


```

DDDDDDDD      AAAAAA      PPPPPPPP      DDDDDDDD      EEEEEEEEEEE      FFFFFFFFFFF
DDDDDDDD      AAAAAA      PPPPPPPP      DDDDDDDD      EEEEEEEEEEE      FFFFFFFFFFF
DD      DD      AA      AA      PP      PP      DD      DD      EE      FF
DD      DD      AA      AA      PP      PP      DD      DD      EE      FF
DD      DD      AA      AA      PP      PP      DD      DD      EE      FF
DD      DD      AA      AA      PP      PP      DD      DD      EE      FF
DD      DD      AA      AA      PPPPPPPP      DD      DD      EEEEEEEEE     FFFFFFFF
DD      DD      AA      AA      PPPPPPPP      DD      DD      EEEEEEEEE     FFFFFFFF
DD      DD      AAAAAAAAAA      PP      DD      DD      EE      FF
DD      DD      AAAAAAAAAA      PP      DD      DD      EE      FF
DD      DD      AA      AA      PP      DD      DD      EE      FF
DD      DD      AA      AA      PP      DD      DD      EE      FF
DDDDDDDD      AA      AA      PP      DDDDDDDD      EEEEEEEEEEE     FF
DDDDDDDD      AA      AA      PP      DDDDDDDD      EEEEEEEEEEE     FF

```

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....
....
....
....

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```

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      MM      DD      DD      LL
MM      MM      MM      DD      DD      LL
MM      MM      MM      DD      DD      LL
MM      MM      MM      DD      DD      LL
MM      MM      DDDDDDDD      LLLLLLLLLLL
MM      MM      DDDDDDDD      LLLLLLLLLLL

```

```

: .TITLE $DAPDEF - DATA ACCESS PROTOCOL DEFINITIONS
: .IDENT 'V04-000'

```

```

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**
: Facility: DAP (Data Access Protocol)

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: Abstract:

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: This module defines the DAP control block. It is both an input and
: output control structure for the FAL$DECODE_MSG and NT$DECODE_MSG
: subroutines in FAL and RMS, respectively.

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: Environment:

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: The MDL translator must be used to convert DAPDEF.MDL into
: DAPDEF.MAR (and DAPDEF.B32).

```

```

: Author: James A. Krycka, Creation Date: 17-OCT-1977

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: Modified By:

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```

: V03-007 JEJ0018 J E Johnson 27-Mar-1984
: Correct double assignment of DAP$V_POS caused in V03-006; now
: P/OS will be identified as DAP$V_P_OS and DAP$K_P_OS.
: Remove no longer used DAP buffer size constants:
: DAP$K_INIBUFSIZ, DAP$K_MINBUFSIZ, and DAP$K_MAXBUFSIZ.

```

```

: V03-006 JAK0124 J A Krycka 06-SEP-1983
: Define operating system class bits analogous to DAP$V_VAXVMS
: (VAXELAN, TOPS10, TOPS20, RT11, RSTS, RSX, IAS, and POS).
: Define DAP$B_X_FIELD containing flags from DAP$Q_DCODE_FLG.

```

Rearrange order of DAP\$Q_DCODE_FLG bits.

- V03-005 JAK0112 J A Krycka 22-JUN-1983
Define DAP\$V_GEQ_V71.
Define DAP\$V_VMS_XPF1 thru VMS_XPF4.
- V03-004 JAK0111 J A Krycka 17-JUN-1983
Upgrade definitions to correspond to DAP V7.0 specification:
Define DAP\$K_VAXELAN and DAP\$K_RMS32S.
Define new SYSCAP bit (OCTALVER).
Define DAP\$K_IN8 and DAP\$K_BN8.
- V03-003 KRM0102 K Malik 09-May-1983
Define new SYSCAP field bits (MODATTCRE, NAM3PART, CHGATTREN,
CHGTIMREN, CHGPROREN, BLKCNT).
Rename SYSCAP bits (CHGATT to CHGATTCLS, CHGTIM to CHGTIMCLS,
CHGPRO to CHGPROCLS, CHGNAM to CHGNAMCLS).
Define DAP\$V_BLKCNT, DAP\$B_BLKCNT, and DAP\$C_BLKCNT.
Define DAP\$V_DSP_3NAM.
Define DAP\$K_QUIT.
- V03-002 KRM0081 K Malik 23-Mar-1983
Define DAP\$V_GEQ_V70.
Rename DAP\$B_SOFTVER to DAP\$B_DECVER.
Rename DAP\$B_USRSOFT to DAP\$K_USRVER.
Define DAP\$K_STMLF and DAP\$K_STMCR.
- V03-001 KRM0065 K Malik 23-NOV-1982
Change DAP\$K_SYSCAP2_V and DAP\$K_VALID_R2F values to support
rename operation.
- V02-047 JAK0070 J A Krycka 27-JAN-1982
Remove all "DAP\$V_..." symbols from expressions and eliminate
the use of "." in symbol names to aid in future conversion of
this MDL file into SDL format.
- V02-046 JAK0063 J A Krycka 24-AUG-1981
Cleanup:
Rearrange sections defined by \$DAPPLGDEF.
Expand several menu fields from one byte to two bytes in length
(DAP\$W_CTLMENU, DAP\$W_TIMENU, DAP\$W_PROMENU, DAP\$W_SUMENU).
For consistency, denote fields that exist in two messages as
DAP\$s_name1 and DAP\$s_name2 (FOP, ALQ, DEQ, DISPLAY, RECNUM).
Remove unused system specific fields (DAP\$L_FOP, DAP\$L_ROP, and
DAP\$L_CTX).
Rename SYSCAP bits (RANREC to RANRRN, MULKEY to IDXORG, and
BITCOUNT to BITOPT).
- V02-045 JAK0063 J A Krycka 21-AUG-1981
Upgrade definitions to correspond to DAP V6.0 specification:
Define DAP\$V_GEQ_V60.
Define DAP\$V_EXTEND and DAP\$V_DISPLAY.
Define new SYSCAP field bits (EXTEND, DISPLAY, GNGOPT, CHGATT,
CHGTIM, CHGPRO, and CHGNAM).
Define new FOP field bit (DIR).
Define new ROP field bits (ROPWAT, RRL, and REA).

:
: Define DAPSK_EXTEND_B and DAPSK_EXTEND_E; remove DAPSK_EXTEND.
: Define DAPSK_CHANGE_B, DAPSK_CHANGE_E, and DAPSK_TERMINATE.
: Rename DAPSK_PURGE to DAPSK_RESET.
: Define DAPSQ_STX and DAPS_STX.
: Define DAPSV_PDT, DAPSQ_PDT, and DAPS_PDT.
: Define DAPSV_ADT, DAPSQ_ADT, and DAPS_ADT.
: Modify value of DAPSK_SYSCAP1_V (set EXTEND and DISPLAY bits).
: Modify value of DAPSK_SYSCAP2_V (set CHGTIM and HGPRO bits).

V02-044 JAK0061 J A Krycka 17-JUL-1981
Define DAPSK_INIBUFSIZ, DAPSK_MINBUFSIZ, and DAPSK_MAXBUFSIZ.
Remove DAPSK_BUFSIZ_F and DAPSK_BUFSIZ_R.

V02-043 JAK0060 J A Krycka 23-JUN-1981
Define DAPSK_TOPS10, and DAPSK_TOPS10F.
Define DAPSV_BDT, DAPSQ_BDT, and DAPS_BDT.
Modify value of DAPSK_FLAGS_U (remove LEN256 bit).
Modify value of DAPSK_SYSCAP1_V (set RANRFA and BIGBLK bits).

V02-042 JAK0050 J A Krycka 22-NOV-1980
Define DAPSV_RMS and DAPSV_FCS.
Fix bug in definition of reserved bit in FOP field.
Change DAPSK_BUFSIZ_F value from <4096+256> to <4096+32>.
Modify value of DAPSK_SYSCAP2_V (include WILDCARD bit).

V02-041 REFORMAT J A Krycka 26-JUL-1980

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**
: Define the overall structure of the DAP control block and symbols related
: to its prologue section.

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: Note: Longword and quadword fields are longword aligned within the control
: block. Fields longer than 8 bytes are not stored within. Instead a
: descriptor is stored in the control block that points to an external
: buffer where the field data is located.
--

