

DDDDDDDDDDDD		CCCCCCCCCCCC	LLL
DDDDDDDDDDDD		CCCCCCCCCCCC	LLL
DDDDDDDDDDDD		CCCCCCCCCCCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDD	DDD	CCC	LLL
DDDDDDDDDDDD		CCCCCCCCCCCC	LLLLLLLLLLLLLLLL
DDDDDDDDDDDD		CCCCCCCCCCCC	LLLLLLLLLLLLLLLL
DDDDDDDDDDDD		CCCCCCCCCCCC	LLLLLLLLLLLLLLLL

DDDDDDDD		CCCCCCCC	LL	DDDDDDDD	EEEEEEEEEE	FFFFFFFFFF	
DDDDDDDD		CCCCCCCC	LL	DDDDDDDD	EEEEEEEEEE	FFFFFFFFFF	
DD	DD	CC	LL	DD	DD	FF	
DD	DD	CC	LL	DD	DD	FF	
DD	DD	CC	LL	DD	DD	FF	
DD	DD	CC	LL	DD	DD	FF	
DD	DD	CC	LL	DD	DD	FF	
DD	DD	CC	LL	DD	DD	FF	
DD	DD	CC	LL	DD	DD	FF	
DD	DD	CC	LL	DD	DD	FF
DDDDDDDD		CCCCCCCC	LLLLLLLLLL	DDDDDDDD	EEEEEEEEEE	FF
DDDDDDDD		CCCCCCCC	LLLLLLLLLL	DDDDDDDD	EEEEEEEEEE	FF

MM	MM	DDDDDDDD	LL	
MM	MM	DDDDDDDD	LL	
MMM	MMM	DD	DD	LL
MMM	MMM	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	DD	DD	LL
MM	MM	DDDDDDDD	LLLLLLLLLL	
MM	MM	DDDDDDDD	LLLLLLLLLL	

DCL Command Language Interpreter internal structure definitions

IDENT 'V04-001'

```

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FACILITY: DCL Command Language Interpreter

ABSTRACT:

These are the structure definitions used by the DCL command interpreter

ENVIRONMENT:

VAX/VMS operating system. supervisor mode.

AUTHOR: Tim Halvorsen, Feb 1980

Modified by:

V04-001 HWS0106 Harold Schultz 07-Sep-1984
 Add PRC_W_ASTSTAI:IS, PRC_W_ASTIOSB, and PRC_W_ASTRETN
 to store status data from the CNTL-Y AST routine.

V03-025 HWS0087 Harold Schultz 20-Jul-1984
 Change order in DCL table so that FLAGS will not
 be on the end. Fixes problem were a BLBx is used
 to interrogate the flag and causes an accvio if the
 three bytes past FLAGS (FLAGS is last allocated byte)

are not readable. (BLBx instructions use longword context, which when applied to FLAGS causes FLAGS + the next three bytes to be accessed).
Add PRC_B_EXONLYL to store indirect level of first encountered exe-only procedure. Add PRC_V_SAVCMDV and PRC_V_SAVIMGV to store saved command and image verification modes. (Make PRC_V_EXEPROC obsolete)

- V03-024 HWS0045 Harold Schultz 30-Mar-1984
Add TABLE flag to SPWN_W_FLAGS.
Add SPWN_Q_TABLE.
Add WRK_V_CLOSERR to WRK_W_FLAGS2
- V03-023 HWS0035 Harold Schultz 21-Mar-1984
Add IRUNDWN flag to new flag byte IMGFLAG to track image rundown.
- V03-022 HWS0007 Harold Schultz 13-Feb-1984
Add PRC_V_CARRCNTL for prompt string carriagecontrol (in FLAGS)
Add PRC_L_STS and PRC_L_STV
Add SPWN_V_NOCTX
- V03-021 PCG0027 Peter George 06-Feb-1984
Add CTX_V_CTRLY and CTX_V_CTRLT.
- V03-020 PCG0026 Peter George 11-Jan-1984
Add PRC_L_IMGACTSTS.
- V03-019 PCG0025 Peter George 11-Jan-1984
Add EDIT_V_LOWERCASE.
- V03-018 PCG0024 Peter George 03-Jan-1984
Change PRC_V_REPROMPT to PRC_V_FLUSH.
- V03-017 PCG0023 Peter George 01-Dec-1983
Add ERASE keypad flag.
- V03-016 PCG0022 Peter George 07-Sep-1983
Add OUTFLAGS to OUT, PRC, and IDF.
- V03-015 PCG0021 Peter George 16-Aug-1983
Add WAIT bit to CTX.
- V03-014 PCG0020 Peter George 27-Jun-1983
Add SPWN_V_CLI and SPWN_Q_CLI.
Add PRC_Q_WAITIOSB and WRK_L_SIGNALRTN.
Incr size of WRK_C_RECALLMAX.
- V03-013 PCG0019 Peter George 01-Jun-1983
Remove PRC_L_TAB_VEC. Incr size of token buffer.
Add SPWN_V_KEYPAD.
- V03-012 RAS0157 Ron Schaefer 17-May-1983
Add support for new logical names services to CTX.

- V03-011 PCG0018 Peter George 03-May-1983
Add PRC_Q_FLUSHTIME and CTX_V_VERIMAGE.
- V03-010 PCG0017 Peter George 20-Apr-1983
Add prompt string and keypad state to CTX.
Add prompt string and new flags to SPWN.
Add output mailbox info to PRC.
- V03-009 PCG0016 Peter George 30-Mar-1983
Add PRC_V_VERIMAGE.
Add SPWN_T_PROCESS.
Increase WRK_C_RSLBUFSIZ.
Increase size of recall buffer.
- V03-008 PCG0015 Peter George 29-Mar-1983
Fix CTX_C_KEY* definitions.
- V03-006 PCG0014 Peter George 17-Feb-1983
Make too many changes to meaningfully list here.
- V03-005 PCG0013 Peter George 28-Jan-1983
Remove the ONEXIT bit from PRC.
Add SPWN_V_NOTIFY and SPWN_V_CONTINUE.
- V03-004 PCG0012 Peter George 01-Dec-1982
Uncomment part of PRC data structure.
Excess ERRRAB and ERRIFI.
Add SYSSOUTPUT PRC fields.
Add OUT data structure.
Add IDF_L_FILENAME.
- V03-003 PCG0011 Peter George 16-Nov-1982
Reorganize WRK block.
Remove WRK_C_DCLBUFSIZ, WRK_G_DCLPRSBUF, WRK_G_RECORD.
Increase size of command buffers.
Add slopover for input buffer - used by LIB\$DO_COMMAND.
Add SIZE field to TMBX.
- V03-002 PCG0010 Peter George 25-Oct-1982
Add PROMPT entities. Add DCL_V_NEXTQUAL flag.
- V03-001 PCG0009 Peter George 21-Jun-1982
Add PTR_V_KEYWORD, PTR_V_SYNTAX, PTR_K_IGNORE, PTR_B_LEVEL,
and PTR_B_NUMBER.
Add WRK_L_PROMPTRTN, WRK_V_CONTIN, WRK_B_VALLEV, and
WRK_V_USRMODE. Delete WRK_V_QUAL.
Double size of WRK_G_RESULT.
Add PRC_G_COMMANDS, PRC_L_NXTCMDPTR, and PRC_V_PEPROMPT.
Add DCL_L_ENTITY, DCL_L_TOKEN, DCL_L_GETVM, DCL_L_FREEVM,
DCL_W_BUFLen, DCL_W_DEFLen, and DCL_L_DEFADDR.
Add PLM_B_QOADESC.


