F 9

```
LLL                 IIIIIIIII     NNN         NNN  KKK         KKK  EEEEEEEEEEEEEEE  RRRRRRRRRRRR
LLL                 IIIIIIIII     NNN         NNN  KKK         KKK  EEEEEEEEEEEEEEE  RRRRRRRRRRRR
LLL                 IIIIIIIII     NNN         NNN  KKK         KKK  EEEEEEEEEEEEEEE  RRRRRRRRRRRR
LLL                    III        NNN         NNN  KKK         KKK  EEE              RRR         RRR
LLL                    III        NNN         NNN  KKK         KKK  EEE              RRR         RRR
LLL                    III        NNN         NNN  KKK         KKK  EEE              RRR         RRR
LLL                    III        NNNNNN      NNN  KKK      KKK     EEE              RRR         RRR
LLL                    III        NNNNNN      NNN  KKK      KKK     EEE              RRR         RRR
LLL                    III        NNNNNN      NNN  KKK      KKK     EEE              RRR         RRR
LLL                    III        NNN   NNN   NNN  KKKKKKKKK        EEEEEEEEEEEE     RRRRRRRRRRRR
LLL                    III        NNN   NNN   NNN  KKKKKKKKK        EEEEEEEEEEEE     RRRRRRRRRRRR
LLL                    III        NNN   NNN   NNN  KKKKKKKKK        EEEEEEEEEEEE     RRRRRRRRRRRR
LLL                    III        NNN      NNNNNN  KKK      KKK     EEE              RRR   RRR
LLL                    III        NNN      NNNNNN  KKK      KKK     EEE              RRR   RRR
LLL                    III        NNN      NNNNNN  KKK      KKK     EEE              RRR   RRR
LLL                    III        NNN         NNN  KKK         KKK  EEE              RRR      RRR
LLL                    III        NNN         NNN  KKK         KKK  EEE              RRR      RRR
LLL                    III        NNN         NNN  KKK         KKK  EEE              RRR      RRR
LLLLLLLLLLLLLLL     IIIIIIIII     NNN         NNN  KKK         KKK  EEEEEEEEEEEEEEE  RRR         RRR
LLLLLLLLLLLLLLL     IIIIIIIII     NNN         NNN  KKK         KKK  EEEEEEEEEEEEEEE  RRR         RRR
LLLLLLLLLLLLLLL     IIIIIIIII     NNN         NNN  KKK         KKK  EEEEEEEEEEEEEEE  RRR         RRR
```

```
**FILE**ID**DATBAS                                    J 11
```

```
DDDDDDDD      AAAAAA    TTTTTTTTTT  BBBBBBBB      AAAAAA      SSSSSSSS
DDDDDDDD      AAAAAA    TTTTTTTTTT  BBBBBBBB      AAAAAA      SSSSSSSS
DD      DD  AA      AA      TT      BB      BB  AA      AA  SS
DD      DD  AA      AA      TT      BB      BB  AA      AA  SS
DD      DD  AA      AA      TT      BB      BB  AA      AA  SS
DD      DD  AA      AA      TT      BB      BB  AA      AA  SS
DD      DD  AA      AA      TT      BBBBBBBB    AA      AA    SSSSSS
DD      DD  AA      AA      TT      BBBBBBBB    AA      AA    SSSSSS
DD      DD  AAAAAAAAAA      TT      BB      BB  AAAAAAAAAA          SS
DD      DD  AAAAAAAAAA      TT      BB      BB  AAAAAAAAAA          SS
DD      DD  AA      AA      TT      BB      BB  AA      AA          SS      ....
DD      DD  AA      AA      TT      BB      BB  AA      AA          SS      ....
DDDDDDDD    AA      AA      TT      BBBBBBBB    AA      AA  SSSSSSSS        ....
DDDDDDDD    AA      AA      TT      BBBBBBBB    AA      AA  SSSSSSSS        ....

MM      MM  DDDDDDDD    LL
MM      MM  DDDDDDDD    LL
MMMM  MMMM  DD      DD  LL
MMMM  MMMM  DD      DD  LL
MM  MM  MM  DD      DD  LL
MM  MM  MM  DD      DD  LL
MM      MM  DD      DD  LL
MM      MM  DD      DD  LL
MM      MM  DD      DD  LL
MM      MM  DD      DD  LL
MM      MM  DD      DD  LL
MM      MM  DD      DD  LL
MM      MM  DDDDDDDD    LLLLLLLLLL