```

```

$STRUCT DAP,PLGDEF      : DAP control block prologue
                        : -----
                        : Parameter and status section
                        : -----
F DCODE_FLG,Q          : Message decode status flags
                        : (output from message decode subroutine)
                        : Note: bits 00-31 are defined external to DAP
                        : Note: bits 32-63 are defined by DAP herein
S VERSION,4,W          : Remote DAP protocol version level (bits 32-47)
S PARTNER,6,W          : Remote system classification (bits 48-63)
V <                    : Meaning:
  ,32                  : Skip over reserved bits
  GEQ_V41              : Partner implemented to DAP since V4.1
  GEQ_V42              : Partner implemented to DAP since V4.2
  GEQ_V52              : Partner implemented to DAP since V5.2
  GEQ_V54              : Partner implemented to DAP since V5.4
  GEQ_V56              : Partner implemented to DAP since V5.6
  GEQ_V60              : Partner implemented to DAP since V6.0
  GEQ_V70              : Partner implemented to DAP since V7.0
  GEQ_V71              : Partner implemented to DAP since V7.1
  ,4                   : Spare
  VMS_XPF1             : VAX/VMS experimental protocol option flag
  VMS_XPF2             : VAX/VMS experimental protocol option flag
  VMS_XPF3             : VAX/VMS experimental protocol option flag
  VMS_XPF4             : VAX/VMS experimental protocol option flag
  RMS                  : Partner uses an RMS based file system
  FCS                  : Partner uses an FCS based file system
  STM_ONLY             : Partner uses a stream ASCII based file system
  ,1                   : Spare
  VAXVMS               : Partner runs under VAX/VMS
  VAXELAN              : Partner runs under VAXELAN
  TOPS10               : Partner runs under TOPS-10
  TOPS20               : Partner runs under TOPS-20
  RT11                 : Partner runs under RT-11
  RSTS                 : Partner runs under RSTS/E
  RSX                  : Partner runs under RSX-11M, -11MP, or -11S
  IAS                  : Partner runs under IAS or RSX-11D
  P_OS                 : Partner runs under PO/S
  ,3                   : Spare
  >
F MSG_BUF1,Q          : On input, descriptor of message string
                        : to decode
                        : On output, descriptor of string remaining
                        : after message just decoded
F MSG_BUF2,Q          : On input, ignored

```

```

F DCODE_STS,L
  S 0,B
  S DCODE_FID,1,B
  S DCODE_MSG,2,B
  S DCODE_MAC,3,B
F MSG_MASR,L

F CRC_RSLT,L
F X_FIELD,B
  V <
  X_RECNUM
  X_CHECK
  >
F .B,3

F .L,2

F CMWA,L,20
K CMWA,<20*4>
S .0,L,4

S .4,L,16

F SSPWA,L,4
K SSPWA,<4*4>
S .0,L,4

F TEMP,L,4
K TEMP,<4*4>
F .L,8

L BLN
E

```

```

: On output, descriptor of message just
: decoded; same as MSG_BUG1 on input if
: no blocked message follows
: Message decode status codes
: (output from message decode subroutine)
: Message decode success/fail (1/0) status flag
: On error, DAP field ID code; else 0
: Message type (0 if invalid)
: On error, DAP MACCODE error code; else 0
: Bit mask of valid messages to receive
: (input to message decode subroutine)
: (bit offsets are derived from message type
: values, e.g., offset for Data message is
: <1@DAP$K DAT MSG>)
: Current CRC resultant value
: Explicit field found in message flags field
: Meaning:
: Message explicitly contained RECNUM field
: Message explicitly contained CHECK field
: Spare
: -----
: Message decode section (part 1)
: -----
: Configuration message save section
: (space for DAP$Q SYSCAP bit mask field
: defined by the $DAPCNFDEF macro)
: -----
: Message decode section (parts 2 and 3)
: -----
: Current message work area
: Current message work area size
: Message header section
: (space for current message header fields
: defined by the $DAPHDRDEF macro)
: Message operand section
: (space for current message operand fields
: defined by the $DAPxxxDEF macros, where xxx
: represents the 15 DAP message mnemonics)
: ***** offset = ^X80 = 128 *****
: -----
: Message decode section (parts 4 and 5)
: -----
: System specific work area
: System specific work area size
: System specific section
: (space for system specific fields
: defined by the $DAPSSPDEF macro)
: Temporary work area
: Temporary work area size
: Spare
: -----
: Define length of DAP control block

```

```

:++
: Define symbols related to the DAP message header.
:--

```

```

$STRUCT DAP,HDRDEF      : DAP message header
F .L,12                 : Position to message header section
                        : of DAP control block
F TYPE,B                : DAP message type field (1) : B
K <                     : DAP message type:
  CNF_MSG,1             : Configuration message
  ATT_MSG,2             : Attributes message
  ACC_MSG,3             : Access message
  CTL_MSG,4             : Control message
  CON_MSG,5             : Continue Transfer message
  ACK_MSG,6             : Acknowledge message
  CMP_MSG,7             : Access Complete message
  DAT_MSG,8             : Data message
  STS_MSG,9             : Status message
  KEY_MSG,10            : Key Definition Attributes message
  ALL_MSG,11            : Allocation Attributes message
  SUM_MSG,12            : Summary Attributes message
  TIM_MSG,13            : Date and Time Attributes message
  PRO_MSG,14            : Protection Attributes message
  NAM_MSG,15            : Name message
                        : (16) reserved for ACL Attributes message
  >
K VALID_R2F,-           : Mask of DAP messages valid for RMS to send:
  <^X0000EDBE>         : CNF, ATT, ACC, CTL, CON, CMP, DAT, KEY, ALL,
                        : TIM, PRO, NAM
K VALID_F2R,-           : Mask of DAP messages valid for FAL to send:
  <^X0000FFC6>         : CNF, ATT, ACK, CMP, DAT, STS, KEY, ALL, SUM,
                        : TIM, PRO, NAM
F FLAGS,B               : DAP message flags field (EX-5) : BM
V <M                    : Menu of fields to follow:
  STREAMID              : STREAMID
  LENGTH                : LENGTH
  LEN256                : LEN256
  BITCNT                : BITCNT
  TMP1$,1               : Reserved
  SYSPEC                : SYSPEC
  SEGMENT               : Flags field options:
                        : This is a segmented DAP message with
                        : at least one more segment to follow
  TMP2$,1               : Reserved
  >
K FLAGS_I,<-            : Define flags options that are invalid:
  <DAPSM_TMP1$>!-      : Reserved
  <DAPSM_TMP2$>!-      : Reserved
  0>
K FLAGS_U,<-            : Define flags options unsupported by VAX:
  <DAPSM_BITCNT>!-     : BITCNT
  <DAPSM_SEGMENT>!-    : SEGMENT
  0>
F STREAMID,B            : Data stream identification field (1) : B
F LENGTH,B              : Length (of rest of message) field (1) : B

```


F LEN256,B
F BITCNT,B
F B,2
F SYSPEC,Q
E

: Length extension field (1) : B
: Bit count field (1) : B
: Padding
: Descriptor pointing to the
: System specific field (I-255) : B
:

:+
:-

```

:++
: Define symbols related to the system specific field (mini-message)
: contained in the DAP message header.
:--

