CRAY RESEARCH, INC.

CRAY X-MP AND CRAY-1® COMPUTER SYSTEMS

COS TABLE DESCRIPTIONS INTERNAL REFERENCE MANUAL

SM-0045

RECORD OF REVISION

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Each time this manual is revised and reprinted, all changes issued against the previous version in the form of change packets are incorporated into the new version and the new version is assigned an alphabetic level. Between reprints, changes may be issued against the current version in the form of change packets. Each change packet is assigned a numeric designator, starting with 01 for the first change packet of each revision level.

Every page changed by a reprint or by a change packet has the revision level and change packet number in the lower righthand corner. Changes to part of a page are noted by a change bar along the margin of the page. A change bar in the margin opposite the page number indicates that the entire page is new; a dot in the same place indicates that information has been moved from one page to another, but has not otherwise changed.

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Revision	Description
	October, 1980 - Original printing. The information in this manual was previously contained in part 5 of the CRAY-OS Version 1 System Programmer's Manual, publication 2240012, which is now obsolete. This manual supports the 1.09 release.
A	July, 1981 - Reprint with revision. This printing adds the Engineering Flaw Table, Partial Word Table, and revises the Queue Control Table. Several features are added including PROM, Resource Generic Names, ECHO, XMI, PMI and job lock. Miscellaneous changes were also made, and section 2 was rewritten. This manual supports the 1.10 release and obsoletes all previous printings.
B	June, 1982 - Reprint with revision. This manual supports the 1.11 release and obsoletes all previous printings. This printing adds section 3, Tape Label Tables. Extensive changes have been made in the Active User Table, Channel Buffer Table, Channel Extension Table, and Data Allocation Table. The I/O Processor Disk Command Table and the IOP Station Command Table have been replaced by new sections under Any Packet Table. The System Dataset Table Queue Pointer Table has been replaced by a new section under the System Dataset Table. Miscellaneous changes were also made.
C	July, 1983 - First version generated automatically. Numerous new tables and codes were added; most text for existing tables was transferred from version B.
D	May, 1984 - Second version generated automatically, conforming with the initial release of COS 1.13. This is generated from PDN=COSPL, ID=V113PL with N09249A applied. Mod N09249A adds definition for AEM type 2 and type 5 tables, and minor editorial changes. Changes in the table generator software have caused some text details from version C to be lost.
E	January, 1985 - This version conforms with the initial release of COS 1.14 with Bugfix 1 applied. This manual obsoletes all previous printings.

PREFACE

Four "tables of contents" are provided. Each table of contents has four columns. The leftmost column contains the table "prefix". The second column contains the table title. The third column contains the table "mnemonic". The fourth (and rightmost) column contains the page number on which the table diagram begins.

The first table of contents is arranged by page number (in the normal fashion).

The second table of contents is arranged by table prefix.

The third table of contents is arranged by table name.

The fourth table of contents is arranged by table mnemonic.

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TABLE OF CONTENTS

TABLE OF CONTENTS BY PREFIX

TABLE OF CONTENTS BY PREFIX

TABLE OF CONTENTS BY TABLE NAME

TABLE OF CONTENTS BY TABLE NAME

INTRODUCTION

This manual graphically shows the tables used by the Cray Operating System (COS). These tables are automatically derived from the system code by a series of programs collectively known as the "table diagram generator." The Table Diagram Generator is described in Cray Research, Inc. publication SR-00xx, COS Table Diagram Generator Reference Manual.

Introductions and other explanatory material are taken from SYSTXT and COSTXT. Some of this text has not been fully edited as of 1.14.

This manual is derived from the COS 1.14 Bugfix I COSPL.

CONVENTIONS

Table diagrams use the following symbols:

$ When two appear on the same line, indicates a range of words not shown. When one appears at the end of one line and another at the beginning of the next, indicates a field crossing a word boundary.

* Indicates that a field is too short to contain its label.

/ Indicates an unused area of a table. Hashed areas can contain information used elsewhere in the system, such as a front-end station.

Numbers in table descriptions are denoted as follows:

O' Indicates an octal number.

D' Indicates a decimal number.

Throughout this manual, word numbers are shown in octal. Bit numbers are decimal.

FIELDS REQUIRED FOR DIAGRAM GENERATION

Some field descriptions read "Required for table diagram generator." These fields must be defined twice to make the diagram more accurate. The first definition supplies the W@ tag; the second, at the end of the table, supplies the S@ and N@ tags. This method allows the generator to draw multiple-word fields.

.bp

OMISSIONS

Definitions are not available for the following tables:

EVW PERT SSL

The following comdecks contain no definitions:

COMEXFC COMMENT
COMHD COMPVC
COMIQT COMSMC
COMLCK
COMMATH

Definitions from COMSEG are contained in the Front-End Protocol Internal Reference Manual, Publication No. SM-0042.

The following tables are not included:

CAT - Channel Address Table
CLT - Channel Limit Table
CMOD - Communication modules
CPT - Class Parameter Tables
ECT - Error Code Table
FIQ - Free input packet queue
FOQ - Free output packet queue
ICT - Interrupt count table
IHT - Interuupt handler table
MCT - Monitor Count Table
(There is a "MCT - Message Control Table"
MEL - Memory Error Log Table
ODT - Overlay Directory Table
OLL - Overlay Load List
PXT - (see 'PX' in tables of contents)
RJI - (see 'RJ' in tables of contents)
RMS - Read Margin Select Table
STPD - STP Dump Directory
STX - System Task Exchange Package Table
UCT - (see 'UCR' in tables of contents)

The Job Accounting Table, illustrated in figure AC-1, defines the format of data returned to the user by the F$ACT call.

L@ACSIT = 5

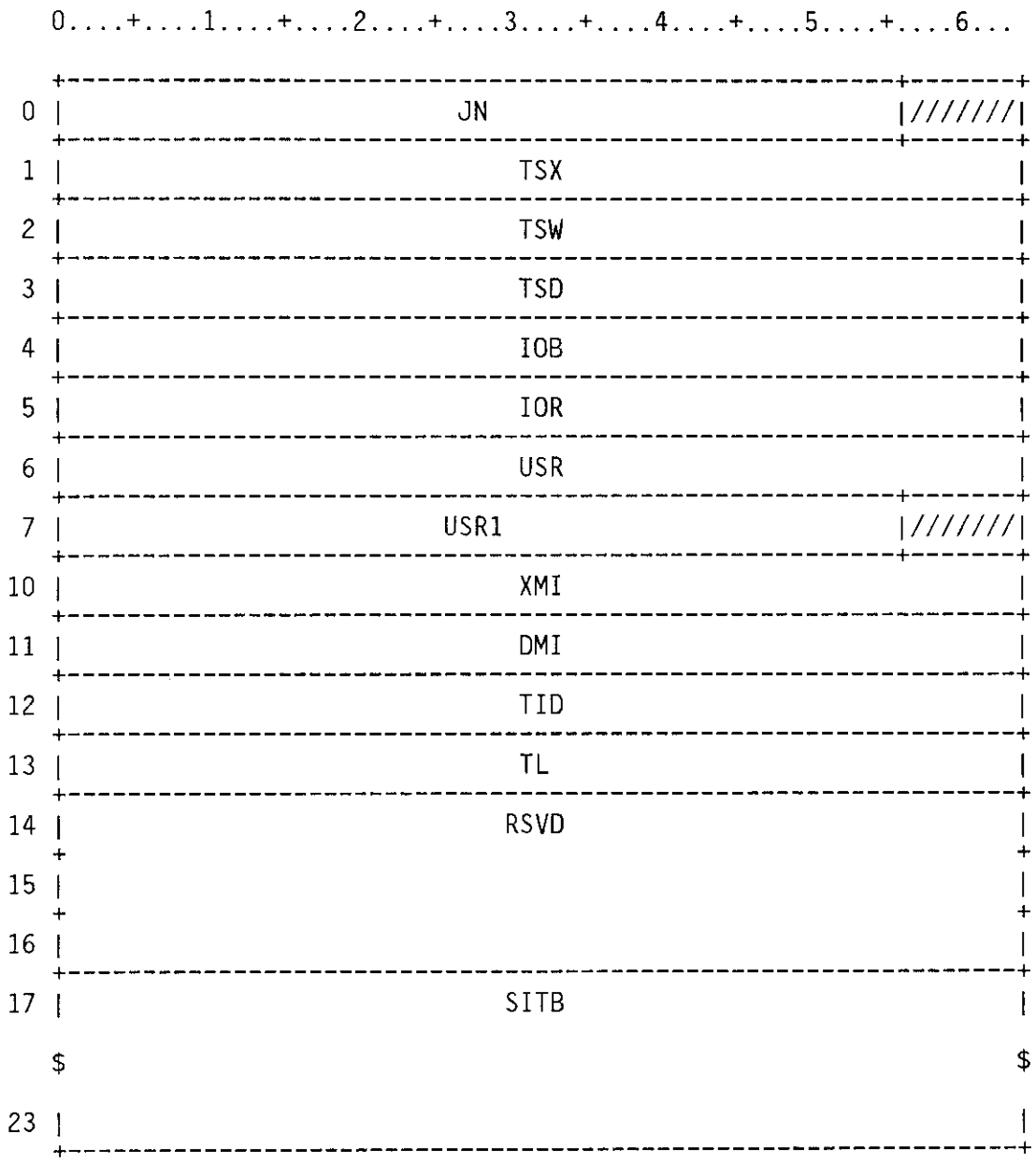


Figure AC-1. Job Accounting Table

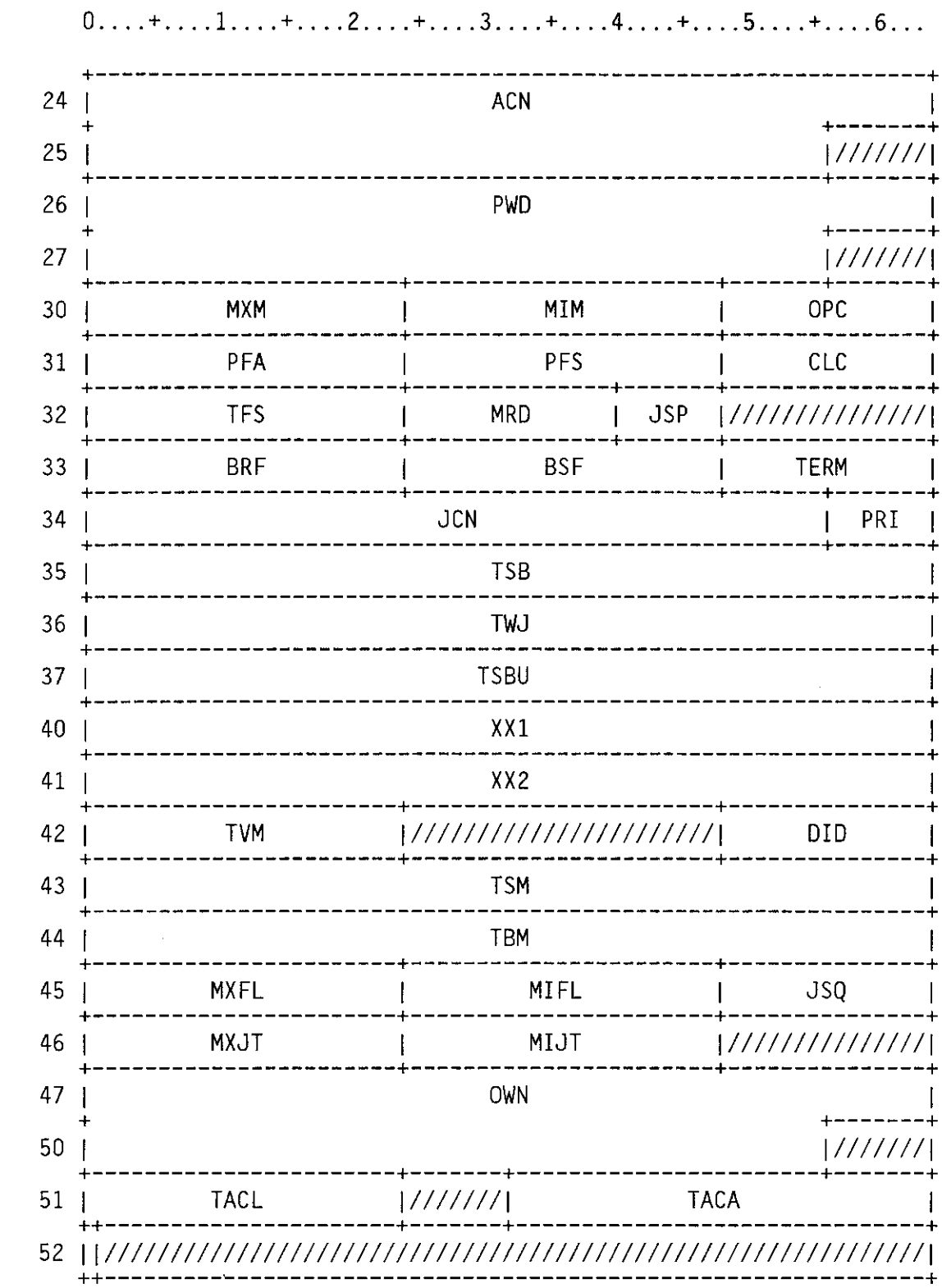


Figure AC-1. Job Accounting Table

Field	Word(base8)	Bits	Description
ACJN	0	0-55	Job name
ACTSX	1	0-63	Timestamp units executing in CPU
ACTSW	2	0-63	Timestamp units waiting for CPU
ACTSD	3	0-63	Timestamp units waiting for I/O
ACIOB	4	0-63	Disk sectors moved
ACIOR	5	0-63	Physical I/O requests
ACUSR	6	0-63	Characters 1-8 of user number
ACUSR1	7	0-55	Character 9-15 of user number
ACXMI	10	0-63	Memory integral (execution) in units of word-seconds
ACDMI	11	0-63	Memory integral (I/O wait) in units of word-seconds
ACTID	12	0-63	Terminal ID
ACTL	13	0-63	Job time limit (timestamp units)
ACRSVD	14-16	0-63	Reserved for use by site
ACSITB	17-23	0-63	Reserved for use by site W@ACSIT1=W@ACSITB W@ACSIT2=W@ACSITB+1 W@ACSIT3=W@ACSITB+2 W@ACSIT4=W@ACSITB+3 W@ACSIT5=W@ACSITB+4
ACACN	24-25	0-63	1-15 character account number
ACACN1	24	0-63	Characters 1-8 of account number
ACACN2	25	0-55	Characters 9-15 of account number
ACPWD	26-27	0-63	1-15 Character password
ACPWD1	26	0-63	Characters 1-8 of password
ACPWD2	27	0-55	Characters 9-15 of password
ACMXM	30	0-23	Maximum job size
ACMIM	30	24-47	Minimum job size

Field	Word(base8)	Bits	Description
ACOPC	30	48-63	Number of OPEN calls
ACPFA	31	0-23	Permanent file space accessed, in blocks
ACPFS	31	24-47	Permanent file space saved, in blocks
ACCLC	31	48-63	Number of CLOSE calls
ACTFS	32	0-23	Temporary file space used, in blocks
ACMRD	32	24-39	Number of memory resident datasets
ACJSP	32	40-47	P parameter from job statement
ACBRF	33	0-23	Number of sectors from front end
ACBSF	33	24-47	Number of sectors sent to front end
ACTERM	33	48-63	Termination status
ACJCN	34	0-55	Job class
ACPRI	34	56-63	Job priority
ACTSB	35	0-63	Timestamp of job submission
ACTWJ	36	0-63	Timestamp units waiting in input queue
ACTSBU	37	0-63	Total system billing units used (int)
ACXX1	40	0-63	Spare word
ACXX2	41	0-63	Spare word
ACTVM	42	0-23	Number of tape volumes mounted
ACDID	42	48-63	Destination ID
ACTSM	43	0-63	Number of tape sectors moved (512-word units of tape data)
ACTBM	44	0-63	Number of tape blocks moved
ACMXFL	45	0-23	Maximum field length used
ACMIFL	45	24-47	Minimum field length used
ACJSQ	45	48-63	Job sequence number

Field	Word(base8)	Bits	Description
ACMXJT	46	0-23	Maximum JTA used
ACMIJT	46	24-47	Minimum JTA used
ACOWN	47-50	0-63	1-15 character ownership value
ACOWN1	47	0-63	Characters 1-8 of ownership value
ACOWN2	50	0-55	Characters 9-15 of ownership value
ACTACL	51	0-23	Length of Task ACcounting table buffer
ACTACA	51	32-63	FWA of Task ACcounting table buffer
ACGRN	52	0	Generic resource counters

The following redefinition is required for the convenience of the table diagram generator.

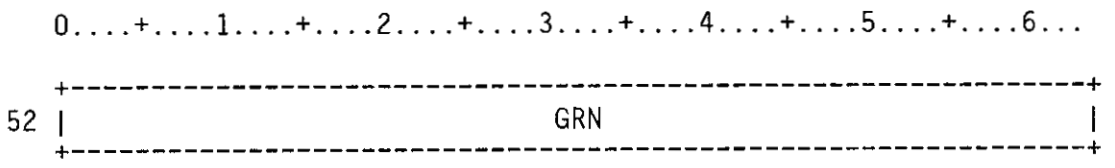


Figure AC-2. Redefinition for ACGRN tags

Field	Word(base8)	Bits	Description
ACGRN	52	0-63	(Required for table diagram generator)

The task accounting table (TAC) is a logical extension to the job accounting table (JAC), and is pointed to by it. The TAC receives detailed accounting for each task initiated by a job, where the JAC contains aggregate totals for the entire job. Information in the TAC, like the JAC, is copied to the user field by the F$ACT request.

ACTACL (in the JAC) is an entry parameter to the accouting process, and specifies the length of a buffer for TAC entries. ACTACA is the address of the buffer. If either ACTACL or ACTACA is zero, then no buffer is present.

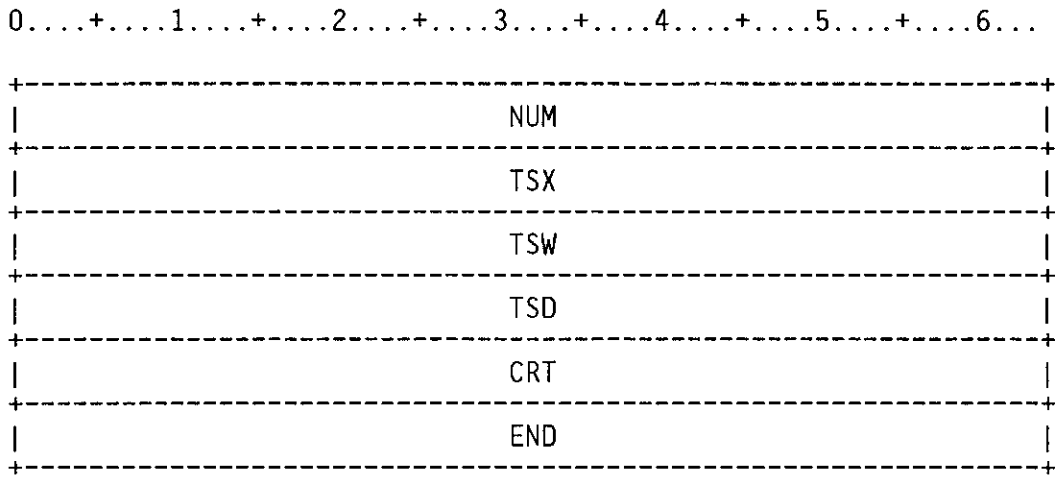


Figure AT-1. Task Accounting table

Field	Word(base8)	Bits	Description
ATNUM	0	0-63	Task number within job
ATTSX	1	0-63	Timestamp units in execution
ATTSW	2	0-63	Timestamp units waiting for CPU
ATTSD	3	0-63	Timestamp units I/O blocked
ATCRT	4	0-63	Timestamp at task creation
ATEND	5	0-63	Timestamp at task end

The IOP error channel message is passed to the MEP task by EXEC for entry into the system log. This information originates in the I/O subsystem.

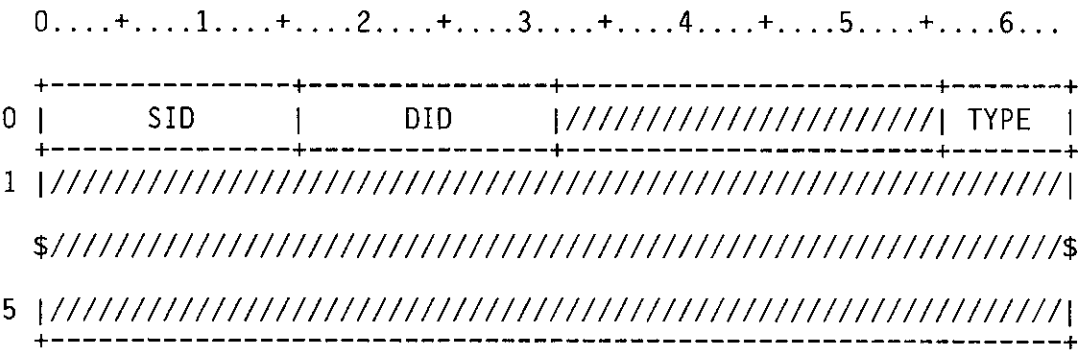


Figure AE-1. IOP Error Channel Message

Field	Word(base8)	Bits	Description
AESID	0	0-15	Source ID ('')
AEDID	0	16-31	Destination ID ('C1')
AETYPE	0	56-63	Type of error. Governs format of words 1-5: figure AE-2 for type 1; figure AE-3 for type 2; blank for types 3 and 4; figure AE-4 for type 5. Type Meaning 1 Memory error 2 Disk error 3 Turn off error logging 4 Turn on error logging 5 Tape error logging

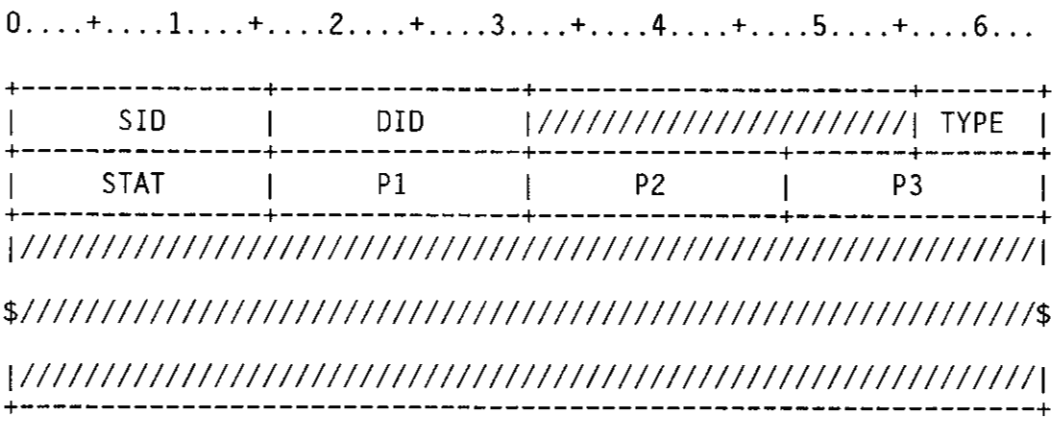


Figure AE-2. Memory Error

Field	Word(base8)	Bits	Description
AESID	0	0-15	Source ID ('')
AEDID	0	16-31	Destination ID ('C1')
AETYPE	0	56-63	Type of error. Governs format of words 1-5: figure AE-2 for type 1; figure AE-3 for type 2; blank for types 3 and 4; figure AE-4 for type 5. Type Meaning 1 Memory error 2 Disk error 3 Turn off error logging 4 Turn on error logging 5 Tape error logging
AESTAT	1	0-15	Augmented error channel status. Find error status and parameters 1-3 in ios Software Internal Reference Manual, CRI publication SM-0046, in the description of the error channel.
AEP1	1	16-31	Error parameter 1
AEP2	1	32-47	Error parameter 2
AEP3	1	48-63	Error parameter 3

The REPORT overlay builds the disk error packet and sends it to the mainframe for logging. Line 0 contains the DAL control information.

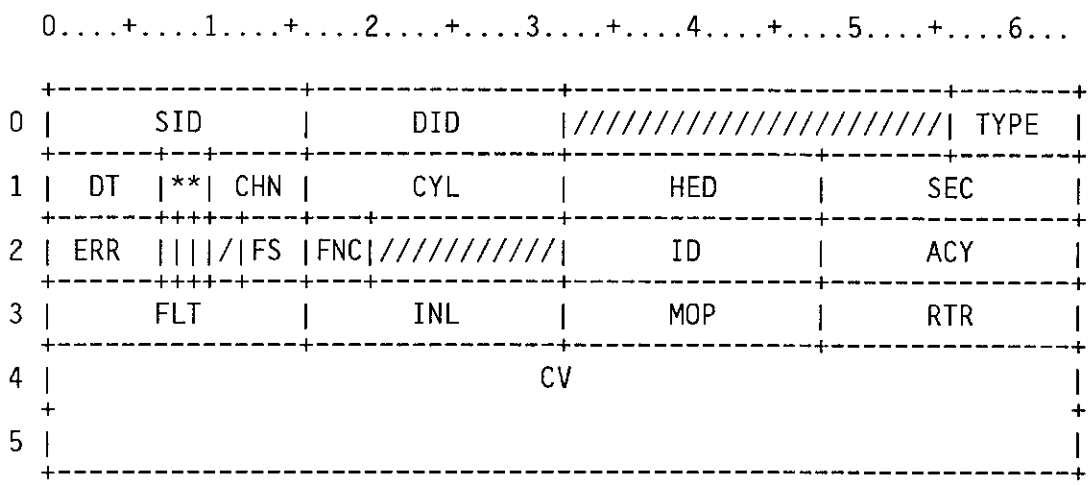


Figure AE-3. Type 2 message - disk error

Field	Word(base8)	Bits	Description
AESID	0	0-15	Source ID
AEDID	0	16-31	Destination ID
AETYPE	0	56-63	Type of error. (3)
AEDT	1	0-6	Device Type
AEIOP	1	7-9	IOP number
AECHN	1	10-15	Channel number
AECYL	1	16-31	Cylinder of request
AEHED	1	32-47	Head group
AESEC	1	48-63	Sector number

Field	Word(base8)	Bits	Description
AEERR	2	0-6	Error type: 0 Interlock 1 Timeout 2 ID error 3 Read data error 4 Write data error 5 Hardware-detected seek error 6 Miscellaneous
AETD	2	8	Data transfer direction 0 Write 1 Read
AEEC	2	9	Error correction flag: 0 Error correction not used 1 Error correction used
AEFS	2	12-15	Final error status:
AEFNC	2	16-19	Disk function in error 12 seek 13 unused 14 write 15 read
AEID	2	32-47	Cylinder number from ID field, reported on an ID error.
AEACY	2	48-63	Cylinder status register, reported on an ID error.
AEFLT	3	0-15	Original fault status
AEINL	3	16-31	Interlock status
AEMOP	3	32-47	Margin/Offset parameters 0-8 Margin select: 0 Normal 1 Early 2 Late 9-10 Offset direction: 0 Towards perimeter of disk 1 Towards center of disk 11-15 Offset magnitude
AERTR	3	48-63	Retry count

Field	Word(base8)	Bits	Description
AECV	4-5	0-63	Correction vector buffer. Used by the FIRECODE overlay when attempting to correct a read data error
AECV0	4	0-31	
AECV1	4	32-63	
AECV2	5	0-31	
AECV3	5	32-63	

The TERROR overlay builds the tape error packet and sends it to the mainframe for logging. Line 0 contains the DAL control information.

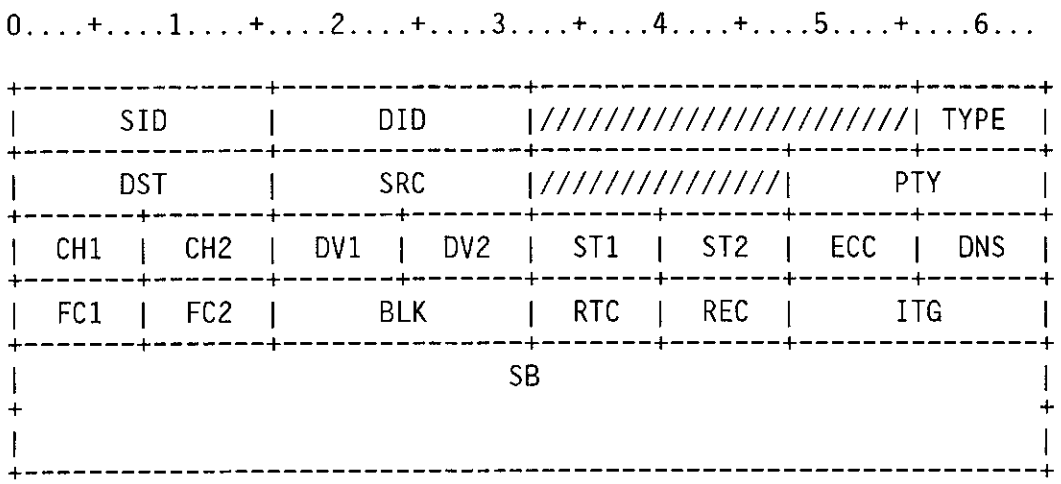


Figure AE-4. Type 5 - Tape error

Field	Word(base8)	Bits	Description
AESID	0	0-15	Source ID ('')
AEDID	0	16-31	Destination ID ('C1')
AETYPE	0	56-63	Type of error. (5)
AEDST	1	0-15	Packet destination ID
AESRC	1	16-31	Packet source ID
AEPTY	1	48-63	Packet subtype, which describes the error type
AECH1	2	0-7	Initial channel in use
AECH2	2	8-15	Last channel used during recovery
AEDV1	2	16-23	Initial device path (ie, control unit)
AEDV2	2	24-31	Last device path used in recovery
AEST1	2	32-39	Initial device status when error occurred
AEST2	2	40-47	Last status at end of recovery

Field	Word(base8)	Bits	Description
AEECC	2	48-55	Error code. The error code is the actual sense bit offset.
AEDNS	2	56-63	Tape density in effect for this device
AEFC1	3	0-7	Command issued to the device before the command that caused the error.
AEFC2	3	8-15	Command issued to the device that caused the error.
AEBLK	3	16-31	Current position
AERTC	3	32-39	Retry count. This is the number of retries attempted before the error was recovered or deemed irrecoverable.
AEREC	3	40-47	Recovery flag: ==0 Recovered !=0 Not recovered
AEITG	3	48-63	Input tags
AESB	4-5	0-63	Sense bytes read from the control unit at the time the error occurred. See Table 7-1 in the IOS Table Descriptions Manual, CRI publication SM=0007 for a description of the sense bytes.
AESB00	4	0-7	
AESB01	4	8-15	
AESB02	4	16-23	
AESB03	4	24-31	
AESB04	4	32-39	
AESB05	4	40-47	
AESB06	4	48-55	
AESB07	4	56-63	
AESB10	5	0-7	
AESB11	5	8-15	

Field	Word(base8)	Bits	Description
AESB12	5	16-23	
AESB13	5	24-31	
AESB14	5	32-39	
AESB15	5	40-47	
AESB16	5	48-55	
AESB17	5	56-63	

Error messages for arithmetic library routines

AR000	=	D'0	Bad call to ARLIB error processor
AR001	=	D'1	Exponent overflow
AR002	=	D'2	Exponent underflow
AR003	=	D'3	Divide by zero
AR004	=	D'4	Bad scalar argument to ARLIB routine
AR005	=	D'5	Bad vector argument to ARLIB routine
AR006	=	D'6	Bad second vector argument to ARLIB

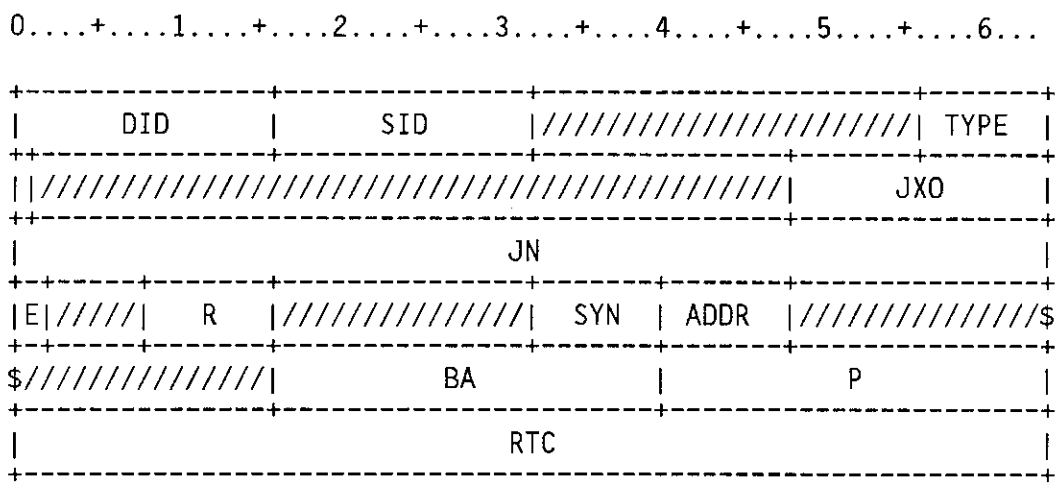


Figure AM-1. Exec Memory Error Message

Field	Word(base8)	Bits	Description
AMDID	0	0-15	Destination ID
AMSID	0	16-31	Source ID
AMTYPE	0	56-63	Type of error (6)
AMSYS	1	0	System running when error
AMJXO	1	48-63	JXO of user running when error
AMJN	2	0-63	Job name
AME	3	0-1	Error type
AMR	3	8-15	Read mode
AMSYN	3	32-39	Syndrome bits
AMADDR	3	40-47	Error address
AMBA	4	16-39	Base address
AMP	4	40-63	Program address
AMRTC	5	0-63	Real-time clock

This table describes the packets passed between EXEC and the MIOP.

Figure AP-1 shows the general form of the 6-word packet. The other figures describe the details of the packets for each purpose.

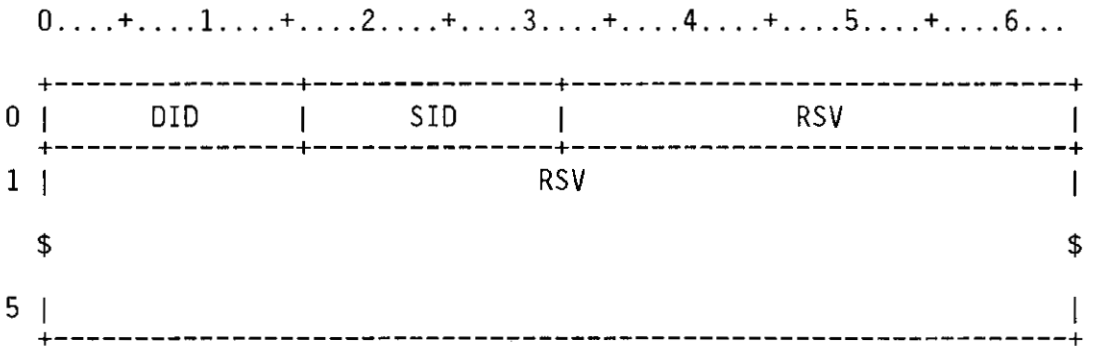


Figure AP-1. General form of IOP packets

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APDTID	0	0-7	Task ID portion of DID
APDPT	0	8-15	Packet-type portion of DID

The following values of packet type start at O'101 to correspond to the existing packet types of 'A', 'B', etc. When the printable ASCII values are exhausted, other packet types can be used.

```
PT$MIN=O'000 Minimum allowable
packet type
PT$A=O'101   'A' packet - disk
request
PT$B=O'102   'B' packet - front end
I/O request
PT$C=O'103   'C' packet - memory
error correction
PT$D=O'104   'D' packet - tape
request
PT$E=O'105   'E' packet - echo
request
PT$F=O'106   'F' packet - user
channel request
PT$G=O'107   'G' packet -
PT$H=O'110   'H' packet - null
PT$I=O'111   'I' packet -down IOS
PT$J=O'112   'J' packet - up IOS
PT$K=O'113   'K' packet - Kernel
request to EXEC
PT$L=O'114   'L' packet - unused
PT$M=O'115   'M' packet - unused
PT$N=O'116   'N' packet - null
PT$O=O'117   'O' packet - unused
PT$P=O'120   'P' packet - unused
PT$Q=O'121   'Q' packet - unused
PT$R=O'122   'R' packet - unused
PT$S=O'123   'S' packet - Kernel
request for stats
PT$T=O'124   'T' packet - UNIX
terminal activity
PT$U=O'125   'U' packet - unused
PT$V=O'126   'V' packet - unused
PT$W=O'127   'W' packet - unused
PT$X=O'130   'X' packet - unused
PT$Y=O'131   'Y' packet - unused
PT$Z=O'132   'Z' packet - unused
PT$MAX=O'133 Maximum allowable
packet type
```

Field	Word(base8)	Bits	Description
APSID	0	16-31	Source ID
APSTID	0	16-23	Task ID portion of SID
APSPT	0	24-31	Packet-type portion of SID PT$C1='C1'R Universal source ID for Cray CPU
APRSV	0	32-63	Reserved for certain packets
APRSV	1-5	0-63	Other packet information

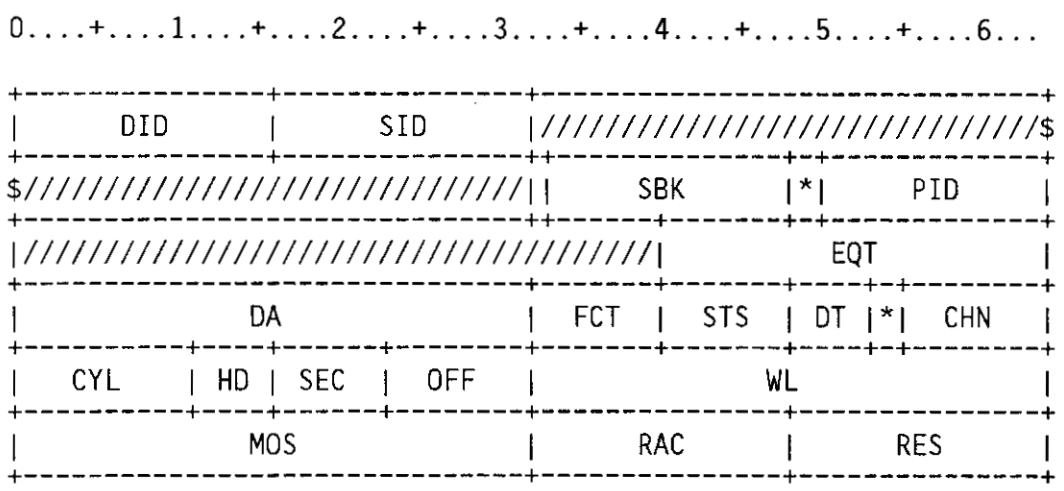


Figure AP-2. A-packet (IOS disk request)

A-packet fields (IOS disk request, APPST=APPSTIOS)

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APCHK	1	32	Request block number check
APSBK	1	33-47	Low 15 bits of starting block number
APPST	1	48-49	Packet sub-type: APPSTIOS=0 IOS APPSTSSD=1 SSD APPSTDCU=2 DCU APPSTUNX=3 UNIX
APPID	1	50-63	Packet ID
APEQT	2	40-63	Equipment table address (STP relative)
APDA	3	0-31	Data buffer address (IOP relative)
APFCT	3	32-39	Function code
APSTS	3	40-47	Status
APDT	3	48-52	Device type
APPN	3	53-54	Processor number
APCHN	3	55-63	Channel number

Field	Word(base8)	Bits	Description
APCYL	4	0-10	Cylinder number
APHD	4	11-15	Head number
APSEC	4	16-22	Sector number
APOFF	4	23-31	Word offset
APWL	4	32-63	Transfer word length
APMOS	5	0-31	MOS address (IOP relative)
APRAC	5	32-47	Sector read-ahead count
APRES	5	48-63	Reserved for IOP

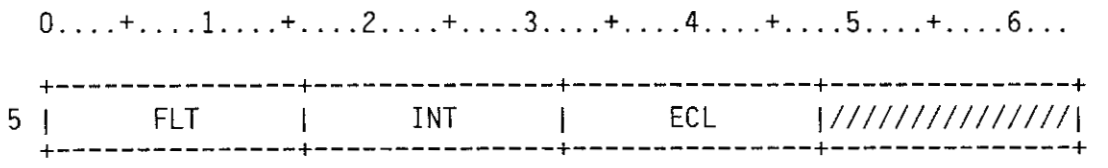


Figure AP-3. A-packet (IOS disk status)

A-packet fields (IOS disk status)

Field	Word(base8)	Bits	Description
APFLT	5	0-15	Disk status and fault status
APINT	5	16-31	Interlock status or seek response
APECL	5	32-47	Cylinder returned on seek error

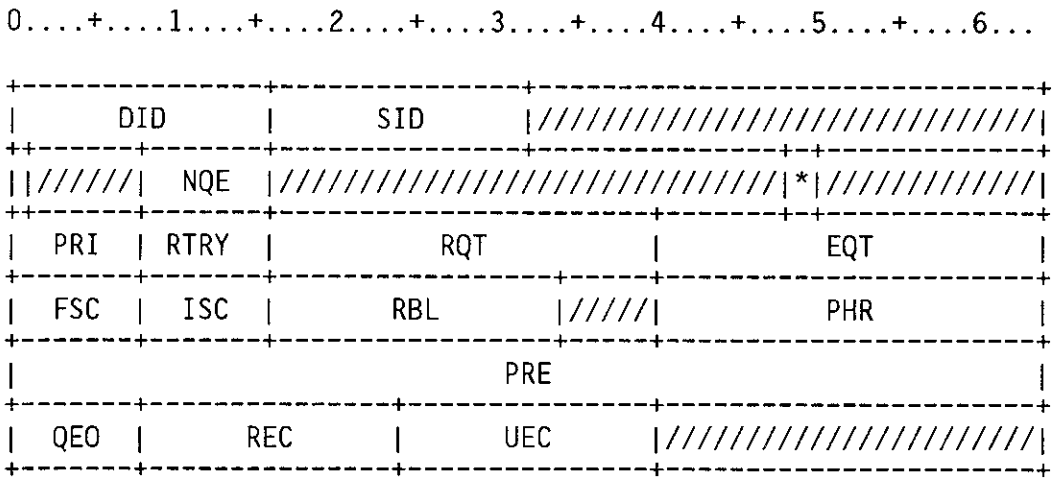


Figure AP-4. A-packet (SSD disk request)

A-packet fields (SSD disk request, APPST=APPSTSSD)

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APLRC	1	0	Logical request complete flag
APNQE	1	8-15	Number of queued I/O entries
APPST	1	48-49	Packet sub-type
APPRI	2	0-7	Number of physical requests initiated
APRTRY	2	8-15	Cumulative retry count
APRQT	2	16-39	Request table address (STP relative)
APEQT	2	40-63	Equipment table address (STP relative)
APFSC	3	0-7	Final status code: RCERR (O'01) recovered error COERR (O'13) corrected data error URERR (O'15) unrecovered error

Field	Word(base8)	Bits	Description
APISC	3	8-15	Initial status code: STOERR (O'100) channel timeout error SSCERR (O'101) status channel error otherwise, lower 6 bits of HSC status word, if EQSCT = @SSDHSP upper 6 bits of status word error flags, if EQSCT = @SSDVHSP
APRBL	3	16-33	Remaining block length
APPHR	3	40-63	Address of physical request
APPRE	4	0-63	Physical request in error
APQEO	5	0-7	Queued I/O entry ordinal in error
APREC	5	8-23	Recovered error count
APUEC	5	24-39	Unrecovered error count

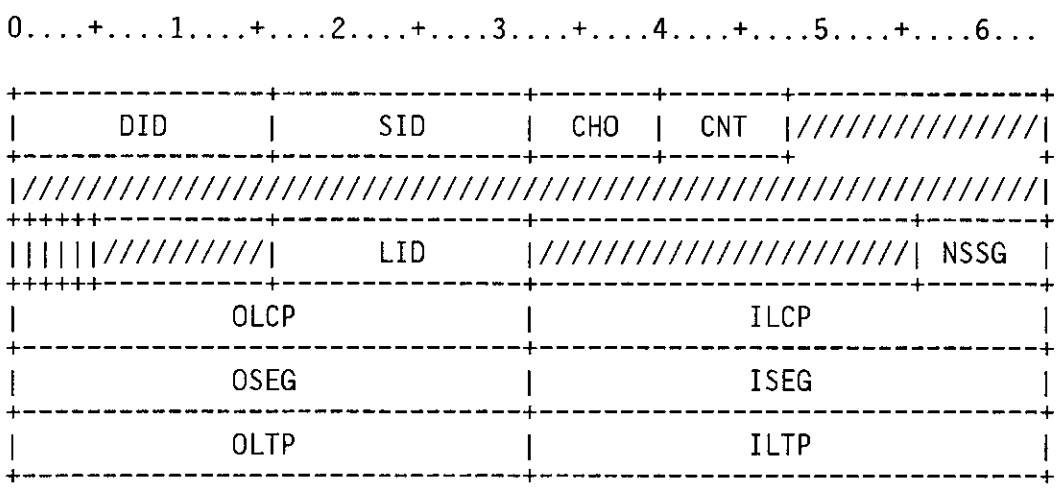


Figure AP-5. B-packet (front end I/O request)

B-packet fields (front end I/O request).

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APCHO	0	32-39	Channel ordinal
APCNT	0	40-47	Message number (modulo 256)
APTYPE	2	0	Address request type flag (set by IOP)
APLOG	2	1	Front end logon flag (set by IOP)
APREJ	2	2	Reject flag (set by EXEC)
APACK	2	3	Ack request flag (set by EXEC)
APDONE	2	4	Acknowledgment flag (set by IOP)
APLID	2	16-31	Front end logical ID
APNSSG	2	56-63	Number of subsegments
APOLCP	3	0-31	Output LCP address (EXEC relative)
APILCP	3	32-63	Input LCP address (EXEC relative)
APOSEG	4	0-31	Output segment address (EXEC relative)
APISEG	4	32-63	Input segment address (EXEC relative)

Field	Word(base8)	Bits	Description
APOLTP	5	0-31	Output LTP address (EXEC relative)
APILTP	5	32-63	Input LTP address (EXEC relative)

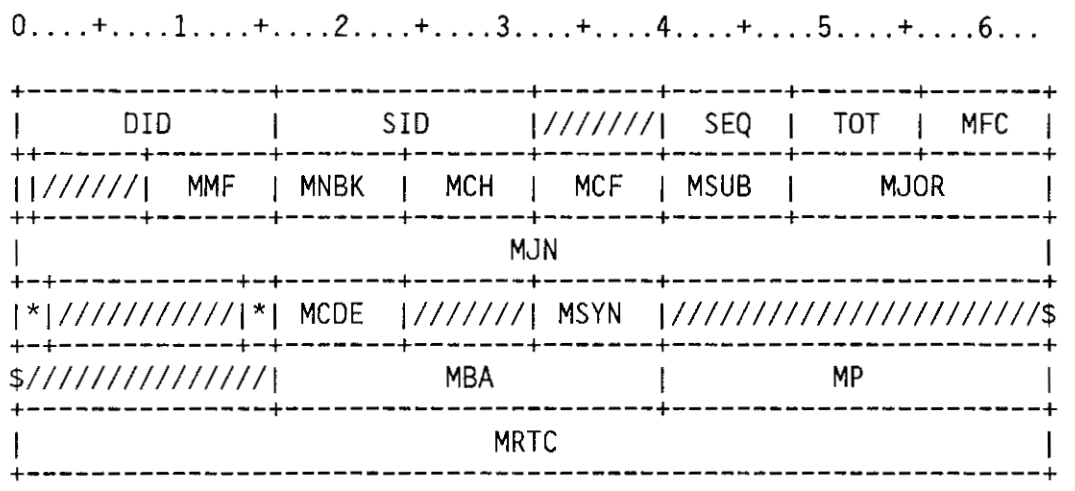


Figure AP-6. C-packet (EXEC-MEP memory error message)

C-packet fields (EXEC-MEP memory error message).

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APSEQ	0	40-47	Sequence number this segment
APTOT	0	48-55	Total number of segments
APMFC	0	56-63	Function code (6)
APMSYS	1	0	System error flag
APMMF	1	8-15	Mainframe type
APMNBK	1	16-23	Number of banks
APMCH	1	24-31	Chip size indicator
APMCF	1	32-39	Configuration
APMSUB	1	40-47	CPU subtype indicator(XMP only)
APMJOR	1	48-63	JXT ordinal of user in the CPU when the error was detected
APMJN	2	0-63	Job name (or 'STP')
APMET	3	0-1	Error type

Field	Word(base8)	Bits	Description
APMRM	3	14-15	Read mode
APMCDE	3	16-23	Code type
APMSYN	3	32-39	Syndrome bits
APMBA	4	16-39	Base address
APMP	4	40-63	Program address
APMRTC	5	0-63	Real Time Clock

The following fields depend on mainframe type
Note that these field widths reflect the significant bits in the Exchange package and not the field widths as described in the hardware reference manual for address assembly.

Memory error for CRAY-1

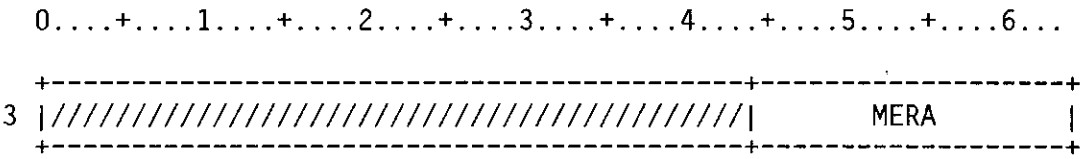


Figure AP-7. Memory error for CRAY-1

Field	Word(base8)	Bits	Description
APMERA	3	44-63	Composite error
APMCHP	3	44	Bank chip field
APMBIT	3	45-59	Bank failing bit

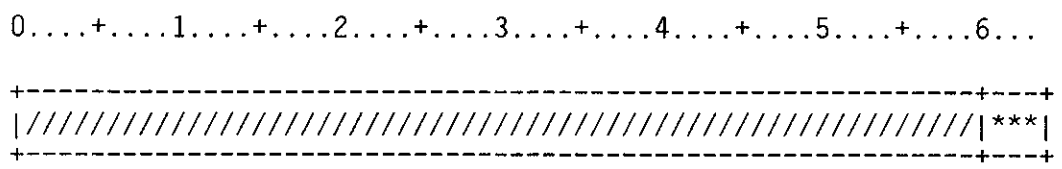


Figure AP-8. Memory error for CRAY-1

Field	Word(base8)	Bits	Description
APMBNK	3	60-63	Composite Bank Error Address
APMB1	3	60	Bank Error Address 16K chips 1
APMB2	3	61	Bank Error Address 16K chips 2
APMB3	3	62-63	Bank Error Address 16K chips 3

Memory error for CRAY-1/S or CRAY-1/M

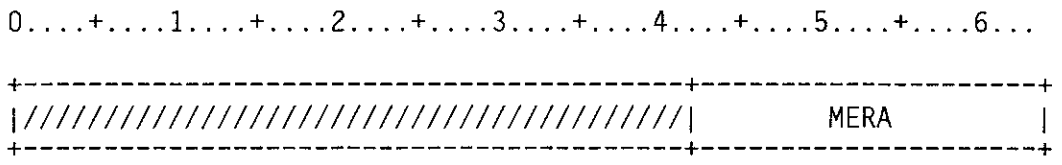


Figure AP-9. Memory error for CRAY-1/S or 1/M

Field	Word(base8)	Bits	Description
APMERA	3	42-63	Composite error
APMCHP	3	42-43	Bank chip field
APMBIT	3	44-59	Bank failing bit

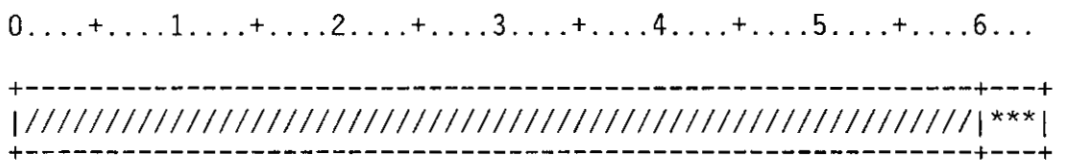


Figure AP-10. Memory error for CRAY-1/S or 1/M

Field	Word(base8)	Bits	Description
APMBNK	3	60-63	Composite Bank Error Address
APMB1	3	60	Bank Error Address 16K chips 1
APMB2	3	61	Bank Error Address 16K chips 2
APMB3	3	62-63	Bank Error Address 16K chips 3

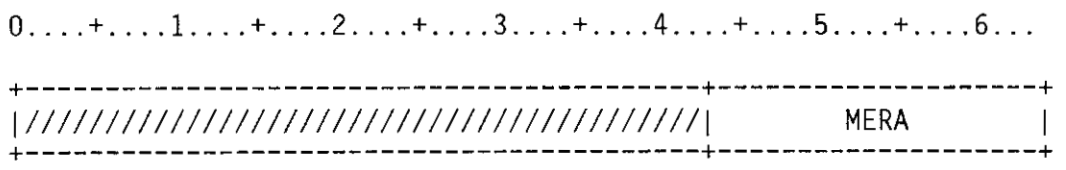


Figure AP-12. Memory error for 16 bank X-MP

Field	Word(base8)	Bits	Description
APMERA	3	43-63	Composite error
APMCHP	3	43-47	Bank chip field
APMBIT	3	48-59	Bank failing bit

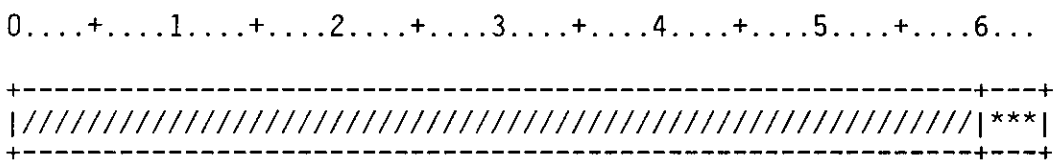


Figure AP-13. Memory error for 16 bank X-MP

Field	Word(base8)	Bits	Description
APMBNK	3	60-63	Composite Bank Error Address
APMB1	3	60	Bank Error Address 16K chips 1
APMB2	3	61	Bank Error Address 16K chips 2
APMB3	3	62-63	Bank Error Address 16K chips 3

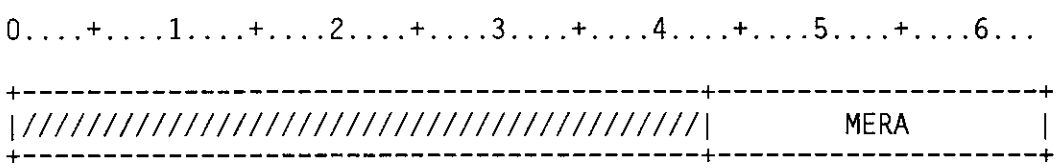


Figure AP-14. Memory error for 16 bank X-MP

Field	Word(base8)	Bits	Description
APMERA	3	43-63	Composite error
APMCHP	3	43-47	Bank chip field
APMBIT	3	48-59	Bank failing bit

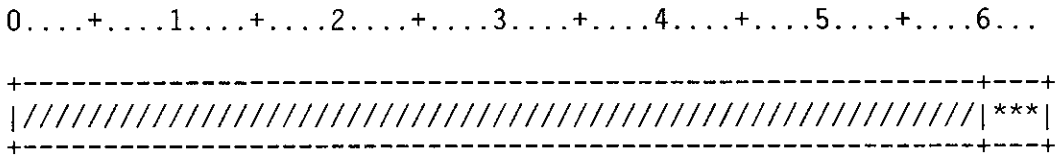


Figure AP-15. Memory error for 16 bank X-MP

Field	Word(base8)	Bits	Description
APMBNK	3	60-63	Composite Bank Error Address
APMB1	3	60	Bank Error Address 16K chips 1
APMB2	3	61	Bank Error Address 16K chips 2
APMB3	3	62-63	Bank Error Address 16K chips 3

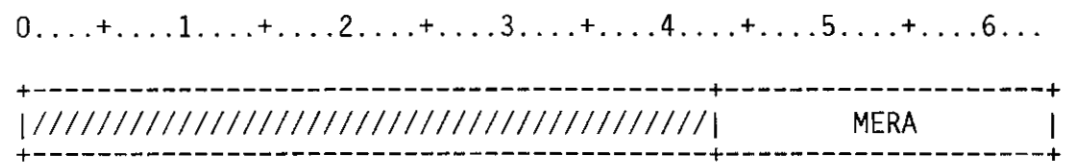


Figure AP-16. Memory error for 16 bank X-MP

Field	Word(base8)	Bits	Description
APMERA	3	43-63	Composite error
APMCHP	3	43-47	Bank chip field
APMBIT	3	48-59	Bank failing bit

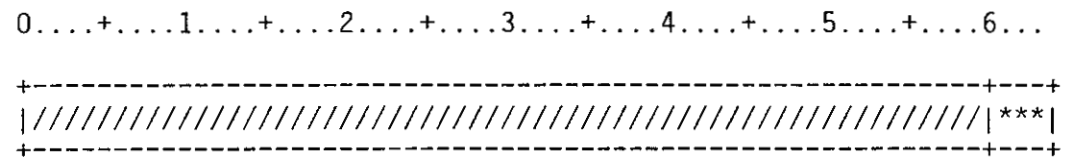


Figure AP-17. Memory error for 16 bank X-MP

Field	Word(base8)	Bits	Description
APMBNK	3	60-63	Composite Bank Error Address
APMB1	3	60	Bank Error Address 16K chips 1
APMB2	3	61	Bank Error Address 16K chips 2
APMB3	3	62-63	Bank Error Address 16K chips 3

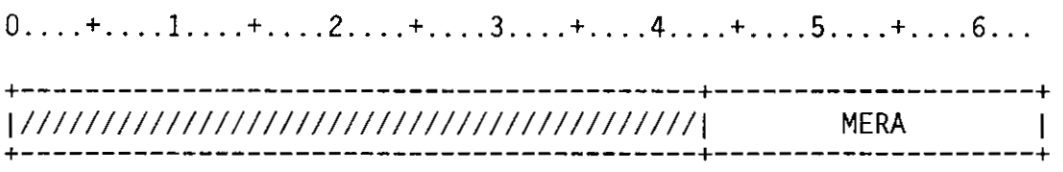


Figure AP-18. Memory error for 16 bank X-MP

Field	Word(base8)	Bits	Description
APMERA	3	43-63	Composite error
APMCHP	3	43-45	Bank chip field
APMBIT	3	46-59	Bank failing bit

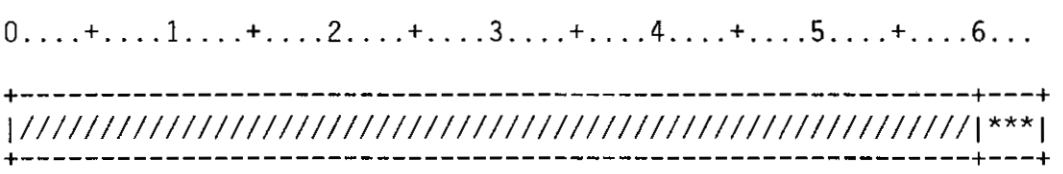


Figure AP-19. Memory error for 16 bank X-MP

Field	Word(base8)	Bits	Description
APMBNK	3	60-63	Composite Bank Error Address
APMB1	3	60	Bank Error Address 16K chips 1
APMB2	3	61	Bank Error Address 16K chips 2
APMB3	3	62-63	Bank Error Address 16K chips 3

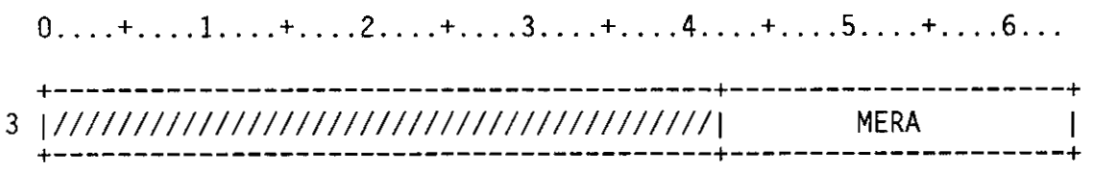


Figure AP-21. Memory error for 32 bank X-MP

Field	Word(base8)	Bits	Description
APMERA	3	42-63	Composite error
APMCHP	3	42-46	Bank chip field
APMBIT	3	47-58	Bank failing bit

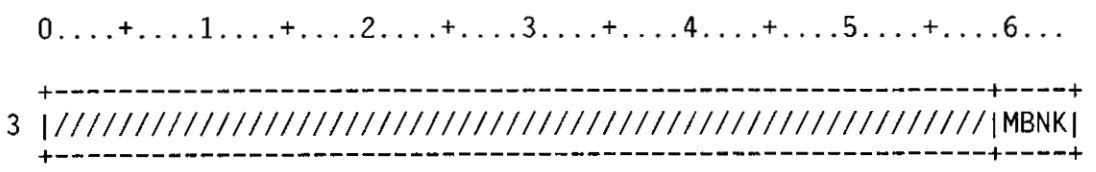


Figure AP-22. Memory error for 32 bank X-MP

Field	Word(base8)	Bits	Description
APMBNK	3	59-63	Composite Bank Error Address
APMB1	3	59	Bank Error Address 16K chips 1
APMB2	3	60-61	Bank Error Address 16K chips 2
APMB3	3	62-63	Bank Error Address 16K chips 3

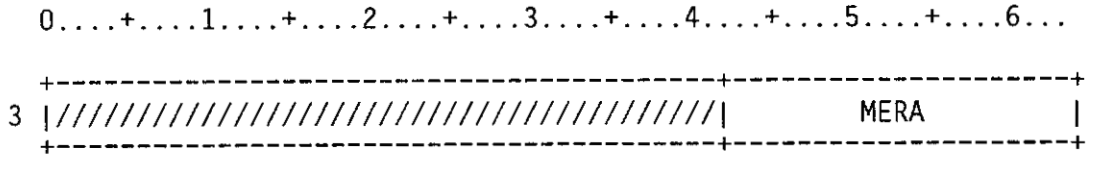


Figure AP-23. Memory error for 32 bank X-MP

Field	Word(base8)	Bits	Description
APMERA	3	42-63	Composite error
APMCHP	3	42-46	Bank chip field
APMBIT	3	47-58	Bank failing bit

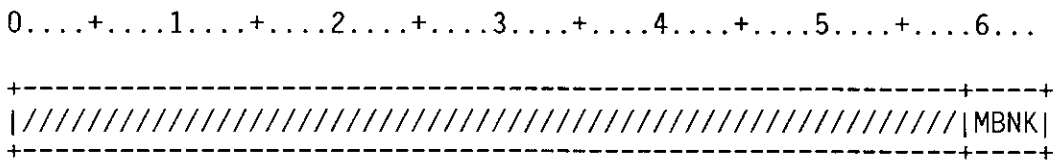


Figure AP-24. Memory error for 32 bank X-MP

Field	Word(base8)	Bits	Description
APMBNK	3	59-63	Composite Bank Error Address
APMB1	3	59	Bank Error Address 16K chips 1
APMB2	3	60-61	Bank Error Address 16K chips 2
APMB3	3	62-63	Bank Error Address 16K chips 3

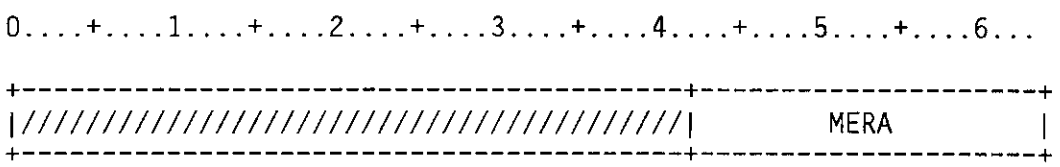


Figure AP-25. Memory error for 32 bank X-MP

Field	Word(base8)	Bits	Description
APMERA	3	42-63	Composite error
APMCHP	3	42-46	Bank chip field
APMBIT	3	47-58	Bank failing bit

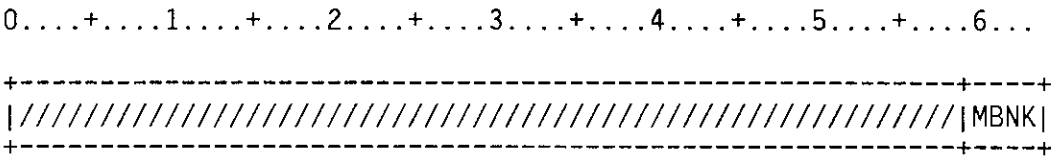


Figure AP-26. Memory error for 32 bank X-MP

Field	Word(base8)	Bits	Description
APMBNK	3	59-63	Composite Bank Error Address
APMB1	3	59	Bank Error Address 16K chips 1
APMB2	3	60-61	Bank Error Address 16K chips 2
APMB3	3	62-63	Bank Error Address 16K chips 3

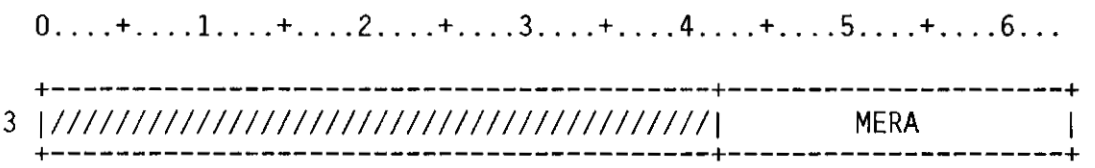


Figure AP-27. Memory error for 32 bank X-MP

Field	Word(base8)	Bits	Description
APMERA	3	42-63	Composite error
APMCHP	3	42-44	Bank chip field
APMBIT	3	45-58	Bank failing bit

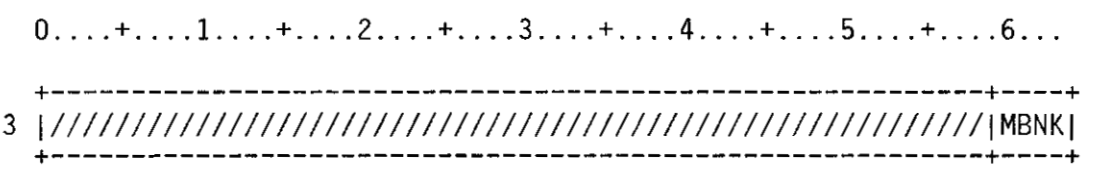


Figure AP-28. Memory error for 32 bank X-MP

Field	Word(base8)	Bits	Description
APMBNK	3	59-63	Composite Bank Error Address
APMB1	3	59	Bank Error Address 16K chips 1
APMB2	3	60-61	Bank Error Address 16K chips 2
APMB3	3	62-63	Bank Error Address 16K chips 3

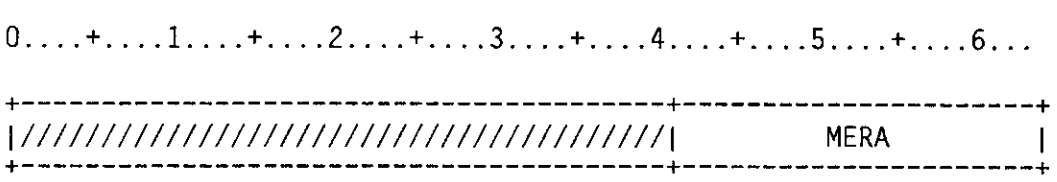


Figure AP-30. Memory error for 64 bank X-MP

Field	Word(base8)	Bits	Description
APMERA	3	41-63	Composite error
APMCHP	3	41-43	Bank chip field
APMBIT	3	44-57	Bank failing bit

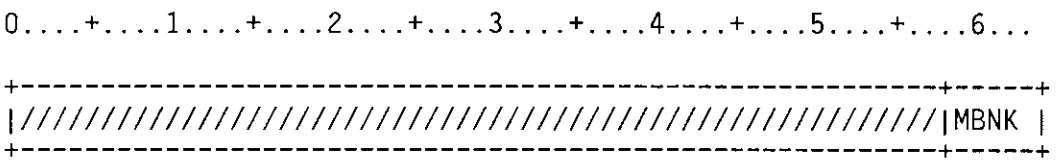


Figure AP-31. Memory error for 64 bank X-MP

Field	Word(base8)	Bits	Description
APMBNK	3	58-63	Composite Bank Error Address(Quad)
APMB1	3	58-59	Bank Error Address 16K chips(Quad) 1
APMB2	3	60-61	Bank Error Address 16K chips(Quad) 2
APMB3	3	62-63	Bank Error Address 16K chips(Quad) 3

F-packet fields (user channel driver request)

F-packets contain requests for action by IOS driver overlays under the user channel shell. Such drivers are used by the ISP system and by subsystem jobs that use devices directly.

F-packets have various formats, depending on the function code of the request (APFCFN). The first word and part of the second have a standard format for all F-packets.

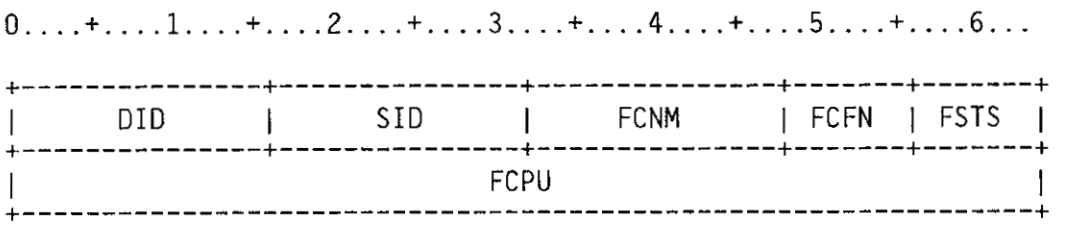


Figure AP-32. Channel Driver Request (F-packet) Header

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APFCNM	0	32-47	Channel name:
APFIOS	0	32-38	Channel location: 0 = CPU nn = Chan.num. of IOS low-speed chan
APFIOP	0	39-41	IOP number (only if APFIOS # 0) 0 = MIOP, 1 = BIOP, etc.
APFCHN	0	42-47	Physical channel number
APFCFN	0	48-55	Channel function code:
APFSTS	0	56-63	Response status code
APFST2	0	56	2nd-half status on CFNRDD, CFNWTD
APFST	0	57-63	Driver status code:
APFCPU	1	0-63	Data for COS system task

The following line is a *CALL to comdeck COMAPFC.

CFN$xxx codes are used to specify the type of request to the shell and/or driver.

If codes are added, CFNMIN, CFNRSV, CFN$DMIN, and CFN$DMAX must be updated accordingly.

```
CFN$MIN=3 Minimum legal code
CFN$OPE=3 Driver Open
CFN$CLS=4 Driver close
CFN$RD=5  Read header
CFN$RDH=6 Read header and hold data
CFN$RDD=7 Read both header and data
CFN$WT=D'8   Write header
CFN$WTH=D'9  Write header and hold
data
CFN$WTD=D'10 Write header and data
CFN$RSV=D'11 - D'31      Reserved
CFN$DMIN=D'32          Minimum
legal driver function code
CFN$DMAX=D'127         Maximum
legal driver function code
```

CST$xxx codes are returned by the shell and drivers.

```
CST$CMP=0 Complete
CST$MIN=CST$CMP        Minimum
status
CST$PRO=3 Protocol error
CST$CHN=4 Illegal channel number
CST$FCN=5 Illegal function code
CST$DVN=6 Illegal driver name
CST$DAE=7 Data address error
CST$DLE=D'8  Data length error
CST$MAX=CST$DLE        Maximum
status
```

```
D'9  - D'31      Reserved
```

```
CST$DMIN=D'32          Min driver
specific code
CST$DMAX=D'127         Max driver
specific code
```

CST$xxx codes for loopback driver.

```
CST$TMO=D'32 Loopback Driver
timeout
```

The Driver Open request (CFN$OPE) creates a driver activity in the I/O Subsystem for a given physical channel. The activity invokes the driver overlay named in the request.

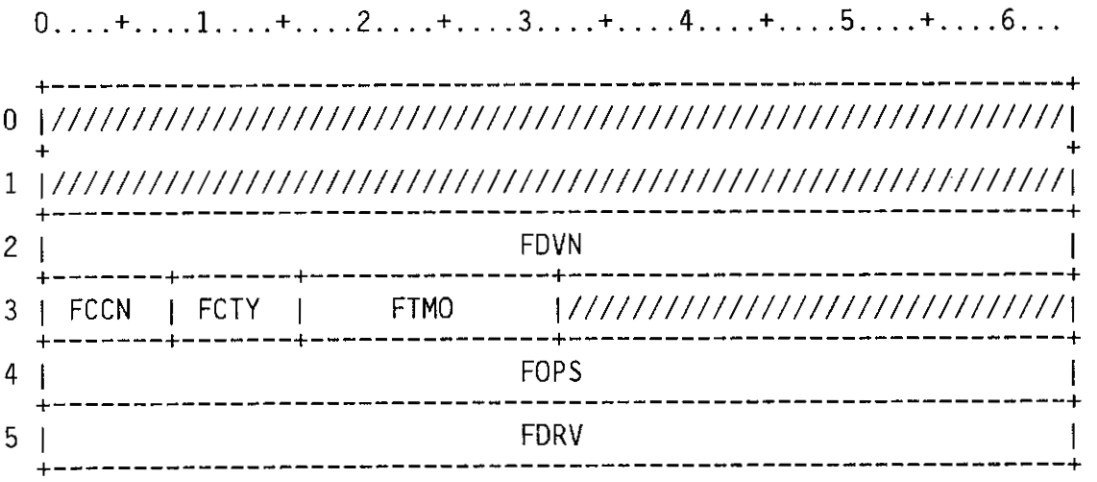


Figure AP-33. DRIVER OPEN function F-packet

Words 0-1 share general format (above)

Field	Word(base8)	Bits	Description
APFDVN	2	0-63	Driver name (ASCII)
APFCCN	3	0-7	Co-channel number
APFCTY	3	8-15	Channel type:
APFTMO	3	16-31	Channel timeout in tenth/second
APFOPS	4	0-63	Spare word for open parameters
APFDRV	5	0-63	Reserved for driver use

The ISP channel driver ISPDRV uses the APFDRV word in the driver request packet for additional parameters on the Driver Open request:

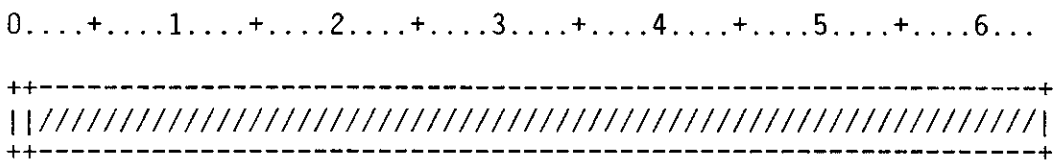


Figure AP-34. ISPDRV Driver Open request fields

Field	Word(base8)	Bits	Description
APFXB	5	0	Use double-buffering if set

The ISP channel driver ISPDRV returns the following fields in the APFDRV word of a reply to a request to read if the data contains an ISP link header:

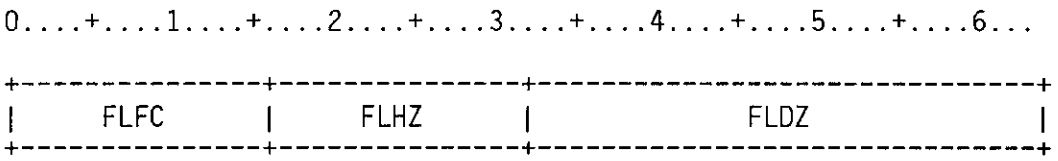


Figure AP-35. ISPDRV I/O reply fields

Field	Word(base8)	Bits	Description
APFLFC	5	0-15	Link header function code
APFLHZ	5	16-31	Header block length in words
APFLDZ	5	32-63	Data block length in words

The following packet format is used for requests to transfer data (CFN$RD, RDH, RDD, WT, WTH and WTD). Depending on the type of request, one or two buffers may be used.

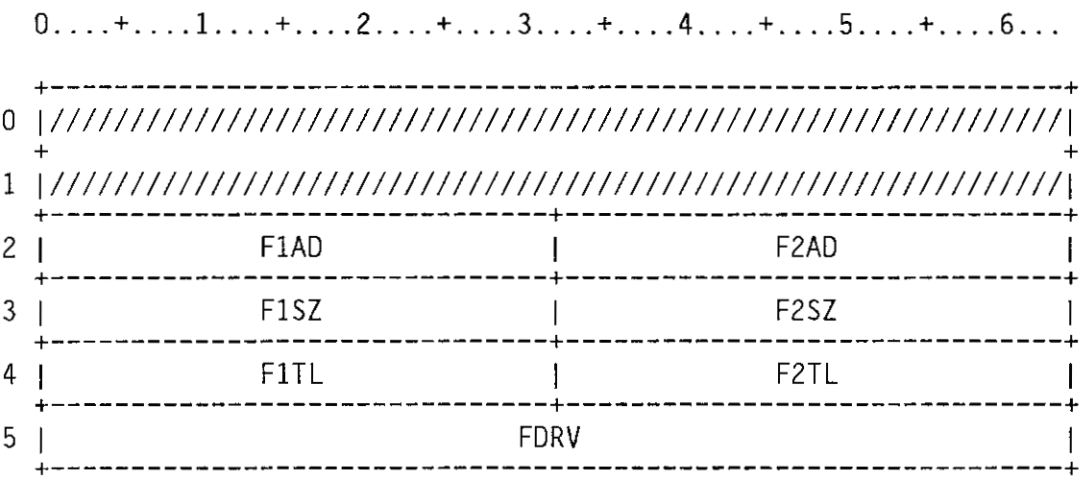


Figure AP-36. READ and WRITE function F-packet

Words 0-1 share general format (above)

Field	Word(base8)	Bits	Description	
APF1AD	2	0-31	First buffer address	
APF2AD	2	32-63	Second buffer address	
APF1SZ	3	0-31	First buffer length	(bytes)
APF2SZ	3	32-63	Second buffer length	(bytes)
APF1TL	4	0-31	First transmitted length	(bytes)
APF2TL	4	32-63	Second transmitted length	(bytes)
APFDRV	5	0-63	Reserved for driver use	

This F-packet format is used by user-defined driver functions (CFN$DMIN through CFN$DMAX) and the Driver Close request (CFN$CLS). Use of the last four words is dependent on the type of driver.

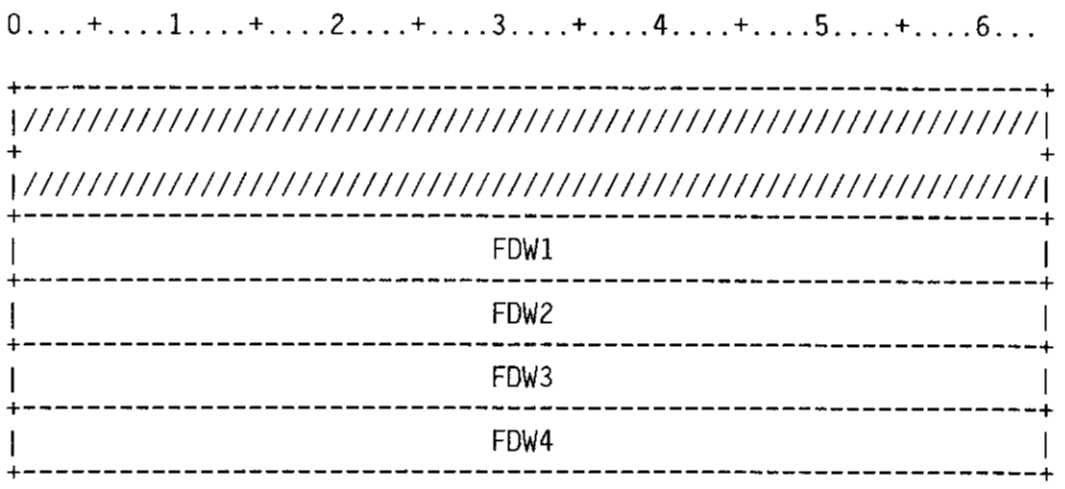


Figure AP-37. Driver request function F-packet

Words 0-1 share general format (above)

Field	Word(base8)	Bits	Description
APFDW1	2	0-63	First word available to user
APFDW2	3	0-63	Second word available to user
APFDW3	4	0-63	Third word available to user
APFDW4	5	0-63	Fourth word available to user

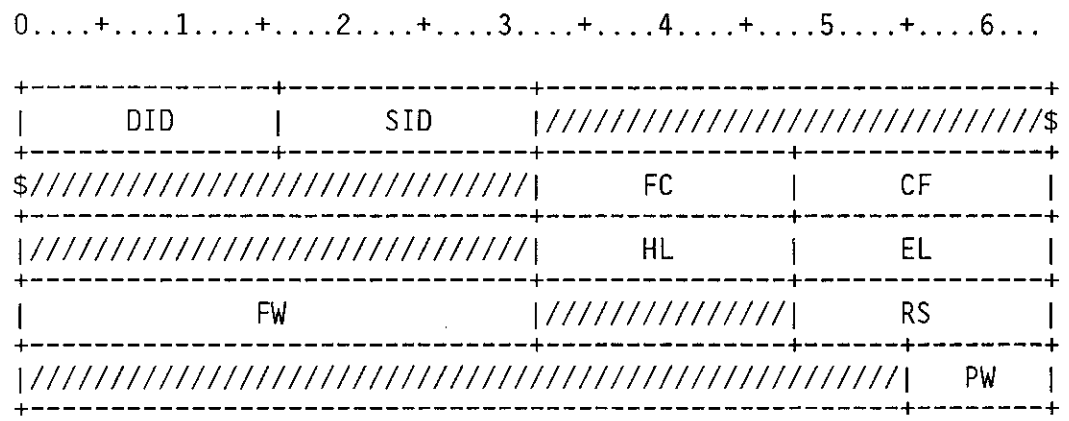


Figure AP-38. G-packet (configuration request)

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APFC	1	32-47	Function code (X$CC)
APCF	1	48-63	Configuration flags
APHL	2	32-47	Header length of COS configuration table (only when APCC=0)
APEL	2	48-63	Entry length of COS configuration table (only when APCC = 0)
APFW	3	0-31	Absolute central memory address of COS configuration table (only when APCC=0)
APRS	3	48-63	Length in sectors of table(rounded up) (only when APCC=0)
APPW	4	55-63	Partial word count of last sector of table (only when APCC=0)

K-packet fields (kernel request).

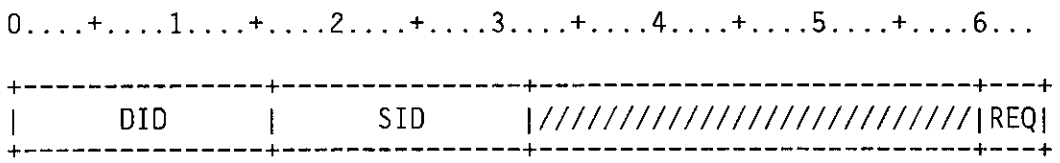


Figure AP-39. K-packet (kernel request)

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APREQ	0	60-63	Request code: APREQCON=0 Channel on APREQCOF=1 Channel off APREQHLT=2 Halt I/O subsystem

If the K-packet is a halt request (APREQHLT), a message is sent after the packet containing an ASCII text explanation.

APHLTML=D'8 Length of halt text sent after packet

S-packet fields (statistics request).

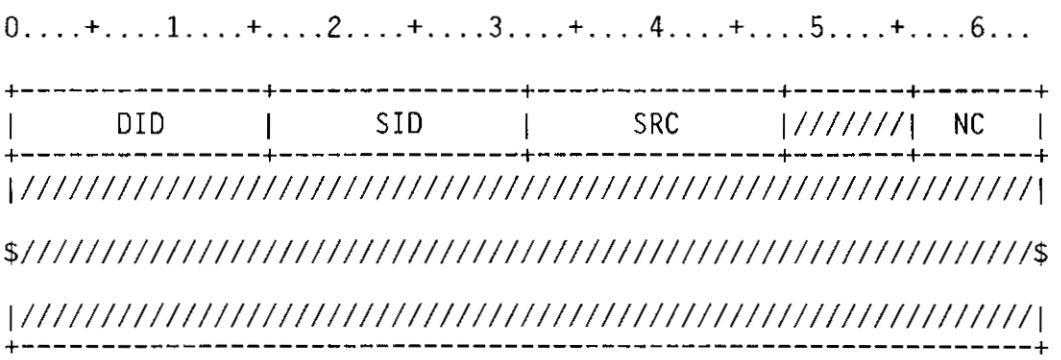


Figure AP-40. S-packet (statistics request)

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APSRC	0	32-47	S-packet request subcode: APSCPU=0 CPU timing statistics APSST=1 System task statistics (global) APSMEM=2 System memory utilization APSSSD=3 SSD channel utilization
APNC	0	56-63	Number of CPUs
AP	1-5	0-63	Subcode-dependent information

CPU timing statistics

For subfunction APSCPU (CPU timing statistics), the following fields are returned.

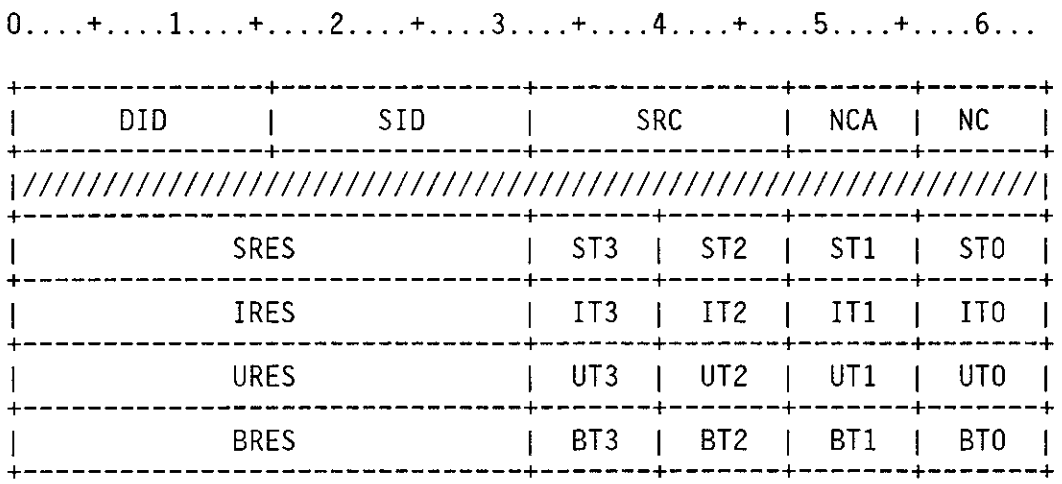


Figure AP-41. CPU timing statistics

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APSRC	0	32-47	S-packet request subcode (0)
APNCA	0	48-55	Number of CPUs Active
APNC	0	56-63	Number of CPUs
APSRES	2	0-31	Reserved
APST3	2	32-39	Percent system time, CPU 3
APST2	2	40-47	Percent system time, CPU 2
APST1	2	48-55	Percent system time, CPU 1
APST0	2	56-63	Percent system time, CPU 0
APIRES	3	0-31	Reserved
APIT3	3	32-39	Percent idle time, CPU 3

Field	Word(base8)	Bits	Description
APIT2	3	40-47	Percent idle time, CPU 2
APIT1	3	48-55	Percent idle time, CPU 1
APIT0	3	56-63	Percent idle time, CPU 0
APURES	4	0-31	Reserved
APUT3	4	32-39	Percent user time, CPU 3
APUT2	4	40-47	Percent user time, CPU 2
APUT1	4	48-55	Percent user time, CPU 1
APUT0	4	56-63	Percent user time, CPU 0
APBRES	5	0-31	Reserved
APBT3	5	32-39	Percent I/O blocked time, CPU 3
APBT2	5	40-47	Percent I/O blocked time, CPU 2
APBT1	5	48-55	Percent I/O blocked time, CPU 1
APBT0	5	56-63	Percent I/O blocked time, CPU 0

The S-packet fields must be expanded if more than four CPUs are defined.

Task timing statistics

For subfunction APSST (task statistics) information is returned about EXEC in the reply packet to the IOS, along with addresses and values which enable the IOS to locate fields within the system task table (STT).

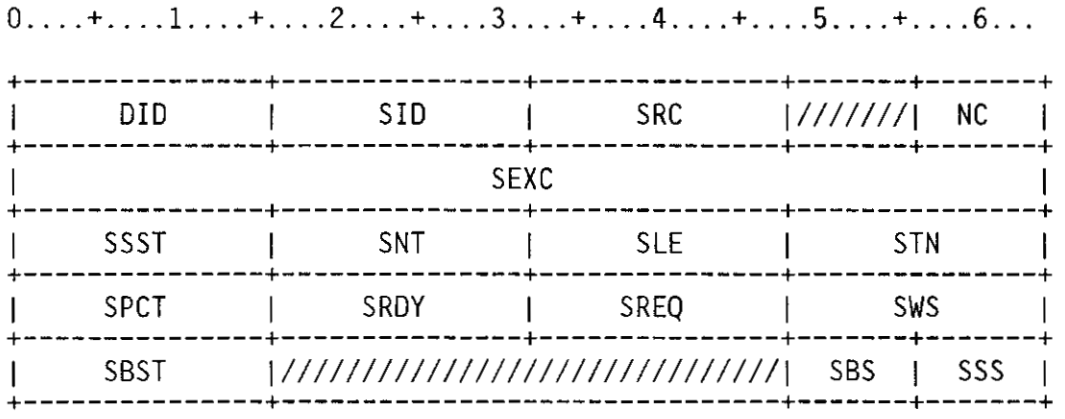


Figure AP-42. Task timing statistics

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APSRC	0	32-47	Task timing statistics (subcode 1)
APNC	0	56-63	Number of CPUs
APSEXC	1	0-63	EXEC timing percentages:
APSCI	1	0-15	% of all CP time, integer portion
APSCF	1	16-31	Fract. portion
APSSI	1	32-47	% of system time, integer portion
APSSF	1	48-63	fract. portion
APSSST	2	0-15	Address of first STT entry
APSNT	2	16-31	Number of system tasks
APSLE	2	32-47	Length of each STT entry
APSTN	2	48-63	Word offset to task name
APSPCT	3	0-15	Word offset to percentage word 1 (formatted the same as EXEC timings)

Field	Word(base8)	Bits	Description
APSRDY	3	16-31	Word offset to task ready count
APSREQ	3	32-47	Word offset to task request count
APSWS	3	48-63	Word offset to suspend flag
APSBST	4	0-15	Base address of STP area
APSBS	4	48-55	Parcel (0-3) in word w/suspend flag
APSSS	4	56-63	Bit (0-15) in parcel w/suspend flag (0 = high order bit in parcel)

Central memory utilization

For central memory utilization (subfunction APSMEM), the following fields are used:

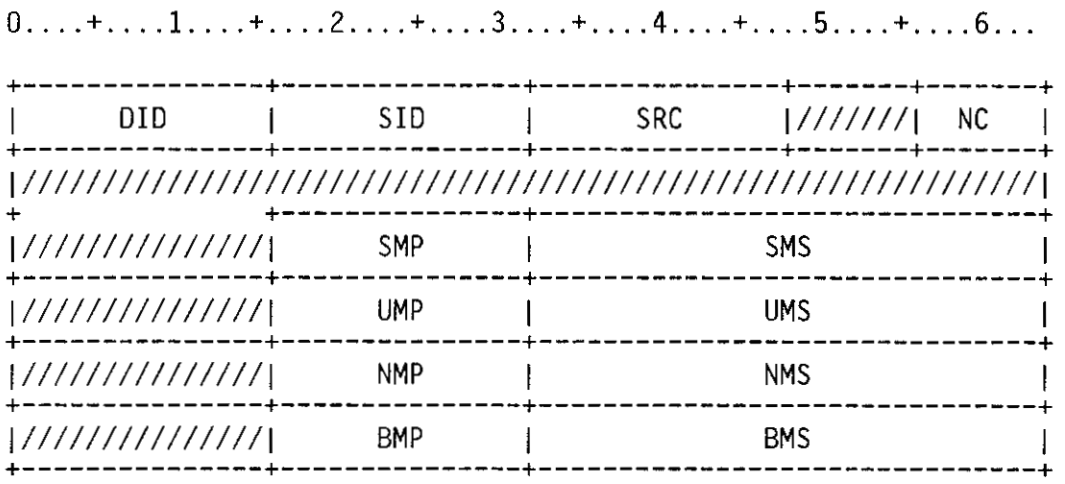


Figure AP-43. Central Memory Utilization

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APSRC	0	32-47	Task timing statistics (subcode 2)
APNC	0	56-63	Number of CPUs
APSMP	2	16-31	System memory percentage
APSMS	2	32-63	System memory size in words
APUMP	3	16-31	User memory percentage
APUMS	3	32-63	User memory size in words
APNMP	4	16-31	Unused memory percentage
APNMS	4	32-63	Unused memory size in words
APBMP	5	16-31	Buffer memory percentage
APBMS	5	32-63	Buffer memory size in words

SSD channel utilization

For SSD channel utilization (subfunction APSSSD), the following fields are used:

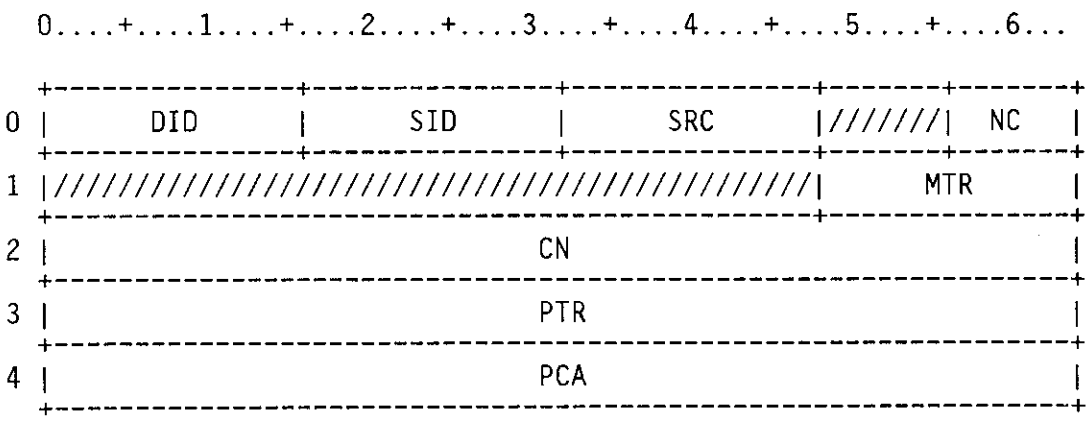


Figure AP-44. SSD Channel Utilization

Field	Word(base8)	Bits	Description
APDID	0	0-15	Destination ID
APSID	0	16-31	Source ID
APSRC	0	32-47	SSD channel utilization (subcode 3)
APNC	0	56-63	Number of channels
APMTR	1	48-63	Maximum transfer rate in mbytes/sec
APCN	2	0-63	Channel number
APCN0	2	0-15	Channel number (channel 0)
APCN1	2	16-31	Channel number (channel 1)
APCN2	2	32-47	Channel number (channel 2)
APCN3	2	48-63	Channel number (channel 3)
APPTR	3	0-63	Percent transfer rate
APPTR0	3	0-15	Percent transfer rate (channel 0)
APPTR1	3	16-31	Percent transfer rate (channel 1)
APPTR2	3	32-47	Percent transfer rate (channel 2)
APPTR3	3	48-63	Percent transfer rate (channel 3)

Field	Word(base8)	Bits	Description
APPCA	4	0-63	Percent channel active
APPCA0	4	0-15	Percent channel active (channel 0)
APPCA1	4	16-31	Percent channel active (channel 1)
APPCA2	4	32-47	Percent channel active (channel 2)
APPCA3	4	48-63	Percent channel active (channel 3)

```
CFN$MIN   =  3              Minimum legal code
CFN$OPE   =  3              Driver Open
CFN$CLS   =  4              Driver close
CFN$RD    =  5              Read header
CFN$RDH   =  6              Read header and hold data
CFN$RDD   =  7              Read both header and data
CFN$WT    =  D'8            Write header
CFN$WTH   =  D'9            Write header and hold data
CFN$WTD   =  D'10           Write header and data
CFN$RSV   =  D'11           - D'31      Reserved
CFN$DMIN  =  D'32           Minimum legal driver function code
CFN$DMAX  =  D'127          Maximum legal driver function code
CST$CMP   =  0              Complete
CST$MIN   =  CST$CMP        Minimum status
CST$PRO   =  3              Protocol error
CST$CHN   =  4              Illegal channel number
CST$FCN   =  5              Illegal function code
CST$DVN   =  6              Illegal driver name
CST$DAE   =  7              Data address error
CST$DLE   =  D'8            Data length error
CST$MAX   =  CST$DLE        Maximum status
CST$DMIN  =  D'32           Min driver specific code
CST$DMAX  =  D'127          Max driver specific code
CST$TMO   =  D'32           Loopback Driver timeout
```

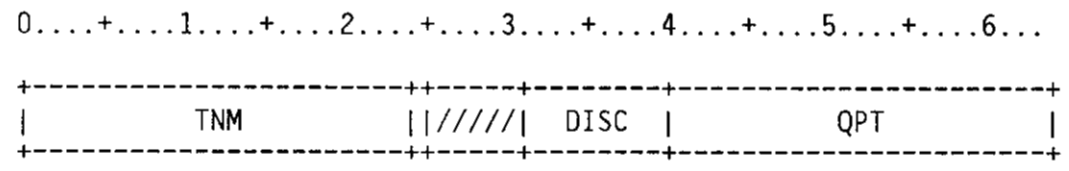


Figure AQ-1. APT(Packet) Queuing Header Table

Field	Word(base8)	Bits	Description
AQTNM	0	0-23	Task name
AQC	0	24	Crash if queue full flag
AQDISC	0	31-39	Count of discarded packets
AQQPT	0	40-63	QPT addr

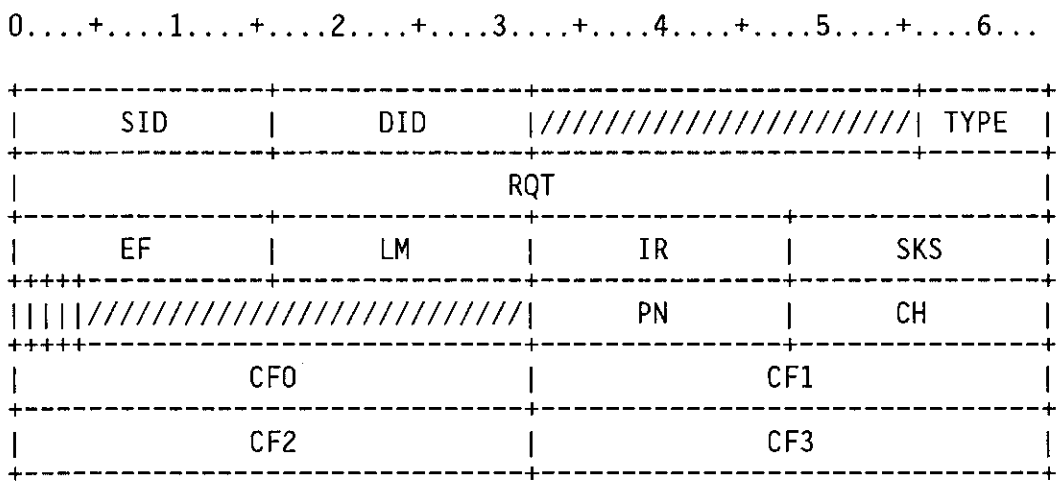


Figure AR-1. IOP Recovered Disk Error Message

Field	Word(base8)	Bits	Description
ARSID	0	0-15	Source ID
ARDID	0	16-31	Destination ID
ARTYPE	0	56-63	Type (2)
ARRQT	1	0-63	CRAY-1 request word
AREF	2	0-15	Initial disk status flags
ARLM	2	16-31	Margin that recovered the request
ARIR	2	32-47	Initial interlock register
ARSKS	2	48-63	Initial seek status
ARTO	3	0	Timeout flag
ARRE	3	1	Disk reservation error
ARCE	3	2	Error correction used flag
ARIFC	3	3	Inconsistent firecode flag
ARPN	3	32-47	IOP processor number
ARCH	3	48-63	IOP channel number

Field	Word(base8)	Bits	Description
ARCF0	4	0-31	Firecode parameter word 0
ARCF1	4	32-63	Firecode parameter word 1
ARCF2	5	0-31	Firecode parameter word 2
ARCF3	5	32-63	Firecode parameter word 3

The Active User Table is an STP-resident table used during interactive communication. An entry is made in the AUT when the user logs on and is released when the user logs off.

There is one AUT entry for each interactive user allowed. Each entry contains the most recent message headers sent to and received from a user terminal; an SDT entry address; queue pointers into the IBT; and other information about the job and terminal state. An entry is active if AUACT=1.

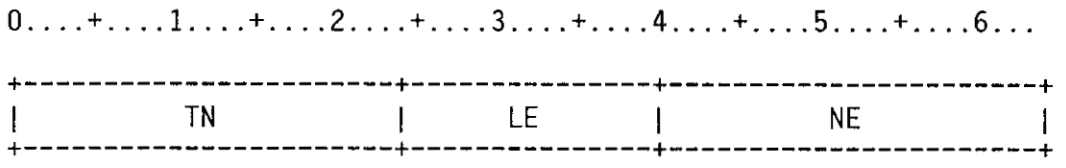


Figure AU-1. Active User Table header

Header.

Field	Word(base8)	Bits	Description
AUTN	0	0-23	Table name ('AUT' in ASCII)
AULE	0	24-39	Entry length (=LE@AUT)
AUNE	0	40-63	Number of entries (=NE@AUT)

Entry.

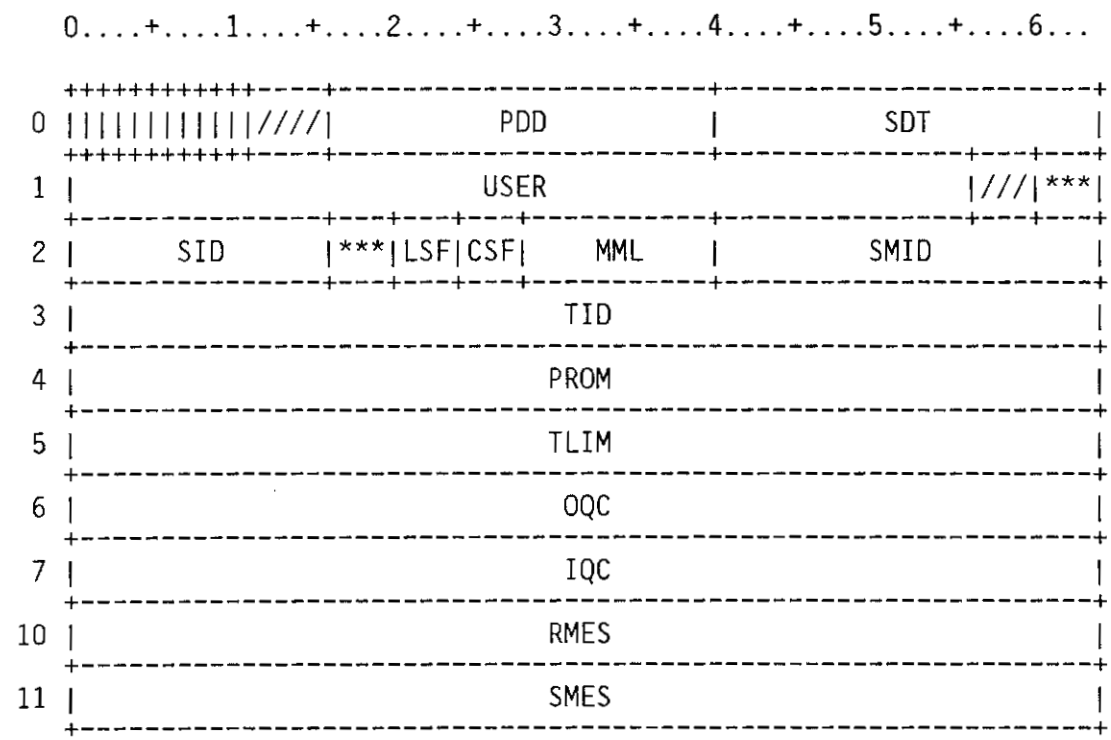


Figure AU-2. Active User Table Entry

Field	Word(base8)	Bits	Description
AUACT	0	0	Active entry flag
AUOFF	0	1	Terminal logged off flag
AUIMR	0	2	Message received flag
AUKILL	0	3	Operator killed the job flag
AUABT	0	4	ABORT special function received flag
AUOPR	0	5	Outstanding prompt at console flag
AUOSUP	0	6	Output suspended flag
AUISUP	0	7	Input suspended flag
AUSLOF	0	8	System logged off the job flag
AULIP	0	9	Logoff-in-process flag
AURDY	0	10	Output is ready for terminal (SCP)
AUPDD	0	16-39	PDD entry address

Field	Word(base8)	Bits	Description
AUSDT	0	40-63	SDT entry address
AUUSER	1	0-55	User name
AUECIN	1	60-63	Last received error code
AUSID	2	0-15	Front end ID
AUNXST	2	16-19	Next state
AULSF	2	20-23	Last received logoff modifier
AUCSF	2	24-27	Last received special function code
AUMML	2	28-39	Maximum message length
AUSMID	2	40-63	Sent message buffer ID to be released
AUTID	3	0-63	Terminal ID
AUPROM	4	0-63	Current terminal prompt
AUTLIM	5	0-63	Time of last input message
AUOQC	6	0-63	Output queue control (1 word):
AUNOM	6	0-15	Number of messages
AUOHSZ	6	16-31	Size of first message
AUOMQT	6	32-47	Message queue tail
AUOMQH	6	48-63	Message queue head
AUIQC	7	0-63	Input queue control (1 word):
AUNIM	7	0-15	Number of messages
AUIHSZ	7	16-31	Size of first message
AUIMQT	7	32-47	Message queue tail
AUIMQH	7	48-63	Message queue head
AURMES	10	0-63	Last received message header (1 word):
AURPN	10	0-11	Process number
AURMN	10	12-15	Message number

Field	Word(base8)	Bits	Description
AURST	10	16-19	Terminal state (receive/suspend)
AUREC	10	20-23	Error code
AURMT	10	24-31	Message type
AURSF	10	32-35	Special function/logoff modifier
AURMOD	10	36	Mode (buffered/unbuffered)
AURCHN	10	37	Chain flag
AURWC	10	52-63	Text word count
AUSMES	11	0-63	Current send message header (1 word):
AUSPN	11	0-11	Process number (assigned at sysgen)
AUSMN	11	12-15	Message number
AUSST	11	16-19	Job state (receive/suspend)
AUSEC	11	20-23	Error code
AUSMT	11	24-31	Message type
AUSSF	11	32-35	Special function code
AUSMOD	11	36	Mode (buffered/unbuffered)
AUSCHN	11	37	Chain flag
AUSWC	11	52-63	Text word count

USED BY:
TQM - Sent as a part of the mount and remount type 3 station messages.

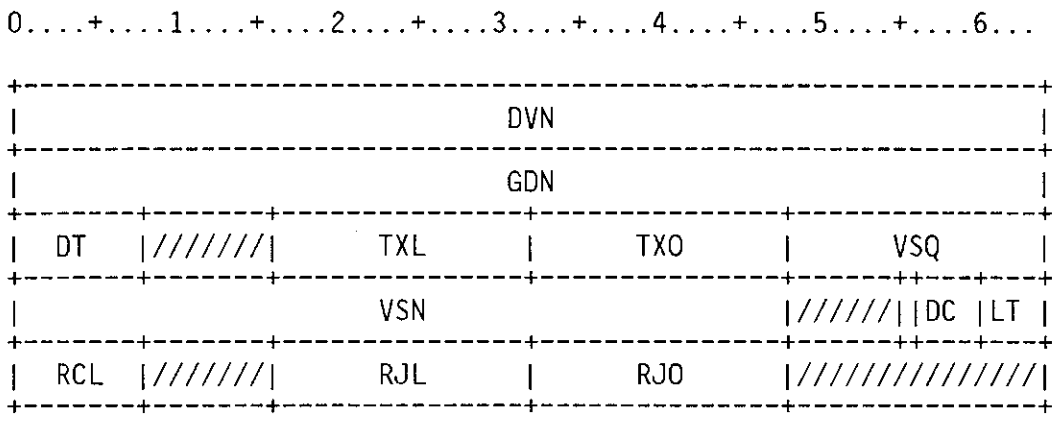


Figure XR-1. Remount/Mount Auxiliary Information Table

Field	Word(base8)	Bits	Description
XRDVN	0	0-63	Device name
XRGDN	1	0-63	Generic device type
XRDT	2	0-7	Device type TPD62(0) = 6250 BPI tape device TPD16(1) = 1600 BPI tape device
XRTXL	2	16-31	Length of text equivalent
XRTXO	2	32-47	Offset to text equivalent
XRVSQ	2	48-63	Volume sequence number(file section)
XRVSN	3	0-47	Requested volume serial number.
XRRG	3	55	Ring status 0 = ring in 1 = ring out
XRDC	3	56-59	Volume disposition code TPOLD(0) = on existing volume TPNEW(1) = new volume

Field	Word(base8)	Bits	Description
XRLT	3	60-63	Requested label type TPLNL(0) = non-labeled TPLAL(1) = ANSI standard labels TPLSS(2) = IBM standard labels
XRRCL	4	0-7	Reject class. remount conditions only TR$NONE(0)= no reject condition TR$VSN (1)= wrong VSN TR$LABL(2)= wrong label type TR$RING(3)= ring change TR$NSCR(4)= not scratchable TR$PDE (5)= write label data error TR$RESH(6)= reset button hit
XRRJL	4	16-31	Length of reject reason
XRRJO	4	32-47	Offset to reject reason

USED BY:
TQM - Sent as a part of the dataset enquiry request and reply type 3 station messages.

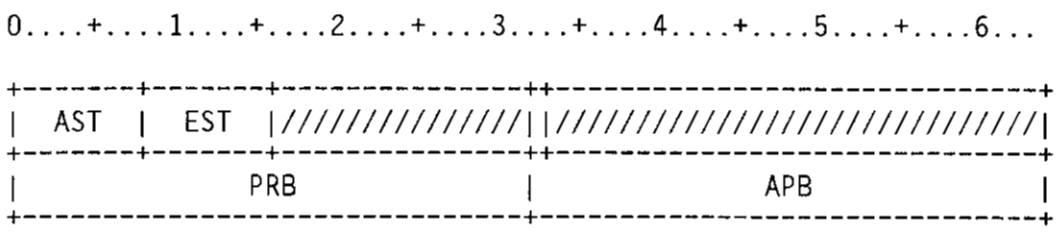


Figure XD-1. Dataset Enquiry Auxiliary Information Table

Field	Word(base8)	Bits	Description
XDAST	0	0-7	Accessability status(reply) XR$NIMP(0) = function not implemented XR$YS (1) = yes and mainframe secure XR$NO (2) = not allowed XR$Y (3) = yes but MF is not secure
XDEST	0	8-15	Existence status(reply) XR$NIMP(0) = function not implemented XR$CAT (1) = dataset is cataloged XR$NCAT(2) = dataset not in catalog XR$NDC (3) = MF has no catalog
XDARG	0	32	Allowable ring status(reply) XR$RIN (0) = ring in is allowed XR$ROUT(1) = ring in is not allowed
XDPRB	1	0-31	Requested permission bits(request)
XDRR	1	0	Read permission
XDRW	1	1	Write permission
XDRRW	1	2	Read followed by write permission
XDRWR	1	3	Write followed by read permission
XDRAP	1	4	Extend(append/mod) permission
XDRDE	1	5	Delete permission
XDRRC	1	6	Recatalog permission
XDRCC	1	7	Characteristic change permission

Field	Word(base8)	Bits	Description
XDAPB	1	32-63	Allowable permission bit(reply)
XDAR	1	32	Read permission
XDAW	1	33	Write permission
XDARW	1	34	Read followed by write permission
XDAWR	1	35	Write followed by read permission
XDAAP	1	36	Extend(append/mod) permission
XDADE	1	37	Delete permission
XDARC	1	38	Recatalog permission
XDACC	1	39	Characteristic change permission

XR$NIMP	=	0	Function not implemented
XR$YS	=	1	Allow access and SFE is secure
XR$N	=	2	Do not allow access
XR$Y	=	3	Allow access but SFE is not secure
XR$CAT	=	1	Dataset is cataloged on SFE
XR$NCAT	=	2	Dataset is not cataloged on SFE
XR$NDC	=	3	SFE has no catalog
XR$RIN	=	0	Allow ring to be in
XR$ROUT	=	1	Force ring to be out

USED BY:
TQM - Sent as a part of the dataset update request and reply type 3 station messages.

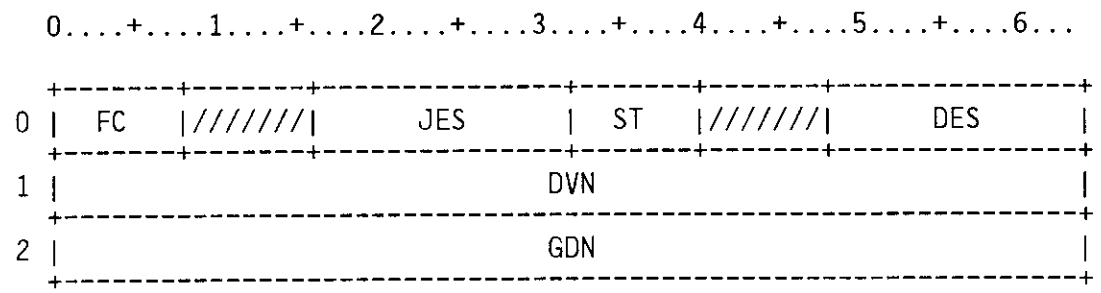


Figure XD-1. Dataset Update Auxiliary Information Table

Field	Word(base8)	Bits	Description
XDFC	0	0-7	Update function code(request/reply) XR$NIMP(0)=Function not implemented XR$UCAT(1)=Catalog dataset XR$URCT(2)=Recatalog dataset XR$UUCT(3)=Uncatalog dataset
XDJES	0	16-31	Job error state(request). last abort for the job(ABxxx).
XDST	0	32-39	Update completion status(reply) XR$NIMP(0)=Function not implemented XR$PASS(1)=Update passed XR$FAIL(2)=Update failed XR$ACAT(3)=Dataset already cataloged XR$NCAT(4)=Dataset is not cataloged
XDDES	0	48-63	Dataset error state(request). Last error reply for the dataset.
XDDVN	1	0-63	Logical device name(request)
XDGDN	2	0-63	Generic device name(request)

XR$UCAT	=	1	Catalog dataset at release time
XR$URCT	=	2	Re-catalog dataset at release time
XR$UUCT	=	3	Un-catalog dataset at release time
XR$UPAS	=	1	Catalog update passed
XR$UFAL	=	2	Catalog update failed
XR$UACT	=	3	Dataset is already cataloged
XR$UNCT	=	4	Dataset is not cataloged
XR$UNCAT	=	5	Front-end does not have a catalog

USED BY:
TQM - Sent as a part of the tape volume access request and reply (type 3 station message).

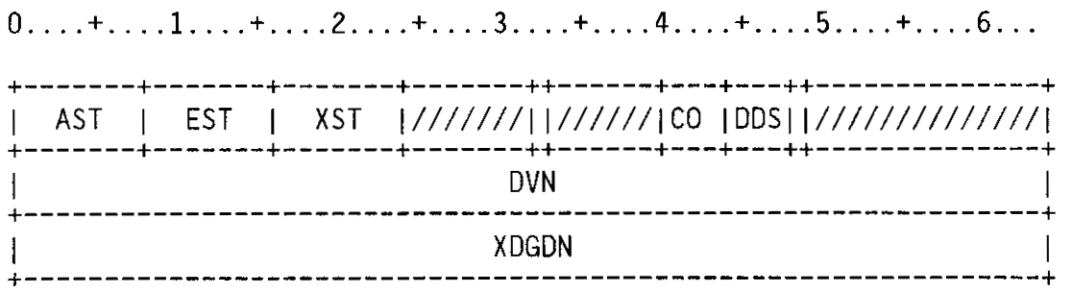


Figure XV-1. Volume Access Auxiliary Information Table

Field	Word(base8)	Bits	Description
XVAST	0	0-7	Accessabilty status(reply) XR$NIMP(0) = Function not implemented XR$YS (1) = Yes and mainframe secure XR$N (2) = Not allowed XR$Y (3) = Yes but MF is not secure
XVEST	0	8-15	Existence status(reply) XR$NIMP(0) = Function not implemented XR$CAT (1) = Volume is in catalog XR$NCAT(2) = Volume is not in catalog XR$NVC (3) = MF has no volume catalog
XVXST	0	16-23	Expiration status(reply) XR$NIMP(0) = Function not implemented XR$VX (1) = Volume is expired XR$VNX (2) = Volume is not expired XR$VIX (3) = Invalid expiration date
XVARG	0	32	Allowable ring status(reply) XR$RIN (0) = Ring may be in volume XR$ROUT(1) = Ring may not be in tape
XVCO	0	40-43	Current operation(request) X$RB (1) = Read X$WB (2) = Write
XVDDS	0	44-47	Dataset disposition(request) TPOLD (0) = Old TPNEW (1) = New

Field	Word(base8)	Bits	Description
XVFAT	0	48	Fatal error on volume access
XVDVN	1	0-63	Logical device name
XDGDN	2	0-63	Generic device name

```
XR$VNC    =  3
XR$VX     =  1
XR$VNX    =  2
XR$VIX    =  3
```

USED BY:
TQM - Sent as a part of the volume update request/reply type 3 station messages.

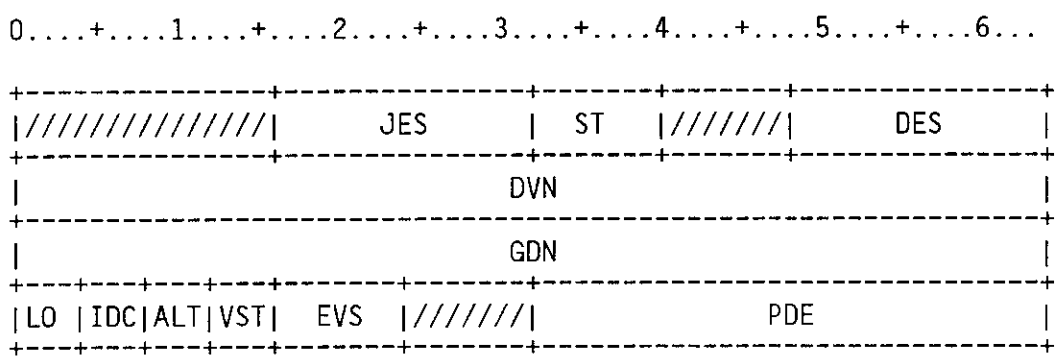


Figure XV-1. Volume Update Auxiliary Information Table

Field	Word(base8)	Bits	Description
XVJES	0	16-31	Last job error state(request)
XVST	0	32-39	Update status(reply) XR$NIMP(0) = Function not implemented XR$PASS(1) = Update passed XR$FAIL(2) = Update failed
XVDES	0	48-63	Last dataset error state(request)
XVDVN	1	0-63	Logical device name
XVGDN	2	0-63	Generic device name
XVLO	3	0-3	Last I/O operation(request) X$RB (1) = Read X$WB (2) = Write
XVIDC	3	4-7	Dataset initial disposition(request) TPOLD (0) = Old TPNEW (1) = New
XVALT	3	8-11	Actual label type(request) TPLNL (0) = Non-labeled TPLAL (1) = ANSI standard labels TPLSL (2) = IBM standard labels

Field	Word(base8)	Bits	Description
XVVST	3	12-15	Current volume state(request) XR$BOV (0) = Begining of volume XR$EOV (1) = End of volume XR$EOF (2) = End of file XR$CLS (3) = Close XR$REW (4) = Rewind
XVEVS	3	16-23	Encountered volume states(request)
XVBOV	3	16	Begining of volume processed
XVEOV	3	17	End of volume processed
XVEOF	3	18	End of file processed
XVCLS	3	19	Close processed
XVREW	3	20	Rewind processed
XVPDE	3	32-63	Permanent data error count(request)

XR$BOV	=	0
XR$EOV	=	1
XR$EOF	=	2
XR$CLS	=	3
XR$REW	=	4

USED BY:

TQM - Received from the servicing front-end as a means of issuing messages, informative or abortive, to the user and/or system logfiles. The messages may or may/not be related to the accompaning reply statuses. The servicing front-end may send more than one message in the table by placing each message on a 10 word boundry, relative to the first message.

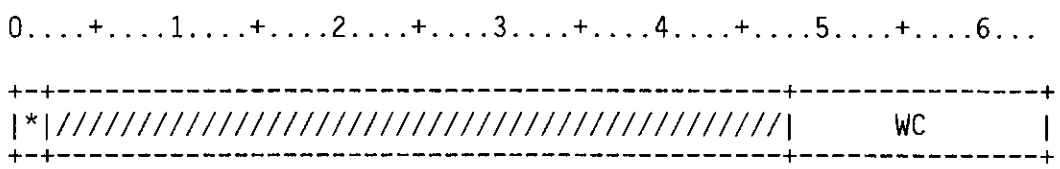


Figure XT-1. Auxiliary Text Message Table

Field	Word(base8)	Bits	Description
XTSU	0	0-1	Logfile selection flags
XTS	0	0	System logfile
XTU	0	1	User logfile
XTWC	0	48-63	Word count

BINARY AUDIT TABLE

The binary audit table is produced by the audit utility for use as input to local utility programs. Because these programs are generally coded in fortran, all fields except those marked as binary are left-justified and blank filled.

There are two basic formats of binary audit tables:

1. A fixed length record containing selected information from the dataset catalog entry for the dataset. There is one such record for each dataset edition in the binary audit file. (See Figure BA-1.)

2. A variable length record containing information from the dataset catalog extension table. There are four subtypes of these records, one each for permits, access tracks, text, and notes. There are as may of these records in the binary audit file as necessary to supply all of the dataset catalog extension information requested on the audit utility control statement.

The variable length records always follow the fixed length record with which they are associated.

Because of the varying length of binary audit records, the FORTRAN BUFFERIN statement is the usual method used to read the binary audit file. The type of record just read can be determined by testing the first word of the record for the following binary integer values (see Figure BA-2):

1 - Permit record (Figures BA-3 and BA-4);
2 - Access tracking record (Figures BA-3 and BA-5);
3 - Text record (Figure BA-6);
4 - Notes record (Figure BA-6).

If the first word is not one of these values, then it is a fixed length dataset catalog information record.

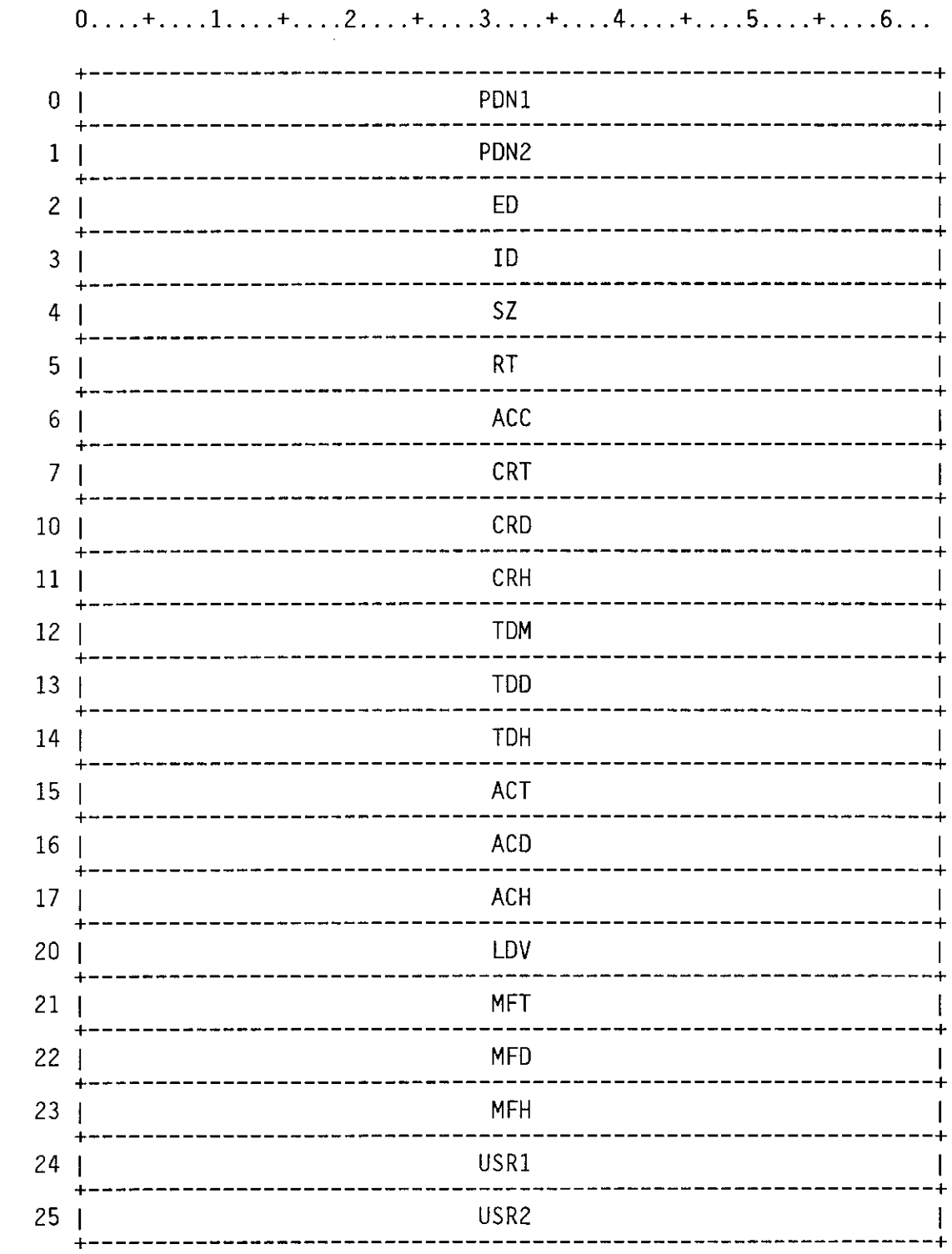


Figure BA-1. Binary audit fixed length record

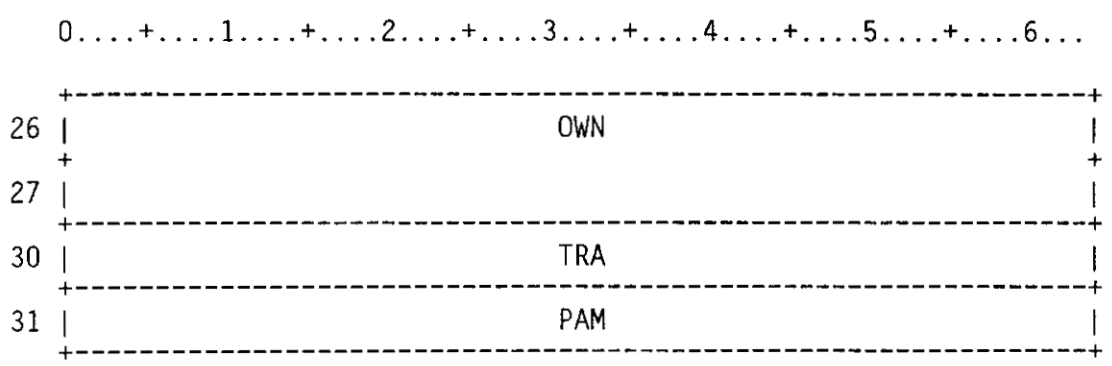


Figure BA-1. Binary audit fixed length record

Field	Word(base8)	Bits	Description
BAPDN1	0	0-63	Permanent dataset name; characters 1-8
BAPDN2	1	0-63	Permanent dataset name; characters 9-15
BAED	2	0-63	Edition number; 1-4095 represented in binary.
BAID	3	0-63	User ID, left-justified with blank fill
BASZ	4	0-63	Dataset size (in words) represented in binary integer
BART	5	0-63	Retention period; 1-4095 represented in binary integer
BAACC	6	0-63	Number of accesses represented in binary
BACRT	7	0-63	Timestamp at Creation time in(binary)
BACRD	10	0-63	Creation date as mm/dd/yy
BACRH	11	0-63	Creation time as hh:mm:ss
BATDM	12	0-63	Timestamp at last dump
BATDD	13	0-63	Date of last dump as mm/dd/yy
BATDH	14	0-63	Time of last dump as hh:mm:ss
BAACT	15	0-63	Timestamp at last access in (binary)

Field	Word(base8)	Bits	Description
BAACD	16	0-63	Date of last access as mm/dd/yy
BAACH	17	0-63	Time of last access as hh:mm:ss
BALDV	20	0-63	Logical device name
BAMFT	21	0-63	Timestamp at last modification in (binary)
BAMFD	22	0-63	Date of last modification as mm/dd/yy
BAMFH	23	0-63	Time of last modification as hh:mm:ss
BAUSR1	24	0-63	User number; characters 1-8.
BAUSR2	25	0-63	User number; characters 9-15.
BAOWN	26-27	0-63	Dataset owner
BAOWN1	26	0-63	Dataset owner; characters 1-8
BAOWN2	27	0-63	Dataset owner; characters 9-15
BATRA	30	0-63	Track access flag ('Y' or 'N')
BAPAM	31	0-63	Public access mode (any of 'NERWM')

The unused words at the end of this record are binary zeros.

Variable length record formats all begin with:

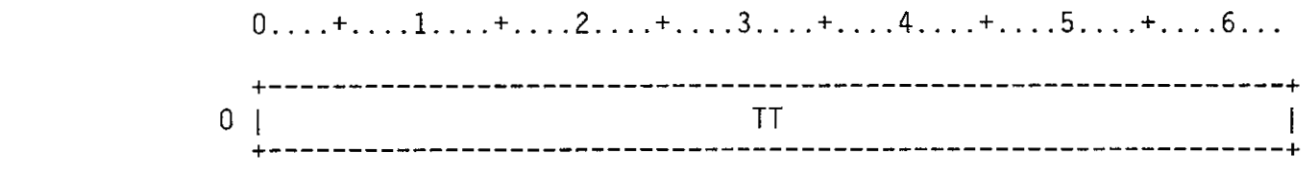


Figure BA-2. Binary audit variable length header

Field	Word(base8)	Bits	Description
BATT	0	0-63	Record type (binary integer) 1=PERMIT,2=TRACK,3=TEXT,4=NOTE

Permit and access tracking records share:

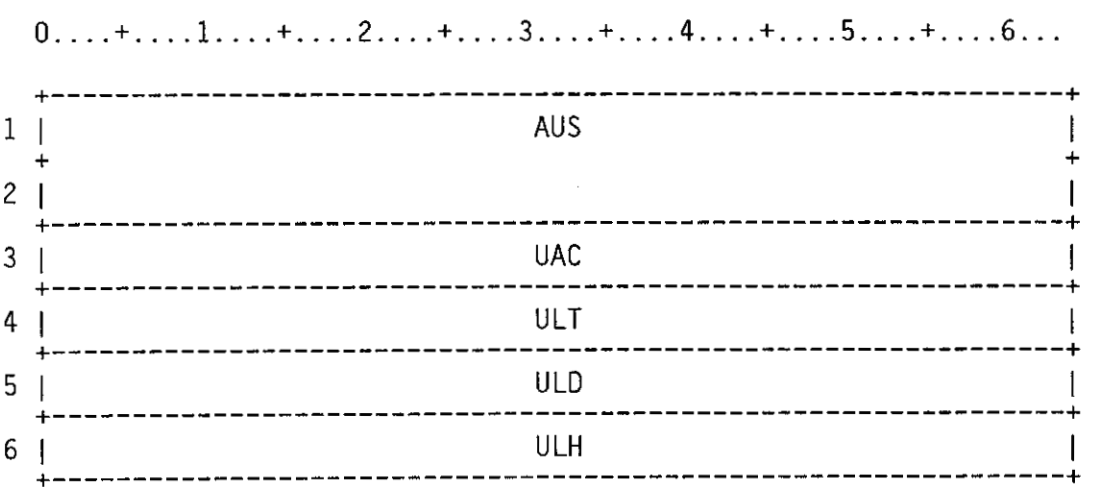


Figure BA-3. Permit and access tracking record

Field	Word(base8)	Bits	Description
BAAUS	1-2	0-63	Permitted or accessing user number
BAAUS1	1	0-63	User number; characters 1-8
BAAUS2	2	0-63	User number; characters 9-15
BAUAC	3	0-63	Access count (binary integer)
BAULT	4	0-63	Timestamp of last access (binary)
BAULD	5	0-63	Date of last access (mm/dd/yy)
BAULH	6	0-63	Time of last access (hh:mm:ss)

Permit records continue with:

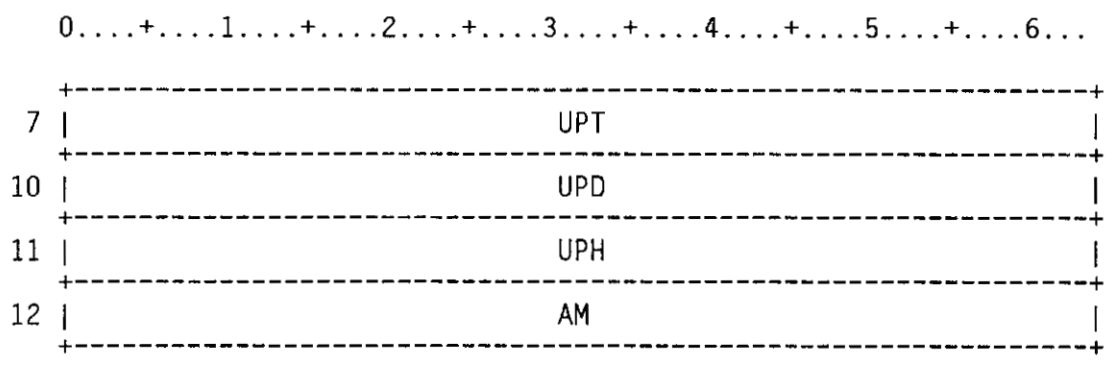


Figure BA-4. Permit continuation

Field	Word(base8)	Bits	Description
BAUPT	7	0-63	Timestamp of permit creation (binary)
BAUPD	10	0-63	Date of permit creation (mm/dd/yy)
BAUPH	11	0-63	Time of permit creation (hh:mm:ss)
BAAM	12	0-63	Permitted access mode (see bapam)

Access tracking records continue with:

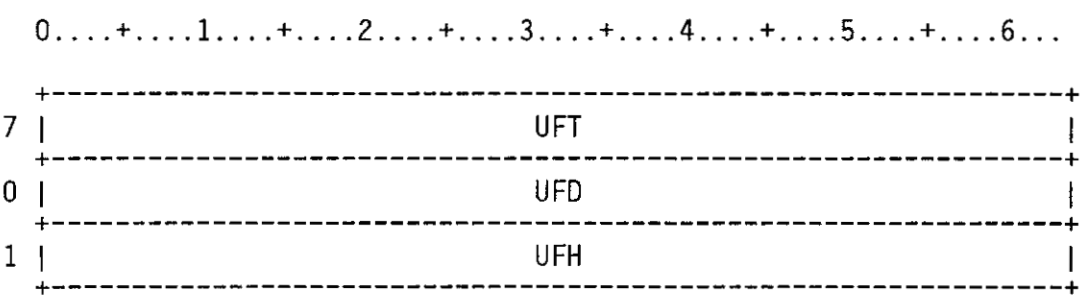


Figure BA-5. Access tracking continuation

Field	Word(base8)	Bits	Description
BAUFT	7	0-63	Timestamp of first access (binary)
BAUFD	10	0-63	Date of first access (mm/dd/yy)
BAUFH	11	0-63	Time of first access (hh:mm:ss)

Text and notes records consist only of the BATT word followed by as many words as necessary to hold the text or notes field. Unused characters in the last word are binary zero filled.

