 26 LH R0,0(,R1) GR0 ---> PARM TEXT LENGTH
000062 4110 1002 00002 27 LA R1,2(,R1) GR1 ---> BEGIN OF PARM TEXT
29 *****
30 * AVAILABLE YOUR ASSEMBLER LANGUAGE CODE AT HERE. *
31 * ===== *
32 * GR0 ---> EXEC PARAMETER TEXT LENGTH *
33 * GR1 ---> EXEC PARAMETER TEXT ADDRESS *
34 * GR13 --> OUR REGISTER SAVEAREA(RSA) *
35 *****
000066 36 MAINPROC DS 0H
000066 5820 C268 00268 37 L R2,=A(X'22222222') GR2 <--- X'22222222'
00006A 5830 C26C 0026C 38 L R3,=A(X'33333333') GR3 <--- X'33333333'
00006E 5840 C270 00270 39 L R4,=A(X'44444444') GR4 <--- X'44444444'
000072 5850 C274 00274 40 L R5,=A(X'55555555') GR5 <--- X'55555555'
000076 5860 C278 00278 41 L R6,=A(X'66666666') GR6 <--- X'66666666'
00007A 5870 C27C 0027C 42 L R7,=A(X'77777777') GR7 <--- X'77777777'
00007E 5880 C280 00280 43 L R8,=A(X'88888888') GR8 <--- X'88888888'
000082 5890 C284 00284 44 L R9,=A(X'99999999') GR9 <--- X'99999999'
000086 58A0 C288 00288 45 L R10,=A(X'AAAAAAAA') GR10 <-- X'AAAAAAAA'
00008A 58B0 C28C 0028C 46 L R11,=A(X'BBBBBBBB') GR11 <-- X'BBBBBBBB'
00008E 5800 C120 00120 48 L R0, FWORD1 LOAD FWORD1
000092 5000 C118 00118 49 ST R0, DWORD STORE IT INTO DWORD
000096 4810 C128 00128 50 LH R1, HWORD1 LOAD HWORD1
00009A 5010 C11C 0011C 51 ST R1, DWORD+4 STORE IT INTO DWORD+4

```

Active Usings: MAINPROG,R12

Loc Object Code Addr1 Addr2 Stmt Source Statement HLASM R6.0 2024/03/06 01.21

```

00009E 4810 C12A 0012A 53 LH R1, HWORD2 LOAD HWORD2
0000A2 4E10 C118 00118 54 CVD R1, DWORD CONVERT IT TO PACKED-DECIMAL
0000A6 D209 C167 C12D 00167 0012D 56 MVC WORKAREA(10), CHAR2 MOVE CHAR2 TO WORKAREA
0000AC 1FEE 58 SLR R14, R14 CLEAR WORKREG
0000AE 41F0 0005 00005 59 LA R15, 5 LOAD LOOP COUNT
0000B2 60 LOOP DS 0H
0000B2 A7EA 0001 61 AHI R14, +1 INCREMENT R14
0000B6 46F0 C0B2 000B2 62 BCT R15, LOOP DO UNTIL R15=0 +
USE CURRENT GR15 AS COMPLETION CODE(CC=0)
63 *****
64 * ----- *
* PROGRAM EXIT PROCEDURE *
* ===== *
* GR15 --> COMPLETION CODE(RETCD *
* ----- *

```

この部分はプログラム終了時の復帰処理。(ひな型なので予め記述されている) これもリンケージ規約というOSが決めたルールに基づいて記述されている。(COBOLやPL/Iなどではコンパイラが生成してくれるが、アセンブラーでは自分で書かねばならない)

```

0000BA 69 EXITPROC DS 0H EXIT PROCEDURE AT HERE
0000BA 58D0 D004 00004 70 L R13,4(,R13) LOAD CALLER'S SAVEAREA ADDRESS
71 RETURN (14,12),T,RC=(15) RESTORE CALLER'S REGISTERS +
AND RETURN TO CALLER WITH RETCD
0000BE 58E0 D00C 0000C 73+ L 14,12(0,13) RESTORE REG 14 @L1C 01-RETUR
0000C2 980C D014 00014 74+ LM 0,12,20(13) RESTORE THE REGISTERS 01-RETUR
0000C6 9601 D00F 0000F 75+ OI 15(13),X'01' SET RETURN INDICATION 01-RETUR
0000CA 07FE 76+ BR 14 RETURN 01-RETUR

```

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ここ以降は、定義されたデータ領域

