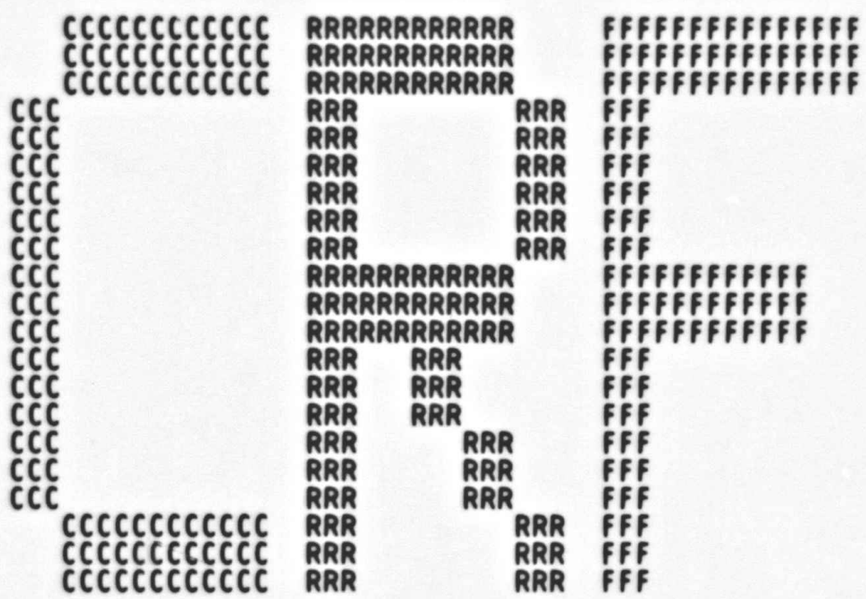
CCCCCCCCCCCC RRRRRRRRRRRR FFFFFFFFFFFFFFF
CCCCCCCCCCCC RRRRRRRRRRRR FFFFFFFFFFFFFFF
CCCCCCCCCCCC RRRRRRRRRRRR FFFFFFFFFFFFFFF
CCC RRR RRR FFF
CCC RRR RRR FFF
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FILEID**CRFOR

```
  CCCCCCCC  RRRRRRRR    FFFFFFFFFF    OOOOOO    RRRRRRRR
  CCCCCCCC  RRRRRRRR    FFFFFFFFFF    OOOOOO    RRRRRRRR
CC          RR      RR  FF            OO    OO  RR      RR
CC          RR      RR  FF            OO    OO  RR      RR
CC          RR      RR  FF            OO    OO  RR      RR
CC          RR      RR  FF            OO    OO  RR      RR
CC          RRRRRRRR    FFFFFFFF      OO    OO  RRRRRRRR
CC          RRRRRRRR    FFFFFFFF      OO    OO  RRRRRRRR
CC          RR   RR     FF            OO    OO  RR   RR
CC          RR   RR     FF            OO    OO  RR   RR
CC          RR     RR   FF            OO    OO  RR     RR      ....
CC          RR     RR   FF            OO    OO  RR     RR      ....
  CCCCCCCC  RR      RR  FF              OOOOOO    RR      RR     ....
  CCCCCCCC  RR      RR  FF              OOOOOO    RR      RR     ....

LL            IIIIII      SSSSSSSS
LL            IIIIII      SSSSSSSS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II      SS
LL              II        SSSSSS
LL              II        SSSSSS
LL              II              SS
LL              II              SS
LL              II              SS
LL              II              SS
LLLLLLLLLL    IIIIII    SSSSSSSS
LLLLLLLLLL    IIIIII    SSSSSSSS
```