```

```

$STRUCT DAP,SSPDEF      : System specific field
F .L,32                 : Position to system specific section
                        : of DAP control block
F SSP_MENU,W           : System specific menu field (EX-5) : B
V <M                   : Menu of fields to follow:
  SSP_CAP              : Extended system capabilities
  SSP_FLG              : Extended flags
  TMPTS,14            : Reserved
>
K SSP_MENU_I,<-        : Define SSP_MENU options that are invalid:
  <DAPSM_TMP1$>!-    : Reserved
  0>
K SSP_MENU_U,<-        : Define SSP_MENU options unsupported by VAX:
  0>
F .W                   : Padding
F SSP_FLG,L            : System specific flags field (EX-5) : B
V <M                   : Meaning:
  LOAD                : Load image modifier for open function
  TMP1$,31            : Reserved
>
K SSP_FLG_I,<-        : Define SSP_FLG options that are invalid:
  <DAPSM_TMP1$>!-    : Reserved
  0>
K SSP_FLG_U,<-        : Define SSP_FLG options unsupported by VAX:
  0>
F SSP_CAP,L            : System specific capabilities field (EX-5) : B
V <M                   : Partner node supports:
  LOADIM              : Load image function
  ,31                 : Reserved
>
K SSP_CAP_V,<-        : Define SSP_CAP options supported by VAX:
  <DAPSM_LOADIM>!-   : LOADIM
  0>
F .L,1                 : Spare
E

```

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:++
: Define symbols related to the Configuration message (TYPE=1).
:--

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$STRUCT DAP,CNFDEF      : DAP Configuration message
M 1                      :
F .L,16                 : Position to message operand section
                        : of DAP control block
F BUFSIZ,W              : Buffer size field (2) : B
                        : (This is DAP buffer size value from partner)
F OSTYPE,B              : Operating system type field (1) : B
K <                     : Operating system type:
  RT11,1                : RT-11
  RSTS,2                 : RSTS/E
  RSX11S,3               : RSX-11S
  RSX11M,4               : RSX-11M
  RSX11D,5               : RSX-11D
  IAS,6                  : IAS
  VAXVMS,7              : VAX/VMS
  TOPS20,8               : TOPS-20
  TOPS10,9               : TOPS-10
  RTS8,10                : RTS-8
  OS8,11                 : OS-8
  RSX11MP,12             : RSX-11M-PLUS
  COPOS11,13             : TOPS-20 (using 2050/2060 front end)
  P OS,14                : P/OS
  VAXELAN,15            : VAXELAN
>
F FILESYS,B             : File system type field (1) : B
K <                     : File system type:
  RMS11,1                : RMS-11
  RMS20,2                : RMS-20
  RMS32,3                : RMS-32
  FCS11,4                : FCS-11
  RT11FS,5               : RT-11
  NO FS,6                : No file system present
  TOPS20FS,7             : TOPS-20
  TOPS10FS,8             : TOPS-10
  OS8FS,9                : OS-8
  RMS32S,10              : RMS-32 subset
>
F VERNUM,B              : DAP version number field (1) : B
K VERNUM_V,7            : Value for VAX/VMS V4.0
F ECONUM,B              : ECO version number field (1) : B
K ECONUM_V,0            : Value for VAX/VMS V4.0
F USRNUM,B              : User protocol version number field (1) : B
K USRNUM_V,0            : Value for VAX/VMS V4.0
F DECVER,B              : DEC software version number field (1) : B
K DECVER_V,4            : Value for VAX/VMS V4.0
F USRVER,B              : User software version number field (1) : B
K USRVER_V,0            : Value for VAX/VMS V4.0
F .B,3                  : Padding
F .L,13                 : Spare
P 1
F .L,10                 : Position to Configuration message save section

```

```

F SYSCAP,Q      : System capabilities field (EX-12) : BM
V <            : Partner node supports:
  FILALL        : Allocation of space at file creation
  SEQORG        : Sequential file organization
  RELORG        : Relative file organization
  .1            : Reserved for HSHORG
  EXTEND        : Manual file extension
  SEQFIL        : Sequential file access (file transfer mode)
  RANRRN        : Random access by relative record number
  RANVBN        : Random access by virtual block number
  RANKEY        : Random access by key value
  .1            : Reserved for RANHSH
  RANRFA        : Random access by record file address
  IDXORG        : Multi-keyed indexed file organization
  SWMODE        : Dynamic switching of access modes
  APPEND        : Append records to end-of-file
  SUBMIT        : Command file submission/execution
  .1            : Reserved for COMPRESS (data compression)
  MDS           : Multiple data streams per file
  DISPLAY       : Display of file attributes on request
  MSGBLK        : Blocking of DAP messages up to response
                  using a 1-byte length field (LENGTH)
  UNRBLK        : Unrestricted blocking of DAP messages
  BIGBLK        : Blocking of DAP messages up to response
                  using a 2-byte length field (LEN256,LENGTH)
  DAPCRC        : DAP message CRC checksum
  KEYXAB        : Key Definition XAB message
  ALLXAB        : Allocation XAB message
  SUMXAB        : Summary XAB message
  DIRECTORY     : Directory list operation
  TIMXAB        : Date and Time XAB message
  PROXAB        : File Protection XAB message
  .1            : Reserved for ACLXAB
  FOPSPL        : Spool file on close FOP option
  FOPSCF        : Execute command file on close FOP option
  FOPDLT        : Delete file on close FOP option
  >
V <            : Partner node supports:
  .32           : (skip over bits defined above)
  .1            : Reserved for DFTFIL (default file spec)
  SEQRAC        : Sequential record access
  .1            : Reserved for RECOVERY
  BITOPT        : Bit count option in the FLAGS field
  WARNING       : Warning Status message and associated error
                  recovery message exchange
  RENAME        : File rename operation
  WILDCARD      : Wildcard operations (excluding directory)
  GNGOPT        : Go/Nogo option in the ACCOPT field
  NAMMSG        : Name message
  SEGMSG        : Segmented DAP messages
  CHGATTCLS     : Changing file attributes on close via ATT msg
  CHGTIMCLS     : Changing file attributes on close via TIM msg
  CHGPROCLS     : Changing file attributes on close via PRO msg
  CHGNAMCLS     : Changing file attributes on close via NAM msg
                  (i.e., rename of file)
  MODATTCRE     : Modified attributes returned on create

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NAM3PART      : 3-part Name message format in DISPLAY field
               : of both Access and Control messages
CHGATTREN     : Changing file attributes on rename via ATT msg
CHGTIMREN     : Changing file attributes on rename via TIM msg
CHGPROREN     : Changing file attributes on rename via PRO msg
BLKCNT        : BLKCNT field in Control message
OCTALVER      : Octal version numbers only in file specs
               : (bit is valid only for DAP V7.0 or later)
               : Reserved
               :
               : Define supported SYSCAP options (bits 00-31):
               : FILALL, SEQORG, RELORG, EXTEND, SEQFIL,
               : RANRRN, RANVBN, RANKEY, RANRFA, IDXORG, SWMODE,
               : APPEND, SUBMIT, DISPLAY, MSGBLK, BIGBLK,
               : DAPCRC, KEYXAB, ALLXAB, SUMXAB, DIRECTORY,
               : TIMXAB, PROXAB, FOPSPL, FOPSCF, FOPDLT
K SYSCAP1 V,-  : Define supported SYSCAP options (bits 32-63):
<^XEFF67DF7>  : SEQRAC, RENAME, WILDCARD, NAMMSG, CHGTIMCLS,
               : CHGPROCLS
               :
E

```