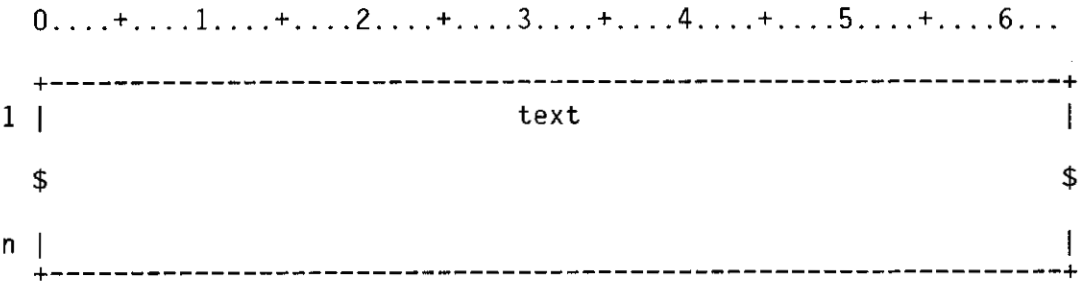


Figure BA-6. Text and notes record

Field	Word(base8)	Bits	Description
BAtext	1-n	0-63	Text or notes

BGN Table. This table is input to the F$BGN call which provides a mechanism for a user program to indicate to the Operating System the location of the executable binary and a P address which the CPU can be released to. In addition, the old BGN format is supported for this release. The following functions are currently supported with the new BGN format:

A) Load a dataset from mass storage as specified by the DSP.
B) Copy memory from a source base address to target base address for lengths specified.
C) Preset memory with supplied pattern from preset base address for lengths specified.

Support is included for the separation of instruction and data segments. Instruction segments are currently supported and any attempt to load a data segment will be aborted.

Define the F$BGN Function codes:

```
BGNLOAD   =  O'1          Load from dataset function code
BGNCOPY   =  O'2          Copy from source to destination
BGNFMAX   =  BGNCOPY      Set max Function Code value
```

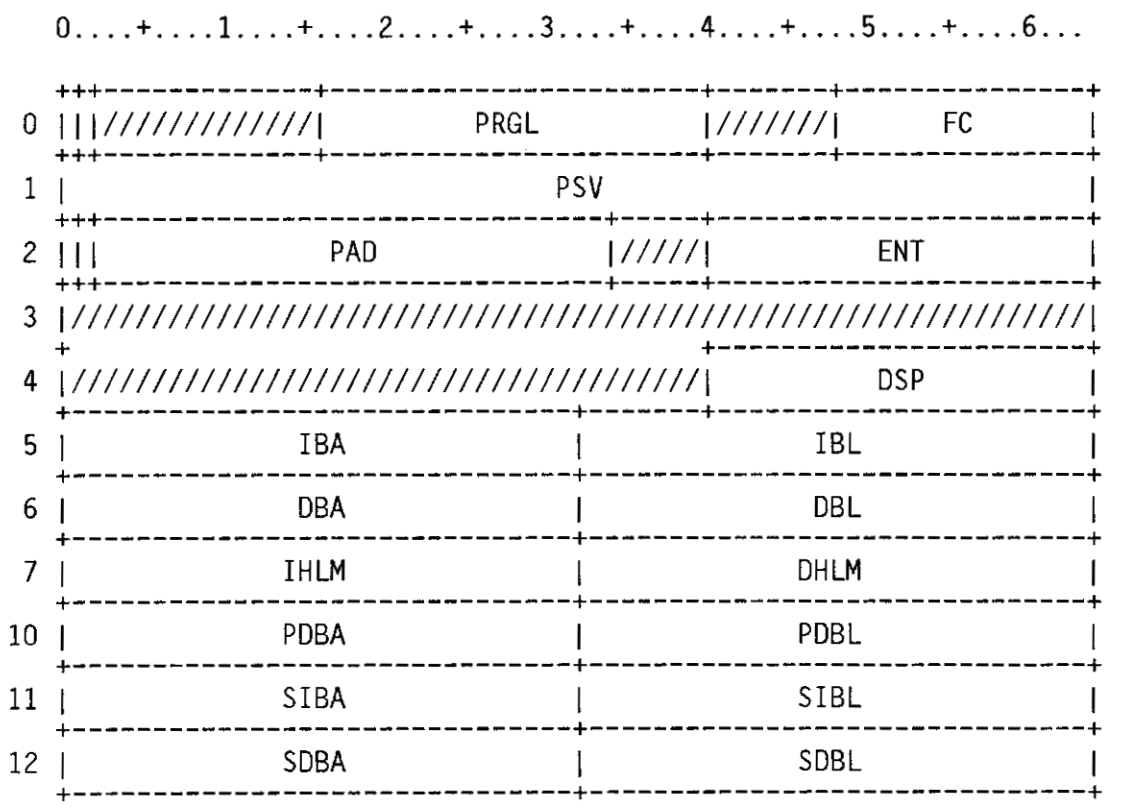


Figure BG-1. Begin Code Execution Table

Field	Word(base8)	Bits	Description
BGPSF	0	0	Preset value flag If=1, preset segment
BGEMA	0	1	EMA setting for new calls, 1=ENABLE
BGPRGL	0	16-39	Program length(Old BGN Format only)
BGFC	0	48-63	BGN Function Code(0 for old)
BGPSV	1	0-63	Preset value
BGBP	2	0	Breakpoint flag
BGNRD	2	1	No reduce bit
BGPAD	2	2-33	Pad value
BGENT	2	40-63	Entry point for instruction segment

New BGN table field definitions

Field	Word(base8)	Bits	Description
BGDSP	4	40-63	DSP address of load dataset
BGIBA	5	0-31	Instruction base address to load to
BGIBL	5	32-63	Instruction segment length
BGDBA	6	0-31	Data base address to load to
BGDBL	6	32-63	Data segment length
BGIHLM	7	0-31	Instruction segment HLM value
BGDHLM	7	32-63	Data segment HLM value
BGPDBA	10	0-31	Preset data base address for pattern
BGPDBL	10	32-63	Preset data length for pattern
BGSIBA	11	0-31	Source Instruction base address(COPY)
BGSIBL	11	32-63	Source Instruction length(COPY)
BGSDBA	12	0-31	Source Data base address(COPY)
BGSDBL	12	32-63	Source Data length(COPY)

Function codes used for F$BIO calls

```
BIOFWR   = 0'50          Write record
BIOFWRP  = 0'40          Write partial record
BIOFRR   = 0'10          Read record
BIOFRRP  = 0             Read partial record
BIOFEOF  = 0'52          Write EOF
BIOFEOD  = 0'56          Write EOD
```

These values represent the required reprieve class designation used in the error message table in EXP.

RPVC00	=	D'00	Disable user reprieve processing
RPVC01	=	D'00	Normal job step termination
RPVC02	=	D'01	User requested abort
RPVC04	=	D'02	System abort
RPVC10	=	D'03	Operator drop
RPVC20	=	D'04	Operator rerun
RPVC40	=	D'05	Memory error
RPVC100	=	D'06	Floating point error
RPVC200	=	D'07	Time limit
RPVC400	=	D'08	Mass storage limit exceeded
RPVC1000	=	D'09	Memory limit exceeded
RPVC2000	=	D'10	Link transfer error
RPVC4000	=	D'11	Security violation
RPVC10K	=	D'12	IA attention, RPVC10000

The Buffer Pool Table, which resides in the high range of memory, is used for buffer pool management in connection with interactive communication.

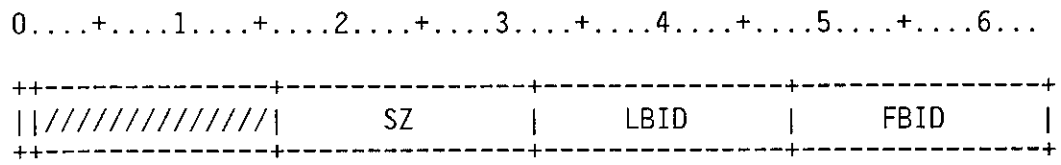


Figure BP-1. Buffer Pool Table

W@BPUBLK=-1 Unblocked message flag

Field	Word(base8)	Bits	Description
BPUBLK	-1	0	W@BPSZ=-1 Message size
BPSZ	-1	16-31	W@BPLBID=-1 Buffer ID for continuation of message
BPLBID	-1	32-47	W@BPFBID=-1 Buffer ID for next message
BPFBID	-1	48-63	W@BPTXT=-2 Beginning of text

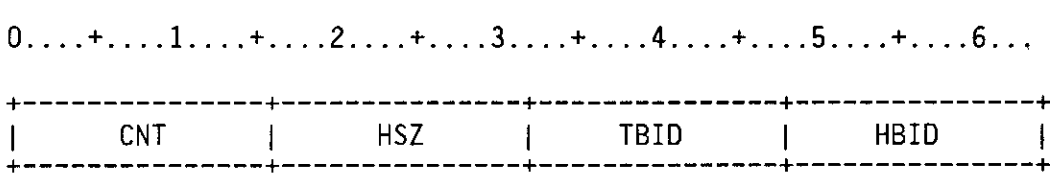


Figure Q-1. Buffer Pool Queue Control Word

Field	Word(base8)	Bits	Description
QCNT	0	0-15	Number of buffers on this string
QHSZ	0	16-31	Size of first message on queue
QTBID	0	32-47	Queue tail buffer ID
QHBID	0	48-63	Queue head buffer ID

This EXEC-resident table is used for working storage by the disk driver and other channel processors.

CHNE = C@CPHCHN-C@CPLCHN+1 Number of physical CPU channels

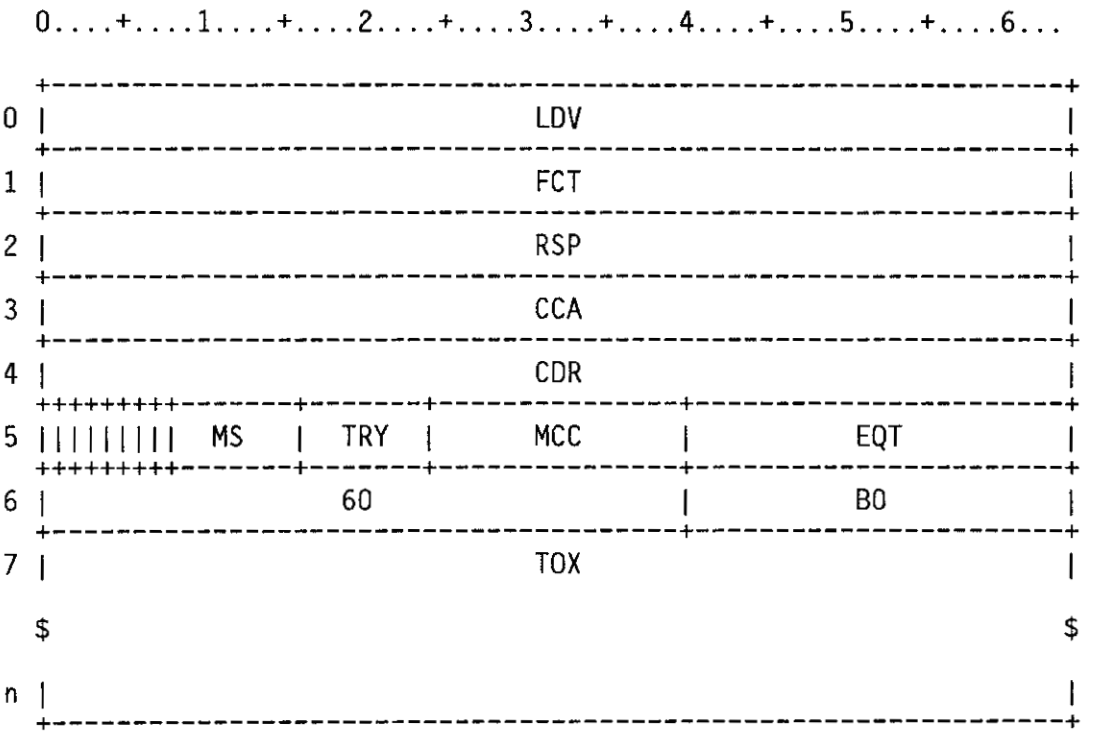


Figure CB-1. Channel Buffer Table

Field	Word(base8)	Bits	Description
CBLDV	0	0-63	Logical device name
CBFCT	1	0-63	Function word
CBUT1	1	53-54	Disk unit number
CBRSP	2	0-63	Last response word
CBSE	2	60-63	HSC error status
CBCCA	3	0-63	Current cylinder address
CBCC3	3	0-15	Current cylinder unit 3

Field	Word(base8)	Bits	Description
CBCC2	3	16-31	Current cylinder unit 2
CBCC1	3	32-47	Current cylinder unit 1
CBCC0	3	48-63	Current cylinder unit 0
CBCDR	4	0-63	Current disk request
* Caution: The format of the following word is assumed to be the same in the EQT, CBT, and RQT.			
CBSC	4	0-13	Sector count
CBCA	4	14-25	Cylinder address
CBTA	4	26-31	Track address
CBSA	4	32-39	Sector address
CBMA	4	40-63	Data memory address
CBTD	5	0	Transfer direction 0 Read 1 Write
CBRWF	5	1	Read/write select flag
CBDT	5	2	Device type 0 DD19 1 DD29
CBBSY	5	3	Device busy flag
CBRM	5	4	Recovery mode flag
CBTM	5	5	Transfer mode: 0 Single 1 Multiblock
CB56	5	6	Undefined
CB57	5	7	Undefined
CBMS	5	8-15	Current margin select offset
CBTRY	5	16-23	Current try count
CBMCC	5	24-39	Master clear count
CBEQT	5	40-63	EQT Table address (EXEC-relative)

Field	Word(base8)	Bits	Description
CB60	6	0-39	Undefined
CBB0	6	40-63	Subroutine return address
CBTOX	7-n	0-63	Active timeout event index

This EXEC-resident table is used for working storage by the disk driver and other channel processors.

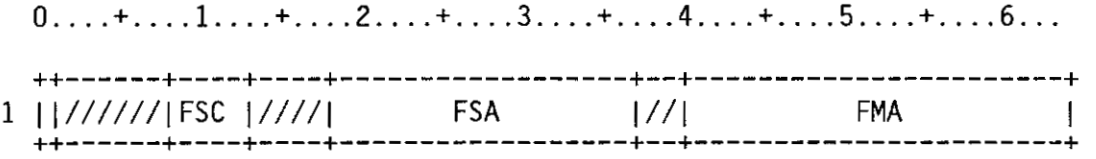


Figure CB-2. HSC Command Word

Field	Word(base8)	Bits	Description
CBFTD	1	0	Transfer direction 0 Read 1 Write
CBFSC	1	8-12	Sector count to transfer
CBFSA	1	18-36	SSD sector address
CBFMA	1	40-63	CP memory address

The chain control word is used in the communication module chain control (CMCC) to locate chains of communication modules (CMODs), which define all task requests in a system. Each word in the CMCC points to a string of CMODs, which define all possible requests to task 0, then to task 1, etc. A task receives and answers any requests through a CMOD. CMODs are described under table CM.

The relation between the CMCC and the chain of CMODs is illustrated in the COS EXEC/STP/CSP Internal Reference Manual, CRI publication SM-0040 (figure 3-1). Figures CC-1 and CC-2 show the formats for the two types of chain control words that form the CMCC.

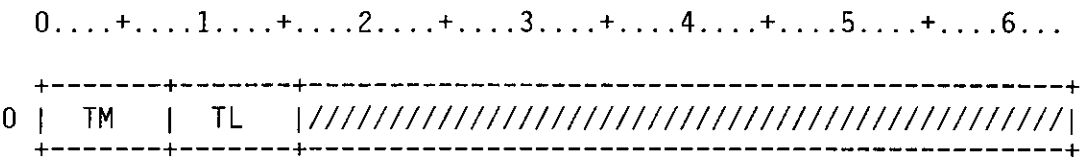


Figure CC-1. Chain Control Word

Field	Word(base8)	Bits	Description
CCTM	0	0-7	Maximum number of items to be queued to a particular task (intertask communication only)
CCTL	0	8-15	Number of items queued to a particular task (intertask communication only)

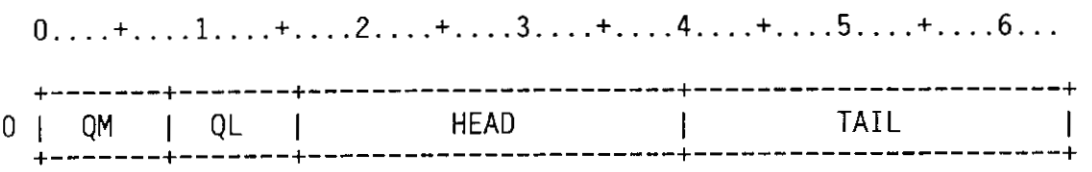


Figure CC-2. Individual Chain Control Words

Field	Word(base8)	Bits	Description
CCQM	0	0-7	Maximum number of items to be queued from one task to another (intertask communication only)
CCQL	0	8-15	Number of items currently queued from one task to another (intertask communication only)
CCHEAD	0	16-39	Address of first item on the chain
CCTAIL	0	40-63	Address of last item on the chain

Any item queued using the STP common routines CHAINZ and CHAINF must reserve the first two words of the item to be used by the common routines.

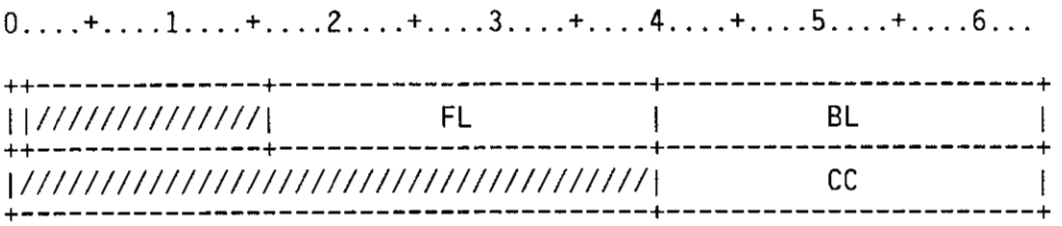


Figure CI-1. Chain Item

Field	Word(base8)	Bits	Description
CIEX	0	0	This bit, if set, indicates that the item is in execution (intertask communication only).
CIFL	0	16-39	Forward link; address of next item on the chain.
CIBL	0	40-63	Backward link; address of the preceding item on the chain.
CICC	1	40-63	Address of the chain control word for this item

The Channel Table resides in EXEC memory and contains information for use by the interrupt handlers. There is one entry for each channel, physical or pseudo.

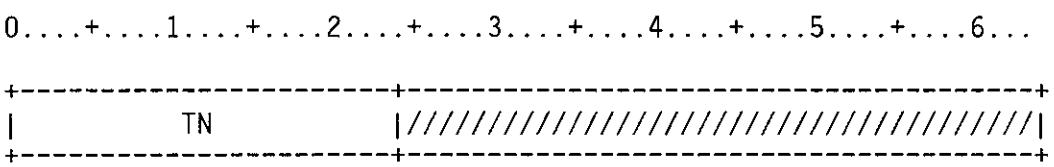


Figure CH-1. Channel Table Header

Field	Word(base8)	Bits	Description
CHTN	0	0-23	Table name; 'CHT' in ASCII.

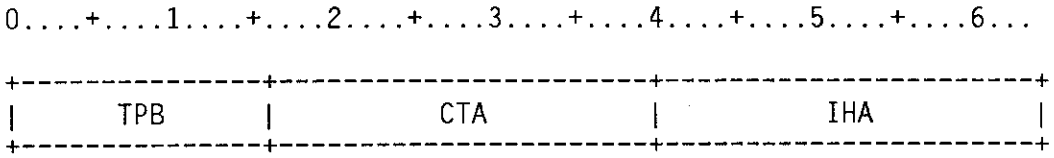


Figure CH-2. Channel Table Entry

Field	Word(base8)	Bits	Description
CHTPB	0	0-15	Address of task parameter block (on a front-end channel)
CHCTA	0	16-39	Channel table address
CHIHA	0	40-63	Interrupt handler address

CN - Configuration Table CNT

The CNT informs the operating system of the status of on-line tape and disk devices. The CNT can be changed during startup by the parameter file or by operator commands.

Each entry, disk or tape, occupies 12 words:

- A tape entry consists of a 4-word configuration table (figure CN-2) and from 0 to 4 tape subentries (each using the format shown in figure CN-4).
- A disk entry consists of a 3-word configuration table (figure CN-3) and 9 words that contain no useful information.

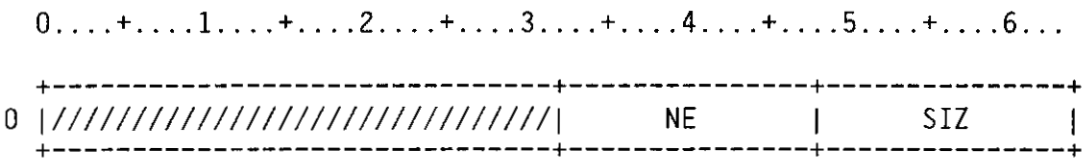


Figure CN-1. Configuration Table header

Field	Word(base8)	Bits	Description
CNNE	0	32-47	Current count of entries in use
CNSIZ	0	48-63	Maximum allowed entries

Tape entry

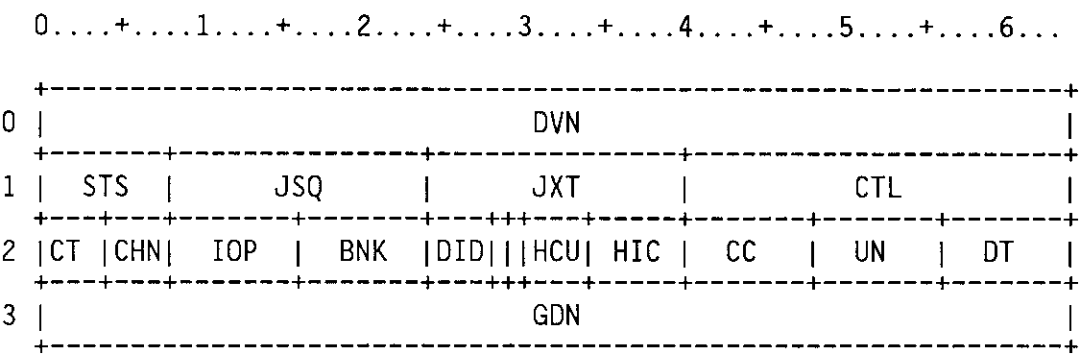


Figure CN-2. Configuration Table Entry for tape

Field	Word(base8)	Bits	Description
CNDVN	0	0-63	Device identifier (name)
CNSTS	1	0-7	Status flags. The following conditions are true if the flag bit is set to 1.
CNDWN	1	0	Device down
CNDBO	1	1	Device downed by operator
CNRDO	1	2	Device is read-only
CNMNT	1	3	Device is in maintenance mode
CNDBS	1	4	Device downed by system
CNNA	1	5	Device not available
CNJSQ	1	8-23	Job sequence number if assigned
CNJXT	1	24-39	JXT ordinal if assigned to job
CNCTL	1	40-63	Control table address (TDT/EQT)
CNCT	2	0-3	Block mux channel type if applicable
CNCHN	2	4-7	CPU channel number if applicable
CNIOP	2	8-15	I/O Subsystem/IOP number
CNBNK	2	16-23	Bank number
CNDID	2	24-27	Device ID (unit number)
CNHST	2	29	Host control unit ID present if flag is set

Field	Word(base8)	Bits	Description
CNHCU	2	30-33	Host control unit if known
CNHIC	2	34-39	Host IOP channel if known
CNCC	2	40-47	Count of IOP channels if applicable
CNUN	2	48-55	Device ordinal in TDT
CNDT	2	56-63	Device type or capability
CNDC	2	56-59	Device type group
CNDCC	2	60-63	Device characteristic within group
CNGDN	3	0-63	Generic device name

Configuration table entry for disk

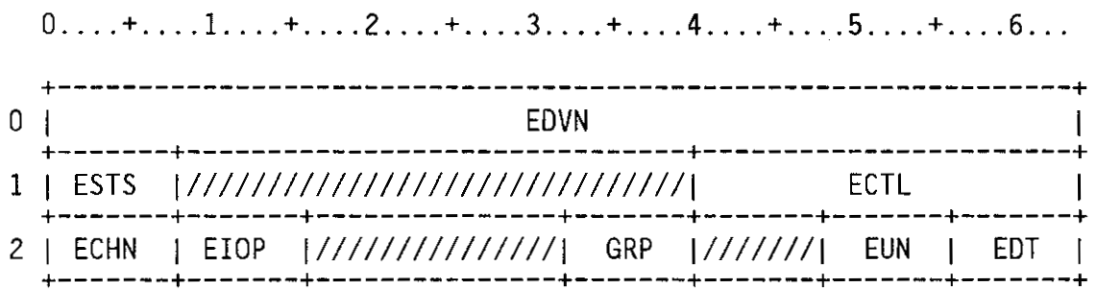


Figure CN-3. Configuration Table entry for disk

Field	Word(base8)	Bits	Description
CNEDVN	0	0-63	Device identifier
CNESTS	1	0-7	Status flags
CNENA	1	0	Device is unavailable
CNEMSD	1	2	Master device
CNEUP	1	3	Device label will be rewritten
CNERBN	1	4	Device is request by name
CNEOFF	1	5	Device is off
CNECTL	1	40-63	Pointer to EQT entry
CNECHN	2	0-7	CPU channel number
CNEIOP	2	8-15	Real I/O processor channel
CNGRP	2	32-39	Disk stripe group id this device
CNEUN	2	48-55	Unit number
CNEDT	2	56-63	Device type

Tape sub-entry

Each tape sub-entry (figure CN-4) shows an IOP channel number and block mux control unit information, which allows turning off a channel or control unit. Space is provided for 8 control unit IDs, although the current maximum is 4. For each control unit that can address the device from a specific IOP channel, the following information is shown:

- Identification
- Whether the control unit is a host or a remote control unit
- Whether the control unit is available (on or off)

Each control unit entry consists of a 4-bit status field and a 4-bit control unit ID, with the used entries left-justified in the word W@CNPTH. The number of applicable sub-entries for tape devices is obtained from field CNCC of the entry.

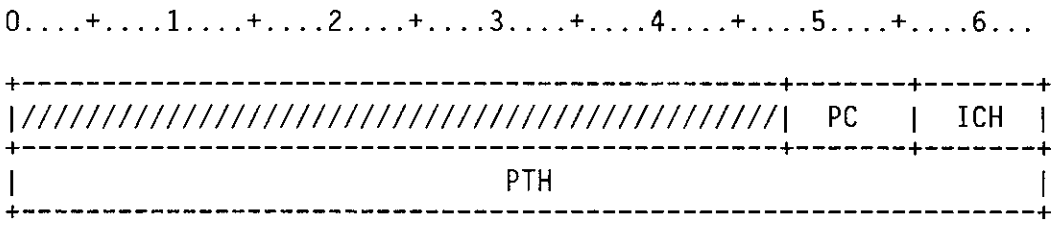


Figure CN-4. CNT Tape Sub-entry

Field	Word(base8)	Bits	Description
CNPC	0	48-55	Count of control unit paths via this IOP channel - 1 to 4
CNICH	0	56-63	IOP channel number
CNPTH	1	0-63	1-8 control unit IDs
CNAPTH	1	0-31	Group of four IDs
CNPTH1	1	0-7	Control unit ID and status
CNOFF	1	0	Control unit off flag
CNHOST	1	1	Control unit is host if set
CNOBS	1	2	Control unit deactivated by system (IOP channel off)
CNCU	1	4-7	Control unit ID
CNPTH2	1	8-15	
CNPTH3	1	16-23	
CNPTH4	1	24-31	
CNBPTH	1	32-63	Second group of four IDs
CNPTH5	1	32-39	
CNPTH6	1	40-47	
CNPTH7	1	48-55	
CNPTH8	1	56-63	

The job class structure definition is contained in the CSD. The CSD header, which contains general information about the structure, precedes the class maps. One CSD class map exists for each class defined in the structure. Class maps appear in descending rank order.

The variable length characteristic expressions follow the class maps, and each class contains a pointer to its expression. The CSD class expressions are variable length. The length of the CSD must be a multiple of 512 words.

**** When LH or LE are changed, the corresponding
**** parameter values in JCSDEF must also be changed.

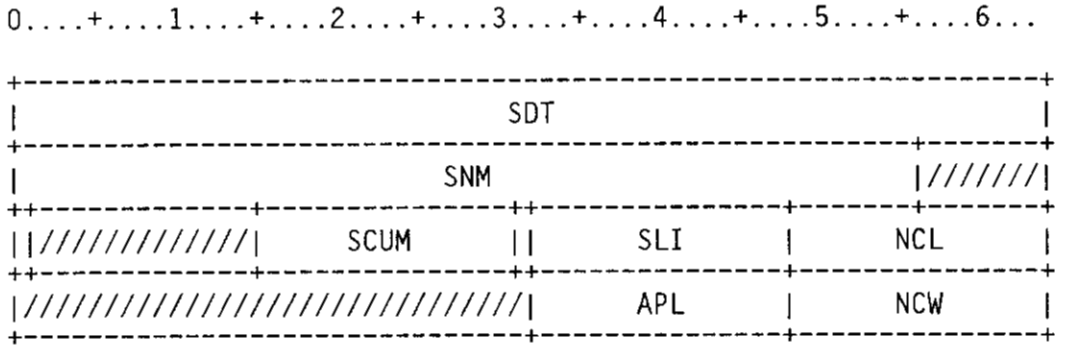


Figure CS-1. Class Structure Definition Header

Field	Word(base8)	Bits	Description
CSSDT	0	0-63	Real-time date and time of last rollout; must be in first sector of structure.
CSSNM	1	0-55	Class structure name
CSALF	2	0	if 1, CSLFF values are valid
CSSCUM	2	15-30	Structure cumulative JXTs reserved
CSAOF	2	31	If 1, all classes off
CSSLI	2	32-47	LIMIT default
CSNCL	2	48-63	Number of classes defined in structure
CSAPL	3	32-47	Number of pool JXTs allocated

Field	Word(base8)	Bits	Description
CSNCW	3	48-63	Number of classes waiting for JXTs.

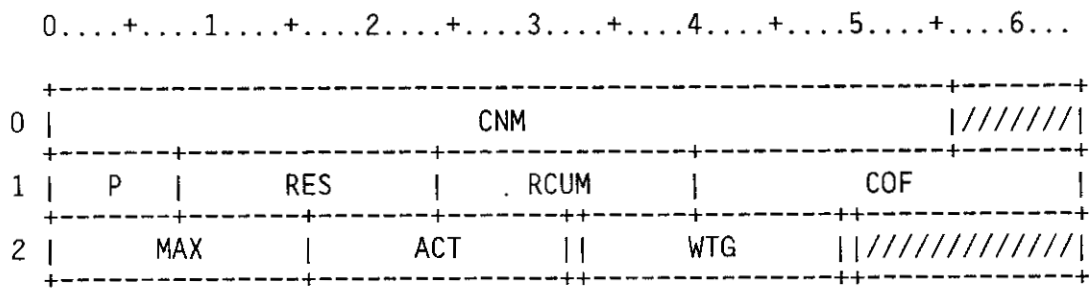


Figure CS-2. Class Structure Definition Entry

Field	Word(base8)	Bits	Description
CSCNM	0	0-55	Class name
CSP	1	0-7	Class assigned priority shifted left 4
CSRES	1	8-23	JXTs reserved by class
CSRCUM	1	24-39	JXTs reserved by all classes of a higher rank
CSCOF	1	40-63	Class offset; pointer to the cracked expression.
CSMAX	2	0-15	Class maximum
CSACT	2	16-31	Actual number of JXTs allocated to this class
CSOFF	2	32	If 1, the class is off; if 0, the class is on.
CSWTG	2	33-48	Number of jobs waiting for JXTs
CSLFF	2	49	value of CSOFF flag before last CLASS ALL OFF command

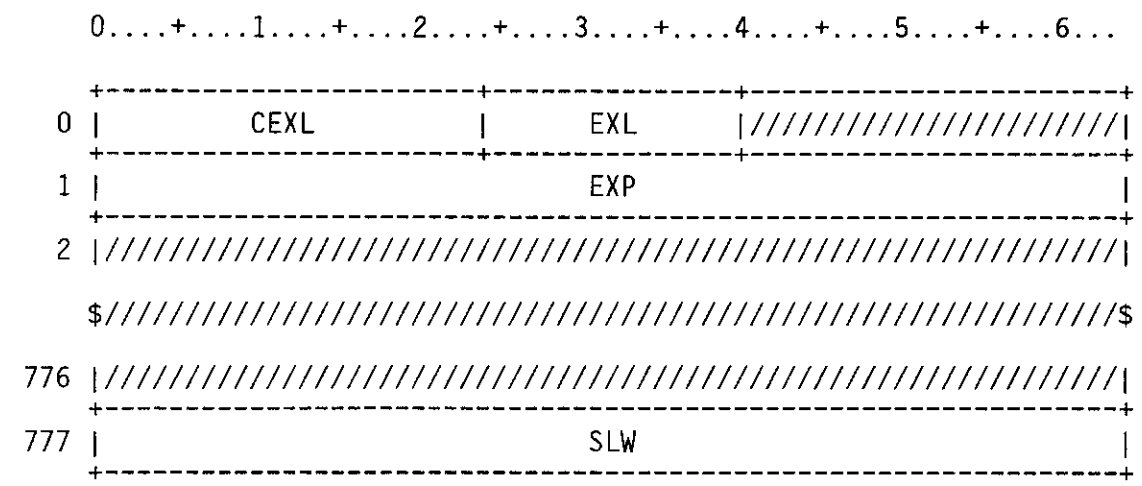


Figure CS-3. Class Structure Definition Entry

Field	Word(base8)	Bits	Description
CSCEXL	0	0-23	Length in words of cracked expression
CSEXL	0	24-39	Length in words of printable expression
CSEXP	1	0-63	Cracked class expression
CSSLW	777	0-63	Real-time date and time of last rollout of this structure. The word number (511) is relative to the last 512-word section of the table.

The formats of the block and record control words in CRAY-1 blocked format are illustrated in figures CW-1 and CW-2.

```
CWMBCW    =  0          Block control word mode field
CWMEOR    =  O'10       End of record mode field
CWMEOF    =  O'16       End of file mode field
CWMEOD    =  O'17       End of data mode field
CWMEOI    =  1          End of Input for DSP
```

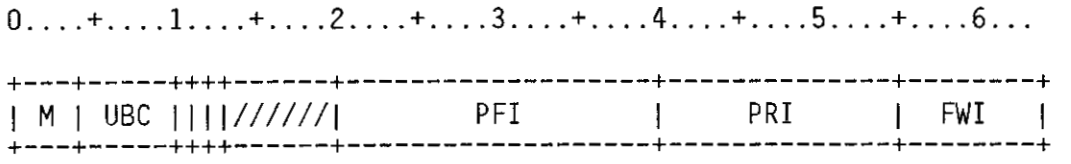


Figure CW-1. Block or Record Control Word

Field	Word(base8)	Bits	Description
CWM	0	0-3	Mode: 00 Block Control Word 10 Record Control Word (end of record) 16 RCW (end of file) 17 RCW (end of data)
CWUBC	0	4-9	Unused bit count (RCW only)
CWTRAN	0	10	Transparent record bit
CWBDF	0	11	Bad data flag
CWSRS	0	12	skip remainder of sector flag
CWPFI	0	20-39	Previous file index (RCW only)
CWPRI	0	40-54	Previous record index (RCW only)
CWFWI	0	55-63	Forward index

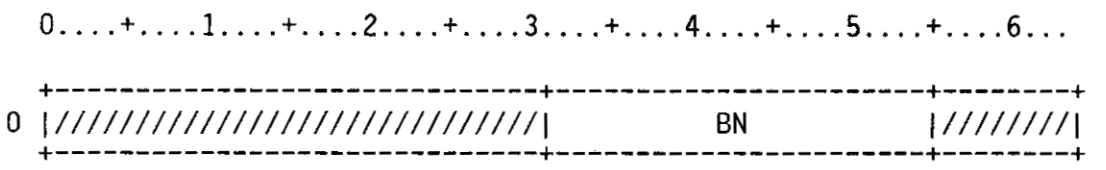


Figure CW-2. Block Control Word

Field	Word(base8)	Bits	Description
CWBN	0	31-54	Block number (for BCW only)

Name: Channel Extension Table (CXT).

Purpose: The Channel Extension Table is EXEC resident. There is one entry for each IOP channel ordinal. EXEC uses this table to communicate with the MIOP for front end I/O.

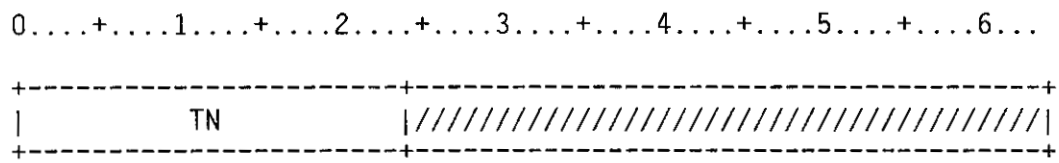


Figure CX-1. Channel Extension Table Header

Field	Word(base8)	Bits	Description
CXTN	0	0-23	Table name ('CXT')

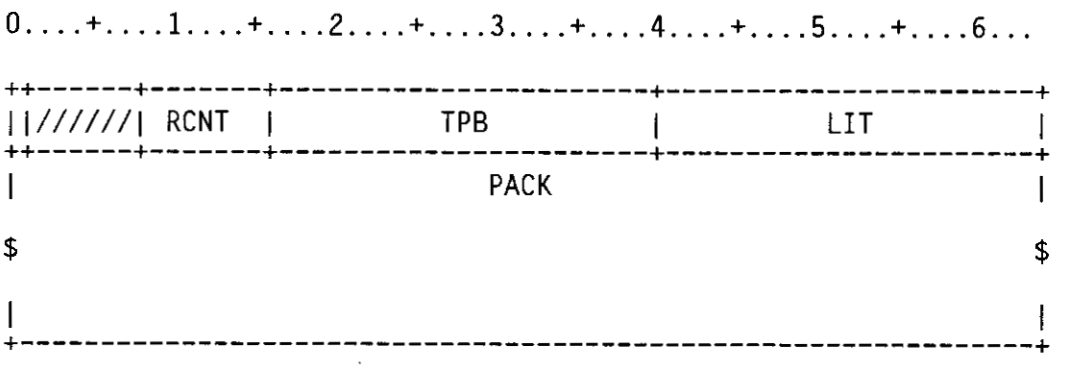
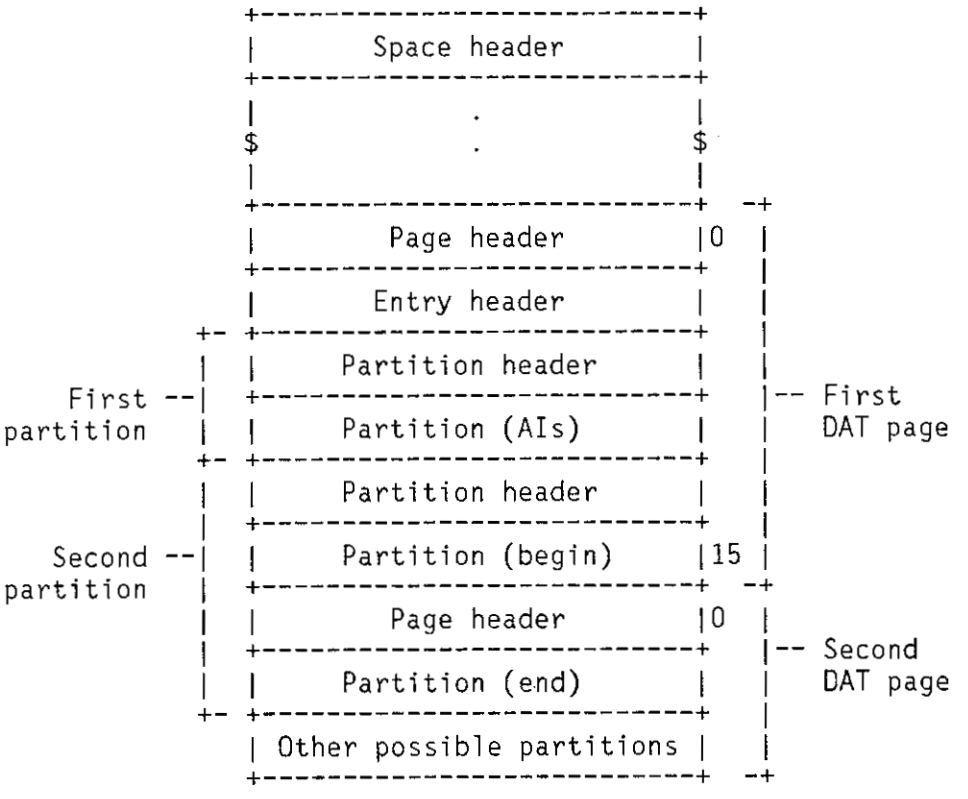


Figure CX-2. Channel Extension Table Entry

Field	Word(base8)	Bits	Description
CXON	0	0	Channel flag; on if set.
CXRCNT	0	8-15	Message number of last request
CXTPB	0	16-39	Task parameter block address (STT part A)
CXLIT	0	40-63	LIT entry address (EXEC relative)
CXPACK	1-n	0-63	Form B or K of Any Packet Table (used as a B-packet or X-packet)

A Dataset Allocation Table defines the mass storage logical location of a dataset by specifying the logical devices and the portions that are used in each device. There is one DAT for each active dataset in the system. If the dataset is permanent, the DAT is entered in the catalog and can be used by more than one user.

The DAT is composed of as many 16-word pages as necessary to represent the mass storage occupied by the dataset. The first page includes a page header, an entry header, at least one partition header, and the first 11 words of the table, which is divided into partitions. A partition represents a portion of the dataset on a single logical device. Each page after the first includes a page header and can include partition headers to begin new partitions.



The space header (figure DA-1) contains a bit map for DAT pages in STP. DAT pages for user datasets are allocated from Pool 7 in the JTA.

The page header (figure DA-2) occupies word 0 on each page. It contains a 24-bit address for the next DAT page, if there is one. DAT pages are not necessarily contiguous in memory.

The entry header (figure DA-3) contains general information about the dataset.

The DAT partition header (figure DA-4) contains general information concerning one partition of the DAT. A DAT partition header can appear anywhere on a DAT page, but the first partition header uses words 3 and 4 of the first DAT page.

The entry (figure DA-5) is divided into partitions. A partition represents a portion of a dataset on a single logical device; that is, if a dataset resides on two devices, it has two partitions. The partitions contain logical track addresses referred to as allocation indices (AIs), which are bit numbers in the respective Device Reservation Table (DRT).

LH@SDAT = 1 Length of DAT space header

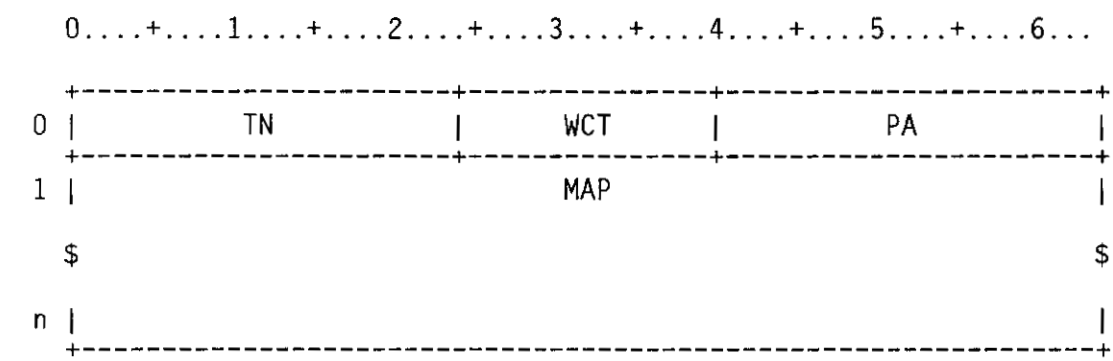


Figure DA-1. DAT Space Header (STP Only)

NAISC=2 Bits to shift to make AI parcel
LH@DATP=2 Length of DAT partition header
L@DATPH=1 Length of DAT page header
L@SDATZ=NE@DAT+D'63 Temporary for L@SDAT
L@SDAT=L@SDATZ/D'64 Length of DAT space
L@DATS=NE@DAT*LE@DAT Space occupied by DAT bodies
NAIPW=4 Number of AIs per word
NAIPOX=LE@DAT-LH@DAT-LH@DATP-L@DATP
NAIPO=NAIPOX*NAIPW Maximum AIs in first DAT
NAIPNX=LE@DAT-L@DATPH
NAIPN=NAIPNX*NAIPW Maximum AIs on other pages

Field	Word(base8)	Bits	Description
DATN	0	0-23	DAT name
DAWCT	0	24-39	DAT space map length in words (unused)
DAPA	0	40-63	Number of DAT pages available
DAMAP	1-n	0-63	First word of DAT page bit map

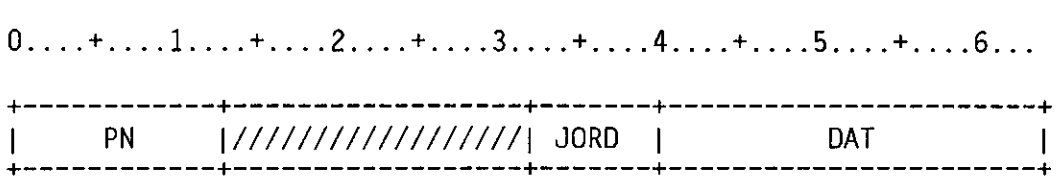


Figure DA-2. DAT Page Header

Field	Word(base8)	Bits	Description
DAPN	0	0-12	Page number
DAJORD	0	32-39	JXT ordinal; set to 0 if the DAT is in STP, set to the JXT ordinal if the DAT is in the JTA.
DADAT	0	40-63	Next page address; set to 0 if no continuation page exists. If the field is greater than 0, the DAT resides in STP and the field contains the STP-relative DAT address. If the field is less than and the DAT address is equal to the JTA address minus the value of the field DADAT.

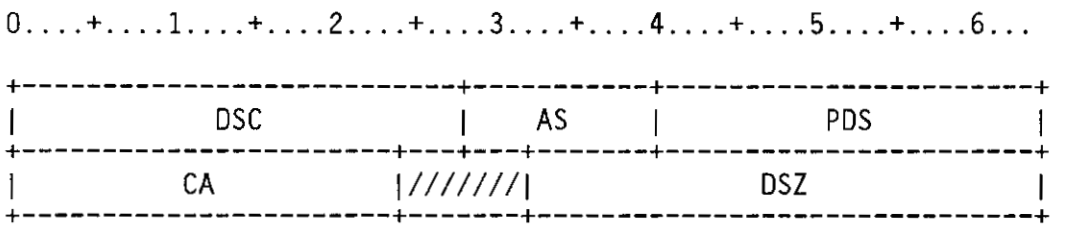


Figure DA-3. DAT entry header

Field	Word(base8)	Bits	Description
DADSC	1	0-27	DSC page pointer (only for permanent dataset)
DAAS	1	28-39	Allocation style (contiguous AUs per AI)
DAPDS	1	40-63	Permanent Dataset Table entry address (only if permanent dataset)
DACA	2	0-23	Pointer to DAT parcel to contain the next allocated AI. Bits Use 0-17 DAT page number 18-21 Word within DAT page 22-23 Parcel within word
DADSZ	2	32-63	Dataset size in words

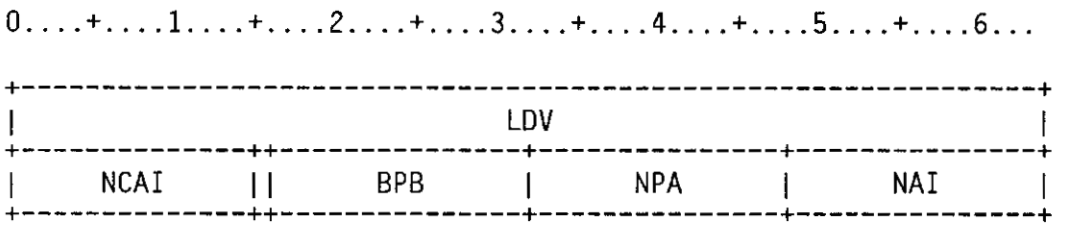


Figure DA-4. DAT Partition Header

Field	Word(base8)	Bits	Description
DALDV	0	0-63	Logical device name
DANCAI	1	0-14	number of contiguous AI's from start
DACAI	1	15	dataset contains contiguous AI's
DABPB	1	16-31	Sectors per bit
DANPA	1	32-47	Pointer to the next DAT partition (relative word address) Bits Use 32-43 DAT page, offset from 1 44-47 Word within DAT page
DANAI	1	48-63	Number of AIs in partition

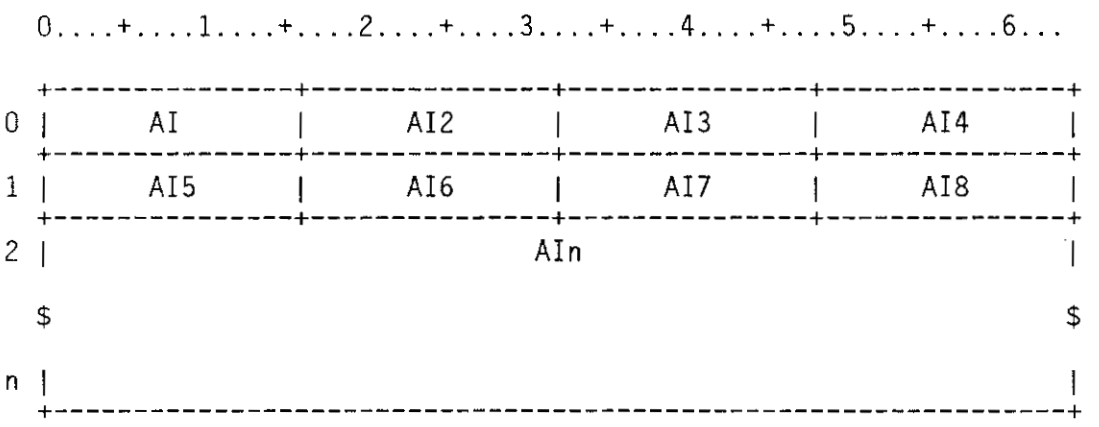


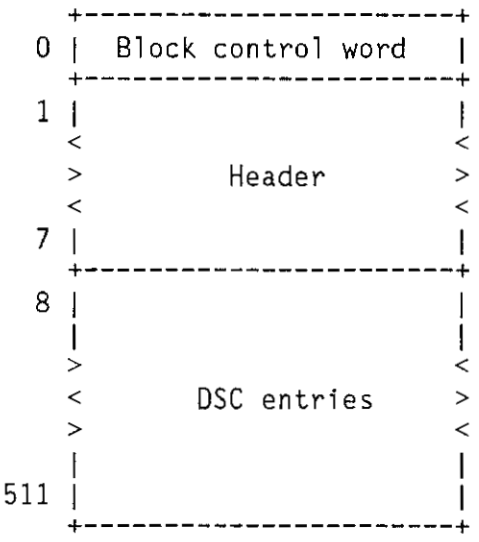
Figure DA-5. DAT Partition Entry

Field	Word(base8)	Bits	Description
DAAI	0	0-15	Allocation index (logical track address)
DAAI2	0	16-31	Second allocation index
DAAI3	0	32-47	Third allocation index
DAAI4	0	48-63	Fourth allocation index
DAAI5	1	0-15	Fifth allocation index
DAAI6	1	16-31	Sixth allocation index
DAAI7	1	32-47	Seventh allocation index
DAAI8	1	48-63	Eighth allocation index
DAAIn	2-n	0-63	Remaining allocation entries

The DSC resides on disk and is divided into 512-word pages, each page consisting of a block control word, a 7-word header, and eight 63-word entries.

There are two types of pages, hash pages and overflow pages. The PDN is hashed to determine the hash page number to be searched for a matching or available DSC entry. If that hash page is full and the function is SAVE or MODIFY, the entry is placed in the sequential overflow page area.

Each DSC page is organized as shown below. Figure DC-1 shows the header used on each page; figure DC-2 shows the DSC entry.



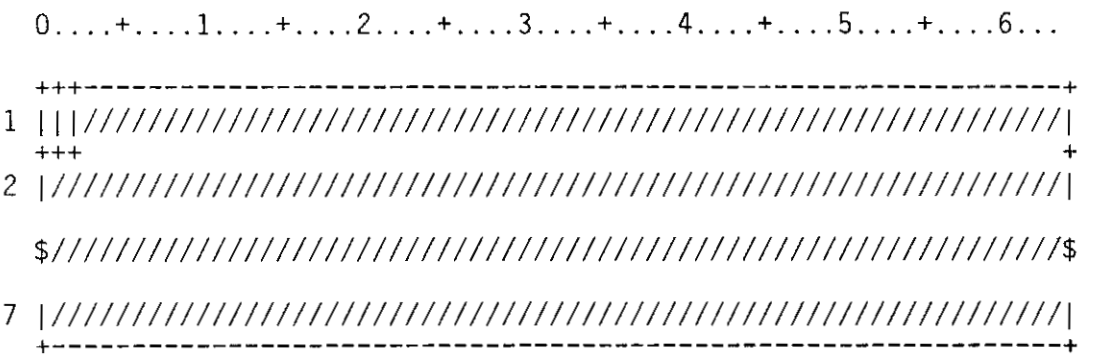


Figure DC-1. Dataset Catalog Page Header

Field	Word(base8)	Bits	Description
DCOV	1	0	Page overflow flag
DCPF	1	1	Page currently full flag

A DSC for a permanent dataset occupies as many DSC entries as necessary to contain the DAT for the dataset. Subsequent DSC entries for the same permanent dataset contain only continuations of the DAT.

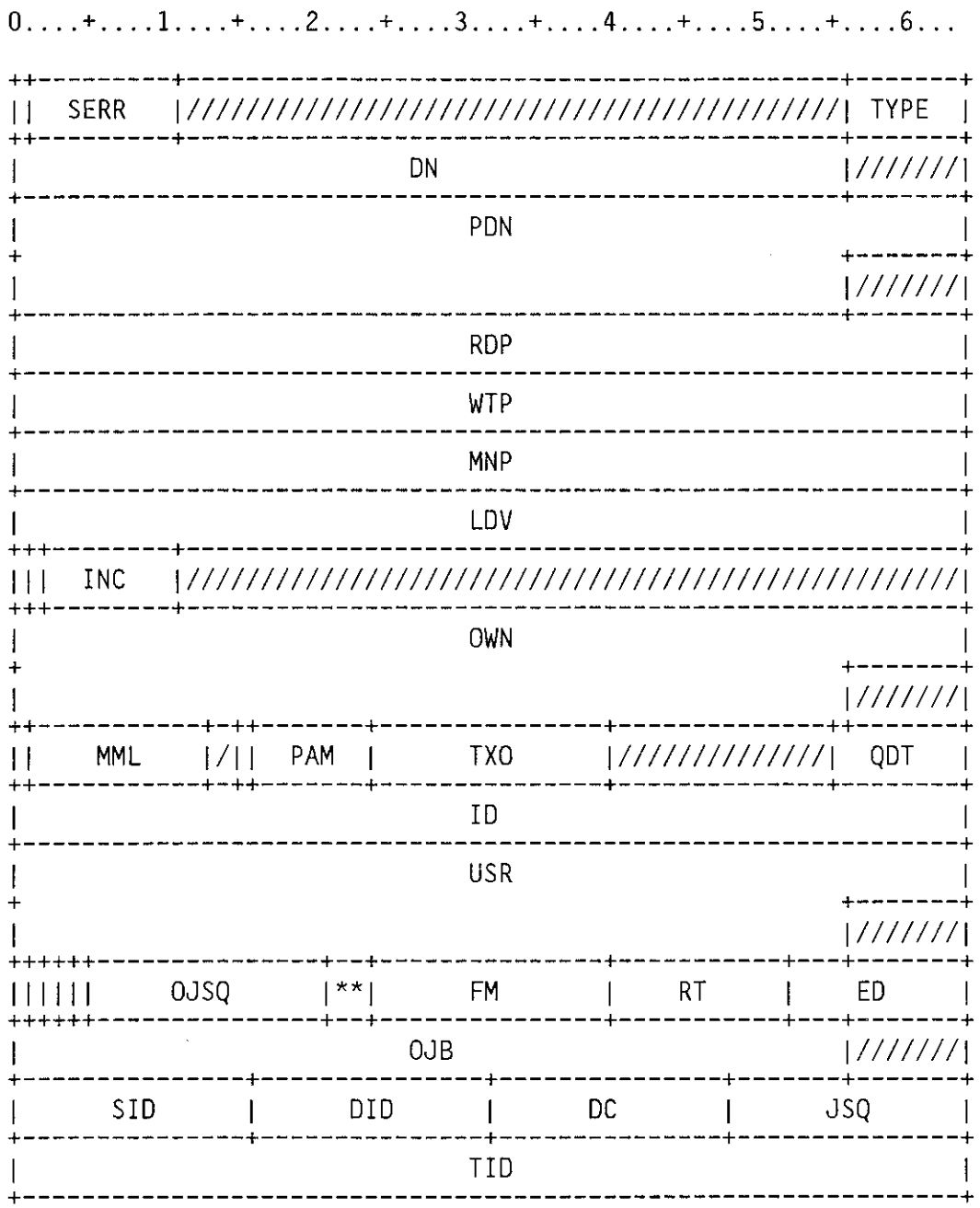


Figure DC-2. Dataset Catalog Entry

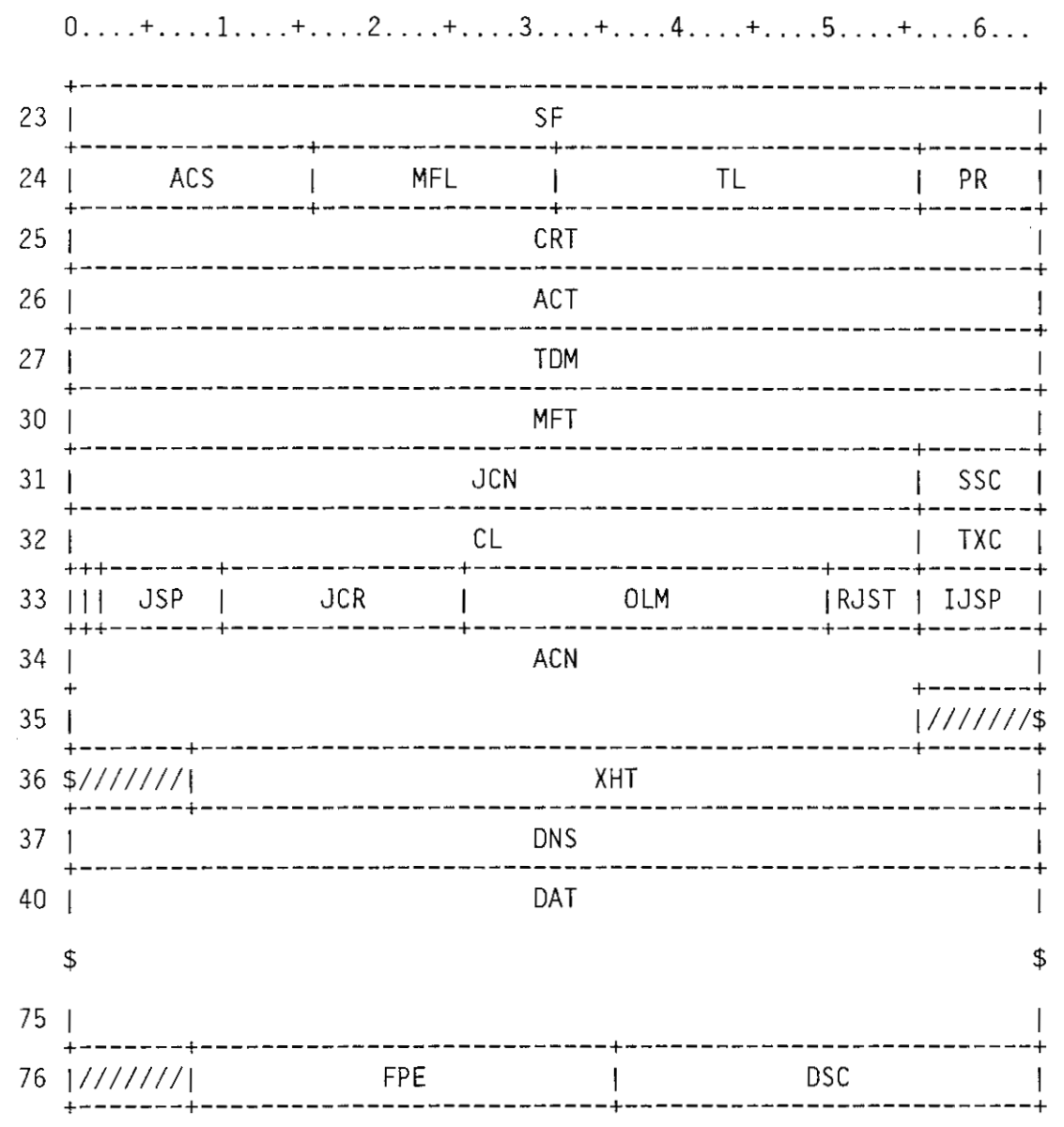


Figure DC-2. Dataset Catalog Entry

Field	Word(base8)	Bits	Description
DCC	0	0	Continuation entry flag
DCSERR	0	1-10	Dataset deactivation flags
DCDWN	0	1	Down device in DAT
DCCRS	0	2	Dataset DAT contains AI conflict
DCERR	0	3	DSC entry is invalid
DCIDA	0	4	Inconsistent disk allocation
DCIQI	0	5	Invalid QDT index
DCDXE	0	6	Startup found DXT errors
DCTYPE	0	56-63	Dataset type (only one can be set)
DCS	0	61	User permanent dataset
DCO	0	62	System spooled output
DCI	0	63	System spooled input
DCDN	1	0-55	Dataset name (spooled)
DCPDN	2-3	0-63	1-15 character permanent dataset name
DCPDN1	2	0-63	Characters 1-8 of PDN
DCPDN2	3	0-55	Characters 9-15 of PDN
DCRDP	4	0-63	Read permission control word
DCWTP	5	0-63	Write permission control word
DCMNP	6	0-63	Maintenance permission control word
DCLDV	7	0-63	logical device name assigned
DCCO	10	0	must have contiguous space per
DCNOF	10	1	do not overflow onto another deivce
DCINC	10	2-10	miniuum sectors to allocate request
DCOWN	11-12	0-63	Dataset owner
DCOWN1	11	0-63	Dataset owner (characters 1-8)
DCOWN2	12	0-55	Dataset owner (characters 9-15)
DCEXO	13	0	Execute-only flag
DCMML	13	1-12	Interactive maximum message length
DCTRA	13	15	Track accesses flag
DCPAM	13	16-23	Public access mode

Field	Word(base8)	Bits	Description
DCTXO	13	24-39	TXT ordinal of user task
DCQDT	13	55-63	Multi-type dataset indicator/pointer
DCID	14	0-63	User ID
DCUSR	15-16	0-63	1-15 character user number
DCUSR1	15	0-63	Characters 1-8 of user number
DCUSR2	16	0-55	Characters 9-15 of user number
DCNRR	17	0	No rerun flag (input)
DCINIT	17	1	Job initiated flag (input)
DCWAIT	17	2	Dispose-wait flag (spooled)
DCIA	17	3	Interactive spooled flag (spooled)
DCDFFL	17	4	Job-used-MFL-default flag
DCOJSQ	17	5-20	Originating job seq. number (spooled)
DCTXL	17	21-23	Length of text in blocks (spooled)
DCFM	17	24-39	Format designator (output)
DCRT	17	40-51	Retention period
DCED	17	52-63	Edition number
DCOJB	20	0-55	Originating job name (spooled)
DCSID	21	0-15	Source ID (spooled)
DCDID	21	16-31	Destination ID (spooled)
DCDC	21	32-47	Disposition code (spooled)
DCJSQ	21	48-63	Job sequence number (spooled)
DCTID	22	0-63	Terminal ID (spooled)
DCSF	23	0-63	Special forms (output)
DCACS	24	0-15	Number of accesses

Field	Word(base8)	Bits	Description
DCMFL	24	16-31	MFL parameter from job card (input)
DCSGFL	24	16	1 indicates MVL was specified with no value, requesting all available memory for a job.
DCFL	24	17-31	Field length divided by 512
DCTL	24	32-55	Time limit (input)
DCPR	24	56-63	Priority (input)
DCCRT	25	0-63	Timestamp at creation
DCACT	26	0-63	Timestamp of last access
DCTDM	27	0-63	Timestamp of last dump
DCMFT	30	0-63	Timestamp of last modification
DCJCN	31	0-55	Job class name (input)
DCSSC	31	56-63	Slot length in words
DCCL	32	0-55	CL parameter from job card (input)
DCTXC	32	56-63	Text length in words
DCOCC	33	0	Operator-changed-class flag
DCSYS	33	1	System job flag (input)
DCJSP	33	2-9	P from the job card (input)
DCJCR	33	10-25	Job class rank (input)
DCOLM	33	26-49	$OUT size in 512-word blocks (input)
DCRJST	33	50-55	Job statement error (input)
DCIJSP	33	56-63	Original jobcard priority (input)
DCACN	34-35	0-63	1-15 character account number
DCACN1	34	0-63	Characters 1-8 of account number
DCACN2	35	0-55	Characters 9-15 of account number

Field	Word(base8)	Bits	Description
DCXHT	36	8-63	DXT head and tail pointers
DCFDX	36	8-35	First DXT page/entry for dataset
DCFDP	36	8-31	Page number
DCFDE	36	32-35	Entry number
DCLDX	36	36-63	Last DXT page/entry for dataset
DCLDP	36	36-59	Page number
DCLDE	36	60-63	Entry number
DCDNS	37	0-63	Reserved for installations

The next two 15-word blocks are reserved for text or DATs:

DCDAT	40-75	0-63	DAT/text base address
DCFPE	76	8-35	First DSC page/entry for dataset
DCFPP	76	8-31	Main page number
DCFEN	76	32-35	Main entry number
DCDSC	76	36-63	Next DSC entry for continuation
DCDCP	76	36-59	Page number of DSC continuation
DCDCE	76	60-63	Entry number of DSC continuation

A Dataset Definition List in the user field must accompany any create DNT (F$DNT) request.

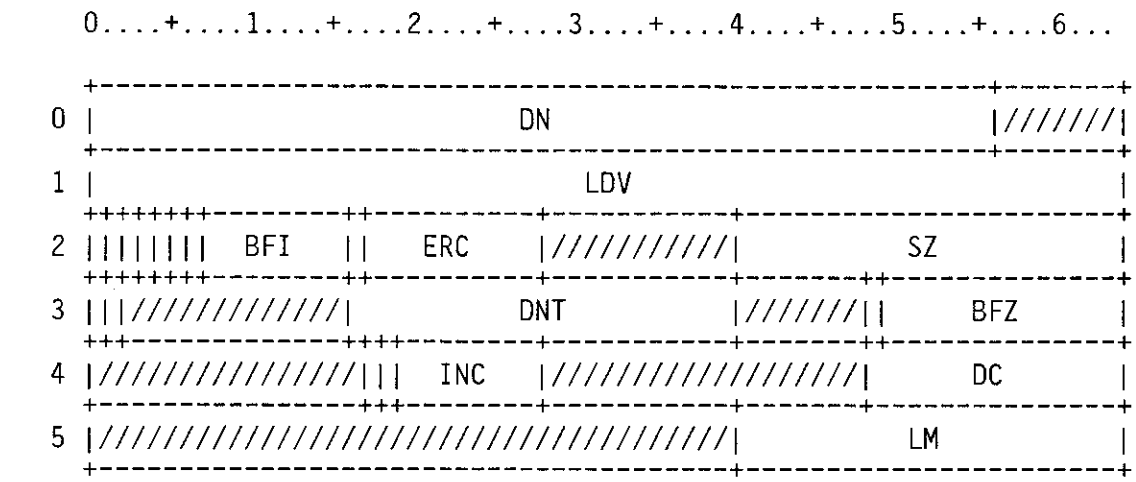


Figure DD-1. Dataset Definition List

Field	Word(base8)	Bits	Description
DDDN	0	0-55	Dataset name
DDLDV	1	0-63	Logical device name
DDRDM	2	0	Random dataset flag: 0 Sequential 1 Random
DDUDS	2	1	Undefined dataset structure: 0 COS blocked dataset structure 1 Undefined structure
DDNFE	2	2	Return error if dataset does not exist. Register S0 returned nonzero if DNT does not exist; no DNT is created.
DDSTAT	2	3	Request dataset statistics; ignored unless DDNFE=1 (see DDDNT)
DDMR	2	4	Dataset is to be memory resident
DDIA	2	5	Interactive type dataset

Field	Word(base8)	Bits	Description
DDTRAN	2	6	Transparent mode for interactive dataset
DDBFI	2	7-15	Blank field indicator (octal) for character I/O: Value Indicator =000 BFI=I@BFI <400 BFI=User-specified ASCII character =400 BFI=000 >400 Blank compression disabled
DDNA	2	16	No-Abort flag
DDERC	2	17-27	Error code if No-Abort set
DDSZ	2	40-63	Dataset size in 512-word blocks
DDSEQ	3	0	Change a dataset from random to sequential. Valid only if dataset is currently random, ignored if sequentia
DDBLK	3	1	Change a dataset form unblocked to blocked. Valid only if dataset is currently unblocked, ignored if blocke
DDDNT	3	16-39	Address of DNT image returned by F$DNT when DDNFE=1 and DDSTAT=1
DDNOF	3	48	No Overflow flag
DDBFZ	3	49-63	Buffer size in 512-word blocks $SYSTXT name
DDC	4	17	allocate contiguous space for request
DDINC	4	19-27	sectors to allocate per request
DDDC	4	48-63	Disposition code (two characters):
DDLM	5	40-63	Dataset size limit in 512-word blocks

```
DD-19/DD-29 Disk driver equates

*** NOTE *** The status codes here are also defined in EXTRACT.
Any change here must also be made in EXTRACT.

EXTENDED ERROR STATUS (8 BIT POSITIONS)

TOERR    =  O'001          Time-out error
SSERR    =  O'002          Subsystem status error
RWERR    =  O'004          Read/write response error
CPERR    =  O'010          Channel parity error
DTERR    =  O'020          Data transfer error
PDSERR   =  O'100          Permament dataset error

FINAL ERROR STATUS CODES (RANGE 0 TO D'255)

RCERR    =  1              Recovered disk error
DAERR    =  2              Unrecovered data error
APERR    =  3              Angular position error
NRERR    =  4              Disk not ready error
LDERR    =  5              Lost data error
ADERR    =  6              Address error
SKERR    =  7              Seek error
MHERR    =  O'10           Multiple head select
RWCERR   =  O'11           Read/write conflict
RWOERR   =  O'12           Read/write off cylinder
COERR    =  O'13           Corrected data error
UCERR    =  O'14           Uncorrected data error
URERR    =  O'15           Unrecovered hardware error
U1ERR    =  O'16           Undefined error
TMERR    =  O'17           Disk function timed out by
                             software
CWERR    =  O'77           Correctable disk error
SSCERR   =  O'100          SSD status channel error (HSP
                             only)
STOERR   =  O'101          SSD timeout error

MAINTENANCE TEST FUNCTION CODES   (RANGE 0 TO D'15)

TFC0     =  0              No maintenance test
TFC1     =  1              Recoverable error test
TFC2     =  2              Unrecoverable error test
TFC3     =  3              Time-out error test
TFC4     =  4              Iop disk error test
TFC5     =  5              Write with zero checkword
TFC6     =  6              Fake memory error
TFC7     =  7              Undefined test

DISK CONTROLLER FUNCTION DEFINITIONS
```

NOTE: Bit 2**16 has been added to the function codes that have a status response. That bit is removed by the disk driver before output. This bit caused an input response to be taken by the driver after output is complete.

```
CRCCERR   =  O'000040          Checkword error status
NOCYL     =  O'001767          Not on cylinder mask
FCMASK    =  O'174777          Function mask
S@RSPBIT  =  D'47              Response bit position

DCREAD    =  O'200000          Read
DCWRT     =  O'210000          Write
DCWWZ     =  O'214000          Write with zero checkword
DCRSV     =  O'020000          Unit reserve
DCURF     =  O'030000          Unreserved unit function
DCRLS     =  O'030400          Unit release
DCCLR     =  O'030300          Release, clear fault, return to
                                 zero
DCRUF     =  O'040000          Reserved unit function
DCSEEK    =  O'050000          Cylinder select
DCMS      =  O'060000          Margin select
DCSTAT    =  O'270000          Status readout function
DCFRS     =  O'270001          Fault register status
DCCNS     =  O'270002          Cylinder number status
DCHNS     =  O'270004          Head group number status
DCORS     =  O'270010          Offset register status
DCIRS     =  O'270020          Interlock register status
DCSNS     =  O'270040          Sector number status
DCECS     =  O'070100          Error correction status
```

SYSDUMP Memory type codes

MEMTYCRY	=	0	Cray main memory
MEMTYBUF	=	1	Buffer (mos) memory
MEMTYCRG	=	2	Cray registers (B/T/V/VM)
MEMTYIO0	=	3	IOP 0 Memory
MEMTYIO1	=	4	IOP 1 Memory
MEMTYIO2	=	5	IOP 2 Memory
MEMTYIO3	=	6	IOP 3 Memory
MEMTYS00	=	O'30	SSD
MEMTYS01	=	O'31	SSD
MEMTYS02	=	O'32	SSD
MEMTYS03	=	O'33	SSD
MEMTYS04	=	O'34	SSD
MEMTYS05	=	O'35	SSD
MEMTYS06	=	O'36	SSD
MEMTYS07	=	O'37	SSD
MEMTYR01	=	O'41	CPU Registers
MEMTYR02	=	O'42	CPU Registers
MEMTYR03	=	O'43	CPU Registers
MEMTYR04	=	O'44	CPU Registers
MEMTYR05	=	O'45	CPU Registers
MEMTYR06	=	O'46	CPU Registers
MEMTYR07	=	O'47	CPU Registers
MEMTYR10	=	O'50	CPU Registers
MEMTYR11	=	O'51	CPU Registers
MEMTYR12	=	O'52	CPU Registers
MEMTYR13	=	O'53	CPU Registers
MEMTYR14	=	O'54	CPU Registers
MEMTYR15	=	O'55	CPU Registers
MEMTYR16	=	O'56	CPU Registers
MEMTYR17	=	O'57	CPU Registers
MEMTYC00	=	O'100	Clusters
MEMTYC01	=	O'101	Clusters
MEMTYC02	=	O'102	Clusters
MEMTYC03	=	O'103	Clusters
MEMTYC04	=	O'104	Clusters
MEMTYC05	=	O'105	Clusters
MEMTYC06	=	O'106	Clusters
MEMTYC07	=	O'107	Clusters
MEMTYC10	=	O'110	Clusters
MEMTYC11	=	O'111	Clusters
MEMTYC12	=	O'112	Clusters
MEMTYC13	=	O'113	Clusters
MEMTYC14	=	O'114	Clusters
MEMTYC15	=	O'115	Clusters
MEMTYC16	=	O'116	Clusters
MEMTYC17	=	O'117	Clusters
MEMTYC20	=	O'120	Clusters
MEMTYC21	=	O'121	Clusters

```
MEMTYC22  =  O'122          Clusters
MEMTYC23  =  O'123          Clusters
MEMTYC24  =  O'124          Clusters
MEMTYC25  =  O'125          Clusters
MEMTYC26  =  O'126          Clusters
MEMTYC27  =  O'127          Clusters
MEMTYC30  =  O'130          Clusters
MEMTYC31  =  O'131          Clusters
MEMTYC32  =  O'132          Clusters
MEMTYC33  =  O'133          Clusters
MEMTYC34  =  O'134          Clusters
MEMTYC35  =  O'135          Clusters
MEMTYC36  =  O'136          Clusters
MEMTYC37  =  O'137          Clusters
```

System dump header fields

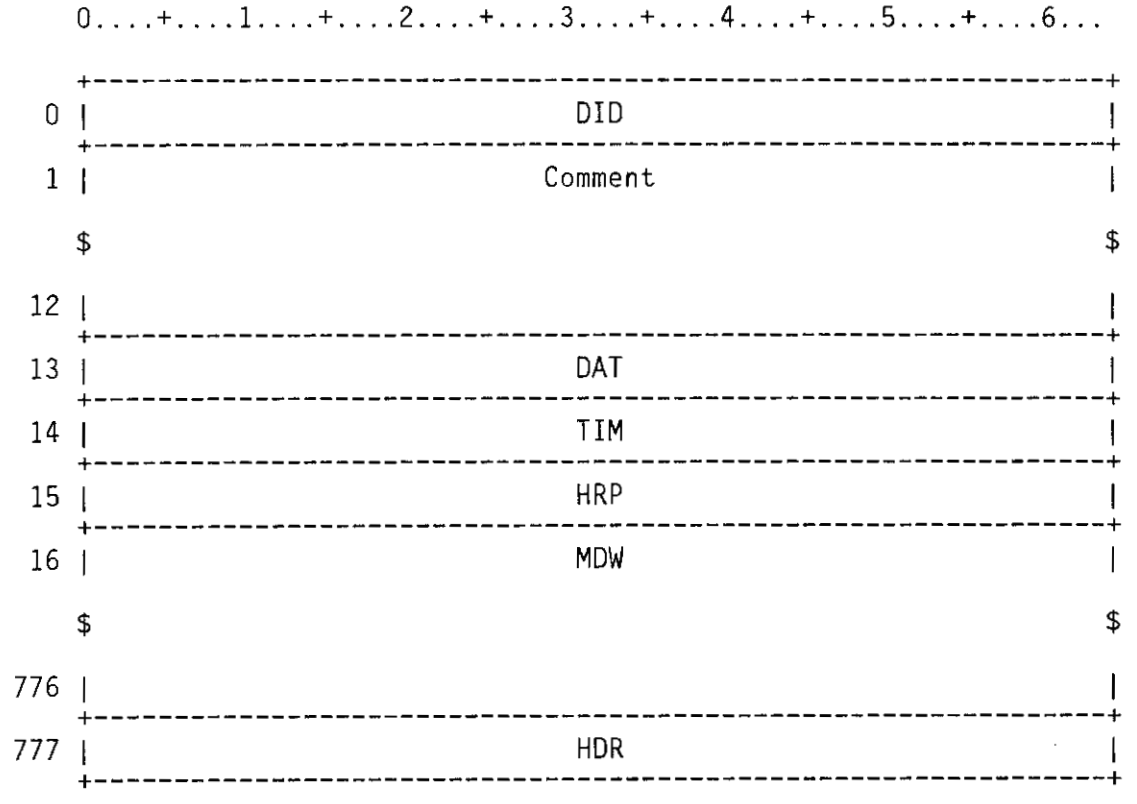


Figure DMP-1. System Dump Header Fields

Field	Word(base8)	Bits	Description
DMPDID	0	0-63	Dump identification. Set to 'SYSDUMP ' by default.
Comment	1-12	0-63	Used as a comment field; at Startup
DMPDAT	13	0-63	Date of startup. Taken from the Maintenance Control Unit (MCU) during Startup; not necessarily related to the time of actual system failure causing the dump to be taken.
DMPTIM	14	0-63	Time of startup. Taken from the Maintenance Control Unit (MCU) during Startup; not necessarily related to the time of actual system failure causing the dump to be taken.
DMPHRP	15	0-63	Header recognition pattern. The default is '*DMPHDR*'.
DMPMDW	16-776	0-63	Beginning of MDW pairs
DMPHDR	777	0-63	Dump header
MDWSYS	777	0-15	System type
MDWPRC	777	16-31	Number of processors
MDWNUM	777	32-63	Number of areas dumped

The DNT in the Job Table Area (JTA) contains an entry for each dataset of a given job. W@JTDNH+1 is the beginning DNT entry address.

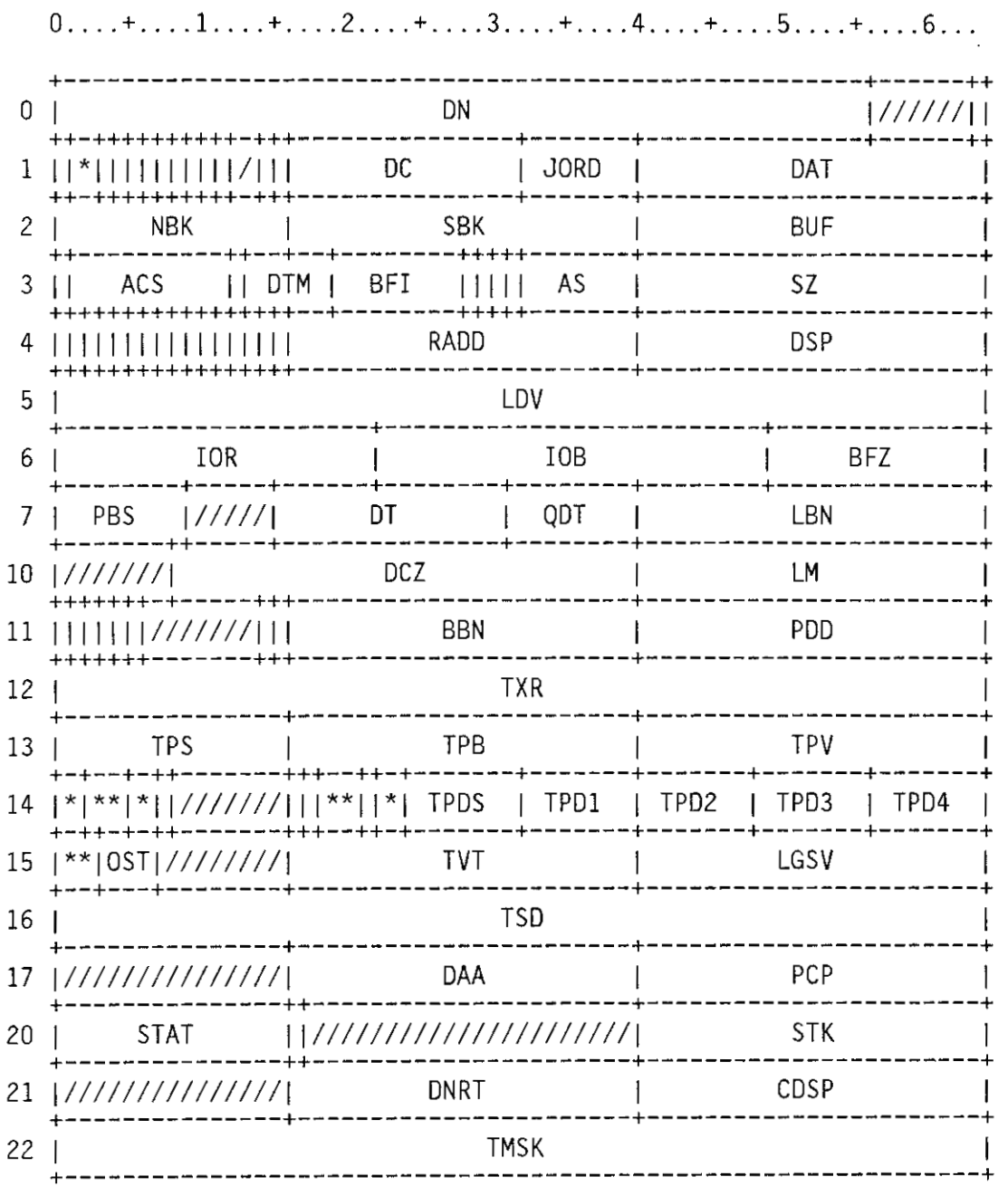


Figure DN-1. Dataset Name Table

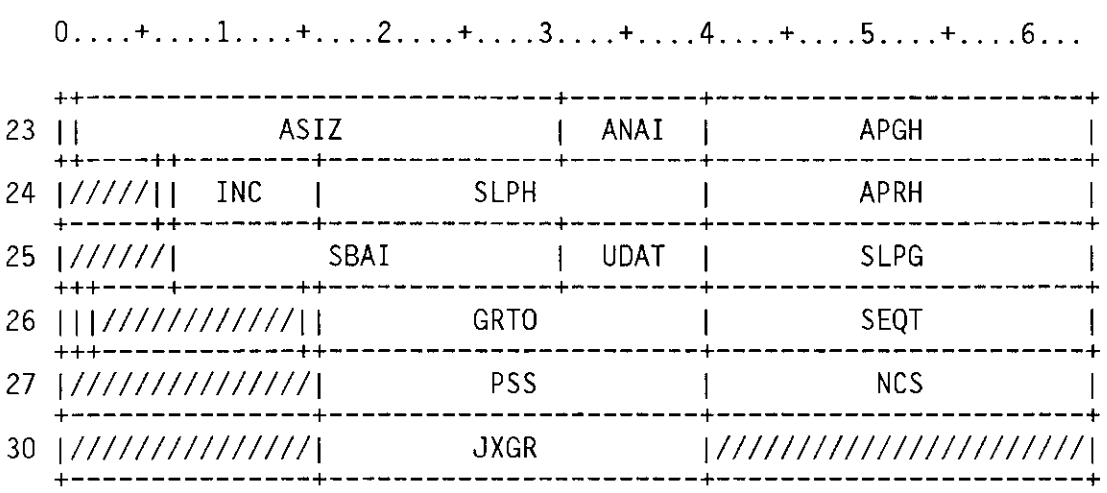


Figure DN-1. Dataset Name Table

Field	Word(base8)	Bits	Description
DNDN	0	0-55	Dataset name
DNPROC	0	63	In-use-as-procedure flag

* *

The following word is modified by DQM as the result of randomly timed interrupts. No field in this word can be modified by any other task unless it is certain that such modification cannot occur while the dataset has active I/O.

* *

DNAIO	1	0	Active I/O, set if outstanding
DNOC	1	1-2	Open/closed status: 00 Closed 10 Open for input 01 Open for output 11 Open for input or output
DNP	1	3	Type of processing; used by Disk Queue Manager: 0 Read 1 Write
DNRDM	1	4	Random dataset flag: 0 Sequential 1 Random

Field	Word(base8)	Bits	Description
DNUDS	1	5	Dataset structure: 0 COS-blocked dataset 1 Unblocked structure
DNIN	1	6	Subdataset; used for $IN.
DNMEM	1	8	Dataset is memory resident
DNIA	1	9	Interactive type dataset
DNTRAN	1	10	Transparent mode for interactive dataset
DNEND	1	11	Write end of dataset flag. Used in conjunction with the partial block size DNPBS. DNEND and DNPBS are set by DQM when DPEND is set. DNEND and DNPBS can also be set by a task which does not use a DSP when calling DQM.
DNSDR	1	14	Dataset resides in the SDR
DNPRW	1	15	Previous operation read/write: 0 Previous operation read 1 Previous operation write
DNDC	1	16-31	Disposition code (two characters): DCIN=IN Job dataset DCST=ST Staged permanent dataset DCSC=SC Scratch dataset DCPR=PR Print dataset DCPU=PU Punch dataset DCPT=PT Plot dataset DCMT=MT Magnetic tape dataset
DNJORD	1	32-39	JXT ordinal if the DNT is in the job's JTA; 0 if the DNT resides in STP.
DNDAT	1	40-63	Dataset allocation table address: =0 No DAT assigned >0 Address of first page header of DAT in STP <0 Two's complement address of first page header of DAT in JTA
DNNBK	2	0-15	Number of blocks to be read or written; number of words in last block to be written if (DNEND)=1.

Field	Word(base8)	Bits	Description
DNSBK	2	16-39	Starting block number
DNBUF	2	40-63	I/O buffer address
DNPDS	3	0	Permanent dataset flag
DNACS	3	1-11	Dataset access flags
DNEXO	3	8	Execute-only
DNMNP	3	9	Maintenance permission flag
DNWTP	3	10	Write permission flag
DNRDP	3	11	Read permission flag
DNPDM	3	12	PERMANENT DATASET MODIFIED FLAG
DNDTM	3	13-18	Index to Task I/O save area
DNBFI	3	19-27	Blank field indicator (octal) for character I/O Value Indicator <400 BFI=User specified ASCII =400 BFI=000 >400 Blank compression disabled
DNNEW	3	28	Secure dataset flag
DNPRC	3	29	I/O Partial Recall Flag
DNXLM	3	30	Dataset-size-limit-exceeded flag
DNNOF	3	31	No Overflow indicator
DNAS	3	32-39	Allocation style (tracks per AI)
DNSZ	3	40-63	Dataset size (in 512-word blocks)

* *

Fields in the following word can by modified by EXP or CIO/TIO as the result of randomly timed interrupts. Because EXP and CIO/TIO are subject to interruption by other tasks, especially DQM, do not insert in this word any fields that can be modified by routines other than EXP or CIO/TIO.

* *

DNRCL	4	0	Recall flag from DSP
DNRLS	4	1	Release flag

DNJTF	4	3	JTA dataset flag; if (DNJTF)=1, buffer is in the JTA.
DNIOU	4	4	User I/O flag; 1 indicates the DSP or buffer for the current I/O request are in the job field (below user HLM).
DNBIO	4	6	Buffered I/O request flag
DNCRC	4	7	User Task in recall for this I/O(CIO)
DNDPS	4	8	Dispose flag
DNMRCL	4	9	Memory recall flag; 1 if waiting for JTA memory expansion.
DNDFR	4	10	Deferred disposition flag
DNDNR	4	11	Device not ready flag
DNTRM	4	12	Dataset-through-termination flag
DNQIO	4	13	Queued I/O Request Flag
DNSRCL	4	14	SSD Queued I/O Recall Flag
DNDRCL	4	15	Disk Queued I/O Recall Flag
DNRADD	4	16-39	CIO task recall return address
DNDSP	4	40-63	DSP address
DNLDV	5	0-63	Logical device name
DNIOR	6	0-21	I/O requests issued to DQM
DNIOB	6	22-48	Blocks transferred
DNBFZ	6	49-63	Dataset buffer size in 512-word blocks
DNPBS	7	0-8	Partial block size in words
DNDT	7	15-30	DEVICE TYPE
DNDTSC	7	15	Scratch device
DNDTCT	7	16	Controlled device
DNDTTP	7	17	Tape dataset (ONLINE/STAGED)
DNQDT	7	31-39	Multitype flag/QDT entry index
DNLBN	7	40-63	Number of last block written

Field	Word(base8)	Bits	Description
DNDCZ	10	8-39	Dataset catalog size in words
DNLM	10	40-63	Dataset size limit in 512-word block
DNCHK	11	0	Block number checking request flag (IOS use only)
DNSNC	11	1	SYNCH TAPE DATASET
DNBSS	11	2	BUFFER SET UP FOR SYNCH
DNSCM	11	3	SYNCH IS COMPLETE
DNSIP	11	4	SYNCH IN PROGRESS
DNFLT	11	5	Field label tape
DNITP	11	14	INTERNAL TAPE POSITION REQUEST FLAG
DNBDF	11	15	Bad data flag
DNBBN	11	16-39	Number of bad block
DNPDD	11	40-63	JTA relative address of the PDD for a deferred disposition
DNTXR	12	0-63	TXT address of user task in recall on
DNTPS	13	0-15	Online tape status
DNTPB	13	16-39	Tape maximum block size in bytes
DNTPV	13	40-63	Tape pointer to system label area
DNTPD	14	0-1	Tape density
DNTPL	14	2-4	Tape label type
DNTPF	14	5-6	Tape format
DNTPC	14	7	Tape cataloged dataset
DNTPM	14	16	Tape online maintenance access
DNTP2	14	17	Tape second device request
DNTPP	14	18-20	Tape parallel device count
DNTPH	14	21	Tape hold device assignment

Field	Word(base8)	Bits	Description
DNTCS	14	22-23	Tape dataset character set
DNTPDS	14	24-31	Tape parallel device status
DNTPD1	14	32-39	Tape device number (stream 1)
DNTPD2	14	40-47	Tape device number (stream 2)
DNTPD3	14	48-55	Tape device number (stream 3)
DNTPD4	14	56-63	Tape device number (stream 4)
DNIDC	15	0-2	Tape initial disposition code
DNOST	15	3-6	OPEN STATUS
DNTVT	15	16-39	ADDR OF TVT
DNLGSV	15	40-63	Save address for MSG queue entry
DNTSD	16	0-63	Time spent delayed
DNDAA	17	16-39	Device accounting area pointer
DNPCP	17	40-63	Pointer to last PC entry used
DNSTAT	20	0-15	DQM reply status for CIO use
DNJTB	20	16	Buffer in JTA if set field
DNSTK	20	40-63	DNT stack pointer (JTA relative)
DNDNRT	21	16-39	Device-not-ready TXT ordinal
DNCDSP	21	40-63	DNT STACK POINTER(JOB RELATIVE)CIO
DNTMSK	22	0-63	Task I/O recall mask
DNAPF	23	0	Allocation DNT pointers ok if 1
DNASIZ	23	1-30	Number of sectors allocated
DNANAI	23	31-39	AI parcel available on current page
DNAPGH	23	40-63	Current page header for allocation
DNC	24	6	Dataset requires contiguous disk space
DNINC	24	7-15	Number of sectors to allocate per request

Field	Word(base8)	Bits	Description
DNSLPH	24	16-39	Last partition header for data transfer
DNAPRH	24	40-63	Current partition header for allocation
DNSBAI	25	7-30	Block number of current AI
DNUDAT	25	31-39	Number of unused DAT pages
DNSLPG	25	40-63	Last DAT page gotten from GETDAT
DNOVL	26	0	Overflowed desired device if set
DNNOTC	26	1	Allocate first space available
DNTRS	26	15	Quick transfer flag has been set up
DNGRTO	26	16-39	GRT entry ordinal
DNSEQT	26	40-63	Current EQT of current DAT partition
DNPSS	27	16-39	Physical starting sector of dataset
DNNCS	27	40-63	Initial contiguous sectors of dataset
DNJXGR	30	16-39	Generic resource address

Logical I/O requires the presence of a DSP for the dataset in the user's field. Refer to CRAY-OS Version 1 Reference Manual, publication SR-0011, for details of DSP use.

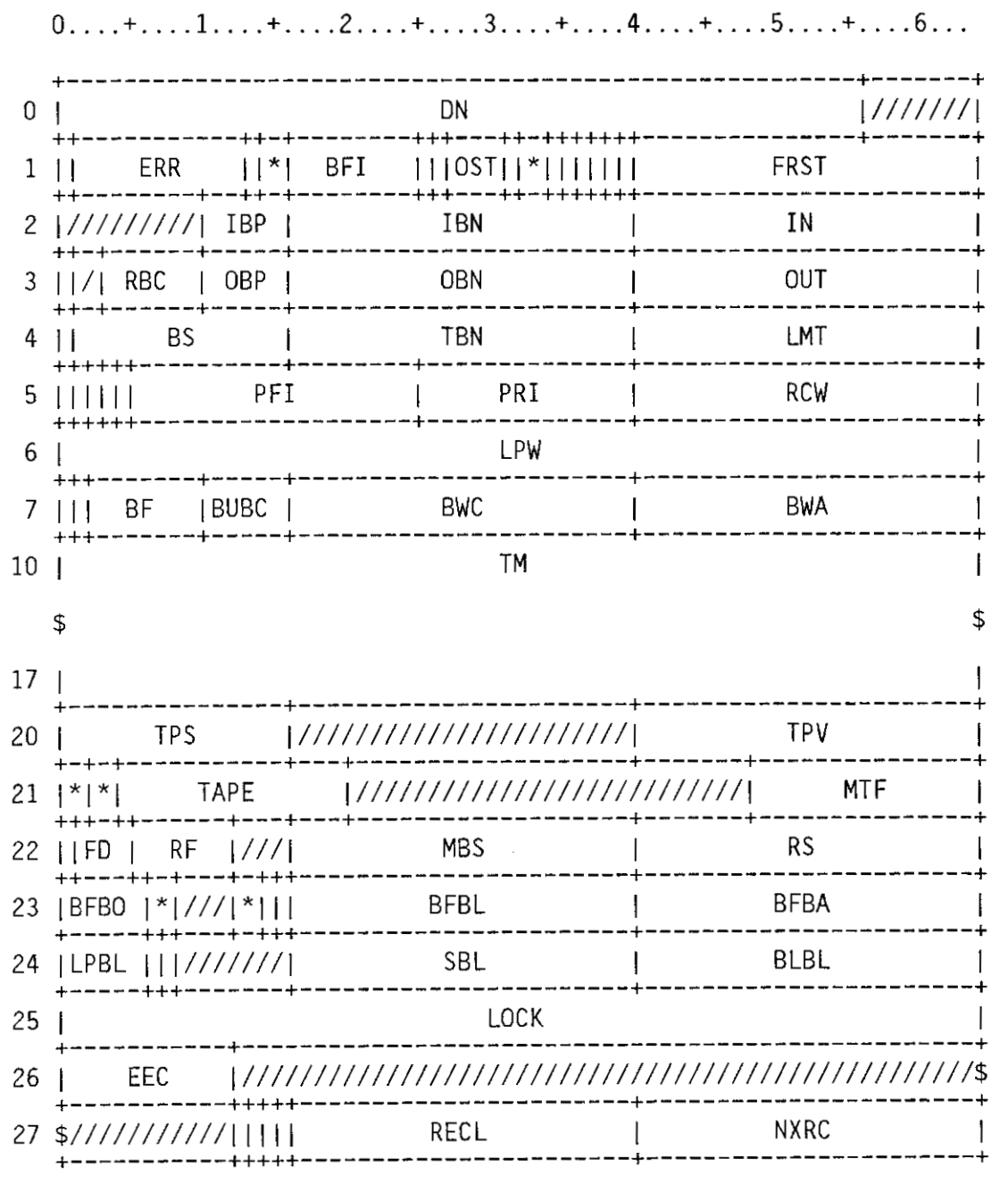


Figure DP-1. Dataset Parameter Table

Field	Word(base8)	Bits	Description
DPDN	0	0-55	Dataset name
DPBSY	1	0	Busy flag, circular I/O: 0 Not busy 1 Busy
DPERR	1	1-12	Error flags:
DPEOI	1	1	End of data on read; write past allocated disk space on write.
DPENX	1	2	Dataset does not exist
DPEOP	1	3	Dataset not open
DPEPD	1	4	Invalid processing direction
DPEBN	1	5	Block number error
DPEDE	1	6	Unrecovered data error
DPEHE	1	7	Unrecovered hardware error
DPERW	1	8	Attempted read after write or past EOD
DPEPT	1	9	Dataset prematurely terminated
DPELE	1	10	Unrecovered logical data error Reserved
DPEEP	1	12	Extended error (see DPEEC)
DPSTS	1	14-15	Status: 00 Closed 01 Open for output (O) 10 Open for input (I) 11 Open for I/O
DPBFI	1	16-24	Blank compression character in ASCII (BFI=O'777 implies no compression)
DPQIO	1	26	Queued I/O Request Flag
DPOST	1	27-30	Open status
DPABD	1	31	Accept bad data flag
DPTP	1	32-33	Tape dataset (online/staged)
DPTRAN	1	34	Transparent mode for interactive dataset
DPIA	1	35	Dataset is interactive
DPMEM	1	36	Dataset is memory resident

Field	Word(base8)	Bits	Description
DPRDM	1	37	Random dataset flag: 0 Sequential dataset 1 Random dataset
DPUDS	1	38	Undefined dataset structure: 0 COS-blocked dataset structure 1 Undefined dataset structure
DPEND	1	39	Write end-of-data flag
DPFRST	1	40-63	Address of first word of buffer
DPIBP	2	10-15	Input bit position
DPIBN	2	16-39	Block number, read request. System reads from block number until buffer is filled. DPIBN is then set to the next block number.
DPIN	2	40-63	Address of current input word
DPSPOS	3	0	Asynchronous SETPOS busy flag
DPRBC	3	3-9	Remaining blank count
DPOBP	3	10-15	Bit position in current output word (character I/O only)
DPOBN	3	16-39	Block number, write request. System writes from block number until buffer is empty. The next block number is then in DPOBN.
DPOUT	3	40-63	Address of current output word
DPUEOF	4	0	Uncleared end-of-file (EOF)
DPBS	4	1-15	Buffer size (in D'512 word sectors)
DPTBN	4	16-39	Temporary block number; used by random I/O for last block read
DPLMT	4	40-63	Address of last word+1 of buffer. LMT minus FRST defines buffer size.
DPEOR	5	0	EOR flag
DPEOF	5	2	EOF flag
DPEOD	5	3	EOD flag

Field	Word(base8)	Bits	Description
DPRW	5	4	Previous operation read/write flag: 0 Read 1 Write
DPPFI	5	5-24	Previous file index; backward index to block containing previous EOF.
DPPRI	5	25-39	Previous record index; backward index to block containing previous EOR.
DPRCW	5	40-63	Control word address: Previous RCW address if in write mode Next RCW if in read mode
DPLPW	6	0-63	Last partial word; used for character mode I/O
DPBIO	7	0	Buffered I/O busy: 0 Buffered I/O operation complete 1 Buffered I/O operation incomplete
DPBER	7	1	Buffered I/O error flag
DPBF	7	2-9	Function code: BIOFRRP = 0 Read partial record BIOFRR = O'10 Read record BIOFWRP = O'40 Write partial record BIOFWR = O'50 Write record BIOFEOF = O'52 Write EOF BIOFEOD = O'56 Write EOF
DPBPD	7	4	Processing direction: 0 Read 1 Write
DPBEO	7	6-9	Termination condition: 00 Partial 10 Record 12 File, write only 16 Dataset, write only
DPBUBC	7	10-15	Unused bit count; must be specified on a write record request. Value returned on a read request.

Field	Word(base8)	Bits	Description
DPBWC	7	16-39	Word count; number of words at DPBWA to read or write. Field contains actual number of words read when request is completed.
DPBWA	7	40-63	Word address of user data area L@DPTM=D'8
DPTM	10-17	0-63	

Wd	Bits	Use
8	0-63	Saved word W@DPPRI
9	0-63	Saved A2 in WB30
10	16-39	$RWDP/$WWDP return address
10	40-63	$RWDP/$WEOF first word address (FWA)
11	16-39	WB30/$WEOF return address
11	40-63	$WEOD return address
12	0-7	JTA length/1000 octal when registers are saved
12	8-15	Bits 0-7 of RBLK/WBLK A5
12	16-39	(B.ZE)
12	40-63	RBLK/WBLK B0
13	16-39	DNT address
13	40-63	(A7) JXT address recall
14	0-15	Bits 8-23 of RBLK/WBLK A5
14	16-39	RBLK/WBLK A2
14	40-63	RBLK/WBLK A3
15	0-63	RBLK/WBLK S6

DPTPS	20	0-15	Online tape status
DPTPV	20	40-63	Tape pointer to label definition table
DPTPD	21	0-1	Tape density
DPTPF	21	2-3	Tape format
DPTAPE	21	4-19	Tape status
DPAEV	21	4	User is at tape end of volume
DPTOR	21	5	Tape off reel
DPTMS	21	6	Tape mark status
DPBLT	21	7	Blank tape
DPEOVR	21	8	EOV READ

MASKS FOR TESTING TAPE STATUS FIELD

```
                                TS$EOV=O'100000         EOV mask
                                TS$TOR=O'040000         Tape off
                                reel mask
                                TS$TMS=O'020000         Tape mark
                                status mask
                                TS$BLT=O'010000         Blank tape
                                detected mask
                                TS$EOVR=O'004000        Read
                                completed in EOV processing

DPMTF       21      48-63   Maintenance test field

DPCV        22        0     Data conversion flag
                              DPCVOFF=0 Data conversion off
                              DPCVON=1  Data conversion on

DPFD        22       1-4    Translation identifier
                              DPFDNONE=0   NO foreign file
                              translation
                              DPFDIBM=1 IBM file translation
                              DPFDCDC=2 CDC file translation

DPRF        22       5-11   Record format (if DPCT nonzero)
                              DPRFUNKN=O'177          Unknown
                              record format
                              DPRFIU=0  IBM undefined
                              DPRFIF=1  IBM fixed
                              DPRFIFB=2 IBM fixed blocked
                              DPRFIV=3  IBM variable
                              DPRFIVB=4 IBM variable blocked
                              DPRFIVBS=5   IBM variable block
                              span
```

Values 21 through 37 are reserved for ANSI record types:

			DPRFIIW=O'00 I tape format, I blocks, W records DPRFICW=O'10 I tape format, C blocks, W records DPRFICZ=O'11 I tape format, C blocks, Z records DPRFICS=O'12 I tape format, C blocks, S records DPRFSIIW=O'40 SI tape format, I blocks, W records DPRFSICW=O'50 SI tape format, C blocks, W records DPRFSICZ=O'51 SI tape format, C blocks, Z records DPRFSICS=O'52 SI tape format, C blocks, S records
DPMBS	22	16-39	Maximum block size
DPRS	22	40-63	Record length
DPBFBO	23	0-5	User data area current bit offset
DPCS	23	6-7	Character set (if DPCT nonzero) DPCSAS=0 ASCII DPCSEB=1 EBCDIC DPCSDC=2 CONTROL DATA display code
DPSCC	23	12-13	Record continuation code
DPBDF	23	14	Bad data flag
DPPCR	23	15	Process-characters-remaining flag
DPBFBL	23	16-39	User data area current bit length
DPBFBA	23	40-63	User data area current address
DPLPBL	24	0-5	Last partial word bit length
DPEOLR	24	6	Foreign dataset end of logical record
DPEOLF	24	7	Foreign dataset end of logical file
DPSBL	24	16-39	Current segment/record bit length
DPBLBL	24	40-63	Current tape block bit length
DPLOCK	25	0-63	Multitasking lock (nonzero TIB address
DPEEC	26	0-11	Error code if DPEEP is set; correspond to EXP abort codes.

Field	Word(base8)	Bits	Description
DPDEL	27	12	FORTRAN file status: 0 Keep 1 Delete
DPBLNK	27	13	FORTRAN numeric input blank conversion: 0 Null 1 Zero
DPDIR	27	14	FORTRAN direct access flag
DPUFMT	27	15	FORTRAN unformatted I/O flag
DPRECL	27	16-39	FORTRAN direct access record length (in number of characters)
DPNXRC	27	40-63	FORTRAN direct access next record number

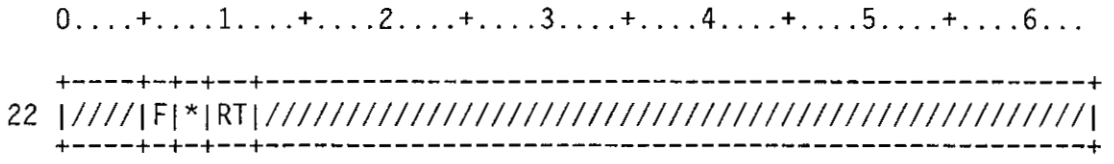


Figure DP-2. CDC record format

Field	Word(base8)	Bits	Description	
DPF	22	5-6	Tape format	
			DPFI=0	Internal
			DPFSI=1	System or scope internal
DPBT	22	7-8	Block type	
			DPBTI=0	Internal
			DPBTC=1	Character count
DPRT	22	9-11	Record type	
			DPRTW=0	Control word
			DPRTZ=1	Zero byte
			DPRTS=2	System-logical

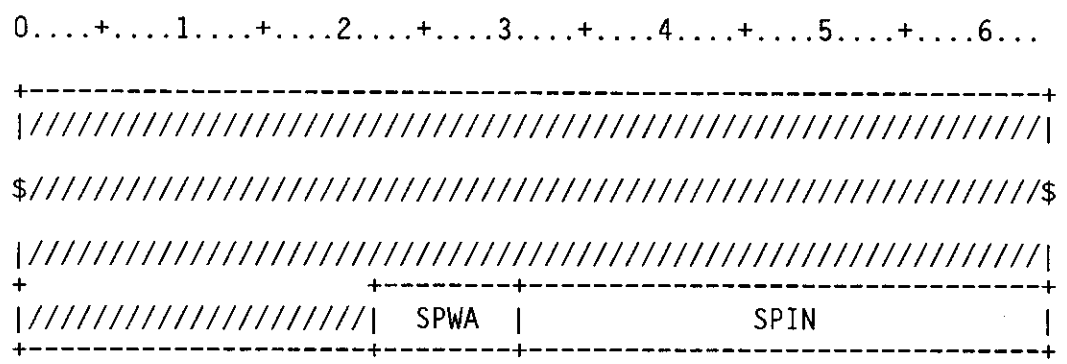


Figure DP-3. Save areas used by asynchronous SETPOS

Field	Word(base8)	Bits	Description
DPSPWA	6	22-30	Word address save areas used
DPSPIN	6	31-63	by asynchronous SETPOS

The PDS is STP resident and contains an entry for each active (accessed) permanent dataset. A PDS entry indicates how a dataset is accessed and, if multiple access exists, how many users are accessing the dataset.

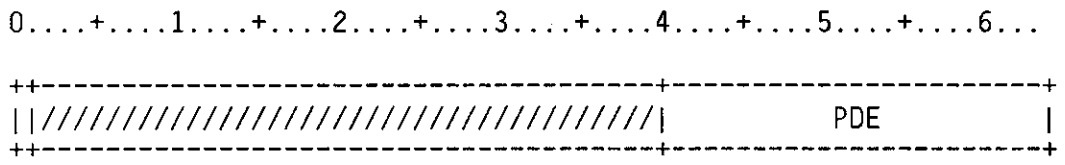


Figure PD-1. Permanent Dataset Table

Field	Word(base8)	Bits	Description
PDFULL	0	0	PDS full indicator; that is, unique datasets currently being accessed are equal in number to the space reserved for PDS entries.
PDPDE	0	40-63	Number of permanent datasets currently being accessed; that is, number of entries in table.

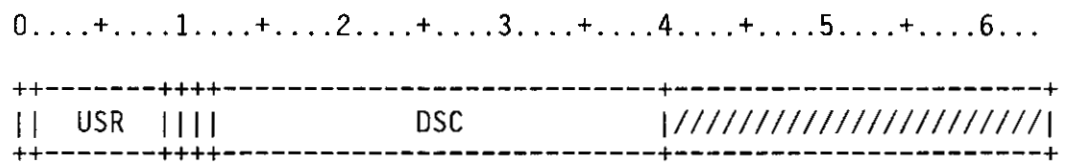


Figure PD-2. Permanent Dataset Table Entry

Field	Word(base8)	Bits	Description
PDUNQ	0	0	Unique access flag
PDUSR	0	1-8	Number of users currently accessing dataset
PDMRR	0	9	Multiread access requested
PDUAR	0	10	Unique access requested
PDENT	0	11	System directory flag
PDDSC	0	12-39	Dataset Catalog pointer
PDDCP	0	12-35	DSC page number
PDDCE	0	36-39	DSC entry number

STP contains a Disk Reservation Table (DRT) for each logical mass storage device known to the system. The table (figure DR-1) consists of a header and a bit map. Each bit in the bit map represents one allocation unit (AU), such as one track on a disk. A set bit implies that the the AU is in use.

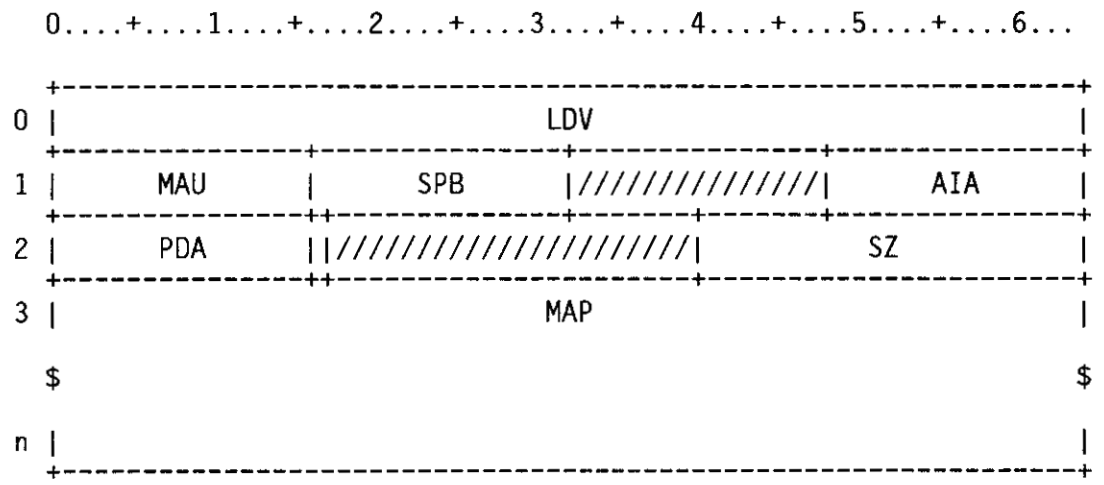


Figure DR-1. Disk Reservation Table

Field	Word(base8)	Bits	Description
DRLDV	0	0-63	Logical device name
DRMAU	1	0-15	Maximum allocation units (AU) less flaws
DRSPB	1	16-31	SECTORS PER RESERVATION BIT
DRAIA	1	48-63	Total available AUs (number of unused bits)
DRPDA	2	0-15	Number of AUs used for permanent dataset
DRFLW	2	16	Indicates that a *flaw directive was in the startup parameter file
DRSZ	2	40-63	DRT map size in words
DRMAP	3-n	0-63	Bit map, one bit per track

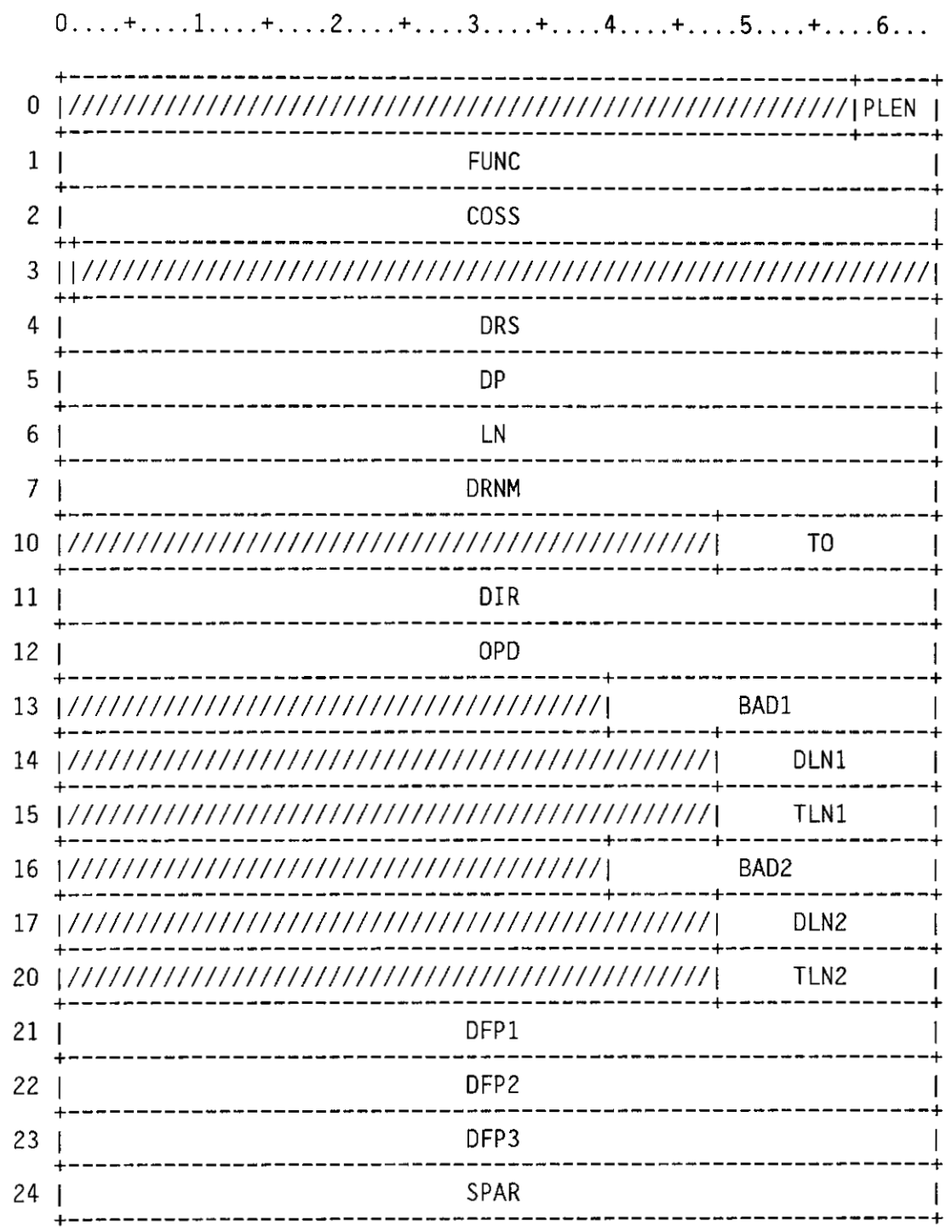


Figure DR-1. F$DRIVER parameter block

Field	Word(base8)	Bits	Description
DRPLEN	0	58-63	Parameter block length
DRFUNC	1	0-63	Subfunction code

The following line is a *CALL to comdeck COMAPFC.

CFN$xxx codes are used to specify the type of request to the shell and/or driver.

If codes are added, CFNMIN, CFNRSV, CFN$DMIN, and CFN$DMAX must be updated accordingly.

```
CFN$MIN=3 Minimum legal code
CFN$OPE=3 Driver Open
CFN$CLS=4 Driver close
CFN$RD=5  Read header
CFN$RDH=6 Read header and hold data
CFN$RDD=7 Read both header and data
CFN$WT=D'8   Write header
CFN$WTH=D'9  Write header and hold
data
CFN$WTD=D'10 Write header and data
CFN$RSV=D'11 - D'31      Reserved
CFN$DMIN=D'32          Minimum
legal driver function code
CFN$DMAX=D'127         Maximum
legal driver function code
```

CST$xxx codes are returned by the shell and drivers.

```
CST$CMP=0 Complete
CST$MIN=CST$CMP        Minimum
status
CST$PRO=3 Protocol error
CST$CHN=4 Illegal channel number
CST$FCN=5 Illegal function code
CST$DVN=6 Illegal driver name
CST$DAE=7 Data address error
CST$DLE=D'8  Data length error
CST$MAX=CST$DLE        Maximum
status
```

D'9 - D'31 Reserved

```
CST$DMIN=D'32          Min driver
specific code
CST$DMAX=D'127         Max driver
specific code
```

CST$xxx codes for loopback driver.

CST$TMO=D'32 Loopback Driver timeout

DRCOSS	2	0-63	Status of the request. DRS$OK=0 Okay DRS$CNO=1 Channel is not open DRS$CAO=2 Channel is already open DRS$RSV=3 Channel is reserved to another task DRS$CUK=4 Channel is unknown DRS$OFF=5 Channel is off DRS$BA1=6 Bad buffer1 address DRS$BA2=7 Bad buffer2 address DRS$BL1=8 Bad buffer1 length DRS$BL2=9 Bad buffer2 length DRS$BPS=10 Bad parameter size DRS$BDI=11 Bad channel direction DRS$BSY=12 Channel is busy DRS$BFN=13 Bad function DRS$NMT=14 Not available to multitasking jobs DRS$NRS=15 Channel is not reserved to you DRS$MIN=DRS$OK Min status DRS$MAX=DRS$NRS+1 Max status+1
DRCOMS	3	0	'Driver complete' status
DRDRS	4	0-63	Driver and shell status
DRDP	5	0-63	Driver parameter
DRLN	6	0-63	Logical channel name; 1-7 chars. Left justified, blank filled.
DRDRNM	7	0-63	Driver name
DRTO	10	48-63	Driver timeout in tenths of a sec
DRDIR	11	0-63	Direction of channel DIR$INP=0 Input DIR$OUT=1 Output
DROPD	12	0-63	OPEN driver spare
DRBAD1	13	40-63	Buffer1 address
DRDLN1	14	48-63	Data1 length
DRTLN1	15	48-63	Transfer1 length

Field	Word(base8)	Bits	Description
DRBAD2	16	40-63	Buffer2 address. Used only with READ/READ, WRITE/WRITE, and WRITE/HOLD requests.
DRDLN2	17	48-63	Data2 length. Used only with READ/READ, READ/HOLD, WRITE/WRITE, and WRITE/HOLD requests.
DRTLN2	20	48-63	Transfer2 length. Set only with READ/READ or WRITE/WRITE requests.
DRDFP1	21	0-63	DRIVER function parameters
DRDFP2	22	0-63	
DRDFP3	23	0-63	
DRSPAR	24	0-63	Spare for future use

The Device Channel Table is STP-resident and is used by the disk driver to report completion of I/O and to report disk status. The DCT acts as a link between the channel and the Equipment Table (EQT). There is only one entry per channel. entry.

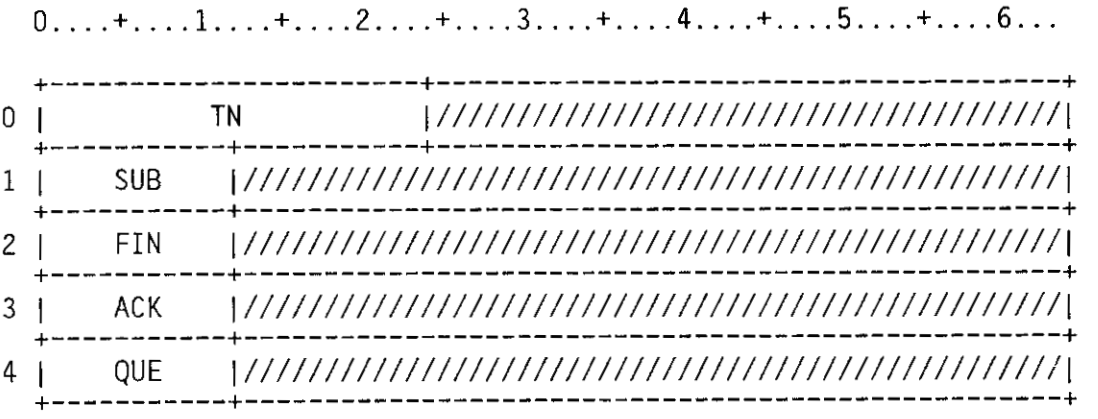


Figure DT-1. Device Channel Table Header

Field	Word(base8)	Bits	Description
DTTN	0	0-23	Table name; 'DCT' in ASCII.
DTSUB	1	0-11	Submitted channel bit map
DTFIN	2	0-11	Completed channel bit map
DTACK	3	0-11	Acknowledged channel bit map
DTQUE	4	0-11	Queued channel bit map

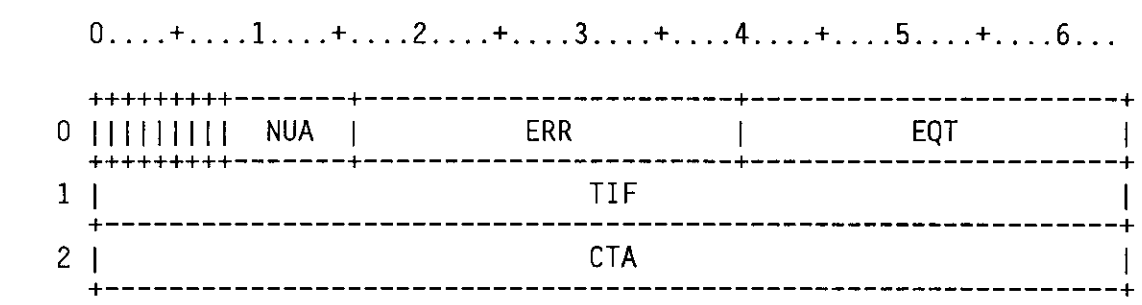


Figure DT-2. Device Channel Table Entry

Field	Word(base8)	Bits	Description
DTRSV	0	0	Channel reserved
DTOFF	0	1	Channel off
DTIA	0	2	Input channel active
DTOA	0	3	Output channel active
DTCRCL	0	4	Clear recall flag
DTBRK	0	5	Break streaming flag
DTMBT	0	6	Multiblock transfer controller. Indicates an SK/SL channel module is present, which allows consecutive disk sectors to be transferred without an intervening interrupt.
DTNUA	0	8-15	Number of units active
DTERR	0	16-39	Cumulative channel error count
DTEQT	0	40-63	Active equipment EQT address
DTTIF	1	0-63	Time function issued
DTCTA	2	0-63	Cumulative channel reserved time

A device label exists on the first usable track of a mass storage device and is created by Startup during an install. The device label contains a bad track label for the device. The device label for the master device also contains pointer to the Dataset Catalog.

Figure DV-2 refines the definition of field DVPCOS and exists to simplify the table diagram generator.

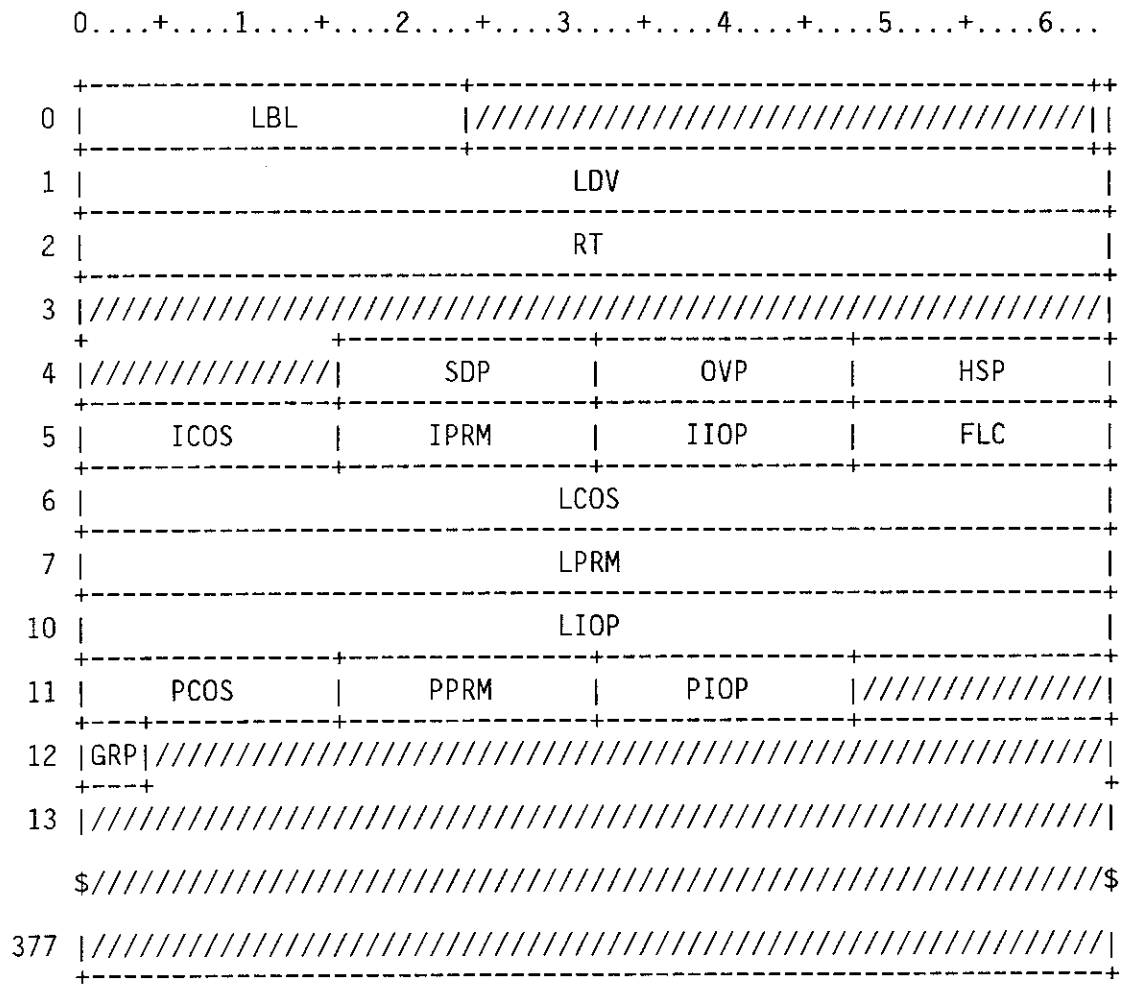


Figure DV-1. Device Label Table

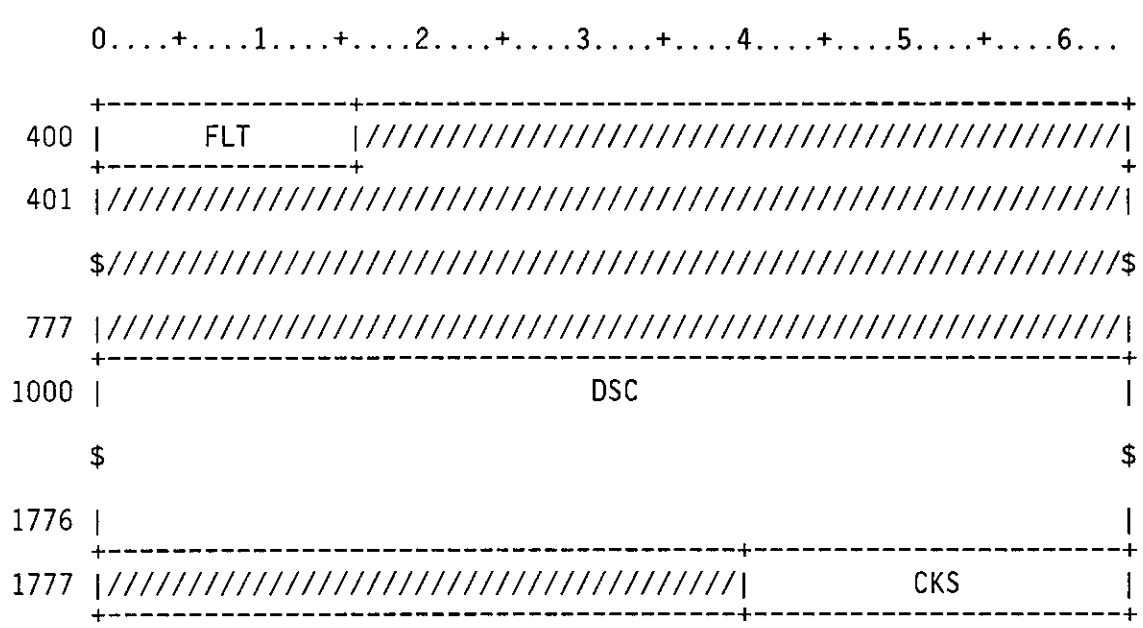


Figure DV-1. Device Label Table

Field	Word(base8)	Bits	Description
DVLBL	0	0-23	Device label indicator; 'DLB' in ASCII.
DVMD	0	63	Master device flag
DVLDV	1	0-63	Logical device name
DVRT	2	0-63	Real-time clock when DVL was written
FIELD	3,0,64		Field available for future use
FIELD	4,0,16		Field available for future use
DVSDP	4	16-31	First track of system dump area
DVOVP	4	32-47	DSC overflow pages if DVMD<>0 (master device)
DVHSP	4	48-63	DSC hash pages if DVMD<>0 (master device)
DVICOS	5	0-15	First AI of COS image from IOS (if master)
DVIPRM	5	16-31	First AI of parameter file image from IOS (if master)

Field	Word(base8)	Bits	Description
DVIIOP	5	32-47	First AI of IOS system image from IOS (if master)
DVFLC	5	48-63	Number of used AIs (if master)
DVLCOS	6	0-63	LDV of device containing COS image (if master)
DVLPRM	7	0-63	LDV of device containing parameter file image (if master)
DVLIOP	10	0-63	LDV of device containing IOS system image (if master)
DVPCOS	11	0-15	IOP number and channel, COS file (if master)
DVPPRM	11	16-31	IOP number and channel, PRM file (if master)
DVPIOP	11	32-47	IOP number and channel, IOP file (if master)
DVGRP	12	0-3	Group ID of stripe to which this device belongs, in range 0-9. If zero, device is not in stripe.
DVFLT	400	0-15	List of reserved AIs such as flaws, FE tracks, etc.
DVDSC	1000-1776	0-63	Dataset Catalog DAT page images if DVMD<>0 (master device)
DVCKS	1777	40-63	Checksum

Startup log message (written to system log):

This subtable refines the definition of DVPCOS. This would usually be done using SUBFIELD macros. In this instance, however, symbols W@ZIOPNO and W@ZIOPCH are not desired, preventing definition of the fields using the SUBFIELD macro.

The existence of this subtable is a concession to the table diagram generator, primarily.

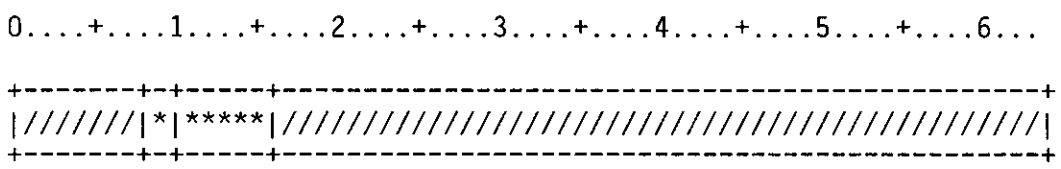


Figure DV-2. IOP and channel number subfields

Field	Word(base8)	Bits	Description
ZIOPNO	11	8-9	IOP NUMBER - BITS 8-9 OF PARCEL
ZIOPCH	11	10-15	IOP CHANNEL - BITS 10-15 OF PARCEL

The Permanent Dataset Catalog Extension Information Table (DXI) contains information used by the Permanent Dataset Manager (PDM) such as the number of pages in the DXT.