```

F      ATTMBX,W      : CHANNEL TO MAILBOX FOR RE-ATTACH REQUESTS
F      INDCLOCK      : TOTAL INDIRECT STACKS & UNSTACKS
F      IMGACTSTS     : IMAGE ACTIVATOR STATUS
F      STS           : RMS COMPLETION CODE (STS AND STV ASSUMED
F      STV           : RMS STATUS VALUE ALWAYS ADJACENT)
F      EXTBLK        : EXIT HANDLER CONTROL BLOCK
F      EXTHND        : EXIT HANDLER ADDRESS
F      EXTARG        : NUMBER OF EXIT HANDLER ARGUMENTS
F      EXTPRM        : ADDRESS OF REASON FOR EXIT (BELOW)
F      EXTCOD        : REASON FOR EXIT
F      STACKPT       : INDIRECT STACK POINTER
F      STACKLM       : INDIRECT STACK LIMIT
F      EXMDEPADR     : 'DOT' FOR EXAMINE/DEPOSIT
F      EXMDEPWID,B   : WIDTH DEFAULT, IE: BYTE,WORD,LONGWORD
F      EXMDEPMOD,B   : MODE DEFAULT, IE: ASCII,HEX,OCTAL
F      DEFRADIX,B    : CURRENT DEFAULT RADIX
C      < K_         : PROCESS RADIX TYPES
      HEX           : HEXIDECIMAL
      DEC           : DECIMAL
      OCT           : OCTAL
      >
F      FLAGS2,B     : PROCESS LEVEL FLAGS (MORE OF THEM)
V      <M
      CMD           : COMMAND CALLBACK HAS BEEN DONE
      CHAIN        : CHAIN CALLBACK HAS BEEN DONE
      RUNDEF       : USE RUN DEFAULT (NOT EXTERNAL)
      EXEONLY      : IMAGE IS EXECUTE ONLY
      PRIV         : IMAGE IS PRIVILEGED
      EXEPROC      : EXE-ONLY COMMAND PROCEDURE (OBSOLETE)
      FLUSH        : FLUSH THE CURRENT INPUT
      VERIMAGE     : HAVE RMS DO IMAGE VERIFICATION
      >
F      LSTSTATUS    : LAST STATUS SET (LONGWORD VALUE)
F      OUTOFBAND    : OUT OF BAND AST ENABLE BITMASK
V      <M
      .20          : SKIP UNUSED CHARACTERS
      CTRLT        : CONTROL T
      .4           : SKIP UNUSED CHARACTERS
      CTRLY        : CONTROL Y
      >
F      ONCTLY       : ADDRESS OF ON CONTROL/Y COMMAND TEXT
F      IDFLNK       : POINTER TO INDIRECT FILE FRAME
F      SPWN         : LISTHEAD OF SPAWN STORAGE BLOCKS FOR EACH
                   : SUBPROCESS CREATED; SPAWN STORAGE FOR PROCESS
                   : CURRENTLY BEING SPAWNED IS FIRST, IF ANY.
                   : SAVED CNTL-Y AST STATUS (TEMPORARY)
F      ASTSTATUS,W  : SAVED CNTL-Y AST REENABLE IOSB (TEMPORARY)
F      ASTIOSB,W   : SAVED CNTL-Y AST REENABLE RETURN STATUS (TMP)
F      ASTRETN,W   : OUTPUT MAILBOX CHANNEL
F      OUTMBXCHN,W : SIZE OF MAXIMUM OUTPUT MAILBOX MESSAGE
F      OUTMBXSIZ,W : OUTPUT MAILBOX REFERENCE COUNT
F      OUTMBXREF,W : OUTPUT LOG FLUSH RATE
F      FLUSHTIME,Q : DESCRIPTOR OF CHAIN IMAGE FILE SPECIFICATION
F      IMAGENAME,Q : DESCRIPTOR OF CHAIN COMMAND LINE FOR LATER
F      COMMAND,Q   : SAVED PRIVILEGED IMAGE PRIVILEGES
F      SAVEPRIV,Q

```

... Prompt string must be kept together (and mimicked in CTX data structure).
...

