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```
0001 0 MODULE STR$FIND_FIRST_SUBSTRING (! Find first substring (in list of
0002 0 ! substrings) occuring in a given
0003 0 ! string.
0004 0
0005 0 IDENT = '1-002' ! File: STRFINDSB.B32 Edit: RKR1002
0006 0
0007 0 ) =
0008 1 BEGIN
0009 1
0010 1
0011 1 *****
0012 1 *
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0030 1 *
0031 1 *
0032 1 *****
0033 1
0034 1
0035 1 ++
0036 1 FACILITY: String support library
0037 1
0038 1 ABSTRACT: This module contains a procedure to find the first substring
0039 1 (in a provided list of substrings) occuring in a given string.
0040 1
0041 1 ENVIRONMENT: User mode, AST reentrant
0042 1
0043 1 AUTHOR: R. Reichert, CREATION DATE: 11-AUG-1982
0044 1
0045 1 MODIFIED BY:
0046 1
0047 1 1-001 - Original. RKR 11-AUG-1982.
0048 1 1-002 - Code improvements. RKR 24-NOV-1982.
0049 1 --
0050 1 !<BLF/PAGE>
```

```

52 0051 1 |
53 0052 1 | SWITCHES:
54 0053 1 |
55 0054 1 |
56 0055 1 | SWITCHES ADDRESSING_MODE
57 0056 1 | (EXTERNAL = GENERAL, NONEXTERNAL = WORD_RELATIVE);
58 0057 1 |
59 0058 1 |
60 0059 1 | LINKAGES
61 0060 1 |
62 0061 1 | REQUIRE 'RTLIN:STRLNK'; ! Linkage to STR$ANALYZE_SDESC_R1
63 0246 1 |
64 0247 1 | TABLE OF CONTENTS:
65 0248 1 |
66 0249 1 |
67 0250 1 | FORWARD ROUTINE
68 0251 1 | STR$FIND_FIRST_SUBSTRING ;
69 0252 1 |
70 0253 1 |
71 0254 1 | INCLUDE FILES:
72 0255 1 |
73 0256 1 |
74 0257 1 | REQUIRE 'RTLIN:RTLPSECT'; ! Declare PSECTS code
75 0352 1 | REQUIRE 'RTLIN:STRMACROS'; ! use string macros to write code
76 1268 1 | LIBRARY 'RTLSTARLE'; ! STARLET library for macros and symbols
77 1269 1 |
78 1270 1 |
79 1271 1 | MACROS: NONE
80 1272 1 |
81 1273 1 |
82 1274 1 |
83 1275 1 | EQUATED SYMBOLS: NONE
84 1276 1 |
85 1277 1 |
86 1278 1 |
87 1279 1 | PSECT DECLARATIONS
88 1280 1 |
89 1281 1 |
90 1282 1 | DECLARE_PSECTS (STR);
91 1283 1 |
92 1284 1 |
93 1285 1 | OWN STORAGE: NONE
94 1286 1 |
95 1287 1 |
96 1288 1 |
97 1289 1 | EXTERNAL REFERENCES
98 1290 1 |
99 1291 1 | EXTERNAL LITERAL
100 1292 1 | STR$_WRONUMARG ; ! Wrong number of arguments
```