MM      MM  DDDDDDDD    LLLLLLLLLL
```

```
;
;       Version 'V04-000'
;
;****************************************************************************
;*                                                                          *
;*  COPYRIGHT (c) 1978, 1980, 1982, 1984 BY                                 *
;*  DIGITAL EQUIPMENT CORPORATION, MAYNARD, MASSACHUSETTS.                  *
;*  ALL RIGHTS RESERVED.                                                    *
;*                                                                          *
;*  THIS SOFTWARE IS FURNISHED UNDER A LICENSE AND MAY BE USED AND COPIED   *
;*  ONLY IN  ACCORDANCE WITH  THE  TERMS  OF  SUCH  LICENSE  AND WITH THE   *
;*  INCLUSION OF THE ABOVE COPYRIGHT NOTICE. THIS SOFTWARE OR  ANY  OTHER   *
;*  COPIES THEREOF MAY NOT BE PROVIDED OR OTHERWISE MADE AVAILABLE TO ANY   *
;*  OTHER PERSON.  NO TITLE TO AND OWNERSHIP OF  THE  SOFTWARE IS  HEREBY   *
;*  TRANSFERRED.                                                            *
;*                                                                          *
;*  THE INFORMATION IN THIS SOFTWARE IS  SUBJECT TO CHANGE WITHOUT NOTICE   *
;*  AND  SHOULD  NOT  BE  CONSTRUED AS  A COMMITMENT BY DIGITAL EQUIPMENT   *
;*  CORPORATION.                                                            *
;*                                                                          *
;*  DIGITAL ASSUMES NO RESPONSIBILITY FOR THE USE  OR  RELIABILITY OF ITS   *
;*  SOFTWARE ON EQUIPMENT WHICH IS NOT SUPPLIED BY DIGITAL.                 *
;*                                                                          *
;*                                                                          *
;****************************************************************************
;
;
;
;
;
;++
;
; MODULE:       datbas.req
;
; FACILITY:     linker
;
; ABSTRACT:     data base compile time formats
;
; HISTORY:
;
;       AUTHOR: T.J. PORTER 01-mar-77
;
;       MODIFICATIONS:
;
;       V03-008 JWT0161         Jim Teague              07-Mar-1984
;               Enlarge cluster name fields -- they take their names
;               from shareable image names, which may now be up to
;               39 characters in length.
;
;       V03-007 ADE0001         Alan D. Eldridge        04-Mar-1984
;               Make CLU$L_GSMATCH its own field rather than multiplexing
;               it between passes in the Linker.
;
;       V03-006 JWT0118         Jim Teague              04-May-1982
;               Added FLG structure.  Consists of bit definitions
;               used in flagstack for processing symbols and
;               expressions in pass 2.
;
;       V03-005 JWT0071         Jim Teague             02-Dec-1982
;               Added NAME and IDENTIFICATION options.  Need CTLMSK flag
;               to indicate that the image id has been set via an option.
;
;       V03-004 JWT0061         Jim Teague             22-Oct-1982
;               Add DCM and DCP structures to aid in the creation
;               of a debugger image section for debug images.
;
;       V03-003 JWT0050         Jim Teague             11-Aug-1982
;               Add LNK$V_CLI flag for cli images.
;
;       V03-002 JWT0044         Jim Teague             30-Jul-1982
;               Add word to FDB to save IFI.
;
;       V03-001 JWT0033         Jim Teague             25-May-1982
;               Add FDB$V_OMDNOBIN flag to indicate that at least one
;               obj mod in the file had no TIR records.
;
;--
```