```
F      PROMPTLEN,B      : LENGTH OF PROMPT STRING
F      PMPTCTRL,W       : PROMPT CONTROL CHARACTERS
F      CONTINUE,B       : PROMPT CONTINUATION CHARACTER
F      PROMPT,G,32      : PROMPT STRING AREA
```

...
... OUTIFI, OUTISI, OUTRABCTX, OUTDVI, and OUTFLAGS must be the same in PRC,
IDF, OUT
...

```
F      OUTIFI,W         : IFI FOR OUTPUT
F      OUTISI,W         : ISI FOR OUTPUT
F      OUTRABCTX        : CONTENTS OF OUTPUT RAB CTX LONGWORD
F      OUTDVI,T,16     : INDIRECT OUTPUT DEVICE (ASCIC)
F      OUTFLAGS,B      : FLAGS
V      <M
      OUTCCL            : CONCEALED OUTPUT DEVICE
      INPCCL            : CONCEALED INPUT DEVICE
      SAVCMDV           : SAVED COMMAND VERIFICATION FLAG
      SAVIMGV           : SAVED IMAGE VERIFICATION FLAG
      >
F      EXONLYL,B       : FIRST E-ONLY INDIRECT LEVEL
F      .B,1            : SPARE
```

... Recall command buffer elements - using them causes the number of indirect
frames available to shrink.
...

```
F      RECALLPTR       : POINTER ,J NEXT COMMAND IN BUFFER
F      COMMANDS,G,1025 : BUFFER OF COMMAND LINES
C      CMDBUFSIZ,1025  : LENGTH OF COMMAND BUFFER

L      LENGTH          : LENGTH OF PROCESS WORK AREA
E
```



```

:
: DEFINE PROCESS RMS DATA AREA
:

```

```

STRUCT PRD
F FAB,G,80 : PROCESS FAB
F NAM,G,96 : PROCESS NAME BLOCK
F INPRAB,G,68 : INPUT RAB
F ALTINPRAB,G,68 : ALTERNATE INPUT RAB
F ALTOURAB,G,68 : ALTERNATE OUTPUT RAB
F OUTRAB,G,68 : OUTPUT RAB
F XABTRM,G,36 : TERMINAL XAB
F TRMLIST,G,48 : ITEMLIST FOR TERMINAL XAB
L LENGTH : NORMAL LENGTH

```

```

:
: FOLLOWING EXTENSION USED ON LEVEL 0 TO STORE FID/DID/FNM FOR QUEUING
: THE JOB LOG FILE TO THE JOB CONTROLLER.
:

```

```

F OUTDVI,T,16 : DEVICE FOR OUTPUT FILE
F OUTFID,W,3 : FILE ID FOR OUTPUT FILE
F OUTDID,W,3 : DIRECTORY ID FOR OUTPUT FILE
F OUTFNM,T,20 : OUTPUT FILE NAME
L XLENGTH : LENGTH OF EXTENDED BLOCK
E

```

```

:
: OFFSETS OF ITEM IS TERMINAL XAB ITEM LIST.
:

```

```

STRUCT ITRM
F MODLEN,W : TRMS_MODIFIERS ENTRY
F MODCODE,W
F MODIFIERS
F MODRET
F PMPTLEN,W : TRMS_PROMPT ENTRY
F PMPTCODE,W
F PMPTADDR
F PMPTRET
L MINLEN : MINIMUM ITRM REQUIRED
F INILEN,W : TRMS_INISTRING ENTRY
F INICODE,W
F INIADDR
F INIRET
F OFFLEN,W : TRMS_INIOFFSET ENTRY
F OFFCODE,W
F OFFSET
F OFFRET
L LENGTH
E

```

```

:
: Define command work area (based at R10)
:

```

```

STRUCT WRK

```

```

:
: Work area constant and length definitions
:

```

```

C      <
      CMDBUFSIZ,1024 : EXPANDED COMMAND BUFFER SIZE IN BYTES
      INPBUFSIZ,256  : INPUT BUFFER SIZE IN BYTES
      SCRSTKSIZ,512  : INTERNAL COMMAND SCRATCH STACK SIZE IN BYTES
      MSGBUFSIZ,132  : OUTPUT MESSAGE BUFFER SIZE IN BYTES
      RSLBUFSIZ,128*12: RESULT PARSE BUFFER SIZE IN BYTES (128 MAX)
      RECALLMAX,20   : MAXIMUM NUMBER OF COMMANDS THAT CAN BE RECALLED
      MAXKEYSTATE,255: MAXIMUM SIZE OF A KEYPAD STATE NAME
      >
-F     ,B,0          : ENDING ADDRESS OF NEGATED STRUCTURE
      :              : (NEEDED TO OBTAIN LENGTH DEFINITION)
L     LENGTH        : LENGTH OF COMMAND PARSING WORK AREA

```

