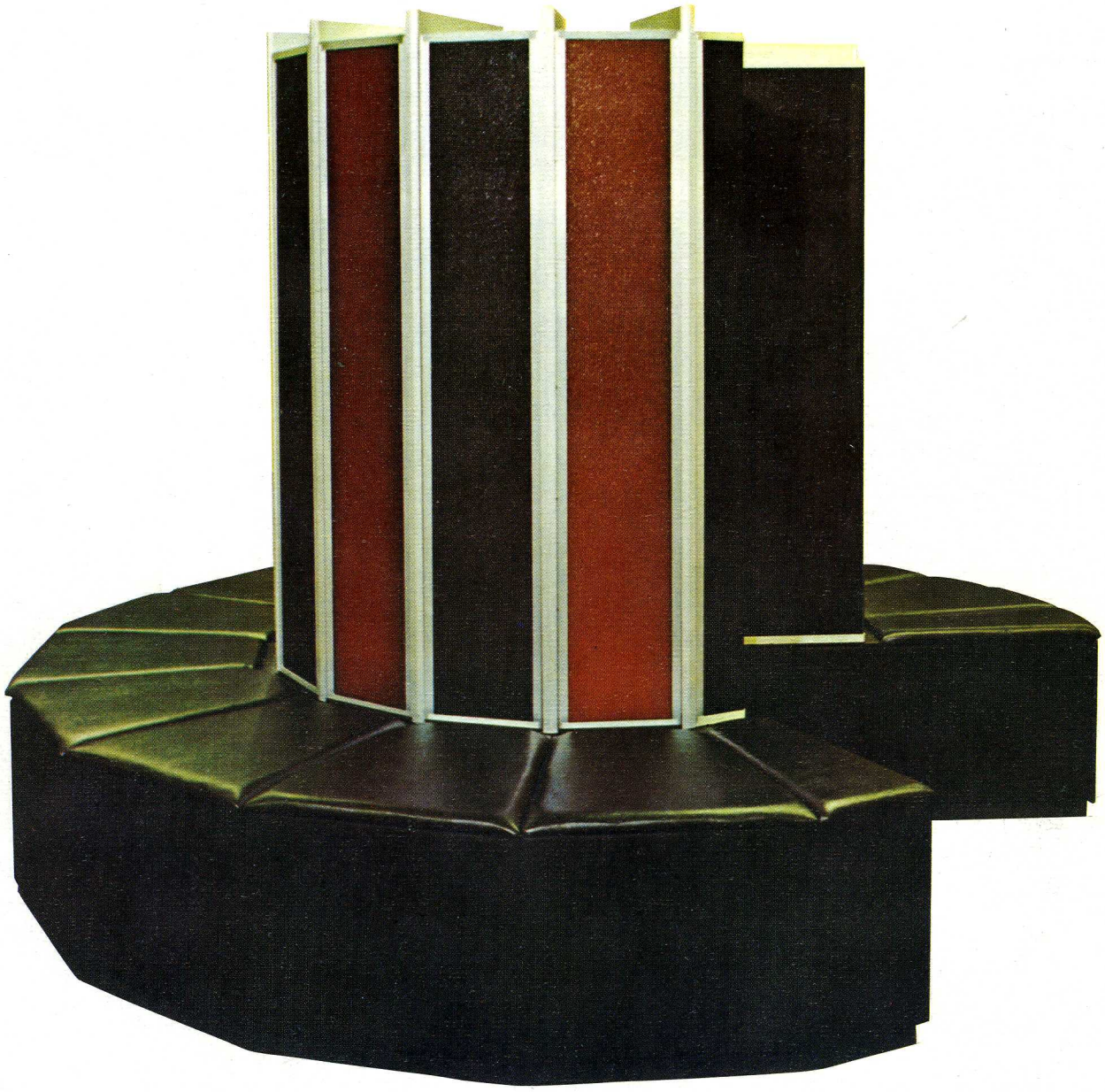
CRAY RESEARCH, INC.

CRAY-1® COMPUTER SYSTEM

CRAY-OS VERSION 1 SYSTEM PROGRAMMER'S MANUAL

2240012



VOLUME THREE

CRAY-1®
COMPUTER SYSTEM

CRAY-OS VERSION 1
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MANUAL
2240012

VOLUME THREE

PART 5 TABLES

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
	January 1977 - Original printing
A	May 1977 - Reprint with revision. This revision obsoletes the previous edition.
A-01	August 1977 - Update packet. This packet reflects changes to EXEC, SCP, PFM, EXP, and operator commands. It also provides interim procedures for system generation.
B	January 1978 - Reprint with revision. This revision obsoletes all previous editions. This printing coincides with the release of Version 1 of the CRAY-1 Operating System.
B-01	April 1978 - Update packet. This packet reflects changes incorporated into Version 1.01 of the CRAY-1 Operating System.
B-02	July 1978 - Update packet. This packet reflects changes incorporated into Version 1.02 of the CRAY-1 Operating System.
C	October 1978 - Reprint with revision. This revision obsoletes all previous editions. With this reprint, this publication has been divided into three volumes; Volume 1 contains Part 1 of this publication, Volume 2 includes Parts 2, 3, and 4, and Volume 3 contains Part 5. This printing coincides with the release of version 1.03 of the CRAY-1 Operating System.
C-01	January 1979 - Update packet. This packet reflects changes incorporated into Version 1.04 of the CRAY-1 Operating System.
C-02	April 1979 - Update packet. This packet reflects changes incorporated into Version 1.05 of the CRAY Operating System.
C-03	July 1979 - Update packet. This packet reflects changes incorporated into Version 1.06 of the CRAY-1 Operating System.
D	September 1979 - Reprint. Revision D is the same as Revision C with change packets C-01, C-02 and C-03 added. No additional changes have been made.
D-01	December, 1979 - Update packet. This packet reflects changes incorporated into Version 1.07 of the CRAY-1 Operating System.
D-02	April, 1980 - Update packet. This packet reflects changes incorporated into Version 1.08 of the CRAY-1 Operating System.

E	May, 1980 - Reprint. Revision E is the same as Revision D with change packets D-02 and D-02 added. No additional changes have been made.

PREFACE

The System Programmer's Manual is written for programmers, analysts, and field engineers who are responsible for installing, debugging, or modifying the CRAY Operating System, Version 1.

This manual contains information to aid the programmer in making the transition from the external features of the operating system as described in the CRAY-OS Version 1 Reference Manual, CRI publication 2240011 to the listings. The reader is assumed to be familiar with the contents of the CRAY-OS Reference Manual and to be experienced in coding in the CRAY Assembly Language (CAL) as described in the CAL Version 1 Reference Manual, CRI publication 2240000.

Although a general familiarity with the concept of operating systems is assumed, this publication does not presume that the reader knows the principles or techniques of any other specific operating system.

This manual is in three parts, as follows:

VOLUME ONE

PART 1 SYSTEM COMPONENTS

This part familiarizes the reader with the structure, major components, interfaces, and philosophy of the system.

VOLUME TWO

PART 2 SYSTEM GENERATION

This part describes the Cray Research released software materials and how they are used to bring the CRAY-OS Operation System and its product set to an operational state.

PART 3 SYSTEM STARTUP AND RECOVERY

This part gives the procedure for installing, starting, or recovering the operating system.

PART 4 SYSTEM MODIFICATION AND MAINTENANCE

This part gives the rules and conventions to be followed when modifying or adding to the system. It also describes system macros, techniques for adding features to the system, and tools and techniques for analyzing and diagnosing problems and failures.

VOLUME THREE

PART 5 SYSTEM TABLE DESCRIPTIONS

This section contains detailed descriptions of tables resident in EXEC and STP.

Part 5

TABLES

CONTENTS
PART 5 TABLES

SYSTEM TABLE DESCRIPTIONS 1

1.1 INTRODUCTION

The tables summarized in table 1.1-1 are described in subsequent sections in alphabetical order according to their unique 2-character prefixes. Pages are also numbered according to the table prefixes. Tables may be manipulated by use of the table management macros described in part 4, section 2.

Table 1.1-1. Summary of tables

Prefix	Table name and common mnemonic	Residence
AC	Job Accounting Table (JAC)	User
AU	Active User Table (AUT)	STP
BA	Binary Audit Table (BAT)	User
BG	Begin Code Execution Table (BGN)	User
CB	Channel Buffer Table (CBT)	EXEC
CC	Chain Control	STP
CH	Channel Table (CHT)	EXEC
CI	Chain Item	STP
CM	Communication Module (CMOD)	STP
CS	Class Structure Definition (CSD)	STP
DA	Dataset Allocation Table (DAT)	STP
DC	Dataset Catalog (DSC)	Disk
DD	Dataset Definition List (DDL)	User
DE	Device Error Table (DET)	STP
DN	Dataset Name Table (DNT)	JTA/STP
DP	Dataset Parameter Area (DSP)	User/STP/JTA
DR	Device Reservation Table (DRT)	STP
DT	Device Channel Table (DCT)	STP
DV	Device Label (DVL)	Disk
EC	Error Code Table (ECT)	STP
EQ	Equipment Table (EQT)	STP
IB	Interactive Buffer Table (IBT)	STP

Table 1.1-1 (continued) Summary of tables

Prefix	Table name and common mnemonic	Residence
JC	Job Communication Block (JCB)	User
JT	Job Table Area (JTA)	Below user
JX	Job Execution Table (JXT)	STP
LC	Link Configuration Table (LCT)	STP
LF	Logical File Table (LFT)	User
LG	Log Tables (LGI,LGR,LGUQ)	STP
LS	Link Interface Stream Table (LST)	STP
LT	Link Interface Table (LIT)	STP
LX	Link Interface Extension Table (LXT)	STP
MP	Memory Pool Table	STP
MS	Memory Segment Table (MST)	STP
OD	Open Dataset Name Table (ODN)	User
PD	Permanent Dataset Table (PDS)	STP
PI	Permanent Dataset Information (PDI)	STP
PM	Permanent Dataset Definition (PDD)	User
PR	Procedure File Stack Table	JTA
PT	Pool Table	STP
PU	Physical Unit Table (PUT)	EXEC
QD	Queued Dataset Table (QDT)	STP
RJ	Rolled Job Index Table (RJI)	STP
RQ	Request Table (RQT)	STP
SD	System Dataset Table (SDT)	STP
ST	System Task Table (STT)	EXEC
TB	Task Breakpoint Table (TBPT)	EXEC

1.AC JOB ACCOUNTING TABLE - JAC

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

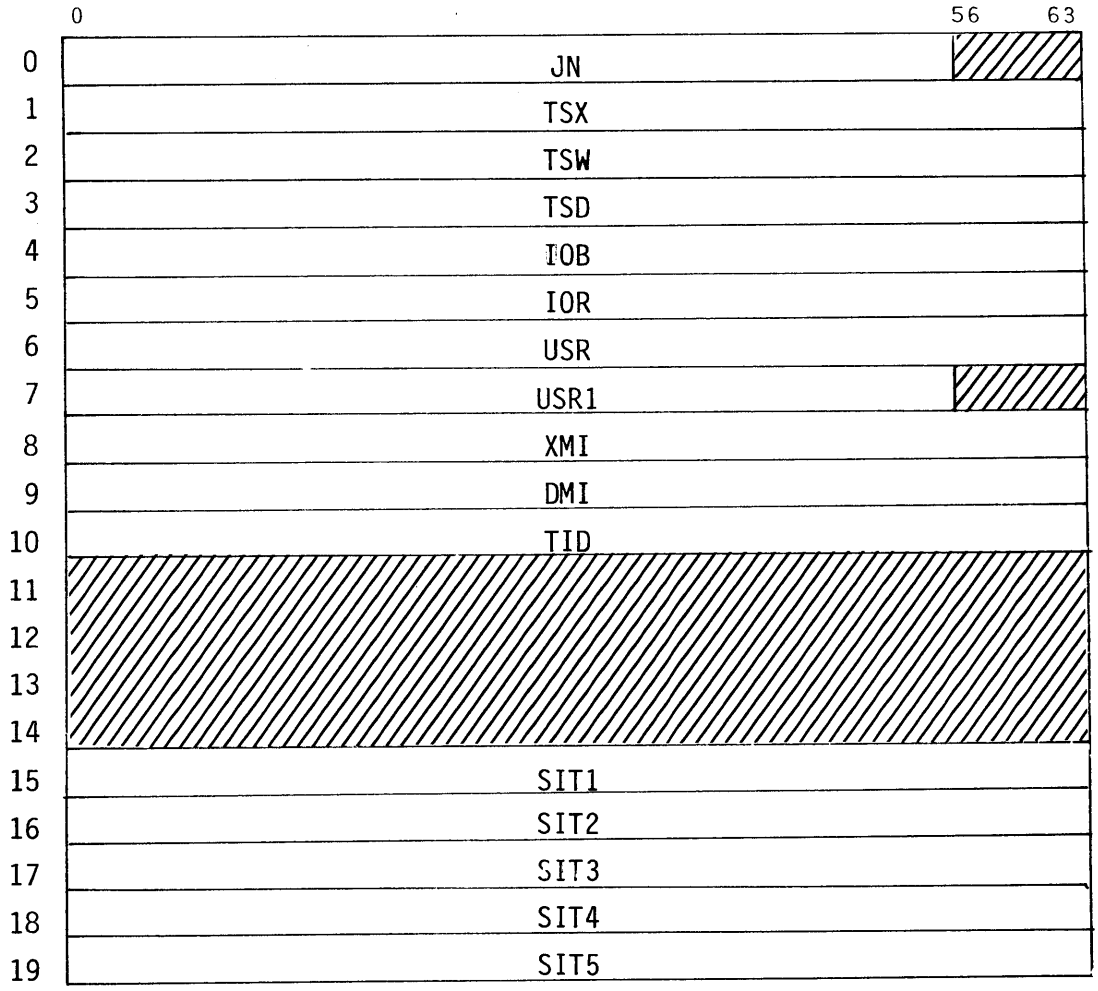


Figure 1.AC-1 Job Accounting Table (JAC)

Field	Word	Bits	Description
ACJN	0	0-55	Jobname
ACTSX	1	0-63	CPU time in cycles
ACTSW	2	0-63	Wait time for CPU
ACTSD	3	0-63	I/O wait time
ACIOB	4	0-63	Disk blocks moved
ACIOR	5	0-63	User I/O request
ACUSR	6	0-63	Characters 1-8 of user number
ACUSR1	7	0-55	Characters 9-15 of user number
ACXMI	8	0-63	Memory integral for execution time
ACDMI	9	0-63	Memory integral for I/O wait time
ACTID	10	0-63	Terminal ID
	11-14	0-63	Reserved
ACSIT1-ACSIT5	15-19	0-63	Reserved for site use

1.AU ACTIVE USER TABLE - AUT

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. The entry is released when user processing is finished and the user logs off.

Header:

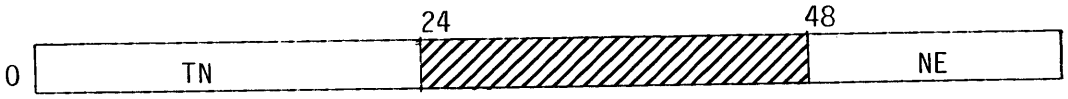


Table:

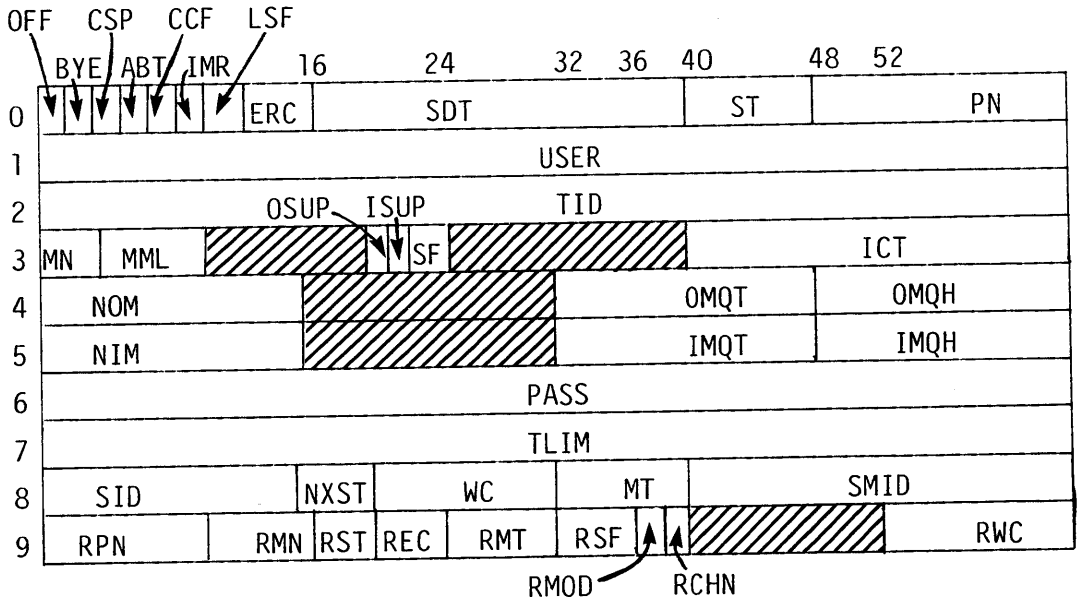


Figure 1.AU-1. Active User Table (AUT)

Field	Word	Bits	Description
AUTN	0	0-24	Table name
AUNE	0	48-63	Number of active entries
AUOFF	0	0	Logged off terminal flag
AUBYE	0	1	Job terminated while logged off
AUCSP	0	2	CSP loaded
AUABT	0	3	Abort flag
AUCCF	0	4	Concentrator relogged flag
AUIMR	0	5	Message received flag

Field	Word	Bits	Description
AULSF	0	6-7	Logoff special function field
AUERC	0	8-15	Error code
AUSDT	0	16-39	SDT for job
AUST	0	40-47	Terminal status
AUPN	0	48-63	Process number
AUUSER	1	0-63	User name
AUTID	2	0-63	Terminal ID
AUMN	3	0-3	Message number
AUMML	3	8-19	Maximum message length
AUOSUP	3	20	Output suspended flag (cleared by SCP)
AUISUP	3	21	Input suspended flag (cleared by SCP)
AUSF	3	22-25	Special function field
AUICT	3	40-63	Interactive console entry pointer
AUOQC	4	0-63	Output Q control word
AUNOM	4	0-15	Number of output messages
AUOMQT	4	32-47	Output message queue tail
AUOMQH	4	48-63	Output message queue head
AUIQC	5	0-63	Input Q control word
AUNIM	5	0-15	Number of input messages
AUIMQT	5	32-47	Input message queue tail
AUIMQH	5	48-63	Input message queue head
AUPASS	6	0-63	Password
AUTLIM	7	0-63	Time of last input message
AUSID	8	0-15	Front end ID
AUNXST	8	16-19	Next state

Field	Word	Bits	Description
AUWC	8	20-31	Word count
AUMT	8	32-39	Sent message type
AUSMID	8	40-63	Sent message ID
AURMES	9	0-63	Received message
AURPN	9	0-11	Received process number
AURMN	9	12-15	Received message number
AURST	9	16-19	Received status
AUREC	9	20-23	Received error code
AURMT	9	24-31	Received message type
AURSF	9	32-35	Received special function
AURMOD	9	36	Received mode
AURCHN	9	37	Received chain flag
AURWC	9	52-63	Received word count

1.BA BINARY AUDIT TABLE - BAT

When the binary output parameter is specified on the AUDIT control statement, the Permanent Dataset Manager creates a 36-word BAT record for each permanent dataset meeting control statement requirements and having a user number that matches the user number for the job.

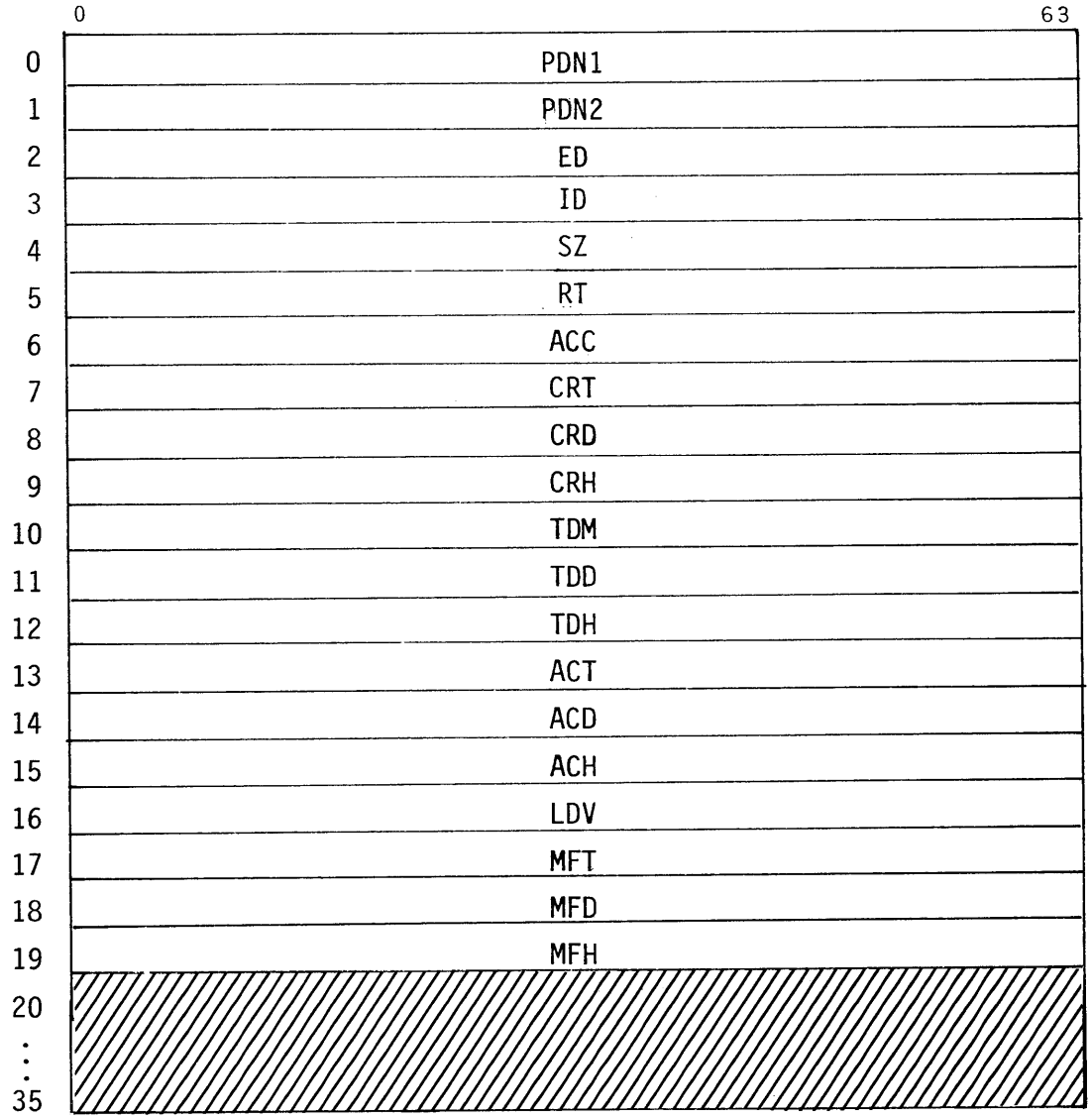


Figure 1.BA-1. Binary Audit Table (BAT)

Field	Word	Bits	Description
BAPDN1	0	0-63	Permanent Dataset Name; characters 1-8 left justified with blank fill
BAPDN2	1	0-55	Permanent Dataset Name; characters 9-15 left justified with blank fill
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
BART	5	0-63	Retention period; 1-4095 represented in binary
BAACC	6	0-63	Number of accesses represented in binary
BACRT	7	0-63	Creation time in cycles
BACRD	8	0-63	Creation date as mm/dd/yy
BACRH	9	0-63	Creation time as hh:mm:ss
BATDM	10	0-63	Time of last dump in cycles
BATDD	11	0-63	Date of last dump as mm/dd/yy
BATDH	12	0-63	Time of last dump as hh:mm:ss
BAACT	13	0-63	Time of last access in cycles
BAACD	14	0-63	Date of last access as mm/dd/yy
BAACH	15	0-63	Time of last access as hh:mm:ss
BALDV	16	0-63	Logical device name
BAMFT	17	0-63	Time of last modification in cycles
BAMFD	18	0-63	Date of last modification as mm/dd/yy
BAMFH	19	0-63	Time of last modification as hh:mm:ss
	20-35	0-63	Reserved

1.BG BEGIN CODE EXECUTION TABLE -BGN

The BGN table specifies necessary parameters to begin the execution of code that has been loaded into the user area by CSP.

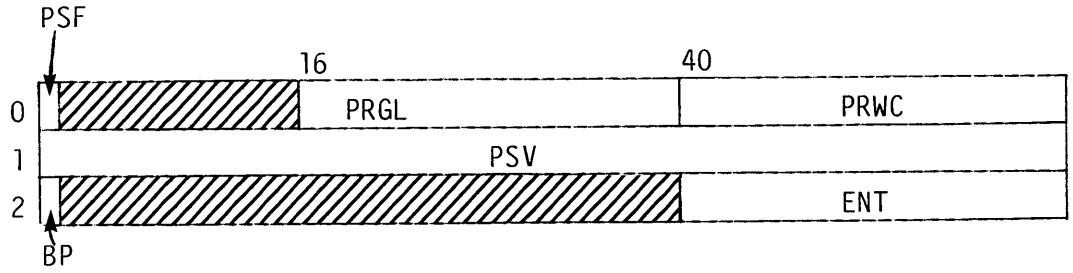


Figure 1.BG-1. Begin Code Execution Table (BGN)

Field	Word	Bits	Description
BGPSF	0	0	Preset value flag
BGPRGL	0	16-39	Total program length including blank common
BGPRWC	0	40-63	Program word count
BGPSV	1	0-63	Preset value, ignored if PSF=0, else value with which to fill program's blank common area
BGBP	2	0	Breakpoint flag
BGENT	2	40-63	Program entry point address

1.BP BUFFER POOL TABLE - BPT

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

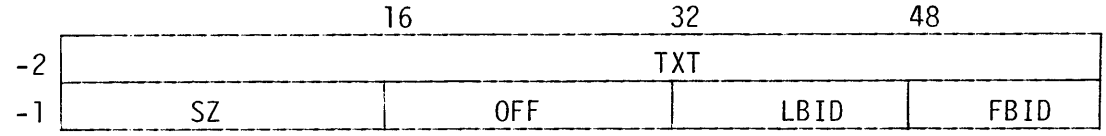


Figure 1.BP-1. Buffer Pool Table (BPT)

Field	Word	Bits	Description
BPTXT	-2	0-63	Beginning of text
BPSZ	-1	0-15	Message size
BPOFF	-1	16-31	Offset to unmoved portion of message
BPLBID	-1	32-47	Buffer ID for continuation of message
BPFBID	-1	48-63	Next message buffer ID

1.CB CHANNEL BUFFER TABLE - CBT

This EXEC-resident table is used for working storage by the disk driver. There is one entry for each disk channel. The three forms of the CBT entries are illustrated in figures 1.CB-1 through 1.CB-3.

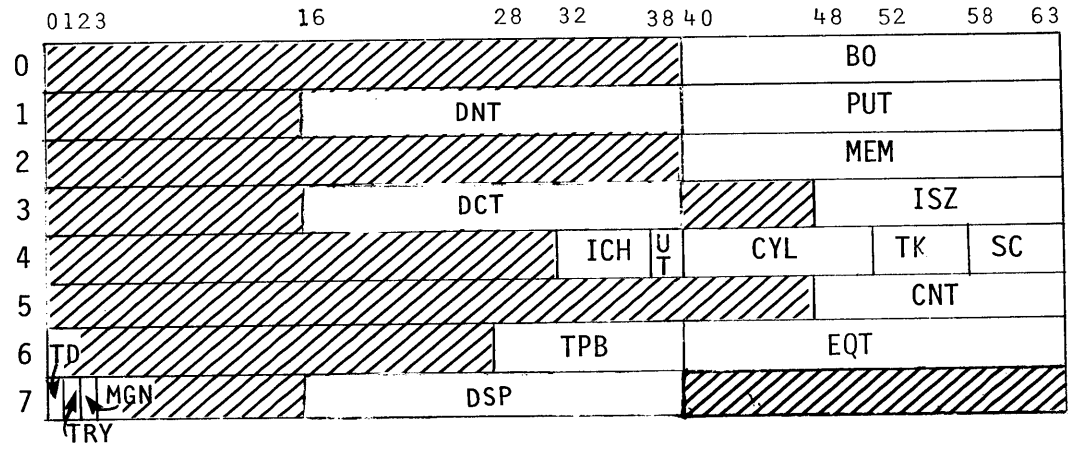


Figure 1.CB-1. Disk I/O form of Channel Buffer Table (CBT)

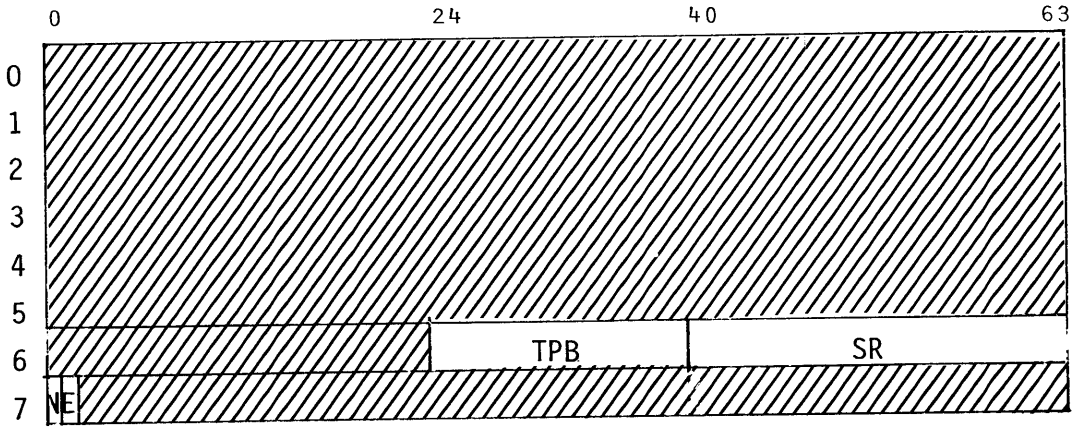


Figure 1.CB-2. Normal and error pseudo channel form of Channel Buffer Table

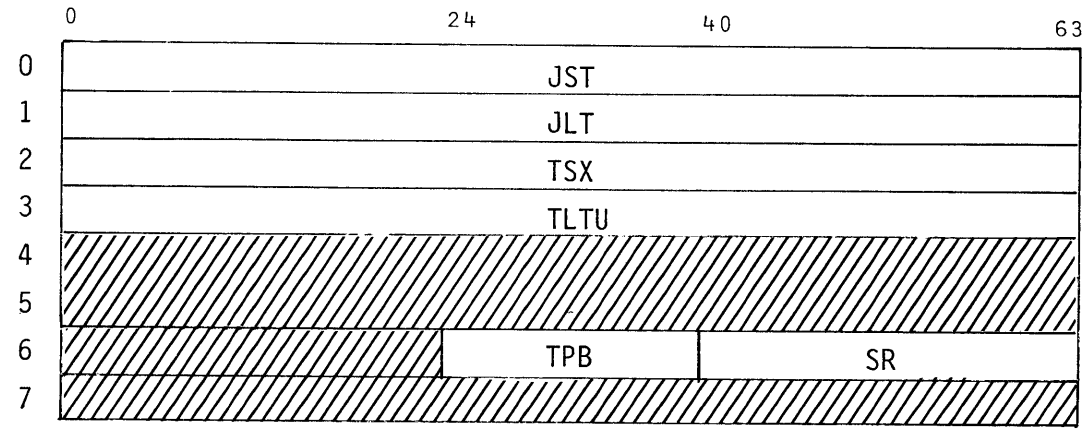


Figure 1.CB-3. Real-time pseudo channel form of Channel Buffer Table (CBT)

Field	Word	Bits	Description
CBBO	0	40-63	Subroutine return address; first form only
CBJST	0	0-63	Job starting time in cycles; third form only
CBDNT	1	16-39	DNT address; first form only
CBPUT	1	40-63	Active physical unit table; first form
CBJLT	1	0-63	Job time limit in cycles; third form only
CBMEM	2	40-63	Current transfer address; first form only
CBTSX	2	0-63	User execution time at start of interval; third form only
CBDCT	3	40-63	DCT address relative to EXEC; first form
CBISZ	3	48-63	Buffer increment size; first form
CBTLTU	3	0-63	Time of last total time update; third form only
CBICH	4	32-37	Input channel number
CBUT	4	38-39	Unit number
CBCYL	4	40-51	Cylinder
CBTK	4	52-57	Track
CBSC	4	58-63	Sector
CBCNT	5	48-63	Sector count
CBTPB	6	24-39	Task parameter block address
CBEQT	6	40-63	Equipment Table address relative to EXEC
CBSR	6	40-63	Status register
CBTD	7	0	Transfer direction; first form only. 1 = write.

