60457370

CONTROL DATA

NOS/BE VERSION 1
SYSTEM PROGRAMMER'S
REFERENCE MANUAL

Volume 2 of 2

CDC® COMPUTER SYSTEMS:
CYBER 180
CYBER 170
CYBER 70
MODELS 71, 72, 73, 74
6000

PAGE INDEX TO TABLES

60457370

CONTROL DATA

NOS/BE VERSION 1
SYSTEM PROGRAMMER'S
REFERENCE MANUAL

Volume 2 of 2

CDC® COMPUTER SYSTEMS:
CYBER 180
CYBER 170
CYBER 70
MODELS 71, 72, 73, 74
6000

REVISION RECORD

REVISION	DESCRIPTION
M (04-20-81)	Manual released. Manual divided into two volumes as of this revision. This revision supports NOS/BE Version 1.5 at PSR level 538. New features documented include support for CTI binary release and improved SECDED error logging. All material concerning INTERCOM 4 is removed to coincide with withdrawal of support for INTERCOM 4.
N (05-17-82)	Manual updated to reflect NOS/BE Version 1.5 at PSR level 564 and to make editorial and technical changes. This revision includes documentation of the Remote Host Facility (RHF) and support for the CYBER 170 Computer Systems Models 825, 835, and 855. This edition obsoletes all previous editions.
P (11-22-82)	Manual updated to reflect NOS/BE Version 1.5 at PSR level 577 and to make editorial and technical changes. This revision includes a new appendix, Remote Host Facility (RHF) Tables, and support for the CYBER 170 Computer Systems Models 865 and 875.
R (02-20-84)	Updated to support NOS/BE Version 1.5 at PSR level 604 and to make editorial and technical corrections.
T (02-22-85)	Manual updated to support NOS/BE Version 1.5 at PSR level 627 and to make editorial and technical corrections.
U (02-21-86)	Manual updated to support NOS/BE Version 1.5 at PSR level 650 and to make editorial and technical corrections.

Publication No.
60457370

REVISION LETTERS I, O, Q, S, X AND Z ARE NOT USED.

Address comments concerning this manual to:

Control Data Corporation
Publications and Graphics Division
4201 North Lexington Avenue
St. Paul, Minnesota 55126-6198

or use Comment Sheet in the back of this manual.

LIST OF EFFECTIVE PAGES

New features, as well as changes, deletions, and additions to information in this manual, are indicated by bars in the margins or by a dot near the page number if the entire page is affected. A bar by the page number indicates pagination rather than content has changed.

PAGE	REV
Front Cover	-
Inside Front Cover	U
Title Page	-
ii	U
iii	U
iv	U
v	U
vi	U
vii	U
viii	U
ix	T
x	U
xi	T
xii	U
xiii	T
A-1	M
A-2	M
A-3	M
A-4	M
A-5	M
A-6	M
A-7	M
A-8	M
A-9	M
A-10	M
A-11	M
A-12	M
B-1	T
B-2	U
B-3	R
B-4	U
B-5	U
B-6	U
B-7	T
B-8	T
B-9	U
B-10	U
B-11	T
B-12	M
B-13	T
B-14	T
B-15	U
B-16	U
B-17	U
B-18	U
B-19	U
B-20	T
B-21	T
B-22	U
B-23	T
B-24	T
B-25	T
B-26	U
B-26.1/B-26.2	U
B-27	T
B-28	T
B-29	T
B-30	T
B-31	T
B-32	T
B-33	T
B-34	T
B-35	T
B-36	T
B-37	T
B-38	T
B-39	M
B-40	T
B-41	N
B-42	T
B-43	T
B-44	T
B-45	U
B-46	U
B-46.1/B-46.2	T
B-47	N
B-48	T
B-49	N
B-50	T
B-51	N
B-52	N
B-53	U
B-54	U
B-55	U
B-56	T
B-57	T
B-58	P
B-59	U
B-60	T
B-61	T
B-62	T
B-63	N
B-64	T
B-65	N
B-66	P
B-67	T
B-68	T
B-69	N
B-70	N
B-71	N
B-72	N
B-73	N
B-74	N
B-75	U
B-76	T
B-77	T
B-78	U
B-79	M
B-80	P
B-81	M
B-82	N
B-83	U
B-84	P
B-85	T
B-86	U
B-87	U
B-88	U
B-89	U
B-90	M
B-91	M
B-92	U
B-93	M
B-94	T
B-94.1	T
B-94.2	T
B-95	T
B-96	U
B-97	U
B-98	U
B-99	U
B-100	U
B-101	M
B-102	U
B-103	T
B-104	U
B-105	T
B-106	U
B-107	U
B-108	U
B-109	U
B-110	M
B-111	M
B-112	U
B-113	U
B-114	M
B-115	N
B-116	U
B-117	U
B-118	U
B-119	U
B-120	U
B-120.1/B-120.2	U
B-121	U
B-122	U
B-123	N
B-124	T
B-125	T
B-126	U
B-127	T
B-128	T
B-129	T
B-130	M
B-131	N
B-132	M
B-133	N
B-134	U
B-135	U
B-136	U
B-136.1/B-136.2	U
B-136.3	U
B-136.4	U
B-136.5	U
B-136.6	U
B-136.7	U
B-136.8	U
B-136.9	U
B-136.10	U
B-136.11	U
B-136.12	U
B-136.13	U
B-136.14	U
B-136.15	U
B-136.16	U
B-136.17	U
B-137	M
B-138	N
B-139	N
B-140	N
B-141	M
B-142	M
B-143	N
B-144	N
B-144.1/B-144.2	U
B-145	T
B-146	N
B-147	T
B-148	N
B-149	N
B-150	M
B-151	U
B-152	U
B-153	N
B-154	U
B-155	U
B-156	N
B-157	M
B-158	N
B-159	N
B-160	N
B-161	M
B-162	U
B-163	M
B-164	M
B-165	M
B-166	P
B-167	N
B-168	M
B-169	R
B-170	N
B-171	M
B-172	T
B-173	P
B-174	N
B-175	N
B-176	M
B-177	M
B-178	T
B-179	M
B-180	M
C-1	U
C-2	U
C-3	U
C-4	T
C-4.1/C-4.2	T
C-5	T
C-6	T
C-7	T
C-8	U
C-9	T
C-10	T
C-11	T
C-12	T
C-12.1	T
C-12.2	U
C-12.3	U
C-12.4	T
C-12.5	T
C-12.6	T
C-13	T
C-14	U
C-15	U
C-16	T
C-17	T
C-18	T
C-19	T
C-20	T
C-20.1/C-20.2	U
C-21	N
C-22	N
C-23	M
C-24	M
C-25	M
C-26	M
C-27	M
C-28	M
C-29	M
D-1	M
D-2	P
D-3	P
D-4	M
D-5	M
D-6	M
D-7	U
D-8	M
D-9	M
D-10	M
D-11	U
D-12	M
D-13	M
D-14	M
D-15	T
D-16	M
D-17	U
D-18	P
D-19	N
D-20	M
D-21	M
D-22	M
D-23	M
D-24	M
D-25	N

PAGE	REV
D-26	M
D-27	M
E-1	T
E-2	U
E-3	T
E-4	T
E-5	T
E-6	U
E-7	T
E-8	N
E-9	N
E-10	N
E-11	N
E-12	N
E-13	M
E-14	M
E-15	M
E-16	M
F-1	M
F-2	N
G-1	N
G-2	N
G-3	P
G-4	N
H-1	T
H-2	T
H-3	T
H-4	T
H-5	T
H-6	U
H-7 through H-8.1/H-8.2	U
H-9	U
H-10	U
H-10.1/H-10.2	U
H-11	U
H-12	U
H-13	U
H-14	U
H-15	P
H-16	T
H-17	T
H-18	R
H-18.1	R
H-18.2	R
H-19	P
H-20	U
H-21	P
H-22	R
H-23	R
H-24	U
H-25	U
H-26	U
H-27	T
H-28	U
H-28.1/H-28.2	U
H-29	U
H-30	P
H-31	P
H-32	P
H-32.1/H-32.2	R
H-33	P
H-34	T
H-35	R
H-36	R
H-36.1/H-36.2	R
H-37	P
H-38	T
H-39	U
H-40	R
H-41	P

PAGE	REV
H-42	T
H-43	T
H-44	R
H-45	T
H-46	U
H-46.1/H-46.2	U
H-47	P
H-48	T
H-49	P
H-50	P
Index-1	U
Index-2	U
Index-3	T
Index-4	U
Index-5	T
Index-6	T
Index-7	U
Index-8	U
Index-9	U
Index-10	T
Index-11	T
Index-12	T
Index-13	T
Index-14	T
Comment Sheet	U
Back Cover	-

PAGE	REV

PAGE	REV

PAGE	REV

PREFACE

This manual describes the CONTROL DATA® Network Operating System/Batch Environment (NOS/BE) Version 1.5. NOS/BE can operate on the following computer systems:

CDC® CYBER 180 Computer Systems
Models 810, 830, 835, 840, 845, 850, 855, 860, and 990

CDC CYBER 170 Computer Systems
Models 171, 172, 173, 174, 175, 176, 720, 730, 740, 750, 760, 815, 825, 835, 845, 855, 865, and 875

CDC CYBER 70 Computer Systems
Models 71, 72, 73, and 74

CDC 6000 Computer Systems

ORGANIZATION

This manual is the second volume of the NOS/BE System Programmer's Reference Manual which comprises two volumes. It is written for system programmers who perform system evaluation or program modification.

Volume 1 describes the system interface with the central processor and peripheral processors, input/output, job processing, permanent file manipulation, and various system utilities.

Volume 2 contains system tables and file formats divided into the following general areas: character sets, central memory, job control point, disk and files, extended core storage, and symbol definitions. In general, the central memory tables, extended core storage tables, disk tables, and file formats are of interest only to system programmers. The character set tables and job control point tables are of interest to all users of the product set. Job control point tables can be used by central processor programs running at any control point. The tables in the appendixes serve as reference material for those familiar with the system and its product set. More detailed information is available in the various reference manuals and internal maintenance specifications.

CONVENTIONS

CENTRAL MEMORY WORD FORMATS

Conventions for central memory word formats are as follows:

- Crosshatching indicates a field is not used by or is not applicable to a function processor. However, Control Data reserves the right to assign these fields to system use in the future.
- Fields reserved for system use are so labeled.
- Fields with numeric labels indicate the actual value that is used or returned for a particular function. Numeric identifiers are octal unless otherwise noted.

CYBER 70 COMPUTER SYSTEMS

The term CYBER 70 Computer Systems refers to models 71, 72, 73, and 74 only.

170-CLASS MAINFRAMES

The term 170-class mainframes refers to CYBER 170 models 171, 172, 173, 174, 175, 176, 720, 730, 740, 750, 760, 865, and 875.

180-CLASS MAINFRAMES

The term 180-class mainframes refers to CYBER 180 models as well as CYBER 170 models 815, 825, 835, 845, and 855, which have most of the functional and architectural attributes of the CYBER 180 mainframes.

EXTENDED MEMORY

Extended memory for model 176 is large central memory extended (LCME). Extended memory for the 180-class mainframes is unified extended memory (UEM).

Extended memory for models 865 and 875 is UEM, extended core storage (ECS), or extended semiconductor memory (ESM). Extended memory for all other NOS/BE computer systems is ECS and ESM. ECS and ESM in 24-bit format standard addressing mode (sometimes called ECS mode) are the only forms of extended memory that can be shared in a multimainframe complex, can be accessed by a distributive data path (DDP), and can be used as a station link medium. In this manual, ECS refers to both ECS and ESM, and extended memory (EM) refers to all forms of extended memory.

CONTROL STATEMENT AND MACRO FORMATS

In the sections that describe the control statements or macros, the control statement or macro formats must be followed carefully. All uppercase letters must be entered exactly as shown and all lowercase letters must be replaced with the appropriate characters as described after the format.

Unless otherwise indicated, bit and byte numbers are given in decimal; word addresses, field and table lengths, and block and page sizes are given in octal. Unless reserved for a specific purpose or group, all currently unused fields, names, codes, and so on are reserved for future development.

SUBMITTING COMMENTS

The last page of this manual is a comment sheet. Please use this comment sheet to give us your opinion of the manual, to suggest specific improvements, and to report technical or typographical errors. If the comment sheet has already been used, you can mail your comments to:

Control Data Corporation
Publications and Graphics Division ARH219
4201 North Lexington Avenue
St. Paul, Minnesota 55126-6198

Please include the manual title, publication number, and revision level with each inquiry, and indicate whether or not you would like a reply.

If you have access to SOLVER, an online facility for reporting problems, you can use it to submit comments about the manual. Use NB0 as the product identifier.

RELATED PUBLICATIONS

Programming information for the various forms of extended memory can be found in the COMPASS Reference Manual and in the appropriate computer system hardware reference manual. Hardware descriptions of the various forms of extended memory can be found in the following manuals.

Control Data Publication	Publication Number
Extended Semiconductor Memory Hardware Reference Manual	60455990
Extended Core Storage Reference Manual	60347100
Extended Core Storage II and Distributive Data Path Reference Manual	60430000

The NOS/BE Manual Abstracts is a pocket-sized manual containing brief descriptions of the contents and intended audience of all NOS/BE and product manuals. The abstracts can be useful in determining which manuals are of greatest interest to a particular user.

The following is a list of NOS/BE operating system manuals, NOS/BE product set reference manuals, and other manuals of interest.

Manuals, except for the NOS/BE System Programmer's Reference Manual, Volumes 1 and 2, are available through Control Data sales offices or Control Data Literature Distribution Services (308 North Dale, St. Paul, Minnesota 55103). The NOS/BE System Programmer's Reference Manual, Volumes 1 and 2, is available through Software Manufacturing Distribution (ARH230, 4201 North Lexington Avenue, St. aul, Minnesota 55112).

Control Data Publication	Publication Number
CYBER Loader Reference Manual	60429800
CYBER Record Manager Advanced Access Methods Version 2 Reference Manual	60499300
CYBER Record Manager Basic Access Methods Version 1.5 Reference Manual	60495700
CYBER 170 Computer Systems Model 825 Hardware Reference Manual	60469350
CYBER 170 Computer Systems Models 835 and 855 Hardware Reference Manual	60469290
CYBER 170 Computer Systems Models 865 and 875 Hardware Reference Manual	60468920
EXPORT High Speed Reference Manual	60456880

Control Data Publication	Publication Number
Export/Inport Reference Manual	60436200
Extended Core Storage Reference Manual	60347100
Extended Semiconductor Memory Hardware Reference Manual	60455990
INTERCOM Version 5 Reference Manual	60455010
NOS/BE Version 1 Diagnostic Handbook	60494400
NOS/BE Version 1 Diagnostic Index	60456490
NOS/BE Version 1 Installation Handbook	60494300
NOS/BE Version 1 Operator's Guide	60493900
NOS/BE Version 1 Reference Manual	60493800
NOS/BE Version 1 System Programmer's Reference Manual, Volume 1 of 2	60494100
Remote Host Facility Access Method Reference Manual	60459990
SCOPE Version 2 Operator's Guide	60455090
Software Publications Release History	60481010
Update Reference Manual	60449900
NOS/BE Version 1 Manual Abstracts	84000470

DISCLAIMER

This product is intended for use only as described in this document. Control Data cannot be responsible for the proper functioning of undescribed features or undefined parameters.

CONTENTS

VOLUME 1

INDEX

FIGURES

TABLES

VOLUME 2

APPENDIXES

CHARACTER SETS A

A character set is composed of graphic and/or control characters. A code set is a set of codes used to represent each character within a character set.

A graphic character may be displayed at a terminal or printed by a line printer. Examples are the characters A through Z and the digits 0 through 9. A control character initiates, modifies, or stops a control operation. An example is the backspace character that moves the terminal carriage or cursor back one space. Although a control character is not a graphic character, a terminal may produce a graphic representation when it receives a control character.

All references within this manual to ASCII character sets or ASCII code set refer to the character sets and code set defined in the American National Standard Code for Information Interchange (ASCII, ANSI Standard X3.4-1977).

NOS/BE supports the following character sets.

- CDC graphic 64- (or 63-) character set.
- ASCII 128-character set.
- ASCII graphic 64- (or 63-) character set.
- ASCII graphic 95-character set.

Each installation selects either the 64-character set or the 63-character set. The differences between the two are described in Character Set Anomalies later in this appendix.

NOS/BE supports the following code sets.

- Display code.
- 12-bit ASCII code.

Display code is a set of 6-bit codes from 00_8 to 77_8.

The 12-bit ASCII code is the ASCII 7-bit code (as defined by ANSI Standard X3.4-1977) right-justified in a 12-bit byte. Assuming that the bits are numbered from the right starting with 0, bits 0 through 6 contain the ASCII code, bits 7 through 10 contain zeros, and bit 11 distinguishes the 12-bit ASCII 0000_8 code from the end-of-line byte. The 12-bit codes are 0001_8 through 0177_8 and 4000_8.

CHARACTER SET ANOMALIES

NOS/BE interprets the codes for the colon and the percent graphic characters differently when the installation selects the 63-character set rather than the 64-character set. In tables A-1 and A-2 the codes for the colon and percent graphic characters in the 64-character set are unshaded; the codes for the colon and percent graphic characters in the 63-character set are shaded. If an installation uses the 63-character set, the colon graphic character is always represented by a 63_8 code.

Also, two or more consecutive 00_8 codes may be confused with an end-of-line byte and should be avoided.

CHARACTER SET TABLES

This appendix contains character set tables for INTERCOM users, batch users, and magnetic tape users. Table A-1 is for INTERCOM users, and table A-2 is for batch users. Tables A-3, A-4, and A-5 are for magnetic tape users and list the magnetic tape codes and their display code equivalents.

The character set tables are designed so the user can either find the character represented by a code (such as in a dump) or find the code that represents a character. To find the character represented by a code, the user looks up the code in the column listing the appropriate code set and then reads across the table to find the character on that line in the column listing the appropriate character set. To find the code that represents a character, the user first looks up the character and then reads across the table to find the code on the same line in the appropriate code column.

INTERCOM USERS

Table A-1 shows the character sets and code sets available to an ASCII code terminal user. When communicating with a terminal, NOS/BE displays by default the ASCII graphic 64- or 63-character set and interprets all input and output as display code. COMPASS and FORTRAN users can elect to use 12-bit ASCII code if the terminal in use will support the code set selected. Refer to the INTERCOM Reference Manual.

BATCH USERS

Table A-2 lists the CDC graphic 64- or 63-character set, the ASCII graphic 64- or 63-character set, and the ASCII graphic 95-character set. It also lists the code sets and card punch codes (026 and 029) that represent the characters.

The 64- or 63-character sets use display code as their code set; the 95-character set uses 12-bit ASCII code. The 95-character set is composed of all the characters in the ASCII 128-character set that can be printed at a line printer (refer to Line Printer Use later in this appendix). Only 12-bit ASCII code files can be printed using the ASCII graphic 95-character set.

LINE PRINTER USE

The print train used determines which batch character set is printed (refer to the ROUTE control statement in section 4). Following is a list of the print trains and their corresponding batch character sets.

Character Set	Print Train
CDC graphic 64- or 63-character set	596-1
ASCII graphic 64- or 63-character set	596-5
ASCII graphic 95-character set	596-6

The characters of the default 596-1 print train are listed in table A-2 in the column labeled CDC Graphic (64 or 63 Characters); the 596-5 print train characters are listed in table A-2 in the column labeled ASCII Graphic (64 or 63 Characters); and 596-6 print train characters are listed in table A-2 in the column labeled ASCII Graphic (95 Characters).

If a transmission error occurs when printing a line, the system stops printing and alerts the operator, who must decide what action to take. The operator ususally decides to rewind the print file and return it to the print queue. An installation option is available which allows print errors to be automatically overridden.

If an unprintable character exists in a line (that is, a 12-bit ASCII code outside the range 0040_8 through 0176_8), the number sign (#) appears in the first printable column of a print line, and a space replaces the unprintable character.

PUNCHED CARD INPUT AND OUTPUT

Punched card data falls into two categories.

- Coded data.
- Binary data.

Coded data is data converted from (or to) a punched card code to (or from) a character set code recognizable by a software product as representing a conventional character. Binary data does not require such conversion. Binary data in this context is usually manipulated in offline operations involving card-to-tape or tape-to-card transmissions, storage of relocated programs, and so forth.

Under NOS/BE, alternative card keypunch codes are available for input of the CDC characters ∨ and < or their ASCII equivalents ! and <.

Depending on which (if any) installation option is selected, the system assumes an input deck has been punched either in 026 or in 029 keypunch mode (regardless of the character set in use). The alternative mode can be specified by a 26 or 29 punched in columns 79 and 80 of the job card or any 7/8/9 card. The mode remains in effect throughout the job unless it is changed by a mode specified on a subsequent 7/8/9 card.

MAGNETIC TAPE USERS

Coded data to be copied from mass storage to magnetic tape is assumed to be represented in display code. NOS/BE converts the data to external BCD code when writing a coded seven-track tape and to ASCII or EBCDIC code (as specified on the tape assignment statement) when writing a coded nine-track tape.

Because only 63 characters can be represented in seven-track even parity, one of the 64 display codes is lost in conversion to and from external BCD code. The following shows the difference in conversion depending on the character set (63 or 64 characters) which the system uses. The ASCII character for the specified character code is shown in parentheses. The output arrow shows how the display code changes when it is written on tape in external BCD. The input arrow shows how the external BCD code changes when the tape is read and converted to display code.

63-Character Set					64-Character Set				
Display Code		External BCD		Display Code	Display Code		External BCD		Display Code
00		16 (%)		00	00 (:)		12 (0)		33 (0)
33 (0)	Output →	12 (0)	Input →	33 (0)	33 (0)	Output →	12 (0)	Input →	33 (0)
63 (:)		12 (0)		33 (0)	63 (%)		16 (%)		63 (%)

If lowercase ASCII or EBCDIC code is read from a nine-track coded tape, it is converted to its uppercase 6-bit display code equivalent. To read and write lowercase ASCII or EBCDIC characters, the user must assign the tape in binary mode and perform his own conversion of the binary data.

Tables A-3 and A-4 show the character set conversions for nine-track tapes. Table A-3 lists the conversions to and from the ASCII character code and display code. Table A-4 lists the conversions between the EBCDIC character code and the display code. Table A-5 shows the character set conversions between external BCD and display code for seven-track tapes.

TABLE A-1. INTERCOM CHARACTER SETS

ASCII Graphic (64 Char)	ASCII Character (128 Char)	Display Code	12-Bit ASCII Code	ASCII Graphic (64 Char)	ASCII Character (128 Char)	Display Code	12-Bit ASCII Code
: colon †		00†		# num. sign	# num. sign	60	0043
Display code 00 is undefined at sites using the 63-character set.				[l. bracket	[l. bracket	61	0133
				] r. bracket	] r. bracket	62	0135
A	A	01	0101	% †	% †	63†	0045
B	B	02	0102	: colon	: colon	63	0072
C	C	03	0103	" quote	" quote	64	0042
D	D	04	0104	_ underline	_ underline	65	0137
E	E	05	0105	!	!	66	0041
F	F	06	0106	& ampersand	& ampersand	67	0046
G	G	07	0107				
				' apostrophe	' apostrophe	70	0047
				?	?	71	0077
H	H	10	0110	<	<	72	0074
I	I	11	0111	>	>	73	0076
J	J	12	0112	@		74	
K	K	13	0113	\ rev. slant	\ rev. slant	75	0134
L	L	14	0114	^ circumflex		76	
M	M	15	0115	; semicolon	; semicolon	77	0073
N	N	16	0116				
O	O	17	0117		@		0100
					^ circumflex		0136
					: colon †		0072
P	P	20	0120		X		0045
Q	Q	21	0121		` grave accent		0140
R	R	22	0122				
S	S	23	0123		a		0141
T	T	24	0124		b		0142
U	U	25	0125		c		0143
V	V	26	0126		d		0144
W	W	27	0127		e		0145
					f		0146
X	X	30	0130		g		0147
Y	Y	31	0131				
Z	Z	32	0132		h		0150
0	0	33	0060		i		0151
1	1	34	0061		j		0152
2	2	35	0062		k		0153
3	3	36	0063		l		0154
4	4	37	0064		m		0155
					n		0156
					o		0157
5	5	40	0065				
6	6	41	0066		p		0160
7	7	42	0067		q		0161
8	8	43	0070		r		0162
9	9	44	0071		s		0163
+	+	45	0053		t		0164
-	-	46	0055		u		0165
*	*	47	0052		v		0166
					w		0167
/	/	50	0057		x		0170
(	(	51	0050		y		0171
)	)	52	0051		z		0172
$	$	53	0044		{ left brace		0173
=	=	54	0075		| vert. line		0174
space	space	55	0040		} right brace		0175
, comma	, comma	56	0054		~ tilde		0176
. period	. period	57	0056		DEL		0177

†The interpretation of this character or code may depend on its context. Refer to Character Set Anomalies elsewhere in this appendix.

00028
1 OF 2

TABLE A-1. INTERCOM CHARACTER SETS (Contd)

ASCII Graphic (64 Char)	ASCII Character (128 Char)	Display Code	12-Bit ASCII Code	ASCII Graphic (64 Char)	ASCII Character (128 Char)	Display Code	12-Bit ASCII Code
	NUL		4000		DLE		0020
	SOH		0001		DC1		0021
	STX		0002		DC2		0022
	ETX		0003		DC3		0023
	EOT		0004		DC4		0024
	ENQ		0005		NAK		0025
	ACK		0006		SYN		0026
	BEL		0007		ETB		0027
	BS		0010		CAN		0030
	HT		0011		EM		0031
	LF		0012		SUB		0032
	VT		0013		ESC		0033
	FF		0014		FS		0034
	CR		0015		GS		0035
	SO		0016		RS		0036
	SI		0017		US		0037

00028
2 OF 2

TABLE A-2. BATCH CHARACTER SETS

CDC Graphic (64 Char)	ASCII Graphic (64 Char)	ASCII Graphic (95 Char)	Display Code	12-Bit ASCII Code	Punch Code	
					026	029
: colon†	: colon†		00†		8-2	8-2
Display code 00 is undefined at sites using the 63-character set.						
A	A	A	01	0101	12-1	12-1
B	B	B	02	0102	12-2	12-2
C	C	C	03	0103	12-3	12-3
D	D	D	04	0104	12-4	12-4
E	E	E	05	0105	12-5	12-5
F	F	F	06	0106	12-6	12-6
G	G	G	07	0107	12-7	12-7
H	H	H	10	0110	12-8	12-8
I	I	I	11	0111	12-9	12-9
J	J	J	12	0112	11-1	11-1
K	K	K	13	0113	11-2	11-2
L	L	L	14	0114	11-3	11-3
M	M	M	15	0115	11-4	11-4
N	N	N	16	0116	11-5	11-5
O	O	O	17	0117	11-6	11-6
P	P	P	20	0120	11-7	11-7
Q	Q	Q	21	0121	11-8	11-8
R	R	R	22	0122	11-9	11-9
S	S	S	23	0123	0-2	0-2
T	T	T	24	0124	0-3	0-3
U	U	U	25	0125	0-4	0-4
V	V	V	26	0126	0-5	0-5
W	W	W	27	0127	0-6	0-6
X	X	X	30	0130	0-7	0-7
Y	Y	Y	31	0131	0-8	0-8
Z	Z	Z	32	0132	0-9	0-9
0	0	0	33	0060	0	0
1	1	1	34	0061	1	1
2	2	2	35	0062	2	2
3	3	3	36	0063	3	3
4	4	4	37	0064	4	4
5	5	5	40	0065	5	5
6	6	6	41	0066	6	6
7	7	7	42	0067	7	7
8	8	8	43	0070	8	8
9	9	9	44	0071	9	9
+	+	+	45	0053	12	12-8-6
-	-	-	46	0055	11	11
*	*	*	47	0052	11-8-4	11-8-4

† The interpretation of this character or code may depend on its context. Refer to Character Set Anomalies elsewhere in this appendix.

00029
1 OF 3

TABLE A-2. BATCH CHARACTER SETS (Contd)

CDC Graphic (64 Char)	ASCII Graphic (64 Char)	ASCII Graphic (95 Char)	Display Code	12-Bit ASCII Code	Punch Code	
					026	029
/	/	/	50	0057	0-1	0-1
(	(	(	51	0050	0-8-4	12-8-5
)	)	)	52	0051	12-8-4	11-8-5
$	$	$	53	0044	11-8-3	11-8-3
=	=	=	54	0075	8-3	8-6
space	space	space	55	0040	no punch	no punch
, comma	, comma	, comma	56	0054	0-8-3	0-8-3
. period	. period	. period	57	0056	12-8-3	12-8-3
≡ equiv.	# num. sign	# num. sign	60	0043	0-8-6	8-3
[l. bracket	[l. bracket	[l. bracket	61	0133	8-7	12-8-2
] r. bracket	] r. bracket	] r. bracket	62	0135	0-8-2	11-8-2
% †	% †	% †	63 †	0045	8-6	0-8-4
: colon	: colon	: colon	63	0072	8-2	8-2
≠	" quote	" quote	64	0042	8-4	8-7
→	_ underline	_ underline	65	0137	0-8-5	0-8-5
∨	!	!	66	0041	11-0	12-8-7
∧	& ampersand	& ampersand	67	0046	0-8-7	12
↑	' apostrophe	' apostrophe	70	0047	11-8-5	8-5
↓	?	?	71	0077	11-8-6	0-8-7
<	<	<	72	0074	12-0	12-8-4
>	>	>	73	0076	11-8-7	0-8-6
≤	@		74		8-5	8-4
≥	\ rev. slant	\ rev. slant	75	0134	12-8-5	0-8-2
¬	^ circumflex		76		12-8-6	11-8-7
; semicolon	; semicolon	; semicolon	77	0073	12-8-7	11-8-6
		@		0100		
		^ circumflex		0136		
		: colon †		0072		
		%		0045		
		` grave accent		0140		
		a		0141		
		b		0142		
		c		0143		
		d		0144		
		e		0145		
		f		0146		
		g		0147		

† The interpretation of this character or code may depend on its context. Refer to Character Set Anomalies elsewhere in this appendix.

00029
2 OF 3

TABLE A-2. BATCH CHARACTER SETS (Contd)

CDC Graphic (64 Char)	ASCII Graphic (64 Char)	ASCII Graphic (95 Char)	Display Code	12-Bit ASCII Code	Punch Code	
					026	029
		h		0150		
		i		0151		
		j		0152		
		k		0153		
		l		0154		
		m		0155		
		n		0156		
		o		0157		
		p		0160		
		q		0161		
		r		0162		
		s		0163		
		t		0164		
		u		0165		
		v		0166		
		w		0167		
		x		0170		
		y		0171		
		z		0172		
		{ left brace		0173		
		| vert. line		0174		
		} right brace		0175		
		~ tilde		0176		

00029
3 OF 3

TABLE A-3. ASCII NINE-TRACK CODED TAPE CONVERSION

ASCII				Display Code		ASCII				Display Code	
Code Conversion†		Character and Code Conversion††				Code Conversion†		Character and Code Conversion††			
Code (Hex)	Char	Code (Hex)	Char	ASCII Char	Code (Octal)	Code (Hex)	Char	Code (Hex)	Char	ASCII Char	Code (Octal)
20	space	00	NUL	space	55	3E	>	1E	RS	>	73
21	!	7D	)	!	66	3F	?	1F	US	?	71
22	"	02	STX	"	64	40	@	60	`	@	74
23	#	03	ETX	#	60	41	A	61	a	A	01
24	$	04	EOT	$	53	42	B	62	b	B	02
25	%	05	ENQ	%	63	43	C	63	c	C	03
25	%	05	ENQ	space†††	55	44	D	64	d	D	04
26	&	06	ACK	&	67	45	E	65	e	E	05
27	'	07	BEL	'	70	46	F	66	f	F	06
28	(	08	BS	(	51	47	G	67	g	G	07
29	)	09	HT	)	52	48	H	68	h	H	10
2A	*	0A	LF	*	47	49	I	69	i	I	11
2B	+	0B	VT	+	45	4A	J	6A	j	J	12
2C	,	0C	FF	,	56	4B	K	6B	k	K	13
2D	-	0D	CR	-	46	4C	L	6C	l	L	14
2E	.	0E	SO	.	57	4D	M	6D	m	M	15
2F	/	0F	SI	/	50	4E	N	6E	n	N	16
30	0	10	DLE	0	33	4F	O	6F	o	O	17
31	1	11	DC1	1	34	50	P	70	p	P	20
32	2	12	DC2	2	35	51	Q	71	q	Q	21
33	3	13	DC3	3	36	52	R	72	r	R	22
34	4	14	DC4	4	37	53	S	73	s	S	23
35	5	15	NAK	5	40	54	T	74	t	T	24
36	6	16	SYN	6	41	55	U	75	u	U	25
37	7	17	ETB	7	42	56	V	76	v	V	26
38	8	18	CAN	8	43	57	W	77	w	W	27
39	9	19	EM	9	44	58	X	78	x	X	30
3A	:	1A	SUB	:	00	59	Y	79	y	Y	31
Display code 00 is undefined as often using the 63-character set.						5A	Z	7A	z	Z	32
3A	:	1A	SUB	:	63	5B	[	1C	FS	[	61
3B	;	1B	ESC	;	77	5C	\	7C	|	\	75
3C	<	7B	(	<	72	5D	]	01	SOH	]	62
3D	=	1D	GS	=	54	5E	^	7E	~	^	76
						5F	_	7F	DEL	_	65

† When these characters are copied from/to a tape, the characters remain the same and the code changes from/to ASCII to/from display code.

†† These characters do not exist in display code. Therefore, when the characters are copied from a tape, each ASCII character is changed to an alternate display code character. The corresponding codes are also changed. Example: When the system copies a lowercase a, 61_{16}, from tape, it writes an uppercase A, 01_8.

††† A display code space always translates to an ASCII space.

00030

TABLE A-4. EBCDIC NINE-TRACK CODED TAPE CONVERSION

EBCDIC				Display Code		EBCDIC				Display Code	
Code Conversion†		Character and Code Conversion††				Code Conversion†		Character and Code Conversion††			
Code (Hex)	Char	Code (Hex)	Char	ASCII Char	Code (Octal)	Code (Hex)	Char	Code (Hex)	Char	ASCII Char	Code (Octal)
40	space	00	NUL	space	55	C4	D	84	d	D	04
4A	¢	1C	IFS	[	61	C5	E	85	e	E	05
4B	.	0E	SO	.	57	C6	F	86	f	F	06
4C	<	C0	{	<	72	C7	G	87	g	G	07
4D	(	16	BS	(	51	C8	H	88	h	H	10
4E	+	0B	VT	+	45	C9	I	89	i	I	11
4F	|	D0	}	!	66	D1	J	91	j	J	12
50	&	2E	ACK	&	67	D2	K	92	k	K	13
5A	!	01	SOH	]	62	D3	L	93	l	L	14
5B	$	37	EOT	$	53	D4	M	94	m	M	15
5C	*	25	LF	*	47	D5	N	95	n	N	16
5D	)	05	HT	)	52	D6	O	96	o	O	17
5E	;	27	ESC	;	77	D7	P	97	p	P	20
5F	¬	A1	-	^	76	D8	Q	98	q	Q	21
60	-	0D	CR	-	46	D9	R	99	r	R	22
61	/	0F	SI	/	50	E0	\	6A	|	\	75
6B	,	0C	FF	,	56	E2	S	A2	s	S	23
6C	%	2D	ENQ	%	63	E3	T	A3	t	T	24
6C	%	2D	ENQ	space†††	55	E4	U	A4	u	U	25
6D	_	07	DEL	_	65	E5	V	A5	v	V	26
6E	>	1E	IRS	>	73	E6	W	A6	w	W	27
6F	?	1F	IUS	?	71	E7	X	A7	x	X	30
7A	:	3F	SUB	:	00	E8	Y	A8	y	Y	31
Display code 00 is undefined at sites using the 63-character set.						E9	Z	A9	z	Z	32
						F0	0	10	DLE	0	33
7A	:	3F	SUB	:	63	F1	1	11	DC1	1	34
7B	#	03	ETX	#	60	F2	2	12	DC2	2	35
7C	@	79	\	@	74	F3	3	13	TM	3	36
7D	'	2F	BEL	'	70	F4	4	3C	DC4	4	37
7E	=	1D	IGS	=	54	F5	5	3D	NAK	5	40
7F	"	02	STX	"	64	F6	6	32	SYN	6	41
C1	A	81	a	A	01	F7	7	26	ETB	7	42
C2	B	82	b	B	02	F8	8	18	CAN	8	43
C3	C	83	c	C	03	F9	9	19	EM	9	44

† When these characters are copied from/to a tape, the characters remain the same (except EBCDIC codes 4A, 4F, 5A, and 5F) and the code changes from/to EBCDIC to/from display code.

†† These characters do not exist in display code. Therefore, when the characters are copied from a tape, each EBCDIC character is changed to an alternate display code character. The corresponding codes are also changed. Example: When the system copies a lowercase a, 81_{16}, from tape, it writes an uppercase A, 01_8.

††† All EBCDIC codes not listed translate to display code 55_8 (space). A display code space always translates to an EBCDIC space.

00031

TABLE A-5. SEVEN-TRACK CODED TAPE CONVERSIONS

External BCD	ASCII Character	Octal Display Code	External BCD	ASCII Character	Octal Display Code
01	1	34	40	-	46
02	2	35	41	J	12
03	3	36	42	K	13
04	4	37	43	L	14
05	5	40	44	M	15
06	6	41	45	N	16
07	7	42	46	O	17
10	8	43	47	P	20
11	9	44	50	Q	21
12†	0	33	51	R	22
13	=	54	52	!	66
14	"	64	53	$	53
15	@	74	54	*	47
16†	%	63	55	'	70
17	[	61	56	?	71
20	space	55	57	>	73
21	/	50	60	+	45
22	S	23	61	A	01
23	T	24	62	B	02
24	U	25	63	C	03
25	V	26	64	D	04
26	W	27	65	E	05
27	X	30	66	F	06
30	Y	31	67	G	07
31	Z	32	70	H	10
32	]	62	71	I	11
33	,	56	72	<	72
34	(	51	73	.	57
35		65	74	)	52
36	#	60	75	\	75
37	&	67	76	^	76
			77	;	77

†As explained previously in this section, conversion of these codes depends on whether the tape is being read or written.

00032

CENTRAL MEMORY RESIDENT

The central memory resident (CMR) area contains the following tables and information.

First Word Address	Table Name	Description
0		CMR pointer area.
100	T.CST	Channel status table.
154	T.PPSI	PP status words.
200	T.CPA$_n$	Control point areas.
	T.XPSCH	System job exchange package area.
	T.PPCI	PP communication areas.
	T.EST†	Equipment status table.
	T.FNT†	File name table.
	T.ITABL†	INTERCOM table.
	T.DAT†	Device activity table.
	T.RMSBUF†	RMS buffer.
	T.STG†	Tapes staging table.
	T.APF	Attached permanent file table.
	T.EXPIO	CYBER 176 exchange package and I/O buffers.
	T.CHT	Channel table.
	T.UQT	Unit queue table.
	T.RQS††	Request stack.
	T.RST	Request scheduling table.
	T.RBR	Record block reservation table (headers).
	T.DST	Device status table.
	T.DOT	Device overflow table.

†Table must begin before 10000$_8$.
††Table must begin before 20000$_8$.

First Word Address	Table Name	Description
	T.SEQ	Sequencer table.
	T.ITMSG	INTERCOM5 terminal dayfile message.
	T.INS	Installation area.
	T.MST	Mounted set table.
	T.DDT	Dismountable device table.
	T.TRB	Trace buffer.
	T.VRNBUF	VSN buffer.
	T.TAPES	Tapes table.
	T.URT	Tape unit recovery table.
	T.MAIL	Scheduler mailbox buffer.
	T.IDT	Logical ID table.
	T.DFB	Dayfile buffers.
	T.PJT	Parameter storage for delayed PP jobs.
	T.MAB	Mainframe attribute block.
	T.QLBMP	Logfile bitmap table.
	T.SSCT	Subsystem control table.
	T.SCHPT	Scheduler performance table (optional).
	T.SCHJCA	Scheduler job control area.
	T.SCHJDT	Scheduler job descriptor table.
	T.EICB	Environment Interface Communication Block.
	T.EPIB	Error Processing Interface Block.
	T.ELST	Error logging status table.
	T.PPOVL	PP resident overlay save buffer.
	T.BRKPT	Breakpoint table (extended memory system).
	T.AREA	Area table (extended memory system).
	T.ENTRY	Entry table (extended memory system).
	T.BCFAP	CEFAP buffer.
	T.EPAGE	Empty page stack.
	T.ECSPRM	Extended memory parameters.
	T.SCBHDR	System circular buffer.

First Word Address	Table Name	Description
	T.SUBPG	Subpage buffer.
		CM resident programs (disk system).
		Segmented system areas (extended memory system).
	T.LIB	Library directory.
		INTERCOM/RMF pointer area. INTERCOM/RMF multiplexer subtables, buffers, and user tables.
		Job control point user field length.
	T.RBT	RBT chains.

Table B-1 contains an alphabetical list of table names giving the word and byte numbers in the CMR pointer area of the pointer to each table. The fourth column of table B-1 gives the value by which the pointer must be multiplied to obtain the FWA of the table.

TABLE B-1. TABLE NAMES AND POINTER LOCATIONS

Table Name	Word	Byte or Bits	Multiplier (octal)
T.APF	6	29-12	1
T.AREA	67	17-0	1
T.BCFAP	T.BCFAP is an entry in the table T.ENTRY.		
T.BRKPT	67	53-36	1
T.CHT	64	41-24	1
$T.CPA_n$	The FWA of $T.CPA_1$ is always 200_8.		
T.CST	5	2	1
T.DAT	13	0	1
T.DDT	7	2	10
T.DFB	3	0	10
T.DOT	T.DOT is an entry in the table T.ENTRY.		
T.DST	13	4	10
T.ECSPRM	11	41-24	1

TABLE B-1. TABLE NAMES AND POINTER LOCATIONS (Contd)

Table Name	Word	Byte or Bits	Multiplier (octal)
T.EICB	71	23-0	1
T.ELST	23	1	10
T.ENTRY	67	35-18	1
T.EPAGE	57	53-36	1
T.EPIB	T.EPIB is an entry in the table T.EICB.		
T.EST	5	0	1
T.EXPIO	64	4	1000
T.FNT	4	0	1
T.IDT	66	4	10
T.INS	10	Defined by installation.	
T.ITABL	16	1	1
T.ITMSG	15	3	10
T.LIB	1	53-36	1
T.MAB	52	0	10
T.MAIL	65	0	10
T.MST	7	4	10
T.PJT	26	3	10
T.PPC1	5	4	1
T.PPOVL	77	3	10
T.PPS1	The FWA of T.PPS1 is always 154_8.		
T.QLBMP	14	2	10
T.RBR	2	53-36	1
T.RBT †	2	4	100
T.RMSBUF	23	3	1
T.RQS	13	2	2
T.RST	T.RST is an entry in the table T.ENTRY.		

†The entries in T.RBT begin at the highest CM address and work their way back toward low core.

TABLE B-1. TABLE NAMES AND POINTER LOCATIONS (Contd)

Table Name	Word	Byte or Bits	Multiplier (octal)
T.SCBHDR	SCBHDR is an entry in the table T.ENTRY.		
T.SCHJCA	60	2	10
T.SCHJDT	60	4	10
T.SCHPT	65	3	10
T.SEQ	4	2	10
T.SSCT	23	2	10
T.STG	15	4	1
T.TAPES	14	0	10
T.TRB	23	4	10
T.UQT	There is a pointer location for T.UQT in each entry of table T.CHT.		
T.URT	15	0	10
T.VRNBUF	43	0	10
T.XPSCH	60	1	10

CMR POINTER AREA

	59	53	47	41	35	29	23	17	11	0	
P.AAZ	Absolute Address Zero										0
P.LIB	C.DIRFWA A		FWA of Library Directory			LWA+1 Library Directory			C.DSFLAG Deadstart Load Flags		1
P.RBR P.RBT P.CMLWA	C.RBRAD		FWA of RBR Area		C.RBTEC RBT Ordinal of Empty Chain		Length/100_8 of RBT Area		C.CMLWA (LWA+1)/100_8 of CM		2
P.NPP P.NCP P.DFB	FWA/10_8 of Dayfile Buffer			Reserved			C.NPP No. of PPs		C.NCP No. of CPs		3
P.SEQ P.FNT P.HEC	C.FNT FWA of FNT		C.FNTLWA LWA+1 of FNT		C.SEQ T.SEQ/10_8		C.SEQL L.SEQ		C.HEC Hardware Error Count		4
P.CST P.PCOM P.EST	C.EST FWA of EST		C.ESTLWA LWA+1 of EST		C.CST FWA of CST		C.CSTL LWA+1 of CST		C.PCOM Address of Comm Area PP1		5
P.PFM1	Reserved		C.APFL No. of APF Entries			C.APF FWA of APF			C.PFMCH Interlock Byte		6
P.MST P.DDT P.DSMO	C.DSMO System Set	Default PF Set	C.NDDT N.FDDT	N.VDDT	C.DDT T.DDT/10_8		C.NMST N.MST		C.MST T.MST/10_8		7
P.INS	Reserved for Installations										10
P.EIRPR	C.LEPAGE L.ECSTK+1			C.ECSPRM T.ECSPRM			ICC Area Address				11
P.ELBST	Maximum Length/ 1000_8 of Extended Memory Library File		Extended Memory Flaw Table Address				Extended Memory Page Stack Address				12
P.DAT P.RQS P.DST	C.DAT T.DAT		C.DATL L.DAT		C.RQSFS FWA/2 of Request Stack			No. of DST Entries	FWA/10_8 of DST		13
P.TAPES T.FNTTH P.QLBMP	C.TAPES T.TAPES/10_8		L.TAPES		C.QLBMP T.QLBMP/10_8		Reserved		C.FNTTH FNT Thresholds		14
P.STG P.URT P.ITMSG	C.URT T.URT/10_8		L.URT				C.ITMSG T.ITMSG/10_8		C.STG T.STG		15
P.INT	C.INT/C.IFL (LWA+1)/100_8 of INTERCOM		C.ITABL FWA of Multiplexer Table Header		C.IBUFF B	FWA of INTERCOM Pointer and Buffer Area			C.ILTABL Length of Multiplexer Table Header		16
P.PGC P.MFL	C.PGC Page Control Info.						C.MFLE Max. Job Extended Memory FL/1000_8		C.MFL Maximum Job FL/100_8		17

The contents of the following words can change in the released version of system.

0 P.AAZ

Word of zeros.

1 P.LIB

A library change flag appears in bit 59. Right-justified in bytes 0 and 1 is the first word address of the library directory; bytes 2 and 3 contain the right-justified last word address plus one of the library directory. Byte 4 contains deadstart load flags.

Bits in the byte C.DSFLAG are:

0	S.SYSEDT	1	Bypass EDITLIB GO/DROP message (internal to deadstart).
1		Not used.	
2	S.MFLVL	0	Not first mainframe to deadstart.
		1	First mainframe to deadstart.
3		Reserved.	
4	S.ECSLVL	0	No extended memory.
		1	Extended memory up.
5	S.USETS	0	Do not validate user sets.
		1	Validate user sets.
7-6	S.IOLVL	00	Recover I/O queues.
		01	Do not recover I/O queues.
		10	Initialize I/O queues.
10-8	S.DSLVL	Deadstart level.	
		000	Level 0 deadstart.
		001	Level 1 deadstart.
		010	Level 2 deadstart.
		011	Level 3 deadstart.
		100 thru 111	Not defined.
11	S.RLIB	0	Reload system libraries.
		1	Do not reload system libraries.

2 P.RBT/P.RBR/P.CMLWA

Bytes 0 and 1 contain the right-justified first word address of the record block reservation area. Byte 2 contains the record block table word-pair ordinal of the first member of the RBT empty chain. Byte 3 contains the current length of the RBT area in 100_8-word blocks. Byte 4 contains the current size of central memory in 100_8-word blocks.

3 P.DFB/P.NPP/P.NCP

Byte 0 contains the FWA/10_8 of the dayfile buffer area. Bytes 1 and 2 are reserved for the 250 graphics package. Bytes 3 and 4 contain the number of PPs and control points in the system, respectively.

4 P.FNT/P.SEQ/P.HEC

Bytes 0 and 1 contain the FWA and LWA+1 addresses of the file name table. Bytes 2 and 3 contain the FWA and length of the sequencer table (SEQ). Byte 4 contains the hardware error count.

5 P.EST/P.CST/P.PCOM

Bytes 0 and 1 contain the FWA and LWA+1 addresses of the equipment status table. Bytes 2 and 3 contain the FWA and LWA+1 addresses of the channel status table. Byte 4 contains the FWA of the communications area for PP1.

6 P.PFMI

Byte 1 contains the maximum number of attached permanent file table entries. Bits 29 through 12 contain FWA of attached permanent file table. The permanent file interlock byte is in byte 4.

Bits in the byte C.PFMCH are:

9-0		Reserved.
10	S.FNTTH	FNT space critical; input is halted.
11	S.PFCIOQ	PFC full flag; input jobs are halted.

7 P.MST/P.DDT/P.DSMO

C.DSMO	Bits 11-6	MST ordinal for system set.
	Bits 5-0	MST ordinal for PF default set.
C.NDDT	Bits 11-6	Maximum number of fixed DDT entries (four words each).
	Bits 5-0	Maximum number of variable DDT entries (two words each).
C.DDT	T.DDT is the first word address divided by 10_8 of the DDT.	
C.NMST	N.MST is the number of entries in the MST (five words each).	
C.MST	T.MST is the first word address divided by 10_8 of the MST.	

10 P.INS

Reserved for installation use.

11 P.EIRPR

Byte 0 contains the size of the extended memory page stack +1 (resident in CM); right-justified in bytes 1 and 2 is the FWA of the extended memory parameter table. Right-justified in bytes 3 and 4 is the FWA of the ICC area address in EM.

12 P.ELBST

Byte 0 contains the maximum size of the extended memory library file in 1000_8-word pages. Bytes 1 and 2 contain the EM address of the extended memory flaw table; bytes 3 and 4 contain the EM address of an empty page stack.

13 P.DAT/P.RQS/P.DST

Bytes 0 and 1 contain the FWA and length, respectively, of the device activity table. Byte 2 contains FWA/2 of the request stack. Right-justified in byte 3 is the current number of device status entries. FWA of the device status table is in byte 4.

14 P.TAPES/P.QLBMP/T.FNTTH

Bytes 0 and 1 contain the FWA/10_8 and length of the tape configuration table. Byte 2 contains the FWA/10_8 of the logfile bitmap table (T.QLBMP). Byte 4 contains the lower FNT space threshold/10_8 in bits 11 through 6 and the upper FNT space threshold/10_8 in bits 5 through 0.

15 P.STG/P.URT/P.ITMSG

Bytes 0 and 1 contain the FWA/10_8 and length of the tape unit recovery table. Byte 2 contains the FWA/10B of the INTERCOM5 terminal message buffer. Byte 4 contains the FWA of the tape staging table.

16 P.INT

Byte 0 contains the (LWA+1)/100_8 of the INTERCOM/RMF pointer and buffer area. Byte 1 contains the FWA and byte 4 the length of the INTERCOM/RMF multiplexer table header. Bytes 2 and 3 contain the FWA of the INTERCOM/RMF pointer and buffer area. Bit 30 is a flag which is nonzero when deadstart is in progress.

17 P.PGC/P.MFL

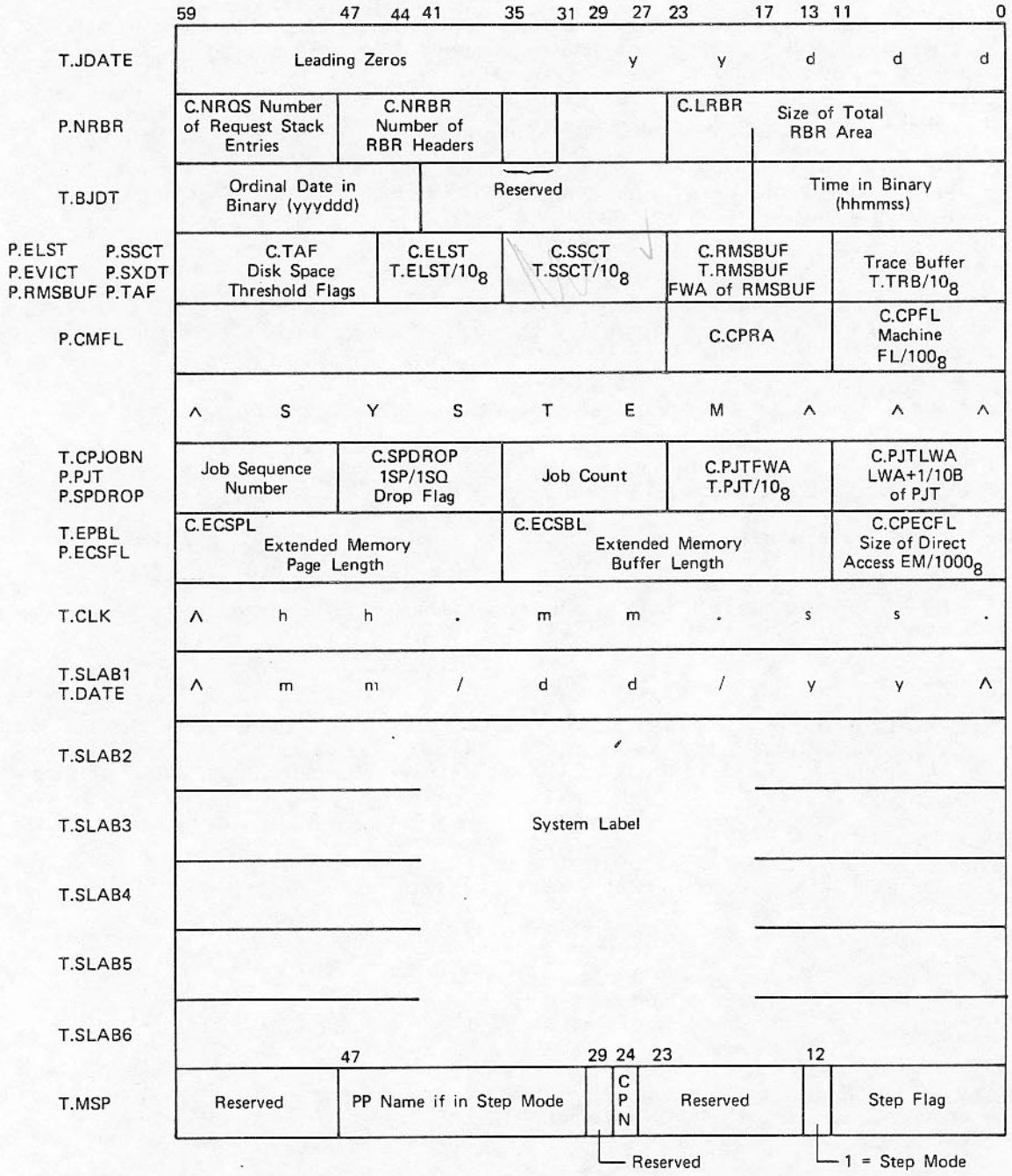
Bytes 0 and 1 (18 bits) define system default page control as follows:

Bit(s)	Description
59-52	System default page size.
51-44	System default page width.
43	System default print density (0 = 6 lpi, 1 = 8 lpi).
42	Reserved.

Byte 3 contains the maximum job extended memory field length (MFLE)/1000_8. Byte 4 contains the maximum job CM field length (MFL)/100_8.

NOTE

The ∧ symbol in the following table indicates that a display code blank is present at the location specified.



20 T.JDATE

The current ordinal date is stored here in the form yyddd with leading zeros.

21 P.NRBR

Byte 0 contains the maximum number of entries in the request stack; byte 1 contains the maximum number of RBR headers; the length of the RBR area is right-justified in bytes 3 and 4.

22 T.BJDT

The current ordinal date (yyyddd) in binary form is stored in bits 59 through 42; the current time (hhmmss), in binary form, is stored in bits 17 through 0.

23 P.EVICT/P.RMSBUF/P.SSCT/P.ELST/P.SXDT/P.TAF

Byte 0 contains the activity flags used by 2RN to determine whether disk space thresholds are active (that is, available space exceeds the threshold). Byte 1 contains the FWA of the error logging status table divided by 10_8. Byte 2 contains the FWA of the subsystem control table divided by 10_8. Byte 3 contains the FWA of the rotating mass storage buffer. Byte 4 contains the FWA of the trace buffer divided by 10_8.

24 P.CMFL

Byte 4 contains defined central memory in 100_8-word blocks; primarily provided for executing at control point 0.

25 W.CPJNAM

Contains control point zero job name in the form SYSTEM.

26 T.CPJOBN/P.PJT/P.SPDROP

Bytes 0 and 2 contain the job sequence number and job count, respectively. FWA and LWA+1 of the peripheral job table is in bytes 3 and 4. Byte 1 contains a value obtained from the millisecond clock. If this value does not equal the value in byte 0 of the RST header word, SPM issues a drop order to one of the stack processors. Before MTR initialization, byte 1 holds the value of N.SPRPP.

27 T.EPBL/P.ECSFL

Right-justified in bytes 0 and 1 is the extended memory page length as set by IP.EPAG; right-justified in bytes 2 and 3 is the extended memory buffer length set by IP.EBUF. Byte 4 contains the total amount of extended memory/1000_8 that can be assigned to users and to CPMTR segments.

30 T.CLK

Current display clock time in the format:

hh.mm.ss

Starting time is entered by the operator.

31 T.DATE/T.SLAB1

Current calendar date in the format:

mm/dd/yy

The current date is entered by the operator. This is the first of a six-word system display label.

32 (IP.SYSL1) TSLAB5

33 T.SLAB3

Words 32 and 33 provide storage for up to 20 characters for the system display label first line, as given by installation parameter.

34 (IP.VER) T.SLAB4

System version identification.

35 (IP.SYSE) T.SLAB5

System edition date.

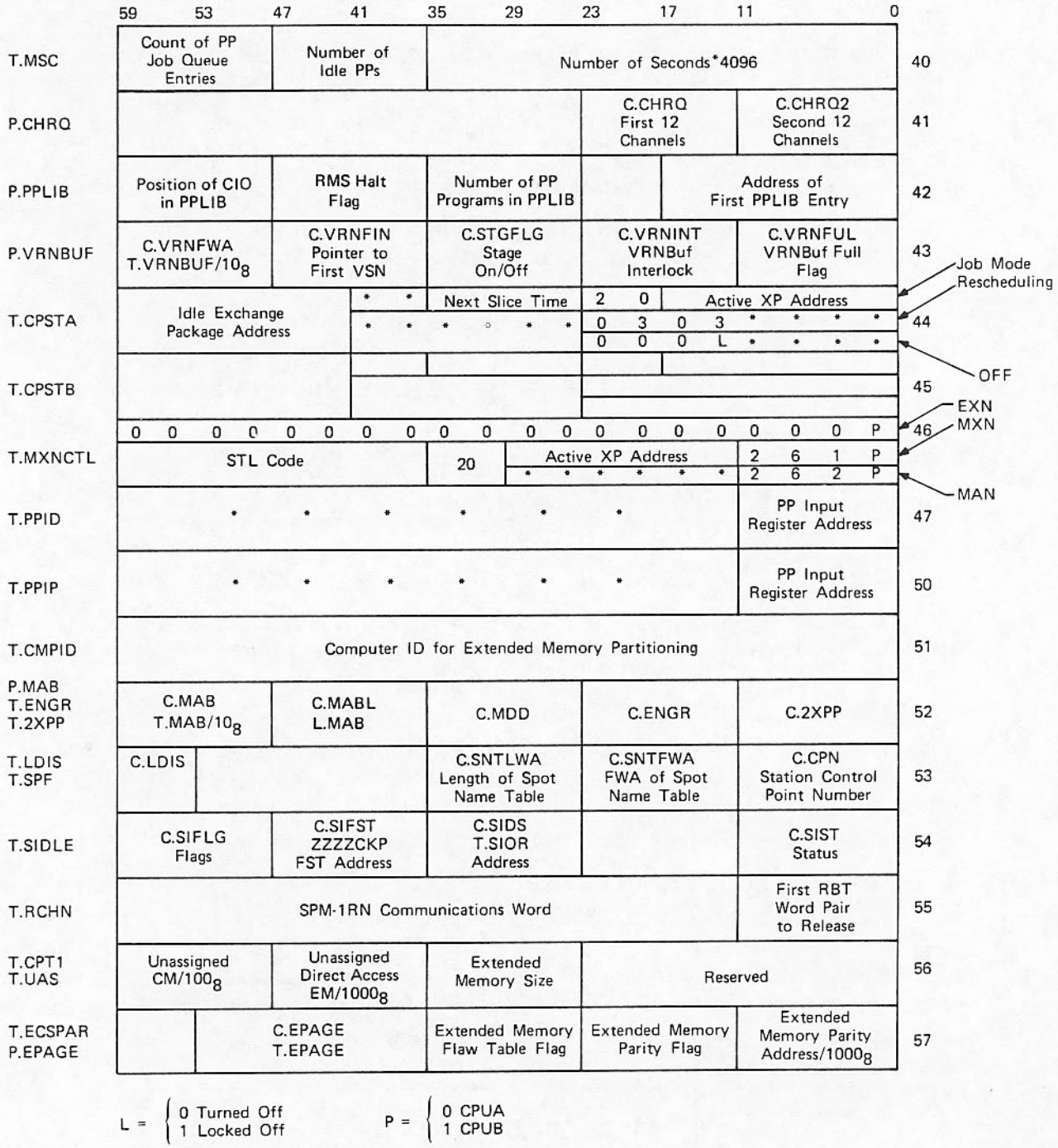
36 T.SLAB6

Used by system dynamic dump.

37 T.MSP

MTR-DSD step mode communication word.

Bit	Meaning
59-48	Reserved.
47-30	Name of PP routine, if any.
29-28	Reserved.
27-24	Control point number (0 = entire system).
23-13	Reserved.
12	1 Step mode.
	0 No step.
11-0	Communication byte.



L = { 0 Turned Off / 1 Locked Off }

P = { 0 CPUA / 1 CPUB }

40 T.MSC

Real time clock (microsecond count) in bytes 2 through 4. Count of jobs in PP job queue in byte 0; a count of idle PPs is in byte 1.

41 P.CHRQ

Channel request flags for the first 12 channels in byte 3; for the second 12 channels in byte 4. (A PP is requesting a channel which another PP reserved.)

Bit Number (decimal)	Channel Number (octal)	Bit Number (decimal)	Channel Number (octal)
23	0	11	20
22	1	10	21
21	2	9	22
20	3	8	23
19	4	7	24
18	5	6	25
17	6	5	26
16	7	4	27
15	10	3	30
14	11	2	31
13	12	1	32
12	13	0	33

42 P.PPLIB

Byte 0 contains the current position of CIO in PPLIB; byte 1 is a communication byte between MDI and 1SP/1SQ; the number of programs in PPLIB is in byte 2. The address of the first PP library table entry is right-justified in bytes 3 and 4.

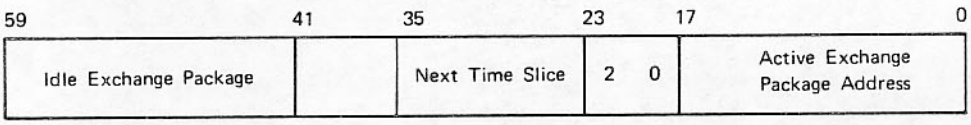
43 P.VRNBUF

Contains volume serial (visual reel) number buffer information and tape staging flags.

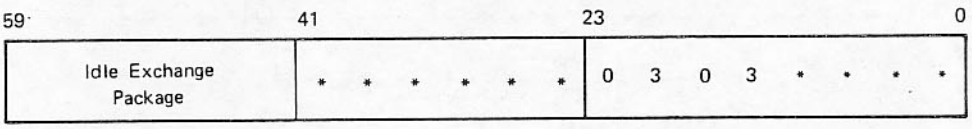
44 T.CPSTA

45 T.CPSTB (one word for each CPU). C.CPUOFF is a pointer to byte 3.

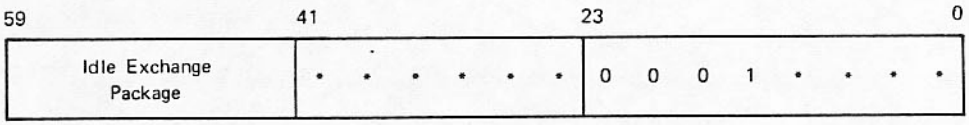
Value while the CPU is running in job mode:



Value while an MXN version of CPMTR is selecting the next job mode:

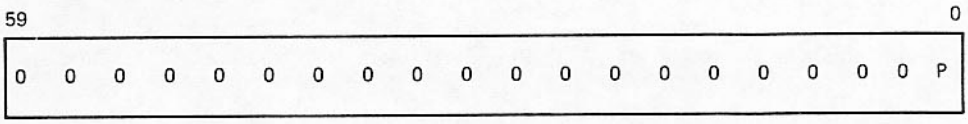


Value while the CPU is turned off:

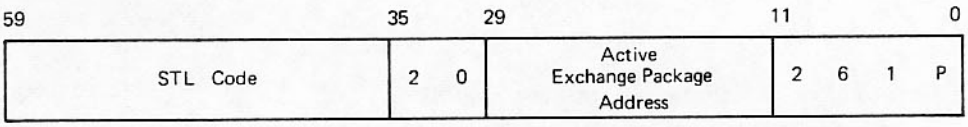


46 T.MXNCTL

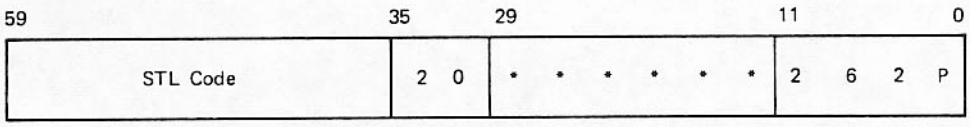
Value while in EXN mode:



Value while in MXN mode:



Value while in MAN mode:



This word contains PP executable code. It is used by PP resident to perform the MXN for any CP monitor function.

P = 0 or 1. The CPU number of the CPU that is running the lower priority job. CPMTR sets this and the active exchange package address at which the job is running.

47 T.PPID

Bytes 0-3 contain meaningless data whose exact bit pattern may vary according to which processor wrote the word last. Byte 4 contains the PP input register address of a PP that is waiting for a CPMTR function.

50 T.PPIP

Bytes 0-3 contain meaningless data whose exact bit pattern may vary according to which processor wrote the word last. Byte 4 contains the PP input register address of a PP that is waiting for a PPMTR function.

51 T.CMPID

Computer ID for extended memory partitioning.

52 P.MAB/T.ENGR/T.2XPP

Byte 0 contains the first word address of the mainframe attribute block divided by 10_8. Byte 1 contains the length of the MAB table.

Byte 2 contains MDD status

Bit	Description
0	Set if MDD unable to access the maintenance channel.
1	Set if MDD unable to access channel to two port multiplexer.
2	Set if MDD has modified a maintenance register.
3	Set if MDD has modified central memory.
4	Set if MDD was initiated by CTI.

Byte 3 contains system mode flags. If the bit is zero, the mode is off. If the bit is a one, the mode is on.

Bit	Field	Description
0	S.ENGR	Engineering mode.
1	S.SDBG	Debug mode.

Byte 4 contains data defining mainframe capabilities.

1-0	PP speed. 0 = 1xPP. 1 = 2xPP. 3 = 4xPP.
10	Set if UEM is being used for EM.
11	Set if CYBER 180-class, 865, or 875 mainframe.

53 T.LDIS/T.SPF

Byte 0, bits 59 through 54, contains the length of the linked station displays. The length and the first word address of the spot name table are in bytes 2 and 3, respectively. The station control point number is in byte 4.

54 T.SIDLE

Byte 0 contains internal flags used by IDLE mode routines. The bits in C.SIFLG are:

Bit	Field	Description
59	S.SICPOF	SYSIDLE turned off a CPU.
58	S.SITDS	TDS was called to initialize ZZZZCKP.
57	S.SICPM	CPMTR initiated SYSIDLE.
56-55	S.SISR	Count of stack requests issued by SYSIDLE.
54	S.SISTEP	SYSIDLE has initiated system STEP mode.

Byte 1 contains the address of FST word 1 for the file ZZZZCKP. Byte 2 contains the address of the SYSIDLE pseudo-PPOR T.SIOR. Byte 4 contains the status of IDLE mode activity as defined by the following codes.

0	SYSIDLE not active.
1	SYSIDLE active.
2	SYSIDLE waiting for acknowledgement from PP which initiated IDLE mode.
3	SYSIDLE waiting for RESUME command.
4	RESUME command entered.

55 T.RCHN

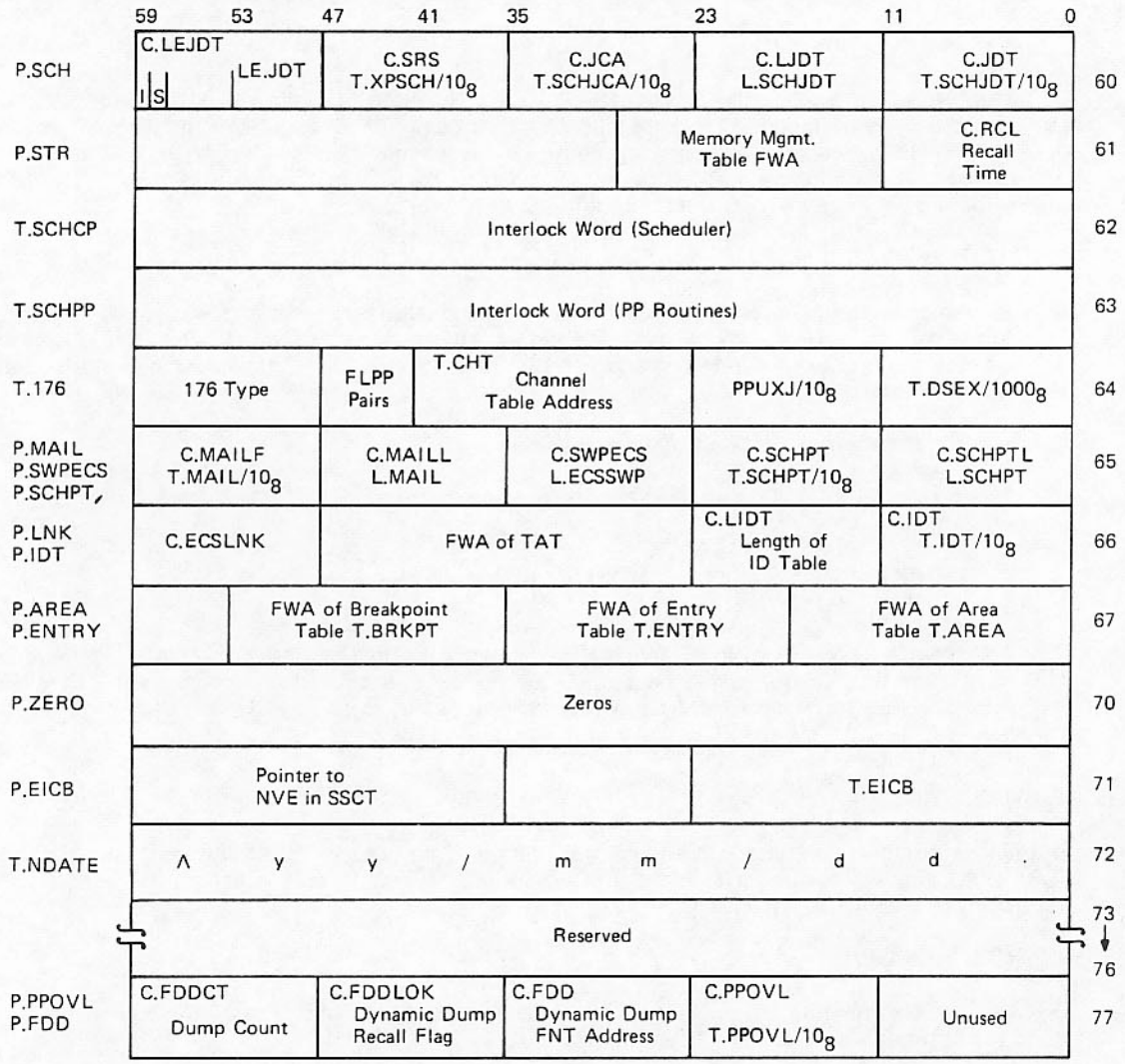
First RBT word pointer of the chain to be released in byte 4. The rest of the word contains the SPM-1RN communications word.

56 T.UAS/T.CPT1

Byte 0 contains the number of unassigned CM 100_8-word storage blocks; byte 1 contains the number of unassigned direct access extended memory 1000_8-word blocks. Byte 2 contains the current size of extended memory. Bytes 3 and 4 contain, right-justified, the initial program address of the CM monitor.

57 T.ECSPAR/P.EPAGE

The FWA of the CM resident extended memory page stack is right-adjusted in bytes 0 and 1; byte 2 contains extended memory flaw table full flag; byte 3 contains extended memory parity flag; byte 4 contains extended memory block address in which parity error occurred.



60 P.SCH

Contains information relative to the integrated scheduler. Length of job description table entries is in byte 0; bit 59 set to one indicates INTERCOM capability; bit 58 set to one indicates that direct access user extended memory can be swapped. Pointer to job scheduler exchange package is in byte 1; a pointer to the job control area is in byte 2; length and pointer to the job description table is in bytes 3 and 4.