```

0000CC 77 *****
78 *      DATA AREA *
79 *****
80 GPRSAVEA DS      18F          STANDARD GPR SAVEAREA(18WORDS)
81 *-----*
82 *      AVAILABLE YOUR ASSEMBLER LANGUAGE DATA AT HERE. *
83 *-----*
000118 84 DATAAREA DS      0D          USER DATA AREA START AT HERE
000118 0000000000000000 85 DWORD      DC      D'0'          x0000000000000000
000120 00003039 86 FWORD1     DC      F'12345'       x00003039
000124 FFFC95 87 FWORD2     DC      FL3'-875'       xFFFC95
000127 00 88 HWORD1     DC      H'6789'          x1A85
000128 1A85 89 HWORD2     DC      H'-123'          xFF85
00012A FF85 90 *
00012C C1 91 CHAR1      DC      C'A'          'A'
00012D C1C2C3C4C5C6C7C8 92 CHAR2     DC      CL10'ABCDEFGH'       'ABCDEFGH '
000137 E7E8E7E8E7E8 93 CHAR3     DC      3CL2'XY'          'XYXYXY'
00013D F1F2F3F4F5404040 94 CHAR4     DC      CL8'12345'        '12345 '
000145 00 95 HEX1      DC      X'00'          x00
000146 00000123 96 HEX2      DC      XL4'123'          x00000123
00014A 12345C 97 PACK1     DC      P'12345'          x12345C
00014D 00003456789C 98 PACK2     DC      PL6'+3456789'      x00003456789C
000153 875D 99 PACK3     DC      P'-875'          x875D
000155 00875D 100 PACK4    DC      PL3'-875'         x00875D
000158 F0F0F0F1F2F3F4C5 101 ZONE1    DC      ZL8'12345'        ' 1234E'
102 *
000160 000000CC 103 ADDR1     DC      A(GPRSAVEA)       x00000xxx
000164 00012C 104 ADDR2     DC      AL3(CHAR1)        x000xxx
105 *-----*

```

Active Usings: MAINPROG,R12

```

Loc Object Code Addr1 Addr2 Stmt Source Statement HLASM R6.0 2024/03/06 01.21
000167 106 WORKAREA DS XL256 --- 256BYTES WORKING AREA ---
107 *-----*
108 YREGS , EXPAND GPR EQUATIONS(z/OS ONLY)
00000 110+R0 EQU 0 01-YREGS
00001 111+R1 EQU 1 01-YREGS
00002 112+R2 EQU 2 01-YREGS
00003 113+R3 EQU 3 01-YREGS
00004 114+R4 EQU 4 01-YREGS
00005 115+R5 EQU 5 01-YREGS
00006 116+R6 EQU 6 01-YREGS
00007 117+R7 EQU 7 01-YREGS
00008 118+R8 EQU 8 01-YREGS
00009 119+R9 EQU 9 01-YREGS
0000A 120+R10 EQU 10 01-YREGS
0000B 121+R11 EQU 11 01-YREGS
0000C 122+R12 EQU 12 01-YREGS
0000D 123+R13 EQU 13 01-YREGS
0000E 124+R14 EQU 14 01-YREGS
0000F 125+R15 EQU 15 01-YREGS
127 END
000268 22222222 128 =A(X'22222222')
00026C 33333333 129 =A(X'33333333')
000270 44444444 130 =A(X'44444444')
000274 55555555 131 =A(X'55555555')
000278 66666666 132 =A(X'66666666')
00027C 77777777 133 =A(X'77777777')
000280 88888888 134 =A(X'88888888')
000284 99999999 135 =A(X'99999999')
000288 AAAAAAAAAA 136 =A(X'AAAAAAAA')
00028C BBBB BBBB 137 =A(X'BBBBBBBB')

```

リテラル定数が定義された部分 (アセンブラーによって展開される)

Relocation Dictionary

```

Pos.Id Rel.Id Address Type Length Action HLASM R6.0 2024/03/06 01.21
00000001 00000001 00000160 A 4 +
00000001 00000001 00000164 A 3 +

```

Ordinary Symbol and Literal Cross Reference