Field	Word	Bits	Description
CBN	7	0	Normal pseudo channel; second form only
CBTRY	7	1	Retry flag; first form only
CBE	7	1	Error pseudo channel; second form only
CBMGN	7	2	Clear margin flag; first form only
CBDSP	7	16-39	DSP address

1.CC CHAIN CONTROL - CC

Intertask communication requires chain control words in the format defined in figure 1.CC-1.

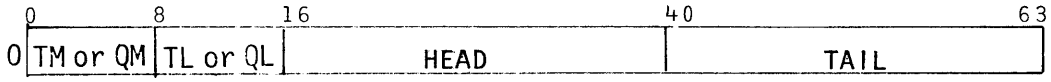


Figure 1.CC-1. Chain Control Word

Field	Word	Bits	Description
CCTM	0	0-7	Maximum number of items to be queued to a particular task
CCQM	0	0-7	Maximum number of items to be queued from one task to another
CCTL	0	8-15	Number of items queued to a particular task
CCQL	0	8-15	Number of items to be queued from one task to another
CCHEAD	0	16-39	Address of first item on the chain
CCTAIL	0	40-63	Address of last item on the chain

1.CH CHANNEL TABLE - CHT

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. Refer to figure 1.CH-1.

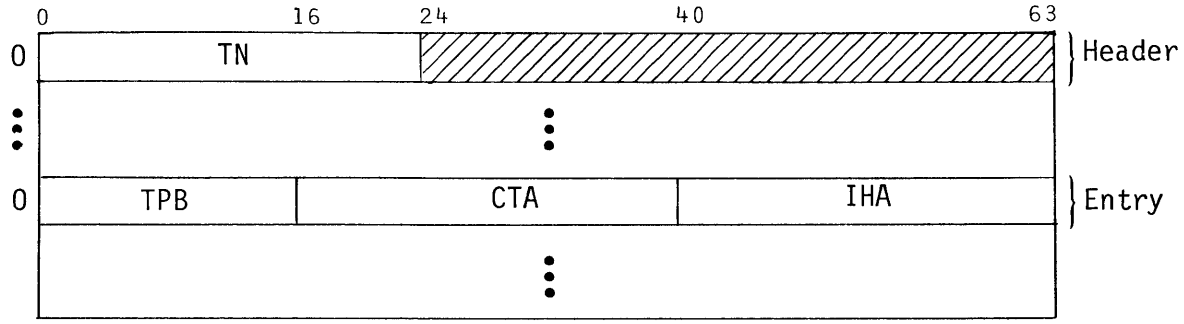


Figure 1.CH-1. Channel Table (CHT)

HEADER

Field	Word	Bits	Description
CHTN	0	0-23	Table name; "CHT" in ASCII

ENTRY

Field	Word	Bits	Description
CHTPB	0	0-15	Address of task parameter word
CHCTA	0	16-39	Control table address
CHIHA	0	40-63	Interrupt handler address

1.CI CHAIN ITEM - CI

Any item queued using the STP common routines CHAIN and UNCHAIN must reserve the first two words of the item to be used by the common routines as shown in figure 1.CI-1.

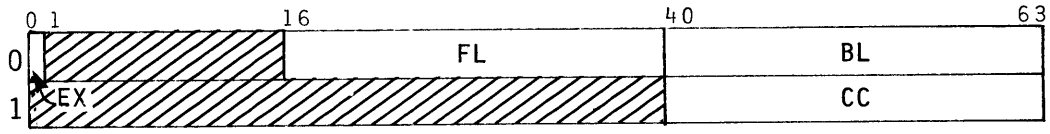


Figure 1.CT-1 Chain Item

Field	Word	Bits	Description
CIEX	0	0	This bit, if set, indicates that the item is in execution.
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

1.CM COMMUNICATION MODULE - CMOD

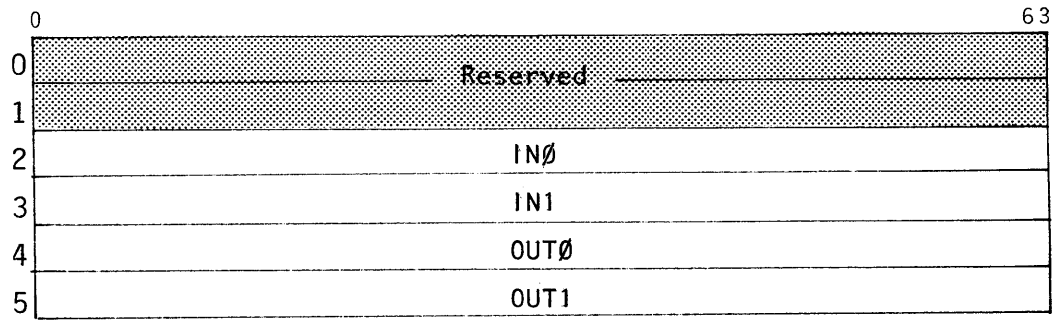


Figure 1.CM-1 Communication Module (CMOD)

Field	Word	Bits	Description
	0,1	0-63	Reserved for chain control
CMINØ	2	0-63	INPUT + 0
CMIN1	3	0-63	INPUT + 1
CMOUTØ	4	0-63	OUTPUT + 0
CMOUT1	5	0-63	OUTPUT + 1

1.CS CLASS STRUCTURE DEFINITION - CSD

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.

Header:

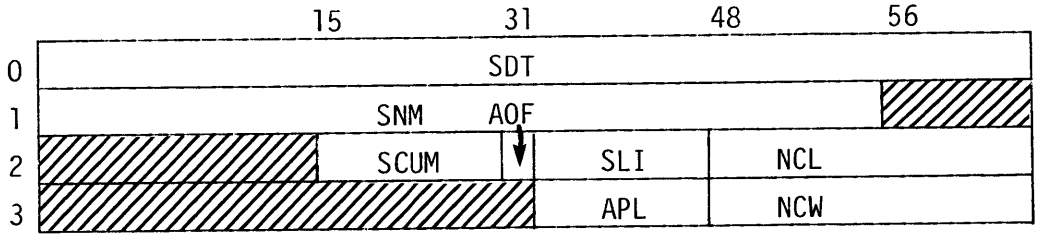


Figure 1.CS-1. Class Structure Definition (CSD) header

Field	Word	Bits	Description
CSSDT	0	0-63	Date/time of last rollout
CSSNM	1	0-55	Class structure name
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
CSNCW	3	48-63	Number of classes waiting for JXTs

Class map:

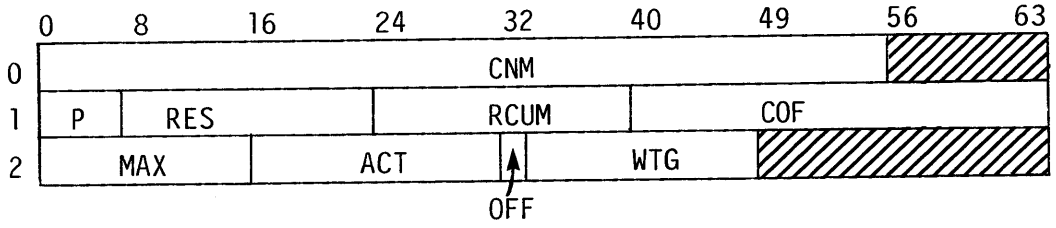


Figure 1.CS-2. CSD map

Field	Word	Bits	Description
CSCNM	0	0-55	Class name
CSP	1	0-7	Class assigned priority shifted left four bits; ignored if CSP=377_8
CSRES	1	8-23	JXTs reserved by class
CSRCUM	1	24-39	JXTs reserved by class of a higher rank
CSCOF	1	40-63	Class offset
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

Class expressions:

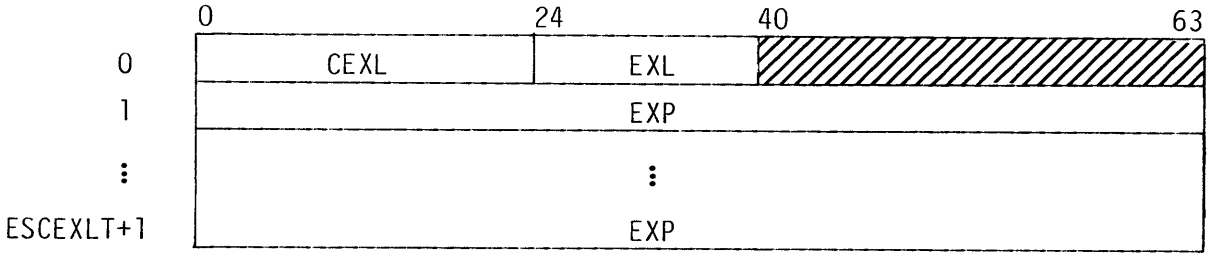


Figure 1.CS-3. CSD expressions

Field	Word	Bits	Descriptions
CSCEXL	0	0-23	Length, in words, of cracked expression
CSEXL	0	24-49	Length, in words, of printable expression
CSEXP	1 to CSCEXL+1	0-63	Cracked class expression

Last word:

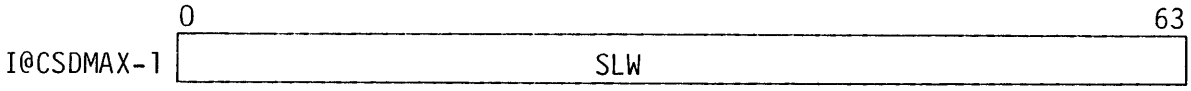


Figure 1.CS-4. CSD last word

Field	Word	Bits	Description
CSSLW	I@CSDMAX-1	0-63	Date/time of last rollout

1.DA DATASET ALLOCATION TABLE - DAT

A DAT exists for each active dataset in the system. A DAT defines where a dataset logically resides on mass storage, i.e., on which logical devices and what portions of each device.

The DAT header contains general dataset information.

The DAT partition header contains general information concerning a particular partition of the DAT. A partition represents a portion of a dataset resident on a single logical device. If the dataset is a permanent dataset, the DAT may be used by multiple users.

Each allocation index in a partition is a bit number in the respective Device Reservation Table (DRT).

The DAT is composed of as many 16-word DAT pages as necessary to represent the mass storage occupied by the dataset. Word 0 of a page contains a 24-bit address of the continuation of the DAT if more pages are necessary. Additional DAT pages continue from the point at which the last DAT left off.

Figure 1.DA-1 illustrates the DAT.

DAT SPACE HEADER

Field	Word	Bits	Description
DATN	0	0-23	DAT table name
DAWCT	0	24-39	DAT space map length in words
DAPA	0	40-63	Number of DAT pages available
DAMAP	1	0-63	Beginning of DAT page map

DAT PAGE HEADER

Field	Word	Bits	Description
DAPN	0	0-7	Page number
DAJORD	0	32-39	JXT ordinal; set to zero if the DAT is in STP, set to the JXT ordinal if the DAT is in the JTA.

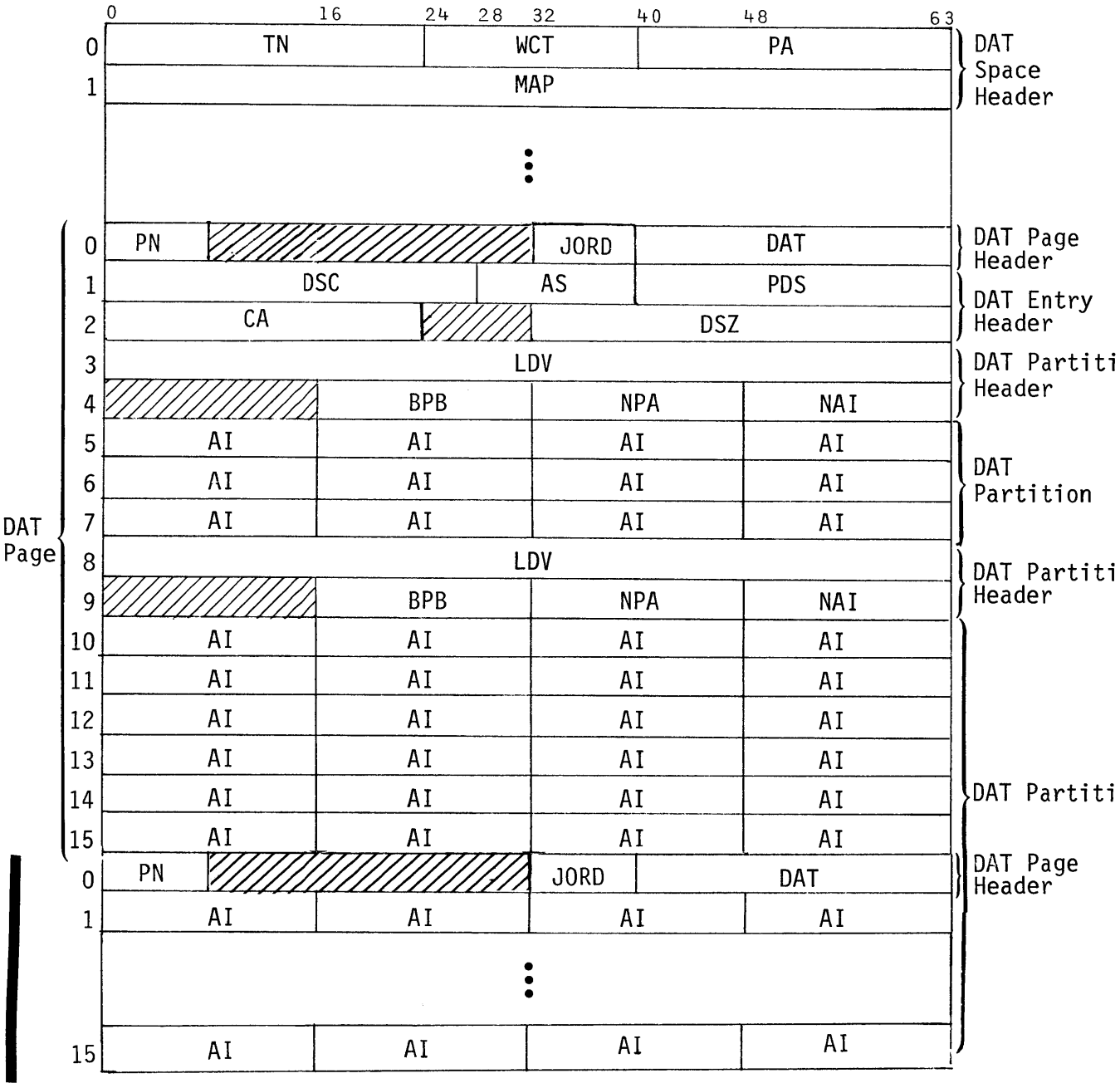


Figure 1.DA-1. Dataset Allocation Table (DAT)

DADAT	0	40-63	Next page address; set to zero if no continuation page exists. If the field is greater than zero, the DAT resides in STP and the field contains the STP relative DAT address. If the field is less than zero, then the DAT resides in the JTA and the DAT address is equal to the JTA address minus the value of the field DADAT.

DAT ENTRY HEADER

Field	Word	Bits	Description
DADSC	1	0-27	DSC pointer (only if permanent dataset)
DAAS	1	28-39	Allocation style (contiguous AU's per AI)
DAPDS	1	40-63	Permanent dataset table entry address (only if permanent dataset)
DACA	2	0-23	Pointer to parcel for next AI
DADSZ	2	32-63	Dataset size in words

DAT PARTITION HEADER

Field	Word	Bits	Description
DALDV	0	0-63	Logical device name
DABPB	1	16-31	Blocks per bit
DANPA	1	32-47	Next partition address (relative word address)
DANAI	1	48-63	Number of AI's in partition
DAAI	n	0-15 16-31 32-47 48-63	Allocation index

1.DC DATASET CATALOG - DSC

The DSC is a disk-resident table. It is divided into 512-word pages with 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 put into the DSC entry. If that has page is full, the entry is placed in the sequential overflow page area.

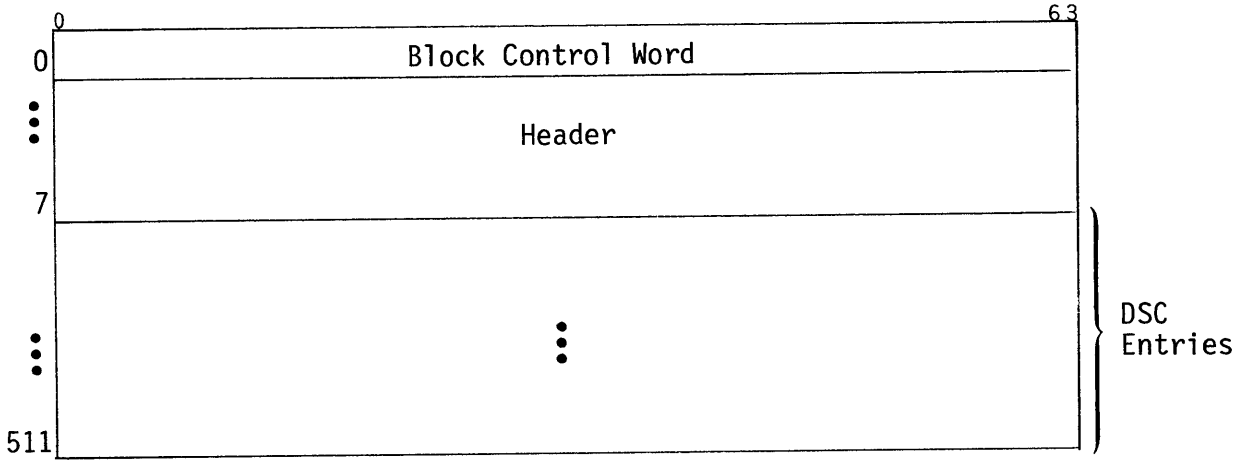


Figure 1.DC-1. Dataset Catalog (DSC) page

DSC PAGE HEADER

Each DSC page has a header as shown in figure 1.DC-2.

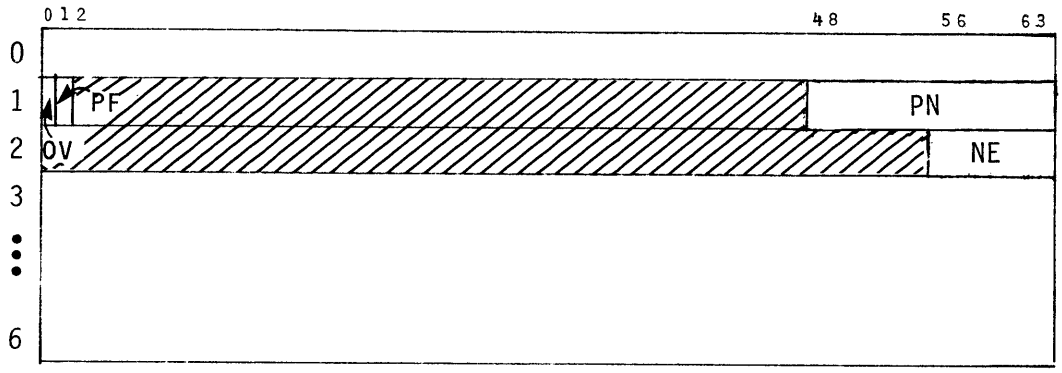


Figure 1.DC-2. DSC Page Header

Field	Word	Bits	Description
DCOV	1	0	Page overflow has occurred
DCPF	1	1	Page is currently full
DCPN	1	48-63	Page number
DCNE	2	56-63	Number of entries in use on this page

DSC ENTRY

A DSC for a permanent dataset may occupy 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.

Field	Word	Bits	Description
DCC	0	0	Continuation flag (set if this is a continuation entry
DCDWN	0	1	Down flag. Set if DAT contains at least one reference to a device whose EQT entry declares the device unavailable (EQNA=1)
DCCRS	0	2	Cross-allocated flag. Set if DAT contains at least one reference to an AI on any device which is either (1) flawed, or (2) mentioned in the DAT for some other permanent dataset, the Dataset Catalog, or the reserved system dump area.
DCERR	0	3	Catastrophic error flag. Set if Startup is unable to recover the dataset due to errors in the DSC entry and the installation or operator selected option was RETAIN.
DCIDA	0	4	Inconsistent disk allocation. Set by Startup if one or more DSC entries with the same Queued Dataset Table (QDT) index do not agree in disk reservation, and if I@DSCERR is RETAIN.
DCIQI	0	5	Invalid Queued Dataset Table (QDT) index. Set during Dataset Catalog recovery if the QDT table is smaller than the QDT index. It is cleared when the QDT table becomes large enough to handle all entries.
DCS	0	61	Saved flag (set if SAVE entry)
DSO	0	62	Output flag (set if output dataset)
DCI	0	63	Input flag (set if input dataset)
DCDN	1	0-55	Dataset name (spooled datasets only)
DCPDN	2 3	0-63 0-55	Permanent dataset name; 1-15 characters
DCPDN1	2	0-63	Permanent dataset name; characters 1-8
DCPDN2	3	0-55	Permanent dataset name; characters 9-15
DCRDP	4	0-63	Read permission control word (saved datasets)
DCWTP	5	0-63	Write permission control word (saved datasets)

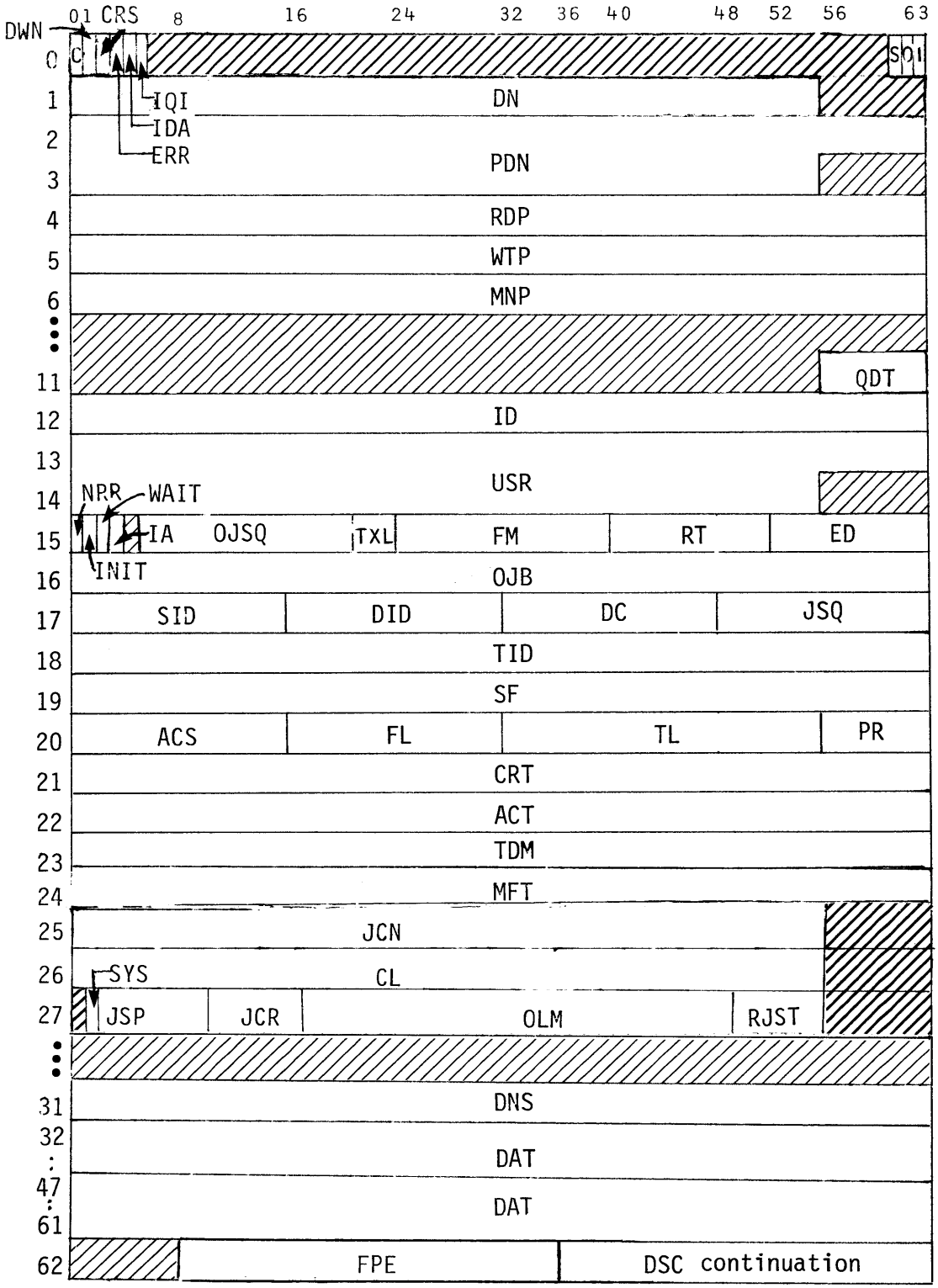


Figure 1.DC-3. Dataset Catalog (DSC) Table entry

Field	Word	Bits	Description
DCMNP	6	0-63	Maintenance permission control word (saved datasets)
DCQDT	11	55-63	Multi-type flag/QDT entry index (saved end spooled)
DCID	12	0-63	User ID (saved dataset)
DCUSR	13 14	0-63 0-55	User number, 1-15 characters
DCUSR1	13	0-63	User number, characters 1-8
DCUSR2	14	0-55	User number, characters 9-15
DCNRR	15	0	Job rerun flag. Set if job cannot be rerun.
DCINIT	15	1	Job initiation flag. Set if job has been initiated.
DCWAIT	15	2	WAIT flag for disposed dataset
DCIA	15	3	Interactive spool flag
DCOJSQ	15	5-20	Originating job sequence number
DCTXL	15	21-23	Text length in blocks (a block is equal to one DSC DAT page)
DCFM	15	24-39	Format designator (output datasets)
DCRT	15	40-51	Retention period (0-4095 days)
DCED	15	52-63	Edition number (1-4095)(saved datasets)
DCOJB	16	0-63	Originiating job name (spooled datasets)
DCSID	17	0-15	Source ID (2 characters)
DCDID	17	16-31	Destination ID (2 characters)
DCDC	17	32-47	Disposition code DCIN=IN Job dataset DCST=ST Staged permanent dataset DCPR=PR Print dataset DCPT=PT Plot dataset DCPU=PU Punch dataset DCMT=MT Magnetic tape dataset
DCJSQ	17	48-63	Job sequence number
DCTID	18	0-63	Terminal ID
DCSF	19	0-63	Special forms
DCACS	20	0-15	Number of accesses (saved datasets)
DCFL	20	16-31	Field length/512 (input datasets)
DCTL	20	32-55	Time limit (input datasets)
DCPR	20	56-63	Priority (input datasets)

Field	Word	Bits	Description
DCCRT	20	0-63	Creation time (cycles)
DCACT	22	0-63	Time of last access (cycles)
DCTDM	23	0-63	Time of last dump (cycles)
DCMFT	24	0-63	Time of last modification (cycles)
DCJCN	25	0-55	Job class name
DCCL	26	0-55	CL parameter from JOB statement
DCSYS	27	1	System job, if set
DCJSP	27	2-9	P parameter from JOB statement
DCJCR	27	10-25	Job class rank
DCOLM	27	26-49	OLM parameter from JOB statement
DCRJST	27	50-55	Job status flag
DCDNS	31	0-63	Reserved for installation
DCDAT	32-46	0-63	A 15-word DAT page or optional text
	47-61	0-63	A 15-word DAT page
DCFPE	62	8-35	First DSC page/entry for the dataset
DCFPP	62	8-31	Page number of first DSC entry
DCFEN	62	32-35	Entry number of first DSC for the dataset
DCDSC	62	36-63	Next DSC entry for continuation:
DCDCP	62	36-59	Page number of DSC continuation
DCDCE	62	60-63	Entry number of DSC continuation

1.DD DATASET DEFINITION LIST - DDL

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

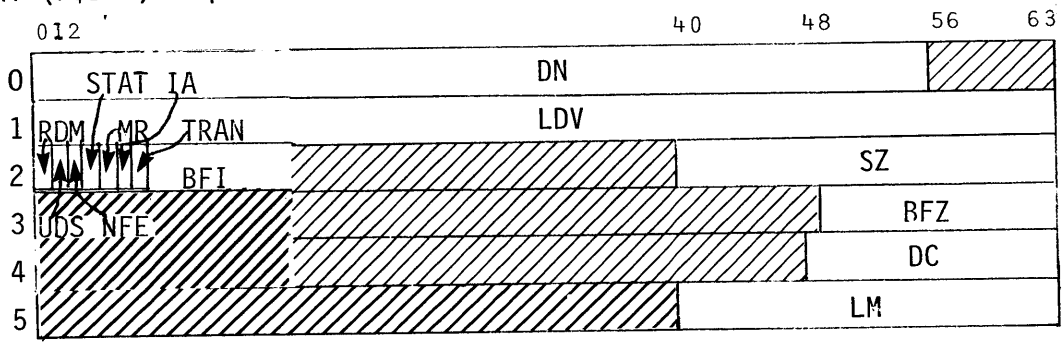


Figure 1.DD-1. Dataset Definition List (DDL)

Field	Word	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. (SØ) returned nonzero if DNT does not exist; no DNT is created.
DDSTAT	2	3	Request dataset statistics
DDMR	2	4	Dataset is to be memory resident
DDIA	2	5	Interactive type dataset
DDTRAN	2	6	Transparent mode for interactive dataset
DDBFI	2	7-15	Blank field indicator for character I/O 0'ØØØ BFI=I@BFI <0'4ØØ BFI=user specified ASCII character =0'4ØØ BFI=ØØØ >0'4ØØ Blank compression disabled
DDSZ	2	40-63	Dataset size in 512-word blocks
DDBFZ	3	49-63	Buffer size in 512-word blocks

Field	Word	Bits	Description
DDBSZ	3	49-63	Alternate name for DDBFZ to match $SYSTXT r
DDDC	4	48-63	Disposition code
			DCIN=IN Job dataset
			DCST=ST Staged permanent dataset
			DCSC=SC Scratch dataset
			DCPR=PR Print dataset
			DCPT=PT Plot dataset
			DCPU=PU Punch dataset
			DCMT=MT Magnetic tape dataset
DDLM	5	40-63	Dataset size limit in 512-word blocks

1.DE DEVICE ERROR TABLE - DET

This STP-resident table is used for building messages for the system log.

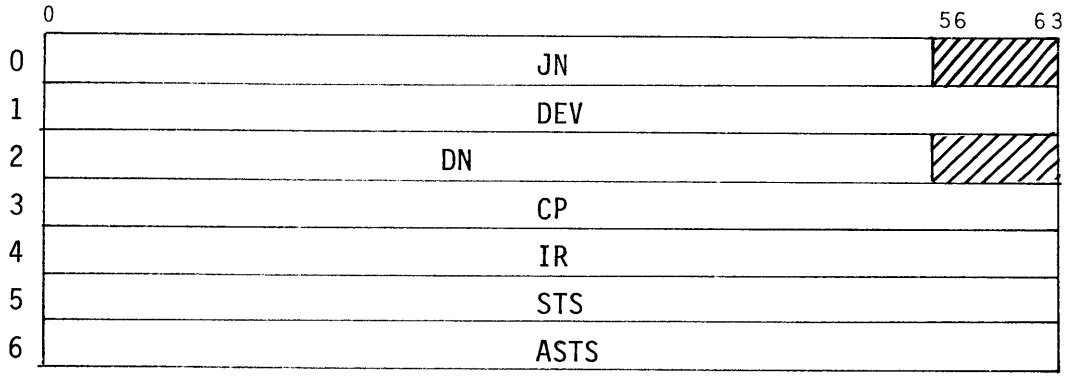


Figure 1.DE-1. Disk Error Table (DET)

Field	Word	Bits	Description
DEJN	0	0-55	Jobname
DEDEV	1	0-63	Logical device name
DEDN	2	0-55	Dataset name
DECP	3	0-63	Device current physical position
DEIR	4	0-63	Device initial logical request
DESTS	5	0-63	Equipment status
DEASTS	6	0-63	Auxiliary status

1.DN DATASET NAME TABLE - DNT

The DNT in the Job Table Area (JTA) contains an entry for each dataset of a given job. W@JTDNT is the beginning DNT entry address. Figure 1.DN-1 illustrates a DNT entry.