```

:
: Command buffers and pointers
:

```

```

-F     EXPANDPTR    : EXPANSION BUFFER CHARACTER POINTER
-F     MARKPTR      : POINTER INTO EXPANSION BUFFER OF THE CURRENT
      :              : SEGMENT BEING PARSED
-F     CHARPTR      : INPUT BUFFER CHARACTER POINTER
-F     BUFFER,G,1024: COMMAND EXPANSION BUFFER
-F     ,B,4         : 4 BYTES BEFORE INPUT BUFFER FOR SLOPUNDER
-F     INPBUF,G,256 : COMMAND INPUT BUFFER FOLLOWS EXPANSION BUFFER
-F     ,B,8         : 8 BYTES BEFORE AFTER BUFFER FOR SLOPOVER

```

```

:
: Input reading and processing routines and data
:

```

```

-F     PMPTLEN,W    : LENGTH OF CURRENT PROMPT STRING
-F     ,W           : SPARE
-F     PMPTADDR     : ADDRESS OF CURRENT PROMPT STRING
-F     PROMPTRTN    : ADDRESS OF PROMPT ROUTINE
-F     READRTN      : ADDRESS OF CONTINUATION INPUT ROUTINE
-F     ERRORRTN     : ADDRESS OF CHARACTER INPUT ERROR ROUTINE
-F     SPECRTN      : ADDRESS OF SPECIAL CHARACTER PROCESSING RTN

```

```

:
: Result parse descriptors and pointers
:

```

```

-F     RESULT,G,1536 : RESULT PARSE DESCRIPTOR AREA (96 MAX)
-F     RSLEND,L      : ADDRESS OF LAST TOKEN DESCRIPTOR
-F     RSLNXT,L      : ADDRESS OF NEXT FREE TOKEN DESCRIPTOR

```

```

:
: Command definition information
:

```

```

-F     VERB         : ADDRESS OF ASCII VERB NAME

```

```

-F VERBTYP,B      ; COMMAND VERB TYPE (SEE $CLIVERBDEF)
-F CMDOPT,B      ; QUALIFIER # CAUSING THE FIRST SYNTAX CHANGE
-F VALLEV,B      ; DEPTH OF CURRENT VALUE ON THE COMMAND LINE
-F RECALLCNT,B   ; NUMBER OF RECALL COMMANDS ISSUES
-F PROPTR       ; ADDRESS OF PARAMETER ENTITY BLOCK LIST
-F QUABLK       ; ADDRESS OF QUALIFIER ENTITY BLOCK LIST
-F PARMCNT,B    ; CURRENT PARAMETER COUNT
-F PARMSUM,B    ; NUMBER OF PARAMETER VALUES
-F MAXPARM,B    ; MAXIMUM NUMBER OF PARAMETERS ALLOWED
-F MINPARM,B    ; MINIMUM NUMBER OF PARAMETERS REQUIRED
-F PAROUT       ; ADDRESS OF LISTS OF OUTPUTS
-F SIGNALRTN    ; ADDRESS OF ERROR SIGNALING ROUTINE
-F ,L          ; SPARE
-F TAB_VEC     ; ADDRESS OF COMMAND TABLE VECTOR
-F IMAGE       ; ADDRESS OF IMAGE NAME STRING; OR TABLE INDEX
-F DISALLOW    ; ADDRESS OF DISALLOW EXPRESSION TREE
-F RECALLPTR   ; POINTER INTO THE RECALL BUFFER
-F IMGCHAN,W   ; IMAGE ACTIVATION CHANNEL NUMBER

```

```

:
: Flags describing the command line
:

```

```

-F FLAGS,W      ; COMMAND LEVEL FLAGS
V <M
RUNDWN         ; RUNDOWN HAS BEEN DONE
COMMAND       ; COMMAND (IMAGE) EXECUTION IN PROGRESS
              ; (SO, AVOID PRINTING ERROR SEGMENT TEXT)
PROMPT        ; PROMPTING IN PROGRESS
CONTIN        ; CONTINUATION IN PROGRESS
QUOTE         ; PROCESSING QUOTED STRING
STAR         ; ASTERISK IS TERMINATOR
VERB          ; PROCESSING VERB
INQUIRE      ; INQUIRE COMMAND - READ REQUIRED
NOSTAT        ; DON'T STORE SUCCESS STATUS ON COMPLETION
TRAILSPC     ; TRAILING SPACES IN CONTINUED LINE
INPSUBST     ; CURRENTLY SUBSTITUTING INPUT RECORD SYMBOLS
NOUPCASE     ; DON'T UPCASE CHARACTERS FROM INPUT BUFFER
COMMENT      ; WE ARE WITHIN A COMMENT DURING "INPSUBST"
              ; (SO, SUPPRESS ANY ERRORS DURING SUBSTITUTION)
USRMODE      ; USER MODE PARSE IS BEING PERFORMED
ESCAPE       ; ESCAPE SEQUENCE IS BEING PROCESSED
>