61 P.STR

Contains additional information relative to the integrated scheduler. Bytes 2 and 3 contain the memory management table FWA. Byte 4 contains the integrated scheduler recall time in milliseconds.

62 T.SCHCP

Interlock word for integrated scheduler.

63 T.SCHPP

Interlock word for PP routines.

64 T.176 contains information relevant to CYBER 170 Model 176 only. Byte 0 contains flags to indicate the type of model 176; byte 1, bits 47 through 42 contains the number of FLPP pairs; byte 1, bits 41 through 36 and byte 2, contains the channel table address; byte 3 is the address divided by 10_8 of the PP interrupt handler table; byte 4 is the address divided by 1000_8 of the exchange package and I/O buffer table (T.EXPIO) for model 176.

65 P.MAIL/P.SWPECS/P.SCHPT

Byte 0 contains the pointer to the scheduler mailbox buffer; byte 1 contains the length of the scheduler mailbox buffer. Byte 2 contains the extended memory swap flags. Byte 3 contains the pointer to the scheduler performance table; byte 4 contains the length of the scheduler performance table.

The extended memory swap flag bits are:

- 0 Swap INTERCOM jobs to extended memory at end of job (EOJ bit set).
- 1 Swap batch jobs in central memory queues to extended memory.
- 2 All INTERCOM and graphics jobs are to be swapped.
- 3 All batch jobs are to be swapped.
- 4 Swap all jobs to disk. When this bit is set, all other extended memory swap flag bits are ignored. Multiuser jobs are still swapped to extended memory. All other jobs are swapped to disk (819 disk if available; otherwise, to any available disk).
- 6 Swap CM and extended memory in parallel.

66 P.IDT/P.LNK

Byte 0 contains the extended memory link restart time control mask. Bytes 1 and 2 contain the first word address of the TBT address table for 819 files. Byte 3 contains the length of the ID table. Byte 4 contains T.IDT/10_8.

67 P.AREA/P.ENTRY

Pointers to the first word address of the breakpoint table, the area table, and the entry table used for extended memory systems.

70 P.ZERO

Contains a full word of binary zeros; a PP can clear five bytes at a time by reading this location. Changing the contents of this word can destroy system operation.

71 P.EICB

Bytes 0 and 1 contain, right-justified, a pointer to the NVE (NOS/VE) entry in the Subsystem Control Table (SSCT).

Bytes 3 and 4 contain, right-justified, the address of the Environment interface communication block.

72 P.NDATE

Date for use by NOS/VE operating system.

73-76 Reserved.

77 P.PPOVL/P.FDD

Byte 0 contains a count of dumps on the system dynamic dump file. Byte 1 contains flag bit S.FDDLOK (0) set by routines which wait for 1DD to complete, and cleared by 1DD. Byte 2 contains the FNT address of the system dynamic dump file ZZZZZDD. Byte 3 contains the FWA of the PP overlay table.

100 T.CST

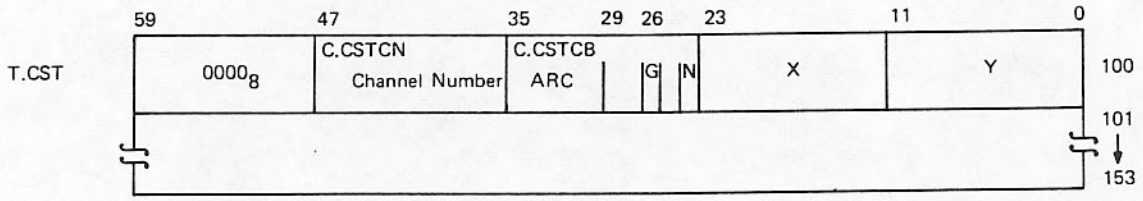
Entries for the channel status table.

154 T.PPSn

One word entries containing status information for up to 20 PPs, beginning with PP1.

CHANNEL STATUS TABLE (CST)

Byte 2 of word 5 in the CMR pointer area contains the first word address of the CST. Byte 3 of word 5 in the CMR pointer area contains the last word address plus 1 of the CST.

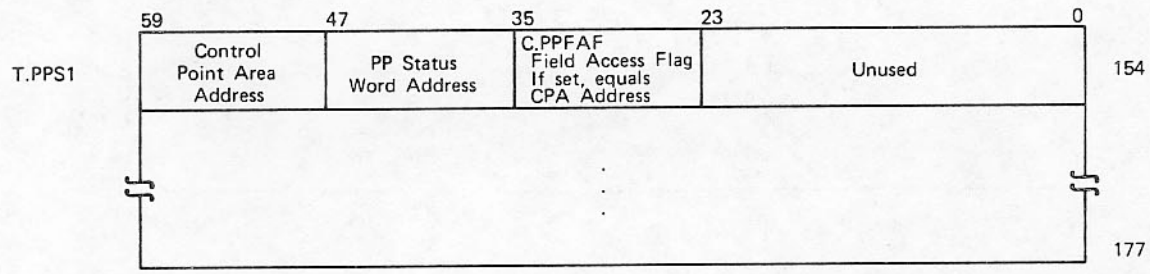


Field Name	Description
ARC	Auto reload controlware count.
G	0 Normal charge for channel time.
	1 No charge to control point for channel time (S.CSNC).
N	Channel available flag; used only by NDR, NLD, and 5CV to share access to a 380-170 NAD channel.
X	Address of this word.

Y Same as X when channel is not reserved; PPIR address when channel is reserved.

Channel Number	Channel Symbol	Description
00-13		Hardware channels
14	CH.FST	Controls access to FST.
15	CH.FNT	Controls access to FNT.
16	CH.DDT	DDT interlock.
17	CH.RBT	Controls access to RBT.
20-33		Hardware channels
34	CH.CPA	Control point area interlock.
35	CH.PFM and CH.APF	Permanent file manager and APF table channel.
36	CH.INS	Reserved for installation.
37	CH.MST	MST interlock.
40	CH.EST = CH.TAPE	Controls access to EST/TAPES table.
41	CH.ICOM	INTERCOM-NOS/BE communication interlock or RMS error buffer interlock.
42	CH.IEMBF	INTERCOM empty buffer channel.
43	CH.IUSER	INTERCOM user table channel.
44	CH.SCH	Scheduler channel.
45	CH.IHUSR	Reserved.
46	CH.IHSMT	Reserved.
47-53		Reserved.

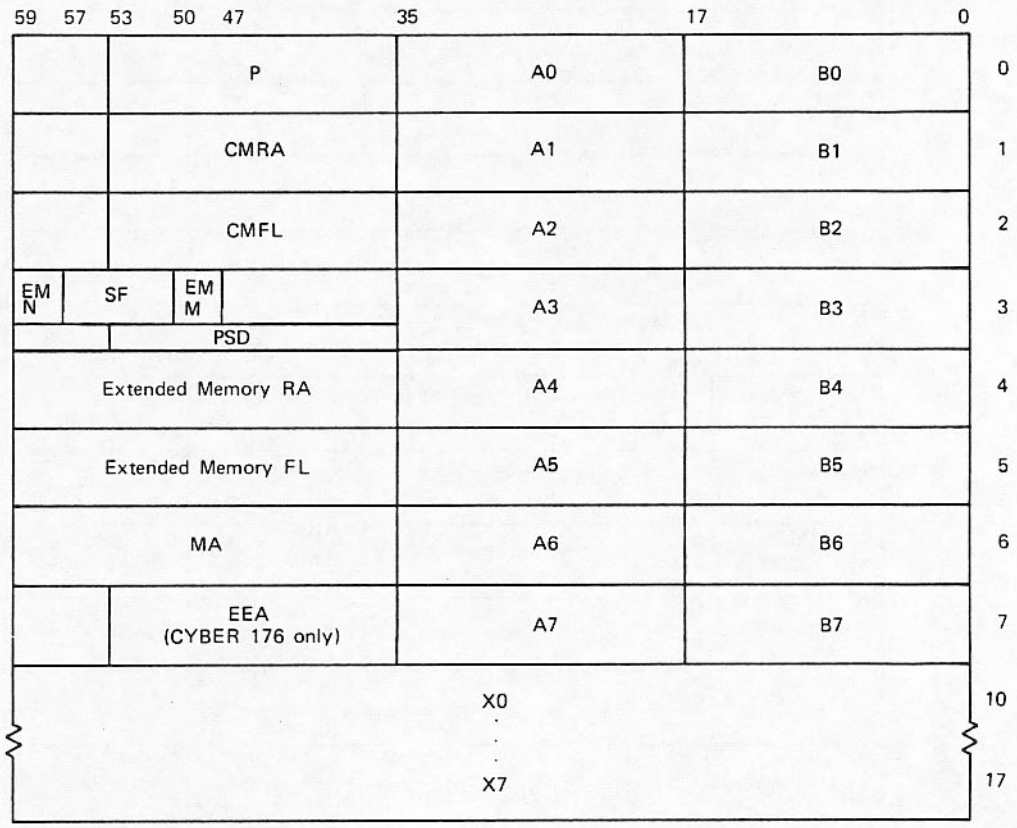
PP STATUS WORDS



PP1 uses T.PPS1; PP2 uses T.PPS1+1; PP3 uses T.PPS1+2; and so on. Byte 0 has meaning only when PP is assigned; byte 1 nonzero means PP is assigned.

Word 177 is used only by HSP, the 819 stack processor.

EXCHANGE PACKAGE FOR CONTROL POINT AREA (WORDS 0 - 17)

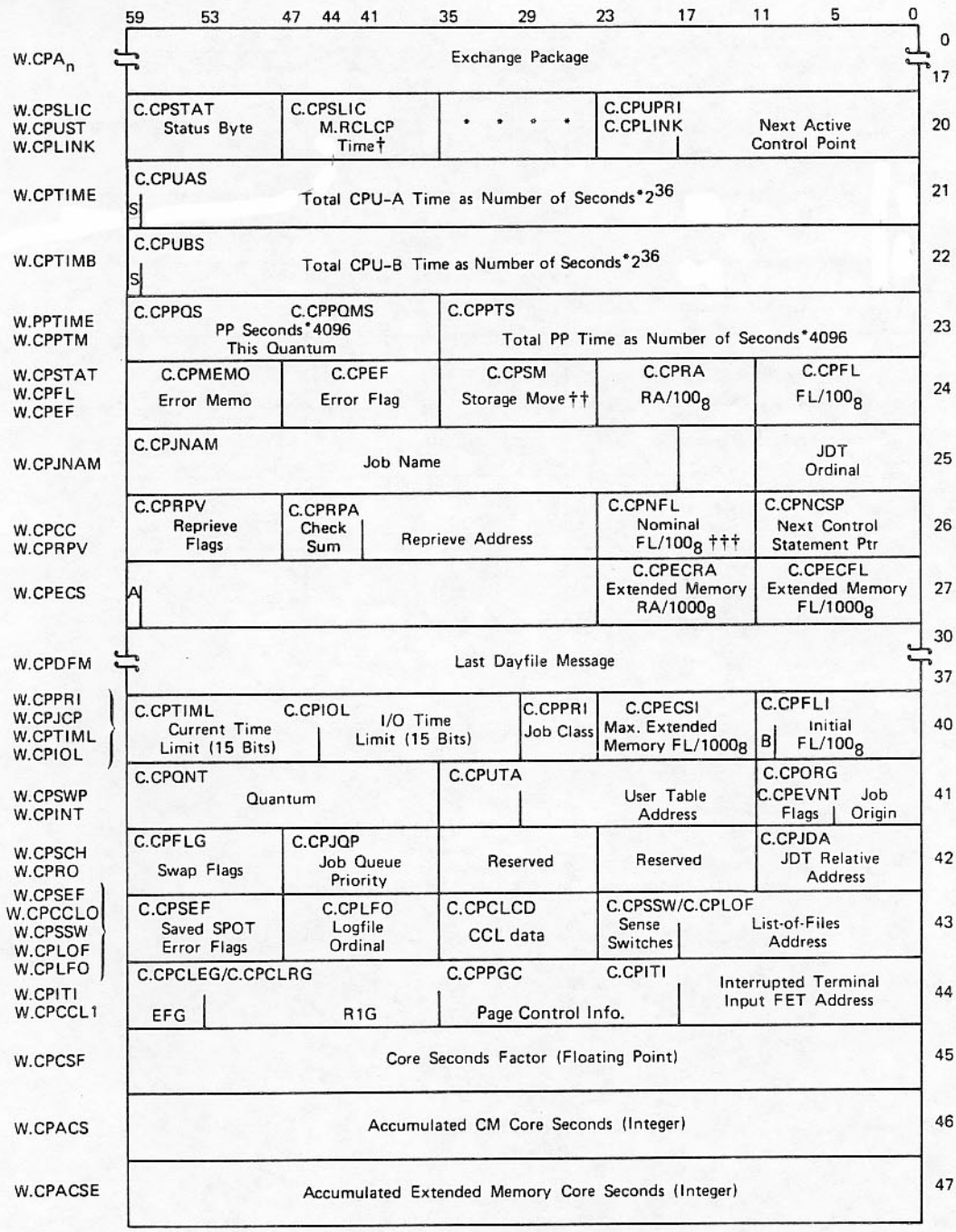


Field Name	Description
EM	Exit mode bits (all models except CYBER 176).
	N Hardware exit mode flags (CYBER 170 only).
	M Hardware exit mode flags (all models).
SF	Software flags (8xx models only).

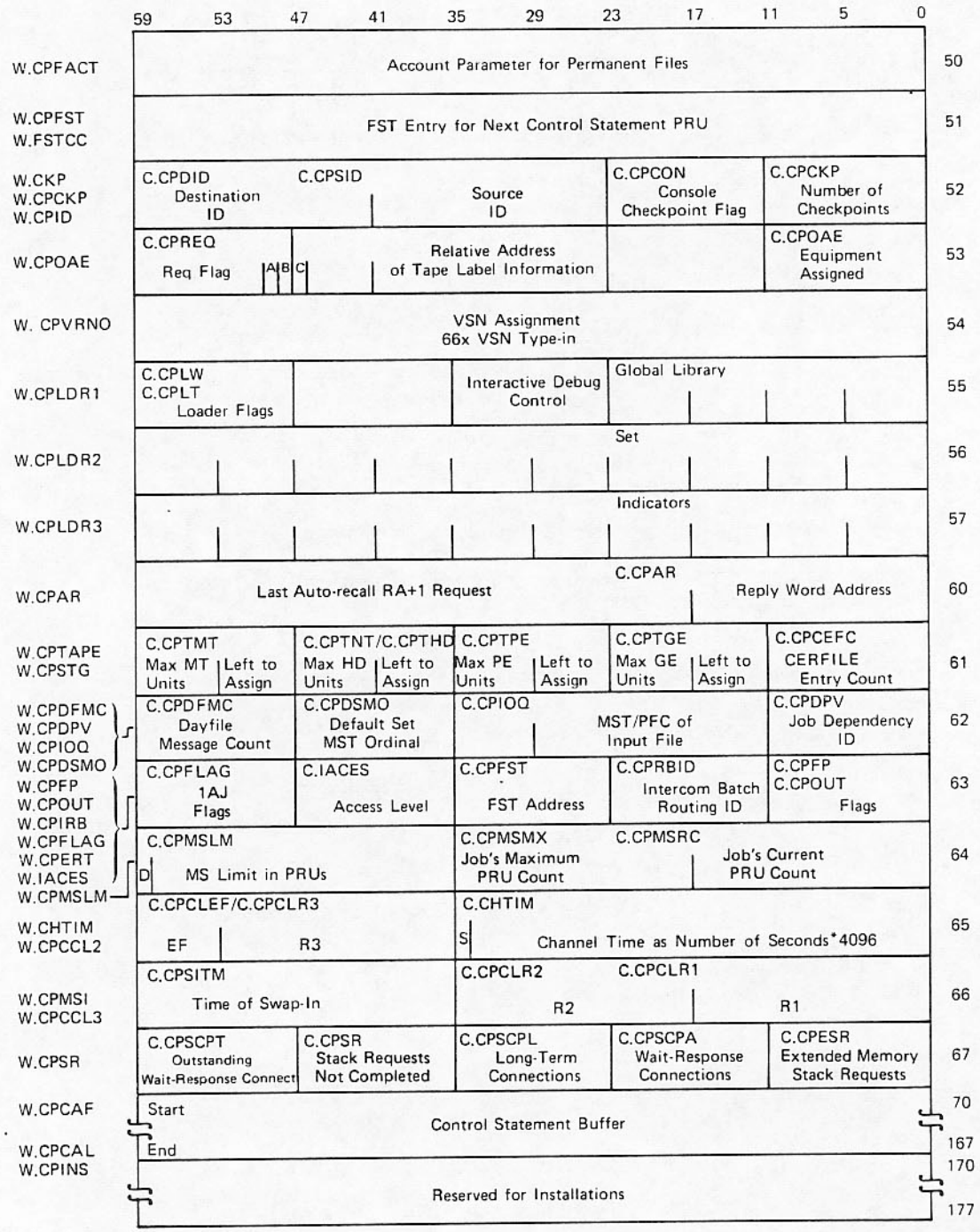
Bit	Description
56	UEM enable flag.
55	Reserved.
54	Reserved.
53	CMU interrupted flag.
52	Instruction stack purge flag.
51	True hardware error flag.

PSD Program status designator (CYBER 176 only).

CONTROL POINT AREA



S If set, no update to cpu time.
A If set, no update to exchange package extended memory RA and FL.
B If set, default CM assigned; no CM parameter on job card.
† Time (nnnn/10000$_8$) when periodic recall expires.
†† Nonzero means CPMTR wants to storage move this control point.
††† Value is set by RFL statement or job card parameter.



A S.YNRDY
B S.YNNO
C Extended label format.
D S.CPM - Do not update user's current PRU count, if set.
S If set, do not update channel time.

W.CPUST(20) C.CPSTAT

Bit	Field	Description
0	S.CPUSTM	Storage move flag; move in progress.
1	S.CPUSTY	Auto recall.
2	S.CPUSTA	CPU-A assigned only.
3	S.CPUSTB	CPU-B assigned only.
4	S.CPUSTX	Periodic recall status.
5	S.CPUSTW	Wait status; 0=do not assign CPU to job; 1=CPU can be assigned to job.
6	S.CPUSTR	Real time job.
7	S.CPUSTC	Active CPU-A.
8	S.CPUSTD	Active CPU-B.
9	S.CPUSTS	Control point activity suspended for swap/roll.
10	S.CPUSTP	Suspended by checkpoint.
11	S.CPUSTZ	Suspended by MTR (too many PP calls).

W.CPUST(20) C.CPUPRI

Bit	Description
23-18	CPU priority level of the control point. Possible values for released system are: 0 PR.IDLE. 1 PR.BATCH. 2 PR.INT. 3 PR.SCP. 4 PR.SYS.

W.CPEF(24) C.CPEF

Value	Field	Description
0001	F.ERTL	CP time limit exceeded; sensed by MTR.
0002	F.ERAR	Arithmetic error; sensed by MTR.
0003	F.ERPP	PP abort (M.ABORT); requested by PP.
0004	F.ERCP	CPU abort (ABT in RA+1); requested by program.
0005	F.ERPCE	PP call error (garbage in RA+1) abort; sensed by MTR.
0006	F.EROD	Operator drop.
0007	F.ERK	Operator kill.

Value	Field	Description
0010	F.ERRN	Operator rerun (batch job only).
0011	F.EREX	Control statement error; set by 1AJ.
	F.ERCC	Control statement error for INTERCOM job.
0012	F.ERECP	Extended memory parity error; sensed by MTR.
0013	F.ERJC	Job statement error.
0014	F.ERPA	Preabort (batch job only).
0015	F.ERRCL	Auto recall error; bad PP call.
0016	F.ERHANG	Job hung in auto recall.
0017	F.ERMSL	Mass storage limit exceeded by stack processor (batch job only).
0020	F.EROVL	PP overlay not in PP LIB.
0021	F.ERIOL	I/O time limit exceeded; sensed by MTR.
0022	F.ERRMS	Dayfile lost on idled device.
0040	F.ERTI	Terminal interrupt by user.
0061	F.ERPARF	Swap-in parity error for graphics.
-77(7700)	F.ERMEMO	Enter MEMO mode.
-0(7777)	F.ERTMM	Terminate MEMO mode.

W.CPRPV(26)

Bit	Description
41	If nonzero, no checksum is taken.
58	If nonzero, extended RPV is selected.
59	If nonzero, user's reprieve routine is active.

W.CPSWP(41) C.CPORG

Bit	Description
5-0	Job origin. 4 Real-time. 10 Graphics. 20 Multiuser. 40 INTERCOM.
6	Swap-out event bit.

W.CPSCH(42) C.CPFLG

Bit	Field	Description
51	S.CP1IB	1IB operating at control point.
52	S.CPFFL	FNTs in positive FL.
53	S.CPEOJ	End of job.
54	S.CPCLR	Control point area clear request.
55	S.CPRFL	Storage request.
56	S.CPROP	Roll-out in progress.
57	S.CPS1P	Swap-in in progress.
58	S.CPSOP	Swap-out in progress.
59	S.CPSWC	Swap-out complete.

W.CPSCH(42) C.CPJDA Values

Value	Description
0-7776	FWA JDT entry (relative to FWA JDT).
7777	No JDT entry assigned.

W.CPLFO(43) C.CPLFO

Bit	Description
47-35	Logfile ordinal ($1-7777_8$).

W.CPCCL0(43) C.CPCLCD

Bit	Description
35	Display skipped commands flag for CCL.
33-24	Procedure nesting level for CCL.

W.CPCCL1(44) C.CPPGC

Bit	Description
35-28	Job default page size.
27-20	Job default page width.
19	Job default print density (0 = 6 lpi, 1 = 8 lpi).
18	Reserved.

W.CPFACT(50)

Bit	Description
11-0	If nonzero, permanent file accounting messages are issued. If 16_8, account number has been validated and is used in creating permanent files.
59-12	Right-justified account number.

W.CPCKP(52) C.CPCON

Bit	Description
0	Console checkpoint request.

W.CPLDR1(55) C.CPLW

Bit	Field	Description
48		Reserved for installations.
49	S.CPLP	Program loaded from nonsystem library.

Bit	Field	Description
50		Reserved.
51	S.CPLRE	Reduce extended memory flag.
52	S.CPLT	Debugging aid flag.
53	S.CPLR	Reduce flag.
57-54	S.CPLM	Map options.
58		Reserved.
59	S.CPLV	Map options validity flag.

W.CPLDR1(55) Interactive Debug Control

Bit	Description
24	Reserved.
25	FTN.
31-26	Reserved.
33-32	Reserved for installations.
34	Copy PIDL, symbol, and line number tables; generate block tables and entry point tables.
35	Load and pass control to the interactive debugger.

W.CPLDR1(55)
W.CPLDR2(56) Global Library Set Indicators
W.CPLDR3(57)

Value	Significance
00	End of global library set.
01-76	LNT ordinal of system library.
77	File name of first user library in W.CPLDR3; file name of second user library in W.CPLDR2.

W.CPTAPE(61) C.CPTMT(0), C.CPTHD(1), C.CPTPE(2), and C.CPTGE(3) have the same fields defined below.

Bit	Description
11-6	Maximum number of tape units of a specific type (MT, HD, PE, or GE) that will be assigned to the control point for a specific job. This value is the number requested on the job statement.
5-0	Number of tape units of a specific type (MT, HD, PE, or GE) left to be assigned to the control point. This value is the maximum number requested minus the number which have been assigned.

W.CPFLAG(63) C.CPFLAG

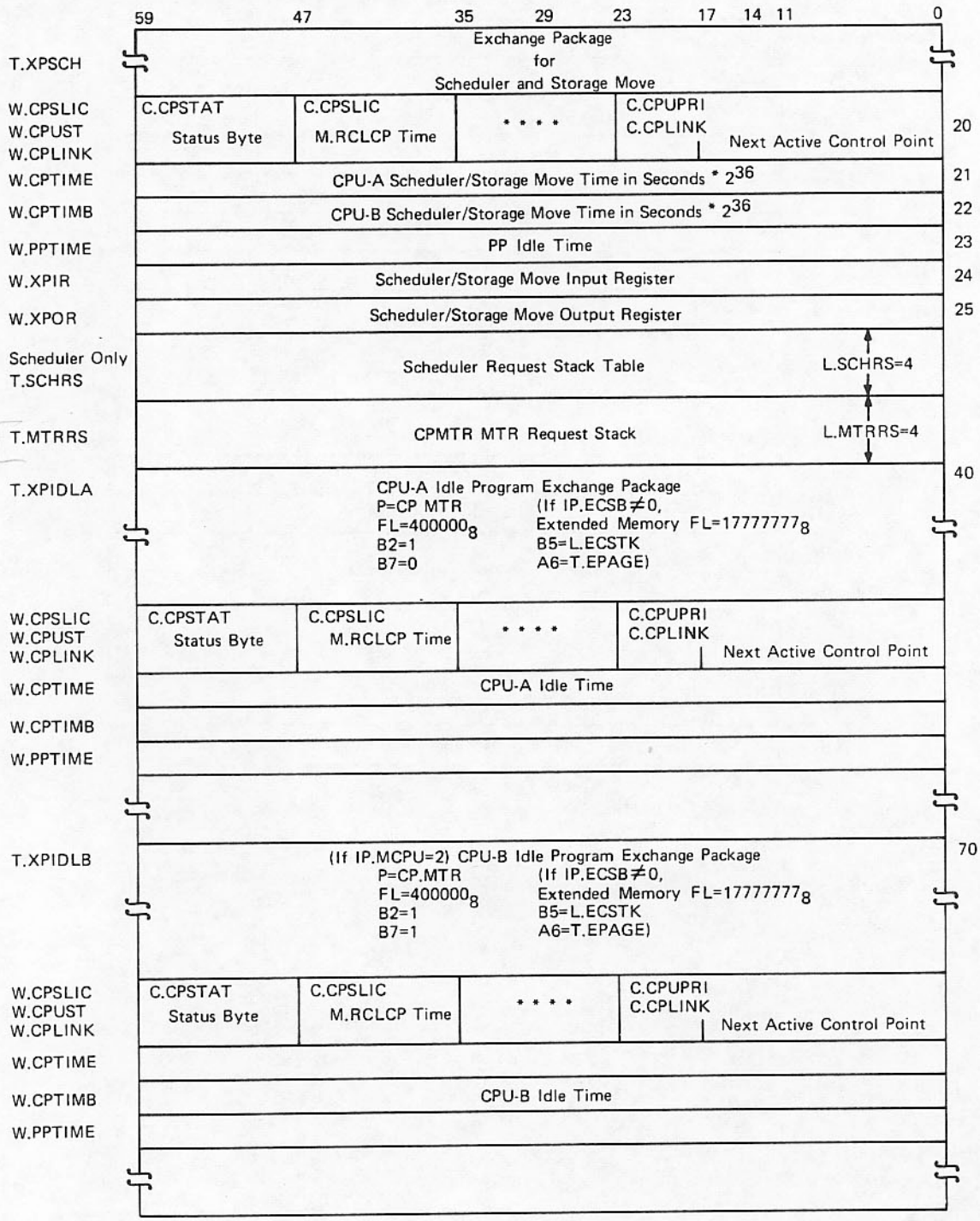
Bit	Field	Description
0	S.CPLDAF	MDI interlock.
1		Reserved.
2	S.CPRK	Previously reprieved after operator KILL.
3	S.CPNFNT	Do not search FNT.
4	S.IOL	I/O time limit previously set.
5	S.CPL	CP time limit previously set.
6	S.MSL	MS limit previously set.
7	S.CPXTS	Look for next EXIT(S) statement.
8	S.CPDMPX	Give no DMPX.
9	S.CPCMM	CMM active flag.
10	S.CPCVL	CVL reserved EST entry for maintenance.
11	S.CPVEX	Control statement validation active.

W.CPFP(63) C.CPFP

Bit	Field	Description
0	S.CPF	Reprocess.
1	S.CPG	Abort.
2	S.CPA	No rerun.
3	S.CPS	Sequencer.
4	S.CPN	Checkpoint taken.
5	S.CPX	Look for EXIT statement.
6	S.CPFEP	Force EXIT processing.
7	S.CPEOR	Reserved.
8	S.CPJFL	Job statement field length assigned.
9	S.CPJ	JANUS.
10	S.CPV	Validate control statements.
11	S.CPE	EXPORT.

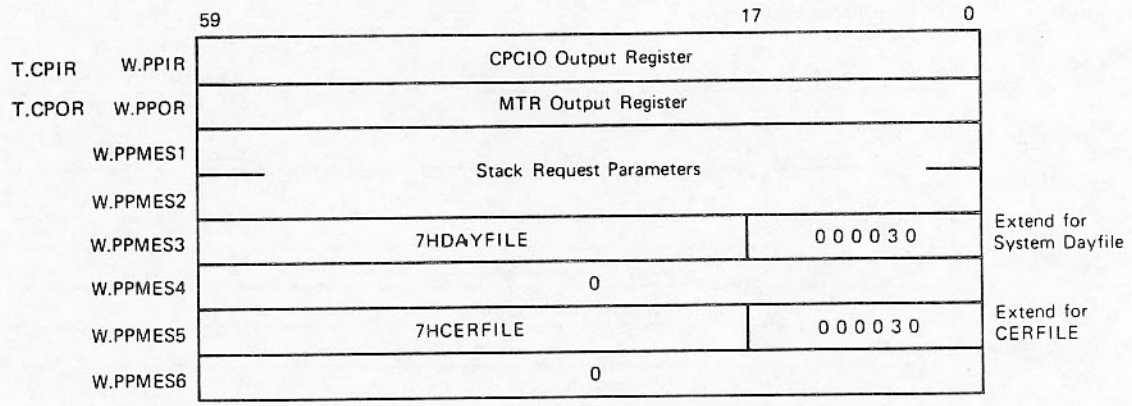
SYSTEM JOB EXCHANGE PACKAGE AREA

Byte 1 of word 60 in the CMR pointer area contains the address of T.XPSCH/10_8. Bits 59 through 43 of word 44 in the CMR pointer area contain the address of T.XPIDLA. Bits 59 through 43 of word 45 in the CMR pointer area contain the address of T.XPIDLB.

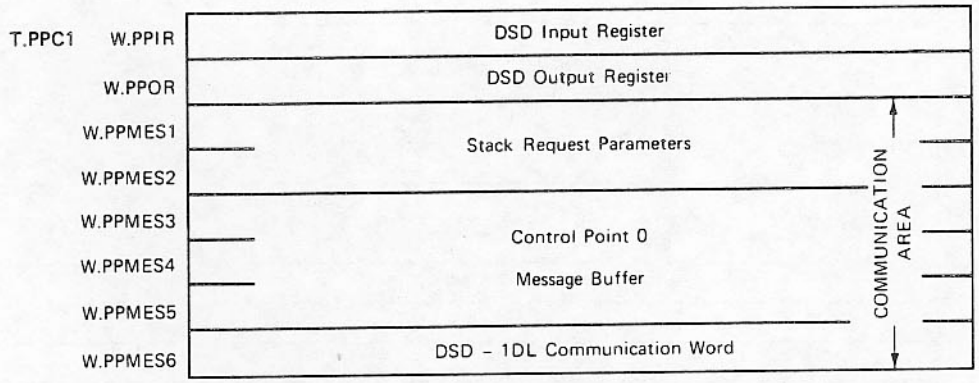


PP COMMUNICATION AREA

FOR PP0

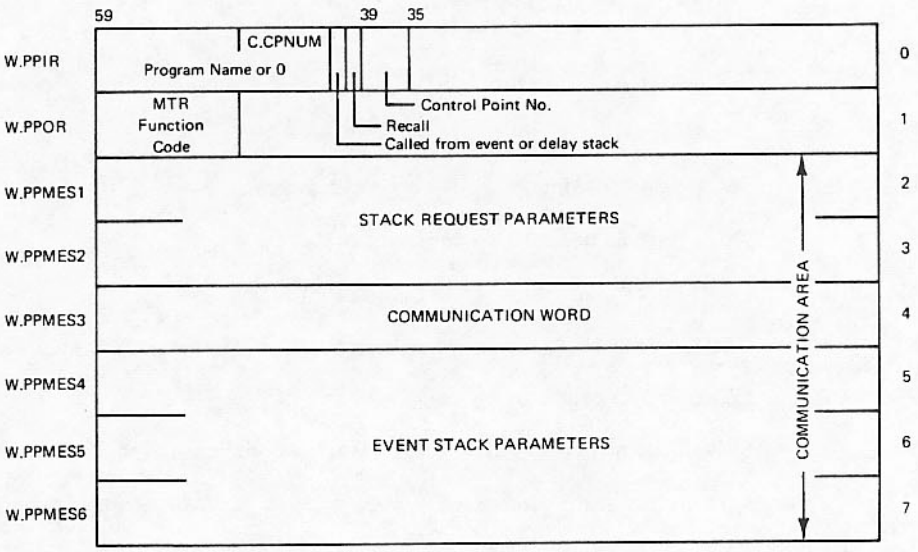


FOR PP1

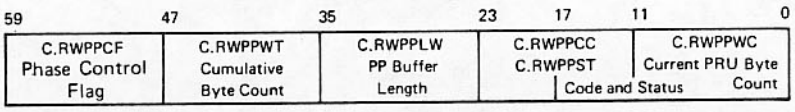


Byte 4 of word 5 in the CMR pointer area contains the address of T.PPC1.

FOR PP2 THROUGH PPn



COMMUNICATION WORD



W. PPMES1 + W. RWPPCW = W. PPMES3

PP PROGRAM NAME RESERVATIONS

The reserved PP program names and CPU monitor functions are as follows.

Routine Name	Description
A	Stack processor segment; zero-filled.
ABC	Buffer controller coldstart bootstrap.
ABS	Dump CM (absolute address).
ABT	Program abort (CPMTR function).
ACE	Advance control statement.
ACT	Helper for program ACCOUNT.
ADS	ADDSET processor; add member to device set.

Routine Name	Description
APR	Automatic program sequencer.
CDF	Copy dayfile file name table.
CED	Deadstart PP control program.
CEE	Second part of deadstart PP control program.
CEF	Third part of deadstart PP control program.
CEM	Central error manager for extended memory.
CIA	Collect data on CPU utilization or CPMTR execution for performance analysis.
CIO	Circular I/O processor.
CKP	Save information necessary to restart a checkpoint job.
CLO	Dummy program used to call CIO.
COM	Deadstart option matrix display routine.
CON	INTERCOM connect file to remote terminal.
CPI	Reserved for on-line diagnostics.
CRI	Reserved for on-line diagnostics.
CT8	Reserved for on-line diagnostics.
CVL	On-line diagnostic validation routine.
CYI	Reset FNT of the file being processed by restart.
DDR	Deadstart 885 or 844 disk driver.

Routine Name	Description
DF7	Reserved for on-line diagnostics.
DF8	Reserved for on-line diagnostics.
DIS	Console display program for a control point.
DLE	Reserved for on-line diagnostics.
DLL	Downline load controlware program.
DLM	DELSET processor; delete member from PF set.
DMD	Dump CM.
DMP	Dump CM.
DSD	System display.
DSM	Dismount pack.
DSP	ROUTE/DISPOSE function processor.
DTS	Deadstart dump for 66x and 67x drivers.
D00	Diagnostic messages for COBOL.
D44	Reserved for on-line diagnostics.
EHS	Export initialization.
ELM	Error log message processor.
END	Normal termination (CPMTR function).
EPF	Send audit information to CM.

Routine Name	Description
FAD	INTERCOM file attach/detach.
FDP	Reserved for on-line diagnostics.
FIN	CCL function processor.
FNT	INTERCOM FNT alter routine.
FSN	Find set name.
FS8	Reserved for on-line diagnostics.
FTP	Reserved for on-line diagnostics.
GBJ	Reserved.
GCC	Graphics class change program.
GEJ	Reserved.
GES	Reserved.
GPF	GETPF (multimainframe).
HDS	Help deadstart.
IAP	INTERCOM initiate another program.
IEF	Reserved for on-line diagnostics.
IPP	INTERCOM password protection.
IRP	Deadstart RMS stack processor.
IUP	INTERCOM initiate user program.
JAC	Job queue acquire information.
JDP	Job dependency count decrementor.

Routine Name	Description
LBK	Reserved for on-line diagnostics.
LBL	LABELMS header.
LCD	Reserved.
LDC	LDCMR utility helper.
LDD	Load capsule directory.
LDL	Loader utility program.
LDQ	FDL quick loader.
LDV	Load CPU absolute overlays.
LDW	Load CPU absolute overlays in conjunction with LDV.
LFP	Deadstart first level peripheral processor (PPU) loader.
LIF	Lower CYBER interactive interface.
LOC	Load octal corrections.
LPF	In conjunction with LOADPF, reload permanent files.
MAC	INTERCOM multiuser job accounting.
MAI	ITF/INTERCOM MUJ swapin initiator.
MDD	Displays CYBER 170 model 800 maintenance registers.
MDI	Used by EDITLIB to handle I/O involved in changing and moving directory.
MDR	Deadstart 66x and 67x driver.
MEM	Process memory function.
MES	INTERCOM write messages to remote terminal.
MLD	Reserved for on-line diagnostics.
MNT	MOUNT processor.

Routine Name	Description
MSD	Direct access module of record manager.
MSG	Issue dayfile messages.
MTR	Monitor.
MTZ	Reserved for on-line diagnostics.
MUJ	INTERCOM multiuser job.
M71	Reserved for on-line diagnostics.
NDR	Remote Host Facility Network Driver.
NLD	NAD LOAD/DUMP Driver.
NSV	PP helper for CPVSN processor.
OPE	Dummy program used to call CIO.
ORD	Reserved for on-line diagnostics.
OSB	Operating system bootstrap routine.
OUX	TRANSPF and DUMPF utility helper.
O26	Console text editor.
PAK	Disk pack management routine.
PCM	Reserved.
PFA	Permanent file manager ATTACH function.
PFC	Permanent file manager CATALOG function.
PFD	Attaches permanent file directory to control point.
PFE	Permanent file manager EXTEND function.
PFP	Permanent file manager PURGE function.
PFR	Permanent file manager RENAME function.
PFS	Permanent file manager POSITION function.

Routine Name	Description
PPI	Reserved.
PRM	Permission checking function.
QAC	I/O queue acquire file.
QAF	Queue access function.
QAJ	Reserved.
QLH	QLOG helper.
RCL	Temporarily relinquish CPU (CPMTR function).
REQ	Make nonallocatable device assignment and format FNT entries for allocatable devices in response to REQUEST control statement or a REQUEST macro call.
RHH	Remote Host Facility helper.
RMS	Reserved for on-line diagnostics.
RPV	Reprieve central program.
RST	Restore control point area of restart job.
RWE	Check for INTERCOM job.
SAC	Extended memory segment activity count (CPMTR function).
SBP	Reserved for on-line diagnostics.
SDA	NOS/VE system deadstart assist.
SLT	Reserved.
SPF	SAVEPF (multimainframe).
SPY	Count P-register samples for CP programs.
SRB	Used by EDITLIB to complete the disk address of a record.
SSC	Subsystem call.
SSF	Subsystem function.
SSH	Station system helper.
STD	Enhanced station channel coupler driver.
STF	Copy central memory into user buffer area.

Routine Name	Description
STL	Deadstart system execution PP resident.
STR	Reserved.
STS	Used by CP program to obtain certain status.
SWT	Switch program in/out.
TAT	PF set table system access.
TBL	INTERCOM get table.
TDS	Terminate deadstart.
TIM	Get current time or date (CPMTR function).
TMT	Table maintenance helper.
T6X	Reserved for on-line diagnostics.
T7X	Reserved for on-line diagnostics.
T76	INTERCOM interface to station control point.
Uxx	Reserved for installations.
VEJ	Verify job statement.
VER	Virtual environment request processor.
VSM	Reserved.
XDQ	PP portion of dump queue.
XJR	Move user PP (CPMTR function).
nUx	Reserved for installations.
0DA-0DZ	INTERCOM 2550 load/dump modules.
0D0-0D9	INTERCOM 2550 load/dump modules.
0FA-0FZ	Reserved.
0F0-0F9	Reserved.
0ND	INTERCOM driver overlay.
0ZA-0ZS	Reserved.
0ZT-0ZZ	Reserved.
0Z1-0Z9	Reserved.

Routine Name	Description
1AB	Identify recovered jobs.
1AJ	Advance job.
1BO	Asynchronous job terminator.
1BR	INTERCOM buffer manager.
1BT	Blank tape label routine.
1CC	Enhanced station CIO overlay.
1CI	INTERCOM queue manager.
1CL	Close function for all nontape or nonpermanent files.
1CR	Reserved.
1CS	Reserved.
1CT	Reserved.
1C9	Write CM for tape read recovery (nine-track system tapes).
1DD	System dynamic dump processor.
1DF	Dump dayfile.
1DI	INTERCOM driver overlay loader.
1DL	Overlay loader and dayfile message processor for DSD.
1DM	Device queue manager.
1DS	INTERCOM H display.
1EJ	End of job processor.
1EV	Off line evict processor.
1FC	Create an RB entry for PFC.
1FE	Reserved.
1FM	Dummy film/hardcopy processor.
1GJ	Reserved.
1GM	Issue GOOD MORNING when time changes from 23.59 to 00.00.
1GR	Reserved.
1GS	Reserved.

Routine Name	Description
1HS	EXPORT main overlay.
1IB	Initiate batch job from input queue.
1ID	Reserved.
1IM	INTERCOM send message to terminal.
1IQ	Initiate JANUS control point.
1IR	Main JANUS routine; drives readers, punches, printers, and so on.
1IS	Initialize overlay setup.
1IT	Integrated tape driver (66x/67x) for main overlay.
1IU	Called by JANUS to backspace print file.
1II	INTERCOM initialization.
1LC	Load tape controller conversion tables.
1LX	Reserved.
1MF	Reserved.
1MH	Tape scheduling/prescheduling routine.
1MM	Multimainframe job queue manager.
1MR	Maintenance channel processor (8xx models only).
1MT	Reserved.
1ND	INTERCOM 255x driver.
1NI	INTERCOM 255x initializer.
1NO	Reserved.
1NP	INTERCOM export processor.
1NR	Reserved.
1NS	Notify station of SPOT completion.
1NW	Reserved.
1N2	Reserved.
1N3	Reserved.
1OP	File open routine for nontape files.

Routine Name	Description
1PC	Close permanent file mass storage.
1PD	Called by PFA to enter event stack, call another PP routine, or swap out.
1PF	Permanent file error recovery.
1PG	PURGE (multimainframe).
1PK	PF set coordinator.
1PL	Dummy plot program.
1P1	Reserved.
1P2	Reserved.
1P3	Reserved.
1P4	Reserved.
1QF	I/O file manager.
1QM	INTERCOM check for MUJ swap-out completion.
1QP	INTERCOM quantum calculator and MUJ servicer.
1RC	Restore field length of a checkpointed job.
1RM	RMF two-port multiplexer driver.
1RN	Age queues, manage RBT chains, and check status of tape drives.
1RP	Reserved.
1RS	Reserved.
1RT	Reserved.
1RV	Reserved.
1R2	Reserved.
1R3	Reserved.
1R9	Reserved.
1SC	Record status/control register errors in CERFILE.
1SI	Routine to swap in or roll in a job.
1SO	Swap out or roll out a job.
1SP	Mass storage I/O stack processor for 7054 and 7154 controllers.

Routine Name	Description
1SQ	Mass storage I/O stack processor for 7155 controller.
1SX	Error message and abort function for stack processors.
1S5	Load and execute 1SP or 3DO at second entry.
1TD	INTERCOM send dayfile message to terminal.
1TF	Reserved.
1TJ	Translate job statement.
1TO	Reserved.
1TR	Reserved.
1TS	Tape sampler; contains 2TACOM.
1VG	Reserved.
1VP	VER helper.
1WB	Reserved.
1WI	Reserved.
1WS	Reserved.
1W5	Reserved.
1W9	Reserved.
1XG	Reserved.
1XP-6XP	Reserved.
1ZA-1ZP	Reserved.
2CC	1CI overlay; process command.
2CS	1CI overlay; status management.
2CU	1CI overlay; create user table.
2DP	DSP overlay; RHF routing directive processor.
2DM	DSM overlay; operation dismount processor.
2FC	1FC overlay; replace mode.
2FE	Reserved.
2GJ	Reserved.
2IA	66x/67x read driver for L tapes.
2IB	66x/67x write driver for L tapes.

Routine Name	Description
2IC	66x/67x read driver for seven-track coded system tapes.
2ID	66x/67x write driver for seven-track coded system tapes.
2IL	66x/67x labels and tape module.
2IO	Submodule for 3IO, 3IL.
2IP	66x/67x tape positioning.
2IR	66x basic read overlay.
2IS	Reservoir of routines for 1IS.
2IT	67x basic read overlay.
2IW	66x basic write overlay.
2IX	67x basic write overlay.
2I1	INTERCOM overlay to 1I1.
2LF	LPF overlay broken connect.
2MN	MNT overlay error processing.
2MZ	MDD overlay.
2ND	INTERCOM driver input command processor.
2NI	INTERCOM initializer overlay.
2NP	INTERCOM batch command processor.
2NQ	NDR overlay; FET I/O READ.
2NR	NDR overlay; READ path data.
2NS	NDR overlay; FET I/O WRITE.
2NT	NDR overlay; FET I/O convert mode read.
2NU	NDR overlay; FET I/O convert mode write.
2NW	NDR overlay; WRITE path data.
2NX	NDR overlay; FET I/O READC.
2NY	NDR overlay; FET I/O WRITEC.
2PA	PFA utility processor.
2PK	1PK overlay.
2QF	1QF overlay; recover queue files.
2RM	1RM overlay; state processors.

Routine Name	Description
2RN	IRN overlay; check available disk space.
2RP	Reserved.
2R2	Reserved.
2ST	Multimainframe CIO staging processor.
2TB	Reserved.
2TC	Reserved.
2VJ	Translate job statement.
2WB	Reserved.
2XP	Reserved.
3AM	ADS overlay member processing.
3DO	Initialize allocatable device file.
3FE	Reserved.
3HS	Export FET processor.
3IC	66x/67x close processor.
3IE	66x/67x basic error processor.
3IF	66x/67x multifile processor.
3II	66x/67x system initialization.
3IJ	66x/67x system call processor.
3IL	66x/67x label write processor.
3IM	66x/67x message processor.
3IN	VSN message processor.
3IO	66x/67x open processor.
3IP	66x/67x positioning within a logical file.
3IR	66x/67x read error recovery.
3IS	JANUS overlay.
3IV	66x/67x close volume processor.
3IW	66x/67x write error recovery.
3LF	LPF overlay; abnormal termination.
3LX	Reserved.

Routine Name	Description
3MN	REQ overlay containing 2TACOM for tape assignments.
3MS	EXPORT overlay.
3ND	1ND overlay; INTERCOM driver input command processor.
3NE	NLD overlay; load NAD controlware.
3NF	NLD overlay; dump NAD controlware.
3NG	NLD overlay; turn on NAD.
3NI	1NI overlay; INTERCOM initializer overlay.
3NM	NDR overlay; miscellaneous functions.
3NN	NDR overlay; disconnect, purge, and initialize functions.
3NP	1NP overlay; INTERCOM batch support subroutines.
3NW	NDR overlay; STATUS/IDLE/DROP.
3PC	PFC helper.
3PM	Reserved.
3PO	Reserved.
3PS	Reserved.
3QF	1QF overlay; 1QF functions 4 and 5.
3RQ	REQ overlay containing 2TACOM.
3R2	Reserved.
3R3	Reserved.
3SW	Reserved.
3SY	Stack processor for 844-21 and 844-4x driver.
3TD	INTERCOM overlay to MSG; send dayfile message to terminal.
3TT	CIO overlay; INTERCOM transmit data from CPU to terminal.
3T1-3T2	INTERCOM overlays to 3TT.
3WB	Reserved.
3XP	Reserved.
4AM	ADS add member overlay.
4DO	Process device independent requests for allocatable devices.
4EJ	RERUN overlay to 1EJ to reconstruct input FNT.

Routine Name	Description
4ES	Enter stack request.
4FE	Reserved.
4HS	EXPORT overlay.
4IS	JANUS overlay.
4LB	Reserved.
4LC	Reserved.
4LF	LPF overlay; abnormal termination.
4LX	Reserved.
4MN	MNT overlay; master not mounted.
4NB	NDR overlay; log NAD block errors.
4NC	NDR overlay; log NAD errors.
4ND	1ND overlay; INTERCOM driver output command processor.
4NI	1NI overlay; INTERCOM initializer overlay.
4NM	NDR overlay; dayfile error messages.
4NP	1NP overlay; INTERCOM diverted file processor.
4PA	PFA overlay for delay/event stack and 1PF interface.
4QF	1QF overlay; 1QF functions 10 and 11.
4SD	Enhanced station channel coupler driver overlay to STD.
4SR	Reserved.
4WB	Reserved.
4XP	Reserved.
5CV	CVL overlay; validate remote NAD.
5CW	Reserved.
5CY	IRP overlay containing stack processor for 844-21, 844-4x, and 885 drivers.
5FE	Reserved.
5FF	Reserved for on-line diagnostics.
5FH	Reserved for on-line diagnostics.
5IS	JANUS overlay.
5LC	Reserved for on-line diagnostics.

Routine Name	Description
5LL	Reserved for on-line diagnostics.
5LX	Reserved.
5MN	MNT overlay; normal termination.
5MU	Reserved for on-line diagnostics.
5ND	IND overlay; INTERCOM batch support subroutines.
5NP	INP overlay; INTERCOM disconnect/recovery processor.
5PA	PFA segment error subroutine.
5QF	IQF overlay; IQF functions 0 through 3.
5WB	Reserved.
5XP	Reserved.
541	Reserved for on-line diagnostics.
55X	Reserved for on-line diagnostics.

Routine Name	Description
56X	Reserved for on-line diagnostics.
57X	Reserved for on-line diagnostics.
58F	Reserved for on-line diagnostics.
58H	Reserved for on-line diagnostics.
58X	Reserved for on-line diagnostics.
6BM	Billing message overlay.
6BR	Reserved.
6BW	Reserved.
6CR	Reserved.
6CW	Reserved.
6DS	INTERCOM H display overlay.
6FB	EXPORT buffer manager overlay.
6FE	Reserved.
6FM	EXPORT file manager overlay.
6IB	EXPORT initial block processor overlay.
6IM	Issue conflict and abort messages for REQ.
6LC	Reserved.
6LM	Reserved.
6LX	Reserved.
6L1	Reserved.
6L2	Reserved.
6L3	Reserved.
6L4	Reserved.
6L5	Reserved.
6L7	Reserved.
6MD	Dummy EDITLIB overlay.
6MN	REQ overlay for tape assignments.
6ND	INTERCOM batch support subroutines.
6NO	Reserved.

Routine Name	Description
6NP	INP overlay; INTERCOM batch command processor.
6PC	Restore main PFC code following 7PC call.
6PD	Write predayfile.
6PM	Permanent file accounting overlay.
6PR	Restore main PFR code following 7PR call.
6RD	Disposed file accounting overlay.
6SD	EXPORT special directive overlay.
6SF	EXPORT file search overlay.
6TB	TBL overlay.
6T1	TDS overlay for load deadstarts.
6T2	TDS overlay for recovery deadstarts.
6WM	Output dayfile error messages for I/O requests.
6XP	Reserved.
7AJ	IAJ overlay for EXIT statement processing.
7A1-7A8	IIU overlays of 580 PFC spacing code arrays.
7CC	Station CIO overlay to ICC.
7EC	Generate extended memory buffers.
7FE	Reserved.
7ID	Auxiliary error processor for RMS I/O.
7ND	IND overlay; INTERCOM transition processor and system support.
7NP	INP overlay; INTERCOM dayfile accounting message.
7PC	Read label of private set master device for PFC.
7PR	Read label of private set master device for PFR.
7RQ	REQ set processor.
7SF	EXPORT file search overlay.
7SI	Process swap-in errors.
7SO	Process swap-out errors.
7T1	Reserved.
7T2	Reserved.
7W1-7W2	Overlay for 6WM.

Routine Name	Description
8AA-8AI	Reserved.
8AJ	1AJ overlay to set/clear the stack purge bit in the exchange package.
8AK-8A9	Reserved.
8BA-8B9	Reserved.
8CA-8C9	Reserved for on-line diagnostics.
8DA	A, I, J display overlay for DSD (dayfile buffers, REQUEST statements, JANUS).
8DB	B display overlay for DSD (control point status).
8DC	C, D, G display overlay for DSD (central memory).
8DD	Reserved for DSD.
8DE	E display overlay for DSD (equipment status table).
8DF	F display overlay for DSD (file name table).
8DG	Reserved for DSD.
8DH	H display for DSD (I/O queues).
8DI	Reserved for DSD.
8DJ	Reserved for DSD.
8DK	K display overlay for DSD (pointers and control point area).
8DL	L display overlay for DSD (central programmable).
8DM	M display overlay for DSD (PP communications area).
8DN	N display overlay for DSD (breakpoint).
8DO	O display overlay for DSD (operator message).
8DP	P display overlay for DSD (tapes table and VSN previewing).
8DQ	Q display overlay for DSD (INTERCOM status).
8DR	R display overlay for DSD (JDT tables and queues).
8DS	S display overlay for DSD (job control area).
8DT	T display overlay for DSD (transfer status-linked mainframe).
8DU	U display overlay for DSD (ID table).
8DV	V display overlay for DSD (RMS devices).
8DW	W display overlay for DSD (waiting packs).

Routine Name	Description
8DX	X display overlay for DSD (extended memory).
8DY	Y display overlay for DSD (command format dictionary).
8DZ	Z display overlay for DSD (display dictionary).
8D0-8D4	DSD.
8EA-8E4	DSD (linked mainframe displays).
8FA-8FD	Reserved.
8FE	Reserved.
8FF-8I9	Reserved.
8GA-8GI	O26 overlays.
8GO	Reserved.
8IA-8IH	DIS overlays.
8JA-8M9	Reserved for DSD alternate overlay names.
8NA-8NC	Reserved.
8ND	IND overlay; INTERCOM driver terminator routines.
8NE-8PS	Reserved.
8NO	Reserved.
8PA	PFA overlay to bring in RBT chain.
8PC	PFC overlay to verify SAAM files.
8PU-8SH	Reserved.
8SI	Segment to ISI that writes debug messages to dayfile if IP.TF=0.
8SJ-8W9	Reserved.
8XA	Channel commands overlay for DSD.
8XB	Debugging commands overlay for DSD.
8XC	PP calling control points requests commands overlay for DSD.
8XD	Equipment status commands overlay for DSD.
8XE	Control point commands overlay for DSD.
8XF	Deadstart commands overlay for DSD.
8XG	Priority and tape staging job control commands overlay for DSD.
8XH	INTERCOM commands for DSD.

Routine Name	Description
8XI	Miscellaneous commands overlay for DSD.
8XJ	Miscellaneous commands overlay for DSD.
8XK	Tape scheduling commands overlay for DSD.
8XL	Operator action manager commands overlay for DSD.
8XM	Error flag commands overlay for DSD.
8XN	CP/PP interlock commands overlay for DSD.
8XO	Initiate system jobs command overlay for DSD.
8XP	Tape assignment command overlay for DSD.
8XQ	Bring up displays command overlay for DSD.
8XR	Divert a file command overlay for DSD.
8XS	Segment debug command overlay for DSD.
8XT	Segment debug command overlay for DSD.
8XU	RMS commands for DSD.
8XV	Logical ID command overlay for DSD.
8XW	ENID command overlay for DSD.
8XX-8X7	Reserved for DSD.
8X8	DSD command syntax table.
8X9	Reserved for DSD.
8YA-8Y9	DSD; linked mainframe commands.
8ZA-8Z9	Reserved.
9AA-9FD	Reserved for on-line diagnostics.
9FE	Reserved.
9FF-9NC	Reserved for on-line diagnostics.
9ND	INTERCOM 255x driver.
9NE-9RL	Reserved for on-line diagnostics.
9RM	1RM termination overlay.
9RN-9Y9	Reserved for on-line diagnostics.
9ZA-9Z9	Reserved.

CPMTR Functions

01	M.SETST	Set CPU status bits.
02	M.CLRST	Clear CPU status bits.
03	M.RCP	Request central processor.
04	M.DCP	Drop central processor.
05	M.RCLCP	Recall central processor.
06	M.ICE/M.SPM	Initiate central executive/SPM call from 1SP. The following subfunctions can be performed.

00	EX.SS	System second calculation.
01	EX.SPM	Call stack processor manager.
02	EX.SPRCL	Stack processor recall.
03	EX.STAT	Change status.
04	EX.NXTPB	Get next PB/PRU.
05	EX.TAT	Lock RBR/RBT processing.
06	EX.RBT	PRU conversion.
07	EX.SIDLE	Initiate system IDLE mode.
10	EX.SSF	Subsystem function.
11	EX.DAM	Initiate DAM processing.
12	EX.BOOT	Start extended memory system.
13	EX.REQEB	Request extended memory buffer.
14	EX.RELE14	Release extended memory buffer.
15	EX.CBM	Circular buffer manager.
16	EX.FLHB	Flush buffer.
17	EX.CSWAP	Clean extended memory after extended memory RPE in swap file.
20	EX.AUTEB	Terminate automatic allocation.
21	EX.ECD	Display extended memory.
22	EX.ECR	Release display.
23	EX.ECW	Modify extended memory.

24	EX.CEM	Clear CEM working flag.
25	EX.ECLDV	Make successive partial reads of extended memory record.
26	EX.BKSPF	Release data in extended memory from input buffer.
27	EX.LNKON	Restart ECS link driver.
30	EX.LNKIN	Initialize MMF ECS link driver.
31	EX.SUB	819 subsystem function.†
32	EX.PPIO	819 PP I/O function.
33	EX.ECE	Extended memory error.
34	EX.BTCHG	Update logfile bitmap.

07	M.CPUST	Change CPU status (IP.MCPU = 1).
10	M.SLICE	MTR interrupts CPMTR at end of time slice for job.
11	M.SPRCL	Stack processor recall.
12	M.RCH	Reserve channel.
13	M.SEF	Set error flag.
14	M.PPLIB	PP library search.
15	M.SCH	Initiate integrated scheduler.
16	M.RBTSTO	Request RBT storage.
17	M.RSTOR	Request storage.
20		Reserved.

PPMTR Functions

21	M.DPP	Drop PP.
22	M.ABORT	Abort control point and drop PP.
23	M.RPJD	Request peripheral job and drop PP.
24	M.EESD	Enter event stack and drop PP.
25	M.SEQ	Assign job sequence number.
26	M.MFLA	Monitor field length access.
27	M.ISP	Initiate stack processor.

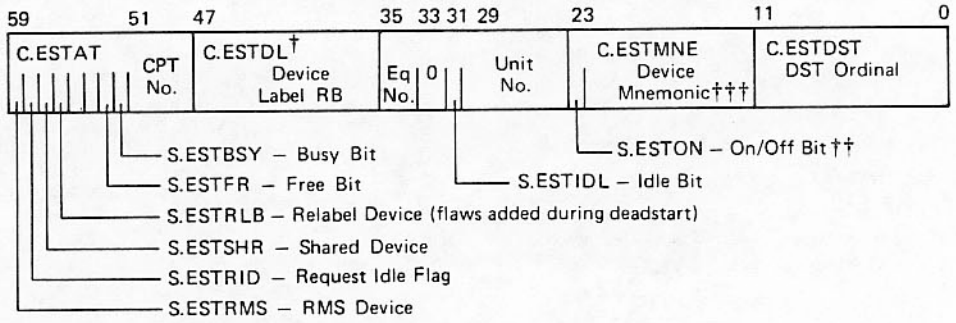
† Refer to the section on Input/Output for more details on the 819 subsystem function.

30	M.DFM	Process dayfile message.
31	M.CCPA	Change control point assignment.
32	M.RPJ	Request peripheral job.
33	M.EES	Enter event stack.
34	M.CPJ	Capture peripheral job.
35	M.TSR	Terminate storage request (IP.RTMTR = 0).
36	M.PASS	Ignored by MTR; cleared by another routine.
37	M.RACT	Request control point activity.
40	M.SCB	System circular buffer surveillance.
41	M.NTIME	Enter new time limit.
42	M.NOTE	Null function that is cleared immediately; used as breakpoint.
43	M.MCH	Read maintenance register (CYBER 180-class mainframes only).
44	M.BUFPTR	Buffer pointer address.
45	M.PATCH	Enter a patch into MTR.
46	M.TRACE	Turn on MTR trace.
47	M.SLPER	XJ to other CPU.
77	M.KILL	Bad monitor request made.

EQUIPMENT STATUS TABLE (EST)

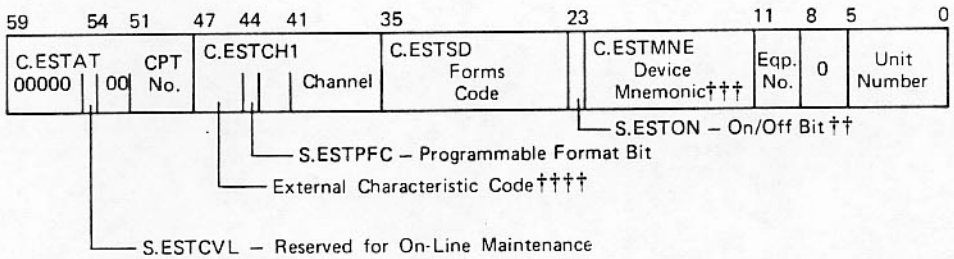
Byte 0 of word 5 in the CMR pointer area contains the first word address of the EST. Byte 1 of word 5 in the CMR pointer area contains the last word address plus one of the EST.

RMS DEVICE ENTRY



Free Bit	Busy Bit	Significance
0	0	Unavailable device.
1	0	Dismounted device.
0	1	Mounted device.
1	1	Device in process of being dismounted.

UNIT RECORD EQUIPMENT ENTRY



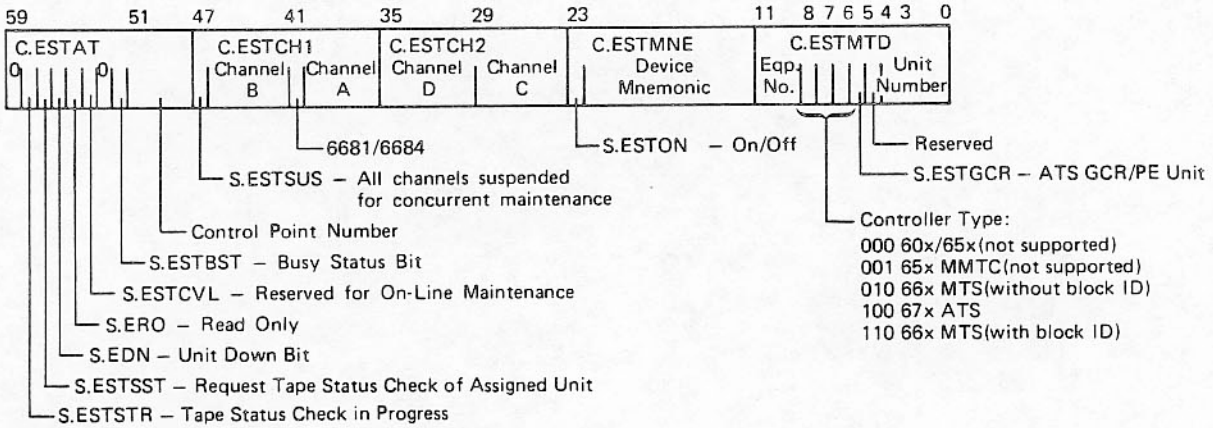
† During a level 0 deadstart, this byte holds the starting cylinder number of CTI/MSL for the preallocation routine in LABELMS.

†† A setting of 0 indicates on; 1 indicates off.

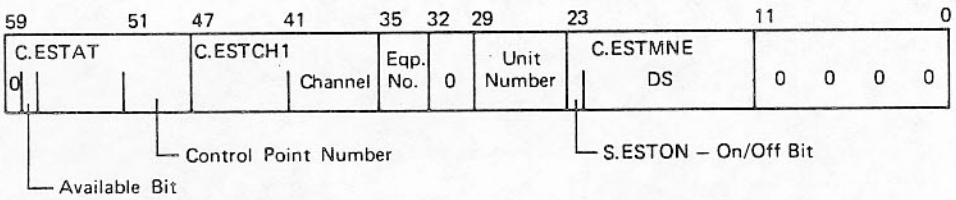
††† See B-75 for mnemonic codes.

†††† See B-79 for bit codes.

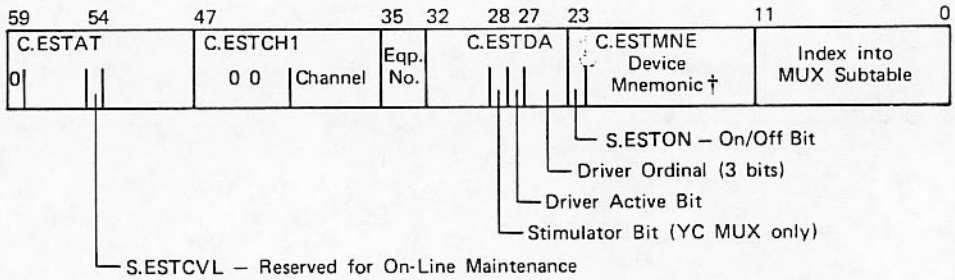
MAGNETIC TAPE ENTRY



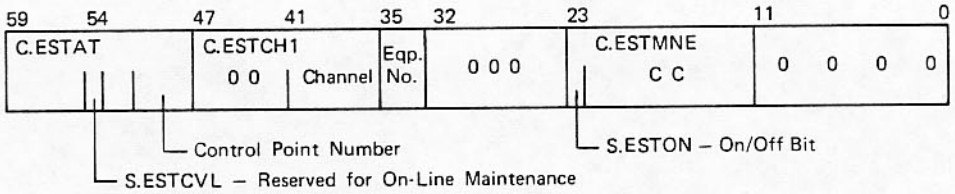
DISPLAY CONSOLE ENTRY



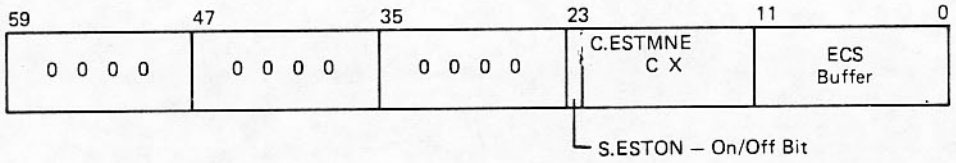
MULTIPLEXER ENTRY



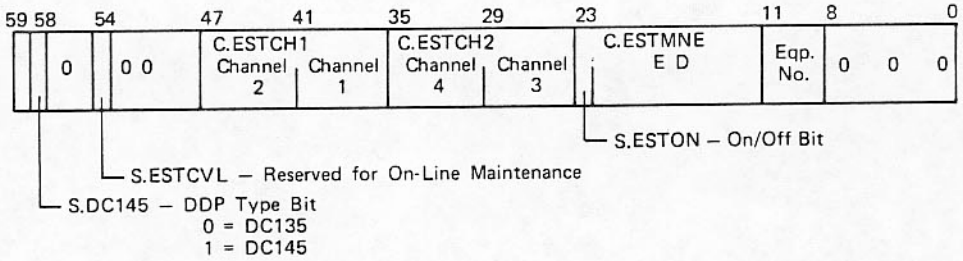
6000/7000 CHANNEL COUPLER



ECS LINK ENTRY

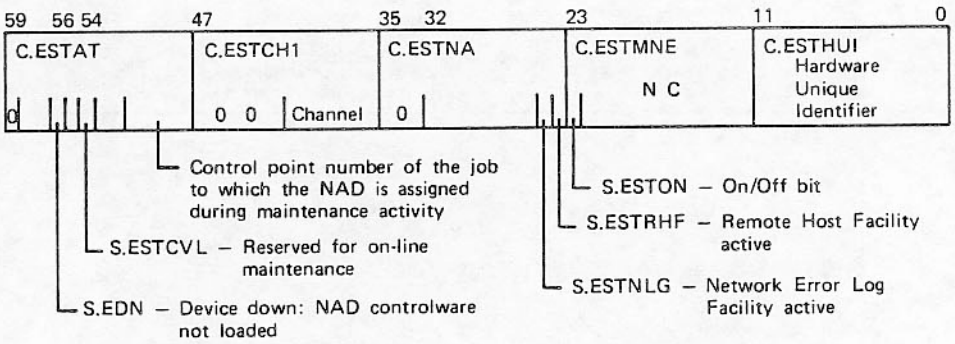


DDP ENTRY



†See B-75 for mnemonic codes.

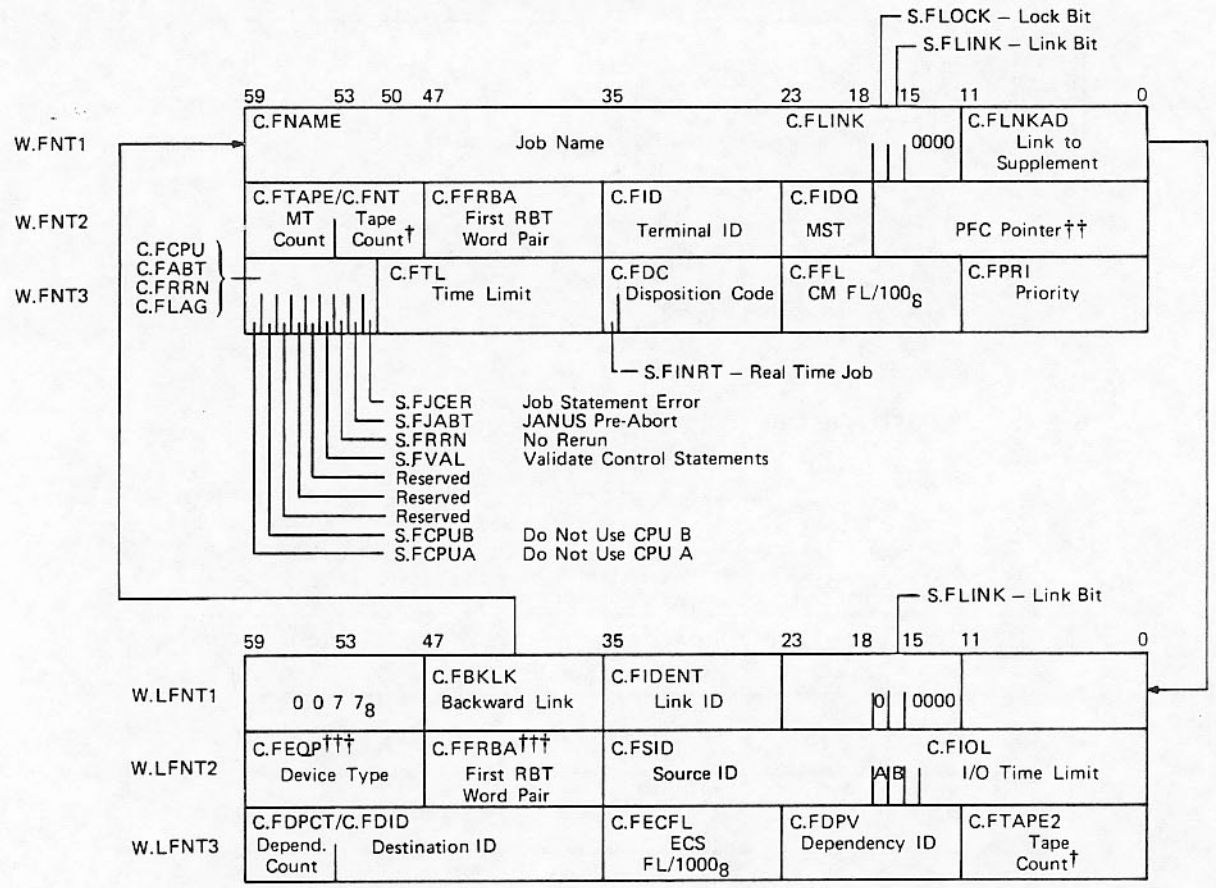
NAD ENTRY


59 56 54 47 35 32 23 11 0
C.ESTAT
C.ESTCH1
C.ESTNA
C.ESTMNE
N C
C.ESTHUI
Hardware
Unique
Identifier
0
0 0 Channel
0
Control point number of the job to which the NAD is assigned during maintenance activity
S.ESTCVL – Reserved for on-line maintenance
S.EDN – Device down: NAD controlware not loaded
S.ESTON – On/Off bit
S.ESTRHF – Remote Host Facility active
S.ESTNLG – Network Error Log Facility active

FILE NAME TABLE

Byte 0 of word 4 in the CMR pointer area contains the FWA of this table. Byte 1 of word 4 contains LWA+1.

ENTRY AND OPTIONAL SUPPLEMENT
FOR FILE IN INPUT QUEUE

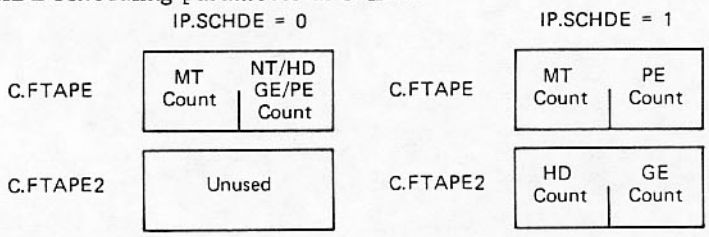


A S.FINKP - Keep bit; indicates file is to be kept on this mainframe, not transferred to another mainframe by station or Gemini.