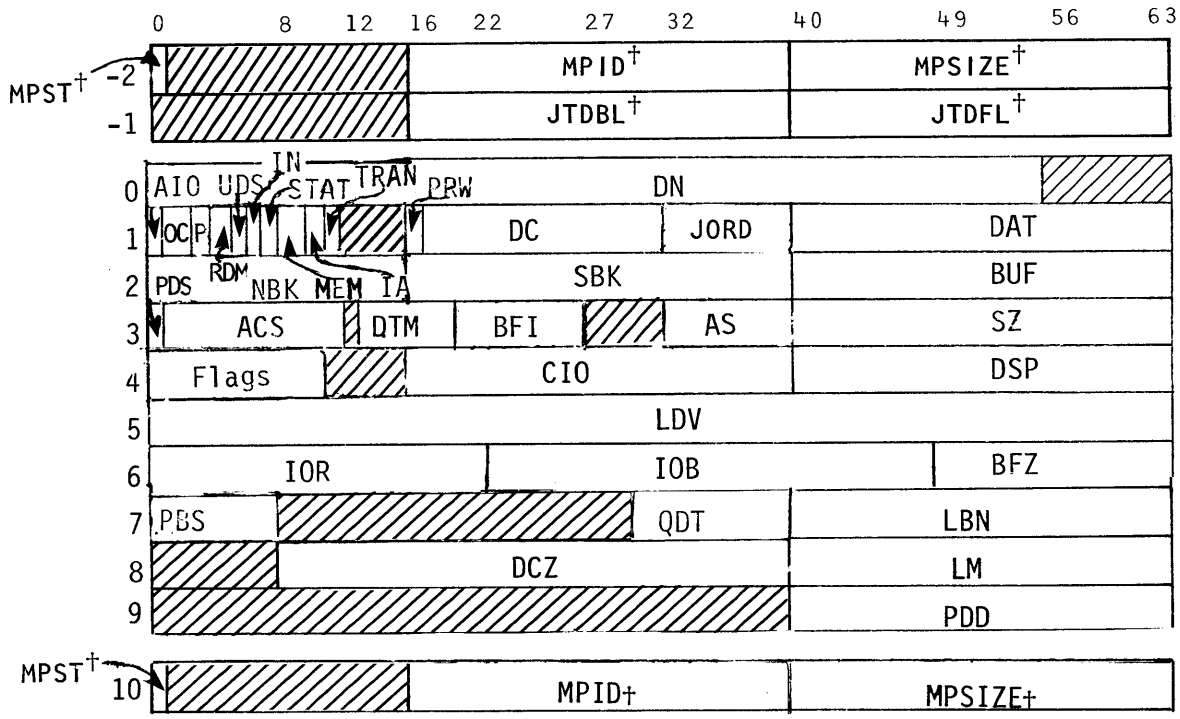


Figure 1.DN-1. Dataset Name Table (DNT) entry

Field	Word	Bits	Description
MPST†	-2	0	Status of memory area 0 Available 1 In use
MPID†	-2	16-39	Memory pool identification 07070707 JTA dynamic memory
MPSIZE†	-2	40-63	Size of the memory area
JTDBL†	-1	16-39	DNT backward link
JTDFL†	-1	40-63	DNT forward link

† Fields that exist only when the DNT is in the dynamic area of the JTA. They are used for dynamic memory allocation and DNT linkage.

Field	Word	Bits	Description
DNDN	0	0-55	Dataset name
DNAIO	1	0	Active I/O, set if outstanding
DNOC	1	1-2	Open/clost status 00 Closed 10 Open for input 01 Open for output 11 Open for I/O
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
DNUDS	1	5	Dataset structure 0 COS blocked dataset 1 Unblocked structure
DNIN	1	6	Subdataset: used for $IN
DNSTAT	1	7	User requests statistics
DNMEM	1	8	Dataset is memory resident
DNIA	1	9	Interactive type dataset
DNTRAN	1	10	Transparent mode for interactive dataset
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 Dataset to be staged and made permanent 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: zero if the DNT resides in STP.

Field	Word	Bits	Description
DNDAT	1	40-63	Dataset allocation table address 0 No DAT assigned 0 DAT in STP 0 DAT in job's 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
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
DNMNP	3	9	Maintenance permission flag
DNWTP	3	10	Write permission flag
DNRDP	3	11	Read permission flag
DNDTM	3	13-18	Index to Task I/O save area
DNBFI	3	19-27	Blank field indicator for character I/O 0'ØØØ BFI=I@BFI 0'4ØØ BFI=user specified ASCII 0'4ØØ BFI=ØØØ 0'4ØØ Blank compression disabled
DNAS	3	32-39	Allocation style (tracks per AI)
DNSZ	3	40-63	Dataset size (in 512-word blocks)
DNRCL	4	0	Recall flag from DSP
DNRLS	4	1	Release flag
DNTIO	4	2	Task I/O recall flag; (DNCIO=recall) address
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).
DNEND	4	5	Write short or zero-length block flag
DNBIO	4	6	Buffered I/O request flag

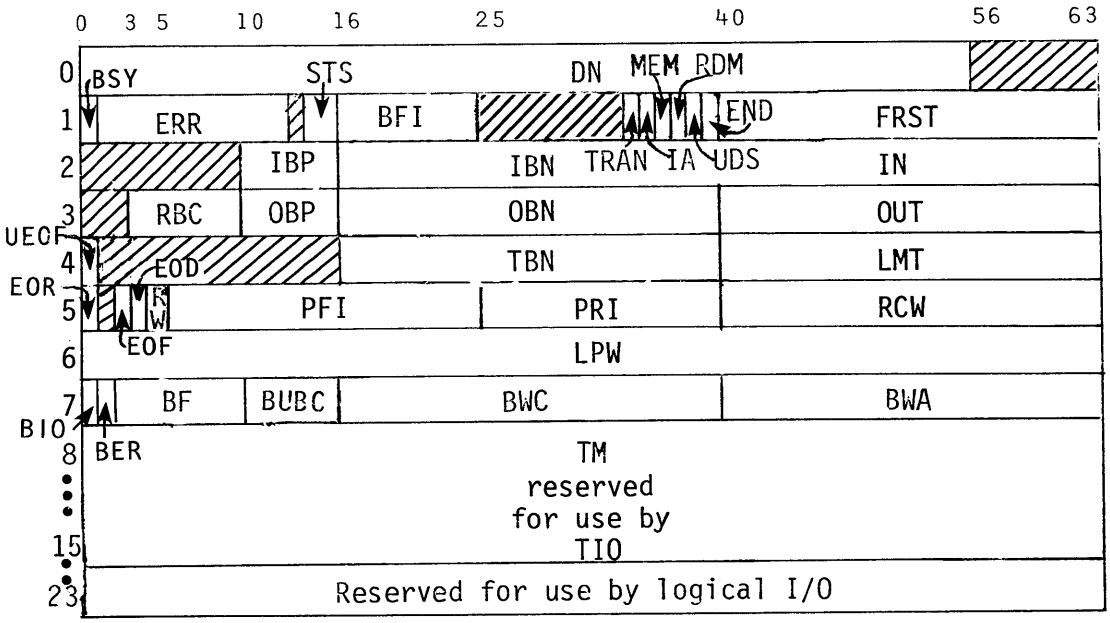
Field	Word	Bits	Description
DNJIO	4	7	Job in recall for this request
DNDPS	4	8	Dispose flag
DNMRCL	4	9	Memory recall flag; 1 if waiting for JTA memory expansion.
DNDFR	4	10	Deferred disposition flag
DNCIO	4	16-39	Return address for task I/O
DNDSP	4	40-63	DSP address
DNLDV	5	0-63	Logical device name
DNIOR	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
DNQDT	7	31-39	Multitype flag/QDT entry index
DNLBN	7	40-63	Number of last block written
DNDCZ	8	8-39	Dataset catalog size in words
DNLM	8	40-63	Dataset size limit in 512-word blocks
DNPDD	9	40-63	JTA relative address of the PDD for a deferred disposition
MPST§	10	0	Status of memory pool area 0 Available 1 In use
MPID§	10	16-39	Memory pool identification 07070707 JTA dynamic memory
MPSIZE§	10	40-63	Size of memory pool area

§ Fields that exist only when the DNT is in the dynamic area of the JTA. They are used for dynamic memory allocation and DNT linkage.

1.DP DATASET PARAMETER AREA - DSP

Logical I/O requires the presence of a DSP for the dataset in the user's field. Refer to publication 2240011 for details of DSP use.

Figure 1.DP-1 illustrates a DSP.



1.DP-1. Dataset Parameter Area (DSP)

Field	Word	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

Field	Word	Bits	Description
DPEPT	1	9	Dataset prematurely terminated
	1	10-12	Reserved
DPSTS	1	14,15	Status 00 Closed 10 Open for input (I) 01 Open for output (O) 11 Open for I/O
DPBFI	1	16-24	Blank compression character in ASCII (BFI=777_8 implies no compression)
DPTRAN	1	34	Transparent mode for interactive dataset
DPIA	1	35	Dataset is interactive
DPMEM	1	36	Dataset is memory resident
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	Bit position in current input word (logical I/O)
DPIBN	2	16-39	Block number, read request System reads from block number until buffer is filled. The next block number is then in word 2.
DPIN	2	40-63	Address of current input word
DPRBC	3	3-9	Remaining blank count
DPOBP	3	10-15	Bit position in current output word
DPOBN	3	16-39	Block number, write request System writes from block number until buffer is empty. The next block number is then in word 3.
DPOUT	3	40-63	Address of current output word
DPUEOF	4	0	Uncleared end-of-file (EOF)
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

Field	Word	Bits	Description
DPEOD	5	3	EOD flag
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 in write mode Next RCW in read mode
DPLPW	6	0-63	Last partial word; used for character mode I/O
DPBIO	7	0	Buffered in/out busy 0 Buffered in/out operation complete 1 Buffered in/out operation incomplete
DPBER	7	1	Buffered I/O error flag
DPBF	7	2-9	Function code: 000 Read partial 010 Read record 040 Write partial 050 Write record 052 Write end-of-file 056 Write end-of-data
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.
DPBWC	7	16-39	Word count. Number of words at DPBWA to read or write. Actual number of words read when request is completed.
DPBWA	7	40-63	Word address of user data area

Field	Word	Bits	Description
DPTM	8-15	0-63	Used by TIO as follows:
	8	0-63	(T.ZA)
	9	0-63	(T.ZB)
	10	16-39	(B.ZA)
	10	40-63	(B.ZB)
	11	16-39	(B.ZC)
	11	40-63	(B.ZD)
	12	0-7	JTA length/O'1ØØØ 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
	13	0-63	RBLK/WBLK S5 during task 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
	16-23	0-63	Reserved for future use by logical I/O

1.DR DEVICE RESERVATION TABLE - DRT

STP resident contains a Device Reservation Table (DRT) for each logical mass storage device known to the system. The table (figure 1.DR-2) consists of a header and a bit map. Each bit in the bit map represents one track on a disk. A set bit implies that the track is in use.

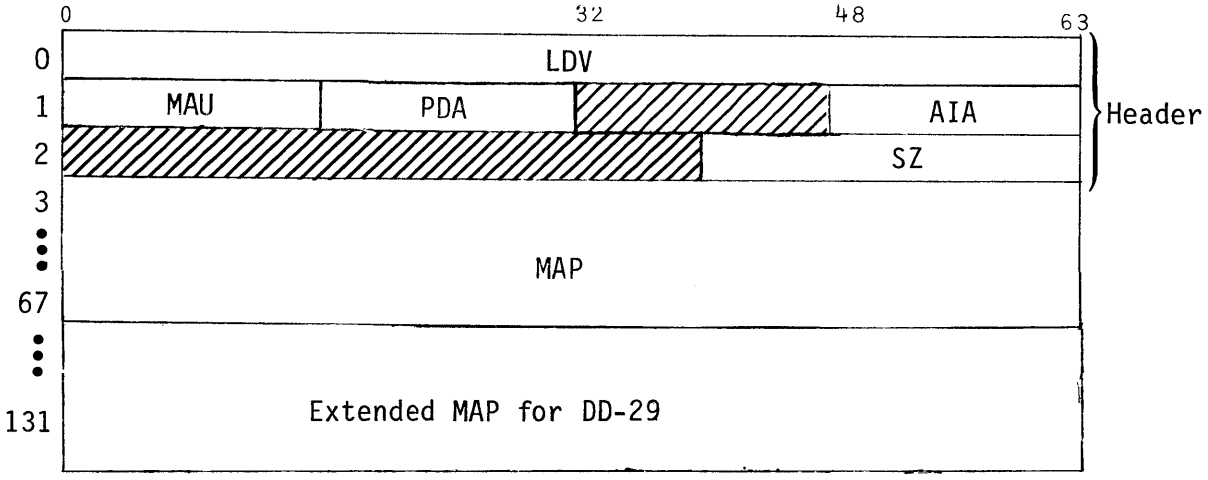


Figure 1.DR-1. Device Reservation Table (DRT)

HEADER

Field	Word	Bits	Description
DRLDV	0	0-63	Logical device name
DRMAU	1	0-15	Maximum allocation units less flaws
DRPDA	1	16-31	Number of AIs used for permanent dataset
DRAIA	1	48-63	Total available AIs (number of unused bits)
DRSZ	2	40-63	DRT map size in words
DRMAP	3-67	0-63	Bit map, one bit per track
DRMAP	3-131	0-63	Extended bit map, one bit per track, to accomodate extra cylinders of DD-29

1.DT DEVICE CHANNEL TABLE - DCT

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).

Figure 1.DT-1 illustrates the Device Channel Table.

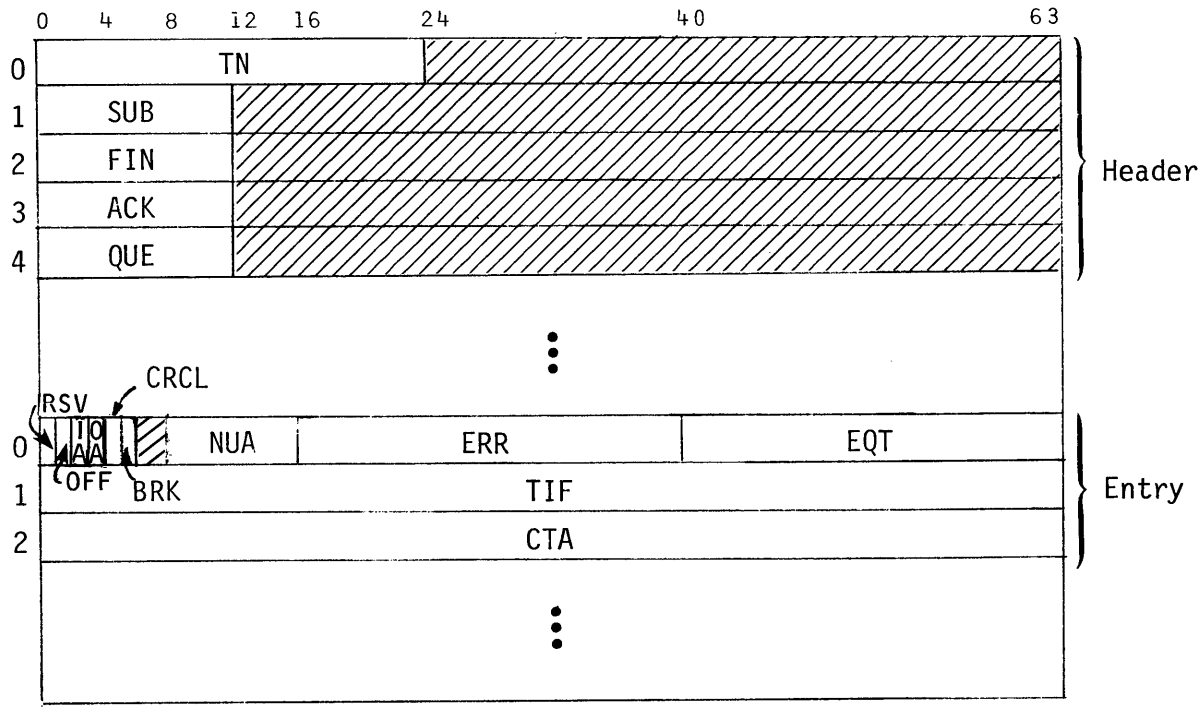


Figure 1.DT-1. Device Channel Table - DCT

HEADER

Field	Word	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

ENTRY

There is one entry per channel.

Field	Word	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
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

1.DV DEVICE LABEL - DVL

A device label for a device resides on the device and is initialized by deadstart initialization. The device label contains a flaw table for the device. The device label for the master device also contains a pointer to Dataset Catalog.

Figure 1.DV illustrates a DVL table.

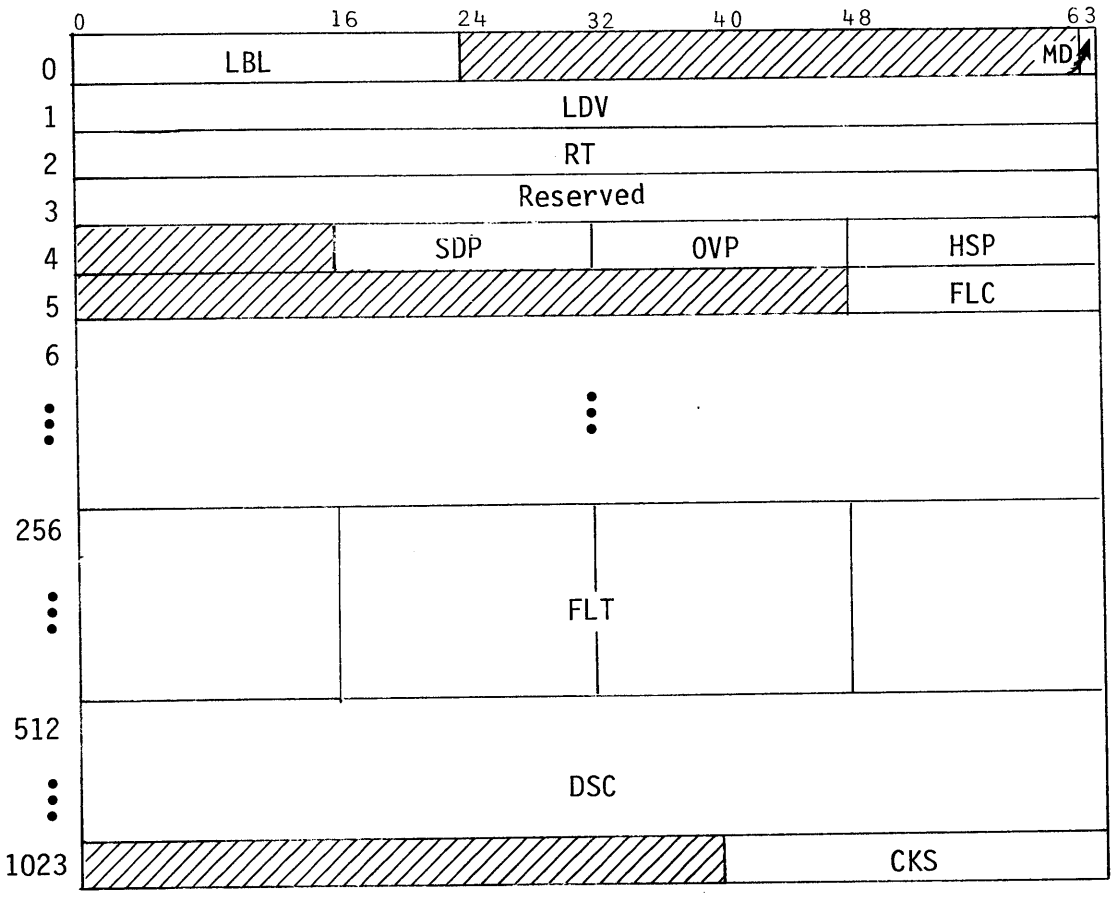


Figure 1.DV-1. Device Label (DVL)

Field	Word	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	Word	Bits	Description
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)
DVFLC	5	48-63	Number of used AIs
DVFLT	256-510	0-63	List of reserved AIs such as flaws, FE tracks, etc.
DVDSC	512-1022	0-63	Dataset Catalog DAT page images if DVMD≠0 (master device)
DVCKS	1023	40-63	Checksum

1.EC ERROR CODE TABLE (ECT)

This STP resident table controls abort and reprieve processing done by UEP. It contains a 1-word entry for each system error code and is defined using the ERDEF macro.

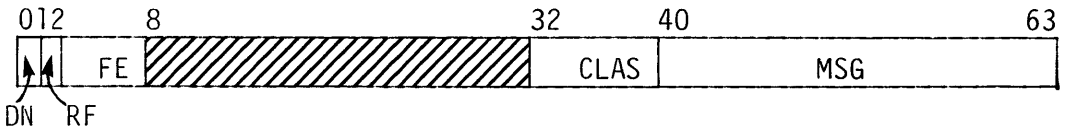


Figure 1.EC-1. Error Code Table (ECT)

Field	Word	Bits	Description
ECDN	0	0	If set, the error message contains the dataset name.
ECRF	0	1	Reprievable error flag 0 Reprievable 1 Non-reprievable
ECFE	0	2-7	Bit number in JTFEFW giving fatal error flag; 0 if not fatal.
ECCLAS	0	32-39	Error class. In order to interpret the value in the table entry, shift a rightmost 1 bit to the left as many times as specified in the table entry; if the table entry is 2, it would be 100_2 or 4_{10}.
ECMSG	0	40-63	Address of message

1.EQ EQUIPMENT TABLE - EQT

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. The EQT is illustrated in figure 1.EQ-1.

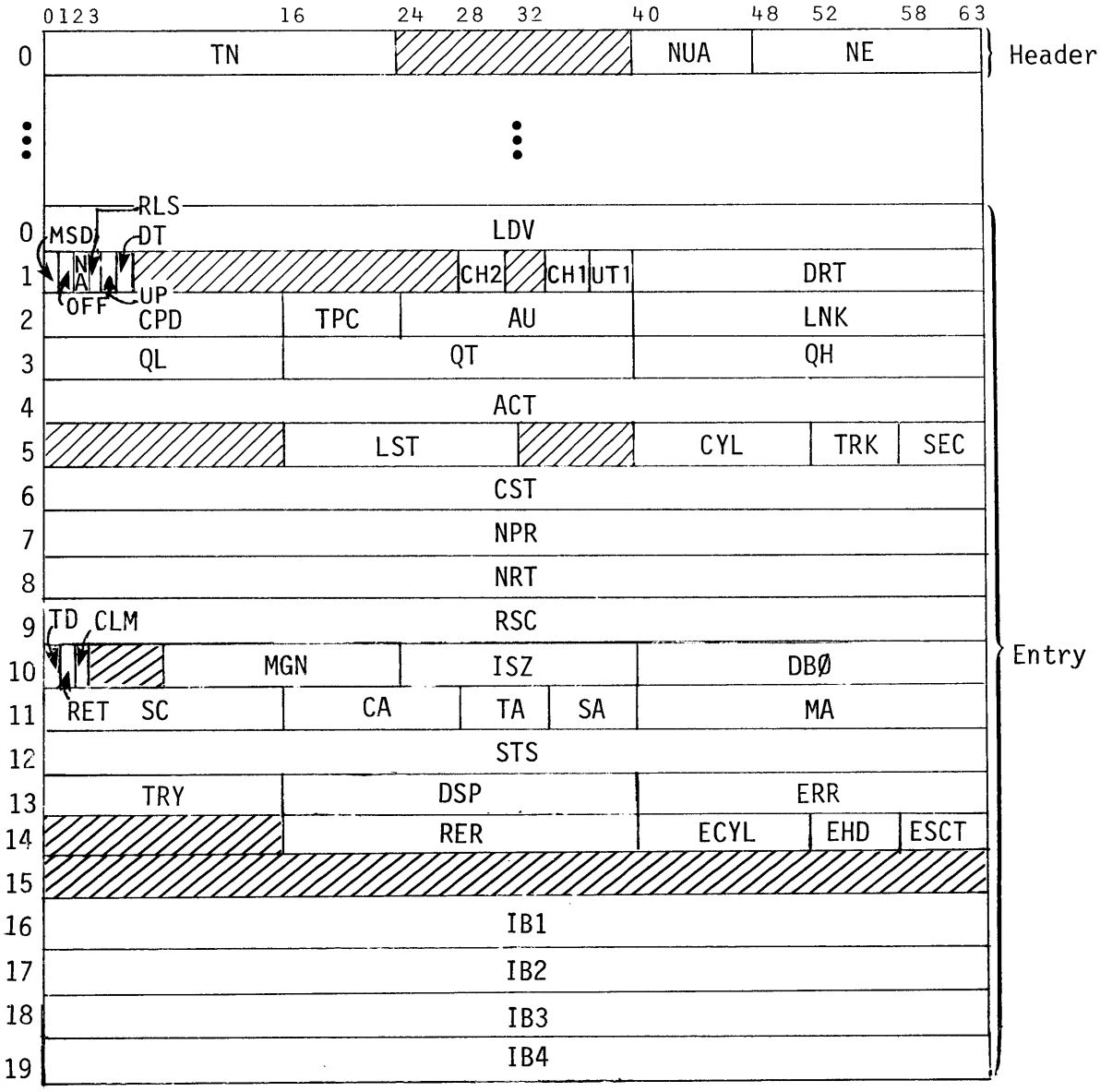


Figure 1.EQ-1. Equipment Table (EQT)

HEADER

Field	Word	Bits	Description
EQTN	0	0-23	Table name; "EQT" in ASCII
EQNUA	0	40-47	Next unit to be allocated
EQNE	0	48-63	Number of entries in table

ENTRY

Field	Word	Bits	Description
EQLDV	0	0-63	Logical device name
EQMSD	1	0	Master device flag
EQOFF	1	1	Unit off
EQNA	1	2	Unit not available
EQRLS	1	3	Flag set if datasets involving this LDV are to be released.
EQUP	1	4	*UP flag; set if *UP parameter is present in parameter file. This allows Startup to write a new device label if there is none so that new devices can be added without requiring an INSTALL type Startup.
EQDT	1	5	Disk type 0 DD-19 1 DD-29
EQCH2	1	28-31	Secondary channel number
EQCH1	1	34-37	Primary channel number
EQUT1	1	38-39	Primary unit number
EQDRT	1	40-63	DRT address
EQCPD	2	0-15	Cylinders per disk
EQTPC	2	16-23	Tracks per cylinder
EQAU	2	24-39	Blocks per allocation unit (sectors per track)
EQLNK	2	40-63	Link to next equipment on channel
EQQL	3	0-15	Queue length
EQQT	3	16-39	Queue tail pointer
EQQH	3	40-63	Queue head pointer
EQACT	4	0-63	Anticipated on cylinder time
EQLST	5	16-31	Logical status
EQCYL	5	40-51	Last cylinder position
EQTRK	5	52-57	Last track position
EQSEC	5	58-63	Last sector position

Field	Word	Bits	Description
EQCST	6	0-63	Cumulative seek time
EQNPR	7	0-63	Number of physical requests
EQNRT	8	0-63	Number of requests
EQRSC	9	0-63	Number of requests not requiring a seek
EQTD	10	0	Transfer direction 0 Read 1 Write
EQRET	10	1	Retry flag
EQCLM	10	2	Clear margin flag
EQMGN	10	8-23	Last margin flag
EQISZ	10	24-39	Buffer increment size
EQDBØ	10	40-63	Driver's saved BØ
EQSC	11	0-15	Remaining sector count
EQCA	11	16-27	Current cylinder address
EQTA	11	28-33	Current track address
EQSA	11	34-39	Current sector address
EQMA	11	40-63	Current memory address
EQSTS	12	0-63	Edited status
EQTRY	13	0-15	Retry count
EQDSP	13	16-39	DSP address or zero; used to pass DSP address to EXEC.
EQERR	13	40-63	Total disk errors
EQRER	14	16-39	Recoverable error count
EQECYL	14	40-51	Last cylinder error address
EQEHD	14	52-57	Last head error address
EQESCT	14	58-63	Last sector error address
EQIB1	16	0-63	Input buffer 1 } Contain error correction vector
EQIB2	17	0-63	Input buffer 2
EQIB3	18	0-63	Input buffer 3
EQIB4	19	0-63	Input buffer 4

1.IB INTERACTIVE BUFFER TABLE - IBT

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

Header:

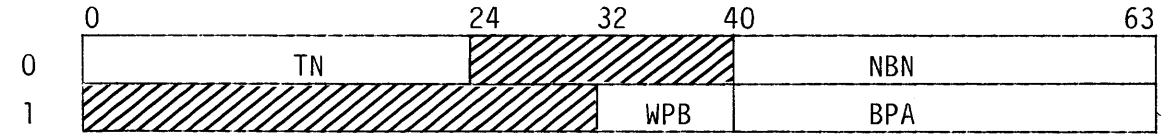


Figure 1.IB-1. Interactive Buffer Table (IBT) header

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

Entry:

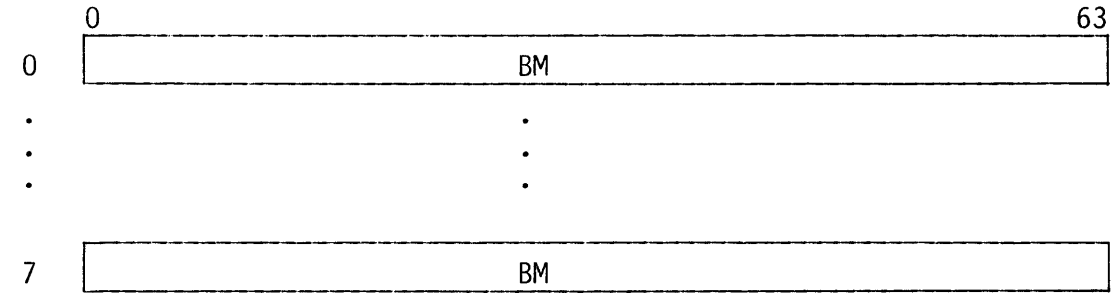


Figure 1.IB-2. IBT entry

Field	Word	Bits	Description
IBBM	0-7	0-63	Bit map

1.JC JOB COMMUNICATION BLOCK - JCB

The first 128 words of each user field consists of a Job Communication Block and is accessible to the user.