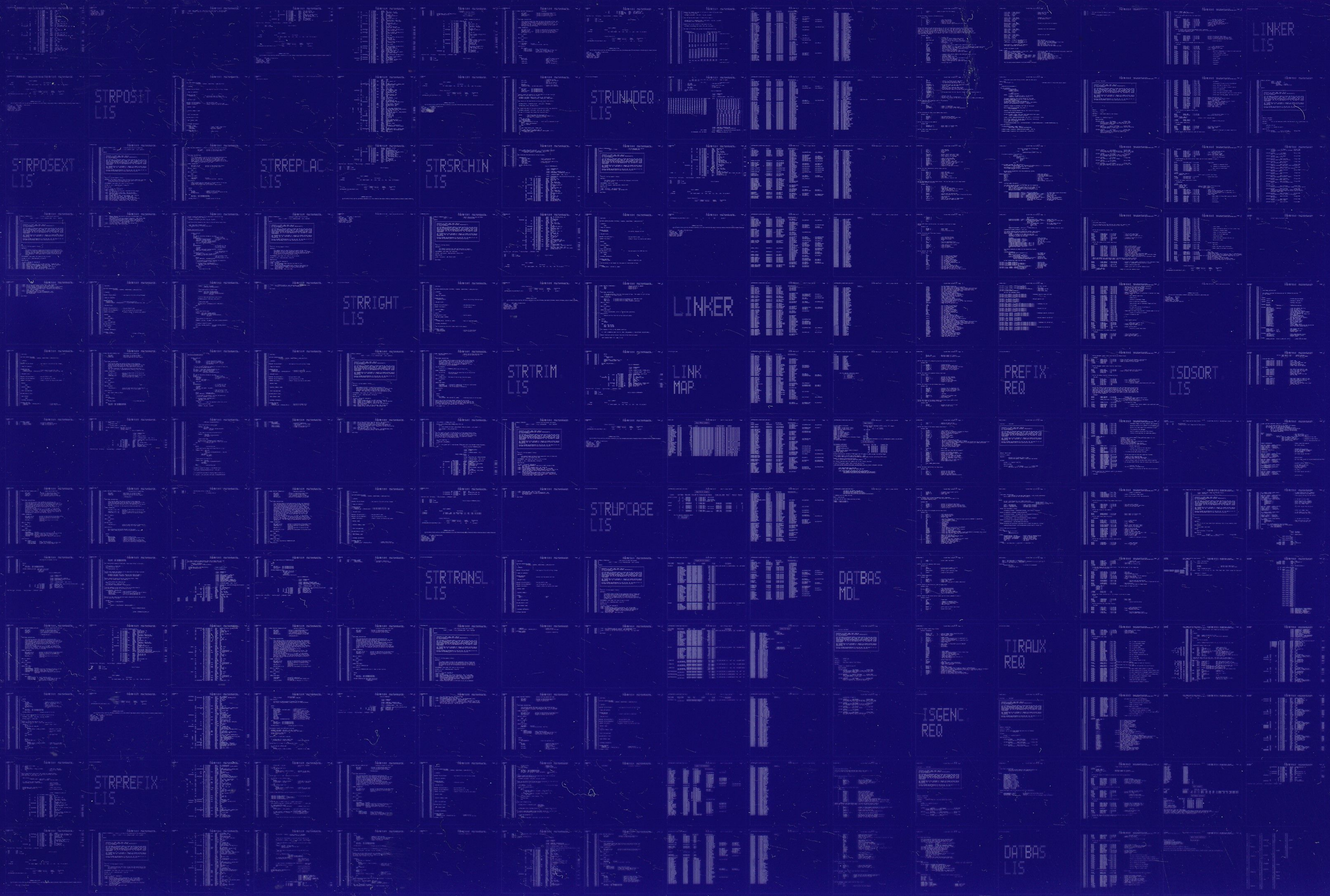
```
;
;++
;
; Functional description:
;
; This is a require file that defines the layout (at compile time)
; of most of the internal data structures of the linker.
;
;--
;
;
; define the collection cluster list
;
        $STRUCT CCD

        F       NXTCLU, L                ; link to next descriptor
        F       NAMLNG, B                ; length of cluster name
        F       NAME, T, 39              ; cluster name (** NOTE SIZE **)
        F       PSCLST, L                ; listhead of psects to collect
        F       PROTECT, B               ; protection flag
        L       SIZE
        E
;
; define the layout of a cluster descriptor
;
        $STRUCT CLU

        F       NXTCLU, L                ; next cluster pointer
        F       PREVCLU, L               ; pointer to previous cluster
        F       FSTFDB, L                ; first file in this cluster
        F       LSTFDB, L                ; last file in this cluster
        F       LPSLST, L                ; List head for local psects
        F       GPSLST, L                ; List head for global psects
        F       FSTISD, L                ; first isect descriptor
        F       LSTISD, L                ; last isect descriptor
        F       CLUOFF, L                ; offset to base of next contained image
        F       LASTCLU, L               ; pointer to cluster descriptor of last contained image
        F       SPCRLST, L               ; Listhead of special g^ references
        F       SHRSYMS, L               ; number of symbols referenced in this shareable image
;
; SHRLST and ADRCNT are used before pass 1 to hold the 64-bit binary creation
; date/time of the shareable image symbol table (if image acquired that way)
;
        M       1
        F       SHRLST, L                ; pointer to first symbol referenced in this shareable image
        F       ADRCNT, L                ; number of .ADDRESSES referencing this cluster
        P       1
        F       CREDAT, Q                ; binary creation date/time
        F       ADRLEFT, L               ; number slots left in current address block
        C       <
                ADRBLOCK, 128            ; number of slots per address block
                >
        F       FSTADRL, L               ; pointer to first block of .ADDRESS references
         S      USRBASE,, L              ; base address as specified by user
        F       LSTADRL, L               ; pointer to last block of .ADDRESS references
        F       FIXISD, L                ; pointer to fixup isect descriptor
        F       NISECTS, L              ; number of isects in this cluster
        F       BASE, L                 ; base address of cluster
        F       PAGES, L                ; pages in this cluster
        F       OWNCLU, L               ; pointer to owning cluster if contained in another shr image
        F       FLAGS, W                ; cluster flags
        V       <M
                BASED                   ; base address specified
                SYMBAS                  ; symbolically
                SHRIMG                  ; contains a shareable image
                PIC                     ; which is position independent
                COPY                    ; take private copy of shareable image sections
                OPEN                    ; file is open
                WRT                     ; at least one section is wrt/non-crf
                PROTECT                 ; cluster is protected
                PREFIXUP                ; image does not have fixup section - created under v1 or v2
                INTCLU                  ; cluster is internally created
                USRBASED                ; cluster is based by user
                SPARE2
                SPARE3
                MATCHCTL, 3             ; i-sect match control
                >
        F       PFC, B                  ; page fault cluster factor
        F       , B                     ; spare byte
        F       NAMLNG, B               ; length of cluster name
        F       NAME, T, 39             ; cluster name (** NOTE SIZE **)
        F       GSMATCH, L              ; global section match
        L       SIZE                    ; Size of a cluster descriptor
        E
;
; define the collect list psect descriptor
;
        $STRUCT CPD

        F       NXTPSC, L               ; link to next descriptor
        F       NAMLNG, B               ; length of psect name
        F       NAME, T, 31             ; psect name (** NOTE SIZE **)
        L       SIZE
        E
;
; define Debugger symbol table Contribution by Module block
;
        $STRUCT DCM

        F       DSTOFF, L       ; offset into DST of this objmod's contribution
        F       DSTLEN, L       ; length of this objmod's DST contribution
        F       NUMPSC, W       ; number of psects in this objmod
        F       , W             ; spare
        L       SIZE
        E

;
; define Debugger symbol table Contrib. Psect block
;
        $STRUCT DCP

        F       BASE, L         ; base of psect for this module
        F       LENGTH, L       ; length of psect for this module
        L       SIZE
        E

;
; define the debug location information block
;
        $STRUCT DLI

        F       LEFT, L                 ; Left tree pointer
        F       RIGHT, L                ; Right tree pointer
        F       BAL, W                  ; Balance this node