Table of contents

```
0000     1          .TITLE  CRFOR   FORTRAN-CALLABLE CRF INTERFACE ROUTINES
0000     2          .IDENT  'V04-000'
0000     3
0000     4  ;
0000     5  ;*****************************************************************************
0000     6  ;*                                                                           *
0000     7  ;*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                                  *
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0000    24  ;*                                                                           *
0000    25  ;*                                                                           *
0000    26  ;*****************************************************************************
0000    27  ;
0000    28
0000    29  ;++
0000    30  ; FACILITY:  CROSS REFERENCE PROGRAM
0000    31  ;
0000    32  ; ABSTRACT:  THIS MODULE CONTAINS INTERFACE ROUTINES TO CRF FOR FORTRAN
0000    33  ;
0000    34  ;
0000    35  ; ENVIRONMENT:  IT IS PART OF A LINKABLE IMAGE.
0000    36  ;
0000    37  ; AUTHOR:  BENN SCHREIBER,      CREATION DATE:  19-SEP-1979
0000    38  ;
0000    39  ; MODIFIED BY:
0000    40  ;
0000    41  ;--
```

```
0000     43          .SBTTL  DECLARATIONS
0000     44 ;
0000     45 ; MACROS:
0000     46 ;
0000     47          $CRFDEF                                 ; DEFINE CRF GLOBALS
```

```
                                0000     49          .SBTTL  LIB$CRF_INS_KEY INSERT A KEY
                                0000     50 ;++
                                0000     51 ; FUNCTIONAL DESCRIPTION:
                                0000     52 ;
                                0000     53 ;       (SEE CRFINSKEY.MAR)
                                0000     54 ;
                                0000     55 ; CALLING SEQUENCE:
                                0000     56 ;
                                0000     57 ;       CALLS   #4,LIB$CRF_INS_KEY
                                0000     58 ;
                                0000     59 ; INPUT PARAMETERS:
                                0000     60 ;
                                0000     61 ;       CRF$L_IK_CTLTBL(AP)     ADDRESS OF THE OUTPUT FORMAT TABLE
                                0000     62 ;       CRF$L_IK_KEYADR(AP)     ADDRESS OF KEY
                                0000     63 ;       CRF$L_IK_VALADR(AP)     ADDRESS OF THE VALUE
                                0000     64 ;       CRF$W_IK_VALFLG(AP)     ADDRESS OF THE VALUE FLAGS
                                0000     65 ;
                                0000     66 ;--
                                0000     67
                           00000000     68          .PSECT  $CODE$, EXE, NOWRT
                                0000     69
                           0000 0000     70          .ENTRY  LIB$CRF_INS_KEY, ^M<>
                                0002     71
                     7E    10 BC  3C     0002     72          MOVZWL  @CRF$W_IK_VALFLG(AP),-(SP)      ; EXTRACT THE VALUE FLAGS AND STACK
                           0C AC  DD     0006     73          PUSHL   CRF$L_IK_VALADR(AP)             ; STACK ADDRESS OF VALUE
                           08 AC  DD     0009     74          PUSHL   CRF$L_IK_KEYADR(AP)             ; STACK KEY ADDRESS
                           04 AC  DD     000C     75          PUSHL   CRF$L_IK_CTLTBL(AP)             ; STACK CONTROL TABLE ADDRESS
                0000'CF    04  FB     000F     76          CALLS   #4,W^CRF$INSRTKEY               ; INSERT KEY
                                0014     77
                           04           0014     78          RET                                     ; ALL DONE
```

```
                        0015    80          .SBTTL  LIB$CRF_INS_REF INSERT REFERENCE
                        0015    81 ;++
                        0015    82 ; FUNCTIONAL DESCRIPTION:
                        0015    83 ;
                        0015    84 ;       (SEE CRFINSREF.MAR)
                        0015    85 ;
                        0015    86 ; CALLING SEQUENCE:
                        0015    87 ;
                        0015    88 ;       CALLS   #5, LIB$CRF_INS_REF
                        0015    89 ;
                        0015    90 ; INPUT PARAMETERS:
                        0015    91 ;
                        0015    92 ;       CRF$L_IR_CTLTBL(AP)     ADDRESS OF THE OUTPUT FORMAT TABLE
                        0015    93 ;       CRF$L_IR_KEYADR(AP)     ADDRESS OF KEY
                        0015    94 ;       CRF$L_IR_REFADR(AP)     ADDRESS OF THE REFERENCE INDICATOR
                        0015    95 ;       CRF$W_IR_REFLAG(AP)     ADDRESS OF THE REFERENCE FLAGS
                        0015    96 ;       CRF$B_IR_DEFIND(AP)     ADDRESS OF DEF/REF INDICATOR
                        0015    97 ;
                        0015    98 ;--
                        0015    99
                  0000  0015   100          .ENTRY  LIB$CRF_INS_REF, ^M<>
                        0017   101