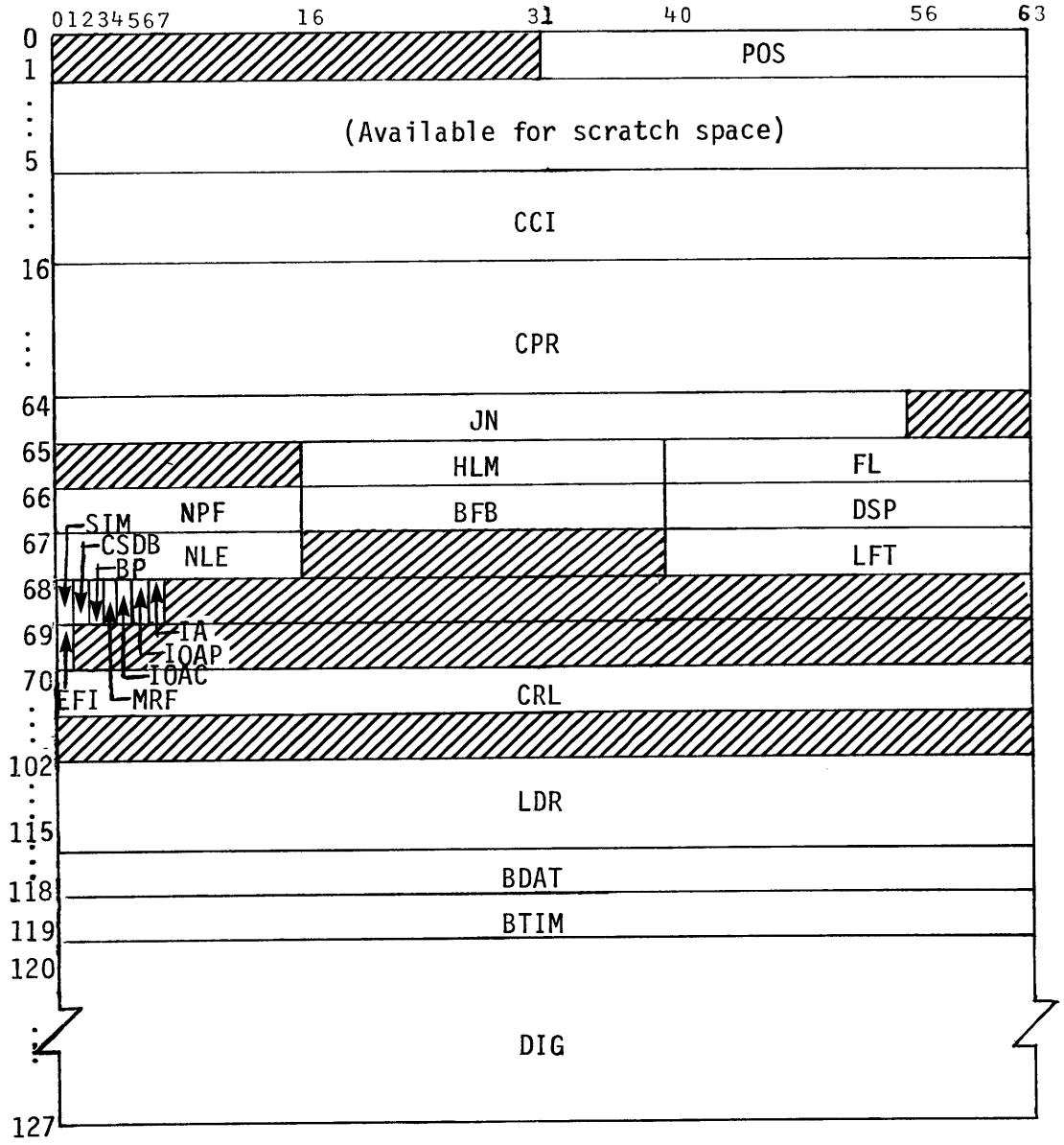


Figure 1.JC-1. Job Communication Block (JCB)

Field	Word	Bits	Description
JCPOS	0	31-63	Current $CS position
JCCCI	5-15	0-63	Control statement image packed 8 characters per word
JCCPR	16-63	0-63	Control statement parameters, expanded to 2 words per parameter
JCJN	64	0-55	Jobname; bits 56-63 must be zero
JCHLM	65	16-39	High limit of user code
JCFL	65	40-63	Current field length
JCNPF	66	0-15	Number of physical buffers and datasets
JCBFB	66	16-39	Base address of I/O buffers
JCDSP	66	40-63	Base address of DSP area
JCNLE	67	0-15	Number of entries in LFT
JCLFT	67	40-63	Base of LFT
JCSIM	68	0	Simulator flag
JCCSDB	68	1	CSP debug flag
JCBP	68	2	JOB statement breakpoint (BP) flag
JCMRF	68	3	Memory request flag. If set, dynamic field management by CAL, LDR, etc. is not allowed.
JCIOAC†	68	4	I/O area current status flag 0 user's I/O area is unlocked 1 user's I/O area is locked
JCIOAP†	68	5	I/O area previous status flag 0 user's I/O area is unlocked 1 user's I/O area is locked
JCIA	68	6	Interactive flag
JCEFI	69	0	Enable floating interrupt flag; used by $FTLIB math routines to reset floating point interrupt flag.
JCCRL	70	0-63	COS revision level
JCCRLS	70	32-63	COS revision number
JCLDR	102-115	0-63	Unsatisfied externals
JCBDAT	118	0-63	Date of absolute load module generation
JCBTIM	119	0-63	Time of absolute load module generation
JCDIG	120-127	0-63	Reserved for diagnostics

†Deferred Implementation

1.JT JOB TABLE AREA - JTA

The JTA (figure 1.JT-1) for a job resides below the field for the job and is not accessible to the user.

Field	Word (octal)	Bits	Description
JTJN	0	0-55	Jobname; bits 55-63 must be zero
JTTSX	1	0-63	Time spent executing in CPU (cycles)
JTTSW	2	0-63	Time spent waiting to execute (cycles)
JTTSD	3	0-63	Time spent waiting for I/O completion
JTIOB	4	0-63	Disk blocks transferred
JTIOR	5	0-63	User I/O requests
JTUSR	6-7	0-63	User number, 1-15 characters
JTBKP	10-17	0-63	Breakpoint registers
JTBKPP	10	0-15	Breakpoint instruction parcel
JTBKP2	10	16-39	Breakpoint parcel address 2
JTBKP1	10	40-63	Breakpoint parcel address 1
JTXP	20-37	0-63	Exchange package
JTTVL	23	24-30	Vector length
JTVM	40	0-63	Vector mask
JTSTR	41	0	Job streaming bit
JTCSTK	42-51	0-63	Control statement file stack
JTTBLL	60	16-39	Length of CSP-managed table area
JTTBL	60	40-63	Address of CSP-managed table area
JTNLE	62	0-15	Number of LFT entries in JTA
JTFLF	62	40-63	Pointer to first of JTA LFT chain
JTTSXL	63	0-63	Time spent executing at last disconnect
JTBIOC	64	0-63	Buffered I/O request count
JTDTS	65	0-63	Date/time of last rollout: must be in first sector of roll dataset
JTSDT	66	16-39	SDT address used by RLD in EXP
JTXPR	66	40-63	Return address used by Exchange Processor
JTEPX	67	0,1	Exchange Processor request word: 1 Error exit (bit 1 set) 2 Normal exit (bit 0 set)
JTEPC	67	2	Flag set if JTEPA has a continuation address
JTEPJ	67	3	Flag set if request made by Job Scheduler
JTEPM	67	4	Flag set if JTA expansion is requested for additional DAT space
JTEPF	67	7-15	Flags from user exchange package

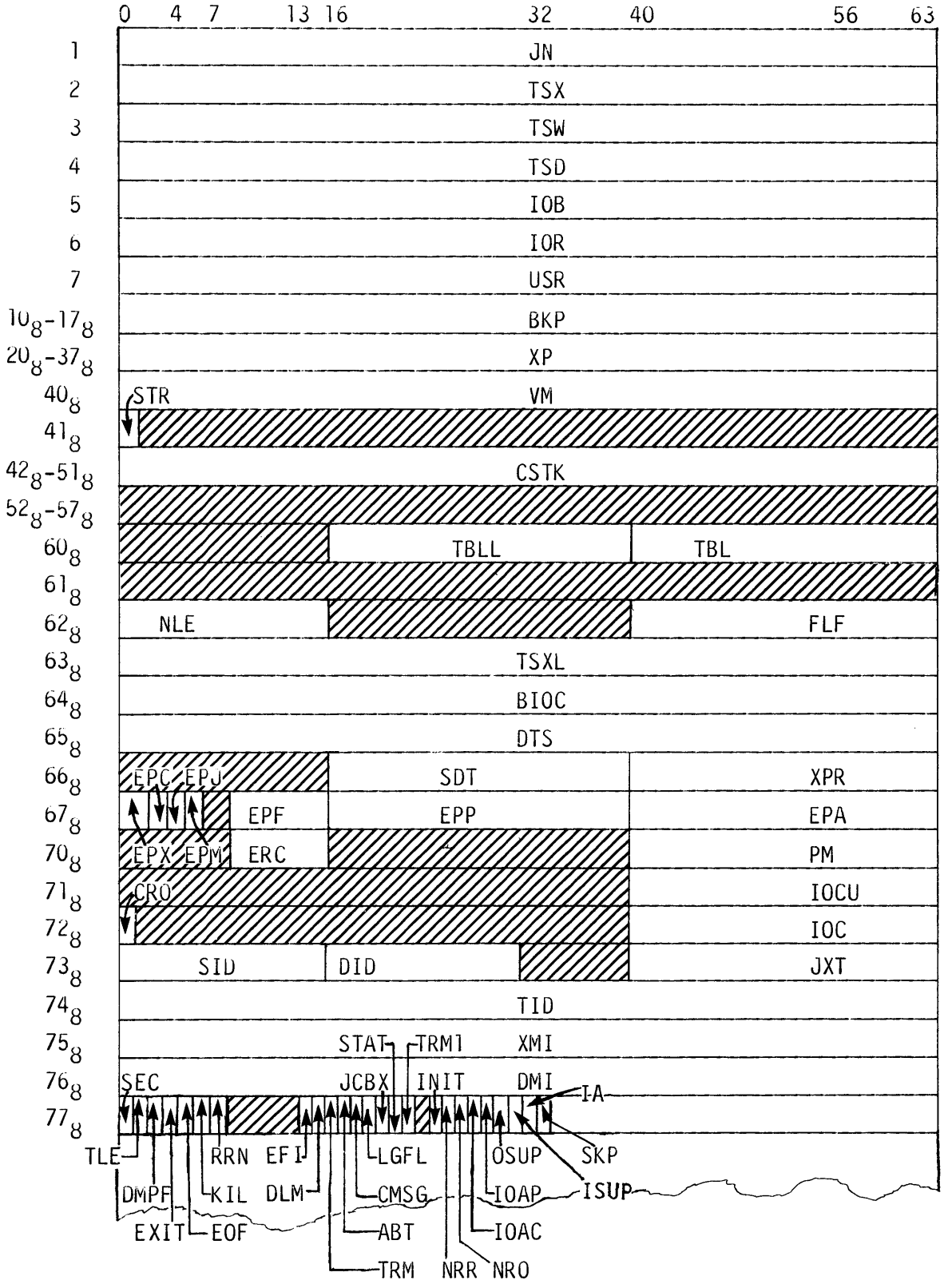


Figure 1.JT-1. Job Table Area (JTA)

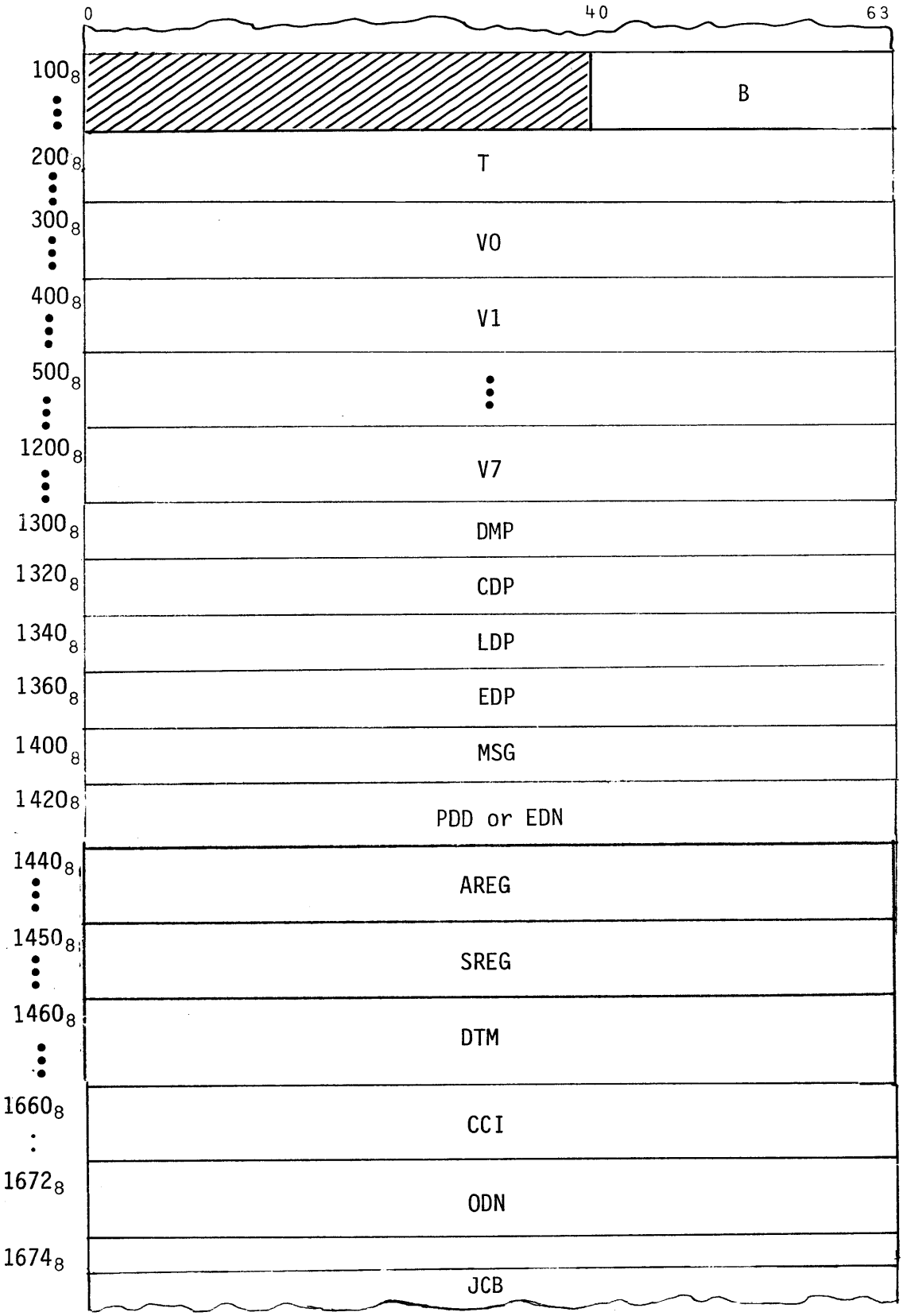


Figure 1.JT-1. Job Table Area (JTA) (continued)

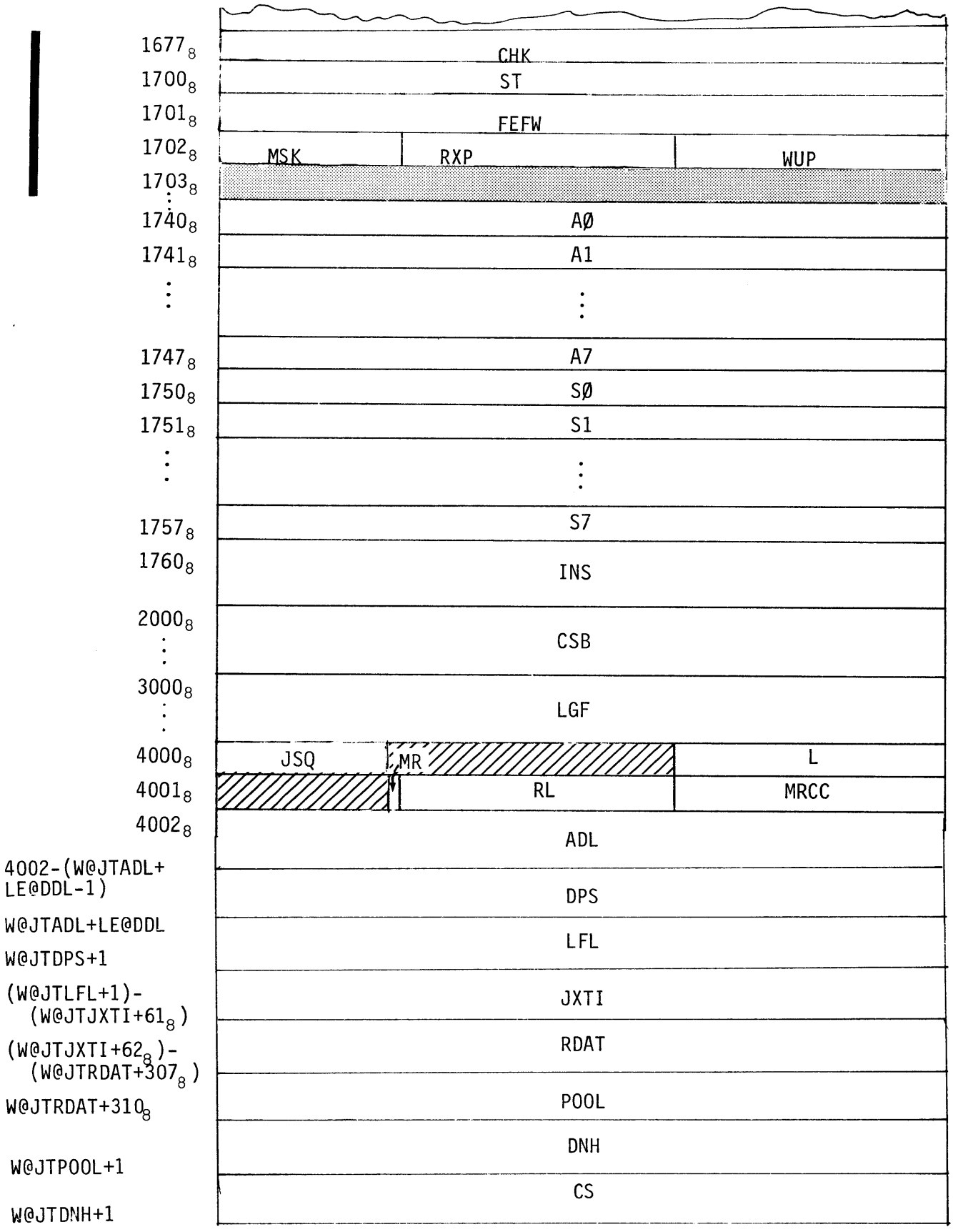


Figure 1.JT-1. Job Table Area (JTA) (continued)

Field	Word (octal)	Bits	Description
JTEPP	67	16-39	P register from user exchange package
JTEPA	67	40-63	Continuation address in EXP
JTERC	70	7-15	Reprieve error code
JTPM	70	40-63	PDD address; used in DISPOSE processing
JTIOCU	71	40-63	User field I/O count; includes buffer in and buffer out requests and I/O requests with DSP
JTCRO	72	0	Outstanding reply from DQM to CIO - must be cleared before job can be expanded or contracted.
JTIOC	72	40-63	Count of active I/O requests or functions
JTSID	73	0-15	Source ID (2 characters)
JTDID	73	16-31	Destination ID (2 characters)
JTJXT	73	40-63	JXT entry address
JTTID	74	0-63	Terminal ID
JTXMI	75	0-63	Memory integral based on execution time
JTDMI	76	0-63	Memory integral based on I/O wait time
JTSEC	77	0	Security flag, set if CSP executing
JTTLE	77	1	Time limit expired once
JTDMPF	77	2	Dump-in-progress flag
JTEXIT	77	3	EXIT statement flag
JTEOF	77	4	End-of-file on $CS flag
JTKIL	77	5	Job killed flag
JTRRN	77	6	Job rerun flag
JTEFI	77	13	Enable floating interrupt flag
JTDLM	77	14	Disable log message
JTTRM	77	15	Job in termination flag
JTABT	77	16	Job abort flag
JTCMSG	77	17	Enable conditional messages flag
JTLGFL	77	18	$LOG size exceeds I@LGUSZ
JTJCBX	77	19	JCB bad flag
JTSTAT	77	20	Request dataset statistics flag
JTTRM1	77	21	Second pass through TRM flag

Field	Word (octal)	Bits	Description
JTINIT	77	23	Job initiated flag
JTNRR	77	24	Not rerunnable if set
JTNRO	77	25	Disables no rerun if set
JTIOAC†	77	26	I/O area current status flag 0 user's I/O area unlocked 1 user's I/O area locked
JTIOAP†	77	27	I/O area previous status flag 0 user's I/O area unlocked 1 user's I/O area locked
JTOSUP	77	28	Interactive output suspended (recovery)
JTISUP	77	29	Interactive input suspended (recovery)
JTIA	77	30	Interactive flag
JTSKP	77	31	Control statement skip flag
JTB	100-177	40-63	B registers
JTT	200-277	0-63	T registers
JTV0	300-377	0-63	V0 register elements
JTV1	400-477	0-63	V1 register elements
JTV2	500-577	0-63	V2 register elements
JTV3	600-677	0-63	V3 register elements
JTV4	700-777	0-63	V4 register elements
JTV5	1000-1077	0-63	V5 register elements
JTV6	1100-1177	0-63	V6 register elements
JTV7	1200-1277	0-63	V7 register elements
JTDMP	1300-1317	0-63	Copy of exchange package for error processing
JTCDP	1320-1337	0-63	Control statement ($CS) DSP
JTLDP	1340-1357	0-63	Logfile ($LOG) DSP
JTEDP	1360-1377	0-63	EXU DSP; also used by DUMPJOB
JTMSG	1400-1417	0-63	Last logfile message issued
JTPDD	1420-1437	0-63	Permanent dataset descriptor entry used by job termination
JTEDN	1420-1427	0-63	DNT for EXU
JTAREG	1440-1447	0-63	A-register save area for RESUME/CONTINUE only
JTSREG	1450-1457	0-63	S-register save area for RESUME/CONTINUE only

†Deferred implementation

Field	Word (octal)	Bits	Description
JTDTM	1460-1657	0-63	Save area for Task I/O
JTCCI	1660-1671	0-63	80 characters of control statement being prescanned
JTODN	1672-1673	0-63	Two-word ODN table used by RELEASE and DISPOSE
JTJCB	1674-1676	0-63	Three words from user JCB starting with W@JCHLM
JTCHK	1677	0-63	Reprieve checksum supplied by user
JTST	1700	0-63	Reprieve status word
JTFEFW	1701	0-63	Reprieve fatal error flag word
JTFE03	1701	1	No DAT space
JTFE10	1701	2	No disk space
JTFE11	1701	3	SDR is full
JTFE23	1701	4	Job time limit exceeded
JTFE24	1701	5	Operator dropped user job
JTFE41	1701	6	Enter allowed on ACCESS only
JTFE58	1701	7	Error exit
JTFE51	1701	8	LFT chain pointer invalid
JTFE43	1701	9	User log size invalid
JTFENR	1701	63	Not reprievable
JTMSK	1702	0-15	Reprieve mask
JTRXP	1702	16-39	Reprieve XP address in user area
JTWUP	1702	40-63	Reprieve entry address in user area
JTAØ,.., JTA7	1740-1747	0-63	A register save area for EXP
JTSØ,.., JTS7	1750-1757	0-63	S register save area for EXP
JTINS	1760-1777	0-63	Reserved for installation
JTCSB	2000-2777	0-63	Control statement ($CS) buffer
JTLGF	3000-3777	0-63	Logfile ($LOG) buffer
JTJSQ	4000	0-15	Job sequence number
JTL	4000	40-63	Length of Job Table Area
JTMR	4001	15	Memory request outstanding flag
JTRL	4001	16-39	Requested length of JTA expansion
JTMRCC	4001	40-63	Count of datasets waiting for JTA memory

Field	Word	Bits	Description
JTADL	4002-(W@JTADL+ LE@DDL-1)	0-63	DDL for OPEN and DUMPJOB; up to six words long
JTDPS	W@JTADL+LE@DDL	0-63	Control word for Task I/O DSP save area
JTLFL	W@JTDPS+1	0-63	User last word before rollout
JTJXTI	(W@JTLFL+1)- (W@JTJXTI+61_8)	0-63	Image of JXT at rollout
JTRDAT	(W@JTJXTI+62_8)- (W@JTRDAT+307_8)	0-63	Image of roll DAT
JTPOOL	W@JTRDAT+310_8		First word of JTA memory pool
MPST		0	Status of memory area 0 Available 1 In use
MPID		16-39	Memory pool identification 07070707 Job Table Area
MPSIZE		40-63	Size of the memory area
JTDNH	W@JTPOOL+1		Head of the DNT chain
JTDBL		16-39	DNT backward link
JTDFL		40-63	DNT forward link
JTCS	W@JTDNH+1	0-63	Control statement ($CS) DNT
JTLOG	W@JTCS+ LE@DNT+3		Logfile ($LOG) DNT

1.JX JOB EXECUTION TABLE - JXT

The JXT in STP memory contains an entry for each job that has begun processing. The JXT is used to control all active jobs in the system.

The JXT may contain from 1 to 63 entries; the first entry is reserved for the operating system, itself.

The JTA entry and the JXT entry for a particular job contain each other's addresses. Word 0 in both entries contains the 7-character job name.

A JXT entry is illustrated in figure 1.JX-1.

Field	Word	Bits	Description
JXJN	0	0-55	Jobname
JXSTCH	1	0-55	Job status in displayable form (7 characters)
JXORD	1	56-63	Ordinal number (0-63) of the JXT entry
JXSTAT	2	0-22	Status; see part 1, section 3.8.6
JXEPC	2	23-27	Reason for abortion if the A status bit is set See Job Scheduler equates for A$*xxx* in COS for abort codes.
JXNR	2	28-39	Number of times the job has been rolled in
JXJTA	2	40-63	Job table area address
JXSDT	3	0-15	SDT offset for this job's SDT entry
JXBLO	3	16-27	Backward link as a JXT offset
JXFLO	3	28-39	Forward link as a JXT offset
JXRJS	3	40-63	Requested job size including JTA
JXCP	4	0-39	CPU priority (based on resource use)
JXCJS	4	40-63	Current job size including JTA
JXP	5	0-7	Priority from JOB statement
JXMP	5	8-39	Floating memory priority (based on JXP)
JXDNT	5	40-63	Rolled image's DNT entry address
JXTSX	6	0-63	Time spent executing as of last rescheduling
JXIOB	7	0-63	Disk blocks transferred as of last rescheduling
JXMEM	8	0-63	Saved memory request word (J$ALLOC)
JXEVW	9	0-63	Saved event word (J$AWAIT)
JXDLY	10	0-63	Wake-up time in cycles (J$DELAY)
JXTL	11	0-63	Time limit in cycles

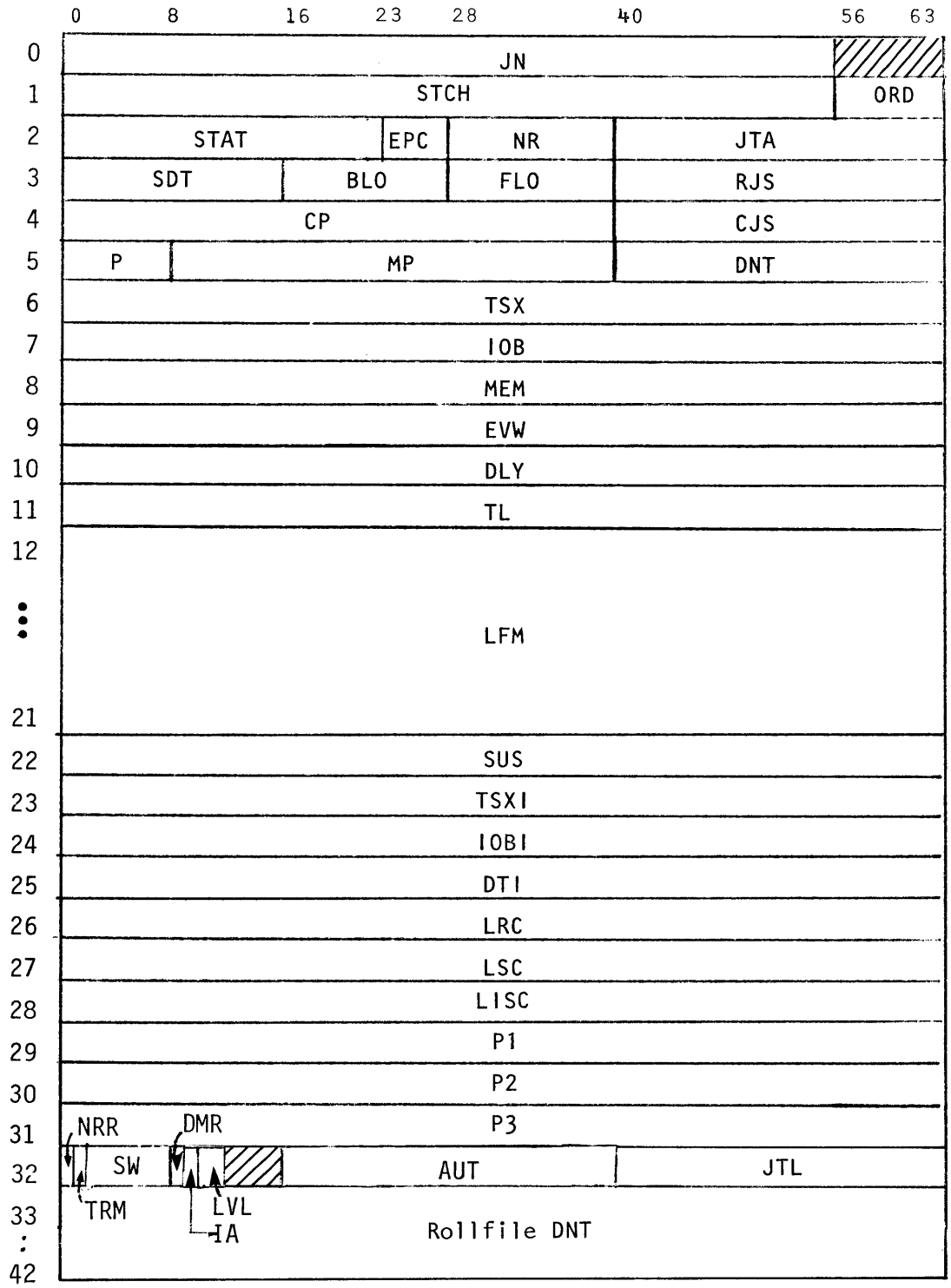


Figure 1.JX-1. Job Execution Table (JXT) entry

Field	Word	Bits	Description
JXLFM	12-21	0-63	Last logfile message
JXSUS	22	0-63	Reply word for J$SUSPK
JXTSXI	23	0-63	Time spent executing in past scheduling interval
JXIOBI	24	0-63	Disk blocks transferred in past scheduling interval
JXDTI	25	0-63	Date and time initiated
JXLRC	26	0-63	Date and time of last residence change
JXLSC	27	0-63	Date and time of last status change
JXLISC	28	0-63	Date and time of last I/O status change
JXP1	29	0-63	Temporary storage word 1 for TRACEMP
JXP2	30	0-63	Temporary storage word 2 for TRACEMP
JXP3	31	0-63	Temporary storage word 3 for TRACEMP
JXNRR	32	0	Job rerun flag; set if job cannot be rerun
JXTRM	32	1	Job in termination flag
JXSW	32	2-7	Sense switches
JXDMR	32	8	Don't-mark-recoverable flag - set when a request is made to declare a job non-recoverable; cleared when the job is connected.
JXIA	32	9	Interactive flag
JXLVL	32	10-12	Current procedure level
JXAUT	32	16-40	Address of Active User Table (AUT) for interactive jobs
JXJTL	32	40-63	Length of the Job Table Area (JTA)
	33-42	0-63	DNT entry for job's roll file

There are four temporary tables for displaying the name, SDT offsets, CPU priority, memory priority, and status for each job in the JXT. These tables, which will be removed when a complete job display is implemented, follow the JXT and precede the MST in memory. Each table consists of a single word for each JXT entry; in each table, the initial entry (for JXT ordinal zero) contains the table description in ASCII (that is, "NAME+SDO", "CPU PRI", "MEM PRI", or "STATUS").

The first table (job names and SDT ordinals) immediately follows the JXT. The SDT ordinal occupies the rightmost 8 bits of a word in this table. The remainder of the word is needed for the 7-character name.

The second and third tables (CPU and memory priorities) contain floating point values in ASCII to four decimal places. Entries in these tables are updated by the Job Scheduler at the end of each scheduling interval when the priorities are recomputed. However, if there are fewer than I@CPPRI + 2 jobs in memory at the end of a scheduling interval, or if I@AGECP is zero, the CPU priorities are not recomputed. (I@CPPRI determines the CPU priority algorithm and is either 0 or 1. I@AGECP also is 0 or 1; if it is 0, aging of CPU priorities is disabled and the changing memory priorities are used instead.) Similarly, if there are no unsatisfied memory requests, the memory priorities are not recomputed.

The fourth table (job statuses) immediately precedes the MST. It contains copies of the JXSTCH and JXORD fields from the JXT. The appropriate entry is updated whenever the status of a job is changed by the Job Scheduler.

1.LC LINK CONFIGURATION TABLE - LCT

The Link Configuration Table resides in STP memory. It contains an entry for each physically connected front-end.

Figure 1.LC-1 illustrates the LCT format.