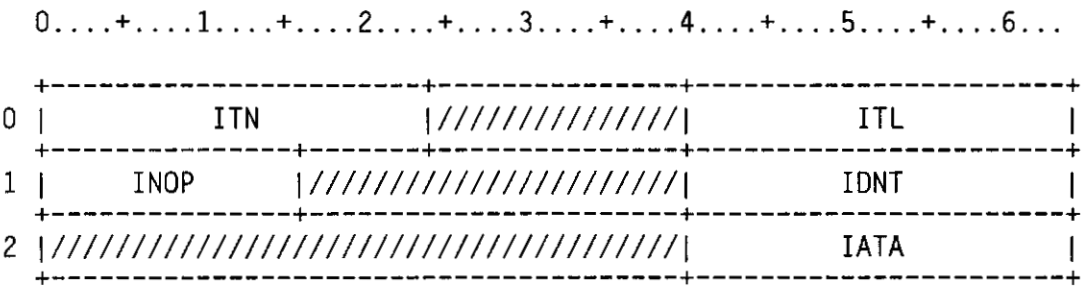


Figure DX-1. DSC Extension Information Table

Field	Word(base8)	Bits	Description
DXITN	0	0-23	Table name
DXITL	0	40-63	Table length in words
DXINOP	1	0-15	Number of pages in the DXT.
DXIDNT	1	40-63	Address of DXT's DNT.
DXIATA	2	40-63	Address of DXT Allocation Table.

The DXT serves as a repository for information that does not fit conveniently into the DSC. The DXT is a system dataset similar to the DSC itself. It is located or created during Deadstart; or it can be created during an Install. It is a permanent dataset with the name $DSC-EXTENSION and edition number 4095.

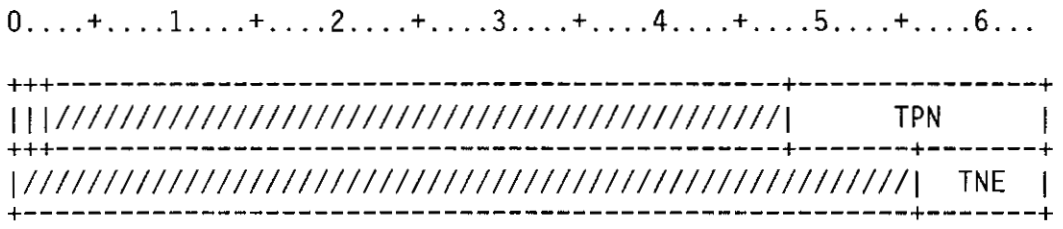


Figure DX-1. DSC Extension page definition table

DSC Extension Page header definition

Field	Word(base8)	Bits	Description
DXTPF	1	1	Page is currently full.
DXTPN	1	48-63	Page number.
DXTNE	2	56-63	Number of entries in use on this page.

DSC Extension page entry header definition

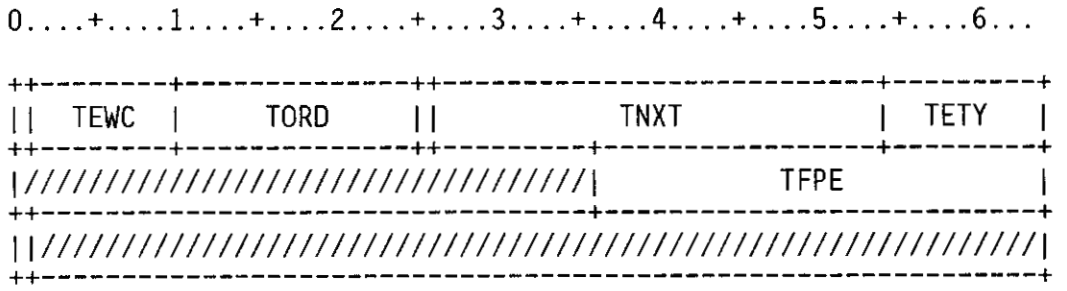


Figure DX-2. DSC Extension page entry header
LH@DXEH=3

DXTUSE	0	0	In use flag (1= entry in use)

Field	Word(base8)	Bits	Description
DXTEWC	0	1-9	Entry word count
DXTORD	0	10-24	DXT ordinal (0-D'32767)
DXTNXT	0	26-53	Next DXT pointer.
DXTNXP	0	26-49	page number
DXTNXE	0	50-53	entry number
DXTETY	0	54-63	Entry type.
DXTCOS	0	54	CRI or Site flag (0=CRI)
DXTETV	0	55-63	entry type value

DXT entry type definitions

DXPERM=1 Permanent dataset permit info.
DXTRAC=2 Permanent dataset track accesses info.
DXTEXT=3 Text entry type
DXNOTE=4 Notes entry type

DXTFPE	1	36-63	First DSC page/entry of owning DXT
DXTACT	2	0	Active/Inactive flag (1=Inactive)

Engineering diagnostics use this disk-resident table to record flaws encountered during a surface analysis of a disk pack. Startup uses the table to make flawed tracks unavailable to COS.

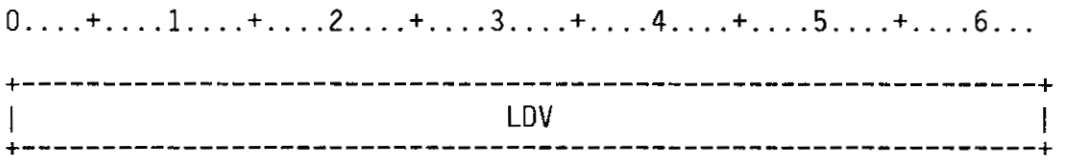


Figure EFT-1. Engineering Flaw Table Header

Field	Word(base8)	Bits	Description
EFTLDV	0	0-63	Logical device name as known to COS

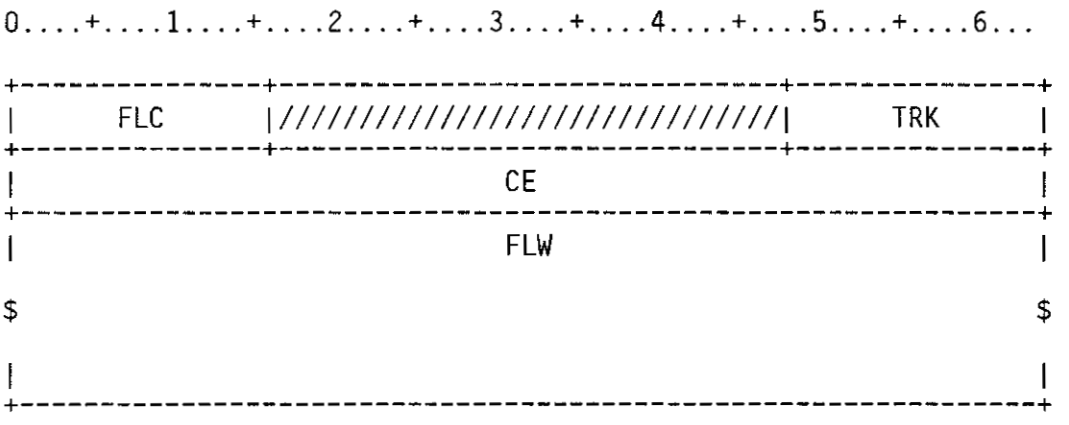


Figure EFT-2. Engineering Flaw Table Entry

Field	Word(base8)	Bits	Description
EFTFLC	0	0-15	Count of flaw entries in list
EFTTRK	0	48-63	Track number where EFT was found
EFTCE	1	0-63	Reserved for use by engineering
EFTFLW	2-n	0-63	Flaw list written by diagnostic

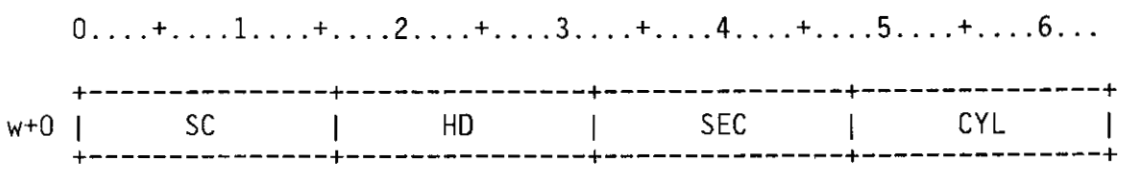


Figure EFT-3. Subfields in each word of flaw

Field	Word(base8)	Bits	Description
EFTSC	w+0	0-15	Count of contiguous flawed sectors
EFTHD	w+0	16-31	Head group number of flawed sectors
EFTSEC	w+0	32-47	First sector with flawed track
EFTCYL	w+0	48-63	Cylinder number of flawed track

Execution profile table, used for F$SPY and F$PROF

EP - Execution Profile Table

The Execution Profile Table (EP) contains the following:

- Time slice for interrupts (in microseconds)
- First and last addresses of the code area to be monitored
- Bucket size (number of words to be mapped into each bucket)
- Values specified on the enable call (EPFW, EPTS, and EPBS are returned)
- Buffer length

Subfunction SPY$ON enables EP; SPY$OFF disables EP and returns the accumulated information to a buffer specified by the user.

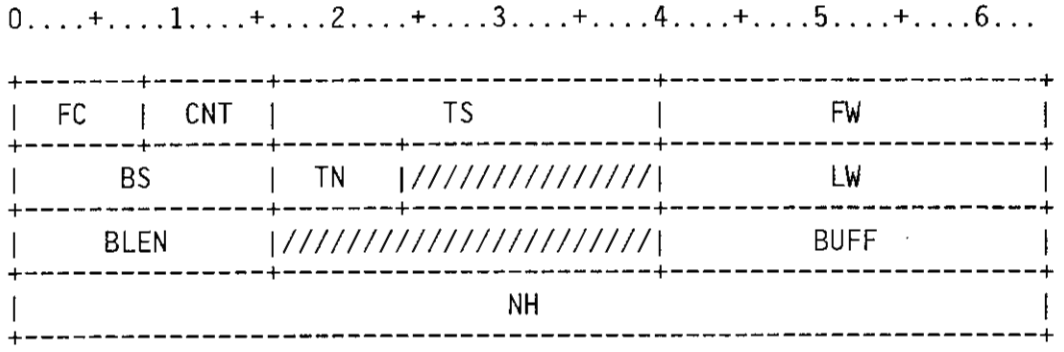


Figure EP-1. Execution Profile Table

Field	Word(base8)	Bits	Description
EPFC	0	0-7	Function code
EPCNT	0	8-15	Count of remaining
EPTS	0	16-39	Time-slice (in micro-seconds)
EPFW	0	40-63	BA of area to be watched(in words)
EPBS	1	0-15	Number of words/bucket
EPTN	1	16-23	STP task number to monitor (F$PROF only)
EPLW	1	40-63	LA of area to be watched(in words)

Field	Word(base8)	Bits	Description
EPBLEN	2	0-15	Length of receive buffer
EPBUFF	2	40-63	Address of receive buffer
EPNH	3	0-63	Total samples while task connected (F$PROF only)

This STP-resident table is used for working storage by the disk driver, for disk allocation, for passing requests to the disk driver, and for queue management. This table is also written to the system log to record disk errors. EXTRACT must be modified if any field definition in the first 8 EQT words is changed. This is for disk error logging.

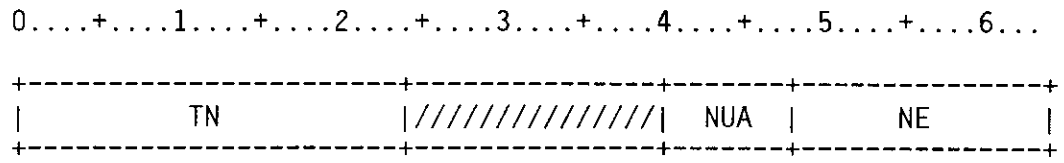


Figure EQ-1. Equipment table header

Field	Word(base8)	Bits	Description
EQTN	0	0-23	Equipment table identifier: A'EQT'
EQNUA	0	40-47	Next unit to be allocated
EQNE	0	48-63	Number of entries in table

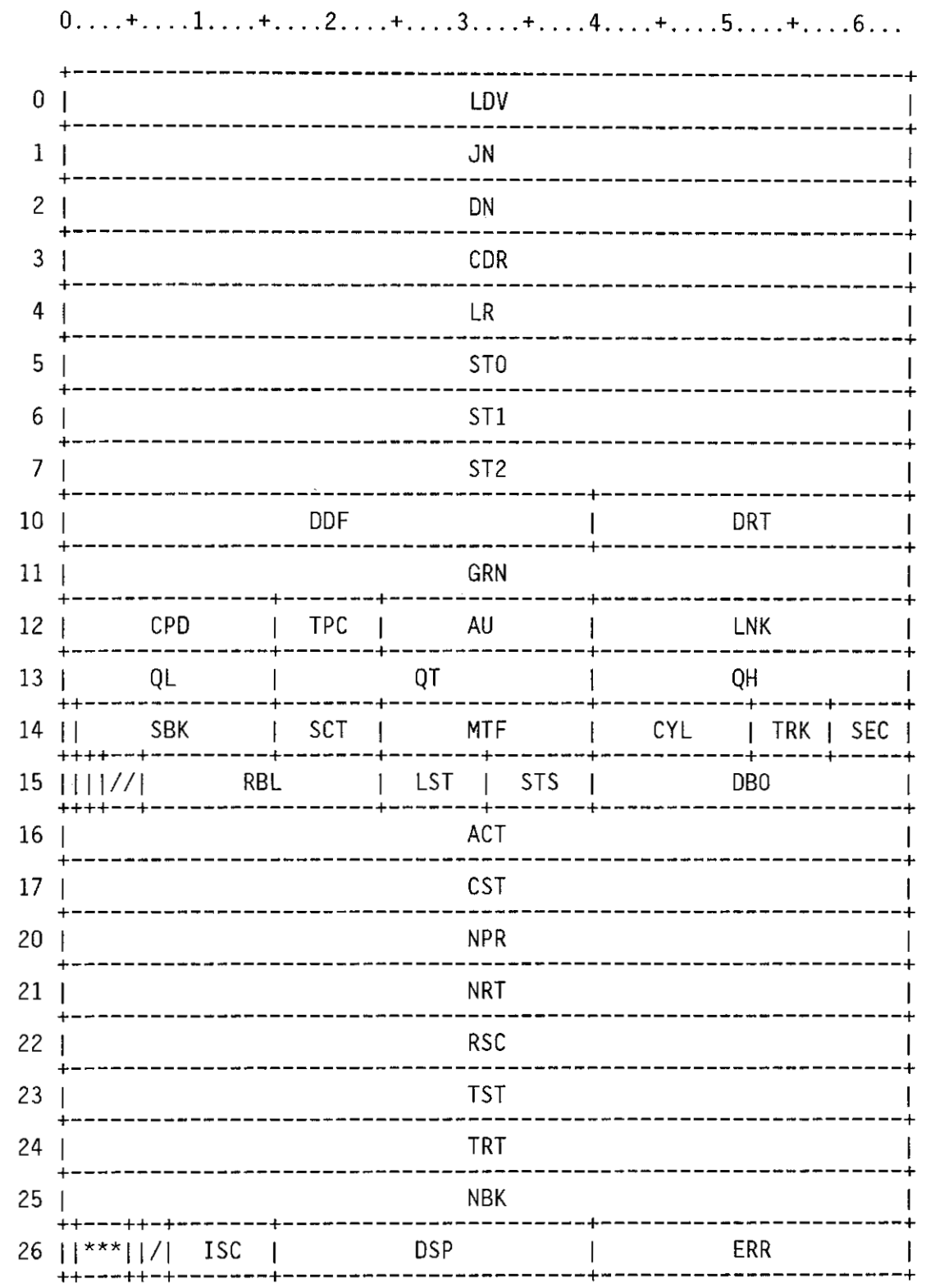


Figure EQ-2. Equipment table entry

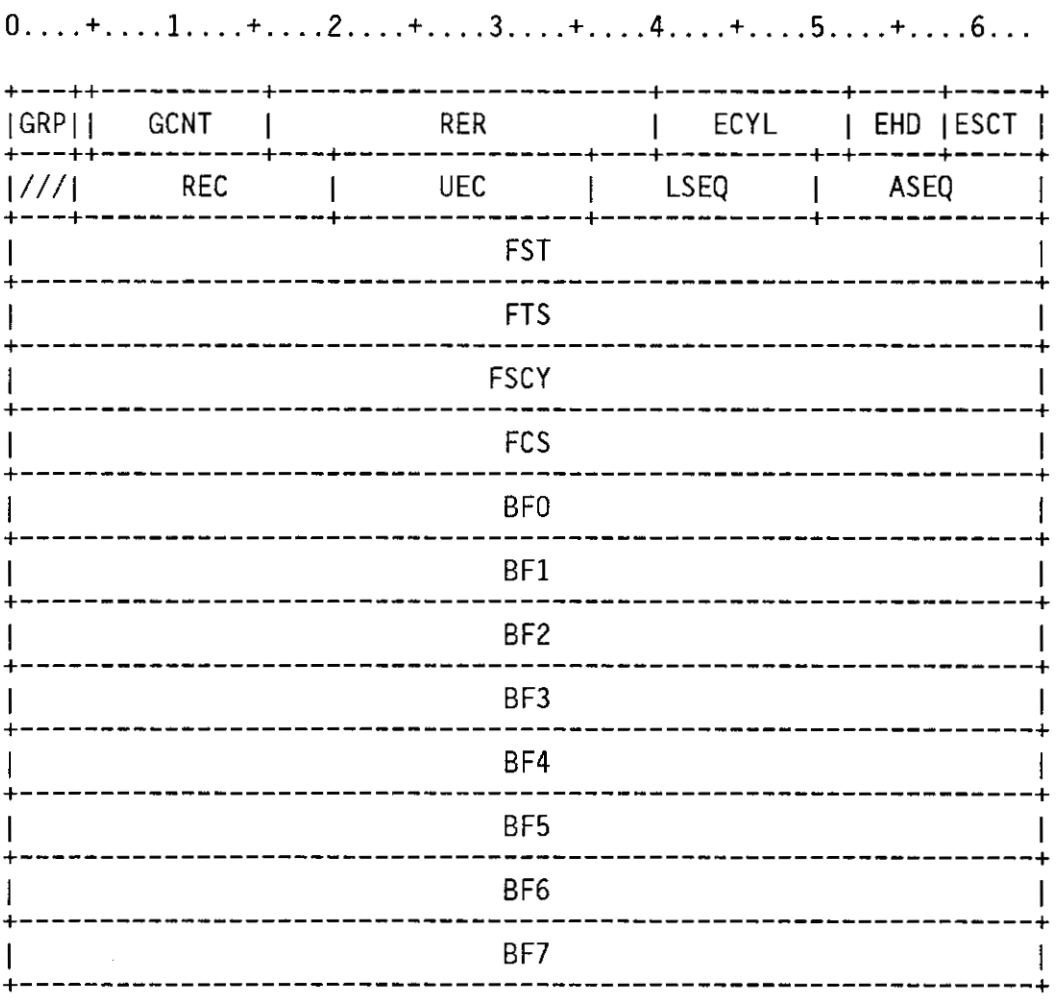


Figure EQ-2. Equipment table entry

Field	Word(base8)	Bits	Description
EQLDV	0	0-63	Logical device name
EQJN	1	0-63	Job name of last error
EQDN	2	0-63	Dataset name of last error
EQCDR	3	0-63	Current physical disk request

* CAUTION: The format of the following word is assumed to
* be the same in EQT, CBT, and RQT.

EQSC	3	0-13	Sector count

Field	Word(base8)	Bits	Description
EQDA	3	14-39	Disk address
EQCA	3	14-25	Current cylinder address
EQTA	3	26-31	Current track address
EQSA	3	32-39	Current sector address
EQMA	3	40-63	Current memory address
EQLR	4	0-63	Logical request of last error
EQINB	4	0-15	Number of blocks to transer
EQISB	4	16-39	Starting block number
EQIBF	4	40-63	Buffer address
EQSTO	5	0-63	First status word
EQFLT	5	0-15	Cumulative fault status: bit description 0 IOP angular position counter failure 1 IOP disk not ready 2 IOP lost data error 3 IOP data error on channel 3 4 IOP data error on channel 2 5 IOP data error on channel 1 6 IOP data error on channel 0 7 Address error 8 Seek error 9 Write fault, channel 3 10 Write fault, channel 2 11 Write fault, channel 1 12 Write fault, channel 0 13 Multiple head select 14 Read and write conflict 15 Not on cylinder and read or wri
EQINT	5	16-31	Cumulative interlock status: bits description 16-23 Undefined 24 Low positive voltage 25 Low negative voltage 26 Undefined 27 Start switch is off 28 Brush cycle not finished 29 Heads not fully loaded 30 Unit not up to speed 31 Logic chassis high temperature

Field	Word(base8)	Bits	Description
EQSST	5	32-47	Cumulative subsystem status: bits description 32-37 Undefined 38 Channel parity error (2**12 to 2**15) 39 Channel parity error (2**8 to 2**11) 40 Channel parity error (2**4 to 2**7) 41 Channel parity error (2**0 to 2**3) 42 Read checkword error 43 DSU ready error 44 DSU not on cylinder 45 DSU index error 46 ID verification error 47 DSU reservation error
EQEST	5	48-55	Cumulative extended error status:
EQIOP	5	48	IOP disk error
EQPDS	5	49	Permanent dataset error
EQCRC	5	50	DCU inconsistent CRC error
EQDTE	5	51	DCU data transfer error
EQCPE	5	52	DCU channel parity error
EQRWE	5	53	DCU read/write response error
EQSSE	5	54	DCU subsystem status error
EQTOE	5	55	DCU software time-out error
EQFSC	5	56-63	Final status code: value description 000 No error 001 Recovered disk error 002 Unrecovered data error 003 Angular position error 004 Disk not ready error 005 Lost data error 006 Address error 007 Seek error 010 Multiple head select 011 Read/write conflict 012 Read/write off cylinder 013 Corrected data error 014 Uncorrected data error 015 Unrecovered hardware error 016 Undefined error status 017 Software timed out
EQST1	6	0-63	Second status word
EQLFC	6	0-15	Last function code

Field	Word(base8)	Bits	Description
EQLSR	6	16-31	Last error status response
EQLRW	6	32-47	Last read/write response error
EQLMS	6	48-55	Last margin select
EQTRY	6	56-63	Last try count
EQST2	7	0-63	Third status word
EQOFR	7	0-15	Offset register status response bits description 6-15 If seek is current, requested cylinder 8-15 If seek is not current, selected margin
EQCYN	7	16-31	Cylinder number status response bits description 22-31 Valid cylinder number
EQHDN	7	32-47	Head group number status response
EQCON	7	42	Bit 42 Unit connect bit. Needed for EXTRACT bits description 42 Unit connect bit 44-47 Valid head group number
EQSCN	7	48-63	Sector number status response bits description 59-63 Valid sector number
EQDDF	10	0-39	Device definition word
EQMSD	10	0	Master device flag
EQOFF	10	1	Unit off if set
EQNA	10	2	Unit not available if set
EQRLS	10	3	Release datasets on this unit if set
EQUP	10	4	Unit up if set (*UP in parameter file)
EQRBN	10	5	Request by name (allocation control)
EQRCH	10	6-13	Real I/O Processor channel number

Field	Word(base8)	Bits	Description
EQDT	10	14-21	Device type (DT@--- defs in COMSYSEQ)
EQDTG	10	14-17	Device type group
EQDTC	10	18-21	Device characteristic within group
EQSCR	10	22	Device contains only scratch dataset
EQVOL	10	23	Dataset for volatile device exists
EQCTL	10	24	Controlled device flag
EQDWN	10	25	Device down flag
EQCH2	10	26-31	Secondary channel number
EQCH1	10	32-37	DCU system: Primary channel number IOP system: Pseudo channel number
EQUT1	10	38-39	DCU system: Primary unit number IOP system: I/O Processor number
EQDRT	10	40-63	Disk reservation table address
EQGRN	11	0-63	GENERIC RESOURCE NAME
EQCPD	12	0-15	Cylinders per disk
EQTPC	12	16-23	Tracks per cylinder
EQAU	12	24-39	Blocks per allocation unit
EQLNK	12	40-63	Link to next equipment on channel
EQQL	13	0-15	Queue length
EQQT	13	16-39	Queue tail pointer
EQQH	13	40-63	Queue head pointer
EQCHK	14	0	Validate starting block number flag
EQSBK	14	1-15	Starting block number
EQSCT	14	16-23	SSD channel type (defs in CONFIG@P)
EQMTF	14	24-39	Maintenance test field
EQTFC	14	24-27	Maintenance test function
EQTD4	14	28-31	Test data (4 bits)
EQTD8	14	32-39	Test data (8 bits).
EQCYL	14	40-51	Last cylinder position

Field	Word(base8)	Bits	Description
EQTRK	14	52-57	Last track position
EQSEC	14	58-63	Last sector position
EQTD	15	0	Transfer direction
EQRET	15	1	Resume transfer flag
EQDEF	15	2	Disk error flag
EQRBL	15	6-23	Remaining block length, if EQSCT = @SSDVHSP
EQLST	15	24-31	Logical state
EQSTS	15	32-39	Reply status
EQDBO	15	40-63	Saved return address
EQACT	16	0-63	Anticipated on-cylinder time
EQCST	17	0-63	Cumulative seek time
EQNPR	20	0-63	Number of physical requests
EQNRT	21	0-63	Number of requests
EQRSC	22	0-63	Number of requests not requiring seek
EQTST	23	0-63	Transfer start time
EQTRT	24	0-63	Cumulative transfer time
EQNBK	25	0-63	Cumulative block count
EQEFT	26	0	EFT found flag
EQEFTK	26	1-4	EFT track on device
EQCNA	26	5	CONFIGURED NAVAIL BY STARTUP
EQISC	26	8-15	Initial SSD status code: STOERR (O'100) channel timeout error SSCERR (O'101) status channel error otherwise, lower 6 bits of HSC status word, if EQSCT = @SSDHSP upper 6 bits of status word error flags, if EQSCT = @SSDVHSP

Field	Word(base8)	Bits	Description
EQDSP	26	16-39	Dataset parameter table address
EQERR	26	40-63	Cumulative unrecovered error count
EQGRP	27	0-3	Group id for striped disks
EQGCHG	27	4	Stripe has changed flag
EQGCNT	27	5-15	Count of members in stripe
EQRER	27	16-39	Cumulative recovered error count
EQECYL	27	40-51	Last cylinder error address
EQEHD	27	52-57	Last head error address
EQESCT	27	58-63	Last sector error address
EQREC	30	4-19	Recovered error count
EQUEC	30	20-35	Unrecovered error count
EQLSEQ	30	36-49	Last packet sequence number
EQASEQ	30	50-63	Expected packet sequence number
EQFST	31	0-63	Floated sectors per track
EQFTS	32	0-63	Floated tracks per sector
EQFSCY	33	0-63	Floated sectors per cyclinder
EQFCS	34	0-63	Floated cyclinders per sector

When I/O is done through an IOS, words EQBF0-EQBF5 are an IOS packet, as defined by the APT A-packet.

When I/O is done through a DCU-3 attached directly to the CPU, tables IB1 and IB2 occupy the space.

EQBF0	35	0-63	I/O buffer word 0 (also EQIB1)
EQBF1	36	0-63	I/O buffer word 1
EQBF2	37	0-63	I/O buffer word 2
EQBF3	40	0-63	I/O buffer word 3 (also EQIB4)
EQBF4	41	0-63	I/O buffer word 4 (also EQIB2)

Field	Word(base8)	Bits	Description
EQBF5	42	0-63	I/O buffer word 5
EQBF6	43	0-63	I/O buffer word 6
EQBF7	44	0-63	I/O buffer word 7
EQBF7	44	0-63	Required by table diagram generator

There are two buffers (IB1 and IB2) provided for data checkwords.

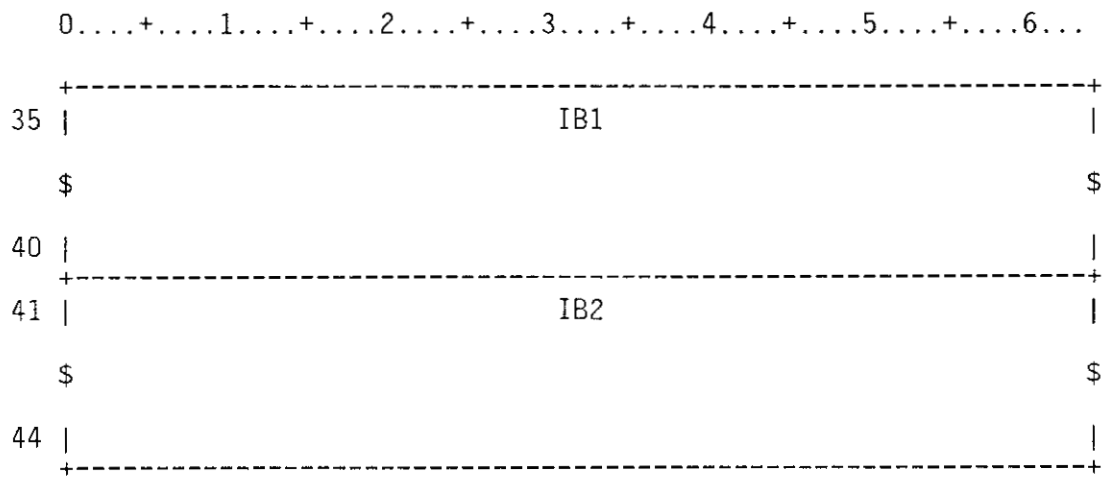


Figure EQ-3. Equipment table entry

Field	Word(base8)	Bits	Description
EQIB1	35-40	0-63	Buffer for data checkwords
EQIB1	35-40	0-63	Required by table diagram generator
EQIB2	41-44	0-63	
EQIB2	41-44	0-63	Required by table diagram generator

EQIB4 is the name of the last word of the EQIB1 buffer. (This awkward representation is due to limitations in the table diagram generator.

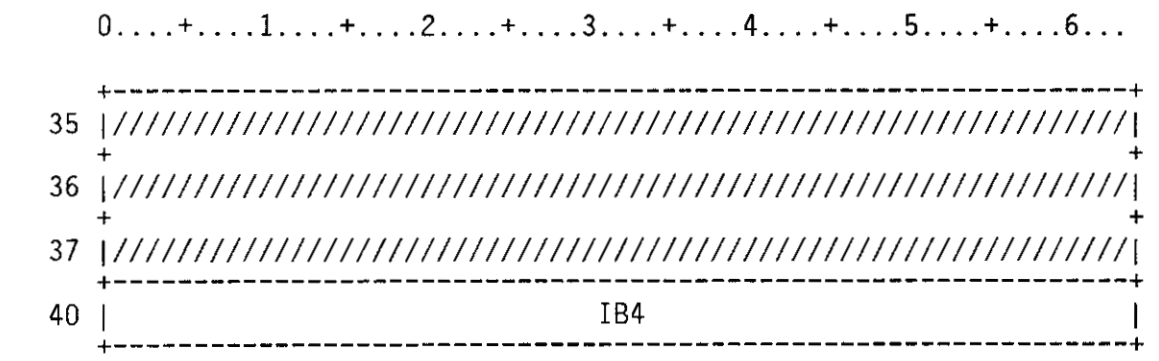


Figure EQ-4. Equipment table entry

Field	Word(base8)	Bits	Description
EQIB4	40	0-63	
EQIB4	40	0-63	Required by table diagram generator

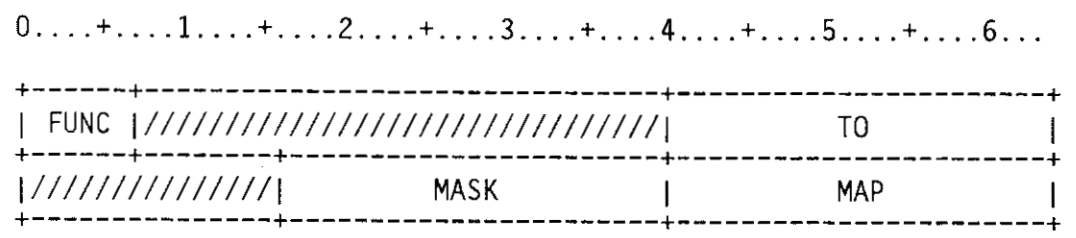


Figure ER-1. F$ERCL parameter block

Field	Word(base8)	Bits	Description
ERFUNC	0	0-6	Subfunction code

The functions range from ERCL$$MI to ERCL$$MA-1. When subfunctions are added adjust the ERCL$$ symbols as needed.

ERCL$DIS=01 Disable event monitoring
ERCL$ENA=02 Enable event monitoring
ERCL$RCL=03 Recall untill event
ERCL$RET=04 Return occurred-events map
ERCL$$MI=01 minimum subfunction
ERCL$$MA=05 maximum subfunction+1

ERTO	0	40-63	Timeout value (milliseconds)
ERMASK	1	16-39	Event selection mask

ERCL$$ values must be changed when new events are added.
Bits zero thru ERM$$MAX-1 must always be defined.
Bits ERM$$FP thru ERM$$LP-1 must always be defined.

ERMSIJ	1	16	Inter-job message arrived
ERMSUO	1	17	Unsolicited oper msg arrived
ERMSOR	1	18	Operator reply arrived
			ERM$$MAX=D'18+1 Last non privileged bit+1
			ERM$$FP=D'26 First privileged bit
ERMSCH	1	26	Channel function done
ERMSIQ	1	27	SDT placed in INPUT queue
ERMSOQ	1	28	SDT placed in OUTPUT queue
			ERM$$LP=D'28+1 Last privileged bit+1

Field	Word(base8)	Bits	Description
ERMAP	1	40-63	Occurred-events map
ERMPIJ	1	40	Inter-job message arrived
ERMPUO	1	41	Unsolicited oper msg arrived
ERMPOR	1	42	Operator reply arrived
ERMPCH	1	50	Channel function done
ERMPIQ	1	51	SDT placed in INPUT queue
ERMPOQ	1	52	SDT placed in OUTPUT queue

On return from F$ERCL, S0 can have the following values.

ERER=00 Okay
ERER$MT=01 Prohibitted to multitasking job
ERER$PV=02 Not a privileged job
ERER$BFN=03 Bad function
ERER$UDB=04 Mask contains undefined bits
ERER$MDI=05 Monitoring not enabled

The Encryption Parameter Table, residing in the user field, is used to pass parameters to the password encryption routine which replaces unencrypted passwords with encrypted passwords.

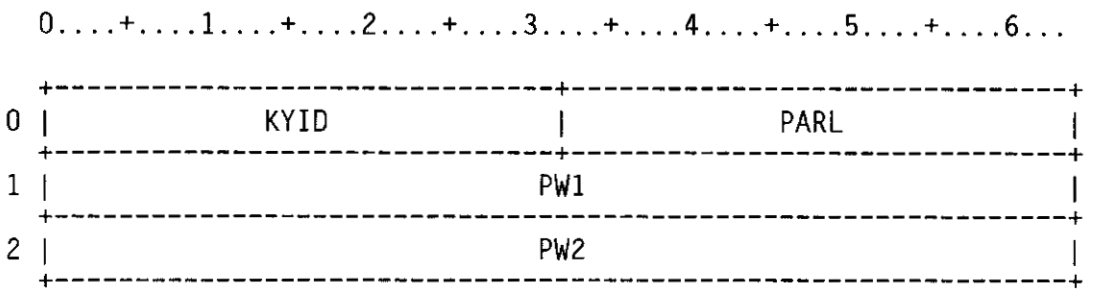


Figure ET-1. Encryption Parameter Table

Field	Word(base8)	Bits	Description
ETKYID	0	0-31	Encryption keyword index
ETPARL	0	32-63	Length of parameter table
ETPW1	1	0-63	First 8 characters of password
ETPW2	2	0-63	Last 7 characters of password

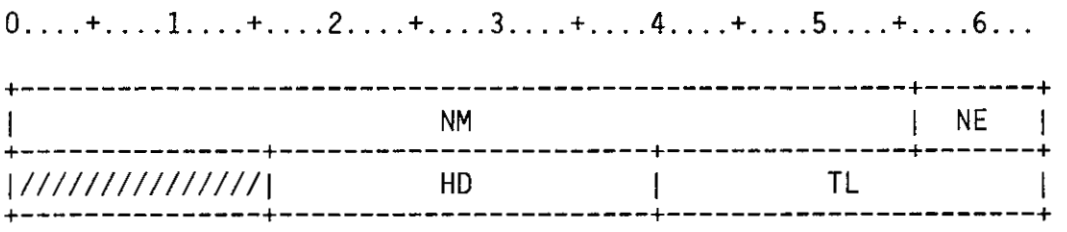


Figure EW-1. Event Wait Table Header

Field	Word(base8)	Bits	Description
EWNM	0	0-55	Table name in ASCII
EWNE	0	56-63	Number of entries
EWHD	1	16-39	Head of the event chain
EWTL	1	40-63	Tail of the event chain

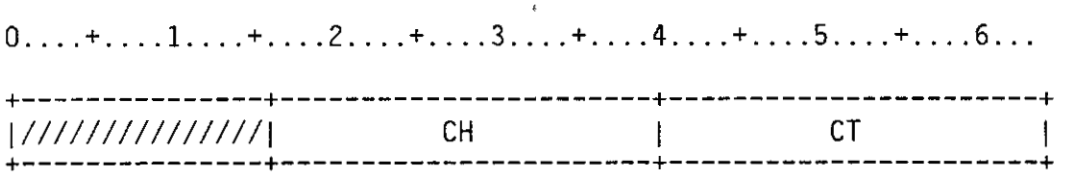


Figure EW-2. Event Wait Table Entry

Field	Word(base8)	Bits	Description
EWCH	0	16-39	Head of event catagory queue
EWCT	0	40-63	Tail of event catagory queue

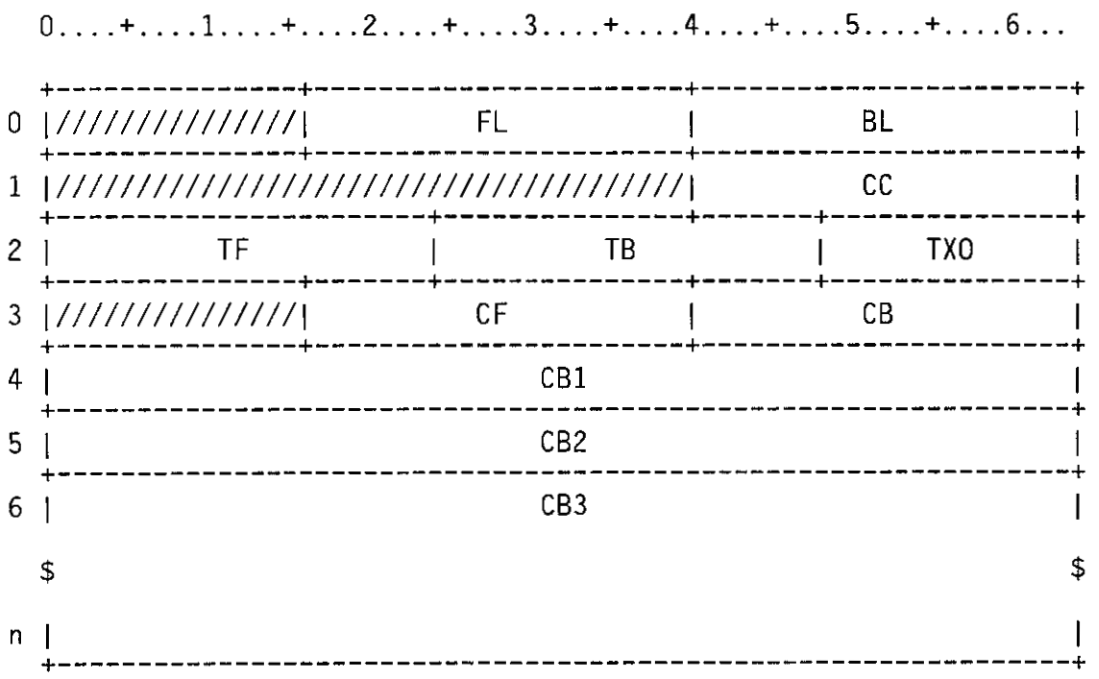


Figure EP-2. Event Pool Entry

Field	Word(base8)	Bits	Description
EPFL	0	16-39	Event chain forward link
EPBL	0	40-63	Event chain backward link
EPCC	1	40-63	Event chain control word address
EPTF	2	0-23	TXT queue forward link
EPTB	2	24-47	TXT queue backward link
EPTXO	2	48-63	TXT ordinal
EPCF	3	16-39	Catagory queue forward link
EPCB	3	40-63	Catagory queue backward link
EPCB1	4	0-63	Parameter block word 0
EPCB2	5	0-63	Parameter block word 1
EPCB3	6-n	0-63	Parameter block word 2

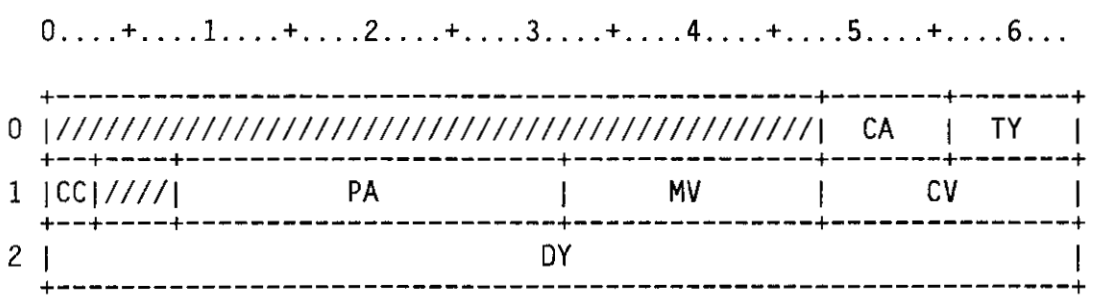


Figure EC-1. J$AWAIT Parameter Call Block

Field	Word(base8)	Bits	Description
ECCA	0	48-55	Event catagory
ECTY	0	56-63	Call type
ECCC	1	0-2	Event completion condition code
ECPA	1	8-31	Event parcel (STP relative)
ECMV	1	32-47	Event mask
ECCV	1	48-63	Event comparison value
ECDY	2	0-63	Delay interval in milliseconds

J$AWD	=	1	Delay task for interval
J$AWE	=	2	Wait on event
J$AWDE	=	4	Wait on event or delay interval
J$AWI	=	O'10	Wait on I/O quiet
N@NECT	=	O'16	Number of permissible event catagories
J$CTCOS	=	0	General event catagory
J$CTPDM	=	1	Events from PDM
J$CTCLM	=	O'10	Largest COS event catagory
J$CTSUB	=	O'11	Events created by subsystems
J$CTLIM	=	N@NECT	Maximum catagory

DQM ERROR CODES

ERUNK	=	1	Unknown request
ERNMT	=	2	No more allocation table space
ERNMS	=	3	No more disk storage space
ERNLD	=	4	No logical device
ERNCS	=	5	No contiguous space
EREOI	=	6	Attempted read beyond EOD
ERUHE	=	7	Unrecovered hardware error
ERUDE	=	D'8	Unrecovered data error
ERIDP	=	D'9	Invalid DSP
EREXT	=	D'10	Attempt to extend permanent dataset
ERDNR	=	D'11	Device-not-ready
ERNSW	=	D'12	Non sequential write illegal
ERXLM	=	D'46	Dataset size limit exceeded

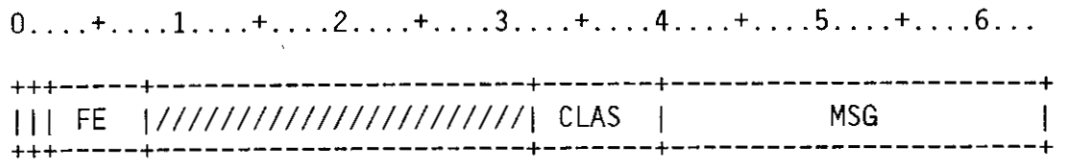


Figure EC-1. EXP Error Code Table

Field	Word(base8)	Bits	Description
ECDN	0	0	DN in message flag
ECRF	0	1	'ERROR REPRIEVABLE?' flag
ECFE	0	2-7	FEFW BIT number
ECCLAS	0	32-39	Major error class
ECMSG	0	40-63	Message address (must be bits 40-63)

```
EREFR    = 1          EOF on read
ERIOA    = 2          Invalid lock or unlock indication
ERNDT    = 3          No DAT space
ERFNO    = 4          File not open
ERINO    = 5          Invalid open
ERINR    = 6          Invalid read
ERINW    = 7          Invalid write
ERRFL    = D'8        Illegal bits in RFL request word
ERDOP    = D'9        Attempt to delete memory outside
                        progr
ERNDS    = D'10       Out of disk space
ERMEM    = D'11       System directory is full
ERCOF    = D'12       Control point overflow
ERGSY    = D'13       FL requested beyond system size
ERGAL    = D'14       FL requested beyond allowable size
ERAQR    = D'15       Unknown acquire error
ERDIN    = D'16       Invalid to dispose $in
ERINC    = D'17       Invalid close
ERDPO    = D'18       Data set previously opened
ERPOR    = D'19       Parameters out of range
ERINP    = D'20       Invalid parameter
ERDNT    = D'21       No DNT entry for name
ERBLW    = D'22       Buffer-length wrong on user-area
                        open
ERTLE    = D'23       Time limit exceeded
EROPD    = D'24       Operator dropped the job
ERABT    = D'25       F$ABT call from user
ERIUC    = D'26       Invalid (undefined) user call
EROVL    = D'27       Call not between user's BA and LA
ERXPE    = D'28       Exchange package error (fp,
                        parity, ee
ERLDV    = D'29       Logical device name not found
ERIBN    = D'30       Block number error reading dataset
ERDE     = D'31       Data error on disk i/o
ERHE     = D'32       Hardware error on disk i/o
ERRW     = D'33       Read after write or past EOD
ERUKN    = D'34       Unknown error
ERIPD    = D'35       Invalid processing direction
EREPT    = D'36
ERBDP    = D'37       Invalid DSP
ERKIL    = D'38       Operator kill
ERRRN    = D'39       Operator rerun
ERIDC    = D'40       Invalid disposition code
ERSDSP   = D'41       System-area DSPs destroyed
ERUDSP   = D'42       User-area DSPs destroyed
ERLGFULL = D'43       User log size exceeded I@LGUSZ
ERIDN    = D'44       Invalid dataset name
ERSLM    = D'45       LM parameter too large
ERXLM    = D'46       Dataset size limit exceeded
ERDNA    = D'47       Dataset transfer not possible
ERCAN    = D'48       Dataset can t be saved on
```

```
                                    front-end
ERSLFT   =  D'49                    System-area LFTs destroyed
ERULFT   =  D'50                    User-area LFTs destroyed
ERCLFT   =  D'51                    User-area LFT continuation addr
                                      bad
ERNMF    =  D'52                    NO USER LFT DN MACTH IN JTA LFTS
ERD53    =  D'53                    XP error - floating point error
ERD54    =  D'54                    XP error - operand range error
ERD55    =  D'55                    XP error - program range error
ERMER    =  D'56                    XP error - uncorrected memory
                                      error
ERCINT   =  D'57                    ERCINT
ERD58    =  D'58                    XP error - error exit
ERDPS    =  D'59                    Dispose failed
ERCSPMEM =  D'60                    Not enough memory for csp
ERNIRW   =  D'61                    No invoke request word specified
ERIAP    =  D'62                    Invoke request already pending
ERILM    =  D'63                    Invoke length not multiple of
                                      o'1000
ERILMX   =  D'64                    Invoke length exceed max allowed
ERCHK    =  D'65                    Checksums don't match
ERODC    =  D'66                    Can t open has outstanding
                                      disposes
ERIPC    =  D'67                    Invalid procedure dataset
ERPLX    =  D'68                    Maximum procedure level exceeded
ERWEX    =  D'69                    PDS-full wait counter exceeded
ERATTN   =  D'70                    Attention for interactive
ERBINV   =  D'71                    Bad class structure invoke
ERDSP    =  D'72                    DSP area has been destroyed
ERUFC    =  D'73
ERIDJ    =  D'74                    Dumpjob processing inhibited
ERENP    =  D'75                    No permission granted for
                                      execute-only
ERDAL    =  D'76                    Dataset is already local to the
                                      job
ERCSP    =  D'77                    Internal CSP error
ERPRV    =  D'78                    Privleged system request
ERUAS    =  D'79                    Ref to unassigned jcl symbol
ERRBO    =  D'80                    Receive buffer too small
ERUDF    =  D'81                    Undefined jcl symbol referenced
ERNJM    =  D'82                    Jcl symbol cant be modified by the
                                      job
ERIMC    =  D'83                    Invalid message class for F$MSG
                                      call
ERIMP    =  D'84
ERDIQ    =  D'85                    Dispose to cray input queue
                                      disallowed
ERBSU    =  D'86                    Buffer size invalid with unblocked
ERIAO    =  D'87                    Invalid F$DNT param with dataset
                                      open
ERIAC    =  D'88                    Invalid F$DNT param with dataset
```

```
                                        close
ERRTL     =  D'89       I/A I/O Request too long
ERBTL     =  D'90       Text addr and/or text length bad
ERTTL     =  D'91       Text length exceeds max allowed
EREPD     =  D'92       Cannot 'enter' empty dataset in
                          sdr
EROPBCP   =  D'93       Bad CPU number on OPTION,CPU=n
                          req.
ERLGHE    =  D'94       HARDWARE ERROR WHILE WRITING $LOG
ERINVX    =  D'95       INVOKE CURRENTLY NOT ACCEPTED
ERITRM    =  D'96       INTERACTIVE JOB TERMINATION
ERRTS     =  D'97       Interactive blocked record too
                          short
ERIMF     =  D'98       Mainframe does not support bt mode
ERAMD     =  D'99       Ambiguous MODE values
ER100     =  D'100      Nonsequential write illegal
ERICI     =  D'101      Interchange is invalid with
                          unblocked
ERUDT     =  D'102      Tape datasets may not be disposed
ERVRE     =  D'103      VSN required for existing dataset
ERTRE     =  D'104      Generic resource limit exceeded
ERLDR     =  D'105      LDT required for labeled dataset
ERILD     =  D'106      Invalid LDT or LDT address
ERUWT     =  D'107      Unable to write trailer label
                          group
ERWPV     =  D'108      Write attempt on protected volume
ERDFE     =  D'109      Data Format Error
ERWPE     =  D'110      Write protocol error
EROEV     =  D'111      Tape off end of reel
ERVPT     =  D'112      Tape volume is protected
ERDPT     =  D'113      Tape dataset is protected
ERNEW     =  D'114      New tape datasets must be written
                          to
ERFID     =  D'115      File id not found in volume set
ERFSC     =  D'116      File section not in volume set
ERLDT     =  D'117      LDT is in an improper format
ERIBC     =  D'118      Corrupted tape label group
ERTFD     =  D'119      Tape label feature not supported
ERNH1     =  D'120      No HDR1 label in label group
ERFMT     =  D'121      Invalid record format specifier
ERBAT     =  D'122      Invalid block attribute specifier
ERBRL     =  D'123      Invalid specified record length
ERBBL     =  D'124      Invalid specified block length
ERBFO     =  D'125      Invalid buffer offset specifier
EROID     =  D'126      Owner id mismatch
ERIVL     =  D'127      Incomplete volume serial list
ERXPR     =  D'128      Attempt to read expired dataset
ERNXP     =  D'129      Attempt to write on non-expired
                          datase
ERIXP     =  D'130      Dataset has invalid expiration
                          date
```

```
ERVBM    = D'131    Volume block count mismatch
ERLTS    = D'132    Label type not scratchable
ERPNT    = D'133    Position illegal for non-tape
ERLBK    = D'134    Large tape block read
ERTRS    = D'135    Resources not available
ERACD    = D'136    Access denied by servicing
                      front-end
ERSNS    = D'137    Servicing front-end is not secure
ERDAE    = D'138    Dataset already in front-end
                      catalog
ERDNC    = D'139    Dataset not in front-end catalog
ERCLF    = D'140    Front-end catalog update failed
ERDNO    = D'141    Device is not open for user i/o
ERVNC    = D'142    Volume not in front-end catalog
ERMCO    = D'143    Mount cancelled by operator
ERMBS    = D'144    Maximum block size exceeded on
                      write
ERIMG    = D'145    Invalid servicing reply message
ERRES    = D'146    Operator reset device
ERFGV    = D'147    FSEC > number of VSN'S
ERNTV    = D'148    No TVT address in DNT
ERTNF    = D'149    F$TBL - table name not found
ERDOF    = D'150    Device overflow with nof declared
ERNAR    = D'151    Synch input request;dataset not at
                      eor
ERNIC    = D'152    Synch req; not interchange format
ERRSQ    = D'153    Random/sequential bits both set in
                      DDL
ERUBB    = D'154    Blocked/unblocked bits both set in
                      DDL
EREOV    = D'155    end of tape volume
ERTMS    = D'156    tape mark status
ERTOR    = D'157    tape off reel
ERBLT    = D'158    blank tape detected
EREVR    = D'159    end of volume read
EREMAJ   = D'160    FL exceeds non-EMA maximum
ERMLFT   = D'161    No Matching LFT found in JTA
EREMAMT  = D'162    Can't set EMA while multitasking
ERNEMA   = D'163    Extended memory address not
                      available
ERNAVL   = D'164    Addt'l vector logical not
                      avaialble
ERNORI   = D'165    Operand range int. can't be
                      disabled
ERBLM    = D'166    AB166-F$BGN-Premature end of
                      program
ERBIW    = D'167    AB167-F$BGN-Invalid user write
                      area
ERBNE    = D'168    AB168-F$BGN-User did not expand
                      mem
ERBCN    = D'169    AB169-F$BGN-CSP not loaded
```

```
ERD170    =  D'170      **** UNASSIGNED ****
ERDRV     =  D'171      Can't pass channel driver reply
                          back
ERDNCS    =  D'172      insufficient contiguous disk space
ERIJC     =  D'173      Inter-job connections during
                          advance
ERNULS    =  D'174      No USER LFT space found
ERHMISF   =  D'175      Invalid F$PERF subfunction
ERHMNP    =  D'176      Performance monitor not available
ERHMIGN   =  D'177      Invalid group number for
                          F$PERF/PM$ON
ERELFT    =  D'178      JTA LFT already exists
ERDNBB    =  D'179      IN/OUT not on a block boundary
ERDILF    =  D'180      Limit less than first
ERDBO     =  D'181      Buffer overlaps LFT/DSP area
ERDII     =  D'182      IN not between first and limit
ERDIO     =  D'183      OUT not between first and limit
ERDIF     =  D'184      FIRST out of bounds
ERDIL     =  D'185      LIMIT out of bounds
ERDIR     =  D'186      RCW out of bounds
ERDIBR    =  D'187      BIO record address out of bounds
ERDIBF    =  D'188      Unknown BIO function
ERDBLM    =  D'189      Buffer not multiple of 512
ERDUE     =  D'190      Uncleared error
ERDBUSY   =  D'191      Attempt to start i/o on busy
                          dataset
ERDSWD    =  D'192      DSP save words destroyed by user
ERALLDEA  =  D'193      All user tasks deactivated
ERDDL     =  D'194      User deadlock detected
ERTAI     =  D'195      Try to deactivate inactive task
ERTAA     =  D'196      Try to activate active task
ERCAS     =  D'197      Try to activate self
ERBID     =  D'198      Bad task id
ERXJT     =  D'199      Maximum tasks/job exceeded
ERD200    =  D'200      **** RESERVED FOR SITE ****
ERD201    =  D'201      **** RESERVED FOR SITE ****
ERD202    =  D'202      **** RESERVED FOR SITE ****
ERD203    =  D'203      **** RESERVED FOR SITE ****
ERD204    =  D'204      **** RESERVED FOR SITE ****
ERD205    =  D'205      **** RESERVED FOR SITE ****
ERD206    =  D'206      **** RESERVED FOR SITE ****
ERD207    =  D'207      **** RESERVED FOR SITE ****
ERD208    =  D'208      **** RESERVED FOR SITE ****
ERD209    =  D'209      **** RESERVED FOR SITE ****
ERD210    =  D'210      **** RESERVED FOR SITE ****
ERD211    =  D'211      **** RESERVED FOR SITE ****
ERD212    =  D'212      **** RESERVED FOR SITE ****
ERD213    =  D'213      **** RESERVED FOR SITE ****
ERD214    =  D'214      **** RESERVED FOR SITE ****
ERD215    =  D'215      **** RESERVED FOR SITE ****
ERD216    =  D'216      **** RESERVED FOR SITE ****
```

```
ERD217   =  D'217     **** RESERVED FOR SITE ****
ERD218   =  D'218     **** RESERVED FOR SITE ****
ERD219   =  D'219     **** RESERVED FOR SITE ****
ERD220   =  D'220     **** RESERVED FOR SITE ****
ERD221   =  D'221     **** RESERVED FOR SITE ****
ERD222   =  D'222     **** RESERVED FOR SITE ****
ERD223   =  D'223     **** RESERVED FOR SITE ****
ERD224   =  D'224     **** RESERVED FOR SITE ****
ERCPY    =  D'225     AB225-F$BGN-source out of range
ERDBL    =  D'226     AB226-F$BGN-Data base/limit not
                        zero
ERDHL    =  D'227     AB227-F$BGN-Data HLM not zero
ERIBL    =  D'228     AB228-F$BGN-Instruction limit zer
EROHL    =  D'229     AB229-F$BGN-Requested length out
                        HLM
ERZFC    =  D'230     AB230-F$BGN-Zero/Invalid Function
                        code
ERLLB    =  D'231     AB231-F$BGN-Instruction limit LE
                        base
ERQMOB   =  D'232     QIO memory address out of bounds
ERQNSN   =  D'233     Negative sector number for QIO
                        request
ERQUSF   =  D'234     Undefined QIO subfunction
ERQNPA   =  D'235     QIO dataset not pre-allocated
ERQMR    =  D'236     QIO dataset cannot be
                        memory-resident
ERQZSC   =  D'237     Zero sector count in QIO request
ERDLK    =  D'238     TASK NOT AT TEST AND SET
ERD239   =  D'239     **** UNASSIGNED ****
ERD240   =  D'240     **** UNASSIGNED ****
         =  D'241     **** UNASSIGNED ****
         =  D'242     **** UNASSIGNED ****
         =  D'243     **** UNASSIGNED ****
         =  D'244     **** UNASSIGNED ****
         =  D'245     **** UNASSIGNED ****
         =  D'246     **** UNASSIGNED ****
         =  D'247     **** UNASSIGNED ****
         =  D'248     **** UNASSIGNED ****
         =  D'249     **** UNASSIGNED ****
         =  D'250     **** UNASSIGNED ****
         =  D'251     **** UNASSIGNED ****
         =  D'252     **** UNASSIGNED ****
         =  D'253     **** UNASSIGNED ****
         =  D'254     **** UNASSIGNED ****
         =  D'255     **** UNASSIGNED ****
         =  D'256     **** UNASSIGNED ****
         =  D'257     **** UNASSIGNED ****
         =  D'258     **** UNASSIGNED ****
         =  D'259     **** UNASSIGNED ****
         =  D'260     **** UNASSIGNED ****
         =  D'261     **** UNASSIGNED ****
```

```
=  D'262          **** UNASSIGNED ****
=  D'263          **** UNASSIGNED ****
=  D'264          **** UNASSIGNED ****
=  D'265          **** UNASSIGNED ****
=  D'266          **** UNASSIGNED ****
=  D'267          **** UNASSIGNED ****
=  D'268          **** UNASSIGNED ****
=  D'269          **** UNASSIGNED ****
=  D'270          **** UNASSIGNED ****
=  D'271          **** UNASSIGNED ****
=  D'272          **** UNASSIGNED ****
=  D'273          **** UNASSIGNED ****
=  D'274          **** UNASSIGNED ****
=  D'275          **** UNASSIGNED ****
=  D'276          **** UNASSIGNED ****
=  D'277          **** UNASSIGNED ****
=  D'278          **** UNASSIGNED ****
=  D'279          **** UNASSIGNED ****
=  D'280          **** UNASSIGNED ****
=  D'281          **** UNASSIGNED ****
=  D'282          **** UNASSIGNED ****
=  D'283          **** UNASSIGNED ****
=  D'284          **** UNASSIGNED ****
=  D'285          **** UNASSIGNED ****
=  D'286          **** UNASSIGNED ****
=  D'287          **** UNASSIGNED ****
=  D'288          **** UNASSIGNED ****
=  D'289          **** UNASSIGNED ****
=  D'290          **** UNASSIGNED ****
=  D'291          **** UNASSIGNED ****
=  D'292          **** UNASSIGNED ****
=  D'293          **** UNASSIGNED ****
=  D'294          **** UNASSIGNED ****
=  D'295          **** UNASSIGNED ****
=  D'296          **** UNASSIGNED ****
=  D'297          **** UNASSIGNED ****
=  D'298          **** UNASSIGNED ****
=  D'299          **** UNASSIGNED ****
=  D'300          **** UNASSIGNED ****
```

ERRORS RETURNED TO TASKS

ERNTS	=	1	No task space left
ERIDA	=	2	<R011> invalid disk address
ERTNX	=	3	Task does not exist
ERRAT	=	4	Resource already assigned to a task
ERCHA	=	5	Channel already active
ERITN	=	6	Illegal task call
ERBPN	=	O'11	Illegal breakpoint number
ERBPB	=	O'12	Address already has a breakpoint
ERBFD	=	O'13	Bad field definition
ERNCP	=	O'14	No control points left
ERIPS	=	O'16	Breakpoint instruction parcel smashed
ERIRN	=	O'20	Illegal register name
ERQFULL	=	O'24	Time delay queue full
ERINB	=	O'25	Insufficient buffer length
ERTALC	=	O'26	Task already created
ERSID	=	O'27	<R022> Source id mismatch
ERBFC	=	O'30	<R022> Bad function code
ERTPB	=	O'31	<R022> Task parameter block changed
ERICH	=	O'32	<R022> Invalid channel number
ERNTC	=	O'33	<R017> No user task connected
ERMT	=	O'34	<R042> Request illegal on this machine
ERCLN	=	O'35	<R042> Invalid cluster number
ERIA	=	O'36	<R042> Invalid address specified

ERROR STATUS RETURNED FROM EQSD2/DQSD2

EQERRLK	=	1	SDT lock bit set
DQERRNA	=	1	No SDT entries available
DQERRNL	=	2	SDT lock bit not set for specific entry dequeue
DQERRWQ	=	3	Wrong queue specified for specific entry dequeue

```
                    SYSTEM  TASK  FUNCTION  CODES                    *

F$ADV     =  O'000              Advance job --- end program
F$ABT     =  O'001              Abort job
F$DAT     =  O'002              Get current date
F$TIM     =  O'003              Get current time
F$MSG     =  O'004              Enter logfile message
F$RCL     =  O'005              Recall on dataset i/o
F$TRM     =  O'006              Terminate job
F$SSW     =  O'007              Set sense switch
F$OPN     =  O'010              Open dataset
F$QIO     =  O'011              Queued I/O
F$LBN     =  O'012              Get last block number
F$CLS     =  O'013              Close local dataset
F$DNT     =  O'014              Create, copy, or modify a dnt
F$MDE     =  O'015              Set exchange package mode
F$GNS     =  O'016              Get next control statement
                          Don't use o'017 until 1.13

F$RLS     =  O'020              Release a local dataset
F$PDM     =  O'021              Permanent dataset manager request
F$RDC     =  O'022              Read disk circular
F$WDC     =  O'023              Write disk circular
F$GRN     =  O'024              Get system revision level
F$DIS     =  O'025              Dispose a local dataset
F$JDA     =  O'026              Get julian date
F$JTI     =  O'027              Get accumulated job CPU time
F$ACT     =  O'030              Get accounting information
F$SPS     =  O'031              Set P address and suspend user
F$CSW     =  O'032              Clear sense switch
F$TSW     =  O'033              Test sense switch
F$BIO     =  O'034              Buffered I/O request
F$DLY     =  O'035              Delay job
F$AQR     =  O'036              Acquire dataset from front-end
F$NRN     =  O'037              Enable/disable not rerunnable
                                  check
F$RRN     =  O'040              Enable/disable job rerun
F$IOA     =  O'041              Set/clear ioarea switches
F$LFT     =  O'042              Delete/change/create a JTA LFT
F$INV     =  O'043              Invoke job class structure
F$DJA     =  O'044              Dump current job area
F$RPV     =  O'045              Enable reprieve processing
F$BGN     =  O'046              Begin loaded user code
F$RCS     =  O'047              Rewind current $CS  -- CSP only
F$PRC     =  O'050              Invoke procedure dataset
F$RTN     =  O'051              Return from procedure dataset
F$LIB     =  O'052              Library search list maintenace
LIBGET    =  0                  Subfunction -- get search list
LIBSET    =  1                  Subfunction -- set search list
F$INS     =  O'053              Perform installation defined
```

```
                                    function
F$UROLL   =  O'054                  Initiate job roll
F$ASD     =  O'055                  Access system (SDR) dataset
F$SYM     =  O'056                  JCL symbol maintence requests
SYMGET    =  0                      Subfunction -- get symbol
SYMSET    =  1                      Subfunction -- set symbol
F$CSB     =  O'057                  Conditional jcl maintenance
                                      requests
CSBINF    =  0                      Retreive current conditional info
CSBINC    =  1                      Increment conditional nest level
CSBDEC    =  2                      Decrement conditional nest level
CSBEXC    =  3                      Flag conditional as in execution
F$ISB     =  O'060                  Iterative JCL maintenance requests
ISBINF    =  0                      Retreive current iterative info
ISBINC    =  1                      Increment iterative nest level
ISBDEC    =  2                      Decrement iterative nest level
ISBRST    =  3                      Reset iterative block
F$EKO     =  O'061                  Alter user's ECHO status

L@OPTPB   =  1                      Length of param block for F$OPT

F$OPT     =  O'062                  Set user options
F$POS     =  O'063                  Position tape  request
POS$REW   =  0                      Subfunction - rewind
POS$BSP   =  1                      Subfunction - backspace
POS$TPST  =  2                      Tape positioning

 TAPE POSITIONING SUBCODES

TP$ABN    =  0                      absolute block number
TP$PFW    =  2                      position forward
TP$PBW    =  3                      position backward

 POSITION RETURN CODES

TPOK      =  0                      Position with no error
TPER      =  1                      Error occured, check DPERR
TPNT      =  2                      Not tape dataset
TPNS      =  3                      Position not fully satisfied
TPTM      =  4                      Tape mark terminated positioning
F$SPM     =  O'064                  Force SPM to run
F$FCH     =  O'65                   Fetch dataset from front end
F$TDT     =  O'066                  Timestamp to date and time
                                      conversion
F$DTT     =  O'067                  Date and time to timestamp
                                      conversion
F$MTT     =  O'070                  RT register to timestamp
                                      conversion
F$TMT     =  O'071                  Timestamp to RT register
                                      conversion
F$SPY     =  O'072                  User execution profile
```

```
F$MEMORY  =  0'73          Memory request
F$PRV     =  0'074         Privilege request
PRV$SDR   =  1             Define SDR module loaded
PRV$RPF   =  2             Read privilege flags
PRV$SPF   =  3             Set privilege flags
PRV$SWP   =  4             Set system job fields
F$DSD     =  0'075         Secure dataset
F$ENC     =  0'076         Encrypt password
F$TASK    =  0'077         User task manipulation call
F$CRASH   =  0'100         User requested system hang
F$SYNCH   =  0'101         Synchronize tape dataset
F$TPOS    =  0'102         Tape position info request
F$RESC    =  0'103         Reschedule user task
F$TBL     =  0'104         Move table request
F$PROF    =  0'105         STP EXECUTION PROFILE
F$CMEM    =  0'106         Copy system memory to user field
F$PERF    =  0'107         User Task Hardware Perf. Monitor
PM$ON     =  0             Subfunction - enable
PM$REP    =  1             Subfunction - report
PM$OFF    =  2             Subfunction - disable
PM$RST    =  3             Subfunction - reset
PM$MAX    =  3             Highest defined F$PERF subfunction
F$TEOV    =  0'110         Tape EOV processing
F$ERCL    =  0'111         Event recall
F$CSP     =  0'112         Dynamic control statement call
F$IJMSG   =  0'113         Inter-job communication
F$DRIVER  =  0'114         User driver function
F$TRB     =  0'115         Direct access to ISP circuits
F$ISP     =  0'116         ISP statement processing
F$CON     =  0'117         CONNECT statement processing

=          0'120      **  UNASSIGNED  **
=          0'121      **  UNASSIGNED  **
=          0'122      **  UNASSIGNED  **
=          0'123      **  UNASSIGNED  **
=          0'124      **  UNASSIGNED  **
=          0'125      **  UNASSIGNED  **
=          0'126      **  UNASSIGNED  **
=          0'127      **  UNASSIGNED  **
=          0'130      **  UNASSIGNED  **
=          0'131      **  UNASSIGNED  **
=          0'132      **  UNASSIGNED  **
=          0'133      **  UNASSIGNED  **
=          0'134      **  UNASSIGNED  **
=          0'135      **  UNASSIGNED  **
=          0'136      **  UNASSIGNED  **
=          0'137      **  UNASSIGNED  **
=          0'140      **  UNASSIGNED  **

SUBFUNCTION CODES
```

```
SPY$ON    =  1                  Enable profile
SPY$OFF   =  2                  Disable and return info
SPY$INFO  =  3                  Return space requirements

 SUBCODES FOR F$TASK CALLS:

TASK$CRE  =  1                  Create a task
TASK$DEL  =  2                  Delete a task
TASK$ACT  =  3                  Activate a task
TASK$DEA  =  4                  Deactivate a task
TASK$SET  =  5                  Set Task Status Block addr

 SNAPSHOT request code.  The following symbol is used within
 the SNAPSHOT macro in an ERR instruction, and flags the
 request for EXP's use.

EREXMIN   =  O'770
$$SNAP$$  =  O'770
EREXMAX   =  O'770

 SUBCODES FOR F$LFT CALLS

DELLFT    =  0                  Delete an LFT
CHGLFT    =  1                  Change an existing LFT
CRELFT    =  2                  Create an LFT
```

FT000	=	D'0	Bad call to FTLIB error processor
FT001	=	D'1	Concatenation call out of order
FT002	=	D'2	Concatenation recursion limit exceeded
FT003	=	D'3	Character argument has invalid length

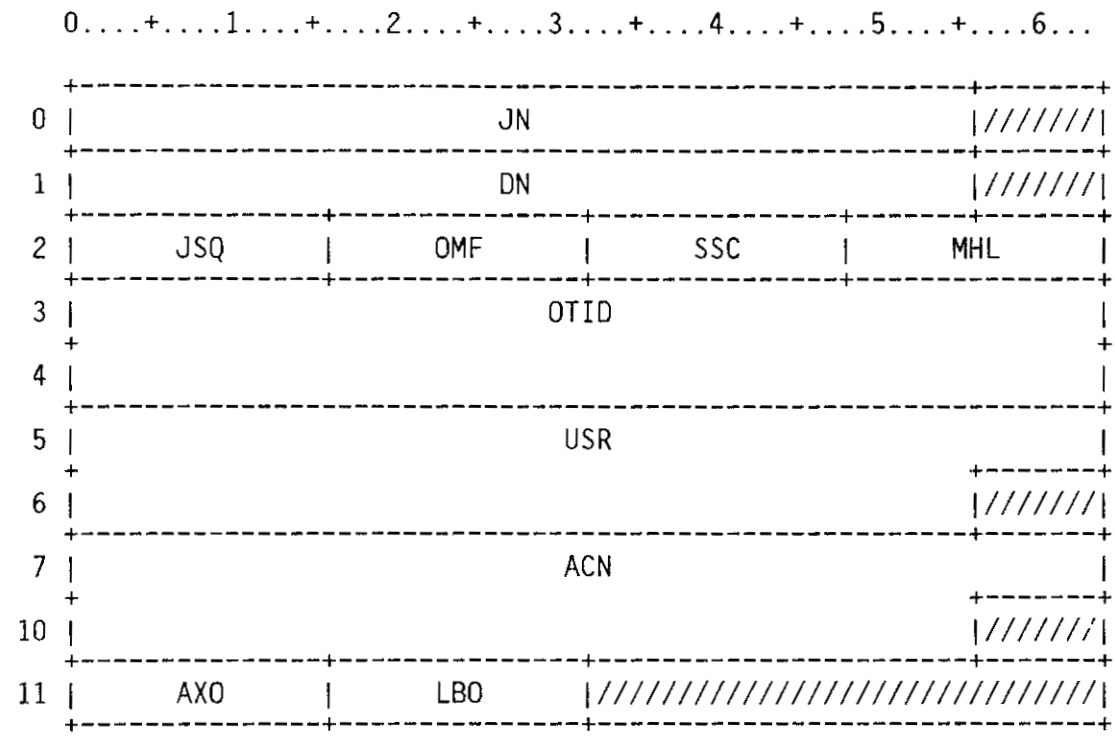


Figure FH-1. Front-end servicing header

Field	Word(base8)	Bits	Description
FHJN	0	0-55	Job name
FHDN	1	0-55	Local dataset name
FHJSQ	2	0-15	Job sequence number
FHOMF	2	16-31	Mainframe of job origin
FHSSC	2	32-47	Station slot (word) count
FHMHL	2	48-63	Overall fsh length(slot included)
FHOTID	3-4	0-63	Terminal id of job origin
FHOTI1	3	0-63	Characters 1 - 8
FHOTI2	4	0-63	Characters 9 - 16
FHUSR	5-6	0-63	Job user number

Field	Word(base8)	Bits	Description
FHUSR1	5	0-63	Characters 1 - 8
FHUSR2	6	0-55	Characters 9 - 15
FHACN	7-10	0-63	Job account number
FHACN1	7	0-63	Characters 1 - 8
FHACN2	10	0-55	Characters 9 - 15
FHAXO	11	0-15	Auxilary information table offset
FHLBO	11	16-31	Label group offset(request side)

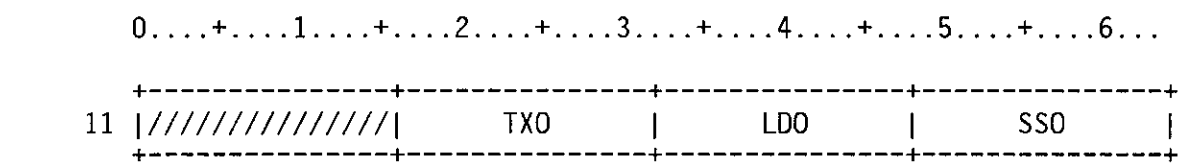


Figure FH-2. Text message offset (reply side)

Field	Word(base8)	Bits	Description
FHTXO	11	16-31	Text message offset(reply side)
FHLDO	11	32-47	LDT offset
FHSSO	11	48-63	Station slot offset

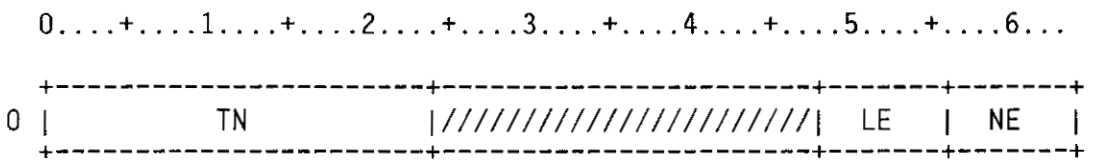


Figure GR-1. Generic Resource Table Header

Field	Word(base8)	Bits	Description
GRTN	0	0-23	Table name
GRLE	0	48-55	GRT entry length
GRNE	0	56-63	Number of GRT entries

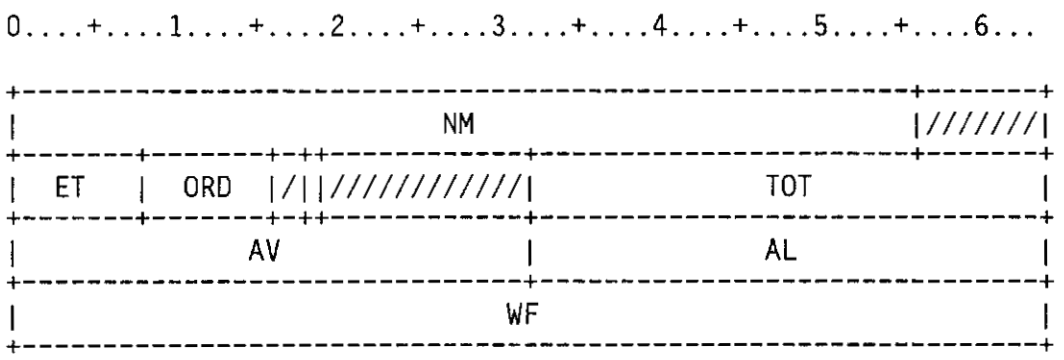


Figure GR-2. Generic Resource Table Entry

Field	Word(base8)	Bits	Description
GRNM	0	0-55	Generic resource name
GRET	1	0-7	Generic resource equipment type
GRORD	1	8-15	GRT entry ordinal
GRDC	1	18	Resource catagory (tape/nontape)
GRTOT	1	32-63	Total number of configured units
GRAV	2	0-31	Number of available units
GRAL	2	32-63	Number of allocated units
GRWF	3	0-63	Weighting factor for SBU accounting

```
SZ@GRT    =  NE@GRT*LE@GRT+LH@GRT
C@L2CSZ   =  D'6                  Log base 2 for BA shift
C@L2CSZ   =  D'5                  Log base 2 for BA shift
C@CSZ     =  D'32                 Instruction buffer size in words
MTYPE     =  'CRAY XMP'           Machine type mnemonic
C@L2CSZ   =  D'4                  Log 2 of instruction buffer size
C@CSZ     =  D'16                 Instruction buffer size in words
MTYPE     =  'CRAY-1S'            Machine type mnemonic
C@L2CSZ   =  D'4                  Log 2 of instruction buffer size
C@CSZ     =  D'16                 Instruction buffer size in words
MTYPE     =  'CRAY-1'             Machine type mnemonic
C@L2CSZ   =  D'4                  Log base 2 of instruction buffer
                                    size
C@CSZ     =  D'16                 Instruction buffer size in words
MTYPE     =  'CRAY-1M'            Machine type mnemonic
C@CHIPSZ  =  D'10                 Chip size as a power of 2
C@CHIPSZ  =  D'11                 Chip size as a power of 2
C@CHIPSZ  =  D'12                 Chip size as a power of 2
C@CHIPSZ  =  D'14                 Chip size as a power of 2
C@CHIPSZ  =  D'16                 Chip size as a power of 2
C@CHIPSZ  =  D'18                 Chip size as a power of 2
```

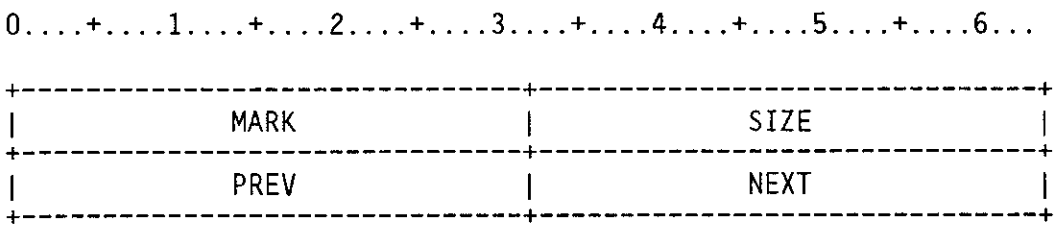


Figure HP-1. Heap block control words

Field	Word(base8)	Bits	Description
HPMARK	0	0-31	Tells if block is allocated or free
HPSIZE	0	32-63	Number of words in the block
HPPREV	1	0-31	Address of previous free block
HPNEXT	1	32-63	Address of next free block

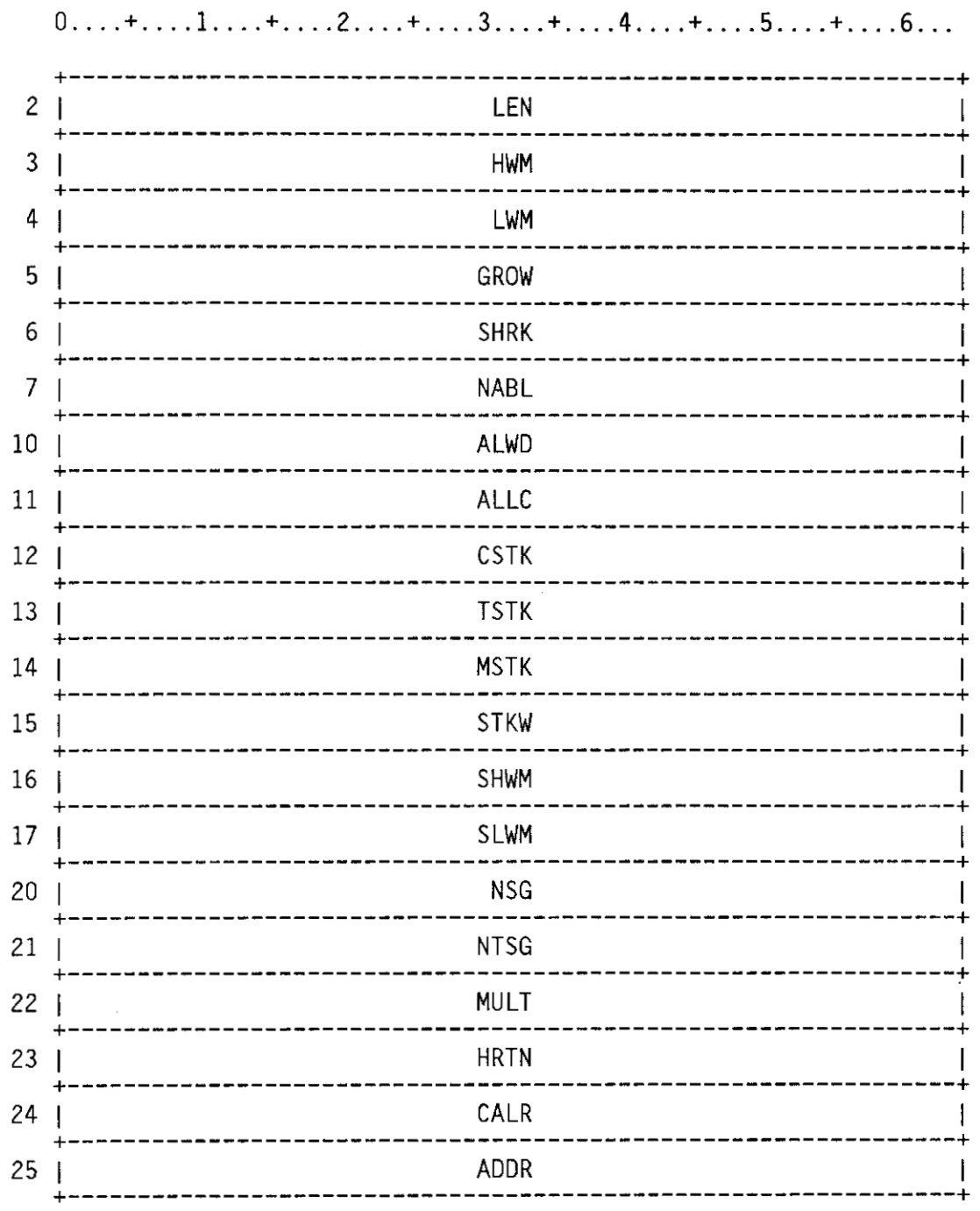


Figure HT-1. Heap statistics table

Field	Word(base8)	Bits	Description
HTLEN	2	0-63	Current heap length
HTHWM	3	0-63	High water mark
HTLWM	4	0-63	Low water mark
HTGROW	5	0-63	Number of times heap has grown
HTSHRK	6	0-63	Number of times heap has shrunk
HTNABL	7	0-63	Number of allocated blocks
HTALWD	10	0-63	Number of words allocated
HTALLC	11	0-63	Number of allocations
HTCSTK	12	0-63	current number of stacks
HTTSTK	13	0-63	total number of stacks
HTMSTK	14	0-63	most stacks at one time
HTSTKW	15	0-63	number of words allocated for stacks
HTSHWM	16	0-63	highest stack high water mark
HTSLWM	17	0-63	lowest stack high water mark
HTNSG	20	0-63	number of stacks that grew
HTNTSG	21	0-63	number of times stacks grew
HTMULT	22	0-63	pointer to multitasking statistics
HTHRTN	23	0-63	Last routine that changed the heap
HTCALR	24	0-63	Return address of last caller
HTADDR	25	0-63	Address of heap area changed last
HTADDR	25	0-63	(Required for table diagram generator)

* COMHM Hardware Performance Monitor

COMHM defines a control block, identified by task number, containing the active monitor group number, as well as a block of counters for each possible performance monitor group. Blocks are created by EXP, and are filled in by EXEC.

The format of the F$PERF request block, which gives users access to the performance monitor for user-mode tasks, is also defined by COMHM.

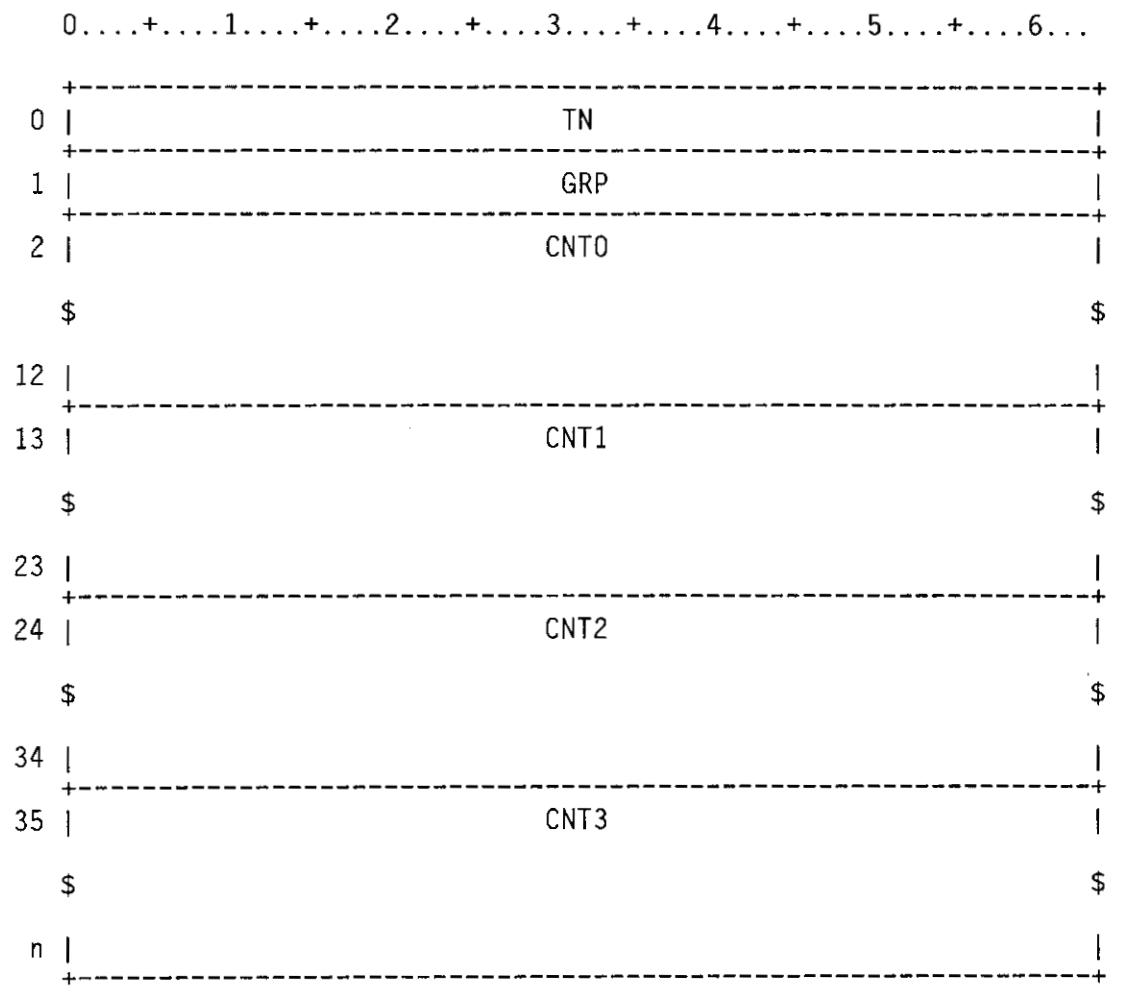


Figure HM-1.

Field	Word(base8)	Bits	Description
HMTN	0	0-63	Task ID number (user or system)
HMGRP	1	0-63	Active group number NE@HMCNT=D'8 Number of counters in an HPM group
HMCNT0	2-12	0-63	Counters in group 0
HMCCY0	12	0-63	Accounted clock periods for group 0
HMCNT1	13-23	0-63	Counters in group 1
HMCCY1	23	0-63	Accounted clock periods for group 1
HMCNT2	24-34	0-63	Counters in group 2
HMCCY2	34	0-63	Accounted clock periods for group 2
HMCNT3	35-n	0-63	Counters in group 3
HMCCY3	45	0-63	Accounted clock periods for group 3 LE@HMGE=W@HMCNT1-W@HMCNT0 Length of each counter group entry

In the description below, fields marked with "*" are set by the system on each F$PERF request; other fields must be set by the user prior to the request.

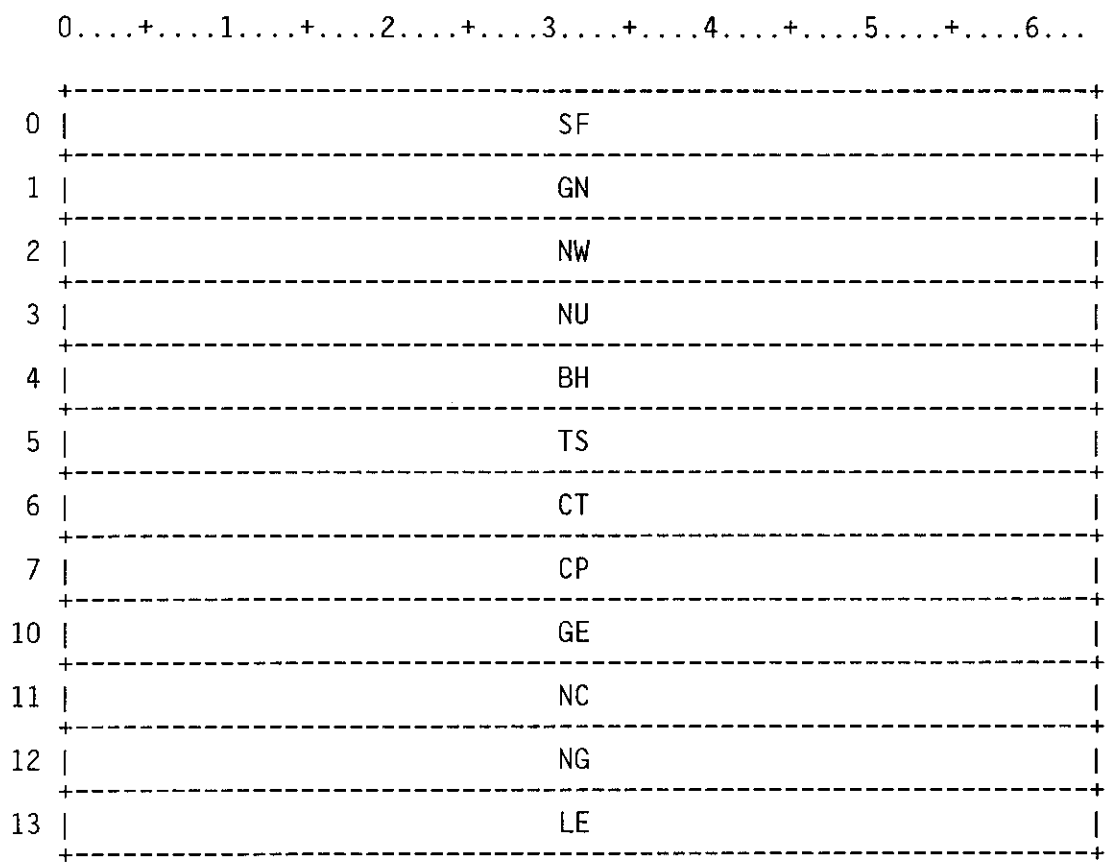


Figure HMR-1. Hardware Performance Monitor - F$PERF request

Field	Word(base8)	Bits	Description
HMRSF	0	0-63	Subfunction (PM$...)
HMRGN	1	0-63	Group number (for PM$ON)
HMRNW	2	0-63	Total num. words in block
HMRNU	3	0-63	* Total num. words used in block
HMRBH	4	0-63	* Num. words in block header (LE@HMR)
HMRTS	5	0-63	* NZ if block too small

Field	Word(base8)	Bits	Description
HMRCT	6	0-63	* Offset to first counter in subblk
HMRCP	7	0-63	* Offset to accounted cycles in subblk
HMRGE	10	0-63	* Num words in group entry
HMRNC	11	0-63	* Num counters in each group (NE@HMCNT)
HMRNG	12	0-63	* Number of counter groups (C@CPHPG+1)
HMRLE	13	0-63	* Length of subblock entries (LE@HM)

First subblock begins at FWA+(@HMRBN)
Next is at FWA+(@HMRBN)+(@HMRLE)

Group 0 counters are at . . .
(subblock) + (@HMRCT)
(next begins (@HMRGE) words later)

Group 0 accounted clock time is at...
(subblock) + (@HMRCP)
(next is (@HMRGE) words later)

Timing subblocks have the same format
as the HM table entries.

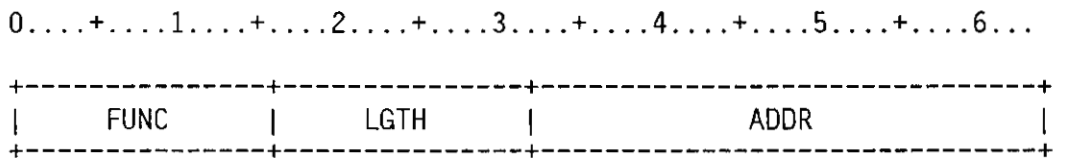


Figure HS-1. Simulated high-speed channel protocol

Field	Word(base8)	Bits	Description
HSFUNC	0	0-15	Function code 0 Read >0 Write
HSLGTH	0	16-31	Transfer length; max=A local memory
HSADDR	0	32-63	Bipolar transfer address

Name: History Trace Function Codes.

Purpose: Assign history trace functions for recording in the EXEC history trace buffer.

Note: Changes made here must be reflected in the History Function Table (HFT) in EXEC.

```
HTIOI    = O'01          01 - I/O interrupt
HTUNE    = O'02          02 - User normal exit
HTSNE    = O'03          03 - STP normal exit
HTENE    = O'04          04 - EXEC normal exit
HTPCI    = O'05          05 - Programmable clock interrupt
HTXPC    = O'06          06 - Copy user XP to JTA
HTFEI    = O'07          07 - Front end input LCP received
HTSCH    = O'10          10 - Schedule user job
HTDIO    = O'11          11 - Disk I/O request
HTITM    = O'12          12 - Inter-task message
HTEEI    = O'13          13 - Error exit
HTFEO    = O'14          14 - Front end output LCP sent
HTSEG    = O'15          15 - Front end I/O segment done
HTSCI    = O'16          16 - Front end SCBs received
HTFEE    = O'17          17 - Front end error (output) LCP
                           sent
HTSCO    = O'20          20 - Front end SCBs sent
HTTSX    = O'21          21 - User time slice expired
HTJIT    = O'22          22 - Job being initiated
HTJRE    = O'23          23 - Job being reactivated
HTJSC    = O'24          24 - Job status change
HTGET    = O'25          25 - Search for free memory
                           segment
HTLIB    = O'26          26 - Liberate memory segment
HTCPU    = O'27          27 - User job connected (GOT)
HTJSH    = O'30          30 - Scheduler received request
HTSSD    = O'31          31 - 'GO SSD' - HSC command word
HTMEM    = O'32          32 - J$ALLOC initial processing
                           done
HTMCU    = O'33          33 - MCU interrupt
HTIPI    = O'34          34 - Inter-processor interrupt
HTDLI    = O'35          35 - Deadlock interrupt
HTSYS    = O'36          36 - Enter SYSWAIT
HTNWT    = O'37          37 - End SYSWAIT
HTIPSET  = O'40          40 - Interprocessor request sent
HTIPACK  = O'41          41 - Interprocessor request ack.
HTASCII  = O'42          42 - Arbritrary ASCII text
HTMEC    = O'43          - 43 - Memory error correction
HTIQY    = O'44          44 - IQM driver reply
```

OLD HISTORY TRACE FUNCTION CODES

IOINT	=	HTIOI	I/O INTERRUPT
USRNE	=	HTUNE	USER NORMAL EXIT
STPNE	=	HTSNE	STP NORMAL EXIT
EXCNE	=	HTENE	EXEC NORMAL EXIT
XPCOPY	=	HTXPC	COPY USER XP TO JTA
SCHUSR	=	HTSCH	SCHEDULE USER
DDREQ	=	HTDIO	DISK DRIVER REQUEST
ITMSG	=	HTITM	INTERTASK MESSAGE
ERREX	=	HTEEI	ERROR EXIT

The ISP Application Level consists of three protocols,
1) ISP Control Protocol, ICP
2) Job Control Protocol, JCP
3) Dataset Transmission Protocol, DTP
Communication between the ISP and COS at this level consists of messages being sent by the Transport Service. Each of these messages begin with the following word of information.

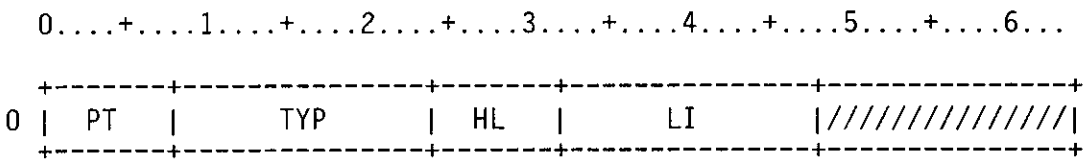


Figure IA-1. ISP Application Level Message Header

Field	Word(base8)	Bits	Description
IAPT	0	0-7	Application Protocol Type IAL$ICP=A'I'R I = ICP, ISP control protocol IAL$JCP=A'J'R J = JCP, Job control protocol IAL$DTP=A'D'R D = DTP, Dataset transmission protocol

Field	Word(base8)	Bits	Description
IATYP	0	8-23	Appliction level message type IAM$NL=A'NL'R NL - Null message IAM$LG=A'LG'R LG - Logon IAM$LR=A'LR'R LR - Logon Reply IAM$JI=A'JI'R JI - Job Init IAM$SL=A'SL'R SL - System Log IAM$QU=A'QU'R QU - Quiesce IAM$RE=A'RE'R RE - Resume IAM$LF=A'LF'R LF - Logoff IAM$JT=A'JT'R JT - Job Term IAM$RS=A'RS'R RS - COS Restart IAM$TI=A'TI'R TI - Task Init IAM$EA=A'EA'R EA - Enable IAM$JL=A'JL'R JL - Job Log IAM$TT=A'TT'R TT - Task Term IAM$TE=A'TE'R TE - Task Enable IAM$AC=A'AC'R AC - Access IAM$AR=A'AR'R AR - Access Reply IAM$OP=A'OP'R OP - Open IAM$CL=A'CL'R CL - Close IAM$RL=A'RL'R RL - Release IAM$RC=A'RC'R RC - Recovery Information
IAHL	0	24-31	Header length
IALI	0	32-47	Total message length includes header

An attempt has been made to have the Application level messages conform as much as possible.

ICP level messages of the type:

LG - Logon
LR - Logon Reply
LF - Logoff
SL - System Log Messages

have the following form

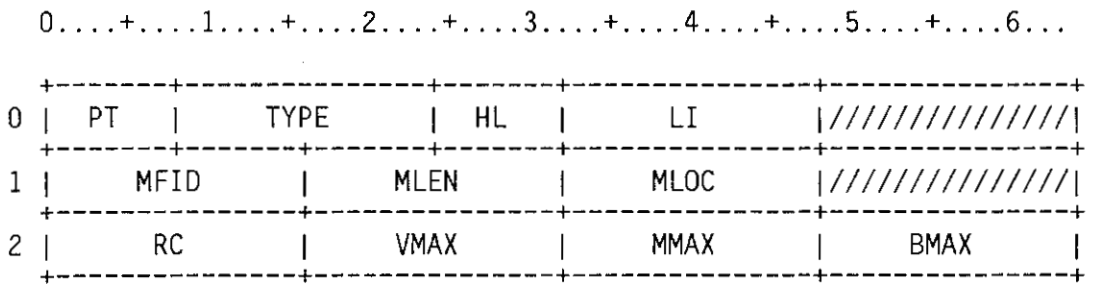


Figure IA-2. ISP ICP Messages LG,LR,LF,SL

Field	Word(base8)	Bits	Description
IAPT	0	0-7	Application Protocol type
IATYPE	0	8-23	Application level message type
IAHL	0	24-31	Header length
IALI	0	32-47	Total message length including header
IAMFID	1	0-15	Mainframe identifier
IAMLEN	1	16-31	Length of ASCII message
IAMLOC	1	32-47	Location, starting word, of message
IARC	2	0-15	Return code IARC$LG=0 LOGON message accepted IARC$MF=4 MFID's do not match
IAVMAX	2	16-31	Maximum connections for a circuit
IAMMAX	2	32-47	Maximum length of a message

Field	Word(base8)	Bits	Description
IABMAX	2	48-63	Maximum data block length LE@IAMLG=3 Length of the logon message LE@IAMLR=3 Length of the logon reply message LE@IAMLF=3 Length of logoff message minus text LE@IAMSL=3 Length of system log message minus tex

ICP level messages of the type:
JT - Job Term
JCP level messages of the type
EA - Job Enable
JT - Job Term
JL - Job Log Messages
DTP level messages of the type:
TE - Task Enable
TT - Task Term
have the following form

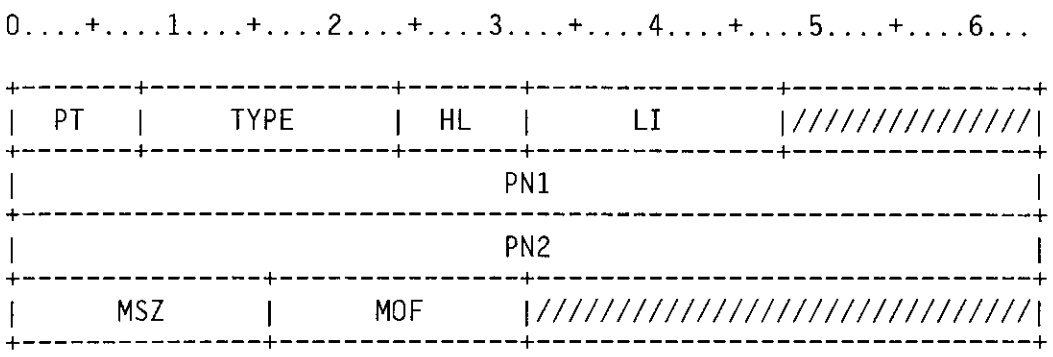


Figure IA-3. ISP ICP Messages JT, JCP EA,JT,JL,

Field	Word(base8)	Bits	Description
IAPT	0	0-7	Application protocol type
IATYPE	0	8-23	Application level message type
IAHL	0	24-31	Header length
IALI	0	32-47	Total message length including header
IAPN1	1	0-63	First word of the process name
IAPN2	2	0-63	Second word of the process name
IAMSZ	3	0-15	Size of the messge text
IAMOF	3	16-31	Offset of the message text

ICP level messges of the type
JI - Job Init
have the following form

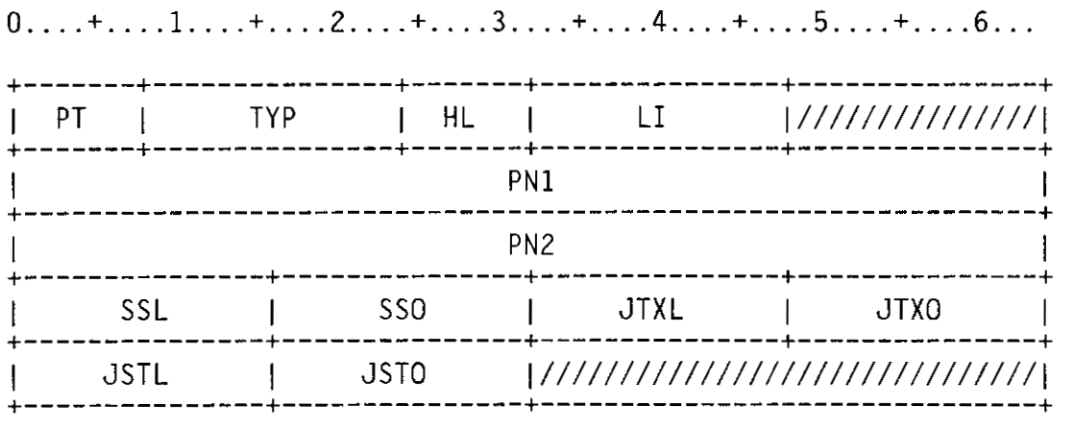


Figure IA-4. ISP ICP Messages JI

Field	Word(base8)	Bits	Description
IAPT	0	0-7	Application Protocol type
IATYP	0	8-23	Application level message type
IAHL	0	24-31	Header length
IALI	0	32-47	Total message length including header
IAPN1	1	0-63	First word of process name
IAPN2	2	0-63	Second word of process name
IASSL	3	0-15	Length of job's system slot
IASSO	3	16-31	Offset to job's system slot
IAJTXL	3	32-47	Length of job init's text
IAJTXO	3	48-63	Offset to job init's text
IAJSTL	4	0-15	Length of job init's secured text
IAJSTO	4	16-31	Offset to job init's secured text

JCP level messages of the type
TI - Task Init
have the following form

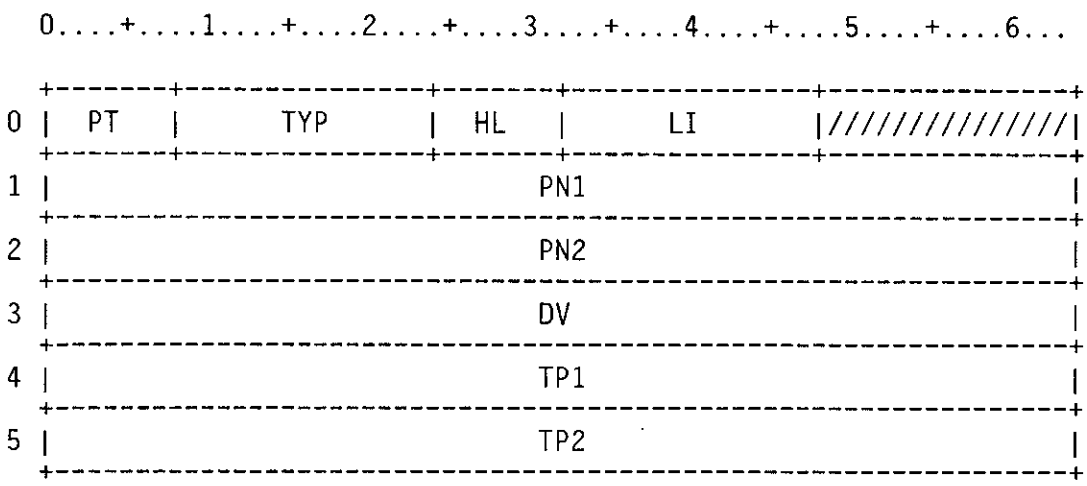


Figure IA-5. ISP JCP Messages TI

Field	Word(base8)	Bits	Description
IAPT	0	0-7	Application Protocol type
IATYP	0	8-23	Application level message type
IAHL	0	24-31	Header length
IALI	0	32-47	Total message length including header
IAPN1	1	0-63	First word of process name
IAPN2	2	0-63	Second word of process name
IADV	3	0-63	Device descriptor word
IATP1	4	0-63	First word of task process name
IATP2	5	0-63	Second word of task process name

DTP level messages of the type
AC - Access
RA - Reaccess
have the following form

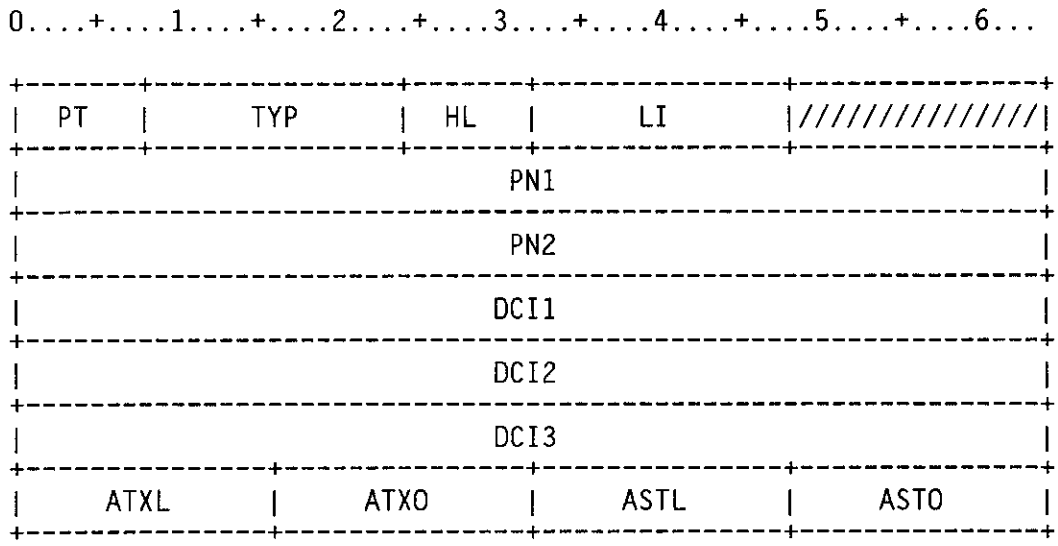


Figure IA-6. ISP DTP Messages AC,RA

Field	Word(base8)	Bits	Description
IAPT	0	0-7	Application protocol type
IATYP	0	8-23	Application level message type
IAHL	0	24-31	Header length
IALI	0	32-47	Total message length including header
IAPN1	1	0-63	First word of process name
IAPN2	2	0-63	Second word of process name
IADCI1	3	0-63	First dataset control information word
IADCI2	4	0-63	Second dataset control information wor
IADCI3	5	0-63	Third dataset control information word
IAATXL	6	0-15	Access text length
IAATXO	6	16-31	Access text offset

Field	Word(base8)	Bits	Description
IAASTL	6	32-47	Access secured text length
IAASTO	6	48-63	Access secured text offset

DTP level messages of the type
OP - Open
CL - Close
RL - Release
have the following form

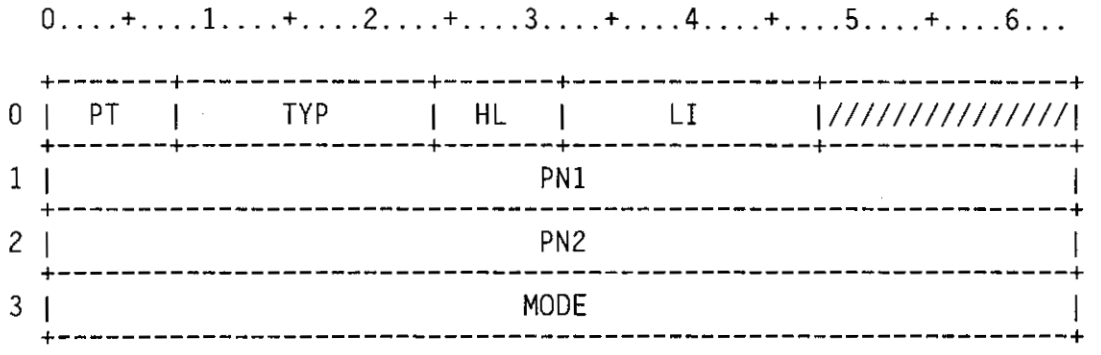


Figure IA-7. ISP DTP Messages OP,CL,RL

Field	Word(base8)	Bits	Description
IAPT	0	0-7	Application protocol type
IATYP	0	8-23	Application level messge type
IAHL	0	24-31	Header length
IALI	0	32-47	Total message length including header
IAPN1	1	0-63	First word of process name
IAPN2	2	0-63	Second word of process name
IAMODE	3	0-63	Transfer mode

DTP level messages of the type
RC - Recinfo
have the following form

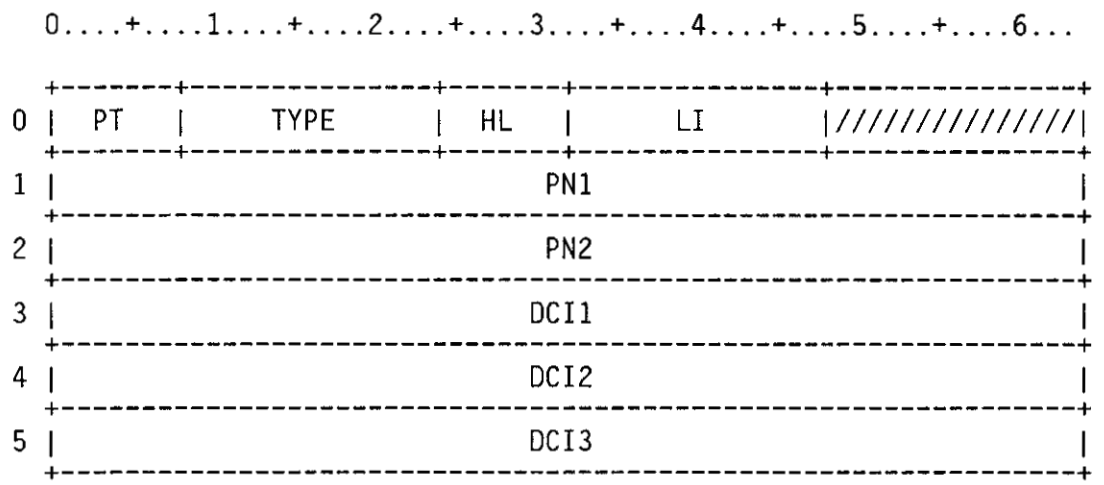


Figure IA-8. ISP DTP Messages RC

Field	Word(base8)	Bits	Description
IAPT	0	0-7	Application protocol type
IATYPE	0	8-23	Application level message type
IAHL	0	24-31	Header length
IALI	0	32-47	Total message length including header
IAPN1	1	0-63	First word of process name
IAPN2	2	0-63	Second word of process name
IADCI1	3	0-63	First dataset control information word
IADCI2	4	0-63	Second dataset control information wor
IADCI3	5	0-63	Third dataset control information word

The Interactive Buffer Table is STP resident and is used to manage the Interactive Buffer Pool Table.

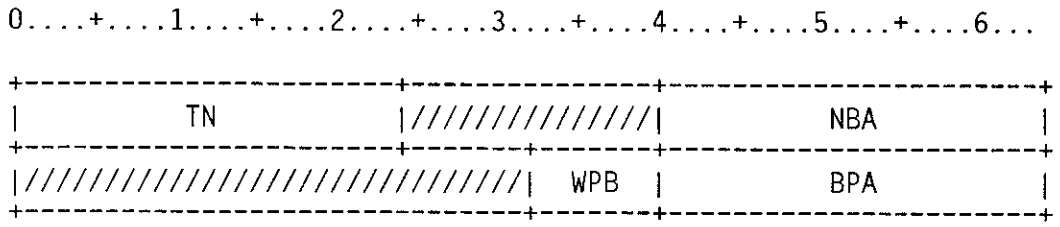


Figure IB-1. Interactive Buffer Table Header

Field	Word(base8)	Bits	Description
IBTN	0	0-23	Table name
IBNBA	0	40-63	Number of available buffers
IBWPB	1	32-39	Words per bit
IBBPA	1	40-63	Buffer pool beginning address

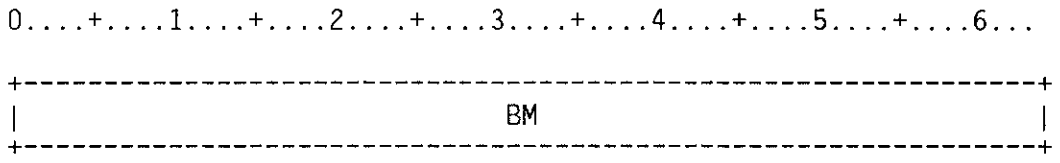


Figure IB-2. Interactive Buffer Table Entry

Field	Word(base8)	Bits	Description
IBBM	0	0-63	Bit map

The Inter-task Communication Table is STP-resident and is used to queue requests and replies between STP tasks.

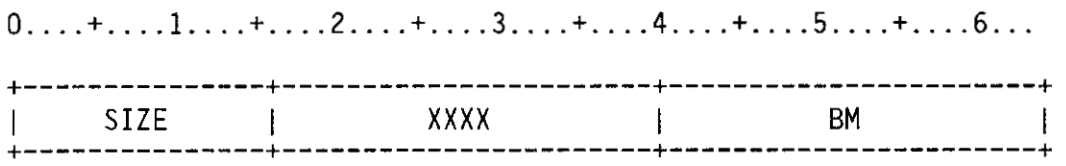


Figure IC-1. STP Inter-task Communication Table

Field	Word(base8)	Bits	Description
ICSIZE	0	0-15	Size of bit-map (in bits)
ICXXXX	0	16-39	**** UNUSED ****
ICBM	0	40-63	Base of bit-map

```
IO0000  =  D'0    Bad call to I/O error processor
IO0001  =  D'1    Backspace on null dataset
IO0002  =  D'2    Repetition count less than 1
IO0003  =  D'3    Call out of sequence
IO0004  =  D'4    Read past end of data
IO0005  =  D'5    Decode record length <1 or >152
IO0006  =  D'6    Numeric: illegal character
IO0007  =  D'7    Numeric: overflow
IO0008  =  D'8    Exponent overflow
IO0009  =  D'9    Exponent underflow
IO0010  =  D'10   Null field
IO0011  =  D'11   Illegal logical value
IO0012  =  D'12   Position <1 or >152
IO0013  =  D'13   Format must begin with (
IO0014  =  D'14   Field specification missing
IO0015  =  D'15   Illegal sequence of characters
IO0016  =  D'16   Unmatched or too many parentheses
IO0017  =  D'17   Illegal format character
IO0018  =  D'18   Illegal field width
IO0019  =  D'19   Value and specification type
                    differ
IO0020  =  D'20   Record length exceeded
IO0021  =  D'21   Write past end of allocated area
IO0022  =  D'22   Requested record length <1 or >152
IO0023  =  D'23   Read or write after uncleared
                    error
IO0024  =  D'24   Buffer word count <1
IO0025  =  D'25   Record 'NAME' on 'UNIT' skipped
IO0026  =  D'26   Illegal type conversion
IO0027  =  D'27   Unrecognized data type
IO0028  =  D'28   Error in constant field
IO0029  =  D'29   Bad subscript
IO0030  =  D'30   Too many subscripts
IO0031  =  D'31   Not followed by replacement
                    character
IO0032  =  D'32   Name not in group list
IO0033  =  D'33   Constant not properly terminated
IO0034  =  D'34   Illegal character in constant
IO0035  =  D'35   Name too long
IO0036  =  D'36   Name must begin with alpha
                    character
IO0037  =  D'37   Missing or illegal constant
IO0038  =  D'38   Constant list exceeds variable
                    list
IO0039  =  D'39   Namelist record out of order
IO0040  =  D'40   Read past end of file or end of
                    data
IO0041  =  D'41   Illegal character argument
IO0042  =  D'42   Length out of range
IO0043  =  D'43   Line length too short for namelist
                    out
```

```
IO044    = D'44    Unrecognized variable type
IO045    = D'45    Read after write or end of data
IO046    = D'46    Unassigned
IO047    = D'47    Copy of XXXXXXXX records completed
IO048    = D'48    Copy of XXXXXXXX records YYYYYYY
                     files
IO049    = D'49    'eod, eod, bod' encountered on
                     'dn'
IO050    = D'50    'x' records 'y' files skipped on
                     'dn'
IO051    = D'51    dataset positioned after eod
IO052    = D'52    attempt to skip forward after
                     write
IO053    = D'53    dataset positioned at eof
IO054    = D'54    attempt to backup from bod
IO055    = D'55    Unassigned
IO056    = D'56    Unassigned
IO057    = D'57    Unassigned
IO058    = D'58    Unassigned
IO059    = D'59    Unassigned
IO060    = D'60    Unassigned
IO061    = D'61    Invalid buffer address for
                     unblocked
IO062    = D'62    Invalid word count for unblocked
                     data
IO063    = D'63    Unassigned
IO064    = D'64    Unassigned
IO065    = D'65    Unassigned
IO066    = D'66    Direct I/O prohibited under seq
                     access
IO067    = D'67    Seq I/O prohibited under direct
                     access
IO068    = D'68    Record number < 0 for direct
                     access
IO069    = D'69    Record length < 0 for direct
                     access
IO070    = D'70    Record address too large for
                     direct
IO071    = D'71    Unformatted record length not word
                     add
IO072    = D'72    Direct read attempted past last
                     record
IO073    = D'73    Blank specifier illegal if
                     unformatted
IO074    = D'74    Status must be delete for scratch
                     data
IO075    = D'75    Illegal unit number
IO076    = D'76    OLD status illegal without file
                     spec
IO077    = D'77    NEW status illegal without file
                     spec
```

```
IO0078  = D'78   File already connected to another
                   unit
IO0079  = D'79   SCRATCH status illegal with file
                   spec
IO0080  = D'80   RECL specifier illegal if not
                   direct
IO0081  = D'81   Access specifier not recognized
IO0082  = D'82   Form specifier not recognized
IO0083  = D'83   Blank specifier not recognized
IO0084  = D'84   Status specifier not recognized
IO0085  = D'85   New access conflicts with existing
IO0086  = D'86   New status conflicts with existing
IO0087  = D'87   New form conflicts with existing
IO0088  = D'88   New recl conflicts with existing
IO0089  = D'89   Missing unit specifier
IO0090  = D'90   NEW status illegal if dataset
                   exists
IO0091  = D'91   OLD status illegal if dataset
                   nonexist
IO0092  = D'92   Unassigned
IO0093  = D'93   Unassigned
IO0094  = D'94   Illegal file name
IO0095  = D'95   RECL must be specified in direct
                   acces
IO0096  = D'96   Bad character argument address
IO0097  = D'97   Unknown conversion type
IO0098  = D'98   List directed I/O illegal under
                   direct
IO0099  = D'99   Unrecovered data error
IO0100  = D'100  Unassigned
IO0101  = D'101  Actual block size > access MBS
                   param
IO0102  = D'102  Actual record size > access RS
                   param
IO0103  = D'103  Segment length > remainder of
                   block
IO0104  = D'104  Invalid IBM segment control code
IO0105  = D'105  Bad format address passed to
                   routine
IO0106  = D'106  Record length exceeded on write
IO0107  = D'107  Buffer too small for variable
                   record
IO0108  = D'108  Character type illegal
IO0109  = D'109  Buffer I/O illegal under random
                   access
IO0110  = D'110  Unassigned
IO0111  = D'111  Unassigned
IO0112  = D'112  'EOD, EOF, BOD' encountered on
                   'DN'
IO0113  = D'113  'X' records 'Y' files skipped on
                   'DN'
```

```
IO114     =  D'114          Dataset positioned after end of
                              data
IO115     =  D'115          Attempt to skip forward after
                              write
IO116     =  D'116          Dataset positioned at end of file
IO117     =  D'117          Attempt to backup from begin of
                              data
```

ISP Transport Messages are transmitted in a block of up to 512 Cray words, containing as many messages as are queued for transmission. The block begins with a six-word link header.
There are two formats of the header, depending on the message code. The first is for a Link Control Header, which contains protocol for control of the channel. The second the Link Data Header, which precedes ISP data on the channel. Both header formats are checksummed, and contain bit patterns which are used as a continuous diagnostic on the channels and interface units. They are differentiated by the contents of the IHFC field, which is zero for a Link Data Header, and nonzero for Link Control Headers.

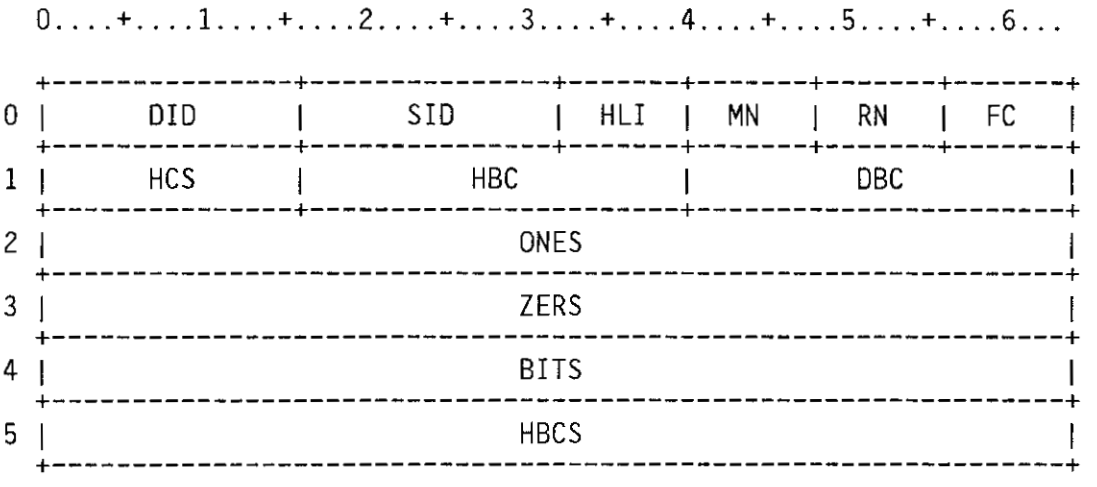


Figure IH-1. ISP Link Header

Field	Word(base8)	Bits	Description
IHDID	0	0-15	Destination I.D. (2 ASCII chars)
IHSID	0	16-31	Source I.D. (2 ASCII characters)
IHHLI	0	32-39	Header length (D'48 bytes)
IHMN	0	40-47	Message number
IHRN	0	48-55	Received message number (deferred)
IHFC	0	56-63	Link function code: IHFC$DAT=0 Data header IHFC$RST=1 RESET command IHFC$RDY=2 READY command

Field	Word(base8)	Bits	Description
IHHCS	1	0-15	Header checksum
IHHBC	1	16-39	Header block bit count
IHDBC	1	40-63	Data block bit count
IHONES	2	0-63	O'1777777777777777777777
IHZERS	3	0-63	O'0000000000000000000000
IHBITS	4	0-63	O'0111111111106666644444
IHHBCS	5	0-63	Header block checksum LE@IHL=6 Length of link-level header only

Some of these definitions are duplicated in the IOS driver overlay for the ISP, ISPDRV. If you change any of the following definitions, the driver must be modified as well. In addition, the driver assumes that the first LE@IHL words of the header have a 16-bit checksum of zero.

In the RESET header, the IHZERS word (word 3), which contains zeros for error diagnostic purposes in other type headers, holds information about the last fatal error, if any, encountered on any link to the same remote transport service.

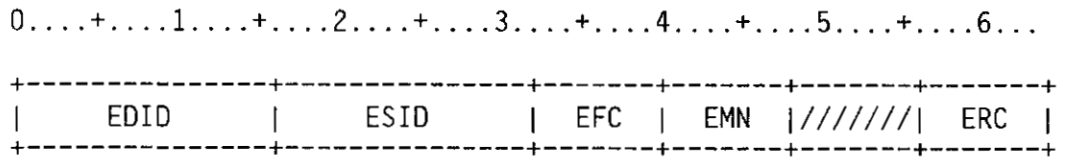


Figure IH-2. RESET Reason Code

Field	Word(base8)	Bits	Description
IHEDID	3	0-15	DID from header of error block
IHESID	3	16-31	SID from header of error block
IHEFC	3	32-39	FC from header of error block
IHEMN	3	40-47	MN from header of error block
IHERC	3	56-63	Error reason code (CST$xxx)

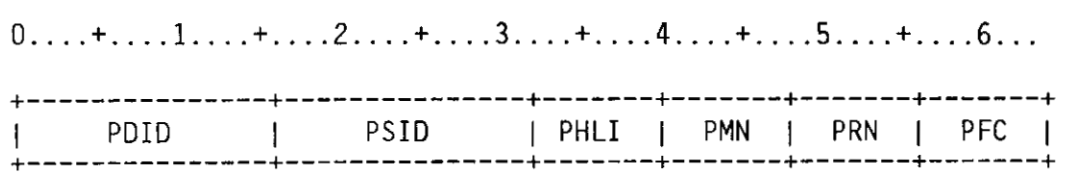


Figure IH-3. ISP Path Header

Field	Word(base8)	Bits	Description
IHPDID	6	0-15	Path destination I.D.
IHPSID	6	16-31	Path source I.D.
IHPHLI	6	32-39	Path header length (8 bytes)
IHPMN	6	40-47	Path message number (unused)
IHPRN	6	48-55	Path received number (unused)
IHPFC	6	56-63	Path function code: IHPF$DAT=0 Data LE@IHP=1 Length of path-level header

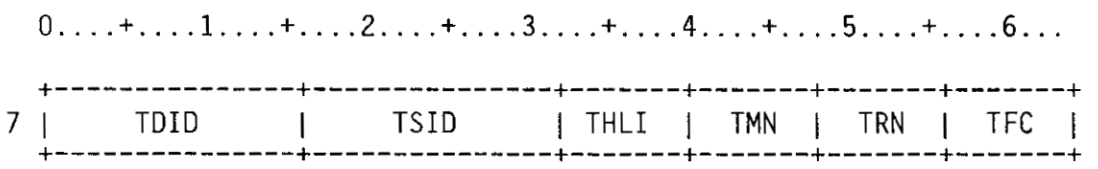


Figure IH-4. ISP Transport Header

Field	Word(base8)	Bits	Description
IHTDID	7	0-15	Transport destination I.D.
IHTSID	7	16-31	Transport source I.D.
IHTHLI	7	32-39	Transport header length (8 bytes)
IHTMN	7	40-47	Transport message number (unused)
IHTRN	7	48-55	Transport received number (unused)
IHTFC	7	56-63	Transport function code: IHTF$TMG=1 Transport-level messages LE@IHT=1 Length of transport-level header

The ISP Dataset Definition table (IDD) is constructed during the CONNECT statement processing by EXP, and sent to the ISP as part of the ACCESS and REACCESS messages in the Dataset Transmission Protocol.

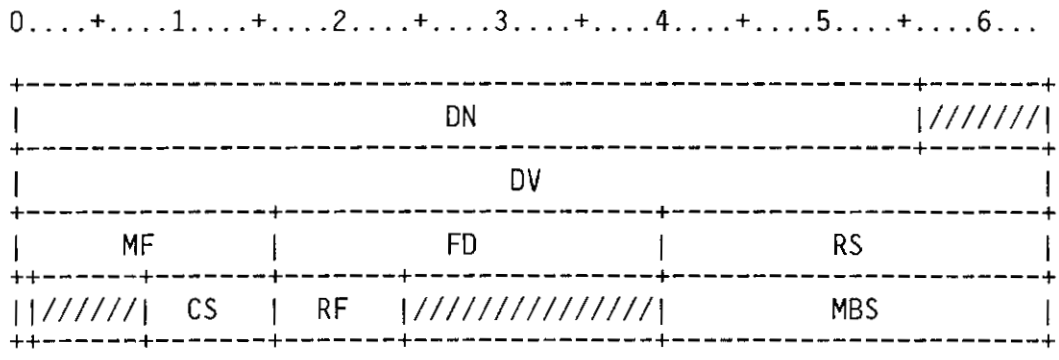


Figure II-1. ISP Dataset Definition Table

Field	Word(base8)	Bits	Description
IIDN	0	0-55	Dataset name (1-7 ASCII characters)
IIDV	1	0-63	Logical ISP device type (8 characters)
IIMF	2	0-15	ISP mainframe ID (2 ASCII characters)
IIFD	2	16-39	File format type (3 ASCII characters - IBM, CDC, etc.)
IIRS	2	40-63	Record length in bytes
IICV	3	0	Conversion enable flag (1 enables conversion by $IOLIB)
IICS	3	8-15	Character-set code 0 = ASCII 1 = EBCDIC
IIRF	3	16-23	Record format 0 = none 1 = IBM undefined 2 = IBM fixed 3 = IBM fixed blocked 4 = IBM variable 5 = IBM variable blocked 6 = IBM variable blocked span

Field	Word(base8)	Bits	Description
IIMBS	3	40-63	Maximum block size in bytes W@IITXT=4 Beginning of text (one or more ISP text records may follow -- see common deck COMIX for text format definition)

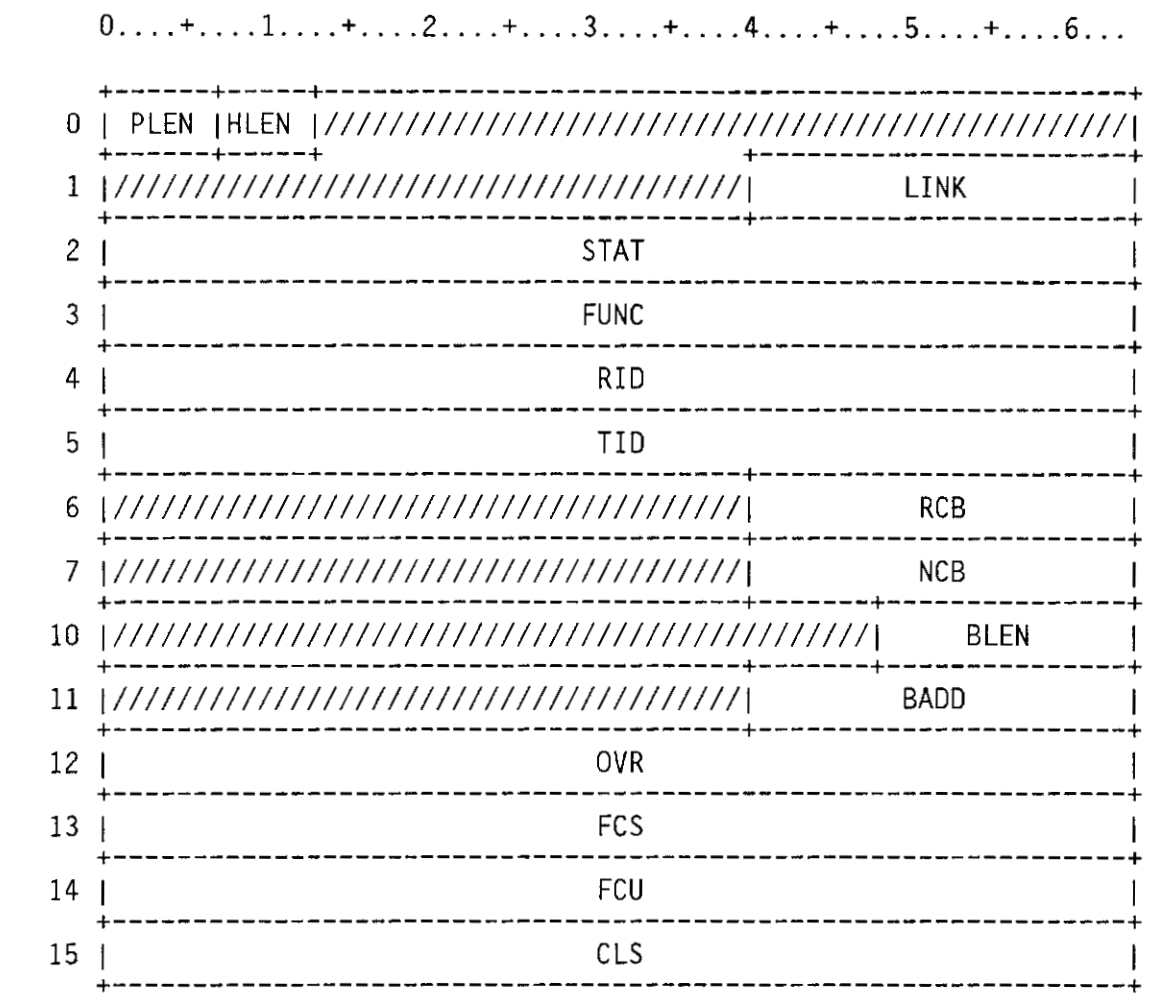


Figure IJ-1. F$IJMSG parameter block

Field	Word(base8)	Bits	Description
IJPLEN	0	0-6	length of the parameter block
IJHLEN	0	7-12	message buffer header length (LH@MHB)
IJLINK	1	40-63	link to next parameter block
IJSTAT	2	0-63	status IJMS$OK=00 completed with no error

The following responses do not terminate a request chain.
If any values are changed, SYSLIB must be changed also.