        F       INDEX, L                ; index of this dli block
        F       LOC, L                  ; location counter associated with this index
        L       SIZE
        E

;
; define the layout of and accessing macros for the file descriptor blocks which forms a doubly
; linked list in the order of specification by the user. the fdb contains an rms auxiliary file
; name block so that the file may be opened by file id after the first time. the auxiliary file
; name block contains a descriptor of the resultant file name string (after all logical names and
; defaults have been applied by rms on the first open) so that this complete name may be used in
; error messages and the map. note however that there is also a descriptor of the name that the user
; supplied in the command.
;
        $STRUCT FDB

        F       NXTFDB, L               ; forward link
        F       OMDLST, L               ; listhead for object module descriptors
                                        ; also used to point to module name list
        F       L.BLSTLNG, W            ; length of the string which is the module
                                        ; name list if this is a library with explicit
                                        ; extraction
        F       FILFLGS, B              ; file specific flags
        V       <M
                NEWUDF                  ;  a module from library added a new undefined symbol to list
                LIBR                    ;  library flag bit
                SHR                     ;  shareable image file flag **NOTE** SHR, SELSER must be at these positions
                SELSER                  ;  selective search file **NOTE** to correspond with OMD$V_SHRIMG, SELSER
                OPTION                  ;  option file (and input file contained in one)
                DEBUGER                 ;  file contains the debugger
                LIBEXTR                 ;  explicit module extraction from library
                LIBSRCH                 ;  library to be searched for undefined symbols
                >
        C       <,$S
                NEWUDF                  ;  a module from library added a new undefined symbol to list
                LIBR                    ;  library flag bit
                SHR                     ;  shareable image file flag
                SELSER                  ;  selective search file
                OPTION                  ;  option file (and input file contained in one)
                DEBUGER                 ;  file contains the debugger
                LIBEXTR                 ;  explicit module extraction from library
                LIBSRCH                 ;  library to be searched for undefined symbols
                >
        F       FLAG2,B                 ; Second flags word
        V       <M
                IMGLIB                  ;  library is library of shr img stb's
                P1                      ;  file has been processed in pass 1
                OMDNOBIN                ;  file has an obj mod without TIR recs
                >
        F       USRNAMDSC, Q            ; string descriptor of the user supplied filename
         S      USRNAMLEN,, W           ;  length of user supplied name
         S      ,, W                    ;  skip a word
         S      USRNAMADR,, L           ;  address of user supplied name string
        F       FILENAME, Q             ; string descriptor of final file name
         S      DEFNAMLEN,, W           ;  used as default name string descriptor before opening
         S      ,, W                    ;
         S      DEFNAMADR,, L           ;
        F       LIBNAMDSC, Q            ; string descriptor for shr img stb library that this module found in
         S      LIBNAMLEN,, W
         S      ,, W
         S      LIBNAMADR,, L
        F       IFI, W                  ; internal file id
        F       AUXFNB, T, 0            ; the rms auxilliary filename block
        L       SIZE                    ; **NOTE** To allocate an fdb the size to allocate is FDB$C_SIZE+NAM$C_BLN
        E
;
; define flag bits for flagstack used in lnk_objpass2
;       symbol processing
;
        $STRUCT FLG

        V       <M
                UNDEF                   ; symbol is undefined
                SHRIMGSYM               ; symbol is shareable image symbol
                SHRSYMEXP               ; stack value is part of shr img expression
                >
        E

;
; define structure of free virual memory descriptors
;
        $STRUCT FVM

        F       NXTFVM, L               ; next descriptor address
        F       ADDRESS, L              ; address this descriptor describes
        F       BYTES, L                ; size of vm this describes
        L       SIZE
        E
;
; Define the fields of the GSMATCH
;
        $STRUCT GMT

        F       MINORID, B, 3           ; Minor ident is 3 bytes long
        F       MAJORID,B , 1           ; Major ident is 1 byte
        E
;
; Define ident check data structure
;
        $STRUCT IDCD
        F       LEFT, L                 ; Left subtree
        F       RIGHT, L                ; Right subtree
        F       BAL, W                  ; Balance
        F       FLAGS, W                ; Flags
        V       <
                BINIDENT                ; Binary rather than ASCII ident
                IDMATCH, 2              ; Match control for binary ident
                ERRSEV, 3               ; Error severity for message