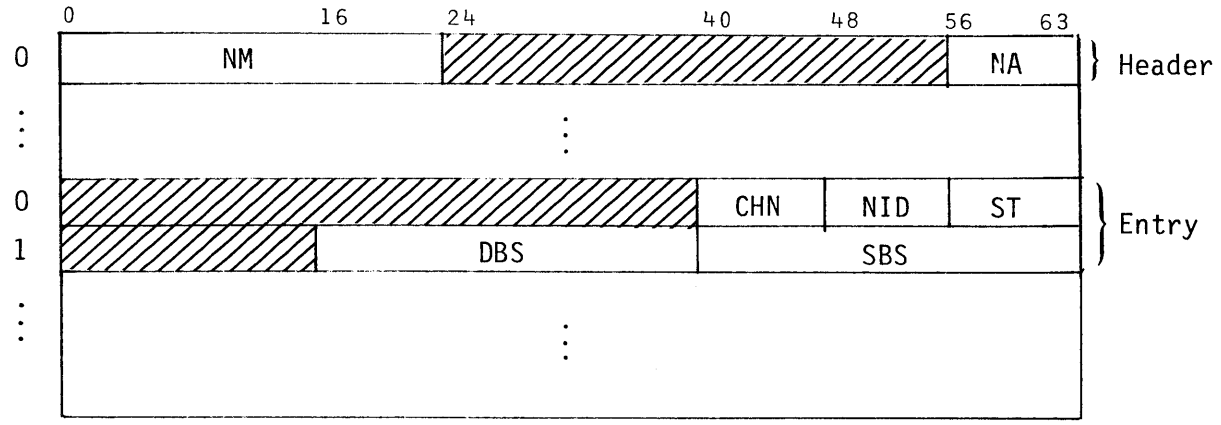


Figure 1.LC-1. Link Configuration Table (LCT)

HEADER

Field	Word	Bits	Description
LCNM	0	0-23	Table name; "LCT" in ASCII
LCNA	0	56-63	Number of active physical channels

ENTRY

Field	Word	Bits	Description
LCCHN	0	40-47	Software channel pair number
LCNID	0	48-55	Number of logical IDs for channel
LCST	0	56-63	Number of streams per physical channel
LCDBS	1	16-39	Size of disk buffer
LCSBS	1	40-63	Maximum size of segment

1.LF LOGICAL FILE TABLE - LFT

The Logical File Table resides below the DSP area in the user field. It contains a 2-word entry for each dataset name and each alias for a dataset (figure 1.LF-1). The LFT and NLE fields of the JCB give the base address and number of entries in the LFT, respectively.

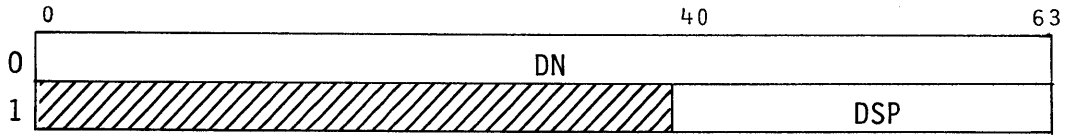


Figure 1.LF-1. Logical File Table (LFT) entry

ENTRY

Field	Word	Bits	Description
LFDN	0	0-63	Dataset name or alias
LFDSP	1	40-63	DSP address

1.LG LOG TABLES - LGI, LGR, LGUQ

1.LG.1 REQUEST WORD TO MSG - LGI

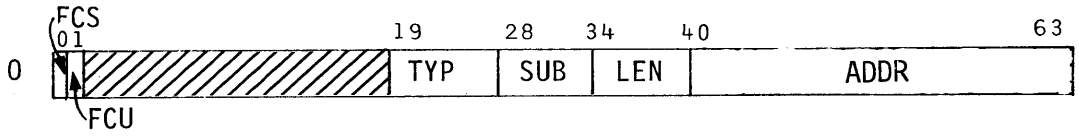


Figure 1.LG-1. Request word to MSG (LGI)

Field	Word	Bits	Description
LGIFCS	0	0	System log flag
LGIFCU	0	1	User log flag
LGITYP	0	19-27	Major type
LGISUB	0	28-33	Subtype
LGILEN	0	34-39	Length
LGADDR	0	40-63	Starting address of message

1.LG.2 RECORD IN SYSTEM LOG - LGR

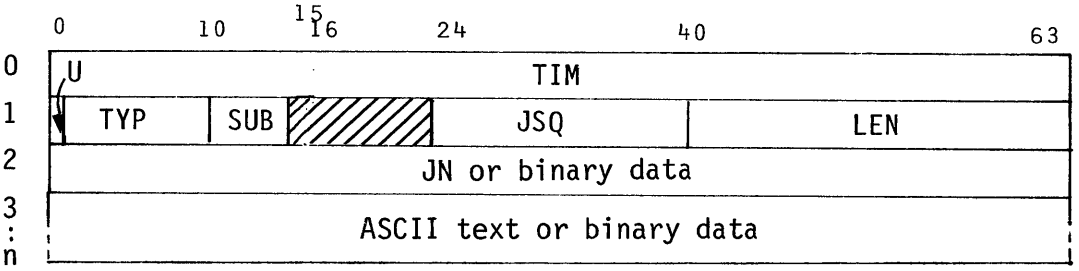


Figure 1.LG-2. Record in system log (LGR)

Field	Word	Bits	Description
LGRTIM	0	0-64	Time
LGRU	1	0	User flag; message also in $LOG
LGRTYP	1	1-9	Major type
LGRSUB	1	10-15	Subtype
LGRJSQ	1	24-39	Job sequence number, if associated with a job, otherwise 0
LGRLEN	1	40-63	Length

LGRJN	2	0-63	Jobname, if associated with a job; otherwise, beginning of binary data
	3-n	0-63	ASCII text or binary data

1.LG.3 $LOG RECORD IN MEMORY POOL (BATCH MODE) - LGUQ

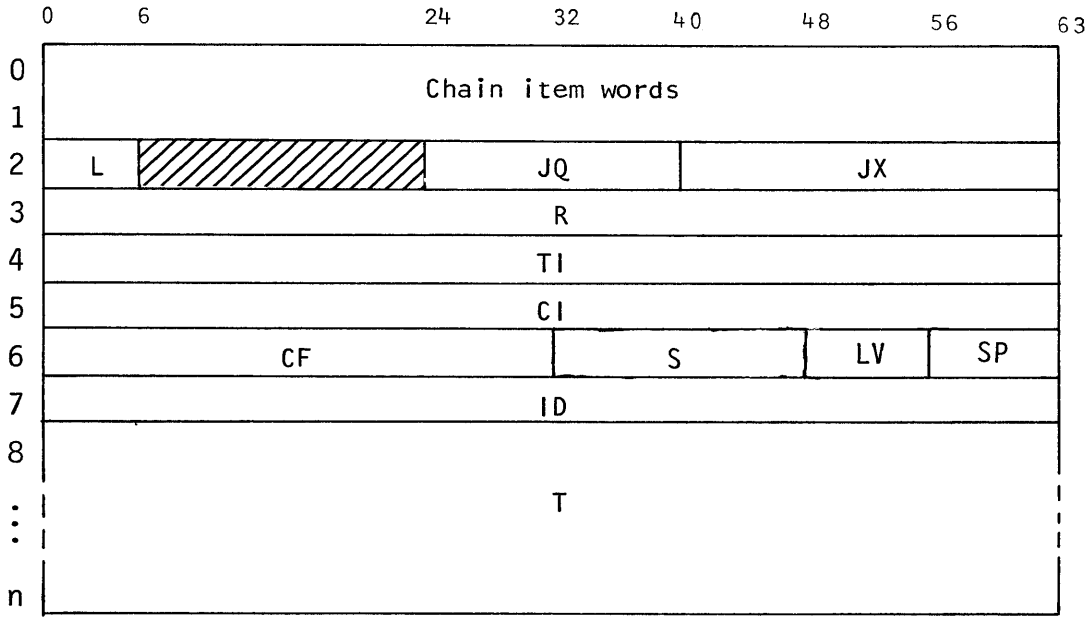


Figure 1.LG-3. $LOG Record in Memory Pool (LGUQ)

Field	Word	Bits	Description
LGUQL	2	0-5	Length of $LOG record
LGUQJQ	2	24-39	Job sequence number
LGUQJX	2	40-63	JXT address
LGUQR	3	0-63	Spaces
LGUQTI	4	0-63	Time
LGUQCI	5	0-63	CPU time (integer portion)
LGUQCF	6	0-31	CPU time (fractional portion)
LGUQS	6	32-47	Two spaces
LGUQLV	6	48-55	Procedure level
LGUQSP	6	56-63	Spare space
LGUQID	7	0-63	Task ID
LGUQT	8-n	0-63	Message text

1.LG.4 $LOG RECORD IN MEMORY POOL (INTERACTIVE MODE) - LGUQ

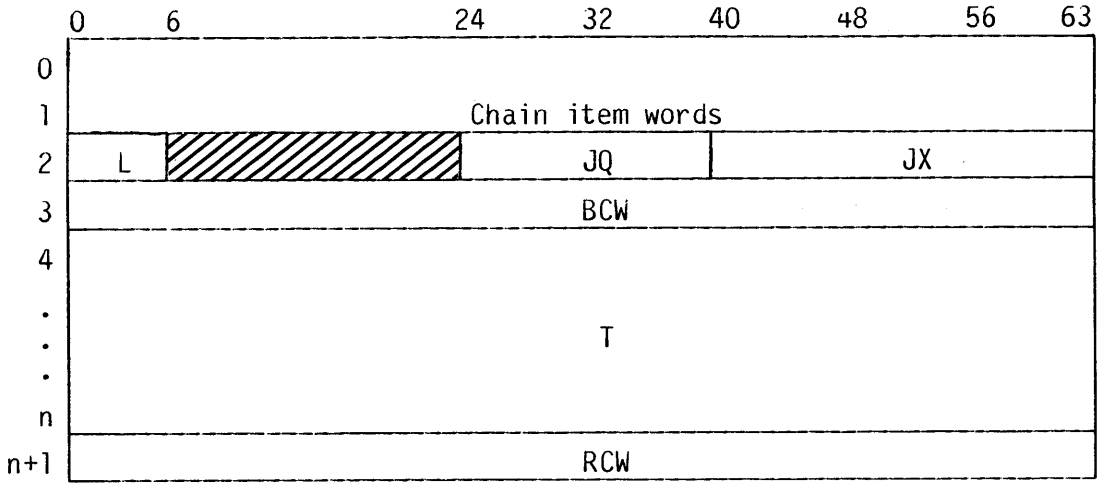


Figure 1.LG-4 $LOG Record in Memory Pool (LGUQ)

Field	Word	Bits	Description
LGUQL	2	0-5	Length of $LOG record
LGUQJQ	2	24-39	Job sequence number
LGUQJX	2	40-63	JXT address
LGUQBCW	3	0-63	Block control word
LGUQT	4 - n	0-63	Message text
LGUQRCW	n+1	0-63	Record control word

1.LG-5 LOG JXT TABLE - LGJ

The LGJ table contains a one-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.

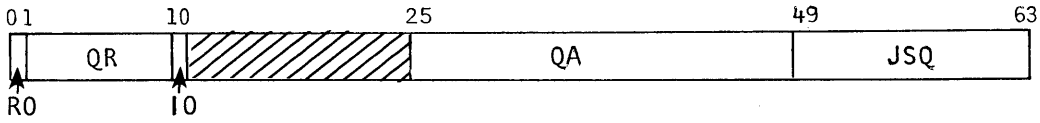


Figure 1.LG-5. $LOG Record in JXT Table (LGJ)

Field	Word	Bits	Description
LGJRO	0	0	Rollout flag - Log Manager tried 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	25-48	Address of queue entry
LGJJSQ	0	49-63	Job sequence number

1.LS LINK INTERFACE STREAM TABLE - LST

Eight input stream LSTs and eight output stream LSTs are contained within each LXT entry. Each LST is used only by the Station Call Processor and contains SCP working storage.

Figure 1.LS-1 illustrates an LST format.

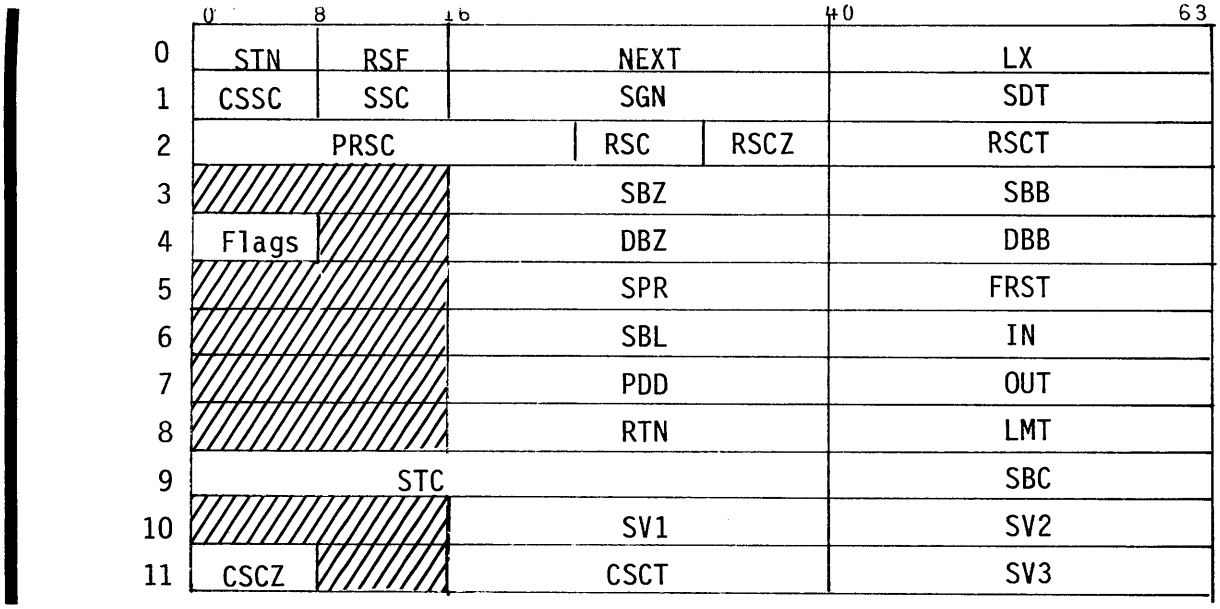


Figure 1.LS-1. Link Interface Stream Table (LST)

Field	Word	Bits	Description
LSSTN	0	0-7	Stream number
LSRSF	0	8-15	Right shift count
LSNEXT	0	16-39	Link to next LST
LSLX	0	40-63	Extension table address
LSCSSC	1	0-7	Current send stream control code
LSSSC	1	8-15	Next send stream control code
LSSGN	1	16-39	Segment number
LSSDT	1	40-63	SDT address
LSPRSC	2	0-23	Process received stream control code
LSRSC	2	24-31	Received stream control code
LSRSCZ	2	32-39	Next received stream control code maximum value

Field	Word	Bits	Description
LSRSCT	2	40-63	Next received stream control start
LSSBZ	3	16-39	Segment buffer size
LSSBB	3	0-63	Segment buffer base address
Flags	4	0-7	
LSSBRF	4	0	Segment buffer ready
LSPR	4	1	Outstanding PUTREQ
LSTRM	4	2	Terminate for PPN, CAN, or MCL
LSLOG	4	3	LOGON received
LSDBZ	4	16-39	Disk buffer size
LSDBB	4	40-63	Disk buffer base address
LSSPR	5	16-39	Segment buffer pointer
LSFRST	5	40-63	Disk buffer "first" address
LSSBL	6	16-39	Segment buffer limit address
LSIN	6	40-63	Disk buffer "in" address
LSPDD	7	16-39	Pointer to PDD for stream request
LSOUT	7	40-63	Disk buffer "out" address
LSRTN	8	16-39	Return address for deferred processing
LSLMT	8	40-63	Disk buffer limit address
LSSTC	9	0-39	Send stream transmission word count
LSSBC	9	40-63	Segment bit count
LSSV1	10	16-39	Save A1 = LIT for common reply
LSSV2	10	40-63	Save A2 = LXT for common reply
LSCSCZ	11	0-7	Current stream control code maximum
LSCSCT	11	16-39	Current stream control code table
LSSV3	11	40-63	Save A3 = LST for common reply

1.LT- LINK INTERFACE TABLE - LIT

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 1.LT-1 illustrates the LIT.

Field	Word	Bits	Description
LTINT	0	0	Channel interrupt flag. Set by EXEC upon completion of O/I, cleared by SCP.
LTCHN	0	1-6	Channel pair number (input channel number divided by 2). (SCP)
LTLID	0	24-39	Link ID (SCP)
LTLX	0	40-63	Extension table address (SCP)
LTON	1	0	Link on flag
LTSGZ	1	22-39	Segment size in words (SCP)
LTSZB	1	40-63	Segment size in bits (SCP)
LTMSSG	2	8-15	Maximum number of subsegments in a segment (SCP)
LTSSGZ	2	22-39	Subsegment size in words (SCP)
LTSSZB	2	40-63	Subsegment size in bits (SCP)
LTCBSZ	3	16-39	Channel buffer space size (SCP)
LTCBS	3	40-63	Channel buffer space base address (SCP)
LTSBT	4	0-7	Total segment buffer count
LTSBC	4	8-15	Free segment buffer count
LTSBZ	4	16-39	Segment buffer size in words (SCP)
LTSBQH	4	40-63	Segment buffer queue head (SCP)
LTDBT	5	0-7	Total disk buffer count
LTDBC	5	8-15	Free disk buffer count
LTDBZ	5	16-39	Disk buffer size in words (SCP)
LTDBQH	5	40-63	Disk buffer queue head (SCP)
LTCKSZ	6	32-39	Checksum width
LTLXQH	6	40-63	Extension table queue head address
LTLXC	7	8-15	Extension table entry count

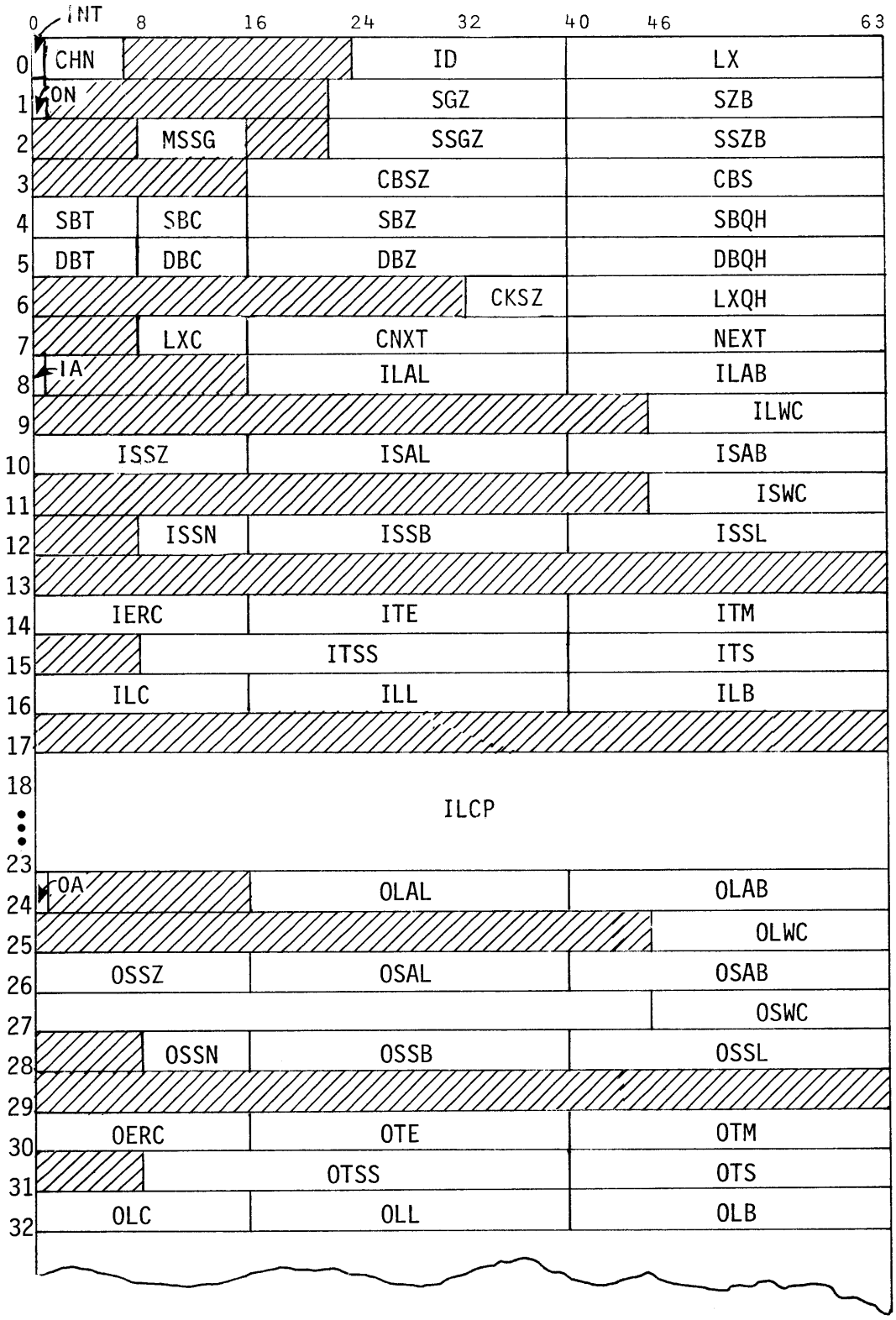


Figure 1.LT-1. Link Interface Table (LIT)

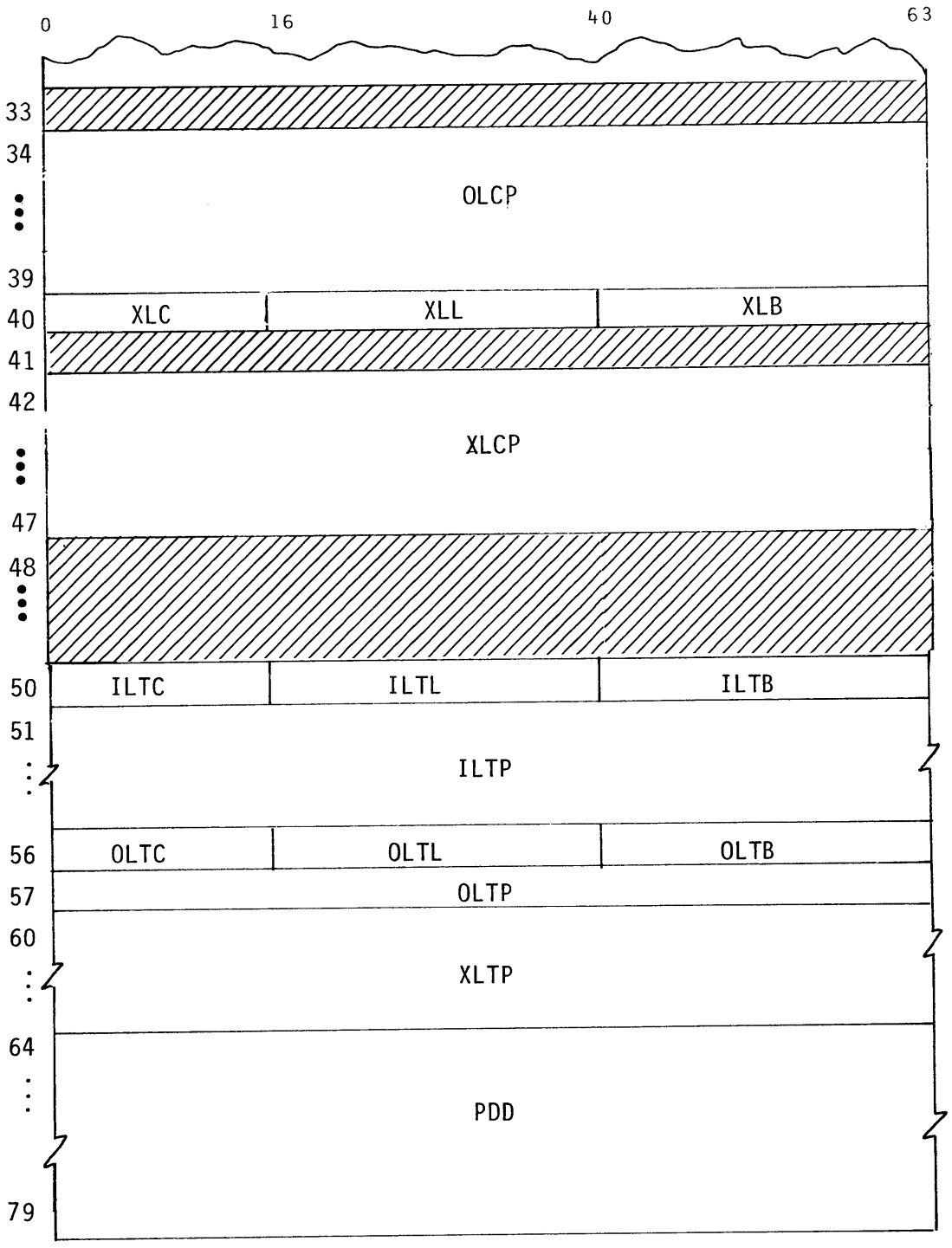


Figure 1.LT-1. Link Interface Table (LIT), continued

Field	Word	Bits	Description
LTCNXT	7	16-39	Link to first active extension table (SCP)
LTNEXT	7	40-63	Link to next LIT entry (SCP)
LTIA	8	0	Input active flag (EXEC)
LTILAL	8	16-39	Input LCP absolute limit address (SCP)
LTILAB	8	40-63	Input LCP absolute base address (SCP)
LTILWC	9	46-63	Input LCP word count (EXEC)
LTISSZ	10	0-15	Input subsegment size in words (SCP)
LTISAL	10	16-39	Input segment absolute limit address (LCP)
LTISAB	10	40-63	Input segment absolute base address (LCP)
LTISWC	11	46-63	Input segment word count (EXEC)
LTISSN	12	8-15	Current input subsegment number (EXEC)
LTISSB	12	16-39	Input subsegment base address (EXEC)
LTISSL	12	40-63	Input subsegment limit address (EXEC)
LTIERC	14	0-15	Input error retry count (EXEC)
LTITE	14	16-39	Input total error message count (EXEC)
LTITM	14	40-63	Input total non-error message count (EXEC)
LTITSS	15	8-39	Input total subsegments count (EXEC)
LTITS	15	40-63	Input total segments count (EXEC)
LTILC	16	0-15	Input LCP buffer word count (SCP)
LTILL	16	16-39	Input LCP buffer limit address (SCP)
LTILB	16	40-63	Input LCP buffer base address (SCP)
LTILCP	18-23	0-63	Input LCP buffer area (SCP)
LTOA	24	0	Output active flag (EXEC)
LTOLAL	24	16-39	Output LCP absolute limit address (SCP)
LTOLAB	24	40-63	Output LCP absolute base address (SCP)
LTOLWC	25	46-63	Output LCP word count (SCP)
LTOSSZ	26	0-15	Output subsegment size in words (SCP)
LTOSAL	26	16-39	Output segment absolute limit address (SCP)
LTOSAB	26	40-63	Output segment absolute base address (SCP)
LTOSWC	27	46-63	Output segment word count (SCP)
LTOSSN	28	8-15	Current output subsegment number (EXEC)

Field	Word	Bits	Description
LTOSSB	28	16-39	Output subsegment base address (EXEC)
LTOSSL	28	40-63	Output subsegment limit address (EXEC)
LTOERC	30	0-15	Output error retry count (EXEC)
LTOTE	30	16-39	Output total error message count (EXEC)
LTOTM	30	40-63	Output total non-error message count (EXEC)
LTOTSS	31	8-39	Output total subsegments count (EXEC)
LTOTS	31	40-63	Output total segments count (EXEC)
LTOLC	32	0-15	Output LCP buffer word count (SCP)
LTOLL	32	16-39	Output LCP buffer limit address (SCP)
LTOLB	32	40-63	Output LCP buffer base address (SCP)
LTOLCP	34-39	0-63	Output LCP buffer area (SCP)
LTXLC	40	0-15	Output LCP buffer word count (EXEC)
LTXLL	40	16-39	Output LCP buffer limit address (EXEC)
LTXLB	40	40-63	Output LCP buffer base address (EXEC)
LTXLCP	42-47	0-63	Output LCP buffer area (EXEC)
LTILTC	50	0-15	Input LTP buffer word count (SCP)
LTILTL	50	16-39	Input LTP buffer limit address (SCP)
LTILTB	50	40-63	Input LTP buffer base address (SCP)
LTILTP	51-53	0-63	Input LTP buffer area (SCP)
LTOLTC	56	0-15	Output LTP buffer word count (SCP)
LTOLTL	56	16-39	Output LTP buffer limit address (SCP)
LTOLTB	56	40-63	Output LTP buffer base address (SCP)
LTOLTP	57-59	0-63	Output LTP buffer area (SCP)
LTXLTP	60-63	0-63	Error LTP
LTXONE	60	0-63	Error - all ones pattern
LTZRO	61	0-63	Error - all zeros pattern
LTXCKS	62	0-63	Error - checksum
LTXLTL	63	16-39	Error - LTP limit address
LTXLTB	63	40-63	Error - LTP base address
LTPDD	64-79	0-63	Channel PDD table (SCP)

1.LX LINK INTERFACE EXTENSION TABLE - LXT

The Link Interface Extension Table is STP resident. It is used only by the Station Call Processor and contains SCP working storage. Also contained in each LXT entry are eight input stream LSTs and eight output stream LSTs. An LXT entry is assigned to an active LIT entry for each front-end ID at LOGON and deassigned at LOGOFF.