IJMS$AR=01 ID is already receptive
IJMS$AU=02 ID is in use
IJMS$BA=03 buffer address or length bad
IJMS$BN=04 NCB is bad
IJMS$BNA=05 NCB address is bad
IJMS$BP=06 path is busy
IJMS$HL=07 HLEN error
IJMS$IF=08 IPT full
IJMS$INR=09 ID not registered
IJMS$INS=10 ID not specified
IJMS$MC=11 bad log message class
IJMS$ML=12 bad message length
IJMS$NA=13 ID is not attached
IJMS$NE=14 path is not open
IJMS$NO=15 no outstanding open request
IJMS$NP=16 path does not exist
IJMS$NR=17 ID is not receptive
IJMS$OO=18 outstanding OPEN was found
IJMS$PE=19 path is already established
IJMS$PF=20 memory pool is full
IJMS$PR=21 ID is privileged
IJMS$RB=22 bad RCB address
IJMS$RF=23 RIT full
IJMS$TA=24 target's buffer address is bad
IJMS$TL=25 target's buffer length is bad

The following responses terminate a request chain.

IJMS$BE=32 IJPB length error

IJMS$BF=33 undefined function
IJMS$LA=34 bad link address
IJMS$MT=35 more than one active TXT
IJMS$NC=36 RIT or IPT has zero entries
IJMS$PV=37 privileged function
IJMS$TP=38 more than I@MPBS parameter blocks
IJMS$MAX=39 maximum status value + 1

IJFUNC 3 0-63 subfunction code

If any values are changed, SYSLIB must be changed also.

IJM$NOP=00 no op
IJM$REC=01 request receptivity state
IJM$OPEN=02 open a communication path
IJM$ACCE=03 accept an IJM$OPEN request
IJM$REJE=04 reject an IJM$OPEN request
IJM$SNDM=05 send a message
IJM$CLOS=06 close a communication path
IJM$END=07 ends the receptivity state
IJM$$HNP=07+1 maximum value + 1 of unprivileged subfunctions

IJM$$MIP=32 minimum privileged function value
IJM$SNDL=32 send a logfile message (privileged)
IJM$$MAX=32+1 maximum subfunction value + 1

IJRID 4 0-63 ID of the requesting job

IJTID 5 0-63 ID of the target job

IJRCB 6 40-63 RCB address

IJNCB 7 40-63 NCB address

IJBLEN 10 48-63 message buffer length

IJBADD 11 40-63 message buffer address

Field	Word(base8)	Bits	Description
IJOVR	12	0-63	log message over-ride flag
IJFCS	13	0-63	log message to system log
IJFCU	14	0-63	log message to user log
IJCLS	15	0-63	log message class

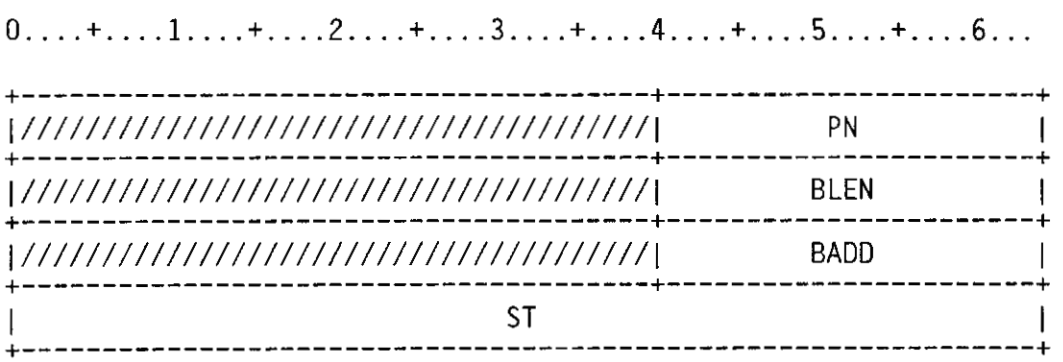


Figure NC-1. Node Control Block

Field	Word(base8)	Bits	Description
NCPN	0	40-63	IPT offset for this path
NCBLEN	1	40-63	length of the node buffer
NCBADD	2	40-63	address of the node buffer
NCST	3	0-63	status
NCMS	3	0	message status
NCOS	3	48-63	open status

If any values are changed, SYSLIB must be changed also.

```
NCB$ACC='AC'R          open request
accepted
NCB$REJ='RJ'R          open request
rejected
NCB$CLO='CL'R          path was
closed
```

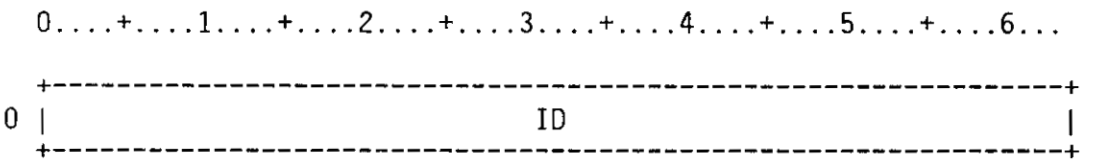


Figure RCB-1. Receptive Control Block

Field	Word(base8)	Bits	Description
RCBID	0	0-63	ID of the job requesting connection

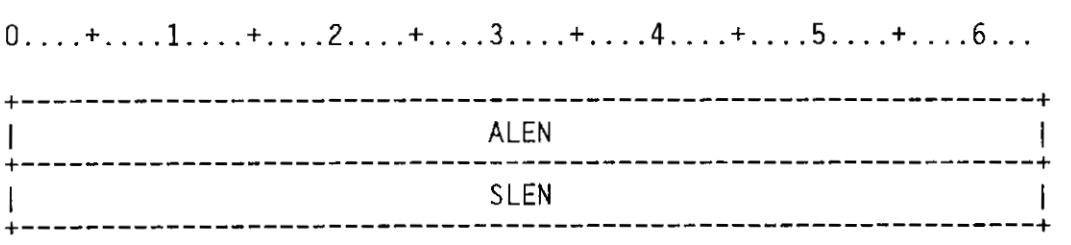


Figure MH-1. Inter-job communication message buffer

Field	Word(base8)	Bits	Description
MHALEN	0	0-63	length of message put into the buffer
MHSLEN	1	0-63	length of the message sent
			This header will be followed by message data in the format defined by the communicating tasks.

The ISP Link Table is used by the Integrated Support Processor communication task, IQM, to control communication links to the ISPs. There is one ILT entry for each input or output FEI box.

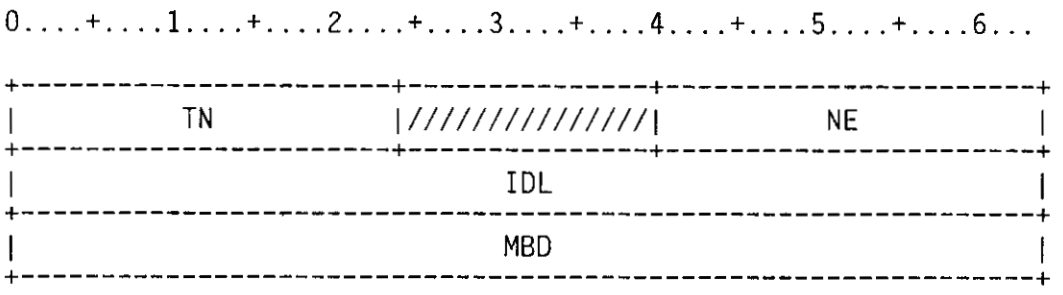


Figure IL-1. ISP Link Table Header

Field	Word(base8)	Bits	Description
ILTN	0	0-23	Table name -- ASCII 'ILT'
ILNE	0	40-63	Number of entries
ILIDL	1	0-63	Idling interval in clock periods
ILMBD	2	0-63	Message block delay interval

IQM uses the first part of the ILT entry to keep track of the overall state of the link -- the name of the link, whether it is up or down, whether a driver is assigned, what stage of handshaking it is in, and so on.

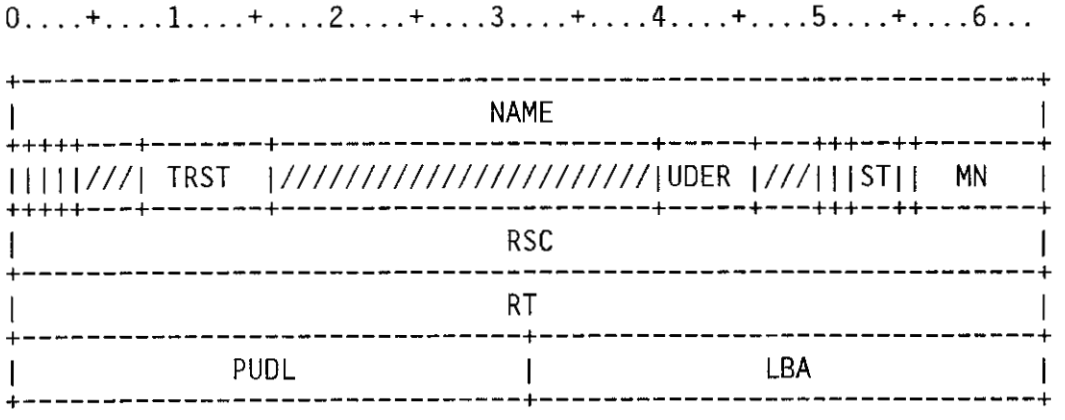


Figure IL-2. ISP Link Table (Link State Control)

Field	Word(base8)	Bits	Description
ILNAME	0	0-63	Channel name and direction
ILNM	0	0-55	Channel name (ASCII)
ILDIR	0	63	Channel direction (1 = output)
ILON	1	0	Link turned on flag
ILXB	1	1	Set to double-buffer in the driver
ILTRAP	1	2	Hang on link errors
ILFAST	1	3	Set nonzero for maximum I/O rate
ILTRST	1	8-15	Hang on this link error code
ILUDER	1	40-45	UDCOM error code value
ILDMY	1	50	Dummy data block flag
ILHBE	1	51	Header block expected next on link
ILST	1	52-54	Link State: ILST$INI=0 INItialization ILST$RST=1 RESET ILST$UP=2 UP ILST$OFF=3 OFF

Field	Word(base8)	Bits	Description
ILMN	1	56-63	Message number counter
ILRSC	2	0-63	Reset counter
ILRT	3	0-63	Real-time clock at last transmission
ILPUDL	4	0-31	User data length
ILLBA	4	32-63	Link buffer address

The following ILT entry fields hold data about link I/O performance.

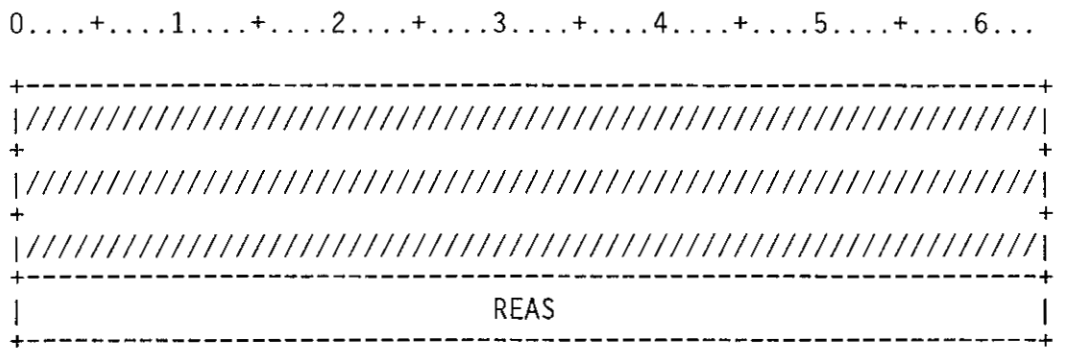


Figure IL-3. ISP Link Table (Link Statistics)

Field	Word(base8)	Bits	Description
ILREAS	10	0-63	Reset reason code
ILEDID	10	0-15	DID from header of error block
ILESID	10	16-31	SID from header of error block
ILEFC	10	32-39	FC from header of error block
ILEMN	10	40-47	MN from header of error block
ILERC	10	56-63	Error reason code (CST$xxx)

Fields in this portion of the ILT entry are used by IQM to manage I/O driver request activity.

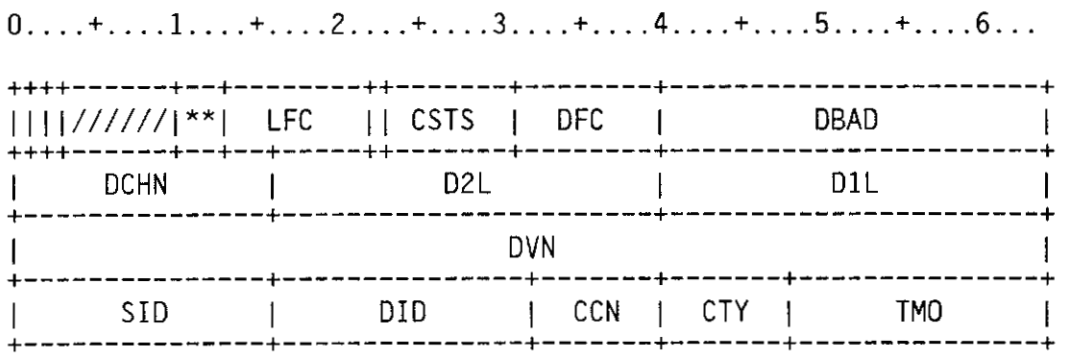


Figure IL-4. ISP Link Table (Driver Control)

Field	Word(base8)	Bits	Description
ILDBZ	11	0	Driver request busy
ILDDN	11	1	Driver request done
ILDOPN	11	2	Driver open
ILPLST	11	10-12	Link state prior to last driver reply
ILLFC	11	13-21	Last link header function code (IHFC)
ILCSTS	11	23-30	Channel status code (CST$xxx)
ILCST2	11	23	Status of 2nd half of RDD and WTD
ILCST	11	24-30	Driver request status: CST$xxx codes < O'40 are returned by the driver shell, and are defined in COMAP. Codes between O'40 and O'77 are returned by the driver. Codes O'100 through O'177 come from verification of link-layer headers.

CST$TMO=O'40 Driver request timeout
CST$HWE=O'41 Driver hardware error
CST$CTY=O'42 Illegal channel type on driver open
CST$DFC=O'43 Illegal driver function code
CST$LEN=O'44 Driver detected data length error
CST$NOI=O'60 Noise record (< 48 bytes)
CST$HCS=O'61 Invalid link header checksum
CST$HSZ=O'62 Incorrect transmission length
CST$BCS=O'63 Invalid header block checksum
CST$ONE=O'64 Dropped bits in IHONES field
CST$ZER=O'65 Picked bits in IHZERS field
CST$BIT=O'66 Invalid IHBITS field
CST$HLI=O'67 Invalid IHHLI field
CST$MN=O'70 Incorrect message number (IHMN)
CST$HFC=O'71 Invalid link function code (IHFC)
CST$OFF=O'72 Link turned off
CST$OLD=O'73 Couldn't find output link to send on
CST$MTYP=O'101 Invalid transport message type field
CST$DCN=O'102 Missing DCN in transport message
CST$MLI=O'103 Bad transport message length field
CST$SCN=O'104 Missing SCN in CON or CNF message
CST$MHL=O'105 Bad transport message header length
CST$FLC=O'106 FLC message too short

ILDFC	11	31-39	Driver function code
ILDBAD	11	40-63	1st Buffer address from last I/O W@ILIQY3=W@ILDBAD 3rd word of HTIQY history trace record
ILDCHN	12	0-15	Driver channel number
ILD2L	12	16-39	2nd data length on last I/O

Field	Word(base8)	Bits	Description
ILD1L	12	40-63	1st data length on last I/O W@ILIQY4=W@ILDCHN 4th word of HTIQY history trace record
ILDVN	13	0-63	Driver name (ASCII)
ILSID	14	0-15	Link source ID
ILDID	14	16-31	Link Destination ID
ILCCN	14	32-39	Co-channel number
ILCTY	14	40-47	Channel type
ILTMO	14	48-63	Channel default timeout

This section of the ILT entry contains fields used by IQM to control the ISP transport layer's use of the link.

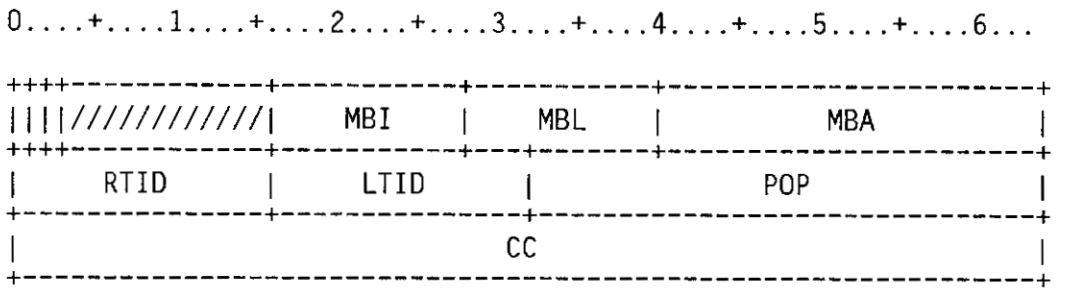


Figure IL-5. ISP Link Table (Transport Control)

Field	Word(base8)	Bits	Description
ILSMB	15	0	Must-send message block flag
ILPRI	15	1	Data path information to transmit
ILWAIT	15	2	Circuits waiting for this link
ILMBI	15	16-27	Message buffer index
ILMBL	15	28-39	Message buffer length
ILMBA	15	40-63	Message buffer address
ILRTID	16	0-15	Remote Transport I.D.
ILLTID	16	16-31	Local Transport I.D.
ILPOP	16	32-63	Number of circuits on this ILT
ILCC	17	0-63	Chain control (queue of VCTs)
ILREQP	17	8-15	Nonzero if data request pending
ILVCT	17	16-39	Address of first VCT on queue

The ILT entry for each ISP link contains a six-word buffer that is used by IQM to hold request packets being sent to the channel and reply packets coming back from the driver. The packets are F-packets, defined in comdeck COMAP.

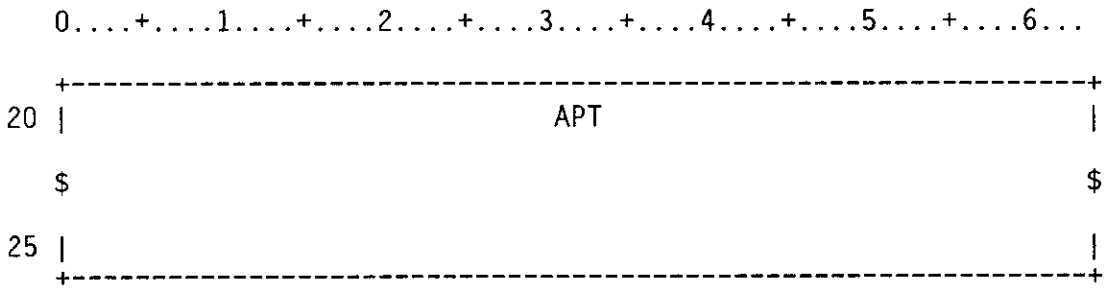


Figure IL-6. ISP Link Table (request packet buffer)

Field	Word(base8)	Bits	Description
ILAPT	20-25	0-63	F-packet buffer
ILAPT	20-25	0-63	(Required by table manual generator)

The Transport Message is a unit of information (usually control information) that passes between the two halves of the transport service in the Integrated Support Processor system. One half is the COS task IQM. The other is a mirror-image process in the ISP. Transport messages consist of a header followed by optional user data. The user data normally comes from operating system components such as EXP. To the transport service, this is user data in the sense that it is transmitted as a meaningless transparent bit string. Only the MSG and DIS messages (see below) may carry user data.

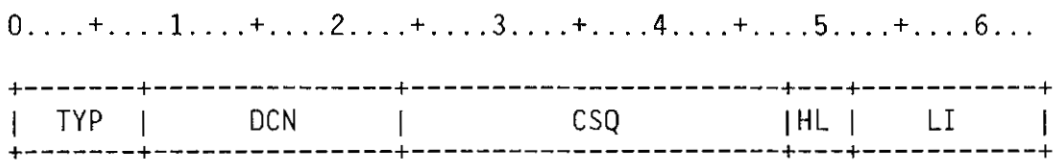


Figure IM-1. ISP Transport Message Header

The header that precedes all Transport Messages (TPDUs) begins with this word, regardless of message type.

Field	Word(base8)	Bits	Description
IMTYP	0	0-7	Message type code: IMT$NUL=0 NULL message IMT$CON=1 CONNECT IMT$CNF=2 CONFIRM IMT$DIS=3 DISCONNECT IMT$MSG=4 USER MESSAGE IMT$RD=5 READ DATA request IMT$WD=6 WRITE DATA IMT$DPE=7 DATA PATH END IMT$NRDY=D'8 Data path NOT READY IMT$RDY=D'9 Data path READY IMT$FLC=D'10 Message FLOW CONTROL IMT$MAX=D'10 Highest legal code
IMDCN	0	8-23	Destination connection number
IMCSQ	0	24-47	Connection sequence number

Field	Word(base8)	Bits	Description
IMHL	0	48-51	Message header length IML$CON=4 CONNECT IML$CNF=2 CONFIRM IML$DIS=2 DISCONNECT IML$MSG=1 MESSAGE IML$RD=5 READ DATA IML$WD=5 WRITE DATA IML$DPE=1 DATA PATH END IML$NRDY=1 NOT READY IML$RDY=1 READY IML$FLC=1 FLOW CONTROL
IMLI	0	52-63	TPDU length indicator

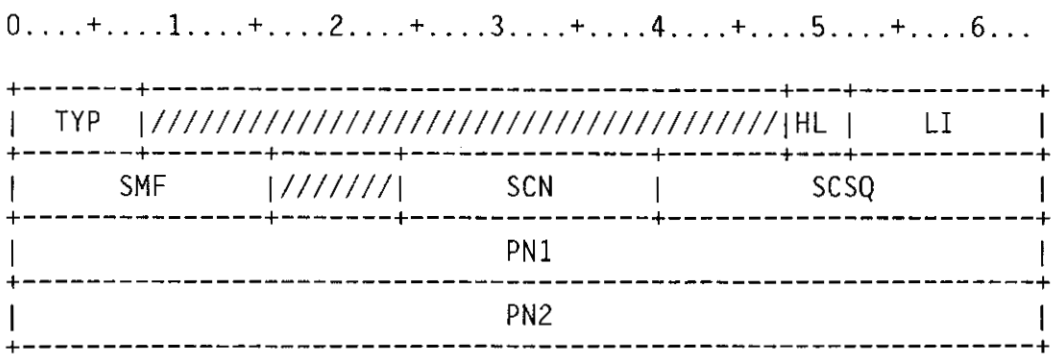


Figure IM-2. CONNECT Message

The CONNECT Message consists of a four-word header with no user data. The header specifies who is calling and who is being called.

Field	Word(base8)	Bits	Description
IMTYP	0	0-7	Message type code
IMHL	0	48-51	Message header length
IMLI	0	52-63	TPDU length indicator
IMSMF	1	0-15	Source mainframe I.D.
IMSCN	1	24-39	Source (caller's) connection number
IMSCSQ	1	40-63	Source connection sequence number
IMPN1	2	0-63	Destination name (1st 8 characters)
IMPN2	3	0-63	Destination mame (2nd 8 characters)

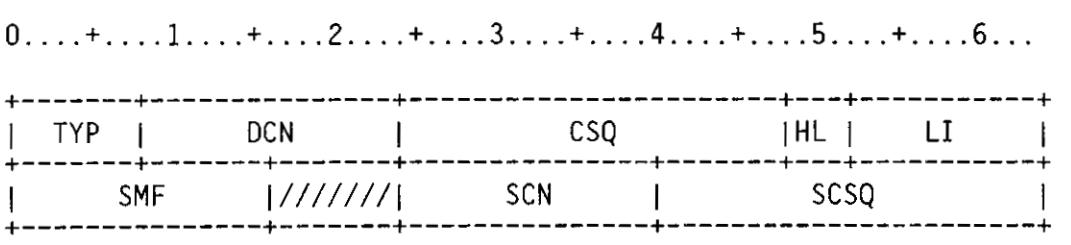


Figure IM-3. CONFIRM Message

The CONFIRM message is 2 words long, with no user data. It sends the local connection number to a remote caller.

Field	Word(base8)	Bits	Description
IMTYP	0	0-7	Message type code
IMDCN	0	8-23	Destination connection number
IMCSQ	0	24-47	Connection sequence number
IMHL	0	48-51	Message header length
IMLI	0	52-63	TPDU length indicator
IMSMF	1	0-15	Source mainframe I.D.
IMSCN	1	24-39	Source (called) connection number
IMSCSQ	1	40-63	Source connection sequence number

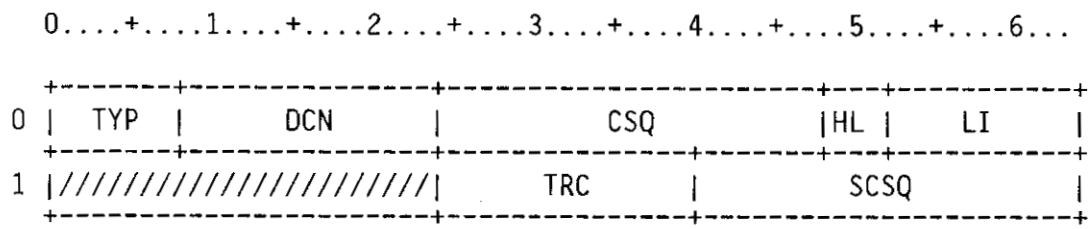


Figure IM-4. DISCONNECT Message

The DISCONNECT message has a 2-word header, and can carry user data as well.

Field	Word(base8)	Bits	Description
IMTYP	0	0-7	Message type code
IMDCN	0	8-23	Destination connection number
IMCSQ	0	24-47	Connection sequence number
IMHL	0	48-51	Message header length
IMLI	0	52-63	TPDU length indicator
IMTRC	1	24-39	Transport disconnect reason code
IMSCSQ	1	40-63	Source connection sequence number

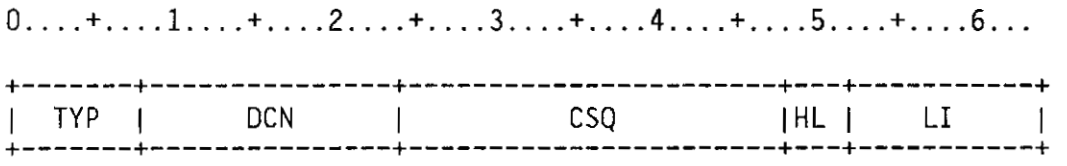


Figure IM-5. MESSAGE Message

The MESSAGE Message carries a user message after a one-word header.

Field	Word(base8)	Bits	Description
IMTYP	0	0-7	Message type code
IMDCN	0	8-23	Destination connection number
IMCSQ	0	24-47	Connection sequence number
IMHL	0	48-51	Message header length
IMLI	0	52-63	TPDU length indicator

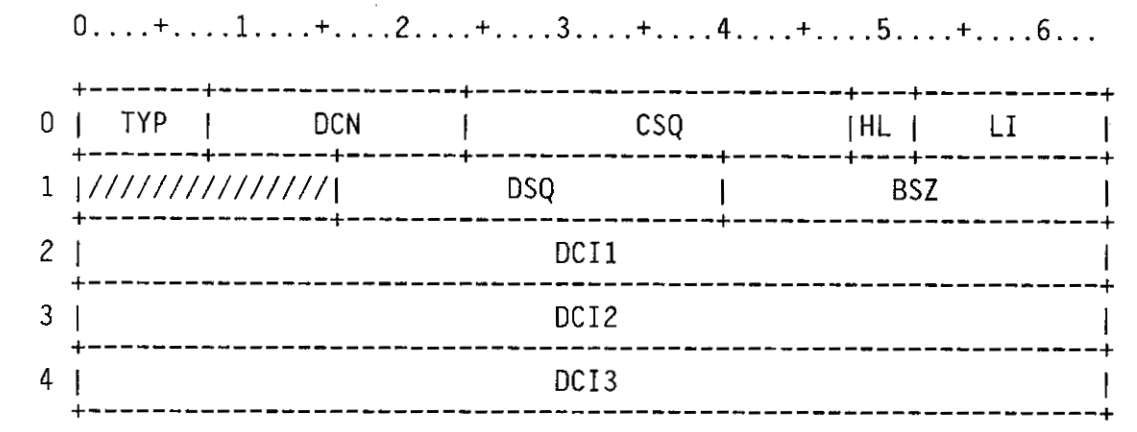


Figure IM-6. READ DATA Message

The READ DATA message has no associated user message, but has a 5-word header containing information about the READ DATA request.

Field	Word(base8)	Bits	Description
IMTYP	0	0-7	Message type code
IMDCN	0	8-23	Destination connection number
IMCSQ	0	24-47	Connection sequence number
IMHL	0	48-51	Message header length
IMLI	0	52-63	TPDU length indicator
IMDSQ	1	16-39	Data request sequence number
IMBSZ	1	40-63	Read buffer size in 64-bit words
IMDCI1	2	0-63	Data control information
IMDCI2	3	0-63	Data control information
IMDCI3	4	0-63	Data control information

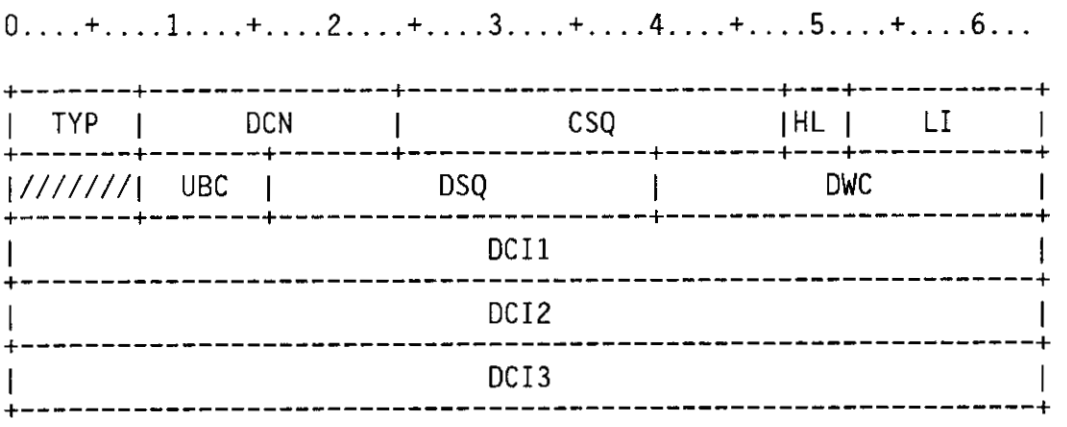


Figure IM-7. WRITE DATA Message

The WRITE DATA message has no user data attached.
It describes the contents of the next data block.

Field	Word(base8)	Bits	Description
IMTYP	0	0-7	Message type code
IMDCN	0	8-23	Destination connection number
IMCSQ	0	24-47	Connection sequence number
IMHL	0	48-51	Message header length
IMLI	0	52-63	TPDU length indicator
IMUBC	1	8-15	Number of unused bits in last word
IMDSQ	1	16-39	Data request sequence number
IMDWC	1	40-63	Data length in 64-bit words
IMDCI1	2	0-63	Data control information
IMDCI2	3	0-63	Data control information
IMDCI3	4	0-63	Data control information

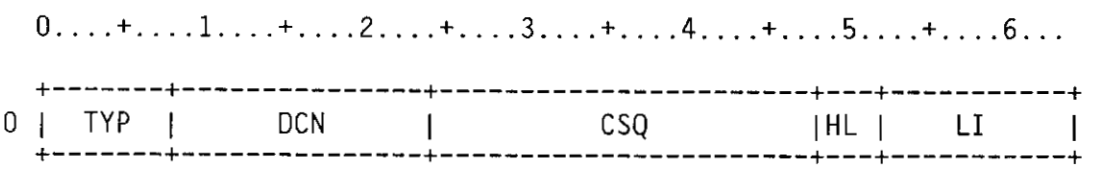


Figure IM-8. DATA PATH END Message

The DATA PATH END message terminates a data transfer sequence. It has a one-word header and no user message.

Field	Word(base8)	Bits	Description
IMTYP	0	0-7	Message type code
IMDCN	0	8-23	Destination connection number
IMCSQ	0	24-47	Connection sequence number
IMHL	0	48-51	Message header length
IMLI	0	52-63	TPDU length indicator

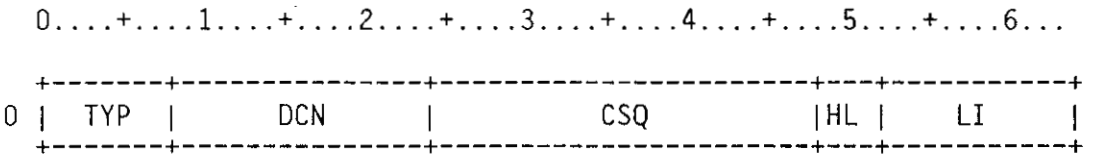


Figure IM-9. NOT READY Message

The NOT READY message suspends a data transfer sequence. It has a one-word header and no user message.

Field	Word(base8)	Bits	Description
IMTYP	0	0-7	Message type code
IMDCN	0	8-23	Destination connection number
IMCSQ	0	24-47	Connection sequence number
IMHL	0	48-51	Message header length
IMLI	0	52-63	TPDU length indicator

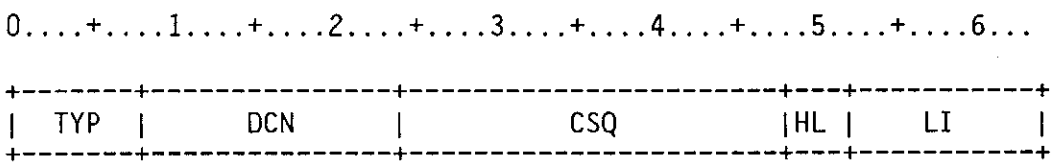


Figure IM-10. READY Message

The READY message resumes a data transfer sequence. It has a one-word header and no user message.

Field	Word(base8)	Bits	Description
IMTYP	0	0-7	Message type code
IMDCN	0	8-23	Destination connection number
IMCSQ	0	24-47	Connection sequence number
IMHL	0	48-51	Message header length
IMLI	0	52-63	TPDU length indicator

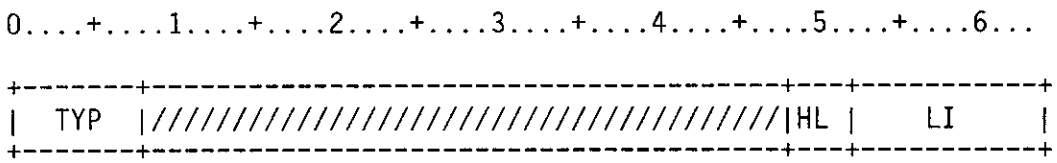


Figure IM-11. FLOW CONTROL Message

The FLOW CONTROL message has a one-word header followed by a vector of flow-control bits, using as many words as are necessary to cover all the virtual circuit table entries.

Field	Word(base8)	Bits	Description
IMTYP	0	0-7	Message type code
IMHL	0	48-51	Message header length
IMLI	0	52-63	TPDU length indicator L@IMFLC=%%SCR/D'64 Length of a COS flow control message

RWDP	=	0	Read record partial
RWDR	=	O'10	Read words record
WWDP	=	O'40	Write words,partial
WWDR	=	O'50	Write words,record
WWDS	=	O'51	Write record with UBC
WEOF	=	O'52	Write EOF
WEOD	=	O'56	Write EOD
REWD	=	O'60	Rewind
DPEOI	=	O'4000	DSP EOI encountered flag
DPEDE	=	O'100	DSP Data error flag
DPEHE	=	O'40	DSP Hardware error flag
DPNUL	=	0	DSP Null

The Path table (IPT) resides in STPTAB and contains an entry for every inter-job communication path currently established in the system.

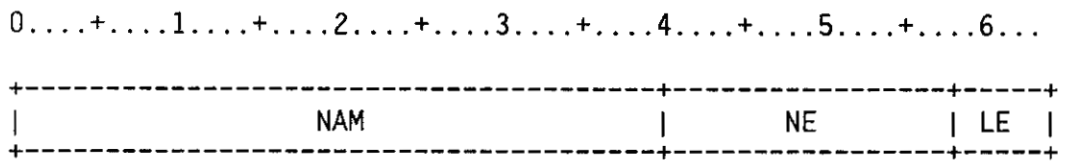


Figure IPT-1. Inter-job communication path table

Field	Word(base8)	Bits	Description
IPTNAM	0	0-39	table name
IPTNE	0	40-57	number of entries
IPTLE	0	58-63	entry length

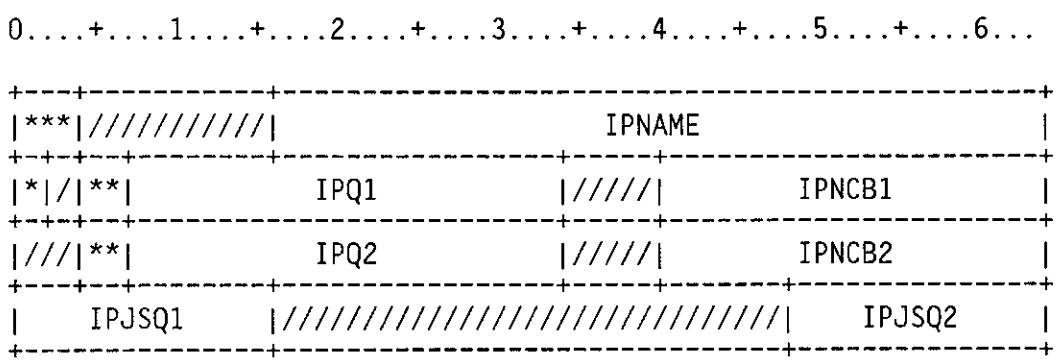


Figure IPT-2. Inter-job communication path table

Field	Word(base8)	Bits	Description
IPSTAT	0	0-3	path status IPT$AV=00 path is unoccupied IPT$OO=01 path OPEN request outstanding IPT$OR=02 path OPEN request rejected IPT$OA=03 path OPEN request accepted IPT$OP=04 path opened IPT$CL=05 path closed
IPNAME	0	16-63	path name
IPRO1	0	16-39	lower node RIT offset - ID1
IPRO2	0	40-63	upper node RIT offset - ID2 IPRO1 < IPRO2
IPA	1	0-1	attached flag
IPA1	1	0	if 1, ID1 attached to ID2
IPA2	1	1	if 1, ID2 attached to ID1
IPHLN1	1	4-6	header length of ID1's buffer
IPQ1	1	7-33	queue field for ID1
IPCQ1	1	7	CLOSE queued for ID1
IPOQ1	1	8	OPEN queued for ID1
IPDQ1	1	9	waiting to drop message queue
IPMQ1	1	10-33	message queue pointer for ID1
IPNCB1	1	40-63	NCB address for ID1
IPHLN2	2	4-6	header length for ID2's buffer

Field	Word(base8)	Bits	Description
IPQ2	2	7-33	queue field for ID2
IPCQ2	2	7	CLOSE queued for ID2
IPOQ2	2	8	OPEN queued for ID2
IPDQ2	2	9	waiting to drop message queue
IPMQ2	2	10-33	message queue pointer for ID2
IPNCB2	2	40-63	NCB address for ID2
IPJSQ1	3	0-15	job sequence number for ID1
IPJSQ2	3	48-63	job sequence number for ID2

```
L@IPT     =  LH@IPT+LE@IPT*NE@IPT
```

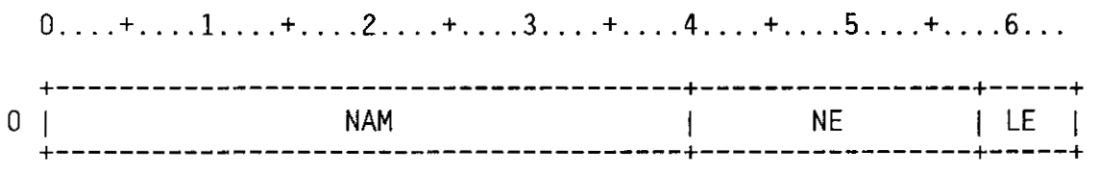


Figure RIT-1. Registered ID table

Field	Word(base8)	Bits	Description
RITNAM	0	0-39	table name
RITNE	0	40-57	number of entries
RITLE	0	58-63	entry length

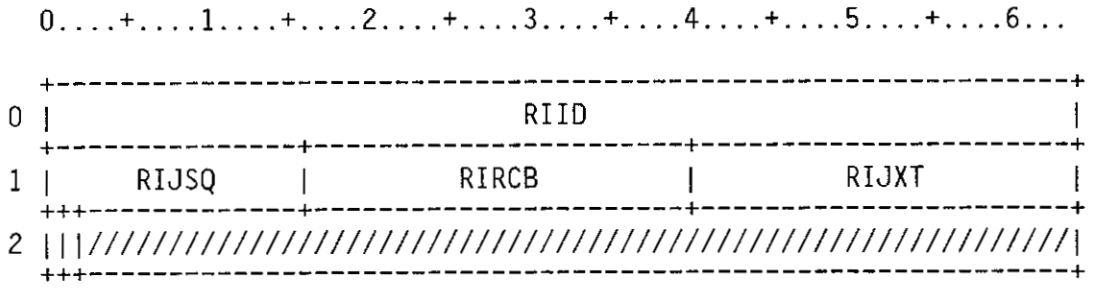


Figure RIT-2. Registered ID table

Field	Word(base8)	Bits	Description
RIID	0	0-63	ID
RIJSQ	1	0-15	JSQ of registered job
RIRCB	1	16-39	RCB address if ID is receptive
RIJXT	1	40-63	JXT address of job
RIR	2	0	reserved ID flag
RIEND	2	1	IJM$END pending

L@RIT = LH@RIT+LE@RIT*NE@RIT

The ISPMAIN Status Table is used by IQM to initiate and maintain conections between COS and the ISPMAIN's which exist on other mainframes. Each entry contains a complete TRB which is used by the Transport Service.

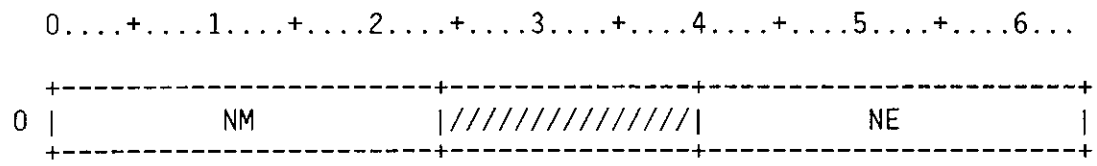


Figure IS-1. ISPMAIN Status Table Header

Header:

Field	Word(base8)	Bits	Description
ISNM	0	0-23	Table name -- ASCII 'IST'
ISNE	0	40-63	Number of entries

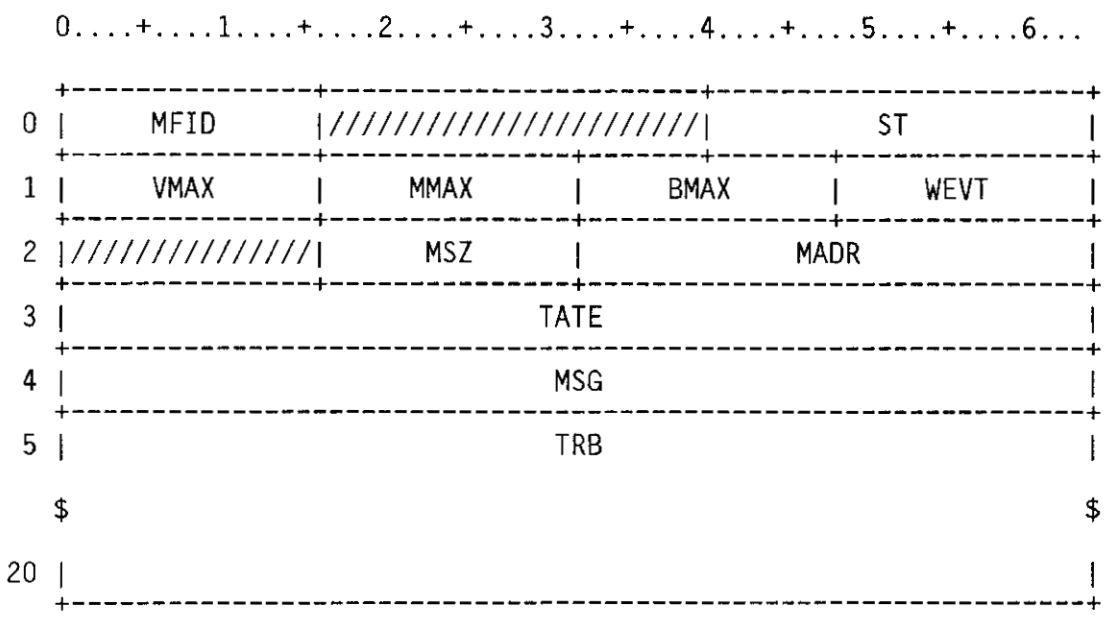


Figure IS-2. ISPMAIN Status Table Entry

Field	Word(base8)	Bits	Description
ISMFID	0	0-15	Mainframe Identifier
ISST	0	40-63	ISPMAIN Connection Status IST$DIS=1 Disconnected IST$OFR=2 Offer outstanding IST$LGW=3 Awaiting Logon IST$LGO=4 Logged On IST$QUI=5 Quiesce received IST$ADS=6 Attempting to disconnect IST$LGF=7 Logged off IST$ALF=D'8 Attempting to logoff IST$ALR=D'9 Attempting to issue logoff reply
ISVMAX	1	0-15	Maximum number of connections
ISMMAX	1	16-31	Maximum message size
ISBMAX	1	32-47	Maximum block size
ISWEVT	1	48-63	Event being waited on
ISMSZ	2	16-31	Length of text for message
ISMADR	2	32-63	Location of text for message
ISTATE	3	0-63	ASCII state of this IST entry

Field	Word(base8)	Bits	Description
ISMSG	4	0-63	First word of last message read
ISTRB	5-20	0-63	IST Transport request block
ISTRB	5-20	0-63	(Required by table diagram generator)

The IST contains a complete transport request block, field definitions of which are described in COMIT. All new words for the IST should be defined before the ISTRB word and adequate space must be reserved for the TRB when allowing for the IST entries.

The Transport Request Block is part of the Integrated Support Processor system. It is a block of data, constructed by a task that communicates with the ISP, containing parameters needed to transfer messages or user data between COS and the ISP. It is the means by which a task passes requests to the ISP transport service (ISPCOM and IQM).

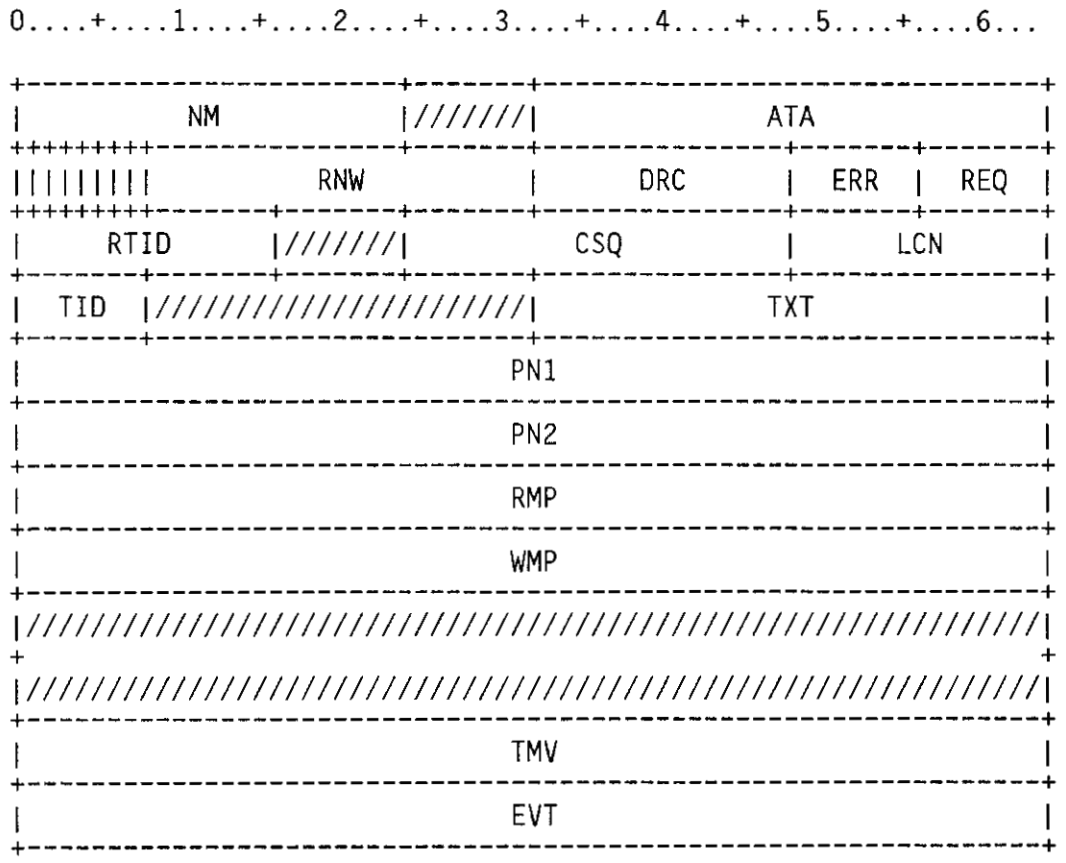


Figure IT-1. ISP Transport Request Block

Field	Word(base8)	Bits	Description
ITNM	0	0-23	Table name - 'TRB'
ITATA	0	32-63	Associated table address
ITBSY	1	0	Request busy
ITCN	1	1	Connected
ITMWT	1	2	Message waiting to be read
ITTMO	1	3	Request timed out
ITNRDY	1	4	Data path not ready
ITDPE	1	5	Data path end
ITRDA	1	6	Read active from other side
ITMBSY	1	7	Remote message buffer busy
ITRNW	1	8-31	Size of read from other side
ITDRC	1	32-47	Disconnect reason code: ITD$LU=1 Local user disconnect ITD$RU=2 Remote user disconnect ITD$LT=3 Local transport disconnect ITD$RT=4 Remote transport disconnect
ITERR	1	48-55	Error code: ITE$ILL=1 Illegal request ITE$LCN=2 Invalid LCN field in TRB ITE$DIS=3 Circuit disconnected ITE$IMP=4 Invalid message address or length ITE$TID=5 Invalid transport destination I.D.
ITREQ	1	56-63	Transport request code: ITR$OFR=1 OFFER ITR$CON=2 CONNECT ITR$DIS=3 DISCONNECT ITR$ST=4 STATUS ITR$WM=5 WRITE MESSAGE ITR$RM=6 READ MESSAGE ITR$WD=7 WRITE DATA ITR$RD=D'8 READ DATA ITR$DPE=D'9 DATA PATH END ITR$MAX=D'9 Maximum legal code

Field	Word(base8)	Bits	Description
ITRTID	2	0-15	Destination transport I.D.
ITCSQ	2	24-47	Connection sequence number
ITLCN	2	48-63	Local connection number
ITTID	3	0-7	Requesting task I.D.
ITTXT	3	32-63	User TXT address
ITPN1	4	0-63	Process name (first 8 characters)
ITPN2	5	0-63	Process name (characters 9-16)
ITRMP	6	0-63	READ MESSAGE parameter word
ITRSTP	6	0	1 if ITRMA is STP-REL
ITRSRQ	6	1	1 if system request (use system buffer where the message currently exists)
ITRML	6	16-31	Read message length
ITRMA	6	32-63	Read message address
ITWMP	7	0-63	WRITE MESSAGE parameter word
ITWSTP	7	0	1 if ITWMA is STP-REL
ITWML	7	16-31	Write message length
ITWMA	7	32-63	Write message address
ITTMV	12	0-63	Request timeout value
ITEVT	13	0-63	Event descriptor for JSH J$AWAIT call

This table is part of the Integrated Support Processor system. It is used by the ISP communication task, IQM, and by its interface subroutine, ITREQ.

In the ISP, each COS dataset or job is represented by a virtual circuit, or an independent logical connection between COS and the ISP. Control protocol and data are transmitted by the ISP transport service (IQM and its mirror image in the ISP) over these connections. Many virtual circuits are multiplexed over a physical channel pair. This table is the data structure for control of the virtual circuit at the COS end.

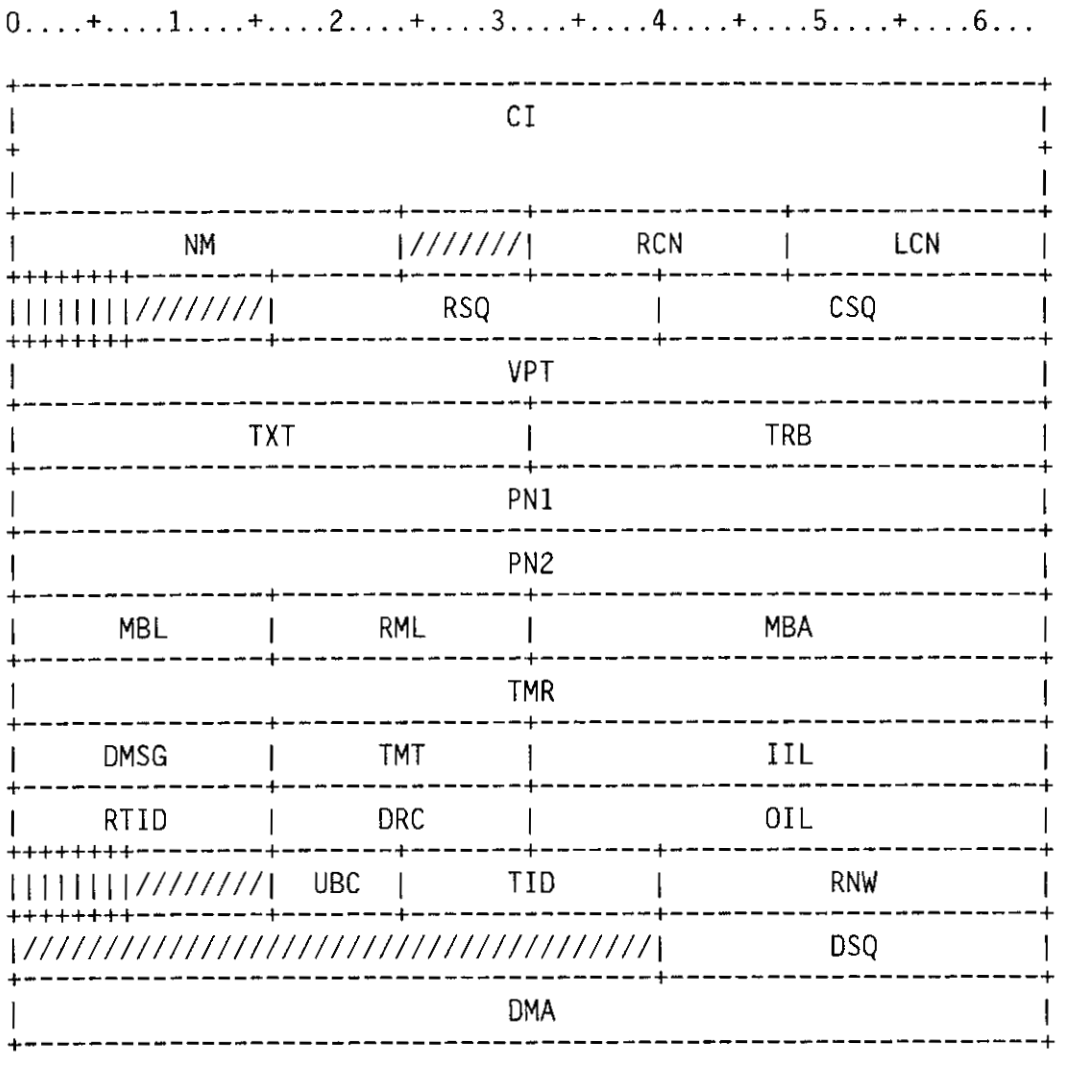


Figure IV-1. ISP Virtual Circuit Table

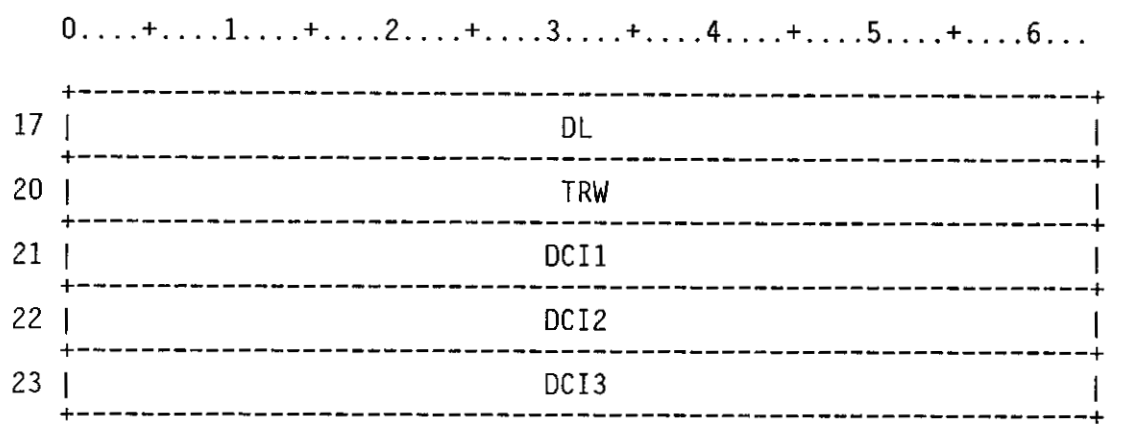


Figure IV-1. ISP Virtual Circuit Table

Field	Word(base8)	Bits	Description
IVCI	0-1	0-63	Chain item (2 words)
IVNM	2	0-23	Table name - 'VCT'
IVRCN	2	32-47	Remote connection number
IVLCN	2	48-63	Local connection number
IVCN	3	0	Connected to the ISP
IVDSC	3	1	Disconnected
IVCNF	3	2	CONFIRM message needs to be sent
IVMBSY	3	3	Remote message buffer busy
IVRFC	3	4	Remote flow control flag
IVMWT	3	5	Received message waiting
IVTMO	3	6	Request timed out
IVRSQ	3	16-39	Remote connection sequence number
IVCSQ	3	40-63	Connection sequence number
IVVPT	4	0-63	VPT entry address
IVTXT	5	0-31	TXT address
IVTRB	5	32-63	TRB address (JTA-REL if IVTXT nonzero)
IVPN1	6	0-63	Process name (16 characters)

Field	Word(base8)	Bits	Description
IVPN2	7	0-63	
IVMBL	10	0-15	Message buffer length
IVRML	10	16-31	Received message length
IVMBA	10	32-63	Message buffer address
IVTMR	11	0-63	Request timer
IVDMSG	12	0-15	Disconnect message code
IVTMT	12	16-31	Timer type code: ITT$OFR=1 OFFER timeout ITT$WM=2 WRITE MESSAGE timeout ITT$RM=3 READ MESSAGE timeout ITT$DR=4 DATA request timeout
IVIIL	12	32-63	Input ILT entry address
IVRTID	13	0-15	Remote transport I.D.
IVDRC	13	16-31	Disconnect reason code
IVOIL	13	32-63	Output ILT entry address
IVDBSY	14	0	Data transfer request busy
IVDDN	14	1	Data transfer request done
IVTD	14	2	Transfer direction (1 = out)
IVRDA	14	3	Read Data active (sent to remote)
IVNRDY	14	4	Data path not ready
IVRDY	14	5	Data path ready
IVDPE	14	6	Data Path End
IVUBC	14	16-23	Unused bit count
IVTID	14	24-39	ID of task for reply
IVRNW	14	40-63	Number of data words requested
IVDSQ	15	40-63	Request sequence number from RD msg
IVDMA	16	0-63	Data buffer memory address

Field	Word(base8)	Bits	Description
IVDL	17	0-63	Data transfer length
IVTRW	20	0-63	Task reply word
IVDCI1	21	0-63	Data control information from RD msg
IVDCI2	22	0-63	.
IVDCI3	23	0-63	.

This table is part of the Integrated Support Processor system. It is a multi-purpose structure, designed to hold a variable-length text record. Text may be ASCII characters, binary data, or something else. It is treated as transparent data by the lower levels of the ISP software that use this table.

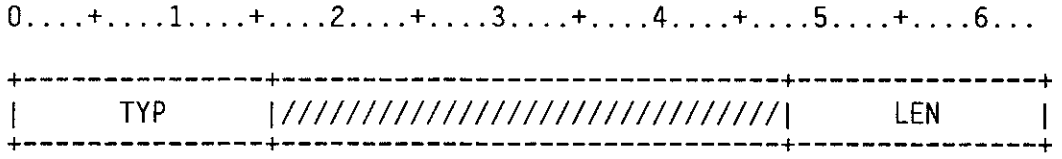


Figure IX-1. ISP Text Record

Field	Word(base8)	Bits	Description
IXTYP	0	0-15	Text type (2 ASCII characters - ST = Secure Text TX = Text
IXLEN	0	48-63	Text length in CRAY words Text body follows immediately, zero-filled in the last word. W@IXTXT=1 ISP text (I@IMXTXT words maximum)

The 1-word JCL Block Information Table (JBI) is generated in the user field and has two formats: one for conditional information (figure JB-1) and the other for iterative information (figure JB-2).

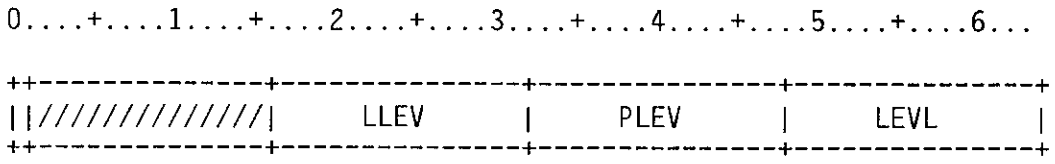


Figure JB-1. JBI Conditional Format

Field	Word(base8)	Bits	Description
JBEXC	0	0	Conditional sequence is in execution
JBLLEV	0	16-31	Conditional is contained in this iterative nesting level
JBPLEV	0	32-47	Iterative is contained in this procedure level
JBLEVL	0	48-63	Current iterative nesting level

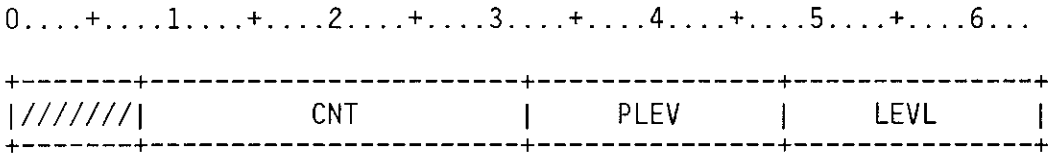


Figure JB-2. JBI Iterative Format

Field	Word(base8)	Bits	Description
JBCNT	0	8-31	Iteration count
JBPLEV	0	32-47	Iterative is contained in this procedure level
JBLEVL	0	48-63	Current iterative nesting level

The first 128 words of each user field comprise the Job Communication Block. The JCB is accessible to the user.

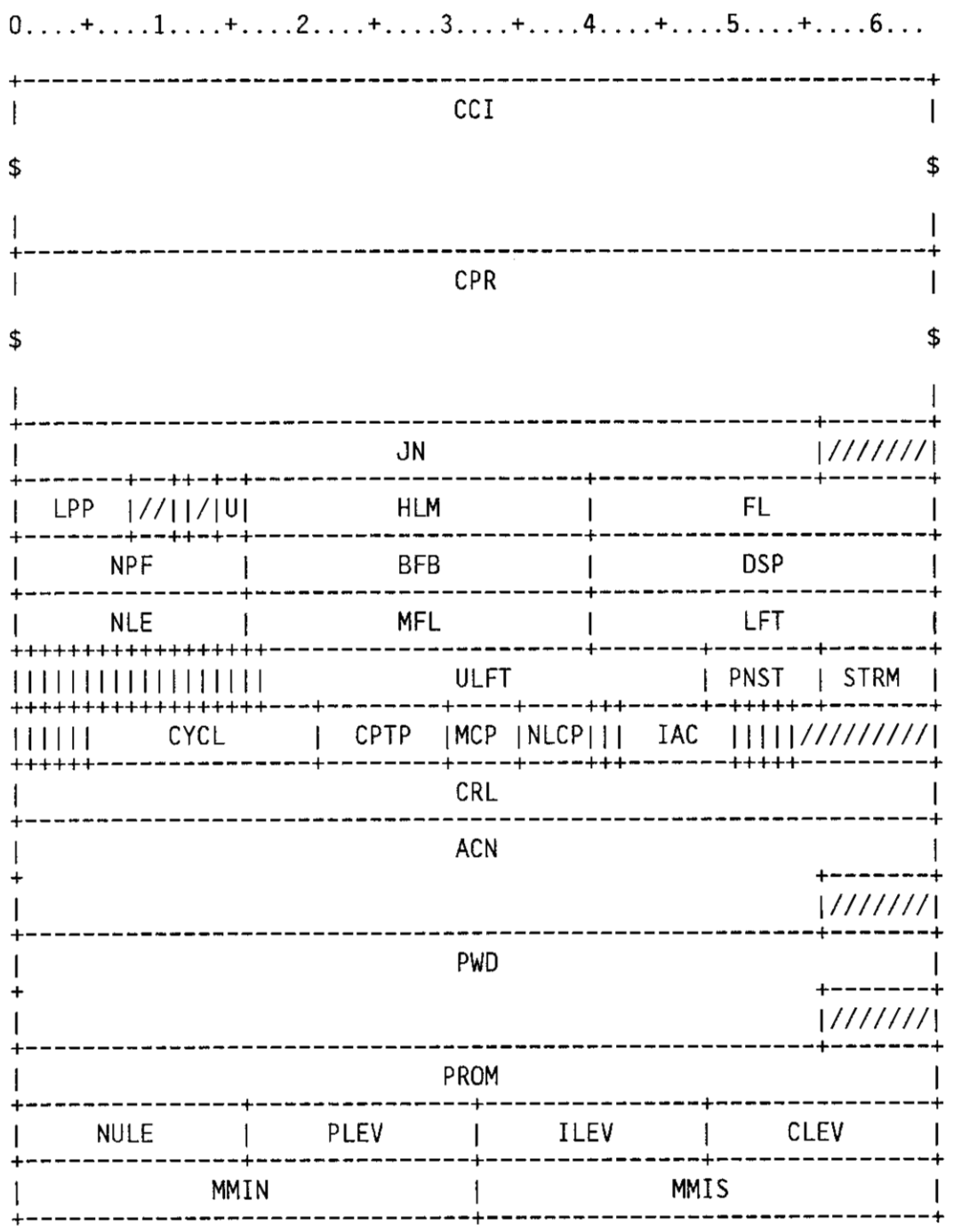


Figure JC-1. Job Communication Block

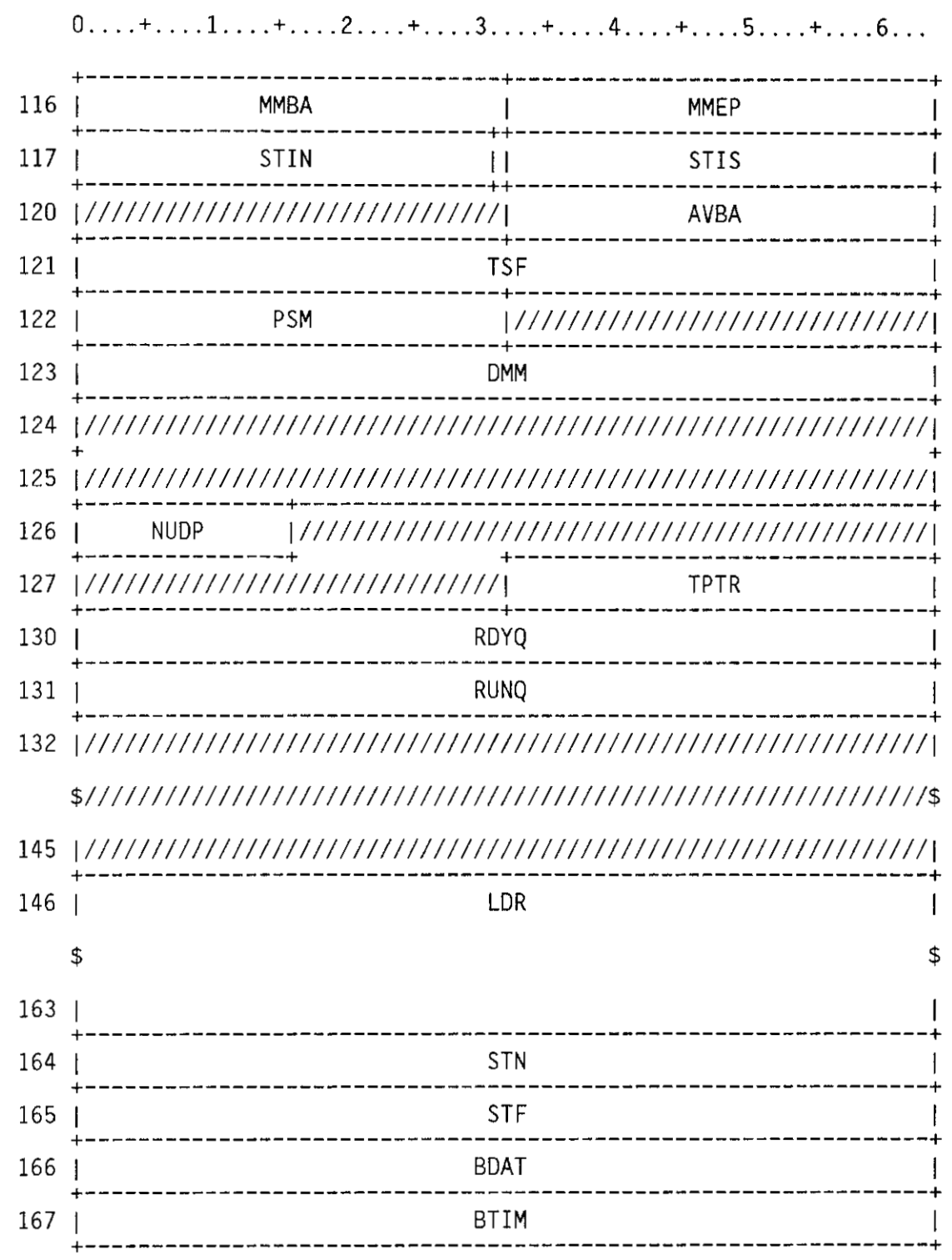


Figure JC-1. Job Communication Block

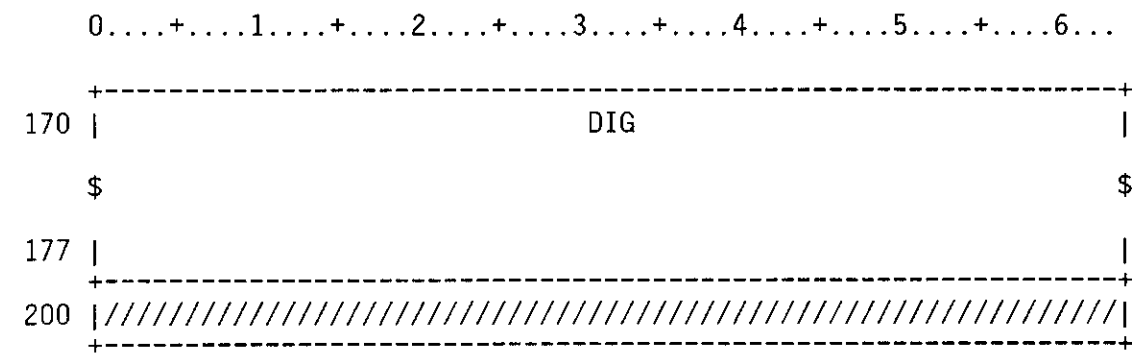


Figure JC-1. Job Communication Block
B@JCB=0 Symbol for JCB base, relative to BA

The first five words of the JCB are assigned as a save area for the BGN table that is used by F$BGN.

Field	Word(base8)	Bits	Description
JCCCI	5-17	0-63	Control statement image packed 8 characters per word
JCCPR	20-77	0-63	Control statement parameters, expanded to two words per parameter
JCJN	100	0-55	Job name; bits 56-63 must be 0.
JCLPP	101	0-7	Lines per page
JCRMSG	101	11	RFL messave sent
JCU	101	14-15	User mode indicator:
JCUL	101	14	Local
JCUG	101	15	Global
JCHLM	101	16-39	High limit of user code
JCFL	101	40-63	Current field length
JCNPF	102	0-15	Number of physical buffers and datasets
JCBFB	102	16-39	Base address of I/O buffers
JCDSP	102	40-63	Base address of DSP area
JCNLE	103	0-15	Number of entries in LFT
JCMFL	103	16-39	Maximum FL allowed

Field	Word(base8)	Bits	Description
JCLFT	103	40-63	Base of LFT
JCDCS	104	0	CSP dynamic control statement flag
JCCSDB	104	1	CSP debug flag
JCBP	104	2	JOB statement breakpoint (BP) flag
JCNTB	104	3	CSP traceback suppression flag
JCIOAC	104	4	I/O area current status flag: 0 User's I/O area is unlocked 1 User's I/O area is locked
JCIOAP	104	5	I/O area previous status flag: 0 User's I/O area is unlocked 1 User's I/O area is locked
JCIA	104	6	Interactive flag
JCCHG	104	7	Execute CHARGES utility for trailer message.
JCJBS	104	8	JOB statement flag (if set, JOB statement just processed)
JCCSIM	104	9	Flag is set when CRAY-1 simulator is running.
JCDLIT	104	10	Display literal delimiters in control statement crack.
JCRPRN	104	11	Retain level 1 parentheses.
JCVSEP	104	12	Last character was valid separator.
JCSDM	104	13	NOECHO of current control statement
JCPDMS	104	14	Suppress PDM user logfile messages
JCCSQ	104	15	New CFT calling sequence in effect
JCOVT	104	16	Overlay type
JCULFT	104	17-47	Base of user LFTs (JCB-REL)
JCPNST	104	48-55	Parentheses nesting level for current control statement

Field	Word(base8)	Bits	Description
JCSTRM	104	56-63	Statement termination for current control statement
JCEFI	105	0	Enable floating-point interrupt flag; used by $ARLIB math routines to reset floating-point interrupt flag
JCOVL	105	1	Overlay flag
JCSBC	105	2	SBCA flag
JCBDM	105	3	Enable bidirectional mode flag
JCORI	105	4	Interrupt on operand range flag
JCCYCL	105	5-20	CPU cycle time, in picoseconds
JCCPTP	105	21-29	CPU type, @CRAYxxx
JCMCP	105	30-34	Maximum number of logical CPUs that
JCNLCP	105	35-39	Current number of logical CPUs asg'd
JCEMA	105	40	1=Extended memory addressing enabled
JCAVL	105	41	1=Additional vector logical unit enab.
JCIAC	105	42-49	Number of account processing retries allowed for an interactive job
JCACRQ	105	50	Accounting mandatory flag
JCPWRQ	105	51	Password mandatory flag
JCRYPT	105	52	Encryption flag
JCSLVL	105	53	Security level flag
JCCRL	106	0-63	COS revision level
JCCRLS	106	32-63	COS revision number
JCACN	107-110	0-63	1 through 15 character account number
JCACN1	107	0-63	Characters 1 through 8 of account number
JCACN2	110	0-55	Characters 9 through 15 of account number

Field	Word(base8)	Bits	Description
JCPWD	111-112	0-63	1 through 15 character password
JCPWD1	111	0-63	Characters 1 through 8 of password
JCPWD2	112	0-55	Characters 9 through 15 of password
JCPROM	113	0-63	Current user job interactive prompt, justified, zero-filled. 64 bits of binary zeroes disables user job prompt. Set to system default at beginning of each job step.
JCNULE	114	0-15	Number of user LFT entries (below HLM)
JCPLEV	114	16-31	Current procedure nesting level
JCILEV	114	32-47	Current iterative nesting level
JCCLEV	114	48-63	Current conditional nesting level
The next four words are used by the run-time memory manager:			
JCMMIN	115	0-31	Size of increments to the managed memo
JCMMIS	115	32-63	Initial size of memory to be managed
JCMMBA	116	0-31	Base address of managed space
JCMMEP	116	32-63	Size of smallest block added to availa
JCSTIN	117	0-30	Size of increments to a stack
JCSTRT	117	31	Flag to indicate stack for root task
JCSTIS	117	32-63	Initial size of a stack
JCAVBA	120	32-63	Base of available space
JCTSF	121	0-63	Task scheduling flag
JCPSM	122	0-31	Pseudo semaphore registers 1 A&B, 1/S
JCDMM	123	0-63	Don't move memory when nonzero
JCNUDP	126	0-15	Number of system DSPs in user
JCTPTR	127	32-63	Pointer to list of all tasks
JCRDYQ	130	0-63	Multitasking ready queue header

Field	Word(base8)	Bits	Description
JCRUNQ	131	0-63	Multitasking run queue header
JCLDR	146-163	0-63	Unsatisfied externals
JCSTN	164	0-63	Job step count
JCSTF	165	0-63	Job step failure flag
JCBDAT	166	0-63	Date of absolute load module generation
JCBTIM	167	0-63	Time of absolute load module generation
JCDIG	170-177	0-63	Reserved for diagnostics

The presence of this figure adds no information. It is required by the table diagram generator to improve the appearance of the table while still supplying the S@JCDIG and N@JCDIG tags.

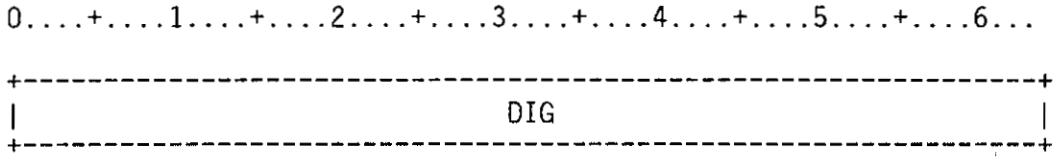


Figure JC-2. Additional tags for diagnostics

Field	Word(base8)	Bits
JCDIG	170	0-63

```
FXC     =  1        Function code to activate FIXCLASS
FXC1    =  2        Function code to activate FIXCLAS1
CASS    =  3        Function code to activate CASSIGN
RCASS   =  4        Function code to activate RCASSIGN
ASSIT   =  5        Function code to activate ASSIGNIT
CGRN    =  6        Function code to crack G. R. data
```

The 4-word JST contains information about system and user symbols.

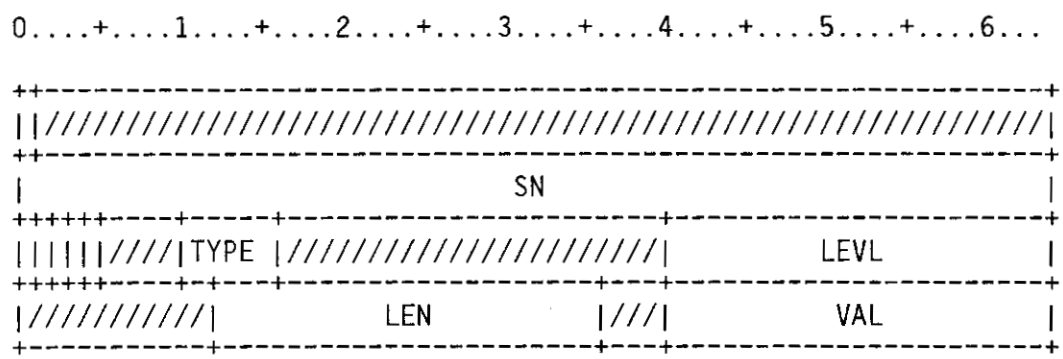


Figure JS-1. JCL Symbol Table

Field	Word(base8)	Bits	Description
JSCRE	0	0	Create if not found. Available only for system use.
JSSN	1	0-63	Symbol name
JSLOC	2	0	Local or global. If set, symbol is procedure local.
JSCON	2	1	Constant or variable. If set, symbol is constant.
JSSRS	2	2	System reserved. If set, the symbol name is reserved by the system.
JSUSR	2	3	User settable. If set, symbol may be modified by the job.
JSSYS	2	4	System settable. If set, the symbol may be modified by COS.
JSTYPE	2	10-15	One of the following symbol types: SYMTUND=O'00 Undefined - no type SYMTBOO=O'01 Boolean - logical SYMTINT=O'02 Decimal integer SYMTLIT=O'03 ASCII literal; 1-8 characters.
JSLEVL	2	40-63	Procedure definition level

Field	Word(base8)	Bits	Description
JSLEN	3	12-35	Length of value
JSVAL	3	40-63	Base of value buffer

```
J%STEP    =  O'4000
J$ALLOC   =  J%STEP              Allocate or release memory for a
J$AWAIT   =  J%STEP+J$ALLOC      Suspend until given event occurs
J$SPARE1  =  J%STEP+J$AWAIT      Spare function
J$SUSP    =  J%STEP+J$SPARE1     Suspend a task momentarily
J$SUSPK   =  J%STEP+J$SUSP       Suspend a job momentarily (system
J$STOP    =  J%STEP+J$SUSPK      Suspend a job indefinitely (opera
J$CLEAR   =  J%STEP+J$STOP       Perform clean-up functions on
                                   abort
J$ABORT   =  J%STEP+J$CLEAR      Cancel a job for a given reason
J$RERUN   =  J%STEP+J$ABORT      Move a job from executing to input
J$DELETE  =  J%STEP+J$RERUN      Move a job from executing to
                                   available
J$IOSUSP  =  J%STEP+J$DELETE     Suspend a job pending an I/O
                                   completion
J$IODONE  =  J%STEP+J$IOSUSP     Resume an I/O-suspended job
J$RESUME  =  J%STEP+J$IODONE     End a momentary (system)
                                   suspension
J$START   =  J%STEP+J$RESUME     End an indefinite (operator)
                                   suspension
J$INDEX   =  J%STEP+J$START      Set job's nonrecoverable bit in i
J$STRALL  =  J%STEP+J$INDEX      Start all jobs (operator)
J$STPALL  =  J%STEP+J$STRALL     Stop all jobs (operator)
J$RCVR    =  J%STEP+J$STPALL     Recover all jobs (operator)
J$SHTDWN  =  J%STEP+J$RCVR       Shutdown (operator)
J$REMK    =  J%STEP+J$SHTDWN     Remove the K bit.
J$INVOKE  =  J%STEP+J$REMK       Invoke new class structure
J$UROLL   =  J%STEP+J$INVOKE     User job roll request
J$CHANGP  =  J%STEP+J$UROLL      Oper request - change priority
J$READY   =  J%STEP+J$CHANGP     Ready task when job in memory
J$GETM    =  J%STEP+J$READY      Get buffer memory
J$RETM    =  J%STEP+J$GETM       Return buffer memory
J$TINIT   =  J%STEP+J$RETM       Initialize a user task
J$ACT     =  J%STEP+J$TINIT      Activate a user task
J$DEACT   =  J%STEP+J$ACT        Deactivate a user task
J$SINGLE  =  J%STEP+J$DEACT      Single thread users tasks
J$DEADLK  =  J%STEP+J$SINGLE     Possible deadlock detected
J%MAX     =  O'10000000          Largest literal field
J%K       =  J%MAX               K=Keep this job in memory
J%A       =  J%K/2               A=Abort pending
J%F       =  J%A/2               F=Suspended to single thread tasks
J%H       =  J%F/2               H=Suspended by user deactivate
J%C       =  J%H/2               C=Forced memory allocation pending
J%G       =  J%C/2               G=Pending job class invoke
J%B       =  J%G/2               B=Suspended by recovery
J%E       =  J%B/2               E=Suspended awaiting an event
J%I       =  J%E/2               I=Suspended for IO
J%M       =  J%I/2               M=Suspended for memory request
J%O       =  J%M/2               O=Suspended by the operator
J%S       =  J%O/2               S=Suspended by the system
J%T       =  J%S/2               T=Suspended for time interval
```

```
J%U       =  J%T/2              U=Suspended for user roll
                                  completion
J%V       =  J%U/2              V=Suspended for roll job index
                                  write
J%Y       =  J%V/2              Y=Suspended for IO quiet
J%D       =  J%Y/2              D=Delete or rerun in progress
J%L       =  J%D/2              L=Roll image load/unload in
                                  progress
J%N       =  J%L/2              N=Not in memory (JXJTA is invalid)
J%Q       =  J%N/2              Q=Queued for initial memory
                                  allocation
J%R       =  J%Q/2              R=Roll image is accurate (rolled
                                  out)
J%X       =  J%R/2              X=Job is currently executing
J%ALLSUS  =  J%B+J%E+J%O+J%S+J%T+J%U+J%V+J%Y+J%F+J%H
A$TLE     =  1                  Time limit expired
A$DROP    =  2                  Operator entered a 'DROP' command
A$KILL    =  3                  Operator entered a 'KILL' command
A$RERUN   =  4                  Operator entered a 'RERUN' command
A$MERR    =  5                  Uncorrectable memory error
A$GSY     =  7                  Too much memory needed
A$TERM    =  6                  Internal system request to abort
                                  job
A$CAN     =  D'8                Dispose-wait dataset cancelled,
                                  abort.
A$CINT    =  D'9                Console interrupt
A$BINV    =  D'10               Bad invoke structure
A$INVX    =  D'11               Invoke's currently not accepted
A$LGOV    =  D'12               $LOG overflow
A$DEADLK  =  D'13               User task deadlock detected
A$ALLDEA  =  D'14               All user tasks are deactivated
JR$JXO    =  1                  Invalid JXT offset supplied
JR$FC     =  2                  Invalid function code supplied
JR$ADR    =  3                  Bad address or code specified
JR$CAN    =  4                  Job has been cancelled
JR$MBUSY  =  5                  Previous memory request
                                  outstanding
JR$REJCT  =  6                  Can not change priority yet
JR$AIM    =  7                  Job already in memory
JR$CBIG   =  D'8                Specified code too large
JR$DOP    =  ERDOP              Attempt to delete memory outside
                                  progr
JR$GSY    =  ERGSY              Job size would exceed the total in
                                  the
JR$GAL    =  ERGAL              Job size would exceed that allowed
                                  by
JR$NIRW   =  ERNIRW             No invoke request word specified
JR$IAP    =  ERIAP              Invoke request already specified
JR$ILM    =  ERILM              Invoke len not multiple of O'1000
JR$ILMX   =  ERILMX             Invoke len greater than max
                                  allowed
JR$BINV   =  ERBINV             Bad class structure invoke
```

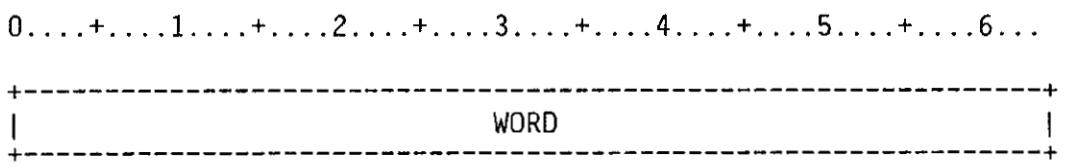


Figure JF-1. Fields within JSH Request Word

Field	Word(base8)	Bits	Description
JFWORD	0	0-63	
JFAUX	0	0-23	Unused (1-81) auxiliary information
JFADR	0	24-47	Address part of request word
JFABC	0	24-47	Abort code field
JFFNC	0	48-52	Function code
JFTXO	0	53-63	TXT ORDINAL
JFJXO	0	53-63	JXT ordinal (inaccurate field size)

Old labels to save a patch to UEP:

```
                                N@JXO=N@JFJXO
                                N@JFC=N@JFFNC

L@JTAEXP  =  O'1000              Symbolic size of JTA expansions
$TMP1     =  1S"$TMPO"
L@DSPINC  =  $TMP2/$TMP1*$TMP1   Standard DSP area increment
JSHDEBUG  =  0                   Disable validate call
JSHTRACE  =  1                   Enable TRACECP and TRACEMP
VNUM      =  0                   Disable vector traces
```

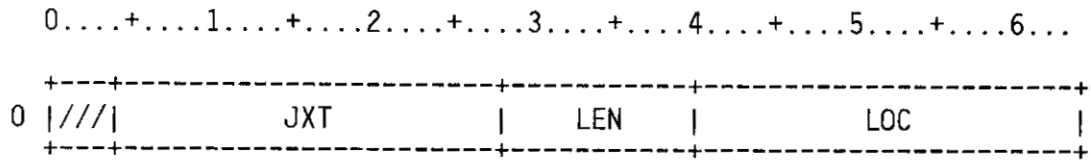


Figure IR-2. Invoke request word

Field	Word(base8)	Bits	Description
IRJXT	0	4-27	
IRLEN	0	28-39	
IRLOC	0	40-63	

JOB EXECUTION TABLE

Figure JX-1 displays the Job Execution Table (JXT). NOTE that the representation of JXGRID and JXGRN is incomplete in the generated diagram. The words immediately following the word containing JXGRID and JXGRN are not undefined (as shown). They are copies of the JXGRID/JXGRN word, repeated L@NGRN times.

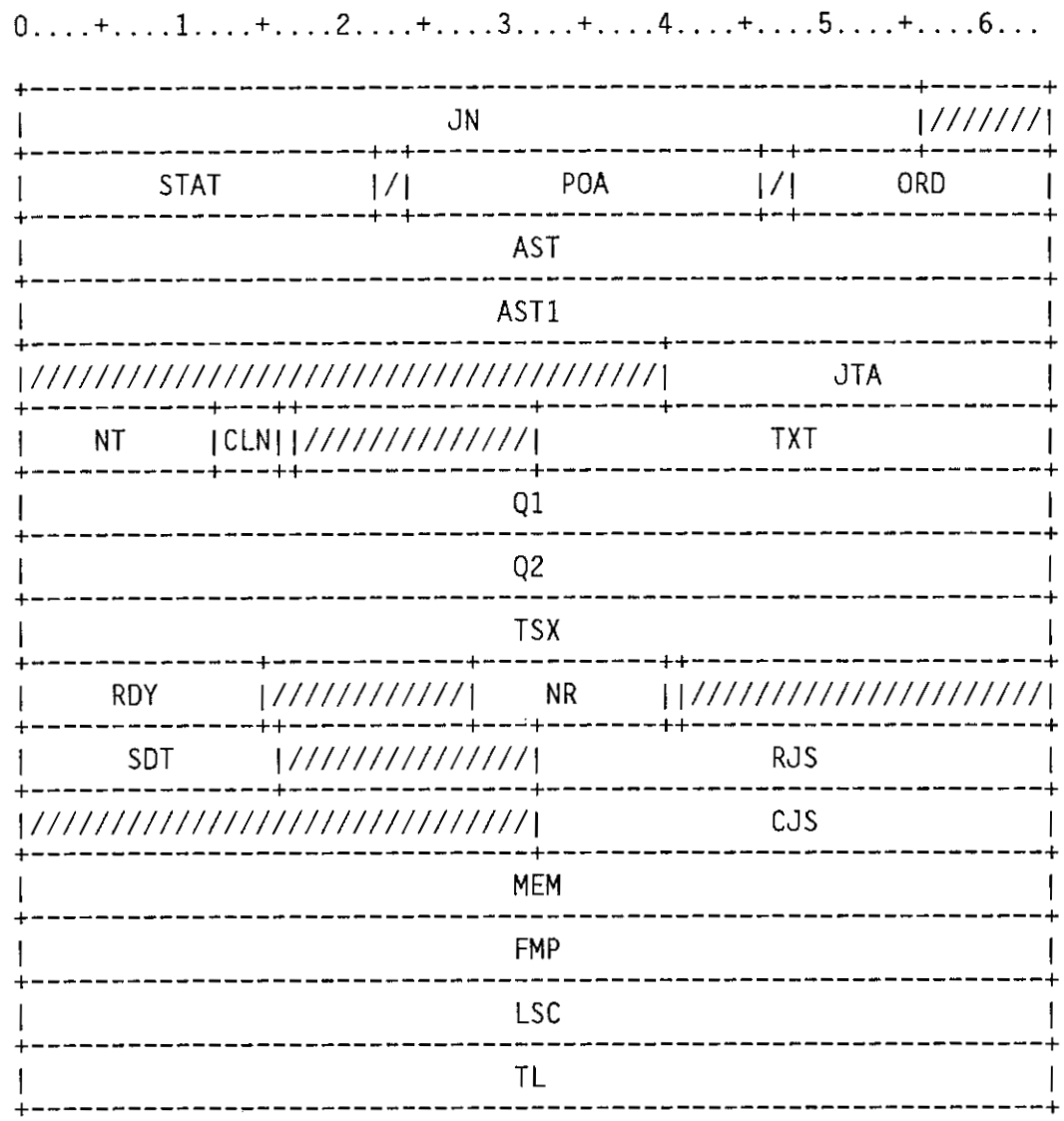


Figure JX-1. Job Execution Table

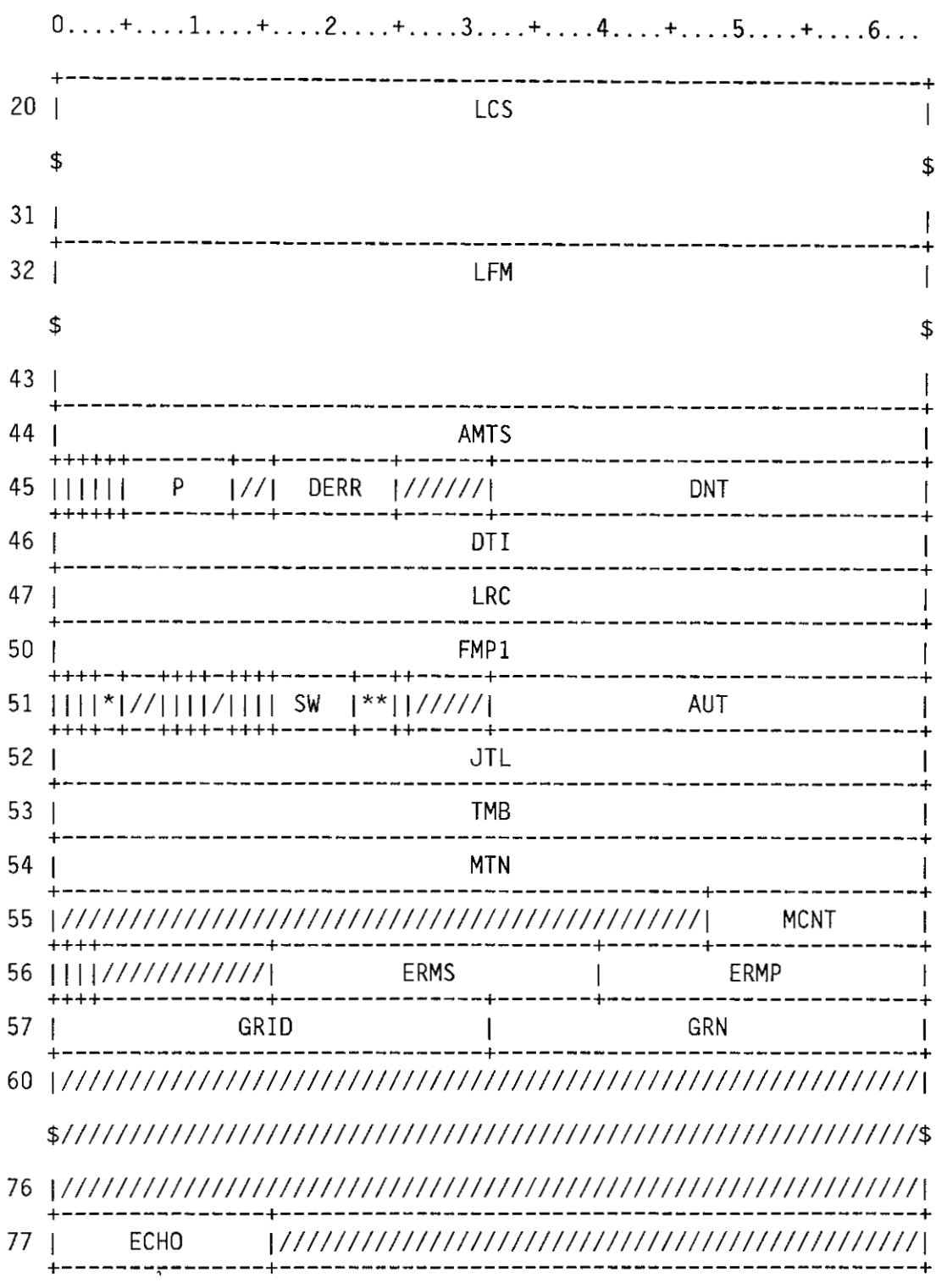


Figure JX-1. Job Execution Table

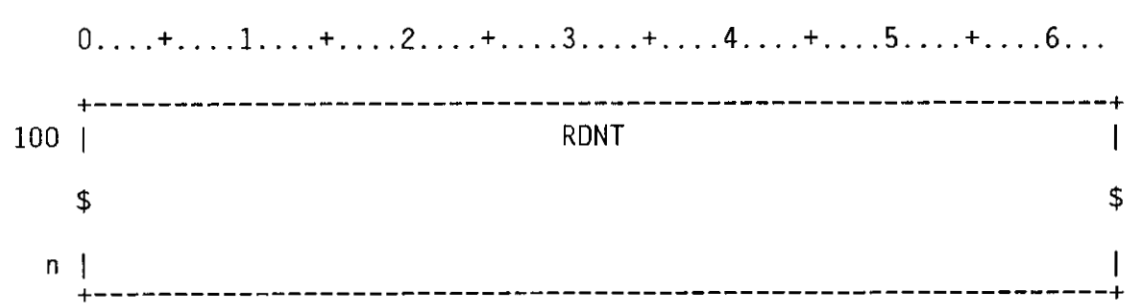


Figure JX-1. Job Execution Table

Field	Word(base8)	Bits	Description
JXJN	0	0-55	Job name
JXSTAT	1	0-21	Job status
JXPOA	1	24-45	Pending job status
JXORD	1	48-63	Ordinal of this JXT entry
JXAST	2	0-63	Ascii status (2 words)
JXAST1	3	0-63	

Eventually JXJTA will fill the entire word:

JXJTA	4	40-63	Address of the Job Table Area
JXNT	5	0-11	Number of active TXTs for job
JXCLN	5	12-15	Cluster number assigned to this job
JXATS	5	16	All tasks suspended
JXTXT	5	32-63	Addr of 1st Task eXecution Table entry
JXQ1	6	0-63	First queue word in JXT
JXQ1F	6	1-7	Job is in a Q1 queue
JXQMS	6	3	Job is in multi-step queue
JXQMR	6	4	Job is in memory request queue
JXBL1	6	8-19	Queue back link as JXT ordinal
JXFL1	6	20-31	Queue fore link as JXT ordinal
JXPR1	6	32-63	Execute address in Q1 word

Field	Word(base8)	Bits	Description
JXQ2	7	0-63	Second queue word in JXT
JXQ2F	7	1-7	Job is in a Q2 queue
JXQPO	7	1	Job awaiting operator action
JXBL2	7	8-19	Q2 back link as JXT ordinal
JXFL2	7	20-31	Q2 fore link as JXT ordinal
JXPR2	7	32-63	Execute address in Q2 word
JXTSX	10	0-63	Cycles executing in CPU
JXRDY	11	0-14	Bit map of system tasks to ready when job rolls in (bit 0 = task 0, etc.)
JXNR	11	28-39	Number of successful rollouts
JXCON	11	40	Connect task from this job flag
JXSDT	12	0-15	SDT offset of Q@EXECUTE entry
JXRJS	12	32-63	Requested job size
JXCJS	13	32-63	Current job size
JXMEM	14	0-63	Memory request word from J$ALLOC
JXFMP	15	0-63	Floating mem pr,(0=suspend,SB=demand)
JXLSC	16	0-63	RT at last job status change
JXTL	17	0-63	Time limit (in cycles) L@JXLCS=D'10 Max length of last control stmt in JXT
JXLCS	20-31	0-63	Last control statement issued for job L@JXLFM=D'10 Max length of $LOG message in JXT
JXLFM	32-43	0-63	Job's last $LOG message, for station
JXAMTS	44	0-63	RT for MEMAGED variable
JXATR	45	0	Avail to roll, thrash lock cleared
JXMPM	45	1	Memory priority at minimum flag
JXJAR	45	3	Job awaiting resource flag
JXP	45	5-12	Priority from JOB stmt, (1st 4 bits)
JXDERR	45	16-24	Status from last DQM roll request

Field	Word(base8)	Bits	Description
JXDNT	45	32-63	DNT address for roll image
JXDTI	46	0-63	RT at job initiation
JXLRC	47	0-63	RT at last residence change
JXFMP1	50	0-63	Floating mem priority, at JXLRC
JXNRR	51	0	Not rerunable if set
JXTRM	51	1	Job in termination if set
JXWOP	51	2	Waiting for operator response
JXLOCK	51	3-4	Job locked out
JXLMEM	51	3	-- Due to memory change
JXLSYS	51	4	-- Due to system change
JXDMR	51	8	Don't-mark-recoverable flag
JXIA	51	9	Interactive job if set
JXACNV	51	10	Account not validated flag
JXDORR	51	13	Flags a rerun at job delete time
JXURLM	51	14	System log message indicator
JXCFL	51	15	Recovered job needs FL update
JXSW	51	16-21	Sense switches
JXLVL	51	22-24	Control statement procedure level
JXEMA	51	25	1=Extended memory addressing (XPEMA)
JXAUT	51	32-63	Address of AUT for interactive job
JXJTL	52	0-63	Length of Job Table Area
JXTMB	53	0-63	Max MOS/Job for tape I/O
JXMTN	54	0-63	Highest task # assigned in job
JXMCNT	55	48-63	Number of messages outstanding
JXERCL	56	0	Event recall flag
JXERMO	56	1	Event monitoring flag

Field	Word(base8)	Bits	Description
JXIJQ	56	2	Inter-job messages are queued
JXERMS	56	16-39	Event recall mask
JXMSIJ	56	16	Inter-job message arrived
JXMSUO	56	17	Unsolicited oper msg arrived
JXMSOR	56	18	Operator reply arrived
JXMSCH	56	26	Channel function done
JXMSIQ	56	27	SDT placed in INPUT queue
JXMSOQ	56	28	SDT placed in OUTPUT queue
JXERMP	56	40-63	Event recall map
JXMPIJ	56	40	Inter-job message arrived
JXMPUO	56	41	Unsolicited oper msg arrived
JXMPOR	56	42	Operator reply arrived
JXMPCH	56	50	Channel function done
JXMPIQ	56	51	SDT placed in INPUT queue
JXMPOQ	56	52	SDT placed in OUTPUT queue
JXGRID	57	0-31	Folded generic resource name
JXGRN	57	32-63	Generic resource counter
JXECHO	77	0-15	Echo status of message classes
JXRDNT	100-n	0-63	Roll file DNT entry

SZ@JXT = LE@JXT*NE@JXT

* Job Table Area (JTA)

The Job Table Area records all information about a job which needs to be present whenever the job is rolled into memory.

There is a fixed portion, followed by a memory pool which holds entries allocated as the jobs needs grow.

Figure JT-1 shows the JTA. The display of field JTDTM is in error. JTDTM is shown as one word, while it in fact occupies the apparently undefined words below it as well.

Figure JT-2 shows the detailed structure of the user breakpoints (JTBKP).

Figure JT-3 shows the detailed structure of the pointer fields within the memory pool areas for the JTA DNTs.

Figures JT-4 and JT-5 provide additional tags for the JTUSR and JTGRN fields. They provide no additional information and exist only for the convenience of the table diagram generator.

Assumed sizes of other tables referenced.

```
LE@SCTR   =  D'512          Disk sector length in words
C@CLSIZE  =  D'17           XMP cluster register save area
                              size
```

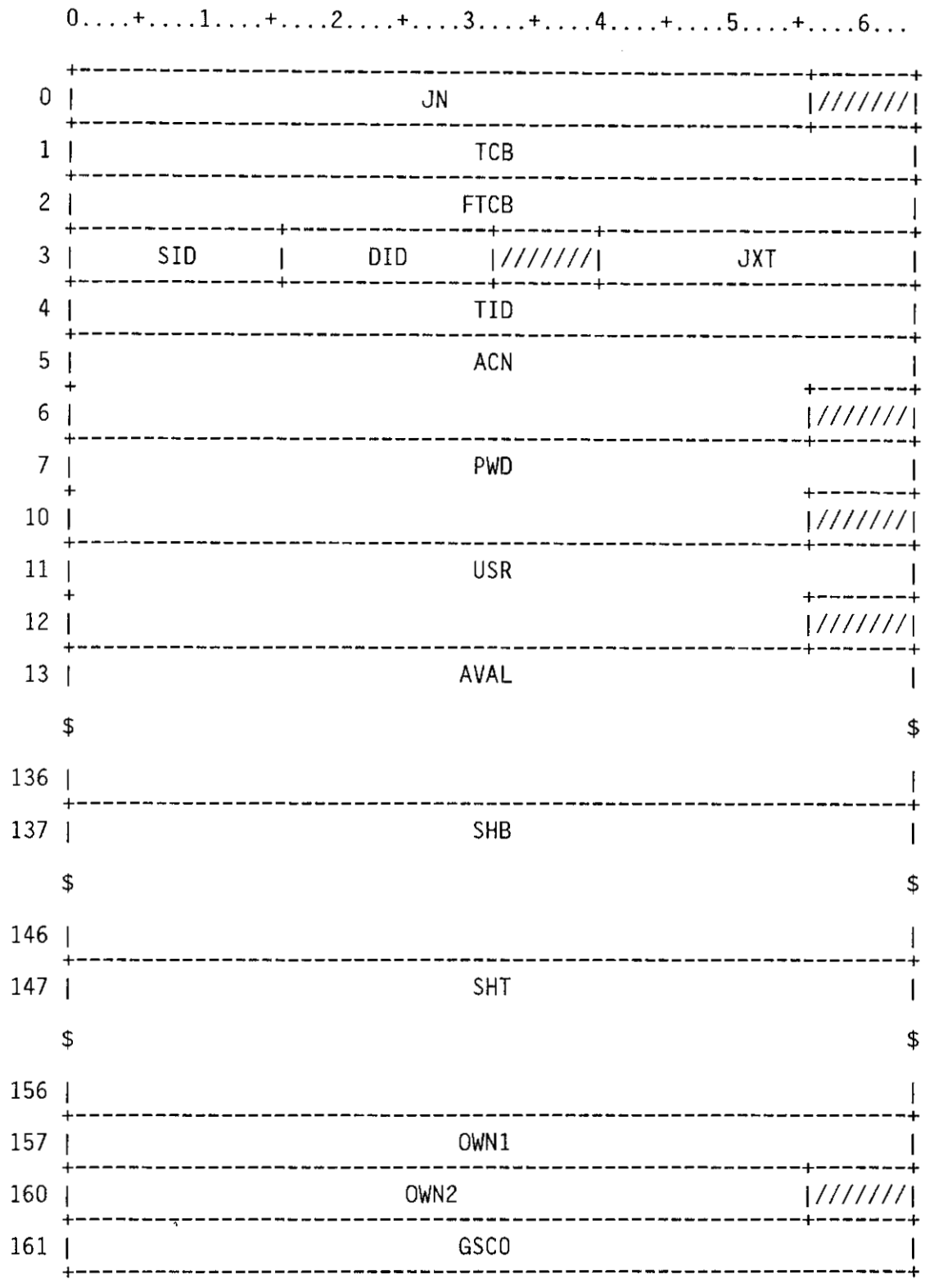


Figure JT-1. Job Table Area

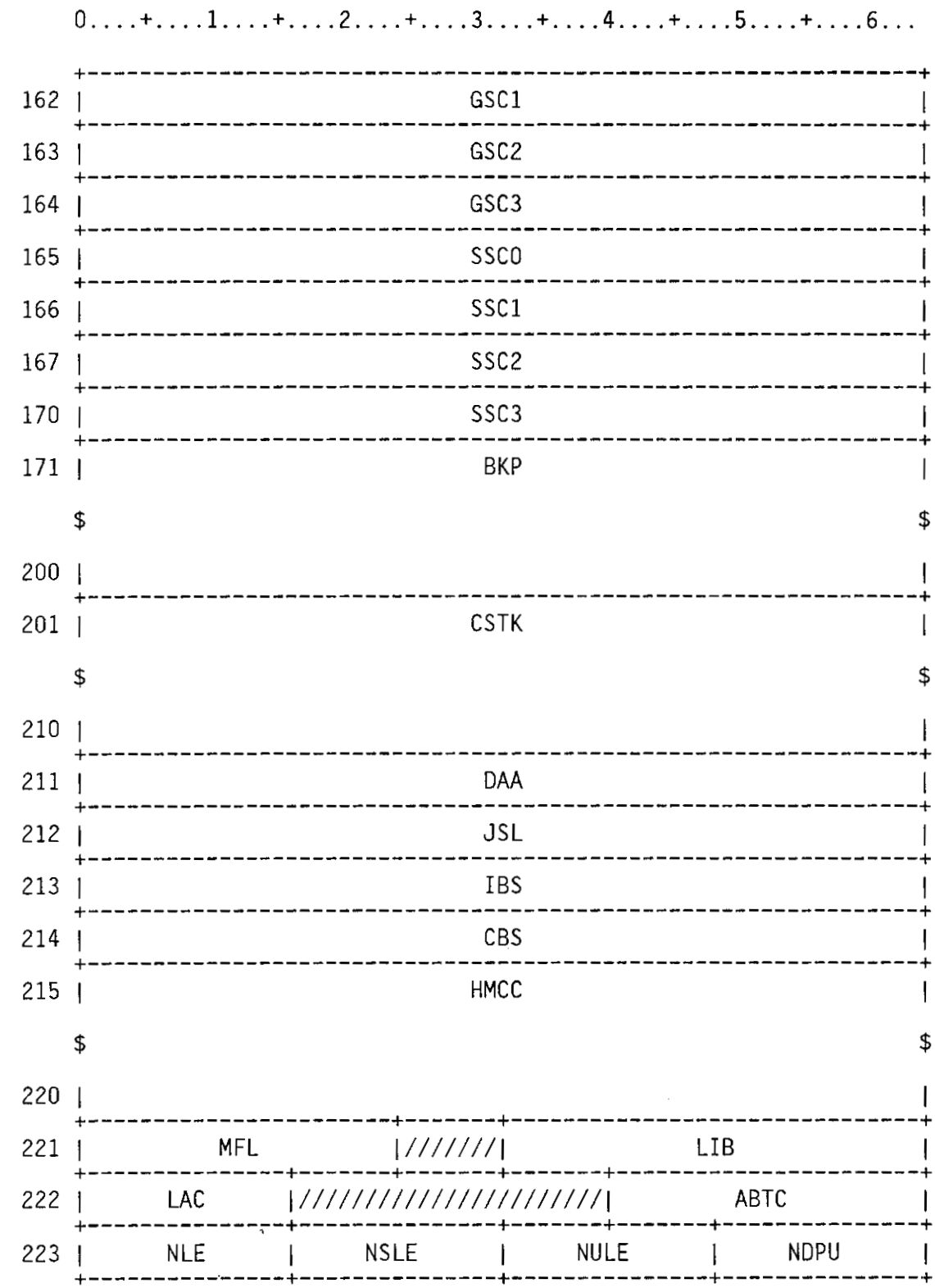


Figure JT-1. Job Table Area

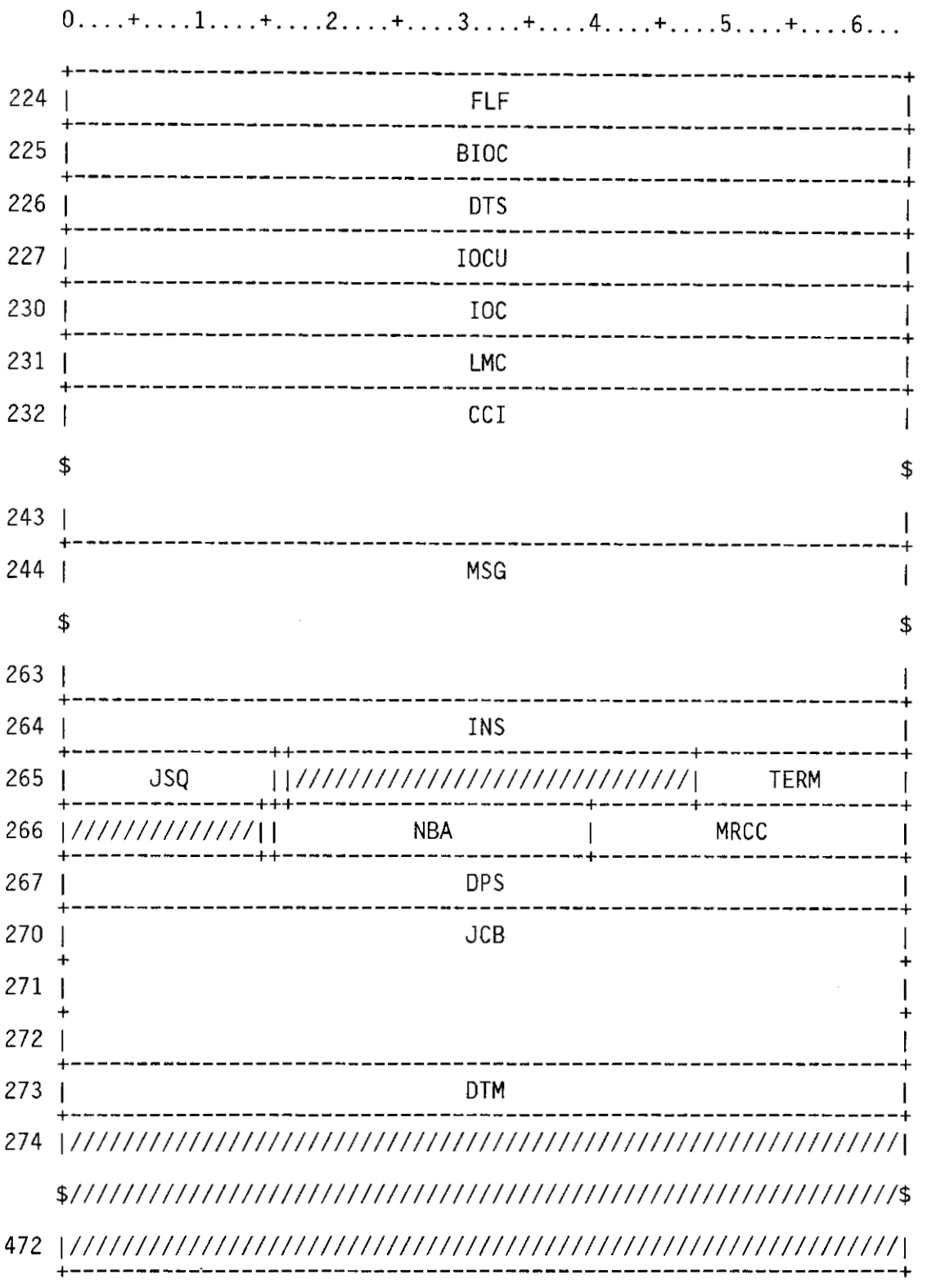


Figure JT-1. Job Table Area

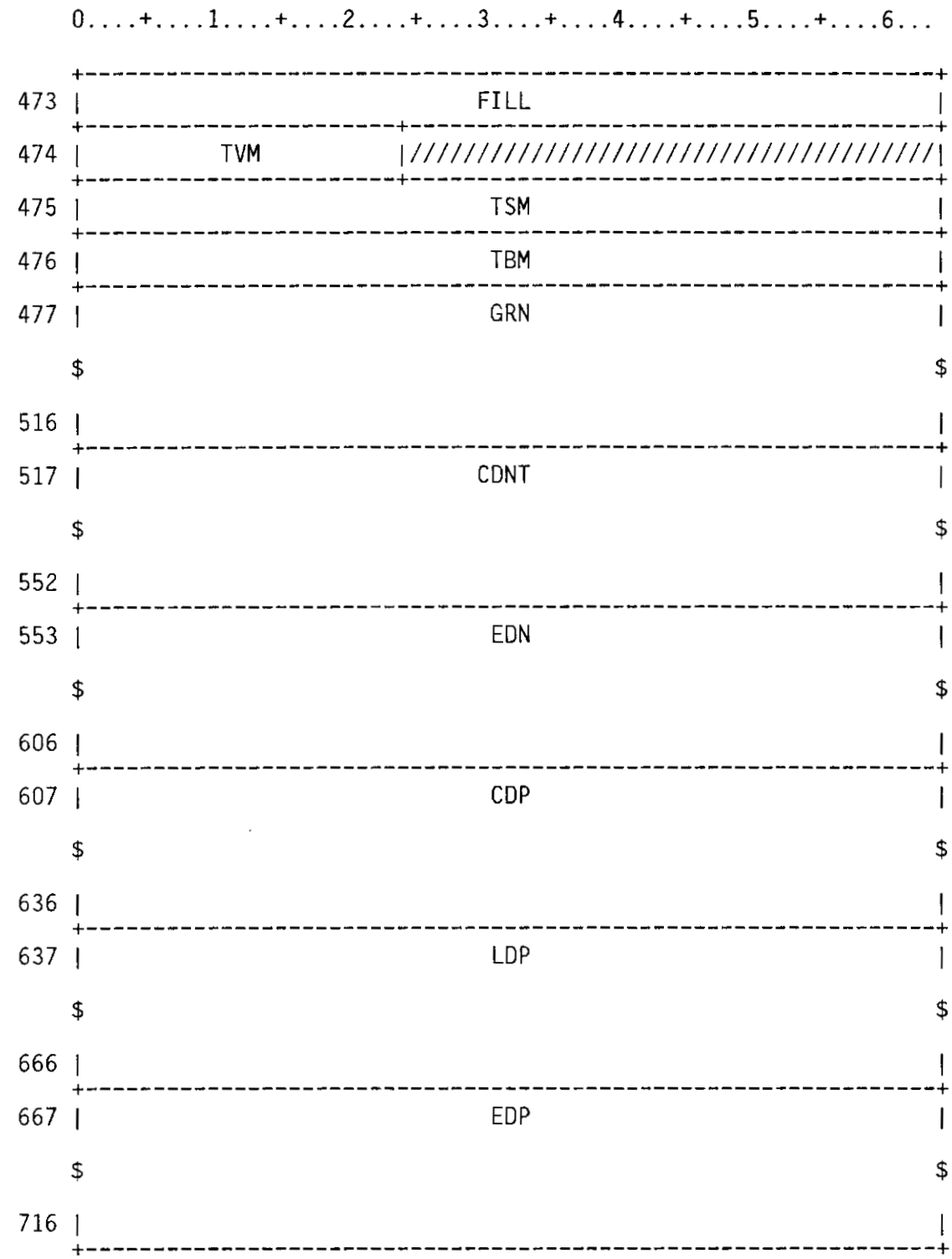


Figure JT-1. Job Table Area

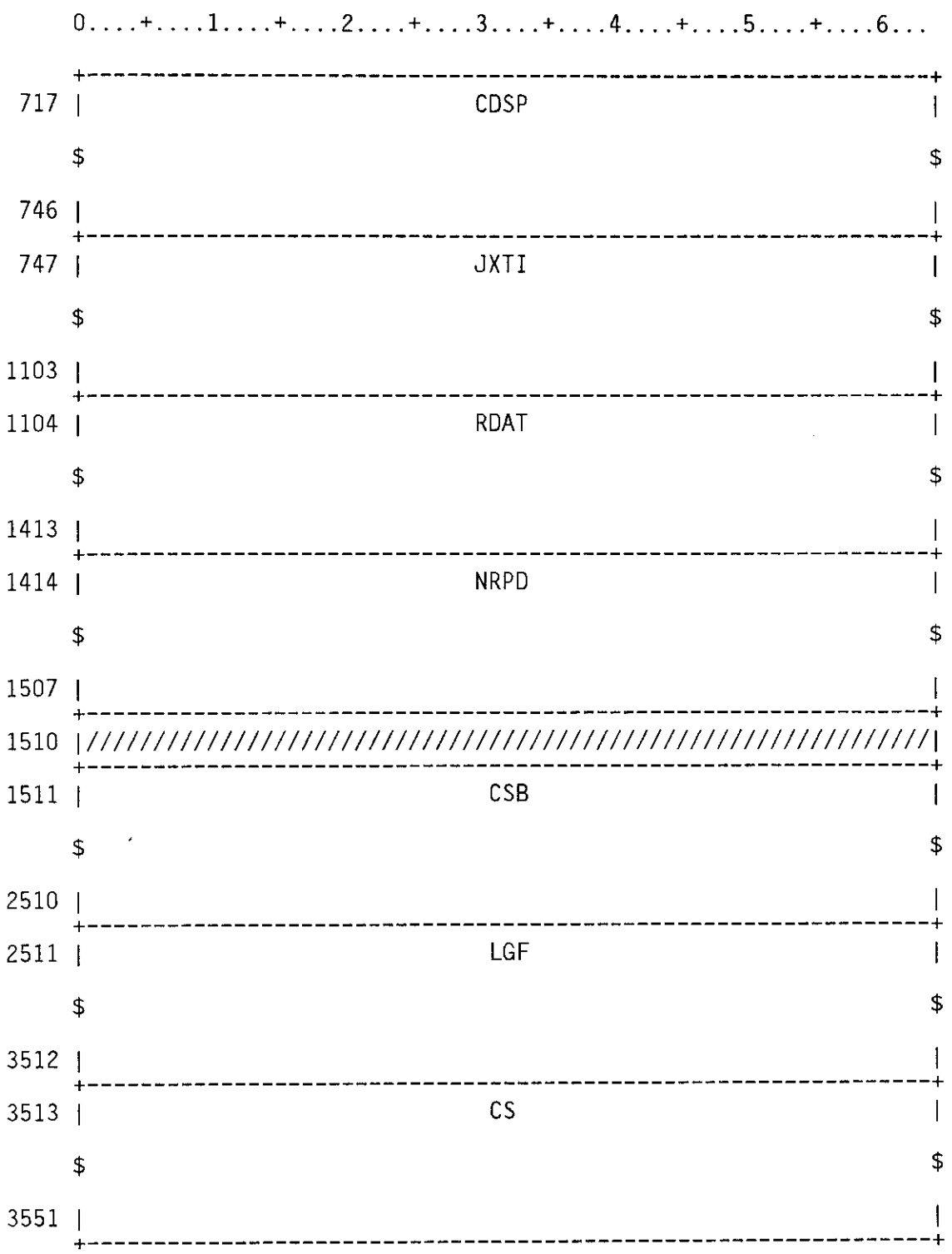


Figure JT-1. Job Table Area

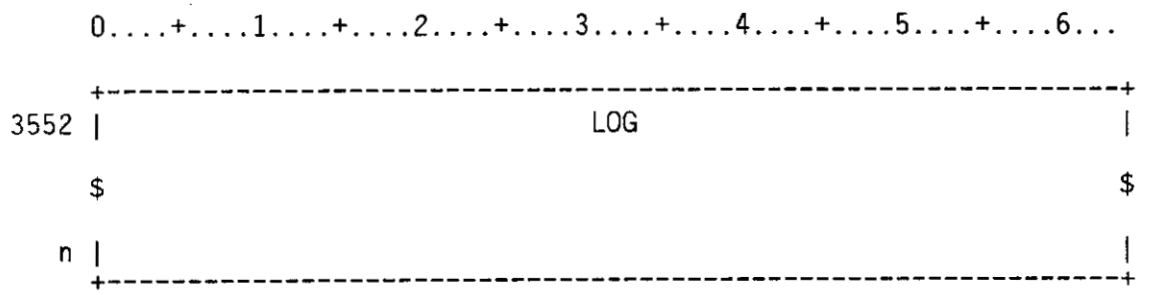


Figure JT-1. Job Table Area

Identifying information.

Field	Word(base8)	Bits	Description
JTJN	0	0-55	Job name
JTTCB	1	0-63	JTA offset of first TCB
JTFTCB	2	0-63	JTA offset of free TCB chain
JTSID	3	0-15	Two character source ID
JTDID	3	16-31	Two character destination ID
	3	32-39	Reserved for expansion of JTJXT
JTJXT	3	40-63	Address of JXT entry
JTTID	4	0-63	Terminal ID
JTACN	5-6	0-63	Fifteen character account number
JTACN1	5	0-63	First eight characters
JTACN2	6	0-55	Last seven characters
JTPWD	7-10	0-63	Fifteen character password:
JTPWD1	7	0-63	First eight characters
JTPWD2	10	0-55	Last seven characters
JTUSR	11-12	0-63	Fifteen character user number
JTUSR1	11	0-63	First eight characters
JTUSR2	12	0-55	Last seven characters

The following fields contain ASCII field names plus the values of the symbols for aid in debugging and for DUMP.

L@JTAVAL=D'64

JTAVAL	13-136	0-63	
Job statistics. These are aggregate task statistics.			
JTTSX	113	0-63	Time spent executing (cycles)
JTDTSX	114	0-63	Sum of all deleted tasks' time spent executing
JTTSW	115	0-63	Time spent waiting to execute(cycles)
JTTSD	116	0-63	Time spent waiting for I/O completion
JTXMI	117	0-63	(CPU time)*(memory size) floating
JTDMI	120	0-63	(I/O wait time)*(memory size) floating
JTIOB	121	0-63	Disk sectors transferred
JTIOR	122	0-63	User I/O requests made
JTDLI	123	0-63	Count of deadlock interrups for job
JTMXM	124	0-23	Maximum job size
JTMIM	124	24-47	Minimum job size
JTOPC	124	48-63	Number of open calls by user
JTPFA	125	0-23	Permanent file space accessed
JTPFS	125	24-47	Permanent file space saved
JTCLC	125	48-63	Number of close calls by user
JTBRF	126	0-23	No. of sectors received from front end
JTBSF	126	24-47	No. of sectors sent to front end
JTTFS	127	0-23	Temporary file space used
JTMRD	127	24-39	Number of memory resident datasets
JTL	127	40-63	Length of job table area
JTMXFL	130	0-23	Maximum field length used

Field	Word(base8)	Bits	Description
JTMIFL	130	24-47	Minimum field length used
JTMXJT	131	0-23	Maximum JTA used
JTMIJT	131	24-47	Minimum JTA used
Flags of every size and flavor.			
JTSEC	132	0	Security flag. CSP is executing
JTTLE	132	1	Initial time limit expired
JTADV	132	2	Job in advance
JTITRM	132	3	Intend to terminate
JTEOF	132	4	End of file on $CS
JTKIL	132	5	Job killed
JTRRN	132	6	Job rerun
JTIDP	132	11	Inhibit dumpjob processing
JTEXO	132	12	Execute only dataset open
JTDLM	132	14	Disable log messages
JTTRM	132	15	Job in termination
JTABT	132	16	Job abort
JTCMSG	132	17	Enable conditional messages
JTLGFL	132	18	$LOG size exdeeded I@LGUSZ
JTJCBX	132	19	Bad JCB detected
JTSTAT	132	20	Request dataset statistics
JTTRM1	132	21	Second pass through TRM
JTINIT	132	23	Job initiated
JTNRR	132	24	Job not rerunnable
JTNRO	132	25	Disable no rerun
JTOSUP	132	28	Interactive output suspended flag

Field	Word(base8)	Bits	Description
JTISUP	132	29	Interactive input suspended flag
JTIA	132	30	Interactive flag
JTSKP	132	31	Control statement skip flag
JTMAC	132	32	Move AC.NO./PW. to JTA flag
JTDNR	132	33	Device-not-ready flag
JTLPP	132	34-41	Lines per page
JTSDR	132	42	Module is from SDR
JTSSM	132	43	Module wants secure datasets
JTVFLG	132	44	Security violation occured flag
JTETRM	132	45	Internal termination flag
JTSCM	132	46	EXU control statement msg flag: 0=issued, 1=not issued
JTFUA	132	47	Force-unique-access (for AQR)
JTVIO	133	0-15	Number of security violations
JTSSF	133	16-33	Subsystem feature flags
JTIJF	133	16	Set if any F$IJMSG function is used
JTIJC	133	18-33	Inter-job connection count

Job-related reprieve information

JTST	134	0-63	Reprieve status word
JTFEFW	135	0-63	Reprieve fatal error flags:
JTFE03	135	1	No DAT space
JTFE10	135	2	No disk space
JTFE11	135	3	System directory is full
JTFE23	135	4	Job time limit exceeded
JTFE24	135	5	Operator dropped user job
JTFE41	135	6	Enter allowed on access only
JTFEXX	SUBFIELD 7,1		** UNASSIGNED **
JTFE51	135	8	LFT chain pointer invalid
JTFE43	135	9	User log size exceeded
JTFE94	135	10	HARDWARE ERROR WHILE WRITING $LOG
JTFENR	135	63	Not reprievable

Cluster registers for job.

JTSEM	136	0-31	Semaphore registers
JTSHB	137-146	0-63	Shared B registers
JTSHT	147-156	0-63	Shared T registers

Security information

JTOWN1	157	0-63	Dataset owner ID, characters 1-8
JTOWN2	160	0-55	Dataset owner ID, characters 9-15
JTGSC0	161	0-63	Global security flags
JTGSC1	162	0-63	
JTGSC2	163	0-63	
JTGSC3	164	0-63	
JTSSC0	165	0-63	Job step security flags
JTSSC1	166	0-63	
JTSSC2	167	0-63	
JTSSC3	170	0-63	

Breakpoint control information.