                >
        F       DEFOMD, L               ; Index of defining OMD
        F       DEFFDB, L               ; Address of defining FDB
        F       IDLNG, B                ; Length of ident
        F       OBJLNG, B               ; Length of object type name
        F       IDENT, L                ; Binary ident or pointer to ascii idnt
        F       OBJNAM, L               ; Pointer to object type name
        F       NAMLNG, B               ; Length of entity name
        F       NAME, T, 0              ; Start of entity name
        L       SIZE                    ; Length of fixed part of block
        E
;
; define the isect generation control table entries
;
        $STRUCT ISC

        F       MASK, W                 ; psect AND mask
        F       MATCH, W                ; psect attribute match
        F       CODE, B                 ; isect type
        F       SIZE, B                 ; size of isd
        F       PFC, B                  ; page fault cluster
        F       FLAGS, B                ; isd flags
        F       MATCTL, B               ; match control field of isd
        L       SIZE
        E
;
; define the image section descriptor block.  The isd that goes in the image header
; is appended to this structure
;
        $STRUCT ISL

        F       NXTISD, L               ; next isd
        F       PREVISD, L              ; previous isd
        F       BUFDSC, L, 2            ; image buffer descriptor
         S      BUFADR,, L              ; image buffer address (do not separate
         S      BUFEND,, L              ;  end of image buffer
        F       CLUDSC, L               ; pointer to cluster descriptor
        F       FLAGS, W                ; flags
        V       <
                REPROT                  ; section must be reprotected
                MEMALO                  ; memory allocated for this isect (fixup section only)
                >
        F       NEWPRT, B               ; new protection
        F       , B                     ; spare byte
        F       HDRISD, T, 0            ; start of isd that goes to image header
        C       <                       ; define types of image sections
                SHRFXD, 1
                PRVFXD, 2
                SHRPIC, 3
                PRVPIC, 4
                >
        L       SIZE
        E
;
; define the linker version array. its content is written to image
; header.
;
        $STRUCT LID

        F       MAJOR, W                ; major ident
        F       MINOR, W                ; minor ident
        L       SIZE                    ; Size of version array
        E
;
; Define structure for link-time literals
;
        $STRUCT LIT

        F       LEFT, L                 ; Left sub-tree pointer
        F       RIGHT, L                ; Right sub-tree pointer
        F       BAL, W                  ; Balance this node
        F       FLAGS, B                ; Flags
        V       <
                PDL, 7                  ; Position dependence level
                STAPX                   ; value is psect base plus offset
                >
        F       INDEX, B                ; index value of this literal
        F       SHRSYM, L               ; saved shrimgsym
        F       SHREXPR, L              ; saved shrsymexpr
        F       VALUE, L                ; value of this literal
        L       SIZE
        E
;
; Define general LNK items
;
        $STRUCT LNK

        V       <M
                IMAGE                   ; set if image to be produced
                EXE                     ; set if an executable image
                SHR                     ; set if shareable image
                SYS                     ; set if system image
                MAP                     ; set if map to be produced
                MAPOPN                  ; set when map file is opened
                DBG                     ; set if debugger requested
                CROS                    ; set for cross referenced map (8)
                LONG                    ; set if long map
                BRIEF                   ; set if brief map
                SYSLIB                  ; set if system library to be
                                        ; searched for undefined symbols
                INTFIL                  ; set when about to open an internally
                                        ; materialized file for first time
                VERIFY                  ; use same bit for options file verification
```

```
                                        ; during command processing
                SYMTBL                  ; set when symbol table output is required
                SUPSYS                  ; set when suppression of system library symbols and p-sections
                SUPDBG                  ; set when suppression of debugger symbols and p-sections (16)
                DBGREC                  ; set in pass 2 when current record is a debug data record
                PICIMG                  ; set when a position independent image
                TRACE                   ; set when traceback enabled
                CONTIG                  ; image must be made contiguous
                SYSSHR                  ; system shareable image(s) enabled
                NOPOBUFS                ; p0 space not available for rms buffers
                USRLIB                  ; user default libraries are enabled
                PROTECT                 ; image is protected with /protect (24)
