

Invocation parameters:

OPTFILE

PROCESS(CBL) statements:

cbl NOTEST

cbl SSRANGE (ZLEN,MSG)

cbl OPTIMIZE(1)

cbl APOST

cbl LIST

Options in effect:

NOADATA

NOADV

AFP (NOVOLATILE)

APOST

ARCH(11)

ARITH (COMPAT)

AWO

BLOCK0

BUFSIZE (8192)

NOCICS

CODEPAGE (1147)

NOCOMPILE(S)

NOCOPYLOC

NOCOPYRIGHT

NOCURRENCY

DATA(31)

DBCS

NODECK

DEFINE (ISBATCH=B'1')

DEFINE (ISCICS=B'0')

DEFINE (ISEXCI=B'0')

DIAGTRUNC

DISPSIGN (SEP)

NODLL

NODUMP

DYNAM

NOEXIT

NOEXPORTALL

FASTSRT

FLAG(I,I)

NOFLAGSTD

HGPR (PRESERVE)

INITCHECK

NOINITIAL

NOINLINE

INTDATE (ANSI)

LANGUAGE (EN)

LINECOUNT (60)

LIST

MAP (HEX)

MAXPCF (100000)

NOMDECK

NONAME

NSYMBOL (NATIONAL)

NONUMBER

NONUMCHECK

NUMPROC (NOPFD)

OBJECT
NOOFFSET
OPTIMIZE (1)
OUTDD (SYSOUT)
NOPARMCHECK
PGMNAME (COMPAT)
QUALIFY (COMPAT)
RENT
RMODE (AUTO)
RULES (ENDPERIOD, EVENPACK, LAXPERF, OMITODOMIN, SLACKBYTES, NOUNREFSOURCE)
NOSERVICE
NOSEQUENCE
SOURCE
SPACE (1)
NOSQL
NOSQLCCSID
NOSQLIMS
SSRANGE (ZLEN, MSG)
NOSTGOPT
SUPPRESS
NOTERM
NOTEST (NODWARF, NOSOURCE, NOSEPARATE)
NOTHREAD
TRUNC (BIN)
NOVBREF
VLR (STANDARD)
VSAMOPENFS (SUCC)
NOWORD
XMLPARSE (XMLSS)
XREF (FULL)
ZONEDATA (NOPFD)
ZWB

```

000001      Identification division.
000002      Program-id. TstRfMod.
000003      *
000004      * This program illustrate problem concerning a set address
000005      * on a variable length data addressed by reference modification
000006      * when SSRANGE option is active
000007      *
000008      Environment division.
000009      Data division.
000010      Working-storage section.
000011      01 Path-address          pointer.                000000000 4C
000012      01 Path-Max            pic S9(4) comp-5 value 1024. 000000000 2C
000013      01 Path-Length         pic S9(4) comp-5.           000000000 2C
000014      01 Element-Length     pic S9(4) comp-5.           000000000 2C
000015      01 Element-Pos        pic S9(4) comp-5.           000000000 2C
000016      Linkage section.
000017      01 The-FPath.
000018          02 A-Pos-in-The-FPath pic X                    BLL=00001,000000000 0CL1024
000019          occurs 1024.                                           BLL=00001,000000000 1C
000020      01 The-VUPath.
000021          02 A-Pos-in-The-VUPath pic X                    BLL=00002,000000000 0CL*
000022          occurs 0 to unbounded                                   BLL=00002,000000000 1C
000023          depending on Path-Length.                               13
000024      01 The-VBPath.
000025          02 A-Pos-in-The-VBPath pic X                    BLL=00003,000000000 0CL1024
000026          occurs 0 to 1024                                       BLL=00003,000000000 1C
000027          depending on Path-Length.                               13
000028      01 The-Element.
000029          02
000030          pic X
000031          occurs 0 to unbounded
000032          depending on Element-Length.                             14
000032      Procedure division.
000033      MAIN.
000034      *
000035          allocate Path-Max characters initialized                12
000036          returning Path-address                                11
000037          set address of The-VUPath to Path-address              IMP 20 11
000038          set address of The-VBPath to Path-address              IMP 24 11
000039          set address of The-FPath to Path-address              IMP 17 11
000040          move 18 to Path-Length                                13
000041      *
000042      *           1           1
000043          move '/root/first/second' to The-VUPath                20
000044      *
000045      *
000046      SET-BY-OCCURS-IN-FPATH.
000047          move 13 to Element-Pos                                15
000048          move 6 to Element-Length                               14
000049          set address of The-Element                             IMP 28
000050          to address of A-Pos-in-The-FPath (Element-Pos)       IMP 18 15
000051          display 'Element = "' The-Element "'                  28
000052      *
000053      *
000054      SET-BY-OCCURS-IN-VUPATH.
000055          move 13 to Element-Pos                                15
000056          move 6 to Element-Length                               14
000057          set address of The-Element                             IMP 28

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000058          to address of A-Pos-in-The-VUPath (Element-Pos)          IMP 21 15
000059          display 'Element = "' The-Element '''                    28
000060          .
000061      *
000062      SET-BY-OCCURS-IN-VBPATH.
000063          move 13 to Element-Pos          15
000064          move 6 to Element-Length        14
000065          set address of The-Element      IMP 28
000066          to address of A-Pos-in-The-VBPath (Element-Pos)          IMP 25 15
000067          display 'Element = "' The-Element '''                    28
000068          .
000069      *
000070      SET-BY-REFERENCE-IN-FPATH.
000071          move 7 to Element-Pos          15
000072          move 5 to Element-Length        14
000073          set address of The-Element      IMP 28
000074          to address of The-FPath (Element-Pos:1)                    IMP 17 15
000075          display 'Element = "' The-Element '''                    28
000076          .
000077      *
000078      SET-BY-REFERENCE-IN-VUPATH.
000079      * this code will abend at run time :-/
000080          move 7 to Element-Pos          15
000081          move 5 to Element-Length        14
000082          set address of The-Element      IMP 28
000083          to address of The-VUPath (Element-Pos:1)                    IMP 20 15
000084          display 'Element = "' The-Element '''                    28
000085          .
000086      *
000087      SET-BY-REFERENCE-IN-VBPATH.
000088          move 7 to Element-Pos          15
000089          move 5 to Element-Length        14
000090          set address of The-Element      IMP 28
000091          to address of The-VBPath (Element-Pos:1)                    IMP 24 15
000092          display 'Element = "' The-Element '''                    28
000093          .
000094      BYE.
000095          Goback
000096          .
000097      End program TstRfMod.          2
  