```

:++
: Define symbols related to the Attributes message (TYPE=2).
:--

```

```

$STRUCT DAP,ATTDEF      : DAP Attributes message
F ,L,16                 : Position to message operand section
                        : of DAP control block
F ATTMENU,L             : Attributes menu field (EX-6) : BM
V <M                   : Menu of fields to follow:
  DATATYPE              : Data type
  ORG                   : File organization
  RFM                   : Record format
  RAT                   : Record attributes
  BLS                   : Block size
  MRS                   : Maximum record size
  ALQ1                  : Allocation quantity
  BKS                   : Bucket size
  FSZ                   : Fixed control area size
  MRN                   : Maximum record number
  RUNSYS                : Run-time system identification
  DEQ1                  : Default extension quantity
  FOP1                  : File options
  BSZ                   : Byte size field
  DEV                   : Device characteristics
  TMP1$,1               : Reserved for SDC
  LRL                   : Longest record length
  HBK                   : Highest virtual block number
  EBK                   : End-of-file block number
  FFB                   : First free byte in end-of-file block
  SBN                   : Starting logical block number
  TMP2$,11              : Reserved
>
K ATTMENU_I,<-         : Define ATTMENU options that are invalid:
  <DAPSM_TMP1$>!-     : Reserved
  <DAPSM_TMP2$>!-     : Reserved
  0>
K ATTMENU_U,<-         : Define ATTMENU options unsupported by VAX:
  0>
F DATATYPE,B           : Data type field (EX-2) : BM
V <M                   : Define offsets and masks:
  ASCII                 : Data in ASCII format
  IMAGE                 : Data in IMAGE format
  TMP1$,1               : Reserved for EBCDIC
  CMPFMT                : Compressed format
  EXEC                  : File contains executable code
  PRIV                  : File contains privileged code
  TMP2$,1               : Reserved (ignore if received)
                        : (this was attributes match flag in DAP V4.1)
  ZERO                  : Zero file on erase file operation
>
K DATATYP_I,<-         : Define DATATYPE options that are invalid:
  <DAPSM_TMP1$>!-     : Reserved
  0>
K DATATYP_U,<-         : Define DATATYPE options unsupported by VAX:
  <DAPSM_CMPFMT>!-    : CMPFMT

```

```

    <DAP$M_ZERO>!--
    0>
K DATATYP D,<--
  <DAP$M_IMAGE>!--
  0>
F ORG,B
K <
  SEQ,0
  REL,16
  IDX,32
  >
K ORG_D,DAP$K_SEQ
F RFM,B
K <
  UDF,0
  FIX,1
  VAR,2
  VFC,3
  STM,4
  STMLF,5
  STMCR,6
  >
K RFM_D,DAP$K_FIX
F RAT,B
V <M
  FTN
  CR
  PRN
  BLK
  EMBEDDED
  TMP1$,1
  LSA
  MACY11
  >
K RAT_I,<--
  <DAP$M_TMP1$>!--
  0>
K RAT_U,<--
  <DAP$M_LSA>!--
  <DAP$M_MACY11>!--
  0>
K RAT_D,<--
  <DAP$M_EMBEDDED>!--
  0>

F BLS,W
K BLS_D,512
F MRS,W
F ALQ1,L
F BKS,B
F FSZ,B
F BSZ,B
K BSZ_D,8

```

```

ZERO
:
: Define default DATATYPE value
IMAGE
:
: File organization field (1) : B
: File organization:
: Sequential
: Relative
: Indexed
: (48) reserved for hash
:
: Define default ORG value
: Record format field (1) : B
: Record format:
: Undefined
: Fixed length
: Variable length
: Variable length with fixed control
: Stream ASCII
: Stream LF
: Stream CR
:
: Define default RFM value
: Record attributes field (EX-3) : BM
: Meaning:
: Fortran carriage control
: Implied (LF-Record-CR) carriage control
: Print file format
: Records do not cross block boundaries
: Records have embedded control characters
: Reserved
: Line sequenced ASCII
: MACY11 format
:
: Define RAT options that are invalid:
: Reserved
:
: Define RAT options unsupported by VAX:
: LSA
: MACY11
:
: Define default RAT value
EMBEDDED
:
: ***** No default value is stated in the
: ***** DAP spec although some systems
: ***** treat EMBEDDED as the default
: Block size field (2) : B
: Define default BLS value
: Maximum record size field (2) : B
: Allocation quantity field (I-5) : B
: Bucket size field (1) : B
: Fixed control area size field (1) : B
: Byte size field (1) : B
: Define default BSZ value

```

```

F ,B      : Padding
F DEQ1,W  : Default extension quantity field (2) : B
F ,B,2    : Padding
F MRN,L   : Maximum record number field (I-5) : B
F RUNSYS,Q : Descriptor pointing to the
           : Run-time system field (I-40) : A
F FOP1,L  : File options field (EX-6) : BM
V <M      : Options:
  RWO     : Rewind magtape on open
  RWC     : Rewind magtape on close
  TMP1$,1 : Reserved
  POS     : Position magtape past last created file
  DLK     : Do not lock file if improperly closed
  DIR     : Directory file
  FLK     : File locked
  CTG     : Contiguous space allocation
  SUP     : Supersede existing file on create
  NEF     : Inhibit positioning magtape to end-of-file
  TMP     : Create temporary file
  TMD     : Create temporary file and mark for delete
  TMP2$,1 : Reserved
  DMO     : Dismount magtape on close
  WCK     : Enable write checking
  RCK     : Enable read checking
  CIF     : Create if no file present else open file
  TMP3$,1 : Reserved for LKO
  SQO     : Sequential access only
  MXV     : Maximize version number
  SPL     : Spool file on close
  SCF     : Submit command file on close
  DLT     : Delete file on close
           : (used stand-alone or as a suboption to
           : SCF or SPL)
  CBT     : Contiguous-best-try space allocation
  TMP4$,1 : Reserved for WAT
  DFW     : Deferred write (REL and IDX files)
  TEF     : Truncate at EOF on close (SEQ files)
  OFP     : Output file parse
  TMP5$,4 : Reserved
>
K FOP_I,<- : Define FOP options that are invalid:
           : (This is used for both FOP1 and FOP2 fields)
  <DAPSM_TMP1$>!- : Reserved
  <DAPSM_TMP2$>!- : Reserved
  <DAPSM_TMP3$>!- : Reserved
  <DAPSM_TMP4$>!- : Reserved
  <DAPSM_TMP5$>!- : Reserved
  0>
K FOP_U,<- : Define FOP options unsupported by VAX:
           : (This is used for both FOP1 and FOP2 fields)
  <DAPSM_DMO>!-  : DMO
  0>             : Note: allow DLK, DIR, and FLK
F DEV,L      : Device characteristics field (EX-6) : BM
V <         : Meaning:
  DEVREC     : Device is record oriented
  DEVCCCL    : Carriage control device

```



```

DEVTRM      : Device is a terminal
DEVDIR      : Device is directory structured
DEVSDI      : Device is single directory structured
DEVSQD      : Seq. block oriented device (e.g., magtape)
TMP1$,1,..M : Reserved
DEVFOD      : Files oriented device (e.g., disk, magtape)
DEVSHR      : Device is sharable
DEVSP      : Device is being spooled
DEVMNT      : Device is mounted
DEVDMT      : Device is marked for dismount
DEVALL      : Device is allocated
DEVIDV      : Device is capable of providing input
DEVODV      : Device is capable of providing output
DEVSWL      : Device is software write locked
DEVAVL      : Device is available
DEVELG      : Device has error logging enabled
DEVMBX      : Device is a mailbox
DEVRTM      : Device is realtime in nature
DEVRND      : Device allows random access
DEVRCK      : Device has read checking enabled
DEWCK      : Device has write checking enabled
DEVFOR      : Device is mounted as foreign (not files-11)
DEVNET      : Network device
DEGEN      : Generic device
TMP2$,6,..M : Reserved
>
K DEV_I, <- : Define DEV options that are invalid:
  <DAPSM_TMP1$>!- : Reserved
  <DAPSM_TMP2$>!- : Reserved
  0>
K DEV_U, <- : Define DEV options unsupported by VAX:
  0>
F .L,1      : Reserved for SDC
F LRL,W     : Longest record length field (2) : B
F FFB,W     : First free byte in EOF block field (2) : B
F HBK,L     : Highest virtual block number field (1-5) : B
F EBK,L     : End-of-file block number field (1-5) : B
F SBN,L     : Starting logical block number field (1-5) : B
E

```