			L@JTBKP=D'8 Length of breakpoint information
JTBKP	171-200	0-63	User breakpoints MAXPRLVL=7 Maximum nesting level, with $CS
JTCSTK	201-210	0-63	Control statement file stack base
JTDAA	211	0-63	Pointer to device name table
JTJSL	212	0-63	JCL symbol list chain control word
JTIBS	213	0-63	Iterative block stack chain control
JTCBS	214	0-63	Conditional block stack chain control
JTHMCC	215-220	0-63	Hardware perf.mon. chain control
JTATCC	216	0-63	Active TCB chain control

Field	Word(base8)	Bits	Description
JTFTCC	217	0-63	Free TCB chain control
JTTACC	220	0-63	Task accounting chain control
JTMFL	221	0-23	Maximum FL
JTLIB	221	32-63	Library search JTA offset
JTLAC	222	0-15	Last abort code
JTABTC	222	40-63	Job step abort code (ABxxx)
JTNLE	223	0-15	Number of LFT entries in JTA
JTNSLE	223	16-31	NUMBER OF JTA LFTS WHICH POINT TO SYSTEM-AREA USER LFTS
JTNULE	223	32-47	NUMBER OF JTA LFTS WHICH POINT TO USER-AREA USER LFTS
JTNDPU	223	48-63	NUMBER OF USER-AREA SYSTEM DSPS
JTFLF	224	0-63	JTA offset of first link in LFT chain
JTBIOC	225	0-63	Buffered I/O request count
JTDTS	226	0-63	RT clock at rollout
JTIOCU	227	0-63	Count of user active I/O requests
JTIOC	230	0-63	Count of active I/O requests/functions
JTLMC	231	0-63	Lock-in-memory counter L@JTCCI=D'80/D'8 80 character buffer for control stmt
JTCCI	232-243	0-63	Control statement being prescanned L@JTMSG=D'128/D'8 128 character buffer for last $LOG msg
JTMSG	244-263	0-63	Last logfile message issued
JTINS	264	0-63	Reserved for installation
JTJSQ	265	0-15	Job sequence number
JTTRM2	265	16	MSG flag to terminate job immediately
JTTERM	265	48-63	Termination status

Field	Word(base8)	Bits	Description
JTMR	266	15	Outstanding memory request flag
JTNBA	266	16-39	New buffer address
JTMRCC	266	40-63	Count of datasets waiting for JTA room
JTDPS	267	0-63	Control word for TIO DSP save area
JTJCB	270-272	0-63	A copy of 3 words in the JCB
Register save area for task I/O			
JTDTM	273	0-63	Save area for task I/O
JTFILL	473	0-63	
JTTVM	474	0-23	Number of tape volumes mounted
JTTSM	475	0-63	Number of tape sectors moved
JTTBM	476	0-63	Number of tape blocks moved
Various other tables contained in the JTA.			
JTGRN	477-516	0-63	Generic resource counters
JTCDNT	517-552	0-63	DNT for CSP reads
JTEDN	553-606	0-63	DNT for EXU
JTCDP	607-636	0-63	Control statement ($CS) DSP
JTLDP	637-666	0-63	Logfile ($LOG) DSP
JTEDP	667-716	0-63	Dumpfile ($DUMP) DSP
JTCDSP	717-746	0-63	DSP FOR CSP reads
JTJXTI	747-1103	0-63	Image of JXT at rollout time
JTLFL	1103	0-63	Last word of roll image L@JTRDAT=D'200 Length of roll DAT image space
JTRDAT	1104-1413	0-63	Roll DAT image
JTNRPD	1414-1507	0-63	PDD FOR NORERUN
JTCSB	1511-2510	0-63	Control statement ($CS) disk buffer

Field	Word(base8)	Bits	Description
JTLGF	2511-3512	0-63	Logfile ($LOG) disk buffer
JTPOOL	3511	0-63	First word of JTA memory pool
JTDNH	3512	0-63	Head of DNT chain
JTCS	3513-3551	0-63	Control statement ($CS) DNT
JTLOG	3552-n	0-63	Logfile ($LOG) DNT

Detailed structure of user breakpoints

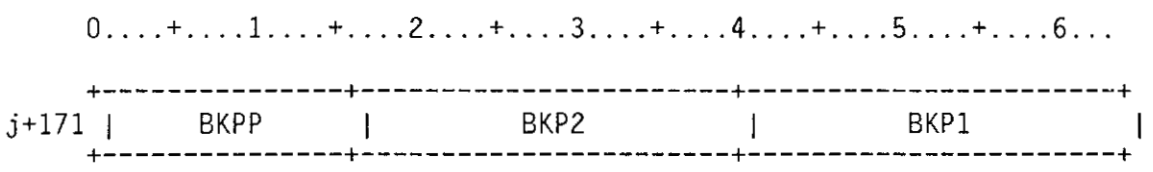


Figure JT-2. JTA User breakpoints

Field	Word(base8)	Bits	Description
JTBKPP	j+171	0-15	Contents of replaced parcel
JTBKP2	j+171	16-39	Breakpoint reset address
JTBKP1	j+171	40-63	Breakpoint address

DEFINE THE POINTER FIELDS WITHIN THE MEMORY POOL
AREAS FOR THE JTA DNT'S

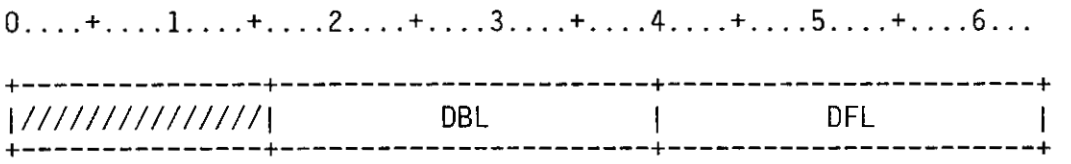


Figure JT-3. JTA DNTs

Field	Word(base8)	Bits	Description
JTDBL	0	16-39	DNT BACKWARD LINK
JTDFL	0	40-63	DNT FORWARD LINK

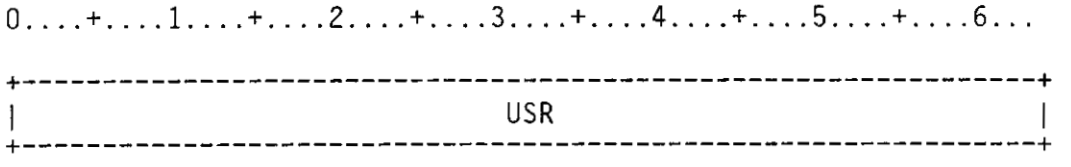


Figure JT-4. Provide tags for JTUSR

Field	Word(base8)	Bits	Description
JTUSR	11	0-63	

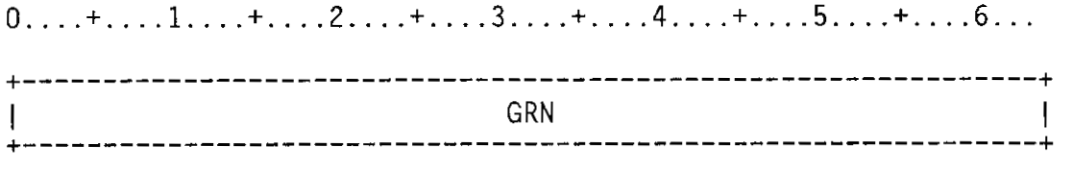


Figure JT-5. Provide tags for JTGRN

Field	Word(base8)	Bits	Description
JTGRN	477	0-63	

There is one LCT entry per channel configured for front-end I/O. The ordinal defines whether the channel is on the CPU or I/O subsystem; the type defines the channel's characteristics. The channel may be configured as 'on', which will simulate a CHANNEL ON operator command during COS startup.

The MCU channel should be configured 'on.'

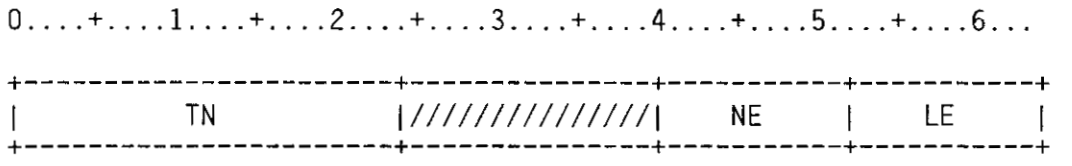


Figure LC-1. Link Configuration Table Header

Header.

Field	Word(base8)	Bits	Description
LCTN	0	0-23	Table name ('LCT' in ASCII)
LCNE	0	40-51	Number of entries (=NE@LCT)
LCLE	0	52-63	Length of entries (=LE@LCT)

Entry.

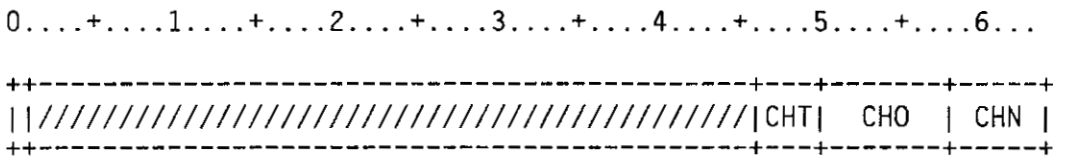


Figure LC-2. Link Configuration Table Entry

Field	Word(base8)	Bits	Description
LCON	0	0	Channel configured on flag
LCCHT	0	46-49	Channel type (if CHO=0): LCCHTIFC=0 IFC (channel coupler) LCCHTNSC=1 NSC Hyperchannel LCCHTVAX=2 VAX version of IFC, A side LCCHTVBX=3 VAX version of IFC, B side
LCCHO	0	50-57	Largest channel ordinal
LCCHN	0	58-63	Channel pair number

The Label Definition Table describes the tape label, and consists of four parts: the LDT header, volume header, header which points to the other entries, these entries are optional and can appear anywhere after the header. The following conditions must be met for constructing a Label Definition Table (LDT):

- The header must be present.
- The header must precede each entry.
- Each entry must be pointed to by the offset value in the LDT header. Zero is used for absent fields.
- The lengths of the whole LDT and of each entry must be set in the proper fields.
- The length value for volume 1 must be at least the length of the entire first VSN. The length value for either header 1 or header 2 must be at least the defined length of the respective entry.

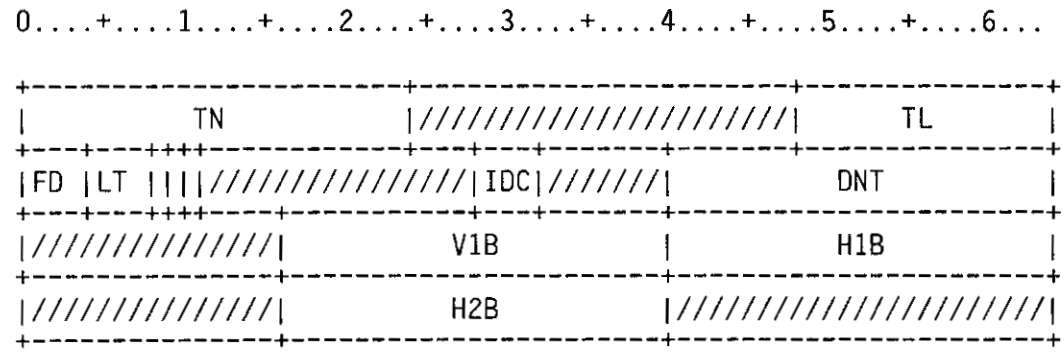


Figure LD-1. Label Definition Table Header

Field	Word(base8)	Bits	Description
LDTN	0	0-23	Table name ('LDT' in ASCII)
LDTL	0	48-63	Table length (variable)
LDFD	1	0-3	Foreign dataset translation identifier This field is used to indicate whether run time foreign dataset translation should be performed on this dataset.
LDLT	1	4-7	Requested label type: 0 TPLNL Non-labeled 1 TPLAL ANSI-standard label 2 TPLSL IBM standard labels
LDPROT	1	8	Protected access indicator. If non-zero for a new tape dataset then the dataset is to be protected on the servicing front-end.
LDCAT	1	9	Cataloged dataset indicator
LDCV	1	10	Dataset data conversion flag. This field is used to indicate whether implicit data conversion shall be done by the run time library.
LDIDC	1	28-31	Initial dataset desposition 0 TPOLD Old dataset 1 TPNEW New dataset
LDDNT	1	40-63	Dataset name table (DNT) pointer. The field value is JTA-relative.

Field	Word(base8)	Bits	Description
LDV1B	2	16-39	Offset of volume 1 entry, relative to LDT base. If the LDT does not contain a VOL1 entry, this field must be zero.
LDH1B	2	40-63	Offset of header 1 entry, relative to LDT base; must be zero if there is no HDR1 entry
LDH2B	3	16-39	Offset of header 2 entry, relative to LDT base; must be zero if there is no HDR2 entry

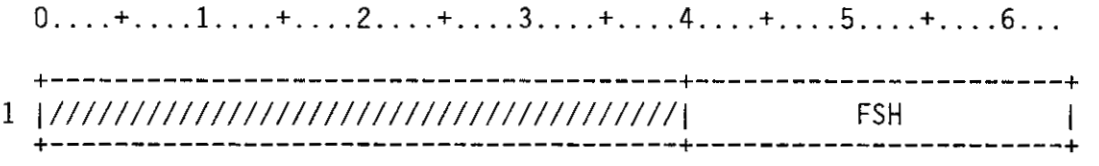


Figure LD-2. Header redefiniton of LDDNT

Field	Word(base8)	Bits	Description
LDFSH	1	40-63	Front-end service header offset

VOLUME 1 ENTRY

The volume 1 entry corresponds to volume 1 labels for all volumes in the dataset. The volume 1 entry can be placed anywhere after the header, as long as the LDV1B header field points to it properly. The volume 1 entry is optional.

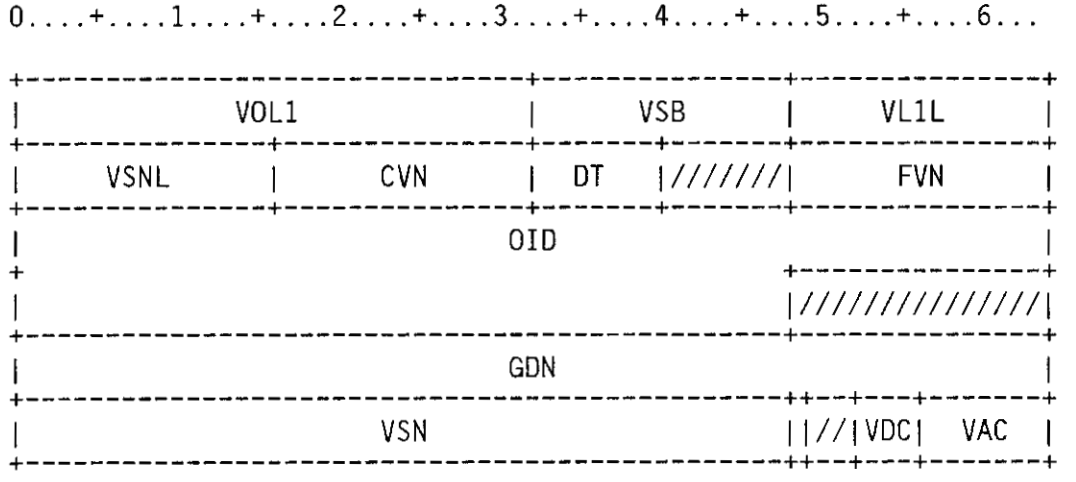


Figure LD-3. VOL1 Entry Description

Field	Word(base8)	Bits	Description
LDVOL1	0	0-31	Entry name ('VOL1' in ASCII)
LDVSB	0	32-47	Volume serial list base offset
LDVL1L	0	48-63	Volume 1 length
LDVSNL	1	0-15	Number of VSNs in entry
LDCVN	1	16-31	Current VSN ordinal
LDDT	1	32-39	Device type 0 TPD62 6250 bpi 1 TPD16 1600 bpi
LDFVN	1	48-63	Final VSN ordinal: ordinal of VSN corresponding with the volume sequence number in access condition
LDOID	2-3	0-63	Owner identifier
LDOID1	2	0-63	Characters 1-8

Field	Word(base8)	Bits	Description
LDOID2	3	0-47	Characters 9-14
LDGDN	4	0-63	Generic device name
LDVSN	5	0-47	Beginning VSN
LDVRG	5	48	Volume-registered flag, set by a servicing front-end. When set, the VSN is from front-end catalog.
LDVDC	5	52-55	Volume disposition 0 TPOLD Existing dataset 1 TPNEW New volume to dataset
LDVAC	5	56-63	Volume accessibility character, obtained from the label group

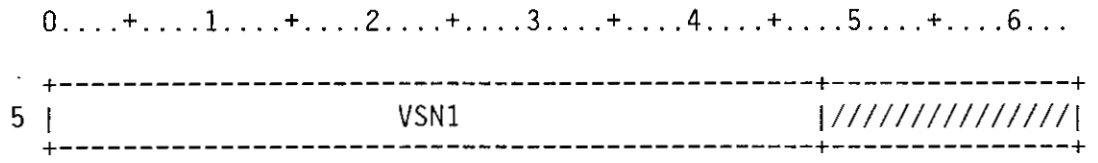


Figure LD-4. Redefinition of LDVSN?

Field	Word(base8)	Bits	Description
LDVSN1	5	0-47	LE@VOL1=W@LDVSN+I@TMV

HEADER 1 ENTRY

The header 1 entry describes dataset attributes and corresponds to the HDR1, EOF1, and EOV1 labels for all volumes in the dataset. Header 1 shows numeric fields in both binary and ASCII. COS uses ASCII for generating and validating the label group. If a field is changed, both versions must be changed. ASCII fields are right-justified with leading zeros. The header 1 entry is optional and can be placed anywhere after the header, provided it is pointed to by header field LDH1B.

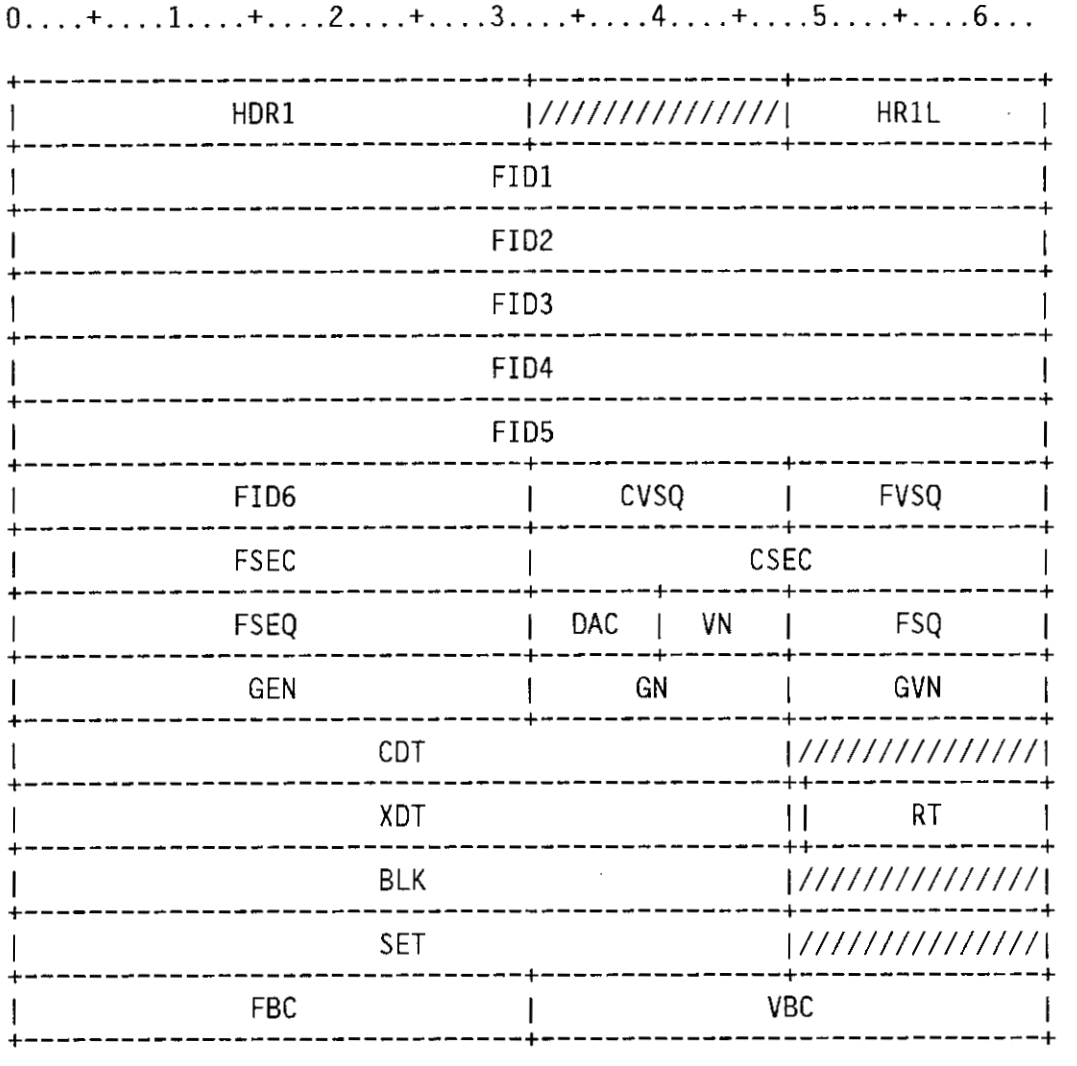


Figure LD-5. HDR1 Entry Description

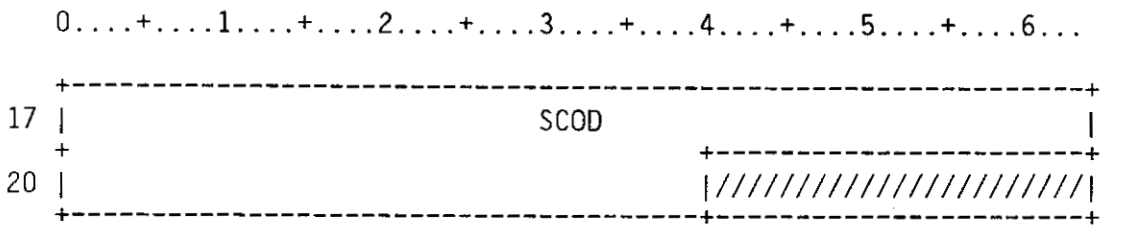


Figure LD-5. HDR1 Entry Description

Field	Word(base8)	Bits	Description
LDHDR1	0	0-31	Entry name ('HDR1' in ASCII)
LDHR1L	0	48-63	Header 1 length
LDFID1	1	0-63	Characters 1-8
LDFID2	2	0-63	Characters 9-16
LDFID3	3	0-63	Characters 17-24
LDFID4	4	0-63	Characters 25-32
LDFID5	5	0-63	Characters 33-40
LDFID6	6	0-31	Characters 41-44
LDCVSQ	6	32-47	Current volume sequence number (file section number), binary equivalent of LDCSEC
LDFVSQ	6	48-63	First volume sequence number (file section number), binary equivalent of LDFSEC
LDFSEC	7	0-31	First file section number (volume sequence number) in ASCII, the ordinal number of the volume to be mounted first
LDCSEC	7	32-63	Current file section number (volume sequence number) in ASCII, the ordinal number of the currently mounted volume
LDFSEQ	10	0-31	File sequence number (ASCII) ordinal of the dataset being accessed. If FSEQ > 1, volume should have more than one dataset.

Field	Word(base8)	Bits	Description
LDDAC	10	32-39	Dataset accessibility character.
LDVN	10	40-47	Generation version number, numeric equivalent of LDGVN
LDFSQ	10	48-63	File sequence number, numeric equivalent of LDFSEQ
LDGEN	11	0-31	Generation number. Any value other than one indicates that a dataset is in a generation data group.
LDGN	11	32-47	Generation number, numeric equivalent of LDGEN
LDGVN	11	48-63	Generation version number (ASCII). Any value other than 0 indicates that the dataset is in a generation data group.
LDCDT	12	0-47	Creation date (ASCII). This field indicates the creation date of the dataset in the julian form: 'yyddd'. Note the space (LDCSP) must be present.
LDCSP	12	0-7	Space
LDCYR	12	8-23	Year
LDCDY	12	24-47	Day
LDXDT	13	0-47	Expiration date; same format as creation date above
LDXSP	13	0-7	Space
LDXYR	13	8-23	Year
LDXDY	13	24-47	Day
LDUXD	13	48	User specified XDT (expiration date) flag
LDRT	13	49-63	Retention period, integer days
LDBLK	14	0-47	Volume block count (ASCII): number of user data blocks present, read from or written into the label. Can be inaccurate because overflow causes it to be cleared; see LDVBC for an accurate count.

Field	Word(base8)	Bits	Description
LDSET	15	0-47	File set identifier, normally set to the serial number of first volume in the dataset
LDFBC	16	0-31	File block count (binary)
LDVBC	16	32-63	Volume block count (binary), number of blocks written on volume so far
LDSCOD	17-20	0-63	System identification code, to identify the operating system or computer system that generated the tape
LDSCD1	17	0-63	Character 1-8
LDSCD2	20	0-39	Character 9-13 identify the operating system or computer system that generated the tape

```
LE@HDR1=W@LDSCD2+1
```

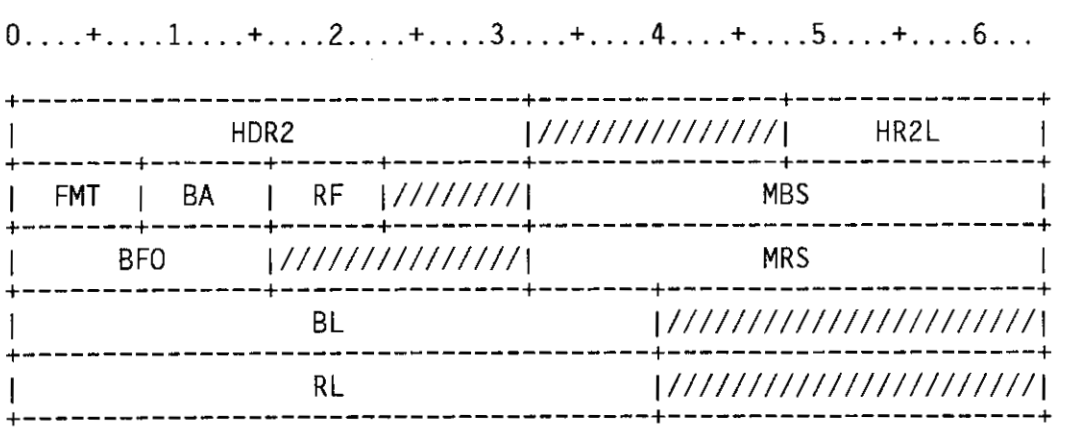


Figure LD-6. HDR2 Entry Description

Field	Word(base8)	Bits	Description
LDHDR2	0	0-31	Entry name ('HDR2' in ASCII)
LDHR2L	0	48-63	Header 2 length
LDFMT	1	0-7	Record format, two types IBM label types: F Fixed-length records V Variable-length records U Undefined record format ANSI label types: F Fixed-length records D Variable-length records S Records span tape blocks
LDBA	1	8-15	Blocking attributes, IBM label types only: B Blocks are an integral multiple of the record size S Records span tape blocks R Records span tape blocks, and the blocks are an integral multiple of the record size
LDRF	1	16-22	Record format.
LDMBS	1	32-63	Maximum block size (binary), maximum size of any tape block that can be read or written
LDBFO	2	0-15	Buffer offset, ANSI only (not currently supported by COS)

Field	Word(base8)	Bits	Description
LDMRS	2	32-63	Maximum record size (binary), maximum size of any record that can be read or written
LDBL	3	0-39	Maximum block size (ASCII), maximum number of bytes in a tape block, read from or written into the label. Can be inaccurate because overflow causes it to be cleared; see LDMBS for an accurate count.
LDRL	4	0-39	Maximum record size (ASCII), maximum number of bytes in a tape record, read from or written into the label. Can be inaccurate because overflow causes it to be cleared; see LDMRS for an accurate count.

LE@HDR2=W@LDRL+1

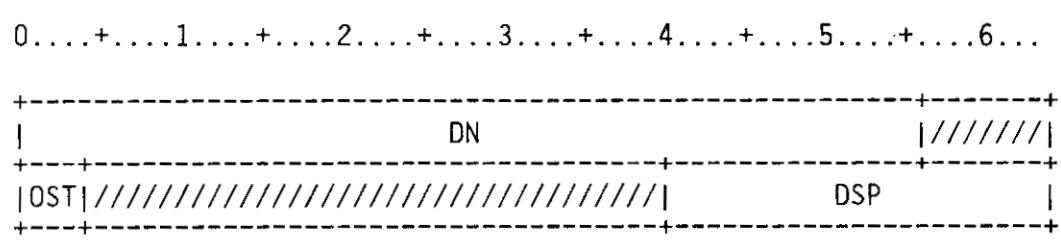


Figure LF-1. Logical File Table

Field	Word(base8)	Bits	Description
LFDN	0	0-55	Dataset name
LFOST	1	0-3	DATASET OPEN STATUS
LFDSP	1	40-63	DSP address

```
Message processor reply codes:

LGRDONE  =  0                  Message has been queued
LGRDLAY  =  1                  Message has not been queued

Message processor definitions:

LGFNOLOG =  0                  Function code
LGFUSER  =  1
LGFSYS   =  2
LGFBOTH  =  3
LGOVROFF =  0                  Override bit
LGOVRON  =  1
LGCLNOCL =  0                  Message class
LGCLJCL  =  1
LGCLABT  =  2
LGTNOTYP =  0                  Types
LGTASCII =  1
LGTSCP   =  2
LGTHW    =  3
LGTACCT  =  4
LGTSTART =  5
LGTSPM   =  6
LGTTDM   =  7
LGONOSUB =  0
LG1NOSUB =  0                  ASCII subtypes
LG1SCP   =  1
LG1UEP   =  2
LG1EXP   =  2
LG1PDM   =  3
LG1DEC   =  4
LG1DQM   =  5
LG1MSG   =  6
LG1MEP   =  7
LG1SPM   =  D'8
LG1JSH   =  D'9
LG1JCM   =  D'10
LG1TQM   =  D'11
LG1STG   =  D'12
LG1FVD   =  D'13
LG1IQM   =  D'14
LG1ABORT =  D'63               User messages
LG1CSP   =  D'62
LG1USER  =  D'61
LG2NOSUB =  0                  Station subtypes
LG2RECV  =  1
LG2TRAN  =  2
LG2RETR  =  3
LG3NOSUB =  0                  Hardware error subtypes
LG3SNGL  =  1
```

```
LG3DBLE  =  2
LG3DISK  =  3
LG3CHAN  =  4
LG3ASCII =  5
LG3IOPCH =  6
LG3IOPDK =  7
LG3IOPTP =  D'8
LG3SSD   =  D'9              SSD error subtype
LG4NOSUB =  0                Accounting subtypes
LG4TERM  =  1
LG4PDM   =  2
LG4TQM   =  3
LG4OPEN  =  4
LG4CLOSE =  5
LG4DISP  =  6
LG4ET    =  7                User task termination
LG5NOSUB =  0                Startup subtypes
LG5PDR   =  1
LG5RRJ   =  2
LG5HCR   =  3
LG5FLW   =  4                Flaw message
LG5FULL  =  O'77
LG6NOSUB =  0                SPM subtypes
LG6TASK  =  2
LG6EXT   =  3
LG6MEM   =  4
LG6DISK  =  5
LG6DSKCH =  6
LG6LINK  =  7
LG6EXC   =  D'8
LG6USER  =  D'9
LG6JSH   =  D'11
LG6JCM   =  D'12
LG6CPU   =  D'13
LG6EIC   =  D'14
LG7NOSUB =  0                Task debug subtypes

LG7TQM   =  1
LGFMT0   =  0                FORMATS
LGFMT1   =  1
NOLEN    =  0
NOADDR   =  0
```

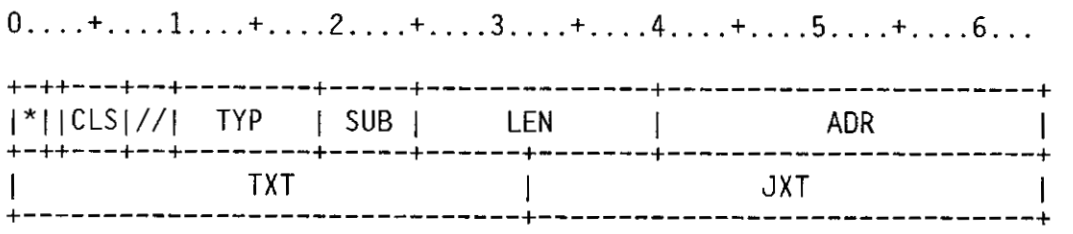


Figure LGI-1. Request Word to MSG

Field	Word(base8)	Bits	Description
LGIFC	0	0-1	Function code
LGIFCS	0	0	System log flag
LGIFCU	0	1	User log flag
LGIOVR	0	2	Override bit
LGICLS	0	3-6	Class of the message
LGITYP	0	10-18	Major type
LGISUB	0	19-24	Subtype
LGILEN	0	25-39	Length
LGIADR	0	40-63	Message address
LGITXT	1	0-31	TXT addr of user task(if task related)
LGIJXT	1	32-63	JXT addr of user job (if job related)

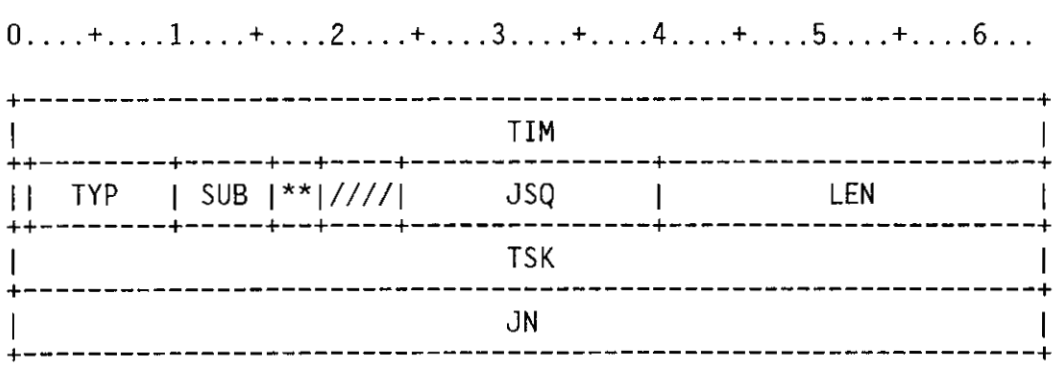


Figure LGR-1. Record in $SYSTEMLOG

Field	Word(base8)	Bits	Description
LGRTIM	0	0-63	Time (the real-time clock value taken when the log record was built)
LGRU	1	0	User flag; message also in $LOG
LGRTYP	1	1-9	Major type
LGRSUB	1	10-15	Subtype
LGRFMT	1	16-18	Format
LGRJSQ	1	24-39	Job sequence number, if associated with a job, otherwise 0
LGRLEN	1	40-63	Length
LGRTSK	2	0-63	Calling task name
LGRJN	3	0-63	Jobname, if associated with a job

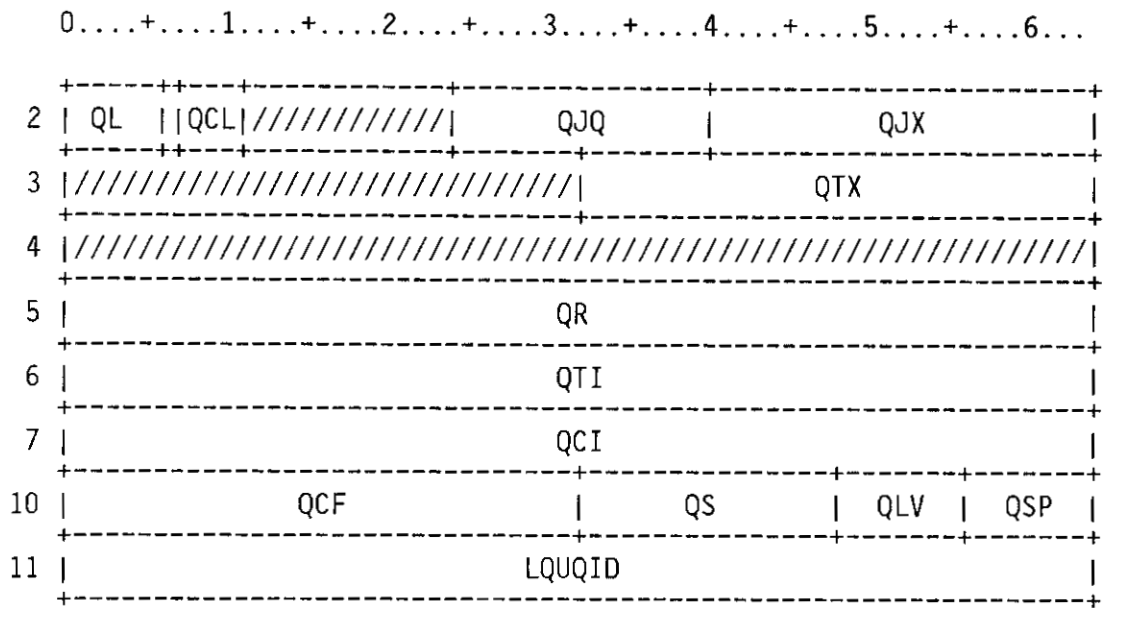


Figure LGU-1. $LOG Record in Memory Pool

Field	Word(base8)	Bits	Description
LGUQL	2	0-5	Length of $LOG record
LGUQOV	2	6	Override bit
LGUQCL	2	7-10	Message class
LGUQJQ	2	24-39	Job sequence number
LGUQJX	2	40-63	JXT address
LGUQTX	3	32-63	TXT address
LGUQR	5	0-63	ASCII spaces
LGUQTI	6	0-63	Wall clock time
LGUQCI	7	0-63	CPU time - integer portion
LGUQCF	10	0-31	CPU time - fractional portion
LGUQS	10	32-47	2 spaces
LGUQLV	10	48-55	Proc.level digit (1-7) or 1 space

Field	Word(base8)	Bits	Description
LGUQSP	10	56-63	1 space
LQUQID	11	0-63	Taskid (ascii)

Message processor reply codes:

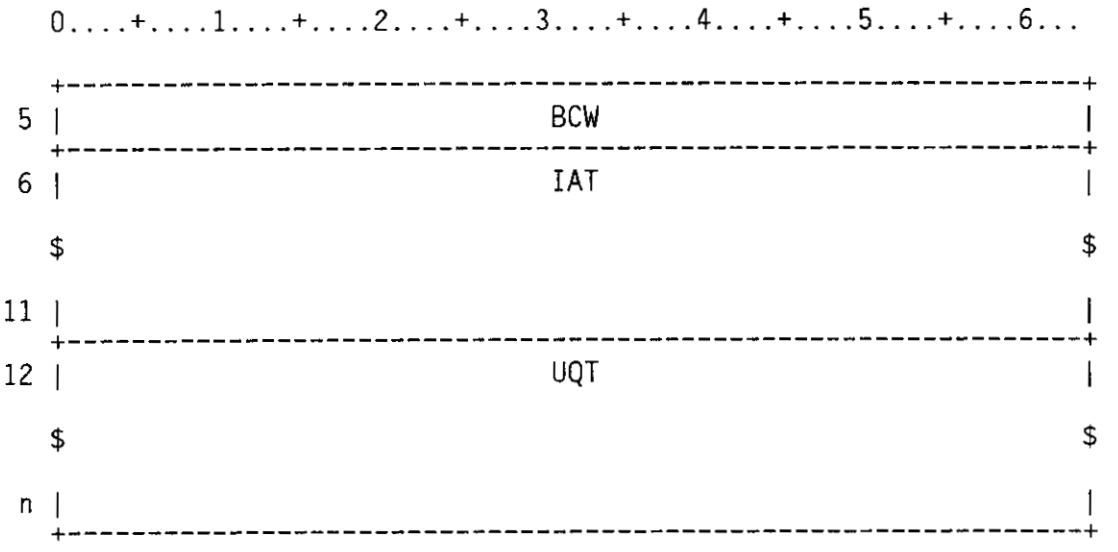


Figure LG-2. Interactive Message

Field	Word(base8)	Bits	Description
LGBCW	5	0-63	BCW for interactive message
LGIAT	6-11	0-63	Text area for interactive message
LGUQT	12-n	0-63	(Batch) message text

The LGJ table contains a 1-word entry for each job having records placed in its user logfile ($LOG). The entries are in the same ordinal positions as their JXT entries.

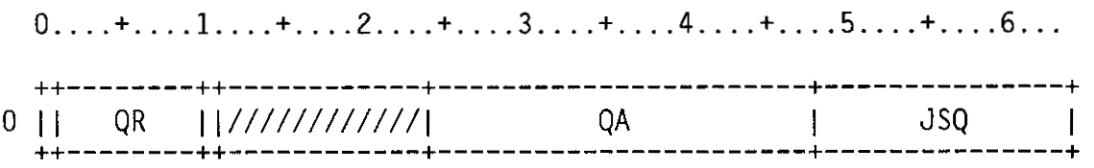


Figure LGJ-1. Pseudo JXT for Log Manager

Field	Word(base8)	Bits	Description
LGJRO	0	0	Rollout flag. Set if Log Manager tries to write message to this job while it was rolled out
LGJQR	0	1-9	Number of queue entries remaining
LGJIO	0	10	I/O busy flag
LGJQA	0	24-47	Address of queue entry
LGJJSQ	0	48-63	Job sequence number

Defined below is the format of the job termination message issued by EXP when a job ends. The message consists, for the most part, of values obtained from the Job Accounting Table.

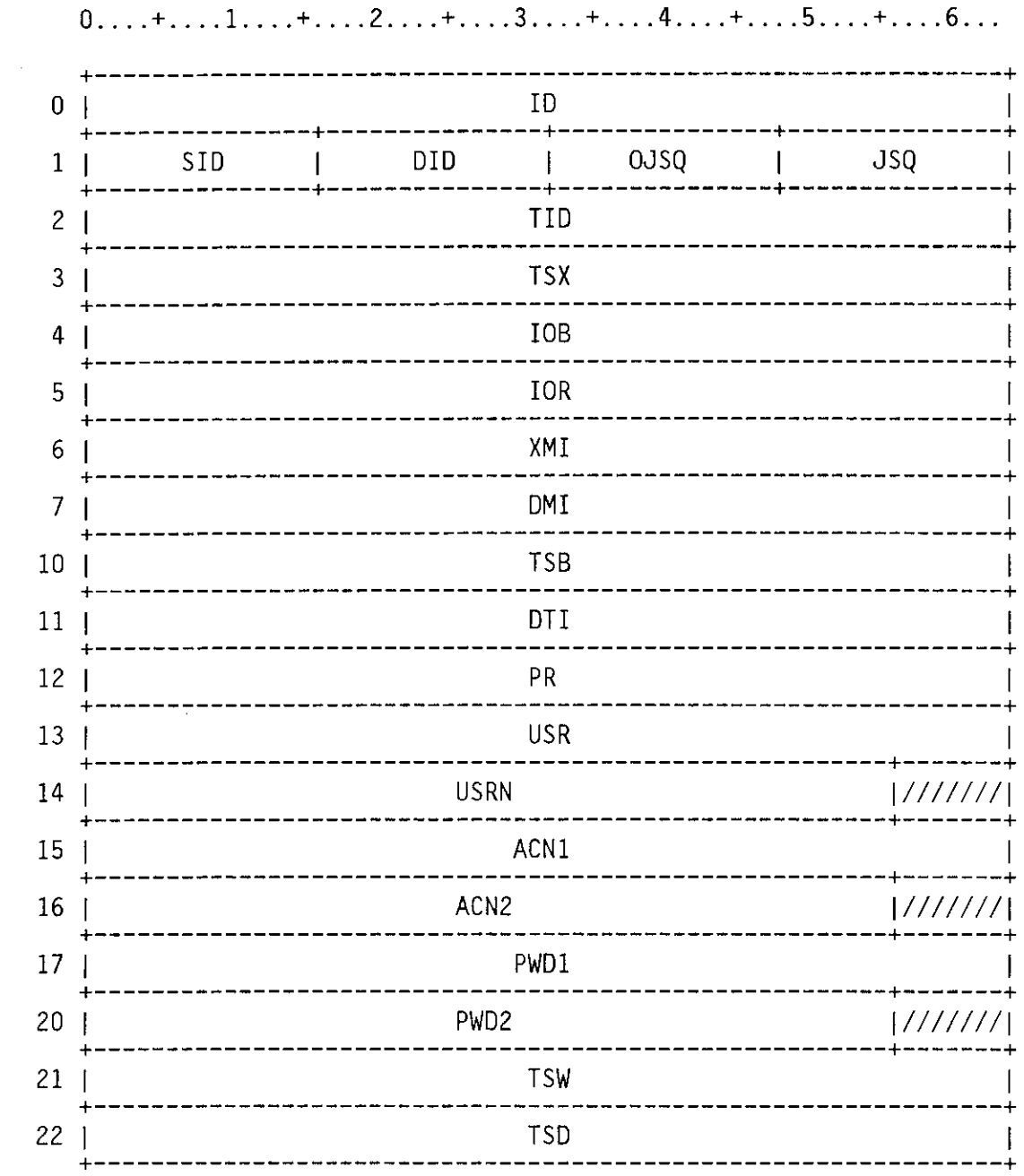


Figure EJ-1. End of job accounting message

```
    0....+....1....+....2....+....3....+....4....+....5....+....6...
   +-----------------------------------------------------------------+
23 |                              TWJ                                |
   +-----------------------------------------------------------------+
24 |                              MXM                                |
   +-----------------------------------------------------------------+
25 |                              MIM                                |
   +-----------------------------------------------------------------+
26 |                              PFA                                |
   +-----------------------------------------------------------------+
27 |                              PFS                                |
   +-----------------------------------------------------------------+
30 |                              TFS                                |
   +-----------------------------------------------------------------+
31 |                              OPC                                |
   +-----------------------------------------------------------------+
32 |                              CLC                                |
   +-----------------------------------------------------------------+
33 |                              MRD                                |
   +-----------------------------------------------------------------+
34 |                              BRF                                |
   +-----------------------------------------------------------------+
35 |                              BSF                                |
   +-----------------------------------------------------------------+
36 |                             TERM                                |
   +-----------------------------------------------------------------+
37 |                              JCN                                |
   +-----------------------------------------------------------------+
40 |                             TSBU                                |
   +-----------------------------------------------------------------+
41 |                              GRC                                |
   +-----------------------------------------------------------------+
42 |                              TVM                                |
   +-----------------------------------------------------------------+
43 |                              TSM                                |
   +-----------------------------------------------------------------+
44 |                              TBM                                |
   +-----------------------------------------------------------------+
45 |                             MXFL                                |
   +-----------------------------------------------------------------+
46 |                             MIFL                                |
   +-----------------------------------------------------------------+
47 |                             MXJT                                |
   +-----------------------------------------------------------------+
50 |                             MIJT                                |
   +-----------------------------------------------------------------+
51 |                             OWN1                                |
   +-----------------------------------------------------------------+
```

Figure EJ-1. End of job accounting message

```
    0....+....1....+....2....+....3....+....4....+....5....+....6...

    +-------------------------------------------------------+-------+
52  |                          OWN2                         |///////|
    +-------------------------------------------------------+-------+
```

Figure EJ-1. End of job accounting message

Field	Word(base8)	Bits	Description
EJID	0	0-63	User ID for permanent datasets
EJSID	1	0-15	Source ID (2 characters)
EJDID	1	16-31	Destination ID (2 characters)
EJOJSQ	1	32-47	Originating job sequence number
EJJSQ	1	48-63	Job sequence number
EJTID	2	0-63	Originating user terminal ID
EJTSX	3	0-63	Timestamp units executing in CPU
EJIOB	4	0-63	Sectors transfered
EJIOR	5	0-63	I/O requests
EJXMI	6	0-63	Execution memory integral in floating word-seconds
EJDMI	7	0-63	I/O wait memory intergral in floating word-seconds
EJTSB	10	0-63	Timestamp at job submission
EJDTI	11	0-63	Timestamp at job initiation
EJPR	12	0-63	Job priority, shifted >4 SC@EJPR=4 (shift count for the above)
EJUSR	13	0-63	User ID number (characters 1-8)
EJUSRN	14	0-55	(characters 9-15)
EJACN1	15	0-63	Account number (characters 1-8)
EJACN2	16	0-55	(characters 9-15)
EJPWD1	17	0-63	Password (characters 1-8)

Field	Word(base8)	Bits	Description
EJPWD2	20	0-55	(characters 9-15)
EJTSW	21	0-63	Timestamp units spent waiting to EXEC
EJTSD	22	0-63	Timestamp units waiting for I/O
EJTWJ	23	0-63	Timestamp units waiting in input queue
EJMXM	24	0-63	Maximum job size
EJMIM	25	0-63	Minimum job size
EJPFA	26	0-63	Permanent dataset space accessed
EJPFS	27	0-63	Permanent dataset space saved
EJTFS	30	0-63	Temporary dataset space used
EJOPC	31	0-63	Count of user OPEN calls
EJCLC	32	0-63	Count of user CLOSE calls
EJMRD	33	0-63	Count of memory resident datasets
EJBRF	34	0-63	Sectors received from front end
EJBSF	35	0-63	Sectors sent to the front end
EJTERM	36	0-63	Job termination status
EJJCN	37	0-63	Job class
EJTSBU	40	0-63	System billing units utilized
EJGRC	41	0-63	Count of generic resources used
EJTVM	42	0-63	Tape volumes mounted
EJTSM	43	0-63	Tape sectors moved
EJTBM	44	0-63	Tape blocks moved
EJMXFL	45	0-63	Maximum field length used
EJMIFL	46	0-63	Minimum field length used
EJMXJT	47	0-63	Maximum JTA used
EJMIJT	50	0-63	Minimum JTA used

Field	Word(base8)	Bits	Description
EJOWN1	51	0-63	Ownership value (characters 1-8)
EJOWN2	52	0-55	(characters 9-15)

Format of text portion of the hardware characteristics record issued by STARTUP and MSG. (Record type STARTMSG, record subtype ZLGSHC.)

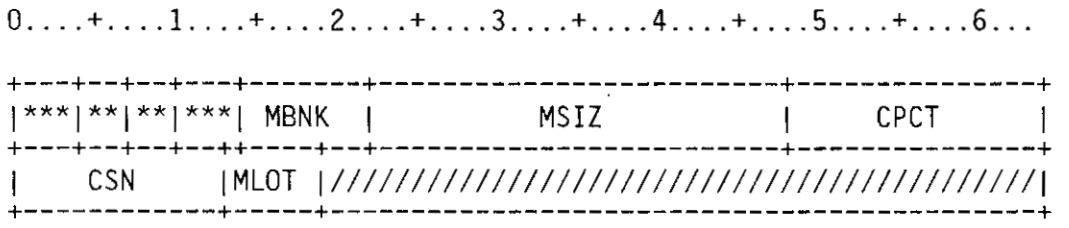


Figure ZH-1. Hardware Characteristics Record

Field	Word(base8)	Bits	Description
ZHCPTY	0	0-3	CPU type (C@CPTYPE)
ZHCPQN	0	4-6	Number of CPUs (C@CPQUAN)
ZHMCON	0	7-9	Memory configuration (C@MMCONF)
ZHMCHP	0	10-13	Memory chip size (C@MMCHIP)
ZHMBNK	0	14-21	Number of mem banks (C@MMBANK)
ZHMSIZ	0	22-47	Memory size (C@MMSIZE)
ZHCPCT	0	48-63	CP cycle time in psec (C@CPCYCL)
ZHCSN	1	0-12	Mainframe serial number
ZHMLOT	1	13-18	Memory layout index

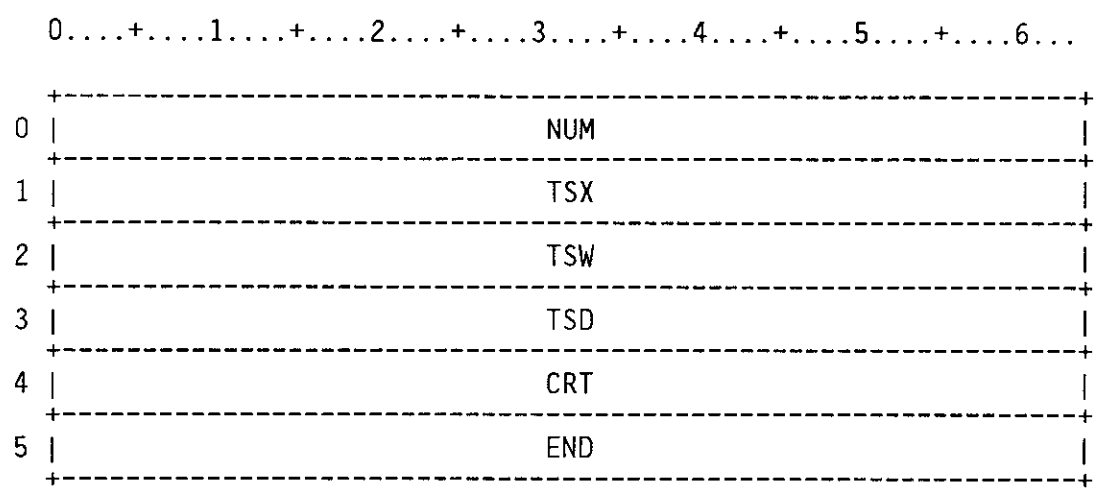


Figure ET-1. End of task accounting

Field	Word(base8)	Bits	Description
ETNUM	0	0-63	Task number
ETTSX	1	0-63	Timestamps executing in CPU
ETTSW	2	0-63	Timestamps waiting for CPU
ETTSD	3	0-63	Timestamps while I/O blocked
ETCRT	4	0-63	Timestamp at task initiation
ETEND	5	0-63	Timestamp at task end

The Link Interface Table is STP resident. It is used by both the Station Call Processor and EXEC and contains SCP-EXEC communication areas, working storage, and channel buffers. An LIT entry is assigned by SCP at deadstart to each channel which is to be used by SCP for link interface communications.

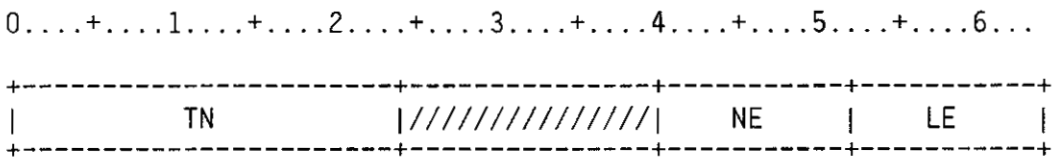


Figure LT-1. Link Interface Table Header

Field	Word(base8)	Bits	Description
LTTN	0	0-23	Table name; 'LIT' in ASCII.
LTNE	0	40-51	Number of entries (=NE@LIT)
LTLE	0	52-63	Length of entries (=LE@LIT)

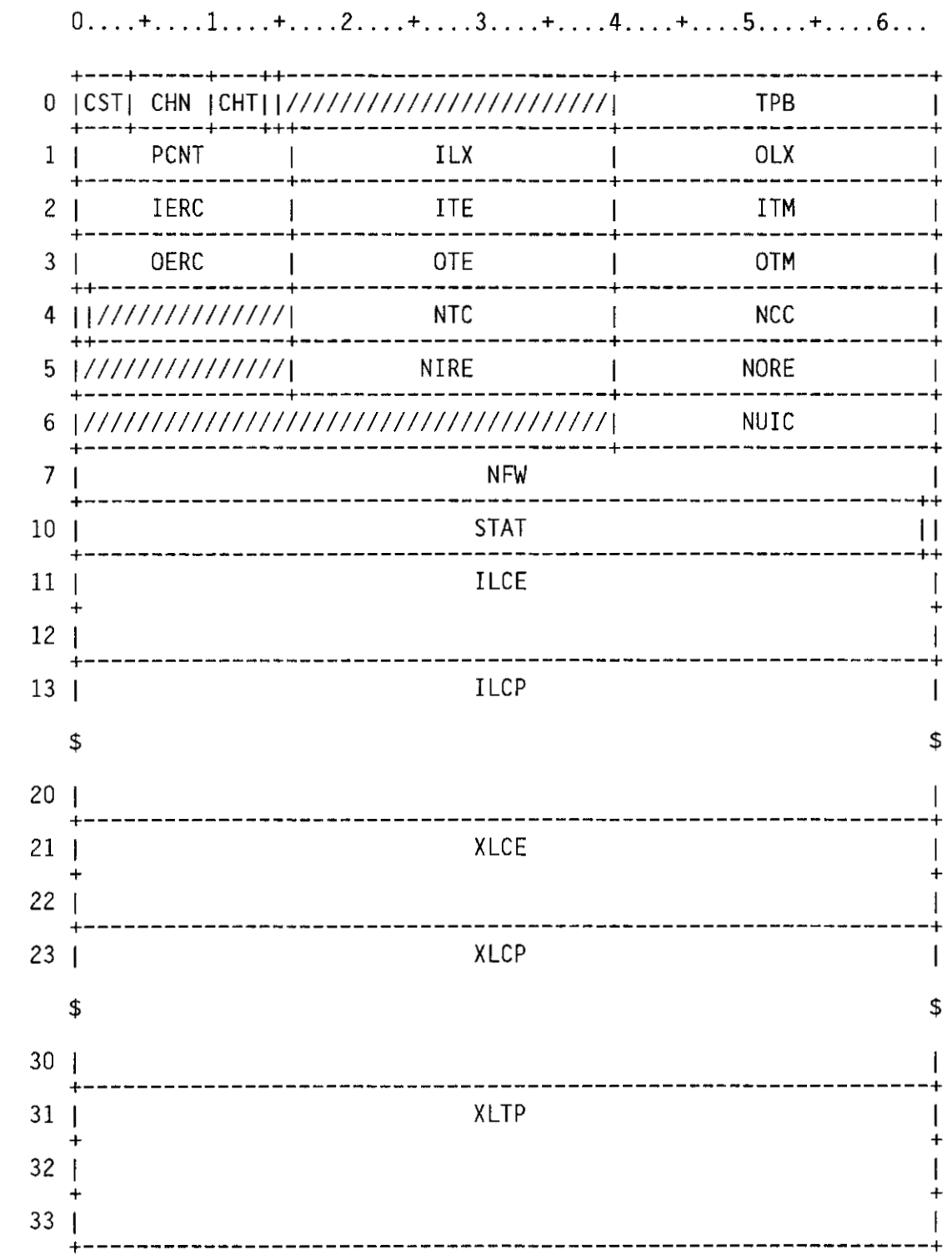


Figure LT-2. Link Interface Table Entry

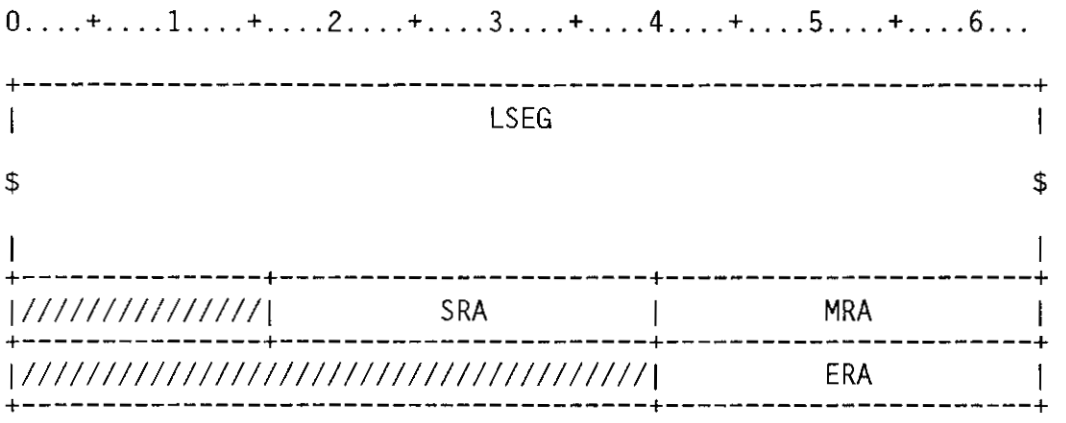


Figure LT-2. Link Interface Table Entry

Field	Word(base8)	Bits	Description
LTCST	0	0-3	Channel state: LTCSTOFF=O'00 Off LTCSTON=O'10 On LTCSTHNG=O'17 Hung (error retry limit exceeded)
LTCHN	0	4-9	Channel pair number
LTCHT	0	10-13	Channel type (see LCCHT)
LTPEND	0	14	Error-message-pending flag
LTTPB	0	40-63	Task parameter block address
LTPCNT	1	0-15	Output pending count
LTILX	1	16-39	Input LXT entry address
LTOLX	1	40-63	Output LXT entry address
LTIERC	2	0-15	Input error retry count
LTITE	2	16-39	Input total error message count
LTITM	2	40-63	Input total valid message count
LTOERC	3	0-15	Output error retry count
LTOTE	3	16-39	Output total error message count
LTOTM	3	40-63	Output total valid message count
LTNTF	4	0	Network timeout flag

Field	Word(base8)	Bits	Description
LTNTC	4	16-39	Network timeout count
LTNCC	4	40-63	Network collision count
LTNIRE	5	16-39	Network input retry count exceeded
LTNORE	5	40-63	Network output retry count exceeded
LTNUIC	6	40-63	Network unknown interrupt count
LTNFW	7	0-63	Network function word:
LTNFC	7	56-61	Function code
LTNMD	7	62-63	Mode
LTSTAT	10	0-62	Network status word
LTILCE	11-12	0-63	Input LCPE
LTILCP	13-20	0-63	Input LCP
LTXLCE	21-22	0-63	Error LCPE
LTXLCP	23-30	0-63	Error LCP
LTXLTP	31-33	0-63	Error LTP
LTLSEG	34-41	0-63	Logon segment
LTSRA	42	16-39	Status subroutine return address
LTMRA	42	40-63	Master clear subroutine return address
LTERA	43	40-63	END OP subroutine return addr (EXEC)

LXT - Link Extension Table

The Link Extension Table (LXT) is used for communication between EXEC and STP. It contains an entry for each configured logical front-end ID; each entry is allocated by FED on receipt of a logon message, and released after an output operation if the OFF bit is set. Receipt of a front-end message is signaled by FED with the INT (interrupt) bit. FED does not modify an entry after setting INT until the next output request is received for that entry.

Note: An LXT entry can be deallocated by SCP if a channel/ordinal is turned off while the LXT entry is active.

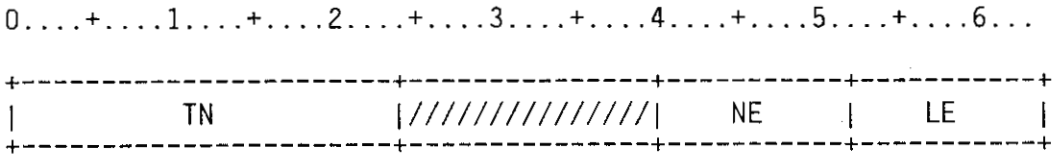


Figure LX-1. Link Extension Table header

Header.

Field	Word(base8)	Bits	Description
LXTN	0	0-23	Table name ('LXT' in ASCII)
LXNE	0	40-51	Number of entries (=NE@LXT)
LXLE	0	52-63	Length of entries (=LE@LXT)

Entry.

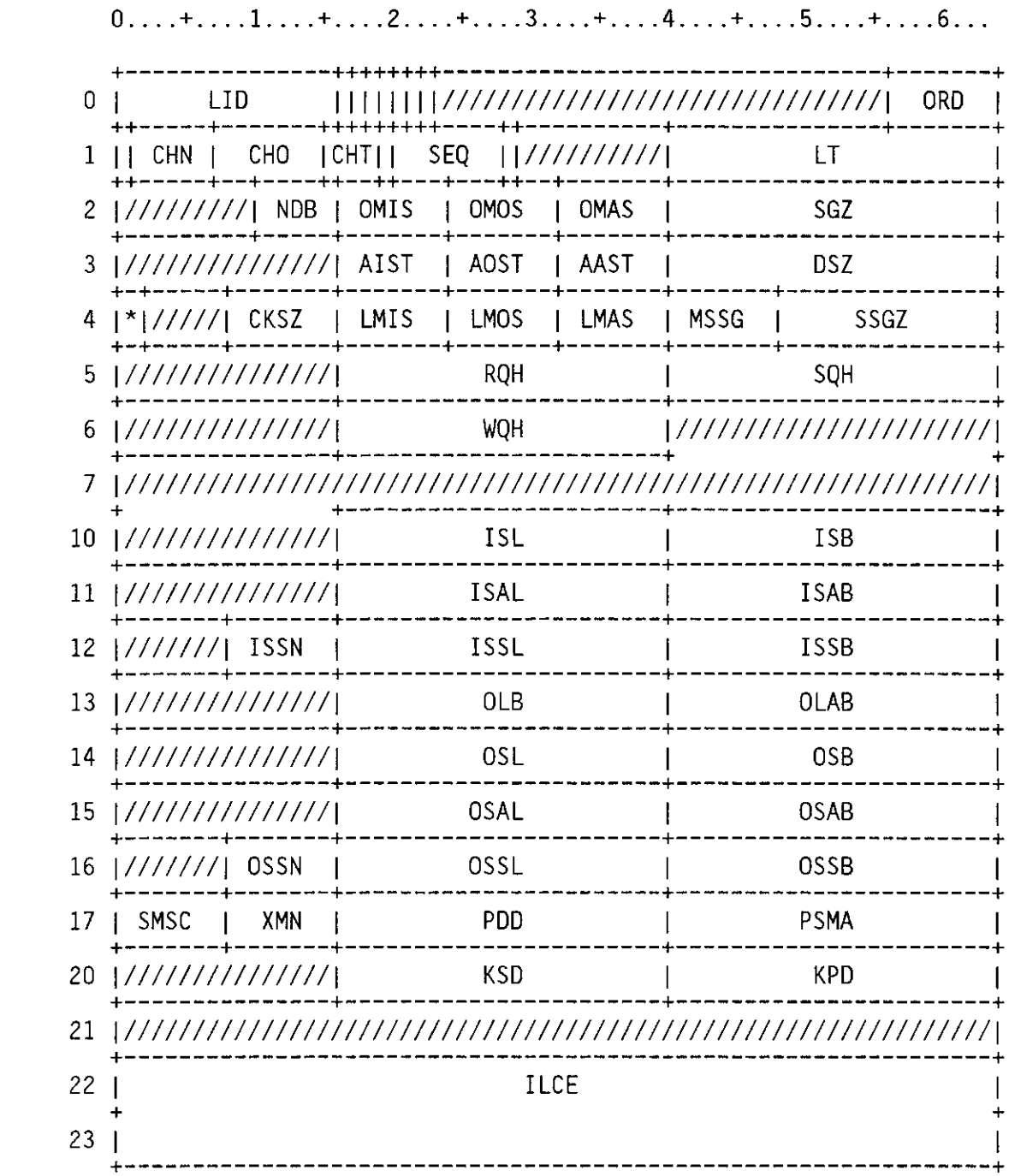


Figure LX-2. Link Extension Table entry

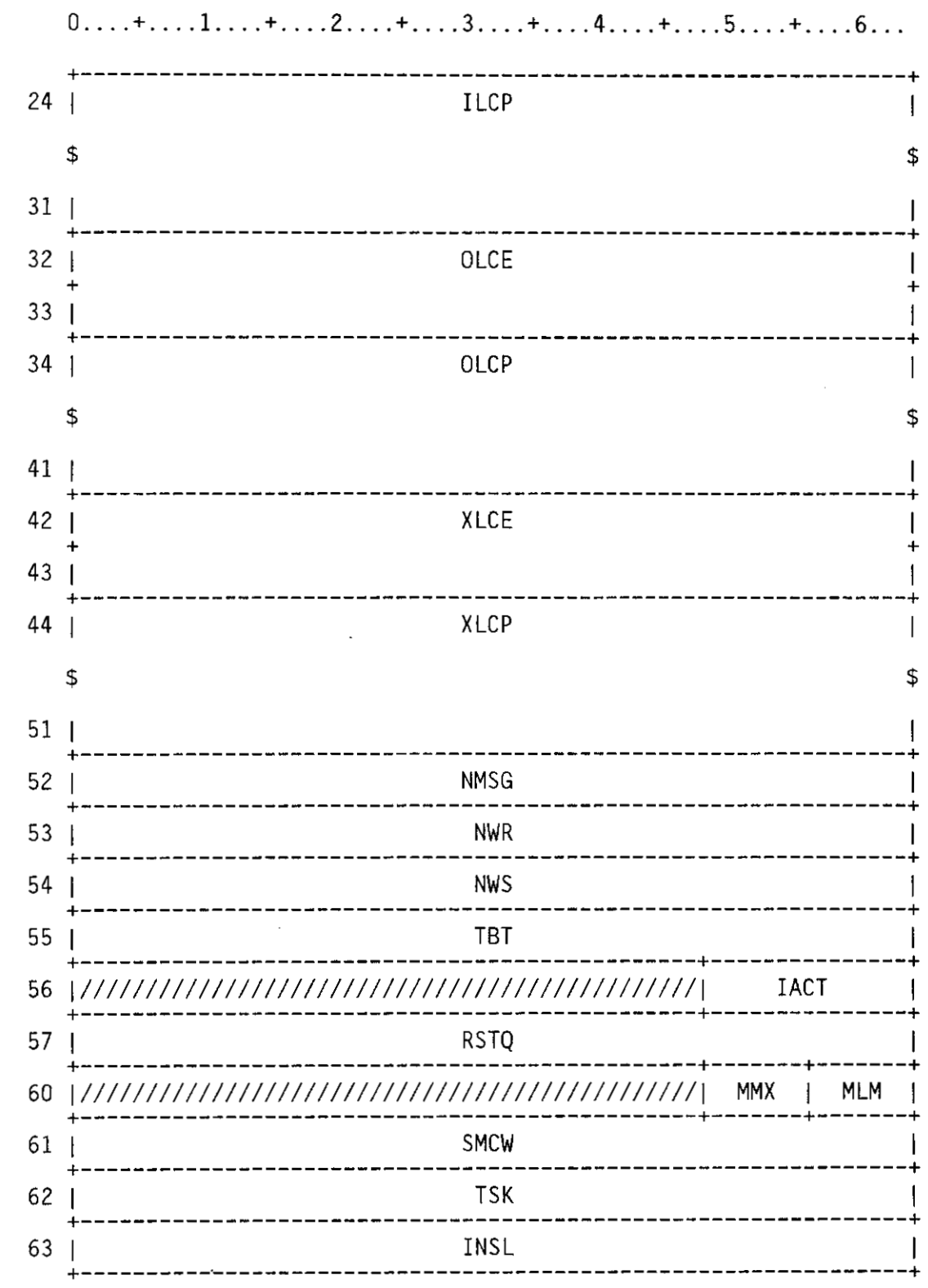


Figure LX-2. Link Extension Table entry

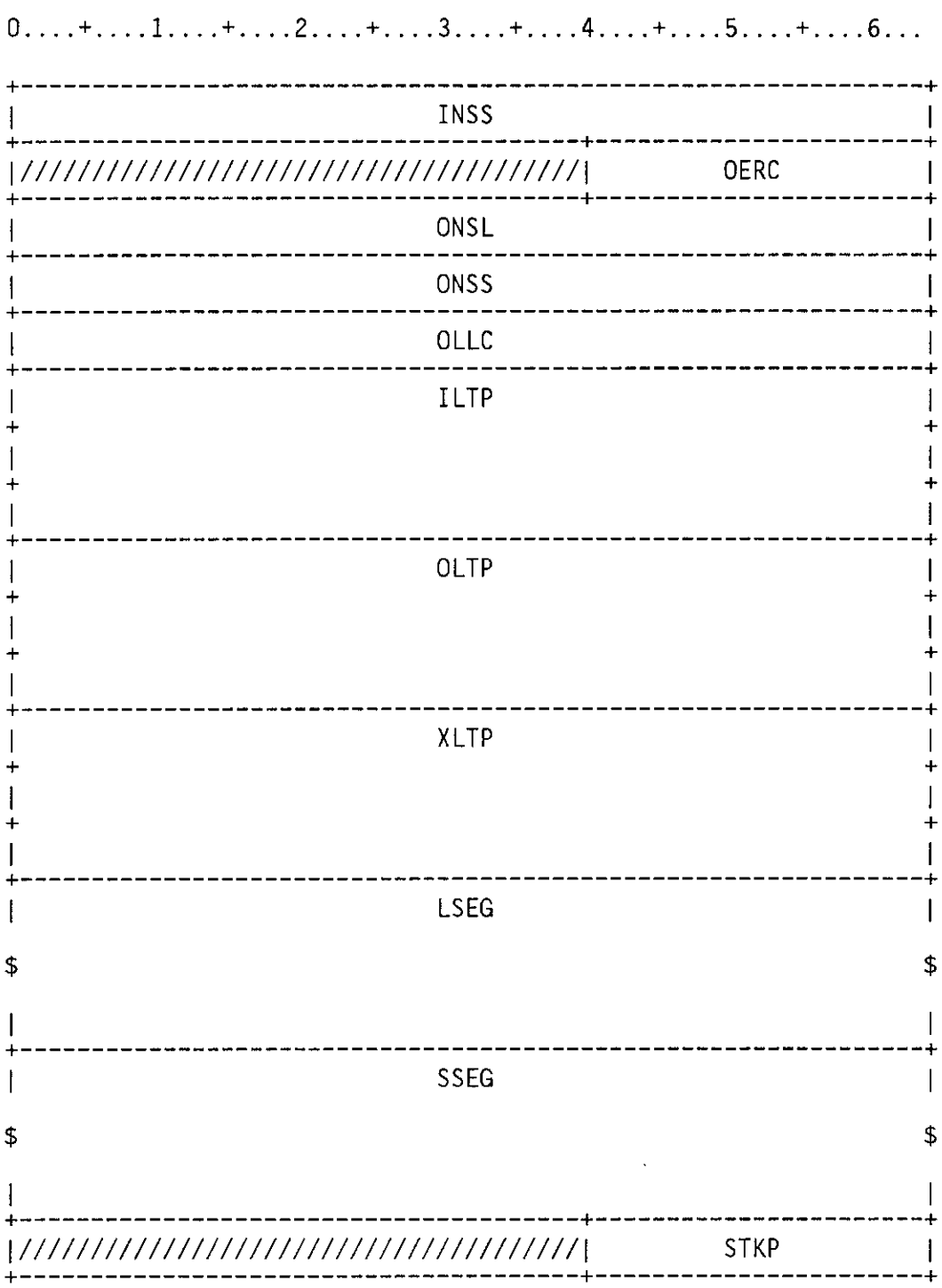


Figure LX-2. Link Extension Table entry

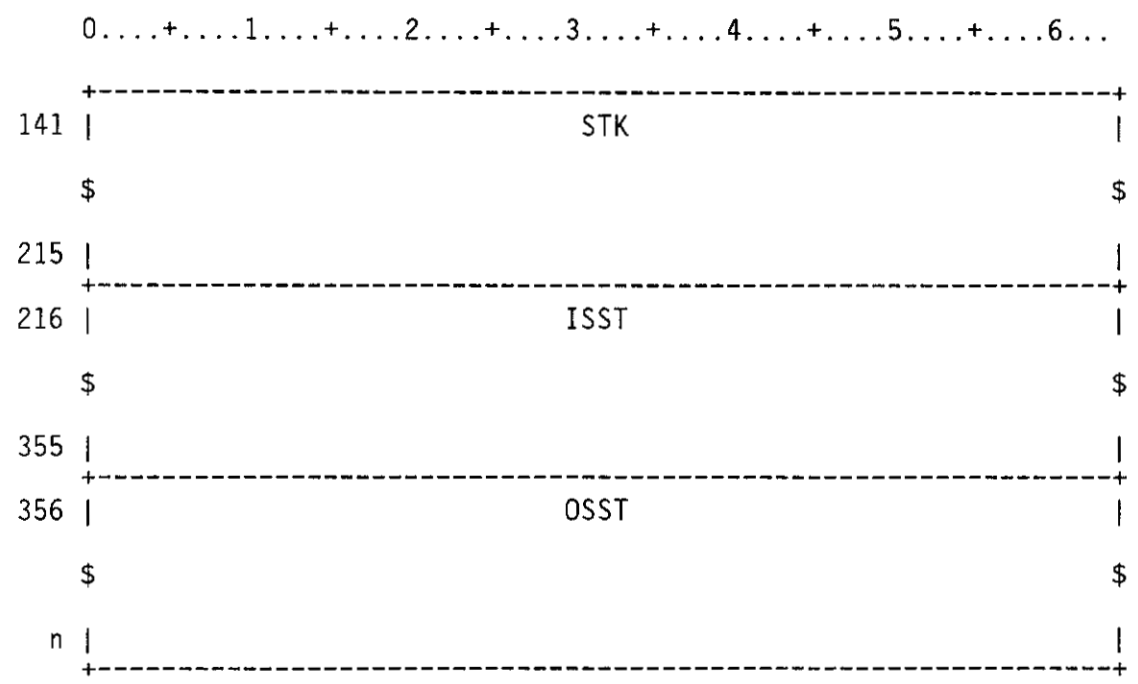


Figure LX-2. Link Extension Table entry

Field	Word(base8)	Bits	Description
LXLID	0	0-15	Logical front end ID (SCP, EXEC)
LXINT	0	16	Channel interrupt (set/EXEC, clear/SCP
LXRDY	0	17	Ready for input flag (EXEC)
LXOFF	0	18	Entry deallocation request (SCP, EXEC)
LXIAST	0	19	Interactive request received (SCP)
LXRLOG	0	20	Relog flag (EXEC, SCP)
LXPEND	0	21	Output pending flag (EXEC)
LXPBAL	0	22	Pool buffer allocated flag
LXORD	0	56-63	LXT entry ordinal (SCP, EXEC)
LXCHN	1	1-6	Channel pair number (SCP, EXEC)
LXCHO	1	7-14	Channel ordinal (SCP, EXEC)
LXCHT	1	15-18	Channel type (SCP, EXEC)
LXSLOT	1	19	Station Slot (set if present)

Field	Word(base8)	Bits	Description
LXSEQ	1	20-27	Task request/reply sequence
LXISLT	1	28	Interactive station slot flag
LXLT	1	40-63	LIT entry address (SCP, EXEC)
LXNDB	2	10-15	Number of disk buffers for streams
LXOMIS	2	16-23	Operator maximum input streams (SCP)
LXOMOS	2	24-31	Operator maximum output streams (SCP)
LXOMAS	2	32-39	Operator maximum active streams (SCP)
LXSGZ	2	40-63	Segment size in words (SCP)
LXAIST	3	16-23	Current active input streams (SCP)
LXAOST	3	24-31	Current active output streams (SCP)
LXAAST	3	32-39	Current total active streams (SCP)
LXDSZ	3	40-63	Maximum output dataset size, in
LXSTYP	4	0-1	Station type (SCP): LXSTYPB=0 Batch only LXSTYPI=1 Interactive only LXSTYPBI=2 Both batch and interactive
LXCKSZ	4	8-15	Checksum width (SCP)
LXLMIS	4	16-23	Logon maximum input streams (SCP)
LXLMOS	4	24-31	Logon maximum output streams (SCP)
LXLMAS	4	32-39	Logon maximum active streams (SCP)
LXMSSG	4	40-47	Number of subsegments (SCP)
LXSSGZ	4	48-63	Subsegment size in words (SCP)
LXRQH	5	16-39	Receiving SDT queue head (SCP)
LXSQH	5	40-63	Sending SDT queue head (SCP)
LXWQH	6	16-39	Waiting SDT queue head (SCP)
LXISL	10	16-39	Input segment limit addr (SCP, EXEC)

Field	Word(base8)	Bits	Description
LXISB	10	40-63	Input segment base addr (SCP, EXEC)
LXISAL	11	16-39	Input segment absolute limit address
LXISAB	11	40-63	Input segment absolute base address
LXISSN	12	8-15	Current input subsegment number (EXEC)
LXISSL	12	16-39	Input subsegment abs limit addr (EXEC)
LXISSB	12	40-63	Input subsegment abs base addr (EXEC)
LXOLB	13	16-39	Output/error LCP entry address (SCP)
LXOLAB	13	40-63	Output LCP abs base addr (SCP, EXEC)
LXOSL	14	16-39	Output segment limit addr (SCP, EXEC)
LXOSB	14	40-63	Output segment base addr (SCP, EXEC)
LXOSAL	15	16-39	Output segment absolute limit address
LXOSAB	15	40-63	Output segment absolute base address
LXOSSN	16	8-15	Current output subsegment number (EXEC
LXOSSL	16	16-39	Output subsegment abs limit addr (EXEC
LXOSSB	16	40-63	Output subsegment abs base addr (EXEC)
LXSMSC	17	0-7	Send message subcode
LXXMN	17	8-15	Expected message number
LXPDD	17	16-39	Address of temporary PDD
LXPSMA	17	40-63	Process send message address
LXKSD	20	16-39	Saved SDT for KILL
LXKPD	20	40-63	Saved PDD for KILL
LXILCE	22-23	0-63	Input LCPE (2 words) (EXEC)
LXILCP	24-31	0-63	Input LCP (6 words) (SCP, EXEC)
LXOLCE	32-33	0-63	Output LCPE (2 words) (EXEC)
LXOLCP	34-41	0-63	Output LCP (6 words) (SCP, EXEC)

Field	Word(base8)	Bits	Description
LXXLCE	42-43	0-63	Error LCPE (2 words) (EXEC)
LXXLCP	44-51	0-63	Error LCP (6 words) (SCP, EXEC)
LXNMSG	52	0-63	Number of messages (SCP, SPM)
LXNWR	53	0-63	Number of words received (SCP, SPM)
LXNWS	54	0-63	Number of words sent (SCP, SPM)
LXTBT	55	0-63	Total number of bits xferred (SCP)
LXIACT	56	48-63	Interactive message count (SCP)
LXRSTQ	57	0-63	Interactive restart queue control
LXNRM	57	0-15	Number of messages
LXHSZ	57	16-31	Size of first message
LXRSQT	57	32-47	Queue head
LXRSQH	57	48-63	Queue tail
LXMMX	60	48-55	Maximum message count/segment (SCP)
LXMLM	60	56-63	Current limit count/segment (SCP)
LXSMCW	61	0-63	Station message control (1 word) (SCP)
LXMQC	61	0-15	Station message queue count
LXTSK	62	0-63	Station message task flags (SCP)
LXINSL	63	0-63	Input net status after LCP(EXEC)
LXINSS	64	0-63	Input net status after segment (EXEC)
LXOERC	65	40-63	Output error count
LXONSL	66	0-63	Output net status after LCP (EXEC)
LXONSS	67	0-63	Output net status after segment (EXEC)
LXOLLC	70	0-63	Last net output LCP+0 (EXEC)
LXILTP	71-73	0-63	Input LTP (3 words) (SCP, EXEC)
LXOLTP	74-76	0-63	Output LTP (3 words) (SCP, EXEC)

Field	Word(base8)	Bits	Description
LXXLTP	77-101	0-63	Error LTP (3 words) (SCP, EXEC)
LXLSEG	102-107	0-63	Logon segment (6 words) (SCP, EXEC) Z@LXSSEG=D'24
LXSSEG	110-137	0-63	Sync request segment (24 words) (SCP)
LXSTKP	140	40-63	Stack pointer (SCP) LXSTKZ=D'45 Stack size
LXSTK	141-215	0-63	Stack
LXISST	216-355	0-63	Start of input SSTs
LXOSST	356-n	0-63	Start of output SSTs

This table is used by INSASCI to control the insertion of parameters into a message.

The header, which must be first, is followed by one entry for Each message defined. There must be MCNM entries. The entries are ordered so that the message number can be used as an offset into the MCT. (The header's position has been taken into account in INSASCI).

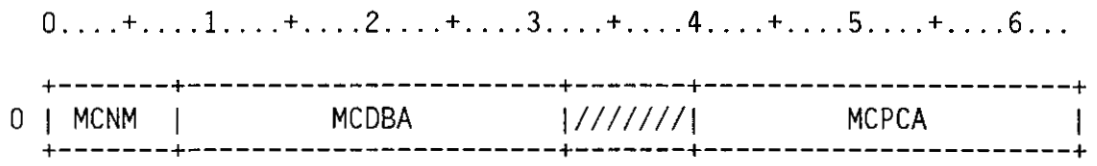


Figure MCT-1. Message Control Table Header

HEADER

Field	Word(base8)	Bits	Description
MCNM	0	0-7	Number of messages (1..256)
MCDBA	0	8-31	Destination buffer address in words
MCPCA	0	40-63	Base address of param control table

ENTRY

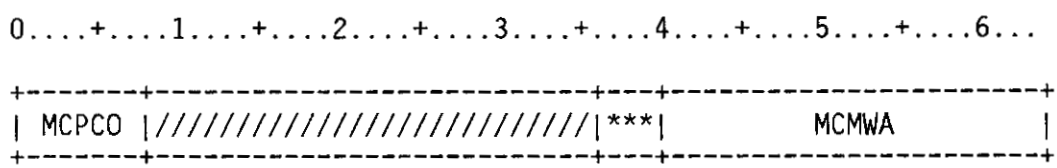


Figure MCT-2. Message Control Table Entry

Field	Word(base8)	Bits	Description
MCPCO	0	0-7	Offset into PCT
MCMWL	0	36-39	Length of message in words
MCMWA	0	40-63	Message address in words

PARAMETER CONTROL TABLE

The PCT has one entry for each different message format. I.e., if two or more messages have the same number of parameters which are inserted into the same places, they could share the same PCT entry. If a message does not have parmeters, then the PCNP and PCPCA fields for that message should be set to zero.

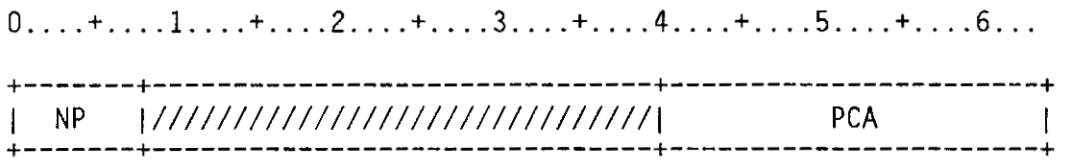


Figure PC-1. Parameter Control Table Header

Field	Word(base8)	Bits	Description
PCNP	0	0-7	Number of params to be inserted
PCPCA	0	40-63	Base addr of param control entry

PARAMETER CONTROL ENTRY

One parameter control entry should be constructed for each PCT entry defined. If a PCT entry's PCNP field is zero, then no PCE should be constructed for it. The number of entries must equal the number of parameters specified in the corresponding PCT entry's PCNP field.

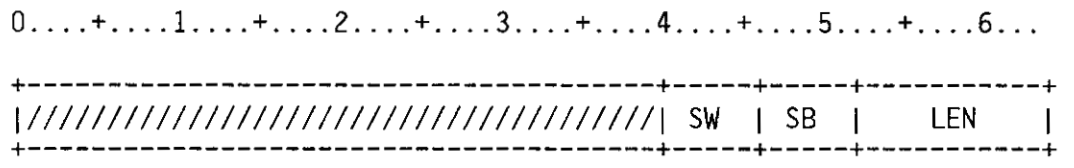


Figure PC-2. Parameter Control Table Entry

Field	Word(base8)	Bits	Description
PCSW	0	40-45	Start word within text (0,1,...)
PCSB	0	46-51	Start bit within start word (0..d'63)
PCLEN	0	52-63	Length in bits (max is d'64)

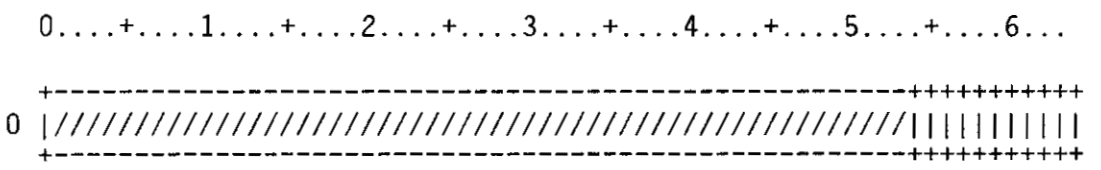


Figure MD-1. Mode Parameter Word

Field	Word(base8)	Bits	Description
MDEORI	0	54	Enable operand range interrupts
MDDORI	0	55	Disable operand range interrupts
MDEEMA	0	56	Enable extended memory addressing
MDDEMA	0	57	Disable extended memory addressing
MDEAVL	0	58	Enable additional vector logical unit
MDDAVL	0	59	Disable additional vector logical unit
MDEBT	0	60	Enable bidirectional transfer flag
MDDBT	0	61	Disable bidirectional transfer flag
MDEFI	0	62	Enable floating interrupt flag
MDDFI	0	63	Disable floating interrupt flag

This table shows memory descriptor word pair fields for system dumps. The header word ID is stored in word 511 decimal of the first sector of the dump file. The information is constructed by STARTUP from the SDP entries.

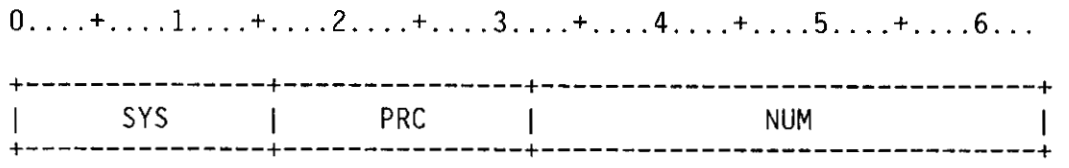


Figure MDW-1. System Dump Memory Descriptor Words

Field	Word(base8)	Bits	Description
MDWSYS	0	0-15	System type
MDWPRC	0	16-31	Number of processors
MDWNUM	0	32-63	Number of areas that have been dumped

MDW pairs are stored in words D'14 through D'509 of the first sector of the dump:

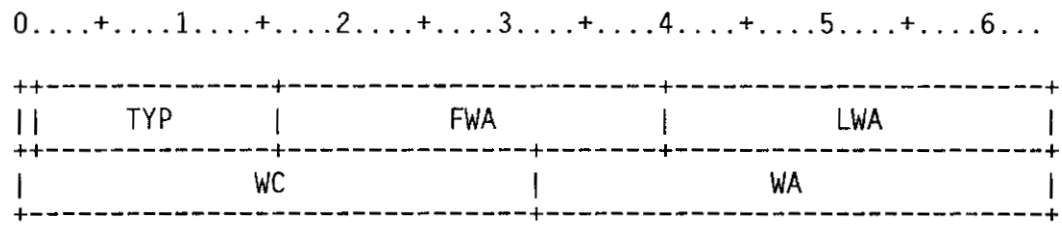


Figure MDW-2. MDW Pairs

Field	Word(base8)	Bits	Description
MDWC	0	0	Compressed dump if nonzero
MDWTYP	0	1-15	Memory type
MDWFWA	0	16-39	FWA of following memory, or words/parcels of following data if it is registers or IOPs
MDWLWA	0	40-63	LWA of following memory, or zero
MDWWC	1	0-31	Number of words on the disk used by the following data
MDWWA	1	32-63	Word address on disk of first data word

NAME: COMMEM

PURPOSE MEMORY DEFINITIONS

SET BY CALLER

```
S@MRB    =  4          Inc  buffer area
S@MRD    =  5          Inc DSP area
S@MRF    =  7          Field length
S@MRJ    =  D'8        Inc JTA
S@MRO    =  D'9        force job to roll out
S@MRDEL  =  D'16       Deletion flag/pointer
N@MRDEL  =  D'24       Deletion flag/pointer
```

Memory pool areas are surrounded by (identical) header and trailer words that control the allocation and deallocation of the areas. A memory pool is depicted in figure MP-1. The communication module, CMOD, is shown separately in this manual.

```
MAXPOOL   =  5

LGPOOL    =  1              Memory pool number for message
                              queue
SPMPOOL   =  1              Performance monitor buffer pool
TXTPOOL   =  1              Pool number for dispose texts
CMPOOL    =  2              Intertask communication pool
                              number
LBLPOOL   =  3              Tape label pool
ISPPOOL   =  I@IPOOL        POOL FOR ISP TABLES
QUEPOOL   =  5              JSH queues pool

JMEMID    =  O'07070707     Memory pool pattern for JTA
CMSIZE    =  6              SIZE OF A COMMUNICATION MODULE
                              (CMOD)
CMIN0     =  2              FIRST INPUT WORD IN CMOD
CMIN1     =  3              SECOND INPUT WORD IN CMOD
CMOUT0    =  4              FIRST OUTPUT WORD IN CMOD
CMOUT1    =  5              SECOND OUTPUT WORD IN CMOD
MISTAKE1  =  1
MISTAKE2  =  2
MISTAKE3  =  3
```

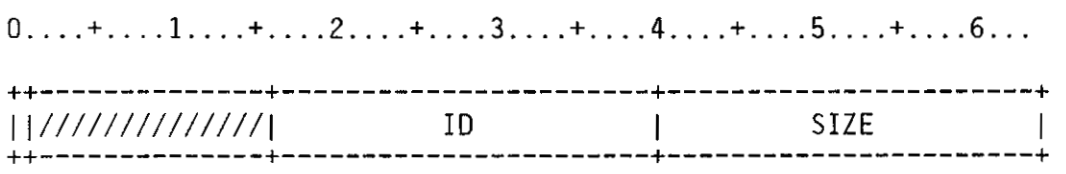


Figure MP-1. Memory Pool

Field	Word(base8)	Bits	Description
MPST	0	0	Status of the memory area: 0 Available 1 In use
MPID	0	16-39	Memory pool identification (octal): 01010101 Pool 1 0x0x0x0x Poolx. Current values are 1, 2, 3, 4, 5 or 7.
MPSIZE	0	40-63	Size of the memory area MPHT=2 Combined memory size, header and trailer MP1S=I@MP1SZ Size of memory pool1 MP2S=I@MP2SZ Size of memory pool2 MP3S=I@MP3SZ Size of memory pool3 MP4S=I@MP4SZ+MPHT Size of memory pool4 MP5S=I@MP5SZ Size of memory pool 5

The MST in STP memory contains a 1-word entry for each segment of memory that has been allocated by the Job Scheduler plus additional entries that describe free and if necessary, 4MW boundary segments.
MST entries are organized in ascending order according to the beginning address of the segment (MSADDR). Any free space between two allocated segments is consolidated and is represented by a single entry stored in the MST between entries for the two allocated segments. The last entry in the table is always followed by a zero word. To provide for the case where every allocated segment is surrounded by free segments, the MST must have twice as many words in it as the maximum number of allocated segments, plus two more. In addition space must be provided for up to three boundary segments, each of which could split a free segment into two parts adding an additional 9 words to the size of the MST. The allocation requirement in total is I@JXTSIZ*2+13 for a maximum memory of 16MW. Each additional increment of 4MW beyond 16MW adds three words to the MST.

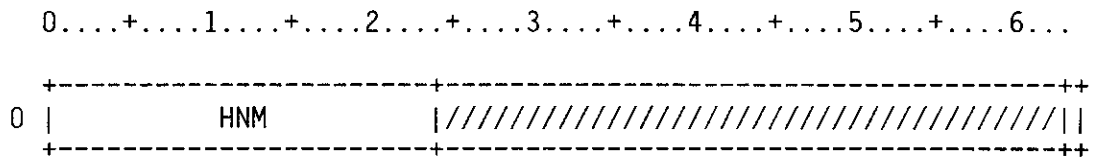


Figure MS-1. Memory Segment Table

Field	Word(base8)	Bits	Description
MSHNM	0	0-23	table name
MSHAM	0	63	addressing mode 0 = not in extended addressing mode 1 = extended addressing mode

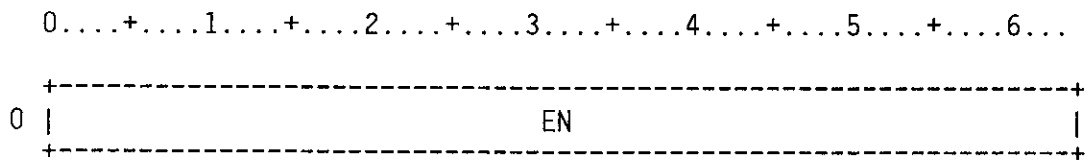


Figure MS-2. Memory Segment Table

Field	Word(base8)	Bits	Description
MSEN	0	0-63	entire entry for move efficiency
MSTYPE	0	0-3	allocation type MST$JOB=O'01 allocated to a job (MSJXT > 0) MST$FRE=O'10 free segment (MSJXT = 0) MST$STG=O'11 STAGER allocation (MSJXT = 0) MST$MRK=O'17 4MW boundary marker (MSJXT = 0)
MSJXT	0	4-15	JXT ordinal
MSSIZE	0	16-39	segment size (multiple of O'1000)
MSADDR	0	40-63	STP-relative address of first segment word (multiple of O'1000)

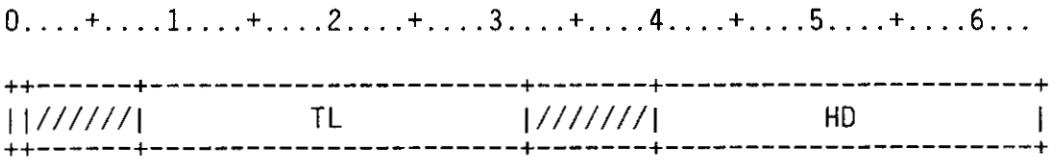


Figure QUE-1. Define Multitasking Queue Header Words

Field	Word(base8)	Bits	Description
QUEFLG	0	0	Switch setting for locks or events
QUETL	0	8-31	Pointer field for tail of queue
QUEHD	0	40-63	Pointer field for head of queue

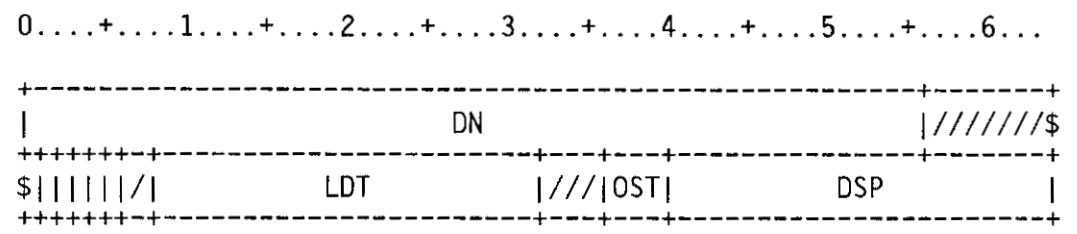


Figure OD-1. Open Dataset Table

Field	Word(base8)	Bits	Description
ODDN	0	0-55	Dataset name
ODV	1	1	Close volume
ODM	1	2	Open for 'mod' (append)
ODS	1	3	Close or open with saved position
ODH	1	4	Hold resources
ODUDS	1	5	Open as unblocked flag
ODLDT	1	8-31	LDT address
ODOST	1	36-39	TYPE OF OPEN REQUESTED OSTSA=0 Create DSP/LFT buffer in system area OSTUA=1 Create DSP/LFT/buffer in user area OSTMSY=2 DSP/LFT/buffer moved to system area
ODDSP	1	40-63	DSP pointer: Negative: negative offset Positive: absolute address

This table is passed for an F$OPT call.

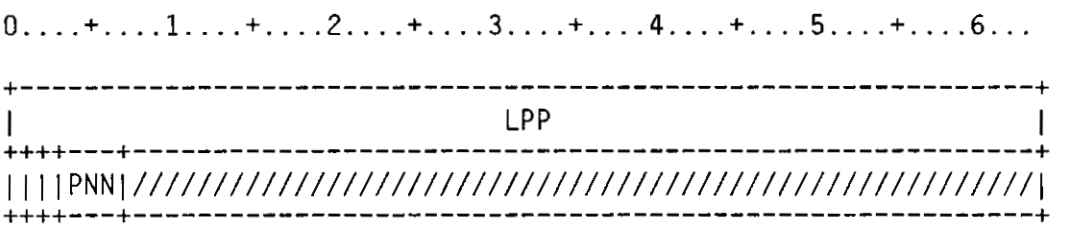


Figure OP-1. Parameter Block for F$OPT

Field	Word(base8)	Bits	Description
OPLPP	0	0-63	Page length
OPSTAT	1	0	Dataset statistics enabled
OPPNCH	1	1	NZ if OPTION,PN selected
OPPNAS	1	2	NZ if PN=n, ZR if PN=ANY
OPPNN	1	3-6	Processor number (if @OPPNAS NZ)

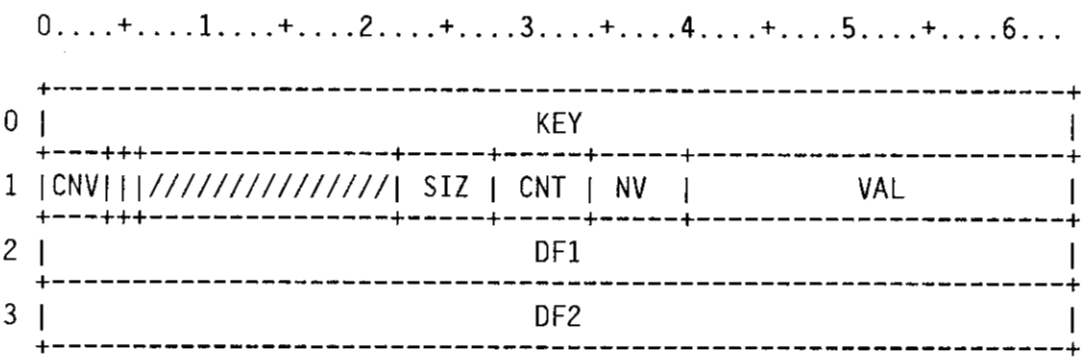


Figure PA-1. Parameter Information Table

Field	Word(base8)	Bits	Description
PAKEY	0	0-63	Keyword, 1-8 ASCII characters or -1 if positional parameter allowed
PACNV	1	0-3	Conversion mode 0 = No conversion 1 = Decimal to binary 2 = Octal to binary
PAREQ	1	4	Parameter required if nonzero
PAPRS	1	5	Parameter is present if nonzero
PASIZ	1	22-27	Maximum words in string
PACNT	1	28-33	Count of concatenated values seen
PANV	1	34-39	Maximum number of concatenated values allowed
PAVAL	1	40-63	Address of value storage, or zero if keyword cannot be equated
PADF1	2	0-63	Value to use if parameter not present
PADF2	3	0-63	Value to use if only keyword is present

The Per-device Accounting Table is used by EXP and DQM to keep dataset statistics by device.

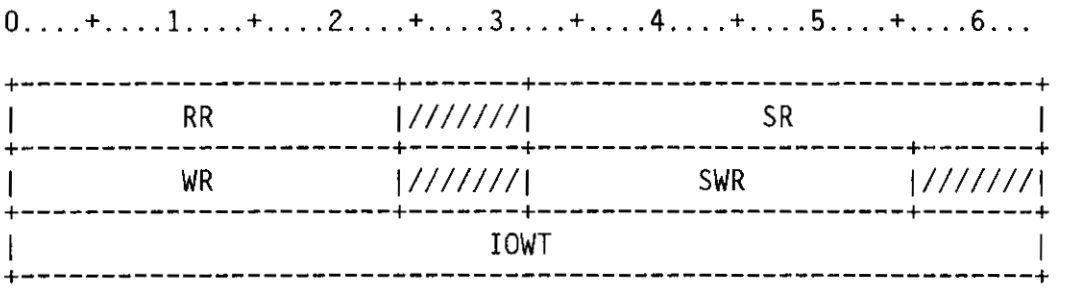


Figure PC-1. Per-device accounting table

Field	Word(base8)	Bits	Description
PCRR	0	0-23	Read requests
PCSR	0	32-63	Sectors read
PCWR	1	0-23	Write requests
PCSWR	1	32-55	Sectors written
PCIOWT	2	0-63	I/O wait time

PERMANENT DATASET FUNCTION CODES

PMFCSU	=	O'10	Save user dataset
PMFCSI	=	O'12	Save input dataset
PMFCSO	=	O'14	Save output dataset
PMFCAU	=	O'20	Access user dataset
PMFCAI	=	O'26	Access input dataset
PMFCAO	=	O'26	Access output dataset
PMFCDU	=	O'30	Delete user dataset
PMFCDI	=	O'36	Delete input dataset
PMFCDO	=	O'36	Delete output dataset
PMFCPG	=	O'40	Read dataset catalog
PMFCPX	=	O'41	Read dataset catalog extension
PMFCLU	=	O'50	Load (save) user dataset
PMFCLI	=	O'52	Load (save) input dataset
PMFCLO	=	O'54	Load (save) output dataset
PMFCRL	=	O'60	Release permanent dataset
PMFCPN	=	O'70	Verify existence of permanent dataset
PMFCDT	=	O'100	Dataset time time request
PMFCDQ	=	O'110	Dequeue SDT
PMFCEA	=	O'120	Queue SDT to available queue
PMFCEI	=	O'122	Queue SDT to input queue
PMFCEO	=	O'124	Queue SDT to output queue
PMFCAD	=	O'130	Adjust permanent dataset
PMFCMD	=	O'140	Modify user permanent dataset
PMFCRSDT	=	O'150	Rewrite SDT entry (system only)
PMFCPSAC	=	O'160	RRJ pseudo-access dataset(system only)
PMFCPU	=	O'170	Dump (access) user dataset
PMFCPI	=	O'176	Dump (access) input dataset
PMFCPO	=	O'176	Dump (access) output dataset
PMFCPE	=	O'200	Permit alternate user to dataset
PMFCLKDX	=	O'210	Link DXT entry
PMFCRTDX	=	O'220	Get DXT entry

Permit DXT entry type - DXPERM

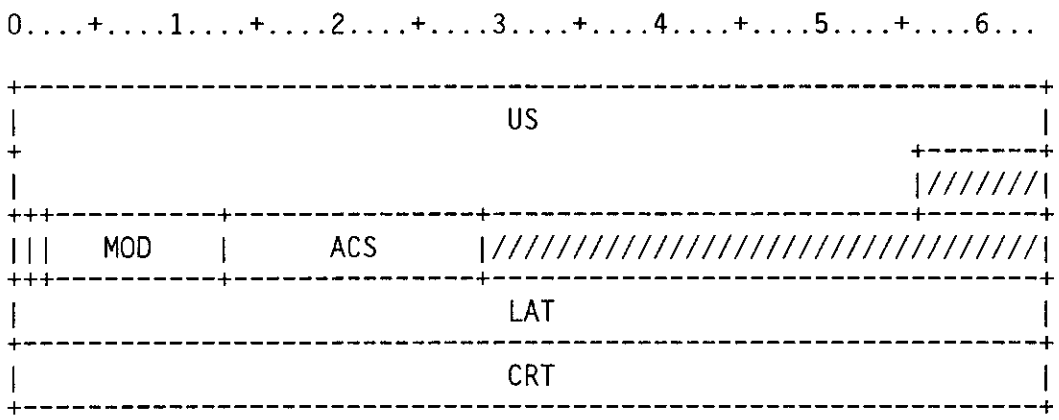


Figure PER-1. Permit DXT entry

Entry definition

Field	Word(base8)	Bits	Description
PERUS	0-1	0-63	Permitted User Number
PERUS1	0	0-63	Permitted user number (1-8)
PERUS2	1	0-55	Permitted user number (9-15)
PERACT	2	0	Active entry flag (1=entry is active)
PERMOD	2	2-12	Permitted access mode
PERACS	2	13-28	Number of accesses (binary)
PERLAT	3	0-63	Time of last access (cycles)
PERCRT	4	0-63	Permit creation time (cycles)

The Physical Request Table is an STP-resident table primarily used for disk queue management.

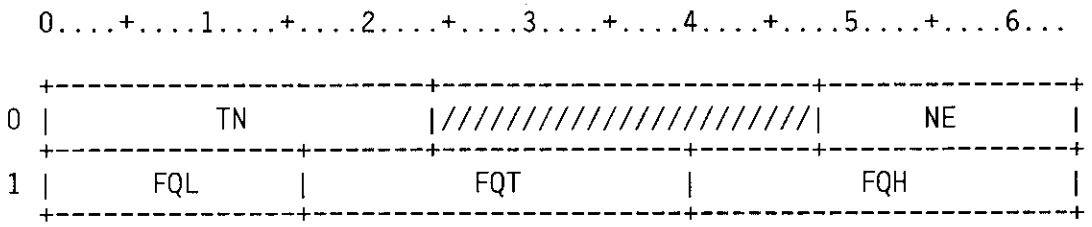


Figure PH-1. Physical Request Table header

Field	Word(base8)	Bits	Description
PHTN	0	0-23	table name ('PHR')
PHNE	0	48-63	number of entries
PHFQL	1	0-15	free queue length
PHFQT	1	16-39	free queue tail
PHFQH	1	40-63	free queue head

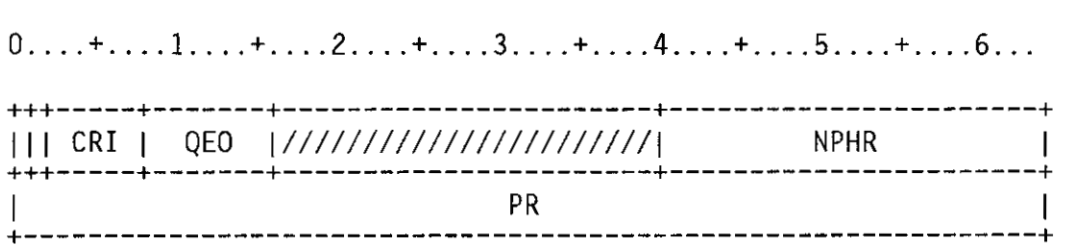


Figure PH-2. Physical Request Table entry

Field	Word(base8)	Bits	Description
PHACT	0	0	active flag
PHQCR	0	1	queued I/O compound request flag
PHCRI	0	2-7	channel requests initiated count
PHQEO	0	8-15	queued I/O entry ordinal (DPOUT rel)
PHNPHR	0	40-63	address of next PHR entry

Word 1 of the PHR is doubly defined as both a physical request and as a logical request. This is done because in CDSP logical request are created but the fields are stored in "PHR" entries.

CAUTION: The format of the following word is assumed to be the same in CBT, EQT, RQT, and SAC.

PHPR	1	0-63	physical request
PHSC	1	0-13	sector count
PHDA	1	14-39	disk address
PHMA	1	40-63	CPU memory address

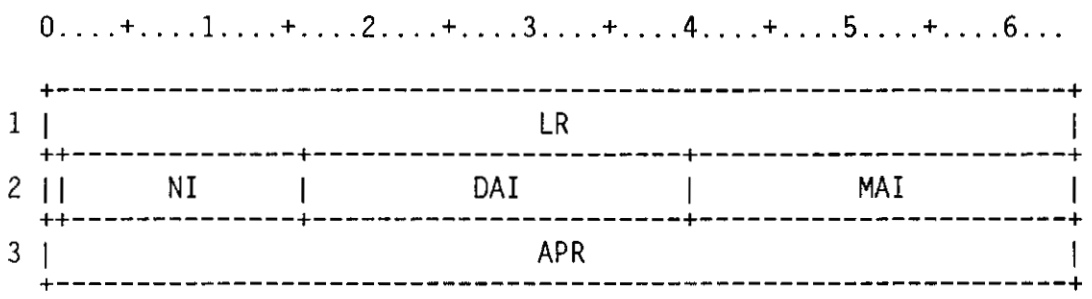


Figure PH-3. Physical Request Table entry

Field	Word(base8)	Bits	Description
PHLR	1	0-63	Logical request
PHLSC	1	0-15	Logical sector count
PHLDA	1	16-39	Logical disk address
PHLMA	1	40-63	Logical memory address
PHTD	2	0	transfer direction
PHNI	2	1-15	number of iterations
PHDAI	2	16-39	disk address increment
PHMAI	2	40-63	CPU memory address increment
PHAPR	3	0-63	actual physical request
PHASC	3	0-13	actual sector count
PHADA	3	14-39	actual disk address
PHAMA	3	40-63	actual CPU memory address

The PDI is a 1-word STP-resident table generated during system startup for use by the Permanent Dataset Manager.

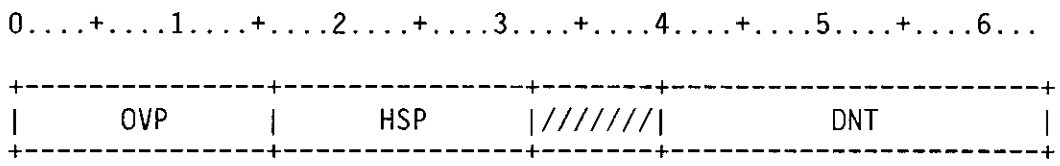


Figure PI-1. Permanent Dataset Information

Field	Word(base8)	Bits	Description
PIOVP	0	0-15	Number of overflow pages
PIHSP	0	16-31	Number of hash pages
PIDNT	0	40-63	DNT for DSC

A PDD is a parameter list that accompanies a Permanent Dataset Management request.

The PDD illustrated in figure PM-1 is used for all save, access, dump access, load, modify, permit, rewrite SDT, pseudo-access, and permanent dataset name requests.

The PDD illustrated in figure PM-2 is used for both DSC and DXT page requests, and for dump time requests.

The PDD illustrated in figure PM-3 is used for all delete, release, and adjust requests.

The PDD illustrated in figure PM-4 is used for queue and dequeue SDT requests, and for get and link DXT requests.

Chart PM-1. Permanent dataset function codes

Symbol	Octal Code	Function
PMFCSU	10	Save user dataset
PMFCSI	12	Save input dataset
PMFCSO	14	Save output dataset
PMFCAU	20	Access user dataset
PMFCAI	26	Access spooled dataset
PMFCAO	26	Access spooled dataset
PMFCDU	30	Delete user dataset
PMFCDI	36	Delete spooled dataset
PMFCDO	36	Delete spooled dataset
PMFCPG	40	DSC Page request
PMFCPX	41	DXT Page request
PMFCLU	50	Load user dataset
PMFCLI	52	Load input dataset
PMFCLO	54	Load output dataset
PMFCRL	60	PDS/Release request
PMFCPN	70	PDN request
PMFCDT	100	Dump time request
PMFCDQ	110	Dequeue SDT
PMFCEA	120	Queue SDT to available queue
PMFCEI	122	Queue SDT to input queue
PMFCEO	124	Queue SDT to output queue
PMFCAD	130	Adjust user dataset
PMFCMD	140	Modify user dataset
PMFCRSDT	150	Rewrite input SDT entry
PMFCPSAC	160	Pseudo-access for RRJ
PMFCPU	170	Access user saved dataset for PDSDUMP
PMFCPO	176	Access output dataset for PDSDUMP
PMFCPI	176	Access input dataset for PDSDUMP
PMFCPE	200	Permit Request
PMFCLKDX	210	Link DXT Request
PMFCRTDX	220	Get DXT Request

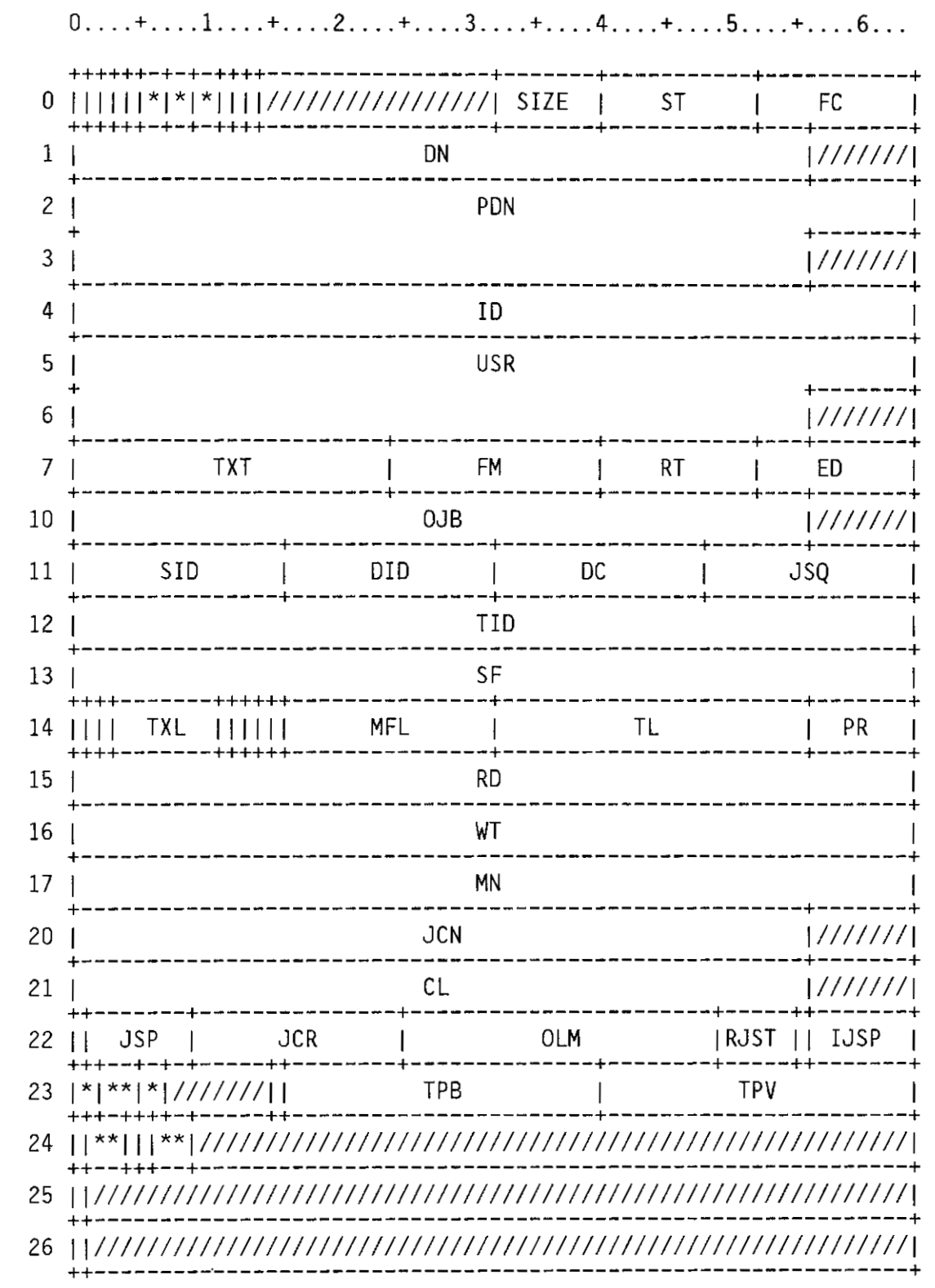


Figure PM-1. Permanent Dataset Definition

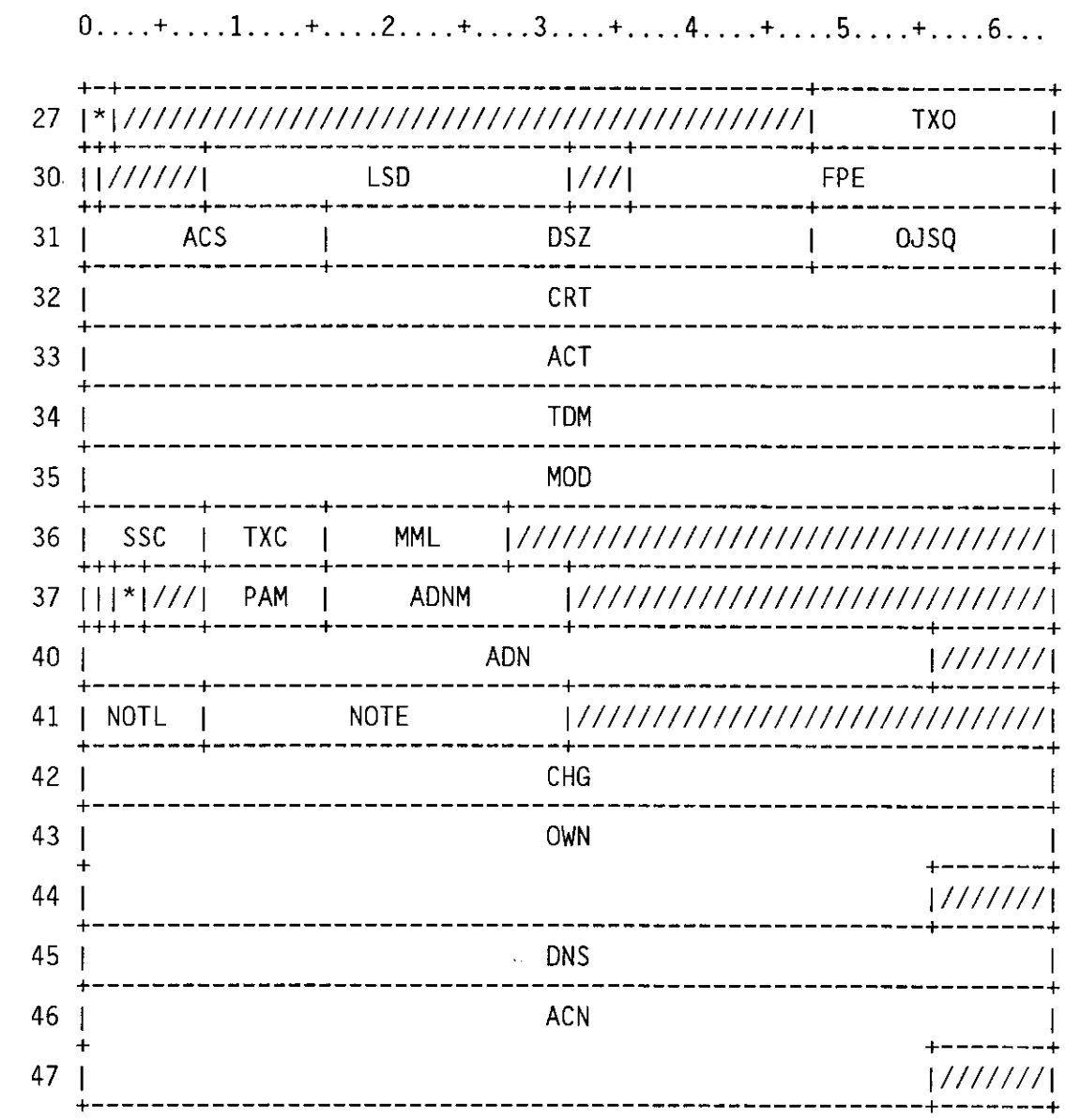


Figure PM-1. Permanent Dataset Definition

LE@MPDD=2 Minimum PDD size
LE@PDD11=D'31 COS 1.11 PDD size

Field	Word(base8)	Bits	Description
PMSG	0	0	Normal completion message suppression indicator
PMERR	0	1	Error message suppression indicator
PMWAIT	0	2	WAIT flag for a disposed dataset
PMNRLS	0	3	No release of dataset on DISPOSE
PMAQR	0	4	Acquire flag for accounting
PMTP	0	5-6	Tape dataset (online/staged)
PMTCS	0	7-8	Tape dataset character set
PMEXO	0	9-10	Execute only
PMDTR	0	11	Update dump-time on PDSDUMP access
PMSMT	0	12	Submit flag
PMDFFL	0	13	Job-used-MFL-default flag
PMSIZE	0	32-39	PDD size in words
PMST	0	40-51	Return status
PMFC	0	52-63	Function code (see chart PM-1)
PMDN	1	0-55	Local dataset name
PMPDN	2-3	0-63	Permanent dataset name
PMPDN1	2	0-63	Characters 1-8
PMPDN2	3	0-55	Characters 9-15
PMID	4	0-63	User identification
PMUSR	5-6	0-63	User number
PMUSR1	5	0-63	Characters 1-8
PMUSR2	6	0-55	Characters 9-15

Field	Word(base8)	Bits	Description
PMTXT	7	0-23	Address of optional text field
PMFM	7	24-39	Format designator (two characters): FMCD=CD Character/deblocked FMCB=CB Character/blocked FMBD=BD Binary/deblocked FMBB=BB Binary/blocked
PMRT	7	40-51	Retention period; 0-4095 days.
PMED	7	52-63	Edition number (0-4095)
PMOJB	10	0-55	Originating job name
PMSID	11	0-15	Source ID; 2 characters.
PMDID	11	16-31	Destination ID; 2 characters.
PMDC	11	32-47	Disposition code; 2 characters. DCIN=IN Job dataset DCST=ST Dataset to be staged DCSC=SC Scratch dataset DCPR=PR Print dataset DCPU=PU Punch dataset DCPT=PT Plot dataset DCMT=MT Magnetic tape dataset
PMJSQ	11	48-63	Job sequence number
PMTID	12	0-63	Terminal ID; 1-8 characters.
PMSF	13	0-63	Special forms
PMUQ	14	0	Unique ACCESS/Write ring requested
PMENT	14	1	Enter in System Directory
PMIR	14	2	Immediate reply requested
PMTXL	14	3-10	Number of words of text
PMNRR	14	11	Job rerun flag; set if job cannot be rerun (input entries only).
PMINIT	14	12	Job initiate flag; set if job has been initiated.
PMIA	14	13	Interactive flag
PMDFR	14	14	Deferred disposition indicator

Field	Word(base8)	Bits	Description
PMNA	14	15	No abort flag. If set, processing continues even if an error is encountered.
PMMFL	14	16-31	MFL parameter from job card (input)
PMSGFL	14	16	All available memory requested
PMFL	14	17-31	Field length/512
PMTL	14	32-55	Time limit (input datasets)
PMPR	14	56-63	Priority (input datasets)
PMRD	15	0-63	Read permission control word
PMWT	16	0-63	Write permission control word
PMMN	17	0-63	Maintenance permission control word
PMJCN	20	0-55	Job class name
PMCL	21	0-55	CL parameter from JOB statement
PMSYS	22	0	System job
PMJSP	22	1-8	JOB statement priority
PMJCR	22	9-24	Job class rank
PMOLM	22	25-48	Size of $OUT in 512-word block
PMRJST	22	49-54	Job status flag
PMIJSP	22	56-63	Original job card priority
PMTPD	23	0-1	Tape density
PMTPL	23	2-4	Tape label type
PMTPF	23	5-6	Tape format
PMTPC	23	15	Tape cataloged dataset
PMTPB	23	16-39	Tape maximum block size in bytes
PMTPV	23	40-63	Tape pointer to label definition table
PMTPM	24	0	Tape online maintenance access
PMTPP	24	1-3	Tape parallel device count

Field	Word(base8)	Bits	Description
PMTP2	24	4	Tape second device assignment
PMTPH	24	5	Tape hold assigned device
PMIDC	24	6-8	Tape initial disposition code
PM2164	25	0	Unused
PM2264	26	0	Unused
PMTSCV	27	0-1	Timestamp conversion specification TSCVTHIS=0 Convert to current COS system TSCVRT=1 Convert to RT-based timestamp TSCVNS=2 Convert to NS-based timestamp TSCVSAME=3 No conversion -- leave timestamp alone
PMTXO	27	48-63	TXT ORDINAL OF USER TASK
PMOCC	30	0	Operator-changed-class flag
PMLSD	30	8-31	Temporary SDT address for load input/output
PMFPE	30	36-63	First DSC page/entry for dataset
PMFPP	30	36-59	First DSC page for dataset
PMFEN	30	60-63	First entry for dataset
PMACS	31	0-15	Number of accesses (load saved datasets only)
PMDSZ	31	16-47	Size of dataset as reflected by DSC DAT bodies (used only when a pseudo access is performed during the recovery of rolled jobs)
PMOJSQ	31	48-63	Originating job sequence number
PMCRT	32	0-63	Creation time in cycles (load request only)
PMACT	33	0-63	Time of last access in cycles (load request only)

Field	Word(base8)	Bits	Description
PMTDM	34	0-63	Time of last dump in cycles (load request only)
PMMOD	35	0-63	Time of last modification in cycles (load request only)
PMSSC	36	0-7	Station slot word length
PMTXC	36	8-15	Text field word length
PMMML	36	16-27	Interactive maximum message length
PMPDE	37	0	Partial delete flag
PMREM	37	1	Remove permit flag
PMTRA	37	2-3	Track accesses flag: TRAKNO=1 Do not track accesses TRAKYE=2 Do track accesses
PMPAM	37	8-15	Public/permit access mode: PAMEX=O'011 Execute only PAMRE=O'001 Read permission PAMWR=O'002 Write permission PAMMA=O'004 Maintanence permission PAMNO=O'200 No permissions MAXPAM=5
PMADNM	37	16-31	ADN propagate attributes mask: PACW=O'000001 Control words PAPAM=O'000002 Public access mode PATRK=O'000004 Track accesses PAPER=O'000010 Permits PATXT=O'000020 Text PANTS=O'000040 Notes PAALL=O'000077 All of the above PANO=O'100000 None MAXPA=D'8 Maximum allowable attributes
PMADN	40	0-55	Attributes dataset name
PMNOTL	41	0-7	Notes length in words

Field	Word(base8)	Bits	Description
PMNOTE	41	8-31	Pointer to notes text LE@NOTE=D'60 Allow 480 characters for notes
PMCHG	42	0-63	Last modification time (PDSLOAD)
PMOWN	43-44	0-63	Dataset Owner
PMOWN1	43	0-63	Owner (char 1-8)
PMOWN2	44	0-55	Owner (char 9-15)
PMDNS	45	0-63	Reserved for installation
PMACN	46-47	0-63	Account Number
PMACN1	46	0-63	Characters 1-8 of account number
PMACN2	47	0-55	Characters 9-15 of account number

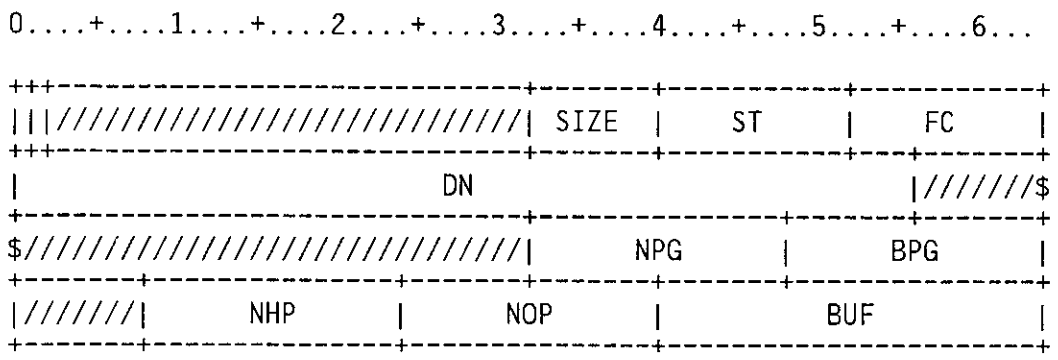


Figure PM-2. PDD Format 2

Field	Word(base8)	Bits	Description
PMSG	0	0	Normal completion message suppression indicator
PMERR	0	1	Error message suppression indicator
PMSIZE	0	32-39	PDD size in words
PMST	0	40-51	Return status
PMFC	0	52-63	Function code (see chart PM-1)
PMDN	1	0-55	Local Dataset Name (PMFCDT)
PMNPG	2	32-47	Number of pages (PMFCPG,PMFCPX)
PMBPG	2	48-63	Beginning page number (PMFCPG,PMFCPX)
PMNHP	3	8-23	Number of hash pages (returned by PDM for PMFCPG requests) for PMFCPX requests)
PMNOP	3	24-39	Number of overflow pages (returned by PDM for PMFCPG requests)
PMBUF	3	40-63	Buffer address

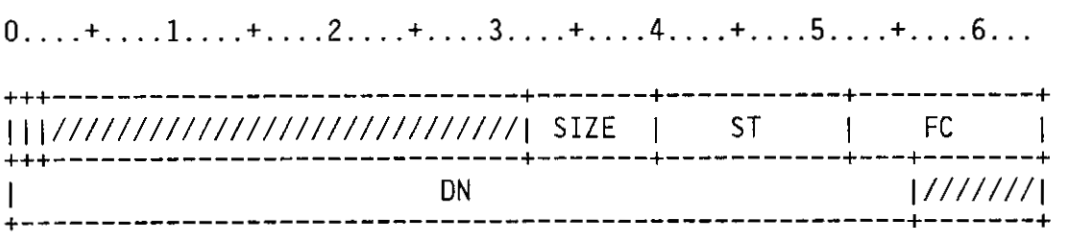


Figure PM-3. PDD Format 3

Field	Word(base8)	Bits	Description
PMSG	0	0	Normal completion message suppression indicator
PMERR	0	1	Error message suppression indicator
PMSIZE	0	32-39	PDD size in words
PMST	0	40-51	Return status
PMFC	0	52-63	Function code (see chart PM-1)
PMDN	1	0-55	Local dataset name

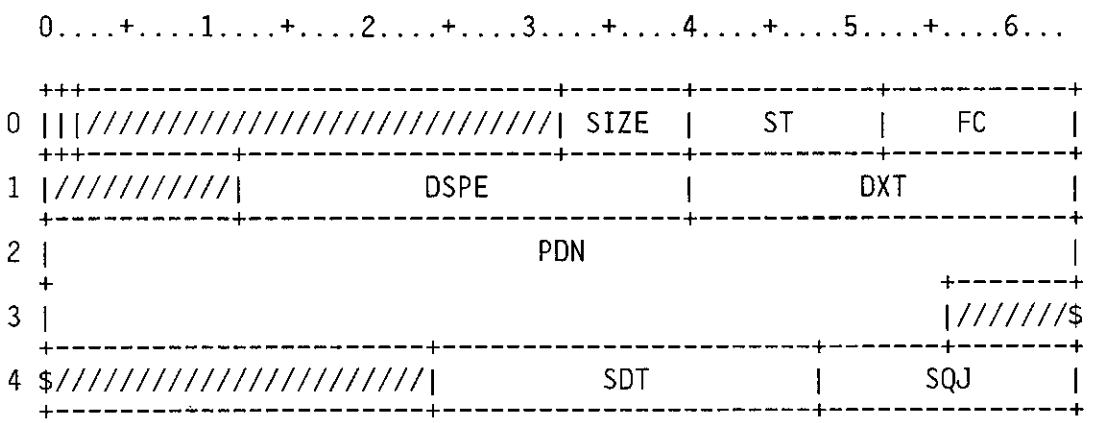


Figure PM-4. PDD Format 4

Field	Word(base8)	Bits	Description
PMSG	0	0	Normal completion message suppression indicator
PMERR	0	1	Error message suppression indicator
PMSIZE	0	32-39	PDD size in words
PMST	0	40-51	Return status
PMFC	0	52-63	Function code (see chart PM-1)
PMDSPE	1	12-39	Page/entry of main DSC entry (PMFCLKDX, PMFCRTDX requests)
PMDSP	1	12-35	Page number of main DSC entry (PMFCLKDX, PMFCRTDX requests)
PMDSE	1	36-39	Entry number of main DSC entry (PMFCLKDX, PMFCRTDX requests)
PMDXT	1	40-63	Pointer to DXT information buffer (PMFCLKDX, PMFCRTDX requests)
PMPDN	2-3	0-63	Permanent dataset name
PMPDN1	2	0-63	Characters 1-8
PMPDN2	3	0-55	Characters 9-15
PMSDT	4	24-47	SDT address Returned by PDM for PMFCDQ request Input for PMFCEA, PMFCEI, PMFCEO

Field	Word(base8)	Bits	Description
PMSQJ	4	48-63	Job sequence number (PMFCDQ request)

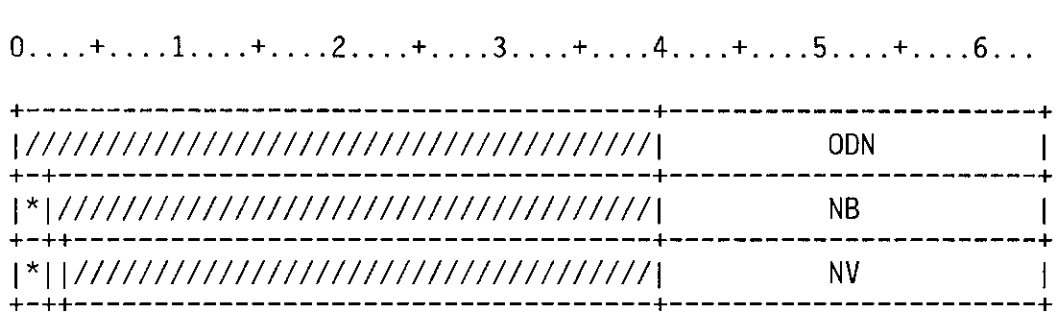


Figure PP-1. Position Parameter List

Field	Word(base8)	Bits	Description
PPODN	0	40-63	ODN addr
PPBD	1	0-1	Block position direction 0 - Absolute block number 2 - Position forward 3 - Position backward
PPNB	1	40-63	Number of blocks / block number
PPVD	2	0-1	Volume direction 0 - Absolute volume number 2 - Position forward 3 - Position backward
PPVF	2	2	Volume number/vol flag 0 - Position by volume number 1 - Position by volume serial number
PPNV	2	40-63	Volume number Output - blocks not sent to iop Input - always 0

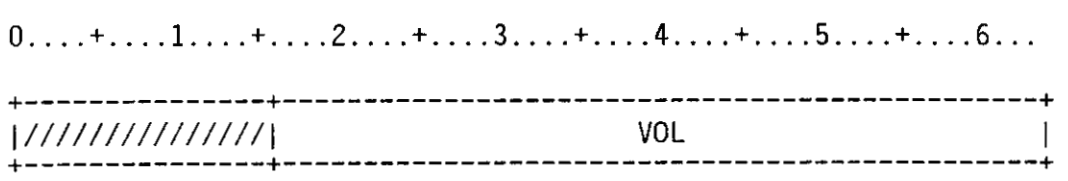


Figure PP-2. Position Parameter List

Field	Word(base8)	Bits	Description
PPVOL	2	16-63	Volume serial number

This comdeck defines symbols to be used in making requests of the permanent dataset manager, PDM.