                POIMAGE                 ; image is p0-only image
                SYSHEADR                ; system image with header
                ALLUNIV                 ; all globals promoted to universal
                UBASED                  ; user specified base address of image
                LBASED                  ; linker based image due to l^ or w^ shr img references
                CLI                     ; resulting image is a CLI
                IMGIDOPT                ; image id set in options file
                >
        C       <,$S
                IMAGE                   ; set if image to be produced
                EXE                     ; set if an executable image
                SHR                     ; set if shareable image
                SYS                     ; set if system image
                MAP                     ; set if map to be produced
                MAPOPN                  ; set when map file is opened
                DBG                     ; set if debugger requested
                CROS                    ; set for cross referenced map
                LONG                    ; set if long map
                BRIEF                   ; set if brief map
                SYSLIB                  ; set if system library to be
                                        ; searched for undefined symbols
                INTFIL                  ; set when about to open an internally
                                        ; materialized file for first time
                VERIFY                  ; use same bit for options file verification
                                        ; during command processing
                SYMTBL                  ; set when symbol table output is required
                SUPSYS                  ; set when suppression of system library symbols and p-sections
                SUPDBG                  ; set when suppression of debugger symbols and p-sections
                DBGREC                  ; set in pass 2 when current record is a debug data record
                PICIMG                  ; set when a position independent image
                TRACE                   ; set when traceback enabled
                CONTIG                  ; image must be made contiguous
                SYSSHR                  ; system shareable image(s) enabled
                NOPOBUFS                ; p0 space not available for rms buffers
                USRLIB                  ; user default libraries are enabled
                PROTECT                 ; image is protected with /protect
                POIMAGE                 ; image is p0-only image
                SYSHEADR                ; system image with header
                ALLUNIV                 ; promote all globals to universal
                UBASED                  , user specified image base address
                LBASED                  ; linker was forced to base image
                CLI                     ; resulting image is a CLI
                IMGIDOPT                ; image id set in options file
                >
        C       <
                NLITS, 256              ; Maximum number of literals
                MAXPSECTS, 65535        ; Maximum number of psects allowed
                >
        E

;
; define the layout of a module's p-section contribution data block
;
        $STRUCT MPC

        F       NXTMPC, L               ; forward pointer
        F       OWNOMD, L               ; pointer to module descriptor
        F       OFFSET, L               ; offset of this contribution from base
        F       LENGTH, L               ; length of this contribution
        F       ALIGN, B                ; alignment of this contribution
        F       PSCNUM, W               ; psect number in this module
        L       SIZE
        E
;
; Define the layout of a general binary tree node
;
        $STRUCT NODE

        F       LEFT, L                 ; pointer to left subtree
        F       RIGHT, L                ; pointer to right subtree
        F       BAL,W, 1, S             ; balance this node
        L       SHORT                   ; length of short node
        F       PTR, L                  ; pointer to associated data
        L       LONG                    ; length of long node
        E
;
; Define the layout of an environment data block
;
        $STRUCT NVD

        F       UDFLINK, L              ; forward link in undefined list
        F       UDBLINK, L              ; backward link in undefined list
        F       SYMTBL, L               ; pointer to this env symbol table
        F       OMDNUM, L               ; number of defining module
        F       FLAGS, W                ; flags
        V       <
                DEF                     ;  defined
                >
        F       NAMLNG, B               ; length of environment name
        F       NAME, T, 0              ; environment name
        L       SIZE                    ; size of block
        E
;
; Define the layout of an object module error block (also used to hold
; option file text for printing in the map)
;
        $STRUCT OEB

        F       NXTOEB                  ; pointer to next or 0 if last
        F       BYTCNT, W               ; number of text bytes
        F       TEXT, T, 0              ; address of text string
        L       SIZE                    ; Size of fixed part of block
        E
;
; define the layout of an object module descriptor