```

:++
: Define symbols related to the Access message (TYPE=3).
:--

```

```

$STRUCT DAP,ACCDEF      : DAP Access message
F .L,16                 : Position to message operand section
                        : of DAP control block
F ACCFUNC,B             : Access function field (1) : B
K <                     : Access function:
  OPEN,1                : Open a file
  CREATE,2              : Create a file
  RENAME,3              : Rename a file
  ERASE,4               : Erase (delete) a file
                        : (5) reserved
  DIR_LIST,6           : Return directory list
  SUBMIT,7              : Submit (copy and execute) a command file
  EXECUTE,8             : Execute a command file
  LOAD,255              : Load image file--for internal use by FAL
>
F ACCOPT,B              : Access options field (EX-5) : BM
V <M                    : Meaning:
  NONFATAL              : I/O errors are not fatal
  TMP1$,2               : Reserved--used to be STS_STORE and STS_RETRV
  RET_CRC               : Return CRC value with each DAP message
  GO_NOGO               : Go/nogo option
  TMP2$,3               : Reserved
K ACCOPT_I,<-           : Define ACCOPT options that are invalid:
  <DAPSM_TMP2$>!-      : Reserved
  0>
K ACCOPT_U,<-           : Define ACCOPT options unsupported by VAX:
  <DAPSM_TMP1$>!-      : Reserved--was defined in DAP V5.4
  <DAPSM_GO_NOGO>!-    : GO_NOGO
  0>
F FAC,B                 : File access field (EX-3) : BM
V <M                    : Access for:
  PUT                   : Put record
  GET                   : Get record
  DEL                   : Delete record
  UPD                   : Update record
  TRN                   : Truncate file
  BIO                   : Block I/O operations only
  BRO                   : Mixed record and block I/O operations
  APP                   : Append record
>
K FAC_I,<-              : Define FAC options that are invalid:
  0>
K FAC_U,<-              : Define FAC options unsupported by VAX:
  0>
K FAC_D,<-              : Note: allow APP
  <DAPSM_GET>!-        : Define default FAC value
  0>
  GET
F SHR,B                 : File sharing field (EX-3) : BM
V <M                    : Shared access for:
  SHRPUT                : Put record

```

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```

SHRGET      : Get record
SHRDEL      : Delete record
SHRUPD      : Update record
MSE         : Multiple record streams enabled
UPI         : User provided interlocking
NIL         : No shared access allowed
TMP1$,1     : Reserved
>
K SHR_I,<-   : Define SHR options that are invalid:
<DAPSM_TMP1$>!- : Reserved
0>
K SHR_U,<-   : Define SHR options unsupported by VAX:
<DAPSM_MSE>!-  : MSE
0>
K SHR_D,<-   : Define default SHR value
0>          : ***** This is contrary to the DAP spec
            : ***** which says that DAPSM_GET is the default
F FILESPEC,0 : Descriptor pointing to the
            : File specification field (I-255) : A
F DISPLAY1,W : Display attributes field (EX-4) : BM
V <M        : Return the following:
  DSP_ATT   : Attributes message
  DSP_KEY   : Key Definition Attributes message
  DSP_ALL   : Allocation Attributes message
  DSP_SUM   : Summary Attributes message
  DSP_TIM   : Date and Time Attributes message
  DSP_PRO   : Protection Attributes message
  TMP1$,2   : Reserved
            : Reserved for ACL Attributes message
  DSP_NAM   : Name message
  DSP_3NAM  : 3-part Name message
  TMP2$,6   : Reserved
>
K DISPLAY_I,<- : Define DISPLAY options that are invalid:
            : (This is used for both DISPLAY1 and DISPLAY2)
            : Reserved
            : Reserved
            : Reserved
K DISPLAY_U,<- : Define DISPLAY options unsupported by VAX:
            : (This is used for both DISPLAY1 and DISPLAY2)
            : 3-Part Name message
            : Reserved
F ,W         : Padding
F PASSWORD,0 : Descriptor pointing to the
            : Password field (I-40) : B
F .L,10     : Spare
E

```

```

:++
: Define symbols related to the Control message (TYPE=4).
:--

```

```

$STRUCT DAP,CTLDEF      : DAP Control message
F .L,16                 : Position to message operand section
                        : of DAP control block
F CTLFUNC,B             : Control function field (1) : B
K <                     : Control function:
  GET_READ,1           : Get record or read block
  CONNECT,2            : Establish data stream
  UPDATE,3             : Update record
  PUT_WRITE,4          : Put record or write block
  DELETE,5             : Delete record
  REWIND,6             : Rewind file
  TRUNCATE,7           : Truncate sequential file
                        : (8) reserved for modify file attributes
  RELEASE,9           : Release locked record
  FREE,10              : Free all locked records
  EXTEND_B,11          : Extend file (beginning message of sequence)
  FLUSH,12             : Flush all records
                        : (13) reserved for next volume processing
  FIND,14              : Find record
  EXTEND_E,15          : Extend file (ending message of sequence)
  DISPLAY,16           : Display file attributes
  SPACE_FW,17          : Space file forward
  SPACE_BW,18          : Space file backward
                        : (19) reserved for checkpoint file
                        : (20) reserved for recovery get
                        : (21) reserved for recovery put
>
F .B,3                  : Padding
F CTLMENU,W             : Control menu field (EX-4) : BM
V <M                    : Menu of fields to follow:
  RAC                   : RAC
  KEY                   : KEY
  KRF                   : KRF
  ROP                   : ROP
  TMP1$,1               : Reserved for HSH
  DISPLAY2              : DISPLAY2
  BLKCNT                : BLKCNT
  TMP2$,9               : Reserved
>
K CTLMENU I,<-          : Define CTLMENU options that are invalid:
  <DAPSM_TMP1$>!-      : Reserved
  <DAPSM_TMP2$>!-      : Reserved
  0>
K CTLMENU U,<-          : Define CTLMENU options unsupported by VAX:
  <DAPSM_BLKCNT>!-     : BLKCNT
  0>
F RAC,B                 : Record access field (1) : B
K <                     : Record access type:
  SEQ_ACC,0             : Sequential record access
  KEY_ACC,1             : Random access by key value or record number
  RFA_ACC,2             : Random access by RFA

```

```

SEQ_FILE,3      : Sequential file transfer mode
BLK_VBN,4       : Block I/O access by VBN
BLK_FILE,5     : Block I/O file transfer mode
>
K RAC_D,DAP$K_SEQ_ACC : Define default RAC value
F KRF,B        : Key of reference field (1) : B
F KEY,Q        : Descriptor pointing to the
                : Key field (1-255) : B
F ROP,L        : Record options field (EX-6) : BM
V <M          : Meaning:
  EOF          : Position to end-of-file
  FDL          : Fast record delete
  UIF          : Convert put to update function as required
  TMP1$,1     : Reserved for HSM
  LOA          : Load buckets according to bucket fill size
  ULK          : Enable manual unlocking of records;
                : disable automatic unlocking
  TPT          : Truncate put; write EOF then put (SEQ files)
  RAH          : Read ahead
  WBH          : Write behind
  KGE          : Key value is greater than or equal
  KGT          : Key value is greater than
  NLK          : Do not lock record
  RLK          : Read of locked record allowed
  ROPBIO      : Connect for block I/O operations only
  LIM          : Compare for key limit reached
  NXR          : Nor-existent record processing
  ROPWAT      : Wait until locked record becomes available
  RRL          : Read record regardless of lock
  REA          : Lock record but allow others to read it
  TMP2$,13   : Reserved
>
K ROP_I,<-     : Define ROP options that are invalid:
  <DAP$M_TMP1$>!-- : Reserved
  <DAP$M_TMP2$>!-- : Reserved
  0>
K ROP_U,<-     : Define ROP options unsupported by VAX:
  0>
F DISPLAY2,W   : Display attributes field (EX-4) : BM
                : (see DISPLAY1 field of Access message
                : for bit definitions)
F BLKCNT,B    : Block count field
F .B          : Padding
F .L,10       : Spare
E