B S.FILRE - Extended memory reduce flag.

---

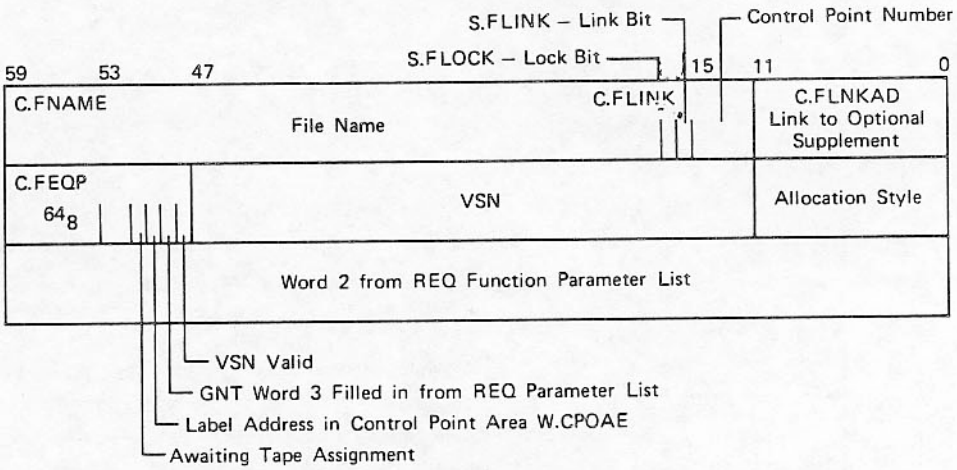
† Dependent on IP.SCHDE scheduling parameter as follows:



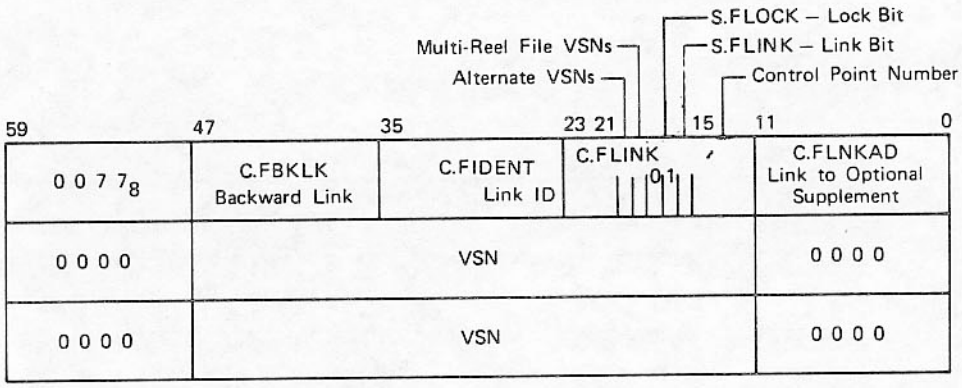
†† Relative PRU of PFC entry for this queue file.
††† If nonzero, fields apply to predayfile.

TAPE FILE ENTRIES

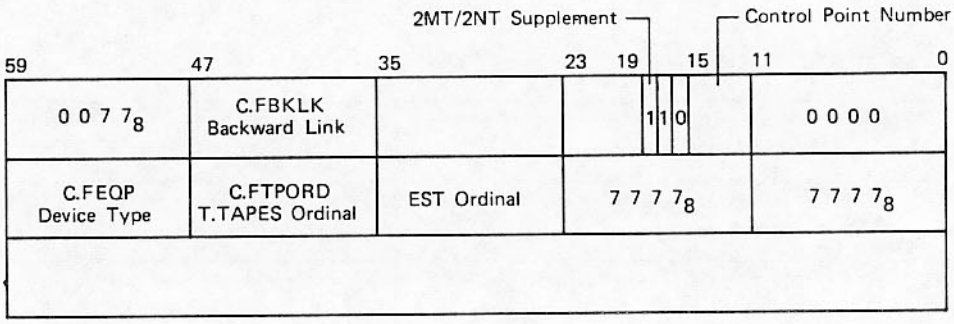
BEFORE EQUIPMENT ASSIGNMENT (GNT)



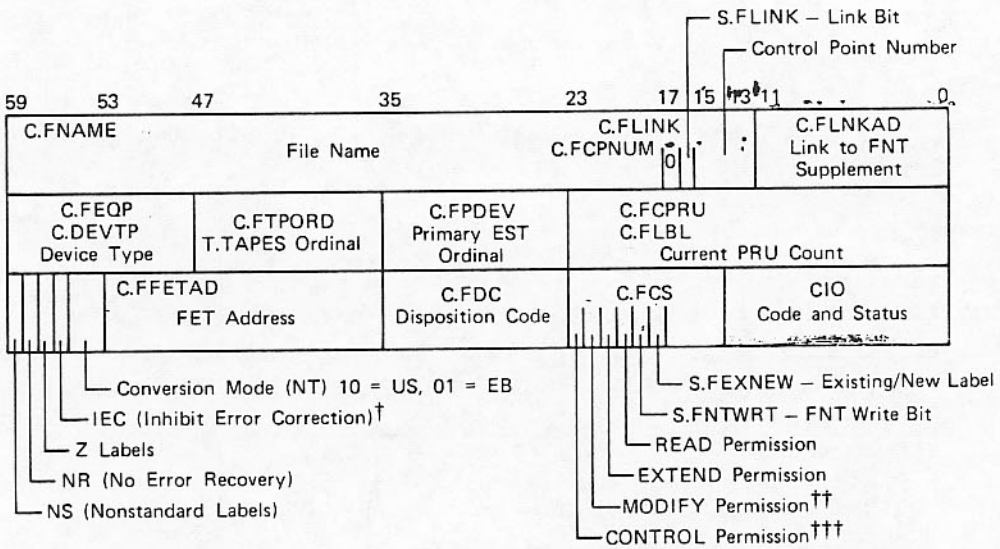
SUPPLEMENT(S) IF MORE THAN ONE VSN GIVEN



SUPPLEMENT IF 2MT/2NT DECLARED



TAPE FILE ENTRY DURING PROCESSING

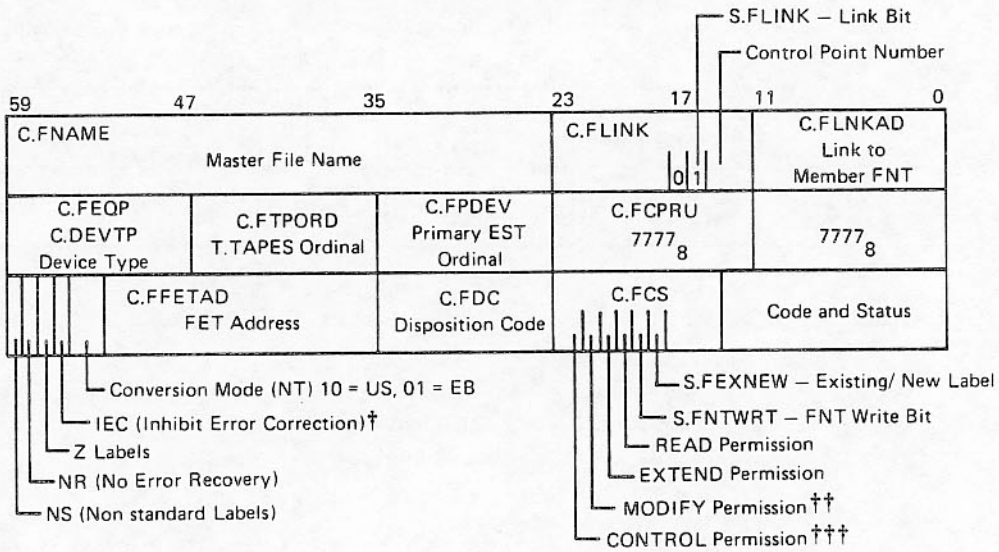


†Applies only to 679 tape units capable of 6250 cpi density. This density exists on models 679-5, 679-6, and 679-7 tape drives only.

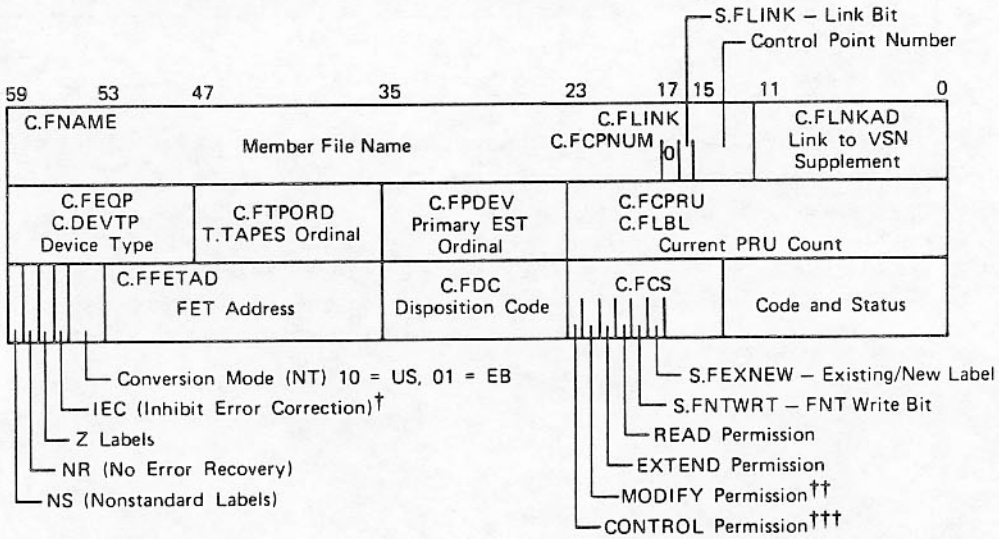
††NORING is not specified.

†††Expired tape label or operator override on unexpired tape label.

TAPE FILE ENTRY FOR MASTER



TAPE FILE ENTRY FOR MEMBER DURING PROCESSING††††



† Applies only to 679 tape units capable of 6250 cpi density. This density exists on models 679-5, 679-6, and 679-7 tape drives only.

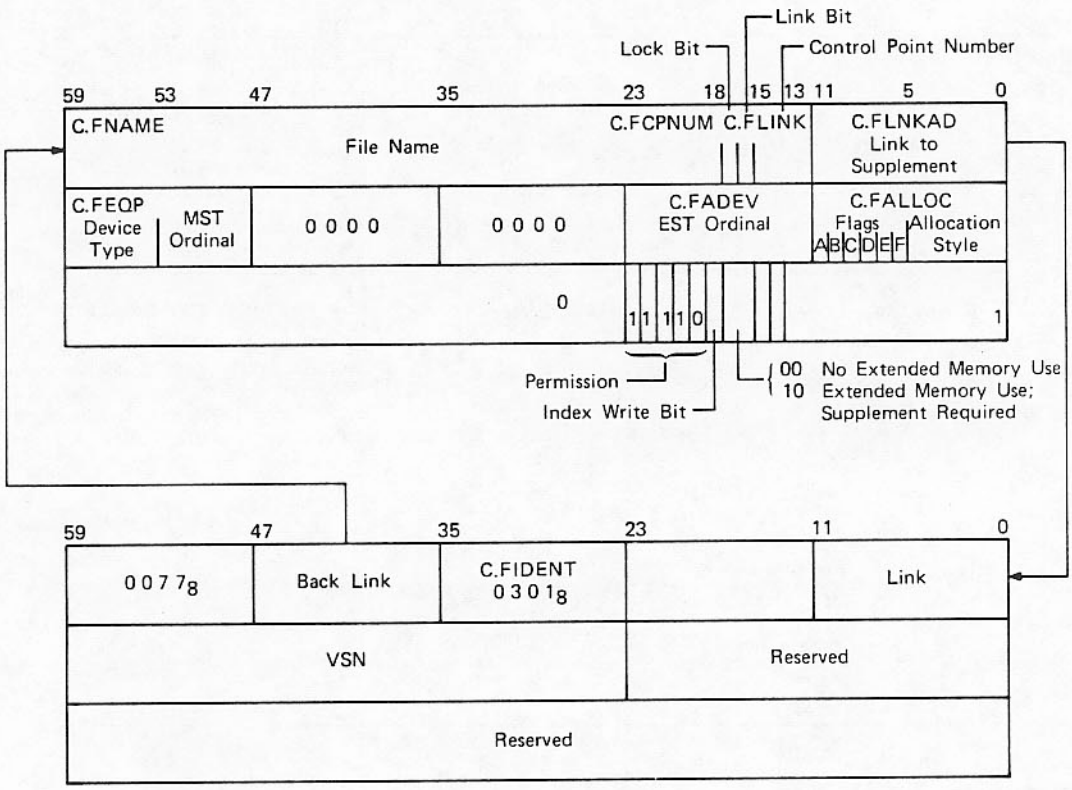
†† NORING is not specified.

††† Expired tape label or operator override on unexpired tape label.

†††† Before a LABEL or LISTMF, after a RETURN of the member file, or after completion of a LISTMF, the member FNT appears as a 2MT/2NT supplement except that bit 18 is zero and bits 17 through 0 are the same as for a regular member FNT.

ENTRY FOR LOCAL RMS FILE

BEFORE ASSIGNMENT TO A DEVICE



A PF device.

B Overflow allowed.

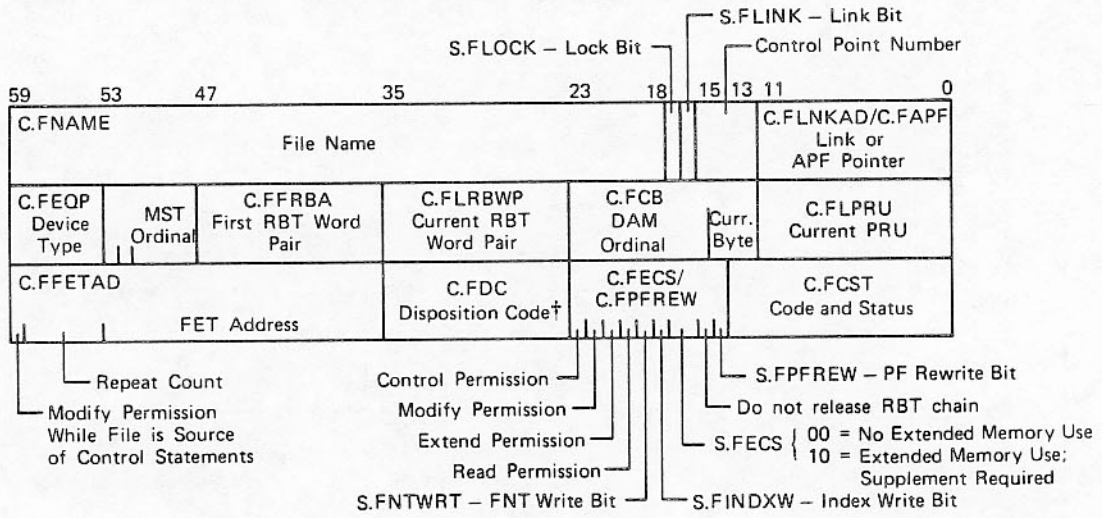
C Queue device.

D Extended memory buffered.

E System device.

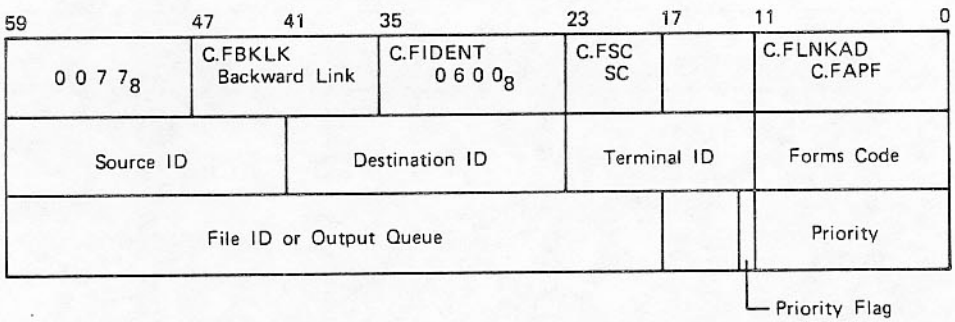
F Deferred assignment.

AFTER ASSIGNMENT TO A DEVICE AND THROUGHOUT PROCESSING



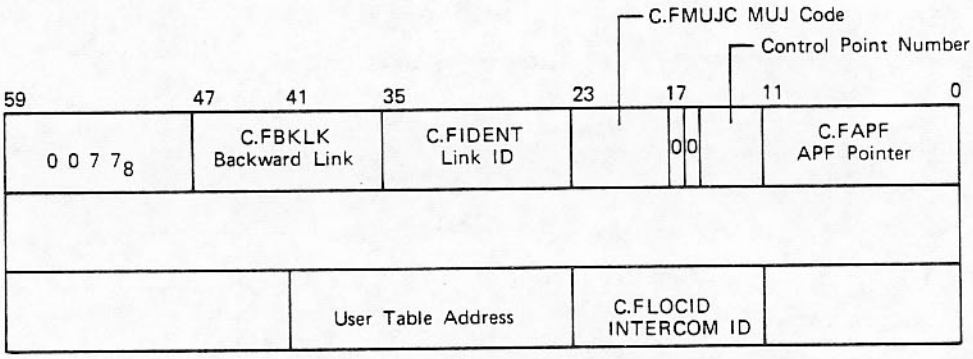
OPTIONAL SUPPLEMENTS FOR LOCAL RMS FILES

FILE ROUTING SUPPLEMENT

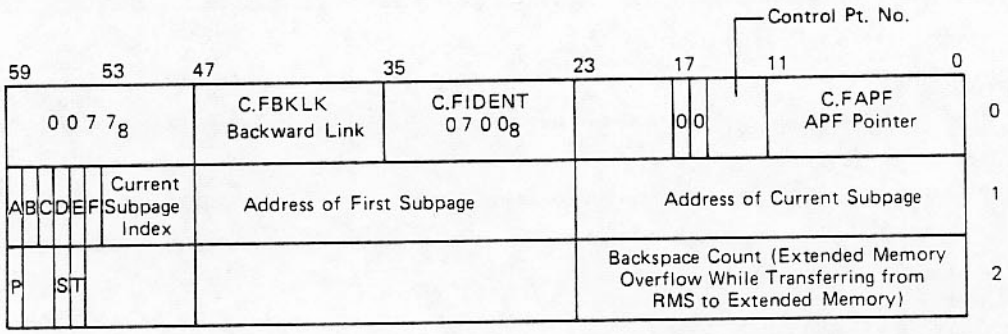


† See B-79 for disposition codes.

INTERCOM USER FILE SUPPLEMENT †



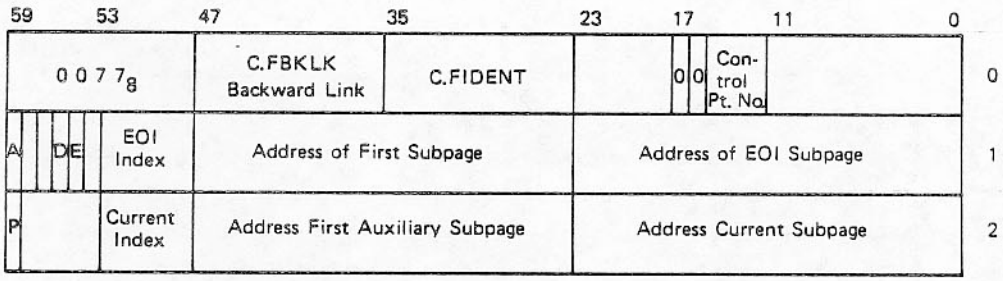
EXTENDED MEMORY FILE SUPPLEMENT (Extended Memory resident files or I/O buffers)



† Required only when file is to be attached to a swapped-out job.

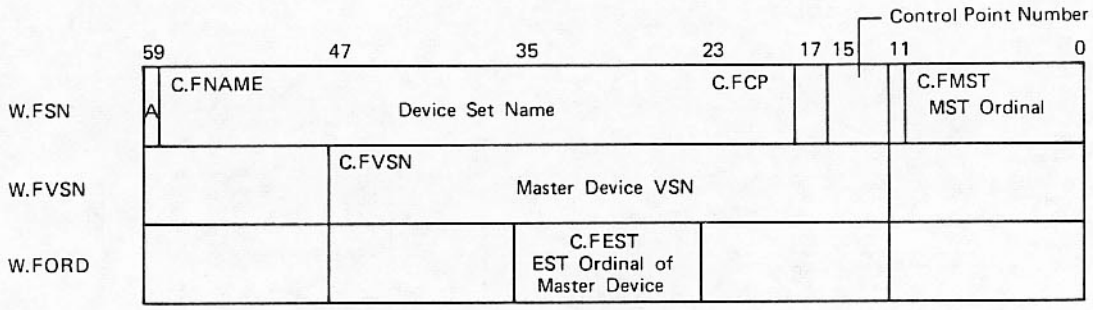
Field Name	Word	Bit	Description
A	1	59	1 Extended memory buffered file.
B		58	Buffer overflow (R option).
C		57	0 Output buffer.
			1 Input buffer.
D		56	1 Release bit.
E		55	Extended memory preallocation flag.
F		54	Outstanding PPCIO request.
P	2	59	Transfer in progress (extended memory resident random files).
S		56	Index written (close random file).
T		55	Release extended memory buffer after the current SR.

EXTENDED MEMORY FILE SUPPLEMENT (Extended Memory Resident Library)



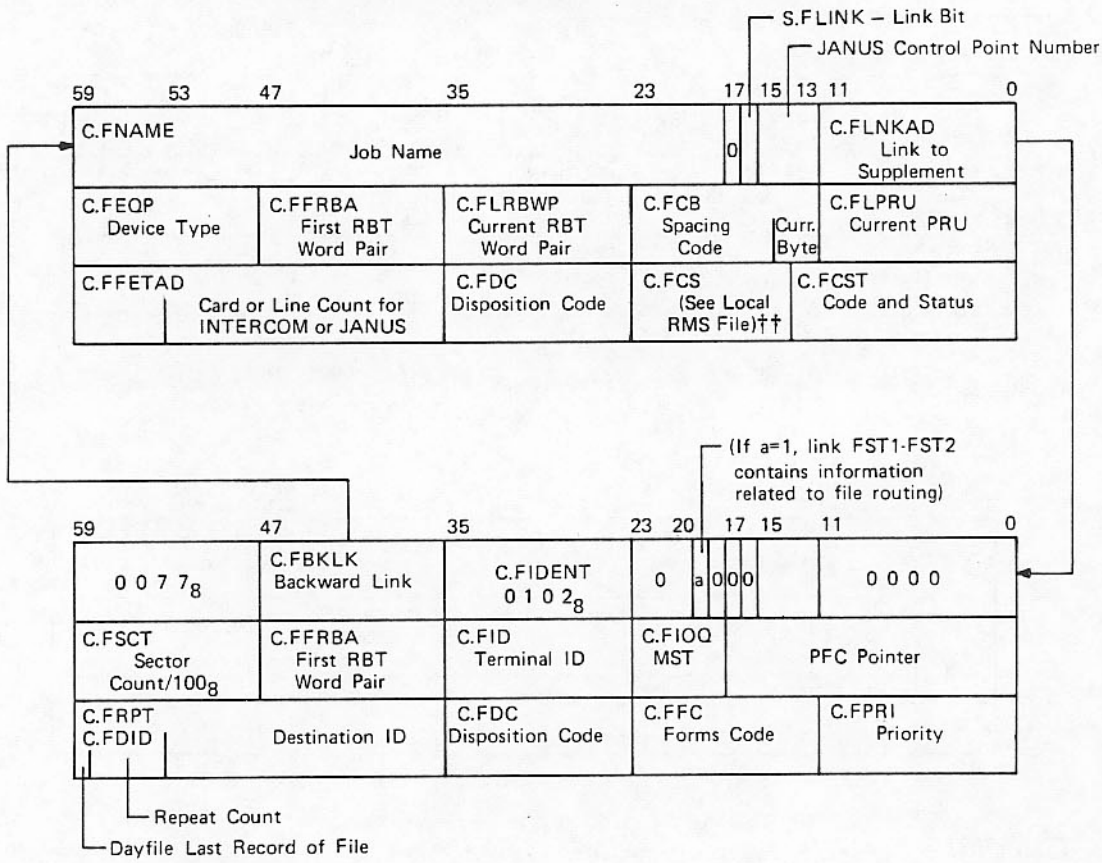
Field Name	Word	Bit	Description
A	1	59	1 Extended memory buffered file.
D		56	1 Release bit.
E		55	Extended memory preallocation flag.
P	2	59	Transfer in progress.

DEVICE SET ENTRY†



Field Name		Description
A	1	S.FSET (set name flag). Identifies this entry as device set entry.

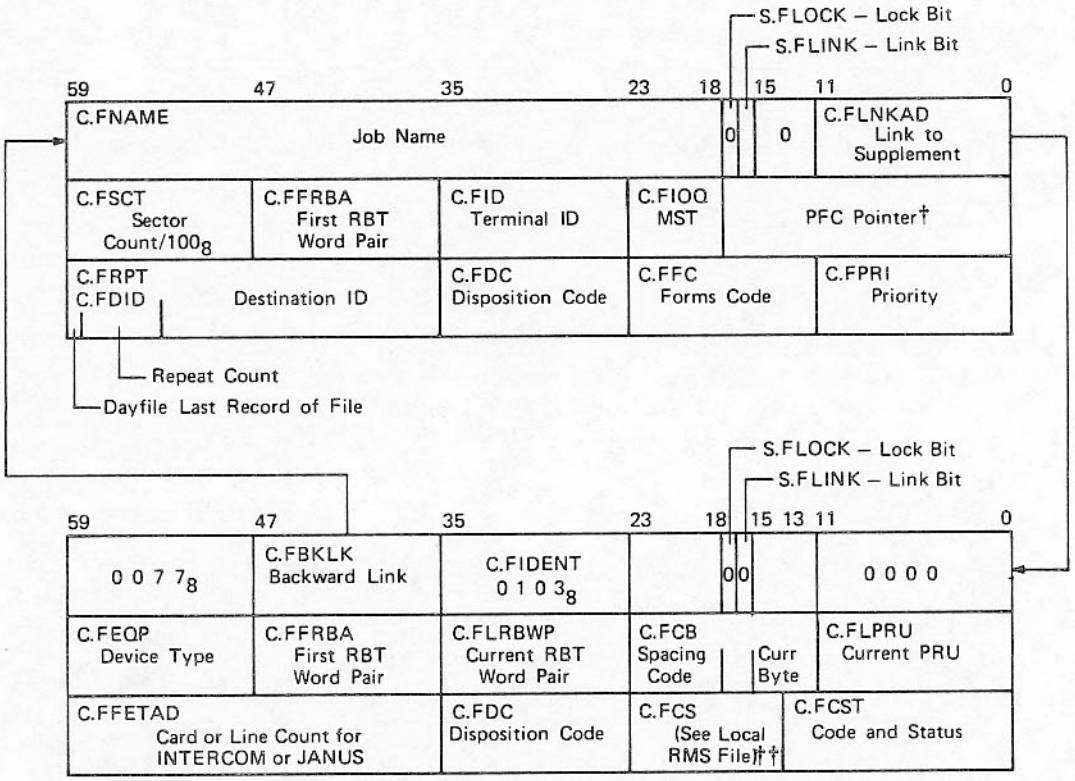
ENTRIES AND REQUIRED SUPPLEMENT FOR FILES IN OUTPUT QUEUES DURING PROCESSING



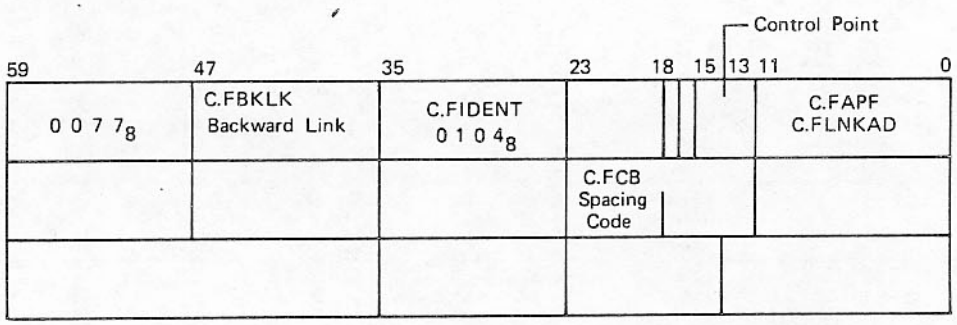
† One entry for each device set that each job has mounted.

†† Supplement will be present if file processing has been interrupted by abort or deadstart recovery. File is not rewound.

ENTRIES AND OPTIONAL SUPPLEMENT FOR FILES
IN OUTPUT QUEUES

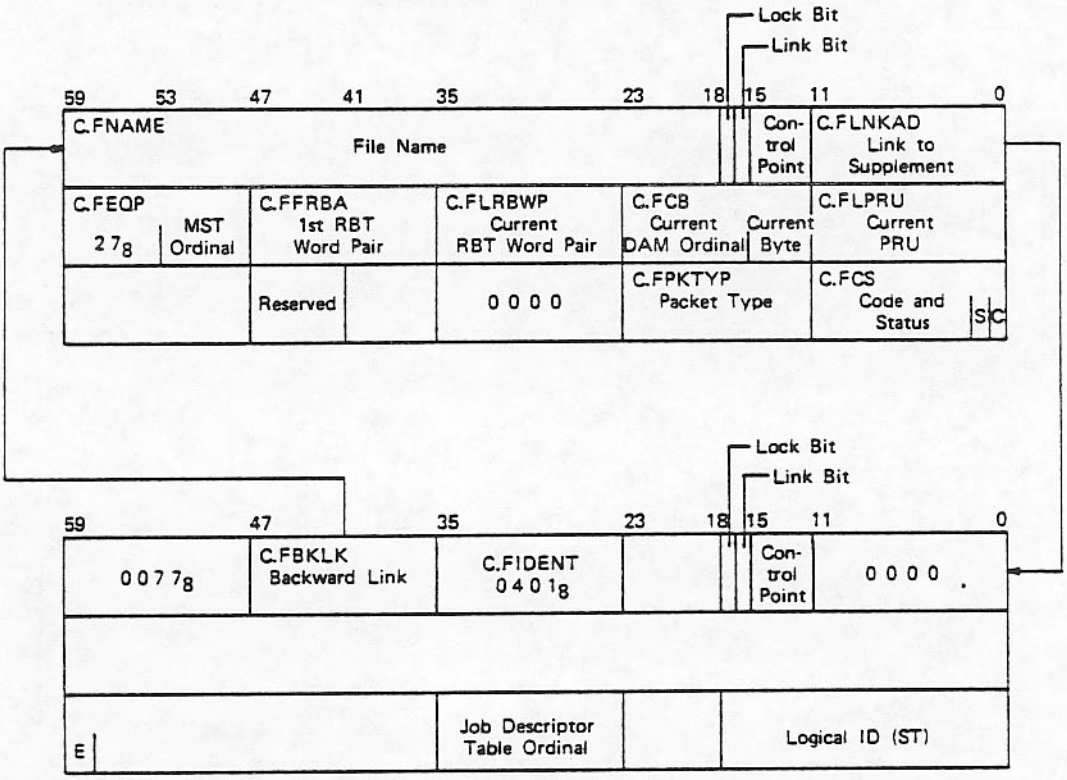


SUPPLEMENT FOR SC SPECIFIED WITH FILE IN OUTPUT QUEUE



†Relative PRU of PFC entry for this queue file.
††Supplement will be present if file processing has been interrupted by abort or deadstart recovery. File is not rewound.

MULTIMAINFRAME PACKET FILE ENTRIES
ENTRY AND REQUIRED SUPPLEMENT FOR FILE BEFORE OPEN (GETPF)

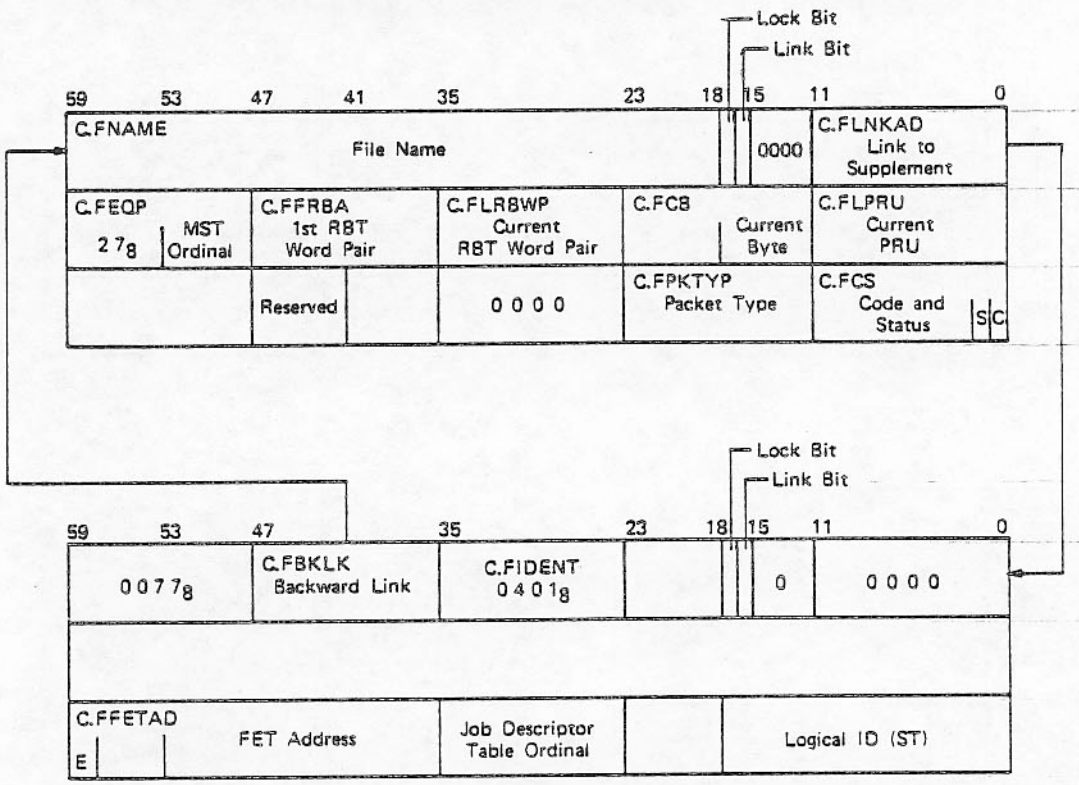


Field Name	Description
S	Packet status bit.
C	Complete bit.
E	EC flag that was saved from the user FDB.

Packet types (C.FPKTYP) are as follows:

Code (in octal)	Type
100	ATTACH
200	CATALOG
300	PURGE

ENTRY AND REQUIRED SUPPLEMENT AT CONTROL POINT 0 AFTER OPEN (GETPF)

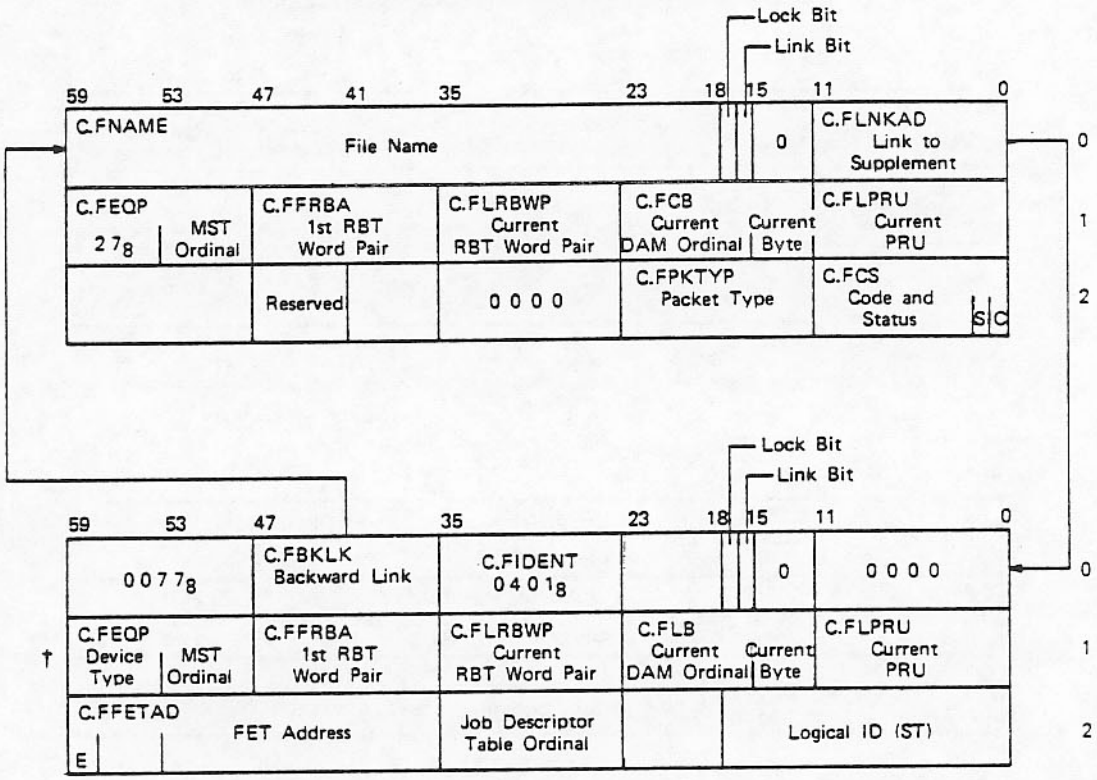


Field Name	Description
S	Packet status bit.
C	Complete bit.
E	EC flag that was saved from the user FDB.

Packet types (C.FPKTYP) are as follows:

Code (in octal)	Type
100	ATTACH
200	CATALOG
300	PURGE

ENTRY AND REQUIRED SUPPLEMENT FOR FILE AT CONTROL POINT 0 AFTER COPY HAS BEEN STAGED (GETPF)



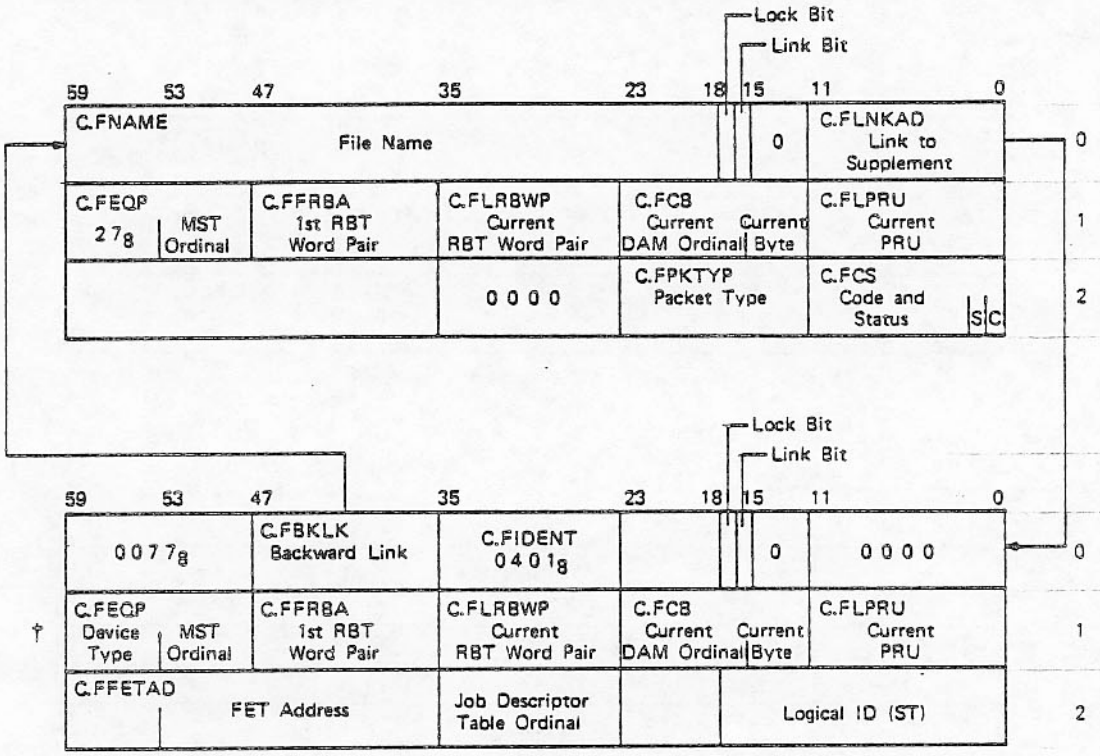
Field Name	Description
S	Packet status bit.
C	Complete bit.
E	EC flag that was saved from the user FDB.

Packet types (C.FPKTYP) are as follows:

Code (in octal)	Type
100	ATTACH
200	CATALOG
300	PURGE

† Actual file information is in word 1 of the supplement.

ENTRY AND REQUIRED SUPPLEMENT FOR FILE AT CONTROL POINT 0 (SAVEPF)



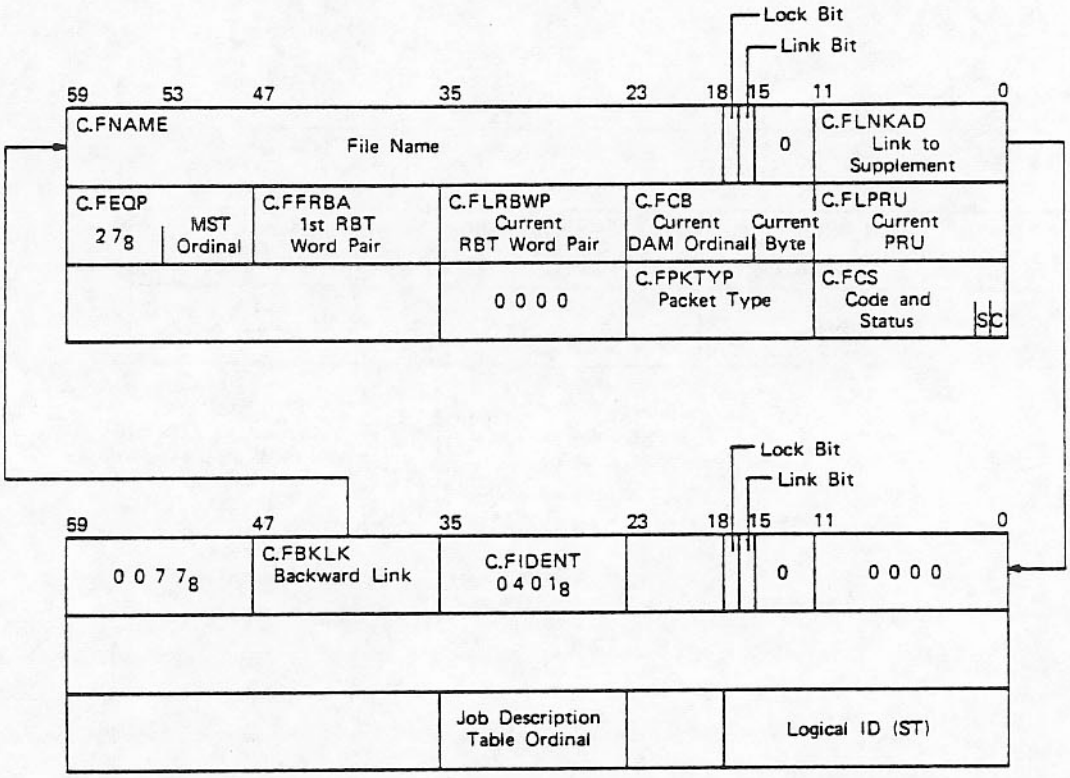
Field Name	Description
S	Packet status bit.
C	Complete bit.

Packet types (C.FPKTYP) are as follows:

Code (in octal)	Type
100	ATTACH
200	CATALOG
300	PURGE

† Actual file information is in word 1 of the supplement.

ENTRY AND REQUIRED SUPPLEMENT FOR FILE AT CONTROL POINT 0 (PURGE)

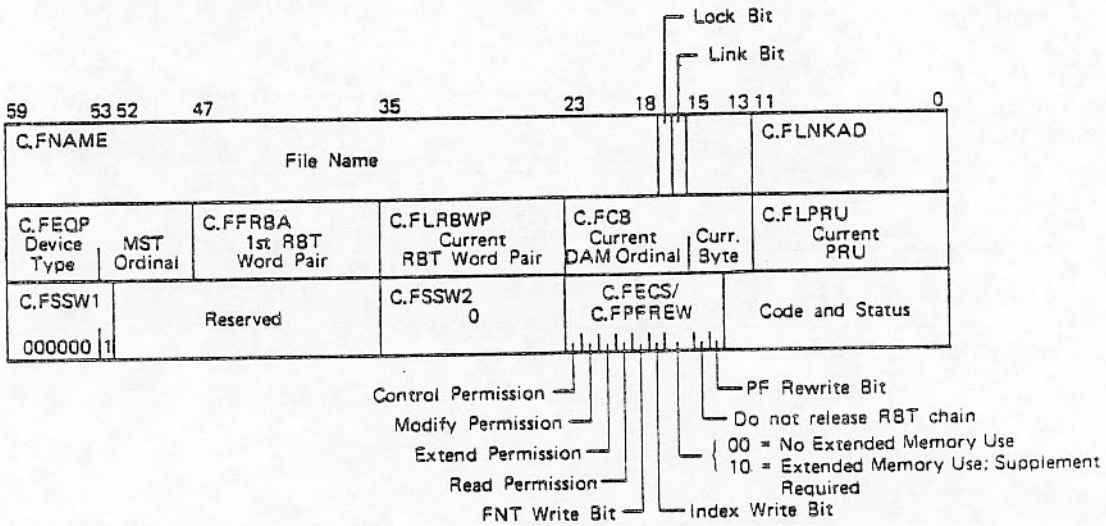


Field Name	Description
S	Packet status bit.
C	Complete bit.

Packet types (C.FPKTYP) are as follows:

Code (in octal)	Type
100	ATTACH
200	CATALOG
300	PURGE

ENTRY FOR CONTROL POINT SWITCH PROGRAM FILE (SWT)



DEVICE CODES

These codes appear in byte C.FEQP of FNT entries.

Device Mnemonic	Device Code	Description
--	01	Reserved.
--	02	
--	03	
--	04	
--	05	
AM	06	Reserved for installations.†
--	07	Reserved.
--	10	
--	11	
--	12	
AY	13	844-21 disk drive.
AZ	14	844-4x disk drive.
AH	15	819 disk drive.
--	16	Reserved.
AJ	17	885 disk drive.
AX	20	Extended memory resident file (no EST entry for this device code).
--	21	Reserved.
--	22	
--	23	
--	24	
--	25	

† Device type is defined but not supported by standard software.

Device Mnemonic	Device Code	Description
LM	26	Link medium file.
- -	27	Packet file FNT (multimainframe).
- -	30	Reserved for installations; RMS devices only.
- -	31	
- -	32	
- -	33	
- -	34	
- -	35	
- -	36	
- -	37	
MT	40 xx †	Seven-track magnetic tape.
NT	41 xx †	Nine-track magnetic tape.
- -	42 xx †	Member file seven-track tape.
- -	43 xx †	Member file nine-track tape.
TR	44	Paper tape reader.††
TP	45	Paper tape punch.††
- -	46	Reserved for installations.
- -	47	Reserved for installations.
LP	50	Any available line printer.††
LQ	52	512 line printer.††
LR	53	580-12 line printer.
LS	54	580-16 line printer.
LT	55	580-20 line printer.
- -	56	Reserved for installations.
- -	57	Reserved for installations.

†Explanation of low order 6 bits (xx) follows this listing.
††Device type is defined but not supported by standard software.

Device Mnemonic	Device Code	Description
CR	60	405 card reader.†
KB	61	Remote terminal keyboard.
- -	62 xx††	Seven-track multifile set tape.
- -	63 xx††	Nine-track multifile set tape.
- -	64	Pseudo code for tape staging.
- -	65	Reserved.
- -	66	Reserved for installations.
- -	67	Reserved for installations.
CP	70	415 card punch.†
DS	71	Keyboard/display console.
GC	72	252-2 graphic console.†
HC	73	253-2 hardcopy recorder.†
FM	74	254-2 microfilm recorder.†
PL	75	Plotter.†
- -	76	Reserved for installations.
- -	77	Reserved for installations.†
CC	- -	6683 channel coupler.
CS	- -	Reserved for installations.
CX	- -	ECS link.
DC	- -	Reserved for installations.
ED	- -	6642-1 distributive data path (DDP).
FE	- -	255x communications NPU.
IX	- -	Reserved for installations.
NC	- -	Network Access Device.
RM	- -	Two-port multiplexer (8xx models only).

† Device type is defined but not supported by standard software.
†† Explanation of low order 6 bits (xx) follows this listing.

Device Mnemonic	Device Code	Description
SC	--	6673/6674 DSC.
Wx	--	Reserved for installations.†
Xx	--	Reserved for installations.†
YC	--	Reserved for installations.†

The low order 6 bits for seven-track and nine-track magnetic tape device types are as follows:

xx	Seven-track	Nine-track
----00	HI density (556 bpi).	Reserved.
----01	LO density (200 bpi).	GE density (6250 cpi).
----10	HY density (800 bpi).	HD density (800 cpi).
----11	Reserved.	PE density (1600 cpi).
--00--	Unlabeled.	Unlabeled.
--01--	U- or Z-labeled.	U- or Z-labeled.
--10--	Y-labeled.	Y-labeled.
--11--	Reserved.	Reserved.
00----	Standard data format.	Standard data format.
01----	Reserved.	Reserved.
10----	S tape.	S tape.
11----	L tape.	L tape.

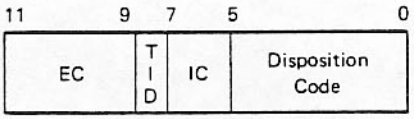
† Device type is defined but not supported by standard software.

DISPOSITION CODE VALUES (C.FDC)

Values for nonallocatable devices are:

Code	Value	Description
CK	xxx1	Checkpoint.
IU	xxx2	Inhibit unload.
CI	xxx3	Checkpoint and inhibit unload.
SV	xxx4	Save.
CS	xxx5	Checkpoint and save.
	xxx6	Reserved.
	xxx7	Reserved.

For allocatable devices, the byte C.FDC is divided into four fields.



Bit	Description
11-9	External code. The first code applies to print files, the second to punch files (print/punch).

Code	Value	Description
Default	000	Default print train/default punch character set.
-- /EC=SB	001	Reserved/punch system binary.
EC=4A/EC=80 column	010	ASCII 48-character print train/punch 80-column binary.
EC=B4/ --	011	BCD 48-character print train.
EC=B6/EC=026	100	BCD 64-character print train/punch 026.
EC=A6/EC=029	101	ASCII 64-character print train/punch 029.
EC=A9/EC=ASCII	110	ASCII 96-character print train/punch ASCII.
-- / --	111	Reserved for installations.

Bit	Description

8 Terminal identification. Relevant only for local files, not queue files.

Code	Value	Description
TID=xy	0	Route file to remote user (xy is terminal identification).
TID=C	1	Ignore remote ID in file routing.

7-6 Internal code.

Code	Value	Description
IC=DIS	00	File is in display code format.
IC=ASCII	01	File is in ASCII format.
IC=BIN	10	File is in binary format.
IC=TRANS	11	File is in transparent format (HASP and 2780/3780 terminals only).

5-0 Disposition code.

Code	Value	Description
	01	Reserved.
	02	Reserved.
	03	Reserved.
	04	Input job ready for scheduling (control point 0) or input file (control point 1 through 17).
	05	Input tape job.
	06	Input tape job on VSN display.
	07	Reserved.
PU, PB, or P8	10	Punch, EC=80, SB, 026, or 029.
FR†	20	Film print.
	21	Reserved.
FL†	22	Film plot.
	23	Reserved.
HR†	24	Hardcopy print.
	25	Reserved.

† Recognized but not supported by the operating system.

Bit	Description	
Code	Value	Description
HL†	26	Hardcopy plot.
	27	Reserved.
PT†	30	Plot.
	31-37	Reserved.
PR	40	Any available printer.
--	41	
P2	42	Reserved for installations.
LR	43	Any available 580-12; only EC=B4, B6, A4, A6, or A9 are valid.
LS	44	Any available 580-16; only EC=B4, B6, A4, A6, or A9 are valid.
LT	45	Any available 580-20; only EC=B4, B6, A4, A6, or A9 are valid.
	46-65	Reserved.
	66	System dynamic dump file.
	67	Scratch file.
	70-77	Reserved for installations.

LINK IDENTIFICATION VALUES (C.FIDENT)

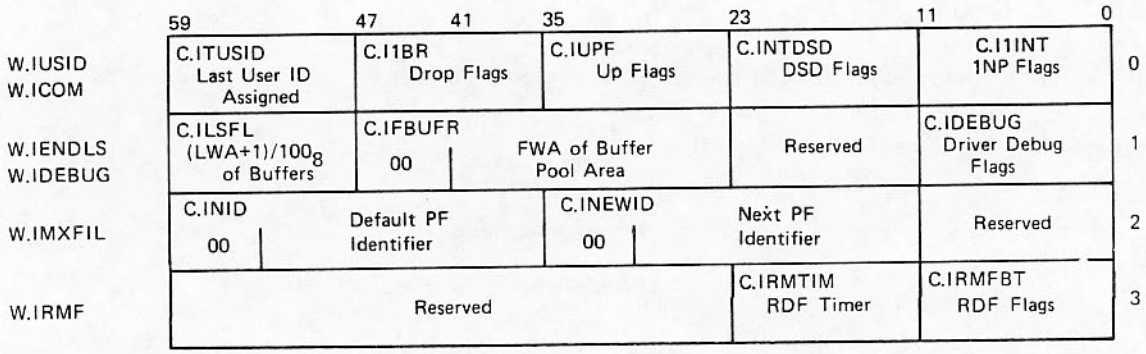
Value (in octal)	Description
0000	Reserved.
0100	Input queue link.
0101	Input queue during processing link.
0102	Output queue during processing link.
0103	Output queue file interrupted by deadstart recovery or ABORT.
0104	Output queue file with SC specified.
0105 thru 0177	Reserved.

†Recognized but not supported by the operating system.

Value (in octal)	Description
0200	Tape with alternate VSNs link.
0201	Tape with multiple VSNs link.
0202	Tape with 2MT(NT) link.
0203 thru 0277	Reserved.
0300	Permanent pack link.
0301	Disk VSN for file assignment.
0302 thru 0377	Reserved.
0400	Editor file during processing link.
0401	File to be replaced link.
0402	File to be deleted link.
0403	SPOT dayfile link.
0404 thru 0477	Reserved.
0500 thru 0577	Reserved.
0600	Routing information link.
0601	Reserved.
0602	System dynamic dump file link.
0603 thru 0677	Reserved
0700	Extended memory resident file or I/O buffered file link.
0701	Reserved for extended memory resident library link.
0702 thru 6777	Reserved.
7000 thru 7777	Reserved for installations.

INTERCOM MULTIPLEXER TABLE HEADER

Byte 1 of word 16 in the CMR pointer area contains the FWA of this table.



W.ICOM(0) C.I1BR(1) Multiplexer Table Header - Communications

Bit	Field	Description
0	S.IEDIT	EDITLIB active.
1	S.II1	1I1 initialization active.
2	S.I1BR	1BR drop flag.
3	S.IDI	Driver-initializer active.

W.ICOM(0) C.IUPF(2)

Bit	Field	Description
0	S.INTUP	INTERCOM active.
1	S.INTH	Reserved.
2	S.IRMFUP	RDF active.
5	S.I1CI	1CI up.
11-6	S.IDD	Driver up.

W.ICOM(0) C.INTDSD(3)

Bit	Field	Description
0	S.INTDRP	INTERCOM drop requested flag.
1	S.INTRST	Restart in progress.
2	S.IRMFDR	RDF drop requested flag.
3		Reserved.
4	S.ILKOUT	Login locked out.
5	S.I1CI	1CI drop requested.
11-6	S.IDD	Driver drop requested.

W.ICOM(0) C.I1NP(4) 1NP Up Flags

Bit	Field	Description
0	S.I1NP	1NP active.

W.MXFIL(2) C.INID(0) Default permanent file identifier, or identifier of the permanent file currently being used by INTERCOM.

W.MXFIL(2) C.INEWID(2) Operator supplied permanent file identifier to be used the next time INTERCOM is initialized.

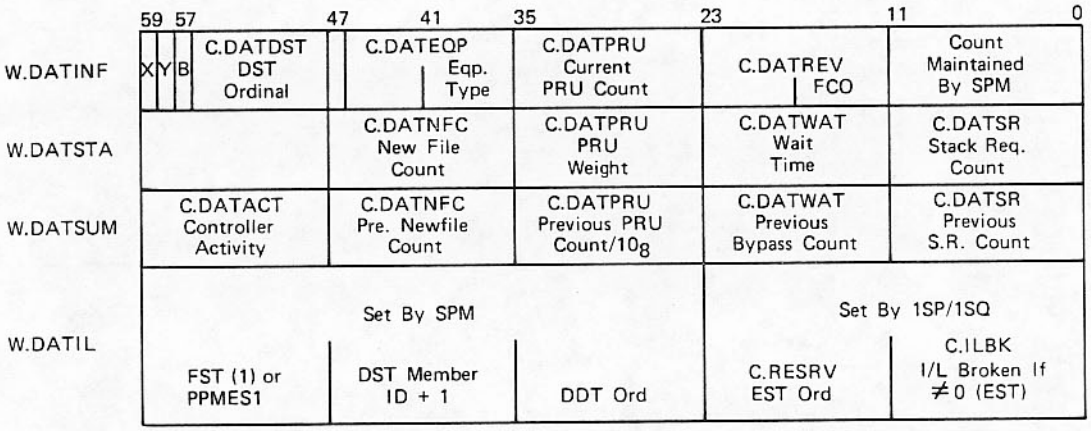
W.IRMF(3) C.IRMTIM(3) RDF timer, decremented if not R mode and no RDF user is logged-in.

W.IRMF(3) C.IRMFBT(4) RDF flags.

Bit	Field	Description
2-0	S.IRMFPN	TPM port number to use.
3	S.IRMFR	R (resident) mode.
4	S.IRMFP	P (privileged) mode.
5	S.IRMFLI	RMF user was logged-in.

DEVICE ACTIVITY TABLE ENTRY (T.DAT)

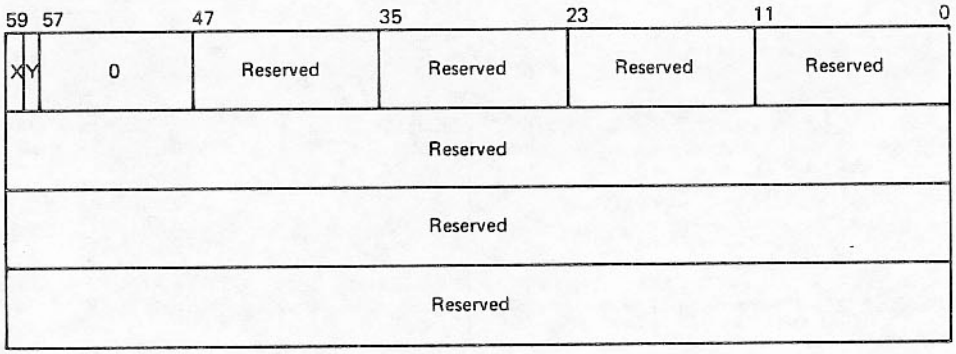
Byte 0, word 13 of the CMR pointer area contains the FWA of this table.



Field Name	Description
X	Controller on is 0; off is 1.
Y	Zero indicates that the controller is autoloaded. Depending on the B field, it was autoloaded during the current deadstart, or it was already autoloaded. A successful BCLOAD also sets Y to zero. One indicates the controller is locked and not autoloaded.
B	Indicates whether or not the operator bypassed controller autoload. Zero indicates no bypass occurred. One indicates that the operator bypassed the autoload in response to an error display (the controller was previously autoloaded with a different revision level of controlware).
FCO	Controlware revision level.

W.DATIL can be cleared only by 1SP/1SQ.

DAT MULTIPLE ACCESS DEVICE ENTRY



Field Name	Description
X	Controller on is 0; off is 1.
Y	Controller autoloaded is 0; not autoloaded is 1.

TAPES STAGING TABLE

Byte 4 of word 15 in the CMR pointer area contains the FWA of this table.

	59 C.STGMT	47 C.STGNT C.STGHD	35 C.STGPE	23 C.STGGR C.STGGE†††	11 0	
W.STGMAX†	Number of MT Defined	Number of NT Defined	Unused	Number of GE Defined	Unused	Total
W.STGFRE†	Number of MT on and Unassigned	Number of NT on and Unassigned	Unused	Number of GE on and Unassigned	Unused	Available
W.STGUFD††	Unfilled MT Demand	Unfilled HD Demand†††	Unfilled PE Demand	Unfilled GE Demand	Unused	Unfilled Demand
W.STGSAT†	Number of MT Held by Satisfied Jobs	Number of NT Held by Satisfied Jobs	Unused	Number of GE Held by Satisfied Jobs	Unused	Assigned
	No Tape Status Flag	Unused				
W.STGTLE	Useless Information from T.MSC		Copy of T.MSC			
W.STGTLR						
W.STGTLT						

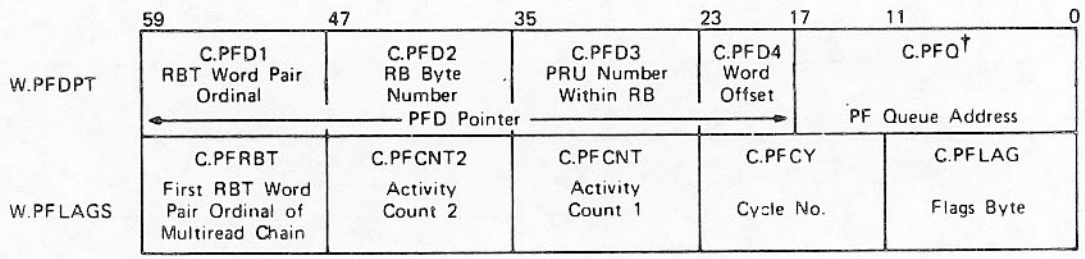
†Indexed according to device. NT is defined in this table as a nine-track tape unit, which can write/read 800/1600 cpi. GE is a nine-track tape unit, which can write/read 1600/6250 cpi.

††Indexed according to user density requests. If NT is requested, the installation's default nine-track density (HE, PE, or GE) will be assigned.

†††Mapped to C.STGNT if installation option OP.SCHDE is zero.

ATTACHED PERMANENT FILE TABLE

Bits 29-12 of word 6 in the CMR pointer area contain the FWA of this table. Byte 1 of word 6 contains the number of entries allowed in this table.



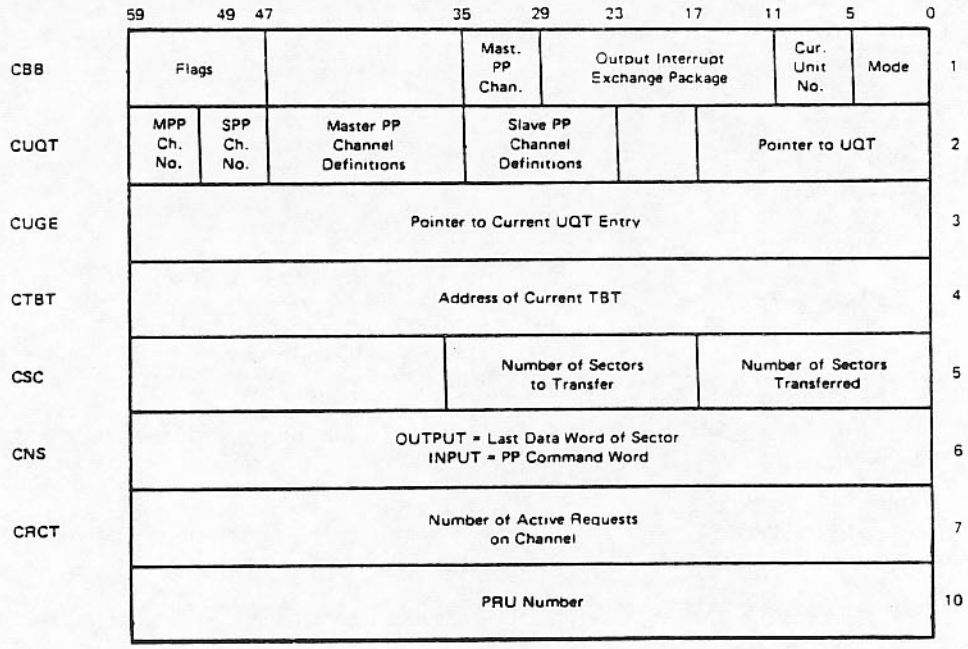
C.PFLAG bits are as follows:

Bit	Description
11	Unused.
10	Full dump (S.PFFD).
9	System file (S.PFSYS).
8	RBT chain obsolete (S.PFOBS).
7	Archived file (S.PFARC).
6	Multimainframe permission conflicts (S.PFMMF).
5	Interlock (S.PFIL).
4	RB conflicts (S.PFRBC).
3	Exclusive access (S.PFEA).
2	Single modify (S.PFSM).
1	Single write (S.PFSW).
0	Priority lockout (S.PFPL). Reserved entry (S.PFRES).

† If nonzero, PF queue address equals JDT address of a job waiting for access to the permanent file.

CHANNEL TABLE

Bits 41–24 of word 64 in the CMR pointer area contain the FWA of this table.



Word 1

Bit	Description
59-48	Flags.

Bit Set	Significance
59	Busy.
58	Down.
57	CHTRQ; transmit request.
56	Term; one more sectors to transmit.
55	BEGPB; next sector to transfer is the end of a PB. Used to maintain a continuous data transfer when switching to NEXTPB.
54	Switch; set for a continuous data switch to a different PB.
53	New TBT; the interrupt handler (IH) has completed switch to a new TBT.
52	Controller error.
51	Initializing; used by IH to start data transfer.
50	EOT; IH terminated data transfer on current request.
49	Active; used by deadstart for loading PPs.
48	HDC recall.

5-0 Mode.

0 Not available.

1 Idle.

2 Request.

3 Data.

Word 2

Bit	Description
59-54	Master PP channel.
53-47	Slave PP channel.
47-36	Master PP channel definition as follows:

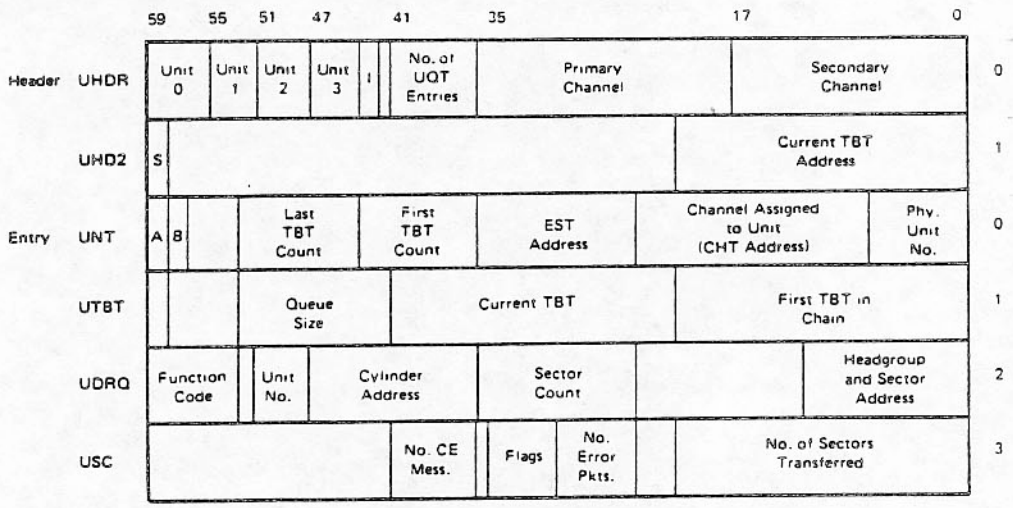
Bit	Definition
47-45	Disk data channel.
44-42	Disk control channel.
41-39	CPU channel.
38-36	Partner PP channel.

35-24 Slave PP channel definitions.

Bit	Definition
35-33	Disk data channel.
32-30	Disk control channel.
29-27	CPU channel.
26-24	Partner PP channel.

UNIT QUEUE TABLE

Word 2 of the Channel Table (CHT) points to an entry in this table.



Header Word 0

Bit	Description
43	Set if UQT has been initialized.

Header Word 1

Bit	Description
59	Set if IH switched to a new TBT.

Entry Word 0

Bit	Description
59	Set if UQTSW sweep mode.
58	Set if UQTFB backward sweep.

Entry Word 1

Bit	Description
59	Set if current TBT preceded the last request on the queue.

Entry Word 3

Bit	Description
41-36	Number of consecutive requests on this unit which resulted in logging a CE error message.
34-30	Flags.

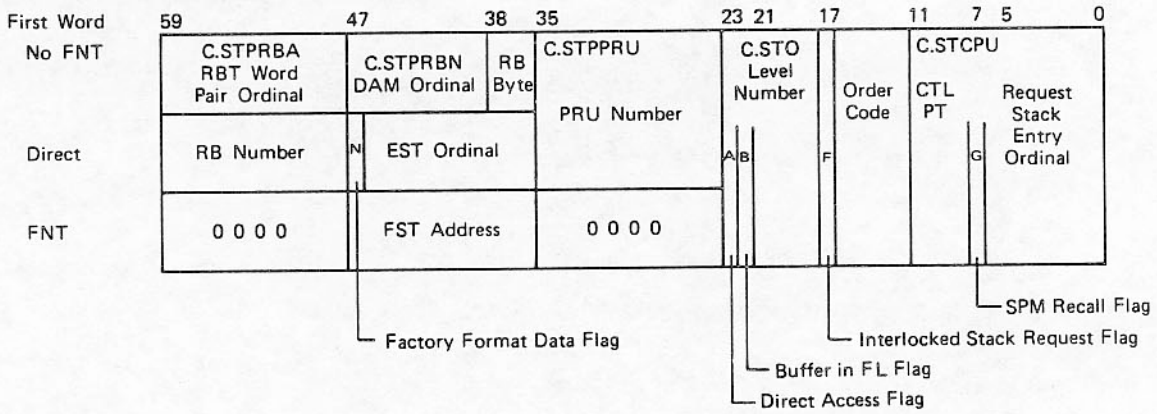
Bit Set	Significance
34	Unrecovered error; flashing ERR message displayed.
33	Unrecovered error.
32	Unrecovered error; no sectors transferred.
31	Unrecovered error; requeue the TBT.
30	Unfinished error logging.

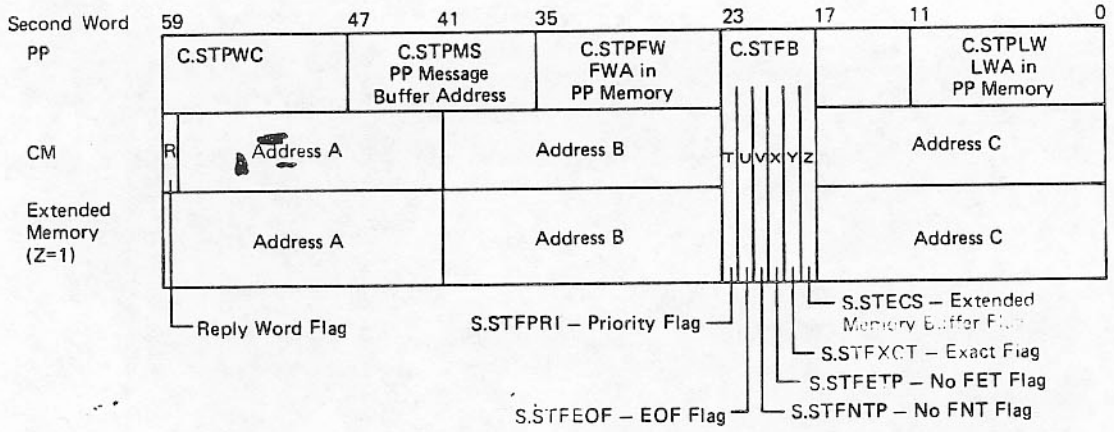
29-24	Number of error packets left to log.

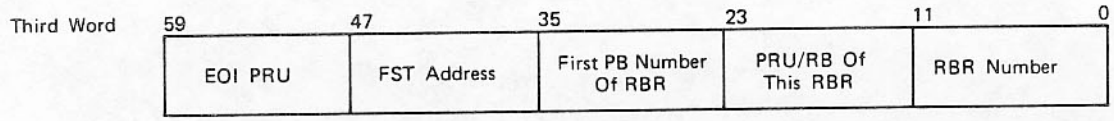
REQUEST STACK ENTRY (T.RQS)

Byte 2 of word 13 in the CMR pointer area contains the first word address divided by 2 of T.RQS. Byte 0 of word 21 in the CMR pointer area contains the number of request stack entries.

PP routines initiate disk I/O by putting a two-word stack request into their message buffers and calling stack processor manager (SPM). SPM adds a third word to make a request stack entry (T.RQS). There are three formats for each of the two words.







The request stack entry is supplied by SPM. SPM converts FNT format into no-FNT format but does not change the no-FNT bit.

The first word of a request stack entry has three formats. If the no FNT flag (S.STFNTP) is set, the no FNT format is used. If the direct access flag (S.STDA) is set, the direct access format is used. If the no FNT flag is zero, the FNT format is used.