Field	Word	Bits	Description
LXLID	0	0-15	Link ID
LXCHN	0	34-39	Channel pair number
LXLT	0	40-63	LIT address
LXIAST	1	0	Interactive request received flag
LXSTYP	1	1-2	Station Type
LXSTBA LXSTIA LXSTBO			0 Batch only 1 Interactive only 2 Both
LXIACT	1	3-18	Interactive message count
LXCXSZ	1	32-39	Checksum width (0, 8, 16, 32, or 64)
LXRSTQ	2	0-63	Interactive restart Q control word
LXNRM	2	0-15	Number of messages
LXRSQT	2	32-47	Q Tail
LXRSQH	2	48-63	Q Head
LXAIST	3	16-23	Current active input streams
LXAOST	3	24-31	Current active output streams
LXAAST	3	32-39	Current total active streams
LXLMIS	5	16-23	Logon maximum active input streams
LXLMOS	5	24-31	Logon maximum active output streams
LXLMAS	5	32-39	Logon maximum total active streams
LXLMSS	5	40-47	Logon maximum subsegments
LXLSSZ	5	48-63	Logon subsegment size
LXLDSZ	6	40-63	Maximum output dataset size (in 512-word blocks)
LXOMIS	7	16-23	Operator maximum active input streams
LXOMOS	7	24-31	Operator maximum active output streams
LXOMAS	7	32-39	Operator maximum total active streams
LXSGZ	8	22-39	Segment size in words
LXDRMC	8	40-63	Deferred received message code

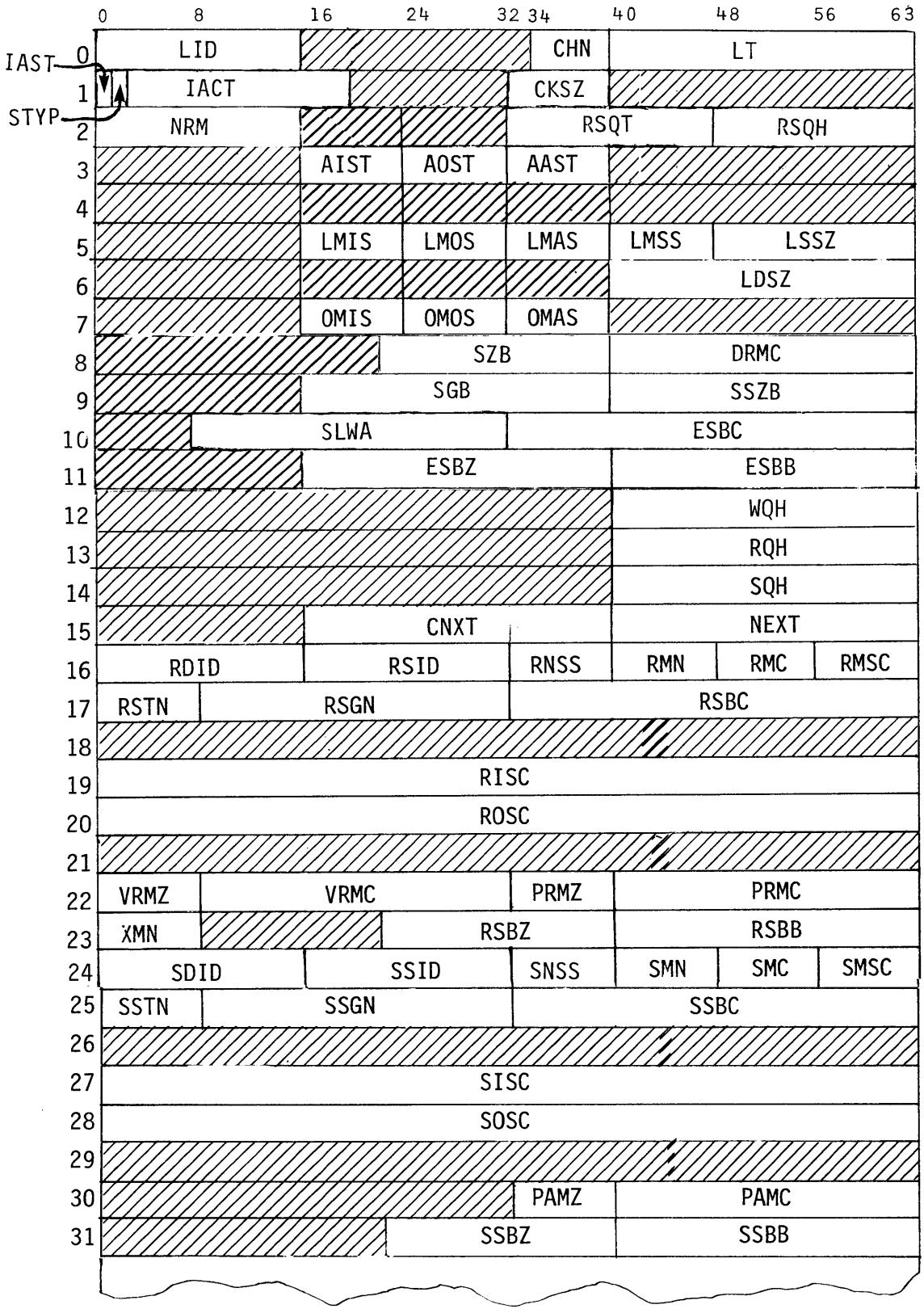


Figure 1.LX-1. Link Interface Extension Table (LXT)

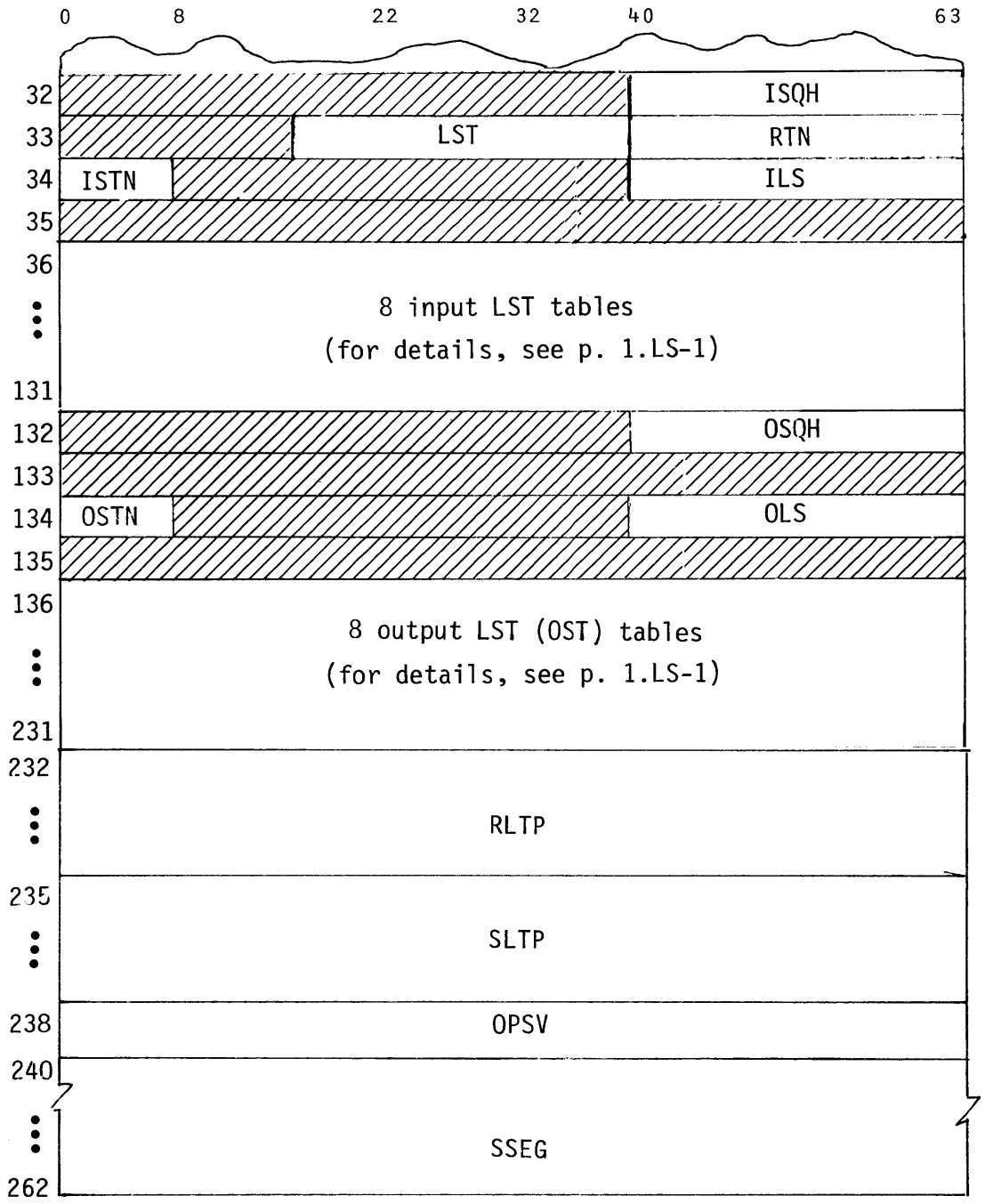


Figure 1.LX-1. Link Interface Extension Table (LXT), continued

Field	Word	Bits	Description
LXSZB	9	16-39	Segment size in bits
LXSSZB	9	40-63	Subsegment size in bits
LXSLWA	10	8-31	LWA+1 of segment
LXESBC	10	32-63	Diagnostic echo segment bit count
LXESBZ	11	16-39	Diagnostic echo segment size
LXESBB	11	40-63	Diagnostic echo segment address
LXWQH	12	40-63	Waiting SDT queue head address
LXRQH	13	40-63	Receiving SDT queue head address
LXSQH	14	40-63	Sending SDT queue head address
LXCNXT	15	16-39	Link to next active LXT entry for this channel
LXNEXT	15	40-63	Link to next available or active LXT entry
LXRDID	16	0-15	Received destination identifier
LXRSID	16	16-31	Received source identifier
LXRNSS	16	32-39	Received number of subsegments
LXRMN	16	40-47	Received message number
LXRMC	16	48-55	Received message code
LXRMSC	16	56-63	Received message subcode
LXRSTN	17	0-7	Received stream number
LXRSGN	17	8-31	Received segment number
LXRSBC	17	32-63	Received segment bit count
LXRISC	19	0-63	Received input stream control bytes
LXROSC	20	0-63	Received output stream control bytes
LXVRMZ	22	0-7	Verify received message code maximum value
LXVRMC	22	8-31	Verify received message code table address
LXPRMZ	22	32-39	Process received message code maximum value
LXPRMC	22	40-63	Process received message code table address
LXXMN	23	0-7	Expected message number
LXRSBZ	23	22-39	Received segment buffer size
LXRSBB	23	40-63	Received segment buffer base address
LXSDID	24	0-15	Send destination identifier
LXSSID	24	16-31	Send source identifier

Field	Word	Bits	Description
LXSNSS	24	32-39	Send number of subsegments
LXSMN	24	40-47	Send message number
LXSMC	24	48-55	Send message code
LXSMSC	24	56-63	Send message subcode
LXSSTN	25	0-7	Send stream number
LXSSGN	25	8-31	Send segment number
LXSSBC	25	32-63	Send segment bit count
LXSISC	27	0-63	Send input stream control bytes
LXSOSC	28	0-63	Send output stream control bytes
LXPAMZ	30	32-39	Process acknowledged message code maximum value
LXPAMC	30	40-63	Process acknowledged message code table
LXSSBZ	31	22-39	Send segment buffer size
LXSSBB	31	40-63	Send segment buffer base address
LXISQH	32	40-63	Input LST queue head address
LXST	33	16-39	Pointer to active LST address
LXRTN	33	40-63	Return address for active LST
LXISTN	34	0-7	Input stream number
LXILS	34	40-63	Input stream LST address
LXIST	36-131	0-63	Input LST table
LXOSQH	132	40-63	Output LST queue head address
LXOSTN	134	0-7	Output stream number
LXOLS	134	40-63	Output stream LST address
LXOST	136-231	0-63	Output LST table
LXRLTP	232-234	0-63	Receive - LTP
LXRONE	232	0-63	Receive - all ones pattern
LXRZRO	233	0-63	Receive - all zeros pattern
LXRCKS	234	0-63	Receive - checksum
LXSLTP	235-237	0-63	Send - LTP
LXSONE	235	0-63	Send - all ones pattern
LXSZRO	236	0-63	Send - all zeros pattern
LXSCKS	237	0-63	Send - checksum
LXOPSV	238-239	0-63	Save area for op requests
LXSSEG	240-262	0-63	"Special protocol" segment

1.MP MEMORY POOL - MP

Memory pool areas are surrounded by header and trailer words that control the allocation and deallocation of the areas. A memory pool is depicted in figure 1.MP-1.

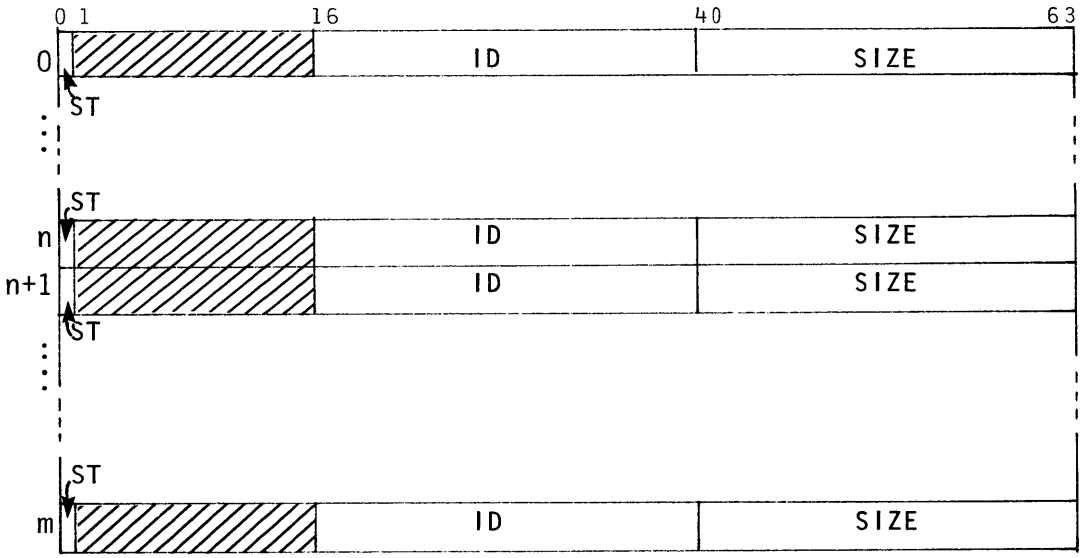


Figure 1.MP-1. Memory Pool

Field	Word	Bits	Description
MPST	0,n,etc.	0	Status of the memory area: 0 Available 1 In use
MPID	0,n,etc.	16-39	Memory pool identification: 01010101 Pool 1 0x0x0x0x Pool x
MPSIZE	0,n,etc.	40-63	Size of the memory pool

1.MS MEMORY SEGMENT TABLE - MST

The MST in STP memory contains a one-word entry for each segment of memory that has been allocated by the Job Scheduler plus additional entries that describe free segments. MST entries are stored 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.

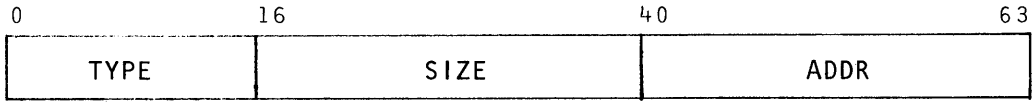


Figure 1.MS-1. Memory Segment Table (MST) entry

Field	Word	Bits	Description
MSTYPE	0	0-15	Contains 0 if the segment is free; otherwise, it contains the JXT ordinal of the job to which the segment is allocated.
MSSIZE	0	16-39	Number of words in the segment. This is always a multiple of 1000_8.
MSADDR	0	40-63	STP-relative address of the first word in the segment. This is always a multiple of 1000_8.

1.OD OPEN DATASET NAME TABLE - ODN

A 2-word Open Dataset Name Table (ODN) is generated in the user field the first time an OPEN of the specified dataset is encountered.

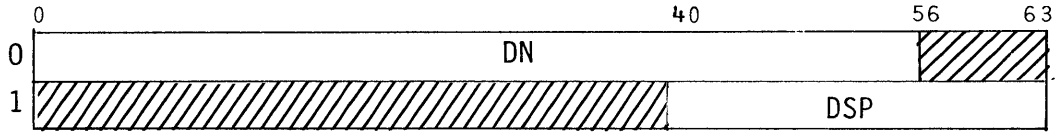


Figure 1.OD-1. Open Dataset Name Table (ODN)

Field	Word	Bits	Description
ODDN	0	0-55	Dataset name
ODDSP	1	40-63	DSP pointer negative - Negative DSP offset positive - Absolute address of DSP

1.PD PERMANENT DATASET TABLE - PDS

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

The PDS is used to control the release of DAT entries for permanent datasets.

Figure 1.PD-1 illustrates the PDS.

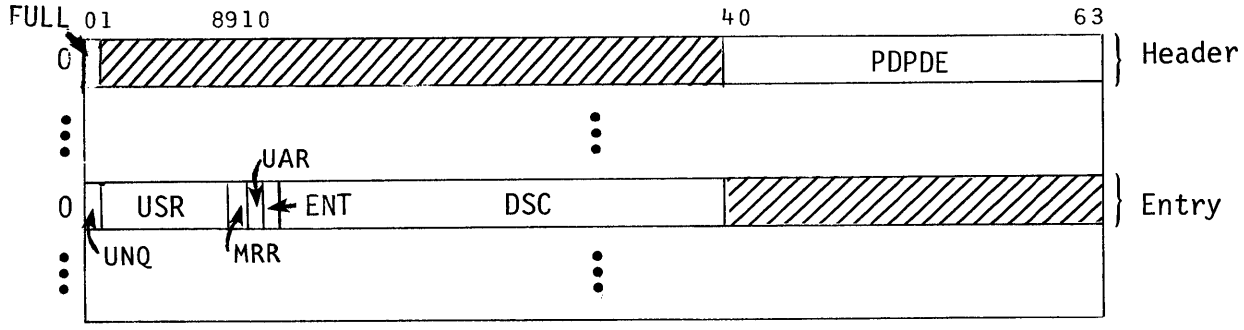


Figure 1.PD-1. Permanent Dataset Table (PDS)

HEADER

Field	Word	Bits	Description
PDFULL	0	0	PDS full indicator; i.e., datasets currently being accessed
PDPDE	0	40-63	Number of permanent datasets currently being accessed; i.e., number of entries in table

ENTRY

Field	Word	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

ENTRY, continued

Field	Word	Bits	Description
PDDSC	0	12-39	Dataset Catalog pointer
PDDCP	0	12-35	DSC page number
PDDCE	0	36-39	DSC entry number

1.PI PERMANENT DATASET INFORMATION TABLE - PDI

The PDI (figure 1.PI-1) is a 1-word STP-resident table generated during system startup for use by the permanent dataset manager.

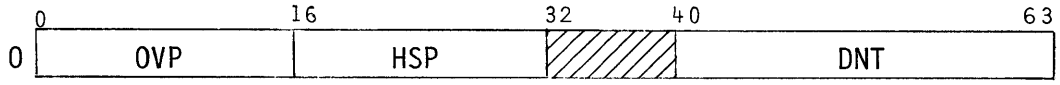


Figure 1.PI-1. Permanent Dataset Information Table (PDI)

Field	Word	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

1.PM PERMANENT DATASET DEFINITION - PDD

A PDD is a parameter list that accompanies a Permanent Dataset Management request and has one of four formats.

FORMAT 1 of PDD

The PDD illustrated in figure 1.PM-1 is used for save, save input, save output, access, access spooled, load, load input, load output, and PDN requests.

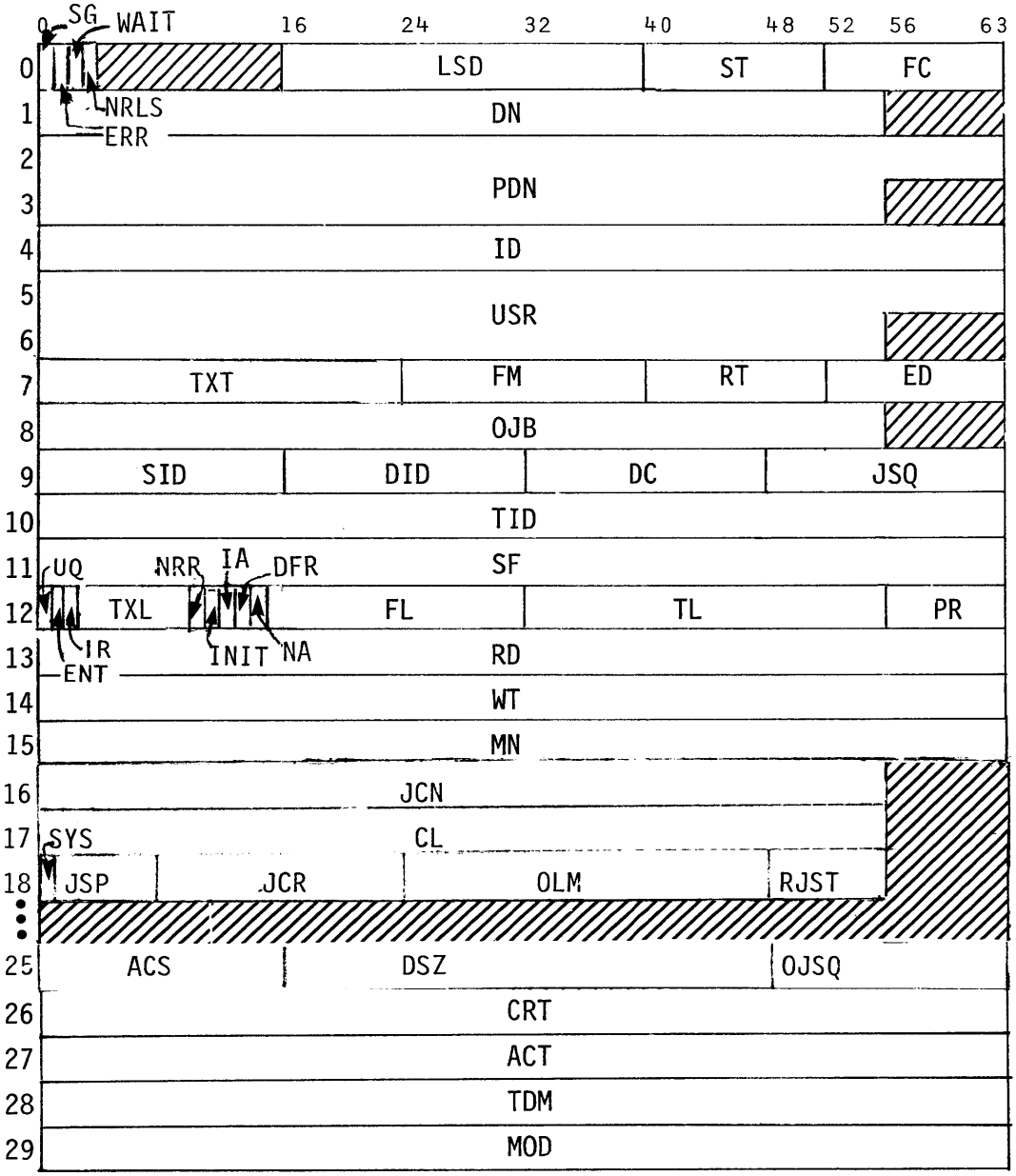


Figure 1.PM-1. PDD Format 1

Field	Word	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
PMLSD	0	16-39	Temporary SDT address for load input/output
PMST	0	40-51	Return status
PMFC	0	52-63	Function code (table 1.PM-1)
PMDN	1	0-55	Local dataset name
PMPDN	2	0-63	Permanent dataset name; 1-15 characters
	3	0-55	Characters
PMPDN1	2	0-63	Characters 1-8
PMPDN2	3	0-63	Characters 9-15
PMID	4	0-63	User identification
PMUSR	5	0-63	User number; 1-15 characters
	6	0-55	
PMTXT	7	0-23	Address of optional text field
PMFM	7	24-39	Format designator: 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	8	0-55	Originating job name
PMSID	9	0-15	Source ID; 2 characters
PMDID	9	16-31	Destination ID; 2 characters
PMDC	9	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	9	48-63	Job sequence number
PMTID	10	0-63	Terminal ID; 1-8 characters

Field	Word	Bits	Description
PMSF	11	0-63	Special forms
PMUQ	12	0	Unique access required
PMENT	12	1	Enter in System Directory
PMIR	12	2	Immediate reply requested
PMTXL	12	3-10	Number of words of text
PMNRR	12	11	Job rerun flag; set if job cannot be rerun (input entries only)
PMINIT	12	12	Job initiate flag; set if job has been initiated
PMIA	12	13	Interactive flag
PMDFR	12	14	Deferred disposition indicator
PMNA	12	15	No abort flag. If set, processing will continue even if an error is encountered.
PMFL	12	16-31	Field length/512 (input datasets only)
PMTL	12	32-55	Time limit (input datasets)
PMPR	12	56-63	Priority (input datasets)
PMRD	13	0-63	Read permission control word
PMWT	14	0-63	Write permission control word
PMMN	15	0-63	Maintenance permission control word
PMJCN	16	0-55	Job class name
PMCL	17	0-55	CL parameter from JOB staement
PMSYS	18	0	System job
PMJSP	18	1-8	JOB statement priority
PMJCR	18	9-24	Job class rank
PMOLM	18	25-48	Size of $OUT in 512-word block
PMRJST	18	49-55	Job status flag
PMACS	25	0-15	Number of accesses (load saved datasets only)
PMDSZ	25	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	25	48-63	Originating job sequence number
PMCRT	26	0-63	Creation time in cycles (load request only)

PMACT	27	0-63	Time of last access in cycles (load request only)
PMTDM	28	0-63	Time of last dump in cycles (load request only)
PMMOD	29	0-63	Time of last modification in cycles (load request only)

FORMAT 2 of PDD

The PDD illustrated in figure 1.PM-2 is used for LOADRQ (PDSLOAD), page requests (AUDIT and PDSDUMP), and dump time requests (PDSDUMP).

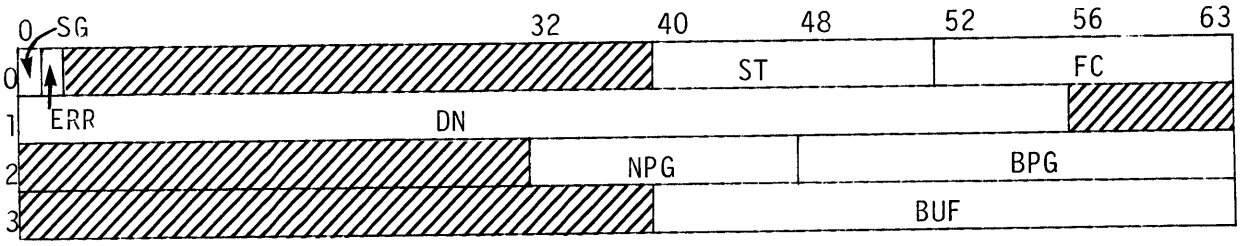


Figure 1.PM-2. PDD Format 2

Field	Word	Bits	Description
PMSG	0	0	Normal completion message suppression indicator
PMERR	0	1	Error message suppression indicator
PMST	0	40-51	Return status
PMFC	0	52-63	Function code (see table 1.PM-1)
PMDN	1	0-55	Local dataset name
PMNPG	2	32-47	Number of pages
PMBPG	2	48-63	Beginning page number
PMBUF	3	40-63	Buffer address

FORMAT 3 of PDD

The PDD illustrated in figure 1.PM-3 is used for delete and release requests.

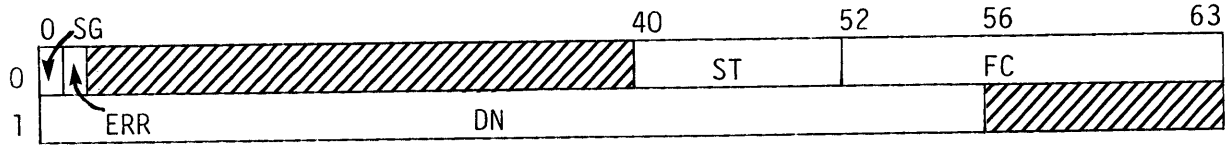


Figure 1.PM-3. PDD Format 3

Field	Word	Bits	Description
PMSG	0	0	Normal completion message suppression indicator
PMERR	0	1	Error message suppression indicator
PMST	0	40-51	Return status
PMFC	0	52-63	Function code (see table 1.PM-1)
PMDN	1	0-55	Local dataset name

FORMAT 4 of PDD

The PDD illustrated in figure 1.PM-4 is used for queue SDT and dequeue SDT processing. On a dequeue SDT request, the Permanent Dataset Manager returns to the requester the address of the SDT in the field PMSDT.

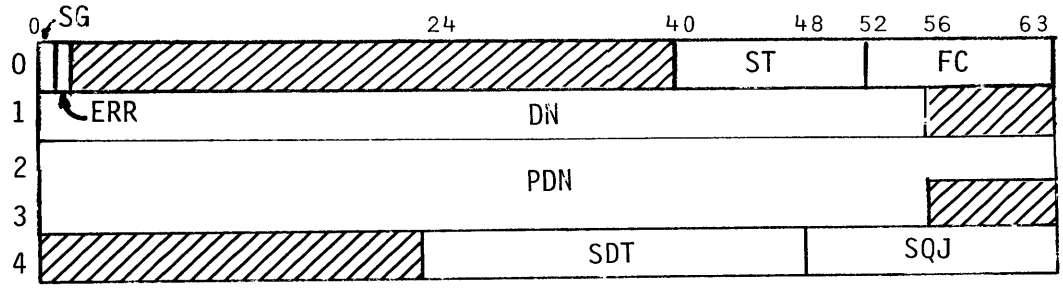


Figure 1.PM-4. PDD Format 4

Field	Word	Bits	Significance
PMSG	0	0	Normal completion message suppression indicator
PMERR	0	1	Error message suppression indicator
PMST	0	40-51	Return status
PMFC	0	52-63	Function code (see table 1.PM-1)
PMDN	1	0-55	Local dataset name
PMPDN	2	0-63	Permanent dataset name;
	3	0-55	1-15 characters
PMSDT	4	24-47	SDT address
PMSQJ	4	48-63	Job sequence number

Table 1.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	Deleter spooled dataset
PMFCPG	40	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
PMPCPI	176	Access input dataset for PDSDUMP

1.PR PROCEDURE FILE STACK TABLE

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.

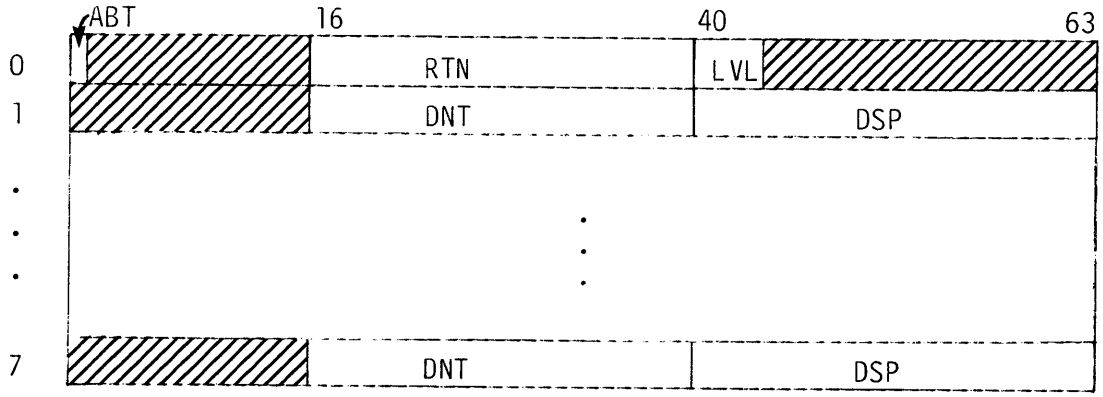


Table 1.PR-1. Procedure File Stack Table

Field	Word	Bits	Description
PRABT	0	1	RTN abort flag
PRRTN	0	16-39	RTN return address
PRLVL	0	40-42	Current stack level (0-7)
PRDNT	1-7	16-39	$CS DNT address (STP relative)
PRDSP	1-7	40-63	$CS JTA save area address (STP relative)

1.PT POOL TABLE - PT

The Pool Table is an STP-resident table used for memory pool management. It is illustrated in figure 1.PT-1.

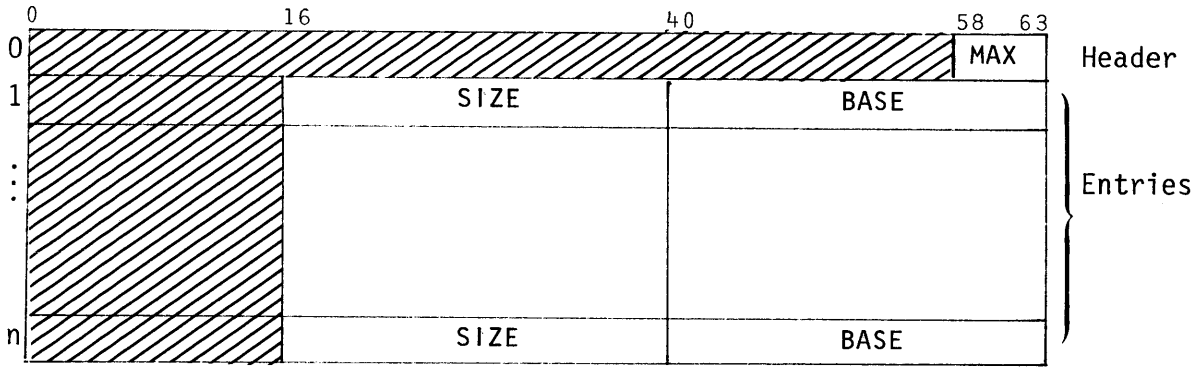


Figure 1.PT-1. Pool Table

HEADER

Field	Word	Bits	Description
PTMAX	0	58-63	Maximum valid memory pool number in system

ENTRY

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

1.PU PHYSICAL UNIT TABLE - PUT

This EXEC-resident table is used for working storage by the disk driver. There is one entry for each disk drive in the system. The PUT is illustrated in figure 1.PU-1.

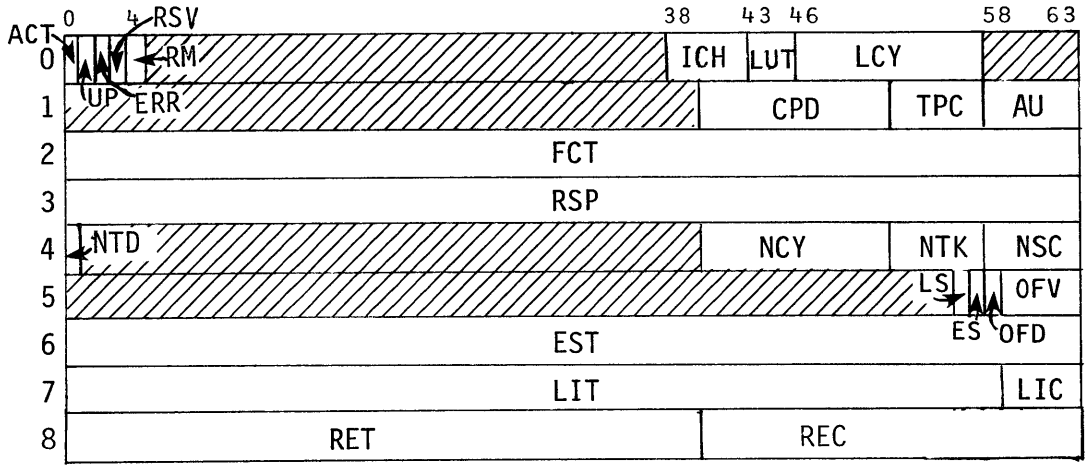


Figure 1.PU-1. Physical Unit Table (PUT)

Field	Word	Bits	Description
PUACT	0	0	Disk active flag
PUUP	0	1	Unit up
PUERR	0	2	Error
PURSV	0	3	Unit reserved
PURM	0	4	Recovery mode
PUICH	0	38-42	Input channel number
PULUT	0	43-45	Last unit number
PULCY	0	46-57	Last cylinder
PUCPD	1	40-51	Cylinders per disk
PUTPC	1	52-57	Tracks per cylinder
PUAU	1	58-63	Blocks per allocation unit (sectors per track)
PUFCT	2	0-63	Last function
PURSP	3	0-63	Last response
PUNTD	4	0	Next transfer direction
PUNCY	4	40-51	Next cylinder
PUNTK	4	52-57	Next track

Field	Word	Bits	Description
PUNSC	4	58-63	Next sector
PULS	5	56	Last margin late strobe flag
PUES	5	57	Last margin early strobe flag
PUOFD	5	58	Last margin offset direction
PUOFV	5	59-63	Last margin offset value
PUEST	6	0-63	Edited status
PUERRE	6	1	Error flag
PUCEF	6	2	Channel error flag encountered
PURWE	6	3	Read/write response error
PULSS	6	16-39	Subsystem status, last retry
PUFSS	6	40-63	Subsystem status, first error
PULIT	7	0-58	Estimated latest time of last function completion for lost-interrupt detection
PULIC	7	59-63	Hardware input channel number
PURET	8	0-39	Time of last retry
PUREC	8	40-63	Retry count

1.QD QUEUED DATASET TABLE - QDT

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 must be equal to the SDT entry count.