;
        $STRUCT OMD

        F       NXTOMD, L               ; link to next in file
        F       DLILST, L               ; debug location information listhead for module
         S      OWNFDB,, L              ; pointer to owning fdb during pass 1
        F       ALLOC, L                ; module's allocation to memory
        F       RFA, B, 6               ; rfa of module
         S      MODVBN,, L              ; virtual block number
         S      BYTOFF,, W              ; and byte offset
        F       HIPSCT, W               ; highest p-sect number
        F       FLAGS, B                ; module flags
        V       <M
                NOPSCT                  ;  set until a p-section is seen
                NOBIN                   ;  set until binary or debug records in module
                SHRIMG                  ;  module is a shareable image **NOTE** SHRIMG and SELSER must be at these positions
                SELSER                  ;  set if selective search module **NOTE** to correspond with FDB$V_SHR,SELSER
                MAPMOD                  ;  set if module to be mapped
                DEBUGER                 ;  this is a module of the debugger
                P256                    ;  module has more than 256 psects
                NOENV                   ;  set until an environment seen
                >
        F       FLAGS1,B                ; more flags
        V       <M
                E256                    ; module has more than 256 environments
                >
        F       HIENV, W                ; highest environment assigned
        F       ENVMAP, L               ; Pointer to environment mapping table
        F       OMDNUM, L               ; object module number
        F       ERRTXT, L               ; pointer to first pass 1 error msg
         S      NXTADR,, L              ;  pointer to next omd with .address
        F       LSTERR, L               ; pointer to last pass 1 error msg
         S      ADRCNT,, L              ;  Number of .addresses found in pass 2
        F       NAMLNG, B               ; name length
        F       NAME, T, 31             ; module name field (** NOTE SIZE **)
        F       PSCMAP, T, 0            ; p-sect mapping table start
        L       OMDSIZ
        C       <
                SIZE, OMD$C_OMDSIZ+2048
                >
        E
;
; define the psect definition list descriptor
;
        $STRUCT PDD

        F       LEFT, L                 ; pointer to left subtree
        F       RIGHT, L                ; pointer to right subtree
        F       BAL, W                  ; balance at this node
        F       FLAGS, W                ; flags set by psect option
        F       FLGMSK, W               ; mask of flags set/cleared by option
        F       ALIGN, B                ; alignment set by psect option
        F       NAMLNG, B               ; length of name
        F       NAME, T, 0              ; psect name
        L       SIZE
        E
;
; define offsets into a p-section mapping table (appended
;       to module descriptors) NOTE:  This structure is also used in the
;       environment mapping table
;

        $STRUCT PMT

        F       PSCDES, L               ; pointer to p-section descriptor
         S      SECPMT,, L              ; pointer to secondary psect mapping table
        F       MODCON, L               ; pointer to module contribution data block
         S      SYMLST,, L              ; forward list of prematurely defined symbols
        L       SIZE                    ; size of an entry
        E
;
; define the layout of a program section descriptor
;
        $STRUCT PSC

        F       LEFT, L                 ; left subtree pointer
        F       RIGHT, L                ; right subtree pointer
        F       BAL, W                  ; balance this node
        F       FLAGS, W                ; p-sect flags
        V       <M
                PIC                     ;  position independent ** these bits must parallel $GPSDEF in OBJFMT.MDL
                LIB                     ;  from a shareable image
                OVR                     ;  overlaid memory allocation
                REL                     ;  relocatable
                GBL                     ;  global scope
                SHR                     ;  shareable
                EXE                     ;  executable
                RD                      ;  readable
                WRT                     ;  writeable
                VEC                     ;  vector psect ** end of bits from $GPSDEF
                OPTPSC                  ;  p-sect defined in option file
                USRPSC                  ;  p-sect definition seen in object source
                SUPRES                  ;  p-sect is suppressed
                SHRIMG                  ;  p-sect is from a shareable image
                DELETED                 ;  p-sect has been deleted from this cluster and moved to shareable img cluster
                NEWDEF                  ;  p-sect was from shr image, defined with SGPS
                >
        F       MPCLST, L               ; module contribution list
        F       LSTMPC, L               ; address of last module contrib. block
        F       SYMLST, L               ; owned relocatable symbol list
        F       BASE, L                 ; base address
        F       LENGTH, L               ; accumulated (if con) / maximum (if ovr) length