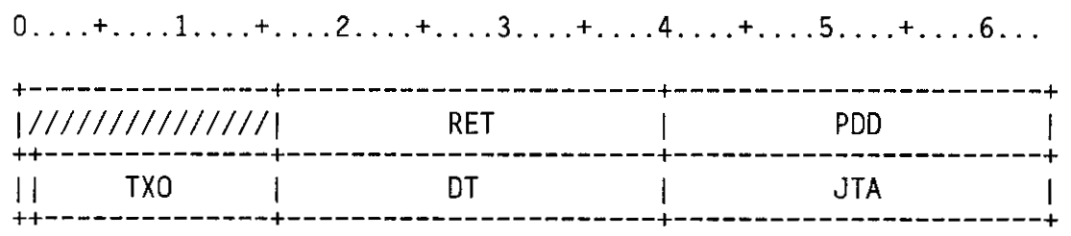


Figure PQ-1. PDM Request Definitions

Input+0

Field	Word(base8)	Bits	Description
PQRET	0	16-39	Return address
PQPDD	0	40-63	PDD address
Input+1			
PQSYS	1	0	=1 if system call, =0 if user call
PQTXO	1	1-15	TXT ordinal, if task-related request
PQDT	1	16-39	DAT/DNT address
PQJTA	1	40-63	JTA address, if job-related request

The Procedure File Stack Table is JTA resident and serves as a stack for the nesting of control statement datasets. The F$PRC and F$RTN calls add entries to and delete them from this stack.

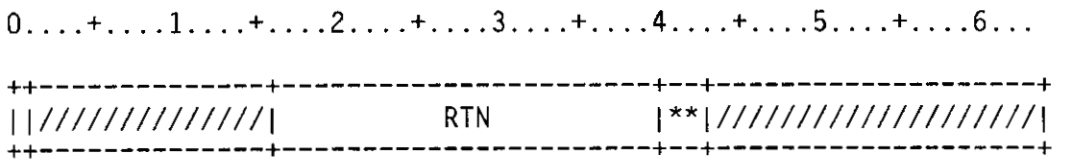


Figure PR-1. Procedure File Stack Table header

Field	Word(base8)	Bits	Description
PRABT	0	0	RTN abort flag
PRRTN	0	16-39	RTN return address
PRLVL	0	40-42	Current stack level (0-7)

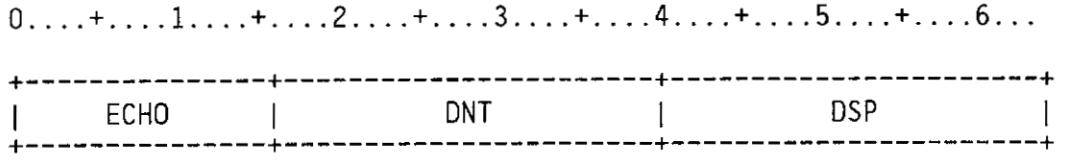


Figure PR-2. Procedure File Stack Table entry

Field	Word(base8)	Bits	Description
PRECHO	0	0-15	ECHO status of message classes
PRDNT	0	16-39	$CS DNT address (JTA relative)
PRDSP	0	40-63	$CS JTA save area address (JTA relative)

The Pool Table is an STP-resident table used for memory pool management.

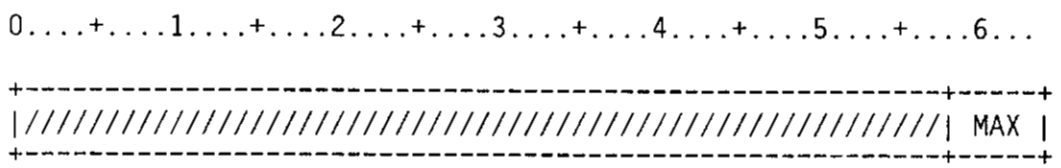


Figure PT-1. Memory Pool Table header

Field	Word(base8)	Bits	Description
PTMAX	0	58-63	Maximum valid pool number

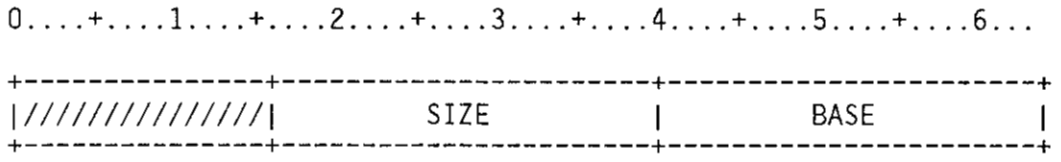


Figure PT-2. Memory Pool Table Entry

Field	Word(base8)	Bits	Description
PTSIZE	0	16-39	Size of the memory pool
PTBASE	0	40-63	Base address of the memory pool

Name: Processor Working Storage (PWS).

Purpose: There is one PWS entry in EXEC memory for each CPU mainframe. It contains exchange packages and CPU-sensitive data.

Note: Because each PWS entry contains exchange packages, each entry must be a multiple of LE@XP in length. In addition, the first entry must be allocated on an exchange package boundary. For this reason, the header is variable-length, and LH@PWS is defined when the table is built.

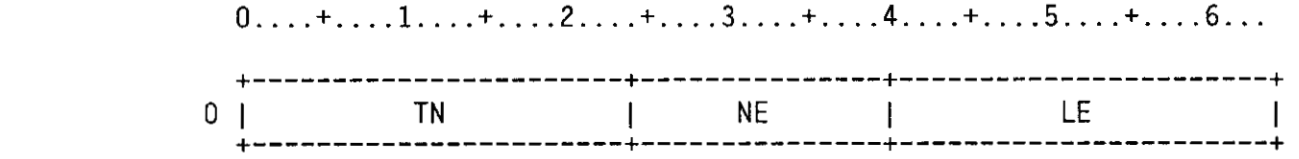


Figure PW-1. Processor Working Storage header

Header. Variable length.

Field	Word(base8)	Bits	Description
PWTN	0	0-23	Table name (ASCII 'PWS')
PWNE	0	24-39	Number of entries (=NE@PWS)
PWLE	0	40-63	Length of entry (=LE@PWS)

Entry. First word is identification and CPU status.
Comments start in column 40.

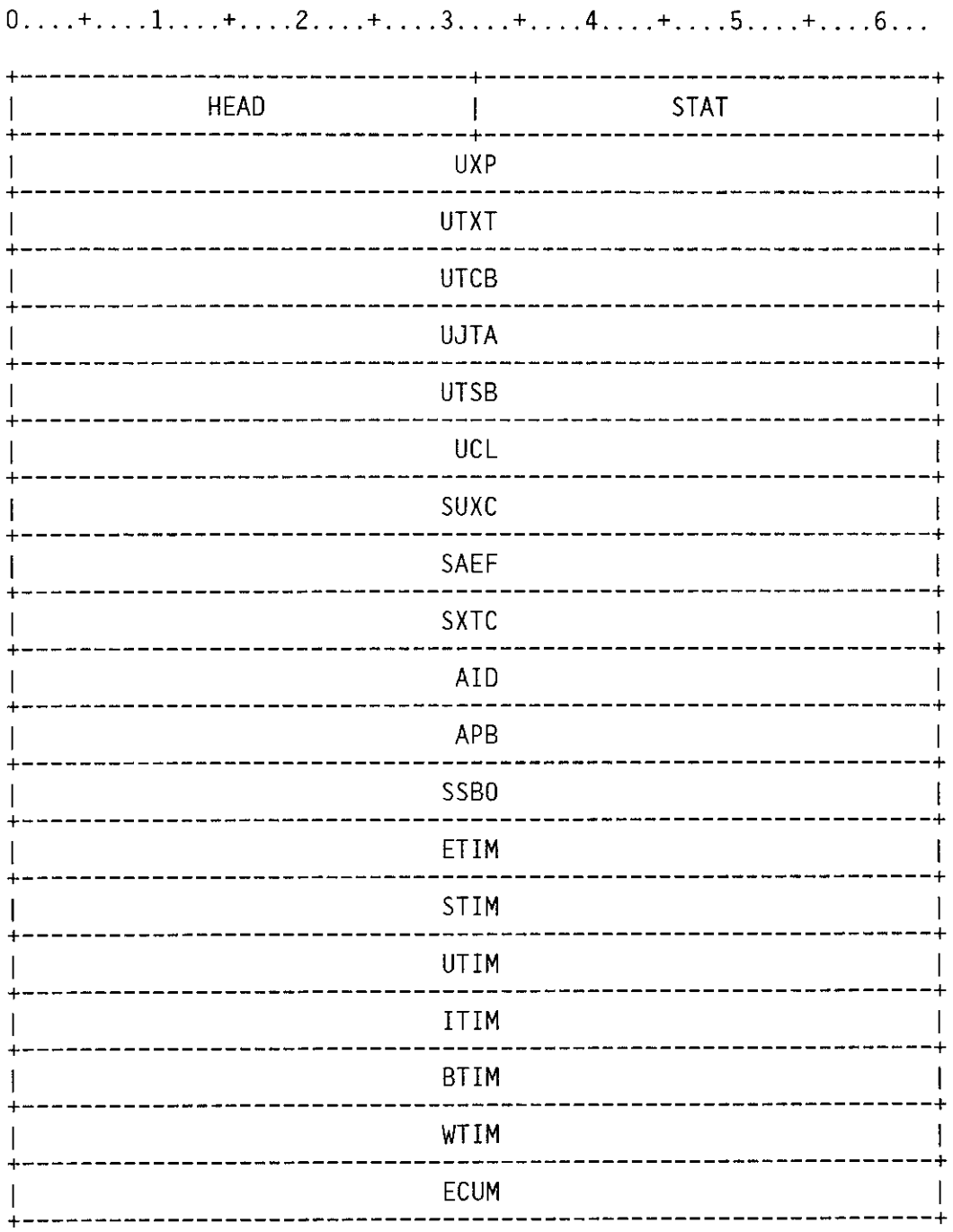


Figure PW-2. Processor Working Storage entry

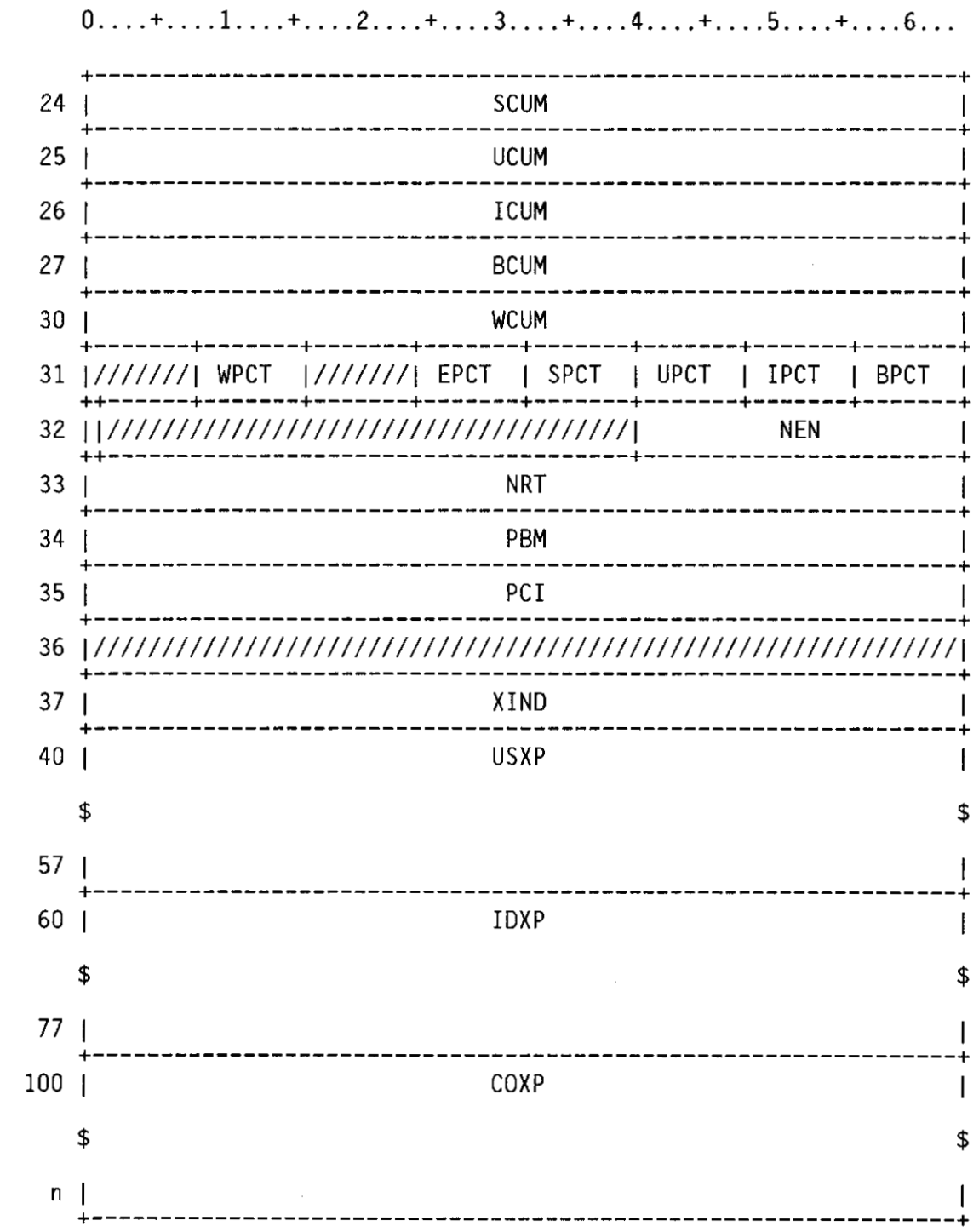


Figure PW-2. Processor Working Storage entry

Field	Word(base8)	Bits	Description
PWHEAD	0	0-31	Entry header (ASCII 'CPUn')
PWSTAT	0	32-63	Processor status
PWINIT	0	62	CPU requested to start
PWEXEC	0	63	CPU has started execution
User job information.			
PWUXP	1	0-63	EXEC address of connected user XP (NZ if any user connected)
PWUTXT	2	0-63	EXEC-rel address of connected TXT
PWUTCB	3	0-63	EXEC-rel address of connected TCB
PWUJTA	4	0-63	EXEC-rel address of JTA for user task connected.
PWUTSB	5	0-63	EXEC-rel addr of user's task status block (0 if none)
PWUCL	6	0-63	XMP cluster assigned to user task
PWSUXC	7	0-63	NZ if user XP in TCB; ZR if PWS
PWSAEF	10	0-63	W@XPF from XP for some requests
PWSXTC	11	0-63	RT at start of EXEC interval
PWAID	12	0-63	ASCII ID of process currently in CPU: USER/IDLE/MEM-COR/task/EXEC.
PWAPB	13	0-63	Active STT entry address
PWSSBO	14	0-63	BOO save area
Processor execution time information.			
PWETIM	15	0-63	EXEC time in interval
PWSTIM	16	0-63	STP time in interval
PWUTIM	17	0-63	User time in interval
PWITIM	20	0-63	Idle time in interval
PWBTIM	21	0-63	I/O blocked time in interval
PWWTIM	22	0-63	SYSWAIT time in interval

Field	Word(base8)	Bits	Description
PWECUM	23	0-63	EXEC time since last SPM call
PWSCUM	24	0-63	STP time since last SPM call
PWUCUM	25	0-63	User time since last SPM call
PWICUM	26	0-63	Idle time since last SPM call
PWBCUM	27	0-63	Blocked time since last SPM call
PWWCUM	30	0-63	SYSWAIT time since last SPM call
PWWPCT	31	8-15	SYSWAIT percent time in interval
PWEPCT	31	24-31	EXEC percent time in interval
PWSPCT	31	32-39	STP percent time in interval
PWUPCT	31	40-47	User percent time in interval
PWIPCT	31	48-55	Idle percent time in interval
PWBPCT	31	56-63	Blocked percent time in interval
Time event and programmable clock information.			
PWCAN	32	0	Event cancelled flag
PWNEN	32	40-63	Event number (-1 if none)
PWNRT	33	0-63	Real time of event (if NEN > 0)
PWPBM	34	0-63	Processor-specific bit map
PWPCI	35	0-63	Last PCI value set
Exchange package header and exchange packages.			
The following series of SETs ensures that PWXIND is on an XP boundary and hence PWUXSP starts on an XP boundary.			
PWXIND	37	0-63	Exchange package indicator
PWUSXP	40-57	0-63	User exchange package
PWIDXP	60-77	0-63	Idle exchange package
PWCOXP	100-n	0-63	Memory error correction exchange pkg.

COMPX

Processor Execution table

The processor execution table is contained in the system task area, and is used by the job scheduler to determine which physical CPUs are available for user scheduling. As CPUs are brought online by EXEC, the corresponding entries in the PX table are updated. All other uses of the table are controlled by system tasks.

The address of the first entry is contained in STP pointer word CPSTAT. Subsequent entries follow at LE@PXT intervals.

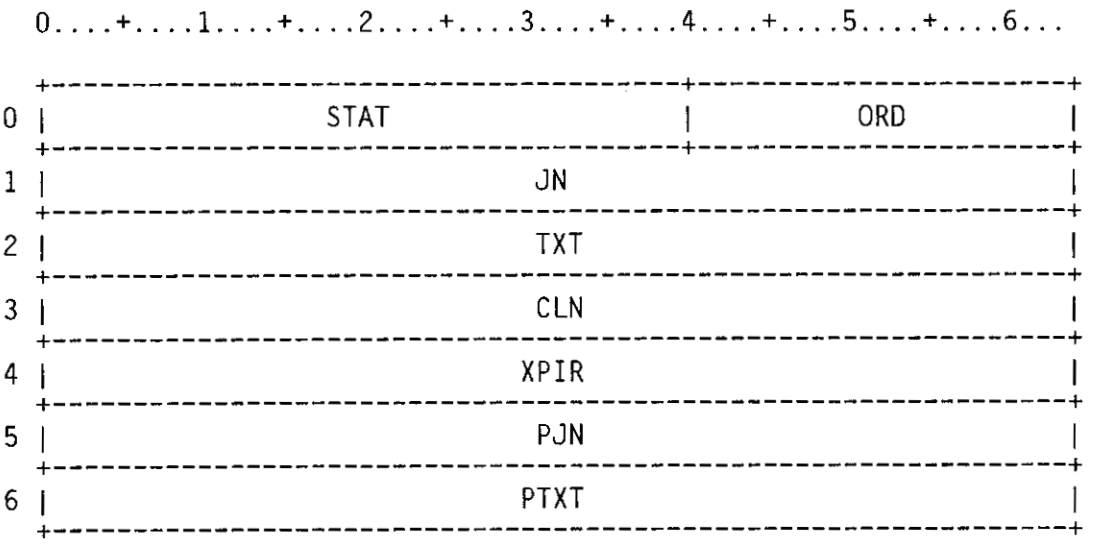


Figure PX-1. Processor execution table

Field	Word(base8)	Bits	Description
PXSTAT	0	0-39	CPU status information:
PXINIT	0	0	CPU initialization has completed
PXPVT	0	1	CPU available only by specific rqst.
PXIDLE	0	2	Operator has requested CPU be idled
PXORD	0	40-63	PXT entry ordinal (CPU number)
PXJN	1	0-63	Name of connected job
PXTXT	2	0-63	TXT address of connected task
PXCLN	3	0-63	Cluster number assigned to task

Field	Word(base8)	Bits	Description
PXXPIR	4	0-63	NZ if time slice has expired for user.
PXPJN	5	0-63	Previously connected job name
PXPTXT	6	0-63	Previously connected TXT address

This EXEC-resident table is used by the I/O Processor driver and time event scheduler. This table is manipulated by EXEC routines CLRQ, ENQ, and DEQ.

This is the table header for tables manipulated by the EXEC queue manager, specifically, FIQ, FOQ, and SCT.

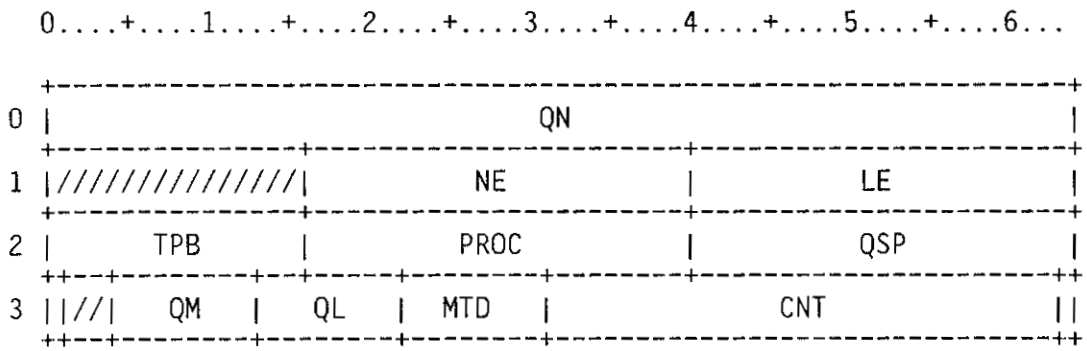


Figure QC-1. Queue Control Table header

Field	Word(base8)	Bits	Description
QCQN	0	0-63	Queue name
QCNE	1	16-39	Initial number of entries in queue
QCLE	1	40-63	Initial length of each queue entry
QCTPB	2	0-15	Task parameter block address
QCPROC	2	16-39	Queue processor address
QCQSP	2	40-63	Pointer to SCT table in STP task
QCINH	3	0	Inhibit enqueueing flag
QCQM	3	4-12	Maximum allowable queue length
QCQL	3	13-21	Current number of items in the queue
QCMTD	3	22-30	Maximum queue length to date
QCCNT	3	31-62	Total items ever queued

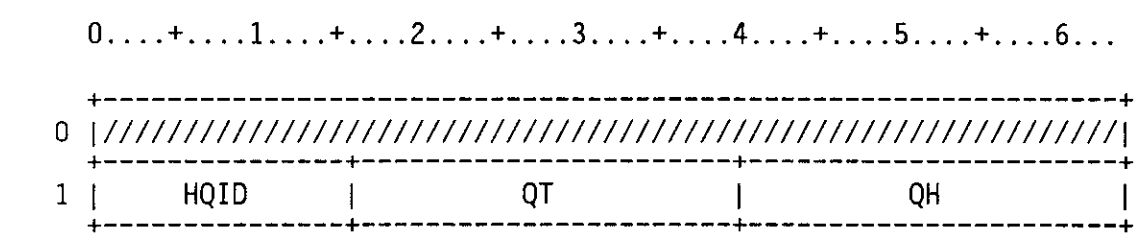


Figure QC-2. Word 1 After Initialization

Field	Word(base8)	Bits	Description
QCHQID	1	0-15	Queue head ID
QCQT	1	16-39	Queue tail link address
QCQH	1	40-63	Queue head link address

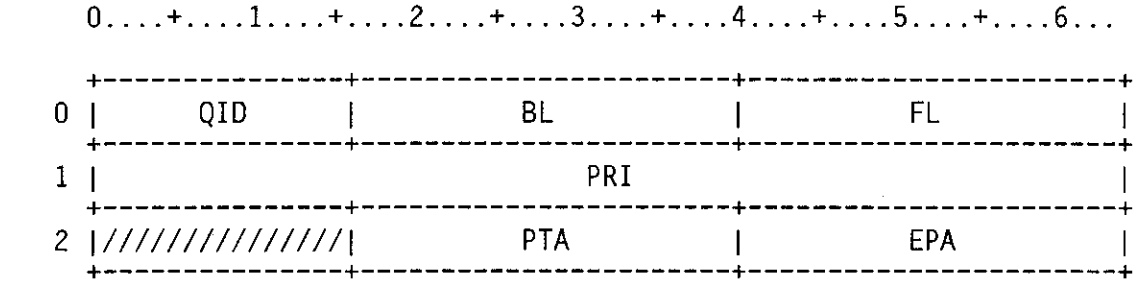


Figure QC-3. Priority and time event queue entry

Field	Word(base8)	Bits	Description
QCQID	0	0-15	Queue ID (two ASCII characters)
QCBL	0	16-39	Backward link address
QCFL	0	40-63	Forward link address
QCPRI	1	0-63	Priority level (for priority enqueue)
QCPTA	2	16-39	Parameter table address
QCEPA	2	40-63	Event processor address

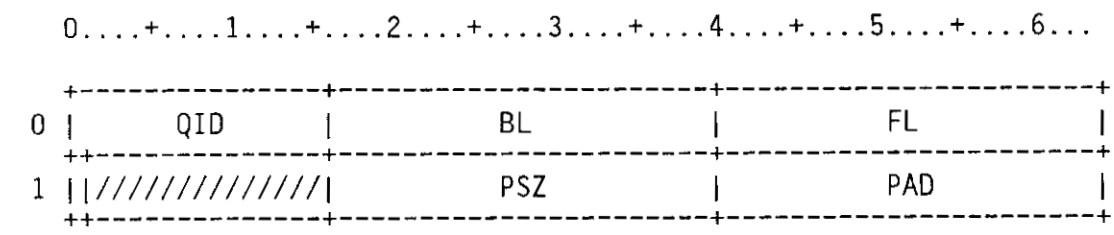


Figure QC-4. IOP driver packet queue Entry

Field	Word(base8)	Bits	Description
QCQID	0	0-15	Queue ID (two ASCII characters)
QCBL	0	16-39	Backward link address
QCFL	0	40-63	Forward link address
QCFREE	1	0	Free packet after output
QCPSZ	1	16-39	Packet size in words
QCPAD	1	40-63	EXEC relative packet address

The Queued Dataset Table is an STP-resident table that describes the multitype attributes for a dataset that has been disposed. This table is managed by PDM and EXP. The number of entries in the QDT equals the SDT entry count.

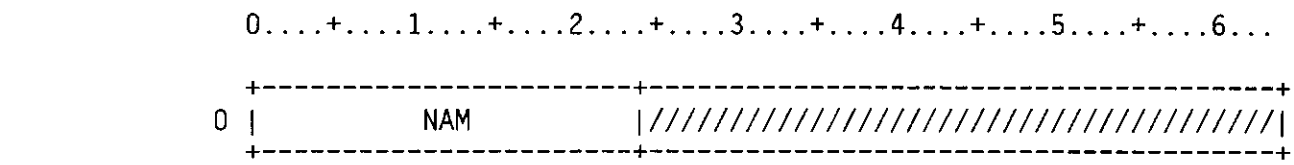


Figure QD-1. Queued Dataset Table header

Field	Word(base8)	Bits	Description
QDNAM	0	0-23	ASCII name of table, 'QDT'

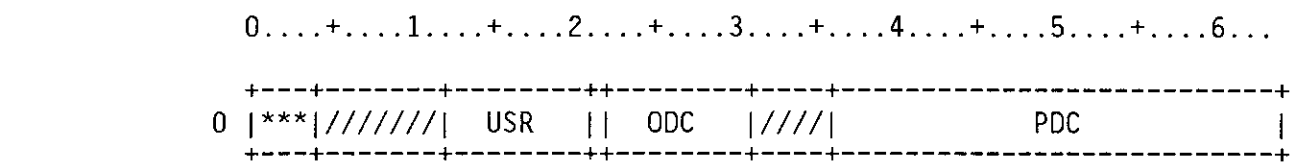


Figure QD-2. Queued Dataset Table entry

Field	Word(base8)	Bits	Description
QDSERR	0	0-3	STARTUP entry deactivation flags
QDDWN	0	0	Down device encountered
QDCRS	0	1	Cross allocation found
QDCAT	0	2	Catastrophic error in DSC entry
QDIDA	0	3	Inconsistent multitype allocation
QDUSR	0	12-20	Number of users who have disposed the dataset with no release
QDODC	0	22-30	Outstanding dispose count
QDPDC	0	36-63	DSC entry of permanent version
QDPDP	0	36-59	DSC page number
QDPDE	0	60-63	DSC entry number

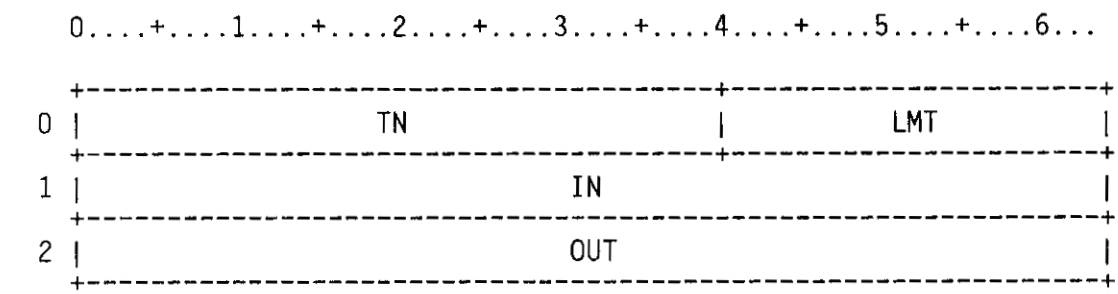


Figure QP-1. Queued Packet Table

Define the header

Field	Word(base8)	Bits	Description
QPTN	0	0-39	Table name in ASCII
QPLMT	0	40-63	LA+1 of entry area
QPIN	1	0-63	IN pointer (modified by sender)
QPOUT	2	0-63	OUT pointer (modified by receiver)

IN and OUT control the amount of valid information in the buffer. If IN == OUT the buffer is empty. If IN+LE@QPT == OUT the buffer is full. Note that the entry just before OUT can never be used, and hence for k usable entries, the queue must contain k+1 entries.
Note also that LMT, IN, and OUT are relative to the base of the QPT header, and hence should be initialized to (e.g., LMT) LH@QPT + LE@QPT*(number of entries).

Now define the entries

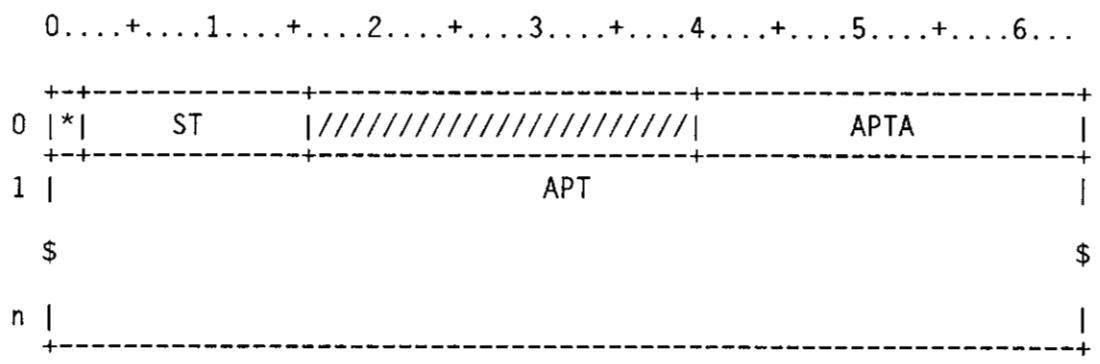


Figure QP-2. Queued Packet Table

Field	Word(base8)	Bits	Description
QPQST	0	0-1	Queue status flags
QPACTV	0	0	Active flag
QPDONE	0	1	Done flag
QPST	0	2-15	Status returned by EXEC
QPAPTA	0	40-63	APT addr (if not in queue)
QPAPT	1-n	0-63	Body of the packet (if QPAPTA zero)

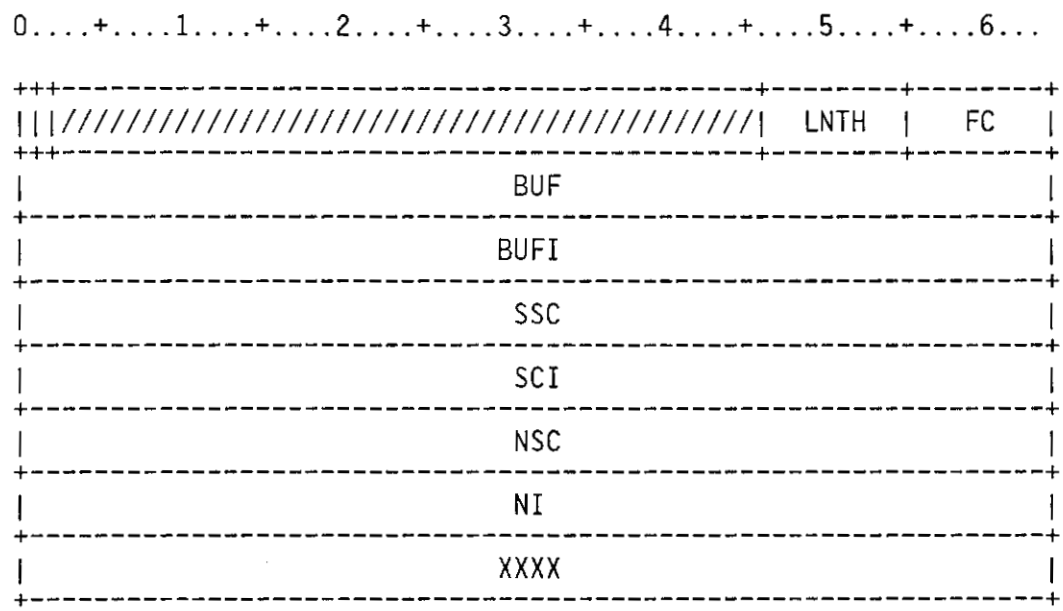


Figure QR-1. Queued I/O Request Table

QRTD	0	0	Transfer direction (0=read)

Field	Word(base8)	Bits	Description
QRCMPD	0	1	Compound request
QRLNTH	0	46-54	Length of entry
QRFC	0	55-63	Function code QIO$STOP=0 Stop QIO$RR=1 Resume if in Recall QIO$IO=2 I/O
QRBUF	1	0-63	Buffer addr
QRBUFI	2	0-63	Buffer addr increment
QRSSC	3	0-63	Sector number
QRSCI	4	0-63	Sector increment
QRNSC	5	0-63	Number of sectors
QRNI	6	0-63	Number of increments
QRXXXX	7	0-63	**** UNUSED ****

Due to a software problem, page number 410 was not used; no information is missing.

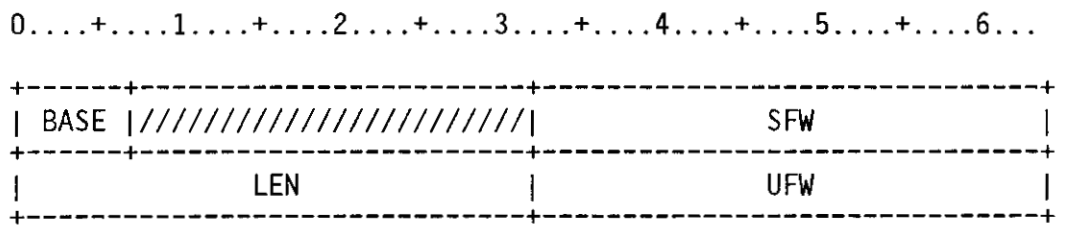


Figure RB-1. Receive Buffer Table

Field	Word(base8)	Bits	Description
RBBASE	0	0-6	Bias of system memory address RBBS$ABS=1 Absolute RBBS$STP=2 STP RBBS$JTA=3 JTA (of this user)
RBSFW	0	32-63	FW of system memory to copy from
RBLEN	1	0-31	Length of memory to copy
RBUFW	1	32-63	FW of user are to copy to

The following symbols define bit positions in the RI word of LOWSTP. Each bit corresponds to a particular EXEC function/ processor which is implicitly enabled.

```
RI$PKT    =  1              IOS packet queued
RI$SSD    =  2              SSD request queued
RI$MAX    =  RI$SSD
```

The RJI table contains entries for each defined JXT entry describing the job assigned to the JXT entry and controlling the recovery of jobs from mass storage entries.Entry zero is used mainly to validate the roll index dataset. Other entries indicate which JXT entries have active jobs, and hold information used to locate roll images.

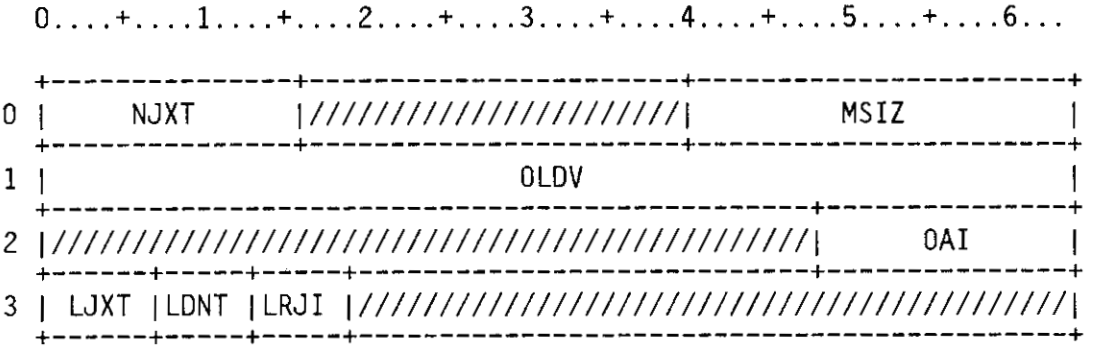


Figure RJ-1. RJ Entry Zero Only

Field	Word(base8)	Bits	Description
RJNJXT	0	0-15	Number of JXT entries in the last deadstarted system
RJMSIZ	0	40-63	Memory size at last deadstart
RJOLDV	1	0-63	Device name containing index for $ROLL dataset
RJOAI	2	48-63	First (or only) AI in $ROLL index
RJLJXT	3	0-6	Length of JXT entry in old system
RJLDNT	3	7-12	Length of DNT entry in old system
RJLRJI	3	13-18	Length of RJ index entry in old system

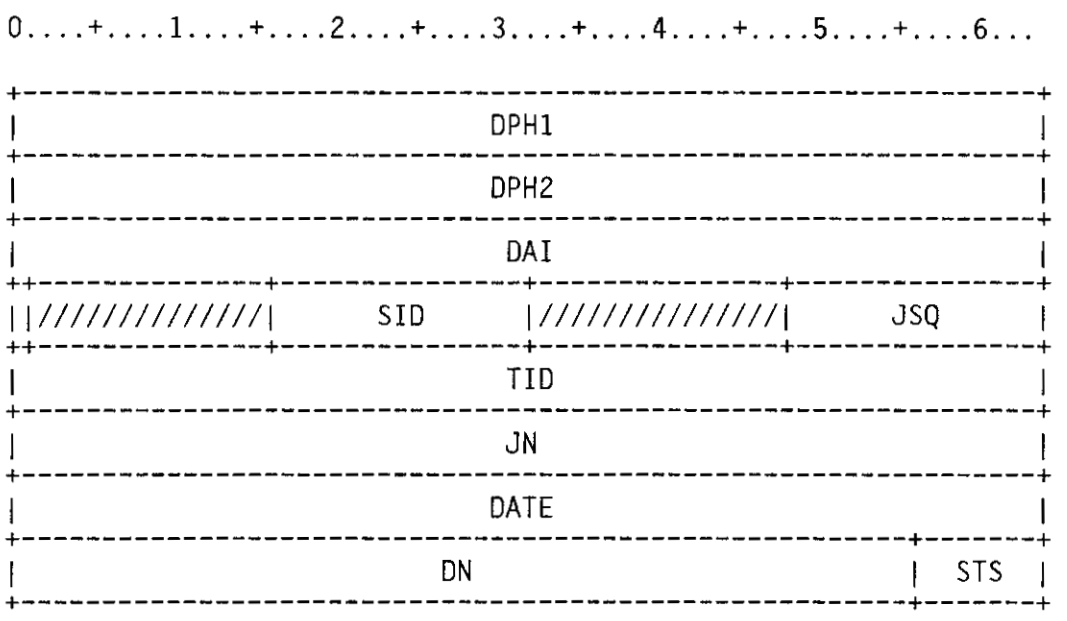


Figure RJ-2. Rolled Job Index Table entry

Field	Word(base8)	Bits	Description
RJDPH1	0	0-63	Word 0 of job roll DAT partition header
RJDPH2	1	0-63	Word 1 of job roll DAT partition header
RJDAI	2	0-63	First AI word from roll DAT (1-4 AIs)
RJNRCV	3	0	Job irrecoverable flag
RJSID	3	16-31	Station ID of job origin
RJJSQ	3	48-63	Job sequence number
RJTID	4	0-63	Terminal ID of job origin
RJJN	5	0-63	Jobname
RJDATE	6	0-63	Date/time (system generated)
RJDN	7	0-55	Dataset name for irrecoverable action
RJSTS	7	56-63	Status causing irrecoverability

Roll index is read and written using buffer RJINDEX. Sizes are as follows:

```
L@RJNDX   =  NE@RJ*LE@RJ        Amount of index that can be used
SZ@RJNX   =  L@RJNDX+D'511
SZ@RJNDX  =  SZ@RJNX/O'1000*O'1000
                          (Must be a multiple of disk sector)

MAXRRJ    =  1                  Maximum code for type of RJ
MAXLOCK   =  2                  Maximum value for lockout option
```

Status set by RRJ into input SDTs:

```
RJCDNINI  =  0                  Job not previously initiated
RJCDRRN   =  1                  Job rerun by system recovery
RJCDNRR   =  2                  System recovery, job not
                                  rerunnable
SDJCE     =  3                  Job statement error code setby
                              system job card interpreter (IND)

SDRIER    =  4                  Roll-in error is rerunnable
SDRIEN    =  5                  Roll-in error is not rerunnable
SDCJSE1   =  6                  Job fits no class
SDCJSE2   =  7                  Class specified by CL doesn't
                                  exist
SDCJSE3   =  D'8                Job doesn't fit class specified by
                                  CL
SDCJSE4   =  D'9                MFL param exceeds maximum allowed
SDCJSE5   =  D'10               MFL param increasedminimum allowed
```

The following codes are values saved in the rolled job index as to why a job is declared not-recoverable at run-time.

```
RJSTNR    =  1                  Job was never rolled out
RJSTWR    =  2                  Write to random dataset
RJSTNSW   =  3                  Non-sequential write
RJSTSV    =  4                  Save of a dataset
RJSTDL    =  5                  Delete of a dataset
RJSTADJ   =  6                  Adjust of a dataset
RJSTMOD   =  7                  Modify of a dataset
RJSTFCH   =  D'8                Fetch of a dataset
RJSTQIO   =  D'9                Queued I/O on a dataset
```

Message codes:

```
RJCD0     =  0                  Unexpected status on access
RJCD1     =  1                  Recovery of rolled jobs aborted
RJCD2     =  2                  Old system JXT count error
RJCD3     =  3                  Index zero device name error
RJCD4     =  4                  Index zero AI error
```

```
RJCD5     = 5              I/O error on $ROLL
RJCD6     = 6              Job not recoverable (index)
RJCD7     = 7              Missing device in roll dataset
RJCD8     = D'8            Down device in roll dataset
RJCD9     = D'9            Job too large for memory
RJCD10    = D'10           I/O error on roll dataset
RJCD11    = D'11           JTA/JXT length error
RJCD12    = D'12           JTA/user time/date error
RJCD13    = D'13           JTA/JXT name error
RJCD14    = D'14           Bad DNT chain
RJCD15    = D'15           STP DAT not $CS or $IN
RJCD16    = D'16           Error on pseudo-access
RJCD17    = D'17           No input SDT
RJCD18    = D'18           DAT space full
RJCD19    = D'19           DAT page number error in roll DAT
RJCD20    = D'20           Ordinal error in roll DAT
RJCD21    = D'21           Bad page pointer in roll DAT
RJCD22    = D'22           DAT validation error
RJCD23    = D'23           Job recovered
RJCD24    = D'24           RRJ impossible in deadstart
RJCD29    = D'29           Unexpected status access class in
                         roll dataset

RJCD30    = D'30           Class roll dataset does not exist
RJCD31    = D'31           Job class structure recovery OK
RJCD32    = D'32           Cannot access dataset from *JCLASS
RJCD33    = D'33           Class structure loaded from
                             *JCLASS
RJCD34    = D'34           Default class structure used
RJCD35    = D'35           Date/time error on JC roll dataset
RJCD36    = D'36           Date/time error on JCLASS dataset
RJCD37    = D'37           Not recoverable dure to EXP resume
RJCD38    = D'38           System mismatch, nonrecoverable
                             job
RJCD39    = D'39           Job resumable after system
                             mismatch
RJCD40    = D'40           Job locked out after system
                             mismatch
RJCD41    = D'41           Job not rerunnable
RJCD42    = D'42           Job will be rerun
RJCD43    = D'43           Invalid QDT index
RJCD44    = D'44           Tape dataset not recoverable
RJCD45    = D'45           Resource profile changed by
                             restart
```

System directory recovery message codes:

```
SDCD25    = D'25           Access failed for $SDR
SDCD26    = D'26           Adjust failed for $SDR
SDCD27    = D'27           Access failed for SDR entry
SDCD28    = D'28           # of resident SDR entries
```

decreased

Error codes for errors encountered during validation of DATs for datasets in rolled jobs:

RJVDBOFF	=	1	Bad JTA offset for first page
RJVDBPN	=	2	Bad first page number
RJVDORD	=	3	Bad JXT ordinal first page
RJVDNSD	=	4	Device not in configuration
RJVDDWN	=	5	Down device
RJVDBAI	=	6	Bad allocation index in DAT
RJVDAIC	=	7	AI conflict
RJVDIA	=	D'8	Inconsistent multi-type allocation
RJVDBNP	=	D'9	Bad next page offset
RJVDBCP	=	D'10	Bad continuation page pointer
RJVDBCO	=	D'11	Bad continuation page JXT ordinal
RJVDSRC	=	D'12	Inconsistent DAT page source
RJVDBCA	=	D'13	Bad continuation page offset address
RJVDBPP	=	D'14	Bad next partition pointer
RJVDPEOD	=	D'15	Premature end-of-DAT
RJVDMSTR	=	D'16	STRIPE GROUPING HAS BEEN MODIFIED

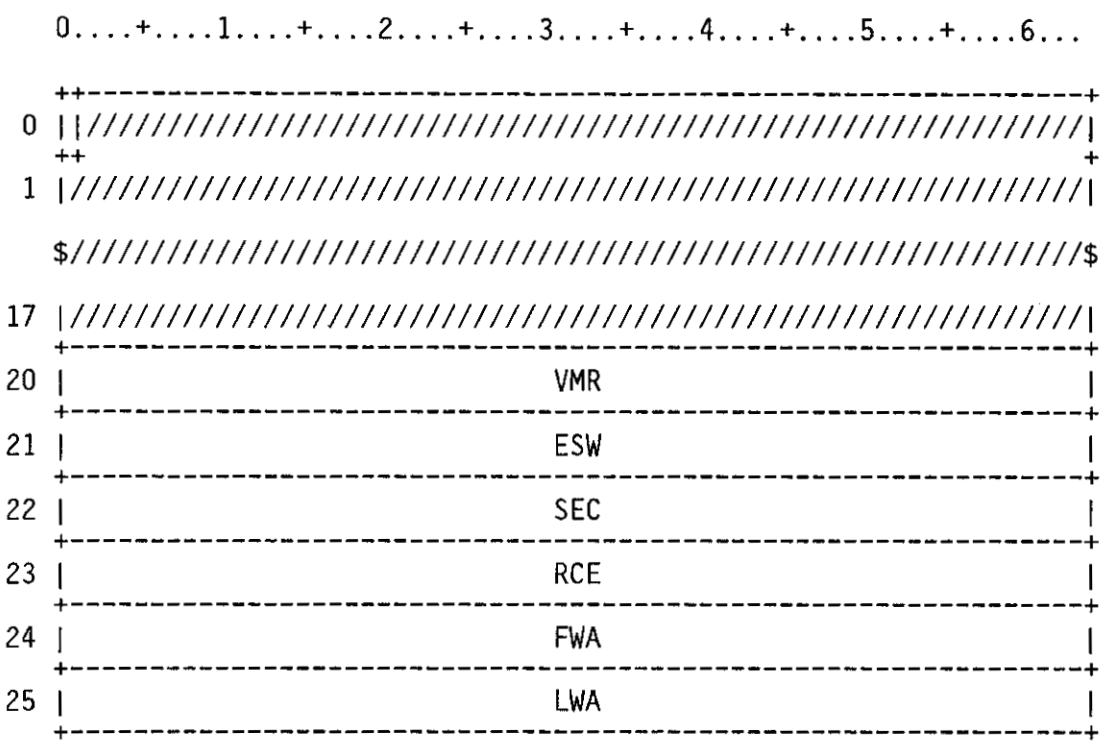


Figure RPV-1. Repreive Data Table

Field	Word(base8)	Bits	Description
RPVXP	0	0	Exchange package save area
RPVVMR	20	0-63	Vector mask register
RPVESW	21	0-63	Error status word
RPVSEC	22	0-63	System error code
RPVRCE	23	0-63	Reprieve code entry point
RPVFWA	24	0-63	First word address of reprieve code
RPVLWA	25	0-63	Last word address of reprieve code

The Request Table is an STP-resident table primarily used for disk queue management.

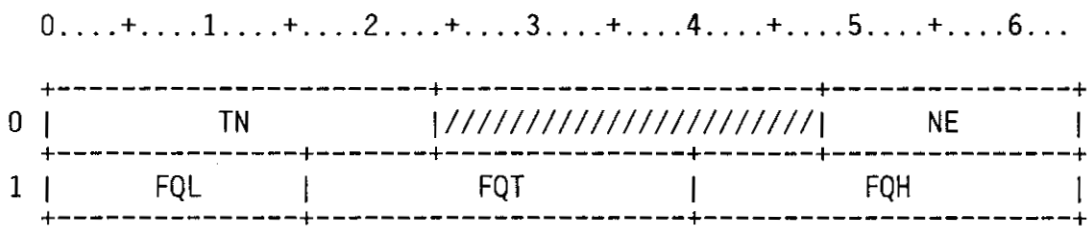


Figure RQ-1. Request Table header

Field	Word(base8)	Bits	Description
RQTN	0	0-23	Table name; 'RQT' in ASCII.
RQNE	0	48-63	Number of entries
RQFQL	1	0-15	Free queue length
RQFQT	1	16-39	Free queue tail
RQFQH	1	40-63	Free queue head

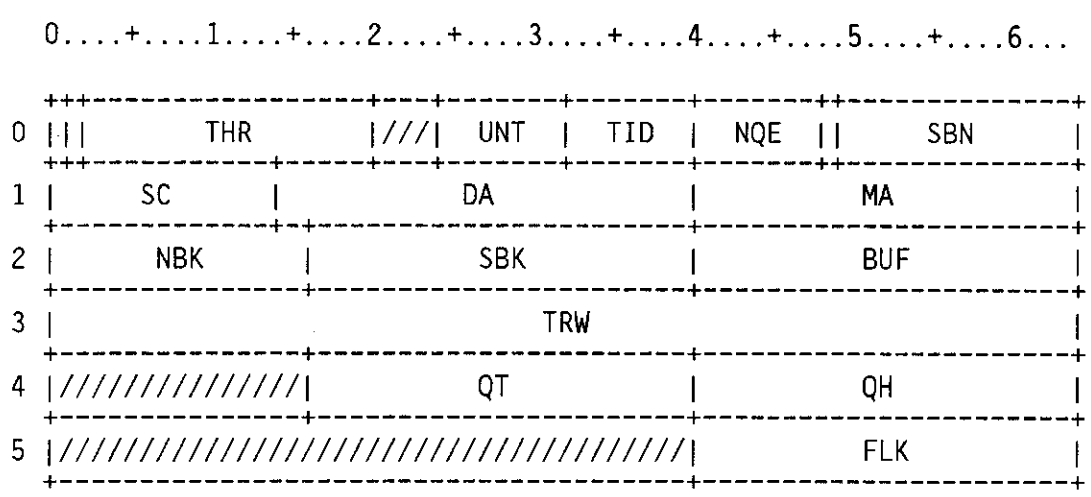


Figure RQ-2. Request Table entry

Field	Word(base8)	Bits	Description
RQTD	0	0	Transfer direction 0=Read 1=Write
RQQIO	0	1	Queued I/O flag
RQTHR	0	2-19	Streaming threshold
RQUNT	0	24-31	Unit number
RQTID	0	32-39	Requesting task ID
RQNQE	0	40-47	Number of queued I/O entries processed
RQCHK	0	48	Block number error checking request flag (for IOS use)
RQSBN	0	49-63	Starting logical block number (for IOS error checking)
RQSC	1	0-13	Sector count
RQDA	1	14-39	Disk address
RQCA	1	14-25	Current cylinder address
RQTA	1	26-31	Current track address
RQSA	1	32-39	Current sector address
RQMA	1	40-63	Memory address
RQNBK	2	0-15	Block count

Field	Word(base8)	Bits	Description
RQSBK	2	16-39	Starting block
RQBUF	2	40-63	Buffer address
RQTRW	3	0-63	Task reply word
RQRET	3	0-23	Caller's return address
RQRCL	3	24	Recall reply flag
RQTXO	3	25-39	TXT offset for job-related requests
RQDNT	3	40-63	DNT address (STP relative)
RQQT	4	16-39	PHR queue tail pointer
RQQH	4	40-63	PHR queue head pointer
RQFLK	5	40-63	Forward link

The SSD Active Channel Table is an STP-resident table used to manage the SSD channels.

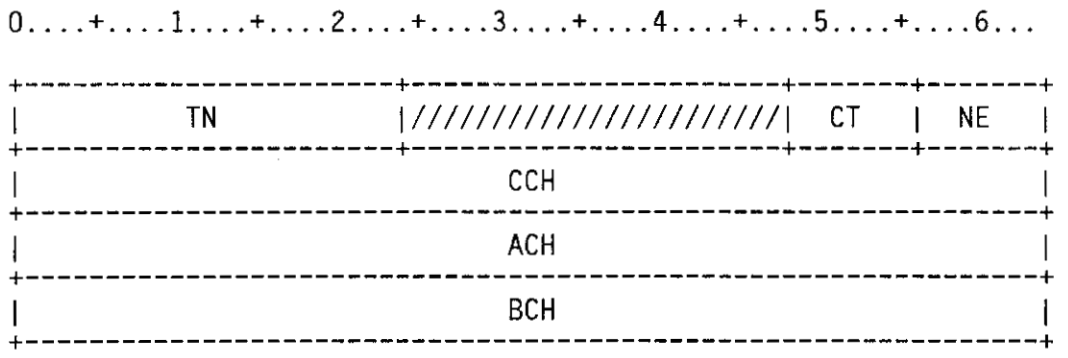


Figure SA-1. SSD Active Channel Table header

Field	Word(base8)	Bits	Description
SATN	0	0-23	table name ('SAC')
SACT	0	48-55	channel type, as defined in CONFIG@P
SANE	0	56-63	number of entries (one per channel)
SACCH	1	0-63	configured channels bitmap
SAACH	2	0-63	available channels bitmap
SABCH	3	0-63	busy channels bitmap

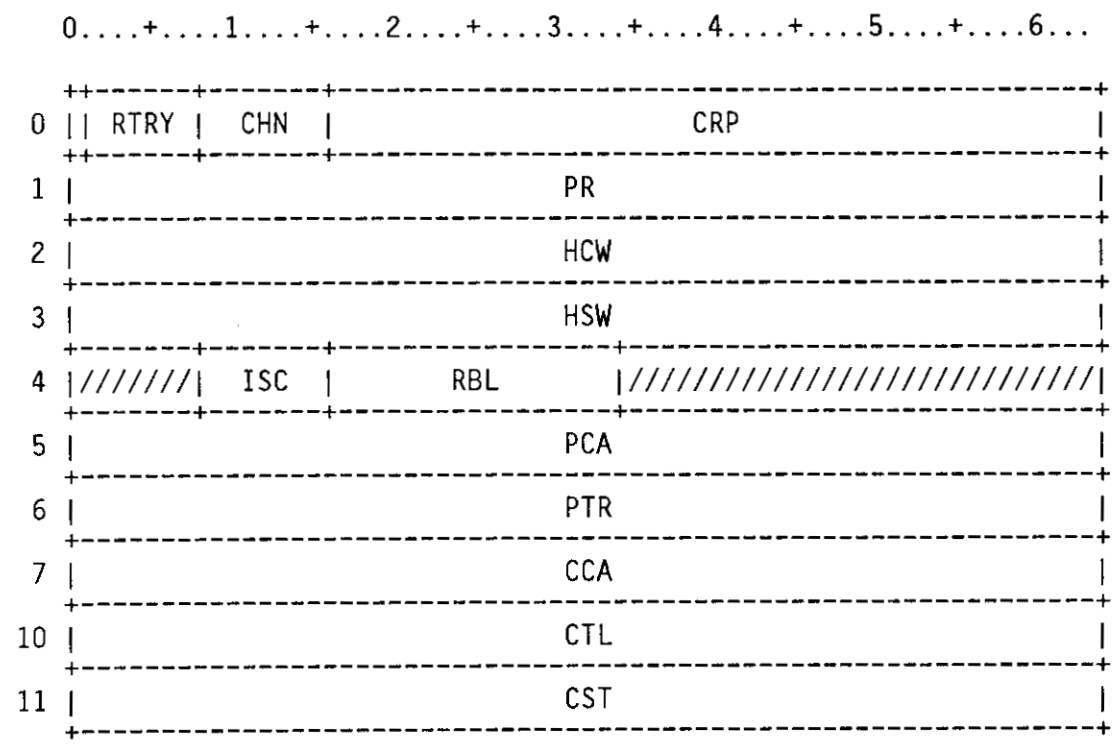


Figure SA-2. SSD Active Channel Table entry

Field	Word(base8)	Bits	Description
SATD	0	0	transfer direction
SARTRY	0	1-7	retry count
SACHN	0	8-15	channel number
SACRP	0	16-63	current request pointers
SALRA	0	16-39	logical request address
SAPRA	0	40-63	physical request address

CAUTION: The format of the following word is assumed to be the same in CBT, EQT, PHR, and RQT.

SAPR	1	0-63	physical request
SASC	1	0-13	sector count
SADA	1	14-39	disk address
SAMA	1	40-63	CPU memory address

The HSC and HDA fields in the next word are set up so that, although the values inserted are in sectors, the High Speed Controller interprets them as in 64-word blocks.

Field	Word(base8)	Bits	Description
SAHCW	2	0-63	HSC command word
SAHTD	2	0	transfer direction
SAHSC	2	8-12	sector count
SAHDA	2	18-36	disk address
SAHMA	2	40-63	CPU memory address
SAHSW	3	0-63	HSC status word
SAHST	3	60-63	status code
SAISC	4	8-15	initial status code
SARBL	4	16-33	remaining block length
SAPCA	5	0-63	percent of interval channel active
SAPTR	6	0-63	percent of max transfer rate
SACCA	7	0-63	cummulative channel active time (CPs)
SACTL	10	0-63	cummulative transfer lengths (sectors)
SACST	11	0-63	channel start time

SBU SYSTEM BILLING UNIT TABLE - SBU

The SBU table is an STP-resident table which contains the values obtained when system billing units are calculated for system resources.

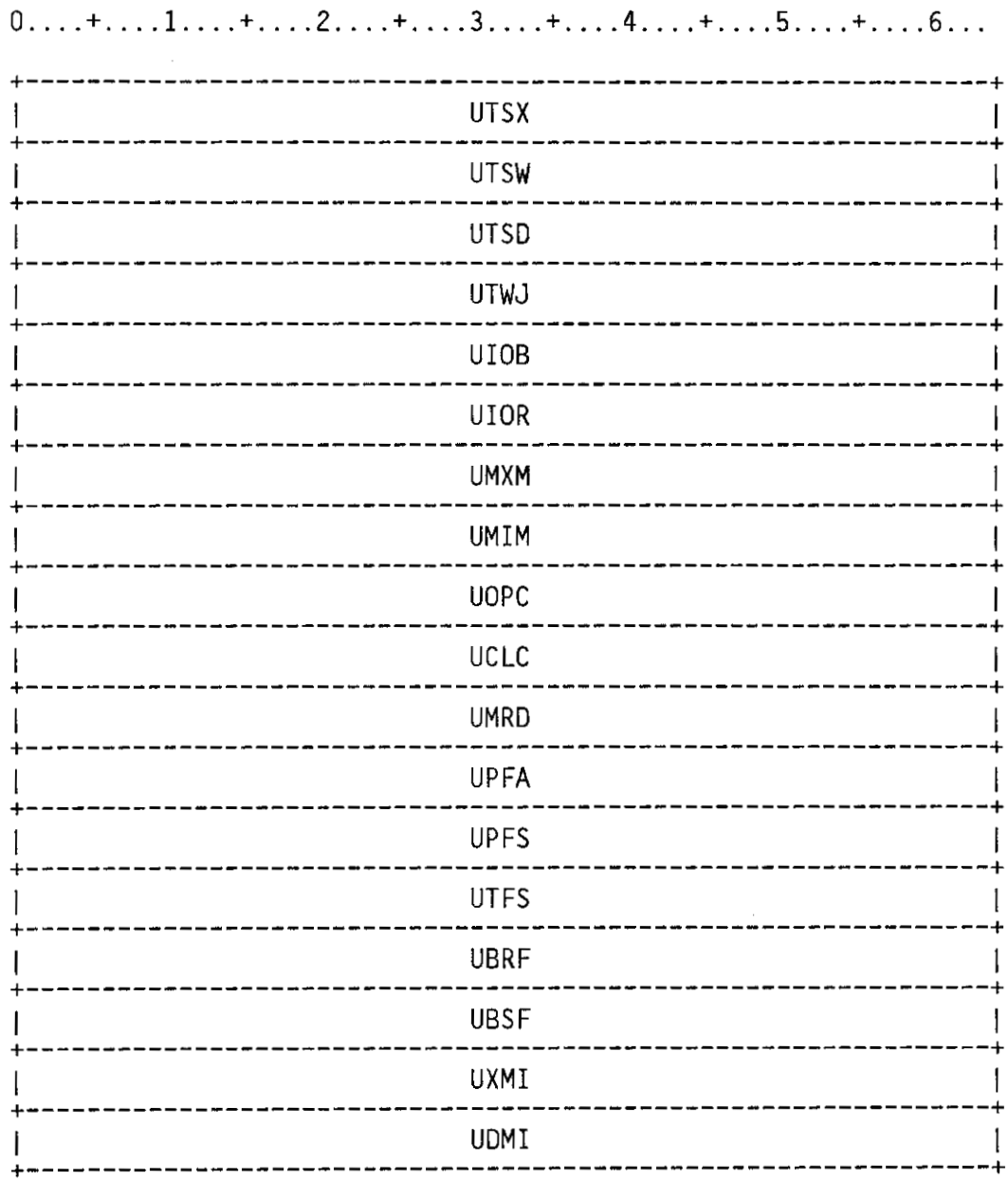


Figure SB-1. System Billing Unit Table

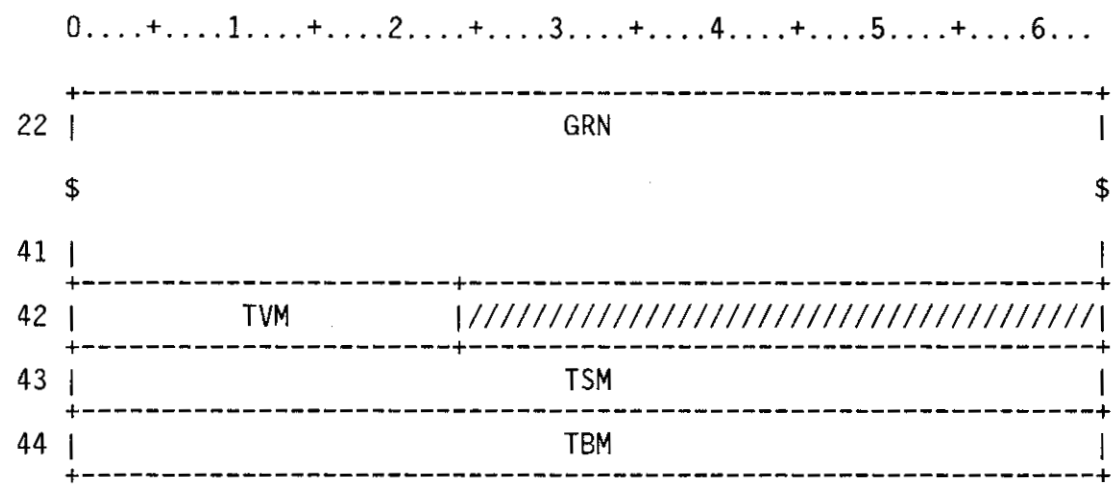


Figure SB-1. System Billing Unit Table

Field	Word(base8)	Bits	Description
SBUTSX	0	0-63	Timestamp units executing in CPU
SBUTSW	1	0-63	Timestamp units waiting for CPU
SBUTSD	2	0-63	Timestamp units waiting for I/O
SBUTWJ	3	0-63	Timestamp units in input queue
SBUIOB	4	0-63	Disk sectors moved
SBUIOR	5	0-63	Physical I/O requests
SBUMXM	6	0-63	Maximum memory used
SBUMIM	7	0-63	Minimum memory used
SBUOPC	10	0-63	Open calls
SBUCLC	11	0-63	Close calls
SBUMRD	12	0-63	Memory resident datasets
SBUPFA	13	0-63	Permanent dataset space accessed
SBUPFS	14	0-63	Permanent dataset space saved
SBUTFS	15	0-63	Temporary dataset space used
SBUBRF	16	0-63	Sectors received from front end
SBUBSF	17	0-63	Sectors sent to the front end

Field	Word(base8)	Bits	Description
SBUXMI	20	0-63	memory integral - CPU in Mword-seconds (floating)
SBUDMI	21	0-63	memory integral - wait for I/O in Mword-seconds (floating)
SBGRN	22-41	0-63	Generic resource fields
SBTVM	42	0-23	Tape volumes mounted
SBTSM	43	0-63	Tape sectors moved
SBTBM	44	0-63	Tape blocks moved

This figure adds tags S@SBGRN and N@SBGRN. It exists for the convenience of the table diagram generator.

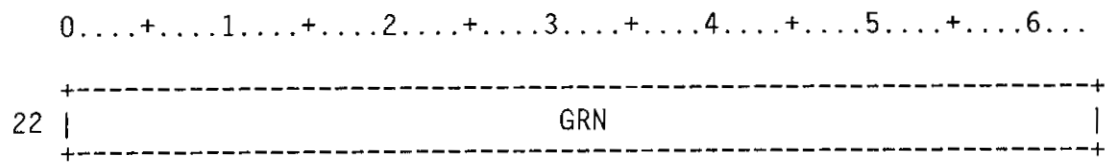


Figure SB-2. System Billing Unit Table

Field	Word(base8)	Bits	Description
SBGRN	22	0-63	Generic resource field

This table is resident in both STP and EXEC. The I/O Subsystem driver uses the EXEC-resident table to control the flow of control packets between the CRAY-1 and the IOS.

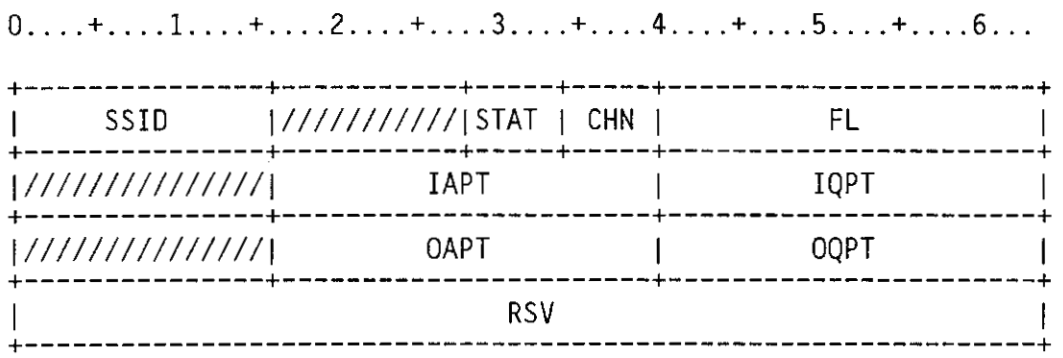


Figure SC-1. Subsystem Control Table

Field	Word(base8)	Bits	Description
SCSSID	0	0-15	Subsystem interface ID (two ASCII characters that must match the packet's destination ID)
SCSTAT	0	28-33	Subsystem status (STP read only)
SCUP	0	28	Subsystem up flag (1==UP)
SCIPR	0	29	I-packet received flag
SCJPR	0	30	J-packet received flag
SCIR	0	31	Input ready flag
SCRST	0	32	Subsystem restart flag
SCDOWN	0	33	Subsystem down flag: 0 Up 1 Down
SCCHN	0	34-39	Input channel number
SCFL	0	40-63	Forward link to another SCT
SCIAPT	1	16-39	Input packet addr
SCIQPT	1	40-63	Input QPT header addr
SCOAPT	2	16-39	Output packet addr
SCOQPT	2	40-63	Output QPT header addr

An STP task uses the STP-resident table to interface to the EXEC I/O Subsystem driver.

Field	Word(base8)	Bits	Description
SCRSV	3	0-63	Reserved for expansion

Name: Link Control Package (LCP).

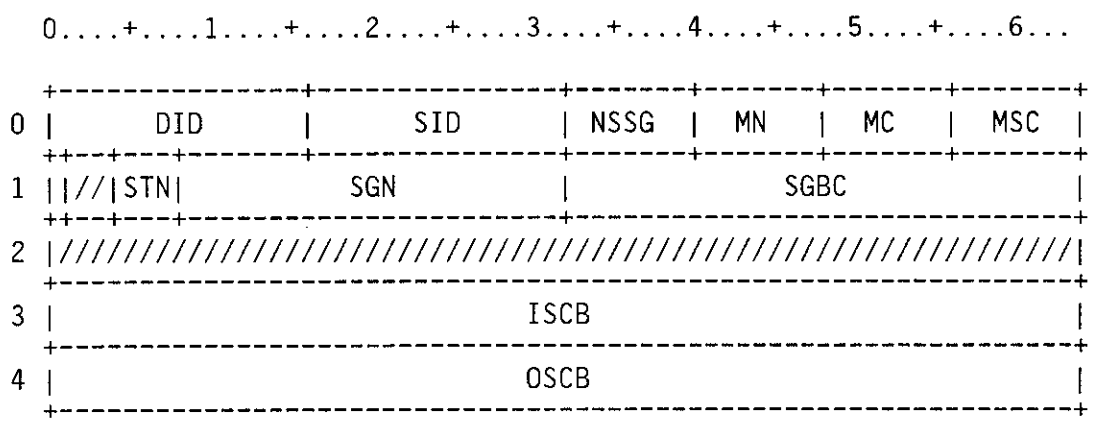


Figure LP-1. Link Control Package

Field	Word(base8)	Bits	Description
LPDID	0	0-15	Destination identifier (2 char)
LPSID	0	16-31	Source identifier (2 char)
LPNSSG	0	32-39	Number of subsegments
LPMN	0	40-47	Message number (modulo 16)

Field	Word(base8)	Bits	Description
LPMC	0	48-55	Message code: LPMCLON=O'1 Logon LPMCRON=O'2 Relog LPMCLOF=O'3 Logoff LPMCSTR=O'4 Start LPMCRST=O'5 Restart LPMCDHR=O'6 Dataset header LPMCDSG=O'7 Dataset segment LPMCCTL=O'11 Control LPMCSTP=O'11 Stop (logoff reply) LPMCERR=O'12 Message error LPMCDTQ=O'13 Dataset transfer request LPMCDTR=O'14 Dataset transfer reply LPMCLEQ=O'15 Log entry request LPMCLER=O'16 Log entry reply LPMCJSQ=O'21 Job status request LPMCSSQ=O'22 System status request LPMCDSQ=O'23 Dataset status request LPMCLSQ=O'24 Link status request LPMCMSQ=O'25 Mass storage status request LPMCOFQ=O'26 Operator function request LPMCDFQ=O'27 Debug function request LPMCJSR=O'31 Job status reply LPMCSSR=O'32 System status reply LPMCDSR=O'33 Dataset status reply LPMCLSR=O'34 Link status reply LPMCMSR=O'35 Mass storage status reply LPMCOFR=O'36 Operator function reply LPMCDFR=O'37 Debug function reply LPMCDEQ=O'40 Diagnostic echo request LPMCDER=O'41 Diagnostic echo reply LPMCIAQ=O'42 Interactive request LPMCIAR=O'43 Interactive reply LPMCCCQ=O'44 Job class status request LPMCCCR=O'45 Job class status reply LPMCSTM=O'46 Station message LPMCSRP=O'47 Station message reply LPMCTCQ=O'50 Tape configuration request LPMCTCR=O'51 Tape configuration reply LPMCTJQ=O'52 Tape system status

```
                request
                LPMCTJR=O'53 Tape system status
                reply
                LPMCCFQ=O'54 Configure request
                LPMCCFR=O'55 Configure reply
                LPMCDOQ=O'56 Data ownership request
                LPMCDOR=O'57 Data ownership reply
                LPMCJYQ=O'60 Job information
                request
                LPMCJYR=O'61 Job information reply
                LPMCSIQ=O'62 Stream status request
                LPMCSIR=O'63 Stream status reply
                LPMCGRQ=O'64 Generic Resource
                Status Request
                LPMCGRR=O'65 Generic Resource
                Status Reply
                LPMCRSVF=O'70          Lowest  code
                reserved for site

.
.       Codes  70-77 reserved for site
.

                LPMCRSVL=O'77          Highest code
                reserved for site
```

Field	Word(base8)	Bits	Description
LPMSC	0	56-63	Message subcode: LPMSCOK=O'0 OK LPMSCNA=O'10 Function not available LPMSCLCP=O'100 LCP field error LPMSCDID=O'101 Destination ID error LPMSCSID=O'102 Source ID error LPMSCNSS=O'103 Number of subsegments error LPMSCMN=O'104 Message number error LPMSCMC=O'105 Message code error LPMSCMSC=O'106 Message subcode error LPMSCSTN=O'107 Stream number error LPMSCSGN=O'110 Segment number error LPMSCSBC=O'111 Segment bit count error LPMSCSCB=O'112 Stream control byte error LPMSCSSS=O'113 Segment size error LPMSCMLE=O'114 Station message limit error LPMSCLP=O'115 Logon parameter error LPMSCRES=O'116 Resource not available for logon LPMSCCS=O'140 Checksum error LPMSCSEG=O'200 Segment data error LPMSCOFN=O'201 operator function not available LPMSCDFN=O'202 debug function not available LPMSCFRO=O'203 function restricted to COS operator LPMSCEDE=O'204 EXEC detected error LPMSCUID=O'205 undefined ID LPMSCUCH=O'206 undefined channel LPMSCIMC=O'207 illegal for

```
MCU
LPMSCUDV=O'210          undefined
device
LPMSCBNL=O'211          breakpoint
number too large
LPMSCBB=O'212           breakpoint
busy
LPMSCATL=O'213          address too
large
LPMSCTMB=O'214          too many
bits
LPMSCRNL=O'215          register
number too large
LPMSCURD=O'216          unknown
register designator
LPMSCBAL=O'217          breakpoint
address too large
LPMSCBNS=O'220          breakpoint
not set
LPMSCBAB=O'221          breakpoint
address busy
LPMSCBNA=O'222          breakpoint
not active
LPMSCNJX=O'223          no JXT
offset in SDT
LPMSCBSD=O'224          bad SDT
pointer in JXT
LPMSCOSE=O'226          operator
function segment error
LPMSCKDL=O'227          attempt to
KILL or DROP locked job
LPMSCJNF=O'230          Job not
found
LPMSCTNF=O'231          Task not
found in job
LPMSCANV=O'232          Account not
validated for job
LPMSCSNC=O'251          STARTUP  not
complete
LPMSCDQE=O'252          Error
detected by DQM
LPMSCPDE=O'253          Error
detected by PDM
LPMSCHDW=O'300          Hardware
error
LPMSCLEN=O'301          Transfer
length error
LPMSCCHN=O'302          Channel
error
LPMSCNLO=O'303          Not logged
on
```

LPMSCFUL=O'304 Max front ends already logged on
LPMSCALO=O'305 Already logged on another channel
LPMSCSEQ=O'306 Attempted to send out of sequence
LPMSCNSC=O'307 NSC Hyperchannel adapter error
LPMSCLOG=O'310 Logon parameter error
LPMSCNDE=O'311 No data expected
LPMSCWPC=O'312 Waiting process completion

LPRQP	1	0	Request pending flag
LPSTN	1	4-7	Stream number
LPSGN	1	8-31	Segment number
LPSGBC	1	32-63	Segment bit count
LPISCB	3	0-63	Input stream control bytes:
LPOSCB	4	0-63	Output stream control bytes:

LPSCBIDL=O'0 Idle
LPSCBRTS=O'1 Request to send
LPSCBPTR=O'2 Preparing to receive
LPSCBSND=O'3 Sending
LPSCBRCV=O'4 Receiving
LPSCBSUS=O'5 Suspend
LPSCBEND=O'6 End
LPSCBSVG=O'7 Saving
LPSCBSVD=O'10 Saved
LPSCBPPN=O'11 Postpone
LPSCBCAN=O'12 Cancel
LPSCBMCL=O'13 Master clear
LPSCBHLD=O'14 Hold
LPSCBMAX=O'14 Maximum valid SCB

Name: Link Control Package Extension (LCPE).

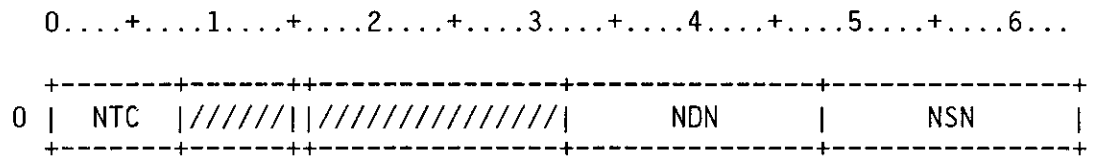


Figure LP-1. Link Control Package Extension

Field	Word(base8)	Bits	Description
LPNTC	0	0-7	Network trunk control
LPNAD	0	15	Associated data flag
LPNDN	0	32-47	Network destination adapter number
LPNSN	0	48-63	Network source adapter number

Name: Link Trailer Package (LTP).

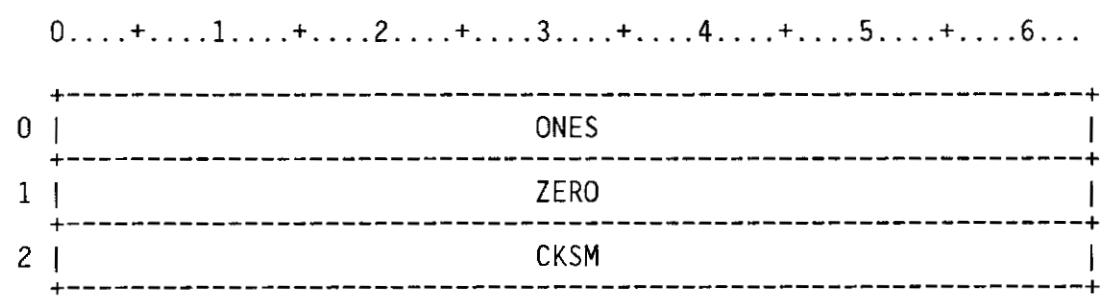


Figure LP-1. Link Trailer Package

Field	Word(base8)	Bits	Description
LPONES	0	0-63	Contains all ones
LPZERO	1	0-63	Contains all zeroes
LPCKSM	2	0-63	Checksum

```
*                                                                    **

        NAME:     Task replies as tables for use in determining       *
                  LXT addresses and comparing request and reply       *
                  sequence numbers.                                   *

*                                                                    **
```

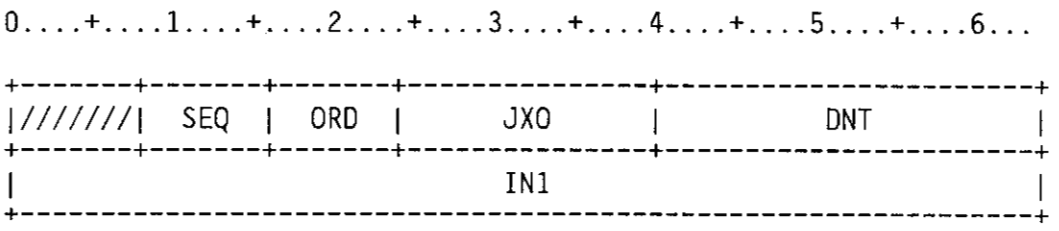


Figure DQ-1. Task reply tables

Field	Word(base8)	Bits	Description
DQSEQ	0	8-15	Request sequence number
DQORD	0	16-23	LXT ordinal
DQJXO	0	24-39	JXT address
DQDNT	0	40-63	DNT address
DQIN1	1	0-63	Input+1

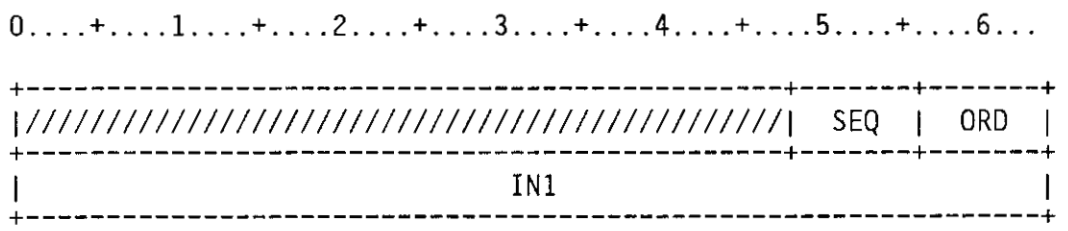


Figure TQ-1. Task reply tables

Field	Word(base8)	Bits	Description
TQSEQ	0	48-55	Request sequence number
TQORD	0	56-63	LXT ordinal
TQIN1	1	0-63	Input+1

An SDT entry is created in System Task Processor (STP) resident memory for each dataset that is spooled to or from a front-end system, or submitted for execution by an executing job.

For datasets that are submitted as jobs to the CRAY-1, the first control statement (the JOB statement) must be cracked to obtain job scheduling information.

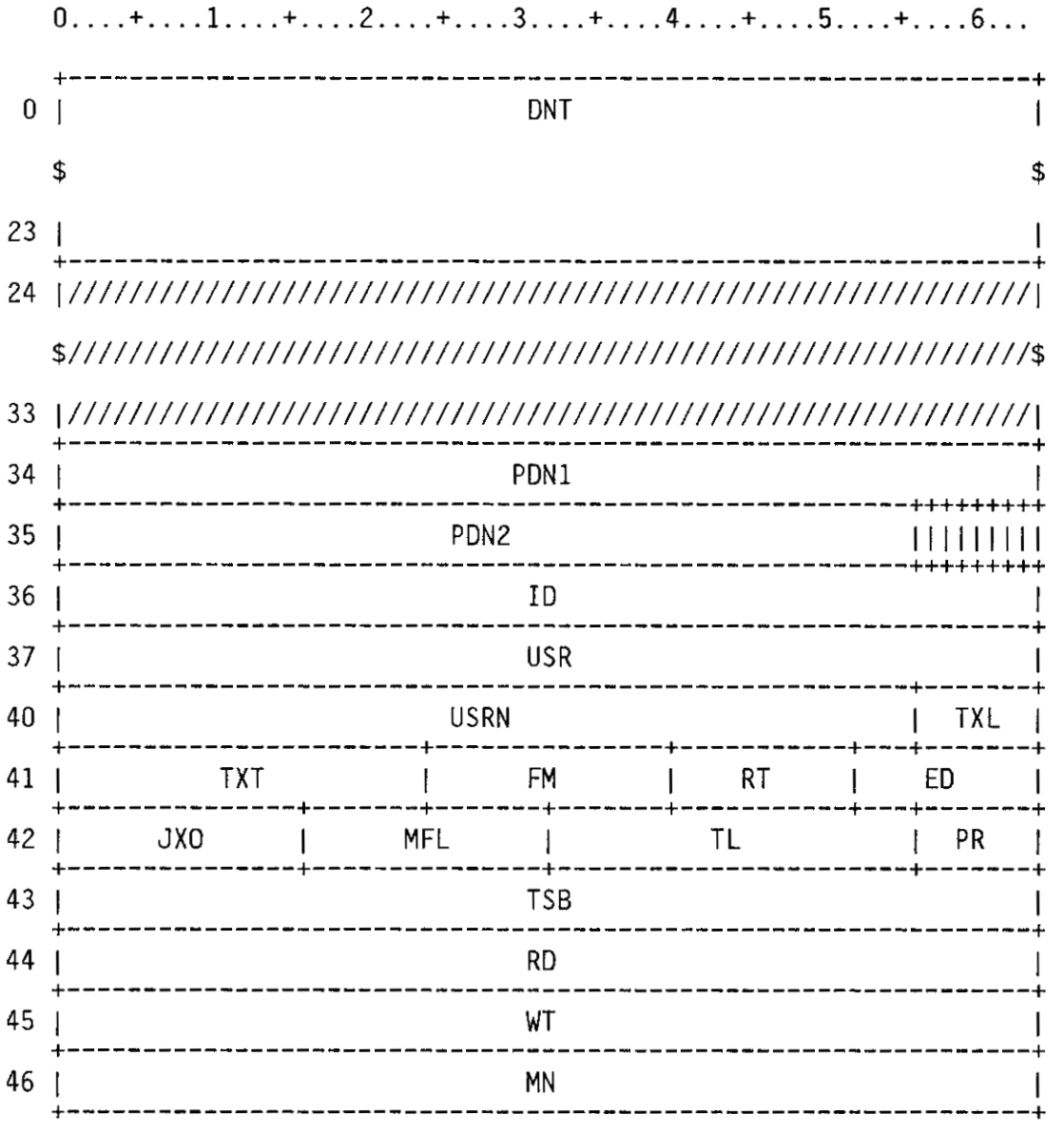


Figure SD-1. System Dataset Table

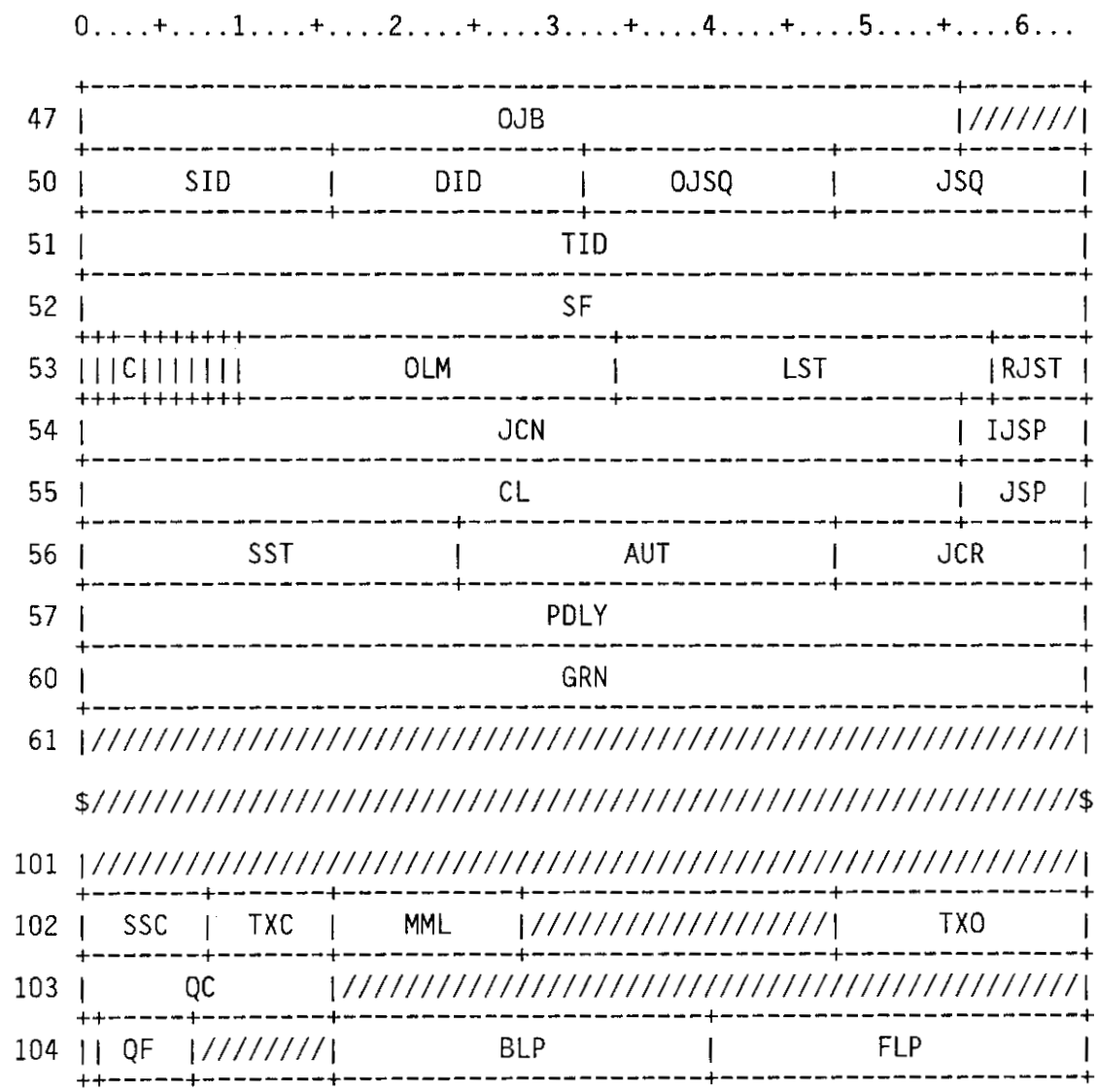


Figure SD-1. System Dataset Table

SDADN=LE@DNT Equate to SDT FWA beyond DNT

Field	Word(base8)	Bits	Description
SDDNT	0-23	0-63	DNT area
SDDNT	0-23	0-63	Required by table diagram generator
SDPDN1	34	0-63	Characters 1-8 of PDN
SDPDN2	35	0-55	Characters 9-15 of PDN
SDORPH	35	56	Orphan job flag
SDSYS	35	57	System job flag
SDIA	35	58	Interactive job flag
SDWAIT	35	59	WAIT flag for a disposed dataset
SDTRA	35	60	Transfer request issued flag
SDTR	35	61	Transfer request flag
SDUQ	35	62	Unique access flag
SDENT	35	63	Enter System Directory flag
SDID	36	0-63	User ID; 1-8 characters.
SDUSR	37	0-63	Characters 1-8 of user number
SDUS1	37	0-7	
SDUS2	37	8-15	
SDUS3	37	16-23	
SDUS4	37	24-31	
SDUS5	37	32-39	
SDUS6	37	40-47	
SDUS7	37	48-55	
SDUS8	37	56-63	
SDUSRN	40	0-55	
SDUS9	40	0-7	
SDUS10	40	8-15	
SDUS11	40	16-23	
SDUS12	40	24-31	
SDUS13	40	32-39	
SDUS14	40	40-47	
SDUS15	40	48-55	
SDTXL	40	56-63	Text field length in blocks

Field	Word(base8)	Bits	Description
SDTXT	41	0-23	Location of text area
SDFM	41	24-39	Format designator (2 characters): FMCD=CD Character/deblocked FMCB=CB Character/blocked FMBD=BD Binary/deblocked FMBB=BB Binary/blocked
SDRT	41	40-51	Retention period (0-4095 days)
SDED	41	52-63	Edition number (0-4095)
SDJXO	42	0-15	JXT offset
SDMFL	42	16-31	MFL parameter from job card
SDSGFL	42	16	no value, requesting all the memory available for a job.
SDFL	42	17-31	Field length/512
SDTL	42	32-55	Time limit
SDPR	42	56-63	Priority
SDTSB	43	0-63	Time submitted
SDRD	44	0-63	Read permission control word
SDWT	45	0-63	Write permission control word
SDMN	46	0-63	Maintenance permission control word
SDOJB	47	0-55	Originating job name
SDSID	50	0-15	Source ID; 2 characters.
SDDID	50	16-31	Destination ID; 2 character
SDOJSQ	50	32-47	Originating job sequence number
SDJSQ	50	48-63	Job sequence number
SDNJSQ	50	48-63	Maximum JSQ number in system with B@JSQBM
SDTID	51	0-63	Terminal ID; 8 characters.
SDSF	52	0-63	Special forms

Field	Word(base8)	Bits	Description
SDNRR	53	0	Job rerun flag; set if job cannot be rerun.
SDINIT	53	1	Job initiation flag; set if job has been initiated.
SDC	53	2-3	Job was locked out by Startup flag. It cannot be rolled in on the current system.
SDDFFL	53	4	Job-used-MFL-default flag
SDNDR	53	5	No devices required flag
SDOPP	53	6	Operator raised priority to 15 flag
SDOCC	53	7	Operator changed class flag
SDHELD	53	8	Held output file flag
SDOLM	53	10-33	Size of $OUT in 512-word blocks
SDLST	53	34-57	Pointer to current LST address
SDRJST	53	58-63	Status flag Set by recovery of rolled job: 0 Never initiated 1 Rerun by system recover 2 Job not recoverable or rerunnable 3 Job statement error Set by Job Scheduler or Job Class Manager: 4 Roll-in error; rerun 5 Roll-in error; not rerunnable 6 Class error: fits not class 7 Class error: no class CL 8 Class error: does not fit CL
SDJCN	54	0-55	JJob class name
SDIJSP	54	56-63	Initial P parameter from job statement
SDCL	55	0-55	CCL parameter from JOB statement
SDJSP	55	56-63	P parameter from job statement
SDSST	56	0-23	SST address if file is transferring
SDAUT	56	24-47	AUT pointer (interactive jobs only)

Field	Word(base8)	Bits	Description
SDJCR	56	48-63	Job class rank
SDPDLY	57	0-63	Postpone delay time: the realtime after which the dataset may be sent
L@NRGN must reflect number of SDRG entries that follow:			
SDGRN	60	0-63	GENERIC RESOURCES (L@NGRN WORDS)
SDSSC	102	0-7	Station slot length in words
SDTXC	102	8-15	Text field length in words
SDMML	102	16-27	Interactive max message length
SDTXO	102	48-63	Associated TXT ordinal
SDQC	103	0-15	Queue count
SDLK	104	0	Lock flag
SDQF	104	1-6	Queue flag
SDI	104	1	Entry is on the input queue
SDO	104	2	Entry is on the output queue
SDE	104	3	Entry is on the executing queue
SDW	104	4	Entry is on the wait queue
SDQ	104	4	Entry is on the request queue
SDR	104	5	Entry is on the receiving queue
SDS	104	6	Entry is on the sending queue (used in queue head only)
SDBLP	104	16-39	Backward link pointer
SDFLP	104	40-63	Forward link pointer

The queue control word (header) and W@SDLK of each STD entry create a circular linked list. FLP contains the address of the next SDT entry or points to the queue header. BLP contains the address of the previous SDT entry or points back to the queue header. Starting at any entry, the circular linked list can be searched backward or forward, stopping at any entry.

When a queue is empty, the pointer points to itself minus W@SDLK. When a queue is not empty, the first and last entries in the queue point to the header word minus W@SDLK.

Ensure that the number of SDT's does not exceed field width.

```
SZ@SDT    =  LH@SDT+LE@SDT*NE@SDT
SDQFO     =  O'20                SDT OUTPUT QUEUE PARAMETER
SDQFI     =  O'40                SDT INPUT QUEUE PARAMETER
```

SDP fields are placed before a memory dump by DDC/IOP to identify the following memory and addresses.

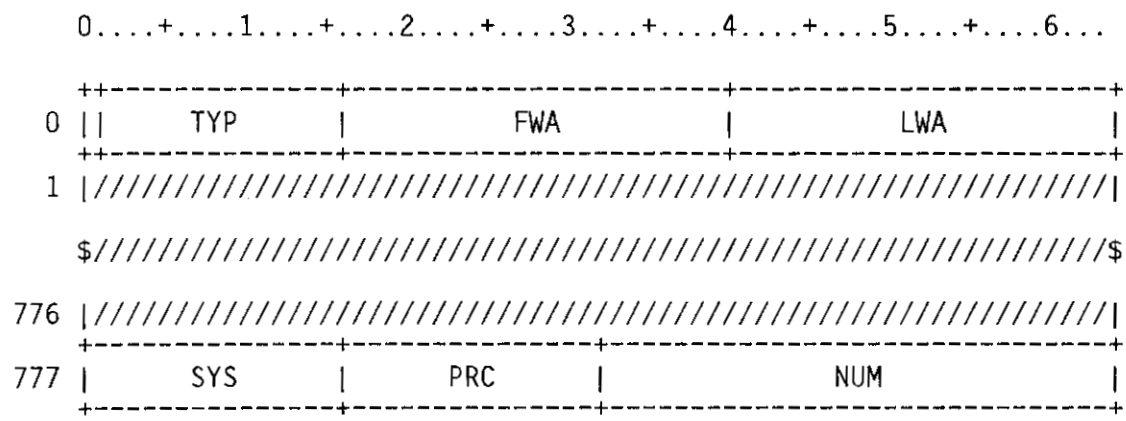


Figure SDP-1. System Dump Header Fields

Field	Word(base8)	Bits	Description
SDPTYP	0	1-15	Memory type
SDPFWA	0	16-39	FWA of Cray or MOS memory,or number of words or parcels if this is a register or IOP dump
SDPLWA	0	40-63	LWA of Cray or MOS memory
Control word, word 511 of first sector of the memory dump:			
SDPSYS	777	0-15	System type
SDPPRC	777	16-31	Number of processors
SDPNUM	777	32-63	Number of areas that have been dumped

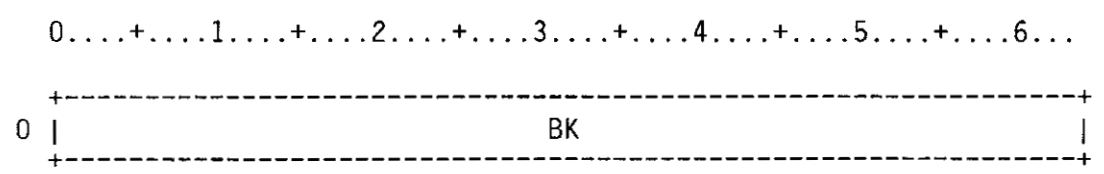


Figure SD-1. System Directory Recovery

Field	Word(base8)	Bits	Description
SDBK	0	0-63	Block number stored in each block

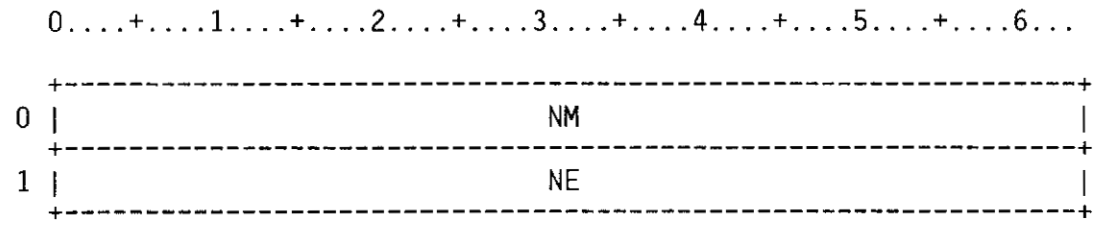


Figure SD-2. System Directory Recovery

Field	Word(base8)	Bits	Description
SDNM	0	0-63	$SDR
SDNE	1	0-63	Number of resident SDR entries

```
 %$NEWSEQ controls conditional assembly of new-sequence code.
 A value of 1 is the only legal value.

%$NEWSEQ  =  1                  New calling sequence in effect

 %$STACK controls conditional assembly of stack-sequence code.
 A value of 0 requests that stack sequences not be used, while
 a value of 1 requests that stack sequence code be used.

%$STACK   =  0                  Default is no stack

 %$MULTI controls conditional assembly of multitasking code.
 A value of 0 requests that multitasking not be supported, while
 a value of 1 requests that multitasking code be generated.

%$MULTI   =  0                  Default is no multitasking

 Define the B registers to be used for stack-sequence support

%STKCBP   =  O'02               Set stack current base pointer to
                                  B02
%STKCTP   =  O'66               Set stack current top pointer to
                                  B66
%STKATP   =  O'67               Set stack absolute top pointer to
                                  B67

 Define a table for the CFT calling sequence argument list
```

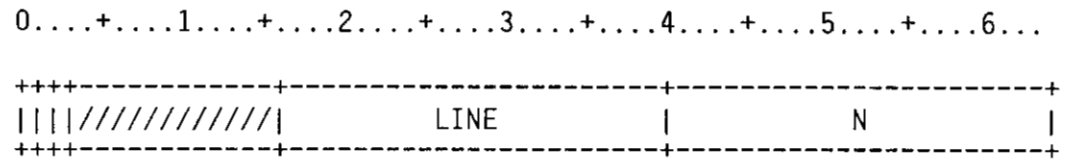


Figure AR-1. Argument List Header

Field definitions.

Argument list header:
VWD 1/FLAG,1/VAL,1/CHR,13/(reserved),24/LINE,24/N
Old sequence did not use an argument list header.
"D'" is used so both $SYSTXT and $COSTXT can use this deck.

Field	Word(base8)	Bits	Description
ARFLAG	0	0	Non-standard sequence flag
ARVAL	0	1	Call-by-value(1)/call-by-address(0)flg
ARCHR	0	2	Character function(1)/non-character(0)
ARLINE	0	16-39	Sequence number of call
ARN	0	40-63	Number of arguments

Character argument descriptors:
VWD 17/(reserved),17/LEN,6/OFF,24/ADD
Each descriptor is one full word of the above form.

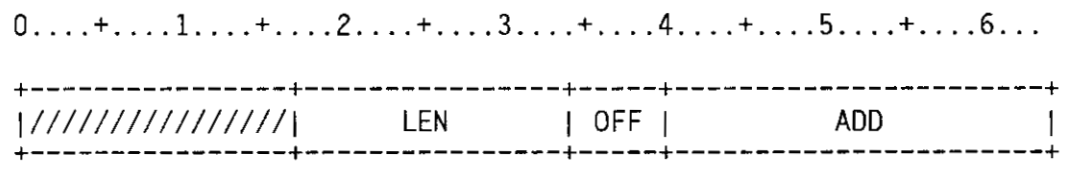


Figure AR-2. Argument Descriptors

Field	Word(base8)	Bits	Description
ARLEN	0	17-33	in bits
AROFF	0	34-39	Offset to first character (in bits) for character argument
ARADD	0	40-63	Address of argument

Maximum bit length for a character entity is 131064 (decimal) bits. This is 16383 characters.

MAXCHL=131064

Station Message codes

```
MSGQNLO  =  O'100          Not logged on
MSGQMPD  =  O'101          Message processing disabled
MSGQMFE  =  O'102          Message format error
MSGQMCE  =  O'103          Message count exceeded
MSGQWCL  =  O'104          Word count too large for this link
MSGQMTD  =  O'105          Message type not enabled
MSGQNPS  =  O'106          No pool space available
```

Station Message constants

```
MSGQMN   =  D'16           Queued message number shift count
MSGTASK  =  O'377          Task count mask
MSGMNM   =  O'177777       Station message number mask
MSGRMN   =  D'32           Reply message number shift count
MSGRID   =  D'48           Reply task ID shift count
MSGMLMS  =  D'56           Message limit shift count
MSGQLO   =  O'140          Station logged off
MSGQRL   =  O'141          Station logged on or relogged
MSGQRP   =  O'200          Reply code.
MSGRDM   =  O'377          reply disable messages
```

PERFORMANCE MONITOR REPORT FORMATS

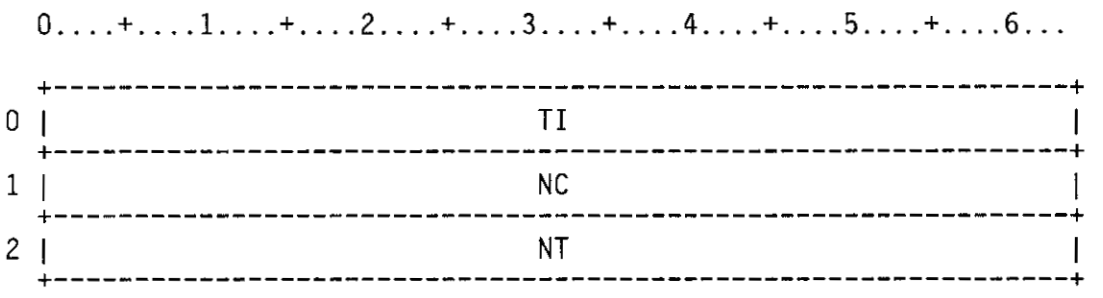


Figure CP-1. SPM CPU Utilization Report header

Header.

Field	Word(base8)	Bits	Description
CPTI	0	0-63	Time interval
CPNC	1	0-63	Number of CPUs
CPNT	2	0-63	Number of tasks

Entries (CPU utilization; one entry per CPU).

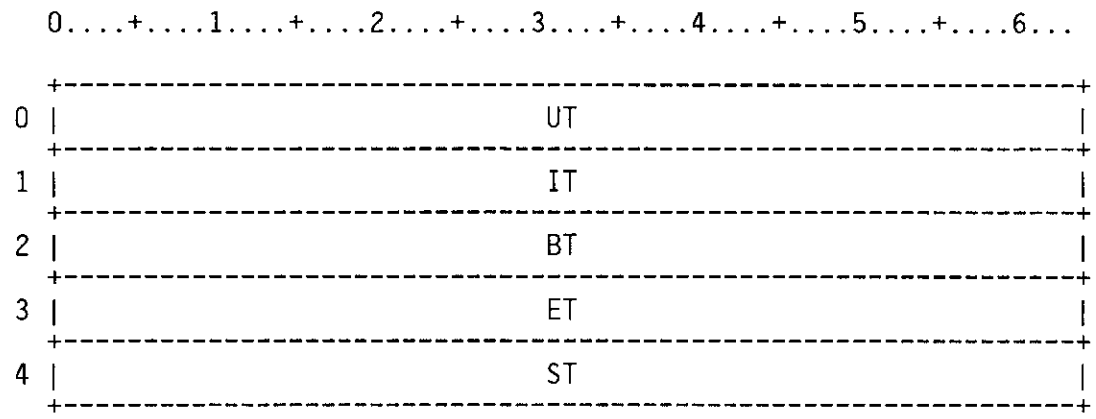


Figure CP-2. SPM CPU Utilization Report entry

Field	Word(base8)	Bits	Description
CPUT	0	0-63	User time, CPU 0-n
CPIT	1	0-63	Idle time, CPU 0
CPBT	2	0-63	Blocked time, CPU 0
CPET	3	0-63	EXEC time, CPU 0
CPST	4	0-63	STP time, CPU 0

The following table is appended to the CPR table. It contains a breakdown of the STP utilization.

CPTT	0	0-63	Task time in cycles, task 0

TASK UTILIZATION REPORT

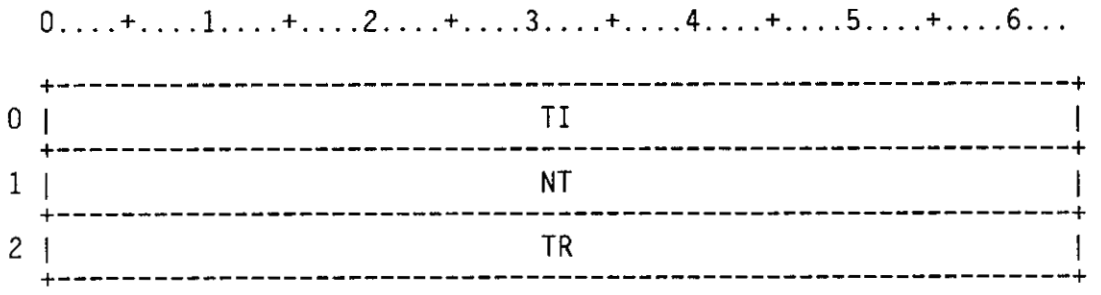


Figure TK-1. SPM Task Utilization Report

Field	Word(base8)	Bits	Description
TKTI	0	0-63	Time interval
TKNT	1	0-63	Number of tasks
TKTR	2	0-63	Task requests for task 0

EXECUTIVE REQUEST REPORT

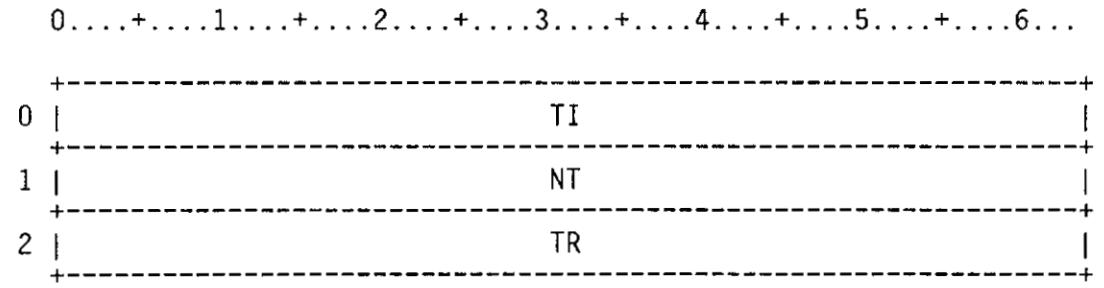


Figure ER-1. SPM Executive Request Report

Field	Word(base8)	Bits	Description
ERTI	0	0-63	Time interval
ERNT	1	0-63	Number of tasks
ERTR	2	0-63	Number of exec requests from task 0

DISK UTILIZATION REPORT

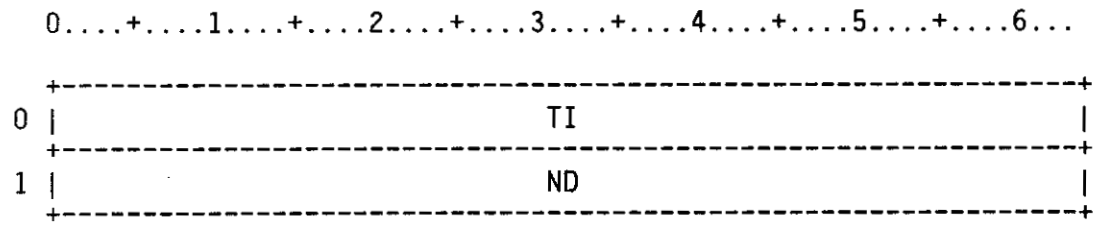


Figure DU-1. SPM Disk Utilization Report

Field	Word(base8)	Bits	Description
DUTI	0	0-63	Time interval
DUND	1	0-63	Number of disks

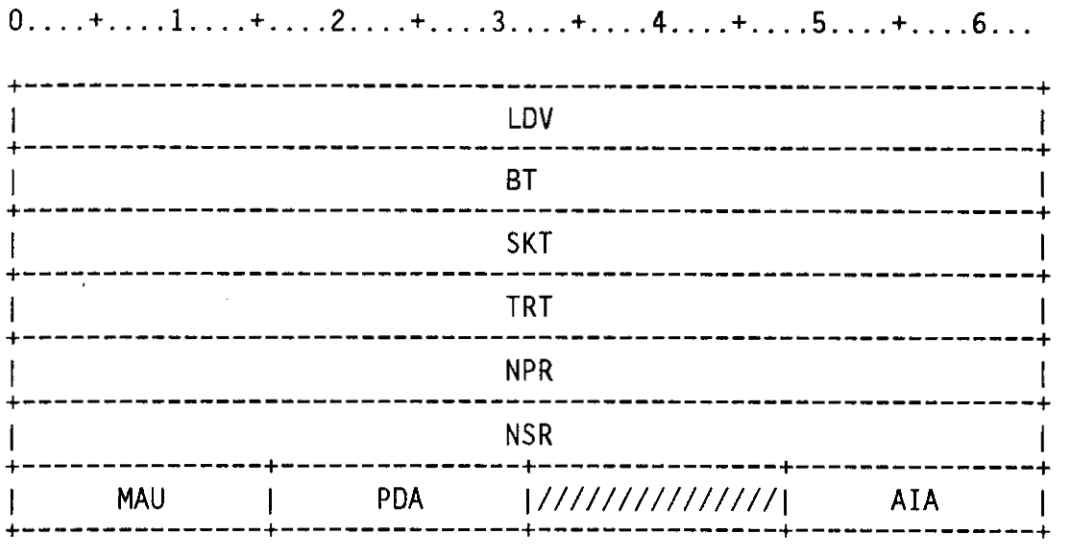


Figure DU-2. SPM Disk Utilization Disk Entry

Field	Word(base8)	Bits	Description
DULDV	0	0-63	Logical device name
DUBT	1	0-63	Blocks transfered
DUSKT	2	0-63	Seek time
DUTRT	3	0-63	Transfer time
DUNPR	4	0-63	Number of physical requests
DUNSR	5	0-63	Number of on-cylinder requests
DUMAU	6	0-15	Maximum allocation units
DUPDA	6	16-31	Number of permanent AI
DUAIA	6	48-63	Number of free AI

DISK CHANNEL UTILIZATION REPORT

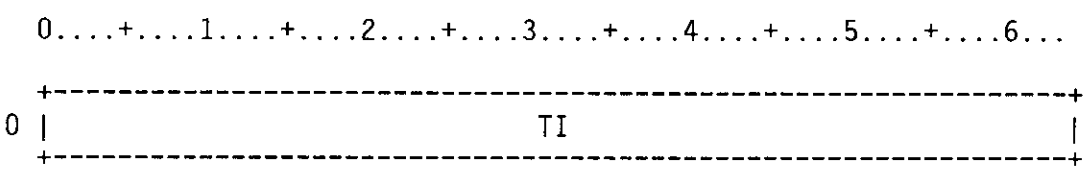


Figure DC-1. SPM Disk Channel Utilization Report

Field	Word(base8)	Bits	Description
DCTI	0	0-63	Time interval

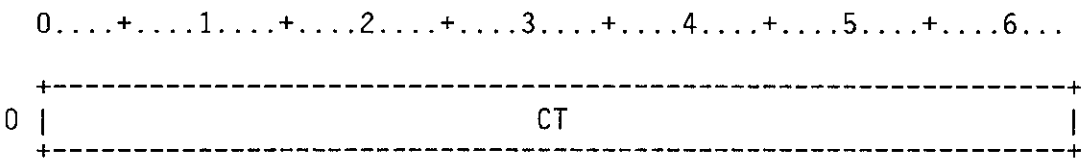


Figure DC-2. SPM Disk Channel Utilization Report

Field	Word(base8)	Bits	Description
DCCT	0	0-63	Channel time

LINK UTILIZATION REPORT

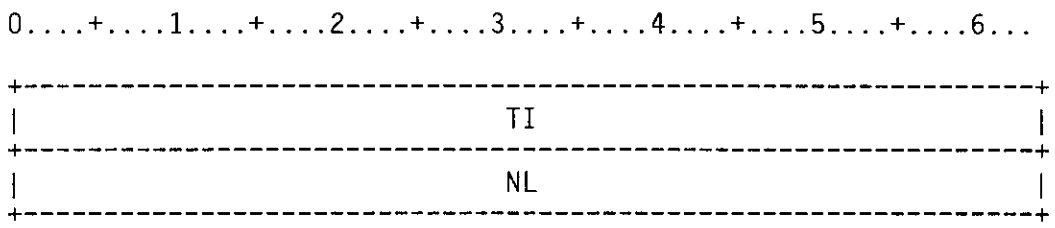


Figure LU-1. SPM Link Utilization Report

Field	Word(base8)	Bits	Description
LUTI	0	0-63	Time interval
LUNL	1	0-63	Number of links

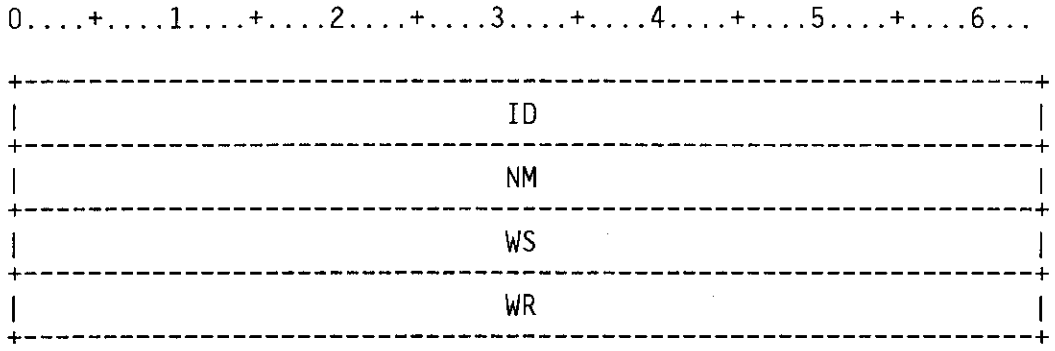


Figure LU-2. SPM Link Utilization Report

Field	Word(base8)	Bits	Description
LUID	0	0-63	Link id
LUNM	1	0-63	Number of messages
LUWS	2	0-63	Words sent
LUWR	3	0-63	Words received

EXECUTIVE CALL REPORT

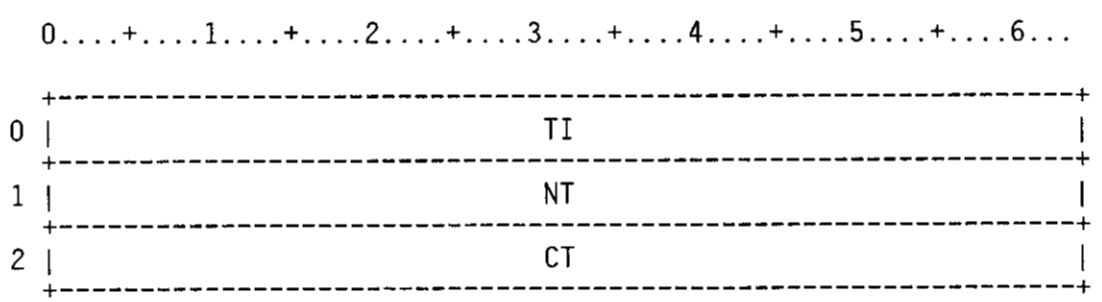


Figure EC-1. SPM Executive Call Report

Field	Word(base8)	Bits	Description
ECTI	0	0-63	Time interval
ECNT	1	0-63	Number of call types
ECCT	2	0-63	Number of type 0 calls

USER CALL USAGE REPORT

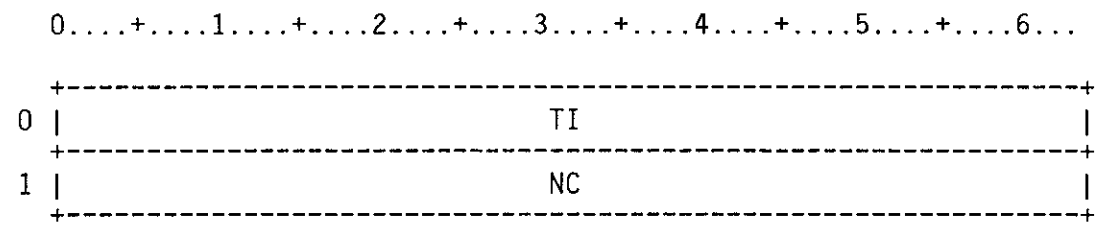


Figure UC-1. SPM User Call Usage Report

Field	Word(base8)	Bits	Description
UCTI	0	0-63	Time interval
UCNC	1	0-63	Number of calls

CHANNEL INTERRUPT REPORT

ICNE = C@CPHCHN+1+D'11+D'11

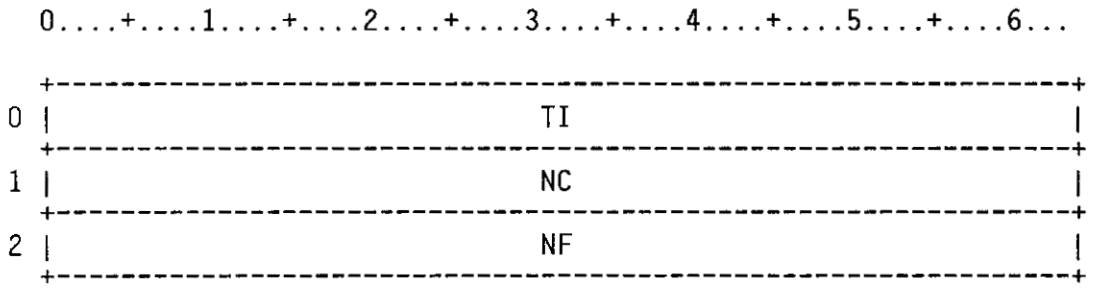


Figure IC-1. SPM Channel Interrupt Report

Header.

Field	Word(base8)	Bits	Description
ICTI	0	0-63	Time interval
ICNC	1	0-63	Highest channel number +1
ICNF	2	0-63	Number of flags

Entries. There are ICNC + 2*ICNF entries; channel entries first, then flag entries, then flag descriptors.

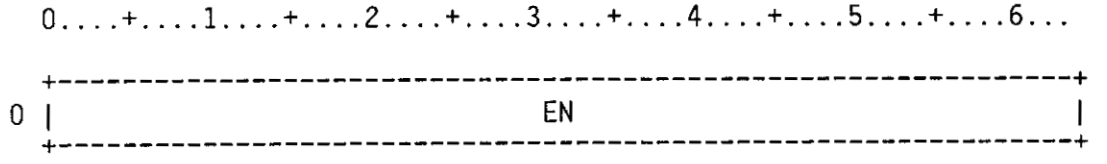


Figure IC-2. SPM Channel Interrupt Report

Field	Word(base8)	Bits	Description
ICEN	0	0-63	Entry word:

SYSTEM BUFFER UTILIZATION REPORT.

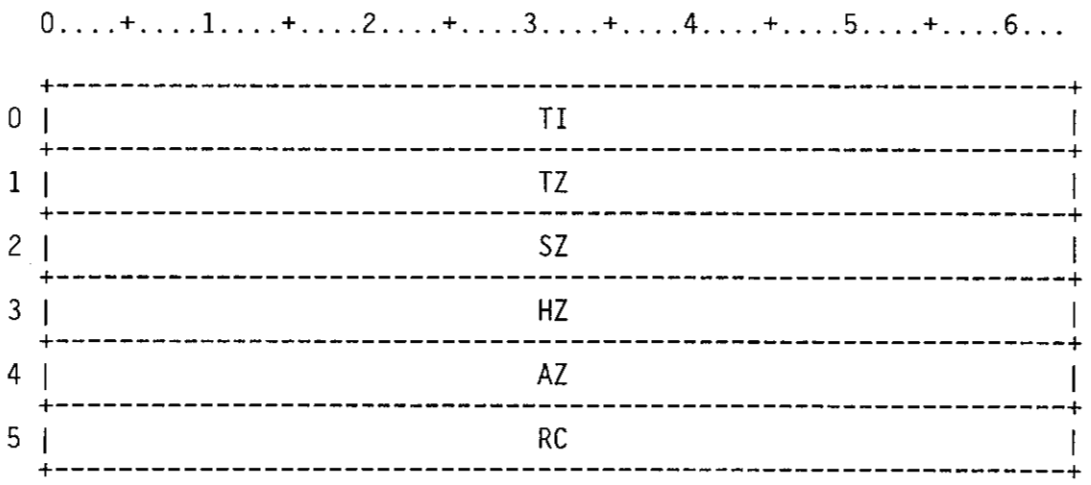


Figure SB-1. SPM System Buffer Utilization Report

Field	Word(base8)	Bits	Description
SBTI	0	0-63	Time interval
SBTZ	1	0-63	Total size of system buffer
SBSZ	2	0-63	Total size of unused space in sys buff
SBHZ	3	0-63	Total size of holes in system buffer
SBAZ	4	0-63	Total size of active buffers in system
SBRC	5	0-63	Memory request count

SPM CONSTANTS

SPMTYPE=6 Log manager message type of spm
SPMNSUBT=D'15 Number of subtypes for SPM

Name: System Lock Queue (SLQ).

Purpose: The SLQ is a ordered list of processors waiting for the O.S. lock.

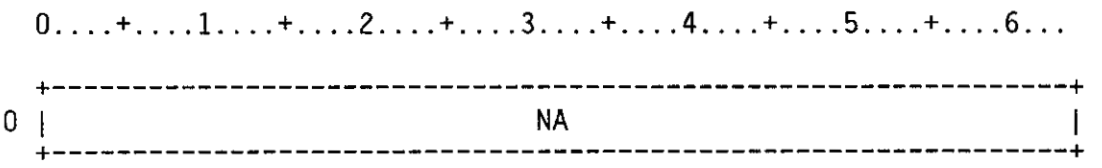


Figure SQ-1. System Lock Queue Header

Header Definitions.

Field	Word(base8)	Bits	Description
SQNA	0	0-63	Number of Active entries

Entry Definition.

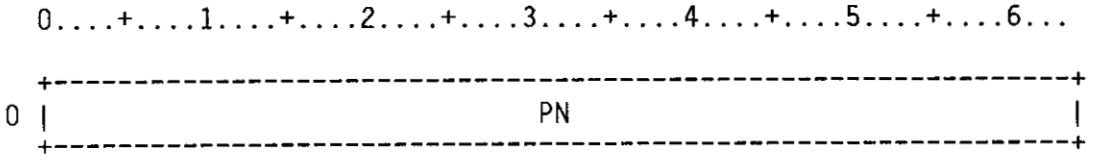


Figure SQ-2. System Lock Queue Entry

Field	Word(base8)	Bits	Description
SQPN	0	0-63	Processor number

SR STATUS REGISTER 0 - SR0

Status register 0 defines fields in the Cray X-MP status register.

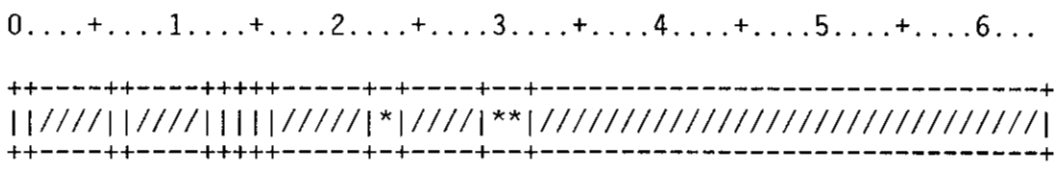


Figure SR0-1. Status Register 0

Field	Word(base8)	Bits	Description
SR0CLX	0	0	Clustered if set
SR0PS	0	6	Processor state
SR0FPE	0	12	Floating interrupt enabled
SR0FPI	0	13	Floating interrupt occurred
SR0ORI	0	14	Operand range interrupt enabled
SR0BM	0	15	Bidirectional memory enabled
SR0PN	0	22-23	Processor number
SR0CLN	0	29-31	Cluster number

Name: Staging stream table (SST).

Purpose: The Staging stream tables are contained in the LXT and hold information concerning the state of streams for an ID. They are also used for communication between SCP and STG.

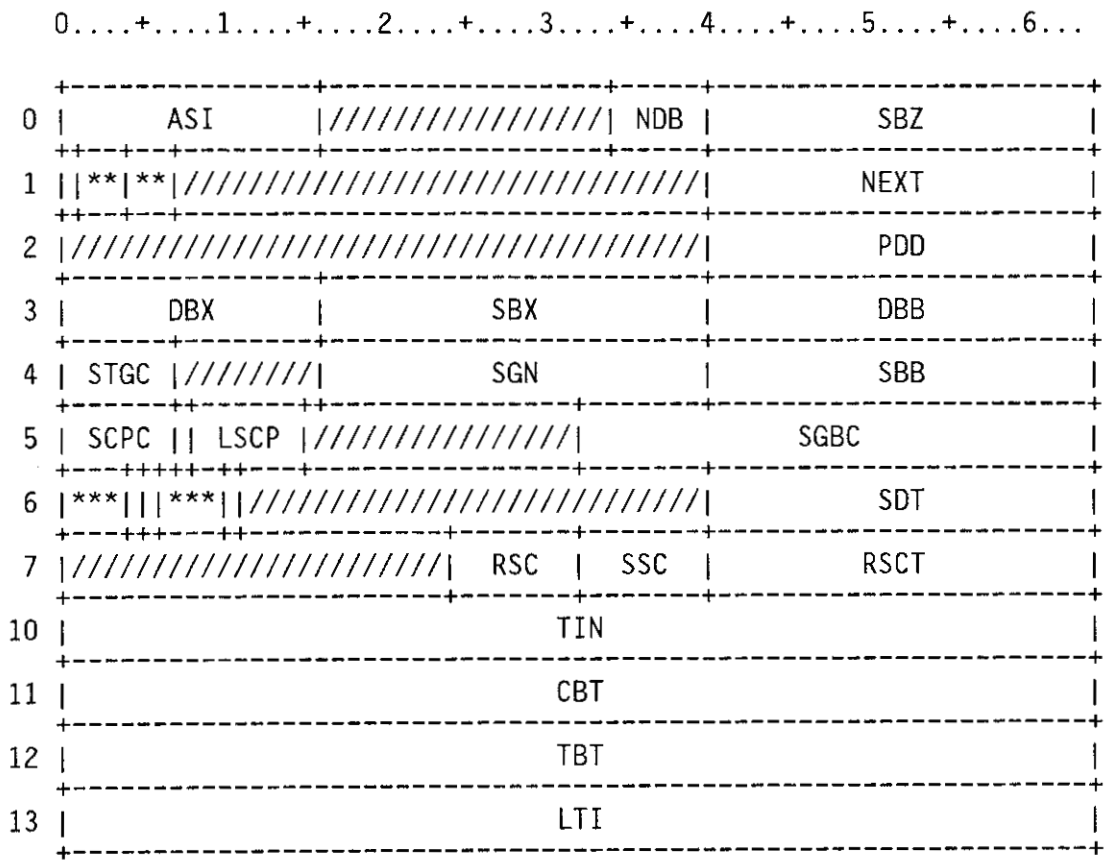


Figure SS-1. Staging Stream Table

Field	Word(base8)	Bits	Description
SSASI	0	0-15	ASCII stream identifier
SSOFLG	0	5	Output stream flag
SSSTN	0	12-15	Stream number
SSNDB	0	34-39	Number of disk buffers
SSSBZ	0	40-63	Segment buffer size
SSEOI	1	0	End of information in buffer flag
SSSTAT	1	1-3	Status of dataset SSSTAOK=0 OK, request complete SSSTAEND=1 EOI or file already exists SSSTAERR=2 Error SSSTABFW=4 Buffer wait (no buffers available) SSSTABSY=7 Busy(I/O active)
SSSRT	1	4-6	PDM delay error retry count
SSNEXT	1	40-63	Next entry on BUSYQ or WAITQ
SSPDD	2	40-63	PDD address
SSDBX	3	0-15	Disk buffer index
SSSBX	3	16-39	Segment buffer index
SSDBB	3	40-63	Disk buffer base address
SSSTGC	4	0-6	STG message code SSMCACK=1 Acknowledge SSMCBFRD=2 Buffer ready SSMCCAN=3 Cancel SSMCEND=4 End SSMCPPN=5 Postpone SSMCPRBF=6 Process buffer SSMCSTRT=7 Start SSMCBFW=D'8 Buffer wait (no buffers available)
SSSGN	4	16-39	Segment number
SSSBB	4	40-63	Segment buffer base address
SSSCPC	5	0-6	SCP message code
SSLSCP	5	8-14	Last SCP request(if STG response BFW)

Field	Word(base8)	Bits	Description
SSSGBC	5	32-63	Segment bit count
SSTERM	6	0-3	Stream termination code SSTCEND=1 End the stream SSTCPPN=2 Postpone the stream SSTCABT=3 Abort the stream
SSBSF	6	4	Buffer sent flag
SSBRF	6	5	Buffer ready flag
SSATRM	6	6-9	Asynchronous termination code
SSASTG	6	10	Need to notify STG of asynch term flag
SSSDT	6	40-63	SDT address
SSRSC	7	24-31	Received SCB
SSSSC	7	32-39	Next send SCB
SSRSCT	7	40-63	Received SCB table address
SSTIN	10	0-63	Real time of stream initialization
SSCBT	11	0-63	Current number of bits xferred
SSTBT	12	0-63	total bits transferred this period
SSLTI	13	0-63	Length of last time interval

The System Task Table (STT) is an EXEC-resident table used by EXEC for scheduling and controlling tasks. The table has three parts: the header, the task parameter block (which contains a parameter area for each task), and a part containing the exchange packages for each task. The STT header is illustrated in figure ST-1; the STT entry is shown in figure ST-2.