```
102 1293 1 GLOBAL ROUTINE STR$FIND_FIRST_SUBSTRING ( ! Find first substring (in
103 1294 1 ! list of substrings)
104 1295 1 ! occurring in the given string.
105 1296 1
106 1297 1     STRING, ! pointer to string descriptor
107 1298 1     INDEX, ! Position in which match was found
108 1299 1     SUB_STRING_INDEX, ! Which substring was found
109 1300 1     SUB_STRING1 ! pointer to first substring
110 1301 1
111 1302 1 ) : =
112 1303 1
113 1304 1 ++
114 1305 1 FUNCTIONAL DESCRIPTION:
115 1306 1
116 1307 1     This routine finds the first occurrence of any of a number of
117 1308 1 substrings in a given string. The given string is searched from left to
118 1309 1 right, character position by character position, against each of the
119 1310 1 provided substrings in the order provided. This is repeated until a
120 1311 1 first match is made against one of the substrings.
121 1312 1     This process is repeated until a match is found or the given
122 1313 1 string is exhausted. If a match is found, the position within STRING
123 1314 1 where the match took place is returned in INDEX and SUB_STRING_INDEX
124 1315 1 is set to the ordinal number of the matching sub_string. If no match
125 1316 1 is found, both INDEX and SUB_STRING_INDEX are 0.
126 1317 1     Note: behavior for zero-length strings:
127 1318 1
128 1319 1     STRING length    Nth-substring length    INDEX    SUB_STRING_INDEX    STATUS
129 1320 1     -----
130 1321 1     0                non-zero                0          0                0
131 1322 1     non-zero        0                1          N                1
132 1323 1     0                0                1          N                1
133 1324 1
134 1325 1 CALLING SEQUENCE:
135 1326 1
136 1327 1     status.wlc.v = STR$FIND_FIRST_SUBSTRING ( STRING.rt.dx,
137 1328 1     INDEX.wl.r,
138 1329 1     SUB_STRING_INDEX.wl.r,
139 1330 1     SUB_STRING1.rt.dx
140 1331 1     [,SUB_STRING2.rt.dx ]
141 1332 1
142 1333 1     [,SUB_STRINGN.rt.dx ]
143 1334 1
144 1335 1 FORMAL PARAMETERS:
145 1336 1
146 1337 1     STRING.rt.dx    pointer to string descriptor
147 1338 1     INDEX.wl.r      Position within STRING where a match was
148 1339 1                     found, else 0.
149 1340 1
150 1341 1     SUB_STRING_INDEX.wl.r  Ordinal number of SUB_STRING that
151 1342 1                     matched ( 1 for 1st, 2 for 2nd, etc.)
152 1343 1                     else 0.
153 1344 1
154 1345 1     SUB_STRING1.rt.dx  First specified sub_string to be found
155 1346 1                     in STRING.
156 1347 1
157 1348 1     [,SUB_STRING2.rt.dx ] Optional. One or more additional
158 1349 1
```

sub_strings to take part in the search.

IMPLICIT INPUTS:

NONE

IMPLICIT OUTPUTS:

NONE

ROUTINE STATUS:

1

If a match was found.

0

If no match was found.

SIDE EFFECTS:

May signal STR\$_ILLSTRCLA on bad string class.
STR\$_WRONUMARG if no substrings supplied.

BEGIN

MAP STRING: REF BLOCK [, BYTE] ;

BUILTIN

ACTUALCOUNT,
ACTUALPARAMETER ;

LOCAL

FIRST_OCCURING,

! Ordinal number of substring
! that occurs earliest in
! string (so far).
! Address within string where
! FIRST_OCCURRING substring
! starts (so far)
! Length of given STRING
! Starting addr of given STRING

LOWEST_INDEX,

STR_LENGTH,
STR_ADDRESS ;

+ See if any substrings were supplied and signal if not.

- IF ACTUALCOUNT () LSS 4
THEN

BEGIN ! Not enough arguments, no substrings supplied

+ Build a local fixed-length descriptor pointing to name of this
! routine and use it to signal STR\$_WRONUMARG.

LOCAL

ROUT_NAME_DESC : \$STR\$DESCRIPTOR;

ROUT_NAME_DESC [DSC\$W_LENGTH] = 24 ;
ROUT_NAME_DESC [DSC\$B_DTYPE] = DSC\$K_DTYPE_T;
ROUT_NAME_DESC [DSC\$B_CLASS] = DSC\$K_CLASS_S;
ROUT_NAME_DESC [DSC\$A_POINTER] = UPLIT
(%ASCII'STR\$FIND_FIRST_SUBSTRING');