```

Data Division Map

Data Definition Attribute codes (rightmost column) have the following meanings:

- D = Object of OCCURS DEPENDING G = GLOBAL S = Spanned file
- E = EXTERNAL O = Has OCCURS clause U = Undefined format file
- F = Fixed-length file OG= Group has own length definition V = Variable-length file
- FB= Fixed-length blocked file R = REDEFINES VB= Variable-length blocked file
- X = Unallocated

Source LineID	Hierarchy and Data Name	Base Locator	Displacement Structure	Asmblr Data Definition	Data Type	Data Def Attributes
2	PROGRAM-ID TSTRFMOD-----					*
11	1 PATH-ADDRESS.		000000000	DS 4C	Pointer	
12	1 PATH-MAX.		000000000	DS 2C	Binary	
13	1 PATH-LENGTH		000000000	DS 2C	Binary	D
14	1 ELEMENT-LENGTH.		000000000	DS 2C	Binary	D
15	1 ELEMENT-POS		000000000	DS 2C	Binary	
17	1 THE-FPATH	BLL=00001	000000000	DS 0CL1024	Group	
18	2 A-POS-IN-THE-FPATH.	BLL=00001	000000000	DS 1C	Display	O
20	1 THE-VUPATH.	BLL=00002	000000000	DS 0CL*	Grp-VarLen	
21	2 A-POS-IN-THE-VUPATH	BLL=00002	000000000	DS 1C	Display	O
24	1 THE-VBPATH.	BLL=00003	000000000	DS 0CL1024	Grp-VarLen	
25	2 A-POS-IN-THE-VBPATH	BLL=00003	000000000	DS 1C	Display	O
28	1 THE-ELEMENT	BLL=00004	000000000	DS 0CL*	Grp-VarLen	
29	2 FILLER.	BLL=00004	000000000	DS 1C	Display	O