```

```
:+  
: Define symbols related to the Continue Transfer message (TYPE=5).  
:--
```

```
$STRUCT DAP,CONDEF      : DAP Continue Transfer message  
F .L,16                 : Position to message operand section  
                        : of DAP control block  
F CONFUNC,B             : Continue transfer function field (1) : B  
K <                     : Recovery action:  
  RETRY,1               : Try access function again  
  SKIP_REC,2           : Skip record in error and continue  
  ABORT,3               : Abort request  
  RESUME,4              : Resume operation  
  QUIT,5                : Terminate file processing  
>  
F .B,3                  : Padding  
F .L,15                 : Spare  
E
```

Define symbols related to the Acknowledge message (TYPE=6).

```
$STRUCT DAP,ACKDEF      ; DAP Acknowledge message
F ,L,16                 ; Position to message operand section
                        ; of DAP control block
F ,L,16                 ; Spare
E
```

```

:++
: Define symbols related to the Access Complete message (TYPE=7).
:--

```

```

$STRUCT DAP,CMPDEF      : DAP Access Complete message
F .L,16                 : Position to message operand section
                        : of DAP control block
F CMPFUNC,B             : Access complete function field (1) : B
K <                     : Access complete function:
  CLOSE,1               : Close file
  RESPONSE,2            : Response to partner's CMPFUNC request
  RESET,3               : Close file and restore it to initial state
                        : (this used to be named PURGE)
  DISCONN,4             : Disconnect record stream
  SKIP_FILE,5           : Skip to next file (i.e., close this file
                        : and open next file)
  CHANGE_B,6            : Close file and change its file attributes
                        : (beginning message of sequence)
  CHANGE_E,7            : Close file and change its file attributes
                        : (ending message of sequence)
  TERMINATE,8           : Terminate (abort) operation and re-initialize
>
F .B                     : Padding
F CHECK,W               : CRC Checksum field (2) : B
F FOP2,L                : File options field (EX-6) : BM
                        : (see FOP1 field of Attributes message
                        : for bit definitions)
F .L,14                 : Spare
E

```



```

:++
: Define symbols related to the Status message (TYPE=9).
:--

```

```

$STRUCT DAP,STSDEF      : DAP Status message
F .L,16                 : Position to message operand section
                        : of DAP control block
F STSCODE,W             : DAP status code field (2) : B
V <M                    : Subfields:
  MICCODE,12            : Micro status code
  MACCODE,4              : Macro status code
>
K <S                    : MACCODE field status code classes:
  PENDING,0             : Operation in progress
  SUCCESS,1             : Operation completed successfully
  UNSUPPORT,2           : DAP implementation does not support request
                        : (3) reserved
  FILE_OPEN,4           : Error related to opening a file
  FILE_XFER,5           : Error encountered while file was open
                        : (i.e., during record access)
  WARNING,6             : Warning error condition
  FILE_CLOS,7           : Error related to closing a file
  FORMAT,8              : Parse error caused by incorrect format
  INVALID,9             : Invalid DAP field value
  MSG_SYNC,10          : DAP message received out-of-order
>
F RFA,W,3               : Record file address field (1-8) : B
F RECNUM2,L            : Record number field (1-8) : B
F STV,L                : Secondary status field (1-8) : B
F STX,Q                : Descriptor pointing to the
                        : Secondary status text field (1-255) : A
F .L,10                : Spare
E

```

```

:++
: Define symbols related to the Key Definition Attributes message (TYPE=10).
:--

```

```

$STRUCT DAP,KEYDEF      : DAP key definition Attributes message
F ,L,16                 : Position to message operand section
                          : of DAP control block
F KEYMENU,L             : Key definition menu field (EX-6) : BM
V <M                    : Menu of fields to follow:
  FLG                   : FLG
  DFL                   : DFL
  IFL                   : IFL
  NSG                   : NSG, POS, SIZ
  REF                   : REF
  KNM                   : KNM
  NUL                   : NUL
  IAN                   : IAN
  LAN                   : LAN
  DAN                   : DAN
  DTP                   : DTP
  RVB                   : RVB
  TMP1$,1               : Reserved for HAL
  DVB                   : DVB
  DBS                   : DBS
  IBS                   : IBS
  LVL                   : LVL
  TKS                   : TKS
  MRL                   : MRL
  TMP2$,13              : Reserved
>
K KEYMENU_I,<-          : Define KEYMENU options that are invalid:
  <DAP$M_TMP1$>!-      : Reserved
  <DAP$M_TMP2$>!-      : Reserved
  0>
K KEYMENU_U,<-          : Define KEYMENU options unsupported by VAX:
  0>
F DFL,W                 : Data bucket fill quantity field (2) : B
F IFL,W                 : Index bucket fill quantity field (2) : B
F FLG,B                 : Key options field (EX-3) : BM
V <M                    : Meaning:
  DUP                   : Duplicate key values allowed
  CHG                   : Key field may change on update (alt key)
  NUL CHR               : Null key character defined (alt key)
  TMPT$,5              : Reserved
>
K FLG_I,<-              : Define key options (FLG) that are invalid:
  <DAP$M_TMP1$>!-      : Reserved
  0>
K FLG_U,<-              : Define key options (FLG) unsupported by VAX:
  0>
F NSG,B                 : Number of key segments field (1) : B
F POS TMP,W             : Temporary work space for POS field processing
S SIZ TMP,0,B           : Temporary work space for SIZ field processing
F POS,0,B               : Key segment position field (2) : B
S POS0,0,W              : Segment 0

```

```

.....
S POS1,2,W      : Segment 1
S POS2,4,W      : Segment 2
S POS3,6,W      : Segment 3
S POS4,8,W      : Segment 4
S POS5,10,W     : Segment 5
S POS6,12,W     : Segment 6
S POS7,14,W     : Segment 7
F SIZ,B,8       : Key segment size field (1) : B
S SIZ0,0,B      : Segment 0
S SIZ1,1,B      : Segment 1
S SIZ2,2,B      : Segment 2
S SIZ3,3,B      : Segment 3
S SIZ4,4,B      : Segment 4
S SIZ5,5,B      : Segment 5
S SIZ6,6,B      : Segment 6
S SIZ7,7,B      : Segment 7
F KNM,Q         : Descriptor pointing to the
                : Key name field (I-40) : A
F REF,B         : Key of reference field (1) : B
F NUL,B         : Null key character field (1) : B
F IAN,B         : Index area number field (1) : B
F LAN,B         : Lowest level index area number field (1) : B
F DAN,B         : Data area number field (1) : B
F DTP,B         : Key data type field (1) : B
K <            : Data type:
  STG,0         : String
  IN2,1         : Signed 2-byte integer
  BN2,2         : Unsigned 2-byte integer (binary)
  IN4,3         : Signed 4-byte integer
  BN4,4         : Unsigned 4-byte integer (binary)
  PAC,5         : Packed decimal (0-31 digits plus sign)
  IN8,6         : Signed 8-byte integer
  BN8,7         : Unsigned 8-byte integer (binary)
>
K DTP_D,DAPSK_STG : Define default DTP value
F MRL,W         : Minimum record length to contain key field (2) : B
F RVB,L         : Root bucket start VBN field (I-8) : B
F DVB,L         : First data bucket start VBN field (I-8) : B
F DBS,B         : Data bucket fill size field (1) : B
F IBS,B         : Index bucket fill size field (1) : B
F LVL,B         : Level of root buckets field (1) : B
F TKS,B         : Total key size field (1) : B
E
.....