Format	Byte	Field	Bit(s)	Description
No FNT	C.STPRBA		59-48	RBT word pair ordinal.
	C.STPRBN		47-39	DAM ordinal.
			38-36	RB byte.
	C.STPPRU		35-24	PRU number.
	C.STO	A	23	Direct access flag. If set, use direct access format for first word to read/write mass storage device label (S.STDA).
		B	22	Buffer in FL flag. If set, do not check for buffer in field length (S.STBFL).
			21-18	Stack request level number.
		F	17	Interlocked stack request flag (S.STIL).
			16-12	Stack request order code.
	C.STCPU		11-8	Control point number.
		G	7	SPM recall flag (S.STRCL).
			6-0	Request stack entry ordinal.
Direct Access	C.STPRBA		59-48	Record block number.
	C.STPRBN	N	47	Factory format data flag. If set, read factory format data from disk according to value of PRU number (C.STPPRU). 0 Read pack serial number. 1 Read factory flaw map. 2 Read utility flaw map.
			46-36	EST ordinal.
	C.STPPRU			Same field(s) as no FNT format.
	C.STO			Same field(s) as no FNT format.
	C.STCPU			Same field(s) as no FNT format.
FNT	C.STPRBA		59-48	Contains zeros.
	C.STPRBN		47-36	FST address.
	C.STPPRU		35-24	Contains zeros.
	C.STO			Same field(s) as no FNT format.
	C.STCPU			Same field(s) as no FNT format.

The second word of the request stack entry has three formats. PP and CPU formats are determined by the request stack order code (C.STO). If the extended memory buffer flag (S.STECS) is set, the extended memory format is used.

Format	Byte	Field	Bit(s)	Description
PP	C.STPWC		59-48	Number of PP bytes to be transmitted.
	C.STPMS		47-36	PP message buffer address.
	C.STPFW		35-24	FWA of PP memory.
	C.STFB	T	23	Priority flag (S.STFPRI).
		U	22	EOF flag. If set for a write request, write EOF (S.STFEOF).
		V	21	No FNT flag (S.STFNTP).
		X	20	No FET flag (S.STFETP).

Format	Byte	Field	Bit(s)	Description
		Y	19	Exact flag. If set, do not read ahead (S.STFXCT).
		Z	18	Extended memory buffer flag. If set, file has an EM buffer (S.STECS).
			17-12	Reserved.
	C.STPLW		11-0	LWA of PP memory.
CPU	C.STPWC	R	59	Reply word flag (RWF).
			58-42	Address A. If RWF = 0, FWA of FET. If RWF = 1, reply word address.
			41-24	Address B. If order code = skip, skip count; otherwise, FWA in CM.
	C.STFB	T-Z	23-18	Same fields as PP format.
			17-0	Address C. If order code = read, LWA+2 in CM. If order code = write, LWA+3 in CM. If no FET flag (S.STFETP) is zero, LIMIT address.
Extended Memory	C.STPWC		59-42	Address A. If no FET flag is zero, DA extended memory I/O address. If no FET flag is set, contains zeros.
			41-24	Address B. If no FET flag is zero, FWA EM/10_8. If no FET flag is set, contains zeros.
	C.STFB	T-Z	23-18	Same fields as PP format.
			17-0	Address C. If no FET flag is zero, EM length/10_8. If no FET flag is set, Buffer length/10_8.

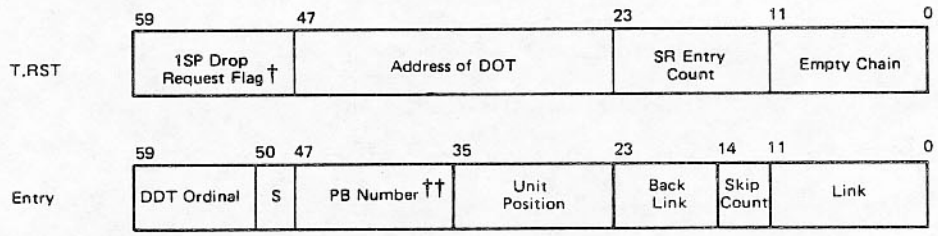
Stack request order codes are as follows:

00	O.READ	Read into central memory.
01	O.RDSK	Readskip into central memory.
02	O.RCMPR	Read into central memory; drop first three CM words.
03	O.RDNS	Read nonstop.
04	O.WRT	Write from central memory.
05	O.WRTR	Write EOF/EOR from central memory.
06	O.RMR	Read multiple records to central memory.
07		Not currently defined.
10	O.RDP	Read into PP memory.
11	O.RDPNP	Read into PP; drop first three CM words.
12	O.SKF†	Skip forward.
13	O.SKB†	Skip backward.
14	O.WRP	Write from PP memory.
15	O.WRPR	Write EOF/EOR from PP memory.
16	O.BPRU†	Backspace PRU.
17	O.RCHN†	Evict (release RBT chain).
20	O.RCTNU	Read nonstop (comparable to tape READN).
24	O.WCTNU	Write nonstop (comparable to tape WRITEN).
35	O.IDLE	Wait for stack request.
36	O.DROP	Drop PP (issued by SPM upon orders from PPM+R).
37	O.SEEK	Issue overlap seeks.

† Setting or not setting the interlock stack request bit has no effect on the interlock.

REQUEST SCHEDULING TABLE (T.RST)

T.RST is used to schedule stack requests in the request stack (T.RQS). The table has one word for each entry in T.RQS and follows T.RQS. The first word address of T.RST is an entry in the T.ENTRY table in CMR.

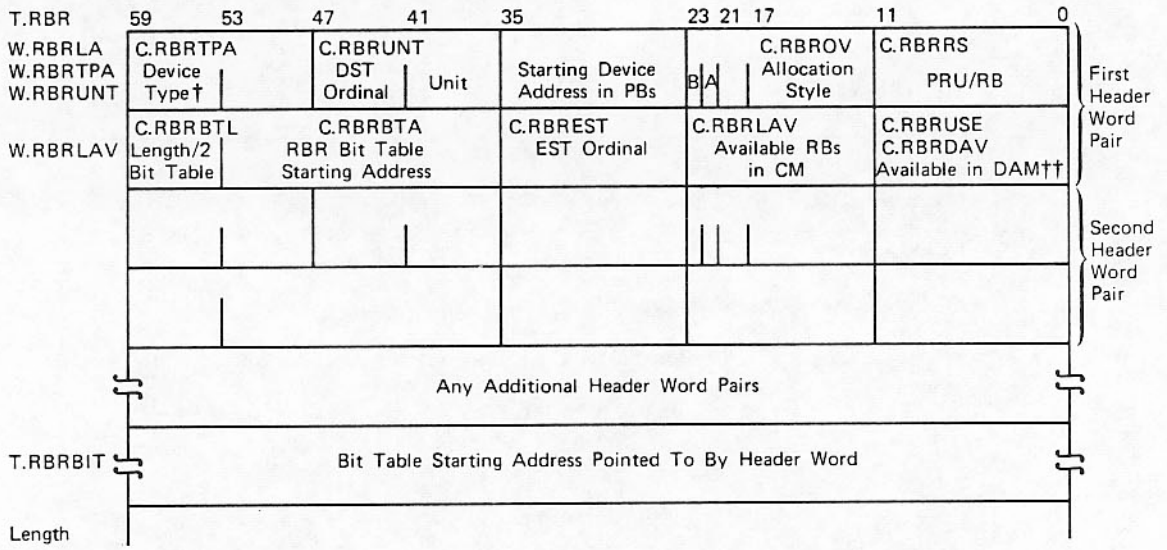


Field Name	Description
S	Status.

†If this flag is not equal to byte C.SPDROP of word P.SPDROP, SPM issues a drop order to one of the stack processors and sets the value of the flag to the value in C.SPDROP.
††Target PB for the stack request; if 7777_8, target PB has not been computed.

RECORD BLOCK RESERVATION TABLE (T.RBR)

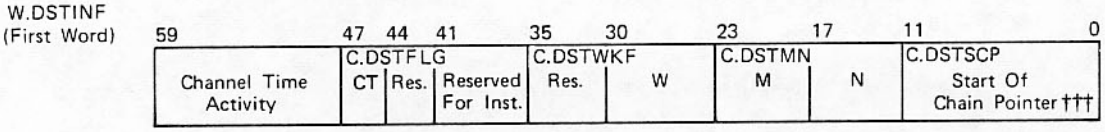
Bits 53 through 36 of word 2 in the CMR pointer area contain the first word address of T.RBR. Byte 1 of word 21 in the CMR pointer area contains the number of RBR headers. Bytes 3 and 4 of word 21 in the CMR pointer area contain the length of the RBR area.



Field Name	Description
A (S.RBROV)	Overflow flag. Zero indicates files cannot overflow to this RBR. One indicates that files can overflow to this RBR.
B (S.RBRDF)	No-attribute file allocation flag. Zero indicates that allocation is not allowed. One indicates that allocation is allowed.

DEVICE STATUS TABLE (MASTER ENTRY)

Device status table (DST) entries are numbered, starting from 1, to identify DST ordinals.



Byte 4 of word 13 in the CMR pointer area contains the first word address divided by 10_8 of the DST. Byte 3 of word 13 in the CMR pointer area contains the number of DST entries.

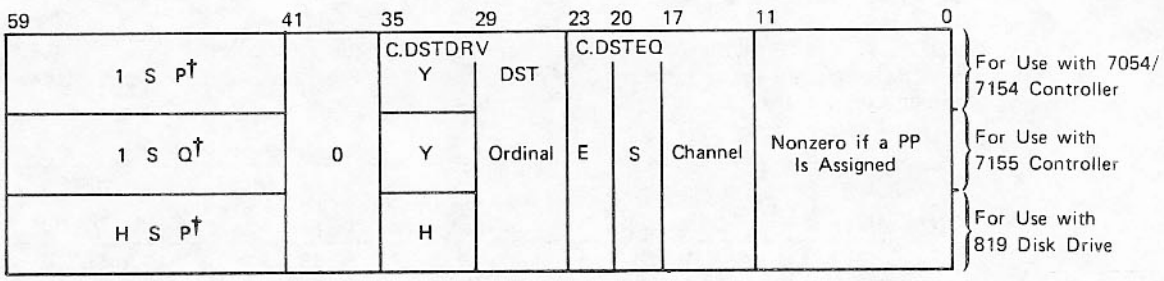
---

†Device type codes are the same as those used for the EST.

††During deadstart this byte contains total number of RBs. This field is only updated when DAM is referenced.

†††The field contains the address in the T.RST for the next stack request to process. This field is zero if there is no stack request to process.

W.DSTSPI (Second Word)



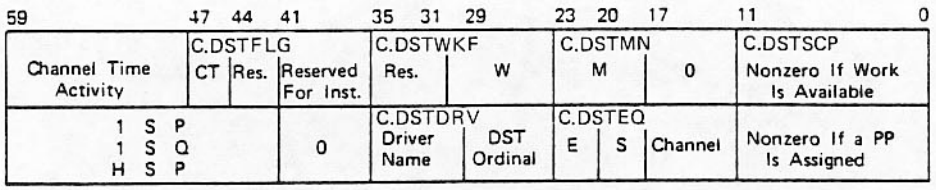
Second word is used as PPIR of the corresponding stack processor.

Field Name	Description
CT	Controller type. 0 Controller that does not require loading of controlware. 1 7054 controller. 2 7154 controller. 3 7155 controller.
W	1SP/1SQ working flag (when 1SP/1SQ is active). 0 1SP/1SQ idle. S Stack request ordinal S assigned.
M	Member number (0 for master entry).
N	Number of DST entries in DST group (number of channel accesses).
Y	Display code Y; used to form the overlay 3SY for 1SP; currently unused in 1SQ.
H	Display code H; currently unused.
E	Equipment.
S	Scheduling options. 0 FIFO. 4 Selection only. 6 Overlap seek and selection.

†1S5 for DST ordinal one.

DST MULTIPLE ACCESS MEMBER ENTRIES

DST entries for second (dual), third, or fourth (844-44 only), access to a set of mass storage units.



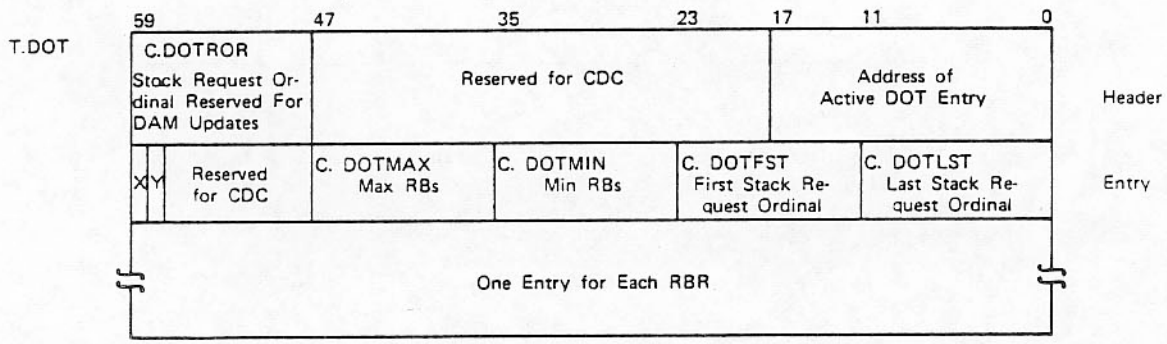
Second word is used for PPIR.

Field Name	Description
M	Member number (1 through 3).

Other field descriptions are identical to those for the master entry.

DEVICE OVERFLOW TABLE

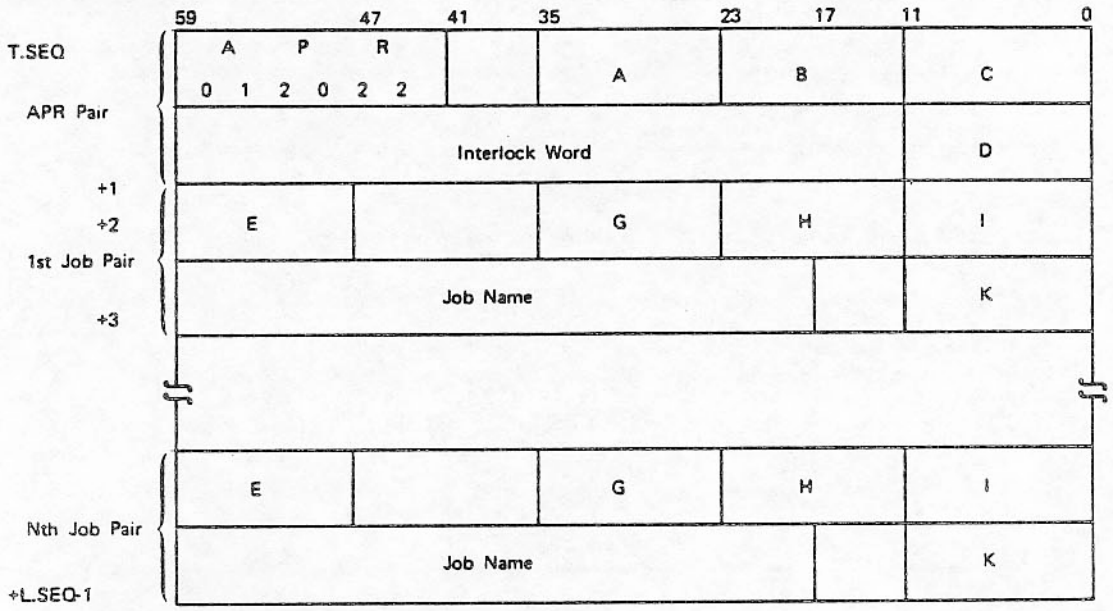
T.DOT is an entry point to CMR and thus is an entry of the table T.ENTRY of CMR. There is also a pointer to T.DOT in the header word of the Request Scheduling Table.



Field Name	Description
X	DAM Update flag.
	0 No DAM update in progress.
	1 DAM update in progress for this entry (active DOT entry).

Field Name	Description
Y	Status of RBS.
	0 Get RBs.
	1 Release RBs.

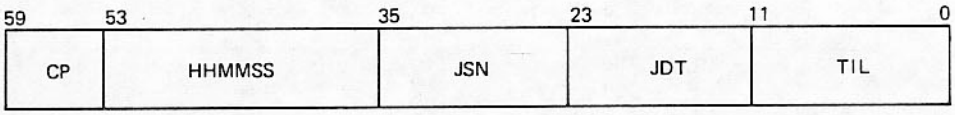
SEQUENCER TABLE



Byte 2 of word 4 in the CMR pointer area contains the FWA/10B of this table. Byte 3 of word 4 has table length.

Field Name	Description
A	Maximum number of job entries (L.SEQ-2/2).
B	Number of jobs in sequencer table.
C	On/off/drop flag. 0 Off. 1 On. 2 Drop.
D	Table interlock flag.
E	Entry in use flag.
G	Entry drop flag.
H	Interval.
I	Clock.
K	Last known FNT address.

Interlock word when sequencer is active.

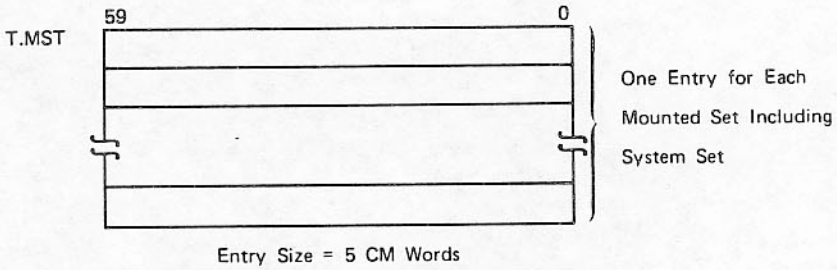


Field Name	Description
CP	Control point number.
HHMMSS	Hours, minutes, seconds in binary.
JSN	Job sequence number.
JDT	JDT ordinal.
TIL	Table interlock flag.

MOUNTED SET TABLE (MST) OVERVIEW

Byte 4 of word 7 in the CMR pointer area contains the address of T.MST divided by 10_8.

The mounted set table follows the CMR installation area.



MST ENTRY

	59	47	35	29	23	17	11	0
W.MSVSN	C.MSVSN Master Device VSN†				C.MSMFO Mainframe Ordinal		C.PFMIL A B C D E F G H I J K L	
W.MSSN	C.MSSN Set Name†				C.MSPEOI Purge EOI			
W.MSPTR	C.MSSMT Pointer to First RB of SMT	C.MSRBR First RBT word pair ordinal of DAM	C.MSEQT Master Dev. Equip. Type Max. Number Files/100_8† ††		C.MSEST Master Device EST Ordinal†		C.MSACT No. Active Jobs Accessing Set Maximum No. of Members† ††	
W.MSPFC	C.MSPFC Primary PFC First RBT Word Pair	C.MSPFC1††† Auxiliary PFC First RBT Word Pair	C.MSPFCS PFC Size in PRUs/10_8		C.MSCEOI MN P PFC Current EOI (PRU Offset)			
W.MSPFD	C.MSPFD Primary PFD First RBT Word Pair	C.MSPFD1††† Auxiliary PFD First RBT Word Pair	C.MSHPN Hashing C.MSHPS Number of Hash Points Left Shift Count		C.MSDFR Default File Retention Period		Reserved	

† Set up by deadstart for postdeadstart.
†† Not used by system after postdeadstart.
††† Not used currently but reserved by system.

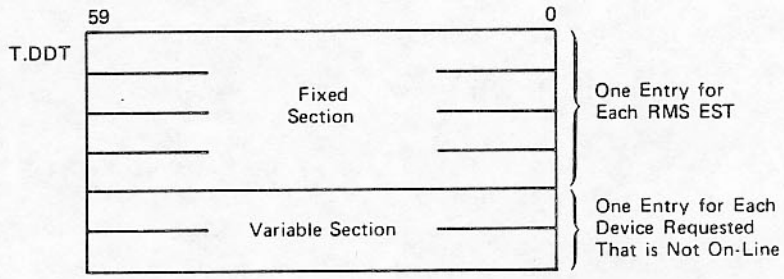
Field Name	Description
A	RB conflict (S.MSTRCF).† ††
B	Reserved (S.MSBF).
C D	Deadstart action (S.MSACT).†
	00 Check.
	01 Initialize.
	10 Modify.
E	System default set (S.MSSCR).†
F	Queue set (S.MSQ).†
G	PF default set (S.MSPF).†
H	System bit (S.MSSYS).†
I	Set interlock (S.MSSETI).
J	Utility interlock (S.MSUTIL).
K	PFM interlock (S.MSPFMI).
L	Reserved.
M	Wrap-around flag for PFC (S.PFCW).
N	Passwords defined in label (S.MSPDL).
P	Universal permissions (S.MSUP).
	1000 Control.
	0100 Modify.
	0010 Extend.
	0001 Read.

† Set up by deadstart for postdeadstart.
†† Not used by system after postdeadstart.

DISMOUNTABLE DEVICE TABLE (DDT) OVERVIEW

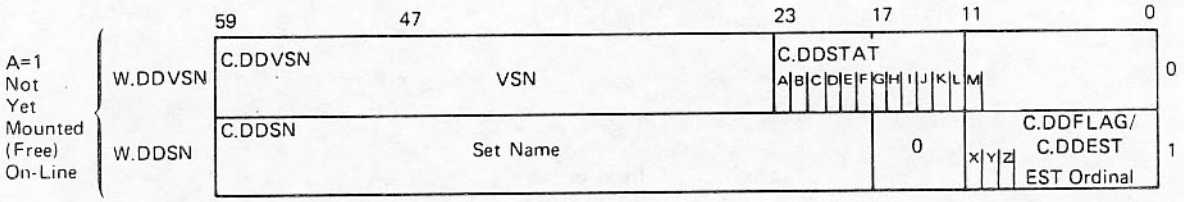
Byte 2 of word 7 in the CMR pointer area contains the address of T.DDT divided by 10_8.

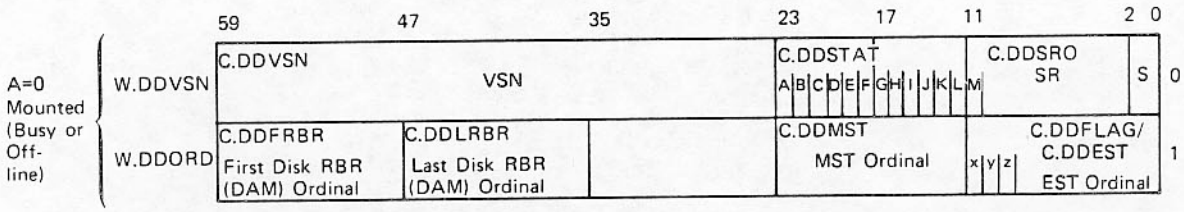
The dismountable device table follows the MST in CMR.



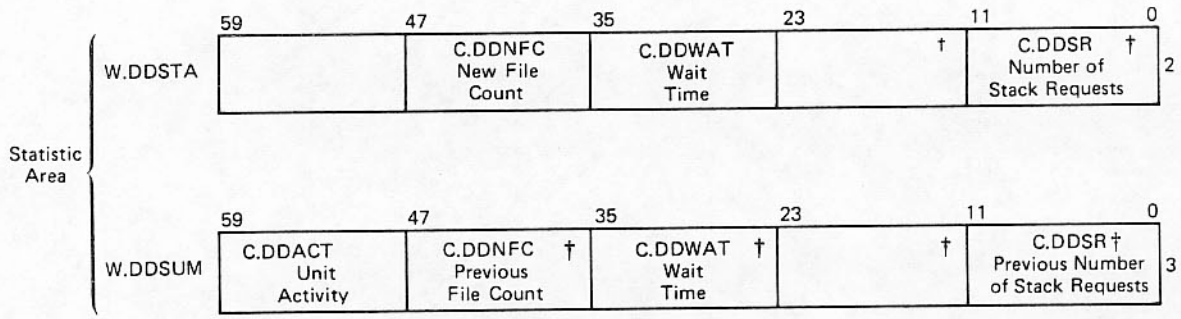
Entry Size = 4 CM Words for Fixed Section
2 CM Words for Variable Section

DDT ENTRY (FIXED SECTION)





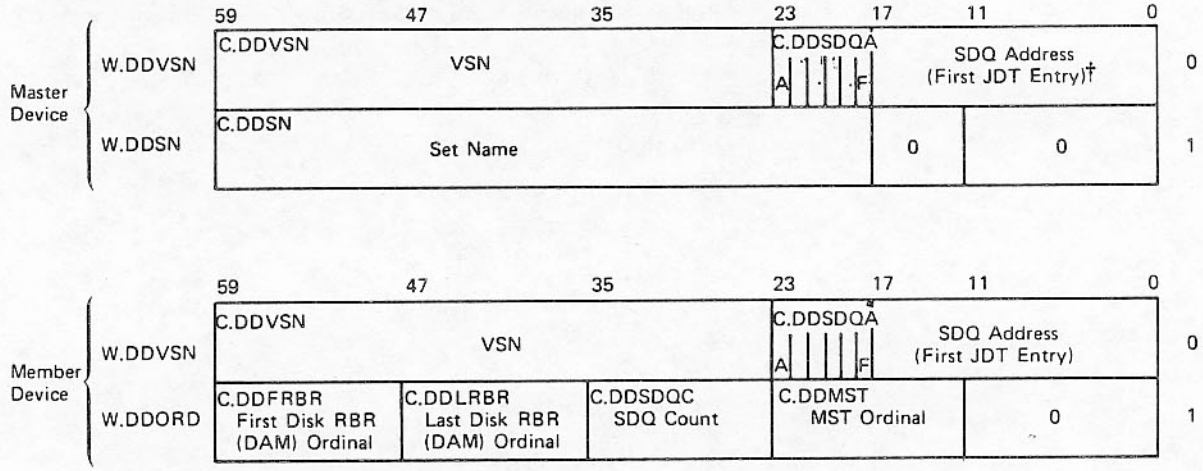
Byte	Field Name	Description
C.DDSTAT	A	SN bit; device not mounted if set (S.DDSN).
	B	Relabel during deadstart (S.DDRLB); during postdeadstart, SR assigned to unit (S.DEVSR).
	C	Off (S.DDOFF).
	D	Free (S.DDFREE).
	E	Busy (S.DDBUSY).
	F	Request idle (S.DDIDLE).
	G	Recording mode; full-track if set (S.DDRM).
	H	Preallocated (S.DDPRE).
	I	Master device (S.DDMSTR).
	J	Queue device (S.DDQ).
	K	PF device (S.DDPF).
	L	System device (S.DDSYS).
C.DDSRO	M	Overlap seek in progress.
	S	Overlap seek status.
	SR	Stack request ordinal assigned to unit (after deadstart completes).
C.DDFLAG/C.DDEST	X	Gap sector flag; no gap sectors if set (S.DDNGS).
	Y	NOS/VE system device (S.DDVE).
	Z	Reserved.



†Used as temporary save area by deadstart.

DDT ENTRY (VARIABLE SECTION)

Each entry is a device waiting to be mounted and is listed in the W-display.

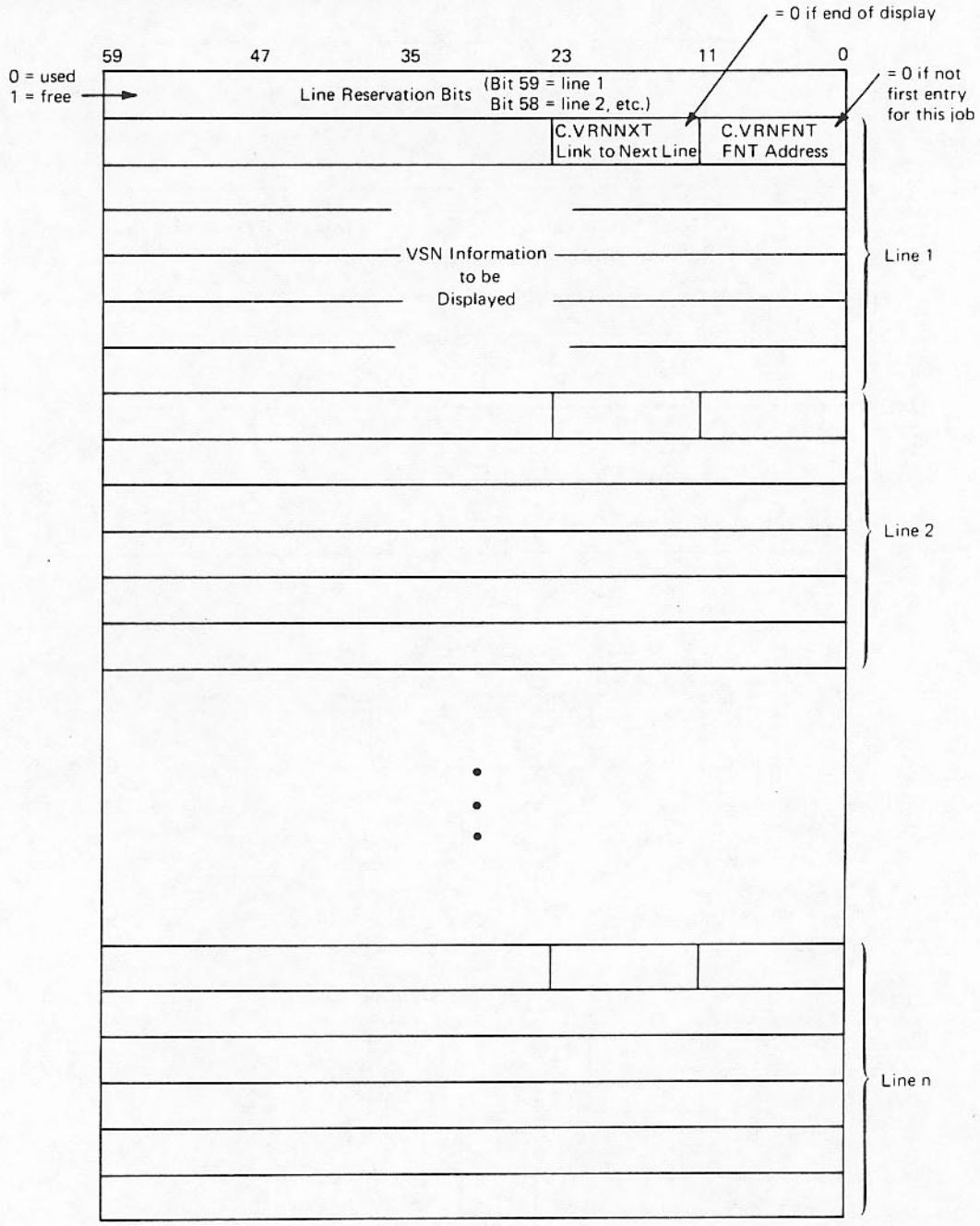


Field Name	Description
A	SN bit; device not mounted if set (S.DDSN).
F	Recording mode for waiting pack; full-track if set (S.DDRMW).

†Points to first job waiting for this device to be mounted.

VSN BUFFER

Byte 0 of word 43 in the CMR pointer area contains the FWA/10B of this table.



TAPES TABLE

Byte 0, word 14 of the CMR pointer area contains the FWA/10_8 of the tapes table. Information in this table appears in the P-display.

	59	47	35	29	23	17	11	0
	EST Ordinal (Binary)	FNT Address	Control Point Number		MT or NT (Display Code)		EST Ordinal (Display Code)	
W.TFLN1	Label Name							
	Label Name						Position Number	
	Edition Number	Retention Cycle	Creation Date					
W.TREEL	Multifile Name				Reel Number			
W.TFLGS	C.TFLGS Flag Bits		Reserved				Communication Area†	
W.TVRN	Volume Serial Number of Current Reel				Last Good Checksum††		Last Good Byte Count††	
W.TVRN1	Volume Serial Number of First Reel				PRU Number of Last PRU That Got Noise Warning 1			

C.TFLGS - Job-Oriented Flag Bits

59	58	57	56	55	54	53	52	51	50	49	48
GO	RC		ST		ES	WL	LT	VP		LC	EC

S.TTFGO – Go bit
S.TTFRC – Recheck bit
(Reserved)
S.TTFST – Stop Staging
(Reserved)
S.TTFES – End of Multifile set
Write labels – S.TTFWL
Dual PP interlock – S.TTFLT
VSN-printed bit – S.TTFVP
(Reserved)
Label checked – S.TTFLC
Label expiration checked – S.TTFEC

C.TFLGS+1 - Unit-Oriented Flag Bits

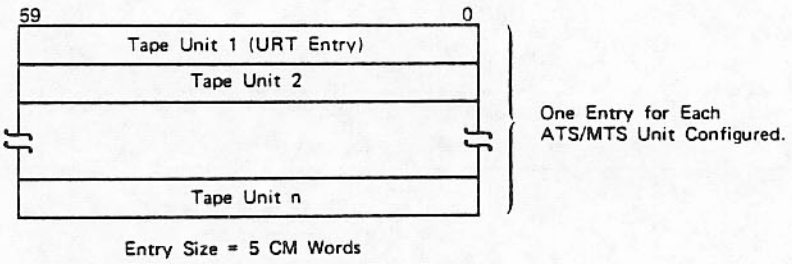
47	46	45	44	43	42	41	40	39	38	37	36
VN	OV	SC	RD			EL	BL	LB	FS	RI	WN

S.TTFVN – VSN read from tape
S.TTFOV – Operator-supplied VSN
S.TTFSC – Scratch
S.TTFRD – Ready
(Reserved)
S.TTWD – Tape unit mis-match
Expired label – S.TTFEL
Blank labeled – S.TTFBL
Labeled – S.TTFLB
Flash save bit – S.TTFFS
Ring in bit – S.TTFRI
Unexpired label w/ring–warning – S.TTFWN

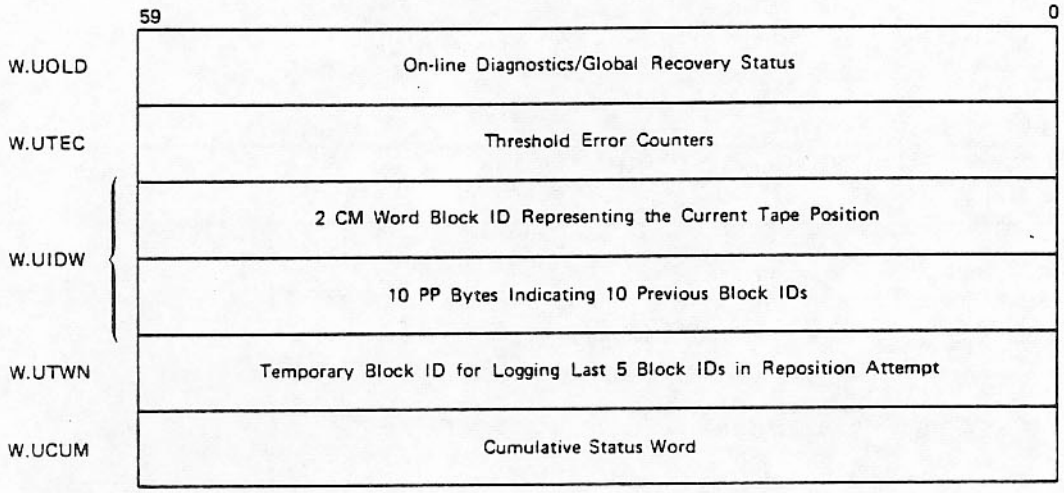
†2IA/2IB slave-master PP communication area.
††These bytes are not used by 66x drivers.

TAPE UNIT RECOVERY TABLE (URT) OVERVIEW

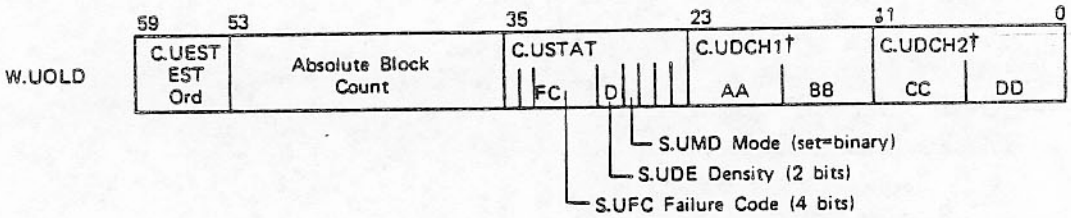
Byte 0 of word 15 in the CMR pointer area contains the FWA/10B of this table.



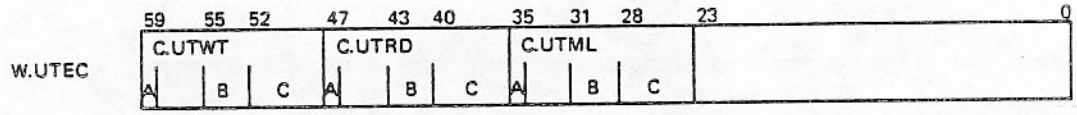
TAPE UNIT RECOVERY TABLE ENTRY



W.UOLD FORMAT

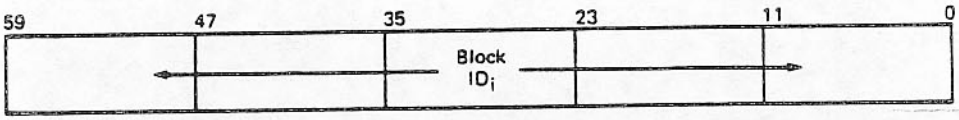


W.UTEC FORMAT



Field Name	Description
A	Reel error reached.
B	Threshold error count (3 bits).
C	Running error count (5 bits).
D	Lost data retry (6 bits).

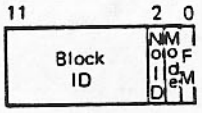
W.UIDW FORMAT



W.UIDW Two words containing the block IDs (five IDs per word) of the previous 10 tape blocks. When updated with most recently processed blocks, new ID is placed in byte 4 of second word, and all preceding block IDs move forward (left shift, end-off); the contents of word 1, byte 0 is lost.

† Channels in the order they are removed from the EST.

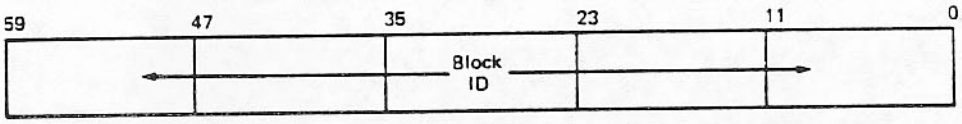
Each 12-bit block ID field has the following format:



Bit	Description
0	If set, indicates file mark.
1	If set, indicates seven-track even parity tape block.
2	If set, indicates bits 11 through 3 contain software code rather than the actual hardware block ID.
11-3	Block ID (if bit 2 clear) or software code (if bit 2 set) as follows:

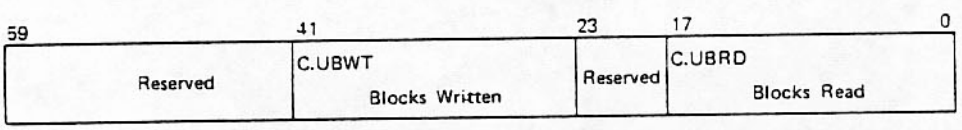
Code	Description
000	Unknown or unusable block ID.
001	Loadpoint.
002	Block resulted from unrecovered read error.
003	Block resulted from unrecovered write error.
004	Block resulted from error on SKIPF.

W.UTWN FORMAT



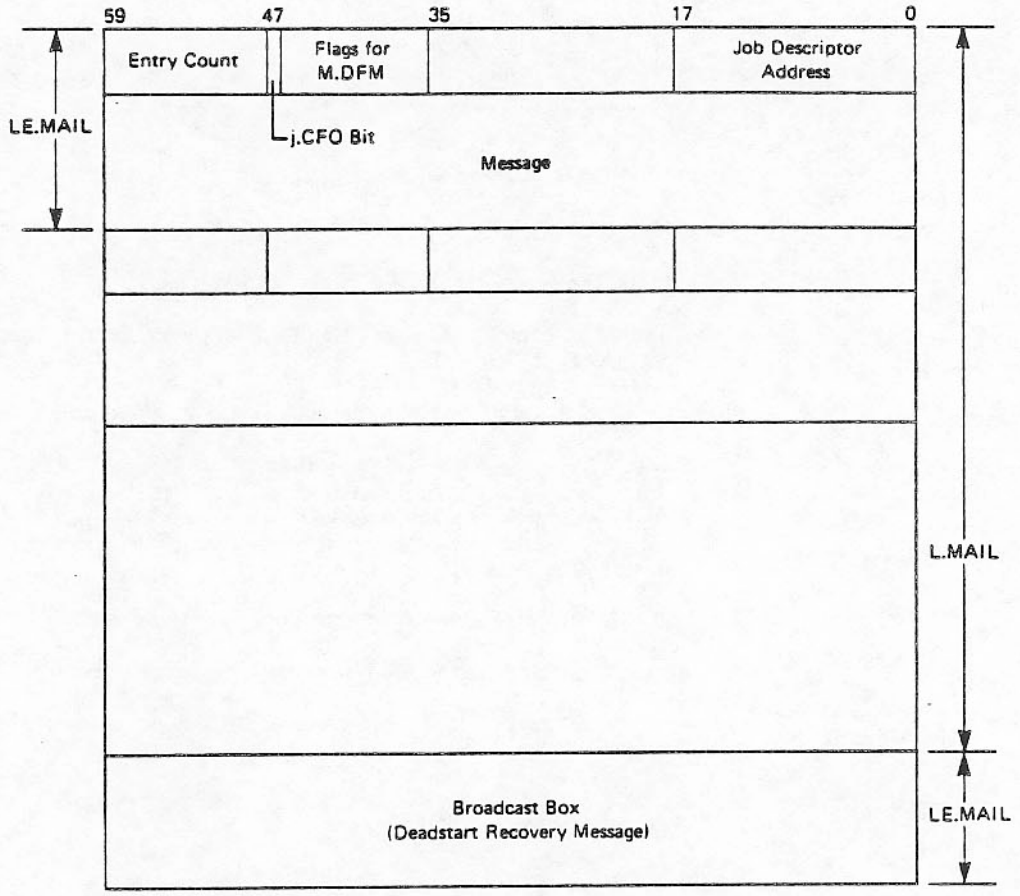
W.UTWN Temporary location of five blocks ID read from tape following reposition attempt; IDs are compared with corresponding IDs in W.UIDW to verify correct repositioning.

W.UCUM FORMAT



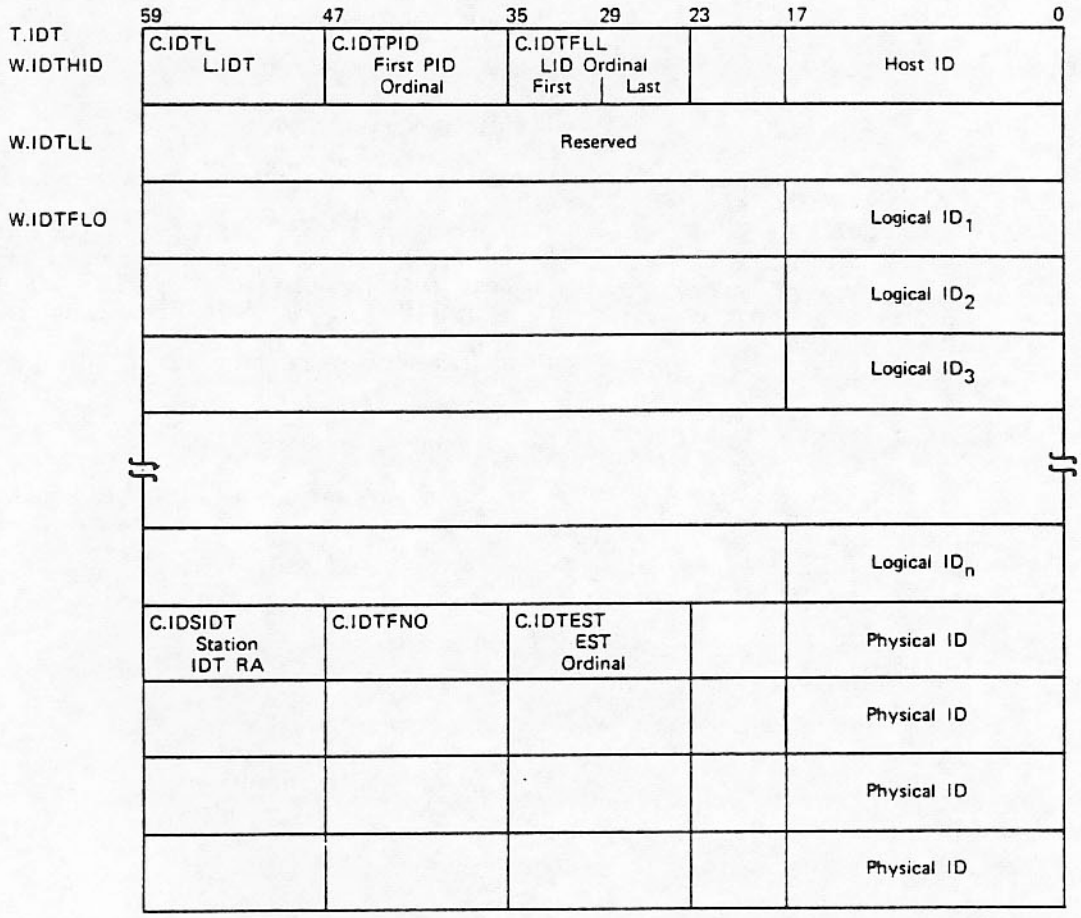
SCHEDULER MAILBOX BUFFER

Byte 0 of word 65 in the CMR pointer area contains the FWA/10B of this buffer. Byte 1 of word 65 contains the buffer length.



LOGICAL ID TABLE

Byte 4 of word 66 in the CMR pointer area contains the address of T.IDT divided by 10_8. Byte 3 of word 66 in the CMR pointer area contains the length of T.IDT.

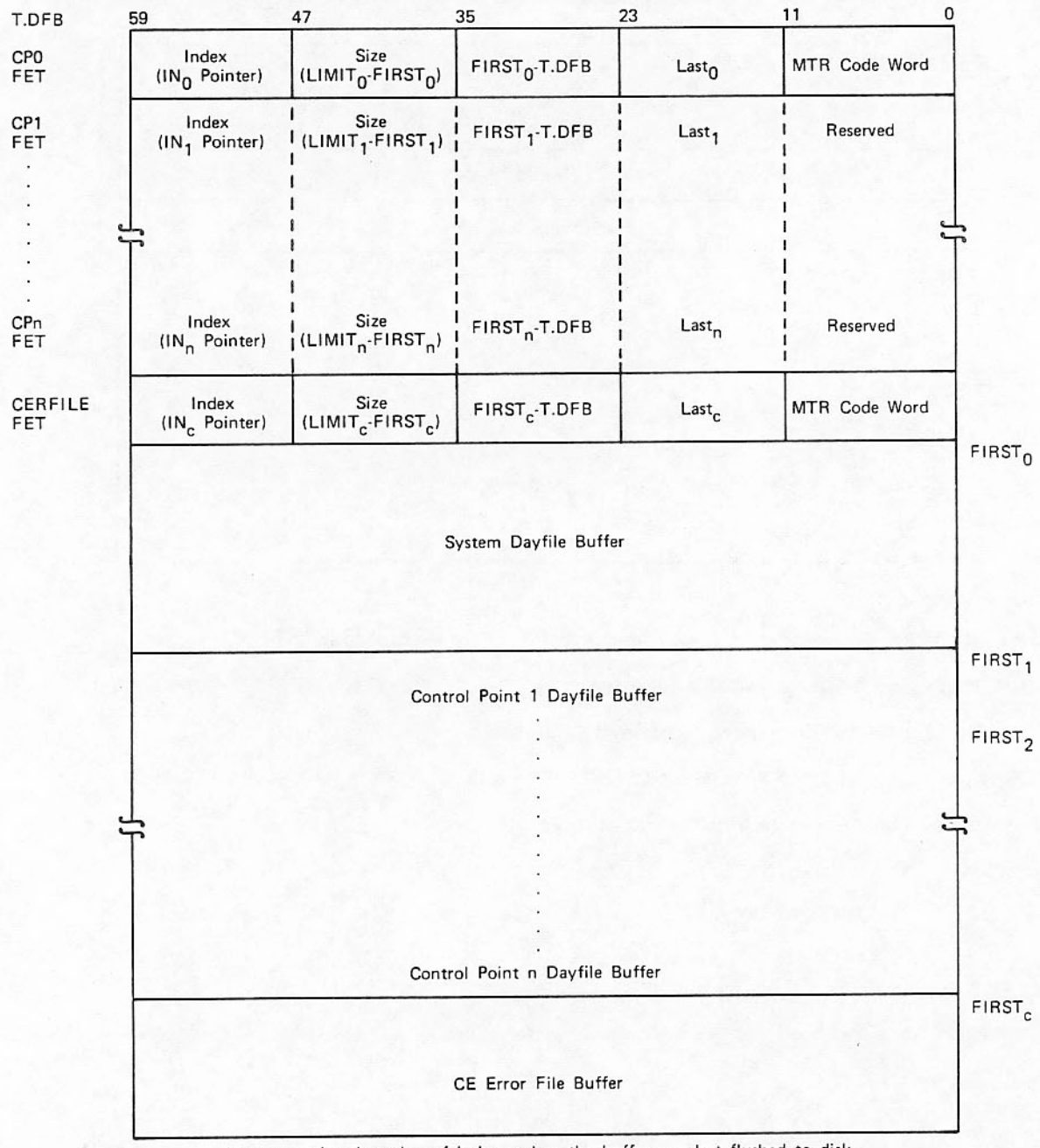


Word	Byte	Bit	Description
W.IDTHID			Host word.
	C.IDTL	59-48	Contains the length of the ID table. Default is 40_8. (L.IDT).
	C.IDTPID	47-36	Contains the first physical ID ordinal.

Word	Byte	Bit	Description
	C.IDTFLL	35-24	Contains the first logical ID ordinal in the upper 6 bits and the last logical ID ordinal in the lower 6 bits.
		17-0	Contains the host ID as three letters or digits. Third character must be a letter.
W.IDTLL			Reserved.
W.IDTFLO			Logical ID entries.
		17-0	Contains a logical ID as three letters or digits.
Link Words	C.IDSIDT	59-48	Contains the relative address of the station ID table. The station ID table is a copy of the central memory resident ID table, but the SIDT also contains lists of the logical ID's associated with linked mainframes.
	C.IDTFNO	47-36	Contains relative address of station PID information area.
	C.IDTEST	35-24	Contains the EST ordinal of the PID.
		17-0	Contains a physical or link ID as three letters or digits.

DAYFILE FET AND BUFFER AREA

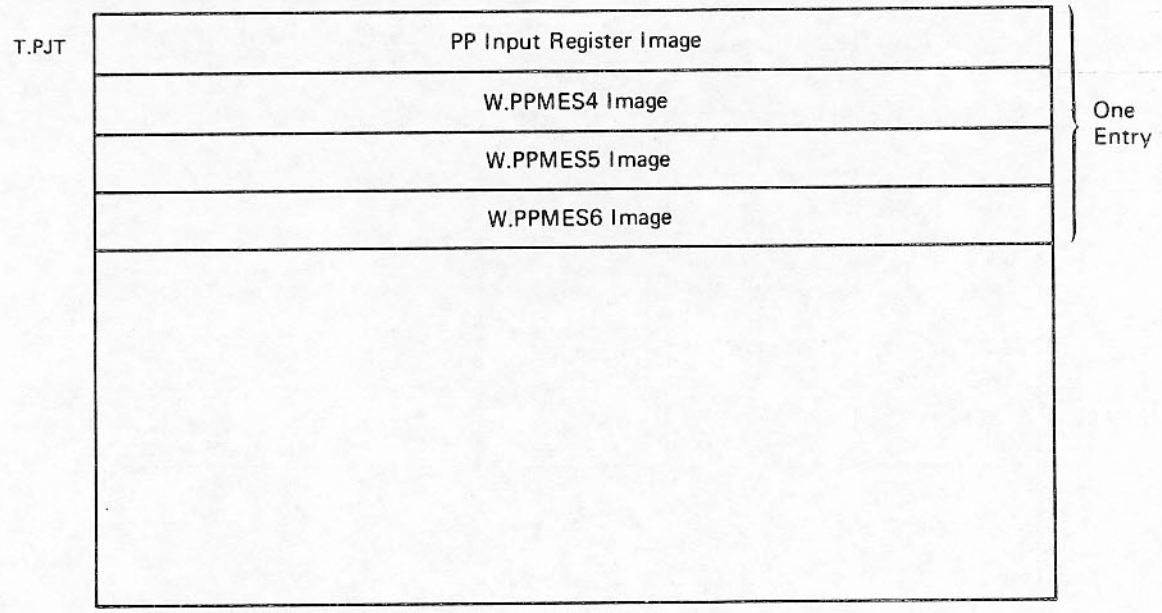
Byte 0 of word 3 in the CMR pointer area contains the address of T.DFB divided by 10_8.



$Last_n$ contains the value of $index_n$ when the buffer was last flushed to disk.

PERIPHERAL JOB TABLE

Byte 3 of word 26 in the CMR pointer area contains the first word address divided by 10_8 of T.PJT.
Byte 4 of word 26 in the CMR pointer area contains the last word address divided by 10_8 of T.PJT.



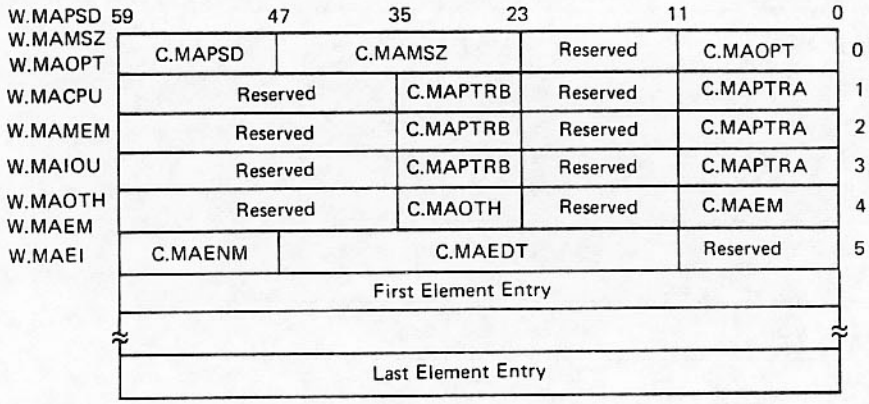
T.PJT contains PP jobs waiting for assignment to a PP. Jobs are placed in one of three queues:

1. Peripheral job queue (waiting for a free PP);
2. Delay stack (waiting for timed delay to end);
3. Event stack (waiting for CM bit to clear or be set).

MTR contains an internal table which manages this table.

MAINFRAME ATTRIBUTE BLOCK

Word 52, byte 0 of the CMR pointer area contains the FWA/10B of this table. Word 52, byte 1 has table length.



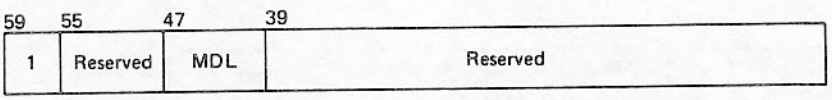
Word	Field	Bit	Description
0	C.MAPSD	59-48	PP speed.
	S.MA4XP	49	If set, 4x speed (PP major cycle = 0.25 usec).
	S.MA2XP	48	If set, 2x speed (PP major cycle = 0.5 usec). If both bits are 0, 1x speed (PP major cycle = 1 usec).
0	C.MAMSZ	47-24	Physically available CM/100$_8$.
0	C.MAOPT	11-0	Mainframe characteristics.

Bits	Field	Meaning (if bit is set)
11	S.MA170	Mainframe is not a CYBER 180-class, 865, or 875.
10-9	S.MA176	Mainframe is a CYBER 170 Model 176 if either or both bits are set.
8	S.MA700	Mainframe is not a CYBER 170 Model 720, 730, 740, 750, 760, or CYBER 176 Model B.
7	S.MAILR	ILR is not present.
6	S.MASCR	SCR is not present.
5		Not used.
4	S.MAIST	CPU 0 has no instruction stack.
3	S.MACMU	CMU is not present or is not used.
2	S.MACEJ	CEJ/MEJ are not present or are not used.
1	S.MACPU	CPU 1 is not present or is not used.
0		CPU 0 is not used.

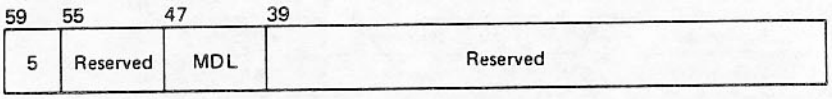
1-3	C.MAPTRB	35-24	Pointer to an element entry. Value is relative to the corresponding pointer word.
4	C.MAOTH	35-24	
1-3	C.MAPTRA	11-0	
4	C.MAEM	11-0	
5	C.MAENM	59-48	EI level name.
5	C.MAEDT	47-12	EI assembly date.

The element entry section for all models except CYBER 180-class mainframes contain at least one entry of each of the following types:

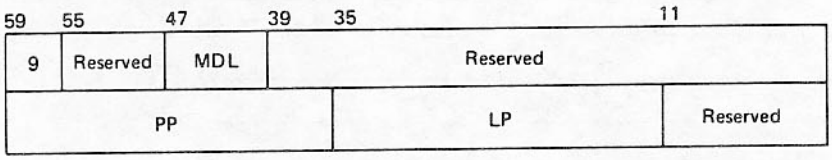
CPU Entry



Memory Entry



I/O Subsystem Entry



Field	Bits	Description
MDL	47-40	An octal number corresponding to the model of the mainframe.

Model	CPU Value	Memory Value	I/O Subsystem Value
Undefined	0	0	0
6200	2	102	202
6400	2	102	202
6500	2, 2	102	202
6600	3	102	202
6700	3, 2	102	202
C71	2	113	213
C72	2	113	213
C73	2	113	213
C74	3, 2	113	213
C171A	22	123	223
C172A	22	123	223
C173A	22	123	223
C174A	22, 22	123	223
C175A	25	123	223
C171B	22	123	223
C172B	22	123	223
C173B	22	123	223
C174B	22, 22	123	223
C175B	25	123	223
C171C	22	123	223
C172C	22	123	223
C173C	22	123	223
C174C	22, 22	123	223
C175C	25	123	223
C176A	42	123	223, 204
C176B	42	123	252, 204

Field	Bits	Description

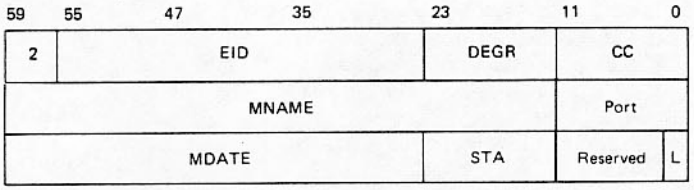
Model	CPU Value	Memory Value	I/O Subsystem Value
720	52, 52	152	252
730	52, 52	152	252
740	54	154	252
750	54	154	252
760	54	154	252
865	55, 55	155	255
875	55, 55	155	255

NOTE

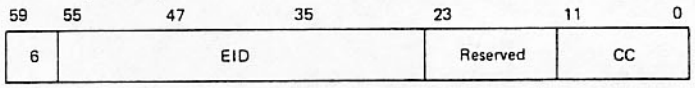
Two values are shown for models that can accommodate dual CPUs or dual I/O subsystems. There is a separate element entry for each CPU or I/O subsystem in a dual configuration.

The element entry section for CYBER 180-class mainframes contain at least one entry of each of the following types:

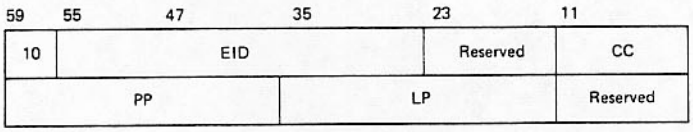
CPU Entry



Memory Entry



IOU Entry



Field	Bits	Description
EID	55-24	Element identifier - the contents of the corresponding EID register.

Bits	Description
55-48	Element.
47-40	Model.
39-24	Serial number.

DEGR	23-12	Map and cache degrade flags.

Bits	Description
23-20	Page map element unavailable.
19-18	Segment map element unavailable.
17-16	Not used.
15-12	Cache element unavailable.

Field	Bits	Description
CC	11-0	Maintenance channel connect code used to access the maintenance registers for the element.

Bits	Description
11-8	Element port number.
7-4	Zero (channel function field).
3-0	Element type.

MNAME	59-12	Microcode name.
PORT	11-0	Memory port to which the processor is connected.
MDATE	59-24	Microcode assembly date.
STA	23-12	Processor status information.

Bits	Description
23-21	Reserved.
20-17	IBS degrade bits (CYBER model 990 only).
16	If set, vector option is not installed (CYBER model 990 only).
15	If set, PMF is not physically present.
14	If set, processor does not support C180 state.
13	If set, processor does not support C170 state.
12	If set, processor is logically off.

L	0	Microcode load flag. If set, microcode load was bypassed.
PP	59-36	Physical PP bit map.

Bits	Description
59-58	Reserved.
57-48	Each bit that is set indicates that the corresponding PP (9-0) is not physically present.
47-46	Reserved.
45-36	Each bit that is set indicates that the corresponding PP (19-10) is not physically present.

or

Physical PPU bit map.

Bits	Description
59-49	Reserved.
48-36	Each bit that is set indicates that the corresponding PPU (12-0) is not physically present.

Field	Bits	Description
LP	35-12	Logical PP bit map.

Bits	Description
35-34	Reserved.
33-24	Each bit that is set indicates that the corresponding PP (9-0) is turned off or is not physically present.
23-22	Reserved.
21-12	Each bit that is set indicates that the corresponding PP (19-10) is turned off or is not physically present.

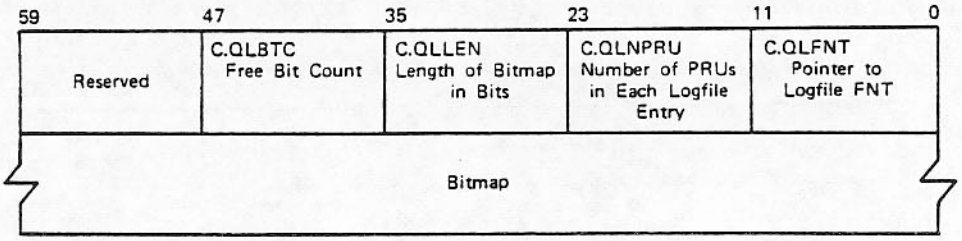
or

Logical PPU bit map.

Bits	Description
35-25	Reserved.
34-12	Each bit that is set indicates that the corresponding PPU (12-0) is turned off or is not physically present.

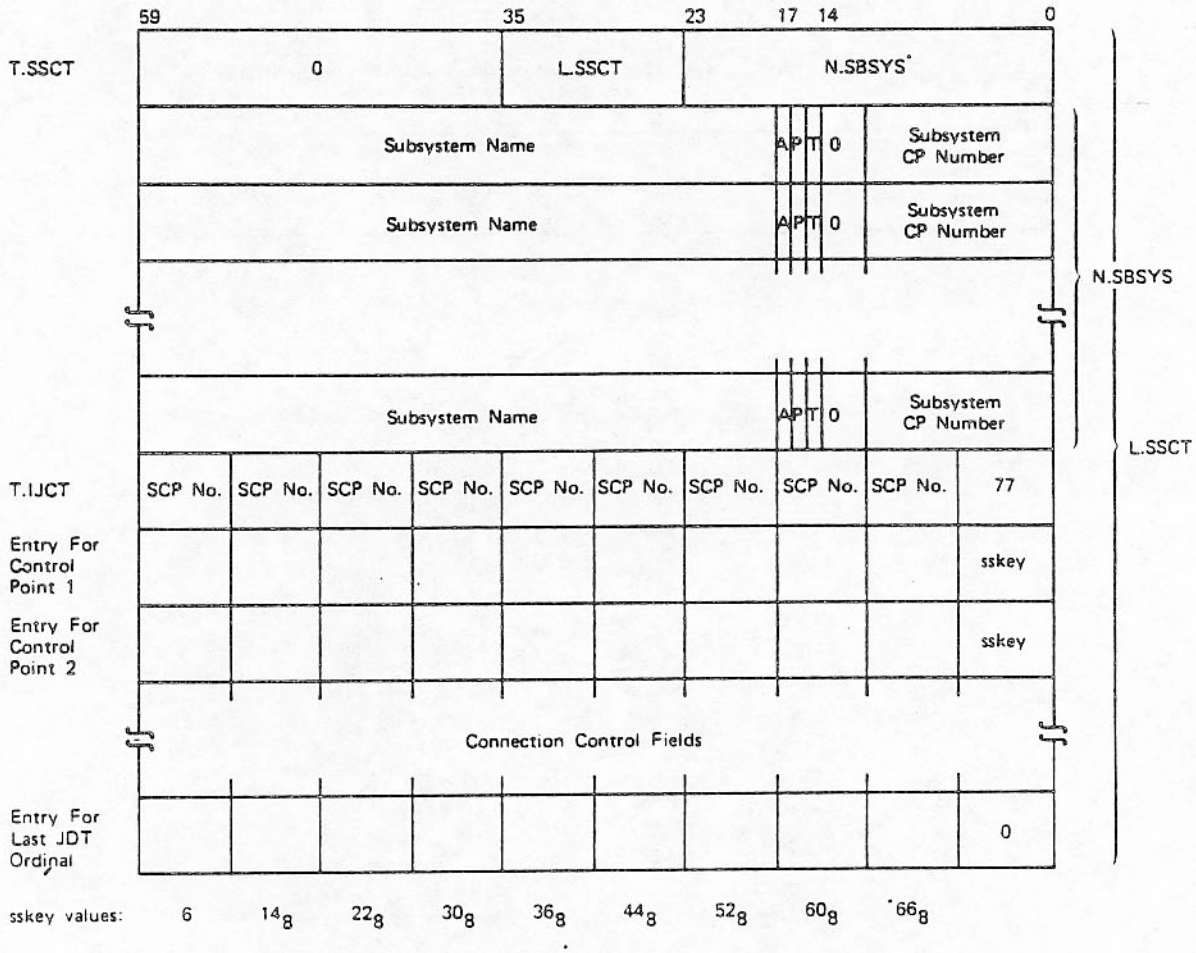
LOGFILE BITMAP TABLE (T.QLBMP)

Byte 2 of word 14 in the CMR pointer area contains the address of T.QLBMP divided by 10_8. Each bit corresponds to an entry in the logfile. The setting of a bit indicates the entry is reserved.

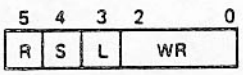


SUBSYSTEM CONTROL TABLE

Byte 2 of word 23 in the CMR pointer area contains the FWA/10B of this table.



Connection control field is as follows:



Field Name	Description	Set/Increment	Clear/Decrement
R	End-of-job connection.	SF.SLTC	SF.CLTC
S	Swap out.	SF.SWPO	SF.SWPI
L	Long-term connection.	SF.SLTC	SF.CLTC
WR	Wait response count.	CALLSS	SF.ENDT

Bit 15 (T) is set by SSF when performing termination processing on a system control point which has its error flag set. (Bit 17 remains set during this time.)

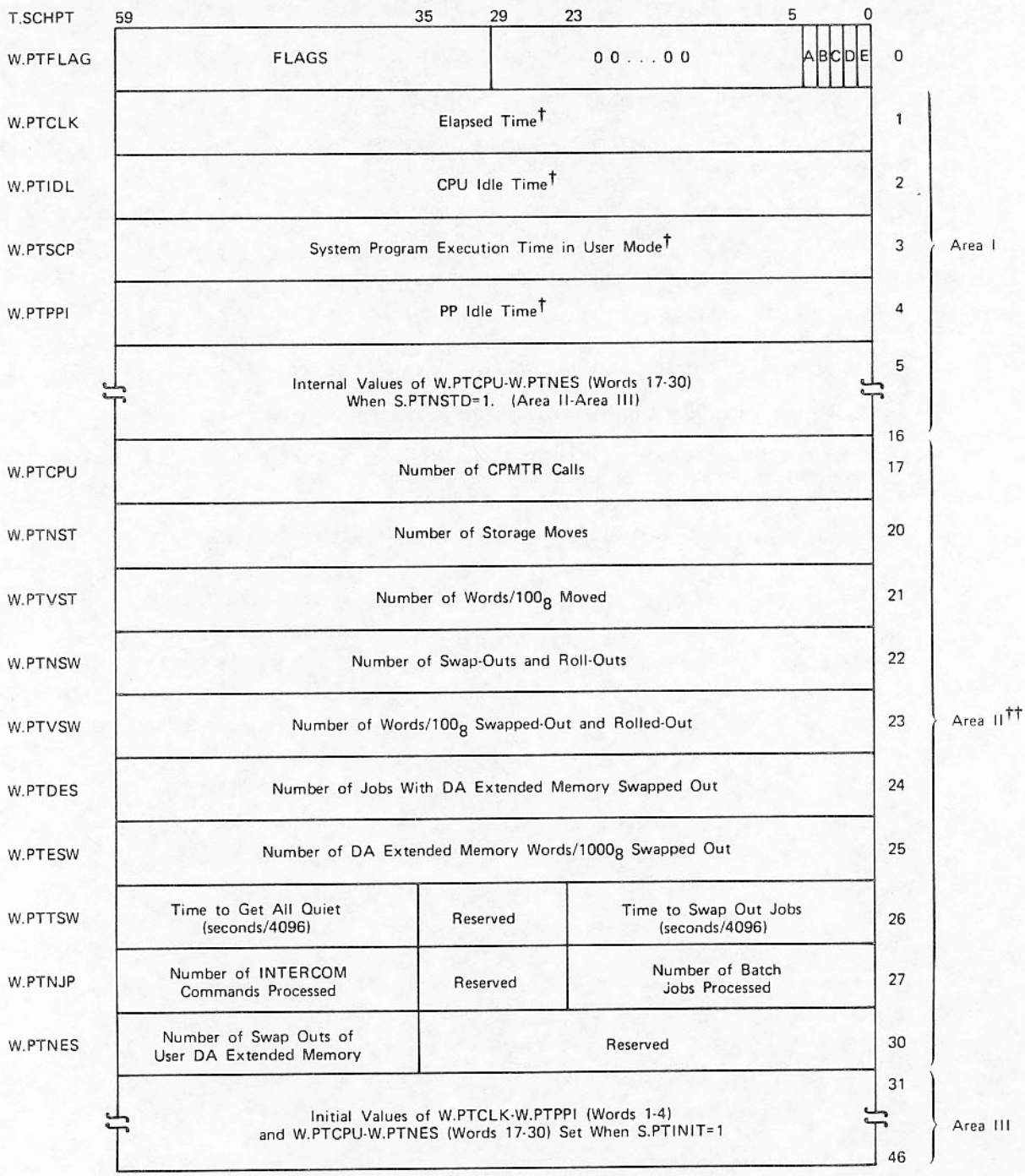
Bit 16 (P) permits a control point to attain system control point status as the specified subsystem even if the job is not system origin (initiated by operator).

When a subsystem is active, the following actions occur.

- Bit 17 (A) is set to 1.
- An sskey value is assigned, which specifies a column of connection control fields.
- This sskey value is put in the word for the subsystem job control point number.
- The subsystem CP number is put in the subsystem word and in the T.IJCT field specified by sskey.

SCHEDULER PERFORMANCE TABLE (SCHPT)

Byte 3, word 65 of the CMR pointer area contains the FWA/10_8 of the scheduler performance table.



† Area I, words W.PTCLK-W.PTPPI, contains current times when S.PTNSTD=0; interval times when S.PTNSTD=1. The unit used to measure the interval of time is one second/4096.

†† Area II always contains current values regardless of the flags.

Address of this table is T.SCHPT.

Field Name	Bit Name	Description
A	S.PTFJOB	First job execution started.
B	S.PTBNCH	Benchmark option selected.
C	S.PTSTOP	Stop data gathering.
D	S.PTINIT	Initialization of TSPT.
E	S.PTNSTD	Manual/benchmark option selected.