End of Data Division Map

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000002:      Program-id. TstRfMod.
000000          000002          PROC      TSTRFMOD
[...]
0001B0          000002 L0005:  EQU      *
0001B0          000035 USER-ENTRY: EQU      *
000035:      allocate Path-Max characters initialized returning Path-address
0001B0 D207 D0F0 31A0      000035      MVC      240(8,R13),416(R3)      £      +416
0001B6 4110 D0F0          000035      LA      R1,240(,R13)      £      _ArgumentList
0001BA 58F0 3020          000035      L      R15,32(,R3)      £
0001BE 58C0 D080          000035      L      R12,128(,R13)      £
0001C2 0DEF          000035      BASR   R14,R15      £      Call "IGZXALOC"
0001C4 50F0 9098          000035      ST     R15,152(,R9)      £
000037:      set address of The-VUPath to Path-address
0001C8 A5F6 7FFF          000037      NILH   R15,0x7fff
0001CC 50F0 8004          000037      ST     R15,4(,R8)      £
000038:      set address of The-VBPath to Path-address
0001D0 50F0 8008          000038      ST     R15,8(,R8)      £
000039:      set address of The-FPath to Path-address
0001D4 50F0 8000          000039      ST     R15,0(,R8)      £      BLL_1
000040:      move 18 to Path-Length
0001D8 E544 90A8 0012      000040      MVVHI  168(,R9),X'0012'      £
0001DE 5820 D170          000000      L      R2,368(,R13)      £      ODOsv_cell
0001E2 EC28 00F 127E      000000      CIJ    R2,L0006,18,(mask=0x8),
0001E8 E54C D170 0012      000000      MVHI   368(,R13),X'0012'      £      ODOsv_cell
0001EE E54C D198 0012      000000      MVHI   408(,R13),X'0012'      £      VLC_cell
0001F4 C004 0000 0000      000000      NOP
0001FA C004 0000 0000      000000      NOP
000200          000000 L0006:  EQU      *
000043:      move '/root/first/second' to The-VUPath
000200 5860 8004          000043      L      R6,4(,R8)      £      THE-VUPATH
000204 4140 3151          000043      LA     R4,337(,R3)      £
000208 5870 D198          000043      L      R7,408(,R13)      £      VLC_cell
00020C A728 0012          000043      LHI    R2,0x12
000210 1852          000043      LR     R5,R2
000212 A728 0040          000043      LHI    R2,0x40
000216          000043 L0064:  EQU      *
000216 A864 2000          000043      MVCLE  R6,R4,0(,R2)      £
00021A A714 FFFE          000043      JO     L0064
000047:      move 13 to Element-Pos
00021E E544 90B8 000D      000047      MVVHI  184(,R9),X'000D'      £
000048:      move 6 to Element-Length
000224 E544 90B0 0006      000048      MVVHI  176(,R9),X'0006'      £
000049:      set address of The-Element
00022A 5820 8000          000049      L      R2,0(,R8)      £      BLL_1
00022E 4120 200C          000049      LA     R2,12(,R2)      £
000232 5020 800C          000049      ST     R2,12(,R8)      £
000236 E55D D178 0006      000000      CLFHSI 376(,R13),X'0006'      £      ODOsv_cell
00023C A784 0008          000000      JE     L0007
000240 E54C D178 0006      000000      MVHI   376(,R13),X'0006'      £      ODOsv_cell
000246 E54C D1A0 0006      000000      MVHI   416(,R13),X'0006'      £      VLC_cell
00024C          000000 L0007:  EQU      *
000051:      display 'Element = '' The-Element '''
00024C D237 D0F0 3068      000051      MVC    240(56,R13),104(R3)      £
000252 5820 800C          000051      L      R2,12(,R8)      £      THE-ELEMENT
000256 5020 D108          000051      ST     R2,264(,R13)      £
00025A 5820 D1A0          000051      L      R2,416(,R13)      £      VLC_cell
00025E 5020 D110          000051      ST     R2,272(,R13)      £
000262 5020 D114          000051      ST     R2,276(,R13)      £