-F FLAGS2,W    ; MORE COMMAND LEVEL FLAGS
V <M
CLIRTN        ; COMMAND INVOKES A INTERNAL CLI ROUTINE
USERRTN      ; COMMAND INVOKES A USER-SPECIFIED ROUTINE
CLOSERR      ; SUPPRESS 'CLOSE' ERROR MESSAGE.
>

```

```

:
: Saved context registers
:

```

```

-F SAVSP      ; SAVED STACK POINTER
-F SAVAP      ; SAVED ARGUMENT POINTER
-F SAVFP      ; SAVED INITIAL FRAME POINTER

```

DCLDEF.MDL;1

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E

DEFINE RESULT PARSE POINTERS. EACH POINTER DESCRIBES
A TOKEN ON THE COMMAND LINE FROM LEFT TO RIGHT.

```

STRUCT PTR
F   DESCR,L           : FIRST LONGWORD
S   VALUE,0,B        : LOW BYTE IS TOKEN LENGTH
V   <
    VALUE,8           : ITEM LENGTH
    OFFSET,12         : ITEM OFFSET IN BUFFER
    FLAGS,4           : ITEM FLAGS
    TERM,4            : ITEM TERMINATOR CLASS NUMBER
    TYPE,4            : ITEM TYPE
    >
V   <
    .20               : FLAG BIT DEFINITIONS
    NEGATE             : QUALIFIER WAS NEGATED
    KEYWORD            : VALUE IS A KEYWORD
    SYNTAX             : CAUSED TRANSITION TO NEW COMMAND SYNTAX
    >
C   <,K,1             : DEFINE TERMINATOR CLASSES, STARTING AT 1
    BLANK              : BLANK
    COLON              : COLON
    SLASH              : SLASH
    PLUS               : PLUS SIGN
    COMMA              : COMMA
    RPAREN             : RIGHT PARENTHESIS
    LPAREN             : LEFT PARENTHESIS
    >
C   <,K,0             : DEFINE TYPE NUMBERS, STARTING AT 0
    COMQUAL            : COMMAND QUALIFIER
    PARMQUAL           : PARAMETER QUALIFIER
    QUALVALU           : QUALIFIER VALUE
    PARAMETR           : PARAMETER
    ENDLINE            : END OF LINE
    IGNORE             : INVALIDATED DESCRIPTOR
    >
F   LEVEL,B          : VALUE LEVEL
F   NUMBER,B         : KEYWORD NUMBER
F   PARMCNT,B        : PARAMETR COUNT
F   ,B               : SPARE
F   ENTITY            : ENTITY BLOCK ADDRESS
L   LENGTH           : FIXED LENGTH OF DESCRIPTOR
E

```

.....
DEFINE PARAMETER LIST MARKER. EACH MARKER DESCRIBES
THE STARTING THRU ENDING POINTERS WHICH DESCRIBE A
GIVEN PARAMETER (INCLUDING QUALIFIERS AND VALUES).
.....

STRUCT	PLM	
F	NXTDESC,B	: NEXT DESCRIPTOR TO BE EXAMINED IN CURRENT LIST
F	FSTDESC,B	: FIRST DESCRIPTOR IN LIST
F	LSTDESC,B	: LAST DESCRIPTOR IN LIST
M	1	
F	TRMDESC,B	: TERMINATOR DESCRIPTOR
L	SIZE	: SIZE OF EACH ENTRY
P	1	
F	QUADESC,B	: FIRST POSSIBLE QUALIFIER DESCRIPTOR
E		

.....
DEFINE STORAGE USED BY OLD CLI INTERFACE.

THE MEMORY FOR THIS AREA IS SUPPLIED BY THE CALLING PROGRAM.
.....

```
STRUCT  RPW           : RESULT PARSE WORK AREA
F       USERCTX      : USER CONTEXT LONGWORD
F       DCLWRK        : ADDRESS OF COMMAND WORK AREA
F       STRPARM,B     : INDEX TO FIRST PARAMETER DESCRIPTOR
F       LSTDESC,B     : INDEX TO LAST PARAMETER DESCRIPTOR
F       .B,2          : SPARE
F       .L,5          : SPARE
F       BITS,G,32     : 256 BITS, 1 IF PLM PROCESSED BY RESULT PARSE
L       HDRSIZ        : SIZE OF FIXED PORTION
F       PRMLIM,G,64   : UP TO 16 PARAMETER LIMIT DESCRIPTORS (PLM)
L       LENGTH        : LENGTH OF MAXIMUM SIZE
E
```

```

:
:
:
DEFINE STORAGE USED BY NEW CLI INTERFACE

```

```

STRUCT DCL
F PRMLIM,L,16 ; Parameter limit descriptors
C CONTEXT,L,7 ; Number of levels of context
F ENTITY,L,7 ; Context entity block addresses
F TOKEN,L,7 ; Context token desc addresses
F QUAL ; Address of last qualifier token
F GETVM ; Address of LIB$GET_VM
F FREEVM ; Address of LIB$FREE_VM
F DEFLN,W ; Length of default value
F W
F DEFADDR,L ; Address of default buffer
F FLAGS,B ; Flags byte
V <
NOWRKAREA ; True if invalid WRK area pointer
NEXTQUAL ; True if processing DCL$NEXTQUAL
>
F BUFLN,W ; Length of default value buffer
F PARAM,B ; Last parameter # requested
L
E

```