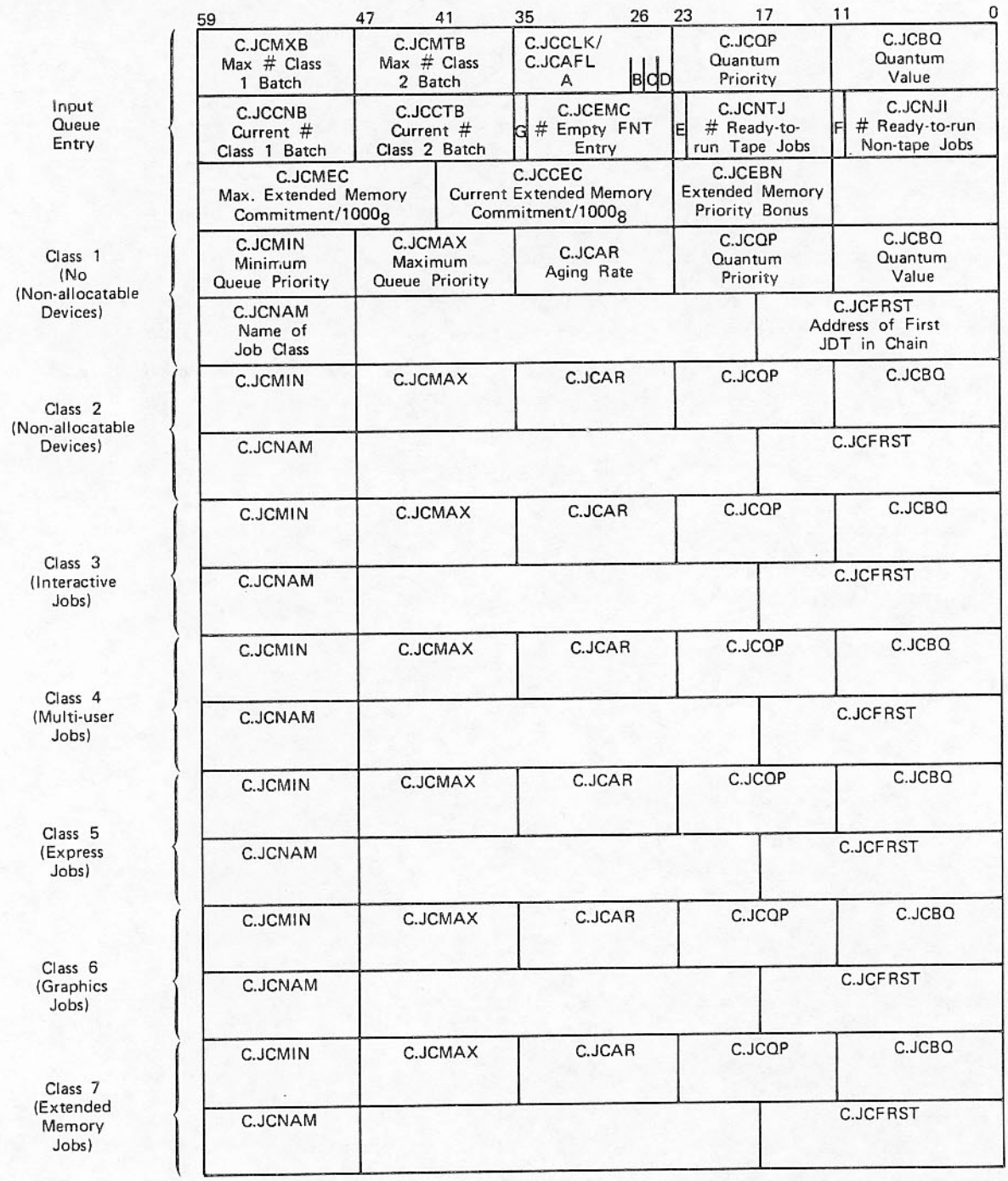
When all bits are zero, data accumulation begins at deadstart (normal mode).

When bits B and E are set, data accumulation begins when the first job begins executing, and ends when the last job finishes (bench mark mode).

When bits D and E are set, data accumulation begins immediately and ends when bits C and E are set (manual mode).

SCHEDULER JOB CONTROL AREA

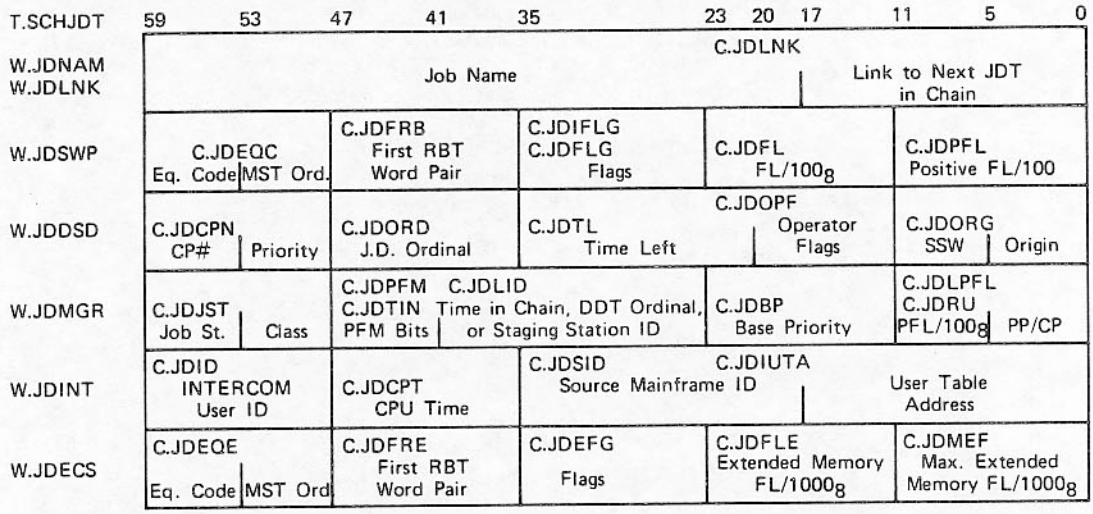
Byte 2 of word 60 in the CMR pointer area contains the FWA/10B of this table.



Field Name	Description
A	Anticipated FL/1000$_8$.
B	1=Increment to AFL for INTERCOM (AFL.INT) has been added (S.JCAFL).
C	1=Increment to AFL for RDF (AFL.RMF) has been added (S.JCAFL+1).
D	1=IIB failed to initiate a job last time called (S.JCIIB).
E	1=Fixed priority tape jobs in input queue.
F	1=Fixed priority nontape jobs in input queue.
G	1=Waiting to issue FNT space critical message.

SCHEDULER JOB DESCRIPTOR TABLE ENTRY

Byte 4 of word 60 in the CMR pointer area contains the FWA/10_8 of T.SCHJDT. Byte 3, word 60 contains T.SCHJDT length. Byte 0, word 60 contains length of each entry in the job descriptor table.



W.JDNAM(0)

Bit	Description
59-18	Job name as found in job input FNT.

W.JDLNK

Bit	Description
17-00	Address of next job descriptor in the chain. (C.JCFRST in JCA points to first entry in chain; a zero field denotes last entry in chain.)

W.JDSWP(1)

Byte	Bit	Field	Description
C.JDEQC(0), C.JDFRB(1)			Equipment code, MST ordinal, and first RBT number of the swap file (F.JDSWT in word W.JDMGR is set); else contains first subpage address of extended memory swap file.
C.JDFLG(2), C.JDIFLG(2)	35	S.JDBCB(43_8)	Set if recovery took place.
	34	S.JDNRR(42_8)	Set if job cannot be rerun.
	33	S.JDLGI(41_8)	Set if no swap file exists and control point area must be initialized (for example, LOGIN command).

Byte	Bit	Field	Description
	32	S.JDLGO(40_8)	Set if no swap file is to be generated for this INTERCOM job (for example, LOGOUT command).
	31	S.JDNJ(37_8)	Set to indicate control statements read from INTERCOM area.
	30	S.JDECS(36_8)	Set if swap file is on extended memory.
	29	S.JDSKFL(35_8)	Set if FL is to be skipped on swap file.
	28	S.JDROLL(34_8)	Set if job can only be rolled.
	27	S.JDNFNT(33_8)	Set if IAJ should not search FNT table.
	26	S.JDFAZ(32_8)	Set if file at control point 0.
	25	S.JDINTR(31_8)	Set to terminate INTERCOM job on recovery deadstart.
	24		Unused.
C.JDFL(3)			FL/100_8 including the job control block, which is created when job is swapped out, needed to swap in this job.
C.JDPFL(4)			Relative starting address/100_8 of the job control block when present for job swapping; otherwise, contains zero.

W.JDDSD(2)

Byte	Bit	Field	Description
C.JDCPN(0)			Control point number in upper 6 bits. (Set when job is in execution or rolled out.) In lower 6 bits, contains job or rerun priority.
C.JDORD(1)			Job descriptor (JDT) ordinal.
C.JDTL(2)			Job time left (upper 12 bits).

Byte	Bit	Field	Description
C.JDOPF(3)			Flags set by operator.
	23-21		Low order 3 bits of time left.
	20		Currently not used.
	19	S.JDTLI(23_8)	Set if job is to be temporarily locked into a CP.
	18	S.JDEXP(22_8)	Set if job is to be placed in express queue.
	17	S.JDGO(21_8)	Set if operator typed GO.
	16	S.JDNS(20_8)	Set if job must not be swapped out or rolled out when at a control point.
	15	S.JDLOK(17_8)	Set if job must not be brought to control point.
	14-12		Error codes: F.JDKILL, F.JDDROP, F.JDRRUN, F.JDRRNP, F.JDTI.
C.JDORG(4)	11-6		Sense switches.
	5	S.JDINT	Set for a standard INTERCOM job.
	4	S.JDMUJ	Set for a multiuser job.
	3	S.JDGR	Set for a graphics job.
	2	S.JDRT	Set for a real-time job.
	1-0		Currently not used.

W.JDMGR(3)

Byte	Bit	Field	Description
C.JDJST(0)	59-54		Values describe the job status.

Value	Name	Job Status
7x	F.JDWMM	Job is waiting for MMF action (GETPF, SAVEPF, PURGE).
6x	F.JDWPK	Job is waiting for permanent pack.
5x	F.JDWIA	Job is waiting for INTERCOM action (in INTERCOM queue).

Byte	Bit	Field	Description		
			Value	Name	Job Status
			4x	F.JDWOA	Job is waiting for operator action (in operator action queue).
			3x	F.JDWDA	Job is waiting for device assignment (in device queue).
			2x	F.JDWPF	Job is waiting for a permanent file availability (in permanent file queue).
			1x	F.JDWCM	Job is waiting for central memory (in central memory queue).
			0x	F.JDLMB	Job is waiting for entry in a scheduling structure.
			x3	F.JDWCC	Job is being swapped or rolled out.
			x2	F.JDACT	Job is currently executing at a control point (is active).
			x1	F.JDSWI	Job is being swapped or rolled in.
			x0		Job is swapped or rolled out.
	53-48		Job class values.		
			Value	Name	Job Status
			07	F.JDECS	Extended memory jobs.
			06	F.JDGRA	Graphics job.
			05	F.JDEXP	Express handling was requested for this job.

Byte	Bit	Field	Description		
			Value	Name	Job Status
			04	F.JDMUJ	Multiuser job.
			03	F.JDINT	Standard INTERCOM job.
			02	F.JDBNA	Batch job with nonallocatable device requirements.
			01	F.JDBAT	Batch job with no nonallocatable device requirements.
C.JDPFM(1)			Information used by permanent file manager.		
	47		Purge bit.		
	46		Exclusive access desired.		
	45		Control permission desired.		
	44		Modify permission desired.		
	43		Extend permission desired.		
	42		Read permission desired.		
C.JDTIN(1)	41-24		Time at which job descriptor was attached to job class chain.		
	41-24		Variable DDT ordinal when a job has been swapped out until the pack becomes available.		
C.JDLID	41-24		ID of the staging station when a job has been swapped to the multimainframe queue.		
C.JDBP(3)	23-12		Job base priority.		
C.JDRU(4), C.JDLPFL(4)	11-6		Positive field length/100_8 of job control block created at swap-out time.		
	5-0		Ratio of PP time to CPU time used by job during its last execution (if job is swapped out) or since start of job (if job is rolled out).		

W.JDINT(4)

Byte	Bit	Field	Description
C.JDID(0)	59-48		INTERCOM user ID associated with remote batch job.
C.JDCPT(1)	47-36		CPU time, in seconds, used by this job.
C.JDSID(2)	35-18		Source mainframe identifier.
C.JDIUTA(3), C.JDIUTA+1	17-0		Address of user table for interactive or graphics jobs, or MUJ table for multiuser jobs.

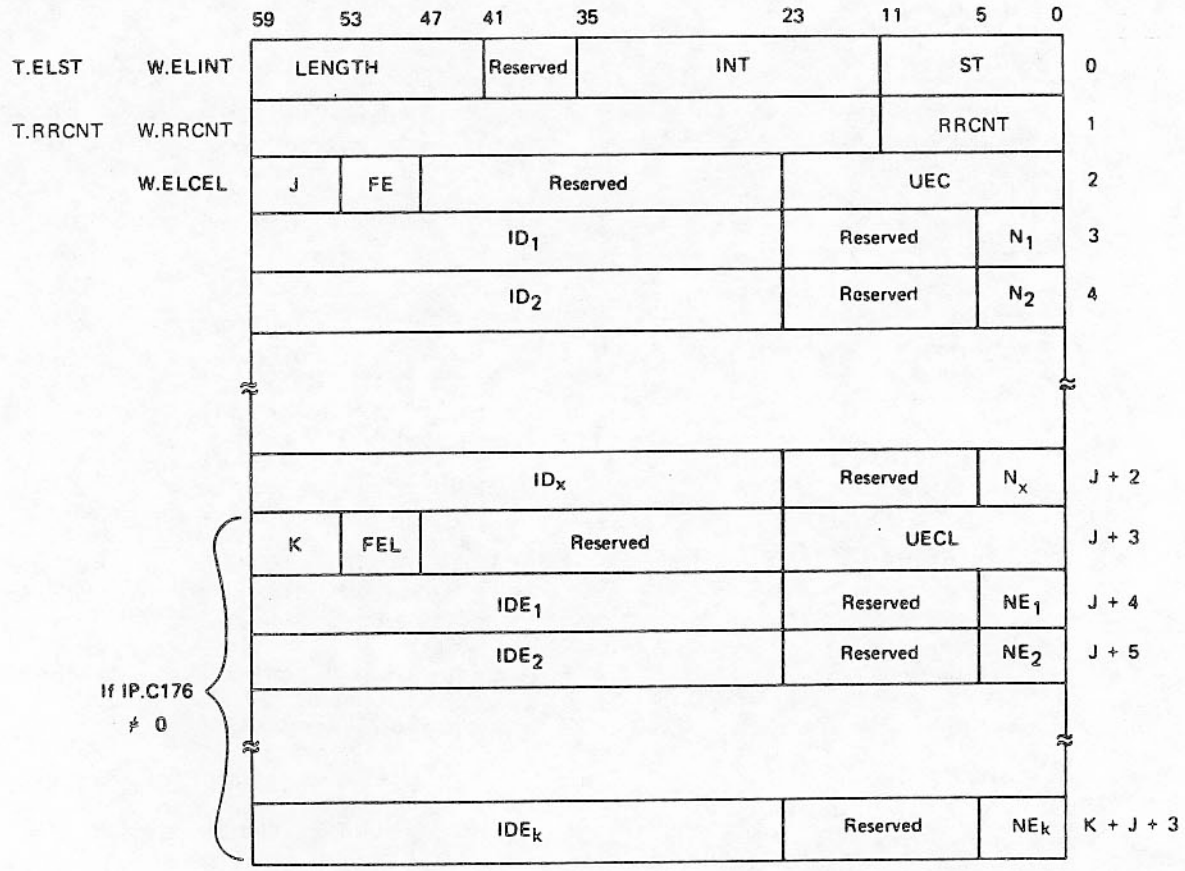
W.JDECS(5)

Byte	Bit	Field	Description
C.JDEQE(0), C.JDFRE(1)			Equipment code, MST ordinal, and first RBT word pair number of the direct access extended memory swap file for the job.
C.JDEFG(2)	25	S.JDEAS(0)	Set if the job's direct access extended memory has been swapped out.
	24	S.JDCPS(1)	Set if swapped-out job is still assigned to a control point (extended memory not swapped out).
C.JDFLE(3)			Current amount of direct access extended memory assigned to the job, in 1000_8 word blocks.
C.JDMEF(4)			Maximum amount of direct access extended memory that the job can obtain, in 1000_8 word blocks.

ERROR LOGGING STATUS TABLE

Byte 1 of word 23 in the CMR pointer area contains the FWA/10B of this table.

For CYBER 170-class mainframes:

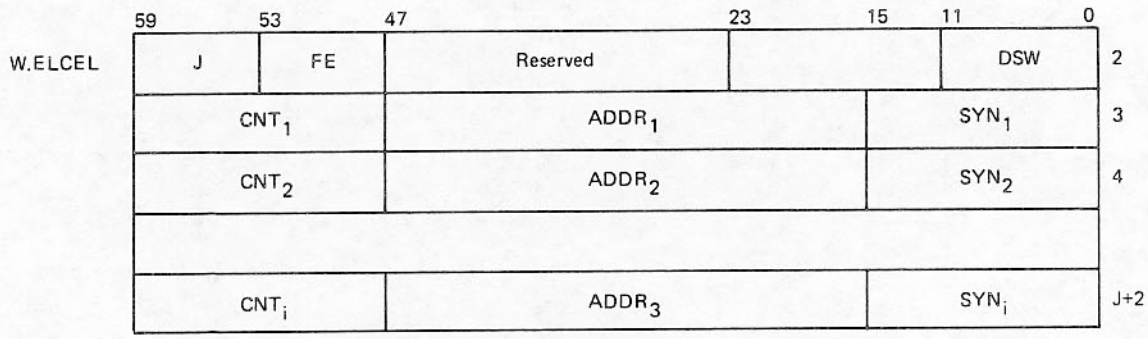


Word	Field	Bits	Description
0	LENGTH	59-42	Length of table in words. System default value (with $J=12_8$ and $K=12_8$) is 30_8.
0	INT	35-12	Expiration time of interval, in binary seconds (copy of bytes 2 and 1 of T.MSC).
0	ST	11-0	Status of error processing.

Value	Meaning
0	MTR monitoring.
1	Error processor PP has been called.
3	Error processor PP dedicated.
5	No further error processing until deadstart.

Word	Field	Bits	Description
1	RRCNT	11-0	Count of jobs rerun during interval due to mode 20 or 67 errors.
2	J	59-54	Maximum number of CM errors that can appear in the table. System default value is 12_8.
2	FE	53-48	Number of unused CM error entries. J-FE is the actual number of CM error entries in the table.
3 to J + 2	ID_X	59-24	Unique identifier of corrected CM error.
3 to J + 2	N_X	5-0	Number of occurrences of error in interval.
J + 3	K	59-54	Maximum number of corrected LCME errors that can appear in the table. System default value is 12_8.
J + 3	FEL	53-48	Number of unused LCME error entries. K-FEL is the actual number of LCME error entries in the table.
J + 3	UECL	23-0	Number of ignored corrected LCME errors (when FEL = 0).
J + 4 to K + J + 3	IDE_X	59-24	Unique identifier of corrected LCME error.
J + 4 to K + J + 3	NE_X	5-0	Number of occurrences of error in interval.
2	UEC	23-0	Number of ignored corrected CM errors when FE equals zero.

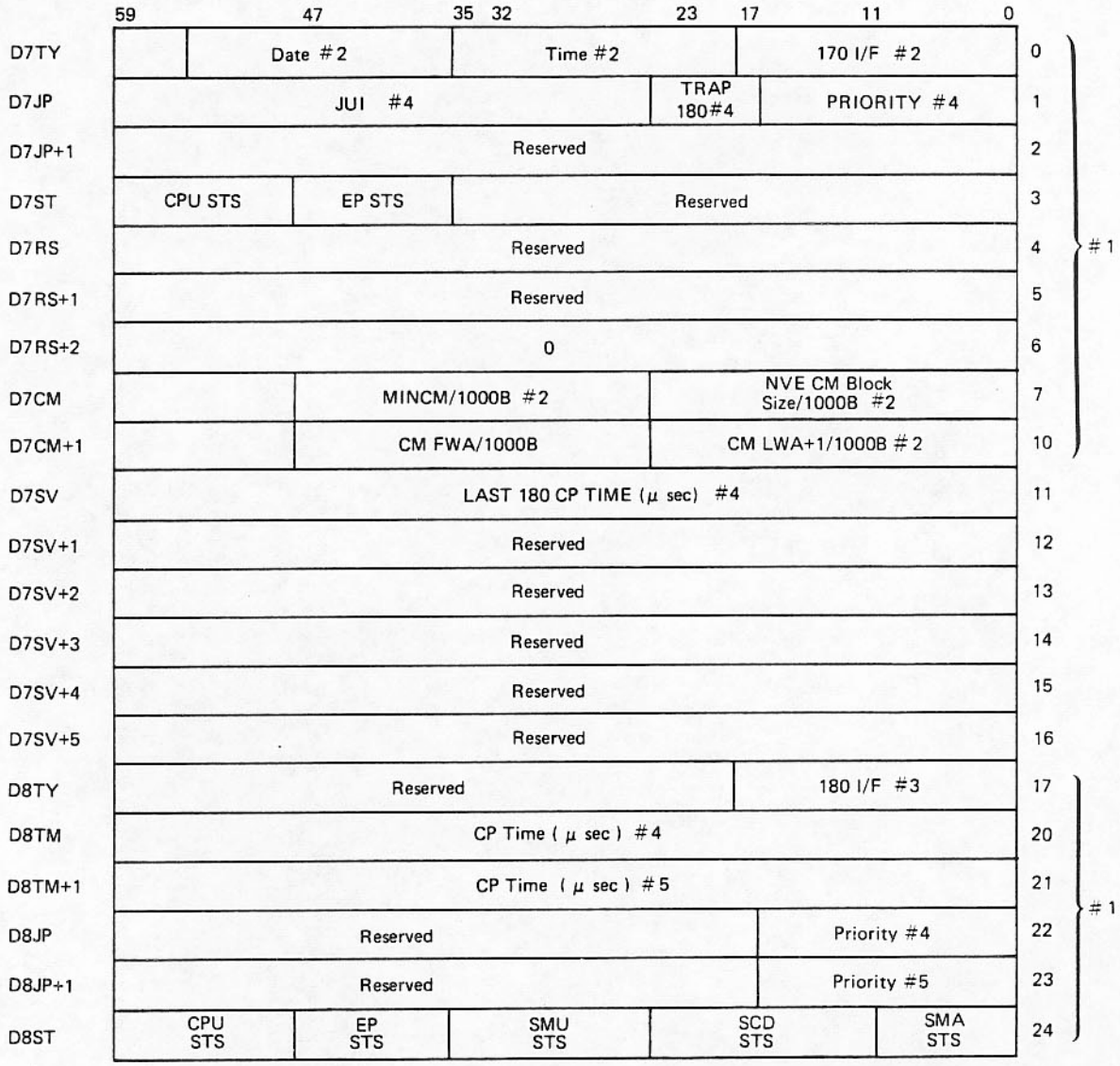
For CYBER 180-class mainframes, Error Logging Status Table words 2 through J+2 have the following fields:



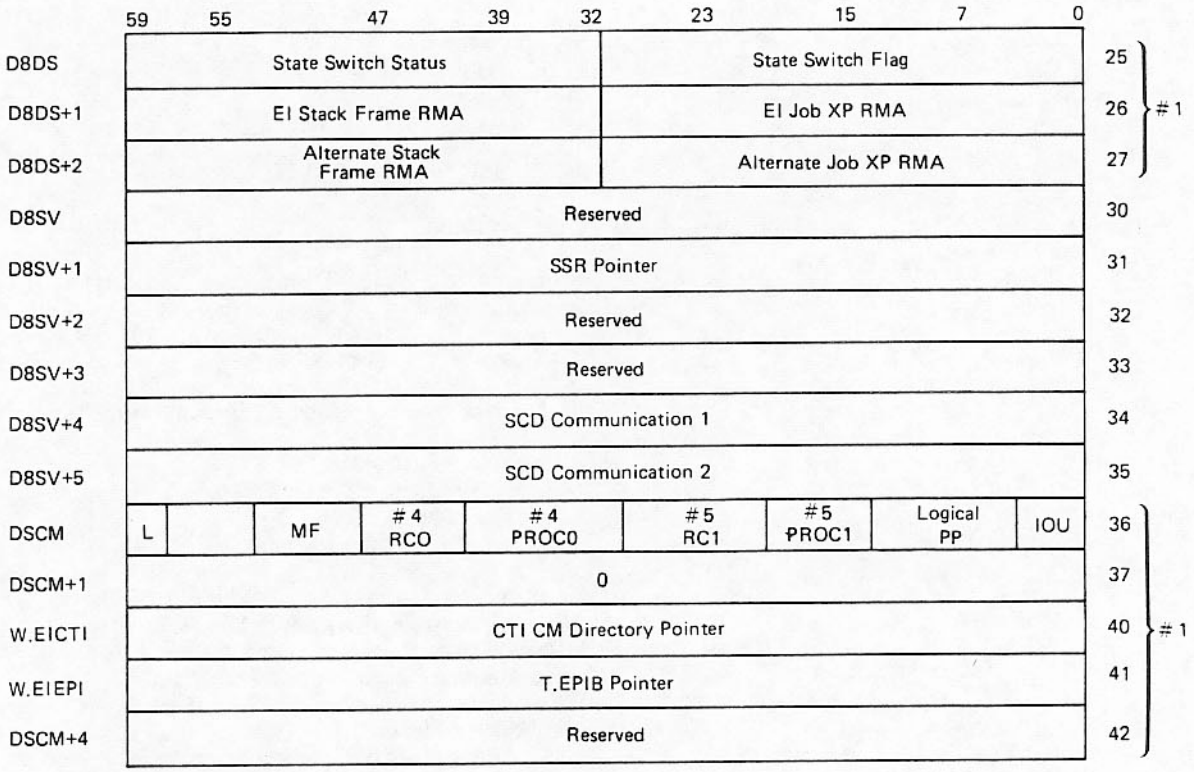
Word	Field	Bits	Description
2	J	59-54	Maximum number of CM errors that can appear in the table. System default value is 12_8.
2	FE	53-48	Number of unused CM error entries. J-FE is the actual number of CM error entries in the table.
2	DSW	11-0	Byte set nonzero to signal the error processing to enter dedicated mode.
3 through J+2	CNT_X	59-48	Number of occurrences of error in interval.
3 through J+2	$ADDR_X$	47-16	Address of word that corrected CM error.
3 through J+2	SYN_X	15-0	Syndrome code of error.

ENVIRONMENT INTERFACE COMMUNICATIONS BLOCK

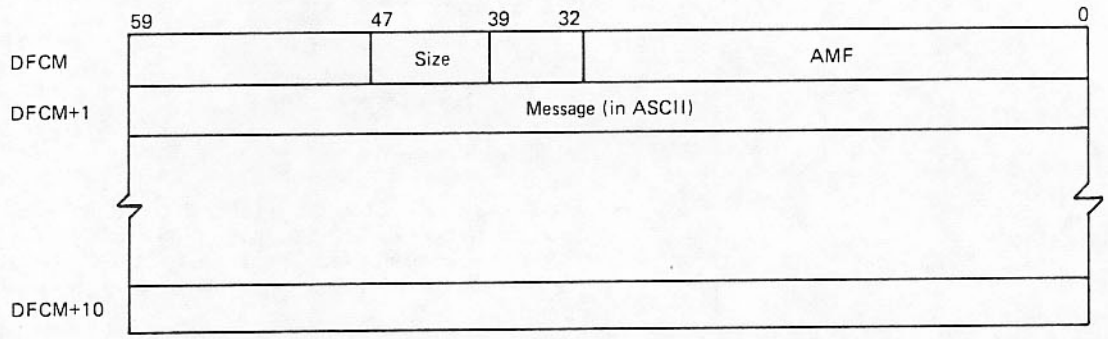
Bytes 3 and 4 of word 71 contain the FWA of this table.



#1 C170/180 interface entries.
#2 Initialized at C170 deadstart time (never changed during 170 execution).
#3 Initialized at 180 OS deadstart time (never changed during 180 execution).
#4 CPU 0
#5 CPU 1



#1 C170/180 interface entries.
#2 Initialized at C170 deadstart time (never changed during 170 execution).
#3 Initialized at 180 OS deadstart time (never changed during 180 execution).
#4 CPU 0
#5 CPU 1



Word	Field	Bits	Description
D7TY		59-54	Reserved for CDC.
	DATE	53-36	Date pointer. Address of a CM word containing the current date in the display coded format (yy/mm/dd.).
	TIME	35-18	Time pointer. Address of a CM word containing the current time of day in the following display coded format (hh.mm.ss.).
	170 I/F	17-12	170 Operating System (OS) type. Six-bit binary value that represents the 170 OS type. (00) = undefined (01) = NOS (02) = NOS/BE (03-77B) = reserved for CDC
		11-6	Environment Interface Communication Block Version number supported by the 170 OS. Six-bit binary value. Changes in size or format of the EICB will force a change in the version number. (00) = undefined (01, 02, 03) = previous version of interface (04) = current version of interface (05-77B) = reserved for CDC
		5-0	Environment Interface Communication Block Implementation Level number supported by the 170 OS. Six-bit binary value. This implementation level is independent of the OS PSR levels. Minor, upward compatible environment interface changes can be reflected with a new interface level. New interface versions will cause the interface level to be reset. (00) = undefined (01) = current interface level (02-77B) = reserved for CDC
D7JP	JUI	59-24	Job unique identifier. Thirty-six bit binary value that identifies the currently running 170 program mode job in CPU 0. This value is composed of the first four characters of the job name (24 bits), and the JDT ordinal or CP number (12 bits).

Word	Field	Bits	Description
	TRAP 180	23-16	Eight-bit binary value that enables appropriate 180 state access priveledges to the current job.
	PRIORITY	15-8	170 CPU priority. Eight-bit binary value that represents the CPU priority of the currently running 170 program mode job in CPU 0.

Octal	Description
00	Idle program.
01	Maintenance programs.
02	Reserved for CDC.
03	Batch/interactive programs.
04-06	Reserved for CDC.
07	Subsystem control point programs.
10	Program mode monitor.
11	Reserved for C180 monitor mode.
12-377	Reserved for CDC.

	-	7-4	170 CPU sub-priority. Four-bit binary value that represents the sub-priority of the currently running 170 program mode job in CPU 0.

Octal	Description
0	170 time slice.
1	170 I/O priority.
2-15	Reserved for CDC.

		3-0	170 CPU quantum for CPU 0. Four-bit binary value always set to zero.
D7JP+1		59-0	Reserved for CDC.

Word	Field	Bits	Description
D7ST	CPU	59	Operational mode.
	STS		A flag to indicate whether the 170 OS is in a production or non-production environment. This condition is always set. (0) = dedicated maintenance mode (non-production mode) (1) = production mode
	-	58	Concurrent maintenance mode. A flag to indicate that the 170 OS is in a concurrent maintenance mode. This condition is indicated by being in ENGR mode. (0) = non-concurrent maintenance mode (1) = concurrent maintenance mode
	-	57	STEP mode. A flag to indicate that the 170 OS is in STEP mode. (0) = non-STEP mode (1) = STEP mode
	-	56-52	Reserved for CDC.
	-	51	Checkpoint system complete. A flag to indicate that a checkpoint has been completed in the 170 OS and that no job processing is taking place. (1) = checkpoint complete NOTE The RESUME command clears this flag.
	-	50	Checkpoint in progress (going down). A flag to indicate that the 170 OS is going down and is in the process of checkpointing its environment. This bit must be cleared and bit 51 must be set when the checkpoint is completed. (1) = checkpoint in progress NOTE The RESUME command clears this flag.
	-	49-48	Reserved for CDC.
	EP STS	47-37	Reserved for CDC.

Word	Field	Bits	Description
	-	36	Drop NOS/VE. A flag to indicate that the 180 OS must be terminated immediately without a checkpoint. (1) = drop NOS/VE
		35-0	Reserved for CDC.
D7RS		59-0	Reserved for CDC.
+1		59-0	Reserved for CDC.
+2		59-0	Zeros.
D7CM		59-48	Reserved for CDC.
	MINCM	47-24	CM allocated to 170 OS (words/1000B).
	NVECM	23-0	CM allocated to NOS/VE (words/1000B).
D7CM+1		59-48	Reserved for CDC.
	CM FWA	47-24	NOS/VE CM FWA/1000B.
	CM LWA	23-0	NOS/VE CM LWA+1/1000B.
D7SV	CP TIME	59-0	Microsecond clock value when 170 OS transferred control to 180 OS.
+1	CP TIME	59-0	Reserved for CDC.
+2		59-0	Reserved for CDC.
+3		59-0	Reserved for CDC.
+4		59-0	Reserved for CDC.
+5		59-0	Reserved for CDC.
D8TY		59-18	Reserved for CDC.
	180 I/F	17-12	180 Operating System (OS) type. Six-bit binary value that represents the 180 OS type. Initialized by EI and NOS/VE at deadstart time. (0) = undefined (1) = EI (2) = NOS/VE (03-77B) = reserved for CDC

Word	Field	Bits	Description
	-	11-6	Environment Interface Communication Block Version number supported by the 180 OS. Six-bit binary value. Initialized by NOS/VE at deadstart time. (00) = undefined (01) = previous interface version (02) = current interface version (03-77B) = reserved for CDC
	-	5-0	Environment Interface Communication Block Implementation Level number supported by the 180 OS (see 170 I/F level). Six-bit binary value. Initialized by NOS/VE at deadstart time. (00) = undefined (01) = current interface level (02-77B) = reserved for CDC
D8TM	CP TIME	59-0	NOS/VE accumulated CPU time (usec) for CPU 0.
D8TM+1	CP TIME	59-0	NOS/VE accumulated CPU time (usec) for CPU 1.
D8JP		59-12	Reserved for CDC.
	PRIORITY	15-8	180 CPU priority. Eight-bit binary value that represents the CPU priority of the currently running 180 state task in CPU 0. See D7JP PRIORITY description.

Hex Code	Description
00	Idle program.
01	Maintenance programs.
02	Reserved for CDC.
03	Batch/interactive programs.
04-06	Reserved for CDC.
07	Key services.
08	Program mode monitor.
09	C180 monitor mode.
0A-FF	

Word	Field	Bits	Description
	-	7-4	180 CPU sub-priority. Four-bit binary value that represents the sub-priority of the currently running 180 program mode job in CPU 0. Hex Code — Description 0 — 180 time slice. 1 — Reserved for 180 I/O priority. 2-F — Reserved for CDC.
		3-0	180 CPU quantum. Four-bit binary value that represents the quantity of CPU 0 that must be assigned to the 180 state. This value is only used when both the 170 and 180 state priorities and subpriorities are equal. If all priorities are equal and the free running counter bits 2^{14} - 2^{17} are less than or equal to the 180 quantum, 180 gets the CPU. Otherwise 170 gets the CPU.
D8JP+1		59-0	Priority fields for CPU 1 are the same as in D8JP.
D8ST	CPU	59	Operational mode (see D7ST).
	STS	58	Concurrent maintenance mode (see D7ST).
	-	57	STEP mode.
	-	56-52	Reserved for CDC.
	-	51	Checkpoint complete.
	-	50	Checkpoint in progress (going down).
	-	49-48	Reserved for CDC.
	EP STS	47-36	Reserved for CDC.
	SMU STS	35-30	Reserved for CDC.
	-	29-24	SMU logical PP number.
	MDD STS	23-18	Reserved for CDC.
	-	17-12	MDD logical PP number.
	SMA STS	11-6	System disk channel.
	-	5-0	System disk PP number.

Word	Field	Bits	Description
D8DS	STATUS	59-32	Additional NOS/VE deadstart status.
	SWITCH	31-0	Interlock to synchronize deadstart of NOS/VE (used by EI and deadstart PP). -1 = prepare for NOS/VE deadstart (set by EI) 1 = ready to deadstart NOS/VE (set by EI) 0 = deadstart complete (set by deadstart PP)
D8DS+1	STACK FRAME	59-32	Real memory (central memory) address of stack frame save area in EI. Set by EI STOP CPU function for communication to NOS/VE during deadstart.
	JOB XP	31-0	RMA of job XP (JPS) area in EI. Set by EI STOP CPU function for communication to NOS/VE during deadstart.
D8DS+2	ALT. STACK FRAME	59-32	RMA of stack frame save area in NOS/VE. Set during NOS/VE deadstart.
	ALT. JOB XP	31-0	RMA of job XP (JPS) area in NOS/VE. Set during NOS/VE deadstart.
D8SV		59-0	Reserved for CDC.
+1	SSR	59-0	SSR pointer (R-register format).
+2		59-0	Reserved for CDC.
+3		59-0	Reserved for CDC.
+4	SCD	63-56	Input count.
		55-32	ASCII characters.
		31-0	RMA of next line in current list.
+5	SCD	63-56	Order to SCD.
		55-48	Hold flag.
		47-32	Reserved for CDC.
		31-0	RMA of first line in new list.
DSCM	L	59	Interlock bit. Before DSCM is modified, this bit is set via a read-and-set-lock instruction (PP program), or a test-and-set-bit instruction (EI or NOS/VE process).
	MF	55-48	Mainframe status that identifies system level error. Hex Code (Octal) Description 10 (20) Short warning. 11 (21) Long warning.
	RC0	47-40	Binary value that is the number of retries associated with processor 0 error codes 22, 25, 31, and 34.

Word	Field	Bits	Description
	PROC0	39-32	Binary value that identifies a processor 0 error.

Hex Code	(Octal)	Description
21	(41)	C170 processor detected uncorrected error (DUE) with process damaged.
24	(44)	180 processor detected uncorrected error (DUE) with process damaged.
22	(42)	C170 processor detected uncorrected error (DUE) with process not damaged and software retry count exhausted.
25	(45)	180 processor detected uncorrected error (DUE) with process not damaged and software retry count exhausted.
31	(61)	C170 processor detected uncorrected error (DUE) with process not damaged. Retry successful.
34	(64)	180 processor detected uncorrected error (DUE) with process not damaged. Retry successful.

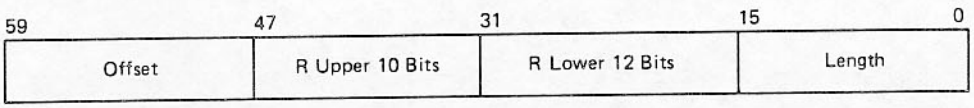
	RC1	31-24	Binary value that contains the number of retries associated with processor 1 error codes 22, 25, 31, and 34.

Word	Field	Bits	Description
	PROC1	23-16	Binary value that identifies a processor 1 error. (Codes used are the same as those for processor 0.)
	Logical PP	15-8	Binary value that is the logical PP number associated with IOU error code 8.
	IOU	7-0	Binary value that identifies an IOU error.

Hex Code	(Octal)	Description
1	(1)	Fatal IOU error.
2	(2)	C170 IOU error.
4	(4)	180 IOU error (SMU).
8	(10)	180 IOU error (not SMU).

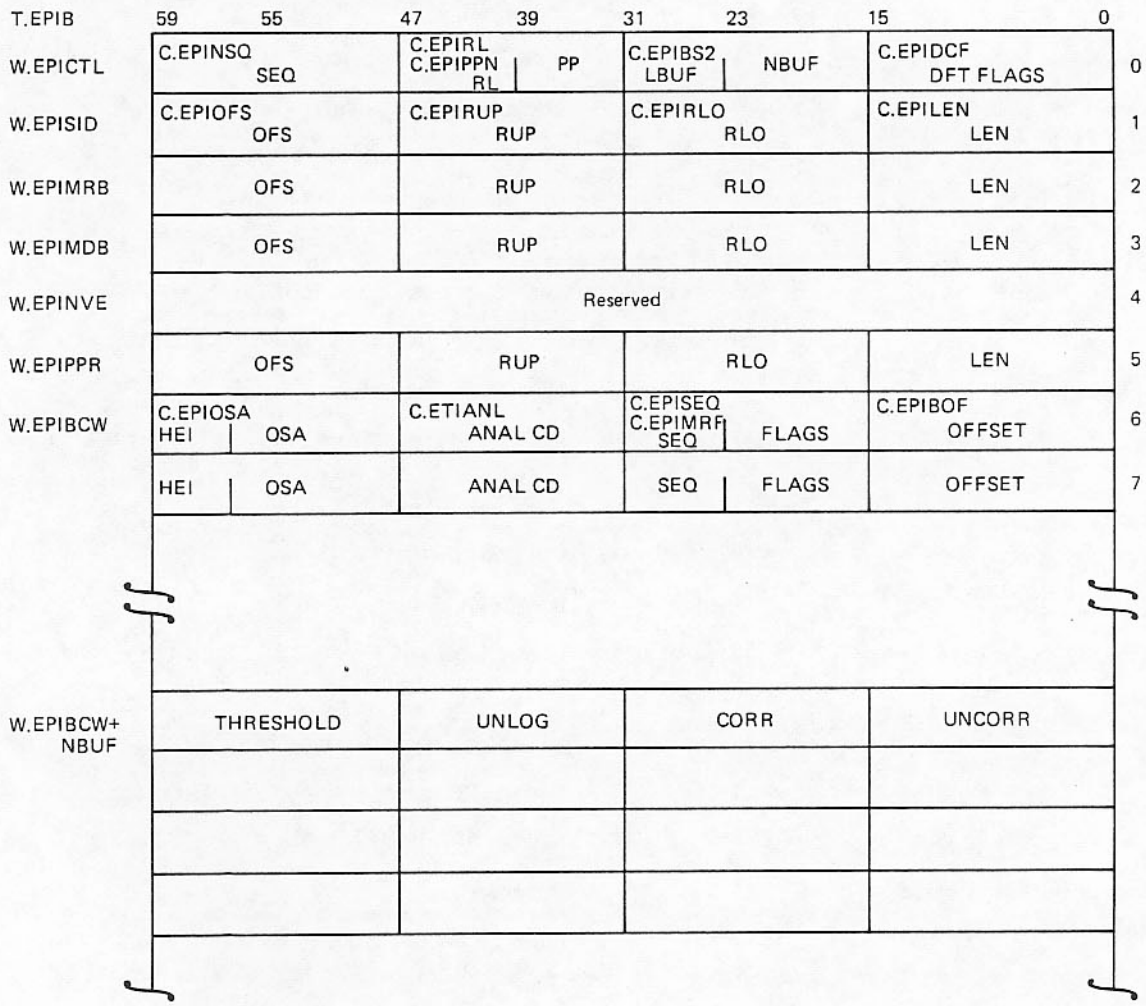
DSCM+1		59-0	Contains a zero.
W.EICTI		59-0	Pointer to CTI CM directory (R-register format).
W.EIEPI		59-0	Pointer to Error Processing Interface Block (R-register format).
DSCM+4		59-0	Reserved for CDC.
DFCM	SIZE	47-40	Number of 8-bit characters in message.
DFCM	AMF	31-0	A count that is incremented when a new message is placed in DFCM+1 to DFCM+10. Used by the display routines to decide if the message area should be sent to the console.

R-register format is as follows:



ERROR PROCESSING INTERFACE BLOCK

The pointer to T.EPIB is contained in W.EIEPI of T.EICB.



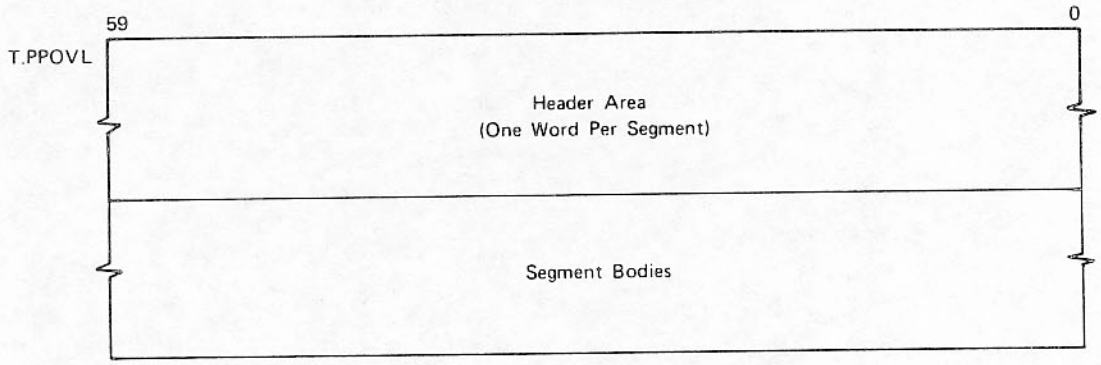
Word	Field	Bits	Description
W.EPICTL	SEQ	55-48	Next sequence number to be assigned.
	RL	47-40	Revision level of table.
	PP	39-32	Number of PP where DFT is running.
	LBUF	31-24	Length of a data buffer.
	NBUF	23-16	Number of data buffers.

Word	Field	Bits	Description
	DFT FLAGS		DFT control flags.
		15-11	Reserved.
		10	Stop DFT MR access.
		9	Freeze system on corrected error.
		8	Freeze system on uncorrected error.
		7	DFT validated revision level.
		6	DFT rejected revision level.
		5	Zero counters end SECDED table.
		4	1=DFT non-dedicated in non-dual state.
W.EPICTL	DFT FLAGS	3	1=170 OS logs data.
		2	0=DFT in dedicated mode. Always cleared when running NOS/VE.
		1	Data valid for NOS/VE.
		0	Data valid for 170 OS.
W.EPISID	OFS	59-54	Reserved.
		53-48	Lower 6 bits of FWA of SECDED table.
		47-42	Reserved.
	RUP	41-32	Upper 10 bits of FWA of SECDED table.
	RLO	27-16	Middle 12 bits of FWA of SECDED table.
	LEN	15-0	Length of SECDED table.
W.EPIMRB	OFS	59-54	Reserved.
		53-48	Lower 6 bits of FWA of data buffers.
		47-42	Reserved.
	RUP	41-32	Upper 10 bits of FWA of data buffers.
	RLO	27-16	Middle 12 bits of FWA of data buffers.
	LEN	15-0	Total length of data buffers.
W.EPIMDB	OFS	59-54	Reserved.
		53-48	Lower 6 bits of FWA of 990 data buffer.
		47-42	Reserved.
	RUP	41-32	Upper 10 bits of FWA of 990 data buffer.
	RLO	27-16	Middle 12 bits of FWA of 990 data buffer.
	LEN	15-0	Length of 990 data buffer.

Word	Field	Bits	Description
W.EPINVE		59-0	Reserved.
W.EPIPPR	OFS	59-54	Reserved.
		53-48	Lower 6 bits of FWA of PPRES save buffer.
		47-42	Reserved.
	RUP	41-32	Upper 10 bits of FWA of PPRES save buffer.
	RLO	27-16	Middle 12 bits of FWA of PPRES save buffer.
	LEN	15-0	Length of PPRES save buffer.
W.EPIBCW	HEI	59-56	ID of element that reported error.
	OSA	55-48	OC action code. EWAC - Environment warning. LPAC - Long power warning. SPAC - Short power warning. WCAC - Warning clear. FIAC - Fatal IOU error. NVAC - NOS/VE IOU error. UMAC - Uncorrected CM error. MBAC - Multiple add bit CM error. UPAC - Uncorrected CPU error.
	ANAL CD	47-32	Code describing type of error.
	SEQ	31-24	Sequence number assigned to data. Used to log error information in the correct order.
	FLAGS	23-16	Data buffer control flags.
		20	1=Error caused count to exceed threshold.
		19	1=Error data must be logged.
		18	Buffer interlock flag.
		17	Valid data in buffer for NOS/VE.
		16	Valid data in buffer for 170 OS.
	OFFSET	15-0	Number of words from location in W.EPIMRB to FWA of this buffer.
W.EPIBCW +NBUF	THRESHOLD	59-48	Trigger value to cause action when the counts exceed it. Corrected errors are not logged and a message is displayed for uncorrected errors. If field is zero, default of 20 is used.
	UNLOG	47-32	Count of errors not logged during interval due to lack of data buffer space.
	CORR	31-16	Count of corrected errors during interval.
	UNCORR	15-0	Count of uncorrected errors during interval.

PP RESIDENT OVERLAY SAVE BUFFER

Byte 3 of word 77 in the CMR pointer area contains the FWA/10B of this table.

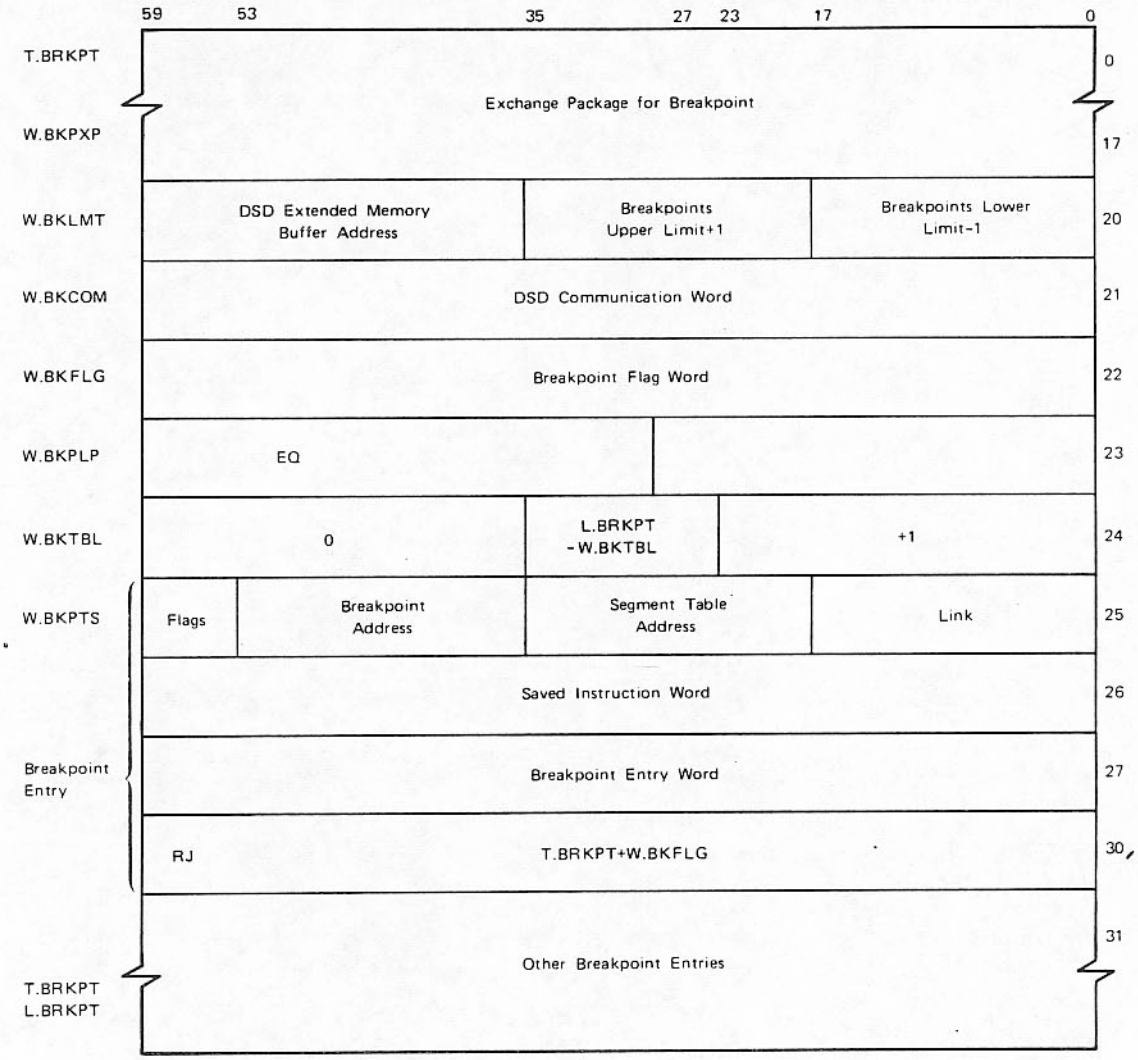


Header entry:

Bit	Description
59-48	Segment header ordinal + 5.
41-24	Absolute CM address of segment.
23-12	Nonzero flag for PP resident to differentiate between segment and overlay.
11-0	Segment length in CM words.

BREAKPOINT TABLE

Bits 59 through 36 of word 67 in the CMR pointer area contain the first word address of T.BRKPT.



W.BKLMNT (20)

Bit	Description
59-36	DSD extended memory display buffer.
35-18	Last absolute address that may be breakpointed +1.
17-0	First absolute address that may be breakpointed -1.

W.BKCOM (21) (Set by DSD)

Bit	Description
59-24	Nonzero if bits 23 through 0 are zero.
23-12	Breakpoint entry relative address +4 (to be processed).
11-0	Mode flag. 1 Monitor. 0 User.

W.BKFLG (22)

Bit	Description
59-48	Processing flag (in octal). 400 Breakpoint bit. 200 Breakpoint processed. 100 Restart CPU. 1000 Release breakpoint.
47-30	Breakpoint entry table address +3 (if flag = 400_8).
29-0	Reserved.

W.BKPLP (23)

Breakpoint wait loop.

W.BKTBL (24)

Bit	Description
59-36	0.
35-24	Number of breakpoint entries *4.
23-0	Start of breakpoint entries.

Breakpoint entry:

Word	Bit	Description
0	59-54	Processing flag.
	53-36	Breakpoint address.
	35-18	Address of segment table entry for segment or 0.
	17-0	Link to next breakpoint entry for the segment (end of chain = 0).
1		Saved instruction word (from breakpoint address).
2		Entry word; breakpoint word is replaced with a return jump to this word.
3		Return jump to breakpoint wait loop.

AREA TABLE

Bits 17 through 0 of word 67 in the CMR pointer area contain the address of T.AREA.

	59	35	17	0	
T.AREA W.CURSYS	Current System Extended Memory Address				0
W.ALTSYS	Alternate System Address (or Terminator)				1
W.CMRES	Extended Memory Address	Length	CM Address		2
W.MTRA	0	Length	CM Address		3
W.USERA	0	Length	CM Address		4
W.SEGT	Extended Memory Address	Length	CM Address		5
W.INIT	Extended Memory Address	Length	CM Address		6
W.EDTIM	Date-Time Stamp (from Extended Memory System)				7

W.CMRES(2)

CM resident descriptor word.

W.MTRA(3)

Monitor mode overlay area descriptor word.

W.USERA(4)

User mode overlay area descriptor word.

W.SEGT(5)

Segment table descriptor word.

W.INIT(6)

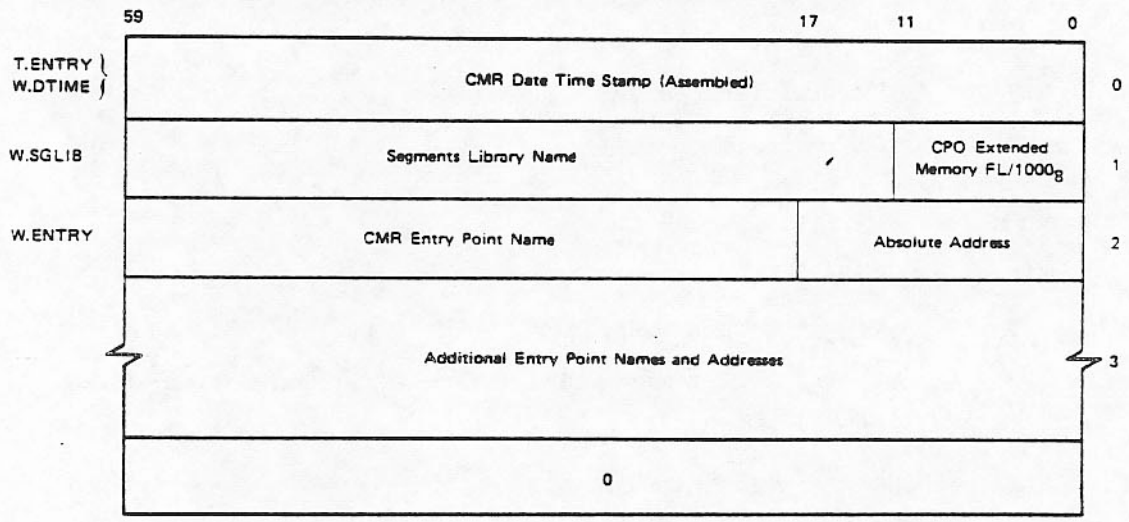
Initialization segment descriptor word.

W.EDTIM(7)

Date-time stamp of CMR for which this extended memory system was loaded. Last digit of year, ordinal date (three digits), two-digit hour, two-digit minutes, and two-digit seconds, all in display code.

ENTRY TABLE

Bits 35 through 18 of word 67 in the CMR pointer area contain the address of T.ENTRY.



W.SGLIB(1)

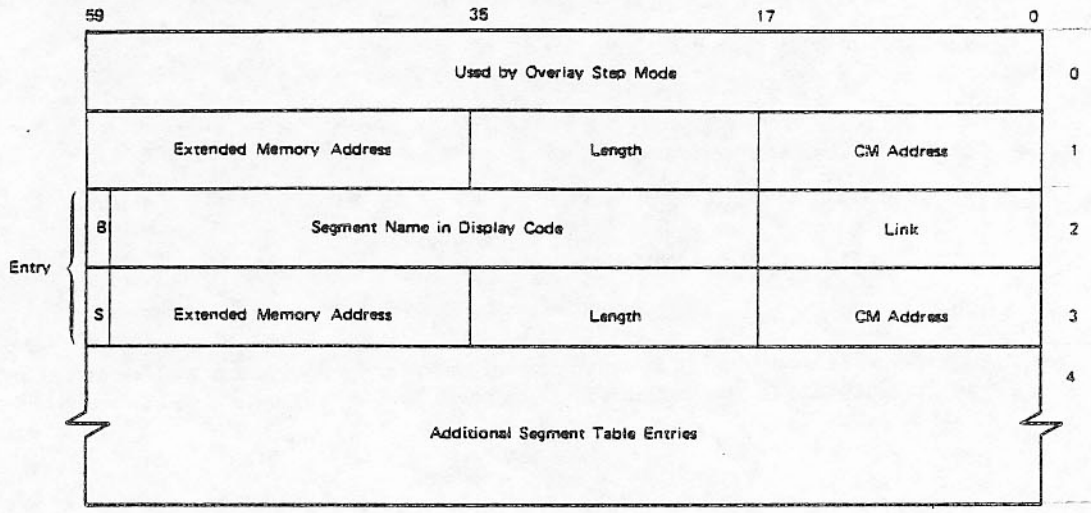
Library containing segments to be used with this CMR. Control point zero FL/1000$_8$ is used for extended memory system code.

W.ENTRY (2)

List of entry points defined in CMR.

SEGMENT TABLE

Word 5 in the area table contains the address of the segment table.



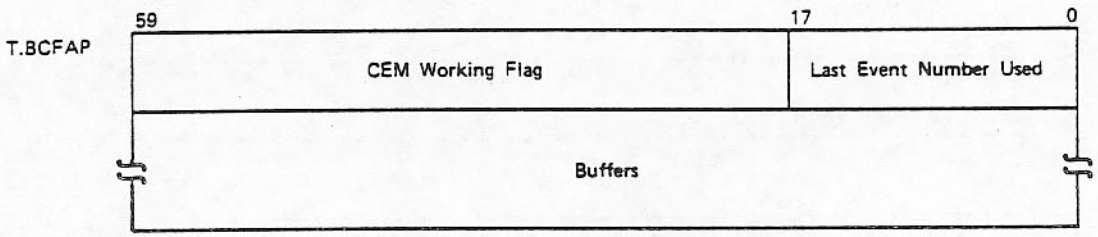
Word	Description
0	Step mode communication word.
1	Extended memory system resident descriptor word.
2 and 3	Segment table entries.

Segment table entry:

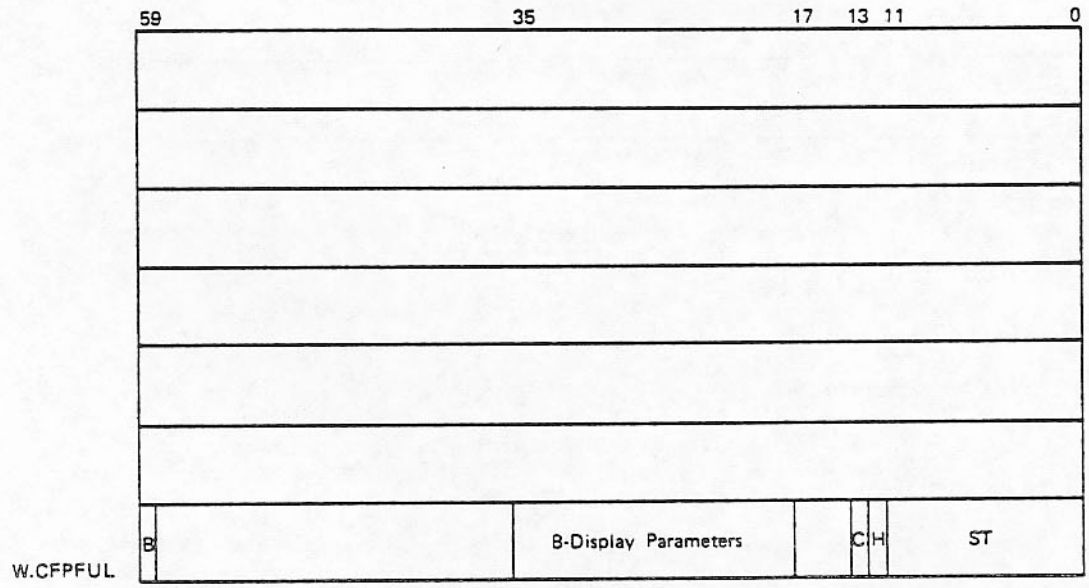
Word	Bit	Description
0	59	Breakpoint flag.
	58-18	Segment name in display code, left-justified, zero-filled.
	17-0	Link to error directory entries or breakpoint entries.
1	59	Step mode flag.
	58-36	Extended memory address of segment.
	35-18	Segment length (exclusive of extended memory error recovery information).
	17-0	CM address where segment should be loaded.

CEFAP BUFFER AREA

T.BCFAP is an entry in the T.ENTRY table.



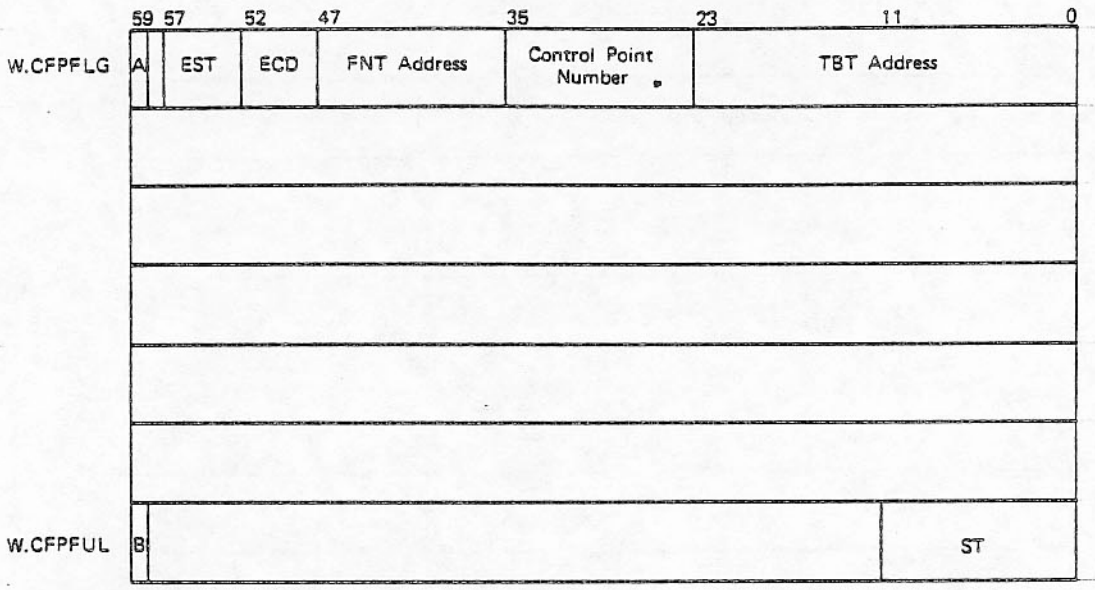
Buffer for 819 Disk Error



Field	Description
B	Busy bit.
C	Set if buffer contains CERFILE message to be recorded.
H	Set if CEM is to call segment HLCN.
ST	Subtype code = 1.

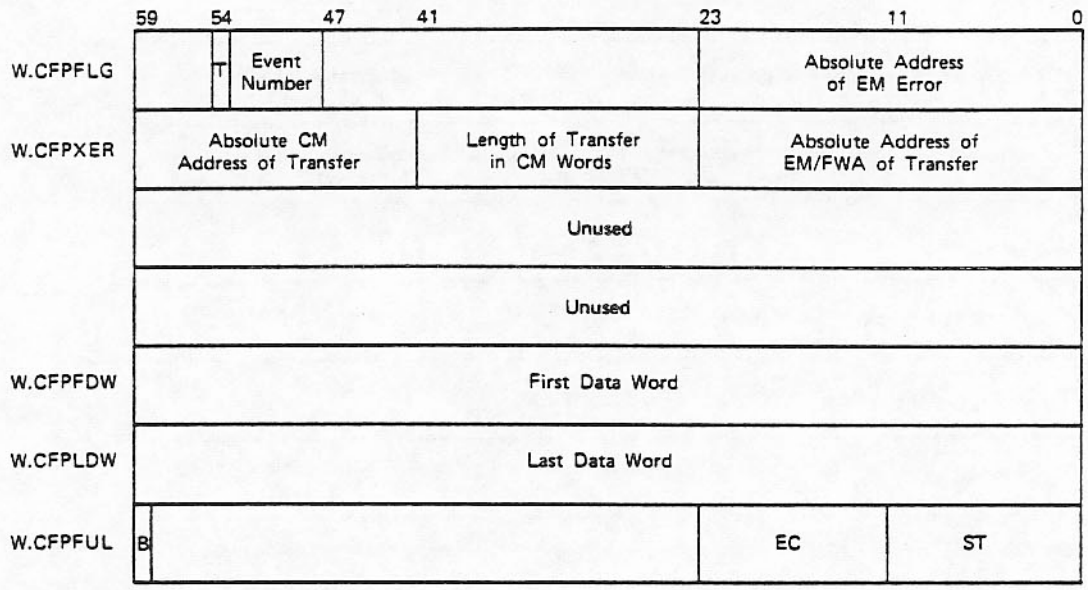
Bits 35 through 18 are parameters for ERRcc, ESTxx, and CHcc messages displayed on the B-display.

Buffer for Dayfile Messages



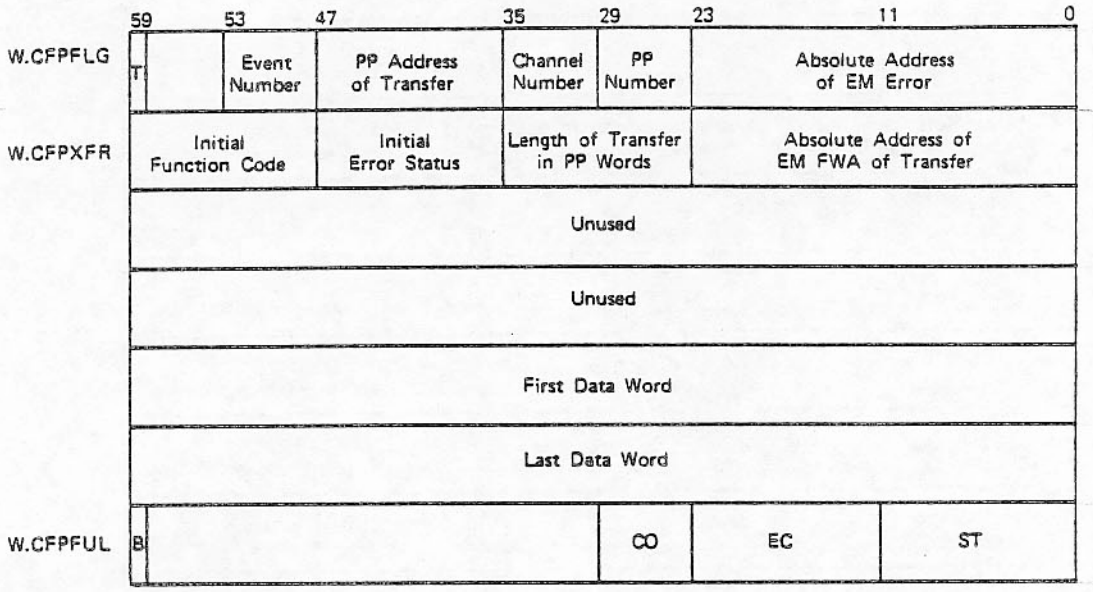
Field	Description
A	Abort flag.
EST	EST ordinal.
ECD	Error codes.
	0 System communication error.
	1 Uncorrectable RMS error.
B	Busy bit.
ST	Subtype code = 2.

CP Read/Write of Extended Memory



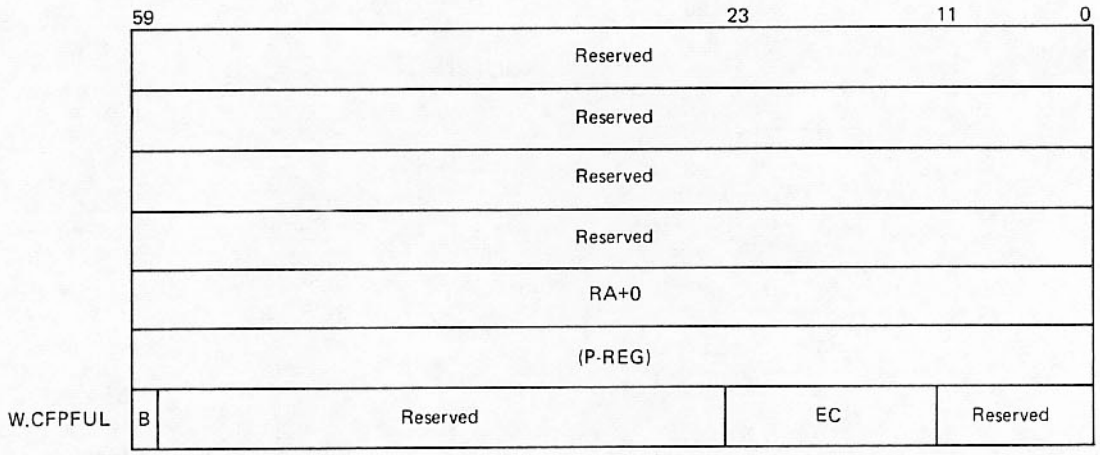
Field	Description
T	Type of access.
	0 System.
	1 Subsystem.
B	Busy bit.
EC	Error code.
	0 Extended memory write abort.
	1 Extended memory write recovered.
	2 Extended memory read parity error.
	3 Recovered extended memory read parity errror.
ST	Subtype code = 0.

DDP Read of Extended Memory



Field	Description
T	Type of access.
	0 System.
	1 Subsystem.
B	Busy bit.
CO	Calling PP overlay. For error codes (EC) 6, 7, 10, and 11, this field contains the display code of the characters P or Q.
	P 1SP
	Q 1SQ
EC	Error code.
	4 DDP read parity error.
	5 Recovered DDP read parity error.
	6 1SP/1SQ DDP read parity error.
	7 1SP/1SQ recovered DDP read parity error.
	10 1SP/1SQ extended memory write abort.
	11 1SP/1SQ extended memory write recovered.
	12 STL DDP read channel parity error.
	13 1SP/1SQ DDP channel error.

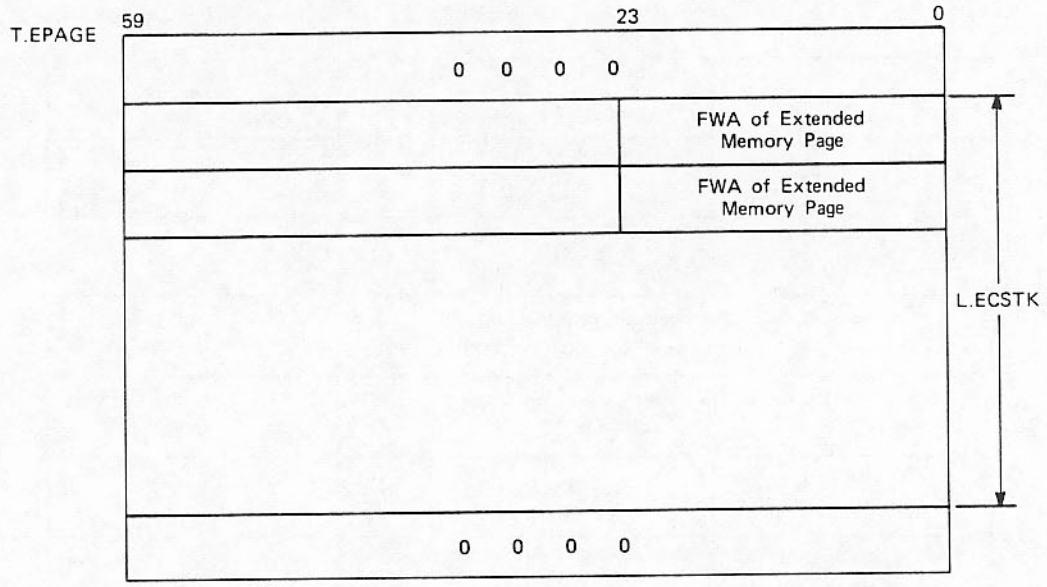
Mode 20 or 67 Error



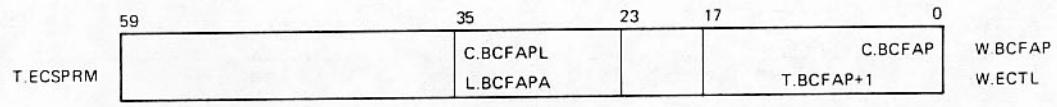
Field	Bits	Description
RA+0	59-0	Contents of RA+0 after error occurred.
(P-REG)	59-0	Contents of location in P-register.
B	59	Buffer busy.
EC	23-11	Error code for CEM (14_8).

EM EMPTY PAGE STACK

Bytes 0 and 1 of word 57 in the CMR pointer area contain the address of T.EPAGE.