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000266	4110	D0F0	000051	LA	R1,240(,R13)	£	_ArgumentList
00026A	58F0	3024	000051	L	R15,36(,R3)	£	
00026E	58C0	D080	000051	L	R12,128(,R13)	£	
000272	0DEF		000051	BASR	R14,R15	£	Call "IGZXDSP"
000055:	move 13 to Element-Pos						
000274	E544	90B8	000D	000055	MVHHI	184(,R9),X'000D'	£
000056:	move 6 to Element-Length						
00027A	E544	90B0	0006	000056	MVHHI	176(,R9),X'0006'	£
000057:	set address of The-Element to address of A-Pos-in-The-VUPath (Element-Pos)						
000280	5820	8004		000057	L	R2,4(,R8)	£ BLL_2
000284	4120	200C		000057	LA	R2,12(,R2)	£
000288	5020	800C		000057	ST	R2,12(,R8)	£ BLL_4
00028C	E55D	D178	0006	000000	CLFHSI	376(,R13),X'0006'	£ ODOsv_cell
000292	A784	0008		000000	JE	L0008	
000296	E54C	D178	0006	000000	MVHI	376(,R13),X'0006'	£ ODOsv_cell
00029C	E54C	D1A0	0006	000000	MVHI	416(,R13),X'0006'	£ VLC_cell
0002A2				000000	L0008: EQU	*	
000059:	display 'Element = '' The-Element ''						
0002A2	D237	D0F0	3068	000059	MVC	240(56,R13),104(R3)	£
0002A8	5820	800C		000059	L	R2,12(,R8)	£ THE-ELEMENT
0002AC	5020	D108		000059	ST	R2,264(,R13)	£
0002B0	5820	D1A0		000059	L	R2,416(,R13)	£ VLC_cell
0002B4	5020	D110		000059	ST	R2,272(,R13)	£
0002B8	5020	D114		000059	ST	R2,276(,R13)	£
0002BC	4110	D0F0		000059	LA	R1,240(,R13)	£ _ArgumentList
0002C0	58F0	3024		000059	L	R15,36(,R3)	£
0002C4	58C0	D080		000059	L	R12,128(,R13)	£
0002C8	0DEF			000059	BASR	R14,R15	£ Call "IGZXDSP"
000063:	move 13 to Element-Pos						
0002CA	E544	90B8	000D	000063	MVHHI	184(,R9),X'000D'	£
000064:	move 6 to Element-Length						
0002D0	E544	90B0	0006	000064	MVHHI	176(,R9),X'0006'	£
000065:	set address of The-Element to address of A-Pos-in-The-VBPath (Element-Pos)						
0002D6	5820	8008		000065	L	R2,8(,R8)	£ BLL_3
0002DA	4120	200C		000065	LA	R2,12(,R2)	£
0002DE	5020	800C		000065	ST	R2,12(,R8)	£ BLL_4
0002E2	E55D	D178	0006	000000	CLFHSI	376(,R13),X'0006'	£ ODOsv_cell
0002E8	A784	000C		000000	JE	L0009	
0002EC	E54C	D178	0006	000000	MVHI	376(,R13),X'0006'	£ ODOsv_cell
0002F2	E54C	D1A0	0006	000000	MVHI	416(,R13),X'0006'	£ VLC_cell
0002F8	C004	0000	0000	000000	NOP		
0002FE	0700			000000	NOP		
000300				000000	L0009: EQU	*	
000067:	display 'Element = '' The-Element ''						
000300	D237	D0F0	3068	000067	MVC	240(56,R13),104(R3)	£
000306	5820	800C		000067	L	R2,12(,R8)	£ THE-ELEMENT
00030A	5020	D108		000067	ST	R2,264(,R13)	£
00030E	5820	D1A0		000067	L	R2,416(,R13)	£ VLC_cell
000312	5020	D110		000067	ST	R2,272(,R13)	£
000316	5020	D114		000067	ST	R2,276(,R13)	£
00031A	4110	D0F0		000067	LA	R1,240(,R13)	£ _ArgumentList
00031E	58F0	3024		000067	L	R15,36(,R3)	£
000322	58C0	D080		000067	L	R12,128(,R13)	£
000326	0DEF			000067	BASR	R14,R15	£ Call "IGZXDSP"
000071:	move 7 to Element-Pos						
000328	E544	90B8	0007	000071	MVHHI	184(,R9),X'0007'	£
000072:	move 5 to Element-Length						
00032E	E544	90B0	0005	000072	MVHHI	176(,R9),X'0005'	£
000073:	set address of The-Element to address of The-FPath (Element-Pos:1)						
000334	5820	8000		000073	L	R2,0(,R8)	£ BLL_1