```

:
: DEFINE SYMBOL TABLE ENTRY
:

```

```

STRUCT SYM
C      MAXSTATES,64      : MAXIMUM NUMBER OF KEYPAD STATES ALLOWED
F      FL                : SYMBOL ENTRY FORWARD LINK
F      BL                : SYMBOL ENTRY BACKWARD LINK
F      SIZE,W           : SIZE OF SYMBOL TABLE ENTRY
F      TYPE,B           : TYPE OF SYMBOL
C      <, K
      STRING            : VALUE IS VARIABLE LENGTH STRING
      PERM              : PERMANENT SYMBOL, STRING
      BINARY            : VALUE IS BINARY LONGWORD VALUE
      LABEL             : VALUE IS RFA OF LINE WITH LABEL
      KEYPAD            : KEYPAD SYMBOL
      >
M      1
F      NONUNIQUE,B      : LENGTH OF NAME PORTION WHICH IS NONUNIQUE
                        : (THAT IS, # CHARS AFTER UNIQUENESS POINT)
P      1
F      FLAGS,B          : KEYPAD FLAGS
V      <M
      ECHO              : ECHO THE SUBSTITUTED COMMAND
      TERMINATE         : TREAT THE KEY AS A TERMINATOR
      STATE             : STATE SHOULD BE SET
      LOCK              : SET THE STATE UNTIL EXPLICITLY RESET
      ERASE             : ERASE THE LINE BEFORE EXECUTING THE KEY
      >
F      SYMBOL,T         : ASCII SYMBOL NAME

```

```

:
: SYMBOL VALUE DIRECTLY FOLLOWS:
:

```

```

FOR STRING: WORD-COUNTED STRING
FOR BINARY: LONGWORD
FOR LABELS: WORD OF 6, FOLLOWED BY 6 BYTE RFA
FOR KEYPAD: WORD-COUNTED STRING OF THE FOLLOWING FORMAT
WORD - SIZE OF STRING
WORD - SIZE OF VALUE STRING
VALUE STRING
BYTE - SIZE OF STRING DESCRIBING THE STATE WHEN THIS
      SYMBOL IS DEFINED
STRING DESCRIBING THE STATE WHEN THIS SYMBOL IS DEFINED
BYTE - SIZE OF STRING DESCRIBING THE STATE THIS SYMBOL SETS
STRING DESCRIBING THE STATE THIS SYMBOL SETS

```

```

:
:
:
E

```

```

:
:
: DEFINE INDIRECT STACK FRAME
:

```

```

STRUCT  IDF
F       LNK           : POINTER TO NEXT INDIRECT FILE FRAME
F       INPIFI,W     : IFI FOR INPUT
F       ONLEVEL,W    : ON ERROR LEVEL NUMBER
F       ONERROR      : ADDRESS OF ON ERROR COMMAND TEXT
F       INPRABCTX    : CONTENTS OF INPUT RAB CTX LONGWORD
F       LOCAL,Q      : LOCAL SYMBOL TABLE LISTHEAD
F       LABEL,Q      : LABEL SYMBOL TABLE LISTHEAD

```

```

:
:
: OUTIFI, OUTISI, OUTRABCTX, OUTDVI, and OUTFLAGS must be the same in PRC,
: IDF, OUT
:

```

```

F       OUTIFI,W     : IFI FOR OUTPUT
F       OUTISI,W     : ISI FOR OUTPUT
F       OUTRABCTX    : CONTENTS OF OUTPUT RAB CTX LONGWORD
F       OUTDVI,T,16  : INDIRECT OUTPUT DEVICE (ASCIC)
F       OUTFLAGS,B   : FLAGS
V       <M
        OUTCCL       : CONCEALED OUTPUT DEVICE
        INPCCL       : CONCEALED INPUT DEVICE
        >
F       .B,3         : SPARE

F       INPDVI,T,16  : INDIRECT INPUT DEVICE (ASCIC)
F       INPFID,W,3   : FILE ID FOR INPUT FILE
F       INPDID,W,3   : DIRECTORY ID FOR INPUT FILE
F       INPRFA,W,3   : RECORD FILE ADDRESS FOR INPUT
F       FLAG,W       : INDIRECT FLAGS
V       <
        INPOPEN      : THIS INPUT OPEN IS REQUIRED
        REMOTE       : COMMAND PROCEDURE EXISTS ON REMOTE NODE
        >
F       ONCTLY       : SAVED ADDRESS OF ON CONTROL/Y COMMAND
F       SEARCHCTX    : LISTHEAD OF F$SEARCH CONTEXT BLOCKS:
                    : 1ST LONGWORD = LINK POINTER, 0 TO END
                    : 2ND LONGWORD = SIZE OF BLOCK IN BYTES
F       FILENAME     : ADDRESS OF ASCIC COMMAND PROCEDURE NAME
F       .W,3
F       .B,2
L       LENGTH      : LENGTH OF INDIRECT FRAME
E

```