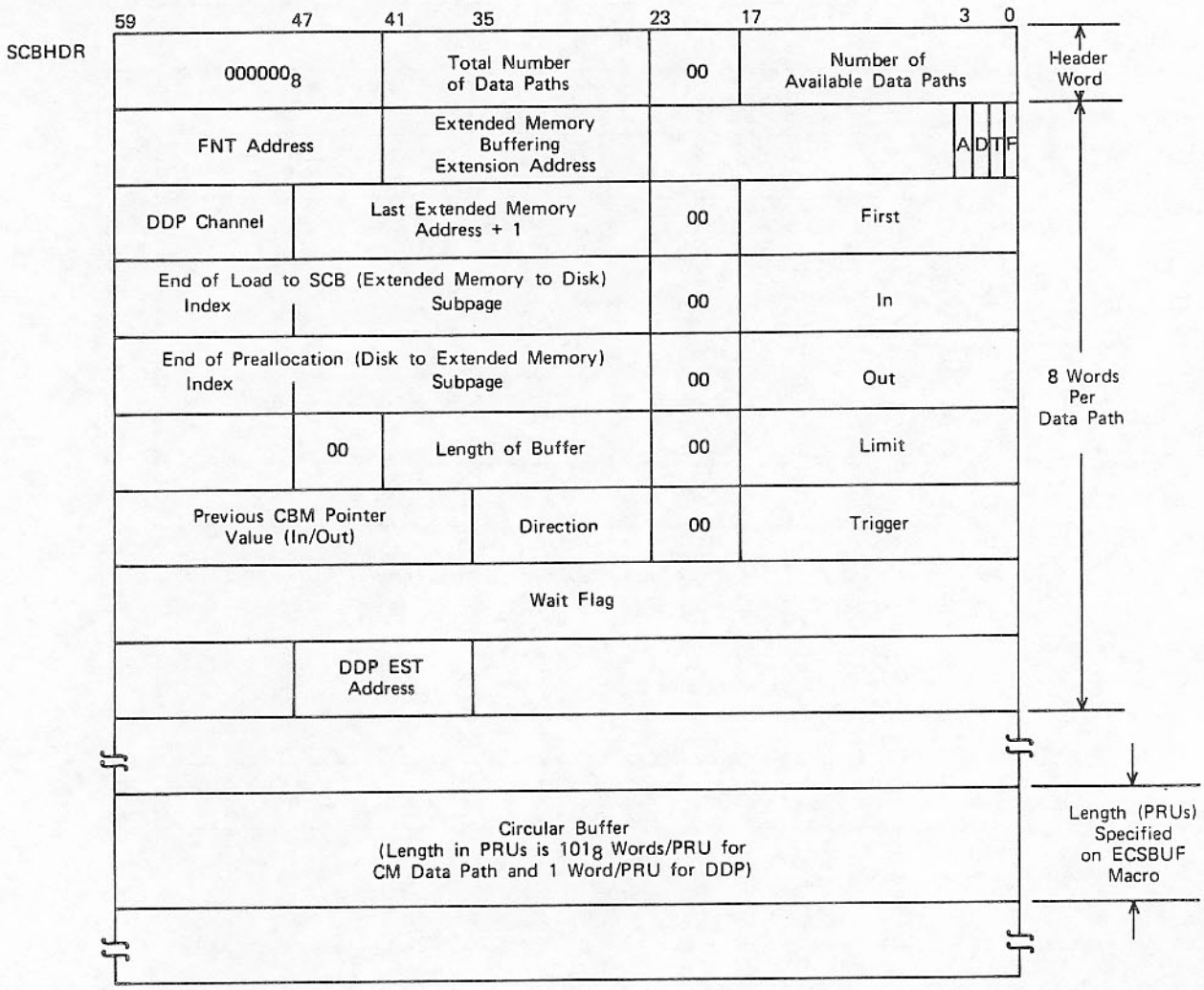
T.EPAGE + (W.B5) Points to Next Entry



T.ECSPRM contains the address of T.BCFAP.

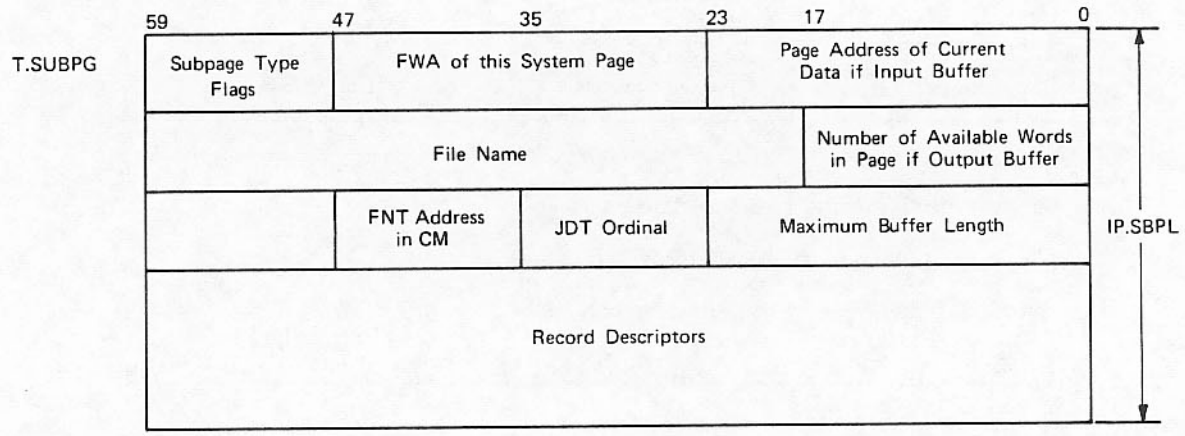
SYSTEM CIRCULAR BUFFER (SCB)

SCBHDR is an entry of table T.ENTRY.



Field Name	Description
A	Direct access extended memory I/O.
D	Direction. 0 Disk to extended memory. 1 Extended memory to disk.
T	Type. 0 CM data path 1 DDP.
F	Free/busy. 0 Busy. 1 Free.

SUBPAGE BUFFER



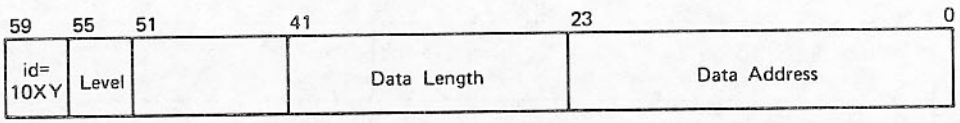
Word	Bit	Description
T.SUBPG	59-50	Subpage data type.

Bit	Description
59	Reserved.
58	Reserved.
57	Index for random extended memory file.
56	Auxiliary file for extended memory resident random file.
55	Swap file.
54	Extended memory resident file.
53	Library file (ZZZZZ06).
52	I/O buffer (with bit 50).
51	Reserved.
50	Release data as read.

49-48 Subpage position

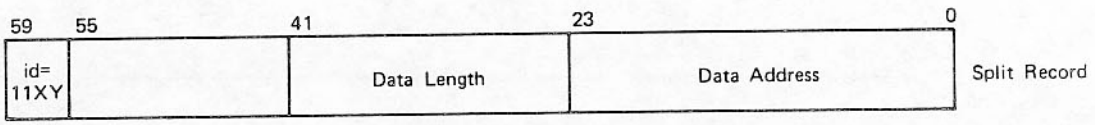
00	Continuation subpage.
01	First subpage in a file.
10	Last subpage.

RECORD DESCRIPTORS



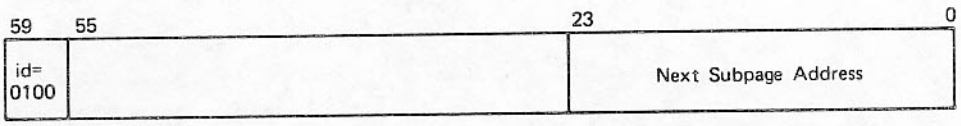
X=1 Beginning of a new data page.

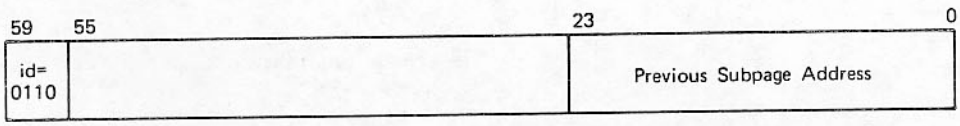
Y=1 Transmission RMS parity error flag.

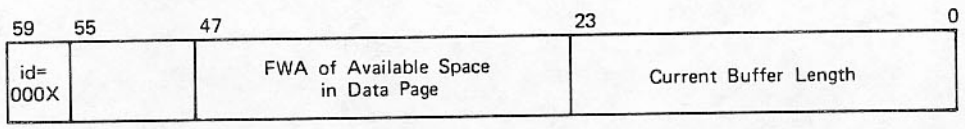


X=1 Beginning of a new data page.

Y=1 Transmission RMS parity error flag.

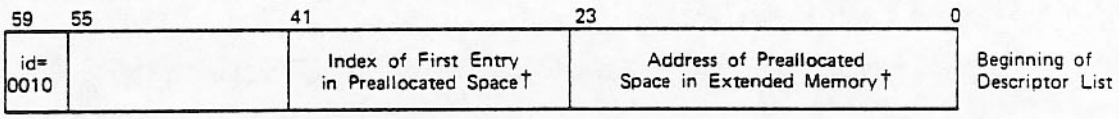






X=0 End of extended memory buffer.

X=1 End of information on disk.



id (Bits 59-56)

0xxx System descriptor.

- 0000 End of list; continued on disk.
- 0001 End of list; EOI on file.
- 0010 Beginning of list.
- 0100 Forward link pointer.
- 0110 Backward link pointer.

1xxx Data descriptor.

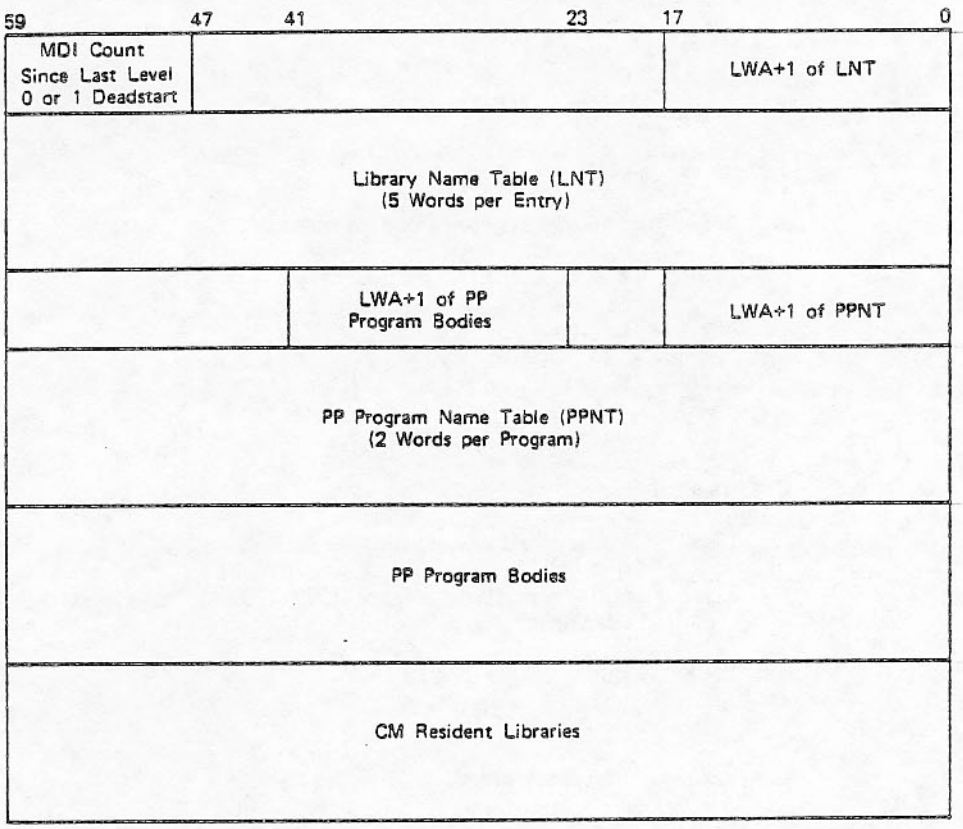
- 10xx Full record descriptor.
- 11xx Split record descriptor (full record described by this and next descriptor).
- 1x0x Current data page.
- 1x1x New data page.
- 1xx0 No parity error.
- 1xx1 Parity error in record.

† Used only for the library.

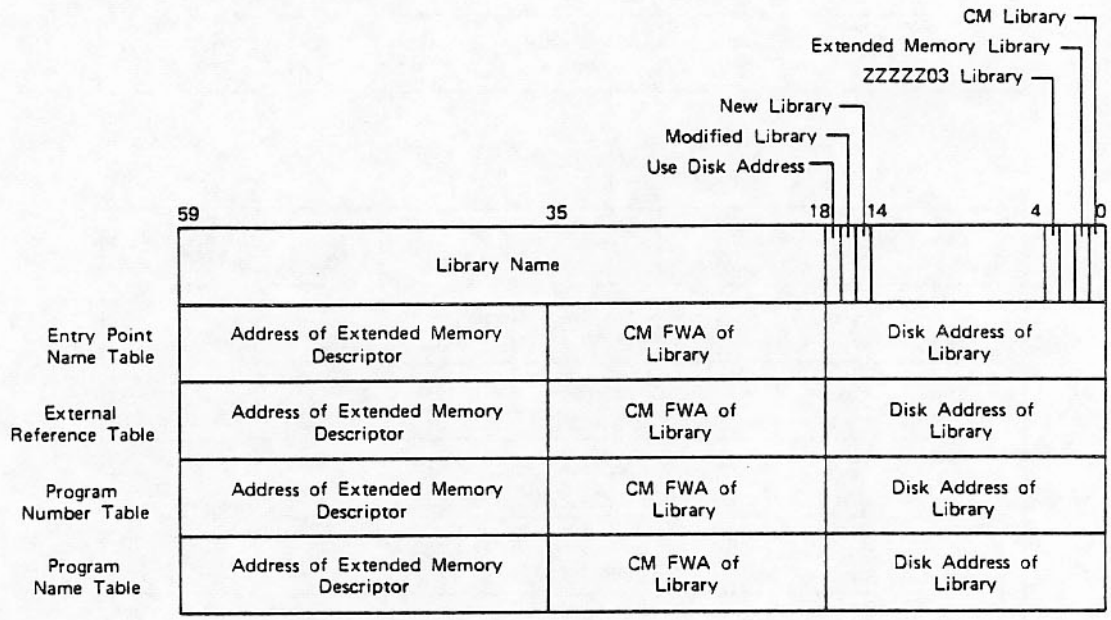
CMR LIBRARY DIRECTORY

Bits 59 through 38 of word 1 in the CMR pointer area contain the address of T.LIB.

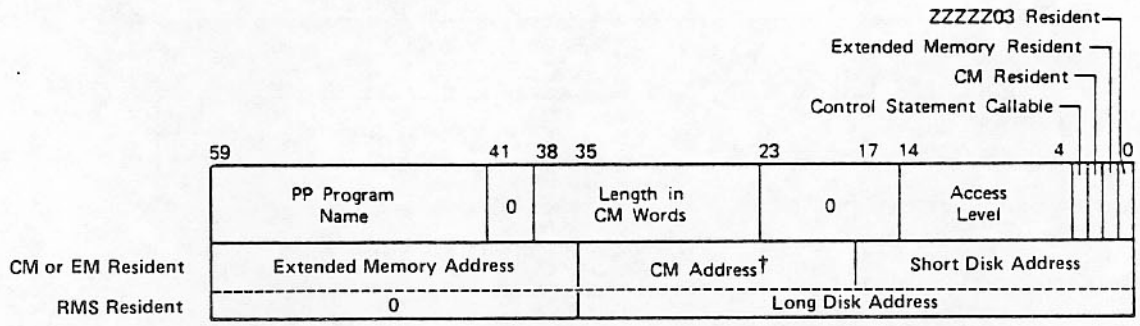
T.LIB



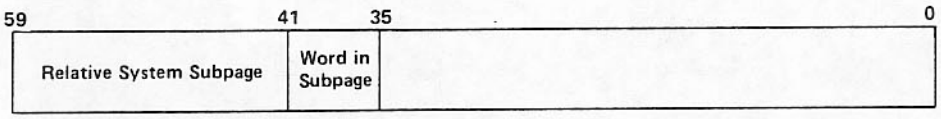
LIBRARY NAME TABLE (LNT) ENTRY



PP PROGRAM NAME TABLE (PPNT) ENTRY

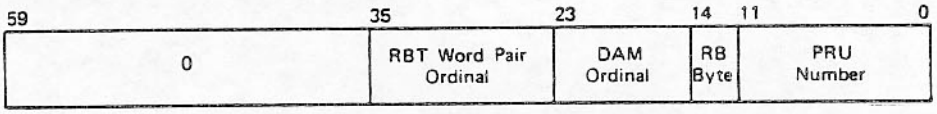


The External Memory Address has the following format.

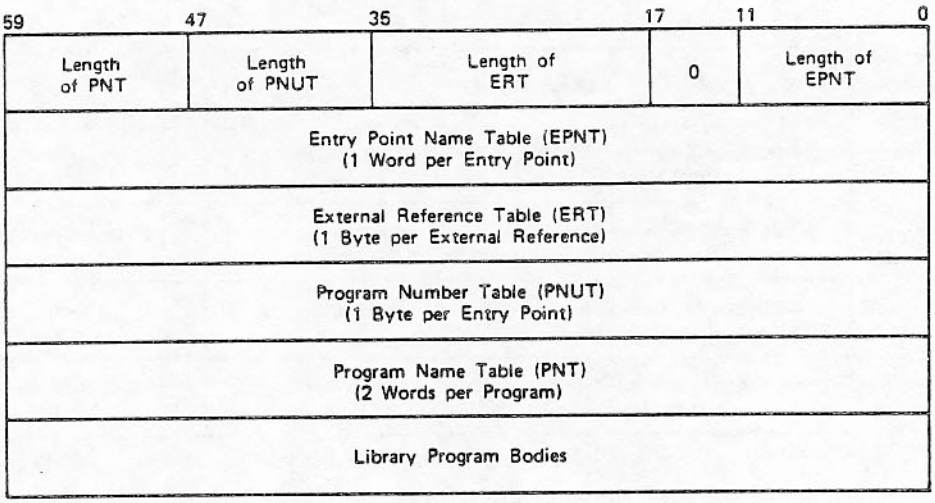


† For extended memory resident overlay, field holds last consecutive access failure count. If failure count overflows a set threshold, residence changes to RMS.

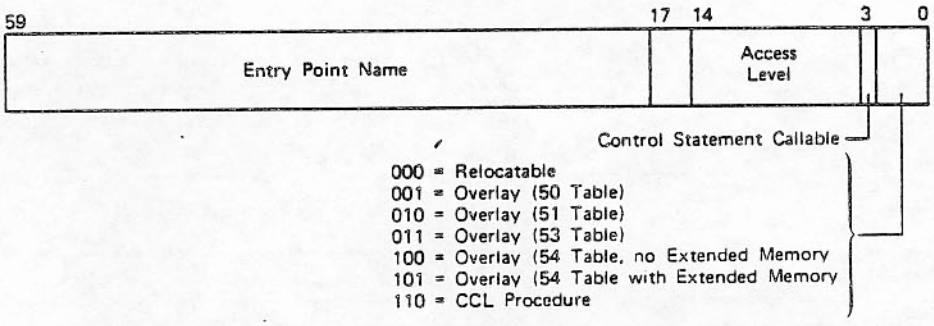
The Long Disk Address has the following format.



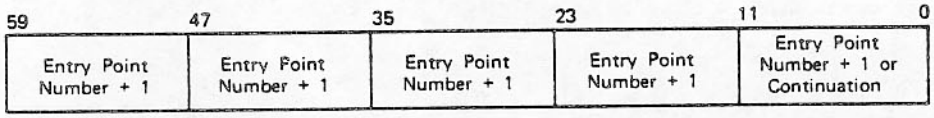
CM RESIDENT LIBRARY FORMAT



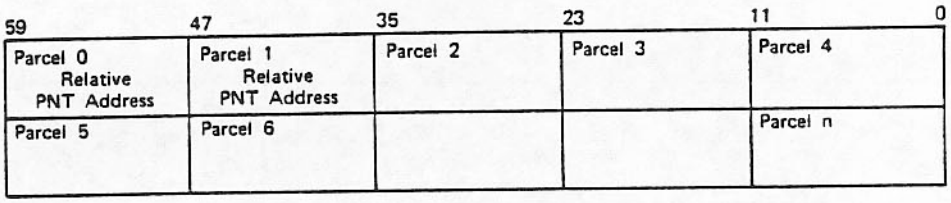
EPNT ENTRY FORMAT



ERT ENTRY FORMAT

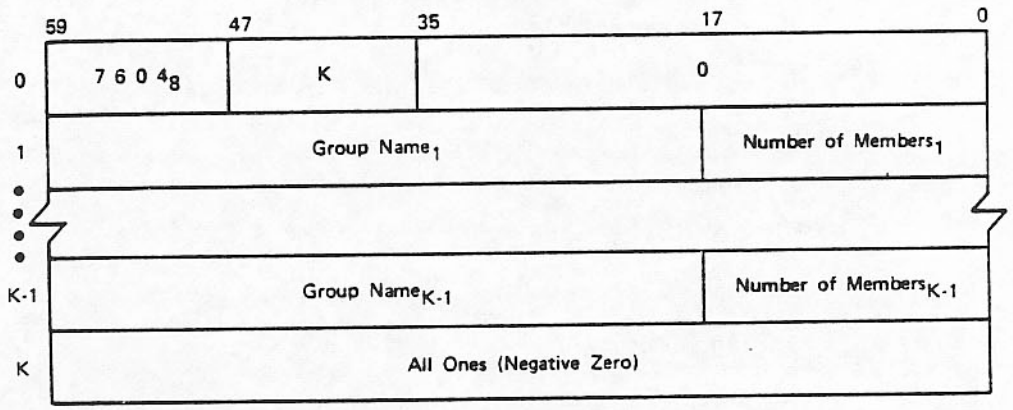


PNUT ENTRY FORMAT



If the library contains any capsules, the program name table begins with the following capsule header.

CAPSULE HEADER FORMAT



Word 0:

Bits 59-48 — 7604_8 is the capsule header code. It and the next K words following it constitute a capsule header.

Bits 47-36 — K contains the number of words (octal) in the capsule header minus one.

Bits 35-0 — Zero.

Words 1 through K-1 or 1 through K:

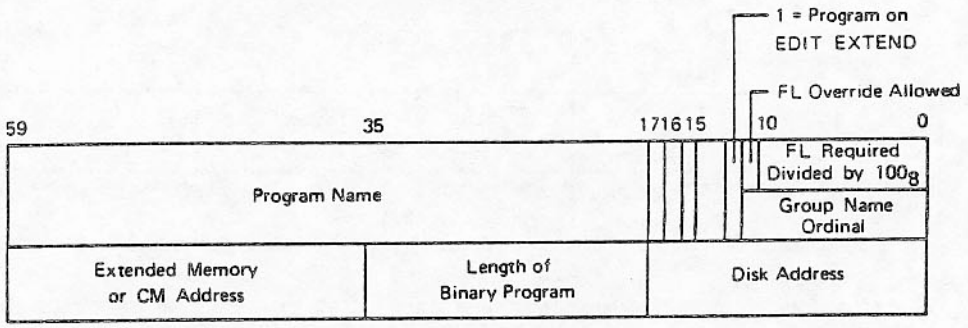
Bits 59-18 — Group name. Name of group of capsules. Display code, left justified, zero fill.

Bits 17-0 — Number of member capsules in the group.

Word K:

The capsule header must be an even number of words in length. If the number of group names in the capsule header is K-1, a word of all ones is added to the end of the capsule header.

PNT ENTRY FORMAT



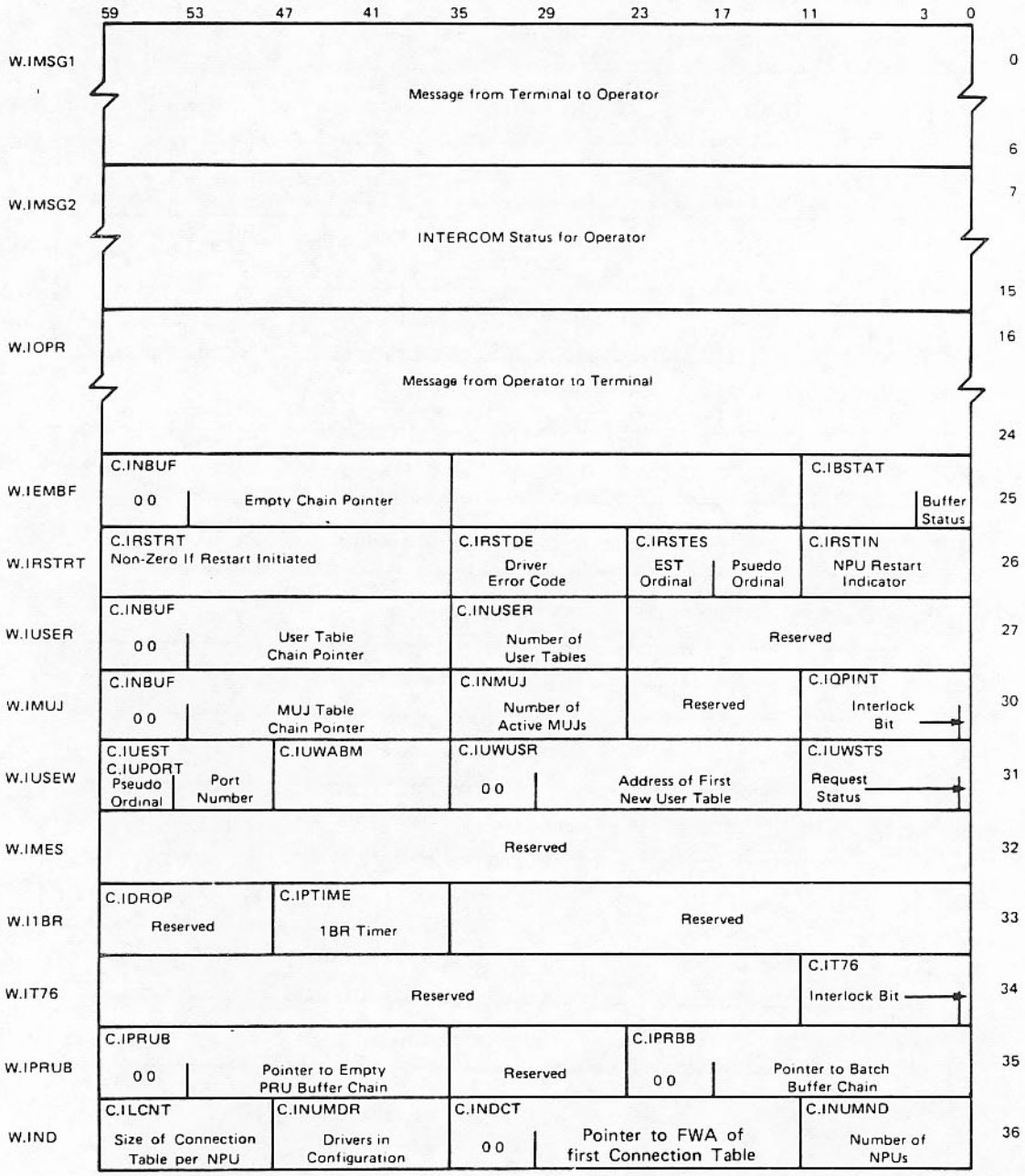
Word 1:

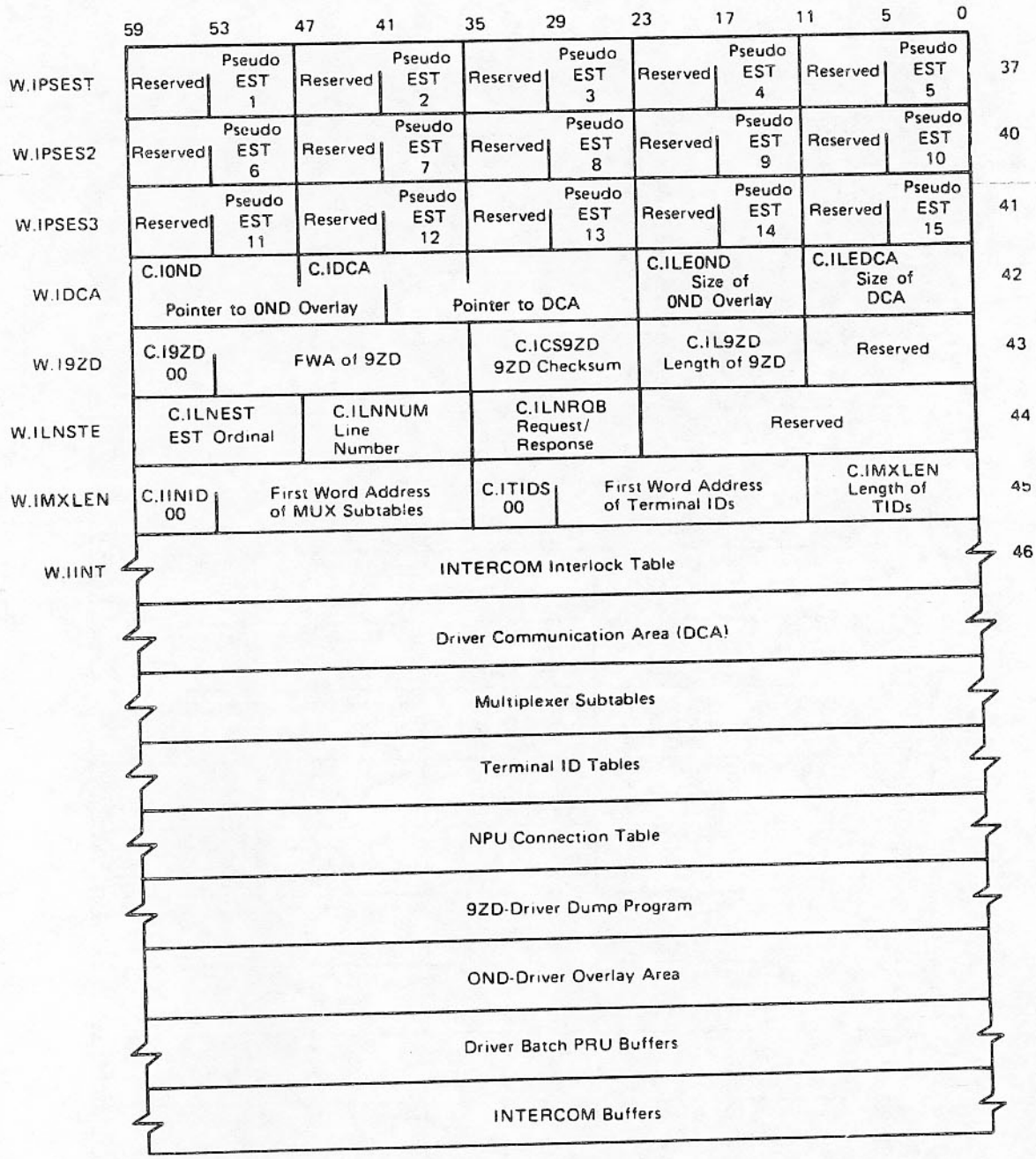
Bits 59-18	Program name in display code.	
Bit 17	0	Normal program.
	1	Capsule.
Bit 16	0	Binary program.
	1	CCL procedure.
Bit 15	Not used.	
Bits 14-13	Program residence.	
	00	Disk address.
	01	CM address.
	10	Extended memory address.
Bit 12	1	Program is on (pfn) ZZZZZ03.
	0	Program is on (pfn) ZZZZZ04.
If bit 17 is 0: Bit 11	INTERCOM field length override bit.	
	0	Do not override.
	1	May be overridden.
If bit 17 is 0: Bits 10-0	Contain the amount of field length divided by 100 (octal) to execute this program. If not specified during an EDITLIB run, it is set to DFAULTFL/100 (octal) where DFAULTFL is a program parameter.	
If bit 17 is 1: Bits 11-0	Group name ordinal. Specifies the ordinal of the group name to which this capsule belongs. The ordinal is derived from the order in which the group names appear in the capsule header.	

The CM address is relative to the LWA+1 of this table. Fields not being used contain zero.

INTERCOM POINTER AND BUFFER AREA

Bits 29-12 of word 16 in the CMR pointer area contain the FWA of this table.

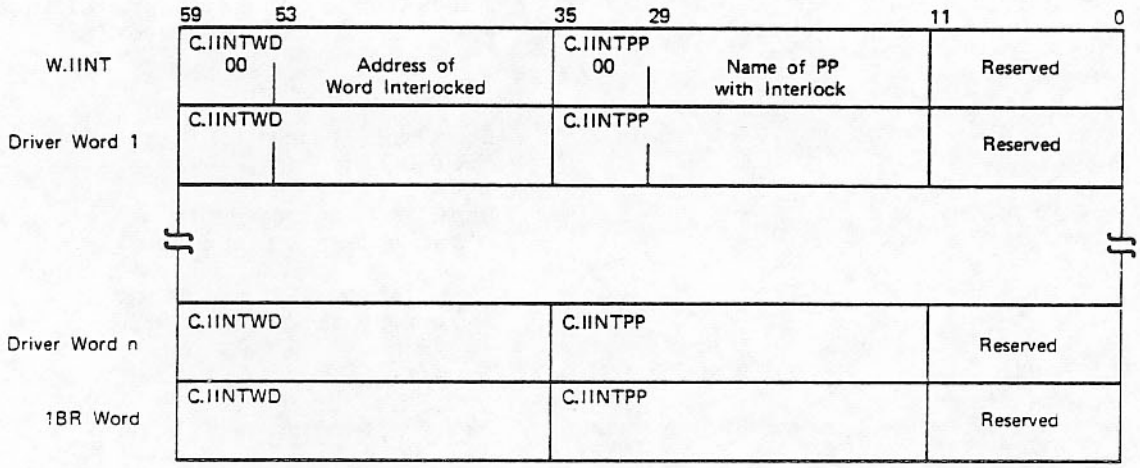



59 53 47 41 35 29 23 17 11 5 0
W.IPSEST
Reserved
Pseudo EST 1
Reserved
Pseudo EST 2
Reserved
Pseudo EST 3
Reserved
Pseudo EST 4
Reserved
Pseudo EST 5
37
W.IPSES2
Reserved
Pseudo EST 6
Reserved
Pseudo EST 7
Reserved
Pseudo EST 8
Reserved
Pseudo EST 9
Reserved
Pseudo EST 10
40
W.IPSES3
Reserved
Pseudo EST 11
Reserved
Pseudo EST 12
Reserved
Pseudo EST 13
Reserved
Pseudo EST 14
Reserved
Pseudo EST 15
41
W.IDCA
C.I0ND
Pointer to 0ND Overlay
C.IDCA
Pointer to DCA
C.ILE0ND
Size of 0ND Overlay
C.ILEDCA
Size of DCA
42
W.I9ZD
C.I9ZD 00
FWA of 9ZD
C.ICS9ZD
9ZD Checksum
C.IL9ZD
Length of 9ZD
Reserved
43
W.ILNSTE
C.ILNEST
EST Ordinal
C.ILNNUM
Line Number
C.ILNRQB
Request/ Response
Reserved
44
W.IMXLEN
C.IINID 00
First Word Address of MUX Subtables
C.ITIDS 00
First Word Address of Terminal IDs
C.IMXLEN
Length of TIDs
45
W.IINT
INTERCOM Interlock Table
46
Driver Communication Area (DCA)
Multiplexer Subtables
Terminal ID Tables
NPU Connection Table
9ZD-Driver Dump Program
0ND-Driver Overlay Area
Driver Batch PRU Buffers
INTERCOM Buffers

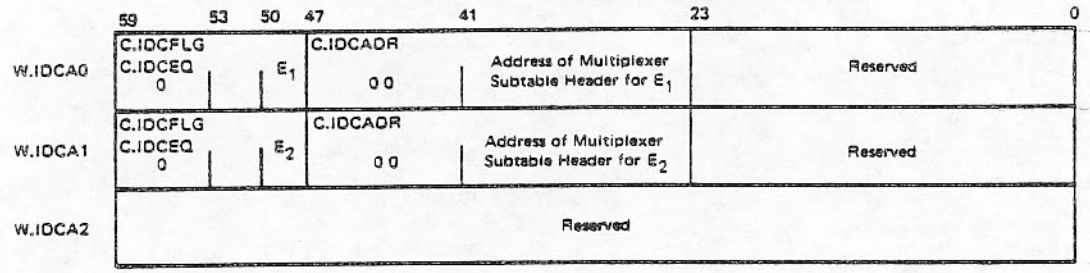
W.ILNSTE(44)

Byte	Bit	Field	Description
C.ILNRQB(2)	11-6	S.ILNRSP	Driver response.
			1 Illegal line number.
			2 Illegal action.
	5-0		Driver request.
			0 Word available (no request pending).
			1 Turn line off.
			2 Turn line on.

INTERLOCK TABLE



DRIVER COMMUNICATIONS AREA ENTRY



W.IDCA0(0)

Byte	Bit	Field	Description
C.IDCFLG(0)=C.IDCEQ(0)	11-6	S.IDCFLG	0 indicates no service is required from standard INTERCOM service routines.
	5-3		Reserved.
	2-0	S.IDCEQ	Equipment number of first NPU on channel (E_1).
C.IDCADR(1)	5-0		Upper 6 bits of multiplexer subtable address of first NPU on channel.
C.IDCADR+1(2)	11-0		Lower 12 bits of multiplexer subtable address of first NPU on channel.

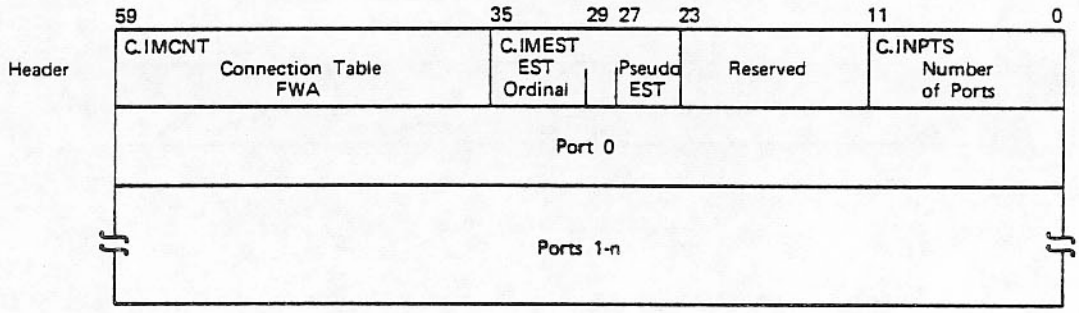
W.IDCA1(1)

Byte	Bit	Field	Description
C.IDCFLG(0)=C.IDCEQ(0)	11-6	S.IDCFLG	0 indicates no service is required from standard INTERCOM service routines.
	5-3		Reserved.
	2-0	S.IDCEQ	Equipment number of second NPU on channel (E_2).
C.IDCADR(1)	5-0		Upper 6 bits of multiplexer subtable address of second NPU on channel.
C.IDCADR+1(2)	11-0		Lower 12 bits of multiplexer subtable address of second NPU on channel.

W.IDCA2(2)

Reserved.

MULTIPLEXER SUBTABLE



C.IMCNT

Bit	Description
5-0	Upper 6 bits of connection table FWA.

C.IMCNT+1

Bit	Description
11-0	Lower 12 bits of connection table FWA.

C.IMEST

Bit	Description
11-6	EST ordinal.
5	Set if 2550 is already loaded (off-line).
4	Reserved.
3-0	Pseudo EST ordinal.

C.INPTS

Bit	Description
8-0	Highest port number + 1. For a 2550 NPU the line entry for port 0 must be empty. A communication line must not be connected to port 0, except for port 0 of a two-port multiplexer.
10-9	Reserved.
11	S.IBDMP; 255x binary dump bit.

SYNCHRONOUS TERMINAL PORT ENTRY

C.ILNST(0)
C.INBUF(0)

Bit	Field	Description
11-7	S.ILNST	Driver line state.
6	S.IMSUTR	User table requested flag.
5-0		Upper 6 bits of address of first user table on port or configuration buffers.

C.INBUF+1(1)

Bit	Description
11-0	Lower 12 bits of first user table on port or configuration buffers.

C.ISITE(2) Site Address for This Port

C.ISTATN(3) Station Address for This Port

C.ITTYPE(4)

Bit	Field	Description
11	S.ILNOFF	Line status. 0 On. 1 Off.
10	S.ILT	Line type. 0 Dial-up terminal. 1 Hardwired terminal.

Bit	Field	Description
9	S.IKCAR	Carrier control. 0 Carrier-controlled terminal. 1 Carrier-constant terminal.
8	S.ILNACO	If set, terminal is off externally.
7	S.ILNACI	If set, terminal is off internally.
6-5	S.ICHCV	Character code conversion. 0 ASCII. 1 External BCD. 2 Display code. 3 EBCDIC.
4-0	S.ITTYPE	Terminal type. 00 Empty. 01-07 Asynchronous. 01 Mode 3. 02-07 Reserved. 10-17 CDC synchronous. 10 Mode 4A. 11 Mode 4C. 12-16 Reserved. 17 Mode 4A/4C autorecognition. 20-27 Non-CDC synchronous. 20 IBM 2780. 21 IBM 3780. 22 HASP. 23-26 Reserved. 27 IBM 2780/IBM 3780/HASP autorecognition. 30-37 Reserved for installation.

ASYNCHRONOUS TERMINAL PORT ENTRY

C.ILNST(0) Identical to Synchronous Terminal Port Entry

C.INBUF(0,1) Identical to Synchronous Terminal Port Entry

C.IASTIM(2)

Bit	Field	Description
11-7		Previous line state (1RM only).
0	S.IASTIM	ASTIM terminal; for use by terminal stimulator.

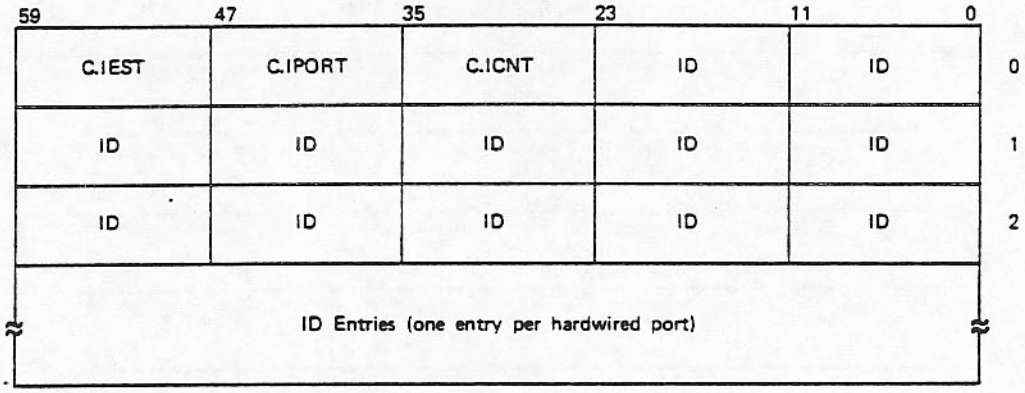
C.ITSPD(3)

Bit	Field	Description
11		Reserved.
10	S.INIC	No initial carrier flag.
9-5		Line or terminal speed if automatic speed detection.
4-0		Line speed.

00	110 baud.
01	134 baud.
02	150 baud.
03	300 baud.
04	600 baud.
05	1200 baud.
06	2400 baud.
07	4800 baud.
10	9600 baud.
11	19200 baud.
12	38400 baud.
13-17	Reserved.
20-36	Reserved for installation.
37	Automatic speed detection.

C.ITTYPE(4) Identical to Synchronous Terminal Port Entry

TERMINAL ID TABLE



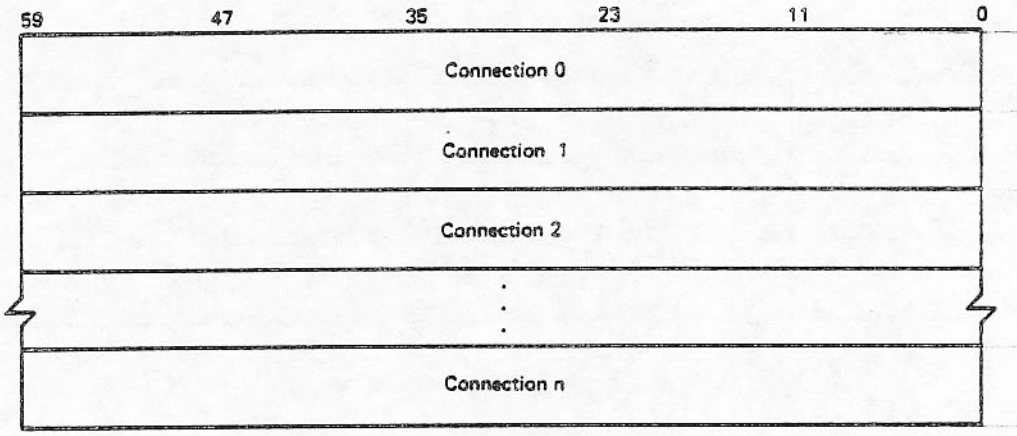
C.IEST(0) EST ordinal for this port.

C.IPORT(1) Port number.

C.ICNT(2) Length of ID entries for this configuration (one to three words).

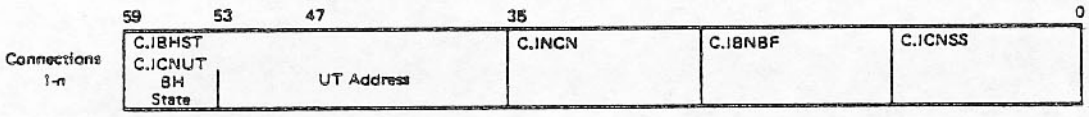
ID Preassigned terminal ID for hardwired primary station of each site (maximum of 12). IDs replaced in this table in the order they are defined, not by site address.

INTERCOM CONNECTION TABLE



CONNECTION TABLE ENTRY FORMATS

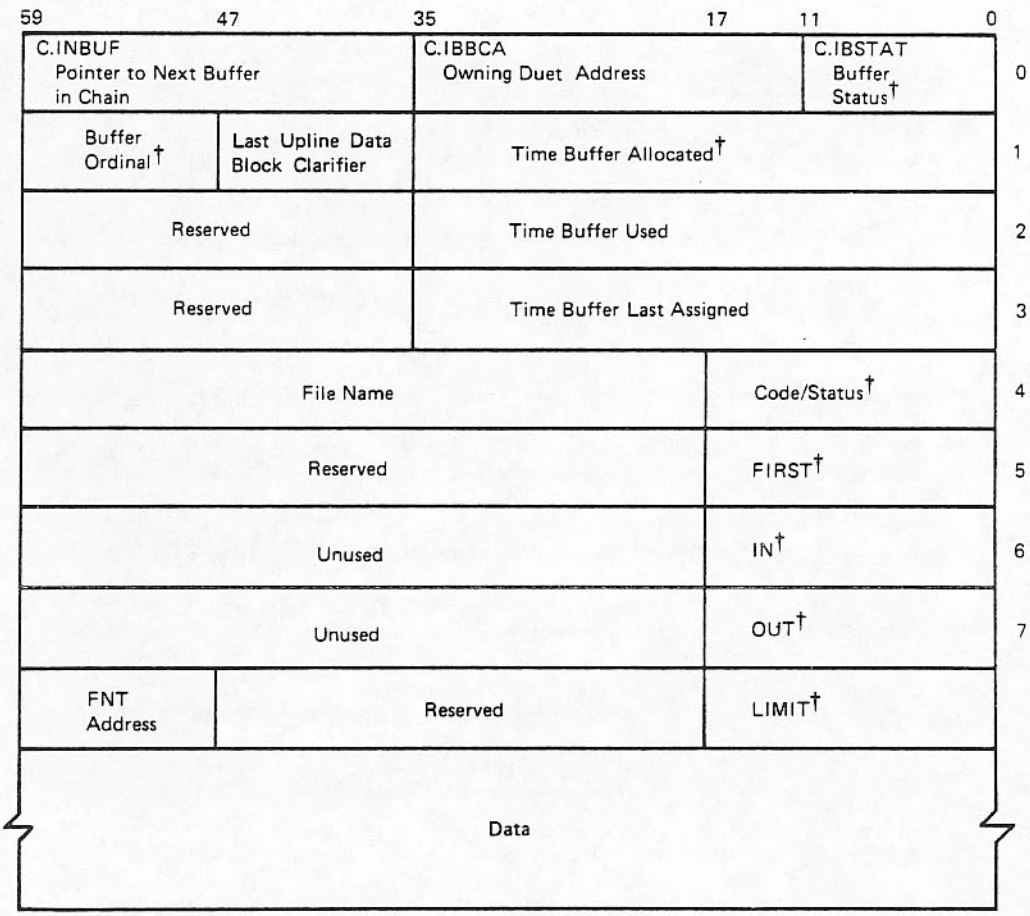
Byte	Bit	Field	Description
C.IBHST(0)	11-6	S.IBHST	Block handler state.
C.IBNBF(3)	11-9		Next upline BSN.
	8-6		Unused.
	5-3		Next downline BSN.
	2-0		Unused.



Byte	Bit	Field	Description
C.IBHST(0)	11-6	S.IBHST	Block handler state position.
C.ICNUT(0)	5-0		Upper 6 bits of user table (UT) address.
C.ICNUT+1(1)	11-0		Lower 12 bits of UT address.

Byte	Bit	Field	Description
C.INCN(2)	11-0	S.INCN	Ordinal of next linked connection table entry.
C.IBNBF(3)	11-9		Next upline BSN.
	8-6		Upline back count.
	5-3		Next downline BSN.
	2-0		Downline back count.
C.ICNSS(4)	11-6		Previous stream state.
	5-0		Current stream state.

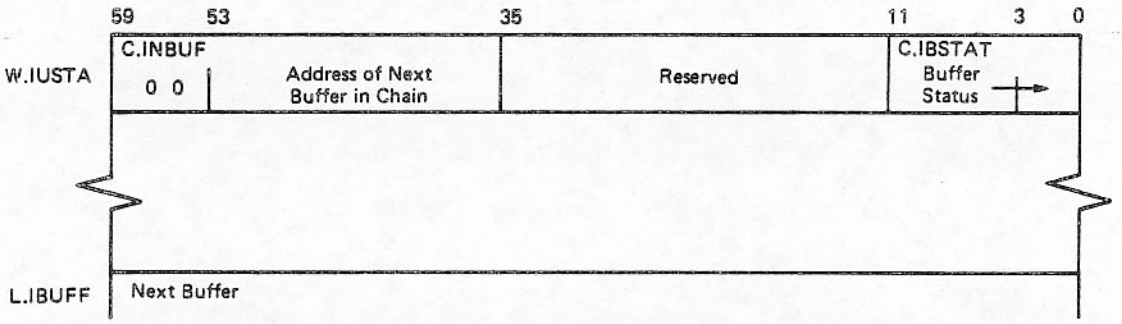
PRU BUFFER



†Initialized by 1I1.

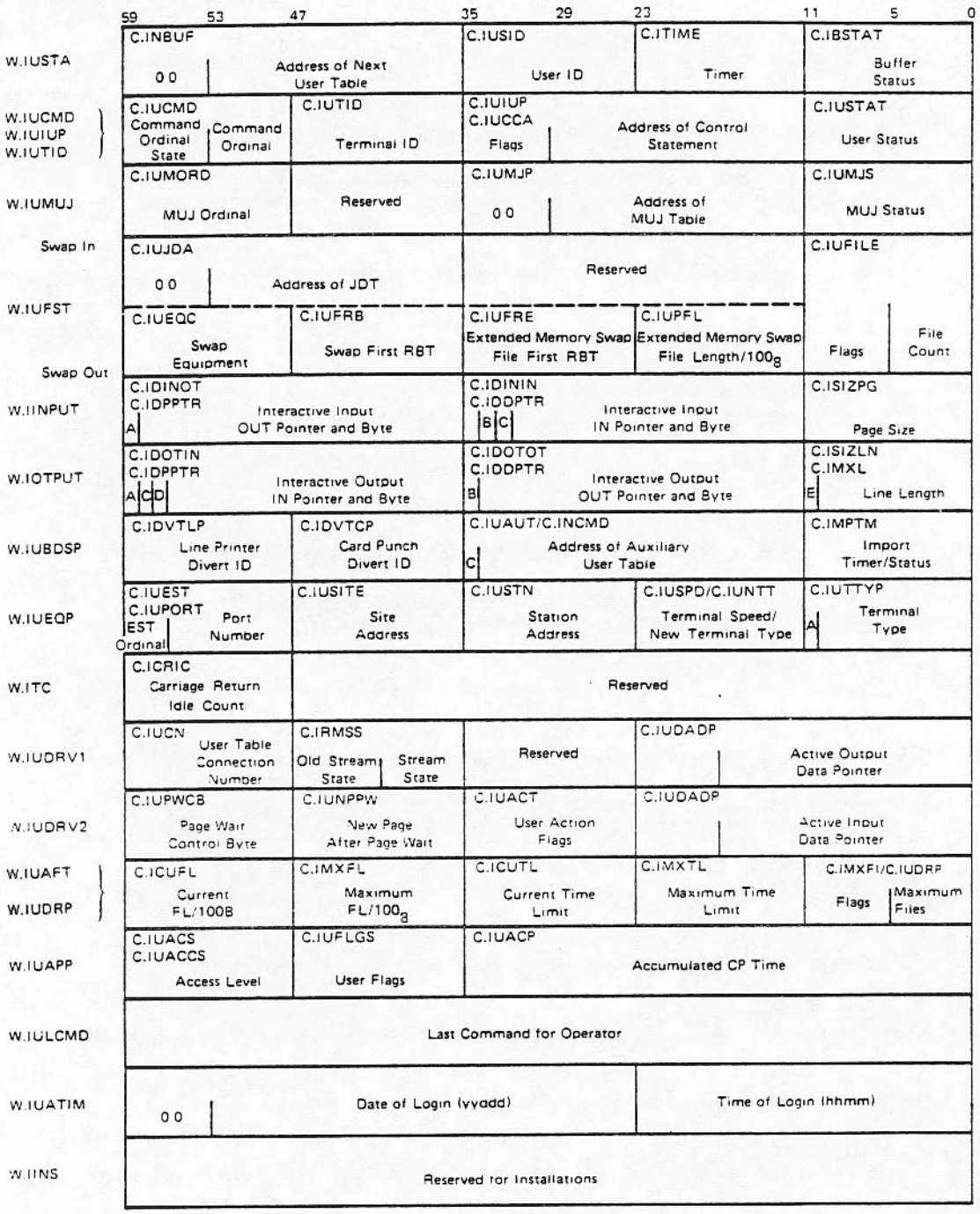
INTERCOM BUFFER AREA

BUFFERS (20_8 Word Boundary)



Byte	Bit	Field	Description
C.IBSTAT	3-0	S.ITYPE	Buffer status (in octal).
			0 Empty.
			1 User table.
			2 Data output/job statement.
			3 Data input.
			4 Interactive control statements.
			5 Multiuser job table (MUJ).
			6 Auxiliary user table (AUT).
			11 Port configuration table.
			12 Limbo buffer.
			13 Batch input PRU buffer.
			14 Batch output PRU buffer.

INTERCOM USER TABLE



W.IUSTA(0)

Byte	Bit	Field	Description
C.IBSTAT(4)	11	S.IABRT	Abort request.
	10	S.IUTAPE	Request paper tape reading.
	9	S.IRDIS	Request disconnected.
	8-7	S.ISTATE	00 Transmission state.
			01 Waiting input.
			10 Waiting output.
			11 Active or assigned to control point.
	6-5	S.ILOGO	00 User logged out.
			01 User logged in.
			10 Automatic logout requested.
			11 Automatic logout in progress.
	4	S.IDISC	Terminal disconnected.
	3-0	S.ITYPE	Buffer type.

W.IUCMD(1)

Byte	Bit	Field	Description
C.IUCMD(0)	59-54		Command ordinal state.
	53-48		Command ordinal.

Ordinal	Command	Description
1B	.ON	Turn on device.
2B	.OFF	Turn off device.
3B	.GO	Go device.
4B	.WAIT	Wait device.
5B	.DEFINE	Define device.
6B	.READFN	Read, filename.
7B	.READ	Read job stream.
10B	.BSP	Backspace output file.

Byte	Bit	Field	Description		
			Ordinal	Command	Description
			11B	.REWIND	Rewind output file.
			12B	.RETURN	Return output file.
			13B	.REPEAT	Repeat output file.
			14B	.END	Terminate file transmission on device.
			15B	.SUS	Suppress forms control.
			16B	.SCREEN	Screen command ordinal to 1NP.
			16B	.BLOCK	Block transmission size for bisynchronous terminal.
			17B	.CONT	Continue batch operations.

			Description
C.IUCCA(2)=C.IUIUP(2)	11	S.IUEDC	Buffer contains control statements from editor.
	10		Unused.
	9	S.IUEXS	Start of execution flag.
	8	S.IUECP	Editor control statements processed.
	7	S.INCT	Command in 1CI table.
	6	S.IUCCP	Control statements moved to control point area.
C.IUSTAT(4)	11	S.ICTAPE	Paper tape on flag.
	10	S.INOCOM	1CI should not issue COMMAND- prompt.
	9	S.IMPORT	IMPORT on at 200 UT.
	8	S.ICBTHW	Allow commands before LOGIN.
	7	S.ICACT	1CI active.
	6	S.ICMES	MES active.
	5-0	S.IUHDIS	Used by IDS for H display ordinal.

W.IUMUJ(2)

Byte	Bit	Field	Description
C.IUMJS(4)	11	S.IMUJ	Attached to MUJ.
	10	S.IMWI	Waiting for input.
	9	S.IMWO	Waiting for output to complete.
	8	S.IMLGS	Logout sent.
	7	S.IMBKS	Break sent.
	6-3		Unused.
	2	S.IMDIS	Reconnected after disconnect.
	1	S.IMRUN	RUN command in progress.
	0	S.IMNUS	New user.

W.IUFST(3)

Byte	Bit	Field	Description
C.IUFILE(4)	11	S.IURED	REDUCE flag.
	10	S.IUFNT	FNT to be associated on next swap.
	9	S.IUECS	Swap file on extended memory.
	8	S.IUPS	Pause bit.
	7	S.IUDMP	SAVEFL flag.
	6	S.IUEOE	End of execution.
	5-0	S.IUCNT	Count of FNT entries in swap file.

W.IINPUT(4)

Byte	Bit	Field	Description
C.IDPPTR(0)	11	S.IINTLK	Interlock bit for 3TT and I/O macros.
	8-6	S.IBYTE	Byte position in current word.
C.IDDPTR(2)	10	S.IRLS	Input line not in progress.
	9	S.IDRACT	Driver active.
	8-6	S.IBYTE	Byte position in current word.

W.IOTPUT(5)

Byte	Bit	Field	Description
C.IDPPTR(0)	11	S.IINTLK	Interlock bit for 3TT and I/O macros.
	10	S.IPWOFF	Page-wait-off flag for processor.
	9	S.I1IML	1IM interlock.
	8-6	S.IBYTE	Byte position in current word.
C.IDDPTR(2)	11	S.IPRNOP	Driver not finished.
	8-6	S.IBYTE	Byte position in current word.
C.ISIZLN(4)	11	S.ILNCHG	Line size change bit.

W.IUBDSP(6) Batch data stream pointers for the following:

Byte	Bit	Field	Description
C.IDVTLP(0)			Line printer divert ID.
C.IDVTCP(1)			Card punch divert ID.
C.IUAUT(2)			Auxiliary user table pointer.
	11	S.IUAUTR	AUT requested when set address is multiplexer subtable address.
	10	S.IURAUT	Recover AUT.
	9	S.IURETA	Release AUT (1NP internal flag).

W.IUBDSP(6) Import timer and status byte.

Byte	Bit	Field	Description
C.IMPTM(4)	11	S.IUDCN	EXPORT completed disconnect.
	8	S.IRLAUT	1CI requesting 1NP to release AUT.

W.IUEQP(7)

Byte	Bit	Field	Description
C.IUEST(0)	11-8	S.IUEST	Pseudo EST ordinal.
	7-0	S.IUPORT	Port number.
C.IURMFT(3)= C.IUSPD(3)= C.IUNTT(3)	11	S.IURMFT	RDF terminal.
	10		Reserved.
	9-5		Terminal speed.
	4-0		New terminal type.
C.IUTTYP(4)	11	S.IUNOP	Inoperative bit.
	10-0		Terminal type (refer to byte C.ITTYPE of the synchronous terminal port entry of the multiplexer subtable for bit definitions).

W.ITC(10) Terminal characteristics.

Byte	Bit	Field	Description
C.ICRIC	11-7		Reserved.
	6-0	S.ICRIC	Carriage return idle count.

W.IUDRV2(12) User action flags.

Byte	Bit	Field	Description
C.IUACT(2)	11-5		Reserved.
	4	S.INDF	Suppress issuing of dayfile messages to terminal.
	3	S.IRUS	User status (%E)
	2	S.IPT	Paper tape mode.
	1	S.ISUP	Suppress output (%S).
	0	S.IABT	User abort required (%A).
C.IUDADP(3)	9	S.IDRACT	Driver active.

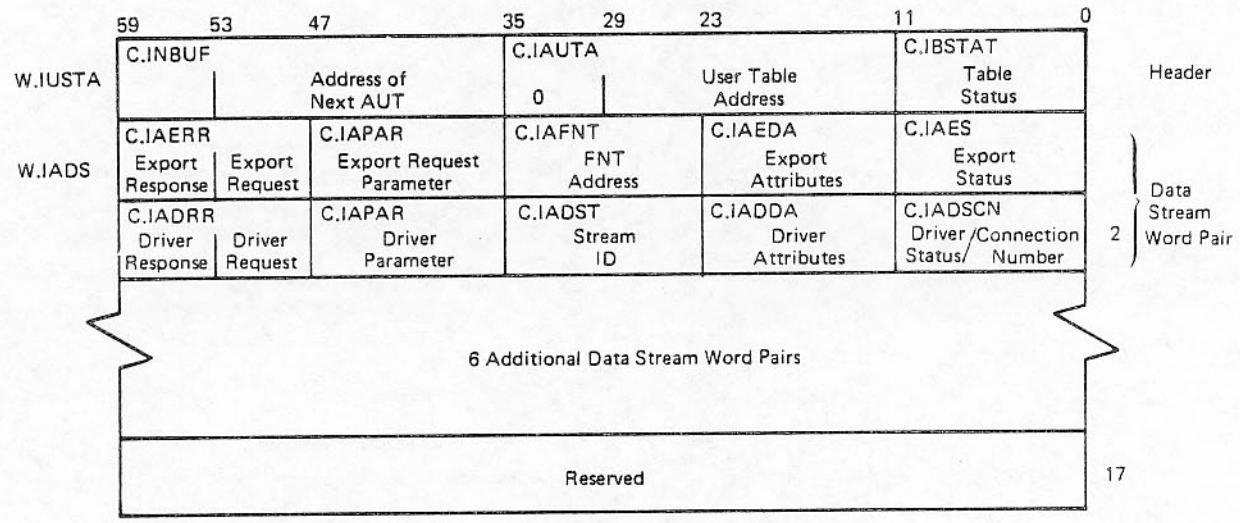
W.IUAFT(13)=W.IUDRP(13)

Byte	Bit	Field	Description
C.IMXFI(4)=C.IUVC(4) = C.IUDRP(4) = C.IUMODE(4)	11	S.IUVC	VC carriage control.
	10	S.IUDRP	1CI has issued a drop for this user table.
	9	S.IDISCW	Disconnect warning sent.
	8	S.IITIMO	Inhibit inactivity time-out.
	7	S.IPMODE	Nonprivileged mode.
	6		Reserved.
	5-0		Maximum number of files.

W.IUAPP(14)

Byte	Bit	Field	Description
C.IUFLGS(1)	11	S.IUUNR	Login with unrestricted password.
	10	S.ITLOK	Lock bit.
	9	S.IRLOK	Request job to be locked out.
	8	S.IUAT	Abort user; no terminal interrupt.
	7	S.INOLK	Job is locked out.
	6	S.IUREU	Reduce mode flag.
	5-0	S.IUSSW	Sense switch changes.

AUXILIARY USER TABLE (AUT)



W.IUSTA(0) Table status.

Byte	Bit	Field	Description
C.IBSTAT(4)	3-9	S.ITYPE	Table type.

W.IAEXWD(0) Export processor word (first of two).

Byte	Bit	Field	Description
C.IAERR(0)	11-6		Export response to driver request.
	5-0		Export request of driver.

W.IAEXWD(0) Export device attributes.

Byte	Bit	Field	Description
C.IAEDA(3)	11-3	S.ILW	Line width.
	2-0	S.ITRAIN	Print train code.

W.IAEXWD(0) Export status.

Byte	Bit	Field	Description
C.IAES(4)	11	S.IPFCFL	Wait PFC full.
	10	S.IENDLP	END,LP command issued.
	9	S.IEOJOF	Turn off device at end-of-file.
	8	S.IREADF	READ,filename command in progress on a card reader or begin data needed on an aborted output stream.
	7	S.IOFF	Off.
	6	S.READ	Read in progress.
	5	S.IBAN	Banner on/off. 0 Banner on. 1 Banner off.
	4	S.IO26†	Character mode for input or punch (IBM HASP/2780/3780 Remote Batch Terminals). 1 O26. 0 O29.
	4	S.IO26†	Pre/post print for IBM HASP Printer. 0 Pre-print. 1 Post-print.
	3	S.ISUPR	Suppress carriage control on printer or EM option on punch (IBM 2780/3780 Remote Batch Terminals).
	2	S.IMRIP	MR option (IBM 2780/3780 Remote Batch Terminals or mode 4C printer type). 0 Nonimpact. 1 Impact.
	1	S.IWAIT	Wait.
	0	S.ISSTOP	Stream stopped.

†The S.IO26 field has a different meaning for the card devices and the printers.

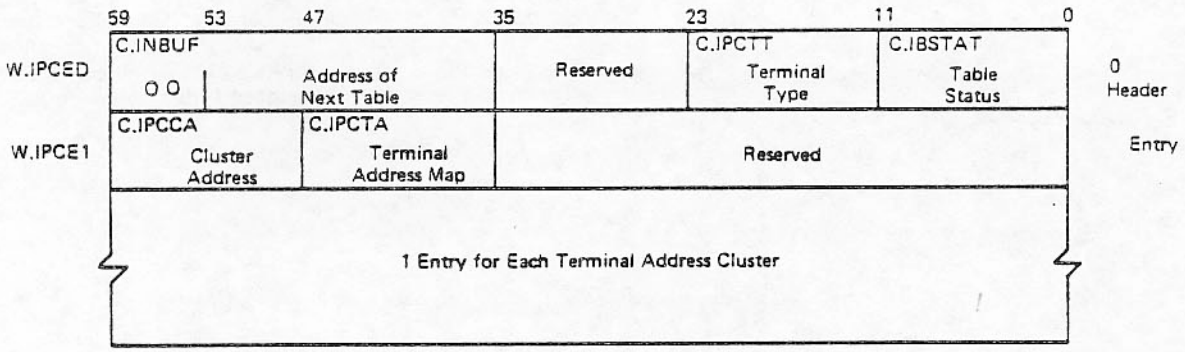
W.IADRWD(1) Driver processor word (second of two).

Byte	Bit	Field	Description
C.IADRR(0)	11-6		Driver response to export request.
	5-0		Driver request of export.

W.IADRWD(1) Stream identification.

Byte	Bit	Field	Description
C.IADST(2)	11	S.ISTSTP	Stream stopped.
	10	S.IJBCRD	Job statement expected (input).
		S.IOTRAN	Transparent mode (output).
	9	S.IOEXCS	Extended character set (output).
	8	S.IMSERR	Mass storage error.
	7	S.IINPUT	Input stream identification.
	6	S.IOTPUT	Output stream identification.
	5-3	S.ISTYPE	Stream type.
	2-0	S.IDEVNR	Device number.

PORT CONFIGURATION TABLE



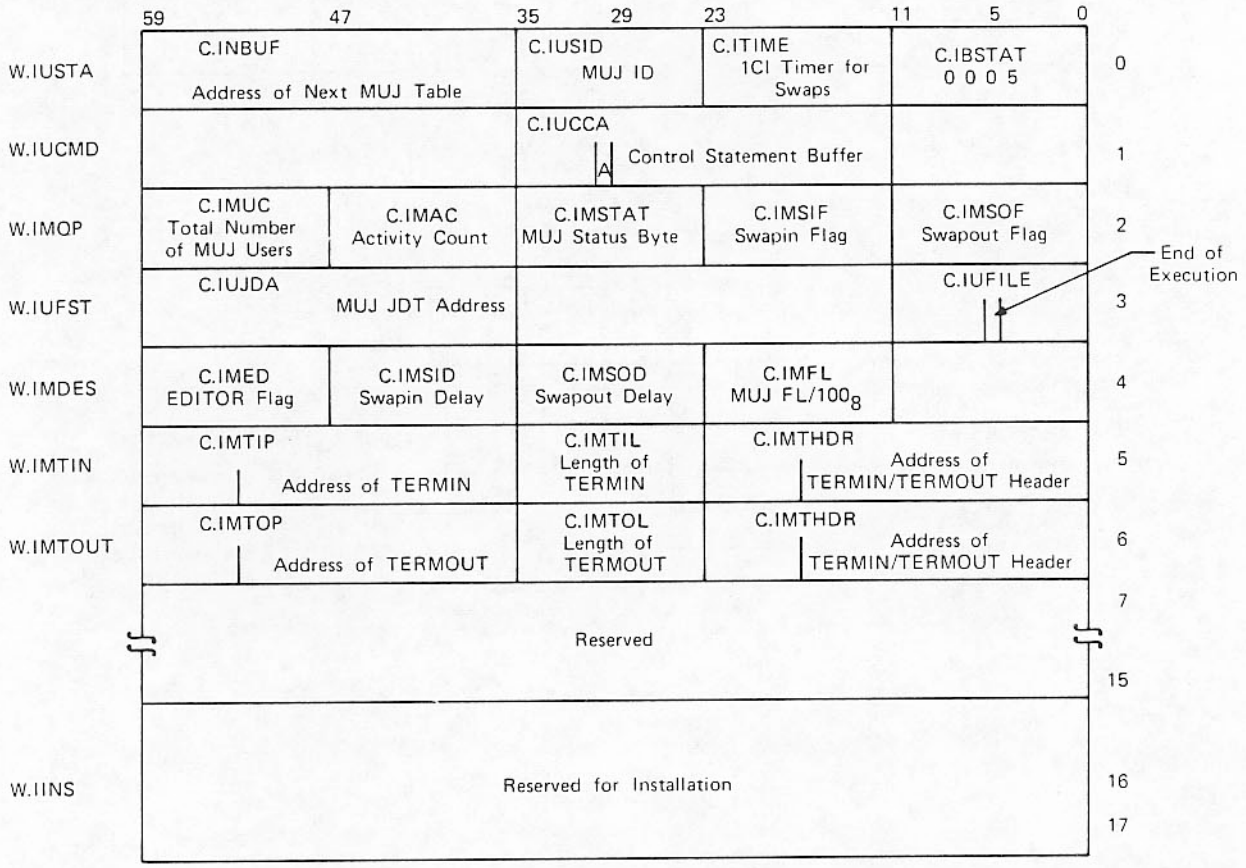
W.IPCED(0)

Byte	Description
C.IPCTT(3)	Terminal type; refer to byte 4 (C.ITTYPE) of synchronous terminal port entry for terminal type definitions.

W.IPCED(0) Buffer status.

Byte	Bit	Field	Description
C.IBSTAT(4)	7-4	S.IPCTWC	Port configuration word count.
	3-0	S.ITYPE	Table type.

MULTIUSER JOB TABLE



W.IUCMD(1)

Byte	Bit	Field	Description
C.IUCCA	30	S.IUCCP	Control statements moved to CPA flag.

W.IMQP(2)

Byte	Bit	Field		Description
C.IMSTAT	35-24		0001	Waiting for I/O
			0003	MUJ active.

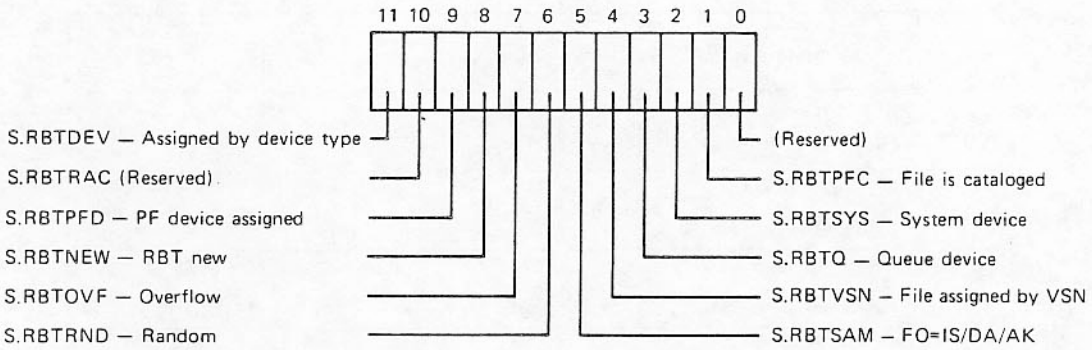
RECORD BLOCK TABLE ENTRY

The RBT entries exist in the highest address of CM above jobs running at control points.

FIRST RBT WORD PAIR

59	47	38	35	29	23	11	0
C.RBTWPL Next Word Pair †	C.RBTDRB DAM Ordinal	7	C.RBTMST MST Ordinal	C.RBTAL Alloc. Type	C.RBTPRU Last PRU + 1	C.RBTBIT Flags	
C.RBTAUS PRUs/RB	C.RBTVSN Volume Serial Number					RB_7	

C.RBTBIT



†When this byte is zero, there are no more word pairs.