000338	4120	2006	000073	LA	R2,6(,R2)	£	
00033C	5020	800C	000073	ST	R2,12(,R8)	£	BLL_4
000340	E55D	D178	0005	CLFHESI	376(,R13),X'0005'	£	ODOsv_cell
000346	A784	0008	000000	JE	L0010		
00034A	E54C	D178	0005	MVHI	376(,R13),X'0005'	£	ODOsv_cell
000350	E54C	D1A0	0005	MVHI	416(,R13),X'0005'	£	VLC_cell
000356			000000	L0010:	EQU	*	
000075:	display 'Element = '' The-Element ''						
000356	D237	D0F0	3068	MVC	240(56,R13),104(R3)	£	
00035C	5820	800C	000075	L	R2,12(,R8)	£	THE-ELEMENT
000360	5020	D108	000075	ST	R2,264(,R13)	£	
000364	5820	D1A0	000075	L	R2,416(,R13)	£	VLC_cell
000368	5020	D110	000075	ST	R2,272(,R13)	£	
00036C	5020	D114	000075	ST	R2,276(,R13)	£	
000370	4120	D0F0	000075	LA	R2,240(,R13)	£	_ArgumentList
000374	1812		000075	LR	R1,R2		
000376	58F0	3024	000075	L	R15,36(,R3)	£	
00037A	58C0	D080	000075	L	R12,128(,R13)	£	
00037E	0DEF		000075	BASR	R14,R15	£	Call "IGZXDSP"
000380	1812		000075	LR	R1,R2		
000080:	move 7 to Element-Pos						
000382	E544	90B8	0007	000080	MVHHI	184(,R9),X'0007'	£
000081:	move 5 to Element-Length						
000388	E544	90B0	0005	000081	MVHHI	176(,R9),X'0005'	£
000082:	set address of The-Element to address of The-VUPath (Element-Pos:1)						
00038E	D22F	1000	30AC	000082	MVC	0(48,R1),172(R3)	£ unconditional IGZ0072S if SSRANGE(ABD)
000394	58F0	301C	000082		L	R15,28(,R3)	£ IGZ0308W if SSRANGE(MSG)
000398	0DEF		000082		BASR	R14,R15	£ Call "IGZXCMMSG"
00039A	5820	8004	000082	L	R2,4(,R8)	£	BLL_2
00039E	4120	2006	000082	LA	R2,6(,R2)	£	
0003A2	5020	800C	000082	ST	R2,12(,R8)	£	BLL_4
0003A6	E55D	D178	0005	CLFHESI	376(,R13),X'0005'	£	ODOsv_cell
0003AC	A784	0008	000000	JE	L0011		
0003B0	E54C	D178	0005	MVHI	376(,R13),X'0005'	£	ODOsv_cell
0003B6	E54C	D1A0	0005	MVHI	416(,R13),X'0005'	£	VLC_cell
0003BC			000000	L0011:	EQU	*	
000084:	display 'Element = '' The-Element ''						
0003BC	D237	D0F0	3068	MVC	240(56,R13),104(R3)	£	
0003C2	5820	800C	000084	L	R2,12(,R8)	£	THE-ELEMENT
0003C6	5020	D108	000084	ST	R2,264(,R13)	£	
0003CA	5820	D1A0	000084	L	R2,416(,R13)	£	VLC_cell
0003CE	5020	D110	000084	ST	R2,272(,R13)	£	
0003D2	5020	D114	000084	ST	R2,276(,R13)	£	
0003D6	4110	D0F0	000084	LA	R1,240(,R13)	£	_ArgumentList
0003DA	58F0	3024	000084	L	R15,36(,R3)	£	
0003DE	58C0	D080	000084	L	R12,128(,R13)	£	
0003E2	0DEF		000084	BASR	R14,R15	£	Call "IGZXDSP"
000088:	move 7 to Element-Pos						
0003E4	E544	90B8	0007	000088	MVHHI	184(,R9),X'0007'	£
000089:	move 5 to Element-Length						
0003EA	E544	90B0	0005	000089	MVHHI	176(,R9),X'0005'	£
000090:	set address of The-Element to address of The-VBPath (Element-Pos:1)						
0003F0	5820	8008	000090	L	R2,8(,R8)	£	BLL_3
0003F4	4120	2006	000090	LA	R2,6(,R2)	£	
0003F8	5020	800C	000090	ST	R2,12(,R8)	£	BLL_4
0003FC	E55D	D178	0005	CLFHESI	376(,R13),X'0005'	£	ODOsv_cell
000402	A784	0008	000000	JE	L0012		
000406	E54C	D178	0005	MVHI	376(,R13),X'0005'	£	ODOsv_cell
00040C	E54C	D1A0	0005	MVHI	416(,R13),X'0005'	£	VLC_cell
000412			000000	L0012:	EQU	*	