Header:

Entry:

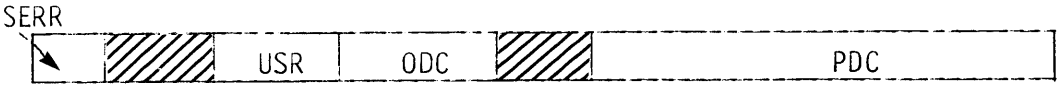


Figure 1.QD-1. Queued dataset table (QDT)

Header:

Field	Word	Bits	Description
QDNAM	0	0-23	ASCII name of table, i.e., "QDT"

Entry:

Field	Word	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	12-21	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

1.RJ ROLLED JOB INDEX - RJI

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 fields (used for index validation)

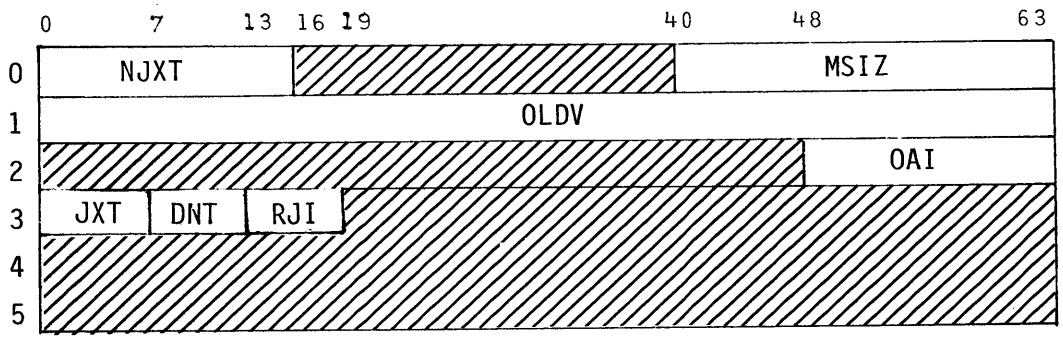


Figure 1.RJ-1. Rolled Job Index (RJI) entry zero fields

Field	Word	Bits	Description
RJNJXT	0	0-15	Number of JXT entries in the last-Deadstarted system
RJMSIZ	0	40-63	Memory size at last Deadstart
RJØLDV	1	0-63	Device name containing index for $ROLL dataset
RJØAI	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

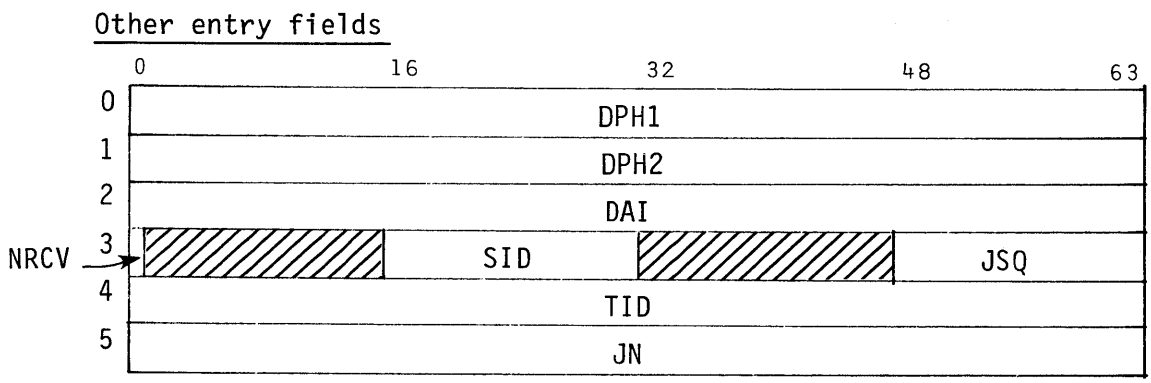


Figure 1.RJ-2. Rolled Job Index (RJI) other entry fields

Field	Word	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

1.RQ REQUEST TABLE - RQT

The Request Table is an STP-resident table primarily used for disk queue management. The RQT is illustrated in figure 1.RQ-1.

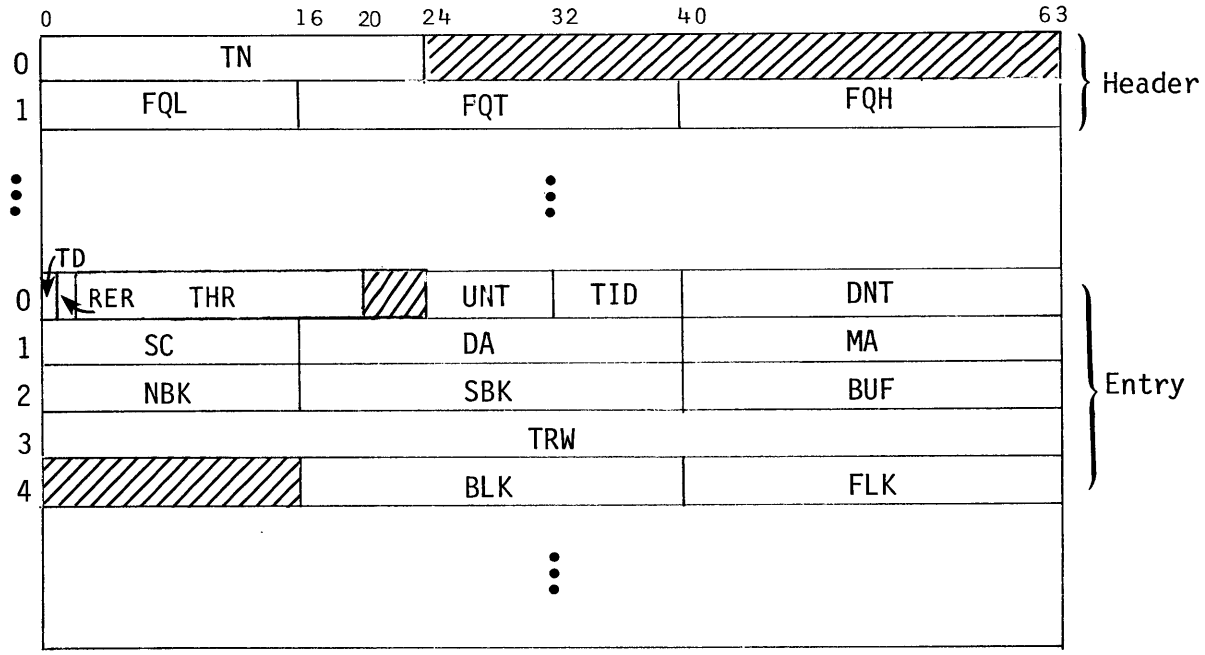


Figure 1.RQ-1. Request Table (RQT)

HEADER

Field	Word	Bits	Description
RQTN	0	0-23	Table name; "RQT" in ASCII
RQFQL	1	0-15	Free queue length
RQFQT	1	16-39	Free queue tail
RQFQH	1	40-63	Free queue head

ENTRY

Field	Word	Bits	Description
RQTD	0	0	Transfer direction
RQRER	0	1	Reread
RQTHR	0	2-19	Streaming threshold

ENTRY, continued

Field	Word	Bits	Description
RQUNT	0	24-31	Unit number
RQTID	0	32-39	Requesting task ID
RQDNT	0	40-63	DNT address
RQSC	1	0-15	Sector count
RQDA	1	16-39	Disk address
RQMA	1	40-63	Memory address
RQNBK	2	0-15	Block count
RQSBK	2	16-39	Starting block
RQBUF	2	40-63	Buffer address
RQTRW	3	0-63	Task reply word
RORET	3	0-23	Caller's return address
RQRCL	3	24	Recall reply flag
RQJXT	3	25-39	JXT offset for job-related requests
RQBLK	4	16-39	Backward link
RQFLK	4	40-63	Forward link

1.SD SYSTEM DATASET TABLE - SDT

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.

For staged datasets that are submitted as jobs to the CRAY-1, the first control statement (the JOB statements) must be cracked to obtain job scheduling information.

Entry:

Field	Word	Bits	Description
SDDN	0	0-55	Dataset name
SDAIO	1	0	Active I/O
SDOC	1	1-2	Open/close status (binary) 1 In 2 Out 3 In/out
SDP	1	3	Type of processing, used by Disk Queue Manager 0 Read 1 Write
SDDC	1	16-31	Disposition code (2 characters) DCIN=IN Job dataset DCST=ST Dataset to be staged and made permanent DCSC=SC Scratch dataset DCPR=PR Print dataset DCPU=PU Punch dataset DCPT=PT Plot dataet DCMT=MT Magnetic tape dataset
SDDAT	1	40-63	DAT address
SDNBK	2	0-15	Number of blocks to be read or written
SDSBK	2	16-39	Starting block number
SDBUF	2	40-63	I/O buffer address
SDPDS	3	0	Permanent dataset flag
SDACS	3	1-11	Dataset access flags
SDRDA	3	1	Read access flag
SDWTA	3	2	Write access flag
SDMNA	3	3	Maintenance access flag
SDSZ	3	40-63	Dataset size in 512-word blocks
SDQDT	7	31-39	Multitype flag/QDT entry index

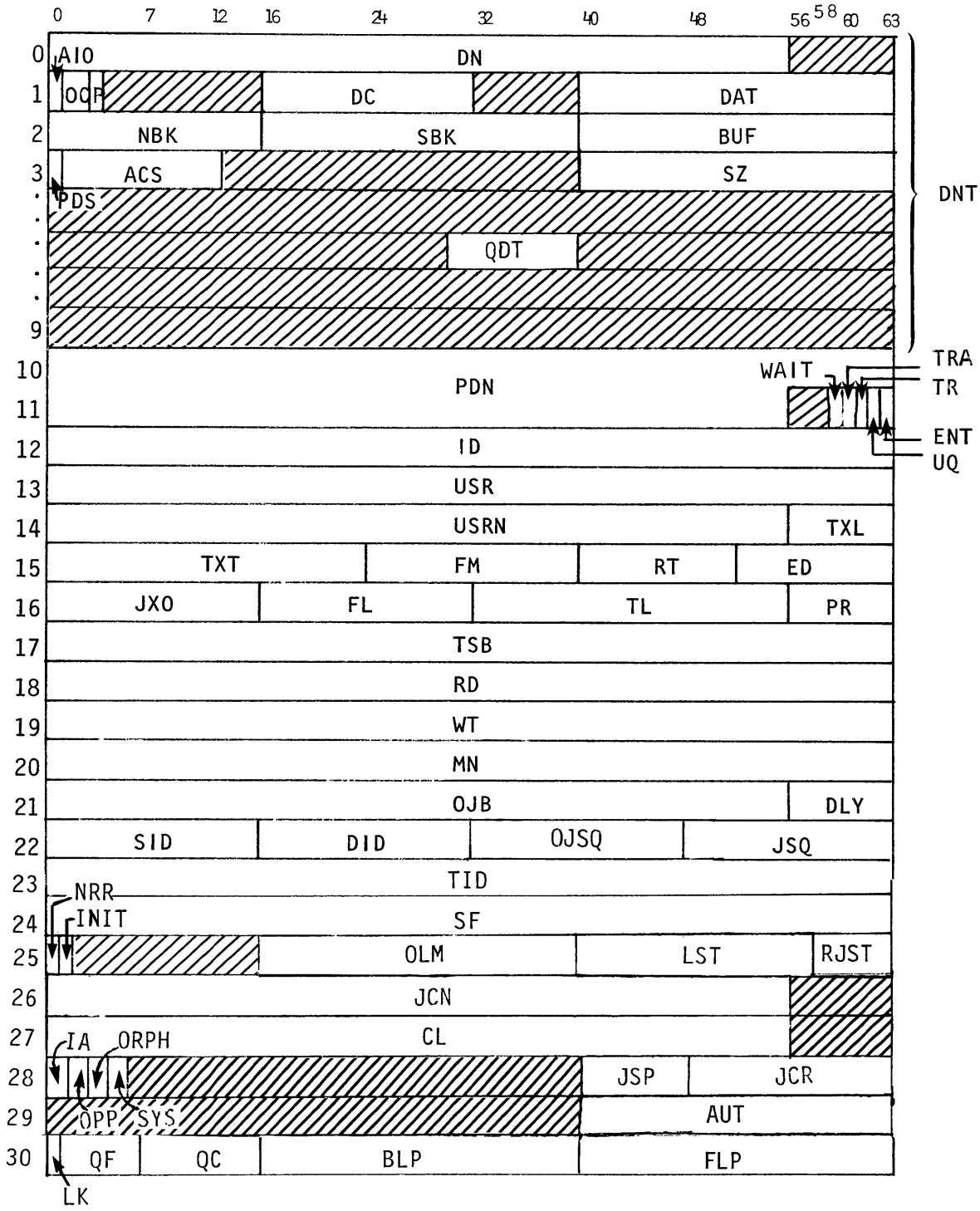


Figure 1.SD-1. SDT entry

Field	Word	Bits	Description
SDPDN	10	0-63	1-15 character permanent dataset name
SDPDN1	10	0-63	Characters 1-8 of PDN
SDPDN2	11	0-55	Characters 9-15 of PDN
SDWAIT	11	59	WAIT flag for a disposed dataset
SDTRA	11	60	Transfer request issued flag
SDTR	11	61	Transfer request flag
SDUQ	11	62	Unique access flag
SDENT	11	63	Enter system directory flag
SDID	12	0-63	User ID: 1-8 characters
SDUSR	13	0-63	Characters 1-8 of user number
SDUSRN	14	0-55	Characters 9-15 of user number
SDTXL	14	56-63	Test field length in blocks
SDTXT	15	0-23	Location of text area
SDFM	15	24-39	Format designator: two characters FMCD=CD Character/deblocked FMCB=CB Character/blocked FMBD=BD Binary/deblocked FMBB=BB Binary/blocked
SDRT	15	40-51	Retention period (0-4095 days)
SDED	15	52-63	Edition number (0-4095)
SDJXO	16	0-15	JXT offset
SDFL	16	16-31	Field length/512
SDTL	16	32-55	Time limit
SDPR	16	56-63	Priority
SDTSB	17	0-63	Time submitted
SDRD	18	0-63	Read permission control word
SDWT	19	0-63	Write permission control word
SDMN	20	0-63	Maintenance permission control word
SDOJB	21	0-55	Originating job name
SDDLY	21	6-63	Postpone delay count
SDSID	22	0-15	Source ID: two characters
SDDID	22	16-31	Destination ID: two characters
SDOJSQ	22	32-47	Originating job sequence number
SDJSQ	22	48-63	Job sequence number

Field	Word	Bits	Description
SDTID	23	0-63	Terminal ID: eight characters
SDSF	24	0-63	Special forms
SDNRR	25	0	Job rerun flag: set if job cannot be rerun
SDINIT	25	1	Job initiation flag: set if job has been initiated
SDOLM	25	10-33	Size of $OUT in 512-word blocks
SDLST	25	34-57	Pointer to current LST address
SDRJST	25	58-63	Status flag set by recovery of rolled job 0 Never initiated 1 Rerun by system recovery 2 Job not recoverable or rerunnable 3 Job statement error
SDJCN	26	0-55	Job class name
SDCL	27	0-55	CL parameter from JOB statement
SDIA	28	0	Interactive job, if set
SDOPP	28	1	Operator raised priority to 15, if set
SDORPH	28	2	Orphan job, if set
SDSYS	28	3	System job, if set
SDJSP	28	40-47	P parameter from JOB statement
SDJCR	28	48-63	Job class rank
SDAUT	29	40-63	AUT pointer (used for interactive only)
SDLK	30	0	Lock flag
SDQF	30	1-6	Queue flags
SDI	30	1	Input
SDO	30	2	Output
SDE	30	3	Execution
SDQ	30	4	Request
SDR	30	5	Receiving
SDS	30	6	Sending
SDQC	30	7-15	Queue count; used in queue head only
SDBLP	30	16-39	Backward link pointer
SDFLP	30	40-63	Forward link pointer

1.ST SYSTEM TASK TABLE - STT

The System Task Table (STT) is an EXEC-resident table used by EXEC for scheduling and controlling tasks. The table has three parts: a header, a part containing a parameter area for each task, and a part containing the exchange packages for each task. The STT is illustrated in figure 1.ST-1.

HEADER

Field	Word	Bits	Description
STTN	0	0-23	Table name; "STT" in ASCII
STRTS	1	0	Request task scheduler flag
STAID	1	44-51	Active task ID
STAPB	1	52-63	Active task parameter block address
STDEF	2	0-29	Defined task flags
STAXP	2	52-63	Active exchange package address
STBPF	4	0-63	Breakpoint flags

ENTRY (PART A)

Field	Word	Bits	Description
STSUS	0	0	Task suspend bit
STRDY	0	7	Task ready request
STPRI	0	8-15	Task priority
STID	0	16-23	Task ID
STCNT	0	24-63	Task startup count
STBO	1	40-63	BO save area
STTIME	2	0-63	Cumulative execution time
STNEC	3	0-63	Count of normal exits from task
STRTQ	4	0-63	Task time delay queue control word

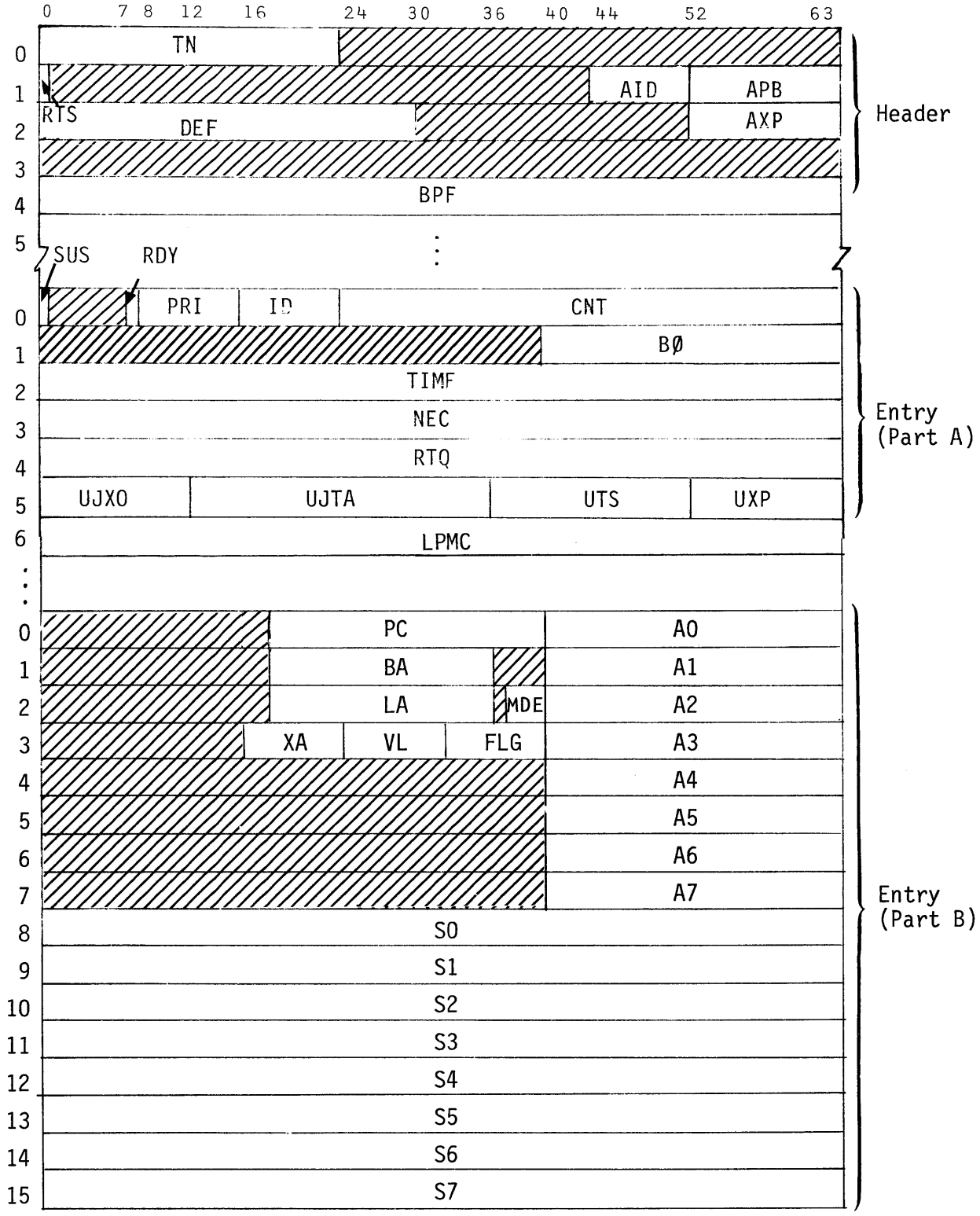


Figure 1.ST-1. System Task Table (STT)

Field	Word	Bits	Description
STUJXO	5	0-12	User job execution table offset
STUJTA	5	13-36	User job table area
STUTS	5	37-51	User time slice
STUXP	5	52-63	User XP address within EXEC
STLPMC	6	0-63	Last performance monitor call

ENTRY (PART B)

Field	Word	Bits	Description
STPC	0	18-39	Program counter
STAØ	0	40-63	AØ
STBA	1	18-35	Base address
STA1	1	40-63	A1
STLA	2	18-35	Limit address
STMDE	2	37-39	Mode flags
STA2	2	40-63	A2
STXA	3	16-23	Exchange address
STVL	3	24-30	Vector length
STFLG	3	31-39	Interrupt flags
STA3	3	40-63	A3
STA4	4	40-63	A4
STA5	5	40-63	A5
STA6	6	40-63	A6
STA7	7	40-63	A7
STSØ	8	0-63	SØ
STS1	9	0-63	S1
STS2	10	0-63	S2
STS3	11	0-63	S3
STS4	12	0-63	S4
STS5	13	0-63	S5
STS6	14	0-63	S6
STS7	15	0-63	S7

1.TB TASK BREAKPOINT TABLE - TBPT

The TBPT table is an EXEC-resident table used by EXEC for interactive debugging using breakpoints.

Figure 1.TB-1 illustrates the TBPT.

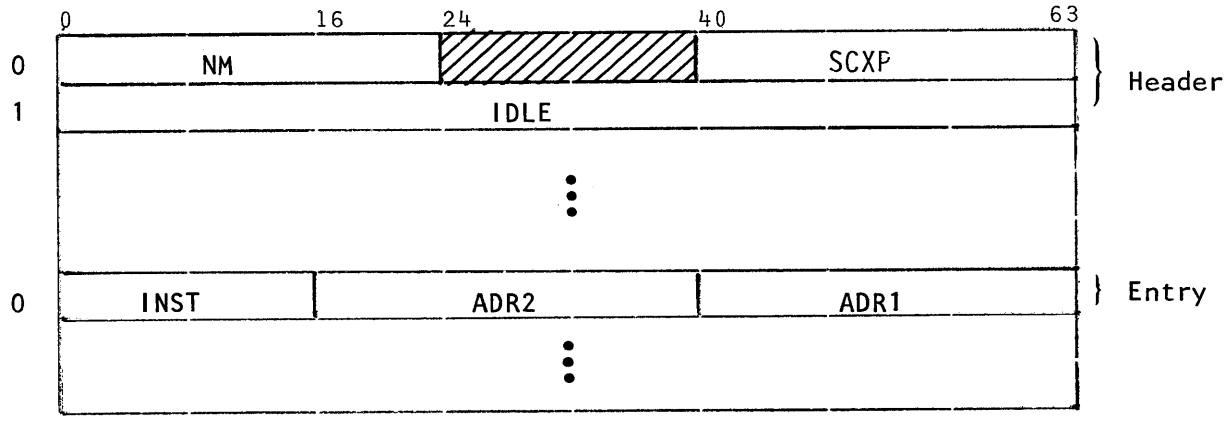


Figure 1.TB-1. Task Breakpoint Table - TBPT

HEADER

Field	Word	Bits	Description
TBNM	0	0-23	Table name; "TBP" in ASCII
TBSCXP	0	40-63	Station control word address
TBIDLE	1	0-63	Idle flag; invokes alternate part of task scheduler.

ENTRY

Field	Word	Bits	Description
TBINST	0	0-15	Instruction replaced by breakpoint
TBADR2	0	16-39	Address of breakpoint used to reset first breakpoint
TBADR1	0	40-63	Address of breakpoint

LOADER TABLE DESCRIPTIONS 2

2.1 INTRODUCTION

A relocatable binary program consists of a single record composed of a series of tables. Nine types of tables are currently defined:

Acronym	Table type (octal)	Name
BRT	15	Block relocation table
DIR	10	Directory (BUILD)
DMT	7	Debug map table
DPT	13	Duplication table
PDT	17	Program description table
SMT	11	Symbol table
TXT	16	Text table
XRT	14	External relocation table
	12	Reserved for user

The first table in a relocatable module is the program description table (PDT). The relocatable code, itself, is contained in one or more text (TXT) tables.

Each table has a prefix word that contains the table type in the leftmost four bits and the table word count in the next 24 bits. The word count serves as an offset to the beginning of the next table.

2.BRT BLOCK RELOCATION TABLE - BRT

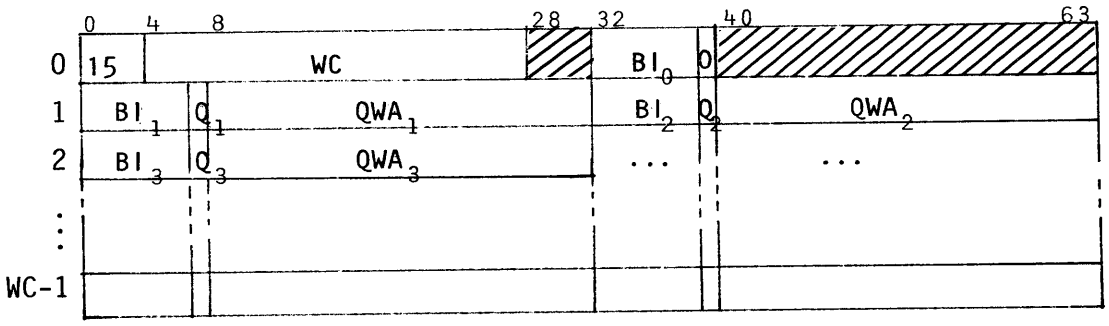
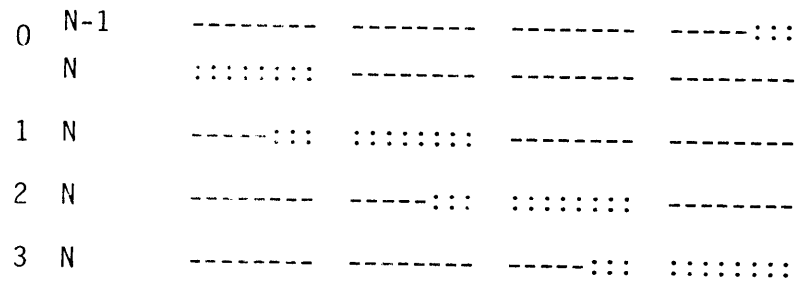


Figure 2.BRT. Block Relocation Table - BRT

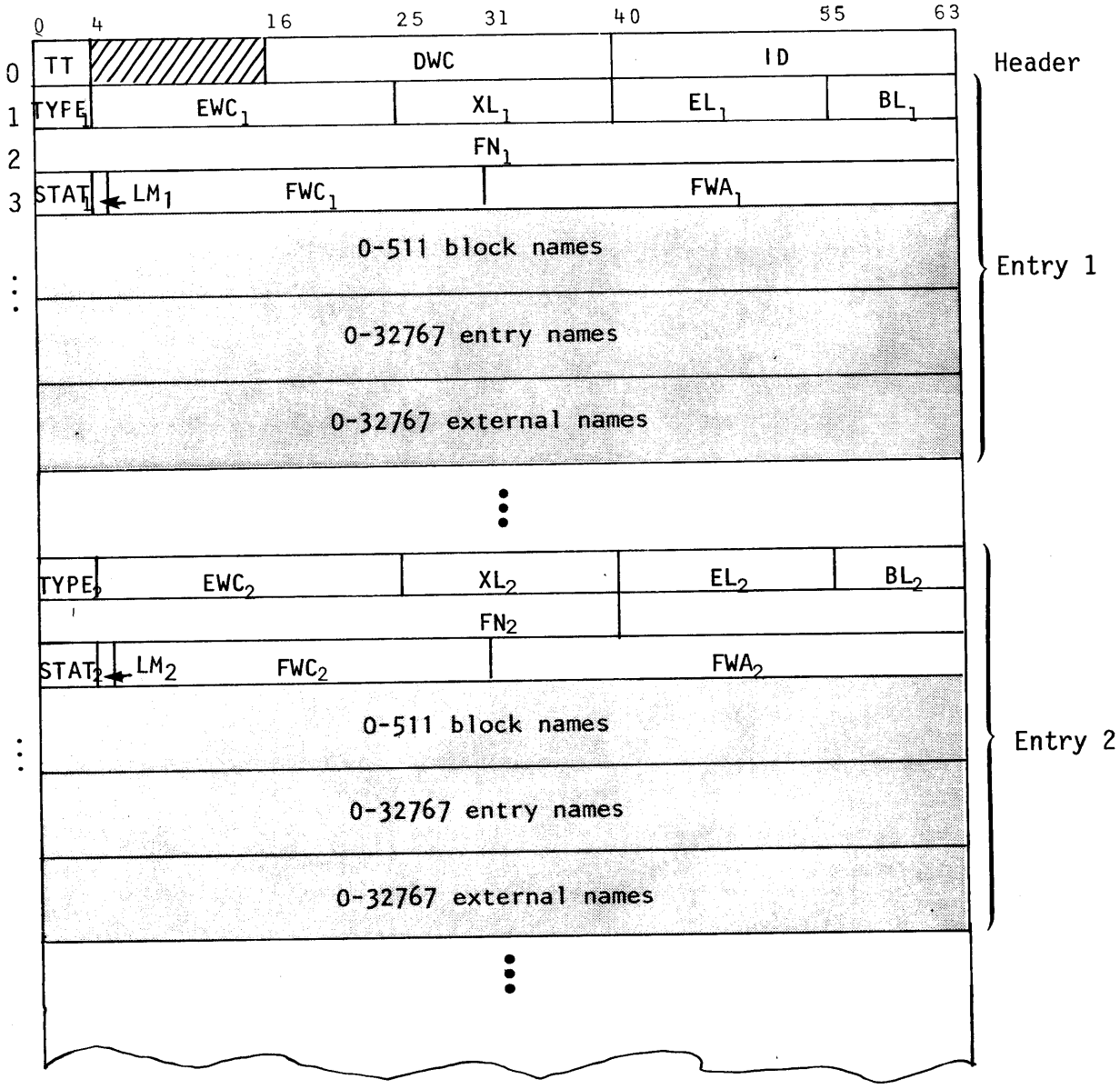
Field	Word	Bits	Description
TT	0	0-3	Table type; 15
WC	0	4-27	Table word count
BI_0		32-38	A relocation quantity to be added to the QWAs to obtain the addresses of the fields to be modified.
$BI_{1,2...n}$	1,2, ...WC-1	0-6, 32-38	Block index; specifies a block base address to be added to the relocation field as the relocation address.
$Q_{1,2...n}$	1,2, ...WC-1	7,39	Relocation mode: 0 Word address relocation is performed on relocation field. 1 Quarter word address relocation is performed. Word address relocation is generally used to relocate the address in memory read and store instructions. Quarter word address relocation is generally used to relocate addresses in branch instructions.
$QWA_{1,2...n}$	1,2, ...WC-1	8-31, 40-63	Quarter word address; indicates the parcel address of a field relative to the block BI to be modified. QWA is composed of a 22-bit word address and a 2-bit field specifying the parcel. Parcels are located within words as follows:

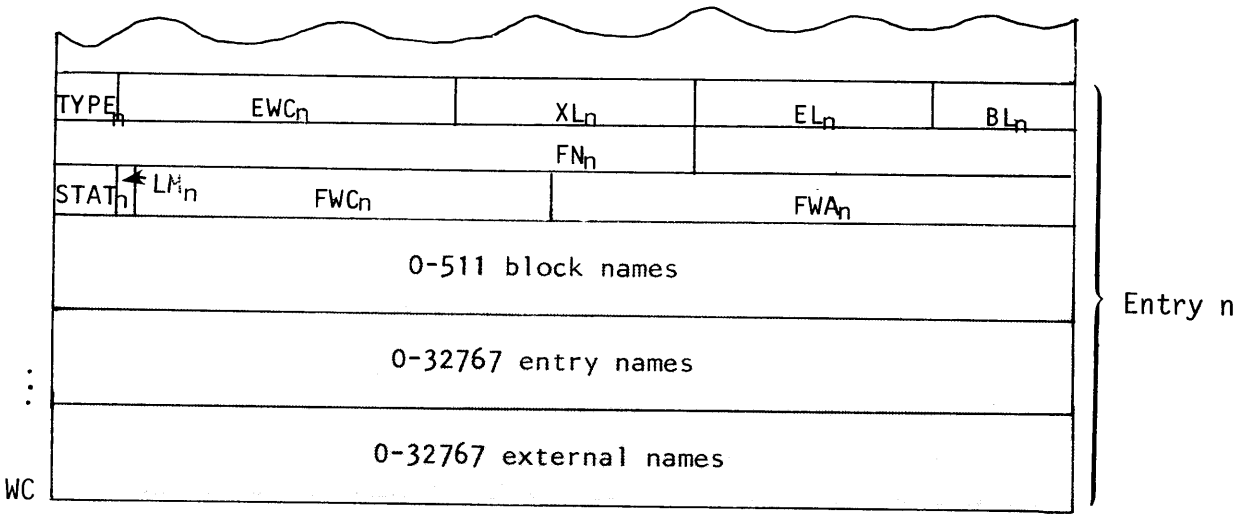


The rightmost bits of the parcel indicate the rightmost bits of the field to be relocated. The relocation is 22 bits wide. Relocation across a word boundary occurs if parcel 0 is specified.