```

```

:++
: Define symbols related to the Allocation Attributes message (TYPE=11).
:--

```

```

$STRUCT DAP,ALLDEF      : DAP Allocation Attributes message
F .L,16                  : Position to message operand section
                          : of DAP control block
F ALLMENU,W              : Allocation menu field (EX-6) : BM
V <M                     : Menu of fields to follow:
  VOL                     : VOL
  ALN                     : ALN
  AOP                     : AOP
  LOC                     : LOC
  TMP1$,1                 : Reserved for RFI
  ALQ2                    : ALQ2
  AID                     : AID
  BKZ                     : BKZ
  DEQ2                    : DEQ2
  TMP2$,7                 : Reserved
>
K ALLMENU_I,<-           : Define ALLMENU options that are invalid:
  <DAP$M_TMP1$>!-       : Reserved
  <DAP$M_TMP2$>!-       : Reserved
  0>
K ALLMENU_U,<-           : Define ALLMENU options unsupported by VAX:
  0>
F VOL,W                  : Relative volume number field (2) : B
F ALN,B                  : Alignment options field (EX-4) : BM
K <                       : Alignment types:
  ANY,0                  : Any allocation placement is ok
  CYL,1                  : Align on cylinder boundary
  LBN,2                  : Align on specified logical block
  VBN,3                  : Allocate near specified virtual block
  RFI,4                  : Allocate near specified related file
>
F AOP,B                  : Allocation options field (EX-4) : BM
V <M                     : Options:
  HRD                    : Return error if requested allocation fails
  CTG2                   : Contiguous space allocation
  CBT2                   : Contiguous-best-try space allocation
  ONC                    : Allocate space on cylinder boundary
  TMP1$,4                : Reserved
>
K AOP_I,<-               : Define AOP options that are invalid:
  <DAP$M_TMP1$>!-       : Reserved
  0>
K AOP_U,<-               : Define AOP options unsupported by VAX:
  0>
F .B,2                   : Padding
F LOC,L                  : Starting location field (I-8) : B
F ALQ2,L                 : Allocation quantity field (I-5) : B
F AID,B                  : Area identification field (1) : B
F BKZ,B                  : Bucket size field (1) : B
F DEQ2,W                 : Default extension quantity field (2) : B
F .L,11                  : Spare

```

E :

```

:++
: Define symbols related to the Summary Attributes message (TYPE=12).
:--

```

```

$STRUCT DAP,SUMDEF      : DAP summary Attributes message
F .L,16                 : Position to message operand section
                        : of DAP control block
F SUMENU,W              : Summary menu field (EX-6) : BM
V <M                   : Menu of fields to follow:
  NOK                   : NOK
  NOA                   : NOA
  NOR                   : NOR
  PVN                   : PVN
  TMP1$,12             : Reserved
>
K SUMENU_I,<-          : Define SUMENU options that are invalid:
  <DAPSM_TMP1$>!-    : Reserved
  0>
K SUMENU_U,<-          : Define SUMENU options unsupported by VAX:
  0>                  : Note: allow NOR
F PVN,W                : Prologue version number field (1) : B
I NOK,B                : Number of keys field (1) : B
I NOA,B                : Number of allocation areas field (1) : B
I NOR,B                : Number of record descriptors field (1) : B
F .B                   : Padding
F .L,14                : Spare
E

```

```

:++
: Define symbols related to the Date and Time Attributes message (TYPE=13).
:--

```

```

$STRUCT DAP,TIMDEF      : DAP date and time Attributes message
F .L,16                 : Position to message operand section
                        : of DAP control block
F TIMENU,W              : Date and time menu field (EX-6) : BM
V <M                    : Menu of fields to follow:
  CDT                   : CDT
  RDT                   : RDT
  EDT                   : EDT
  RVN                   : RVN
  BDT                   : BDT
  PDT                   : PDT
  ADT                   : ADT
  TMP1$,9              : Reserved
>
K TIMENU_I,<-           : Define TIMENU options that are invalid:
  <DAPSM_TMP1$>!-     : Reserved
0>
K TIMENU_U,<-           : Define TIMENU options unsupported by VAX:
0>                       Note: allow PDT and ADT
F RVN,W                 : Revision number field (2) : B
F .L                    : Padding
F CDT,Q                 : Creation date and time field (18) : A
                        : (stored in DAP control block as a
                        : 64-bit time value per VMS convention)
F RDT,Q                 : Revision date and time field (18) : A
                        : (stored in DAP control block as a
                        : 64-bit time value per VMS convention)
F EDT,Q                 : Expiration date and time field (18) : A
                        : (stored in DAP control block as a
                        : 64-bit time value per VMS convention)
F BDT,Q                 : Backup date and time field (18) : A
                        : (stored in DAP control block as a
                        : 64-bit time value per VMS convention)
F PDT,Q                 : Physical creation date and time field (18) : A
                        : (stored in DAP control block as a
                        : 64-bit time value per VMS convention)
F ADT,Q                 : Accessed date and time field (18) : A
                        : (stored in DAP control block as a
                        : 64-bit time value per VMS convention)
F .L,2                  : Spare
E

```



```

:++
: Define symbols related to the Protection Attributes message (TYPE=14).
:--

```

```

$STRUCT DAP,PRODEF      : DAP protection Attributes message
F .L,16                 : Position to message operand section
                          : of DAP control block
F PROMENU,W             : Protection menu field (EX-6) : BM
V <M                    : Menu of fields to follow:
  OWNER                 : OWNER
  PROSYS                : PROSYS
  PROOWN                : PROOWN
  PROGRP                : PROGRP
  PROWLD                : PROWLD
  TMP1$,11              : Reserved
>
K PROMENU_I,<-          : Define PROMENU options that are invalid:
  <DAP$M_TMP1$>!-     : Reserved
  0>
K PROMENU_U,<-          : Define PROMENU options unsupported by VAX:
  0>
F .W,3                  : Padding
F OWNER,0               : Descriptor pointing to the
                          : File owner field (I-40) : A
F PROSYS,W              : System protection field (EX-3) : BM
V <M                    : Meaning:
  RED_ACC               : Deny read access
  WRT_ACC               : Deny write access
  EXE_ACC               : Deny execute access
  DLT_ACC               : Deny delete access
  APP_ACC               : Deny append access
  DIR_ACC               : Deny directory access
  UPD_ACC               : Deny update access
  CHG_ACC               : Deny change protection access
  EXT_ACC               : Deny extend access
  TMP1$,7              : Reserved
>
K PROTECT_I,<-          : Define protection options that are invalid:
  <DAP$M_TMP1$>!-     : Reserved
  0>
                          : This mask applies to PROSYS, PROOWN, PROGRP,
                          : and PROWLD fields
K PROTECT_U,<-          : Define protection options unsupported by VAX:
  0>
                          : This mask applies to PROSYS, PROOWN, PROGRP,
                          : and PROWLD fields
                          : Note: allow APP_ACC, DIR_ACC, UPD_ACC,
                          :       CHG_ACC, and EXT_ACC
F PROOWN,W              : Owner protection field (EX-3) : BM
F PROGRP,W              : Group protection field (EX-3) : BM
F PROWLD,W              : World protection field (EX-3) : BM
F .L,10                 : Spare
E

```

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:++
: Define symbols related to the Name Attributes message (TYPE=15).
:--