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000092:          display 'Element = '' The-Element '''
000412 D237 D0F0 3068 000092 MVC 240(56,R13),104(R3) £
000418 5820 800C 000092 L R2,12(,R8) £ THE-ELEMENT
00041C 5020 D108 000092 ST R2,264(,R13) £
000420 5820 D1A0 000092 L R2,416(,R13) £ VLC_cell
000424 5020 D110 000092 ST R2,272(,R13) £
000428 5020 D114 000092 ST R2,276(,R13) £
00042C 4120 D0F0 000092 LA R2,240(,R13) £ _ArgumentList
000430 1812 000092 LR R1,R2
000432 58F0 3024 000092 L R15,36(,R3) £
000436 58C0 D080 000092 L R12,128(,R13) £
00043A 0DEF 000092 BASR R14,R15 £ Call "IGZXDSP"

000095:          Goback
00043C 9181 D12C 000095 TM 300(,R13),X'81' £ DSAFlags
000440 A784 001D 000095 JE L0013
000444 A718 0000 000095 LHI R1,0x0
000448 58F0 3028 000095 L R15,40(,R3) £
00044C 0DEF 000095 BASR R14,R15 £ Call "IGZXRTN"
00044E 1812 000095 LR R1,R2
000450 9180 D12C 000095 TM 300(,R13),X'80' £ DSAFlags
000454 A784 0013 000095 JE L0013
000458 E54C D0E8 0000 000095 MVHI 232(,R13),X'0000' £
00045E E54C D0E4 0000 000095 MVHI 228(,R13),X'0000' £
000464 4120 D0E8 000095 LA R2,232(,R13) £ TS2=38
000468 5020 1000 000095 ST R2,0(,R1) £
00046C 4120 D0E4 000095 LA R2,228(,R13) £ TS2=39
000470 5020 1004 000095 ST R2,4(,R1) £
000474 58F0 302C 000095 L R15,44(,R3) £
000478 0DEF 000095 BASR R14,R15 £ Call "IGZXRTN"
00047A 000095 EQU *
00047A EBFF 805C 006A 000095 ASI 92(,R8),X'FF' £ IPCB_NumEnts
000480 A7F8 0000 000095 LHI R15,0x0
000484 EB1F D08C 0096 000095 LMH R1,R15,140(,R13) £
00048A 58D0 D004 000095 L R13,4(,R13) £ Caller's DSA
00048E 58E0 D00C 000095 L R14,12(,R13) £ Return Address
000492 980C D014 000095 LM R0,R12,20(,R13) £ Restore Caller's registers
000496 07FE 000095 BR R14 £ Return
000498 0707 000095 BCR 0,R7
00049A 000095 RET

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