     7E   14 BC    9A   0017   102          MOVZBL  @CRF$B_IR_DEFIND(AP),-(SP)      ; STACK DEF/REF INDICATOR
     7E   10 BC    3C   001B   103          MOVZWL  @CRF$W_IR_REFLAG(AP),-(SP)      ; STACK REFERENCE FLAGS
          0C AC    DD   001F   104          PUSHL   CRF$L_IR_REFADR(AP)             ; STACK ADDRESS OF REFERENCE INDICAT
          08 AC    DD   0022   105          PUSHL   CRF$L_IR_KEYADR(AP)             ; STACK ADDRESS OF KEY
          04 AC    DD   0025   106          PUSHL   CRF$L_IR_CTLTBL(AP)             ; STACK CONTROL TABLE ADDRESS
0000'CF   05       FB   0028   107          CALLS   #5,W^CRF$INSRTREF               ; INSERT REFERENCE
                   04   002D   108          RET
```

```
                                002E   110          .SBTTL  LIB$CRF_OUTPUT  OUTPUT THE CROSS REFERENCE LISTING
                                002E   111
                                002E   112 ;++
                                002E   113 ; FUNCTIONAL DESCRIPTION:
                                002E   114 ;
                                002E   115 ;       (SEE CRFOUT.MAR)
                                002E   116 ;
                                002E   117 ; CALLING SEQUENCE:
                                002E   118 ;
                                002E   119 ;       CALLS   #6,LIB$CRF_OUTPUT
                                002E   120 ;
                                002E   121 ; INPUTS PARAMETERS:
                                002E   122 ;
                                002E   123 ;       CRF$L_OU_CTLTBL(AP)     ADDRESS OF THE OUTPUT FORMAT TABLE
                                002E   124 ;       CRF$L_OU_LINWID(AP)     ADDRESS OF THE LINE WIDTH
                                002E   125 ;       CRF$B_OU_PAG1(AP)       ADDRESS OF NUMBER OF LINES ON FIRST PAGE
                                002E   126 ;       CRF$B_OU_SUCPAG(AP)     ADDRESS OF NUMBER OF LINES ON SUCCESSIVE PAGES
                                002E   127 ;       CRF$B_OU_PRTIND(AP)     ADDRESS OF THE PRINT INDICATOR
                                002E   128 ;                                       CRF$K_VALUES     PRINT VALUES
                                002E   129 ;                                       CRF$K_DEFS_REFS PRINT VALUES, DEFS AND REFS
                                002E   130 ;                                       CRF$K_VALS_REFS PRINT VALUES AND REFS
                                002E   131 ;       CRF$B_OU_SAVIND(AP)     ADDRESS OF THE SAVE/DELETE INDICATOR
                                002E   132 ;                                       CRF$K_SAVE       SAVE THE CRF TABLE
                                002E   133 ;                                       CRF$K_DELETE     DELETE THE CRF TABLE
                                002E   134 ;
                                002E   135 ;--
                                002E   136
                         0000   002E   137          .ENTRY  LIB$CRF_OUTPUT, ^M<>
                                0030   138
                     7E  18 BC  9A 0030   139          MOVZBL  @CRF$B_OU_SAVIND(AP),-(SP)      ; STACK SAVE/DELETE INDICATOR
                     7E  14 BC  9A 0034   140          MOVZBL  @CRF$B_OU_PRTIND(AP),-(SP)      ; STACK PRINT INDICATOR
                     7E  10 BC  9A 0038   141          MOVZBL  @CRF$B_OU_SUCPAG(AP),-(SP)      ; STACK # LINES ON SUCCESSIVE PAGES
                     7E  0C BC  9A 003C   142          MOVZBL  @CRF$B_OU_PAG1(AP),-(SP)        ; STACK # LINES ON FIRST PAGE
                         08 BC  DD 0040   143          PUSHL   @CRF$L_OU_LINWID(AP)            ; STACK THE LINE WIDTH
                         04 AC  DD 0043   144          PUSHL   CRF$L_OU_CTLTBL(AP)             ; STACK CONTROL TABLE ADDRESS
                0000'CF    06  FB 0046   145          CALLS   #6,W^CRF$OUT                    ; OUTPUT THE CROSS REFERENCE
                               04 004B   146          RET
                                  004C   147
                                  004C   148          .END
```

```
CRF$B_IR_DEFIND                 = 00000014
CRF$B_OU_PAG1                   = 0000000C
CRF$B_OU_PRTIND                 = 00000014
CRF$B_OU_SAVIND                 = 00000018
CRF$B_OU_SUCPAG                 = 00000010
CRF$INSRTKEY                      ********    X   02
CRF$INSRTREF                      ********    X   02
CRF$L_IK_CTLTBL                 = 00000004
CRF$L_IK_KEYADR                 = 00000008
CRF$L_IK_VALADR                 = 0000000C
CRF$L_IR_CTLTBL                 = 00000004
CRF$L_IR_KEYADR                 = 00000008
CRF$L_IR_REFADR                 = 0000000C
CRF$L_OU_CTLTBL                 = 00000004
CRF$L_OU_LINWID                 = 00000008
CRF$OUT                           ********    X   02
CRF$W_IK_VALFLG                 = 00000010
CRF$W_IR_REFLAG                 = 00000010
LIB$CRF_INS_KEY                   00000000 RG    02
LIB$CRF_INS_REF                   00000015 RG    02
LIB$CRF_OUTPUT                    0000002E RG    02
```