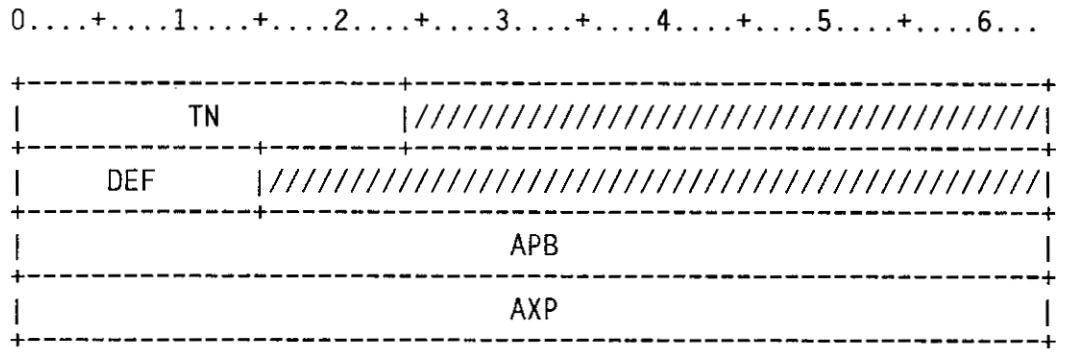


Figure ST-1. System Task Table

Field	Word(base8)	Bits	Description
STTN	0	0-23	Table name; 'STT' in ASCII.
STDEF	1	0-14	Defined task flags
STAPB	2	0-63	Active task parameter block address
STAXP	3	0-63	Active Exchange Package address

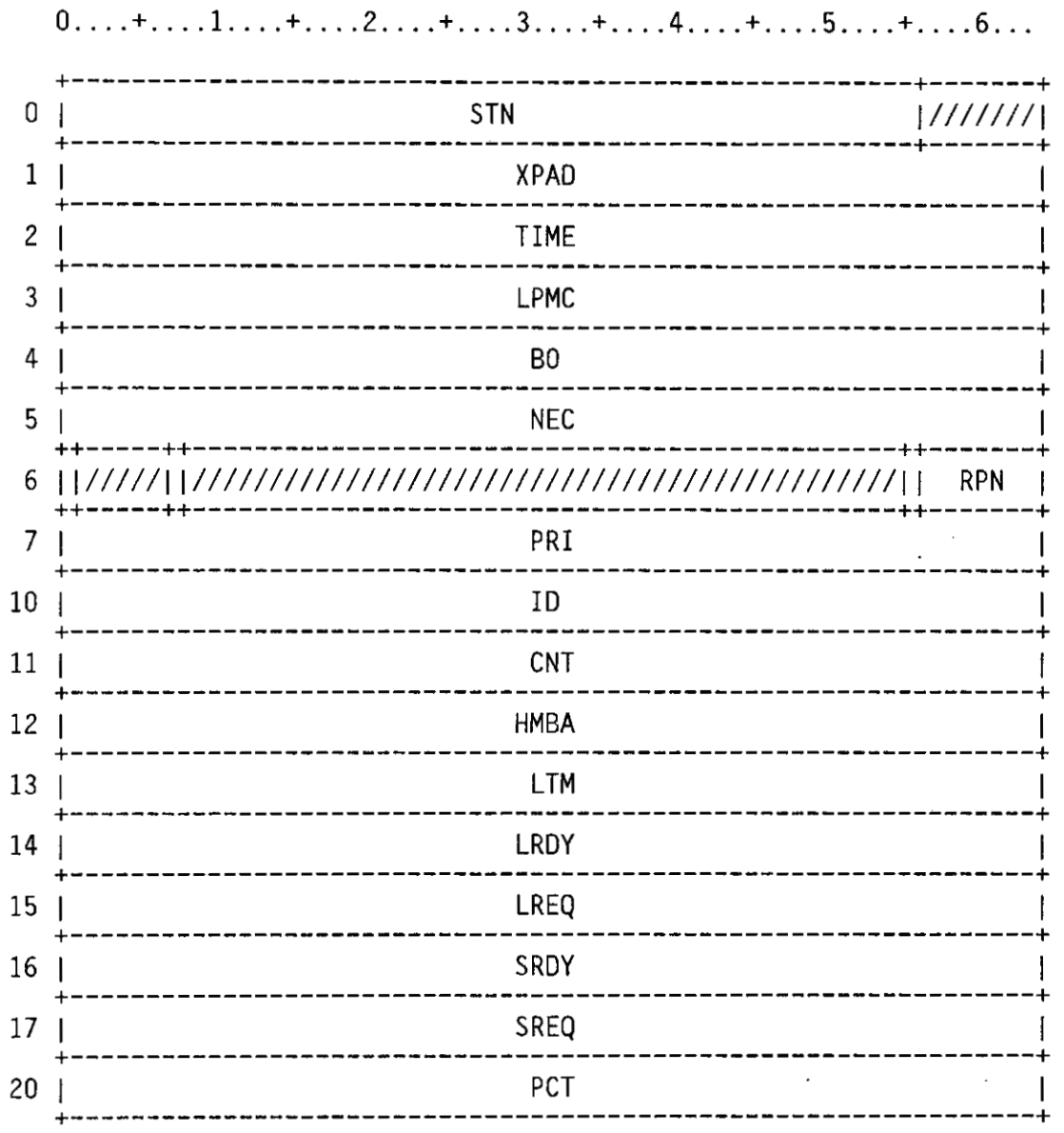


Figure ST-2. System Task Table

Field	Word(base8)	Bits	Description
STSTN	0	0-55	Task name in ASCII
STXPAD	1	0-63	Task exchange package address
STTIME	2	0-63	Cumulative execution time
STLPMC	3	0-63	Last performance monitor call
STBO	4	0-63	BO save area
STNEC	5	0-63	Count of normal exits from task
STSUS	6	0	Task suspend bit
STRDY	6	7	Re-ready bit (task ready request)
STSRP	6	55	Task Scheduling restricted to a CPU
STRPN	6	56-63	CPU allowed to schedule this task
STPRI	7	0-63	Task priority
STID	10	0-63	Task ID
STCNT	11	0-63	Task startup count
STHMBA	12	0-63	H'ware perf.mon. ctl block addr, or 0
Timers and counters as of last statistics event:			
STLTM	13	0-63	Task time (cycles)
STLRDY	14	0-63	Task readies count
STLREQ	15	0-63	Task request count
Data for IOP task monitor display:			
STSRDY	16	0-63	Number of task readies in last intrvl
STSREQ	17	0-63	Number of task requests, last intrvl
STPCT	20	0-63	Task statistics in last interval:
STSCI	20	0-15	% of all CP time, XX in XX.YY
STSCF	20	16-31	YY in XX.YY
STSSI	20	32-47	% of system time, XX in XX.YY
STSSF	20	48-63	YY in XX.YY

Stack control Header

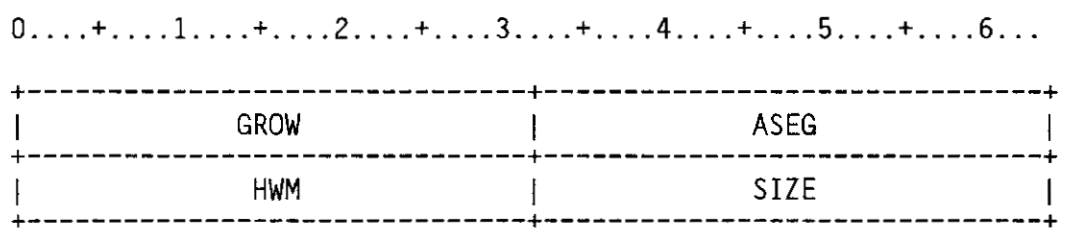


Figure SH-1. Stack Control Header

Field	Word(base8)	Bits	Description
SHGROW	0	0-31	Number of times the stack has grown
SHASEG	0	32-63	Size of increments to stack
SHHWM	1	0-31	High water mark of stack
SHSIZE	1	32-63	Current size of stack (all segments)

Stack Segment linkage control

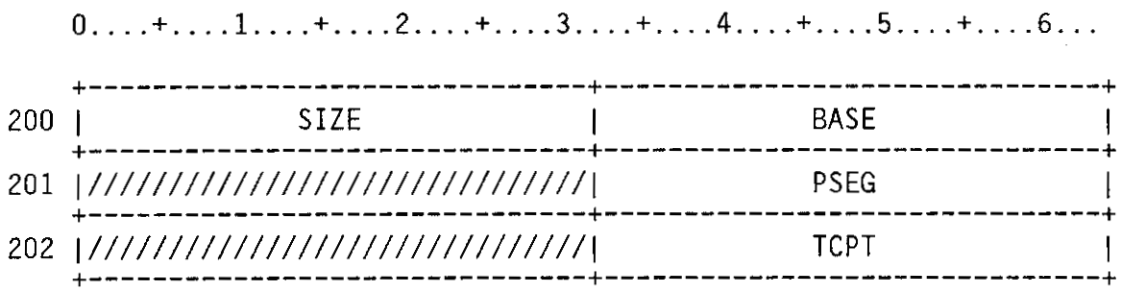


Figure SS-1. Stack Segment Linkage Control

Field	Word(base8)	Bits	Description
SSSIZE	200	0-31	Number of words in this segment
SSBASE	200	32-63	Offset to stack base
SSPSEG	201	32-63	Offset to linkage control of previous segment of stack
SSTCPT	202	32-63	Pointer to task common address block ($TASKCOM)

The following job values are from cracked job card.

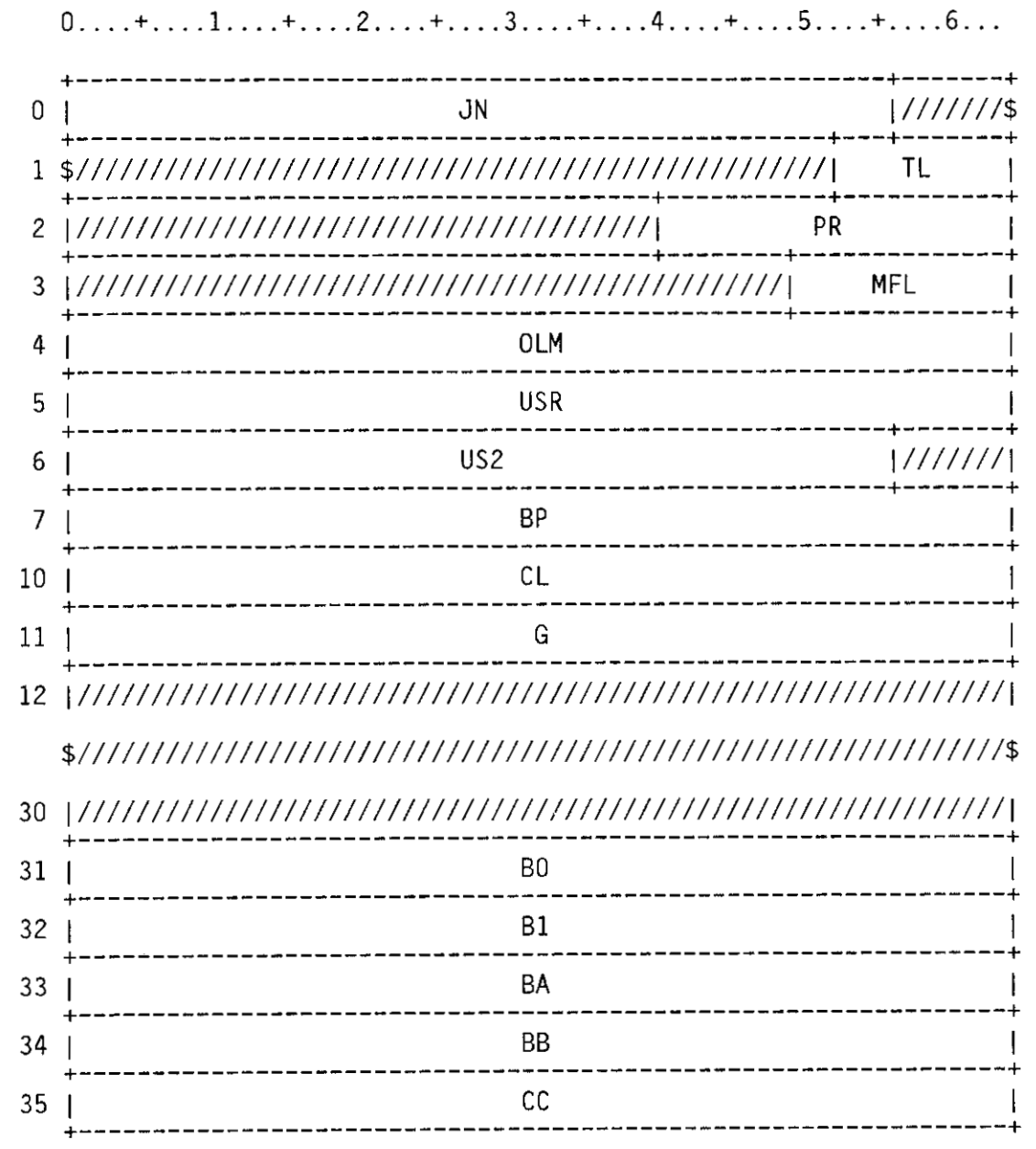


Figure STP-1. Job Card Values

Field	Word(base8)	Bits	Description
STPJN	0	0-55	Job name
STPTL	1	52-63	Time limit
STPPR	2	40-63	Priority
STPMFL	3	49-63	Maximum field length
STPOLM	4	0-63	Output limit
STPUSR	5	0-63	User number
STPUS2	6	0-55	
STPBP	7	0-63	Breakpoint parameter
STPCL	10	0-63	Class assignment
STPG	11	0-63	Generic resource names
STPB0	31	0-63	IND B0 save
STPB1	32	0-63	IND B1 save
STPBA	33	0-63	SCJS B0 save
STPBB	34	0-63	SCJS B1 save
STPCC	35	0-63	Cracked control card buffer

user security priviledge table

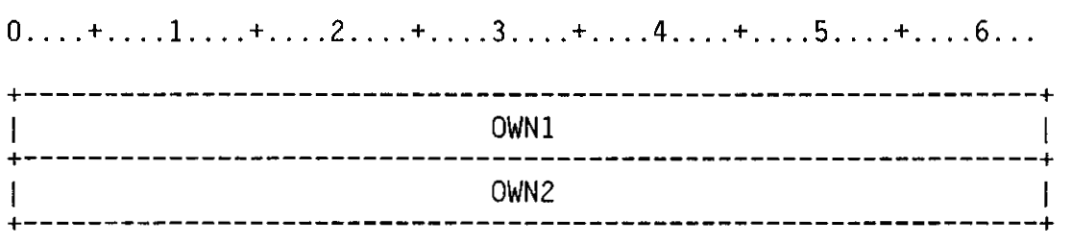


Figure SW-1. Security Swap Table

Field	Word(base8)	Bits	Description
SWOWN1	0	0-63	Dataset owner ID (characters 1-8)
SWOWN2	1	0-63	Dataset owner ID (characters 9-15)

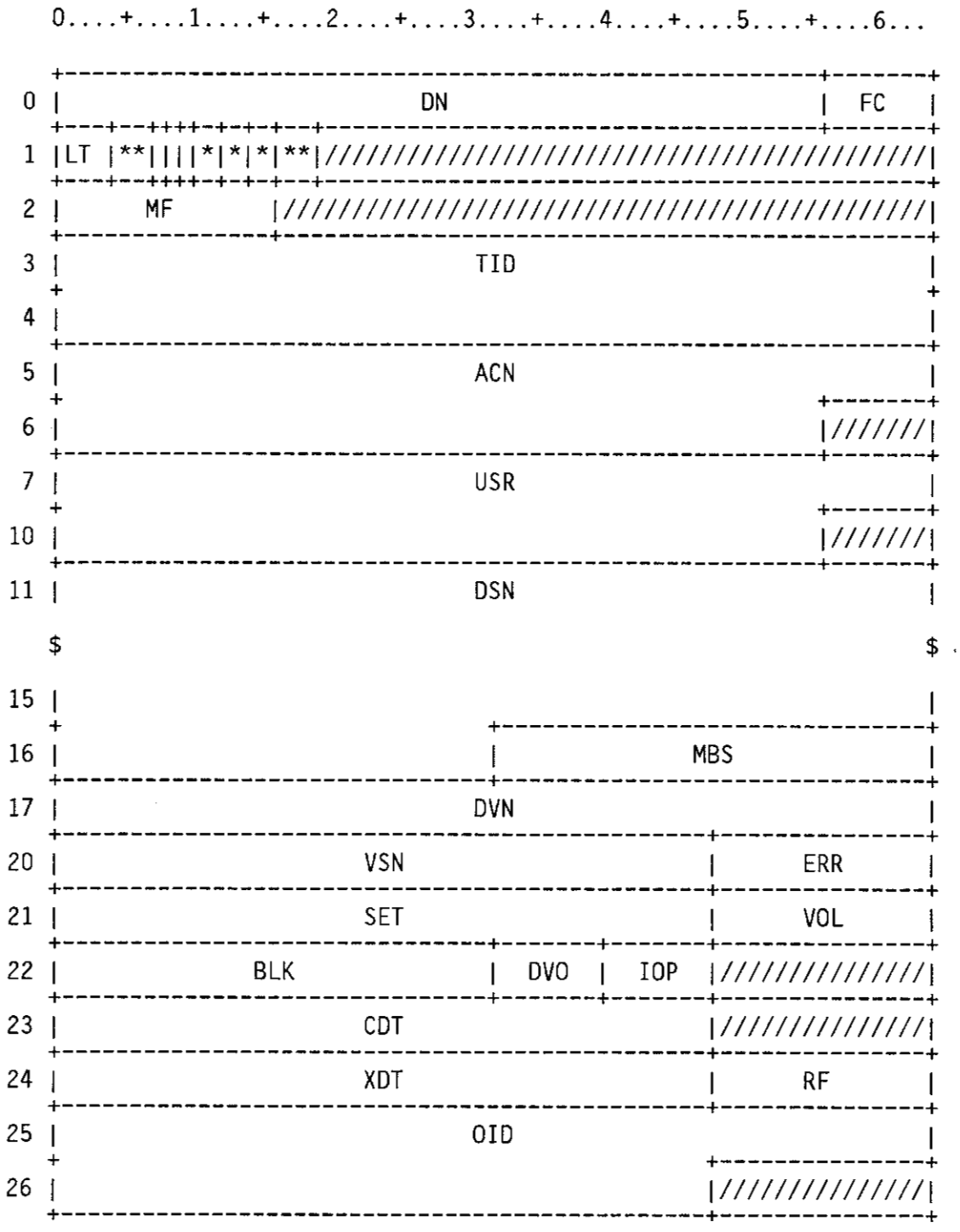


Figure TA-1. Tape Accounting Log Message

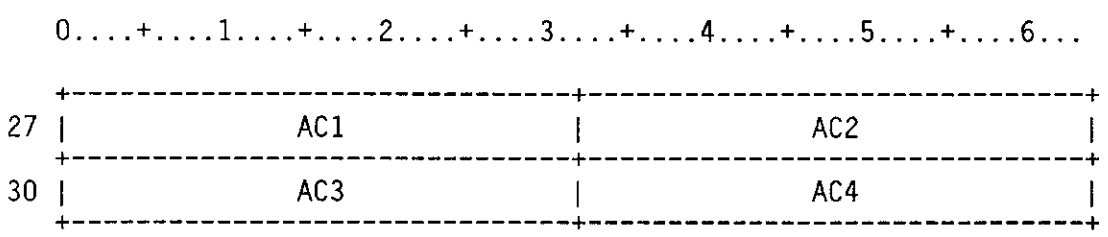


Figure TA-1. Tape Accounting Log Message

Field	Word(base8)	Bits	Description
TADN	0	0-55	Local dataset name
TAFC	0	56-63	Function code: 0 Beginning of volume 1 End of volume 2 Rewind 3 End of data 4 Release 5 Close
TALT	1	0-3	Verified label type: 0 Non-labeled 1 ANSI-standard labeled 2 IBM-standard labeled 3 Bypass label processing 4 Foreign label (LMT, not capable)
TACDC	1	4-6	Current disposition code: 0 Old 1 New 2 Mod
TAUF	1	7	Cray blocked format flag, 1=unblocked
TADF	1	8	Tape format (0=TR, 1=IC)
TAABT	1	9	Abort flag
TARW	1	10-11	Last I/O operation (XRB, XWB)
TADEN	1	12-13	Tape density (0=6250, 1=1600)
TACC	1	14-15	IOP channel access count
TAODC	1	16-18	Original disposition
TAMF	2	0-15	Mainframe ID of job origin
TATID	3-4	0-63	Terminal identification of job origin

Field	Word(base8)	Bits	Description
TATID1	3	0-63	Character 1-8
TATID2	4	0-63	Character 9-16
TAACN	5-6	0-63	CRAY account number
TAACN1	5	0-63	Character 1-8
TAACN2	6	0-55	Character 9-15
TAUSR	7-10	0-63	CRAY user number
TAUSR1	7	0-63	Character 1-8
TAUSR2	10	0-55	Character 9-15
TADSN	11-16	0-63	IBM-compatible dataset name
TADSN1	11	0-63	Character 1-8
TADSN2	12	0-63	Character 9-16
TADSN3	13	0-63	Character 17-24
TADSN4	14	0-63	Character 25-32
TADSN5	15	0-63	Character 33-40
TADSN6	16	0-31	Character 41-44
TAMBS	16	32-63	Maximum block size in bytes
TADVN	17	0-63	Cray device name
TAVSN	20	0-47	VSN currently mounted
TAERR	20	48-63	Error count
TASET	21	0-47	File set identifier
TAVOL	21	48-63	Volume section number
TABLK	22	0-31	Volume block count
TADVO	22	32-39	Cray device ordinal
TAIOP	22	40-47	IOP subsystem ID
TACDT	23	0-47	Creation date

Field	Word(base8)	Bits	Description
TAXDT	24	0-47	Expiration date (ASCII, Julian)
TARF	24	48-63	Record/block format (ASCII)
TAOID	25-26	0-63	Owner identification
TAOID1	25	0-63	Character 1-8
TAOID2	26	0-47	Character 9-14
TAAC1	27	0-31	Access path first channel
TACU1	27	0-3	First control unit id
TACU2	27	4-7	Second control unit id (optional)
TACU3	27	8-11	Third control unit id (optional)
TACU4	27	12-15	Fourth control unit id (optional)
TACUC	27	16-23	Number of valid CU id present
TACHN	27	24-31	IOP channel number
TAAC2	27	32-63	Access path second channel
TAAC3	30	0-31	Access path third channel
TAAC4	30	32-63	Access path fourth channel

TQM FIELD CONTENT DEFINITIONS

```
TPB62    =  D'8              SECTORS/BLOCK AT 6250 BPI
TPB16    =  4                SECTORS/BLOCK AT 1600 BPI
TPRD     =  0                NO RING DESIRED
TPWRT    =  1                WRITE RING REQUESTED
TPD62    =  0                DENSITY IS 6250 BPI
TPD16    =  1                DENSITY IS 1600 BPI
TPLNL    =  0                NON-LABELED
TPLAN    =  1                ANSI LABELED
TPLSL    =  2                IBM STANDARD LABELED
TPLBP    =  3                BY-PASS LABELED
TPLFR    =  4                FOREIGN LABEL (LTM OR NOT CAPABLE)
TPLFAL   =  5                FIELD ANSI LABELED
TPLFNL   =  6                FIELD NON LABELED
TPLFSL   =  7                FIELD IBM LABELED
TPFTR    =  0                TRANSPARENT FORMAT
TPFIC    =  1                INTERCHANGE FORMAT
TCSAN    =  0                ANSI CHARACTER DATA
TCSEB    =  1                EBCDIC CHARACTER DATA
TCSDC    =  2                CONTROL DATA display code
TPMOD    =  2                EXTEND OLD DATASET
TPNEW    =  1                NEW DATASET
TPOLD    =  0                OLD DATASET
TPJMB    =  2*I@TMBS/D'8+1   MAX MOS/JOB FOR TAPE IO (WORDS)
```

TASK BREAKPOINT TABLE

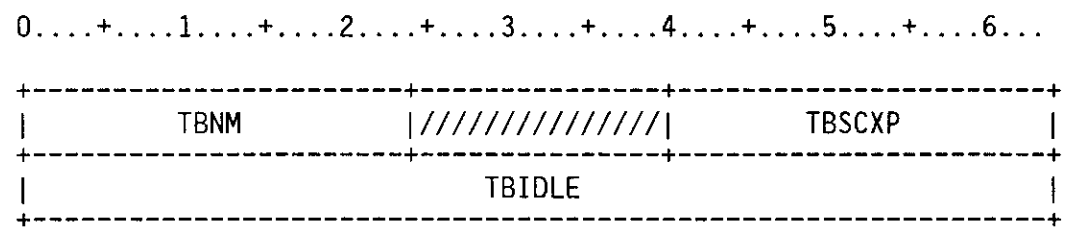


Figure TP-1. Task Breakpoint Table header

Field	Word(base8)	Bits	Description
TBNM	0	0-23	Task breakpoint table identifier
TBSCXP	0	40-63	SCP exchange package address
TBIDLE	1	0-63	Alternate scheduler request word

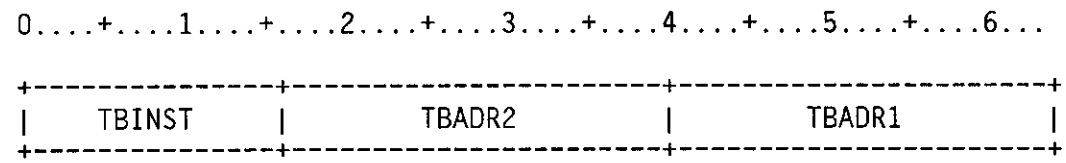


Figure TP-2. Task Breakpoint Table entry

Field	Word(base8)	Bits	Description
TBINST	0	0-15	Breakpoint instruction parcel
TBADR2	0	16-39	Breakpoint parcel address 2
TBADR1	0	40-63	Breakpoint parcel address 1

TBLK - Define the table for all the task common blocks. *
SEGLDR and LDR generate this table into the abolute binary *
when the external routine $TASKCOM is called. *

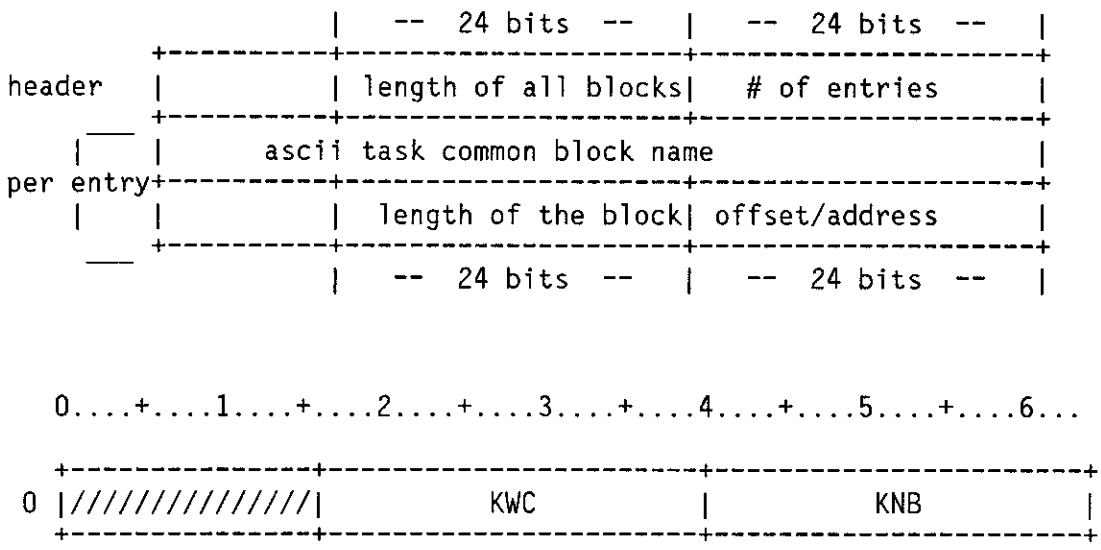


Figure TBL-1. Task Common Block Header

Define header word content

Field	Word(base8)	Bits	Description
TBLKWC	0	16-39	Sum of all task common block length
TBLKNB	0	40-63	Number of task common blocks

Define block entry content

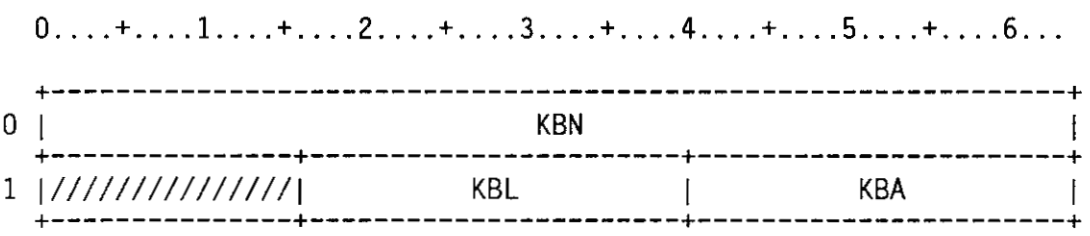


Figure TBL-2. Task Common Block Entry

Field	Word(base8)	Bits	Description
TBLKBN	0	0-63	ASCII task common block name
TBLKBL	1	16-39	Length of task common block
TBLKBA	1	40-63	Offset or address of the block

* Task Control Block (TCB)

The task control block is located in the Job Table Area (JTA). There is one TCB entry allocated for each user task known to COS. The TCB entry is used for storage of information specific to each task within a job such as the exchange package, vector registers, timings, I/O request information, and other save areas.

Assumed sizes of other tables referenced.

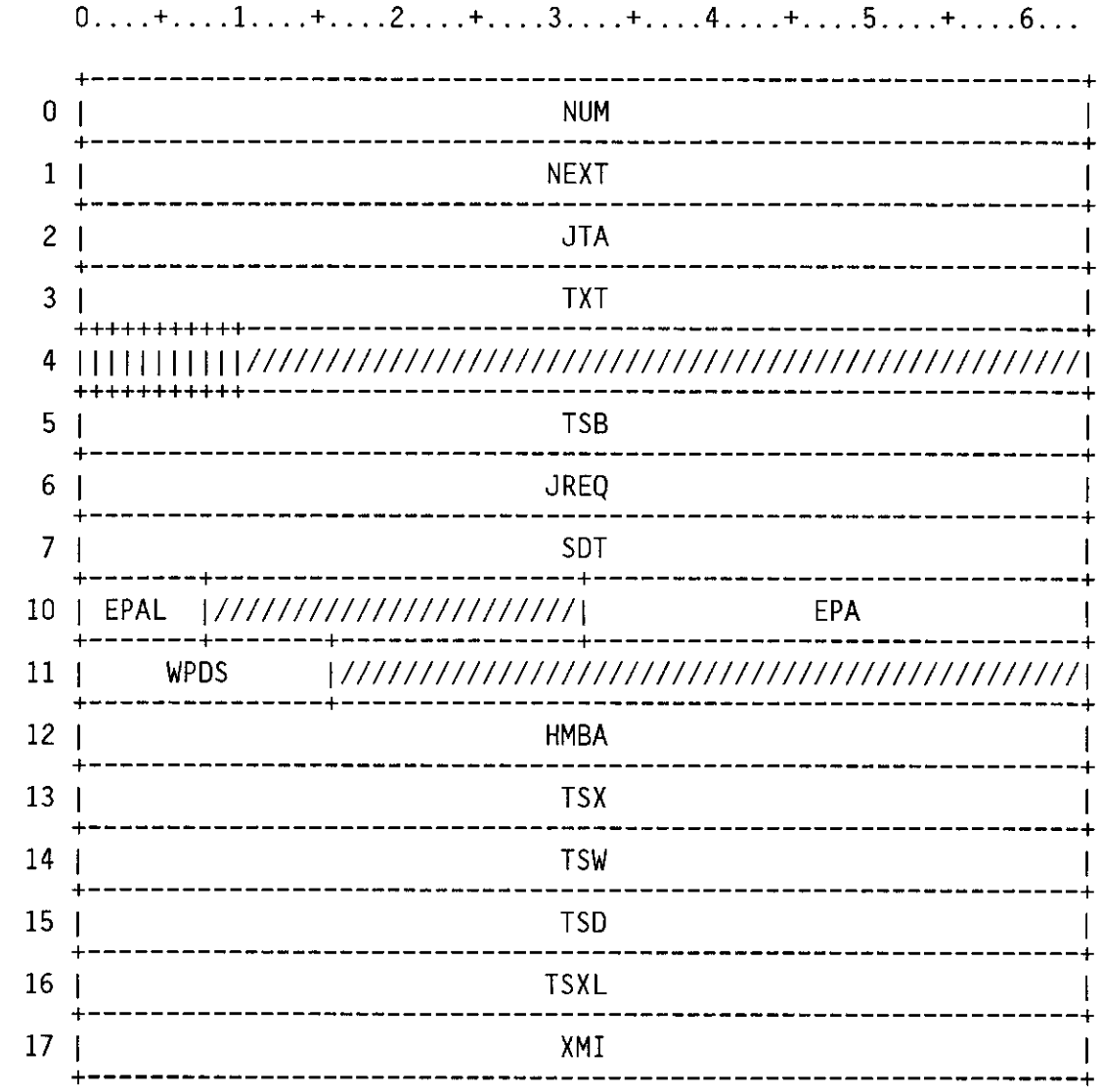


Figure TC-1. Task Control Block

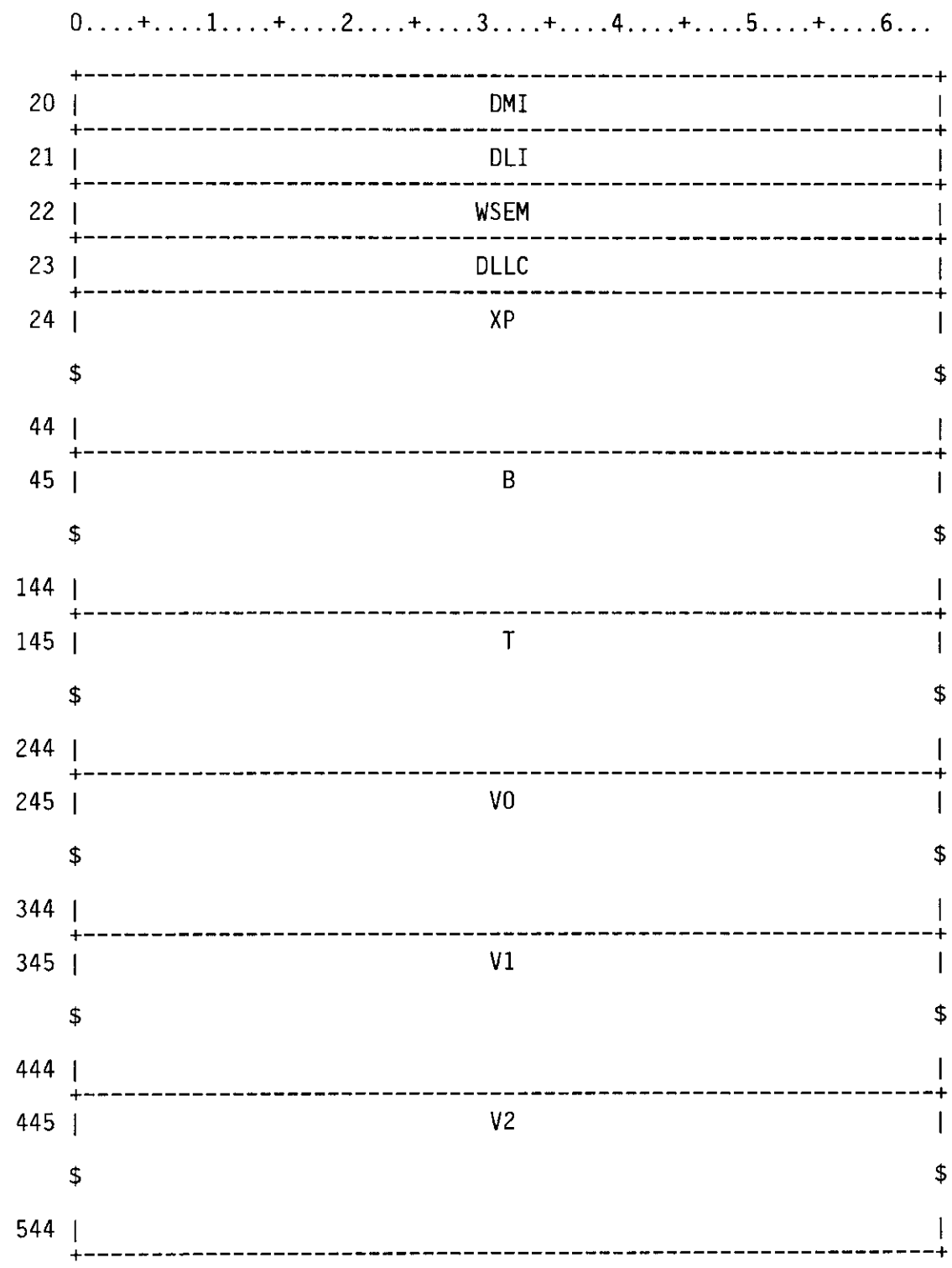


Figure TC-1. Task Control Block

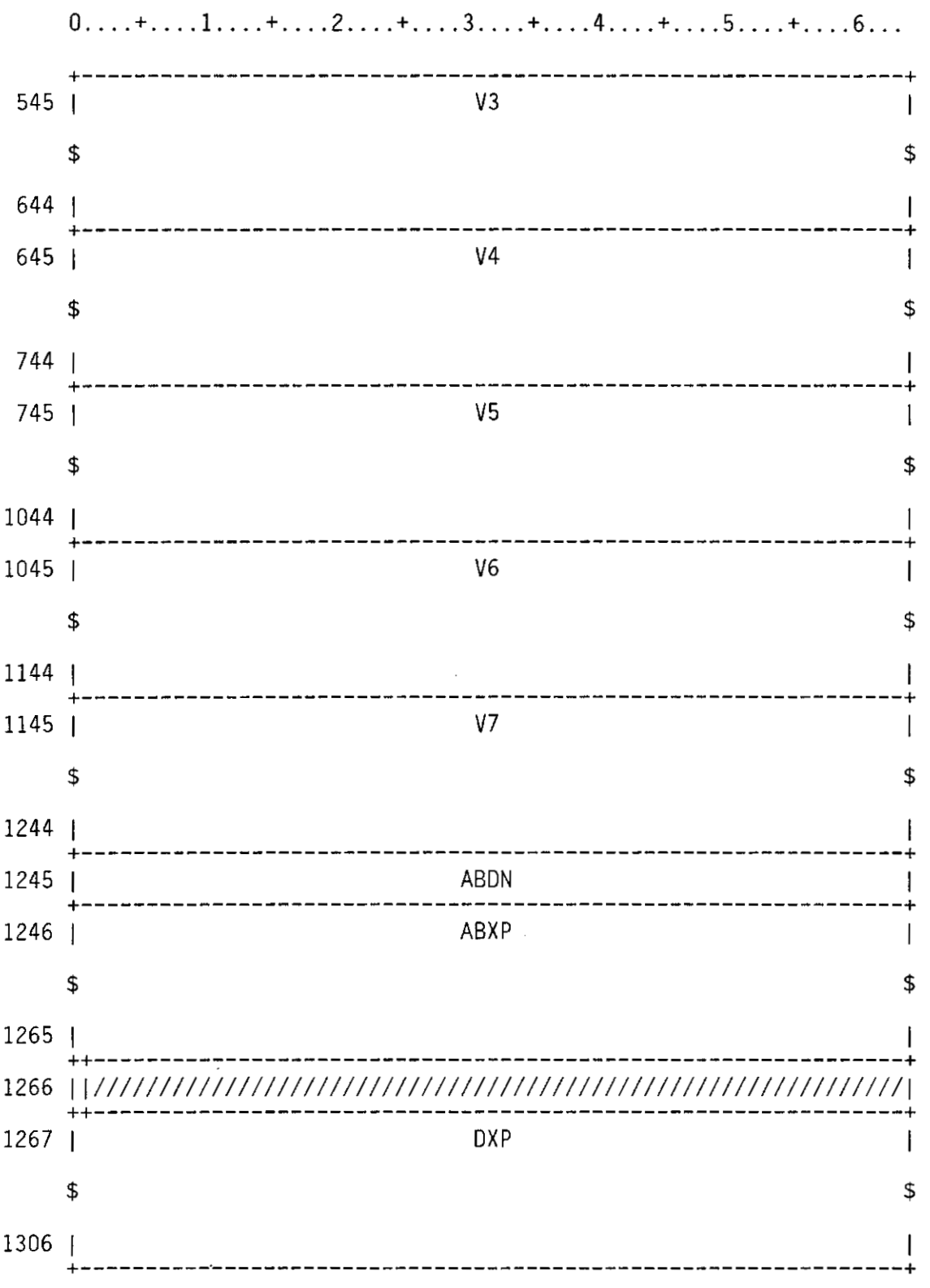


Figure TC-1. Task Control Block

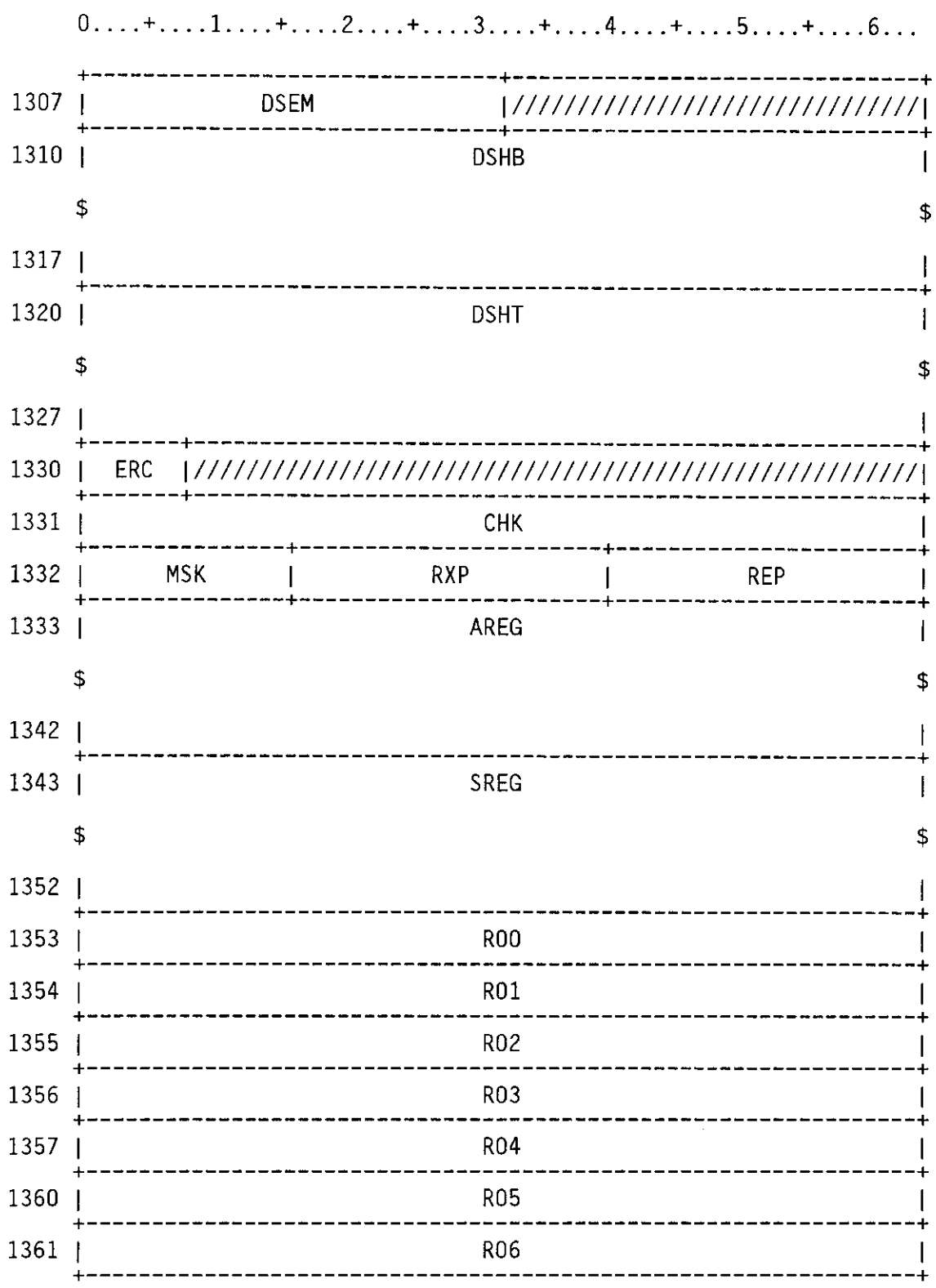


Figure TC-1. Task Control Block

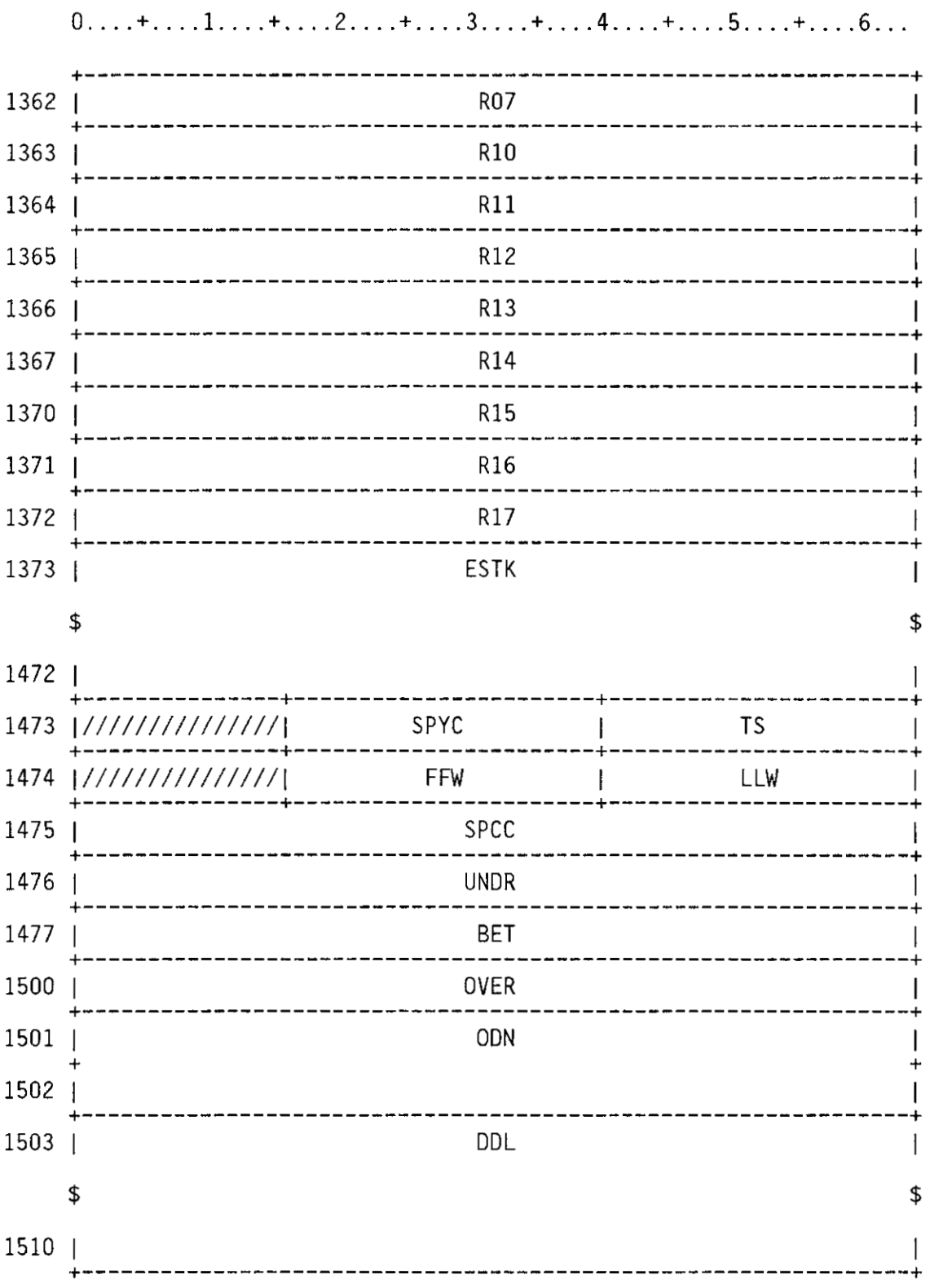


Figure TC-1. Task Control Block

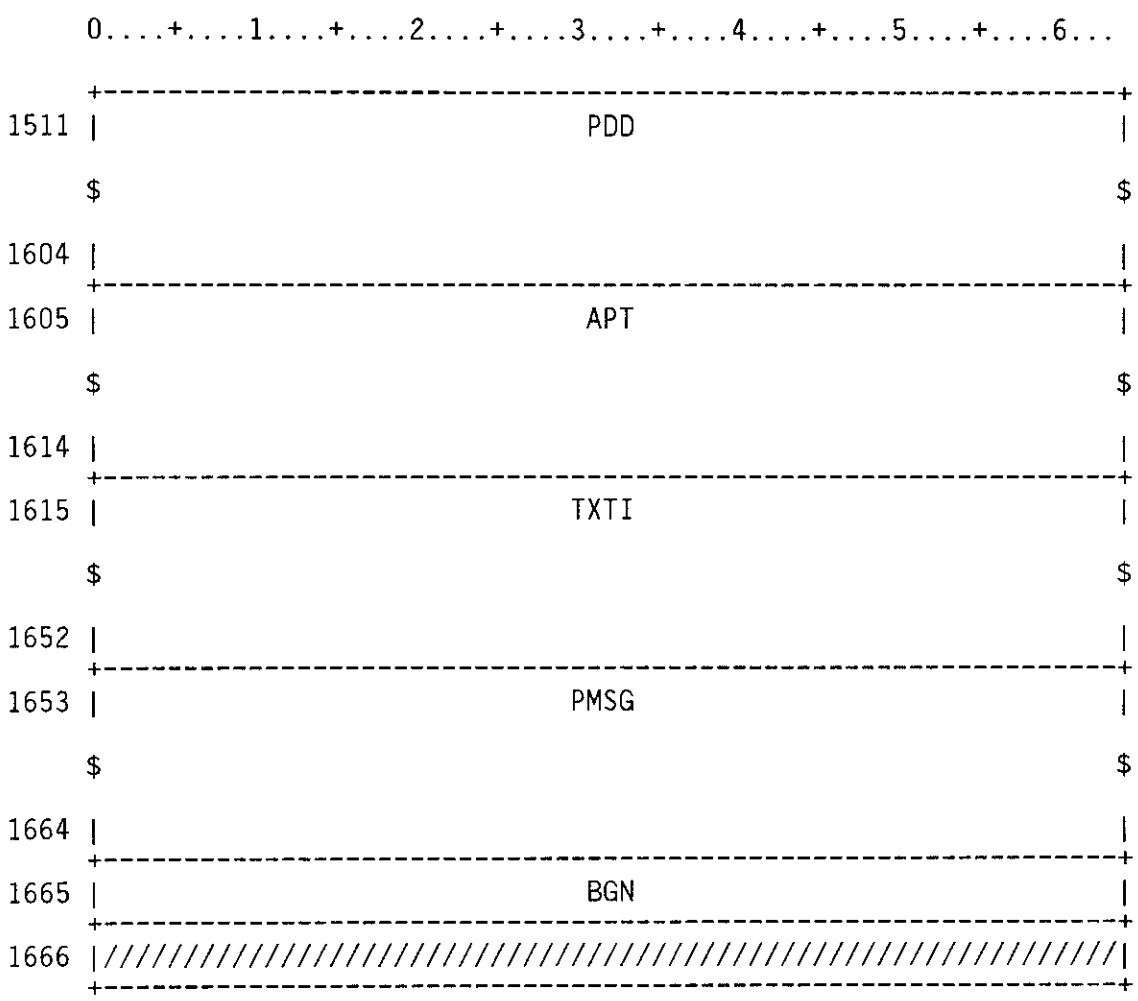


Figure TC-1. Task Control Block

TCB - Task control block.

Field	Word(base8)	Bits	Description
TCNUM	0	0-63	Task number within job
TCNEXT	1	0-63	Next TCB pointer offset from JTA(0)
TCJTA	2	0-63	Offset of TCB from JTA(0)
TCTXT	3	0-63	Address of associated TXT entry
TCEFI	4	0	Enable floating interrupts
TCIOAC	4	1	Current IOAREA status
TCIOAP	4	2	Previous IOAREA status

Field	Word(base8)	Bits	Description
TCBDM	4	3	Enable bidirectional mode flag
TCORI	4	4	Interrupt on operand range flag
TCSPY	4	5	SPY enabled when <> 0
TCACTV	4	6	ACTIVE-DURING-CURRENT-JOB-STEP FLAG
TCFGR	4	7	Force another GETREPLY before EPTK1
TCEMA	4	8	1=Extended memory addressing enabled
TCAVL	4	9	1=Additional vector logical unit enab.
TCTSB	5	0-63	Task Status Block addr (JTA-rel), or 0
TCJREQ	6	0-63	Word for JSH requests
TCSDT	7	0-63	SDT address, used by RLD in EXP
TCEPAL	10	0-7	NZ if EXEC should schedule EXP instead of connected user task
TCEPFG	10	0-6	Flags that EXP clears on specific events:
TCEPN	10	0	Set on normal exchange
TCEPE	10	1	Set on error exchange
TCEPC	10	2	Set if TCEPA is valid
TCEPJ	10	3	Set on JSH-to-EXP request
TCEPM	10	4	Resubmit no-DAT-space I/O request
TCEPNR	10	5	Resubmit not-ready I/O request
TCEPDL	10	6	Set on deadlock-error exchange
TCEXPF	10	7	Set by EXEC when EXP should examine Cleared by EXP to allow user execution
TCEPA	10	32-63	Continuation address within EXP
TCWPDS	11	0-15	PDS-full delay counter
TCHMBA	12	0-63	H'ware perf.mon. blk addr (JTA offset)
Task statistics. Times are in cycles unless noted otherwise.			
TCTSX	13	0-63	Time spent executing
TCTSW	14	0-63	Time spent waiting to execute
TCTSD	15	0-63	Time spend waiting for I/O

Field	Word(base8)	Bits	Description
TCTSXL	16	0-63	(TCTSX) at last CONNECT request
TCXMI	17	0-63	(CPU time)*(memory size) floating
TCDMI	20	0-63	(I/O wait time)*(memory size) floating
TCDLI	21	0-63	Total # of deadlock interrupts
TCWSEM	22	0-63	Semaphore number task is waiting for
TCDLLC	23	0-63	Count of deadlocks to ignore before scheduling EXP. (EXEC-use only)
Task registers.			
TCXP	24-44	0-63	Exchange package
TCVM	44	0-63	Vector mask
TCB	45-144	0-63	B registers
TCT	145-244	0-63	T registers
TCV0	245-344	0-63	V0 register
TCV1	345-444	0-63	V1 register
TCV2	445-544	0-63	V2 register
TCV3	545-644	0-63	V3 register
TCV4	645-744	0-63	V4 register
TCV5	745-1044	0-63	V5 register
TCV6	1045-1144	0-63	V6 register
TCV7	1145-1244	0-63	V7 register
Abort save areas			
TCABDN	1245	0-63	Dataset name for abort
TCABXP	1246-1265	0-63	Abort exchange package save

Debug register save area.
These fields are used to take a snapshot of the current state of the task when a DEBUG request is made by the user. The debugging utility in the user space can then make another request to retrieve the information.

Field	Word(base8)	Bits	Description
TCDACT	1266	0	Debug information is active flag
TCDXP	1267-1306	0-63	Exchange package
TCDB00	1267	32-63	Register B00
TCDSEM	1307	0-31	Semaphore registers
TCDSHB	1310-1317	0-63	Shared B registers
TCDSHT	1320-1327	0-63	Shared T registers
Reprieve control information.			
TCERC	1330	0-7	Reprieve error code
TCCHK	1331	0-63	Reprieve checksum
TCMSK	1332	0-15	Reprieve mask
TCRXP	1332	16-39	Reprieve XP address in user area
TCREP	1332	40-63	Reprieve entry address in user area
Register save area for resume/continue			
TCAREG	1333-1342	0-63	A register save area
TCSREG	1343-1352	0-63	S register save area
Register save area for EXP			
TCR00	1353	0-63	Register save area 00
TCR01	1354	0-63	Register save area 01
TCR02	1355	0-63	Register save area 02
TCR03	1356	0-63	Register save area 03
TCR04	1357	0-63	Register save area 04
TCR05	1360	0-63	Register save area 05
TCR06	1361	0-63	Register save area 06
TCR07	1362	0-63	Register save area 07
TCR10	1363	0-63	Register save area 10

Field	Word(base8)	Bits	Description
TCR11	1364	0-63	Register save area 11
TCR12	1365	0-63	Register save area 12
TCR13	1366	0-63	Register save area 13
TCR14	1367	0-63	Register save area 14
TCR15	1370	0-63	Register save area 15
TCR16	1371	0-63	Register save area 16
TCR17	1372	0-63	Register save area 17 L@TCESTK=D'64 EXP stack size
TCESTK	1373-1472	0-63	Stack for EXP
F$SPY fields			
TCSPYC	1473	16-39	# SPY areas enabled
TCTS	1473	40-63	User requested time slice
TCFFW	1474	16-39	First of SPY FW's
TCLLW	1474	40-63	Last of SPY LW's
TCSPCC	1475	0-63	Chain control for user profile
TCUNDR	1476	0-63	'under' counter
TCBET	1477	0-63	'between' counter
TCOVER	1500	0-63	'over' counter
TCODN	1501-1502	0-63	ODN table. Used by RELEASE/DISPOSE
TCDDL	1503-1510	0-63	DDL for FETCH/ACQUIRE
TCPDD	1511-1604	0-63	PDD for FETCH/ACQUIRE
TCAPT	1605-1614	0-63	F-PACKET for user driver requests
TCCCNT	1613	0-63	Count of outstnding channel requests
TCOCNT	1614	0-63	Count of open channels
TCTXTI	1615-1652	0-63	Copy of TXT at rollout

		L@TCPMSG=D'10	Length of pending message
TCPMSG	1653-1664	0-63	Text of pending message

TCB Copy of F$BGN table:

TCBGN	1665	0-63	BGN for F$BGN Call

Define an array for user multitasking task control information

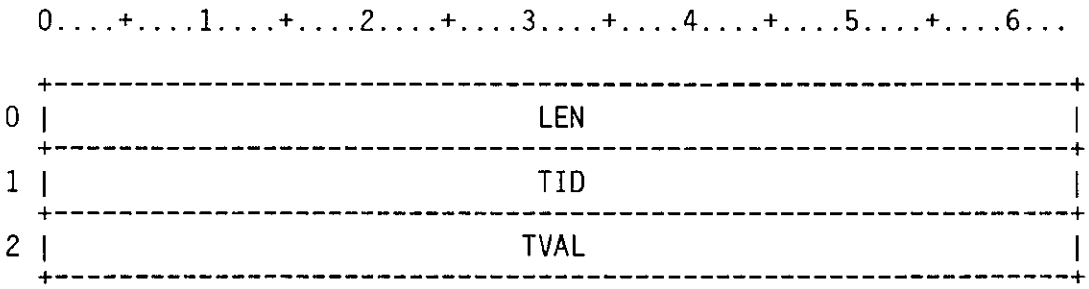


Figure TC-1. Task Control Array

Field Definitions.

Field	Word(base8)	Bits	Description
TCLEN	0	0-63	Task Control Array Length
TCTID	1	0-63	Task Identification Code
TCTVAL	2	0-63	Task value passed to created task

The TDT is used by the Tape Queue Manager (TQM) task to control tape devices. It can be changed by Startup as the result of changes made in the CNT.

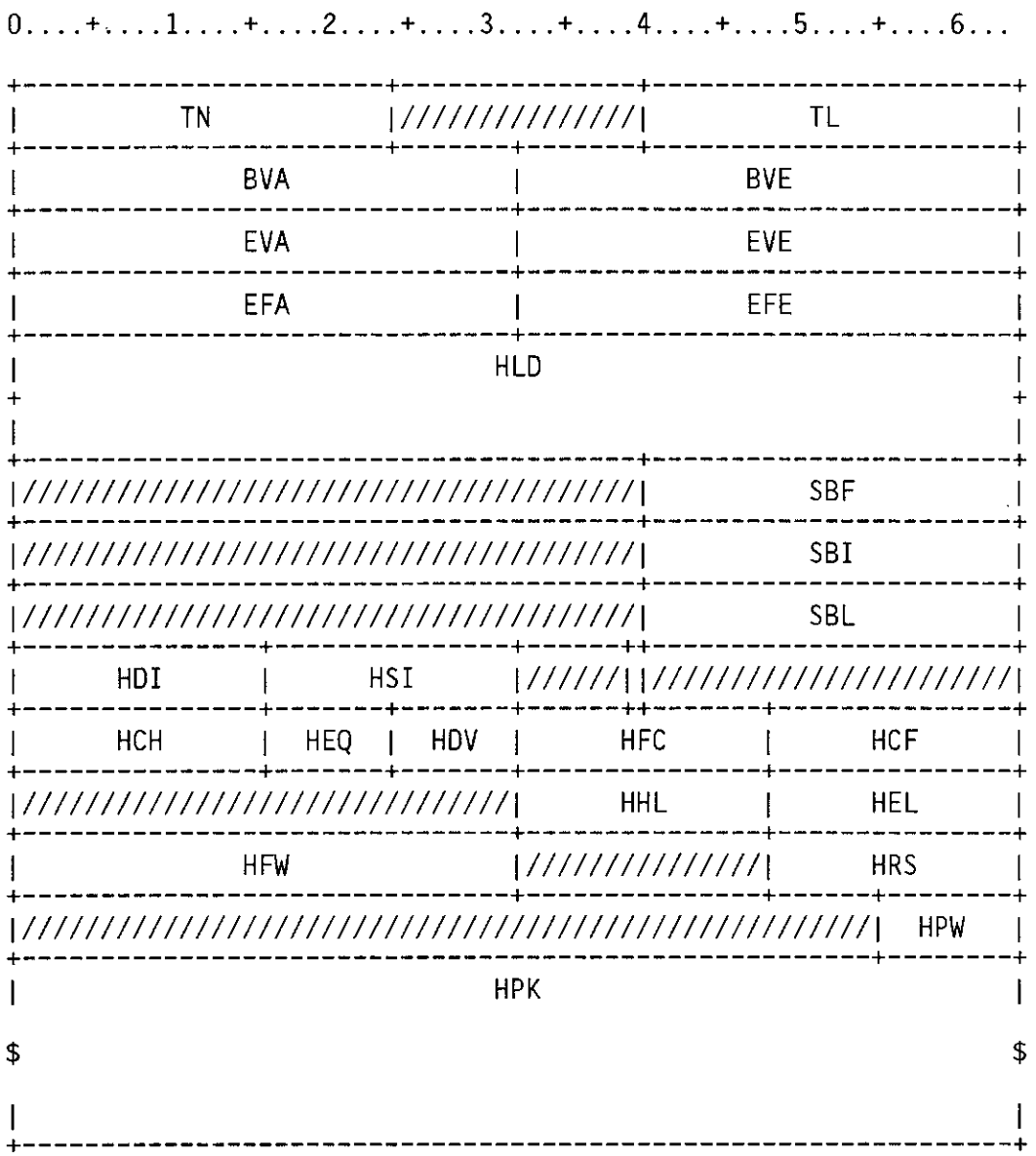


Figure TD-1. Tape Device Table header

Field	Word(base8)	Bits	Description
TDTN	0	0-23	Table name
TDTL	0	40-63	Total table length
TDBVA	1	0-31	ASCII 'VOL1'
TDBVE	1	32-63	EBCDIC 'VOL1'
TDEVA	2	0-31	ASCII 'EOV1'
TDEVE	2	32-63	EBCDIC 'EOV1'
TDEFA	3	0-31	ASCII 'EOF1'
TDEFE	3	32-63	EBCDIC 'EOF1'
TDHLD	4-5	0-63	Last device assigned in a tape bank (one TDT address per bank - indexed by bank number)
TDSBF	6	40-63	TQM snap buffer 'FIRST' pointer (bits 0-15 contain 'F=' in ASCII)
TDSBI	7	40-63	TQM snap buffer 'IN' pointer (bits
TDSBL	10	40-63	TQM snap buffer 'LIMIT' pointer (bits 0-15 contain 'L=' in ASCII)
TDHDI	11	0-15	Destination ID
TDHSI	11	16-31	Source ID
TDHBS	11	39	Packet I/O is outstanding
TDHCH	12	0-15	Channel ID (octal 20-37)
TDHEQ	12	16-23	Equipment ID (one hex digit)
TDHDV	12	24-31	Device ID (ordinal)
TDHFC	12	32-47	X$CC function code
TDHCF	12	48-63	Configuration flags
TDHOP	12	59	Operation (0=on, 1=off)
TDHDR	12	60	Device Request; if set, command applies to a specific tape drive.
TDHER	12	61	Equipment Request; if set, command applies to a specific control unit.

TDHCR	12	62	Channel Request; if set, command applies to an IOP channel.
TDHCC	12	63	Configuration change request if 1; Startup Configuration Table if 0.
TDHHL	13	32-47	Header length of COS configuration table (meaningful when TDHCC=0)
TDHEL	13	48-63	Entry length of COS configuration table (meaningful when TDHCC=0)
TDHFW	14	0-31	Absolute Cray address of COS configuration table (meaningful when TDHCC=0)
TDHRS	14	48-63	Sector length of table (rounded up) (meaningful when TDHCC=0)
TDHPW	15	55-63	Partial word count of last sector of table (meaningful when TDHCC=0)
TDHPK	16-n	0-63	Last word of CONFIG packet

The TDT is used by the Tape Queue Manager (TQM) task to control tape devices. It can be changed by Startup as the result of changes made in the CNT.

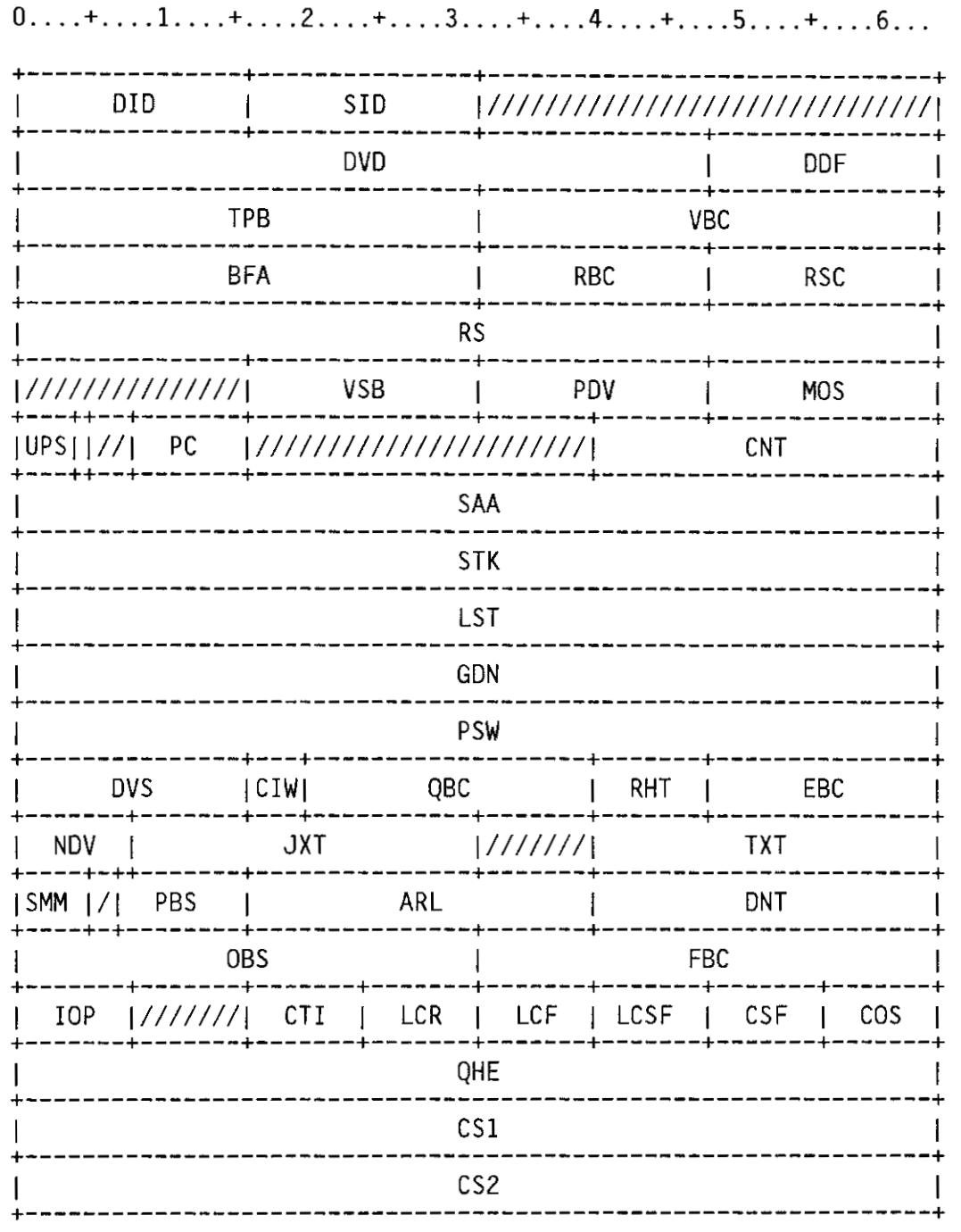


Figure TD-2. Tape Device Table Entry

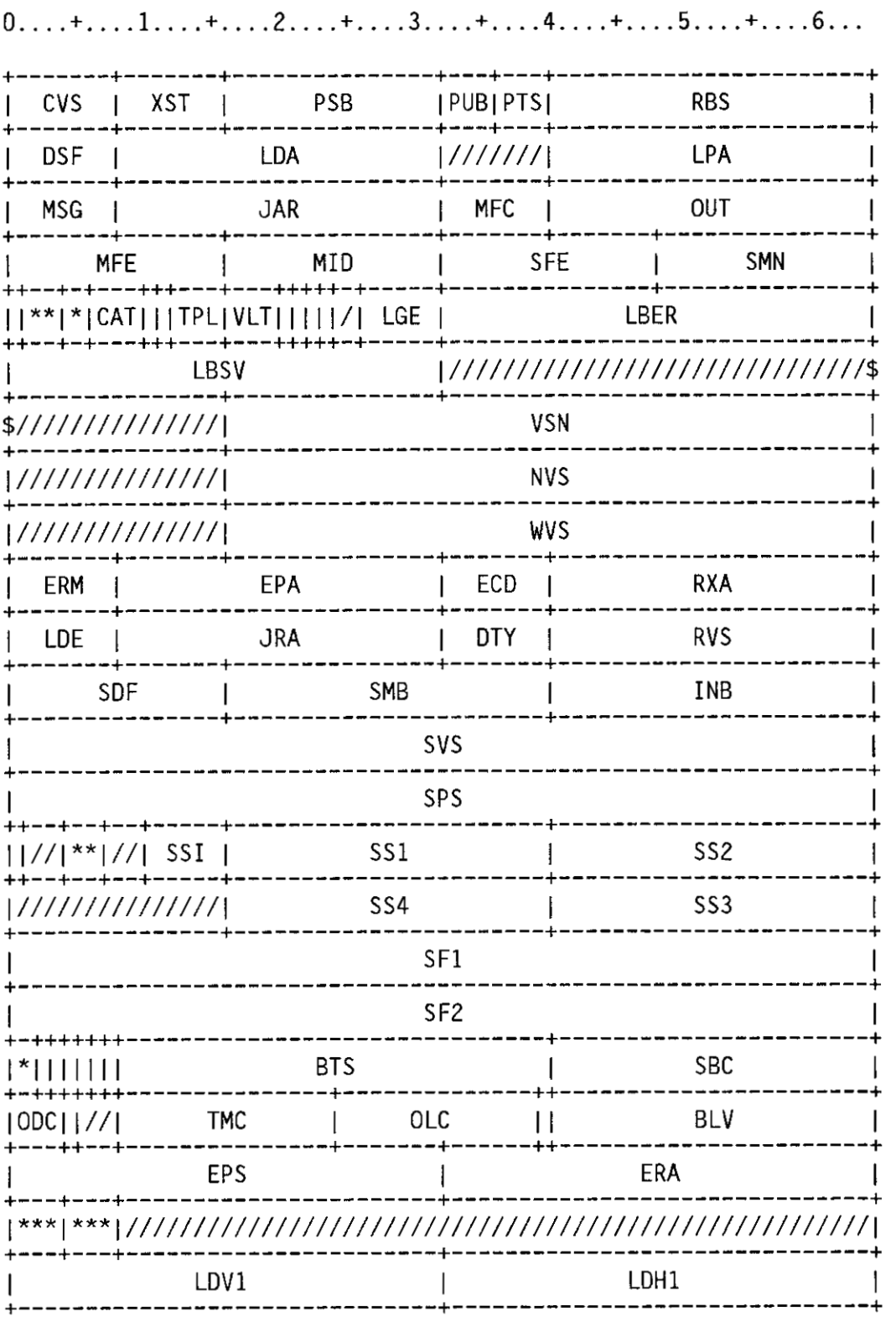


Figure TD-2. Tape Device Table Entry

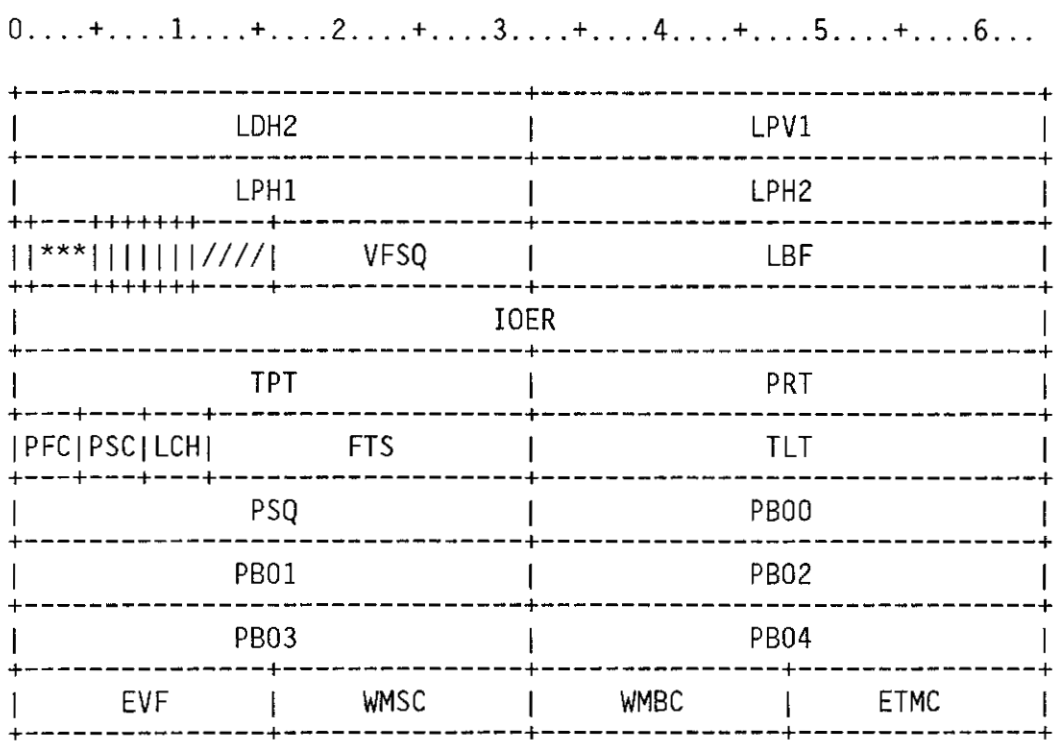


Figure TD-2. Tape Device Table Entry

Field	Word(base8)	Bits	Description
TDDID	0	0-15	Destination ID
TDSID	0	16-31	Source ID
TDDVD	1	0-47	Device descriptor
TDJXO	1	0-15	JXT offset
TDDVN	1	16-31	Device number
TDFCN	1	32-47	Function code
TDDDF	1	48-63	Dataset flags
TDNRR	1	50	No read recovery attempted
TDUPW	1	51	Read buffer size if field TDPWC
TDAPP	1	52	APPEND MOS DATA TO INPUT
TDWLB	1	53	Write last tape block (partial block)
TDNVP	1	54	Next valid packet
TDDEN	1	55-56	Dataset density
TDDFM	1	57-58	Dataset format
TDDUD	1	59	DISCARD USER DATA
TDDIS	1	60	Discard MOS data
TDDHL	1	61	Hold MOS data
TDSNC	1	62	SYNCHRONIZE TAPE D.S.
TDNWR	1	63	Do not write data to tape if 1.

Field	Word(base8)	Bits	Description
TDTPB	2	0-31	Tape block size
TDVBC	2	32-63	Volume tape block count
TDBFA	3	0-31	Bipolar buffer FWA
TDRBC	3	32-47	Request tape block count
TDRSC	3	48-63	Request count of 512-word units
TDRS	4	0-63	Reply status word from XIOP
TDTBC	4	0-15	Count of tape blocks was transferred
TDTSC	4	16-31	Count of 512-word units was transferred
TDSTS	4	32-47	Status from XIOP
TDBFN	4	32	Tape block finished
TDDTR	4	33	Data transferred
TDTMS	4	34	Tape mark status
TDLBK	4	35	Large tape block read
TDLSD	4	36	Lost data
TDPDE	4	37	Permanent data error
TDNOR	4	38	No ring in reel
TDBOT	4	39	Beginning of tape
TDEOT	4	40	End of tape
TDNTR	4	41	Not ready
TDRES	4	42	Reset hit
TDNOP	4	43	Not operational
TDNCD	4	44	Not capable device
TDWFE	4	45	Write format error
TDBTD	4	46	BLANK TAPE DETECTED
TDPEC	4	47	PROTOCOL ERROR
TDDBF	4	48	Data bad flag
TDUBC	4	49-54	Unused bit count
TDPWC	4	55-63	Partial sector word count
TDVSB	5	16-31	Valid sectors (read), valid tape blocks (write)
TDPDV	5	32-47	Previous device number for X$RM
TDMOS	5	48-63	Unallocated MOS sector count
TDUPS	6	0-3	Up/assigned status
TDOFF	6	0	Device is off
TDASN	6	1	Device is assigned
TDDWN	6	2	Device is down
TDPDN	6	3	Down of device is pending
TDCRP	6	4	Configuration reply is pending

FIELD	$,5,3		UNUSED
TDPC	6	8-15	IOP-3 channel path count
FIELD	$,16,16		UNUSED
TDCNT	6	40-63	Configuration entry address
TDSAA	7	0-63	Stack area address
TDSTK	10	0-63	Available stack address
TDLST	11	0-63	Last word address of stack area
TDGDN	12	0-63	Generic device name
TDPSW	13	0-63	Packet status word
TDMSC	13	0-15	Count of 512-word units count in Buffer Memory
TDMBC	13	16-31	Count of tape blocks in buffer memory
TDOSC	13	32-47	Count of outstanding 512-word units
TDOBC	13	48-63	Count of outstanding tape blocks
TDDVS	14	0-15	Device status flags:
TDCNR	14	0	CIO 'not ready' status issued
TDCLT	14	1	Labels have already been read flag
TDDEC	14	2	Dataset enquiry complete
TDVAC	14	3	Volume access complete
TDEIR	14	4	End of information returned
TDWMN	14	5	Wait on volume mount
TDEND	14	6	Write end of data/EOD read
TDQWT	14	7	Queued write request(MOS full)
TDQRD	14	7	Queued read request (MOS empty)
TDRNG	14	8	Ring state(in/1,out/0)
TDBDP	14	9	Transfer of bad data pending for read
TDEOV	14	10	EOV waiting on DTR completion
TDULC	14	11	Unload processing completed
TDJIM	14	12	Suspended on job not in memory
TDDMR	14	13	Discard mount/remount XIOP reply
TDSDP	14	14	Discard any reply packets
TDDNRL	14	15	Do not read label
TDCIW	14	16-19	Control word detected for writes
SUBFIELD	16,1		UNUSED
TDEOR	14	17	EOR control word detected
TDEOF	14	18	EOF control word detected
TDEOD	14	19	EOD control word detected
TDQBC	14	20-39	QUEUED BLOCK COUNT

Field	Word(base8)	Bits	Description
TDRHT	14	40-47	Read-ahead reissue threshold
TDEBC	14	48-63	Excess MOS block count
TDNDV	15	0-7	New device number for reselect
TDJXT	15	8-31	JXT address
FIELD	$,32,8		UNUSED
TDTXT	15	40-63	TXT address
TDSMM	16	0-4	Save area for XVOL
FIELD	$,5,2		UNUSED
TDPBS	16	7-15	Partial sector word count
TDARL	16	16-39	Accumulated record length
TDDNT	16	40-63	DNT address (JTA relative)
TDOBS	17	0-31	Original block size
TDFBC	17	32-63	Dataset tape block count (excluding labels)
TDIOP	20	0-7	I/O operation in progress flag
FIELD	$,8,8		UNUSED
TDCTI	20	16-23	Calling task ID
TDLCR	20	24-31	Last COS request
TDLCF	20	32-39	Last COS function
TDLCSF	20	40-47	Last COS subfunction
TDCSF	20	48-55	Current COS subfunction code
TDCOS	20	56-63	Current COS function code
TDQHE	21	0-63	queued COS response
TDCS1	22	0-63	INPUT+0 of current COS request:
TDRRTN	22	16-39	Caller return address
TDRTXO	22	40-55	TXT ordinal
TDRFC	22	56-63	Function code of request

Field	Word(base8)	Bits	Description
TDCS2	23	0-63	INPUT+1 of current COS request:
TDRDNT	23	16-39	DNT address JTA relative
TDRAUX	23	40-63	Auxiliary address
TDCVS	24	0-7	Current volume state
TDXST	24	8-15	Expiration processing status from servicing front-end
TDPSB	24	16-31	Pending action status bits:
TDRSP	24	16	Reselect is pending
TDWRT	24	17	User write ring request
SUBFIELD	18,6		UNUSED
TDSMP	24	24-31	Station message pending flags
TDPOM	24	24-27	Pending operator messages
TDMMP	24	24	Mount message is pending
TDVRP	24	25	VSN request is pending
TDXPP	24	26	Expiration request is pending
TDLSF	24	27	Servicing front-end logon request is pending
TDPSM	24	28-31	Pending servicing messages
TDDEP	24	28	Dataset enquiry is pending
TDDUP	24	29	Dataset update is pending
TDVAP	24	30	Volume access is pending
TDVUP	24	31	Volume update is pending
TDPUB	24	32-35	Pending update status bits:
TDULD	24	32	User's LDT (JTA copy)
TDUMC	24	33	User's volumes mounted count
SUBFIELD	34,2		UNUSED
TDPTS	24	36-39	Pending TQM action/status
TDLBP	24	36	Last block write pending
TDARS	24	37	Automatic reselect pending
SUBFIELD	38,2		UNUSED
TDRBS	24	40-63	Read block scanned
TDDSF	25	0-7	Dataset/volume state flags:
TDDVB	25	0	Begining of volume processed
TDDVE	25	1	End of volume processed
TDDFE	25	2	End of file processed
TDDCL	25	3	Close processed
TDDRW	25	4	Rewind processed

SUBFIELD	5,3		UNUSED
TDLDA	25	8-31	LDT address in memory pool
FIELD	$,32,8		UNUSED
TDLPA	25	40-63	Label group address in memory pool
TDMSG	26	0-7	Type of last station message (TF$xxx)
TDJAR	26	8-31	Active JAR entry address
TDMFC	26	32-39	Subtype of last station msg (TF$xxx)
TDOUT	26	40-63	Out pointer for queued read
TDMFE	27	0-15	Master operator logon ID
TDMID	27	16-31	Current message number to operator
TDSFE	27	32-47	Servicing front-end logon ID
TDSMN	27	48-63	Current message number to servicing front-end
TDTBL	30	0	Trace buffer has been logged flag
TDIDC	30	1-3	Current volume/dataset disposition
TDOC	30	4-5	Current open code (in/out)
TDCAT	30	6-9	Current servicing front end catalog request (XR$uxxx)
TDUSFE	30	10	User specified servicing front end indicator
FIELD	$,11,1		UNUSED
TDTPL	30	12-15	Requested label type (TPL...)
TDVLT	30	16-19	Verified label type of volume mounted
TDVLS	30	20	Volume switch has occured
TDVSO	30	21	Volume switch has occured on rewind
TDNSS	30	22	Non-specific volume scratch
TDMCO	30	23	Mount cancelled by operator
FIELD	$,24,2		UNUSED

Field	Word(base8)	Bits	Description
TDLGE	30	26-31	Number of PDE'ed blocks in label group
TDLBER	30	32-63	Label validation error flags
TDLBSV	31	0-31	LABEL MASK SAVE
FIELD	$,32,32		UNUSED
TDVSN	32	16-63	Current volume serial number
TDNVS	33	16-63	Next volume serial number
TDWVS	34	16-63	VSN of volume to be rejected
TDERM	35	0-7	Remount message type for XIOP error reply
TDEPA	35	8-31	Error address for XIOP reply
TDECD	35	32-39	Abort code for XIOP error reply
TDRXA	35	40-63	XIOP reply exit address
TDLDE	36	0-7	Last error for dataset
TDJRA	36	8-31	Job in memory resume address
TDDTY	36	32-39	DEVICE TYPE (CNDT)
TDRVS	36	40-63	Return address for message reply
TDSDF	37	0-15	Saved dataset definition flags (TDDDF)
TDSMB	37	16-39	Number of bad/EOF sectors moved
TDINB	37	40-63	In pointer for bad data
TDSVS	40	0-63	Saved reply status word(TDRS)
TDSPS	41	0-63	Saved packet status word (TDPSW)
TDSSA	42	0	Sequencer active flag
TDSNL	42	4-6	Sequencer nesting level
TDSSI	42	10-15	Current sequencer string index
TDSS1	42	16-39	Error exit address for sequence

Field	Word(base8)	Bits	Description
TDSS2	42	40-63	End-of-sequence return address
TDSS4	43	16-39	Save address across sequencer
TDSS3	43	40-63	Intermediate reply address
TDSF1	44	0-63	Sequencer function string 1
TDSCF	44	0-15	Current sequencer function
TDSNXF	44	0	Not an XIOP function
TDSAC	44	7-9	Advance code
TDSFC	44	10-15	Function code
TDSNF	44	16-31	Next function
TDSF2	45	0-63	Sequencer function string 2
TDSBD	46	0-1	Space block direction
TDTPS	46	2	Wait for tape positioning tape switch
TDPEV	46	3	Position to EOV
TDEVR	46	4	End of volume reached
TDNRA	46	5	Do not do read ahead
TDUOP	46	6	UN OPERATIONAL
FIELD	$,7,1		UNUSED
TDBTS	46	8-39	Number of blocks to skip from bod
TDSBC	46	40-63	Space block count
TDODC	47	0-3	Original disposition code
TDRSI	47	4	Restart synch I/O
FIELD	$,5,3		UNUSED
TDTMC	47	8-23	Outstanding tapemark count
TDOLC	47	24-38	Original label block count
TDCRB	47	39	0 - TDRBS is for last tape
TDBLV	47	40-63	Number of blocks on last volume
TDEPS	50	0-31	NUMBER OF BLOCKS TO RE-POSITION
TDERA	50	32-63	ERROR RE-POSITION RETURN ADDRESS

Field	Word(base8)	Bits	Description
TDEPFC	51	0-3	ERROR SAVE FUNCTION
TDEPSC	51	4-7	ERROR SAVE STATE
FIELD	$,8,56		UNUSED
TDLDV1	52	0-31	VOL1 address in LDT
TDLDH1	52	32-63	HDR1 address in LDT
TDLDH2	53	0-31	HDR2 address in LDT
TDLPV1	53	32-63	VOL1 address in LPA
TDLPH1	54	0-31	HDR1 address in LPA
TDLPH2	54	32-63	HDR2 address in LPA
TDEOI	55	0	End of information during position
TDPFCI	55	1-4	INITIAL TPT PROCESSING FUNCTION
TDEOFP	55	5	EOF REPLY PENDING
TDEOVP	55	6	EOV REPLY PENDING
TDBTRP	55	7	BLANK TAPE REPLY PENDING
TDOERP	55	8	OFF END OF REEL REPLY PENDING
TDEPP	55	9	ERROR RE-POSITION PENDING
TDEPLK	55	10	ERROR RE-POSITION IN PROGRESS
FIELD	$,11,5		UNUSED
TDVFSQ	55	16-31	File sequence in volume
TDLBF	55	32-63	Label buffer address
TDIOER	56	0-63	Mask for expected I/O status
TDTPT	57	0-31	TPT address
TDPRT	57	32-63	TPT return address
TDPFC	60	0-3	TPT function code
TDPSC	60	4-7	TPT state code

Field	Word(base8)	Bits	Description
TDLCH	60	8-11	Label character type 0 => ASCII 1 => EBCDIC
TDFTS	60	12-31	Files to skip counter
TDTLT	60	32-63	TLT table address
TDPSQ	61	0-31	Current TPT sequence address (TPS)
TDPB00	61	32-63	LEVEL 0 return address
TDPB01	62	0-31	LEVEL 1 return address
TDPB02	62	32-63	LEVEL 2 return address
TDPB03	63	0-31	
TDPB04	63	32-63	
TDEVF	64	0-15	EOV flags
TDSPO	64	0	EOV SPECIAL processing option 0 - no EOV processing requested 1 - EOV processing is needed
TDAEV	64	1	Tape is at EOV
TDISP	64	2	In user eov special processing
TDCLSV	64	3	Processing CLOSEV request
TDRTEV	64	4	Replied to end of volume
TDTLO	64	5-6	Write trailer label option
TDDWD	64	7	Discard user WRITE data at ENDSP
TDOEV	64	8	1 - Dataset is output when EOV occurs
TDWTL	64	9	1 - WRITE TRAILER LABEL
TD1MB	64	10	ALLOW 1 MORE BLOCK TO BE WRITTEN
TD1BW	64	11	1 BLOCK WRITTEN
TDCLVE	64	12	CLOSEV TRAILER OPTION FOR INPUT
TDWMSC	64	16-31	Save area of write TDMSC at STARTSP
TDWMBC	64	32-47	Save area of write TDMBC at STARTSP
TDETMC	64	48-63	EOV tape mark count

Name: Time Event Table (TET).

Purpose: This table is used by EXEC to schedule and manage time events.

Note: Time events are assigned numbers. The number is the bit position (0=sign bit) in the bit map, and also the entry ordinal.

Bit-map layout. Also defines number of entries.

```
TEUTIL   =  0                 Utilization interval event
TECHAN   =  C@CPLCHN          Entries for hardware channels
TETASK   =  TECHAN+C@CPHCHN   Entries for STP tasks
TEDEFL   =  TETASK+NE@STT     Entries for default events
TEUSER   =  TEDEFL+C@CPQUAN   Entries for user jobs
TESPY    =  TEUSER+C@CPQUAN   entries for user SPY
TEPROF   =  TESPY+C@CPQUAN    Entry for system execution profile
TESIZE   =  TEPROF+1          Next available entry
```

Check assumptions.

Table description.

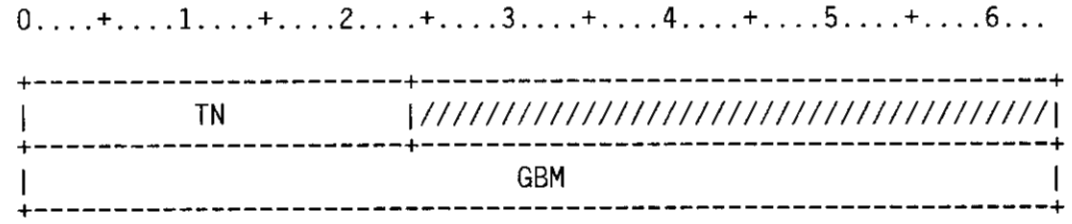


Figure TE-1. Time Event Table

Table header.

Field	Word(base8)	Bits	Description
TETN	0	0-23	Table name ('TET' in ASCII)
TEGBM	1	0-63	General event bit map

Event entry (one per event).

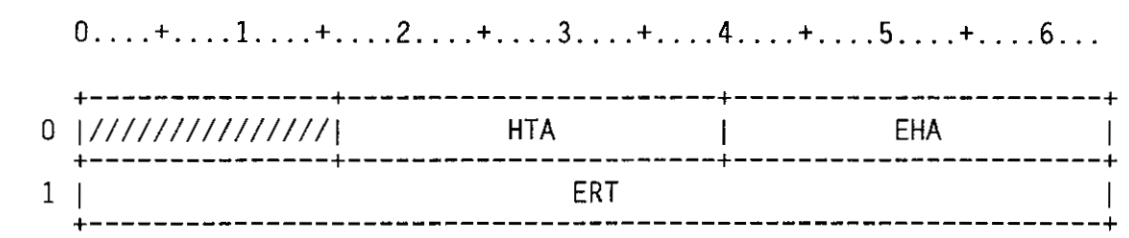


Figure TE-2. Time Event Table

Field	Word(base8)	Bits	Description
TEHTA	0	16-39	Event handler table address
TEEHA	0	40-63	Event handler address
TEERT	1	0-63	Event real time

The TET table describes error states along with an associated processing routine address.

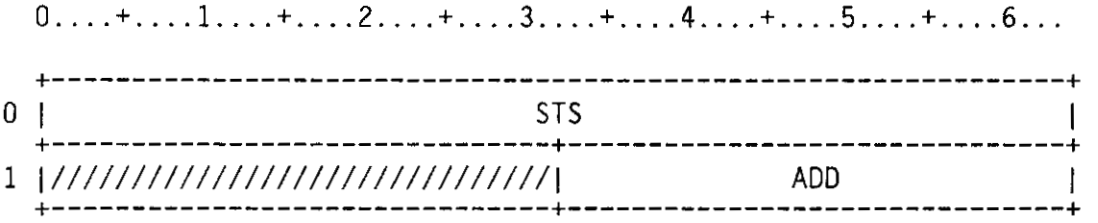


Figure TET-3. Tape Error Table

Field	Word(base8)	Bits	Description
TETSTS	0	0-63	Status
TETADD	1	32-63	Routine address

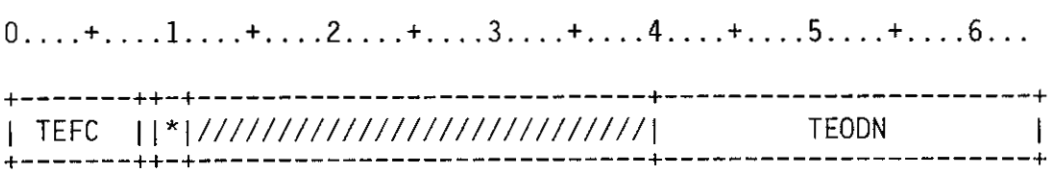


Figure TEV-1.

Field	Word(base8)	Bits	Description
TEFC	0	0-7	FUNCTION CODE TE$SVP=0 Set special processing TE$SSP=1 Start special processing TE$ESP=2 End special processing TE$CLSV=3 CLOSEV request
TESPO	0	8	1 - set EOV processing on
TEWLB	0	9-10	Write trailer label option for CLOSEV TE$NTL=0 0 - DO NOT WRITE TRAILER LABEL TE$EOV=1 1 - Write EOV trailer label
TEODN	0	40-63	ODN address

Define a table for user multitasking task information

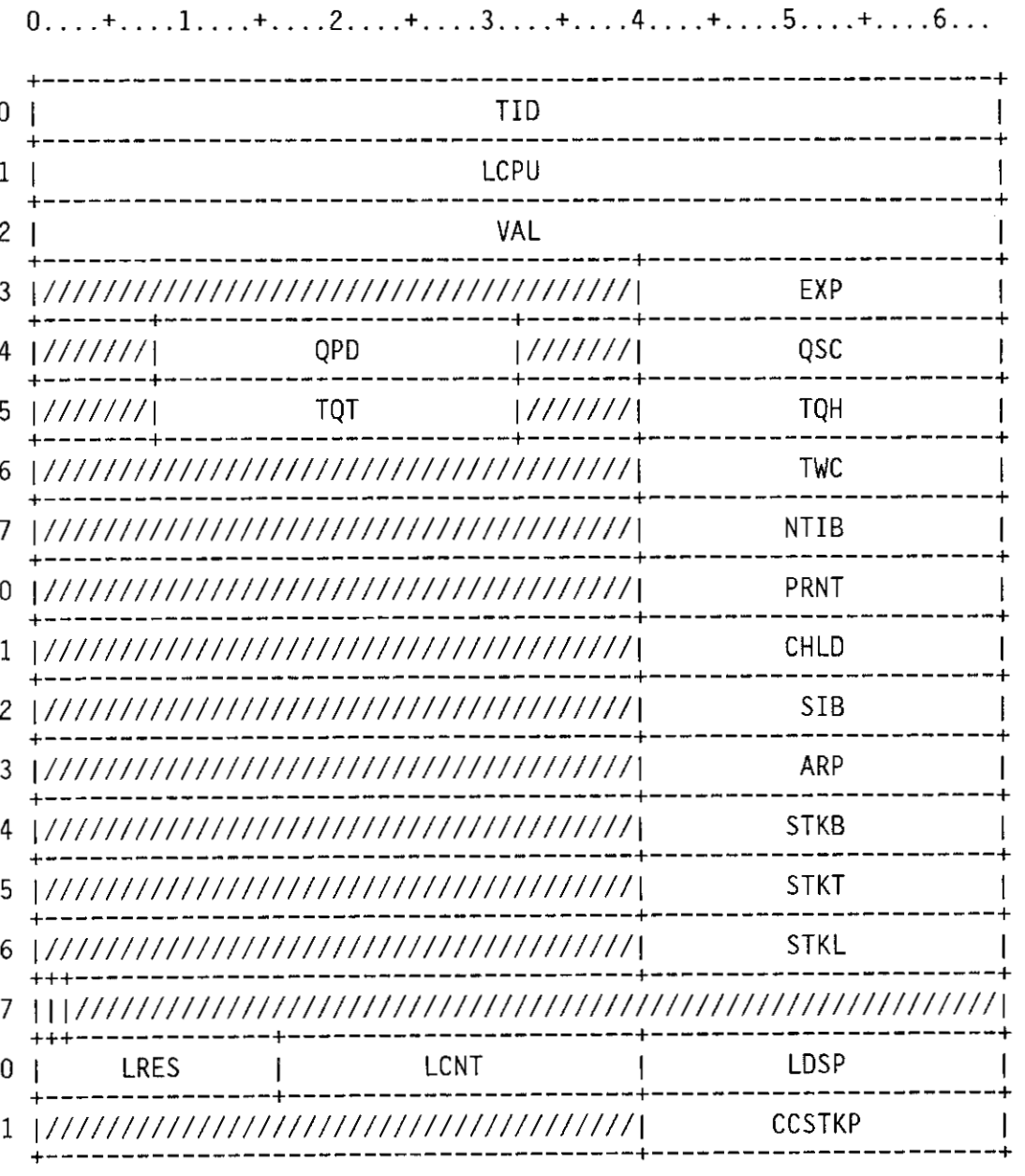


Figure TI-1. Task Information Block

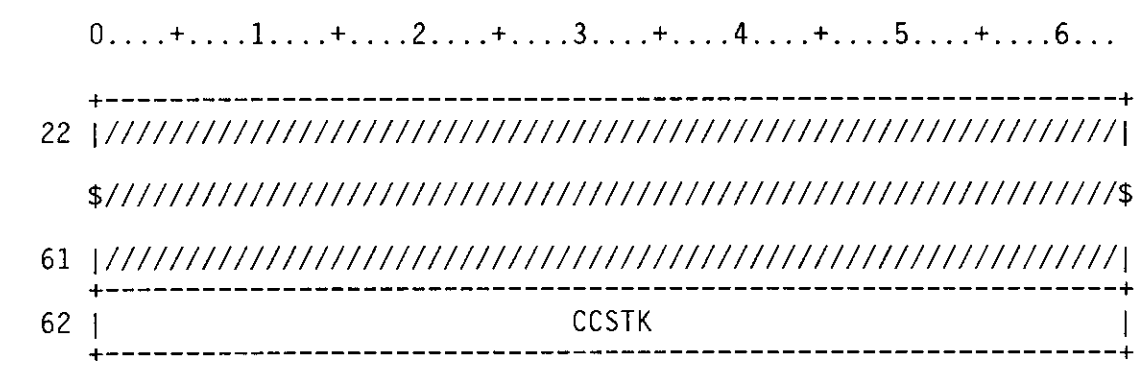


Figure TI-1. Task Information Block

Field definitions.

Field	Word(base8)	Bits	Description
TITID	0	0-63	Task ID
TILCPU	1	0-63	Logical CPU assigned to task
TIVAL	2	0-63	User defined task value
TIEXP	3	40-63	Execution point address for task
TIQPD	4	8-31	Run/ready/wait queue predecessor ptr
TIQSC	4	40-63	Run/ready/wait queue successor ptr
TITQT	5	8-31	Task completion queue tail
TITQH	5	40-63	Task completion queue header
TITWC	6	40-63	Count of tasks waiting for this task
TINTIB	7	40-63	Pointer to next assigned TIB
TIPRNT	10	40-63	Pointer to parent TIB
TICHLD	11	40-63	Pointer to first child's TIB
TISIB	12	40-63	Pointer to next siblings TIB
TIARP	13	40-63	Pointer to current argument list (B01)
TISTKB	14	40-63	Current base of stack for task (B02)
TISTKT	15	40-63	Current top of stack for task (B66)
TISTKL	16	40-63	Current limit of stack for task (B67)

Field	Word(base8)	Bits	Description
TIFIM	17	0	Current floating interrupt mode
TIBDM	17	1	Current bidirectional memory mode
TILRES	20	0-15	Reserved for DSPLOCK macro use
TILCNT	20	16-39	Locked DSP count, i.e. number of
TILDSP	20	40-63	Locked DSP address (STP relative)
CCSTKP	21	40-63	Stack pointer for character concatenation routines
CCSTK	62	0-63	Static stack for concatenation routine

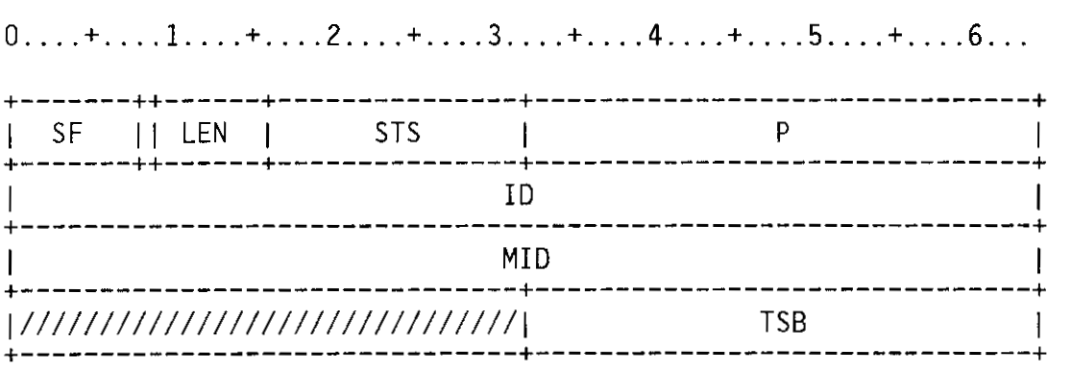


Figure TK-1. F$TASK Table

Field	Word(base8)	Bits	Description
TKSF	0	0-7	Sub-function code
TKNA	0	8	No-abort flag
TKLEN	0	9-15	Length of TK table
TKSTS	0	16-31	Return status

POSSIBLE VALUES OF RETURN STATUS

TK$ERXJT=1 Maximum tasks/job exceeded
TK$ERBID=2 Bad task id
TK$ERCAS=3 Attempt to activate self
TK$ERTAA=4 Attempt to activate active task
TK$ERTAI=5 Attempt to deactivate inactive task
TK$ERMEM=6 Not enough memory for new TCB
TK$ERBP=7 Bad P-addr for new task
TK$ERBTS=D'9 Bad TSB address
TK$ERADE=D'8 All tasks for job deactivated

TKP	0	32-63	P-Addr for new task
TKID	1	0-63	ID of task to be operated on
TKMID	2	0-63	ID of task requesting operation

Field	Word(base8)	Bits	Description
TKTSB	3	32-63	Task Status Block(TSB) addr (OPTIONAL)

This table defines magnetic tape label volume 1. It is constructed using the complex table definition macros. All values are expressed in characters; no binary equivalent is used.

Note that the VLOID field is drawn in the tables manual using special comments interpreted only by the table diagram generator. The table as it is now defined cannot be drawn by the table diagram generator with its present capabilities.

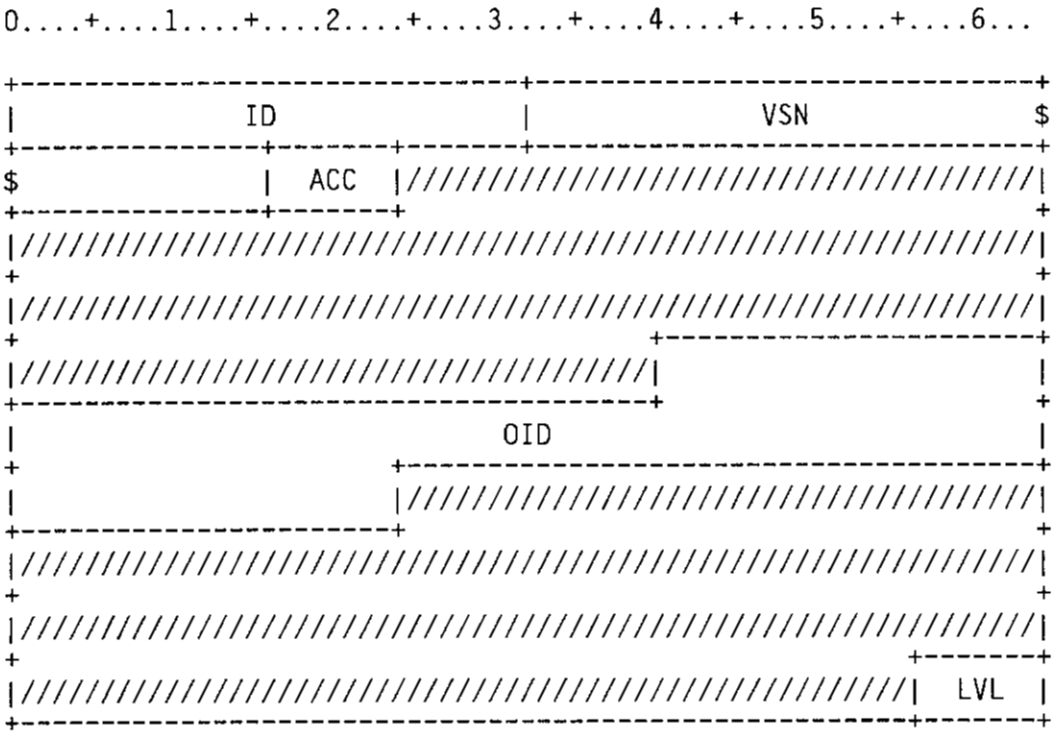


Figure VL-1. Volume Label Group

Field	Word(base8)	Bits	Description
VLID	0	0-31	Label name (VOL 1)
VLLID	0	0-23	Label identifier (VOL)
VLNUM	0	24-31	Label group number (1)
VLVSN	0-1	0-63	Volume serial number
VLACC	1	16-23	Volume accessibility character
VLOID	4-6	0-63	Owner identification VLOID1 tags word 4, bit 40 through word 5, bit 39 VLOID2 tags word 5, bit 40 through word 6, bit 23
VLLVL	11	56-63	ANSI standards level

Note that the IDOID field is drawn in the tables manual using special comments interpreted only by the table diagram generator. The table as it is now defined cannot be drawn by the table diagram generator with its present capabilities.

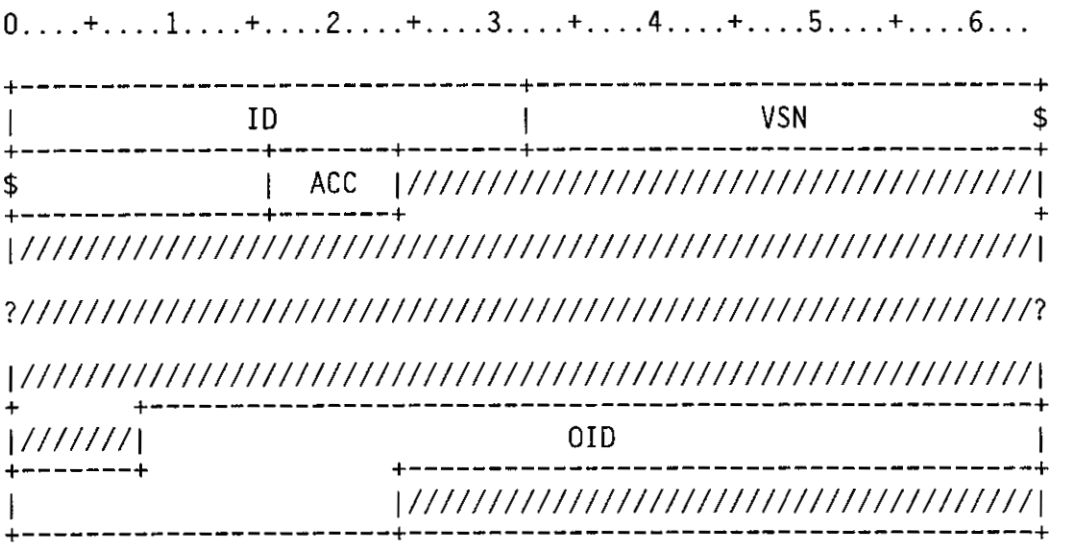


Figure IV-2. IBM Standard Label - Volume Label

Field	Word(base8)	Bits	Description
IVID	0	0-31	Label name (VOL 1)
IVLID	0	0-23	Label identifier (VOL)
IVNUM	0	24-31	Label group number (1)
IVVSN	0-1	0-63	Volume serial number
IVACC	1	16-23	Volume accessibility character
IVOID	5-6	0-63	Owner identification IVOID1 tags word 5, bit 8 through word 6, bit 7 IVOID2 tags word 6, bit 8 through word 6, bit 23

The dataset label group has two formats, one for label group 1, and one for label group 2. These tables are constructed by the complex table definition macros. All values are in characters; no binary equivalent is used.

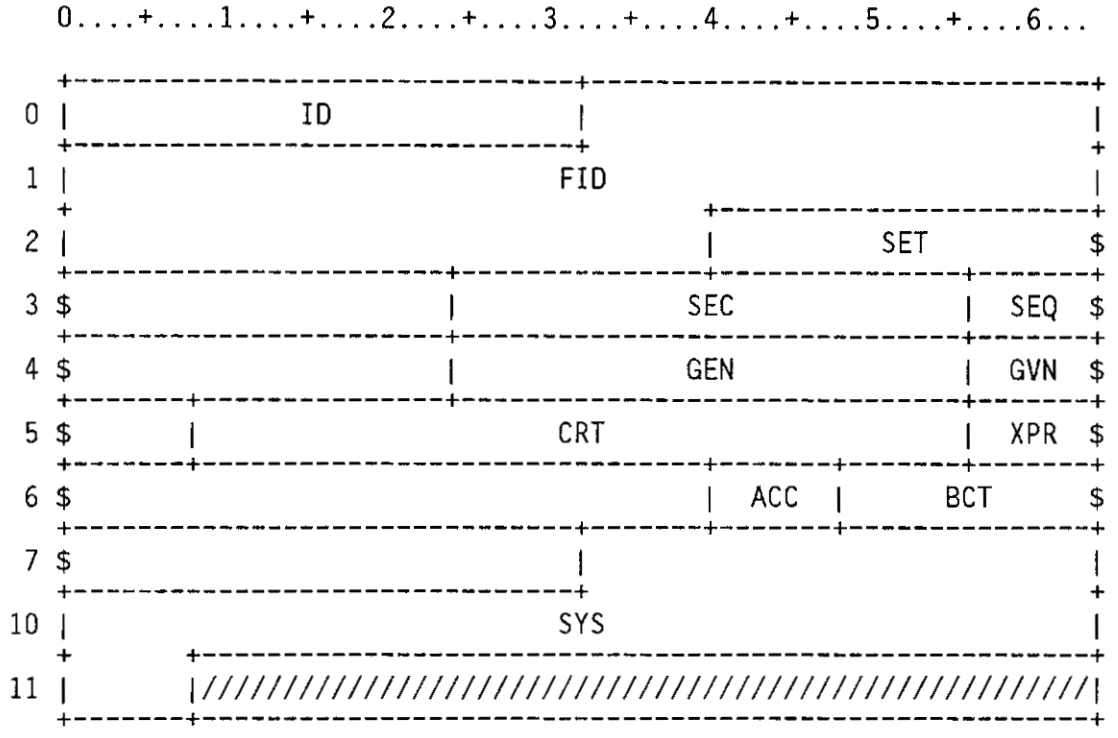


Figure DL-3. First Dataset Label Group

Field	Word(base8)	Bits	Description
DLID	0	0-31	Label name (HDR1, EOF1, EOV1) Label name (HDR2, EOF2, EOV2)
DLLID	0	0-23	Label identifier (HDR, EOF, EOV) Label identifier (HDR, EOF, EOV)
DLNUM	0	24-31	Label group number (1), ASCII Label group number (2), ASCII

Field	Word(base8)	Bits	Description
DLFID	0-2	0-63	File identifier (dataset name) DLFID1 tags word 0, bit 32 through word 1, bit 31 DLFID2 tags word 1, bit 32 through word 2, bit 31 DLFID3 tags word 2, bit 32 through word 2, bit 39
DLSET	2-3	0-63	Set identifier
DLSEC	3	24-55	File section number (volume sequence number)
DLSEQ	3-4	0-63	File sequence number
DLGEN	4	24-55	File generation number
DLGVN	4-5	0-63	File generation version number
DLCRT	5	8-55	File creation date
DLCRS	5	8-15	Space
DLCRY	5	16-31	Creation year
DLCRD	5	32-55	Creation day of year
DLXPR	5-6	0-63	File expiration date
DLXPS	5	56-63	Space
DLXPY	5	0-15	Expiration year
DLXPD	5	16-39	Expiration day of year
DLACC	6	40-47	File accessibility character
DLBCT	6-7	0-63	Tape block count
DLSYS	7-11	0-63	System code DLSYS1 tags word 7, bit 32 through word 8, bit 31 DLSYS2 tags word 8, bit 32 through word 9, bit 7

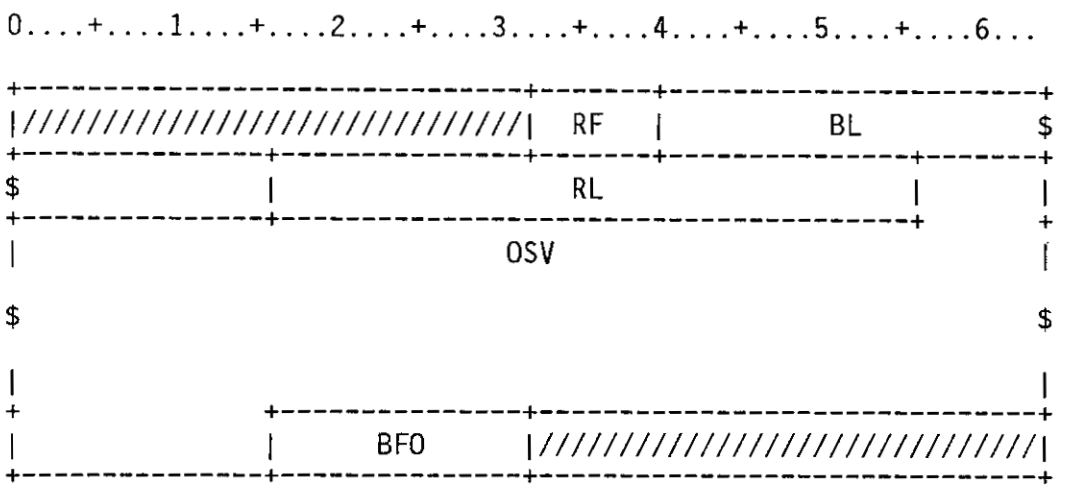


Figure DL-4. Second Dataset Label Group

Field	Word(base8)	Bits	Description
DLRF	0	32-39	Record fmt is one of the following: 'F' = Fixed length 'D' = Variable; length in decimal 'V' = Variable; length in binary 'U' = Undefined
DLBL	0-1	0-63	Tape block length
DLRL	1	16-55	Record length
DLOSV	1-6	0-63	Reserved for operating system DLOSV1 tags word 1, bit 56 through word 2, bit 55 DLOSV2 tags word 2, bit 56 through word 3, bit 55 DLOSV3 tags word 3, bit 56 through word 4, bit 55 DLOSV4 tags word 4, bit 56 through word 5, bit 55 DLOSV5 tags word 5, bit 56 through word 6, bit 15
DLBFO	6	16-31	Buffer offset (optional)

The IDLG is the IBM equivalent of the DLG format 2. This definition is for tape dataset label group two. It is constructed using the complex table definition macros. All values are expressed in characters; no binary equivalent is used.

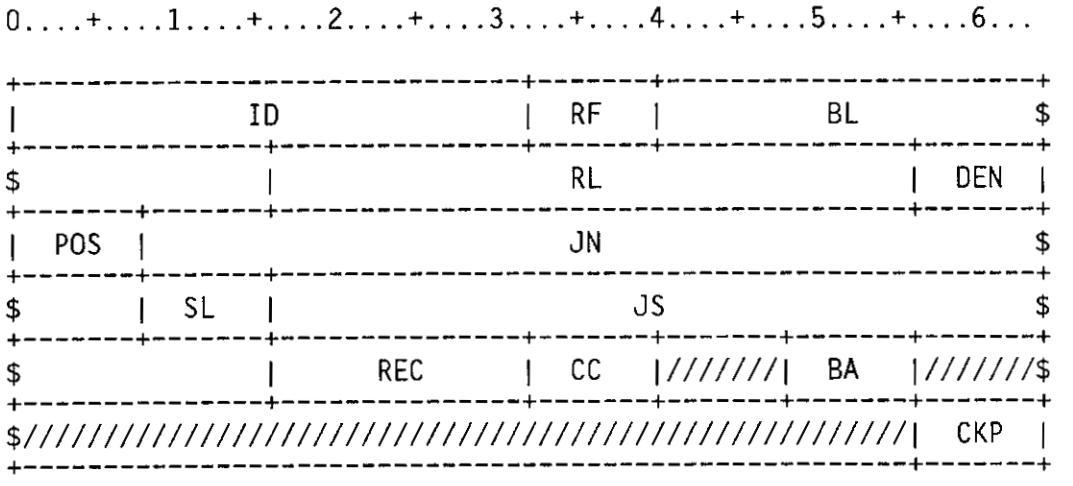


Figure ID-5. Second IBM Dataset Label Group

Field	Word(base8)	Bits	Description
IDID	0	0-31	Label name (HDR2, EOF2, EOV2)
IDLID	0	0-23	Label identifier (HDR, EOF, EOV)
IDNUM	0	24-31	Label group number (2)
IDRF	0	32-39	Record fmt is one of the following: 'F' = Fixed length 'V' = Variable 'U' = Undefined
IDBL	0-1	0-63	Tape block length
IDRL	1	16-55	Record length
IDDEN	1	56-63	Recording density
IDPOS	2	0-7	Dataset position (volume switch flag)
IDJN	2-3	0-63	Job name
IDSL	3	8-15	Slash '/'
IDJS	3-4	0-63	Job step name

Field	Word(base8)	Bits	Description
IDREC	4	16-31	Recording technique
IDCC	4	32-39	Control characters present flag
IDBA	4	48-55	Block attributes; one of the following: B Tape blocked records S Spanned records M Tape blocked and spanned records
IDCKP	5	56-63	Checkpoint dataset identifier

The TLT table is used to describe parameters for label classes used by the system during label validation. Current label classes are ANSI standard and IBM standard.

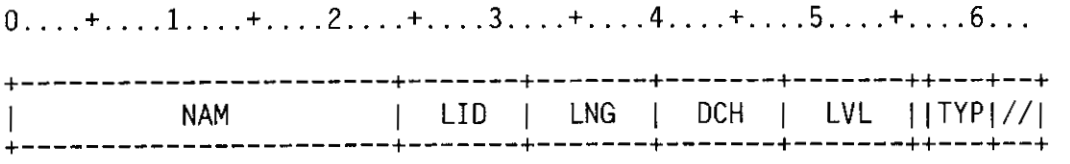


Figure TL-1. Tape Label Table

Field	Word(base8)	Bits	Description
TLNAM	0	0-23	Label name
TLLID	0	24-31	Label number
TLLNG	0	32-39	Length of label in bytes
TLDCH	0	40-47	Default character
TLLVL	0	48-55	Standard level (ansi)
TLFXD	0	56	Length fixed if set
TLTYP	0	57-60	Label type (TLT$...)

TLT$VL1	=	1	VOL1
TLT$HR1	=	2	HDR1
TLT$HR2	=	3	HDR2
TLT$EV1	=	4	EOV1
TLT$EV2	=	5	EOV2
TLT$EF1	=	6	EOF1
TLT$EF2	=	7	EOF2

The Inter-task Message Table is STP-resident. Each entry contains an intertask message plus control information.

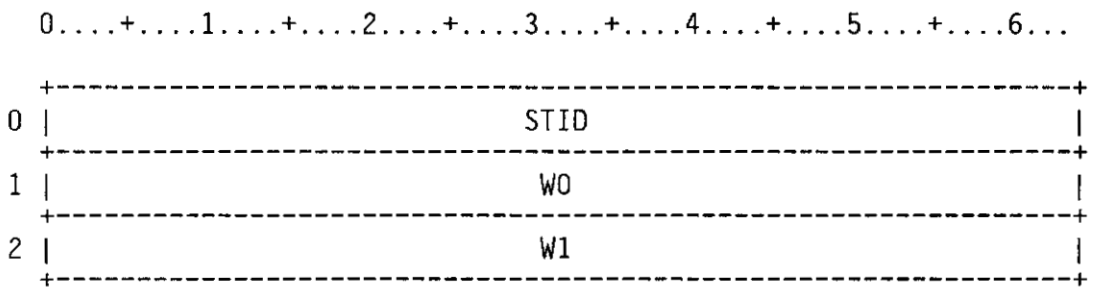


Figure TM-1. STP Inter-task Message Table

Field	Word(base8)	Bits	Description
TMSTID	0	0-63	Sending task's ID
TMW0	1	0-63	Inter-task message word 0
TMW1	2	0-63	Inter-task message word 1

The tape label migration table is used when a tape mounted for a write is labeled differently than that requested. The table is scanned to see if the mounted tape can migrate to the requested label type.

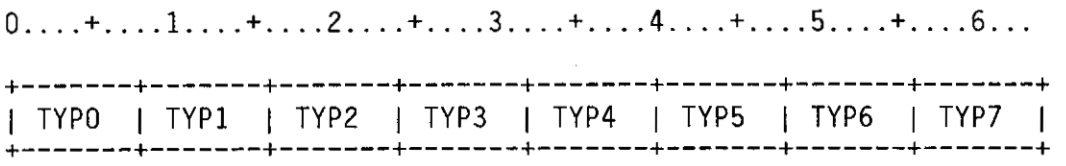


Figure TM-2. Tape Label Migration Table

Field	Word(base8)	Bits	Description
TMTYP0	0	0-7	ENTRY 0
TMTYP1	0	8-15	ENTRY 1
TMTYP2	0	16-23	ENTRY 2
TMTYP3	0	24-31	ENTRY 3
TMTYP4	0	32-39	ENTRY 4
TMTYP5	0	40-47	ENTRY 5
TMTYP6	0	48-55	ENTRY 6
TMTYP7	0	56-63	ENTRY 7
TMT$END = O'377			TERMINATOR

COMTN

Table Name Table

The Table Name Table (TNT) is contained in the system task area and is used by EXP to service the F$TBL function. This deck is also used to define fields for the F$TBL call block.

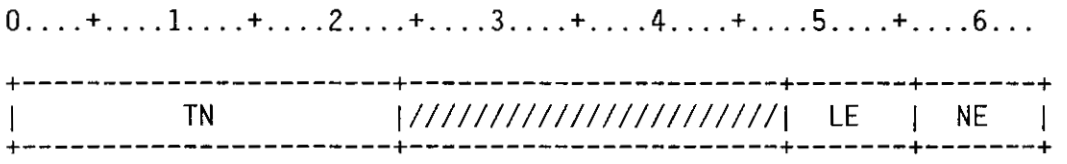


Figure TN-1. Table Name Table

Define TNT header.

Field	Word(base8)	Bits	Description
TNTN	0	0-23	Table name
TNLE	0	48-55	TNT entry length
TNNE	0	56-63	Number of TNT entries (set by BUILD)

Define TNT entry.

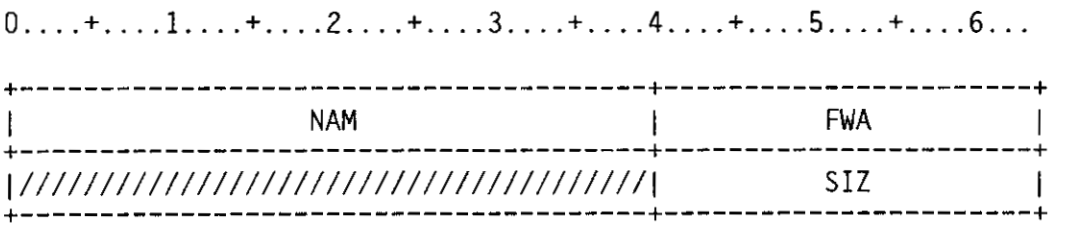


Figure TN-2. Table Name Table

Field	Word(base8)	Bits	Description
TNNAM	0	0-39	Table name ('ASCII'L)
TNFWA	0	40-63	Starting address of table
TNSIZ	1	40-63	Table size

Define fields for the F$TBL call block.

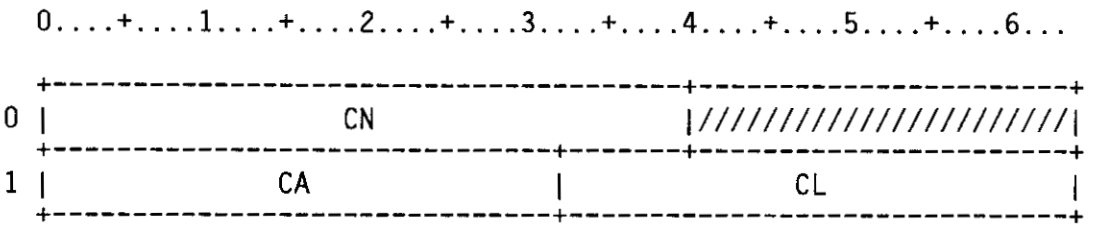


Figure TBL-1. F$TBL Call Block

Field	Word(base8)	Bits	Description
TBLCN	0	0-39	Table name ('ASCII'L)
TBLCA	1	0-31	Receive buffer address
TBLCL	1	32-63	Receive buffer length

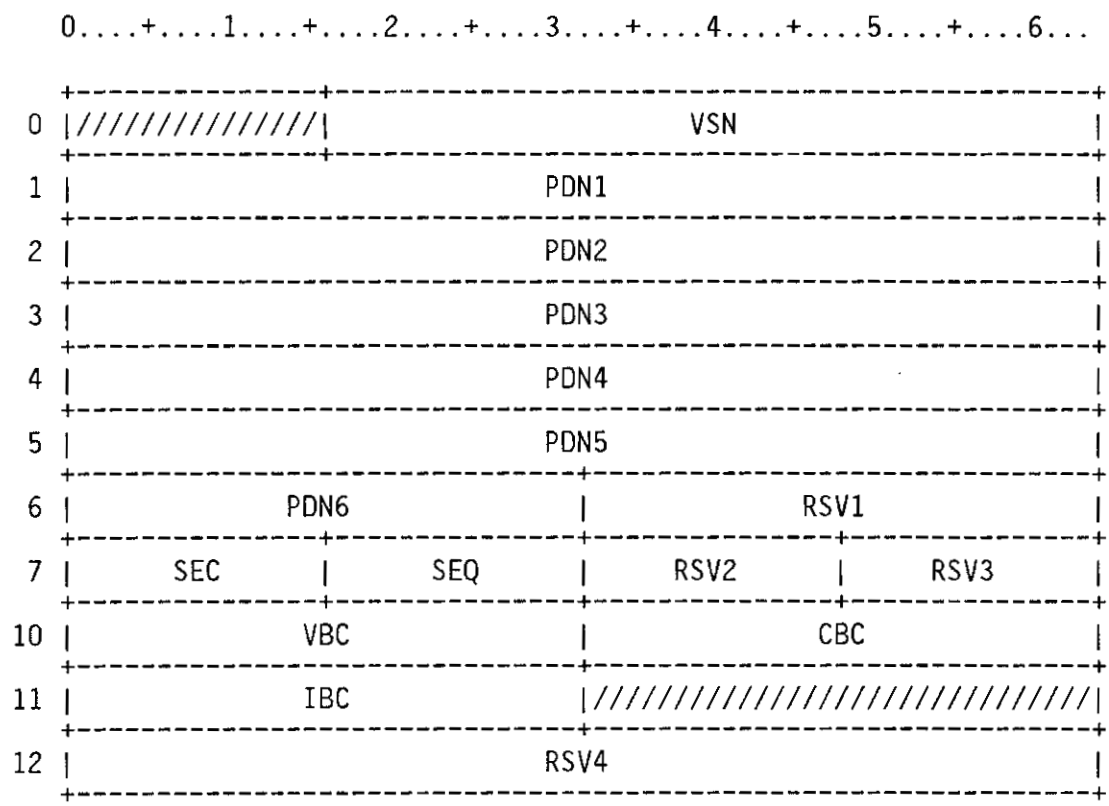


Figure TP-1. Tape Position Information Table

Field	Word(base8)	Bits	Description
TPVSN	0	16-63	VSN of last block processed
TPPDN1	1	0-63	Characters 1 - 8 of PDN
TPPDN2	2	0-63	Characters 9 - 16 of PDN
TPPDN3	3	0-63	Characters 17 - 24 of PDN
TPPDN4	4	0-63	Characters 25 - 32 of PDN
TPPDN5	5	0-63	Characters 33 - 40 of PDN
TPPDN6	6	0-31	Characters 41 - 44 of PDN
TPRSV1	6	32-63	Reserved for future use
TPSEC	7	0-15	File section number

Field	Word(base8)	Bits	Description
TPSEQ	7	16-31	File sequence number
TPRSV2	7	32-47	Reserved- for concatenation
TPRSV3	7	48-63	Reserved
TPVBC	10	0-31	Block number
TPCBC	10	32-63	Number of blocks in circular buffer Output - blocks not sent to IOP Input - always 0
TPIBC	11	0-31	Number of blocks in IOP buffer
TPRSV4	12	0-63	Reserved

This table defines routines which are called for processing based on the current function (TPF$...) and the current state (TPS$...). Each defined label type has an associated TPT table during access, TQM links the appropriate TPT to the TDT based o the requested label type.

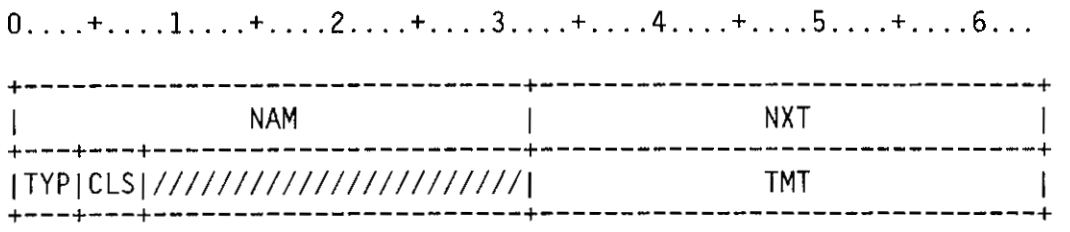


Figure TP-1. Tape Processing Table

Field	Word(base8)	Bits	Description
TPNAM	0	0-31	Table name in ascii (TPT)
TPNXT	0	32-63	Link to next TPT
TPTYP	1	0-3	Label format. 'LB' on access.
TPCLS	1	4-7	Label class. TPSL/TPAN/TPNL
TPTMT	1	32-63	Pointer to tape migration table

There is one TPS entry built for each defined state (TPS$...) Each TPS entry contains a processing routine address which is dependent on the current function. The functions are READ,WRITE and position. Additionally, there is information relating to label verification and error processing.

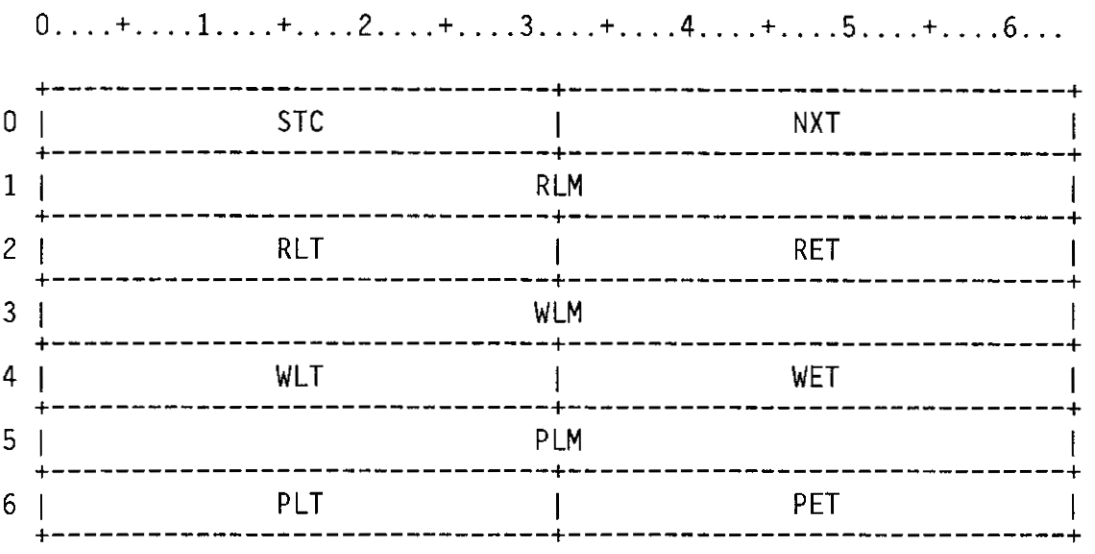


Figure TPS-1. TPS Table Header

Field	Word(base8)	Bits	Description
TPSSTC	0	0-31	State code for following sequence
TPSNXT	0	32-63	Pointer to next sequence
TPSRLM	1	0-63	READ: label verification mask
TPSRLT	2	0-31	READ: label processing table
TPSRET	2	32-63	READ: error processing table
TPSWLM	3	0-63	WRITE: label verification mask
TPSWLT	4	0-31	WRITE: label processing table
TPSWET	4	32-63	WRITE: error processing table
TPSPLM	5	0-63	POSITION: label verification mask
TPSPLT	6	0-31	POSITION: label processing table

Field	Word(base8)	Bits	Description
TPSPET	6	32-63	POSITION: error processing table

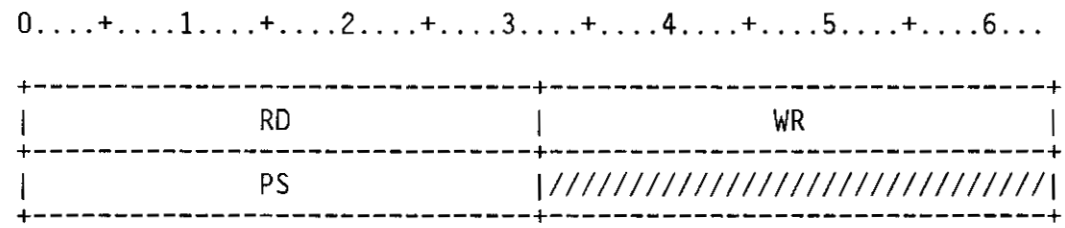


Figure TPE-2. TPS Table Entry

Field	Word(base8)	Bits	Description
TPERD	0	0-31	Read sequence routine address
TPEWR	0	32-63	Write sequence routine address
TPEPS	1	0-31	Position sequence routine address

TPS$BOT	=	1	Beginning-of-tape sequence
TPS$TM	=	2	Tape mark sequence
TPS$EOT	=	3	End-of-tape sequence
TPS$ERR	=	4	Tape error sequence
TPS$URW	=	5	User rewind to bod
TPF$RD	=	1	Read
TPF$WR	=	2	Write
TPF$PS	=	3	Position

TAPE QUEUE MANAGER FUNCTION CODES (EXP TO TQM)

```
T$CIO    =  1          CIO request
T$OPN    =  2          Open dataset
T$POS    =  3          Rewind dataset
T$CLO    =  4          Close dataset
T$RLS    =  5          Release dataset
T$PDM    =  6          Tape PDM call
T$TPOS   =  7          Tape position request
T$TEOV   =  O'10       TAPE EOV REQUEST
T$ILL    =  O'11       ILLEGAL IF GE T$ILL
```

TQM TO XIOP FUNCTION CODES

```
X$RB     =  01         Read block
X$WB     =  02         Write block
X$MN     =  03         Mount and connect device
X$FD     =  04         Free device
X$UL     =  05         Unload
X$RW     =  06         Rewind
X$CR     =  07         Continue read
X$WT     =  10         Write TM
X$1TR    =  11         Write 1 TM and rewind
X$SF     =  12         Search TM forward
X$PF     =  13         Position forward
X$SB     =  14         Search TM backward
X$PB     =  15         Position backward
X$US     =  16         Unsolicited XIOP status
X$CC     =  17         Configuration change
X$RP     =  20         Reposition tape
X$VP     =  21         Verify position
X$ET     =  22         Erase tape
X$DE     =  23         Data security erase
X$RM     =  24         Remount device
X$2TR    =  25         Write 2 TM's and rewind
X$1TU    =  26         Write 1 TM and unload
X$2TU    =  27         Write 2 TM's and unload
X$VR     =  30         END OF VOLUME CONTINUE READ
X$FR     =  31         END OF FILE CONTINUE READ
X$NO     =  32         NO-OP COMMAND
```

Track permanent dataset accesses DXT entry type - DXTRAC

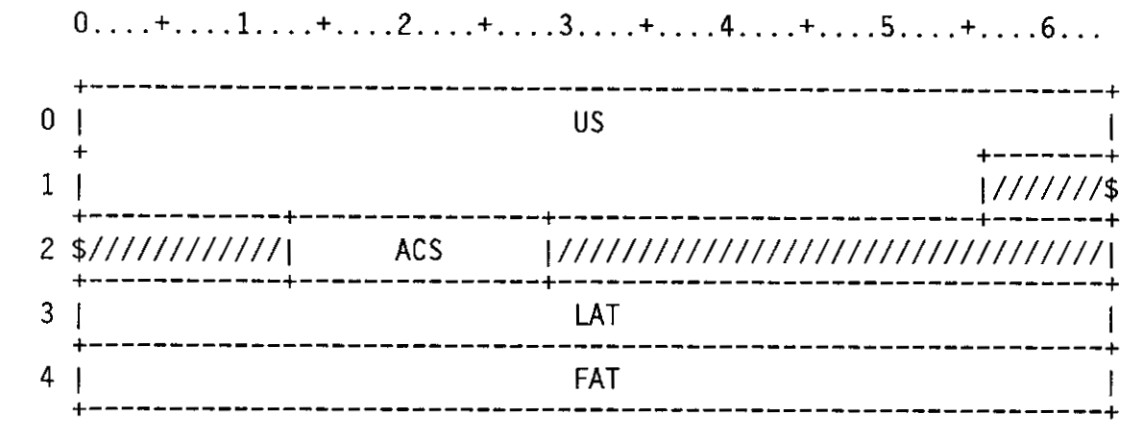


Figure TR-1. Track Permanent Accesses

Entry definition

Field	Word(base8)	Bits	Description
TRUS	0-1	0-63	User Number
TRUS1	0	0-63	User number (1-8)
TRUS2	1	0-55	User number (9-15)
TRACS	2	13-28	Number of accesses (binary)
TRLAT	3	0-63	Time of last access (cycles)
TRFAT	4	0-63	Time of first access (cycles)

The Inter-task Trace Table is STP-resident. Each entry contains trace information for one inter-task message.