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```

$STRUCT DAP,NAMDEF      ; DAP name Attributes message
F .L,16                 ; Position to message operand section
                        ; of DAP control block
F NAMETYPE,B           ; Name type field (EX-3) : BM
  V <M                 ; Type:
    FILSPEC            ; Primary file specification
    FILNAME            ; File name
    DIRNAME            ; Directory name
    VOLNAME            ; Volume or structure name
    DFTSPEC            ; Default file specification
    TMP1$,1            ; Reserved for RELSPEC
    TMP2$,2            ; Reserved
  >
F .B,3                  ; Padding
  K NAMETYP_I,<-       ; Define NAMETYPE options that are invalid:
    <DAPSM_TMP1$>!-   ; Reserved
    <DAPSM_TMP2$>!-   ; Reserved
  0>
  K NAMETYP_U,<-       ; Define NAMETYPE options unsupported by VAX:
    <DAPSM_DFTSPEC>!- ; DFTSPEC
  0>
F NAMESPEC,Q           ; Descriptor pointing to the
                        ; Name field (I-255) : A
F .L,13                 ; Spare
E

```

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:++
: Define symbols related to DAP message CRC checksum computation.
: The CRC polynomial function (order 16) used is:
:
:--
      X**16 + X**15 + X**13 + X**7 + X**4 + X**2 + X**1 + 1

$STRUCT DAP,CRCDEF      : DAP message CRC checksum symbol definitions
K CRC_INIT,<^X0000FFFF> : Initial CRC value
K CRC_POLY,<^X0000E905> : CRC polynomial representation used as
                        : input to LIB$CRC_TABLE to generate
                        : the CRC polynomial table below:
K CRC_TBL0,<^X00C00000> : Table entry 0
K CRC_TBL1,<^X000053E3> : Table entry 1
K CRC_TBL2,<^X0000A7C6> : Table entry 2
K CRC_TBL3,<^X0000F425> : Table entry 3
K CRC_TBL4,<^X00009D87> : Table entry 4
K CRC_TBL5,<^X0000CE64> : Table entry 5
K CRC_TBL6,<^X00003A41> : Table entry 6
K CRC_TBL7,<^X000069A2> : Table entry 7
K CRC_TBL8,<^X0000E905> : Table entry 8
K CRC_TBL9,<^X0000BAE6> : Table entry 9
K CRC_TBLA,<^X00004EC3> : Table entry 10
K CRC_TBLB,<^X00001D20> : Table entry 11
K CRC_TBLC,<^X00007482> : Table entry 12
K CRC_TBLD,<^X00002761> : Table entry 13
K CRC_TBLE,<^X0000D344> : Table entry 14
K CRC_TBLF,<^X000080A7> : Table entry 15
E

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:++
: $DAPFIDDEF defines DAP field identification code symbols.
: These are used to identify a field in a DAP Status message.
:--

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$STRUCT DAP,FIDDEF      : DAP field ID codes

K <,$                   : Miscellaneous field codes:
  UNKNOWN,0             :   Unknown field
  TYPE,8                 :   DAP message type field
>
K <,$                   : Message header field codes:
  FLAGS,8                :   DAP message flags field
  STREAMID,9             :   Data stream identification field
  LENGTH,10              :   Length field
  LEN256,11              :   Length extension field
  BITCNT,12              :   Bit count field
                          :   (13) reserved
  SYSPEC,14              :   System specific field
                          :   whose subfields use the same code
  SSP_MENU,14            :   System specific menu field
  SSP_CAP,14             :   System specific capabilities field
  SSP_FLG,14             :   System specific flags field
>
K <,$                   : Configuration message field codes:
  BUFSIZ,16              :   Buffer size field
  OSTYPE,17              :   Operating system type field
  FILESYS,18             :   File system type field
  VERNUM,19              :   DAP version number field
  ECONUM,20              :   ECO version number field
  USRNUM,21              :   User protocol version number field
  DECVER,22              :   DEC software version number field
  USRVER,23              :   User software version number field
  SYSCAP,24              :   System capabilities field
>
K <,$                   : Attributes message field codes:
  ATTMENU,16             :   Attributes menu field
  DATATYPE,17           :   Data type field
  ORG,18                 :   File organization field
  RFM,19                 :   Record format field
  RAT,20                 :   Record attributes field
  BLS,21                 :   Block size field
  MRS,22                 :   Maximum record size field
  ALOI,23                :   Allocation quantity field
  BKS,24                 :   Bucket size field
  FSZ,25                 :   Fixed control area size field
  MRN,26                 :   Maximum record number field
  RUNSYS,27              :   Run-time system field
  DEQ1,28                :   Default extension quantity field
  FOP1,29                :   File options field
  BSZ,30                 :   Byte size field
  DEV,31                 :   Device characteristics field
                          :   (32) reserved for SDC field
  LRL,33                 :   Longest record length field
  HBK,34                 :   Highest virtual block number field
  EBK,35                 :   End-of-file block number field

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FFB,36      : First free byte in EOF block field
SBN,37      : Starting logical block number field
>
K <,$      : Access message field codes:
ACCFUNC,16  : Access function field
ACCOPT,17   : Access options field
FILESPEC,18 : File specification field
FAC,19      : File access field
SHR,20      : File sharing field
DISPLAY1,21 : Display attributes field
PASSWORD,22 : Password field
>
K <,$      : Control message field codes:
CTLFUNC,16  : Control function field
CTLMENU,17  : Control menu field
RAC,18      : Record access field
KEY,19      : Key field
KRF,20      : Key of reference field
ROP,21      : Record options field
            : (22) reserved for HSH field
DISPLAY2,23 : Display attributes field
BLKCNT,24   : Block count field
>
K <,$      : Continue Transfer message field codes:
CONFUNC,16  : Continue transfer function field
>
            : Acknowledge message field codes:
            : none
K <,$      : Access Complete message field codes:
CMPFUNC,16  : Access complete function field
FUP2,17     : File options field
CHECK,18    : CRC Checksum field
>
K <,$      : Data message field codes:
RECNUM1,16  : Record number field
FILEDATA,17 : File data field
>
K <,$      : Status message field codes:
SISCODE,16  : Status code field used for both:
            : MACCODE,16
            : MICCODE,17
RFA,18      : Record file address field
RECNUM2,19  : Record number field
STV,20      : Secondary status value field
STX,21      : Secondary status text field
>
K <,$      : Key definition attributes message field codes:
KEYMENU,16  : Key definition menu field
FLG,17      : Key options field
DFL,18      : Data bucket fill quantity field
IFL,19      : Index bucket fill quantity field
NSG,20      : Number of key segments field
POS,21      : Key segment position field
POS_TMP,21  : (alias for POS)
SIZ,22      : Key segment size field
SIZ_TMP,22  : (alias for SIZ)

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REF,23      : Key of reference field
KNM,24      : Key name field
NUL,25      : Null key character field
IAN,26      : Index area number field
LAN,27      : Lowest level index area number field
DAN,28      : Data area number field
DTP,29      : Key data type field
RVB,30      : Root bucket start VBN field
              (31) reserved for HAL field
DVB,32      : First data bucket start VBN field
DBS,33      : Data bucket fill size field
IBS,34      : Index bucket fill size field
LVL,35      : Level of root buckets field
TKS,36      : Total key size field
MRL,37      : Minimum record length to contain key field
>
K <,S      : Allocation attributes message field codes:
ALLMENU,16  : Allocation menu field
VOL,17      : Relative volume number field
ALN,18      : Alignment options field
AOP,19      : Allocation options field
LOC,20      : Starting location field
              (21) reserved for RFI field
ALQ2,22     : Allocation quantity field
AID,23      : Area identification field
BKZ,24      : Bucket size field
DEQ2,25     : Default extension quantity field
>
K <,S      : Summary attributes message field codes:
SUMENU,16   : Summary menu field
NOK,17      : Number of keys field
NOA,18      : Number of allocation areas field
NOR,19      : Number of record descriptors field
PVN,20      : Prologue version number field
>
K <,S      : Date and time attributes message field codes:
TIMENU,16   : Date and time menu field
CDT,17      : Creation date and time field
RDT,18      : Revision date and time field
EDT,19      : Expiration date and time field
RVN,20      : Revision number field
BDT,21      : Backup date and time field
PDT,22      : Physical creation date and time field
ADT,23      : Accessed date and time field
>
K <,S      : Protection attributes message field codes:
PROMENU,16  : Protection menu field
OWNER,17     : File owner field
PROSYS,18   : System protection field
PROOWN,19   : Owner protection field
PROGRP,20   : Group protection field
PROWLD,21   : World protection field
>
K <,S      : Name message field codes:
NAMETYPE,16 : Name type field
NAMESPEC,17 : Name field

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E >

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: End of module

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