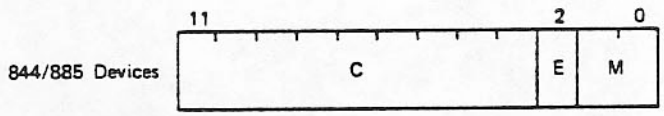
OTHER WORD PAIRS EXCEPT OVERFLOW

59	47	38	35	23	11	0
C.RBTWPL Next Word Pair†	C.RBTDRB DAM Ordinal	0	RB_0	RB_1	RB_2	
RB_3	RB_4		RB_5	RB_6	RB_7	

OVERFLOW WORD PAIRS

59	47	38	35 29	23	11	0
C.RBTWPL Next Word Pair†	777	0	C.RBTMST MST Ordinal	End of Volume PRU + 1	C.RBTODO DAM Ordinal	
C.RBTAUS PRUs/RB	C.RBTVSN Volume Serial Number				0 0 0 0	

RECORD BLOCK TABLE BYTE MINUS ONE



Computation of physical addresses for default allocation styles is as follows:

844/885 half-track (2:1 interlace):

Cylinder = C

Track = (PS*M)/TS

Sector = E+remainder of (PS*M)/TS

E is 0 for even; E is 1 for odd.

† When this byte is zero, there are no more word pairs.

844/885 full-track (1:1 interlace):

Cylinder = C

Track = (PS*EM)/TS

Sector = Remainder of (PS*EM)/TS

Values for PS and TS in the preceding computations are as follows:

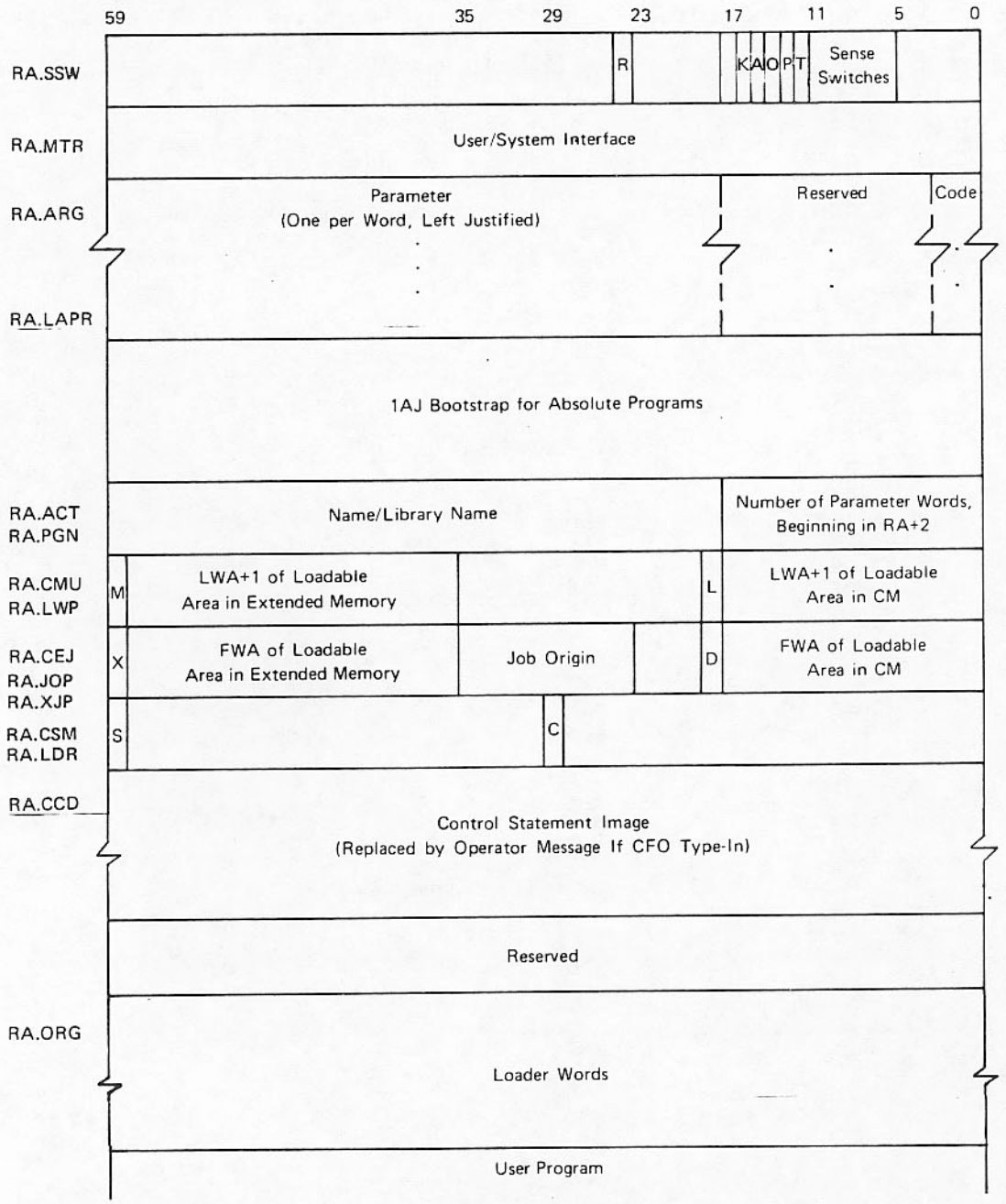
PS PB size in PRUs (decimal).

Device	PRUs
844	114
885	320

TS Track size in PRUs (decimal).

Device	PRUs
844	24
885	40

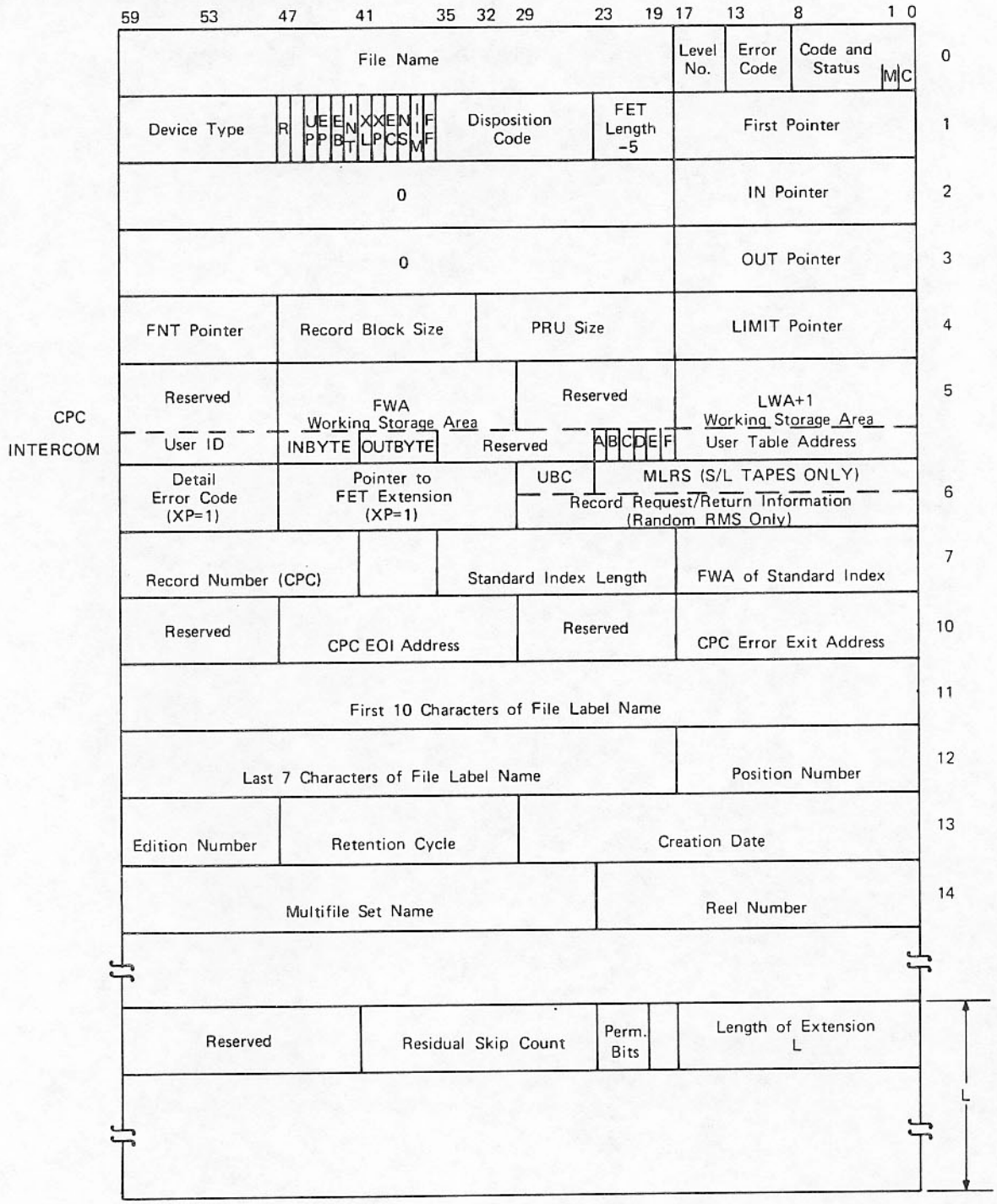
RA COMMUNICATION AREA



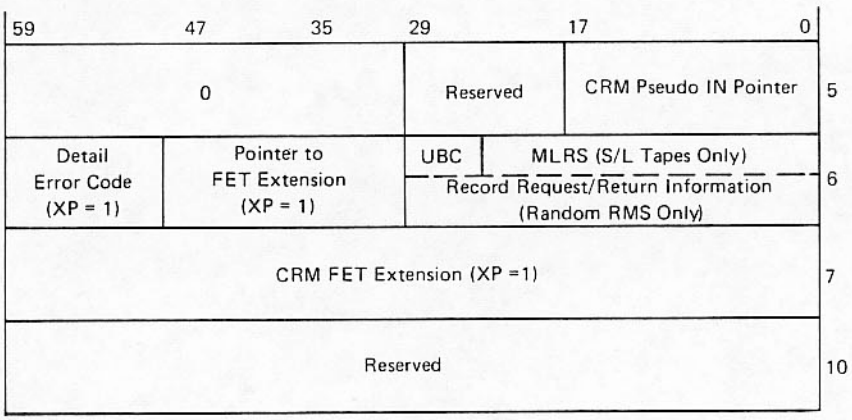
Word	Field Name	Bit	Description
RA+0	R	24	Job dependency recheck bit.
	K	16	Operator acknowledge flag; set to 1 by DSD when operator enters X.ACK command, cleared by the job.
	A	15	Job swap-out to operator action queue flag (1 indicates the job will be placed under operator action queue upon swap-out regardless of job origin).
	O	14	CFO flag (1 is accept comment from operator).
	T	13	Storage move flag (1 is move being attempted).
	P	12	Pause flag (1 is control point pausing).
RA+2	Code	3-0	00 Continuation. 01 Comma. 02 Equal sign. 03 Slash. 04 Left parenthesis. 05 Plus sign. 06 Minus sign. 07 10 Semicolon. 11 12 13 Reserved. 14 15 16 Other. 17 Termination.

Word	Field Name	Bit	Description
RA+65	M	59	CMU bit; if M is 1, CMU can be issued.
	L	18	Library/file flag (1 indicates name is the library name).
RA+66	X	59	XJ flag; if X is 1, XJ can be issued.
	Job origin		0 System.
			1 Batch.
			2 Remote batch.
			3 Interactive terminal.
	D	18	DIS RSS flag.
RA+67	S	59	Character set; if S is 1, 64 characters.
	C	29	LDV completion flag.

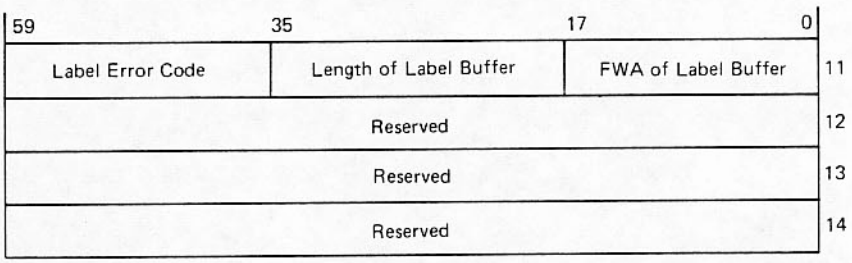
FILE ENVIRONMENT TABLE



If using cyber record manager, FET words 5-10 have the following fields.



If using extended label (XL=1), FET words 11-14 have the following fields.



WORD 0

Code and Status

All codes are shown for coded mode operation; add 2 for binary mode. For example, 010 is coded READ; 012 is binary READ.

Code	Function
000	RPHR
004	WPHR
010	READ
014	WRITE
020	READSKP
024	WRITER
030	-
034	WRITEF
040	BKSP
044	BKSPRU
050	REWIND
054	-
060	UNLOAD
064	-
070	RETURN
074	-
100	OPEN,NR
104	OPEN WRITE,NR
110	POSMF
114	EVICT
120	OPEN,NR
124	-
130	CLOSE,NR
134	-
140	OPEN
144	OPEN WRITE

Code	Function
150	CLOSE
154	-
160	OPEN
164	-
170	CLOSE,UNLOAD
174	CLOSE,RETURN
200	READC
204	WRITEC
210	READLS
214	REWRITE
220	-
224	REWRITER
230	-
234	REWRITEF
240	SKIPF
244	-
250	READNS
254	-
260	READN
264	WRITEN
270-274	-
300	OPEN,NR
304-324	-
330	CLOSER
334	-
340	OPEN
350	CLOSER
354-364	-
370	CLOSER,UNLOAD
374	CLOSER,RETURN

Code	Function
400-474	-
500-574	Reserved for installations.
600	Reserved for NOS READEI.
604-634	-
640	SKIPB
644-774	-

Error Codes

Error Code	Description
01	End of information.
02	End of reel.
04	Parity error.
10	Device capacity exceeded.
11	Implicit MOUNT inhibited.
20	Additional error status returned.
21	End of multifile set.
22	Fatal error.
23	Index buffer full.
24	Interlock broken for shared RMS.
25	Index full on random read/write of record n.
26	Nonexistent record named on random read.
27	Nonexistent record named on random write and index is full.
30	Function undefined on device.
31	Permission not granted.
32	Function illegal on permanent file.
33	No public set has required attributes.
34-37	Reserved.

Word 1

Meaning if bit is set:

Bit	Field	Description
47	R	Process standard index if OPEN/CLOSE; otherwise, random read/write.
46		Reserved.
45	UP	User processing at end of volume.
44	EP	User processing on error condition.
43	EB	Inhibit error recovery while reading magnetic tape.
42	INT	Allows use of the INTERCOM word (FET+5) which is needed to set ASCII 256 mode or ASCII 128 mode, or to enable multiline reads.
41	XL	Extended label processing.
40	XP	Extended error processing.
39	EC	Disallow automatic allocation of extended memory buffer.
38	NS	File has nonstandard labels; processing of label records is left to user.
37	IIM	Inhibit implicit MOUNT.
36	FF	File flushing; unwritten data in a sequential file's buffer will be written to mass storage if a job step ends abnormally, even if the file has scratch disposition.

Word 5

Meaning if bit is set:

Bit	Field	Description
23	A	Set for ASCII 256 mode.
22	B	Set for ASCII 128 mode.
21	C	If bit 22 is also set, set for ASCII 128 mode with unit separators.
20	D	Do not interpret carriage control on output.
19	E	Set for multiline reads. Normally, only one input line is transferred into the circular buffer. When this bit is set, multiple lines are transferred if they are available and if there is room in the buffer.
18	F	If bit 23 is also set, force parity option. On input, parity bit is always zero. This affects processing of bit 7 (parity bit) of each 12-bit data byte. On output, parity bit of data byte delivered to the INTERCOM driver is modified to produce even parity.

Word 6 — Detail Error Code (Bits 59-48)

When the XP bit is set to 1, this field contains extended tape error processing codes which give additional detail of abnormal conditions resulting from the last input/output operation. The user is responsible for clearing this field after reading it.

Codes 1 through 77 (octal) are considered software warnings to the user; they are not results of hardware failures. The tape-related codes and subsequent software warnings are as follows:

Detail Error Code	Software Warning
24	Read error in opposite mode.
25	Function not complete.
27	Record fragment possible.
30	Data read exceeds MLRS/PRU size.
31	Multifile set ill-formed.
32	Write attempt on protected volume.
33	Write at 200 bpi not allowed on 66x tape drive.
35	Multifile name not found on multifile device.
36	Next volume unknown.
37	File not allowed on assigned device.

Codes 100 through 177 (octal) are considered cases where the tape unit has lost position. These codes are as follows:

Detail Error Code	Position
100	Position uncertain; data intact.
101	Position uncertain; data destroyed.
102	Physical/logical positions disagree.
103	Position uncertain; ready dropped during last operation.

Codes 200 through 277 (octal) are considered unit-oriented errors. Switching physical tape devices allows the program to continue after repositioning. These codes and subsequent errors are as follows:

Detail Error Code	Unit
200	System error; tape table.
201	Hardware; unit hung busy.
202	Hardware; no end of operation.
203	Hardware density change during I/O.

Detail Error Code	Unit
204	Unit reserved by another buffer controller.
205	Loop fault.
206	Unable to read tape label just written.
207	Marginal transport indication.
210	Lost data.
211	Multiple load points on tape.
212	No read after write.
213	Coldstart.
214	Irrecoverable write reposition error.
215	Tried to use unit which is down.

Codes 400 through 477 (octal) are errors resulting from hardware failure between the PP and the physical tape unit. These codes and subsequent errors are as follows:

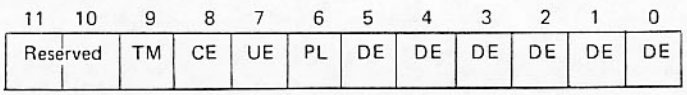
Detail Error Code	Data Path Error
400	Hardware; 668x malfunction.
402	Hardware; 6681 failed, no data on IAN.
403	Hardware; transmission parity error.
404	System error.

Codes 1000 through 1005 (octal) are errors resulting from a bad tape. These codes and subsequent errors are as follows:

Detail Error Code	Tape (Medium)
1000	Tape parity error.
1001	25 feet erased tape.
1002	Blank tape read.
1003	Incomplete erasure of tape bad spot.
1004	Noise in IRG.
1005	Erase limit reached.

Codes 6000 through 7777 (octal) are reserved for installations.

Codes are combined meanings of the following bits:



TM Tape medium.

CE Controller error (controller, 6681, and so on).

UE Unit caused error.

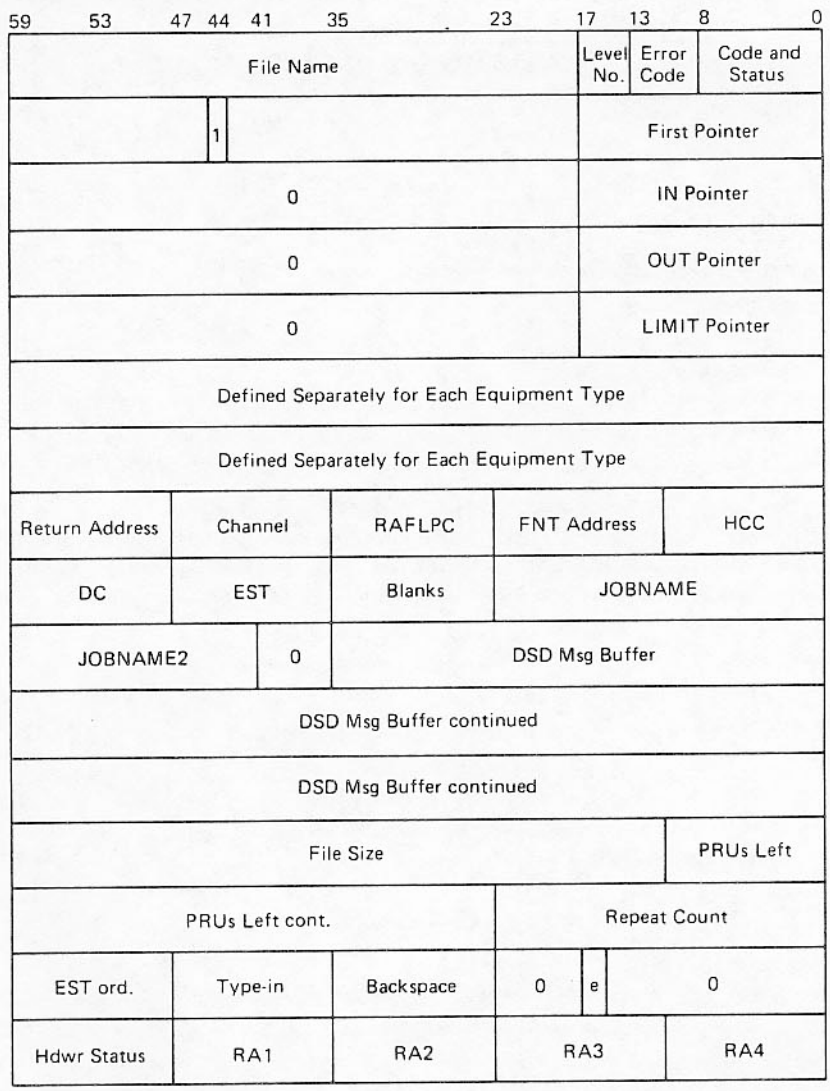
PL Position lost.

DE Detailed error.

The references to system noise record and last good record refer to procedures the system follows in recovery attempts.

Detailed error codes allow a central processor program to take appropriate action when a nonuser-caused error occurs. For example, the message UBC IN FET TOO LARGE does not have a detailed error code because it is a user-caused error. On the other hand, the message TAPE PARITY ERROR is assigned to a detailed error code because the condition is an externally-caused error.

JANUS FILE ENVIRONMENT TABLE



JANUS FET

Each FET occupies 16 CM words. The first five words have the form of an ordinary minimum-length FET with the EP bit set so that a disk parity error will not abort JANUS.

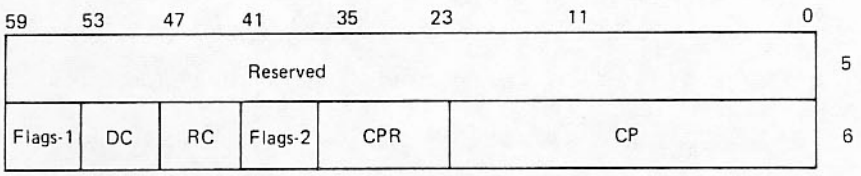
Field	Word	Bit	Description
File Name	0	59-18	Name of file (one - seven letters or digits) beginning with a letter.
Level Number		17-14	Record level number.
Error Code		13- 9	Refer to CIO FET error code descriptions.
Code and Status		8- 0	Refer to CIO FET code and status descriptions.

Some JANUS FET statuses are given special names (within IIR) for cross-referencing.

Field	Bit	Description
Status	0	If set, file not busy (FL.IDLE).
	2	CR - For card reader, file is being written to disk (FL.WRITE). CP - For card punch, every end of file is followed by a blank card. So after setting up the EOF, the FET status is set to 0036B or 1037B (depending if it was 0033B or 1033B) indicating that a blank card is to be punched. LP - For a print file, for a file to be backspaced, IIU sets the FET status to 17B on completion.
	3	If set, file at EOF (FL.EOF).
	4	If set, file at EOR, EOF (FL.EOR).
	9	If set, file at EOI (FL.EOI).

Words 5 and 6 are special information needed for each file. The format of these words is different for each file type.

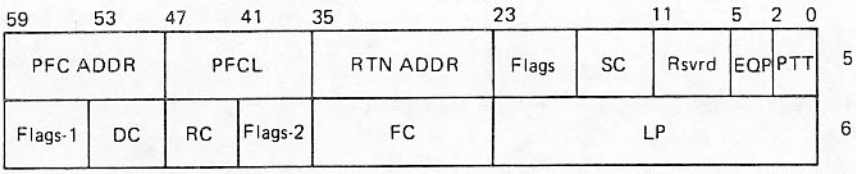
For punch:



Field	Word	Bit	Description
FLAGS-1	6	59	If set, offset the card image that was just sent (FL.OS).
		58	If set, just prepared the image of a card to be offset (FL.PROS).
		57	If set, just sent a BCD card image (FL.BCDO).
		56	If set, just set up a BCD card image (FL.BCDN).
		55	Reserved.
		54	Reserved.

Field	Word	Bit	Description
DC		53-48	Disposition codes. 10B=026 hollerith 11B=029 hollerith 12B=normal binary 14B=80-col binary
RC		47-42	Repeat count.
FLAGS-2		41	Reserved.
		40	Reserved.
		39	If set, a card image not yet sent to punch (FL.IMAGE).
		38	If set, an image is more than 80 columns, no end-of-line (FL.LONG).
		37	If set, a /SW type-in was recognized (FL.SWCH).
		36	Alternates between 0 and 1 to indicate successive card image in two areas. This allows saving the image of the last two cards. If a compare error on hardware, you must repunch both cards. (This is a hardware limitation.) (FL.FLIP).
CPR		35-24	Number of cards punched in this record.
CP		23-0	Number of cards punched.

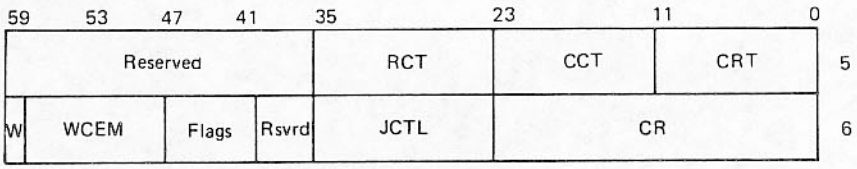
For printer:



Field	Word	Bit	Description
PFC ADDR	5	59-48	Address of PFC image to be loaded.
PFCL		47-36	Length of PFC image (PP words). Can be used as a return address.
RTN ADDR		35-24	Return address used during PFC load.
FLAGS		23	If set, 580 is a PFC printer (FL.PFC).
		22	If set, verify forms message to be output or printer is to be spaced beyond coincidence point. Forms position may be off due to V carriage control (FL.VFB).
		21	If set, a V carriage control was loaded (accounting) (FL.VACC).
		20	If set, the PFC buffer to be reloaded (FL.LOAD).
		19	Reserved
		18	Reserved.
SC		17-12	Spacing code.
		11- 6	Reserved.

Field	Word	Bit	Description
EQP		5- 3	Equipment type 0=LQ 1=LR 2=LS 3=LT
PTT		2- 0	Print train type 0=Default 2=A4, ASCII 48 3=B4, BCD 48 4=B6, BCD 64 5=A6, ASCII 64 6=A9, ASCII 96
FLAGS-1	6	59	If set, format suppressed (carriage control ignored) (FL.SU).
		58	If set, a /SUP was seen. Print the format suppressed message and set FL.SU (FL.PRSU).
		57	If set, print the EOL message and terminate listing (FL.FMES).
		56	If set, unprintable character(s) were found in line just printed using a 48 or 96 character print train. Next line will indicate the unprintable characters and set FL.CMEB. (FL.CMEA).
		55	Indicates that the previous line contained unprintable character(s) and that the appropriate diagnostic message is to be printed (FL.CMEB).
		54	Printing this file at eight lines per inch (LPI). If a reset is needed, you have to reset eight LPI (FL.8LL).
DC		53-48	Disposition code. 40=Any printer 41=501 LP 42=512 LQ 43=580-12 LR 44=580-16 LS 45=580-20 LT
RC		47-42	Repeat count.
FLAGS-2		41	Set, if using a 512 or 580 printer (FL.512).
		40	Set, if auto page eject needed (FL.AUTO).
		39	Set, if page eject is to be done because you switched to a new printer, or when the final message is set up at the end of a file (FL.PAGE).
		38	Set, if a line is too long for the buffer (more than 310 characters), or if no EOL was found (FL.LONG).
		37	Set, if a /SW was seen (FL.SWCH).
		36	Set, if a line began but not yet sent to printer (FL.LINE).
FC		35-24	Forms code.
LP		23- 0	Lines printed.

For card readers (Input):



Field	Word	Bit	Description
RCT	5	35-24	Record count within file.
CCT		23-12	Card count within record.
CRT		11-0	Current record type (binary, BCD, special).
W	6	59	If set, before terminating a pre-output file has to be written containing error messages and an FNT slot has to become free (FL.WTFNT).
WCEM		58-48	CM word count for error messages.
FLAGS		47	If set, a file ended with EOI not preceeded by a EOR. The EOR read is faked, and the next time around a EOI read is faked (FL.EOJ).
		46	If set, a fatal error was found in the file. The job was pre-aborted (FL.PREAB).
		45	If set, job card error (FL.JOBER).
		44	Reserved.
		43	Reserved.
		42	If set, file is in 029 instead of 026 (FL.029).
		41	If set, jobcard has 7000 destination (FL.7000).
		40	If set, file is to be killed due to disk failure (FL.TERMC).
		39	If set, card was physically read, but not logically read and decoded (FL.IMAGE).
		38	Reserved.
		37	Reserved.
		36	Reserved.
JCTL		35-24	Lower 12 bits of job card time limit.
CR		23-0	Cards read.

Field	Word	Bit	Description
Return Addr	7	59-48	Return address.
Chan		47-36	Channel number of equipment.
RAFLPC		35-24	Return address for file at LPC.
FNT Addr		23-12	FNT address.
HCC		11-0	Hardware connect code.
DC	10	59-48	Device type, display code.
EST		47-36	EST ordinal, display code.
Blanks		35-24	Display code blanks.
JOBNAME		23-0	First four characters of jobname, display code.
JOBNAME 2	11	59-42	Last three characters of jobname, display code.
		41-36	Reserved.

Field	Word	Bit	Description
DSD Msg Buffer		35- 0	DSD message buffer for 26 display code characters.
	12	59- 0	Continuation of DSD message buffer. If the first two characters following the jobname are non-zero (or non-blank for devices driven by IIR), the messages are displayed on the B-display and J-display. The message may extend through FET+15B (FET+13B for devices driven by IIR).
	13	59- 0	
File Size	14	59-12	File size in decimal display code with leading zeros suppressed. For print and punch files, size is PRUs. For card reader file, size is number of cards read.
PRUs Left		11- 0	Remaining file size (PRUs left) in decimal display code with leading zeros suppressed.
	15	59-24	Used for print and punch files.
Repeat Count		23- 0	File repeat count in decimal display code with leading zeros suppressed.
EST Ord.	16	59-48	EST ordinal, octal number.
Type-in		47-36	Code for JANUS operation commands as described below.

Code	Command	
1	/END	Stop processing file.
2	/SUP	Suppress format control.
3	/REP	Increment file repeat count.
4	/SW	Switch file to another device.
5	/REW	Rewind file.
6	/OK	Acknowledge messages.
7	/BS	Backspace file.
10	/ABORT	JANUS drops from control point.
11	/FS	Forward skip file.
12	/CUT	Stop file processing and return it to queue without rewind.

Backspace		35-24	Backspace code.
E		18	Processing control for /END commands. Zero indicates that the dayfile is to be printed. One indicates immediate termination. This flag is used to distinguish between the first and subsequent /ENDS on a file.
Hdwr Status	17	59-48	Hardware status.
RA1		47-36	Return address for file over LPC.
RA2		35-24	Return address for file over LPC.
RA3		23-12	Return address for file over LPC.
RA4		11- 0	Return address for file over LPC.

RESERVED LOCAL FILE NAMES

The following list represents the reserved local file names that appear in a FET for the named product set file.

File Name	Product Set File	Use
ZZCCLAA-ZZ	CCL	CCL files.
ZZZZCKP	NOS/BE	System checkpoint file.
ZZZZECS	EDITLIB	System extended memory resident library creation job (permanent file).
ZZZZZ01	EDITLIB	Reset file (permanent file).
ZZZZZ02	EDITLIB	Restore file (permanent file).
ZZZZZ03	EDITLIB	System extend file (permanent file).
ZZZZZ04	EDITLIB	System file (permanent file).
ZZZZZ05	EDITLIB	Interpreted directives.
ZZZZZ06	EDITLIB	Extended memory resident routines library file.
ZZZZZ07	EDITLIB	Entry point name table spill file.
ZZZZZ08	EDITLIB	Program number table spill file.
ZZZZZ09	DIAXNOS	
ZZZZZ0A	FTN45	Comments file.
ZZZZZ0G	FTN45	Token list file.
ZZZZZ0H	FTN45	Name table file.
ZZZZZ0I	FTN45	Invented name file.
ZZZZZ0J	FTN45	Data statement analysis file.
ZZZZZ10	EDITLIB	Program name table spill file.
ZZZZZ11	EDITLIB	External reference table spill file.
ZZZZZ12	EDITLIB	External reference collection spill file.
ZZZZZ13	EDITLIB	Library or deadstart program collection file.
ZZZZZ14	EDITLIB	Scratch.
ZZZZZ15	EDITLIB	PP program name table spill file.
ZZZZZ16	EDITLIB	Library name table spill file.
ZZZZZ17	LOADER	Entry point list.

File Name	Product Set File	Use
ZZZZZ18	LOADER	Owned global blocks.
ZZZZZ19	FORM	
ZZZZZ1A-1Z	SORT/MERGE	
ZZZZZ20	FORM	
ZZZZZ21	FORM	
ZZZZZ22	6RM	Memory manager.
ZZZZZ23	EDITLIB	Current directory file.
ZZZZZ24	QUERY/UPDATE	
ZZZZZ25	LOADER	Global library set.
ZZZZZ26	GRAPHICS	
ZZZZZ27	LOADER	Overlay/segment generator.
ZZZZZ28	DEBUGGING AIDS	
ZZZZZ29	LOADO	Extended memory hold file.
ZZZZZ2A-2Z	SORT/MERGE	
ZZZZZ30	LOADER	SEGBILD scratch file (random).
ZZZZZ31	LOADER	SEGBILD sort file (random).
ZZZZZ32	LOADER	SEGBILD sort file (random).
ZZZZZ3A-3Z	SORT/MERGE	
ZZZZZ41-49	COBOL	
ZZZZZ50-59		Reserved for Control Data.
ZZZZZAA-A9	Index Processor	
ZZZZZAD	TRANSPF	
ZZZZZBA-B0	Index Processor	
ZZZZZB1	BINEDIT	Scratch directive file.
ZZZZZB2	BINEDIT	Scratch list file.
ZZZZZB3	BINEDIT	Scratch patch file.
ZZZZZC0-C2	CCL	CCL files.
ZZZZZC3	CDC Special Systems	
ZZZZZC4	CDC Special Systems	

File Name	Product Set File	Use
ZZZZZCB	DDL	
ZZZZZCC	DDL	Scratch file.
ZZZZZCD	DDL	Scratch file.
ZZZZZCF	SYMPL	Reserved.
ZZZZZCP	INTERCOM	Copy permanent files.
ZZZZZCR	SYMPL	Reserved.
ZZZZZCR	CDCS2	Rollout file.
ZZZZZCS	CDCS2	Rollout file.
ZZZZZCT	CDCS2	Internal route file.
ZZZZZDB	COBOL Debug File	
ZZZZZDC	BASIC	Debug binary file.
ZZZZZDD	System Dynamic Dump	Core-image dump file.
ZZZZZDE	INTERCOM	Scratch file.
ZZZZZDF	6RM/LOADER or RHF	File control statement processor for 6RM/LOADER or dayfile processor for RHF.
ZZZZZDG	CRM/LOADER or RHF	File control statement processor for CRM/LOADER or dayfile processor for RHF.
ZZZZZDI	CID	Reserved for CYBER Interactive Debug.
ZZZZZDM	NOS/BE	FNT used by SPM to access DAM.
ZZZZZDO	CID	Reserved for CYBER Interactive Debug.
ZZZZZDP	FORTRAN 5	Post Mortem Dump core-image dump file.
ZZZZZDS	CID	Reserved for CYBER Interactive Debug.
ZZZZZDT	CID	Reserved for CYBER Interactive Debug.
ZZZZZEF	6RM	Error message file.
ZZZZZEG	CRM	Error message file.
ZZZZZFC	FTN4	Symbolic object code file.
ZZZZZGN	SYMPL	Reserved.
ZZZZZGO	NOTE	Scratch file for ENTER entry point.
ZZZZZG1-9	NOS	Reserved.

File Name	Product Set File	Use
ZZZZZI3	INTERCOM	Scratch file.
ZZZZZI4-I9	ALGOL 5	Scratch files.
ZZZZZIC	SYMPL	Reserved.
ZZZZZII	INTERCOM	INID/Password file.
ZZZZZIL	SYMPL	Reserved.
ZZZZZIM	IMF	Scratch file.
ZZZZZIN	INTERCOM Utility/QU/CID	Connected files.
ZZZZZL1-L9	LDCMR	Scratch files.
ZZZZZMF	LISTMF	Temporary member file.
ZZZZZMP	FORTRAN 5	Post Mortem Dump load map file.
ZZZZZOD	TRANSPF	
ZZZZZOP	FTN/COMPASS	
ZZZZZOU	INTERCOM Utility/QU/CID	Connected files.
ZZZZZQU	QUERY/UPDATE	
ZZZZQ1-Q6	QUERY/UPDATE	
ZZZZZPA	PFM	Scratch file.
ZZZZZPB	PFM	Scratch file.
ZZZZZPC	PFM	Attached RBTC.
ZZZZZPD	PFM	Attached PFD.
ZZZZZPE	PFM	Reserved.
ZZZZZPF	PFM	Attached permanent file.
ZZZZZPG	PFM	Reserved.
ZZZZZPK	MMF-PFN	Multimainframe packet file.
ZZZZZPS	SYMPL	Reserved.
ZZZZZPT	PFM	Permanent file dump tape.
ZZZZZPW	PFM	Attached permanent file DUM.
ZZZZZR0	MFLINK	Recovery text file.
ZZZZZR1	MFLINK	Scratch file.

File Name	Product Set File	Use
ZZZZZR2	MFLINK	Scratch file.
ZZZZZRE	INTERCOM	Restricted passwords.
ZZZZZRL	FTN4/COMPASS	
ZZZZZRM	FTN4/COMPASS	
ZZZZZRN	PAGE Utility	Interim random page file.
ZZZZZRT	PFM	
ZZZZZS1	DDL	
ZZZZZS2	DDL	
ZZZZZSA-SD	SIFT	
ZZZZZSE	EDITOR	
ZZZZZSF	EDITOR	
ZZZZZSG	EDITOR	
ZZZZZSH	EDITOR	
ZZZZZSY	FORTRAN 5	Post Mortem Dump symbol tables.
ZZZZZTC	TRANSPF	
ZZZZZTD	TRANSPF	
ZZZZZTE	INTERCOM	Scratch file.
ZZZZZUI	CID	Reserved for CYBER Interactive Debug.
ZZZZZUN	INTERCOM	Unrestricted passwords.
ZZZZZVx-Zx		Reserved for installations.

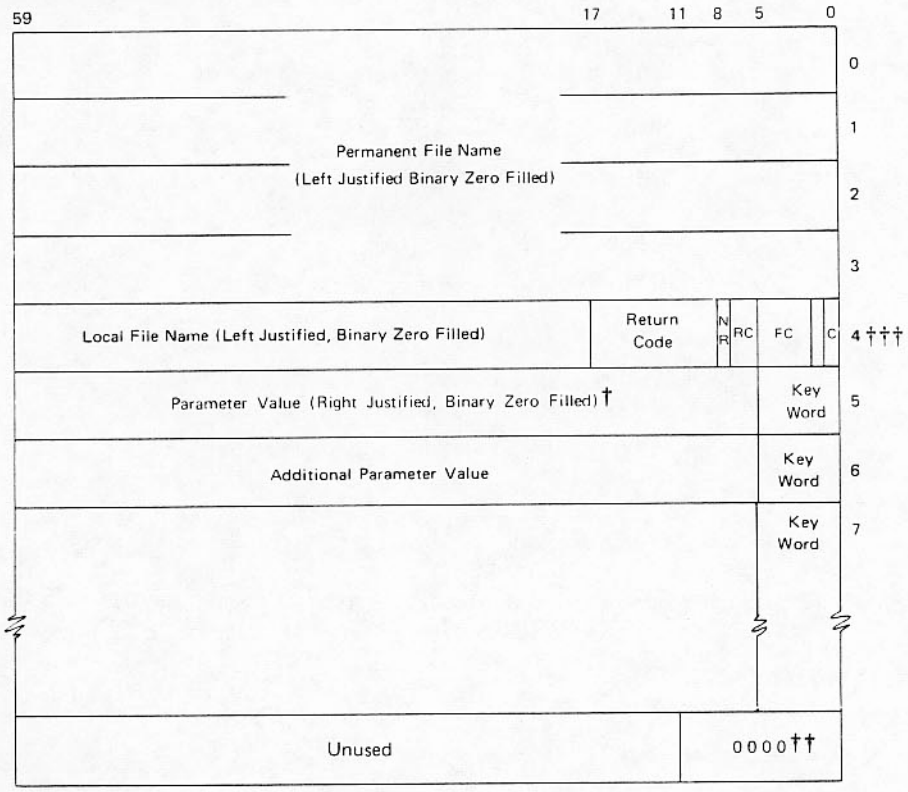
ENTRY POINT NAMES

Name	Product
AGxxxxx ALxxxxx	ALGOL
ATxxxxx	APT
BAxxxxx	BASIC
CBxxxxx COxxxxx	COBOL

Name	Product
CPxxxxx	COMPASS
D.xxxxx	COBOL
DIxxxxx	CE Diagnostics
EBxxxxx	8231 IMPORT
ECxxxxx	EXPORT IMPORT 200
EHxxxxx	6000 EXPORT High Speed
FExxxxx FXxxxxx	FORTRAN Extended Version 4
FMxxxxx	FORM
G6xxxxx	IGS/6000 EXPORT HS
G7xxxxx	IGS/1700 IMPORT
INxxxxx	INTERCOM
IXxxxxx	Index Processor
ISxxxxx	SIS 1.0
ITxxxxx	INTERCOM
I7xxxxx	1700 IMPORT HS
I8xxxxx	8231 IMPORT HS
JVxxxxx	JOVIAL
MIxxxxx	1700 MSOS IMPORT HS
MRxxxxx	MARS VI
OHxxxxx	OPHELIE
OPxxxxx OTxxxxx	OPTIMA
PLxxxxx	PL1
PTxxxxx	PERT/TIME
QUxxxxx	QUERY UPDATE
RMxxxxx	6RM
SCxxxxx	SCOPE
SIxxxxx	SIMSCRIPT

Name	Product
SMxxxxx SOxxxxx	SORT/MERGE
SSxxxxx	SIMSCRIPT
SUxxxxx	SIMULA
Uxxxxxx Vxxxxxx Wxxxxxx Xxxxxxx Yxxxxxx Zxxxxxx	Reserved for installation.

FILE DEFINITION BLOCK



Word 4

Bit	Field		Description
8	NR	1	NR option specified; no automatic recall.
7-6	RC	01	No RC or RT specified.
		00	RC option specified.
		10	RT option specified (implies RC as well).

†If VSN (key word 41) is specified, the one- to six-character volume serial number is contained in bits 59 through 24 with leading display code zero-filled.
††The system checks only bits 11 through 0 of this word.
†††All PF macros point to this word in the FDB, not to the first word.

Bit	Field	Description
5-2	FC	Function code:
		0001 SETP
		0010 ATTACH,GETPF
		0100 CATALOG,SAVEPF
		0110 EXTEND
		0111 ALTER
		1000 PURGE,PURGE(ST=xxx)
		1010 RENAME
		1100 PERM
0	C	Complete bit:
		1 Function completed.

Return code (bits 17 through 9 of word 4) and message written to the job dayfile:

Code	Significance
000	Function successful.
001	PFN/ID error.
002	lfn already in use.
003	Unknown lfn.
004	No room for extra cycle (limit is five).
005	PFC full.
006	No lfn or pfn.
010	Latest index not written for a random file.
011	File not on PF device.
012	File not cataloged; SN=setname.
013	Archive retrieval aborted.
014	Bad LPF communication.
015	Cycle number limit reached. Maximum value of cycle number is 999.
016	PFD full.
017	Function attempted on nonpermanent file.

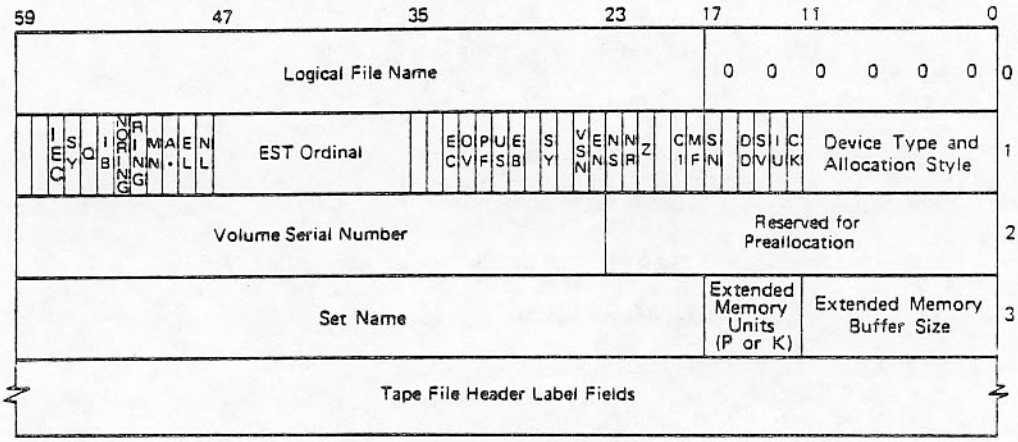
Code	Significance
020	Function attempted on nonlocal file.
021	Improper archive retrieval call.
022	File never assigned to a device.
023	Cycle incomplete or dumped.
024	PF already attached.
025	File archived.
026	Illegal character in FDB parameter.
027	Illegal lfn.
030	File dumped.
031	Illegal function code.
032	Purge attempt ignored; use RB parameter.
033	ALTER needs exclusive access.
034	FDB is too large.
035	File already in system.
036	No APF space.
037	Permission conflicts.
040	Illegal setname specified.
041	Device set not mounted at control point.
042	RBT chain too large for PFC.
043	File resides on unavailable device.
044	File not available.
070	PFM stopped by system.
071	Incorrect permission.
072	FDB address error.
073	I/O error on PFD/PFC read/write.
074	Illegal function attempt on incomplete cycle.

Keyword (bits 5 through 0 of any parameter word) and parameter value:

Value	Parameter
00	—; end of FDB list.
02	RP; retention period in days (binary).
03	CY; cycle number (binary).

Value	Parameter
04	TK; turnkey password definition (display code).
05	CN; control password definition (display code).
06	MD; modify password definition (display code).
07	EX; extend password definition (display code).
10	RD; read password definition (display code).
11	MR; multiread parameter (binary).
13	XR; control, modify, extend password definition (display code).
14	ID; owner-identification (display code).
16	AC; account parameter (display code).
17	EC; extended memory buffering (display code).
20	PW; passwords submitted (display code).
21	
22	
23	
24	
25	FO; file organization (display code).
26	PS; position.
30	PF; permanent file name.
31	LC; lowest cycle (binary).
32	ST; staging ID (display code).
33	RW; multiaccess rewrite (binary).
40	SN; set name (display code left-justified).
41	VS; VSN parameter (display code).
43	RB; RB conflict on permanent file.
53	UV; universal password (display code).

REQ FUNCTION PARAMETER LIST

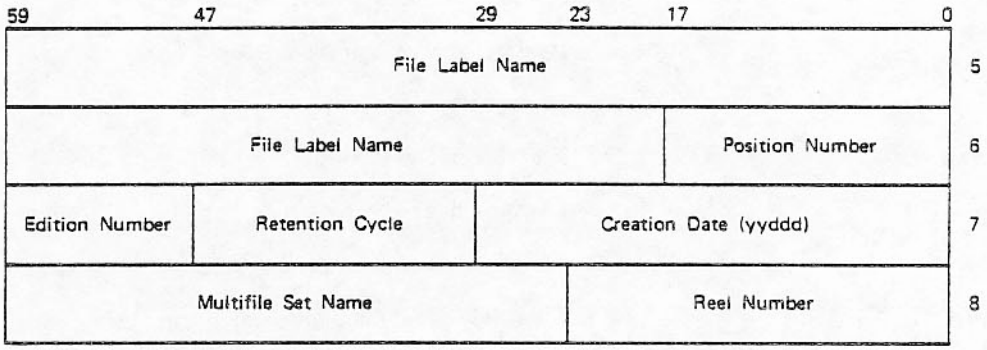


Word	Bit	Field	Description
2	59-58		Reserved.
	57	IEC	1 inhibits error correction on GE (6250 cpi) writes.
	56		1 assigns file to system device in system set.
	55	Q	1 assigns file to queue device (in queue set if no set name given).
	53	NORING	1 prohibits write enable ring in tape.
	52	RING	1 requires write enable ring in tape.
	51	MN	1 accepts either MT or NT assignment; disallows automatic assignment.
	50	A*	1 assigns any RMS device; overrides device-type specification.
	49	EL	1 is extended label fields in parameter words 5 through 9.
	48	NL	1 is normal label fields in parameter words 5 through 8.
	35		Reserved.
	34		Reserved.
	33	EC	1 is extended memory buffering requested; parameter word 4.
	32	OV	1 allows overflow to a different device.
	31	PF	1 assigns file to a PF device.

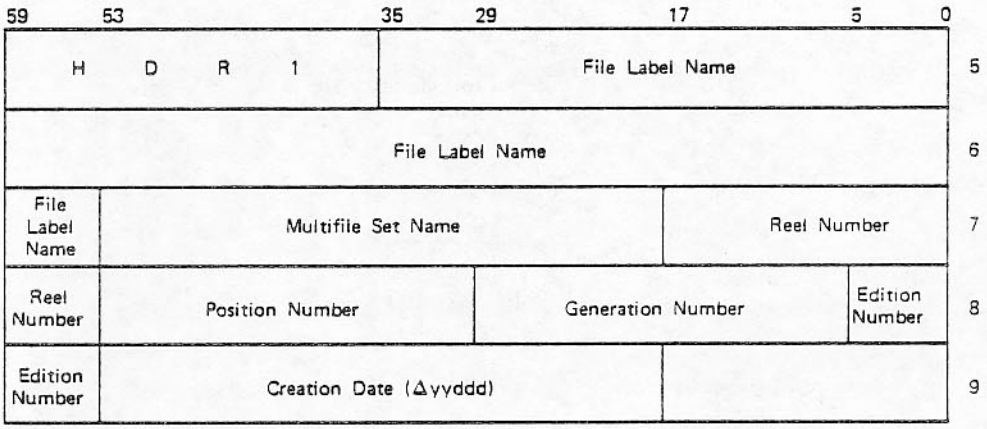
Word	Bit	Field	Description
	30	US	1 is ASCII conversion mode on nine-track tape.†
	29	EB	1 is EBCDIC conversion mode on nine-track tape.
	28		1 assigns automatically.
	27	SY	1 prints card image from RA+70.
	26		1 assigns two devices.
	25	VSN	1 is VSN declared in parameter word 3.
	24	EN	1 is tape has existing labels.
	23	NS	1 is tape has nonstandard labels.
	22	NR	1 is disable standard tape parity recovery procedure.
	21	Z	1 is SCOPE 3.3 labeled tape.
	20		1 returns error code without dayfile message or operator intervention.
	19	CI	1 is console checkpoint request.
	18	MF	1 is multiuser tape request.
	17	SN	1 is set name request.
	16		Reserved.
	15	DD	1 is default density for labels and data.
	14	SV	1 saves tape.
	13	IU	1 inhibits physical unload.
	12	CK	1 is checkpoint tape.
	11-0		Device type and allocation style (binary).

†An * preceding a parameter causes automatic assignment.

NORMAL LABEL FIELDS

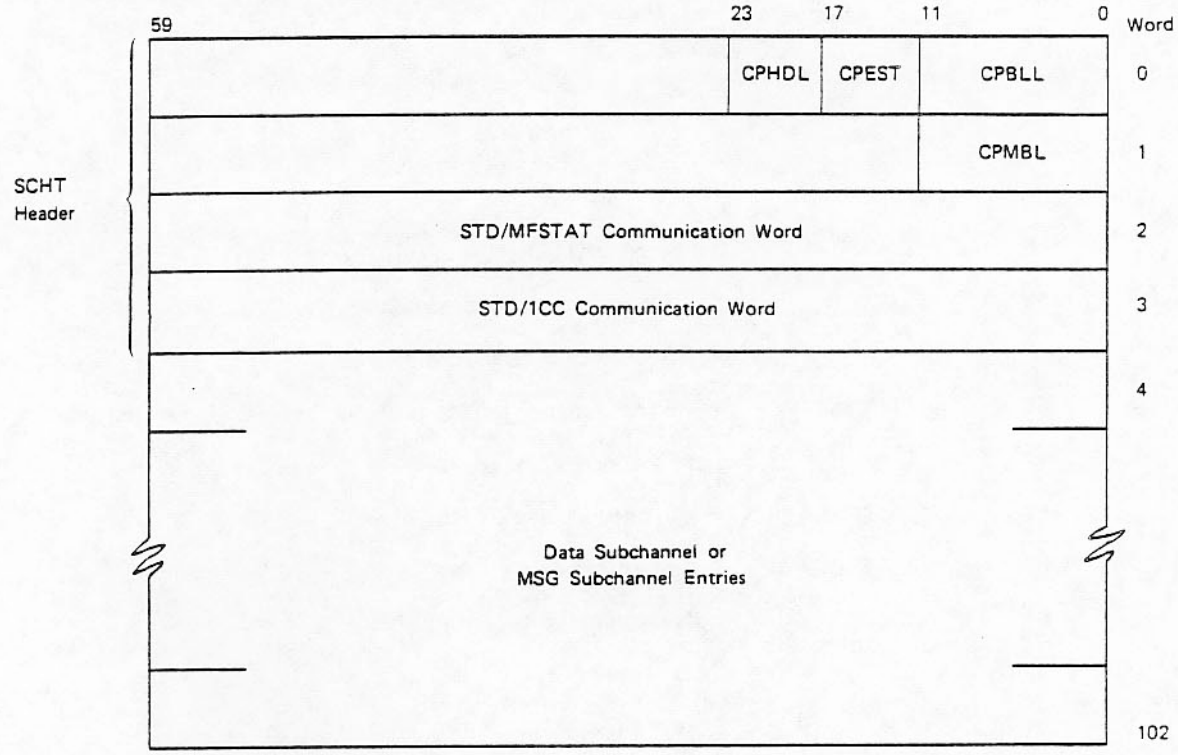


EXTENDED LABEL FIELDS



SUBCHANNEL TABLE (SCHT)

The SCHT is used by the CYBER Station in a multimainframe configuration. The SCHT consists of two parts, the header and one-word entries that represent data or message subchannels. This table resides within the field length of the station. Its purpose is to coordinate the transmission/reception of data or messages, to or from the linked mainframe, between the spun-off task (SPOT), STD, and MFSTAT. Word 2 of the header is a communications word between STD and MFSTAT. Word 3 of the header is a communications word between STD and 1CC.



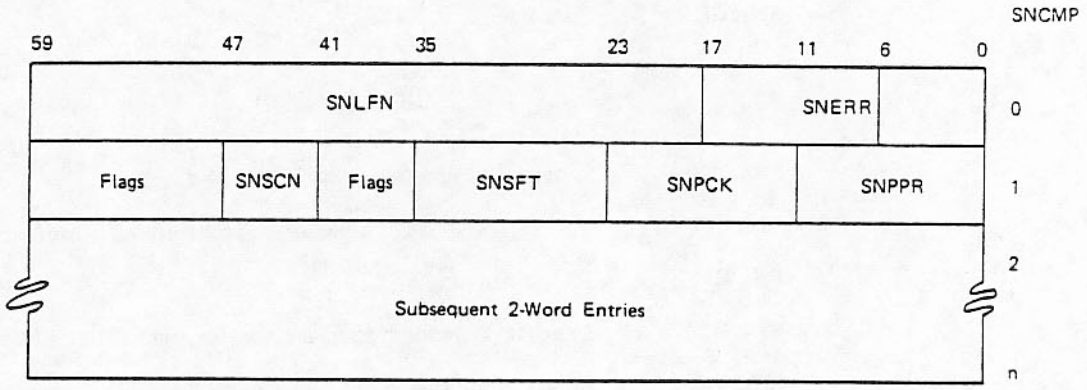
Word	Bit	Field	Description
0	23-18	CPHDL	SCHT header size minus 4.
	17-12	CPEST	EST ordinal.
	11-0	CPBLL	Current standard buffer size.
1	11-0	CPMBL	Maximum standard buffer size.
2	59-54	CPRCD	Request code (station only).
	52-48	CPRSC	Subchannel number.

Word	Bit	Field	Description
3	59-54	PPRCD	Request code.
	58	PPBUS	Request word busy.
	53-48	PPRSC	Subchannel busy.
	47-36	PPRCP	Control point number.
	17-0	PPRFT	FET address.
4-102†	59	LMTTY	Subchannel type. 1 Data. 0 Message.
	58	LMTSB	Indicates transmit buffer full.
	58	LMTDR	1 Receive data subchannel. 0 Transmit data subchannel.
	57	LMTAK	Indicates transmit buffer full and acknowledge expected.
	57	LMTEI	Send end-of-information.
	57	LMTCK	Try to request more data.
	56	LMTCN	End-of-information sent.
	56	LMTRB	Indicate receive buffer full.
	55	LMTUX	Unexpected data.
	54	LMTEX	Excess data.
	52-48	LMTCP	Control point of spun-off task.
	47-36	LMTRL	Receive message buffer length.
	35-18	LMTRC	Receive word count (data subchannel).
	35-18	LMTRF	Receive message buffer address.
	17-0	LMTSF	Transmit message buffer address.
	17-0	LMTFT	FET address.

† Data and message subchannel entries.

SPOT NAME TABLE (SNT)

The SNT is used by the CYBER Station in a multimainframe configuration. The SNT consists of two-word entries that reside within the field length of the station. For each spun-off task (SPOT), there is one entry with the name of the task in the first word of the entry. Its chief purpose is communications between the task and the station, in which 1CC acts as the communicator for the task. The opening, closing, and backspacing of the staged file are coordinated through the SNT. Routines that access this table are 1NS, 1CC, MFSTAT, and DSD.

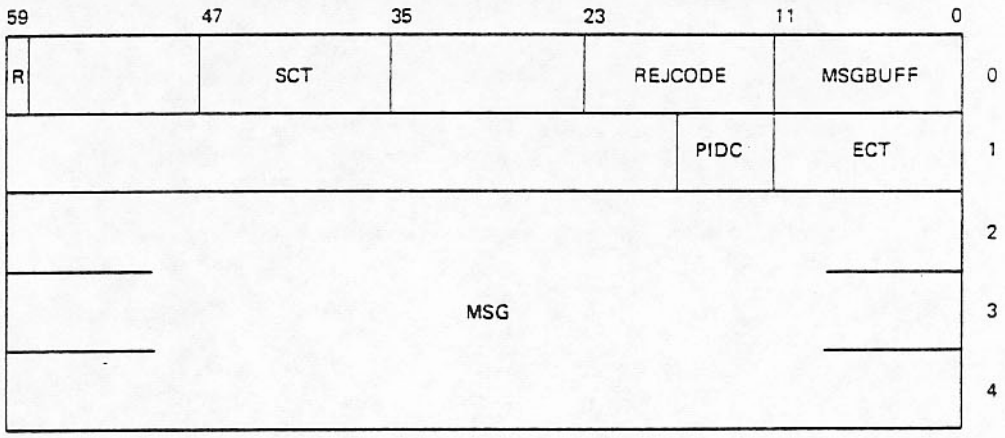


Word	Bit	Field	Description
0	59-18	SNLFN	Name of spun-off task is mnnnncc. m is the identifying character of linked mainframe, and n's are the job ordinal on mainframe m. cc are arbitrary characters assigned by the station.
	17-6	SNERR	1EJ error return code.
	00	SNCMP	Complete indicator set to 0 when task is spun off, and set to 1 when 1EJ goes through end-of-job processing.
1	59	SNIIN	Operation for spooled input file.
	58	SNOIN	Operation for spooled output file.
	57	SNCLO	File close operation.
	56	SNOPN	File open operation.
	55	SNFLK	File linkup chores are in progress or complete (if e is 0).
	54	SNBKS	Backspace operation (for end-of-volume tape stage processing). When this bit is set, bits 17 through 0 contain backspace word count.
	53	SNBUS	1CC busy bit; if on, open, close, or backspace, operation is in progress (set and cleared by 1CC only).

Word	Bit	Field	Description
	52	SNDOP	Open procedure for the task dayfile is complete.
	51	SNFIN	Dayfile transfer completed.
	49	SNRFL	Buffer space obtained for dayfile transmission.
	48	SNRWI	File direction. 0 Transmit. 1 Receive.
	47-42	SNSCN	Subchannel number to be used for file I/O.
	41	SNIOR	I/O request message received from linked mainframe.
	41	SNDRM	File is random.
	40	SNODD	Deadstart or dump request received and file can be opened.
	40	SNCAN	Linked mainframe can receive or transmit a spooled file.
	40	SNIOD	I/O delink transmitted to linked mainframe.
	39	SNIOL	I/O linkup transmitted to linked mainframe.
	39	SNCNT	Linked mainframe cannot receive or transmit a spool file.
	38-36	SNSAT	Type of spun-off task. 1 ATTACH. 2 CATALOG. 3 POST STAGE (write). 4 PRE STAGE (read). 5 SPOOLED FILE (in or out). 6 DEADSTART OR DUMP FILE. 7 LOCAL FILE.
	35-24	SNSFT	File ordinal.
	23-12	SNPCK	Address for spooling file packet (linkage).
	17-0	SNPRU	Number of words to backspace.
	17-0	SNDBF	Dayfile buffer address.
	11-0	SNPPR	Address of subchannel table for mainframe.
2		ENTRY	More two-word entries following.

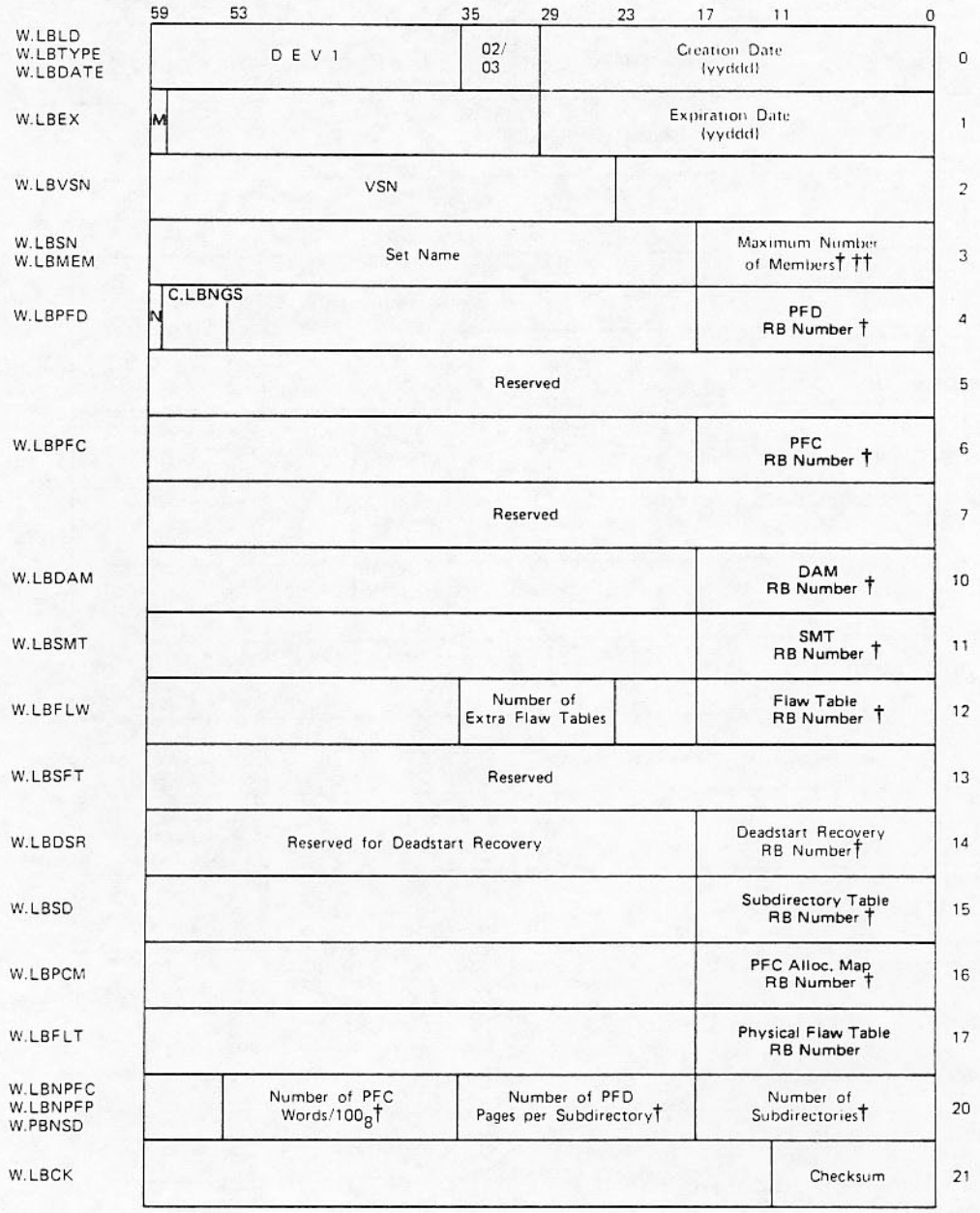
DSD-INTERCOM COMMUNICATION THROUGH STATION (MSG)

MSG is used by the CYBER Station in a multimainframe configuration. This table, residing within the station field length, serves as a communication area for DSD, INTERCOM, and the station.



Word	Bit	Field	Description
0	59	R	Command or display rejected by linked mainframe.
	47-36	SCT	Station sequence count.
	23-12	REJCODE	Type of error.
	11-0	MSGBUFF	Address reply to the message (relative to RA of station). Replay is available when SCT equals ECT.
1	17-12	PIDC	Identifying character of PID, to which message is sent.
	11-0	ECT	External processor (DSD or INTERCOM) sequence count. Message should be stored before the word containing PIDC and ECT (which should be incremented by one).
2		MSG	Message request from external processor to be sent to designated mainframe. MSG starts in word 2 and can be up to three words long.

DEVICE SET LABEL

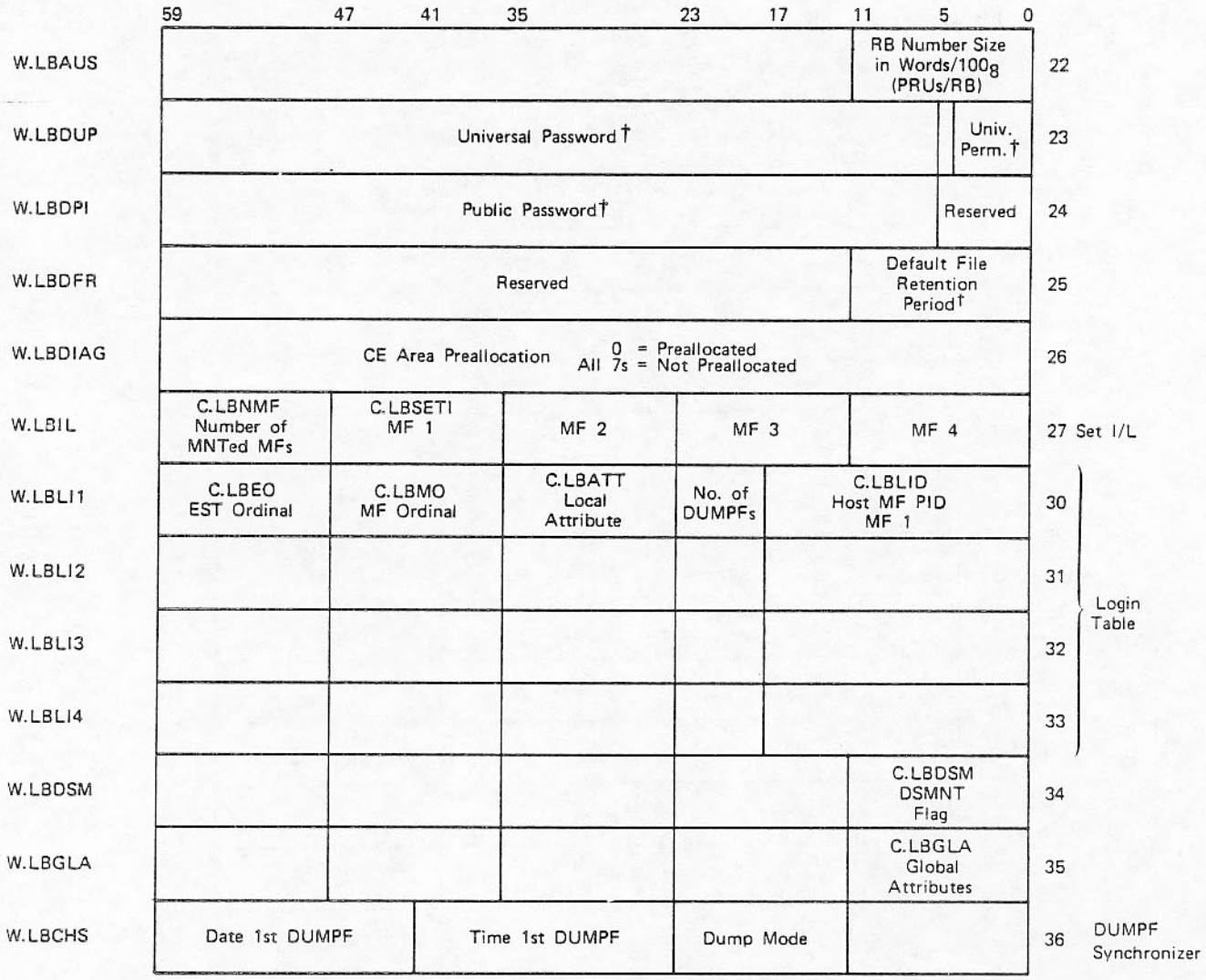


M If set, system of PSR level 430 or higher initialized pack. At this time, PB size changed from 56 to 112.

N Gap sector flag; if set, no gap sectors.

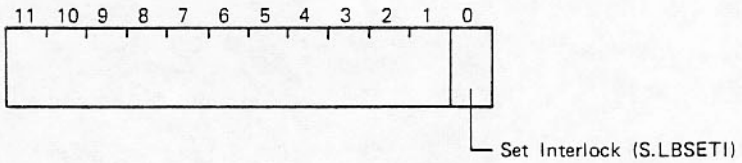
† Field contains nonzero value only on master device.

†† The length of the SMT is twice the value contained in this field.

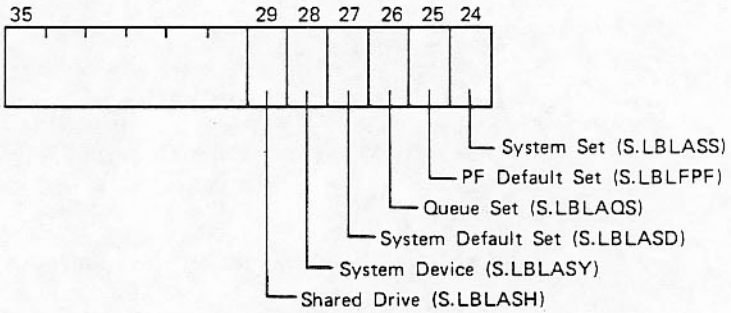


†Field contains nonzero value only on master device.