        F       ISECT, L                ; address of image section descriptor
        F       CLUDSC, L               ; address of cluster descriptor
        F       OMDNUM, L               ; Number of obj. module defined in
        F       ALIGN, B                ; alignment of p-sect base
        F       NAMLNG, B               ; p-sect name length
        F       NAME, T, 0              ; p-sect name (variable)
        L       SIZE
        E
;
; define record file address (RFA) acces
;
        $STRUCT RFA

        F       VBN,L                   ; Virtual block number in file
        F       OFFSET,W                ; Byte offset within block
        C       <,
                INDEX,65535             ; Offset = FFFF indicate index
                >
        L       LENGTH                  ; Length of RFA pointer
        E
;
; define symbol name block
;
        $STRUCT SNB

        F       COLIST, L               ; collision list pointer
        F       NAMLNG, B               ; symbol name length
        F       NAME, T, 0              ; symbol name
        L       FXDLEN                  ; length of fixed part of symbol name block
        E
;
; define layout of the store pic code ref data block
;
        $STRUCT SPCR

        F       LEFT, L                 ; Left sub-tree pointer
        F       RIGHT, L                ; right sub-tree pointer
        F       BAL, W                  ; balance this node
        F       OFFSET, L               ; Offset into target image
        F       FIXADR, L               ; VA in fixup section assigned
        L       SIZE                    ; Size of an SPCR block
        E
;
; define layout of the store control table use for store commands in pass 2
;
        $STRUCT STOCTL

        F       FLAGS, B                ; flags byte
        V       <M
                REP                     ;  command is repeated store
                DISPL                   ;  command is a displaced store
                CONMBZ                  ;  mbz field is conditional
                MBZBIT, 5               ;  mbz bit field
                >
        C       <
                MBZBIT, 3               ; shift count to shift into field
                >
        F       BYTES, B                ; output byte count
        L       SIZE
        E
;
```

```
; define the symbol table entry format
;
        $STRUCT SYM,BOLBLK

        C       <
                TBLSIZ, 277             ; size of symbol table (should be prime)
                MAXLNG, 31              ; Maximum symbol length
                SHORTNAME, 15           ; Short symbol length
                >
        F       VALUE, L                ; symbol value
         S      UDFLINK,, L             ;  which is also forward link in undefined list
        F       PSCLST, L               ; thread from defining psect
         S      UDFBLINK,, L            ;  which is also backward link in undefined list
        F       ENTMSK, W               ; entry point mask
        F       FLAGS, W                ; symbol flags
        V       <M
                WEAK                    ; Weak symbol ** These MUST parallel $OBJFMT
                DEF                     ; Definition
                UNI                     ; Universal
                REL                     ; Relocatable
                SPARE1
                SPARE2
                SPARE3
                SPARE4
                LCLSYM                  ;  local symbol
                OPTSYM                  ;  symbol defined by option ** First Linker flag
                INTSYM                  ;  internally created symbol
                SHRIMG                  ;  symbol is from shareable image
                REDEF                   ;  symbol is to be redefined
                SUPRES                  ;  suppressed symbol
                GREF                    ;  symbol has been entered into shr lst
                ENTMSK                  ;  has an entry mask
                >
        F       FLAG2, W                ; second flags word
        V       <M
                GSTMISS                 ;  gst miss
                CROSREF                 ; symbol has been cross referenced
                REREL                   ; symbol needs to be made relocatable
                                        ;  when it is redefined
                >
        F       DATYP, B                ; data type
        F       NAMLNG, B               ; symbol name length
        F       NEWVAL, L               ; re-definition value (set in pass 2, used in lnk$symtblout)
         S      OFFSET,, L              ; offset of this symbol into shareable image (set in lnk$vmallo, used in lnkimgout)
                                        ; (symbol will either be redefined or be in another image, but not both)
        F       OMDNUM, L               ; owning obj module number
        F       VALDATA, L              ; pointer to argument validation data
        F       SHRLNK, L               ; pointer to next symbol this shareable image
        F       CLUDSC, L               ; pointer to cluster descriptor of owning cluster
        L       SIZE
        E
```

0215 AH-BT13A-SE
VAX/VMS V4.0

DIGITAL EQUIPMENT CORPORATION
CONFIDENTIAL AND PROPRIETARY



LINKER
LIS

STRPOSIT
LIS

STRUNWDEQ
LIS

STRPOSEXT
LIS

STRREPLAC
LIS

STRSRCHIN
LIS

STRRIGHT
LIS

LINKER

STRTRIM
LIS

LINK
MAP

PREFIX
REQ

ISDSORT
LIS

STRUPCASE
LIS

STRTRANSL
LIS

DATBAS
MDL

TIRAUX
REQ

ISGENC
REQ

STRPREFIX
LIS

DATBAS
LIS