```

:
: TEMPORARY STORAGE USED FOR SPAWNING SUBPROCESSES
:

```

```

STRUCT  SPWN
F      LINK,L      : POINTER TO NEXT IN CHAIN
F      SIZE,W      : SIZE OF BLOCK
F      ,W          : UNUSED
F      UNIT,W      : TERMINATION MAILBOX UNIT NUMBER
F      CHAN,W      : CONTEXT MAILBOX CHANNEL
F      FLAGS,W     : FLAGS
V      <M
LOG      : /LOG SPECIFIED
PRCNAM  : /PROCESS NAME SPECIFIED
WAIT    : /WAIT SPECIFIED
AUTOLOGO : SILENT LOGOUT AFTER CMDSTR EXECUTED
MODE    : BATCH/INTERACTIVE MODE OF SUBPROCESS
CLISYM  : COPY CLI SYMBOLS TO SUBPROCESS
LOGNAM  : COPY LOGICAL NAMES TO SUBPROCESS
ACTIVE  : PROCESS CURRENTLY BEING SPAWNED
NOTIFY  : /NOTIFY SPECIFIED
PROMPT  : /PROMPT SPECIFIED
INPUT   : /INPUT=value SPECIFIED
OUTPUT  : OUTPUT IS SET TO SYSS$OUTPUT
KEYPAD  : COPY KEYPAD STATE TO SUBPROCESS
CLI     : /CLI=value SPECIFIED
NOCTX   : PASS/NOPASS CONTEXT TO SUBPROCESS
TABLE   : /TABLE=value SPECIFIED
>
F      ACMODE,B    : ACCESS MODE TO CALL ASTADR AST ROUTINE
: OR TO PROBE STSADR LONGWORD
F      EFN,B      : EVENT FLAG TO SET WHEN SUBPROCESS COMPLETES
: (-1 IF NONE)
F      MBXNAM,Q   : DESCRIPTOR OF CONTEXT MAILBOX NAME
F      PRCNAM,Q   : DESCRIPTOR OF PROCESS NAME
F      INPUT,Q    : DESCRIPTOR OF SUBPROCESS INPUT FILESPEC
F      OUTPUT,Q   : DESCRIPTOR OF SUBPROCESS OUTPUT FILESPEC
F      CMDSTR,Q   : DESCRIPTOR OF COMMAND STRING TO BE EXECUTED
F      IOSB,Q    : I/O STATUS BLOCK FOR QIO REQUESTS
F      SUBPID,L   : PID OF NEWLY CREATED SUBPROCESS
F      STATUS,L  : FINAL STATUS FROM COMPLETED SUBPROCESS
F      PRIB,L    : BASE PRIORITY OF SUBPROCESS
F      ASTADR,L  : AST ROUTINE TO CALL ON SUBPROCESS
: TERMINATION (ZERO IF NONE)
F      ASTPRM,L  : PARAMETER TO AST ROUTINE
F      STSADR,L  : ADDRESS OF LONGWORD TO RECEIVE
: TERMINATION STATUS (ZERO IF NONE)
F      OUTOFBAND,L : OUT-OF-BAND AST CHARACTER MASK
F      IMAGCNT,L : PROCESS IMAGE COUNT
F      QUOTAS,G,50 : SPACE FOR SUBPROCESS QUOTA LIST
F      PROCESS,T,16 : ASCII SUBPROCESS NAME

: Prompt string must be kept together (and mimicked in PRC and CTX)
F      PROMPTLEN,B : LENGTH OF PROMPT STRING

```

```
F      PMPTCTRL,W      : PROMPT CONTROL CHARACTERS
F      CONTINUE,B     : PROMPT CONTINUATION CHARACTER
F      PROMPT,G,32    : PROMPT STRING AREA
F      CLI,Q          : DESCRIPTOR OF CLI NAME
F      TABLE,Q       : DESCRIPTOR OF CLI TABLE NAME

L      LENGTH
```

```

:
: FORMAT OF THE CONTEXT MESSAGES WHICH ARE TRANSMITTED FROM THE SPAWN
: COMMAND TO THE SUBPROCESS INITIALIZATION.
:

```

```

STRUCT CTX
C      MAXLEN,1024      : MAXIMUM RECORD SIZE
F      TYPE,W          : MESSAGE TYPE
C      <
      HEADER           : HEADER RECORD
      CMDSTR           : COMMAND STRING
      LOGNAM           : LOGICAL NAMES
      CLISYM           : CLI SYMBOLS
      KEYSTATE         : KEYPAD STATE
      LNMTABLE         : LOGICAL NAME TABLE
      LNMNAME          : LOGICAL NAME BLOCK (INITIAL RECORD)
      LNMNTRAN         : ADDITIONAL TRANSLATIONS (NYI)
      >
M      1
; FOR HEADER RECORDS
F      PROCPRIV,Q      : PROCESS PRIVILEGES
F      OUTFBAND,L      : OUT-OF-BAND AST CHARACTER MASK
V      <M
      ,20              : SKIP UNUSED CHARACTERS
      CTRLT            : CONTROL T
      ,4               : SKIP UNUSED CHARACTERS
      CTRLY            : CONTROL Y
      >
F      FLAGS,B         : FLAGS BYTE
V      <M
      AUTOLOGO         : SILENT LOGOUT AFTER COMMAND STRING EXECUTED
                        : (IF OFF, REVERT TO SYSSINPUT AFTER EXECUTION)
      MODE             : BATCH/INTERACTIVE MODE BIT
      VERIFY           : VERIFICATION FLAG
      VERIMAGE         : IMAGE VERIFICATION FLAG
      WAIT             : WAIT/NOWAIT SUBPROCESS BIT
      >
; Prompt string must be kept together (and mimicked in PRC and SPWN)
F      PROMPTLEN,B     : LENGTH OF PROMPT STRING
F      PMPTCTRL,W      : PROMPT CONTROL CHARACTERS
F      CONTINUE,B      : PROMPT CONTINUATION CHARACTER
F      PROMPT,G,32     : PROMPT STRING AREA
L      HDRLEN          : FIXED SIZE OF HEADER RECORD
; FOR COMMAND STRING RECORDS
P      1
F      CMDSTR,T        : ASCII COMMAND STRING (NO COUNT)

```

; FOR LOGICAL NAME RECORDS