```

Symbol Length Value Id R Type Asm Program Defn References HLASM R6.0 2024/03/06 01.21
CHAR1 1 0000012C 00000001 C C 91 104
CHAR2 10 0000012D 00000001 C C 92 56
DWORD 8 00000118 00000001 D D 85 49M 51M 54M
FWORD1 4 00000120 00000001 F F 86 48
GPRSAVEA 4 000000CC 00000001 F F 80 22 103
HWORD1 2 00000128 00000001 H H 88 50
HWORD2 2 0000012A 00000001 H H 89 53
LOOP 2 000000B2 00000001 H H 60 62B
R0 1 00000000 00000001 A U 110 26M 48M 49
R1 1 00000001 00000001 A U 111 25M 25 26 27M 27 50M 51 53M 54
R10 1 0000000A 00000001 A U 120 45M
R11 1 0000000B 00000001 A U 121 46M
R12 1 0000000C 00000001 A U 122 11U 20M
R13 1 0000000D 00000001 A U 123 21 22M 23 24 70M 70

```

クロス・リファレンス (参照されているデータ領域や未使用レジスターの判別に利用できる。プログラム修正による影響範囲の確認等にも応用できる)

```

R14      1 0000000E 00000001 A U      124 58M
R15      1 0000000F 00000001 A U      125 20 21M 23 24 59M 62M
R2       1 00000002 00000001 A U      112 37M
R3       1 00000003 00000001 A U      113 38M
R4       1 00000004 00000001 A U      114 39M
R5       1 00000005 00000001 A U      115 40M
R6       1 00000006 00000001 A U      116 41M
R7       1 00000007 00000001 A U      117 42M
R8       1 00000008 00000001 A U      118 43M
R9       1 00000009 00000001 A U      119 44M
WORKAREA 256 00000167 00000001 X X    106 56M
=A(X'AAAAAAA')
  4 00000288 00000001 A      136 45
=A(X'BBBBBBB')
  4 0000028C 00000001 A      137 46
=A(X'2222222')
  4 00000268 00000001 A      128 37
=A(X'3333333')
  4 0000026C 00000001 A      129 38
=A(X'4444444')
  4 00000270 00000001 A      130 39
=A(X'5555555')
  4 00000274 00000001 A      131 40
=A(X'6666666')
  4 00000278 00000001 A      132 41
=A(X'7777777')
  4 0000027C 00000001 A      133 42
=A(X'8888888')
  4 00000280 00000001 A      134 43
=A(X'9999999')
  4 00000284 00000001 A      135 44

```

Unreferenced Symbols Defined in CSECTs

```

Defn Symbol
103 ADDR1
104 ADDR2
 93 CHAR3
 94 CHAR4
 84 DATAAREA
 69 EXITPROC
 87 FWORD2
 95 HEX1
 96 HEX2
 36 MAINPROC
 10 MAINPROG
 97 PACK1
 98 PACK2
 99 PACK3
100 PACK4
101 ZONE1

```

未参照シンボルのクロス・リファレンス  
(参照されていないデータ領域の一覧。データ定義等を削除しても大丈夫かどうかの判別にも利用できる)

Macro and Copy Code Source Summary

```

Con Source
L1 SYS1.MACLIB

```

マクロ・ライブラリー・サマリー  
(マクロ命令等をどこから持ってきたかを確認できる)

```

Volume Members
VTMVSC RETURN SAVE SYSSTATE YREGS
Using Map

```

```

Stmt -----Location----- Action -----Using----- Reg Max Last Label and Using Text
      Count      Id      Type      Value      Range      Id      Disp      Stmt
  11 00000000 00000001 USING ORDINARY 00000000 00001000 00000001 12 0028C 62 *,R12

```

General Purpose Register Cross Reference

```

Register References (M=modified, B=branch, U=USING, D=DROP, N=index)
 0(0) 19 26M 48M 49 74M
 1(1) 19 25M 25 26 27M 27 50M 51 53M 54 74M
 2(2) 19 37M 74M
 3(3) 19 38M 74M
 4(4) 19 39M 74M
 5(5) 19 40M 74M
 6(6) 19 41M 74M
 7(7) 19 42M 74M
 8(8) 19 43M 74M
 9(9) 19 44M 74M
10(A) 19 45M 74M
11(B) 19 46M 74M
12(C) 11U 19 20M 74M
13(D) 19 21 22M 23 24 70M 70 73 74 75
14(E) 19 58M 58 61M 73M 76B
15(F) 14 19 20 21M 23 24 59M 62M

```

Diagnostic Cross Reference and Assembler Summary

No Statements Flagged in this Assembly

HIGH LEVEL ASSEMBLER, 5696-234, RELEASE 6.0, PTF UI94775

SYSTEM: z/OS 02.04.00

JOBNAME: Zxxxxx@A

STEPNAME: ASMACL

PROCSTEP: C

Unicode Module: ASMA047C From Page 1148 To Page 17584

ECECP: International 1

Data Sets Allocated for this Assembly

**【以下省略】**