Psect synopsis

PSECT name	Allocation	PSECT No.	Attributes
. ABS .	00000000 (0.)	00 (0.)	NOPIC USR CON ABS LCL NOSHR NOEXE NORD NOWRT NOVEC BYTE
ABS	00000000 (0.)	01 (1.)	NOPIC USR CON ABS LCL NOSHR EXE RD WRT NOVEC BYTE
$CODE$	0000004C (76.)	02 (2.)	NOPIC USR CON REL LCL NOSHR EXE RD NOWRT NOVEC BYTE

Performance indicators

Phase	Page faults	CPU Time	Elapsed Time
Initialization	42	00:00:00.08	00:00:00.41
Command processing	168	00:00:00.59	00:00:02.25
Pass 1	129	00:00:01.18	00:00:04.31
Symbol table sort	0	00:00:00.02	00:00:00.04
Pass 2	44	00:00:00.39	00:00:01.02
Symbol table output	4	00:00:00.02	00:00:00.03
Psect synopsis output	2	00:00:00.02	00:00:00.03
Cross-reference output	0	00:00:00.00	00:00:00.00
Assembler run totals	391	00:00:02.31	00:00:08.10

The working set limit was 1050 pages.
3968 bytes (8 pages) of virtual memory were used to buffer the intermediate code.
There were 10 pages of symbol table space allocated to hold 46 non-local and 0 local symbols.
148 source lines were read in Pass 1, producing 22 object records in Pass 2.
8 pages of virtual memory were used to define 7 macros.

```
                                        J 10
```

Macro library statistics

Macro library name	Macros defined
_255DUA28:[CRF.OBJ]CRF.MLB;1	1
_255DUA28:[SYSLIB]STARLET.MLB;2	3
TOTALS (all libraries)	4

99 GETS were required to define 4 macros.

There were no errors, warnings or information messages.

```
MACRO/LIS=LIS$:CRFOR/OBJ=OBJ$:CRFOR MSRC$:CRFOR/UPDATE=(ENH$:CRFOR)+LIB$:CRF/LIB
```

CRFOR
LIS

CRFMEM
LIS

CRFMACROS
MAR

CLITABDEF
SDL

FILINPUT
LIS

KEYS
LIS

CRFTFRVEC
LIS

DCLDEF
MDL

CRFMDL
MDL

CREF
LIS

CRFERRMSG
LIS

CRF
SDL

CRF

CRFSUB
LIS

FILOUTPUT
LIS

CRFSHR
MAP

CRFGLOBAL
LIS

CRFMAC
REQ

DCL

DCL
MAP