```
216 1407 3 SIGNAL_STOP (STR$WRONUMARG, 2, ACTUALCOUNT (), ROUT_NAME_DESC);
217 1408 2 END;
218 1409 2 ! Not enough arguments, no substrings supplied
219 1410 2
220 1411 2 !+ Calc. length and starting address of given string
221 1412 2 !-
222 1413 2 $STR$GET_LEN_ADDR ( STRING, STR_LENGTH, STR_ADDRESS ) ;
223 1414 2
224 1415 2 LOWEST_INDEX = .STR_ADDRESS + .STR_LENGTH ; ! To impossibly high value
225 1416 2
226 1417 2 FIRST_OCCURING = 0; ! Set to none
227 1418 2 INCR I FROM 4 TO ACTUALCOUNT ()
228 1419 2 DO
229 1420 2 BEGIN ! Search loop
230 1421 2 LOCAL
231 1422 2 PTR, ! Pointer returned by CH$FIND_SUB
232 1423 2 SUB_LENGTH, ! Length of nth substring
233 1424 2 SUB_ADDRESS; ! Address of nth substring
234 1425 2
235 1426 2 BIND
236 1427 2 NTH_PARAMETER = ACTUALPARAMETER (.I) : BLOCK [,BYTE];
237 1428 2
238 1429 2 $STR$GET_LEN_ADDR ( NTH_PARAMETER, SUB_LENGTH, SUB_ADDRESS);
239 1430 2
240 1431 2 IF .SUB_LENGTH EQL 0
241 1432 2 THEN
242 1433 2 BEGIN ! Force to look like found
243 1434 2 !+
244 1435 2 ! If we are about to look up a null string, this one is
245 1436 2 ! guaranteed to be the winner since a null string is
246 1437 2 ! defined to be found anywhere -- in particular in the
247 1438 2 ! first byte position. Force an exit at this point.
248 1439 2 !-
249 1440 2 .INDEX = 1 ; ! Position 1
250 1441 2 .SUB_STRING_INDEX = .I - 3 ; ! This substring
251 1442 2 RETURN (1); ! Return success
252 1443 2 END ! Force to look like found
253 1444 2 ELSE
254 1445 2 BEGIN ! Use MATCHC
255 1446 2 IF (PTR = CH$FIND_SUB ( .STR_LENGTH, .STR_ADDRESS,
256 1447 2 .SUB_LENGTH, .SUB_ADDRESS)) NEQ 0
257 1448 2 THEN
258 1449 2 BEGIN ! Found a new contender for first
259 1450 2 IF .PTR LSS .LOWEST_INDEX
260 1451 2 THEN
261 1452 2 BEGIN ! Found an earlier
262 1453 2 FIRST_OCCURING = .I - 3 ; ! Record which substring
263 1454 2 LOWEST_INDEX = .PTR ; ! Remember its address
264 1455 2 END; ! Found an earlier
265 1456 2 END; ! Found a new contender for first
266 1457 2 END; ! Use MATCHC
267 1458 2 END; ! Search loop
268 1459 2
269 1460 2 !+
270 1461 2 ! As we exit from the loop above, FIRST_OCCURING is the ordinal number
271 1462 2 ! of the substring that appears earliest in STRING. LOWEST_INDEX is
272 1463 2 ! address within STRING where FIRST_OCCURING starts.
```

STR\$FIND_FIRST_
1-002

K 9
16-Sep-1984 01:38:47
14-Sep-1984 12:40:06

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[LIBRTL.SRC]STR\$FINDSB.B32;1

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```

: 273      1464 2 !-
: 274      1465
: 275      1466
: 276      1467
: 277      1468
: 278      1469
: 279      1470
: 280      1471
: 281      1472
: 282      1473
: 283      1474
: 284      1475
: 285      1476 1

IF .FIRST_OCCURING EQL 0
THEN
    BEGIN ! No matches found
        .INDEX = 0;
        .SUB_STRING_INDEX = 0;
        RETURN (0);
    END; ! No matches found

.SUB_STRING_INDEX = .FIRST_OCCURING ;
.INDEX = .LOWEST_INDEX - .STR_ADDRESS + 1;
RETURN (1);
END ;

! Procedure STR$FIND_FIRST_SUBSTRING
```

										.TITLE	STR\$FIND_FIRST_SUBSTRING																
										.IDENT	\1-002\																
										.PSECT	_STR\$CODE,NOWRT, SHR, PIC,2																
5F	54	53	52	49	46	5F	44	4E	49	46	24	52	54	53	00000	P.AAA:	.ASCII	\STR\$FIND_FIRST_SUBSTRING\									
						47	4E	49	52	54	53	42	55	53	0000F												
										.EXTN	STR\$_WRONUMARG, STR\$ANALYZE_SDESC_R1																
										.ENTRY	STR\$FIND_FIRST_SUBSTRING, Save R2,R3,R4,R5,-; 1293																
										R6,R7,R8,R9,R10,R11																	
										MOVAB	STR\$ANALYZE_SDESC_R1, R11																
										SUBL2	#8, SP																
										CMPB	(AP), #4 1392																
										BGEQU	1\$																
										MOVL	#17694744, ROUT_NAME_DESC 1402																
										MOVAB	P.AAA, ROUT_NAME_DESC+4 1405																
										PUSHL	SP 1407																
										MOVZBL	(AP), -(SP)																
										PUSHL	#2																
										PUSHL	#STR\$_WRONUMARG																
										CALLS	#4, LIB\$STOP																
										MOVL	STRING, R0 1413																
										CMPB	3(R0), #2																
										BGTRU	2\$																
										MOVZWL	(R0), STR_LENGTH																
										MOVL	4(R0), STR_ADDRESS																
										BRB	3\$																
										JSB	STR\$ANALYZE_SDESC_R1																
										MOVL	R0, R8																
										MOVL	R1, R10																
										ADDL3	STR_LENGTH, STR_ADDRESS, LOWEST_INDEX 1415																
										MOVZBL	(AP), R9 1418																
										MOVQ	#3, I																
										BRB	9\$																
										MOVL	(AP)[I], R2 1427																
										CMPB	3(R2), #2 1429																
										BGTRU	5\$																
										MOVZWL	(R2), SUB_LENGTH																
										MOVL	4(R2), SUB_ADDRESS																
										BRB	6\$																