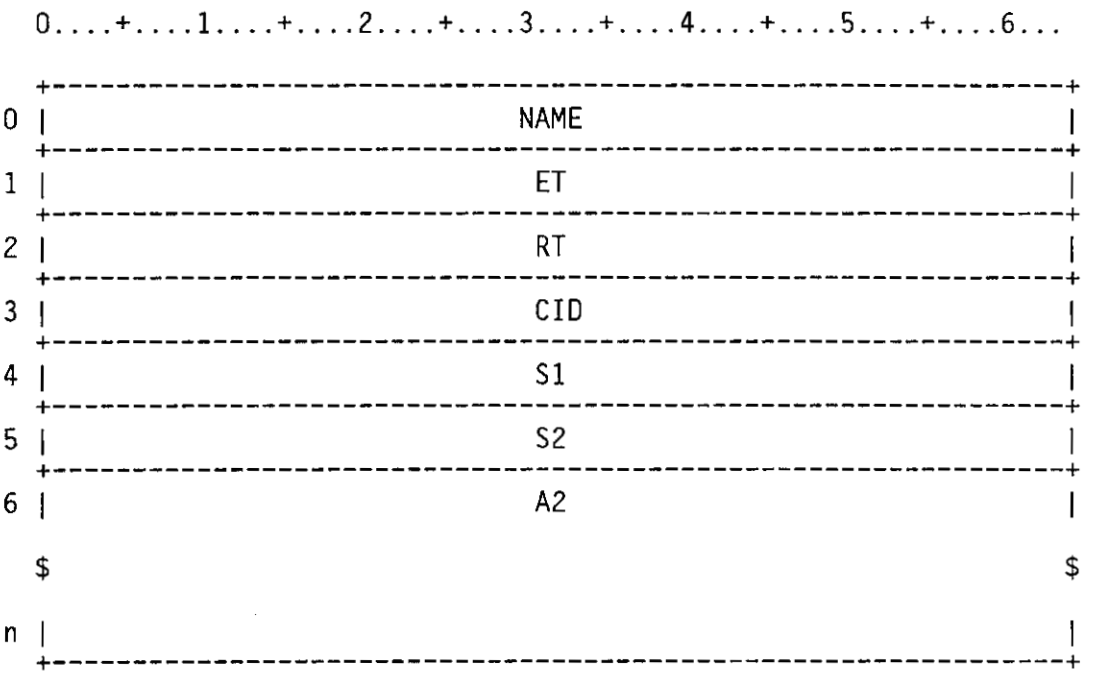


Figure TT-1. STP Inter-task Trace Table

The follow four words are common to all history trace buffers that FDUMP can recognize and collate with other history traces of the same nature.

Field	Word(base8)	Bits	Description
TTNAME	0	0-63	ASCII name associated with the trace e
TTET	1	0-63	Elapsed Real-time clock since last ent
TTRT	2	0-63	Current real-time clock
TTCID	3	0-63	Current STP task ID

The following words are specific to the Inter-Task Communicatio history Trace buffer. The information contained here is reflec an actual inter-task communication of some sorts, such as a request or a reply.

TTS1	4	0-63	Current value of S1 (input+0/output+0)
TTS2	5	0-63	Current value of S2 (input+1/output+1)
TTA2	6-n	0-63	Current value of A2 (TID requested/req

TAPE VOLUME TABLE

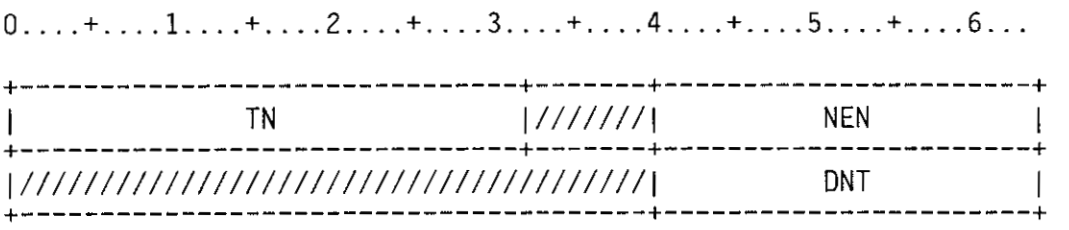


Figure TV-1. Tape Volume Table

DEFINE HEADER OF TVT

Field	Word(base8)	Bits	Description
TVTN	0	0-31	Name of TVT
TVNEN	0	40-63	Number of TVT entries
TVDNT	1	40-63	DNT address

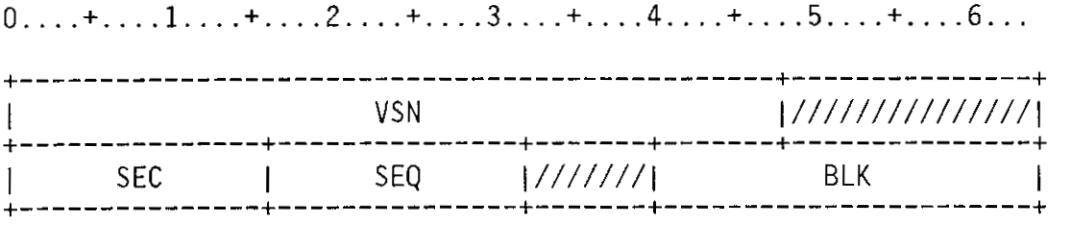


Figure TV-2. Tape Volume Table Entry

DEFINE ENTRIES OF TVT

Field	Word(base8)	Bits	Description
TVVSN	0	0-47	VSN
TVSEC	1	0-15	File section number
TVSEQ	1	16-31	File sequence number
TVBLK	1	40-63	Number of tape blocks on volume

* TXT Task execution table

The task execution table (TXT) contains information needed to schedule physical CPUs to user tasks.

A TXT entry exists for every task known to the system, without regard for the rolled/in memory status of the initiating job. The TXT is consulted when performing CPU scheduling, and is used in generating the task status display for stations.

TXT ordinals, offsets, and addresses are used to uniquely identify the requestor of system services.

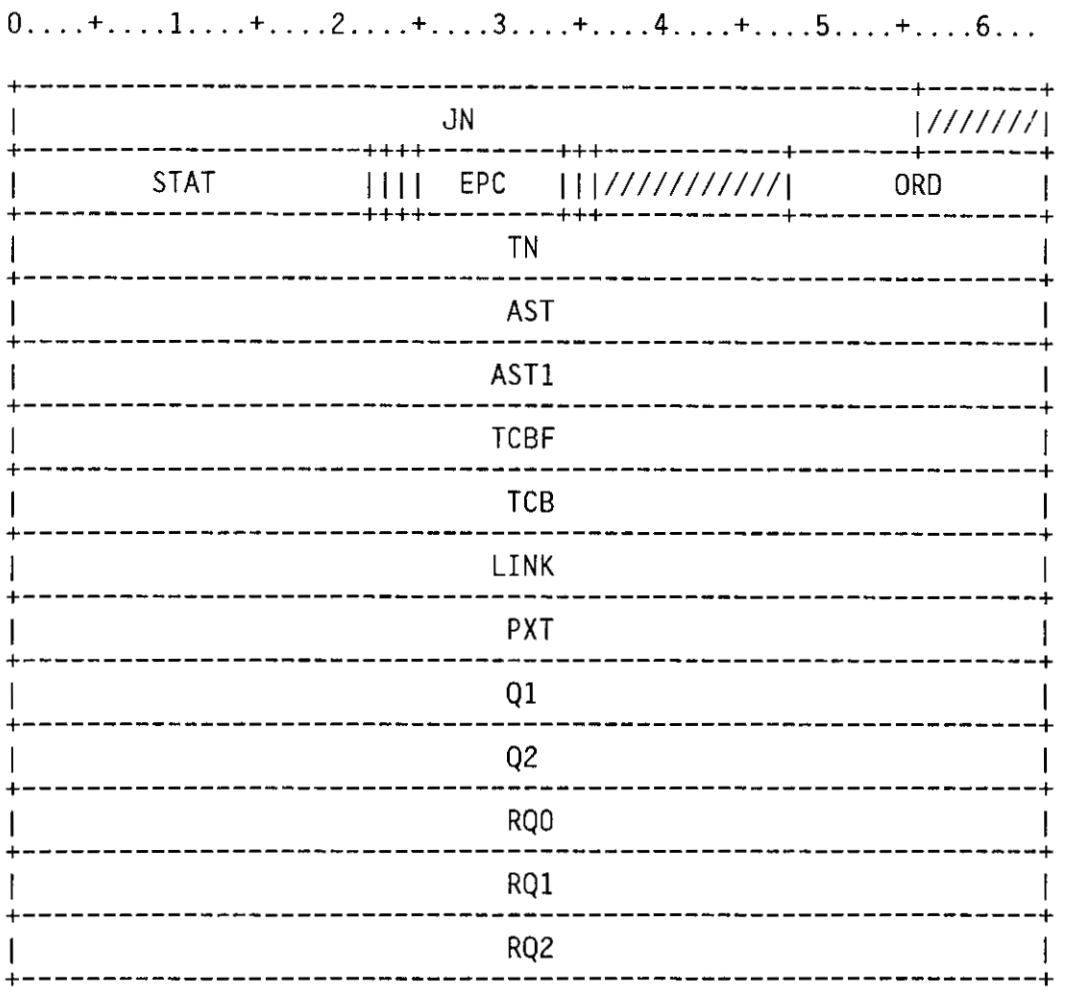


Figure TX-1. Task Execution Table

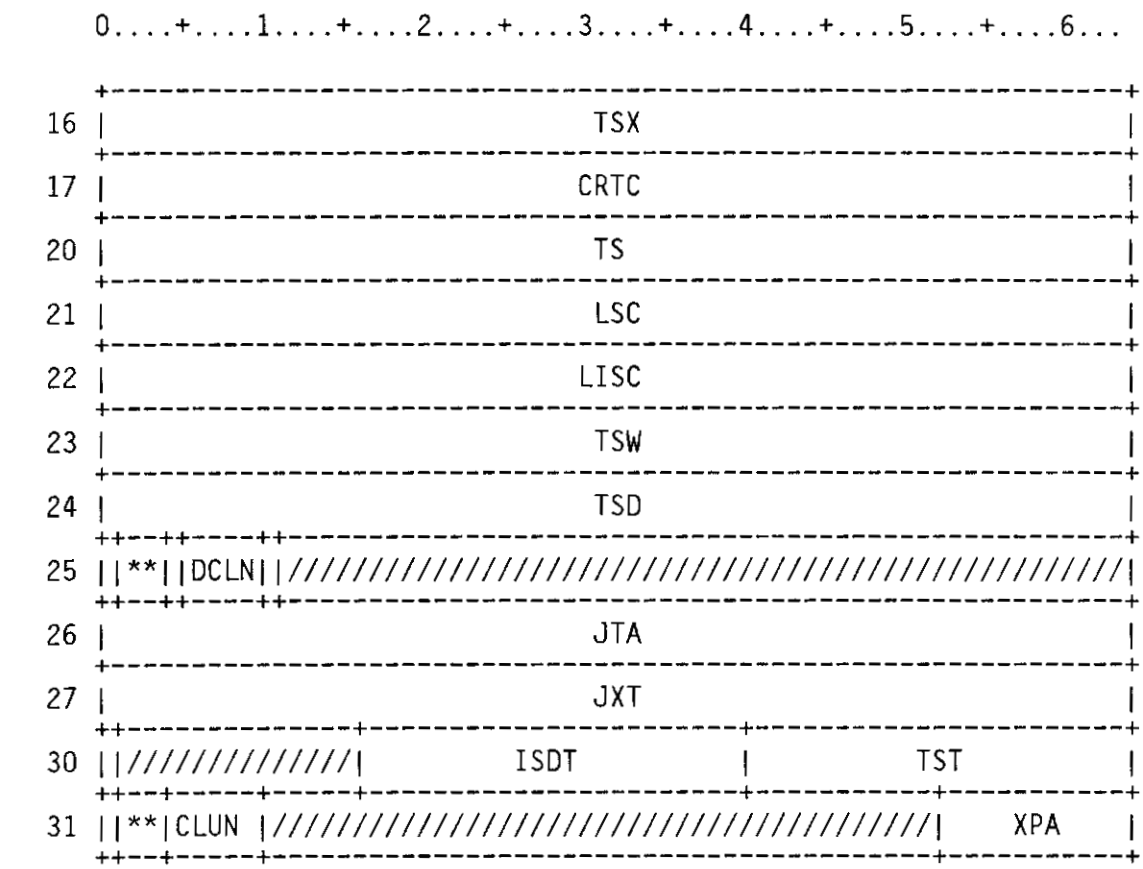


Figure TX-1. Task Execution Table

Field	Word(base8)	Bits	Description
TXJN	0	0-55	Job name initiating task
TXSTAT	1	0-21	Task status
TXIAI	1	22	Task suspended for interactive input
TXIAO	1	23	Task suspended for interactive output
TXEPC	1	25-33	Reason for cancellation if J%A is set
TXDISC	1	34	Task in disconnect processing
TXINIT	1	35	Task initializing flag
TXORD	1	48-63	Ordinal of this TXT
TXTN	2	0-63	Task number
TXAST	3	0-63	Ascii status (2 words)

Field	Word(base8)	Bits	Description
TXAST1	4	0-63	
TXTCBF	5	0-63	TCB offset from JTA(0)
TXTCB	6	0-63	TCB address (STP-relative)
TXLINK	7	0-63	Address of next TXT entry for job
TXPXT	10	0-63	PXT entry address if task connected
TXQ1	11	0-63	First task queue word
TXQ1F	11	1-7	Task is in a Q1 queue
TXQCP	11	1	Task is in CPU queue
TXQSP	11	2	Task is in suspend queue (in memory)
TXQMS	11	3	Task is in multi-step queue
TXQRE	11	5	Task is in CPU queue reenter queue
TXQDL	11	6	Task is in deadlock queue (DLKQ)
TXBL1	11	8-19	Queue back link as TXT ordinal
TXFL1	11	20-31	Queue fore link as TXT ordinal
TXPR1	11	32-63	Execute address in Q1 word
TXQ2	12	0-63	Second task queue word
TXQ2F	12	1-7	Task is in a Q2 queue
TXQAB	12	1	Task is in abort queue
TXQTE	12	2	Task is in timer/event queue
TXBL2	12	8-19	Q2 back link as TXT ordinal
TXFL2	12	20-31	Q2 fore link as TXT ordinal
TXPR2	12	32-63	Execute address in Q2 word
TXRQ0	13	0-63	Request words used by EXP/CIO for
TXRQ1	14	0-63	JSH requests which need call block
TXRQ2	15	0-63	
TXTSX	16	0-63	CPU cycles executing in CPU
TXCRTC	17	0-63	RT at task creation
TXTS	20	0-63	Time slice
TXLSC	21	0-63	RT at last status change
TXLISC	22	0-63	RT at last I/O status change
TXTSW	23	0-63	CPU cycles waiting for CPU
TXTSD	24	0-63	CPU cycles spent I/O blocked
TXDCP	25	0	=1 if specific CPU requested

Field	Word(base8)	Bits	Description
TXDCPN	25	1-3	Requested CPU number
TXDCL	25	4	=1 if specific XMP cluster requested
TXDCLN	25	5-9	Requested cluster number
TXSYS	25	10	=1 if system task; 0 if user task
TXJTA	26	0-63	JTA address (STP relative)
TXJXT	27	0-63	JXT address (STP relative)
TXDNR	30	0	Device not ready flag
TXISDT	30	16-39	SDT addr for FETCH/ACQUIRE
TXTST	30	40-63	TQM return status

the following word is write only by EXEC between RCP/DCP requests:

TXRCP	31	0	Set if task is connected to CPU
TXCPUN	31	1-3	Physical CPU number assigned to
TXCLUN	31	4-9	Physical cluster number assigned
TXXPA	31	52-63	Exchange package address in EXEC

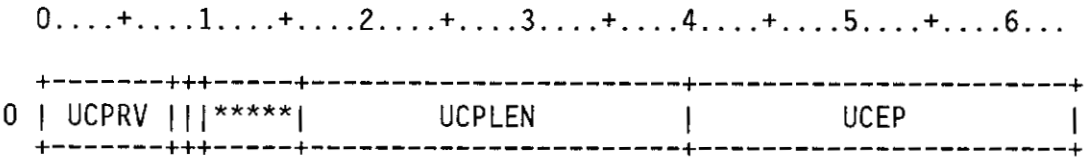


Figure ER-1. EXP User Call Table

Field	Word(base8)	Bits	Description
UCPRV	0	0-7	Index of job privilege (if privileged)
UCPDD	0	8	Flag for PDD as param
UCCSP	0	9	Flag for CSP special privilege
UCXXXX	0	10-15	**** UNUSED ****
UCPLEN	0	16-39	Length of param table
UCEP	0	40-63	EXP Entry point addr

The User Driver Table is used by the User Channel driver interface routines to control activities on user channels. It has one entry for each user channel, two entries for a channel pair.

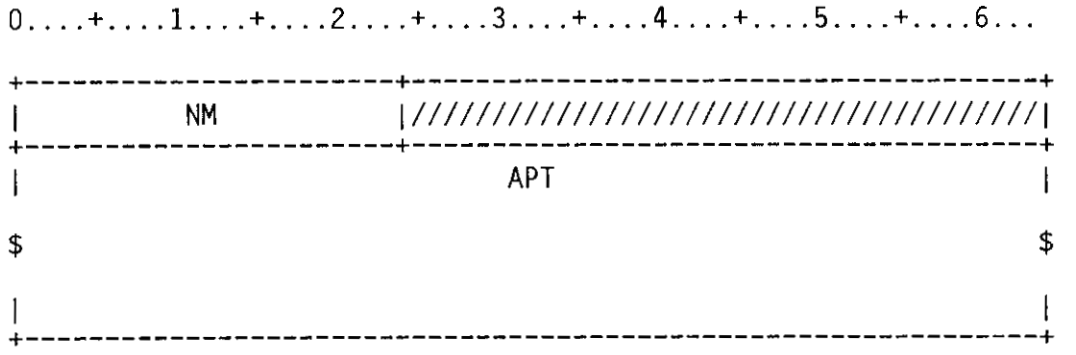


Figure UD-1. User Driver Table Header

Header:

Field	Word(base8)	Bits	Description
UDNM	0	0-23	Table name -- ASCII 'UDT'
UDAPT	1-6	0-63	F-packet reply buffer
UDAPT	1-6	0-63	(Required by table manual generator)

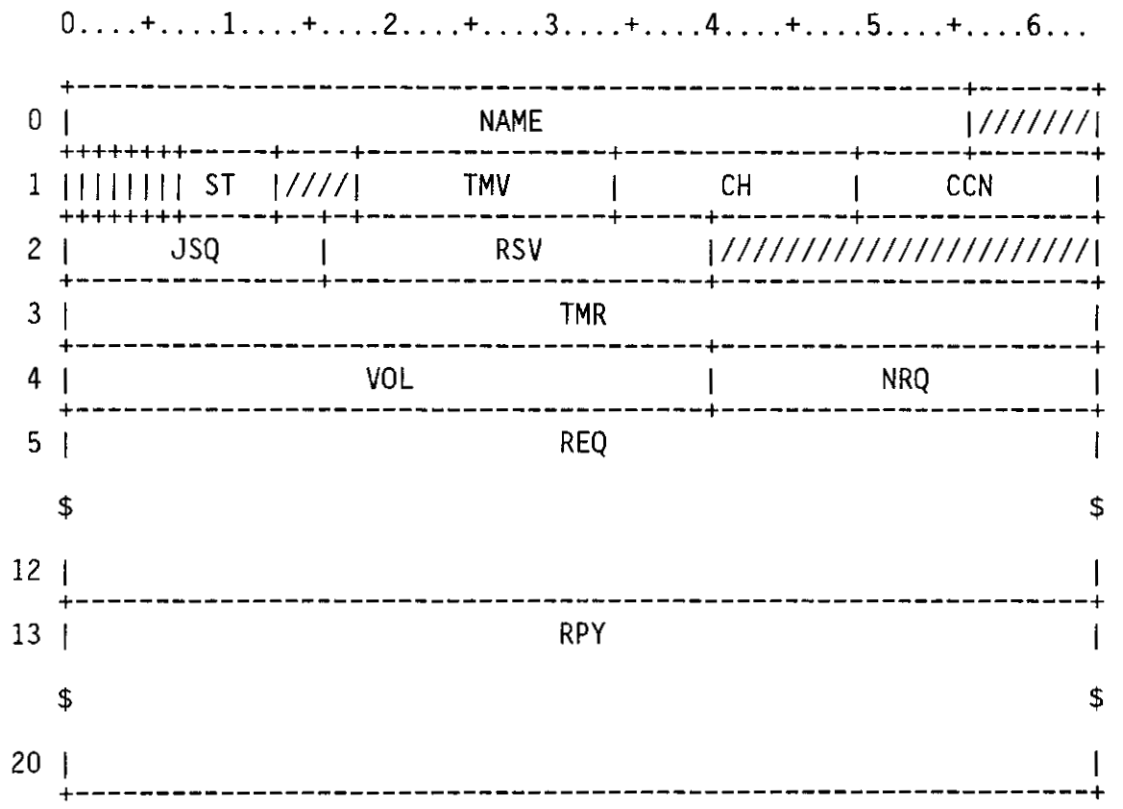


Figure UD-2. User Driver Table Entry

Field	Word(base8)	Bits	Description
UDNAME	0	0-55	Logical channel name
UDON	1	0	Channel turned on
UDRQA	1	1	Request active on channel
UDRPW	1	2	Reply waiting on channel
UDLL	1	4	Local loopback channel
UDLLR2	1	5	Loop to 2nd part of request
UDST	1	7-12	Channel state: UDST$CLS=0 Closed UDST$OPG=1 Opening UDST$OPN=2 Open UDST$IO=3 I/O active UDST$CLG=5 Closing
UDTMV	1	18-33	Channel timer interval (tenths)

Field	Word(base8)	Bits	Description
UDCH	1	34-48	Channel specification
UDDIR	1	48	Channel direction
UDCCN	1	49-63	Co-channel number
UDJSQ	2	0-15	JSQ of job that owns this entry
UDRSV	2	16-39	Task ID or JXT offset of owner
UDTMR	3	0-63	Channel timer
UDVOL	4	0-39	Cumulative channel volume in words
UDNRQ	4	40-63	Cumulative number of requests
UDREQ	5-12	0-63	Request F-packet buffer
UDREQ	5-12	0-63	(Required by table manual generator)
UDRPY	13-20	0-63	Reply F-packet buffer
UDRPY	13-20	0-63	(Required by table manual generator)

UDEROFF	= 1	Channel is turned off
UDERRSV	= 2	Channel reservation error
UDERBUF	= 3	I/O buffer address is zero
UDERDIR	= 4	Illegal I/O direction
UDERFNC	= 5	Illegal driver function code
UDERCHN	= 6	Illegal or nonexistent channel
UDERSEQ	= 7	Driver operation out of sequence
UDERBSY	= D'8	Request queue full

UT000	=	D'0	Bad call to UTLIB error processor
UT001	=	D'1	Illegal character in decimal convert
UT002	=	D'2	Illegal character in octal convert
UT003	=	D'3	EXIT called by XXXXXXXX
UT004	=	D'4	PDUMP: abort after completion
UT005	=	D'5	PDUMP: LWA < FWA, dump ignored
UT006	=	D'6	PDUMP: F < 0 or > 7
UT007	=	D'7	PDUMP: incorrect number of arguments
UT008	=	D'8	User remark
UT009	=	D'9	User remark
UT010	=	D'10	STOP XXXXXXXX in YYYYYYYY
UT011	=	D'11	PAUSE not supported, STOP substituted
UT012	=	D'12	PAUSE XXXXXXXX in YYYYYYYY
UT013	=	D'13	Fatal stack overflow
UT014	=	D'14	No space available for stack creation
UT015	=	D'15	EVREL called with task wait for event
UT016	=	D'16	LOCKREL called with lock set
UT017	=	D'17	Invalid lock identifier or non-empty
UT018	=	D'18	Invalid heap block length
UT019	=	D'19	Heap is full
UT020	=	D'20	Address is not within the heap
UT021	=	D'21	Heap block is free
UT022	=	D'22	Bad control word for allocated block
UT023	=	D'23	Bad control word in following block
UT024	=	D'24	Deadlock - all tasks waiting
UT025	=	D'25	Unrecognized scheduler parameter name
UT026	=	D'26	invalid input to conversion routine

The User Security Privilege Table, which resides in the user field, contains user privileges, user number, and the number of remaining violations allowed. This information is put into the user JTA at account time and transferred back to the user area when CHARGES is executed.

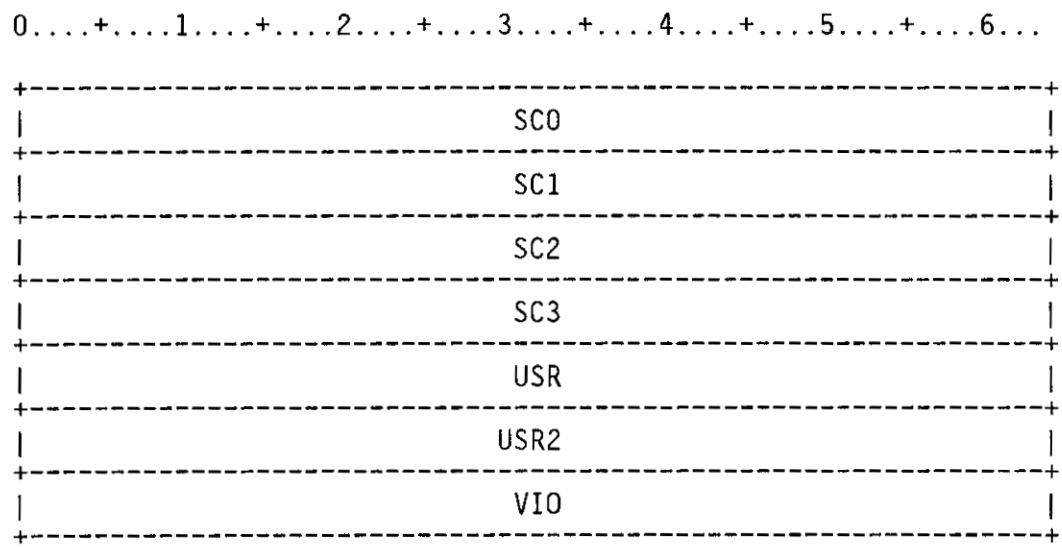


Figure UP-1. User Security Priviledge Table

Field	Word(base8)	Bits	Description
UPSC0	0	0-63	Security privileges word 0
UPSC1	1	0-63	Security privileges word 1
UPSC2	2	0-63	Security privileges word 2
UPSC3	3	0-63	Security privileges word 3
UPUSR	4	0-63	User number (characters 1-8)
UPUSR2	5	0-63	User number (characters 9-15)
UPVIO	6	0-63	User violations

User task status block

The user task status block resides in the user field and provides a mechanism for keeping the run-time library aware of the various aspects of CPU accounting data for the associated software process.

Various UTSB fields are dynamically updated by EXEC as the logical CPU becomes associated with a physical CPU.

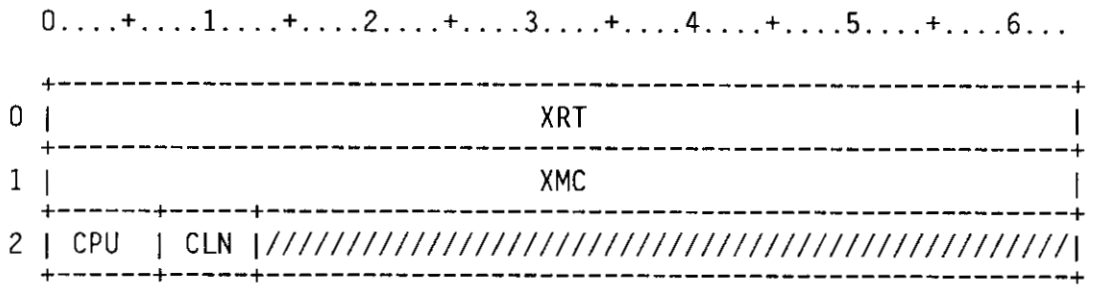


Figure UT-1. User task status block

Field	Word(base8)	Bits	Description
UTXRT	0	0-63	RT at last exchange to task
UTXMC	1	0-63	Time used as of last exchange (cycles)
UTCPU	2	0-6	Number of assigned CPU
UTCLN	2	7-12	Number of assigned X-MP cluster

The VPT is part of the Integrated Support Processor system. In the ISP system, COS tasks communicate with applications in the ISP over Virtual Circuits, which are software paths multiplexed by IQM over the physical channels. Each circuit requires a Virtual Circuit Table (VCT) to manage it. The VCT is dynamically allocated in a memory pool when the circuit is created. The VPT is fixed in STPTAB, and contains a list of the active VCTs. The IVLCN (Local Connection Number) field in the VCT contains the ordinal of the VPT entry that points to it.

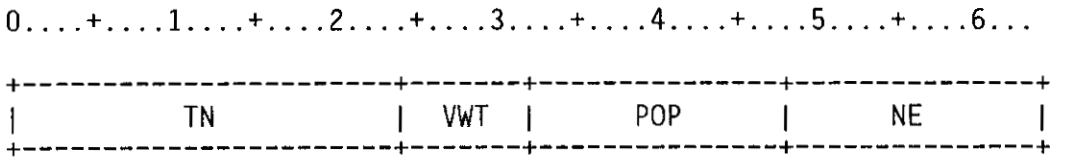


Figure VP-1. ISP Virtual Circuit Pointer Table Header

Field	Word(base8)	Bits	Description
VPTN	0	0-23	Table name (ASCII 'VPT')
VPVWT	0	24-31	Waiting for VCT assignment: IEV$VB=1 VCT space available IEV$VC=2 Free circuit available
VPPOP	0	32-47	Number of entries in use
VPNE	0	48-63	Number of entries in the table

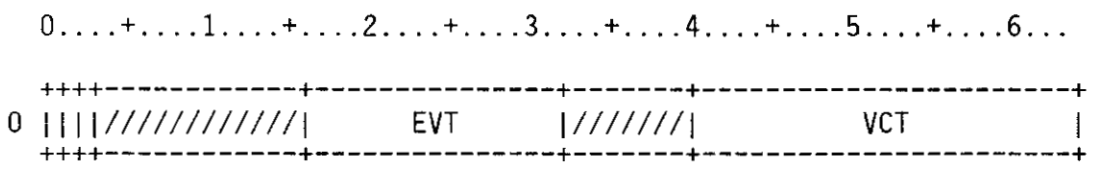


Figure VP-2. ISP Virtual Circuit Pointer Table Entry

Field	Word(base8)	Bits	Description
VPASG	0	0	Entry assigned to a user
VPOFR	0	1	OFFER request outstanding
VPLFC	0	2	Local flow-control bit
VPEVT	0	16-31	Waiting for event: IEV$CON=3 CONNECT message IEV$CNF=4 CONFIRM message IEV$MSG=5 MSG message IEV$LFC=6 Local flow control IEV$RFC=7 Remote flow control IEV$RDY=D'8 RDY or RD message
VPVCT	0	40-63	VCT address

L@VPT = LH@VPT+LE@VPT*NE@VPT Length of VPT table in words

DXT Allocation Table

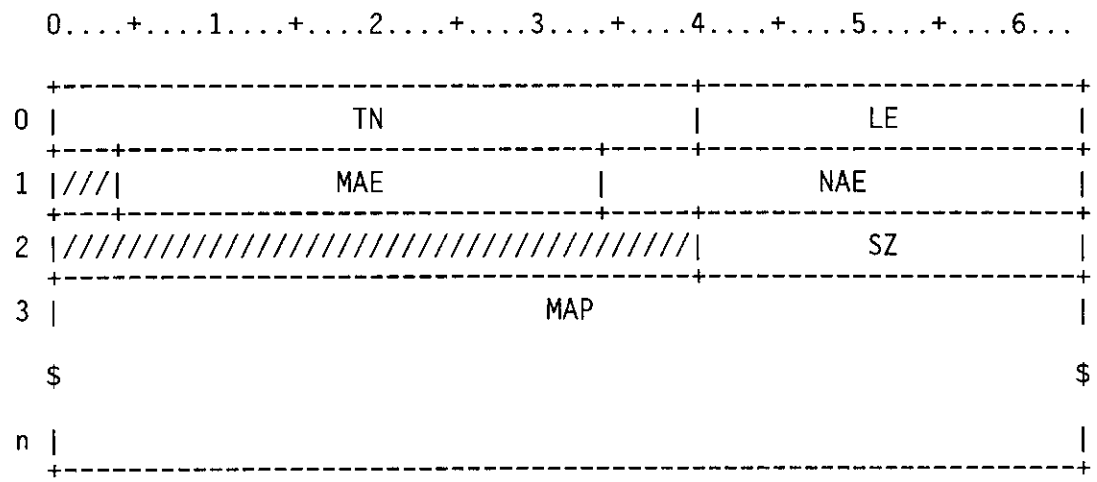


Figure XAT-1. DSC Extension high memory allocation table

XAT table header definition

Field	Word(base8)	Bits	Description
XATTN	0	0-39	Table name (*XAT*)
XATLE	0	40-63	Length of XAT bit map in words
XATMAE	1	4-33	Maximum allocatable DXT entries.
XATNAE	1	34-63	Number of available DXT entries.
XATSZ	2	40-63	Size of XAT table (header + map).

XAT table map definition

XATMAP	3-n	0-63	Map words - one bit per DXT entry.

The History Trace Function Table contains one entry for each possible history trace function, plus a global-enable entry. It is used to manage the History Trace Table (XTT).

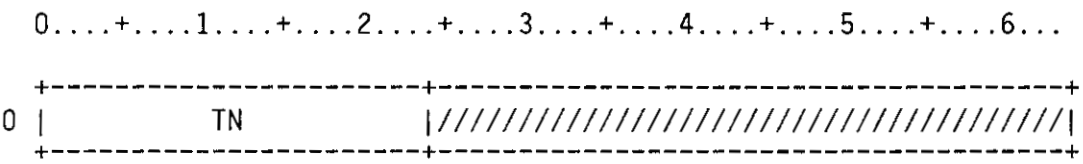


Figure XF-1. History Trace Function Table header

Field	Word(base8)	Bits	Description
XFTN	0	0-23	Table name ('XFT' in ASCII)

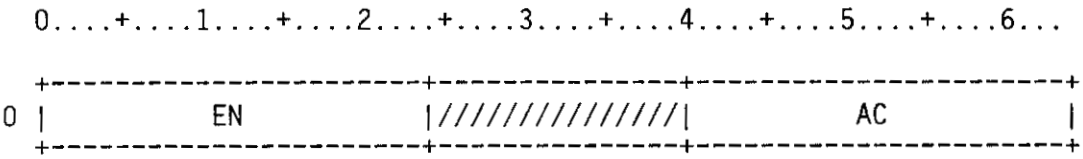


Figure XF-2. History Trace Function Table entry

Field	Word(base8)	Bits	Description
XFEN	0	0-23	Entry name (3 ASCII characters)
XFAC	0	40-63	Active entry (active if nonzero)

Define exchange package for each mainframe type.

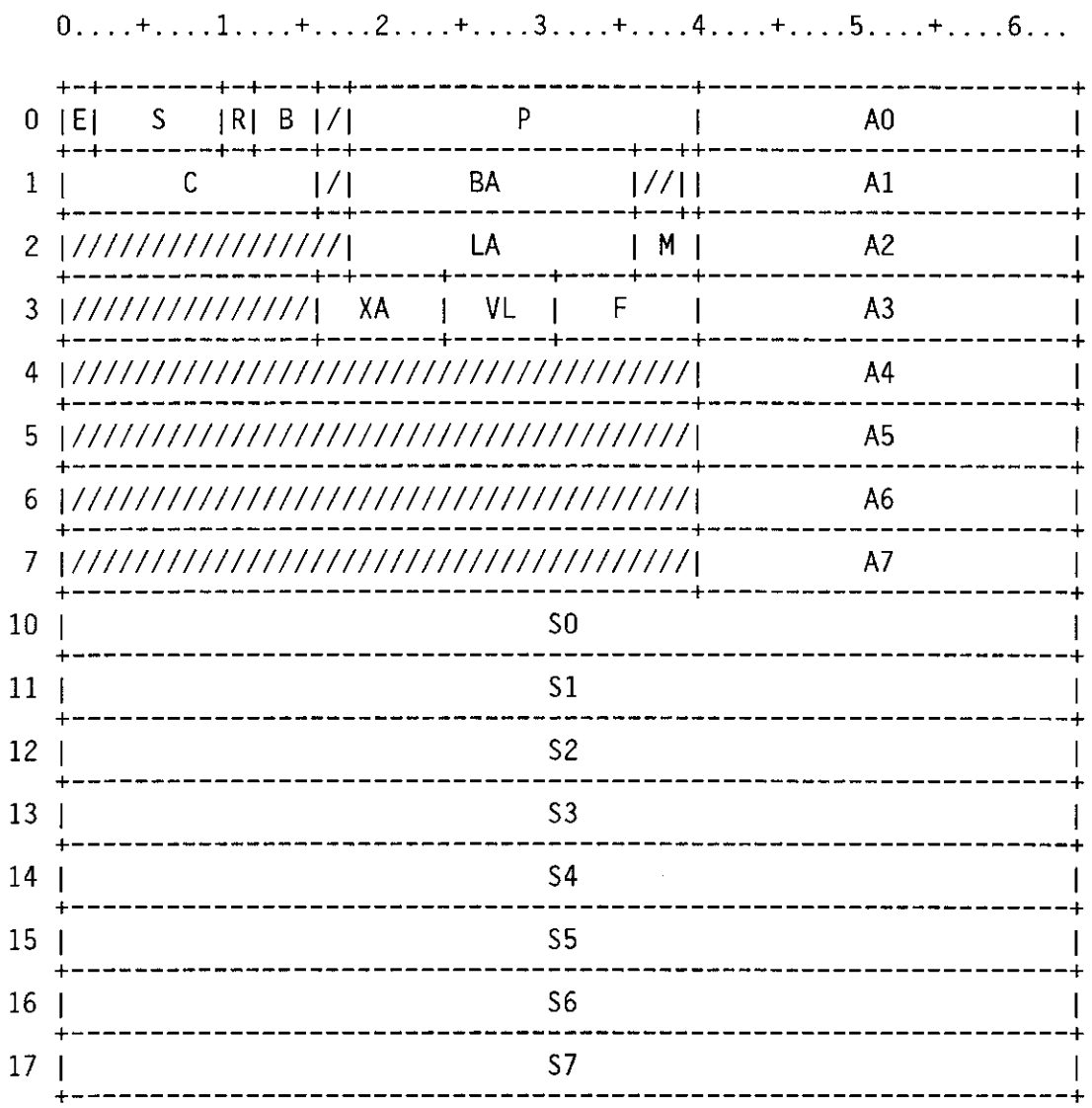


Figure XP-1. CRAY-1 Exchange package

Field	Word(base8)	Bits	Description
XPE	0	0-1	Error type
XPS	0	2-9	Syndrome bits
XPR	0	10-11	Read mode
XPB	0	12-15	Bank Error Address
XPB1	0	12	Bank Error Address
XPB2	0	13	Bank Error Address
XPB3	0	14-15	Bank Error Address
XPP	0	18-39	Program register
XPA0	0	40-63	Register A0
XPC	1	0-15	Chip error address
XPBA	1	18-35	Base address
XPIMM	1	39	Interrupt monitor-mode bit
XPA1	1	40-63	Register A1
XPLA	2	18-35	Limit address
XPM	2	36-39	Mode bits
XPICM	2	36	Interrupt on correctable memory error
XPIFP	2	37	Interrupt on floating point error
XPIUM	2	38	Interrupt on uncorrectable mem. error
XPMM	2	39	Monitor mode
XPA2	2	40-63	Register A2
XPXA	3	16-23	Exchange address
XPVL	3	24-30	Vector length
XPF	3	31-39	Flags
XPPCI	3	31	Programmable clock interrupt
XPMCU	3	32	MCU interrupt
XPFPE	3	33	Floating point error
XPORE	3	34	Operand range error
XPPRE	3	35	Program range error
XPME	3	36	Memory error
XPIOI	3	37	I/O interrupt
XPEE	3	38	Error exit
XPNE	3	39	Normal exit
XPA3	3	40-63	Register A3

Field	Word(base8)	Bits	Description
XPA4	4	40-63	Register A4
XPA5	5	40-63	Register A5
XPA6	6	40-63	Register A6
XPA7	7	40-63	Register A7
XPS0	10	0-63	Register S0
XPS1	11	0-63	Register S1
XPS2	12	0-63	Register S2
XPS3	13	0-63	Register S3
XPS4	14	0-63	Register S4
XPS5	15	0-63	Register S5
XPS6	16	0-63	Register S6
XPS7	17	0-63	Register S7

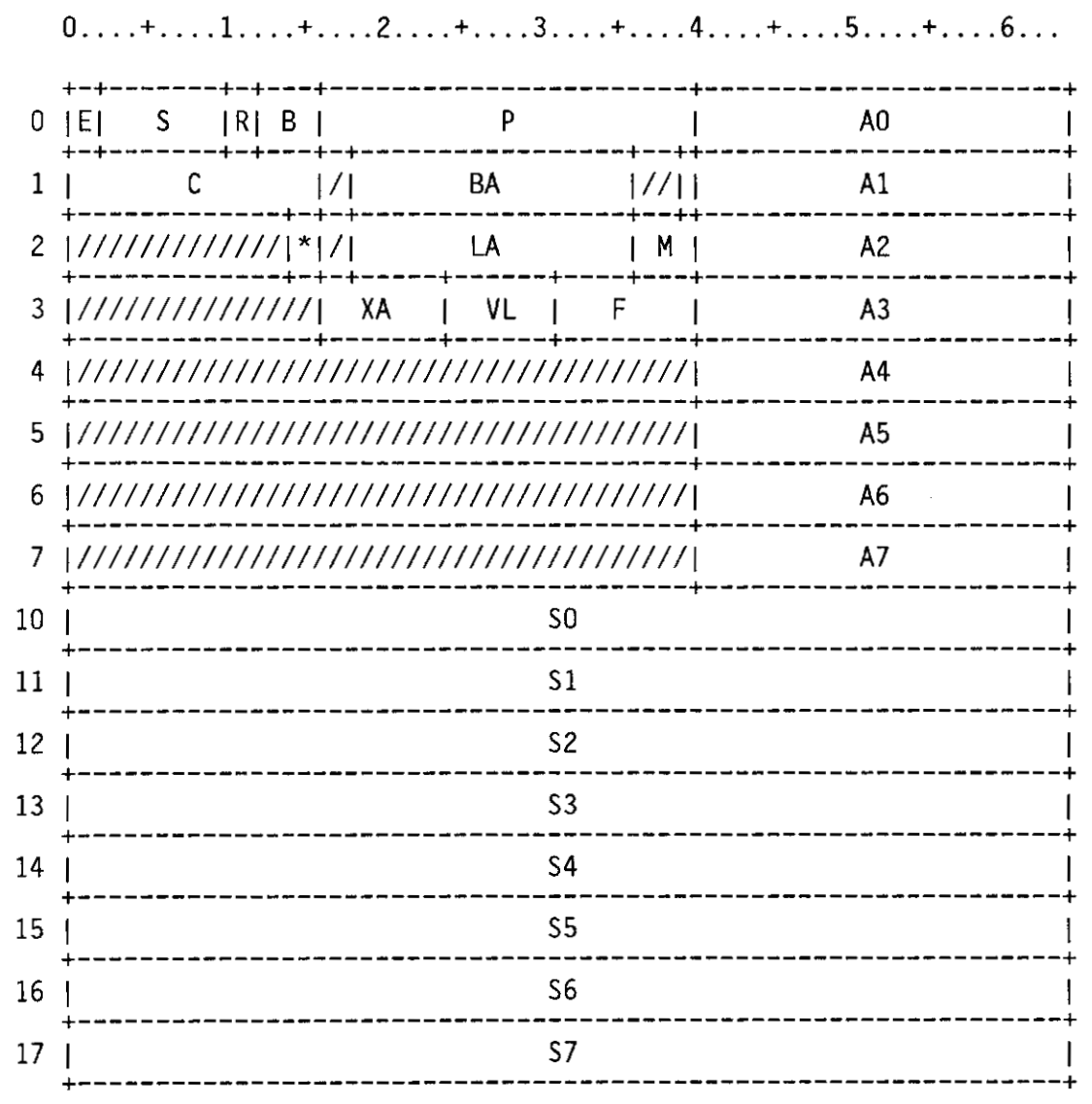


Figure XP-2. CRAY-1/S or 1/M Exchange Package

Field	Word(base8)	Bits	Description
XPE	0	0-1	Error type
XPS	0	2-9	Syndrome bits
XPR	0	10-11	Read mode
XPB	0	12-15	Bank Error Address
XPB1	0	12	Bank Error Address
XPB2	0	13	Bank Error Address
XPB3	0	14-15	Bank Error Address
XPP	0	16-39	PROGRAM REGISTER
XPA0	0	40-63	Register A0
XPC	1	0-15	Chip error address
XPBA	1	18-35	Base address
XPIMM	1	39	Interrupt monitor-mode bit
XPA1	1	40-63	Register A1
XPRH	2	14-15	* High-order bits of memory error read address
XPLA	2	18-35	Limit address
XPM	2	36-39	Mode bits
XPICM	2	36	Interrupt on correctable memory error
XPIFP	2	37	Interrupt on floating point error
XPIUM	2	38	Interrupt on uncorrectable mem. error
XPMM	2	39	Monitor mode
XPA2	2	40-63	Register A2
XPXA	3	16-23	Exchange address
XPVL	3	24-30	Vector length
XPF	3	31-39	Flags
XPPCI	3	31	Programmable clock interrupt
XPMCU	3	32	MCU interrupt
XPFPE	3	33	Floating point error
XPORE	3	34	Operand range error
XPPRE	3	35	Program range error
XPME	3	36	Memory error
XPIOI	3	37	I/O interrupt
XPEE	3	38	Error exit
XPNE	3	39	Normal exit

Field	Word(base8)	Bits	Description
XPA3	3	40-63	Register A3
XPA4	4	40-63	Register A4
XPA5	5	40-63	Register A5
XPA6	6	40-63	Register A6
XPA7	7	40-63	Register A7
XPS0	10	0-63	Register S0
XPS1	11	0-63	Register S1
XPS2	12	0-63	Register S2
XPS3	13	0-63	Register S3
XPS4	14	0-63	Register S4
XPS5	15	0-63	Register S5
XPS6	16	0-63	Register S6
XPS7	17	0-63	Register S7

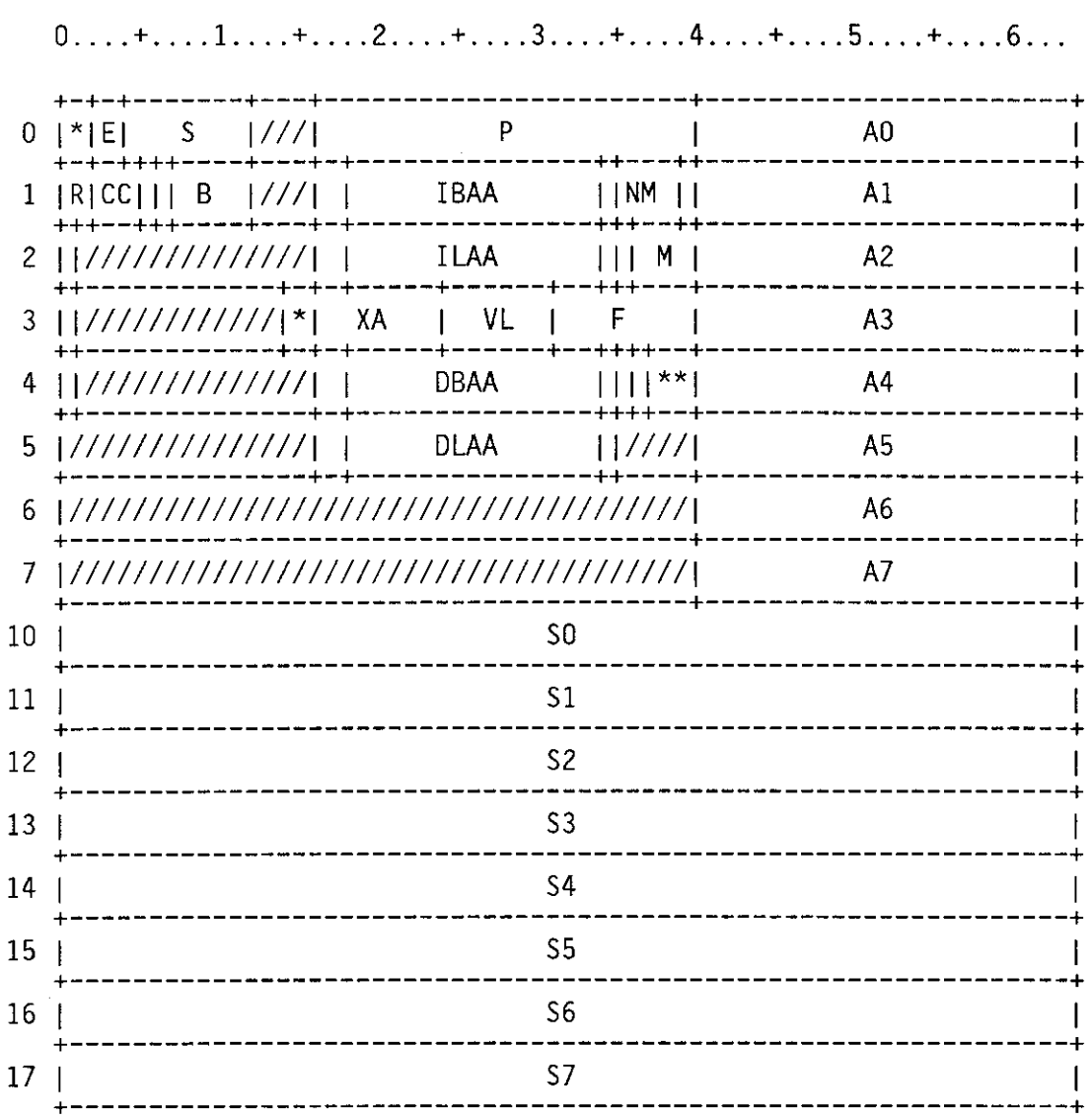


Figure XP-3. CRAY X-MP Exchange package

Field	Word(base8)	Bits	Description
XPPN	0	0-1	Processor number
XPE	0	2-3	Error type
XPS	0	4-11	Syndrome bits
XPP	0	16-39	Program register
XPA0	0	40-63	Register A0
XPR	1	0-1	Read mode

Field	Word(base8)	Bits	Description
XPC	1	2-6	Chip error address 1K chips
XPC	1	2-6	Chip error address 2K chips
XPC	1	2-6	Chip error address 4K chips
XPC	1	2-5	Chip Error Address 16K chips(Quad)
XPC	1	2-4	Chip Error address 16K chips
XPB	1	6-11	Bank Error Address (Quad)
XPB1	1	6-7	Bank Error Address (Quad) 1
XPB2	1	8-9	Bank Error Address (Quad) 2
XPB3	1	10-11	Bank Error Address (Quad) 3
XPB	1	7-11	Bank Error Address
XPB1	1	7	Bank Error Address 1
XPB2	1	8-9	Bank Error Address 2
XPB3	1	10-11	Bank Error Address 3
XPIBA	1	16-33	Instruction base address(Quad)
XPIBA	1	18-34	Instruction base address
XPNM	1	35-38	* New modes and status
XPWS	1	35	* Waiting on semaphore flag
XPFPS	1	36	* Floating point error status flag
XPBDM	1	37	* Bidirectional memory status flag
XPSEI	1	38	* Select for external interrupt flag
XPIMM	1	39	Interrupt monitor-mode bit
XPA1	1	40-63	Register A1
XPVNU	2	0	* Vector register not used bit
XPILA	2	16-33	Instruction limit address(Quad)
XPILA	2	18-34	Instruction limit address
XPIOR	2	35	Interrupt on operand range error mode
XPM	2	36-39	Mode bits
XPICM	2	36	Interrupt on correctable memory error
XPIFP	2	37	Interrupt on floating point error
XPIUM	2	38	Interrupt on uncorrectable mem. error
XPMM	2	39	Monitor mode
XPA2	2	40-63	Register A2

Field	Word(base8)	Bits	Description
XPAVL	3	0	* Additional vector logical unit bit (1 = enabled)
XPNF	3	14-15	* New flags
XPICP	3	14	* Interprocessor interrupt
XPDL	3	15	* Deadlock on semaphore
XPXA	3	16-23	Exchange address
XPVL	3	24-30	Vector length
XPF	3	31-39	Flags
XPPCI	3	31	Programmable clock interrupt
XPMCU	3	32	MCU interrupt
XPFPE	3	33	Floating point error
XPORE	3	34	Operand range error
XPPRE	3	35	Program range error
XPME	3	36	Memory error
XPIOI	3	37	I/O interrupt
XPEE	3	38	Error exit
XPNE	3	39	Normal exit
XPA3	3	40-63	Register A3
XPEMA	4	0	* Extended memory addressing bit (1 = enabled)
XPDBA	4	16-33	Data base address(Quad)
XPDBA	4	18-34	Data base address
XPPS	4	35	* User program state (master/slave) flag
XPCLN	4	37-39	* Cluster number
XPA4	4	40-63	Register A4
XPDLA	5	16-33	Data limit address(Quad)
XPDLA	5	18-34	Data limit address
XPA5	5	40-63	Register A5
XPA6	6	40-63	Register A6
XPA7	7	40-63	Register A7
XPS0	10	0-63	Register S0
XPS1	11	0-63	Register S1

Field	Word(base8)	Bits	Description
XPS2	12	0-63	Register S2
XPS3	13	0-63	Register S3
XPS4	14	0-63	Register S4
XPS5	15	0-63	Register S5
XPS6	16	0-63	Register S6
XPS7	17	0-63	Register S7

Name: History Trace Table (XTT).

Purpose: This table is an EXEC-resident circular buffer that logs system activity. Entries are made by DEBUG subroutine calls in EXEC. (STP can make a monitor request via the POST macro to use DEBUG.)

Note: The header is variable-length so the entries begin on a 4-word boundary.

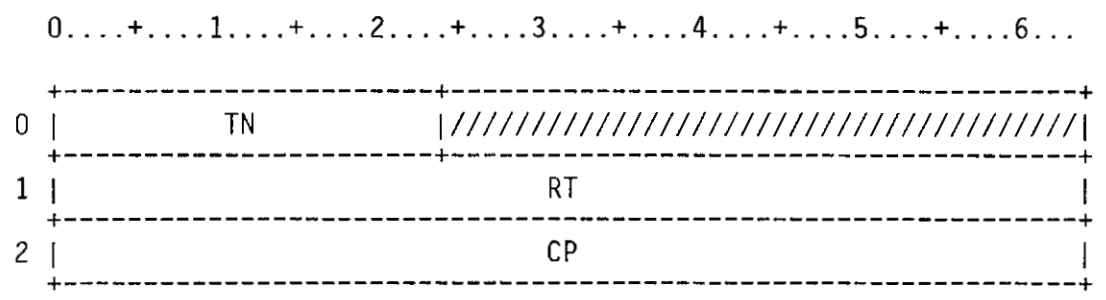


Figure XT-1. History Trace Table Header

Header (may be padded so entries are on 4-word boundary).

Field	Word(base8)	Bits	Description
XTTN	0	0-23	Table name ('XTT' in ASCII)
XTRT	1	0-63	Real time of last trace entry
XTCP	2	0-63	Current position in buffer

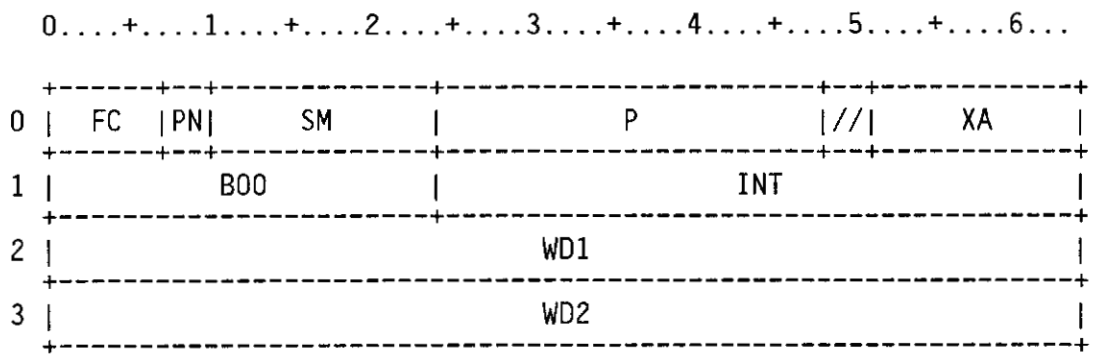


Figure XT-2. History Trace Table Entry

Field	Word(base8)	Bits	Description
XTFC	0	0-6	Function code
XTPN	0	7-9	Processor number
XTSM	0	10-23	First 14 semaphores
XTP	0	24-47	Current exchange package P-register
XTXA	0	51-63	Current exchange package address
XTB00	1	0-23	Last B00 value (if task related)
XTINT	1	24-63	Interval since last entry in cycles
XTWD1	2	0-63	Caller supplied word 1
XTWD2	3	0-63	Caller supplied word 2

This one-word table describes multitype datasets that are in error. It is associated with the corresponding QDT.

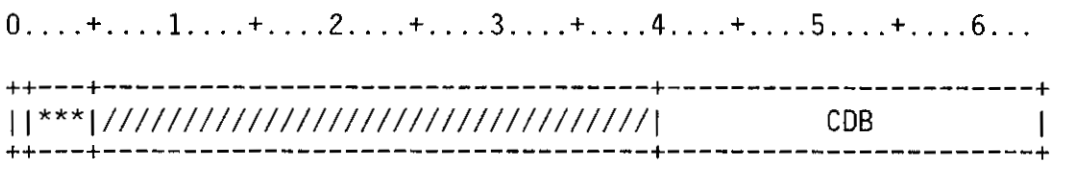


Figure ZM-1. Startup Managed Table

Field	Word(base8)	Bits	Description
ZMUSE	0	0	Entry is in use
ZMSERR	0	1-4	Error flags
ZMRLS	0	1	Released device in DAT chain
ZMDWN	0	2	Downed device in DAT chain
ZMERR	0	3	Catastrophic error in DAT chain
ZMIDA	0	4	Inconsistent disk allocation
ZMCDB	0	40-63	FWA of current STP DAT body but PDM will deny access.

This table contains a copy of the device label in the first 2000-octal words of the table, and STARTUP information in the remaining words.

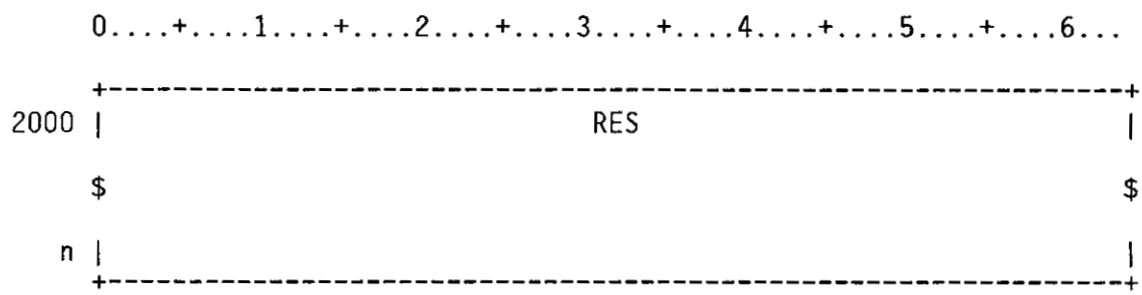


Figure ZDV-1. Startup Device Label Table

Field	Word(base8)	Bits	Description
ZDVRES	2000-n	0-63	
ZDVUPD	2003	0	Update label flag
ZDVOL	2003	1	Old label read flag
ZDVGP	2003	2	Stripe group processed flag
ZDVPGP	2003	3-6	Previous stripe ID if any
ZDVLTK	2003	40-63	Track containing label

The following definitions are used for STARTUP messages to be written to the system log.

W@ZLGSTY	=	0	Word offset of message subtype in buf
W@ZLGLTH	=	1	Word offset of message length in buf
ZMG0CD	=	0	Dataset on released/missing device
ZMG1CD	=	1	Dataset resides on down device
ZMG2CD	=	2	Dataset DAT contains AI conflict
ZMG3CD	=	3	DSC DAT contains AI conflict
ZMG4CD	=	4	System dump DAT contains AI conflict
ZMGCD5	=	5	SYS DUMP not saved
ZMGCD6	=	6	SYS DUMP successfully saved
ZMGCD7	=	7	Catastrophic error in DSC entry
ZMGCD8	=	D'8	Multi-type inconsistent allocation
ZMGCD9	=	D'9	Multi-type out of bounds QDT index
ZMGCD10	=	D'10	Dataset recovered on scratch device
ZMGCD11	=	D'11	System dump copy abandoned
ZMGCD12	=	D'12	DXT's DAT contains AI conflicts.
ZMGCD13	=	D'13	Invalid DXT pointer in DSC entry.
ZMGCD14	=	D'14	DXT entry has a bad forward pointer.
ZMGCD15	=	D'15	DXT crossed allocation.
ZMGCD16	=	D'16	Conflicting DXT tail pointers.
ZMGCD17	=	D'17	Conflicting 'in use' flag
ZMGCD18	=	D'18	DXT creation time error
ZMGCD19	=	D'19	DXMISC contains owner value error
ZMGCD20	=	D'20	DXT contains a bad ordinal (DXTORD)
ZMGCD21	=	D'21	Reason for taking system dump
ZMGCD22	=	D'22	Dataset deleted message
ZMGFL0	=	0	Flaw assembled in STPTAB
ZMGFL1	=	1	Flaw defined by parameter file
ZMGFL2	=	2	Flaw defined in EFT
ZMGFL3	=	3	Flaw recovered from label
ZMGFL4	=	4	Delete flaw defined by parameter file

This table defines the format for flaw messages from SYSTEMLOG. These messages descibe the flawed area and where the flaw originated.

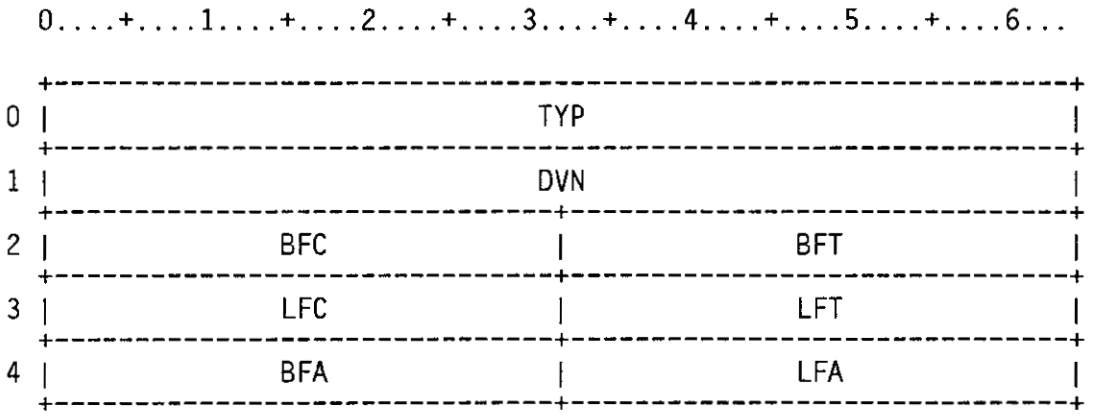


Figure ZF-1. Startup Flaw Message Format

Field	Word(base8)	Bits	Description
ZFTYP	0	0-63	Message type
ZFDVN	1	0-63	Device name
ZFBFC	2	0-31	Beginning cylinder in flaw sequence
ZFBFT	2	32-63	Beginning track in flaw sequence
ZFLFC	3	0-31	Last cylinder in flaw sequence
ZFLFT	3	32-63	Last track in flaw sequence
ZFBFA	4	0-31	Beginning AI in flaw sequence
ZFLFA	4	32-63	Last AI in flaw sequence

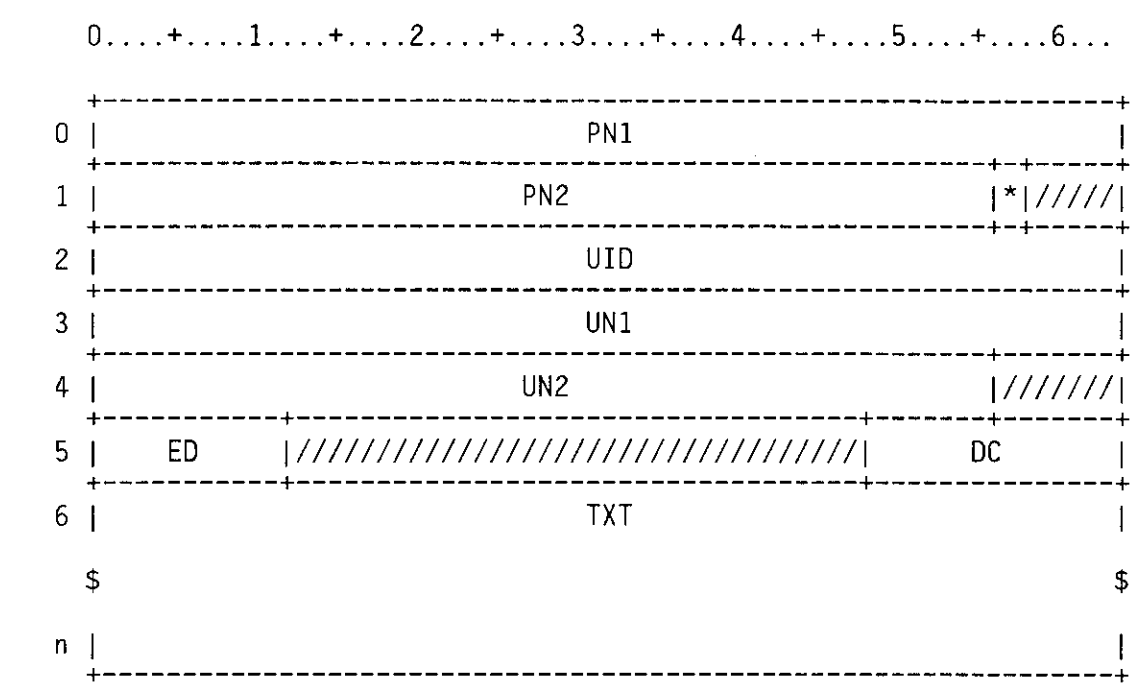


Figure ZMG-1. Startup Permanent Dataset Recovery Message

Field	Word(base8)	Bits	Description
ZMGPN1	0	0-63	PDN part 1
ZMGPN2	1	0-55	PDN part 2
ZMGSPL	1	56-57	Spooled flags (DCI + DCO)
ZMGUID	2	0-63	User id
ZMGUN1	3	0-63	User number part 1
ZMGUN2	4	0-55	User number part 2
ZMGED	5	0-11	Edition number
ZMGDC	5	48-63	Disposition code
ZMGTXT	6-n	0-63	Beginning of variable text

Field	Word(base8)	Bits	Description
ZMGDBA	0	0-23	Destination address in bits
ZMGSWA	0	24-47	Source address in words
ZMGJSQ	0	48	JSQ needed for this message
ZMGLBT	0	49-63	Length of message in bits

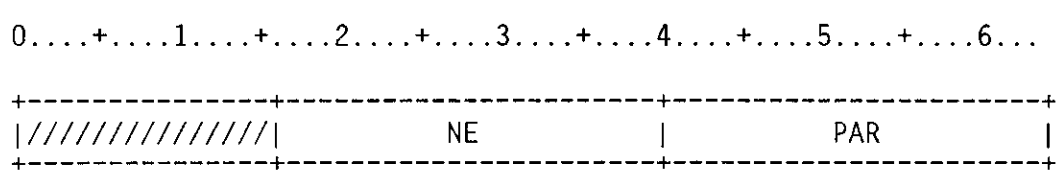


Figure ZMH-1. Startup ZMG Table Header

Field	Word(base8)	Bits	Description
ZMHNE	0	16-39	Length of message control table (ZMG)
ZMHPAR	0	40-63	Parameter control table base

L@ZMSGBK=D'16 LENGTH OF MESSAGE BUFFER (WORDS)

The following field definitions define the message parameter control words for startup. The ZPA fields define each individual parameter, and the ZPC fields define the parameters expected for each message. If the ZPC entry for a message code is zero, there are no parameters expected for that message. One ZPC entry must be provided for each defined message code, and one ZPA entry must be provided for each parameter which is expected for a message. If no parameters are expected, no ZPA entries should be provided.

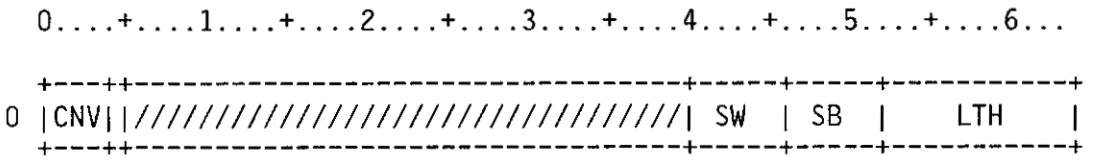


Figure ZPA-1. Startup Message Parameter Control Words

Field	Word(base8)	Bits	Description
ZPACNV	0	0-3	Conversion mode 0 ASCII, right-justified 1 Octal with leading zeroes 2 Decimal with leading zeroes 3 ASCII, no shifting done
ZPAZB	0	4	Source ends on zero byte flag
ZPASW	0	40-45	Start word within text
ZPASB	0	46-51	Start bit within (ZPASW)
ZPALTH	0	52-63	Length in bits (maximum is D'64)

LE@ZPA=1

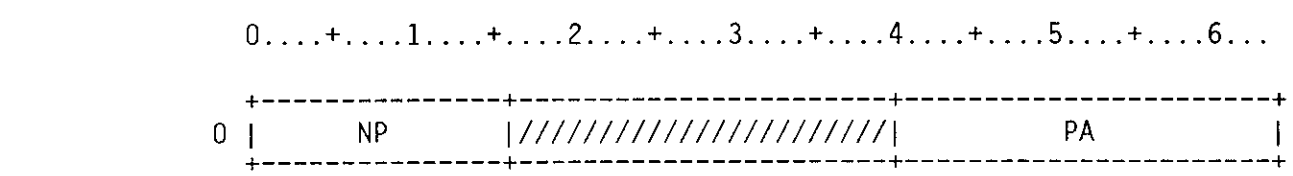


Figure ZPC-1. Startup Message Parameter Table

Field	Word(base8)	Bits	Description
ZPCNP	0	0-15	Number of parameters expected
ZPCPA	0	40-63	Address of first ZPA entry

LE@ZPC=1

LOADER TABLES

A relocatable binary program consists of a single record composed of a series of tables. Nine types of tables are currently defined.

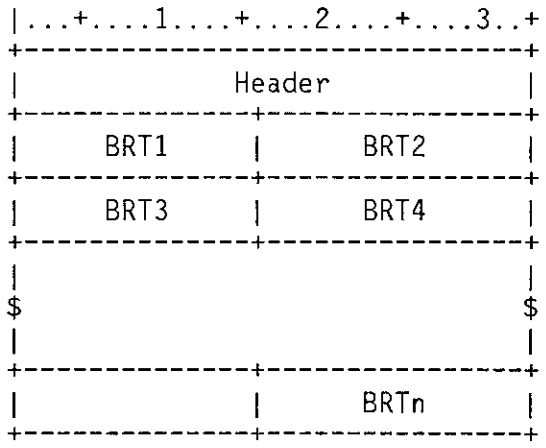
Summary of loader tables

Name	Type (octal)	Name
BRT	15	Block Relocation Table
DFT	10	Directory (BUILD)
DMT	7	Debug Map Table
DPT	13	Duplication Table
PDT	17	Program Description Table
PWT	6	Partial Word Table
SMT	11	Symbol Table
TXT	16	Text Table
XRT	14	External Relocation Table

The first table in a relocatable module is the Program Description Table.

The Block Relocation Table (BRT) contains information which enables the loader to relocate relative addresses within a program. Any number of BRT entries can appear after the heading.

In the Standard BRT format, there are two BRT entries per word, arranged as shown below:



See Figure BRT-1 for the detailed header description and Figure BRT-2 for the description of each BRT entry.

In the Extended BRT format, there is one entry per word, as shown by Figure BRT-3.

```
BRTTYPE   =  O'15              Table type code for BRT
```

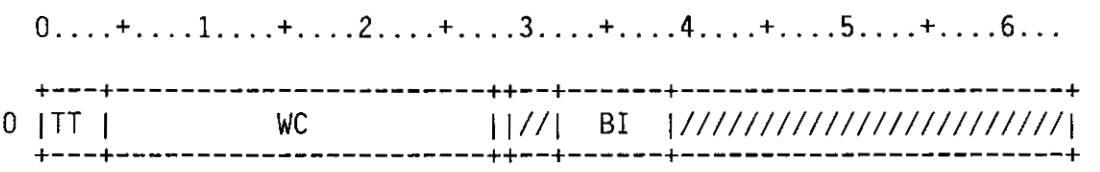


Figure BRT-1. Loader Block Relocation Table

Field	Word(base8)	Bits	Description
BRTTT	0	0-3	Table type
BRTWC	0	4-27	Word count including header
BRTX	0	28	Format bit: 0 = Standard BRT format 1 = Extended BRT format
BRTBI	0	32-38	Block index of destination; specifies a block base address to be added to the relocation field as the relocation address.

The following fields define the BRT entries for Standard BRTs. There are two entries per word.

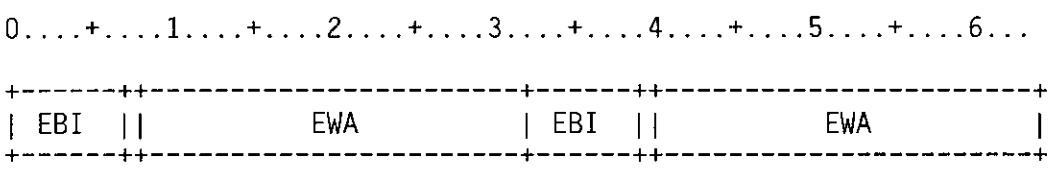


Figure BRT-2. Loader Block Relocation Table

Field	Word(base8)	Bits	Description
BRTEBI	1+0	0-6	Block index
BRTEQ	1+0	7	Relocation mode 0 = Word 1 = Parcel
BRTEWA	1+0	8-31	Parcel address to be modified (as 22-bit word address and 2-bit parcel)
BRTEBI	1+0	32-38	Block index
BRTEQ	1+0	39	Relocation mode
BRTEWA	1+0	40-63	Parcel address to be modified (as 22-

The following fields define the BRT entries for Extended BRTs. There is one entry per word.

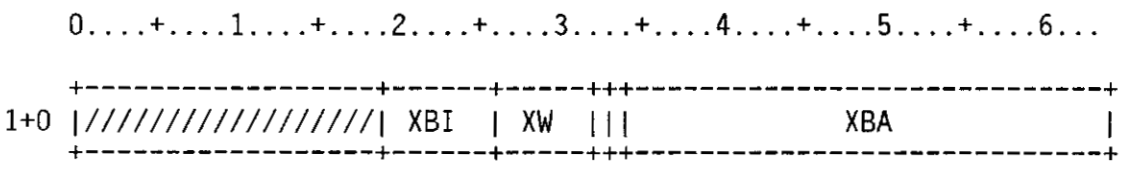


Figure BRT-3. Loader Block Relocation Table

Field	Word(base8)	Bits	Description
BRTXBI	1+0	19-25	Block index of destination. Specifies a block base address to be added to the relocation field as the relocation address
BRTXW	1+0	26-31	The width of the field to be modified (in bits). Zero means all 64 bits are modified.
BRTXQ	1+0	32	Relocation mode: 0=Word address relocation is performed on relocation field. 1=Quarter word address relocation is performed on relocation field.
BRTXN	1+0	33	Negative bit: 0=Value passed is positive 1=Value passed is negative
BRTXBA	1+0	34-63	Bit address. Indicates the address of a field relative to the block BI to be modified.

BUILD is an operating system utility program for generating and maintaining library datasets. BUILD generates a directory file consisting of a 1-word header followed by a variable-length entry for each program in the library dataset. A program record's entry may have any length from 3 to 66,048 words.

Any of the three sets of names (block, entry, or external) can be null. Each name is 1 to 8 ASCII characters, left-justified with zero fill. No blank characters are used. Block names represent FORTRAN references to BLOCK DATA subprograms and labeled common.

Entry names correspond to names of main programs and subroutines and to names of any labeled common blocks that are initialized by DATA statements.

External names represent references to entry names in other programs.

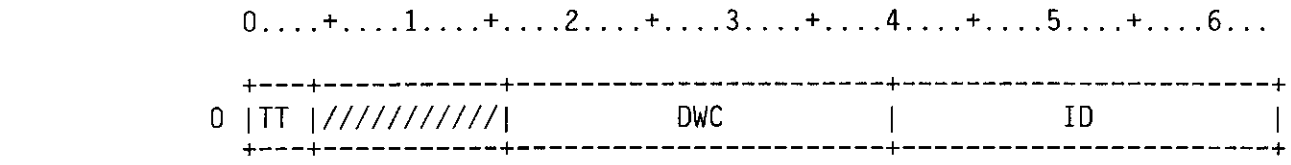


Figure DF-1. Loader Directory Table

Field	Word(base8)	Bits	Description
DFTT	0	0-3	Table type; 10 octal.
DFDWC	0	16-39	Directory's word count
DFID	0	40-63	'D01' in ASCII. The 01 indicates the BUILD revision level, thus specifying the directory format.

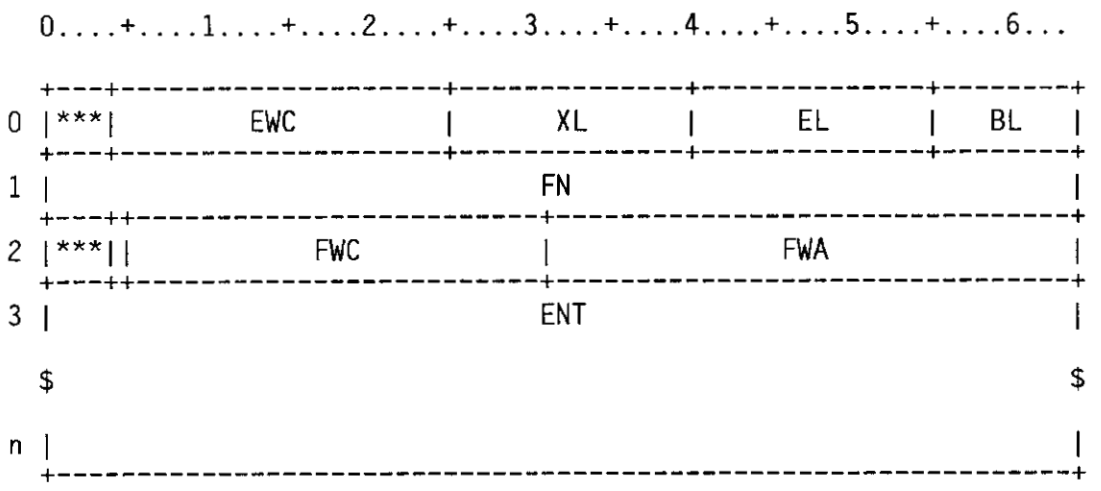


Figure BD-2. Loader Directory Table (BUILD) entry

Field	Word(base8)	Bits	Description
BDTYPE	0	0-3	Entry type. BDTYPEA=0 Absolute binary BDTYPER=1 Relocateable binary BDTYPEP=2 Control statement processor BDTYPED=3 Data or undefined
BDEWC	0	4-24	Word count of entry, maximum 66,048
BDXL	0	25-39	Number of external names, maximum
BDEL	0	40-54	Number of entry names, maximum 32,767
BDBL	0	55-63	Number of block names, maximum 511
BDFN	1	0-63	8-character name of program module
BDSTAT	2	0-3	Entry status
BDLM	2	4	Load module flag (LDR set and used)
BDFWC	2	5-30	Program module's maximum word count, for information only)
BDFWA	2	31-63	Program module's location,
BDENT	3-n	0-63	Directory entry blocks, entry names, externals

```
L@BDEH=W@BDENT          Length of
directory entry header
LH@BDT=2  Required by LDR
DIRTT=O'10   Directory table type
```

The DMT is a binary version of the load map that the loader produces. Subsequent products or job steps, such as a debugger, use DMT.

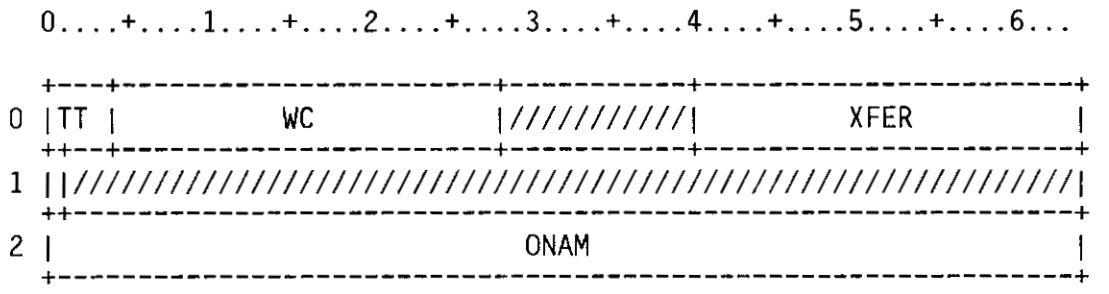


Figure DM-1. Debug Map Table header

Field	Word(base8)	Bits	Description
DMTT	0	0-3	Table type; 7.
DMWC	0	4-27	Table word count.
DMXFER	0	40-63	Transfer address. (0 if not used)
DMOVF	1	0	Overlay flag; set if overlays exist.
DMONAM	2	0-63	Overlay name in ASCII.

The following figure shows the entry format. The first entry starts after the header in word 3. The last entry is in words WC-2 and WC-1.

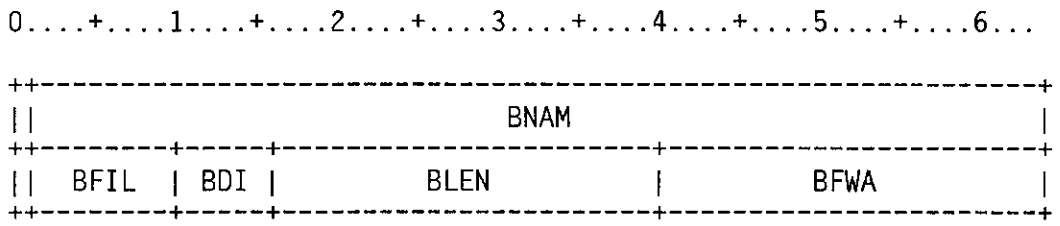


Figure DM-2. DMT entry format

Field	Word(base8)	Bits	Description
DMCBF	0	0	Conmmon block flag
DMBNAM	0	1-63	Block name in ASCII
DMTSCM	1	0	Task common flag. Set if this is a task common block.
DMBFIL	1	1-9	Number of words of 'fill' between the previous block and the current block, This field is used by LDR when it forces blocks to start on buffer boundaries.
DMBDI	1	10-15	Dataset index, showing from which load dataset or library the block was loaded.
DMBLEN	1	16-39	Length of the block in words.
DMBFWA	1	40-63	First word address of the block.

The DPT duplicates a word a given number of times. It provides a compact form for expressing a large number of words at load time without requiring a correspondingly large number of words in the relocatable dataset.

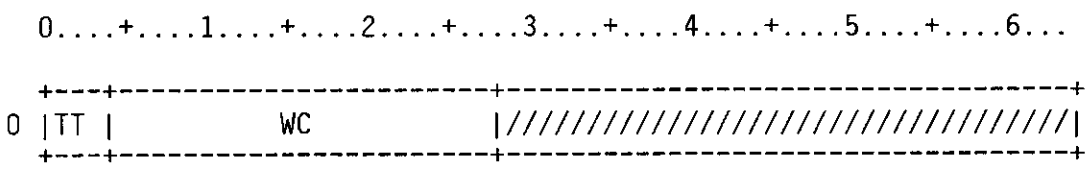


Figure DPT-1. Loader Duplication Table

Field	Word(base8)	Bits	Description
DPTTT	0	0-3	Table type (O'13)
DPTWC	0	4-27	Word count including header

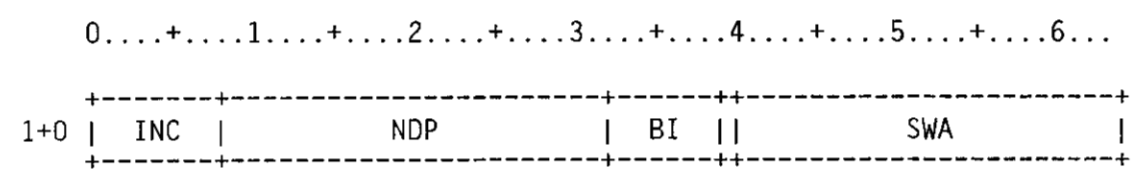


Figure DPT-2. Loader Duplication Table Entry

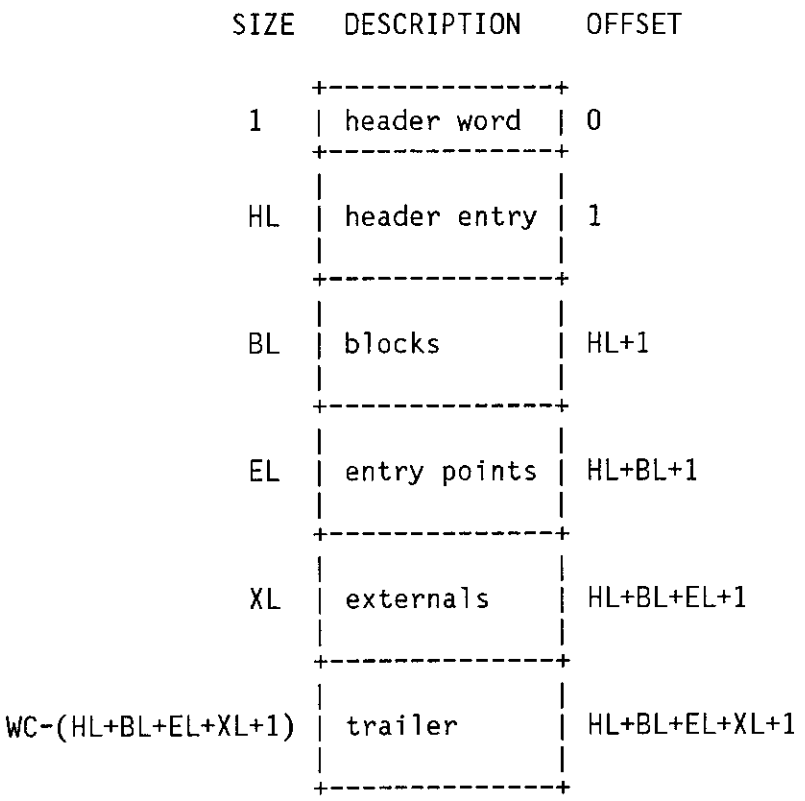
Field	Word(base8)	Bits	Description
DPTINC	1+0	0-7	Increment between stores of the source word. No duplication occurs if a zero increment is specified.
DPTNDP	1+0	8-31	Number of times the word at SWA is duplicated. NDP must be non-zero.
DPTBI	1+0	32-38	Block index; specifies the block whose base adress is added to SWA in obtaining the word to be duplicated
DPTSWA	1+0	40-63	Source word address; the address of the word that is duplicated. Duplication is performed before relocation or external linkage in the load process.

DPTTYPE=O'13 Table type code for DPT

The Program Description Table (PDT) is the first table of a program binary, and can be the first table on a dataset. The PDT contains information needed for relocation, such as entry points, externals, blocks, indexes, and the date and time of assembly.

The table has two formats: old and new. They are differentiated by bit 8 in the second word. This book describes only the new format. The old format does not include the header entry (figure PDT-2); the following fields from that entry are in the same bit positions in the program entry (figure PDT-3): TMT, TCSQ, TTYP, and TMOD. Starting addresses for table sections in the old format use the following numbers and variables cumulatively: 3, BL, EL, XL. These are added in the same way as in the new format, below:

Table organization:



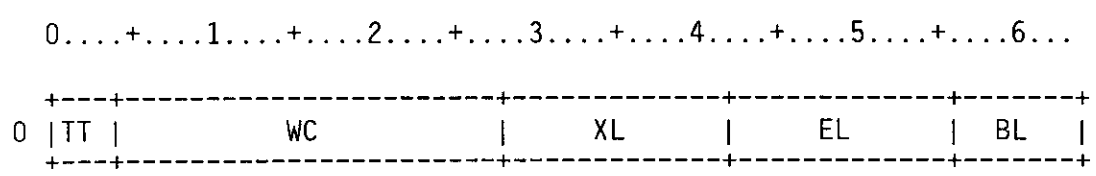


Figure PDT-1. Loader PDT Header Word

Field	Word(base8)	Bits	Description
PDTTT	0	0-3	Table type (O'17)
PDTWC	0	4-27	Word count including header word
PDTXL	0	28-41	Number of words-external descriptors
PDTEL	0	42-55	Number of words-entry point descriptor
PDTBL	0	56-63	Number of words-block name descriptors

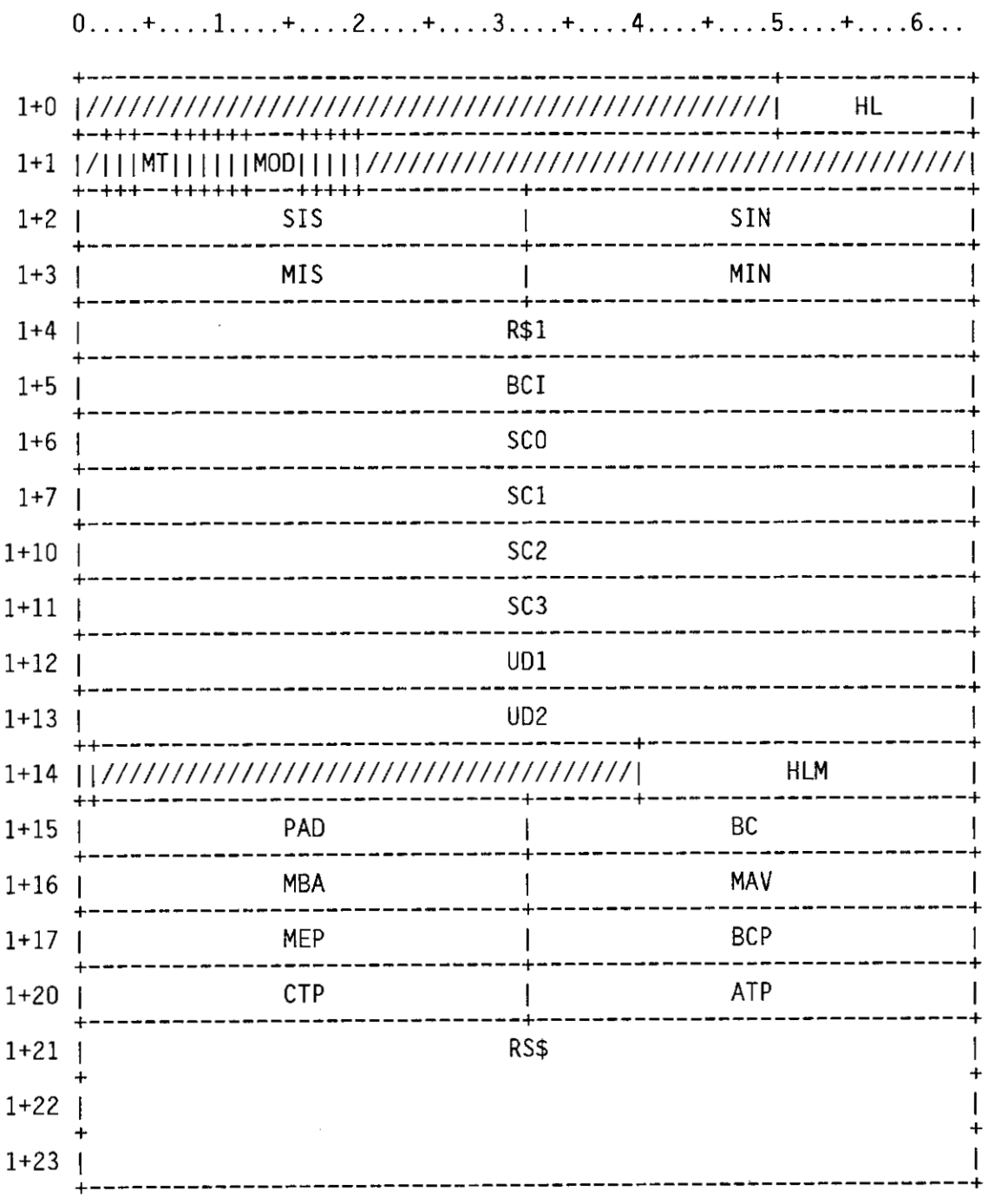


Figure PDT-2. Loader PDT Header entry

Field	Word(base8)	Bits	Description
PDTHL	1+0	50-63	Word length of header entry
PDTOVL	1+1	2	Overlay flag
PDTSBC	1+1	3	SBCA flag
PDTMT	1+1	4-6	Machine type
PDTCSQ	1+1	7	Calling sequence flag
PDTTYP	1+1	8	PDT type - 0=old PDT,1=new PDT
PDTSTK	1+1	9	Stack flag
PDTOVT	1+1	10	Overlay type - 0=type1, 1=type2
PDTMOD	1+1	12-15	Relocatable overlay module type
PDTSSM	1+1	16	Secure memory flag
PDTSDR	1+1	17	SDR module flag
PDTSDM	1+1	18	Special job - implies no echo
PDTEMA	1+1	19	EMA flag 0 - no extended memory 1 - extended memory (Cray X-MP)
PDTSIS	1+2	0-31	Initial stack size
PDTSIN	1+2	32-63	Stack increment size
PDTMIS	1+3	0-31	Initial managed memory size
PDTMIN	1+3	32-63	Managed memory increment size
PDTR$1	1+4	0-63	Reserved for future use
PDTBCI	1+5	0-63	Blank common initialization value
PDTSC0	1+6	0-63	Privilege word
PDTSC1	1+7	0-63	Privilege word
PDTSC2	1+10	0-63	Privilege word
PDTSC3	1+11	0-63	Privilege word
PDTUD1	1+12	0-63	User definable word 1

Field	Word(base8)	Bits	Description
PDTUD2	1+13	0-63	User definable word 2
PDTNRD	1+14	0	NORED flag
PDTHLM	1+14	40-63	HLM for binary
PDTPAD	1+15	0-31	Pad increment for field length
PDTBC	1+15	32-63	Blank common increment
PDTMBA	1+16	0-31	Managed memory base address
PDTMAV	1+16	32-63	Managed memory available base address
PDTMEP	1+17	0-31	Managed memory epsilon
PDTBCP	1+17	32-63	B.%STKBCP value
PDTCTP	1+20	0-31	B.%STKCTP value
PDTATP	1+20	32-63	B.%STKATP value
PDTRS$	1+21 to 1+23	0-63	Reserved for future use L@PDTRS$=3
PDTRS$	1+21	0-63	(Required by table diagram generator)
PDTRS$	1+22	0-63	(Required by table diagram generator)
PDTRS$	1+23	0-63	(Required by table diagram generator)
			LE@PDTHE=D'20 word length of header entry

BL/2 = number of entries

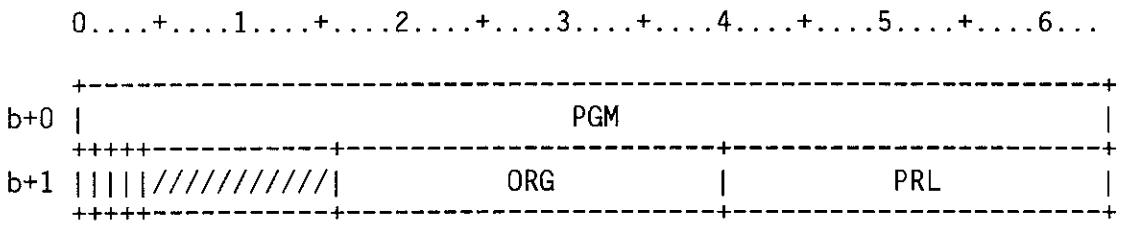


Figure PDT-3. Loader PDT block entry

Field	Word(base8)	Bits	Description
PDTPGM	b+0	0-63	Program name
PDTAF	b+1	0	Absolute module flag
PDTFE	b+1	1	Fatal error flag
PDTBD	b+1	2	Block data
PDTAL	b+1	3	Program block align flag
PDTORG	b+1	16-39	Origin address
PDTPRL	b+1	40-63	Program length

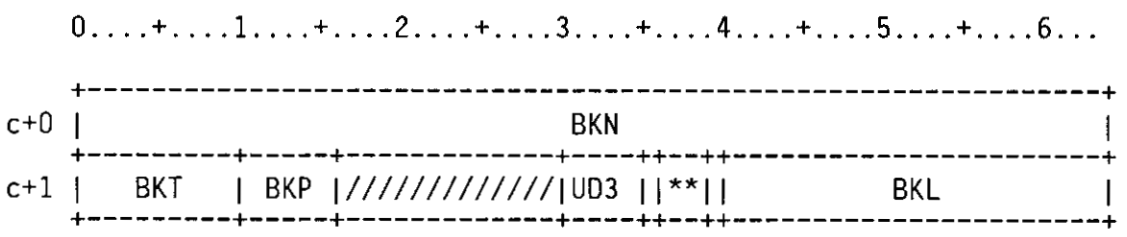


Figure PDT-4. Loader PDT common block entry

Field	Word(base8)	Bits	Description
PDTBKN	c+0	0-63	Block name
PDTBKT	c+1	0-9	Block type: 0 - common 1 - mixed (code/data) 2 - code 3 - data 4 - stack 5 - dynamic 6 - task common
PDTBKP	c+1	10-15	Block placement: 0 - global memory 1 - reserved for Cray 2 local memory 2 - extended memory (Cray X-MP)
PDTUD3	c+1	30-34	Reserved for customer use
PDTBKD	c+1	35	Dynamic common flag-not used by COS
PDTUD4	c+1	36-38	Reserved for customer use
PDTALC	c+1	39	Common block ALIGN flag
PDTBKL	c+1	40-63	Block length LE@PDTBK=2 word length of block entry

EL/3 = number of entries

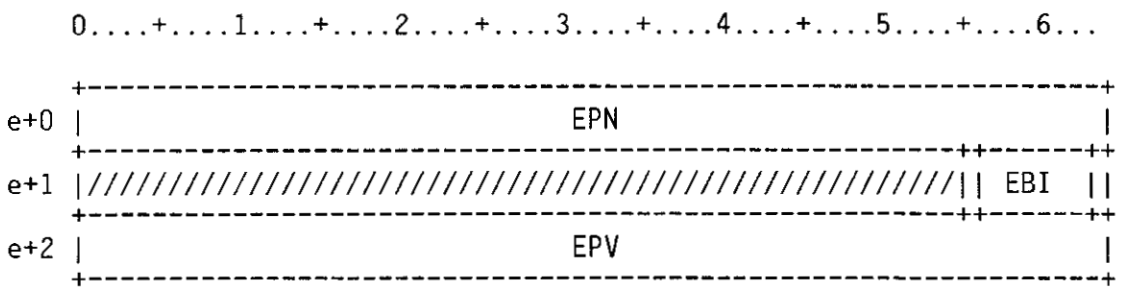


Figure PDT-5. Loader PDT entry point entry

Field	Word(base8)	Bits	Description
PDTEPN	e+0	0-63	Entry point name
PDTEPE	e+1	55	Primary entry type. If this bit is set, this entry is the primary entry of the current load. The loader transfers control to the first encountered primary entry.
PDTEBI	e+1	56-62	Block index; specifies the block containing the named entry. Associated with the block is a block address used to modify the entry value when it is used to satisfy externals of the same name. The entries define a relocation quantity as follows: 0 None 1 Negative to the program block 2 Positive to the program block 3 Positive to common block 1 4 Positive to common block 2 . . . 127 Positive to common block 125
PDTEPQ	e+1	63	Relocation mode
PDTEPV	e+2	0-63	A quantity associated with the entry name. For satisfying externals, an entry relocation quantity is determined by adding an EBI block address to the entry value

LE@PDTEP=3 word length of entry point entry

XL = number of entries

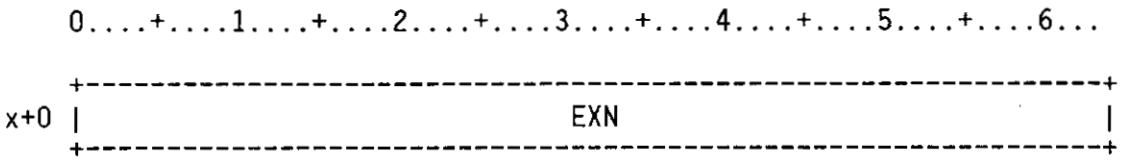


Figure PDT-6. Loader PDT external entry

Field	Word(base8)	Bits	Description
PDTEXN	x+0	0-63	External name

LE@PDTEX=1 word length of external entry

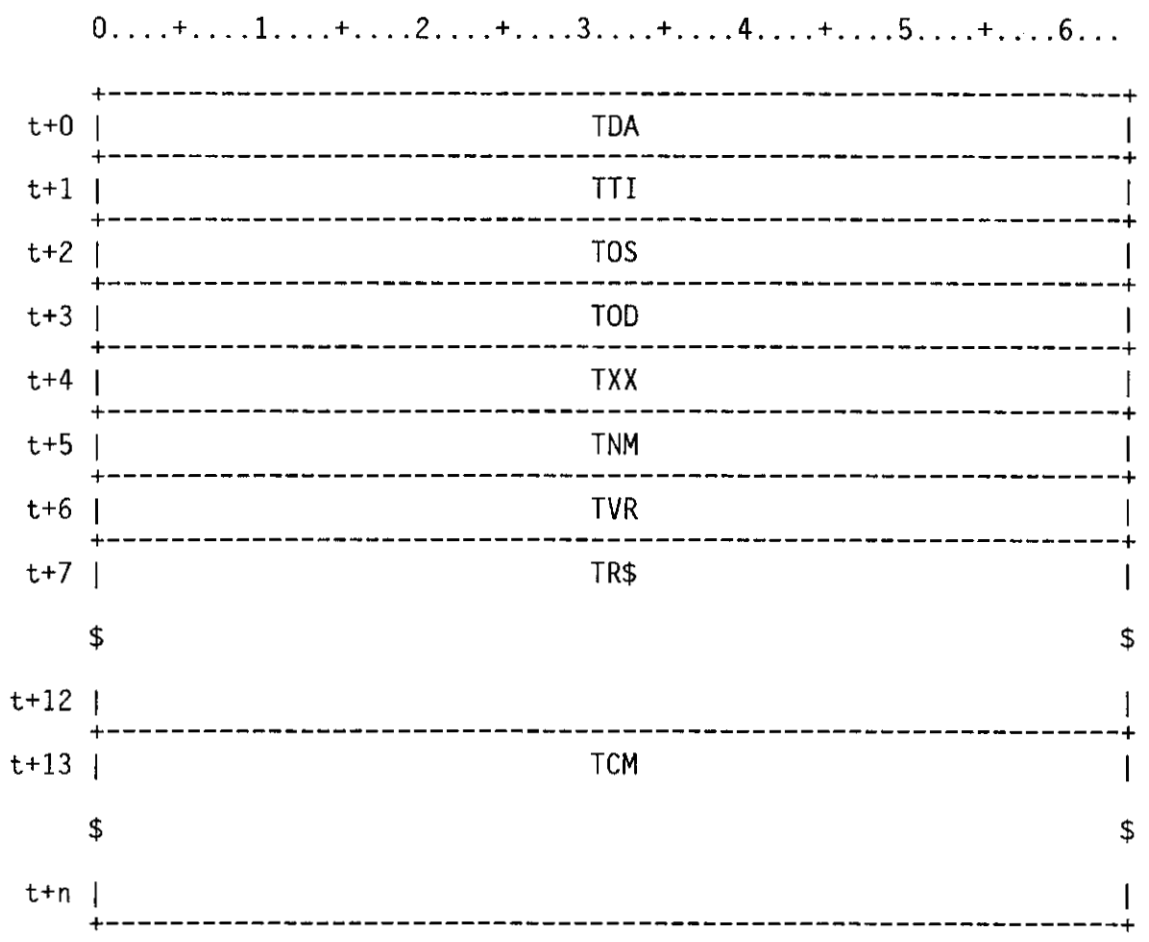


Figure PDT-7. Loader PDT trailer entry

Field	Word(base8)	Bits	Description
PDTTDA	t+0	0-63	Date of PDT generation
PDTTTI	t+1	0-63	Time of PDT generation
PDTTOS	t+2	0-63	Operating system version
PDTTOD	t+3	0-63	Operating system assembly date
PDTTXX	t+4	0-63	Reserved
PDTTNM	t+5	0-63	Name of generating product
PDTTVR	t+6	0-63	Version of generating product
PDTTR$	t+7 to t+12	0-63	Reserved for future use L@PDTTR$=4 Word length of reserved field

PDTTCMt+13 to n	0-63	comments

(In earlier documentation, this segment was called the PDT "header", even though it was the last entry in the PDT.)

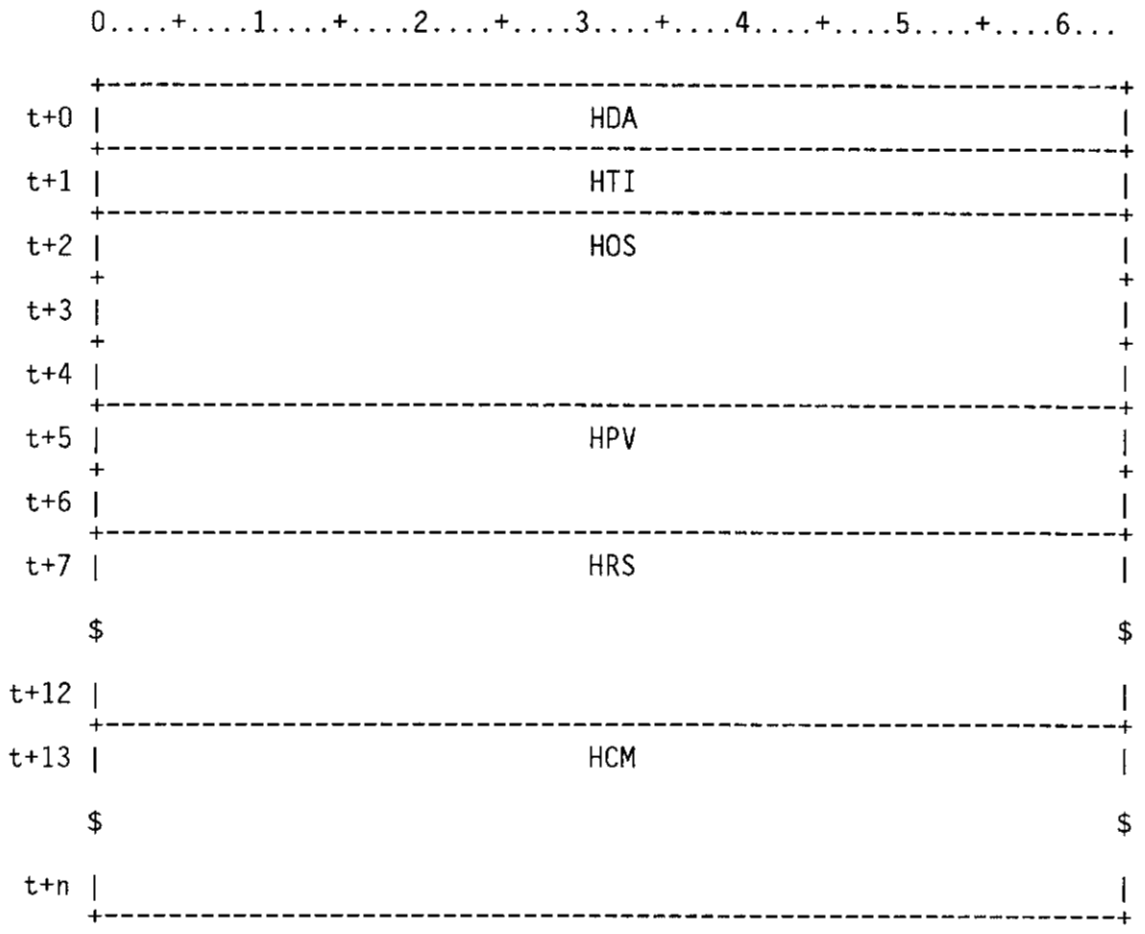


Figure PDT-8. Loader PDT old trailer (header)

Figure PDT-8. Loader PDT old trailer (header)

Field	Word(base8)	Bits	Description
PDTHDA	t+0	0-63	Date of compilation
PDTHTI	t+1	0-63	Time of compilation
PDTHOS	t+2 to t+4	0-63	Operating system id L@PDTHOS=3 word length of os id
PDTHPV	t+5 to t+6	0-63	Processor name and version L@PDTHPV=2 word length of name and version
PDTHRS	t+7 to t+12	0-63	Reserved for expansion L@PDTHRS=4 word length of reserved section
PDTHCM	t+13 to n	0-63	optional comments

table type

PDTTYPE=O'17 table type for PDT

relocatable overlay module type definitions

MODROVL=O'1 relocatable overlay

The PWT contains data from the progrm to be loaded. The data is specified as a starting bit of a word and a number of bits. The loading can cross boundaries.

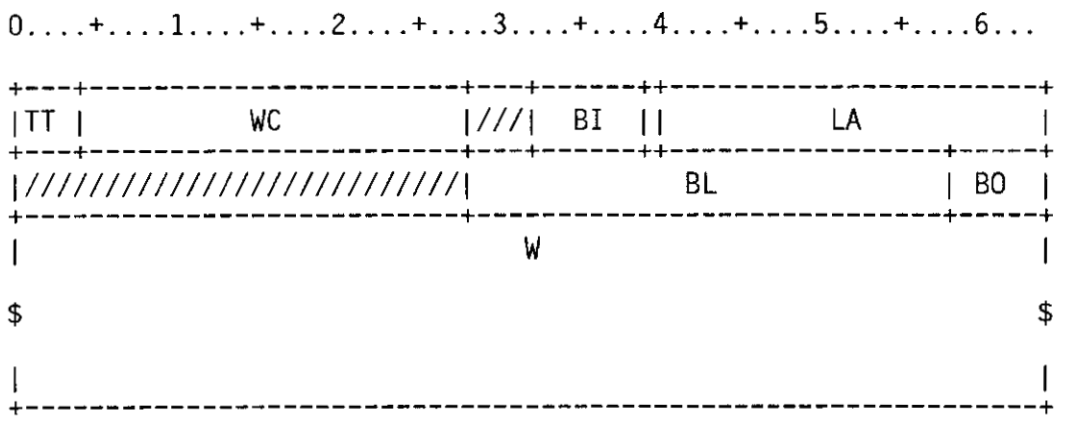
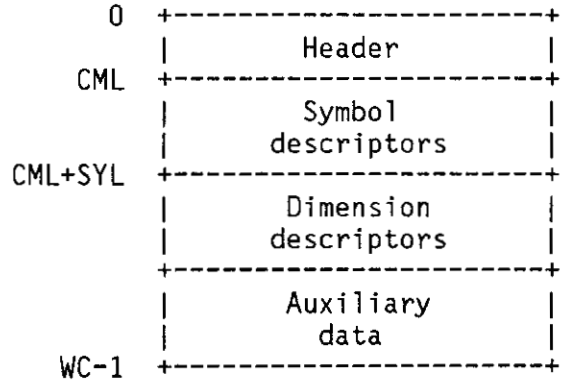


Figure PWT-1. Partial Word Table

Field	Word(base8)	Bits	Description
PWTTT	0	0-3	Table type; 6
PWTWC	0	4-27	Table word count
PWTBI	0	32-38	Block index; specifies the block into which text will be loaded.
PWTQ	0	39	Relocation mode of the entry name; this field is always 0.
PWTLA	0	40-63	Relative load address in block BI; LA is always specified as a word address.
PWTBL	1	28-57	Number of bits to be loaded
PWTBO	1	58-63	Bit offset; the leftmost bit of the field to be loaded
PWTW	2-n	0-63	Text words to be loaded into the program field in contiguous location starting at an address determined by adding LA to the base address indicated for block BI

A relocatable file can contain symbol table information for each program unit in a compilation. The information is a sequence of tables of type 11. The sequence always includes a subroutine table and can include one or more common block tables.

The Subroutine Table contains information about the subroutine block, the common block(s) referenced by the subroutine, and the local symbols. The organization of the Subroutine Table is shown below. The header format is shown in figure SMT-1. Sybmol descriptor format is snown in figure SMT-3. The dimension descriptor format is shown in figure SMT-7.



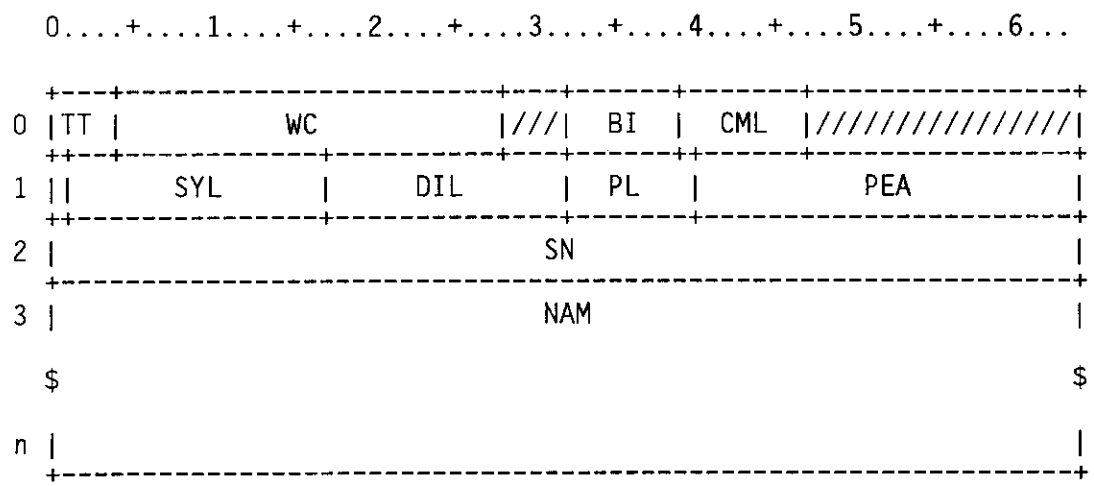
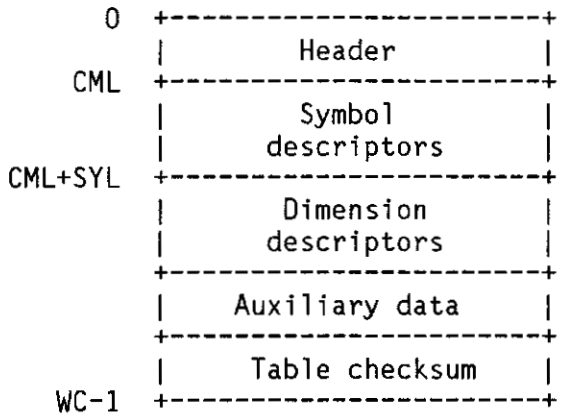


Figure SMT-1. Subroutine Table Header

Field	Word(base8)	Bits	Description
SMTTT	0	0-3	Table type (O'11)
SMTWC	0	4-27	Table word count
SMTBI	0	32-38	Block index. This is an index into the Subroutine Table common block name list (the same list as contained in the PDT table.)
SMTCML	0	39-46	Length in words of table header
SMTDBF	1	0	Dynamic block flag: 0 Static 1 Dynamic
SMTSYL	1	1-16	
SMTDIL	1	17-31	Dimension block length
SMTPL	1	32-39	Prologue length (parcel)
SMTPEA	1	40-63	Primary entry address (parcel)
SMTSN	2	0-63	Subroutine name
SMTNAM	3-n	0-63	Name(s) of common block(s) referenced by this routine.

The Common Block Table contains information about a specific common block referenced within a subroutine and the symbols that the common block contains. A Symbol Table contains one Common Block Table for each common block named in the Subroutine table. The final word of the Common Block Table, field THC, gives the Common Block Table checksum. The over-all organization of the Common Block Table is shown below. The header format is shown in figure SM.1-2. Symbol descriptor format is shown in figure SM.1-3. The dimension descriptor format is shown in figure SM.1-7.



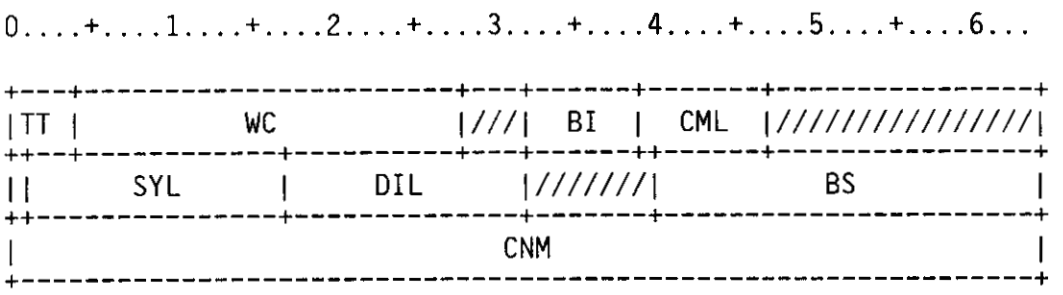


Figure SMT-2. Common Block Table Header

Field	Word(base8)	Bits	Description
SMTTT	0	0-3	Table type; 11 octal
SMTWC	0	4-27	Word count (number of words occupied by this table)
SMTBI	0	32-38	Block index
SMTCML	0	39-46	Common block length. This field is always 3 for a common block.
SMTDBF	1	0	Dynamic block flag: 0 Static 1 Dynamic
SMTSYL	1	1-16	Symbol block length (words)
SMTDIL	1	17-31	Dimension block length (words)
SMTBS	1	40-63	Block size; storage size of the named common block in words.
SMTCNM	2	0-63	Name of common block; ASCII, left-justified, zero-filled.

Words CML through CML+SYL-1 contain descriptors of local symbols. Each descriptor (figure SM.1-3) may be 3 through 6 words long, depending on the symbol length. In addition, a dimensioned variable symbol points to a group of words in the dimension block for its dimension information.

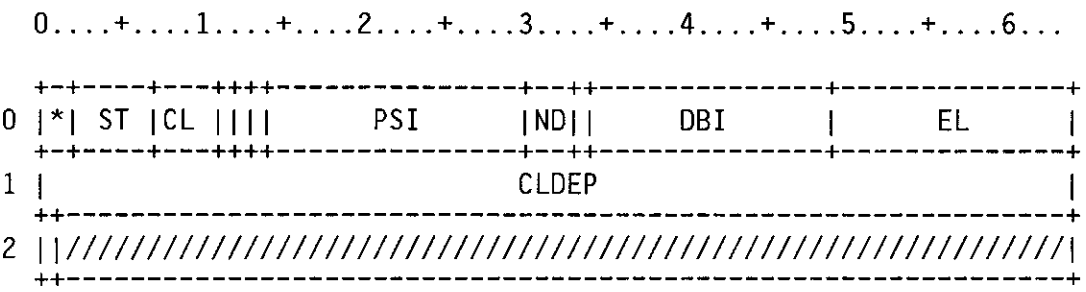


Figure SMT-3. Symbol Descriptor Format

Field	Word(base8)	Bits	Description
SMTSL	0	0-1	Symbol name length-1 in words
SMTST	0	2-6	Symbol type: 0 Unknown 1 Program (external) 2 Entry point 3 Label 4 Integer 5 Real 6 Complex 7 Logical 8 Character 9 Bit (Boolean) 10 File 11 Pointer 12 DP integer 13 DP real 14 DP complex 15 Structure 16 Address
SMTCL	0	7-10	Symbol class: 0 Constant 1 Register 2 Normal 3 Stack 4 Based pointer 5 Based descriptor

Field	Word(base8)	Bits	Description
SMTDA	0	11	Dummy argument (parameter). If non-zero, the symbol is a dummy argument.
SMTAM	0	12	Argument mode: 0 Address 1 Value
SMTEQ	0	13	Equivalence. If non-zero, the symbol is equivalenced.
SMTPSI	0	14-29	Parent symbol index. If nonzero, the index is within SYL of the top parent.
SMTND	0	30-32	Number of dimensions
SMTASM	0	33	Array storage mode: 0 By column 1 By row
SMTDBI	0	34-48	Dimension block index
SMTEL	0	49-63	Element length (in bits)
CLDEP	1	0-63	Symbol class-dependent information: Class Figure 0 SM.1-4 1 SM.1-5 2-5 SM.1-6
SMTSNM	2	0	Symbol name; 1-4 words (32 character maximum) in 8-bit ascii, left-justified, null-filled to end of word.

The contents of word S2 of the symbol descriptor are determined by the class of the symbol. Class type may be found in field CL of the Subroutine Table, word CML, bits 7-10.

Classes are as follows:

0 Constant value
1 Register
2 Normal
3 Stack
4 Based pointer
5 Based descriptor

Figures SM.1-4, SM.1-5, and SM.1-6 describe the formats that word 2 of the symbol descriptor can take, based on the symbol class.

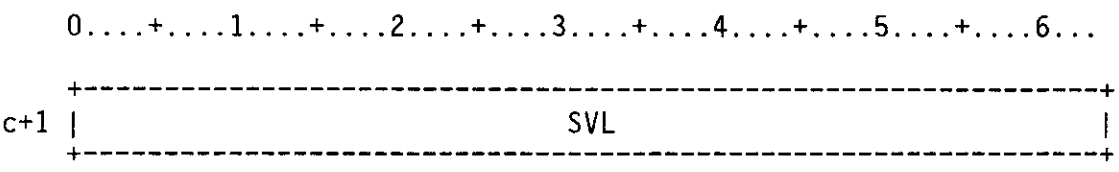


Figure SMT-4. Word S2 for class 0

Field	Word(base8)	Bits	Description
SMTSVL	c+1	0-63	

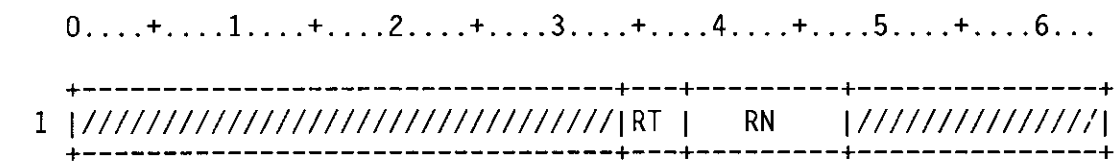


Figure SMT-5. Word S2 for class 1

Field	Word(base8)	Bits	Description
SMTRT	1	34-37	Register type: 1 A 2 B 3 S 4 T 5 V 6 Special
SMTRN	1	38-47	Register number or subtype. For register types 1 through 5, RN contain a register number. For register type RN contains one of the following value right-justified with zero fill. 0 Vector length register 1 Vector mask register 2-31 Channel address register 32 P register

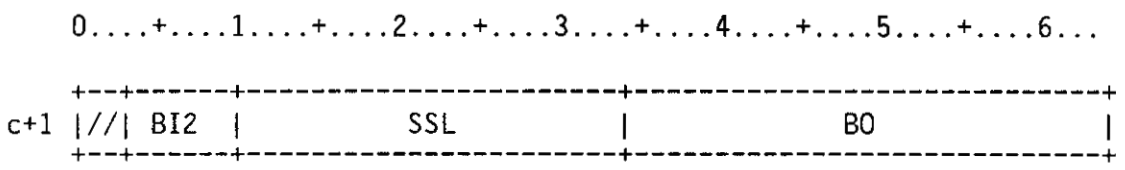


Figure SMT-6. Word S2 for class 2-5

Field	Word(base8)	Bits	Description
SMTBI2	c+1	3-9	Block index
SMTSSL	c+1	10-33	Symbol storage length; words occupied in storage.
SMTBO	c+1	34-63	Bit offset; offset in bits from the block base or from the parent symbol base.

The dimension descriptor portion of the Subroutine or Common Block Table contains a dimension descriptor for each dimensioned variable symbol (ND><0). Each descriptor consists of an n-word entry, where n is the dimension of the variable. Figure SM.1-7 illustrates a dimension descriptor entry.

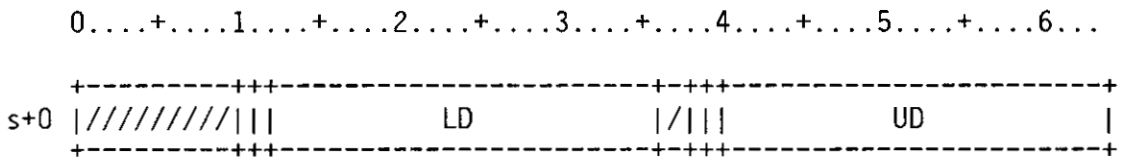


Figure SMT-7. Dimension Descriptor Format

Field	Word(base8)	Bits	Description
SMTLDE	s+0	10	Lower dimension expression. If LDE is nonzero, the lower dimension field (LD) contains an index into the dimension block of the expression definition required to evaluate the lower dimension. (See description of L field.)
SMTLDI	s+0	11	Lower dimension indirect. If LDI is nonzero, the lower dimension contains an index into a symbol list of the symbol that contains the lower dimension value. (See description of LD field.)

Field	Word(base8)	Bits	Description
SMTLD	s+0	12-35	Lower dimension. The contents of LD depend on the values of LDE and LDI. If LDE and LDI equal 0, then LD is the lower dimension value. If LDE is not 0, then LD consists of the following subfields:

```
  1....+....2....+....3....+
  --+-------+-------------+
  ..|  ACCL |     DIMI    |
  --+-------+-------------+
```

ACCL 12-19 The length in half words of the access function
DIMI 20-35 Index into DIL of the dimension expression

If LDI><0, then LD consists of the following subfields:

```
 1....+....2....+....3....+
 ---+------+-------------+
 ...|  BI  |     DSI     |
 ---+------+-------------+
```

BI 13-19 Block index
DSI 20-35 Dimension symbol index

DSI is an origin=1 index into the symbol descriptors. For example, DSI=1 is word CML of SMT. Where LDI is nonzero, DSI points to the first word of a descriptor whose symbol holds the lower dimension bound. Where UDI is nonzero, DSI points to the first word of a descriptor whose symbol holds the dimension length.
Example: Given SUBROUTINE S(M,N) DIMENSION A(M:M+N), where M=3 and N=8, LDI=UDI=1, DSI for LD points to a symbol whose value is 3, and DSI for UD point to a symbol whose value is 9.

SMTUDE	s+0	38	Upper dimension expression (same as LDE, for upper dimension)
SMTUDI	s+0	39	Upper dimension indirect

Field	Word(base8)	Bits	Description
SMTUD	s+0	40-63	Upper dimension. The contents of UD depend on the values of UDE and UDI. UDI=0 then UD is the dimension upper bound. If UDE is nonzero, it has the same format as LD. If UDI is nonzero, UD is the same as LD when LDI is nonzero, and points to a symbol containing the dimension extent (not an upper dimension).

The TXT contains the code or data of the program to be loaded.

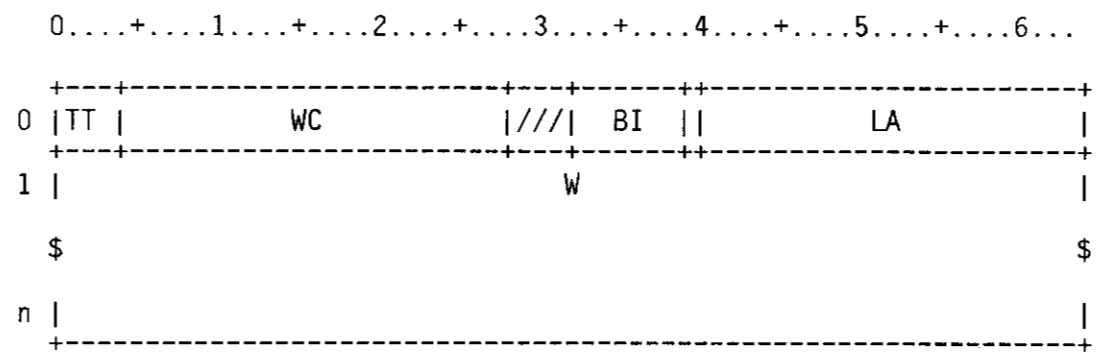


Figure TXT-1. Loader Text Table

Field	Word(base8)	Bits	Description
TXTTT	0	0-3	Table type; 16.
TXTWC	0	4-27	Table word count
TXTBI	0	32-38	Block index; specifies the block into which the text will be loaded.
TXTQ	0	39	Relocation mode of the entry name; this field is always 0.
TXTLA	0	40-63	Relative load address in block BI. LA is always specified as a word address.
TXTW	1-n	0-63	Text words to be loaded into the program field in contiguous locations starting at an address determined by adding LA to the base address indicated for block BI

TXTTYPE=O'16 Table type for TXT

The XRT contains information that enables the loader to relocate external references.

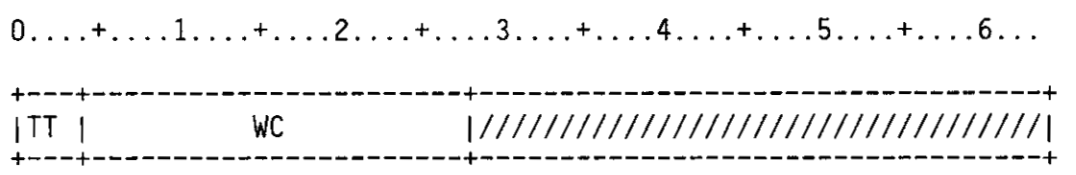


Figure XRT-1. Loader External Relocation Table

Field	Word(base8)	Bits	Description
XRTTT	0	0-3	Table type (O'14)
XRTWC	0	4-27	Word count

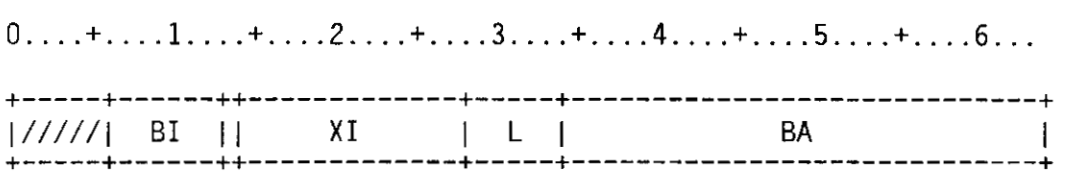


Figure XRT-2. External relocation table entry

Field	Word(base8)	Bits	Description
XRTBI	0	6-12	Block index; defines a block address to be added to a BA in obtaining the field to be relocated (linked).
XRTQ	0	13	Q flag; indicates attribute of the field to be linked. Q is set if the field requires a parcel address. Q is zero if a word address is desired. The loader adjusts the entry values in links where the respective Q flags do not match.
XRTXI	0	14-27	External index. This is an index into the externals list of the PDT. The entry value corresponding to the entry name that matches the named external in the PDT table is used to relocate the field.
XRTL	0	28-33	Length of bits of the relocation field. If L=0, the relocation field is assumed to be 64 bits; otherwise, it is the length specified by L.
XRTBA	0	34-63	Bit address within (BI) of rightmost bit to be modified

XRTTYPE=O'14 TABLE TYPE FOR XRT

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