```

P      1
F      ENTSIZE,W      : SIZE OF ENTRY
F      ACMODE,B       : ACCESS MODE OF LOGICAL NAME
M      2
F      LOGNAM,T       : ASCII LOGICAL NAME
                        : WORD-COUNTED VALUE STRING FOLLOWS

```

; FOR CLI SYMBOL RECORDS

```

P      1
F      ,W
F      SYMTAB,B       : SYMBOL TABLE TYPE
C      <
      GLOBAL
      LOCAL
      KEYTABL
      >
F      SYMTYPE,B      : SYMBOL TYPE
C      <
      STRING          : VALUE IS VARIABLE LENGTH STRING
      PERM            : PERMANENT SYMBOL, STRING
      BINARY          : VALUE IS BINARY LONGWORD VALUE
      LABEL           : DUMMY - LABELS ARE NOT PASSED
      KEYPAD          : VALUE IS A KEYPAD SYMBOL
      >
F      NONUNIQUE,B    : LENGTH OF NON-UNIQUE PORTION OF NAME
                        : (I.E. # CHARS AFTER UNIQUENESS POINT)
F      SYMBOL,T       : ASCII SYMBOL NAME
                        : SYMBOL VALUE DIRECTLY FOLLOWS:
                        :   FOR STRING: WORD-COUNTED STRING
                        :   FOR BINARY: LONGWORD

```

; FOR KEYPAD STATE RECORD

```

P      1
F      KEYLENGTH,B    : STATE LENGTH
F      KEYSTATE,T     : ASCII STATE NAME

```

; FOR LOGICAL NAME TABLE RECORDS (LNMTABLE)

```

P      2
F      TFLAGS,B       : TABLE FLAGS
F      PROT,W         : PROTECTION MASK
F      QUOTA,L        : TABLE QUOTA
F      LNMTABLE,T     : ASCII LOGICAL NAME FOR TABLE
                        : ASCII PARENT TABLE NAME FOLLOWS

```

; FOR LOGICAL NAME RECORDS (LNMNAME & LNMNTRAN)

```

P      2
F      NFLAGS,B       : NAME FLAGS OF LOGICAL NAME
F      TRANCNT,B      : NUMBER OF TRANSLATIONS
F      LNMNAME,T      : ASCII PARENT TABLE NAME

```

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: ASCII LOGICAL NAME FOLLOWS
: ASCII EQUIVALENCE NAME(S) FOLLOW
: TERMINATED BY A FLAG BYTE

E

: :
: : TERMINATION MAILBOX LIST ITEM
: :

```
STRUCT  TMBX
C      MAXREF ,4      : MAXIMUM NUMBER OF SUBPROCESSES USING A
                   : SINGLE TERMINATION MAILBOX
F      LINK,L        : POINTER TO NEXT ITEM
F      UNIT,W        : MAILBOX UNIT NUMBER
F      CHANNEL,W     : MAILBOX CHANNEL NUMBER
F      REFS,B        : NUMBER OF SUBPROCESSES CURRENTLY USING
                   : THIS MAILBOX
F      ,B            : UNUSED
F      SIZE,W        : SIZE OF BLOCK
F      PRC,L         : ADDRESS OF PROCESS WORK AREA
L      LENGTH        : SIZE OF STRUCTURE
E
```


OUTPUT FILE INFORMATION

OUTIFI, OUTISI, OUTRABCTX, OUTDVI, and OUTFLAGS must be the same in PRC, IDF, OUT

```

STRUCT  OUT
F      OUTIFI,W      : IFI FOR OUTPUT
F      OUTISI,W      : ISI FOR OUTPUT
F      OUTRABCTX     : CONTENTS OF OUTPUT RAB CTX LONGWORD
F      OUTDVI,T,16   : INDIRECT OUTPUT DEVICE (ASCIC)
F      OUTFLAGS,B    : FLAGS
V      <M
      OUTCCL         : CONCEALED OUTPUT DEVICE
      INPCCL        : CONCEALED INPUT DEVICE
      >
F      .B,3          : SPARE
L      LENGTH       : SIZE OF STRUCTURE
E

```

⋮
EDIT FLAGS
⋮

STRUCT	EDIT	
F	FLAGS,B	; FLAGS BYTE
V	<M	
	UNCOMMENT	
	COMPRESS	
	COLLAPSE	
	TRIM	
	UPCASE	
	LOWERCASE	
	EOL	
	>	
E		

CRFOR LIS	CRFMEM LIS	CRFMACROS MAR	CLITABDEF SCL
FILINPUT LIS	KEYS LIS	CRFMDL MDL	CRFTRVEC LIS
CRFMDL MDL	CRF LIS	CRFERMSG LIS	DCLDEF MDL
CRF SCL	CRF	CRFSUB LIS	
FILOUTPUT LIS	CRFSHR MAP	CRFGLOBAL LIS	
CRFMAC REQ		DCL	
		DCL MAP	