2.DIR DIRECTORY - DIR (BUILD)

BUILD is an operating system utility program for generating and maintaining library datasets. BUILD generates a directory file consisting of a one word header followed by one variable-length entry for each program in the library dataset. A program record's entry may have any length from 3 to 66048 words.





Field	Word	Bits	Description
TT	0	0-3	Table type: 10_8
DWC	0	16-39	Directory's word count
ID	0	40-63	'DØ1' in ASCII. The Ø1 indicates the BUILD revision level, thus specifying the directory format.
TYPE	1	0-3	Entry type: 1
EWC	1	4-24	Entry's word count, 66048 maximum
XL	1	25-39	Number of external names, 32767 maximum
EL	1	40-54	Number of entry names, 32767 maximum
BL	1	55-63	Number of block names, 511 maximum
FN	2	0-63	8-character name of program module
STAT	3	0-3	Entry status: 1
LM	3	4	Load module flag (LDR set and used)
FWC	3	4-30	Program module's maximum word count, 134 x 10^6 (an approximate value for information only)
FWA	3	31-63	Program module's location, 17 x 10^9 maximum

Any of the three sets of names (block, entry, or external) may 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.

2.DMT DEBUG MAP TABLE - DMT

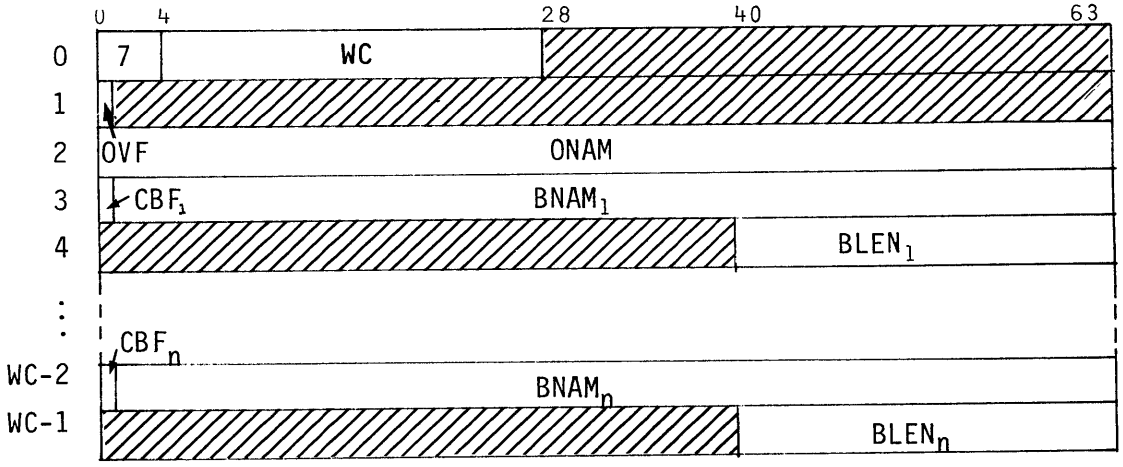


Figure 2.DMT-1. Debug map table - DMT

Field	Word	Bits	Description
TT	0	0-3	Table type; 7
WC	0	4-27	Table word count
OVF	1	0	Overlay flag; set if overlays exist
ONAM	2	0-63	Overlay name in ASCII
CBF	3,5,7..WC-2	0	Common block flag
BNAM	3,5,7..WC-2	1-63	Block name in ASCII
BLEN	4,6,8..WC-1	40-63	Length of block in words

2.DPT DUPLICATION TABLE - DPT

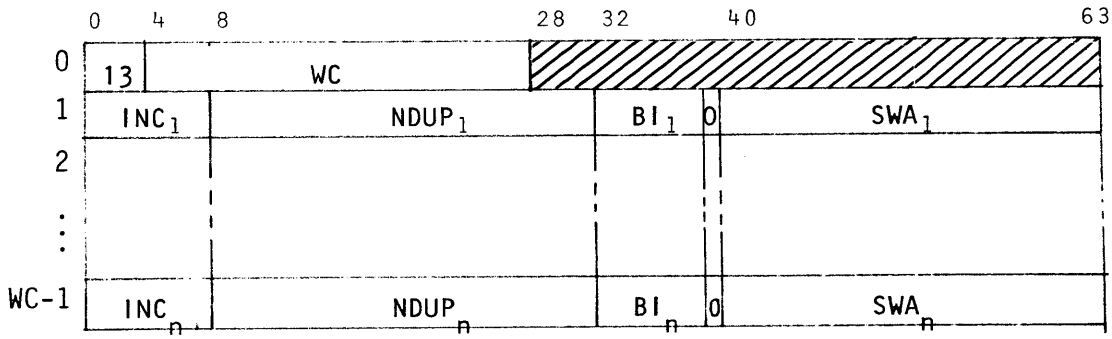


Figure 2.DPT. Duplication Table - DPT

Field	Word	Bits	Description
TT	0	0-3	Table type; 13
WC	0	4-27	Table word count
$INC_{1,2...n}$	1,2,... WC-1	0-7	Increment between stores of the source word. No duplication occurs if a zero increment is specified.
$NDUP_{1,2...n}$	1,2,... WC-1	8-31	Number of times the word at SWA is duplicated. NDUP must be nonzero.
$BI_{1,2...n}$	1,2,... WC-1	32-38	Block index; specifies the block whose base address is added to SWA in obtaining the word to be duplicated.
$SWA_{1,2...n}$	1,2,... WC-1	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.

2.PDT PROGRAM DESCRIPTION TABLE - PDT

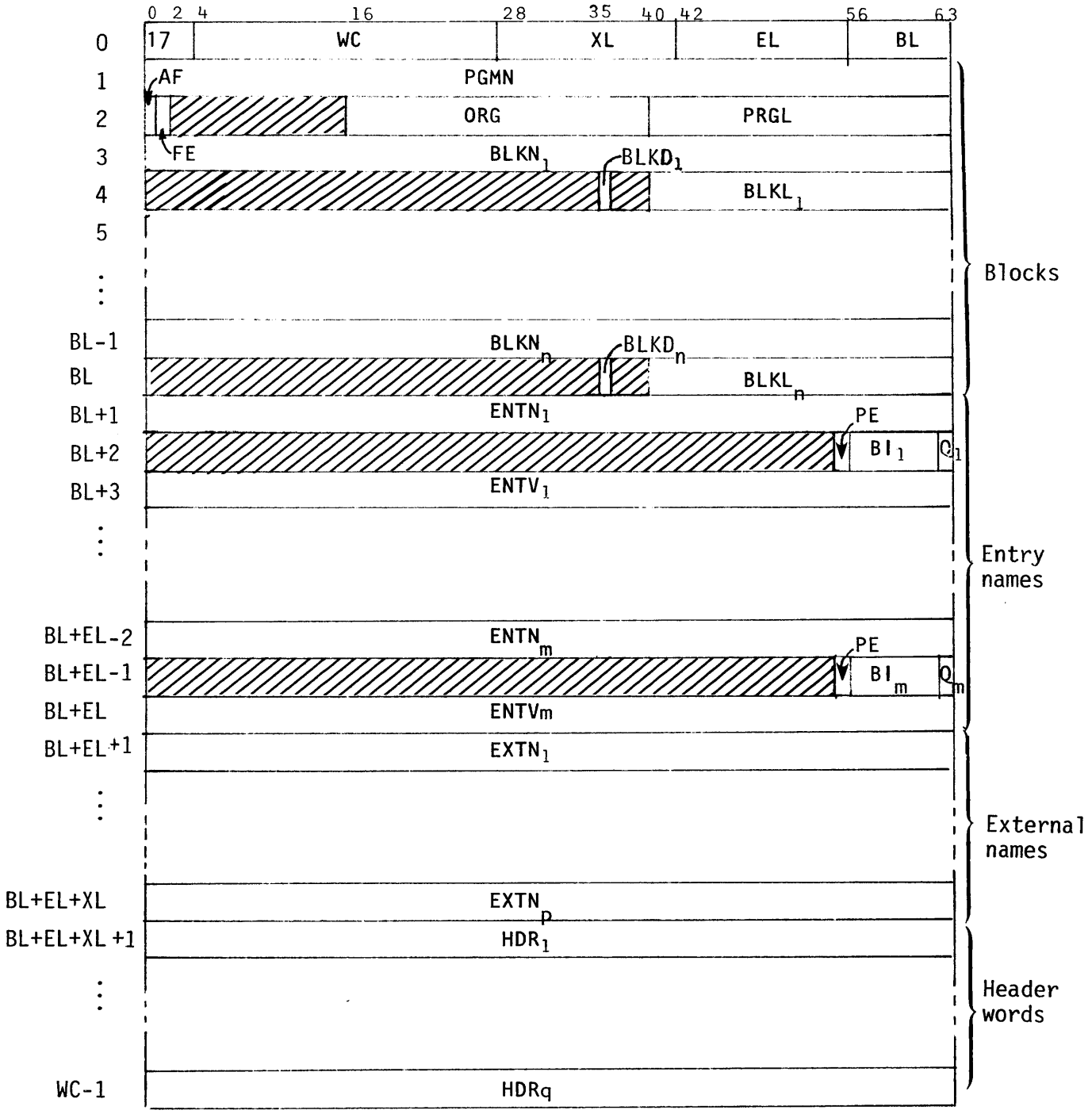


Figure 2.PDT-1. Program Description Table - PDT

Field	Word	Bits	Description
TT	0	0-3	Table type; 17
WC	0	4-27	Table word count
XL	0	28-41	Word count for external names
EL	0	42-55	Word count for entry names
BL	0	57-63	Word count for block information
PGMN	1	0-63	Program name
AF	2	0	Absolute flag; set to 1 if code has no BRT or XRT tables.
FE	2	1	Fatal error flag; set to 1 if fatal compile/assembly errors occurred. The loader ignores the binary record.
ORG	2	16-39	Origin of absolute blocks
PRGL	2	40-63	Program length in words
$BLKN_{1,2...n}$	3,5,7...	0-63	Block name
$BLKD_{1,2...n}$	4,6,8...	35	Reserved for dynamic common block indicator; not used by COS loader.
$BLKL_{1,2...n}$	4,6,8...	40-63	Length in words of named common block
$ENTN_{1,2...m}$	BL+1,+4, +7...	0-63	Entry name
$PE_{1,2...m}$	BL+2,+5, +8...	55	Primary entry flag. 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.
$BI_{1,2...m}$	BL+2,+5, +8...	56-62	Block index; specifies the block contain- 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 7-bit BI field used in all table entries defines 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 : 127 Positive to common block 125
$Q_{1,2...m}$	BL+2,+5, +8...	63	The Q field determines the relocation mode of the entry value. If the bit is set, the entry value is a parcel address and the block address is justified before relocation. If clear, relocation is performed with a word address. Note that if BI=0, the entry value is not modified.

Field	Word	Bits	Description
$ENTV_{1,2...m}$	BL+3,+6, +9...	0-63	Entry value. This is a 64-bit quantity associated with the entry name. For satisfying externals, an entry relocation quantity is determined by adding a BI block address to the entry value.
$EXTN_{1,2...p}$	BL+EL+1, +2...	0-63	External name. A name is t through 8 characters, left justified with zero fill. The string must not include the space character. Blank common is indicated in the tables either by a zero word or by the name //.
$HDR_{1,2...q}$	BL+EL+XL+1 through WC-1	0-63	PDT header data. See figure 2.PDT-2.

0	M	M	/	D	D	/	Y	Y	Date and time of compilation
1	H	H	:	M	M	:	S	S	
	C	O	S	Δ	1	.	N	N	COS revision level
	M	M	/	D	D	/	Y	Y	COS assembly date
4	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
5	C	A	L	Δ	1	.	0	0	Processor name and version
6	7	6	2	1	6	Δ	Δ	Δ	Processor level (Julian date or
7	o	...					...	o	modification level)
8	o	...					...	o	
9	o	...					...	o	Reserved for future use - hardware
10	o	...					...	o	dependencies, etc.
11	C	O	P	Y	R	I	G	H	
.	T	Δ	C	R	A	Y	Δ	R	0-80 characters of user comment left
:	E	S	E	A	R	C	H	Δ	justified, blank filled
N≤20	I	N	C	.	1	9	7	6	

Figure 2.PDT-2. PDT header data

2.SMT SYMBOL TABLE - SMT

A relocatable file may contain symbol table information for each program unit in a compilation. The information is in table type 11. A type 11 table consists of two parts: a subroutine table and one or more common block tables.

Subroutine table

The subroutine table contains information about the subroutine block, the common block(s) referenced by the subroutine, and the local symbols. Figure 2.SMT-1 illustrates the basic format of the subroutine table; for more detail, refer to the figures named in figure 2.SMT-1.

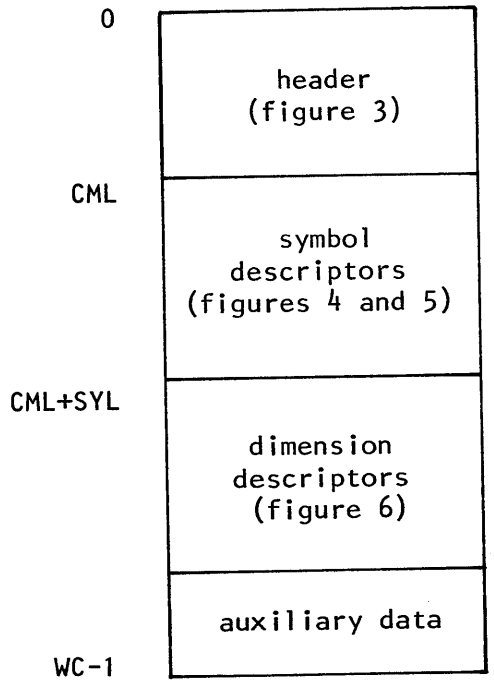


Figure 2.SMT-1. Subroutine table

Common block table

The common block table contains information about a specific common block referenced within a subroutine and the symbols that the common block contains. In a symbol table there is 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. Figure 2.SMT-2 illustrates the basic format of the common block table.

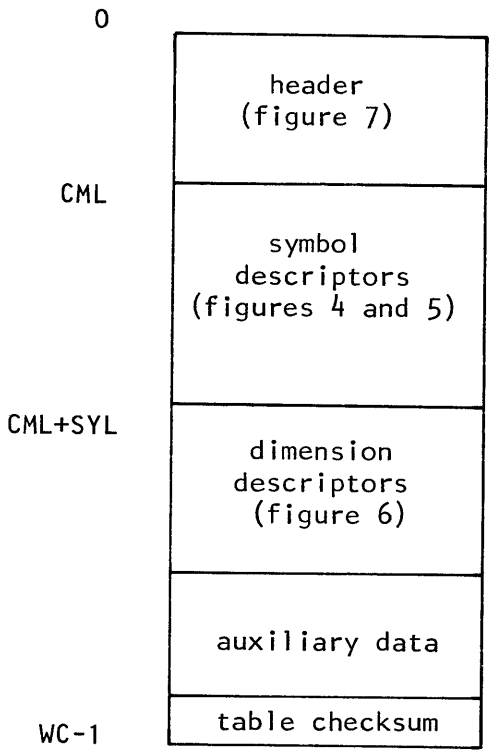


Figure 2.SMT-2. Common block table

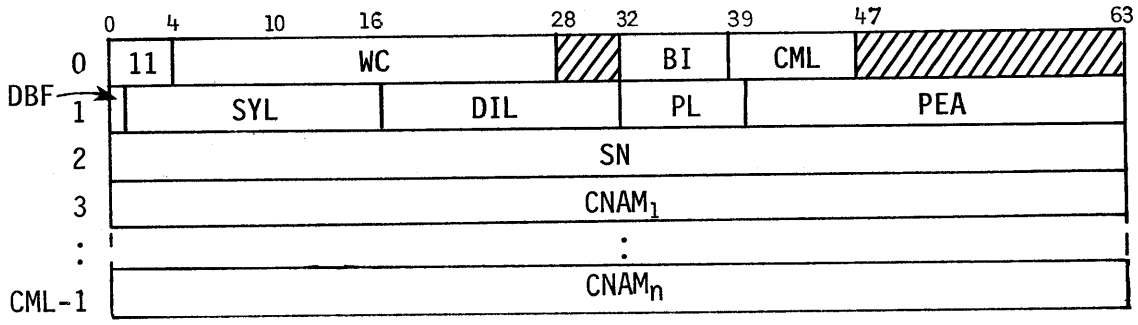


Figure 2.SMT-3. Subroutine table header

Field	Word	Bits	Description
TT	0	0-3	Table type; 11
WC	0	4-27	Table word count
BI	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).
CML	0	39-46	Length in words of named common block
DBF	1	0	Dynamic block flag 0 Static 1 Dynamic
SYL	1	1-16	Symbol block length
DIL	1	17-31	Dimension block length
PL	1	32-39	Prologue length (parcel)
PEA	1	40-63	Primary entry address (parcel)
SN	2	0-63	Subroutine name
$CNAM_1$- $CNAM_n$	3,..., CML-1	0-63	Name(s) of common block(s) referenced by the named subroutine

Symbol descriptors

Words CML through CML+SYL+1 contain descriptors of local symbols. Each descriptor (figure 2.SMT-4) 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.

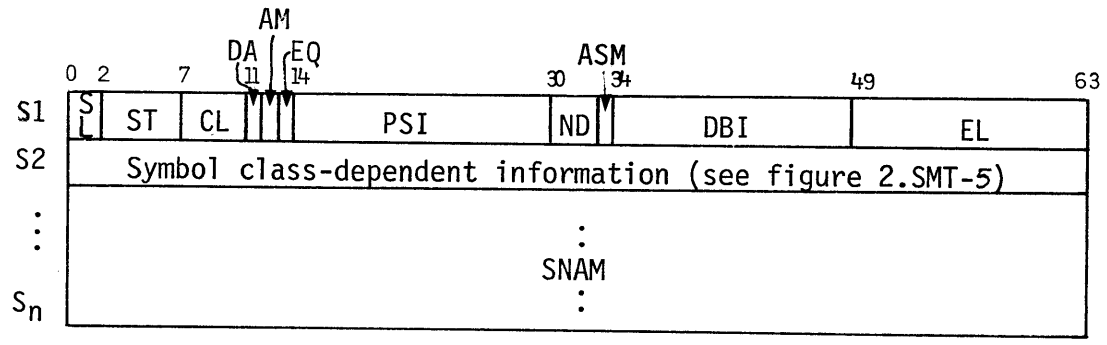


Figure 2.SMT-4. Symbol descriptor format

Field	Word	Bits	Description
SL	S1	0-1	Symbol name length-1 in words
ST	S1	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

Field	Word	Bits	Description
CL	S1	7-10	Symbol class 0 Constant 1 Register 2 Normal 3 Stack 4 Based pointer 5 Based descriptor
DA	S1	11	Dummy argument (parameter). If non-zero, the symbol is a dummy argument.
AM	S1	12	Argument mode 0 Address 1 Value
EQ	S1	13	Equivalence. If non-zero, the symbol is equivalenced.
PSI	S1	14-29	Parent symbol index. If non-zero, the index is within SYL of the top parent.
ND	S1	30-32	Number of dimensions
ASM	S1	33	Array storage mode 0 By column 1 By row
DBI	S1	34-48	Dimension block index
EL	S1	49-63	Element length (in bits)
	S2	0-63	Symbol class-dependent information; see figure 2.SMT-5. Class: Figure 0: 2.SMT-5a 1: 2.SMT-5b 2-5: 2.SMT-5c
SNAM	S3-S6	0-63	Symbol name. 1-4 words (32 character maximum) in 8-bit ASCII, left-justified, null filled to end-of-word.

Symbol class-dependent information

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

Figure 2.SMT-5a, b, and c describe the formats that word 2 of the symbol descriptor can take, based on the symbol class.

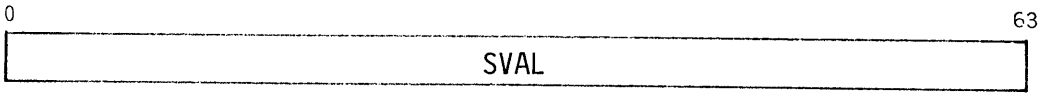


Figure 2.SMT-5a. Word CML+1 for class 0 symbols

Field	Word	Bits	Description
SVAL	CML+1	0-63	The value of the symbol

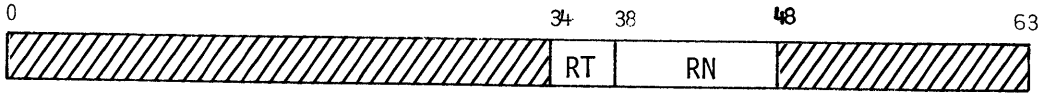


Figure 2.SMT-5b. Word CML+1 for class 1 symbols

Field	Word	Bits	Description
RT	CML+1	34-37	Register type 1 A 4 T 2 B 5 V 3 S 6 Special

Field	Word	Bits	Description
RN	CML+1	38-47	Register number or subtype. For register types 1 through 5, RN contains a register register number. For register type 6, RN contains one of the following values, right justified with zero fill: 0 Vector length register 1 Vector mask register 2-31 Channel address register 32 P register

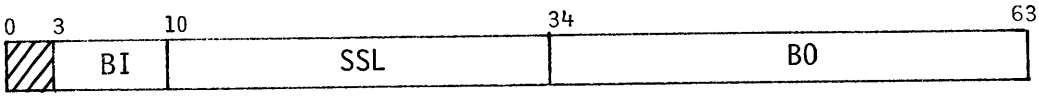


Figure 2.SMT-5c. Word CML+1 for class 2-5 symbols

Field	Word	Bits	Description
BI	CML+1	3-9	Block index
SSL	CML+1	10-33	Symbol storage length; words occupied in storage
BO	CML+1	34-63	Bit offset; offset in bits from the block base or from the parent symbol base

Dimension descriptors

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 2.SMT-6 illustrates a dimension descriptor entry.

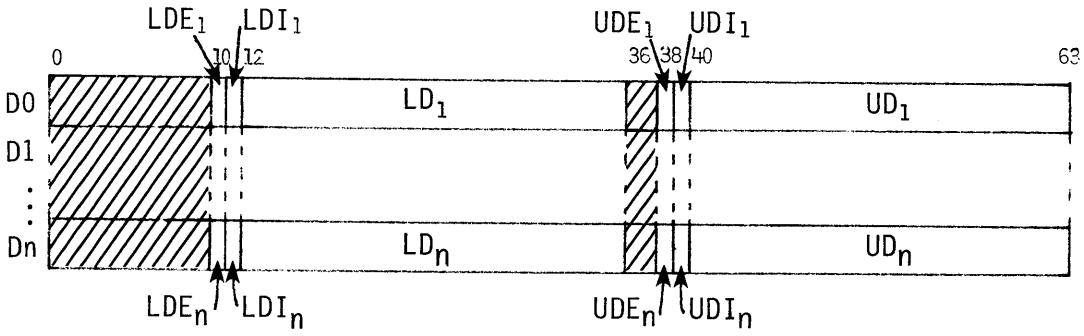
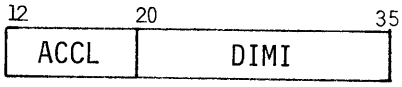


Figure 2.SMT-6. Dimension descriptor entry format

Field	Word	Bits	Description
LDE	D0,D1,...,Dn	10	Lower dimension expression. If LDE is non-zero, 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 LD field.)
LDI	D0,D1,...,Dn	11	Lower dimension indirect. If LDI is non-zero, the lower dimension contains an index into a symbol list of the symbol that contains the lower dimension value. (See description of LD field.)
LD	D0,D1,...,Dn	12-35	Lower dimension. The contents of LD depend on the values of LDE and LDI. If LDE=0 and LDI=0 then LD is the lower dimension value. If LDE≠0†, then LD consists of the following subfields:

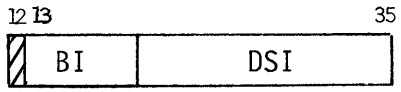


ACCL The length in half words of the access function

DIMI Index into DIL of the dimension expression

† NOTE: Cray Research software does not support LDE≠0 or UDE≠0

Field	Word	Bits	Description
			If LDI≠0†, then LD consists of the following subfields:



BI Block index

DSI Dimension symbol index

UDE	D0,D1,...,Dn	38	Upper dimension expression. (Same as LDE, for upper dimension.)
UDI	D0,D1,...,Dn	39	Upper dimension indirect. (Same as LDI, for upper dimension.)
UD	D0,D1,...,Dn	40-63	Upper dimension. The contents of UD depend on the values of UDE and UDI. The alternative formats for UD are the same as for LD.

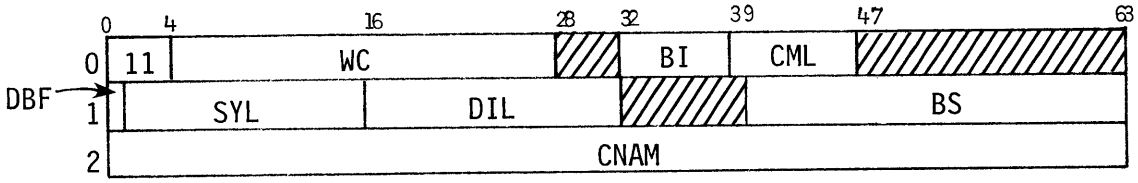


Figure 2.SMT-7. Common block table header format

Field	Word	Bits	Description
TT	0	0-3	Table type; 11
WC	0	4-27	Word count
BI	0	32-38	Block index
CML	0	39-46	Common block length
DBF	1	0	Dynamic block flag 0 Static 1 Dynamic
SYL	1	1-16	Symbol block length
DIL	1	17-31	Dimension block length
BS	1	40-63	Block size
CNAM	2	0-63	Name of common block

† NOTE: Cray Research software does not support LDI≠0 or UDI≠0

2.TXT TEXT TABLE - TXT

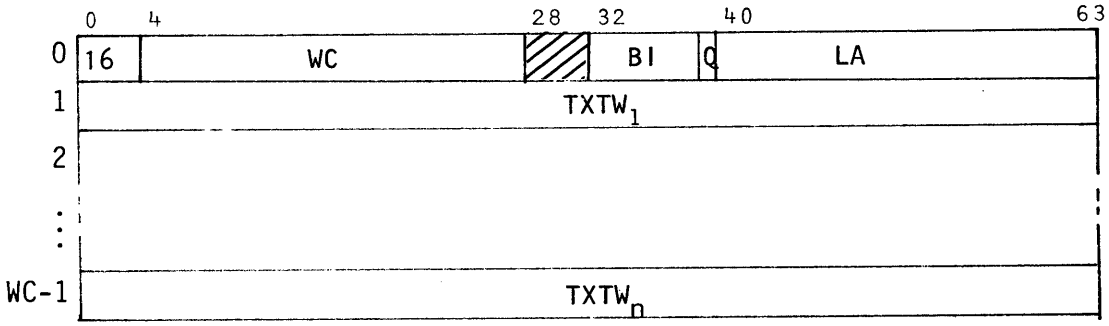


Figure 2.TXT. Text Table - TXT

Field	Word	Bits	Description
TT	0	0-3	Table type; 16
WC	0	4-27	Table word count
BI	0	32-38	Block index; specifies the block into which the text will be loaded.
Q	0	39	Relocation mode of the entry name; this field is always 0.
LA	0	40-63	Relative load address in block BI. LA is always specified as a word address.
$TXTW_{1,2...n}$	1,2...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.

2.XRT EXTERNAL RELOCATION TABLE - XRT

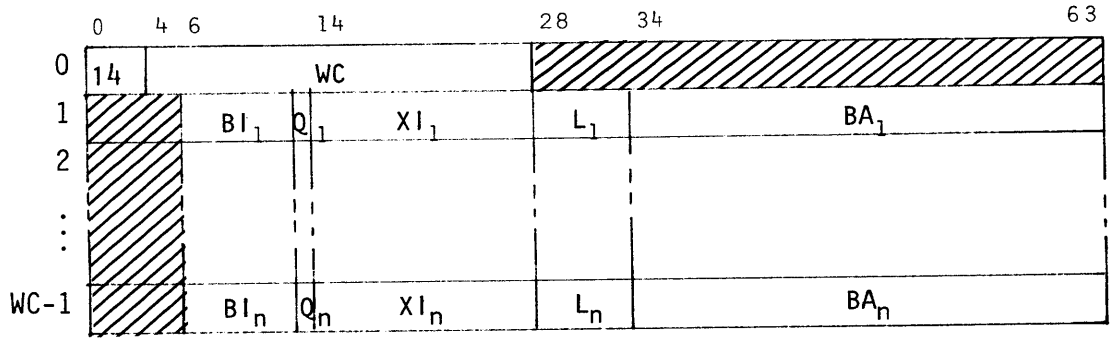


Figure 2.XRT External Relocation Table - XRT

Field	Word	Bits	Description
TT	0	0-3	Table type; 14
WC	0	4-27	Table word count
$BI_{1,2...n}$	1,2...n	6-12	Block index; defines a block address to be added to a BA in obtaining the field to be relocated (linked).
$Q_{1,2...n}$	1,2...n	13	Q flag; indicates attribute of the field to be linked. Q is set if the field requires a parcel address. Q is 0 if a word address is desired. The loader adjusts the entry values in links where the respective Q flags do not match.
$XI_{1,2...n}$	1,2...n	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.
$L_{1,2...}$	1,2...n	28-33	Length in bits of the relocation field. If L=0, the relocation field is assumed to be 64 bits, otherwise, it is the length specifield by L.
$BA_{1,2...n}$	1,2...n	34-63	Bit address of the low order bit in the field to be relocated. Relocation is performed in 2's complement arithmetic and relocation will span at most only one word boundary.

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FOLD

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