										OFFC	00000									
										5B	00000000G 00 9E 00002									
										5E	08 C2 00009									
										04	6C 91 0000C									
										20 1E 0000F										
										6E	010E0018 8F D0 00011									
										04	AE CD AF 9E 00018									
										5E DD 0001D										
										7E	6C 9A 0001F									
										02 DD 00022										
										00000000G 8F DD 00024										
										00	04 FB 0002A									
										50	04 AC D0 00031 1\$:									
										02	03 A0 91 00035									
										09 1A 00039										
										58	60 3C 0003B									
										5A	04 A0 D0 0003E									
										08 11 00042										
										6B 16 00044 2\$:										
										58	50 D0 00046									
										5A	51 D0 00049									
										5A	58 C1 0004C 3\$:									
										59	6C 9A 00050									
										54	03 7D 00053									
										45 11 00056										
										52	6C44 D0 00058 4\$:									
										02	03 A2 91 0005C									
										09 1A 00060										
										57	62 3C 00062									
										51	04 A2 D0 00065									
										08 11 00069										

STR\$FIND_FIRST_
1-002

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[LIBRTL.SRC]STRFINDSB.B32;1

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6A	58	50	62	D0	0006B	5\$:	MOVL	(R2), R0	:	
		57	6B	16	0006E		JSB	STR\$ANALYZE_SDESC_R1	:	
			50	D0	00070		MOVL	R0, R7	:	
			57	D5	00073	6\$:	TSTL	SUB_LENGTH	:	1431
			0B	12	00075		BNEQ	7\$	:	
	08	BC	01	D0	00077		MOVL	#1, @INDEX	:	1440
	0C	BC	A4	9E	0007B		MOVAB	-3(R4), @SUB_STRING_INDEX	:	1441
			37	11	00080		BRB	11\$	:	1442
		61	57	39	00082	7\$:	MATCHC	SUB_LENGTH, (SUB_ADDRESS), STR_LENGTH, - (STR_ADDRESS)	:	1447
			03	13	00087		BEQL	8\$	:	
		53	57	D0	00089		MOVL	SUB_LENGTH, R3	:	
		53	57	C2	0008C	8\$:	SUBL2	SUB_LENGTH, R3	:	
			0C	13	0008F		BEQL	9\$	:	
		56	53	D1	00091		CMPL	PTR, LOWEST_INDEX	:	1450
			07	18	00094		BGEQ	9\$	:	
		55	A4	9E	00096		MOVAB	-3(R4), FIRST_OCCURING	:	1453
		56	53	D0	0009A		MOVL	PTR, LOWEST_INDEX	:	1454
	B7	54	59	F3	0009D	9\$:	AOBLEQ	R9, I, 4\$	:	1418
			55	D5	000A1		TSTL	FIRST_OCCURING	:	1465
			08	12	000A3		BNEQ	10\$	:	
			08	BC	D4	000A5	CLRL	@INDEX	:	1468
			0C	BC	D4	000A8	CLRL	@SUB_STRING_INDEX	:	1469
			10	11	000AB		BRB	12\$	:	1470
	0C	BC	55	D0	000AD	10\$:	MOVL	FIRST_OCCURING, @SUB_STRING_INDEX	:	1473
		56	5A	C2	000B1		SUBL2	STR_ADDRESS, R6	:	1474
	08	BC	A6	9E	000B4		MOVAB	1(R6), @INDEX	:	
		50	01	D0	000B9	11\$:	MOVL	#1, R0	:	1475
				04	000BC		RET		:	
			50	D4	000BD	12\$:	CLRL	R0	:	1476
				04	000BF		RET		:	

; Routine Size: 192 bytes, Routine Base: _STR\$CODE + 0018

STR\$FIND_FIRST_
1-002

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VAX-11 Bliss-32 V4.0-742
[LIBRTL.SRC]STRFINDSB.B32;1

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: 287 1477 1 END
: 288 1478 0 ELUDOM

!End of module

.EXTRN LIB\$STOP

PSECT SUMMARY

: Name Bytes Attributes
: _STR\$CODE 216 NOVEC,NOWRT, RD , EXE, SHR, LCL, REL, CON, PIC,ALIGN(2)

Library Statistics

: File Total Symbols Loaded Percent Pages Mapped Processing Time
: _\$255\$DUA28:[SYSLIB]STARLET.L32;1 9776 7 0 581 00:00.8

COMMAND QUALIFIERS

: BLISS/CHECK=(FIELD,INITIAL,OPTIMIZE)/NOTRACE/LIS=LIS\$:STRFINDSB/OBJ=OBJ\$:STRFINDSB MSRC\$:STRFINDSB/UPDATE=(ENH\$:STRFINDSB
:)

: Size: 192 code + 24 data bytes
: Run Time: 00:06.5
: Elapsed Time: 00:27.3
: Lines/CPU Min: 13643
: Lexemes/CPU-Min: 33396
: Memory Used: 107 pages
: Compilation Complete

0214 AH-BT13A-SE
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