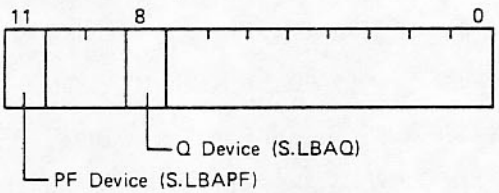
Detail: Set Interlock Byte in W.LBIL (Word 27)



Detail: Local Attributes in W.LBLI1-W.LBLI4 (Words 30-33)



Detail: Global Attributes in W.LBGLA (Word 35)



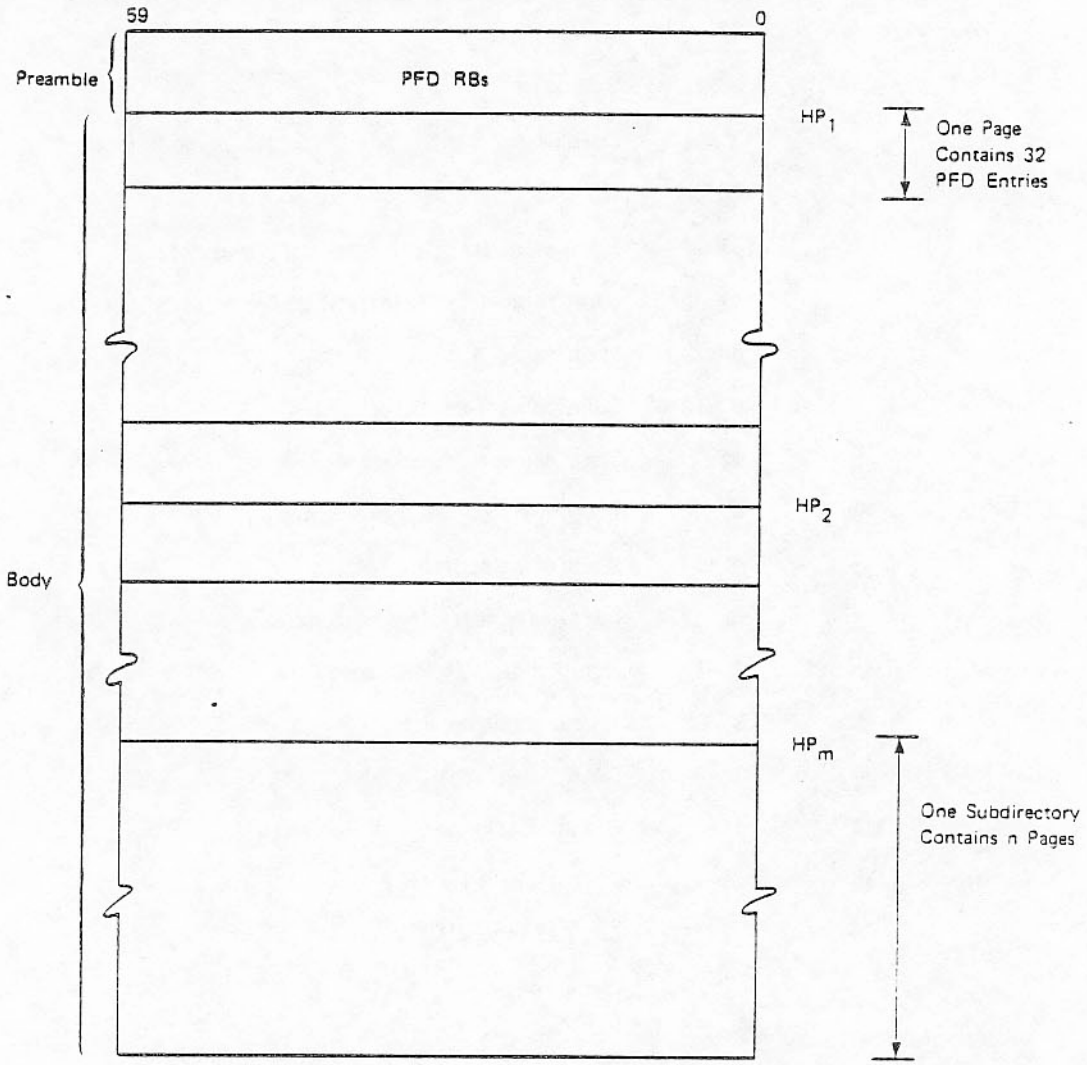
Symbol	Word	Bit	Description
W.LBLD	0	59-36	DEV1 in display code.
W.LBTYPE	0	35-30	02 in display code indicates half-track recording mode.
			03 in display code indicates full-track recording mode.
W.LBDATE	0	29-0	Creation date in the form yyddd (display code).
W.LBEX	1	29-0	Expiration date in the form yyddd (display code).
W.LBVSN	2	59-24	VSN right-justified, display zero-filled (display code).

Symbol	Word	Bit	Description
W.LBSN	3	59-18	Set name left-justified, binary zero-filled (display code).
W.LBMEM	3	17-0	Maximum number of members (binary).
W.LBPFD	4	59	Gap sector flag; if set, no gap sectors.
		17-0	PFD RB number (binary).
-	5	59-0	Reserved.
W.LBPFC	6	17-0	PFC RB number (binary).
-	7	59-0	Reserved.
W.LBDAM	10	17-0	DAM RB number (binary).
W.LBSMT	11	17-0	SMT RB number (binary).
W.LBFLW	12	35-24	Number of extra flaw tables.
		17-0	Flaw table RB number (binary).
-	13	59-0	Reserved.
W.LBDSR	14	17-0	Deadstart recovery RB number.
W.LBSD	15	17-0	Subdirectory table RB number (binary).
W.LBPCM	16	17-0	PFC allocation map RBs (binary).
W.LBFLT	17	17-0	Physical flaw table RB number (binary).
W.LBNPFC	20	53-36	Number of PFC words/100_8.
W.LBNPFP	20	35-18	Number of PFD pages per subdirectory (binary).
W.LBNSD	20	17-0	Number of subdirectories (binary).
W.LBCK	21	11-0	Checksum of this label PRU.
W.LBAUS	22	11-0	RB size.
W.LBDUP	23	59-6	Universal password (display code).
		3-0	Universal permission bits.

Bit	Permission
3	Control (C).
2	Modify (M).
1	Extend (E).
0	Read (R).

Symbol	Word	Bit	Description
W.LBDPI	24	59-6	Public password (display code).
		5-0	Reserved.
W.LBDFR	25	59-12	Reserved.
		11-0	Default permanent file retention period (binary).
W.LBDIAG	26	59-0	CE area preallocation.
W.LBIL	27	59-48	Number of mainframes sharing mass storage.
		47-36	Mainframe 1 set interlock (refer to detail).
		35-24	Mainframe 2 set interlock.
		23-12	Mainframe 3 set interlock.
		11-0	Mainframe 4 set interlock.
W.LBLI1 through W.LBLI4	30-33	59-48	Equipment status table ordinal.
		47-36	Mainframe ordinal.
		35-24	Local attributes (refer to detail).
		23-18	Number of DUMPFs executing.
		17-0	Mainframe identification.
W.LBDSM	34	11-0	DMNT flag.
W.LBGLA	35	11-0	Global attribute (refer to detail).
W.LBCHS	36	59-42	Date of first DUMPF.
		41-24	Time of first DUMPF.
		23-12	Dump mode.

PERMANENT FILE DIRECTORY (PFD) OVERVIEW

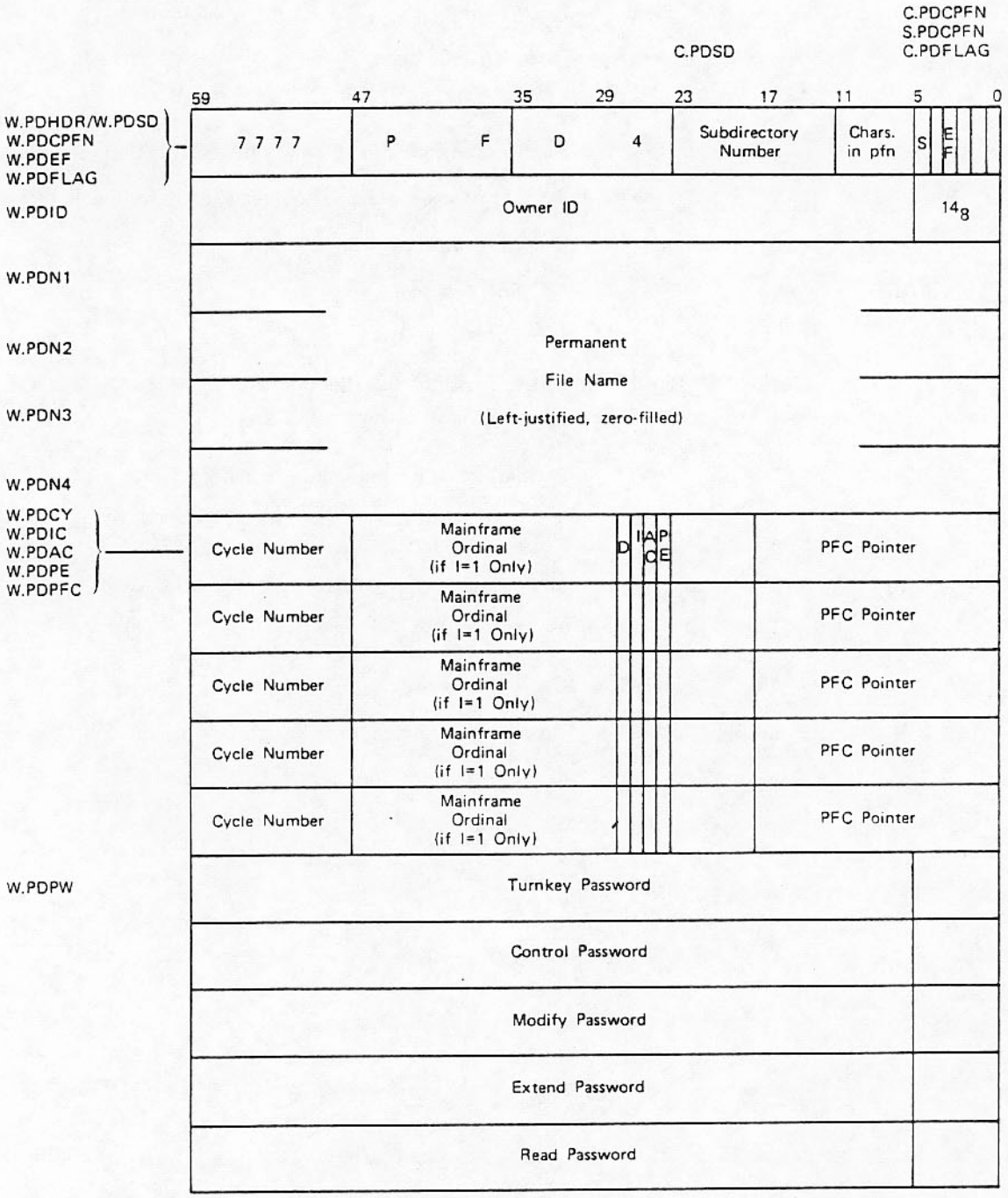


This table has a preamble that describes the RBs assigned to the table. The preamble is the first PRU of the first RB assigned to the table. Starting with byte 0 of word 0 of the preamble, each byte contains an RB number assigned to this table. A 0 byte indicates the last RB number.

HP_1	ID hash point.
m	Number of ID hash points.
n	Number of pages between ID hash points; must be an integral power of 2.

m * n = number of pages in the PFD body.

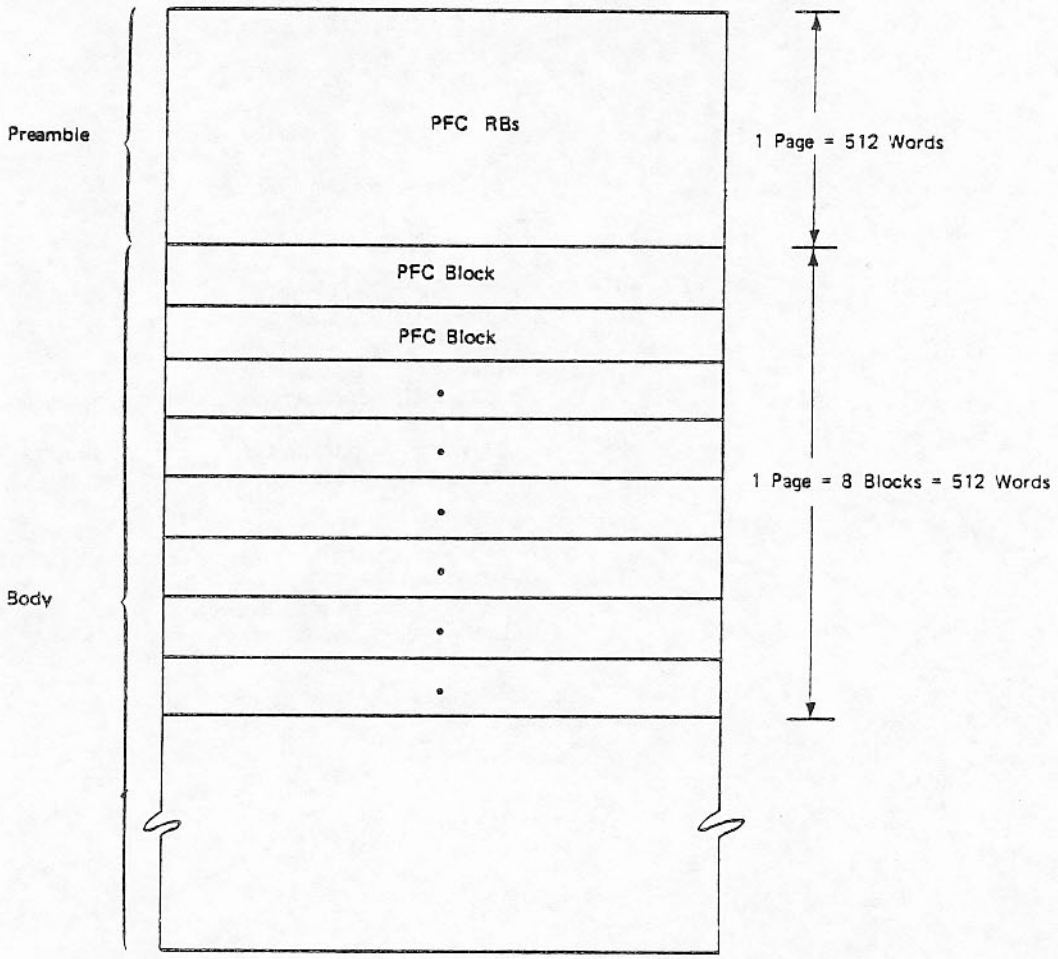
PFD ENTRY


C.PDCPFN
S.PDCPFN
C.PDFLAG
C.PDSD
59
47
35
29
23
17
11
5
0
W.PDHDR/W.PDSD
W.PDCPFN
W.PDEF
W.PDFLAG
7 7 7 7
P
F
D
4
Subdirectory Number
Chars. in pfn
S
E
F
0
W.PDID
Owner ID
14_8
1
W.PDN1
2
W.PDN2
Permanent
3
File Name
W.PDN3
(Left-justified, zero-filled)
4
W.PDN4
5
W.PDCY
W.PDIC
W.PDAC
W.PDPE
W.PDPFC
Cycle Number
Mainframe Ordinal (if I=1 Only)
D
I
A
C
P
E
PFC Pointer
6
7
10
11
12
W.PDPW
Turnkey Password
13
Control Password
14
Modify Password
15
Extend Password
16
Read Password
17

Symbol	Word	Bit	Description
W.PDHDR	0	59-48	7's in binary.
		47-36	PF in variable code.
		35-24	DR in variable code.
W.PDSD	0	23-12	Subdirectory number to which the ID was hashed (binary).
W.PDCPFN	0	11-6	Number of characters in the permanent file name (binary).
W.PDFLAG	0	5	End of subdirectory flag.
W.PDEF	0	3	0 Entry is free.
			1 Entry is in use.
W.PDID	1	59-6	Owner ID, right-justified, blank-filled (display code).
		5-0	14_8.
W.PDN1	2	59-0	Permanent file name, left-justified, trailing binary zeros with no nested bytes of zeros.
W.PDN2	3	59-0	Same as W.PDN1.
W.PDN3	4	59-0	Same as W.PDN1.
W.PDN4	5	59-0	Same as W.PDN1.
W.PDCY	6-12	59-48	Cycle number (binary).
W.PDFMO	6-12	47-36	Mainframe ordinal; for incomplete cycle only.
W.PDCY	6-12	27	0 Cycle is not dumped.
			1 Cycle is dumped.

Symbol	Word	Bit	Description
W.PDIC	6-12	26	0 Cycle is complete.
			1 Cycle is incomplete.
W.PDAC	6-12	25	0 Cycle is not archived.
			1 Cycle is archived.
W.PDPE	6-12	24	0 Cycle has no parity errors.
			1 Cycle has parity errors.
W.PDPFC	6-12	17-0	PFC pointer as a 100_8 word offset (binary).
W.PDPW	13	59-6	Password parameter for turnkey permission, right-justified, binary zero-filled (display code).
	14	59-6	Password parameter for control permission, right-justified, binary zero-filled (display code).
	15	59-6	Password parameter for modify permission, right-justified, binary zero-filled (display code).
	16	59-6	Password parameter for extend permission, right-justified, binary zero-filled (display code).
	17	59-6	Password parameter for read permission, right-justified, binary zero-filled (display code).

PERMANENT FILE CATALOG (PFC) OVERVIEW†



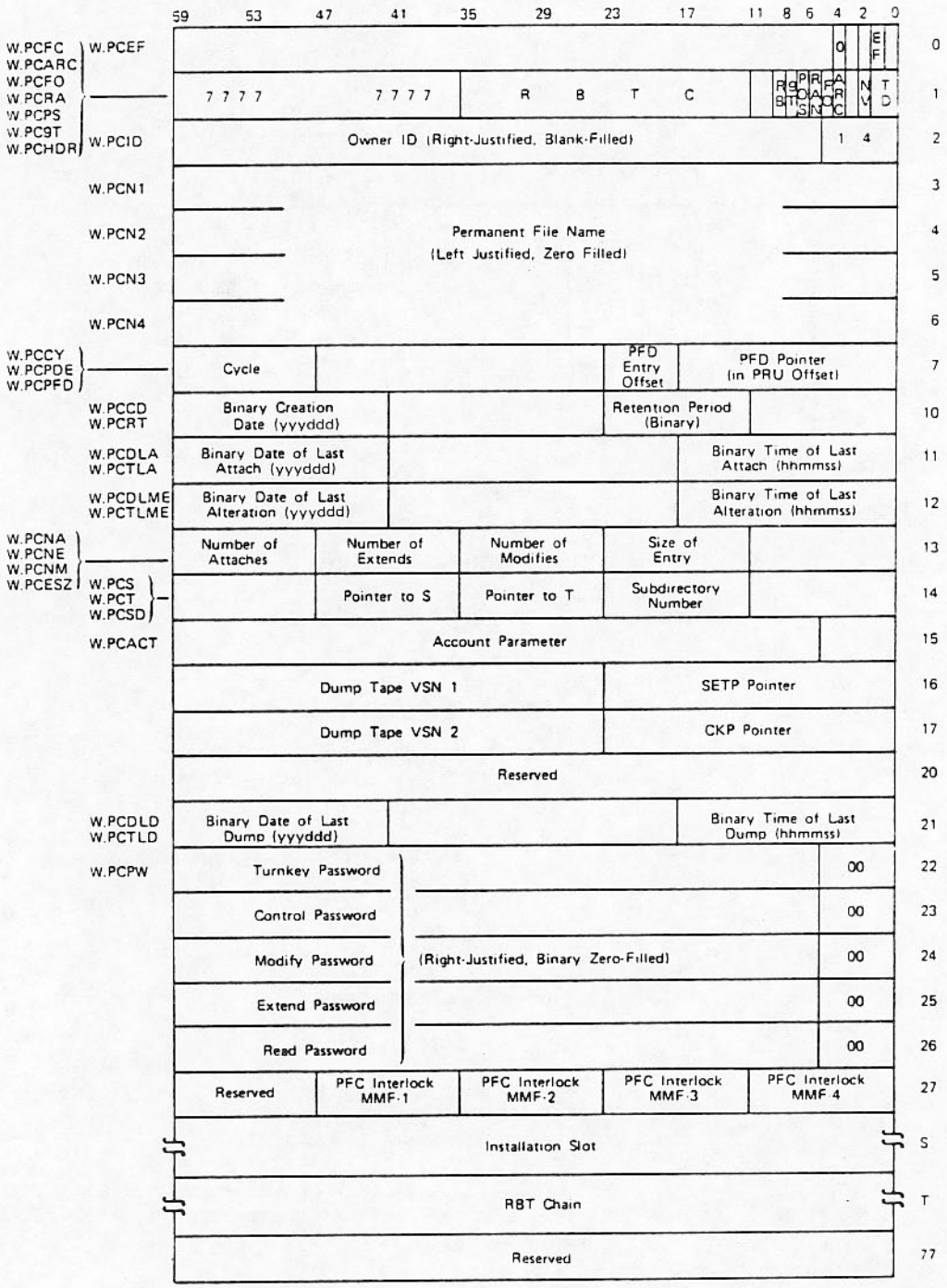
This table has a preamble that describes the RBs assigned to the table. The preamble is the first PRU of the first RB assigned to the table. Starting with byte 0 of word 0 of the preamble, each byte contains an RB number assigned to this table. A 0 byte indicates the last RB number.

Each PFC entry occupies one or more consecutive PFC blocks.

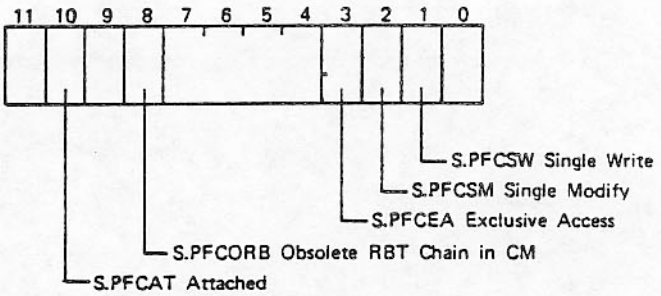
---

†The PFC was formerly called the record block table catalog (RBTC).

PFC ENTRY FOR PERMANENT FILES



Detail: PFC Interlock Byte



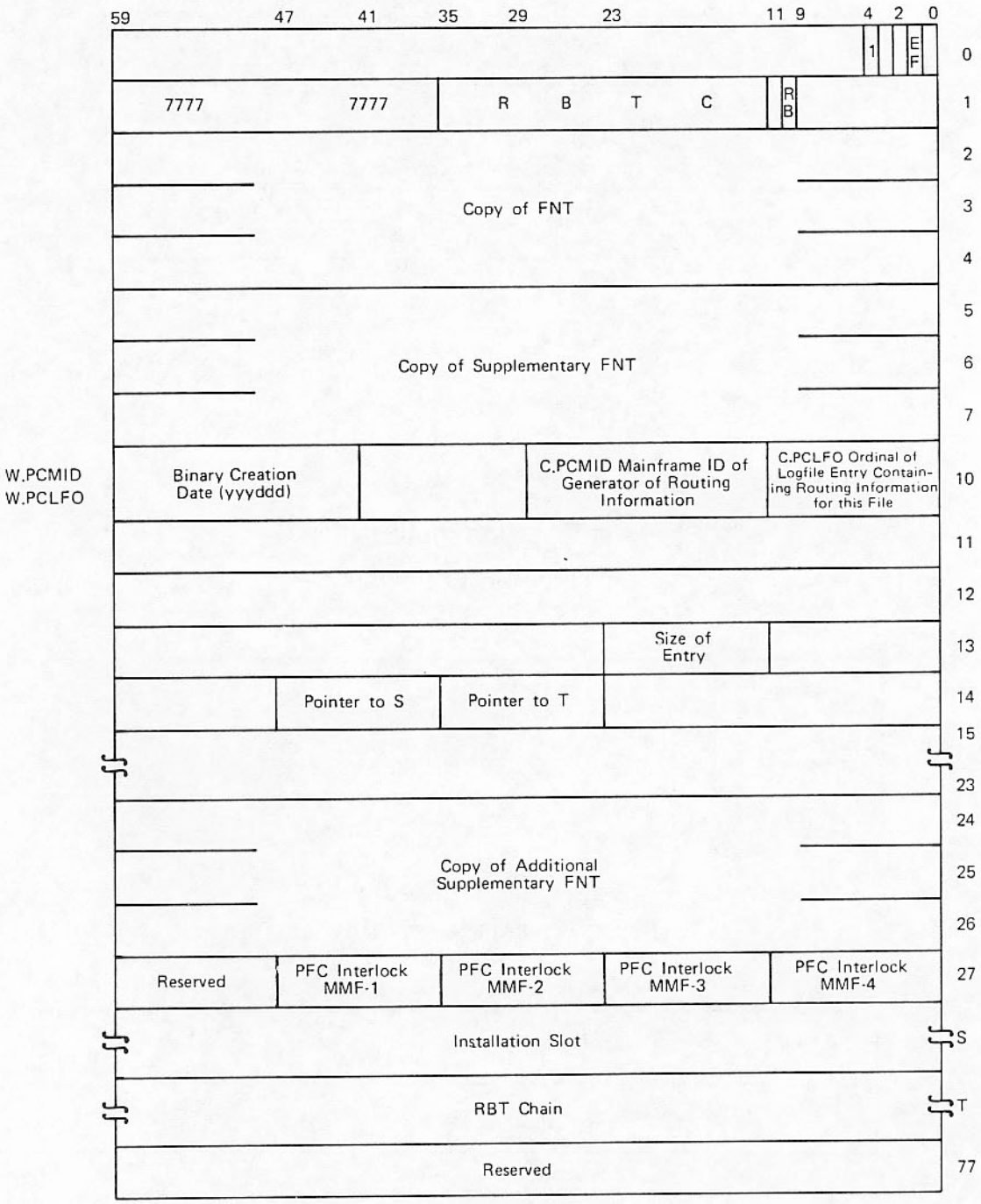
Symbol	Word	Bit		Description
W.PCEF	0	4	0	Permanent file entry.
			1	Queue file entry.
		1	0	Entry free.
			1	Entry in use.
W.PCHDR	1	35-12	RBTC in display code.	
W.PCRB	1	9	0	No RB conflicts.
			1	RB conflicts exist on this file.
W.PC9T	1	8	0	Seven-track tape.
			1	Nine-track tape.
W.PCPS	1	7	0	File is not positioned.
			1	File is positioned.
W.PCRA	1	6	0	File is not random.
			1	File is random.
W.PCPO	1	5	0	File is not an SAAM file.
			1	File is an SAAM file (file organization IS/DA/AK).

Symbol	Word	Bit	Description
W.PCARC	1	4	0 Cycle is not archived.
			1 Cycle is archived.
W.PCFC	1	2	0 Dumped.
			1 New version.
		1-0	Tape density, seven-track.
			00 556 cpi.
			01 200 cpi.
			10 800 cpi.
			11 Default.
			Tape density, nine-track.
			00 Default
			01 6250 cpi.
			10 800 cpi.
			11 1600 cpi.
W.PCID	2	59-6	Owner ID.
		5-9	14_8.
W.PCN1	3	59-0	Permanent file name, left-justified, zero-filled (display code).
W.PCN2	4	59-0	Same as W.PCN1.
W.PCN3	5	59-0	Same as W.PCN1.
W.PCN4	6	59-0	Same as W.PCN1.
W.PCCY	7	59-48	Cycle number (binary).
W.PCPDE	7	23-18	PFD entry number.
W.PCPFD	7	17-0	PFD pointer as a sector offset (binary).
W.PCCD	10	59-42	Creation date in the form yyddd (binary).
W.PCRT	10	23-12	Retention period (binary).
W.PCDLA	11	59-42	Date of last attach in form yyddd (binary).
W.PCTLA	11	17-0	Time of the last attach in the form hhmmss (binary).

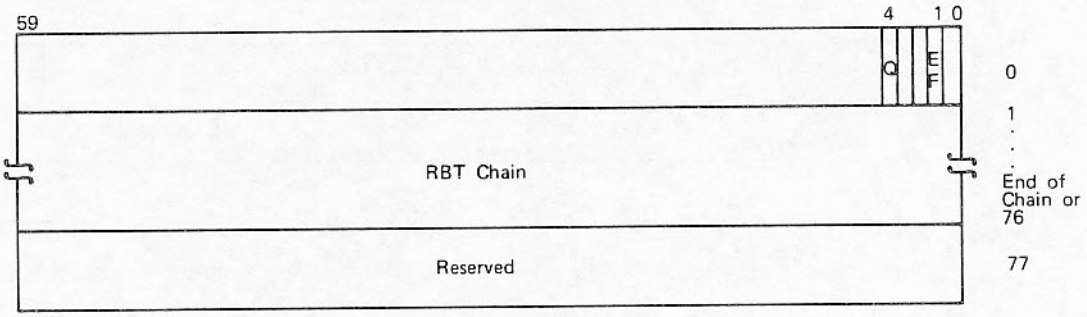
Symbol	Word	Bit	Description
W.PCDLME	12	59-42	Date of the last alter in the form yyddd (binary).
W.PCTLME	12	17-0	Time of the last alter in the form hhmmss (binary).
W.PCNA	13	59-48	Number of attaches (binary).
W.PCNE	13	47-36	Number of extends (binary).
W.PCNM	13	35-24	Number of modifies (binary).
W.PCESZ	13	23-12	Size of the entry in binary number of words.
W.PCS	14	47-36	Number of words from word 13 to the user area.
W.PCT	14	35-24	Number of words between word 13 and start of RBT chain.
W.PCSD	14	23-12	Subdirectory number (binary).
W.PCACT	15	15	Account parameter code, left-justified, blank-filled (display code).
	27		PFC interlock for MMF configuration; each byte contains the following flags.

Bit	Description
10	File attached (S.PFCAT).
8	Obsolete RBT chain in CM (S.PFCORB).
3	Exclusive access (S.PFCEA).
2	Single modify (S.PFCSM).
1	Single write (S.PFCSW).

PFC ENTRY FOR I/O QUEUES



PFC ENTRY OVERFLOW



Q=0 Permanent file PFC entry.

Q=1 Queue file PFC entry.

DEVICE SET RBT CHAINS IN PFC

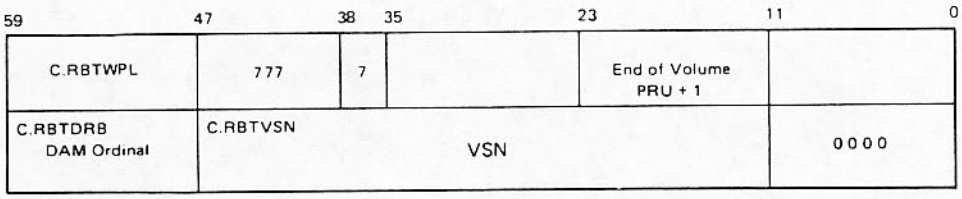
FIRST RBT WORD PAIR

59	47	38	35	29	23	11	0
C.RBTWPL		7	C.RBTAL Device Type	Alloc. Type	C.RBTPRU Last PRU + 1	C.RBTBIT Flags	
C.RBTDRB DAM Ordinal	C.RBTVSN VSN					RB_7	

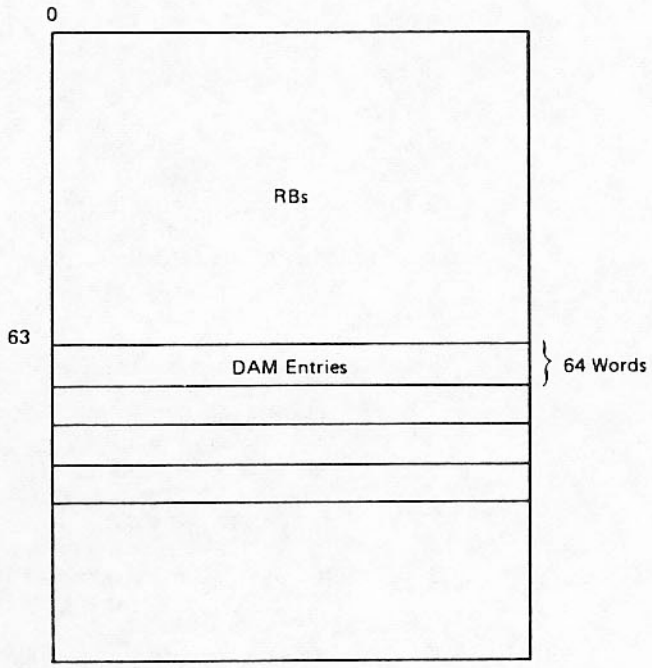
OTHER WORD PAIRS EXCEPT OVERFLOW

59	47	38	35	23	11	0
C.RBTWPL		0	RB_0	RB_1	RB_2	
RB_3	RB_4		RB_5	RB_6	RB_7	

OVERFLOW WORD PAIRS



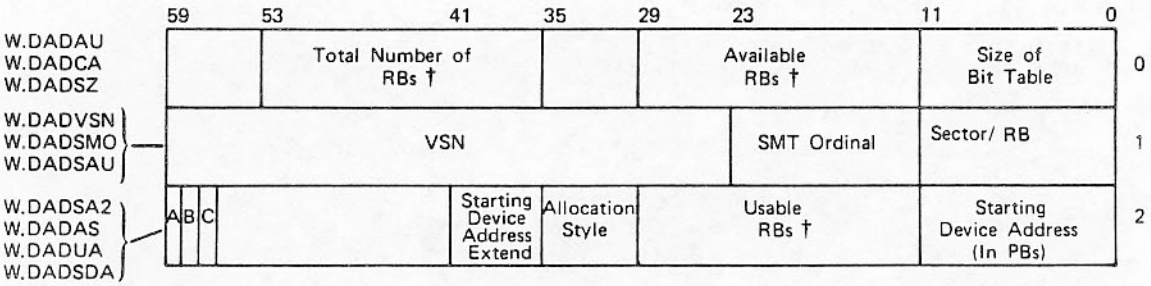
DEVICE ALLOCATION MAP (DAM) OVERVIEW



This table has a preamble that describes the RBs assigned to the table. The preamble is the first PRU of the first RB assigned to the table. Starting with byte 0 of word 0 of the preamble, each byte contains an RB number assigned to this table. A 0 byte indicates the last RB number.

Every DAM starts on a sector boundary. If the entry is greater than 64 words, it overflows to the next PRU or PRUs.

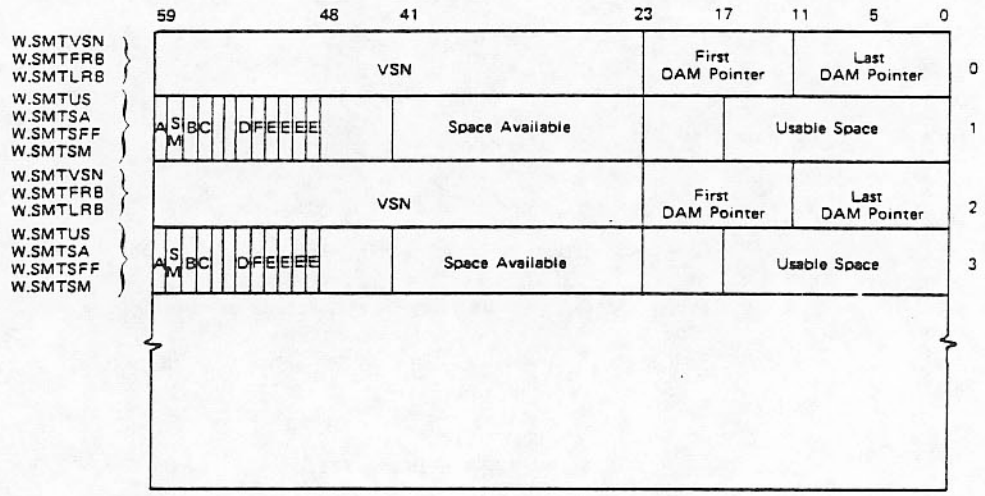
DAM HEADER



Field Name	Symbol	Word	Bit	Description
	W.DADAU	0	53-36	Total number of RBs.
	W.DADCA	0	29-12	Currently available RBs.
	W.DADSZ	0	11-0	Size of bit table in words.
	W.DADVSN	1	59-24	VSN.
	W.DADSMO	1	23-12	Set member ordinal.
	W.DADSAU	1	11-0	Sectors per RB.
A	W.DADPBC	2	59	PB size compatibility flag. Zero indicates PB size is 56_{10}PRUs. One indicates PB size is $112_{10}/114_{10}$ PRUs.
B	W.DADFAD	2	58	If set, no-attribute-file allocation flag (S.DADFA) is defined in DAM.
C	W.DADFA	2	57	No-attribute-file allocation flag. Zero indicates allocation is not allowed. One indicates allocation is allowed.
	W.DADSA2	2	41-36	Extension of starting device address (W.DADSDA).
	W.DADAS	2	35-30	Allocation style.
	W.DADUA	2	29-12	Usable RBs equal total RBs minus flaws minus system RBs.
	W.DADSDA	2	11-0	Starting device address (SDA) in PBs. Two times SDA is used for 844 devices.

†Values exceeding 4095_{10} are not supported.

SET MEMBER TABLE (MASS STORAGE)



Field Name	Description
A	PF device (S.SMTSFF).
SM	Mounted flag (S.STMTSM).
B	Recover flag.
C	Queue device (S.SMTSFQ).
D	Preallocated for C.E. diagnostics (S.SMTPR).
E	Mounted on mainframe ordinal 1 through 4 (bit 51 equals 1, bit 50 equals 2, bit 49 equals 3, bit 48 equals 4) (S.SMTMF).
F	Operator requested dismount (S.SMTOD).

The length of the SMT is two times the maximum number of members as shown in word 3 of the master device label. A two-word entry will exist for each member in a set.

Zero entries can be intermixed with VSN entries for member devices.

Symbol	Word	Bit	Description
W.SMTVSN	Even	59-24	VSN of the pack, right-justified, display zero-filled.
W.SMTFRB	Even	23-12	First DAM pointer as a sector offset (binary).
W.SMTLRB	Even	11-0	Last DAM pointer as a sector offset (binary).

Symbol	Word	Bit		Description
W.SMTSFF	Odd	59	0	Permanent files do not reside on this device.
			1	Permanent files may reside on this device.
W.SMTSM	Odd	58	0	Device is not mounted.
			1	Device is mounted.
		57		Recover interlock (master pack only).
		56	0	Queue files do not reside on this device.
			1	Queue files may reside on this device.
		53	0	Device is not preallocated.
			1	Device is preallocated.
		52	0	Operator dismount not outstanding.
			1	Operator dismount outstanding.
		51-48	0	Not mounted by mainframe with this mainframe ordinal.
			1	Mounted by mainframe with this mainframe ordinal.
				(Bit 51 is mainframe ordinal 1, bit 50 is mainframe ordinal 2, and so on.)
W.SMTSA	Odd	41-24		Total allocatable space available on this device (binary) is number of RBs currently not in use on the device.
W.SMTUS	Odd	17-0		Total number of RBs minus number of flaws and minus number of system table RBs.

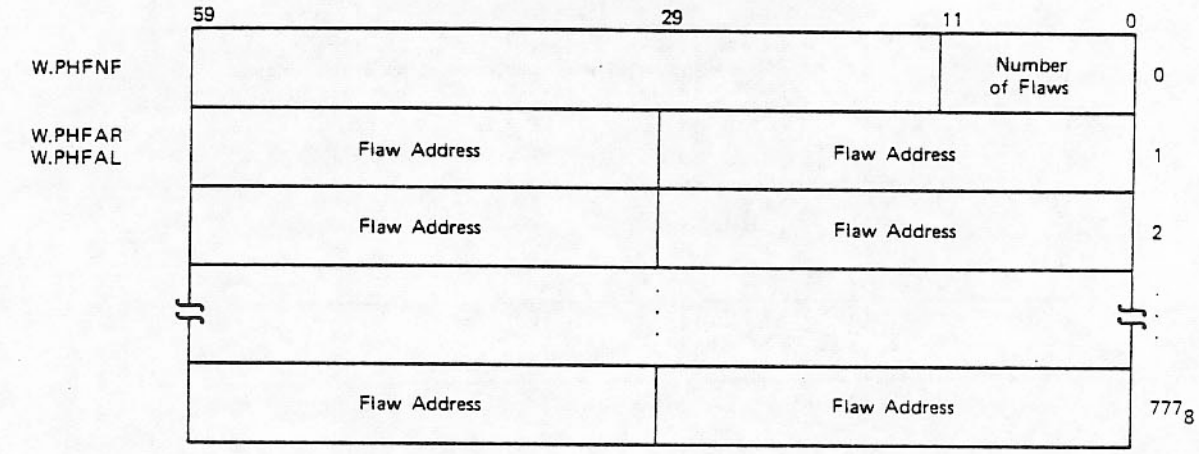
LOGICAL FLAW TABLE (LFT)

The logical flaw table has the same format as the DAM, but only bits corresponding to flawed sectors (within allocation unit) are set.

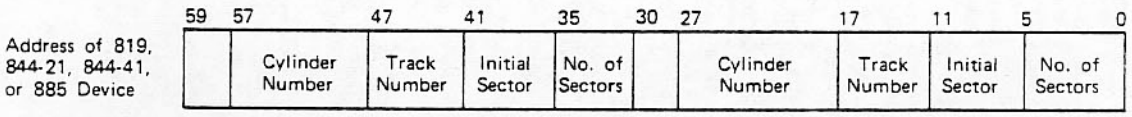
This table has a preamble that describes the RBs assigned to the table. The preamble is the first PRU of the first RB assigned to the table. Starting with byte 0 of word 0 of the preamble, each byte contains an RB number assigned to this table. A 0 byte indicates the last RB number.

PHYSICAL FLAW TABLE

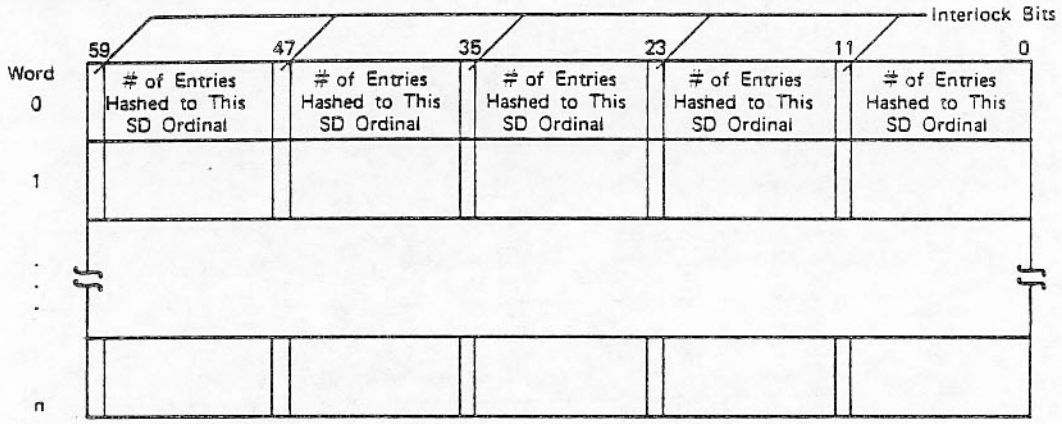
819, 844-21, 844-41, AND 885 DEVICES



PHYSICAL FLAW TABLE ENTRIES



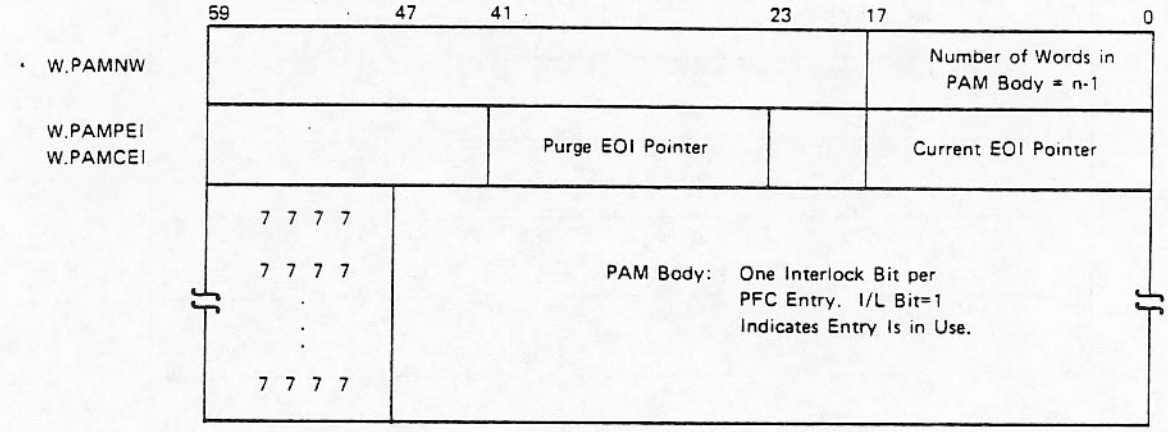
SUBDIRECTORY TABLE



Word	Bit	Description
0-n	59,47,35,23,11	Interlock bit; always zero on RMS copy of the table (reserved for 7000 use only).
	58-48,46-36,34-24,22-12,10-0	Number of entries that have hashed to this subdirectory ordinal (binary).

PFC ALLOCATION MATRIX (PAM)

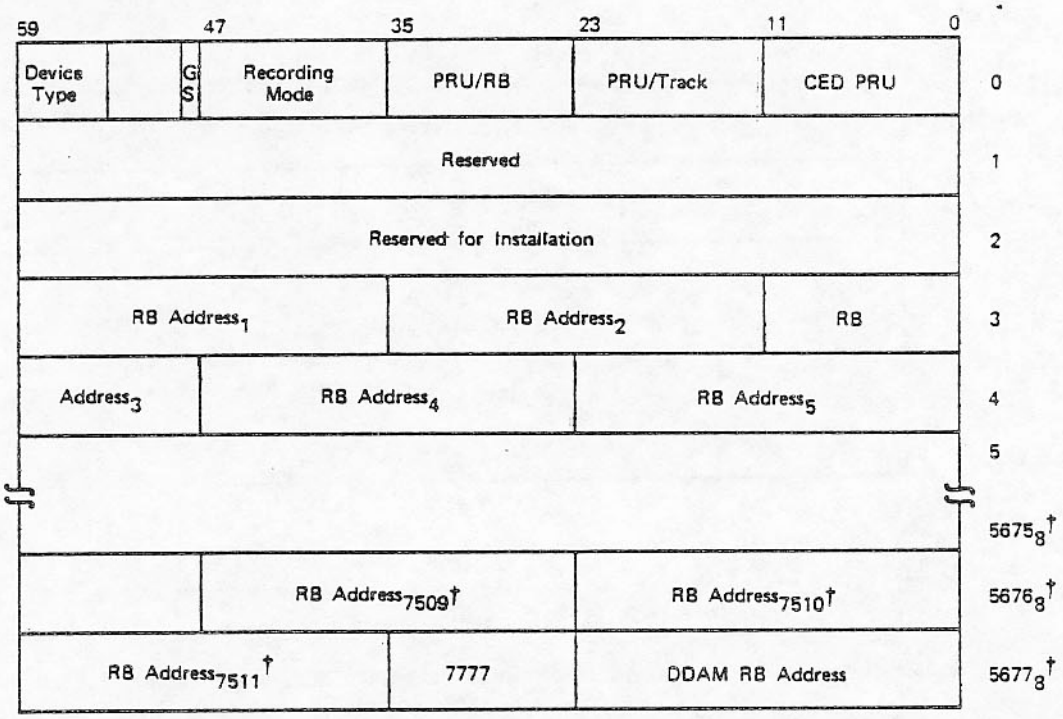
(Reserved for SCOPE 2 processing.)



Symbol	Word	Bit	Description
W.PAMNW	0	17-0	Number of words in PAM body.
W.PAMPEI	1	41-24	Pointer to empty 100_8 word block created by purge as a PFC sector offset.
W.PAMCEI	1	17-0	PFC sector offset to first 100_8 word block not in use after the last 100_8 word block in use.

The PAM body represents one interlock bit per PFC entry. A PAM bit set implies that an entry is in use. Only bits 47 through 0 of the body are used.

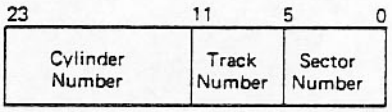
DDAM FILE FORMAT



Word	Bit	Description
0	59-54	Device type.
		13 844-21 disk drive.
		14 844-41 disk drive.
		17 885 disk drive.
	53-49	Not used.
	48	Gap sector flag.
		1 No gap sectors.
	47-36	Recording mode.
		2 Half-track.
		1 Full-track.
	35-24	RB size in PRUs.

†Assumes 57 PRUs/RB.

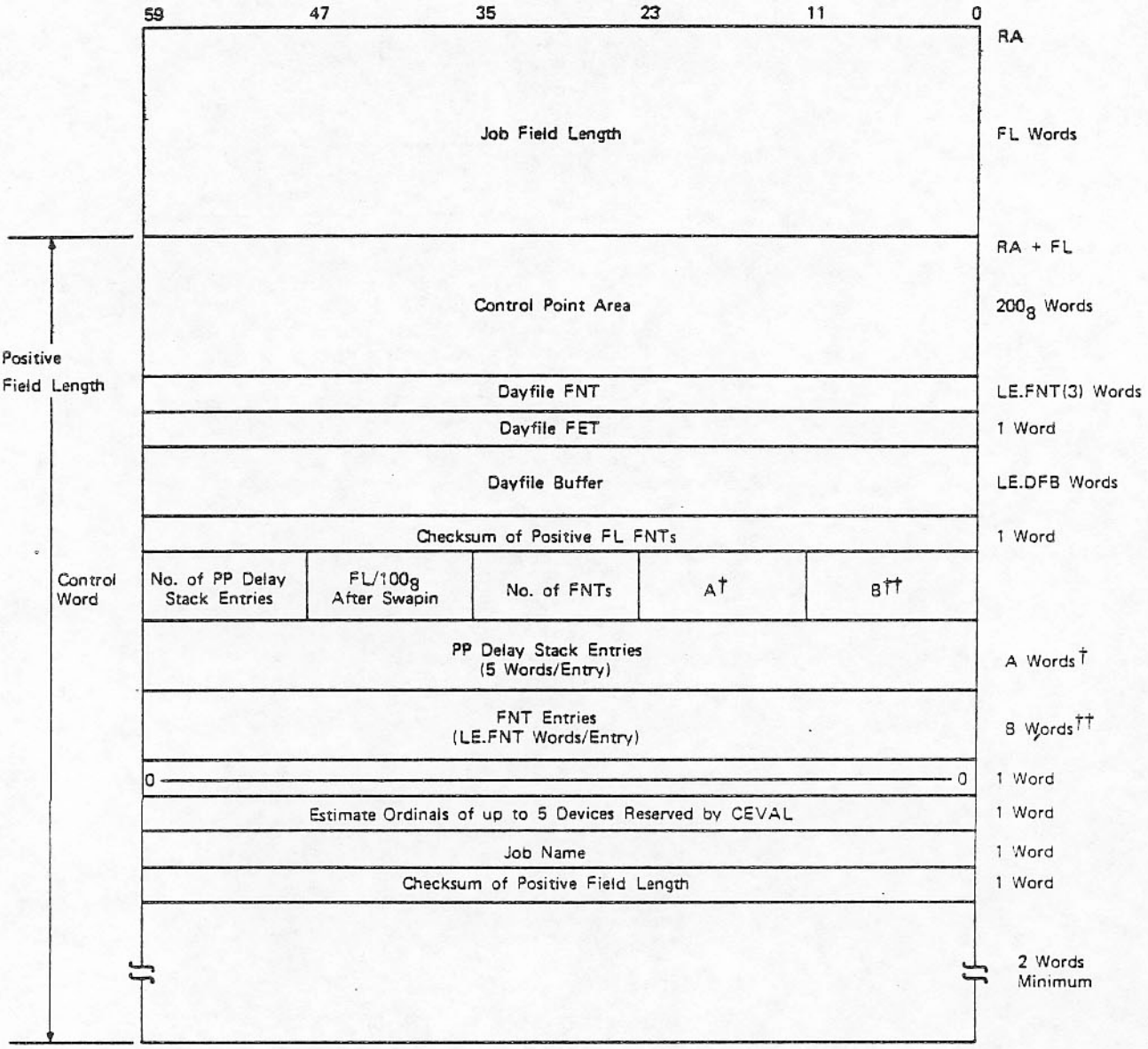
Word	Bit	Description
	23-12	Device track size in PRUs.
	11-0	Number of first PRU of CED in the first RB.
3 through 5677_8†		Physical address of the first PRU of the RB. The format of this address is:



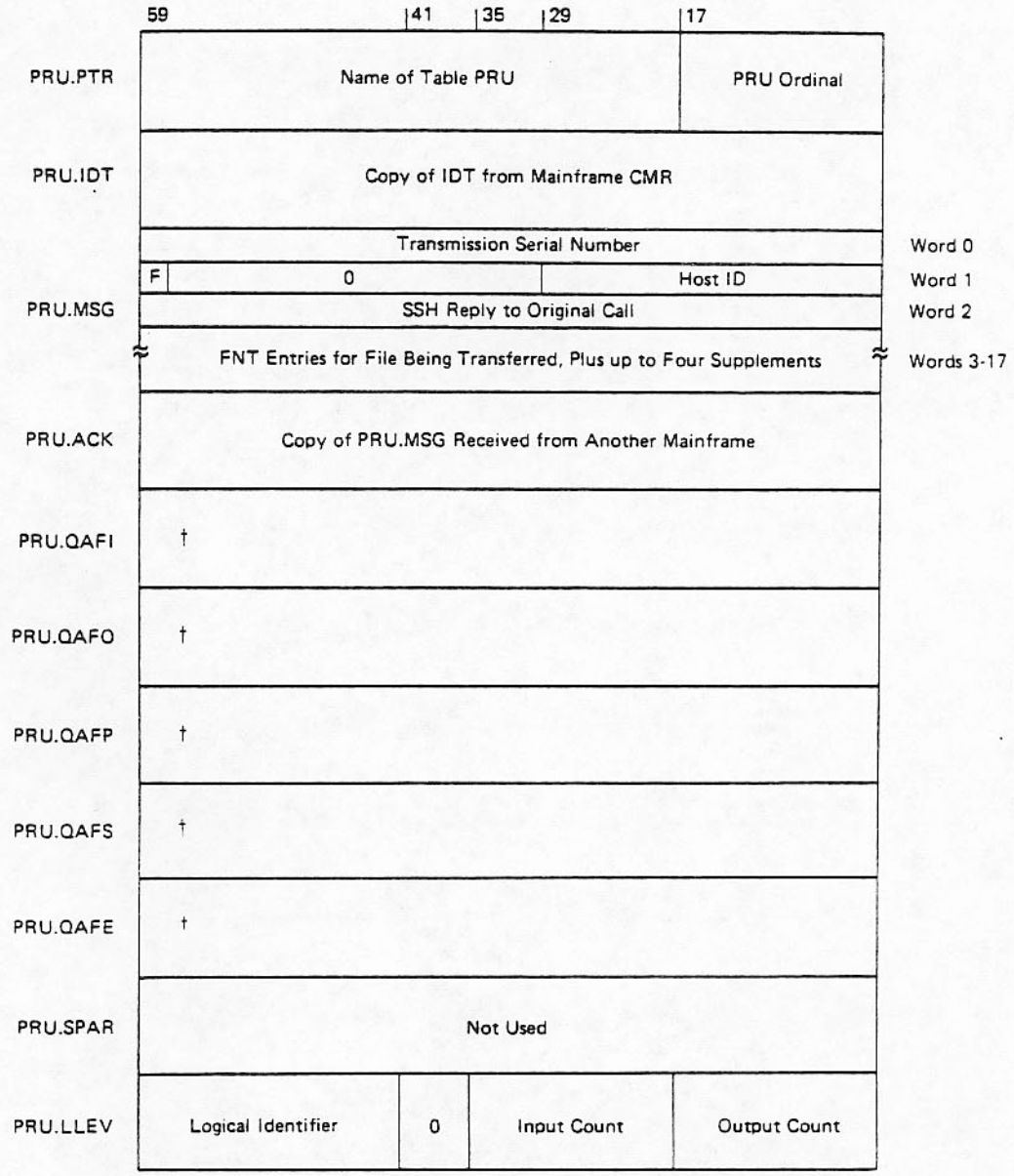
A value of 7777_8 in the cylinder number field indicates the end of the DDAM RB. If a value of 7777_8 is found in the next byte, it indicates the end of the DDAM file. Otherwise, the next two bytes contain the physical address of the first PRU of the next RB of the DDAM file in the same format. The first RB address of the second and succeeding RBs of the DDAM file is in word 0, bits 47 through 24.

†Assumes 57 PRUs/RB.

SWAP FILE FORMAT

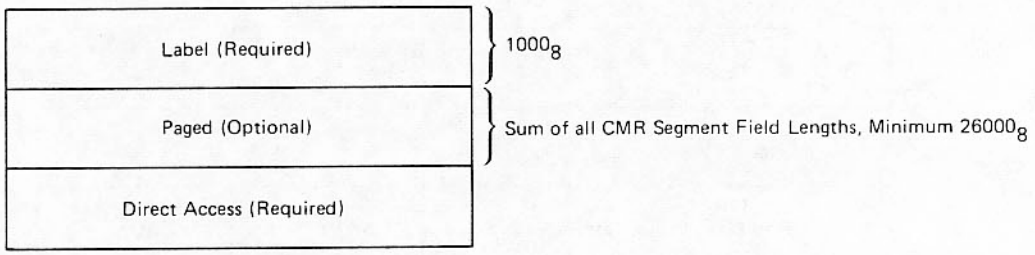


GEMINI LINK FILE FORMAT

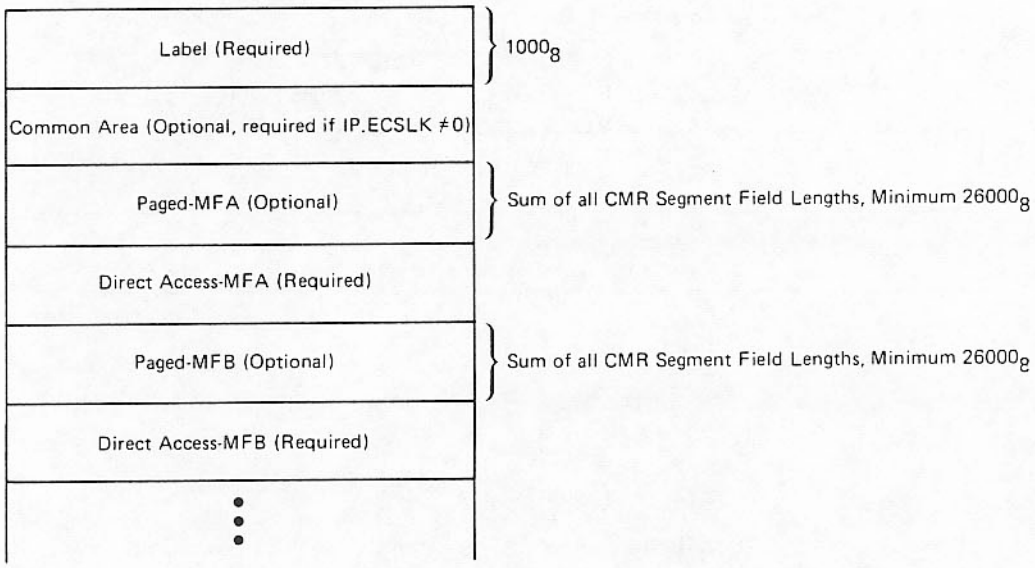


† Consists of a block of 15 PRUs. The first word of each PRU contains the time (hh.mm.dd) the queue was scanned. The remaining 63 words consist of 21 three-word replies from QAF. The end of a list is indicated by an empty three-word entry.

EXTENDED MEMORY FOR ONE MAINFRAME



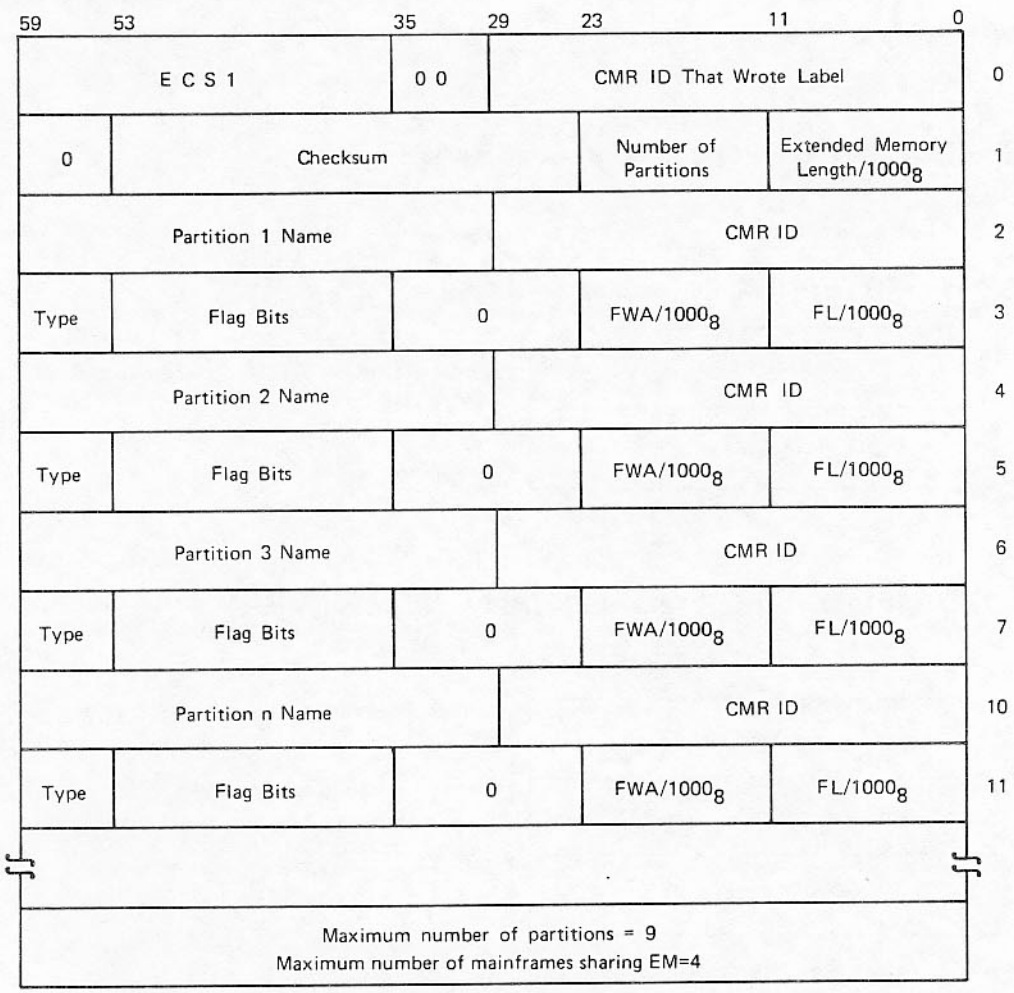
EXTENDED MEMORY FOR MORE THAN ONE MAINFRAME



Extended memory label is written to one of the areas starting at 120_8, 230_8, 340_8, 450_8, 560_8, or 670_8.

Unified extended memory (UEM) can be accessed by only one mainframe.

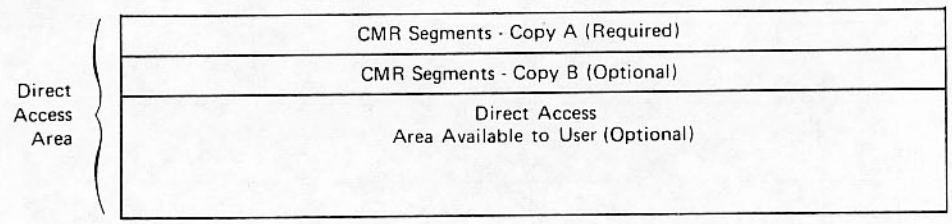
EXTENDED MEMORY LABEL



Field	Bit	Description
Type	59-54	
	1	Direct access area.
	2	Allocatable device area (system and paged area).
	3	COMMON area.
CMRID	29-0	Central memory resident identifier for mainframe using this section of EM.

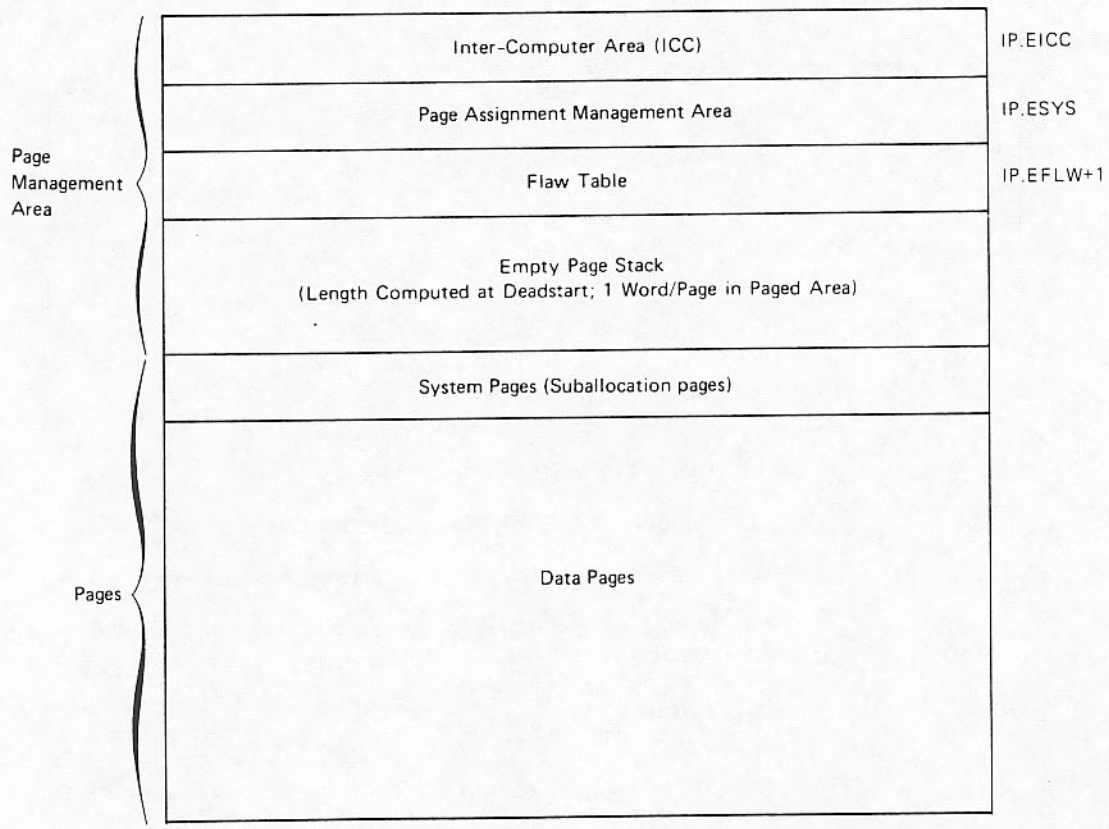
DIRECT ACCESS AREA (TYPE 1 PARTITION)

The system uses this area to store CMR segments. Users are assigned contiguous blocks in the same way CM is assigned.



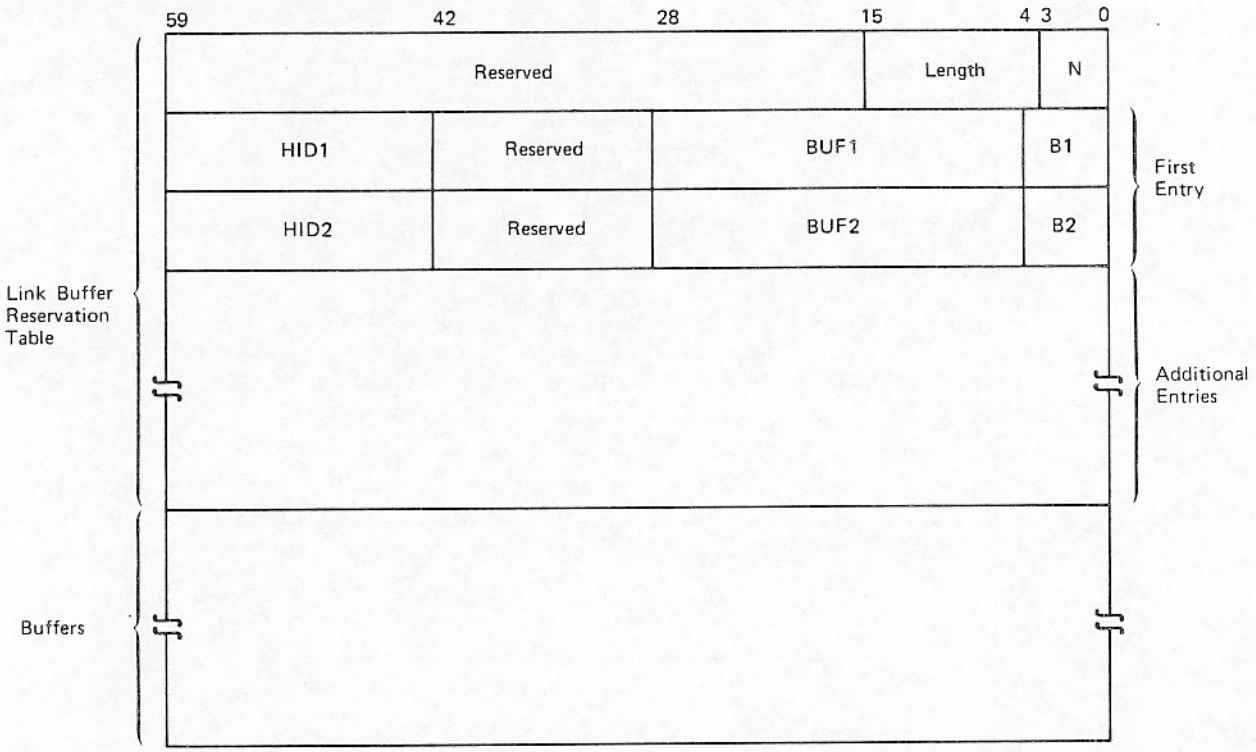
PAGED AREA (TYPE 2 PARTITION)

The system uses this area for storing EM-resident programs and library tables, and for swapping/rolling jobs. Users may use this area for file storage (REQUEST, lfn, A*.) and EM buffer location (REQUEST, lfn, PF, ECIO.). Storage is allocated and deallocated by pages; a page is typically 1000g words.



COMMON AREA (TYPE 3 PARTITION)

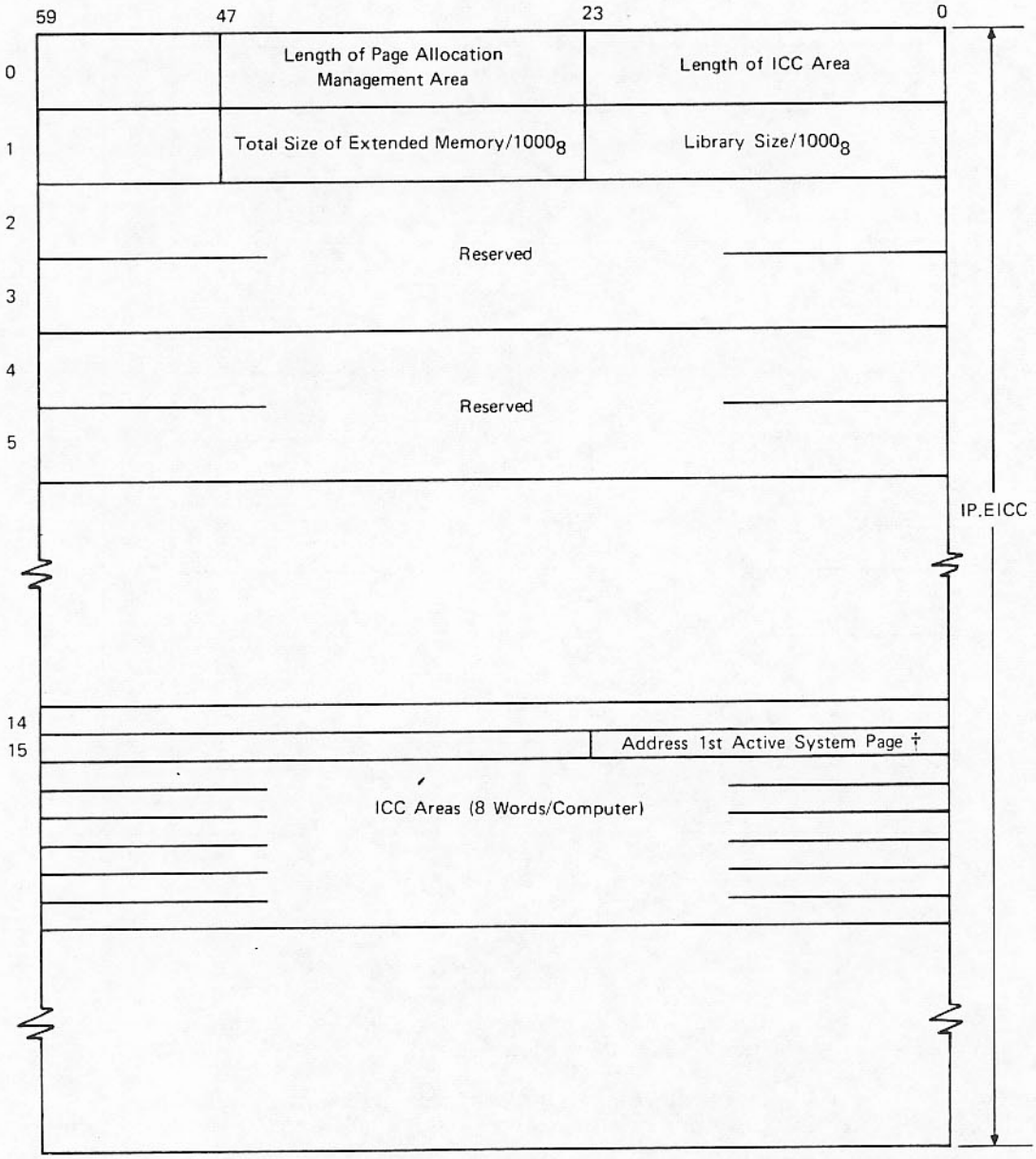
This section of EM is used only by the station (MFSTAT).



Field Name	Description
Length	Length of each buffer.
N	IP.LNKBF; number of entries in table.
HID1	Mainframe ID of first mainframe to reserve a buffer for this link.
HID2	Mainframe ID of second mainframe to reserve a buffer for this link.
BUF1	FWA of receiving buffer for first mainframe (HID1) and send buffer for second mainframe (HID2).
BUF2	FWA of receiving buffer for second mainframe (HID2) and send buffer for first mainframe (HID1).
B1	TN.BUF1; link status bit in the extended memory interlock register for BUF1.
B2	TN.BUF2; link status bit in the extended memory interlock register for BUF2.

INTERCOMPUTER AREA (ICC)

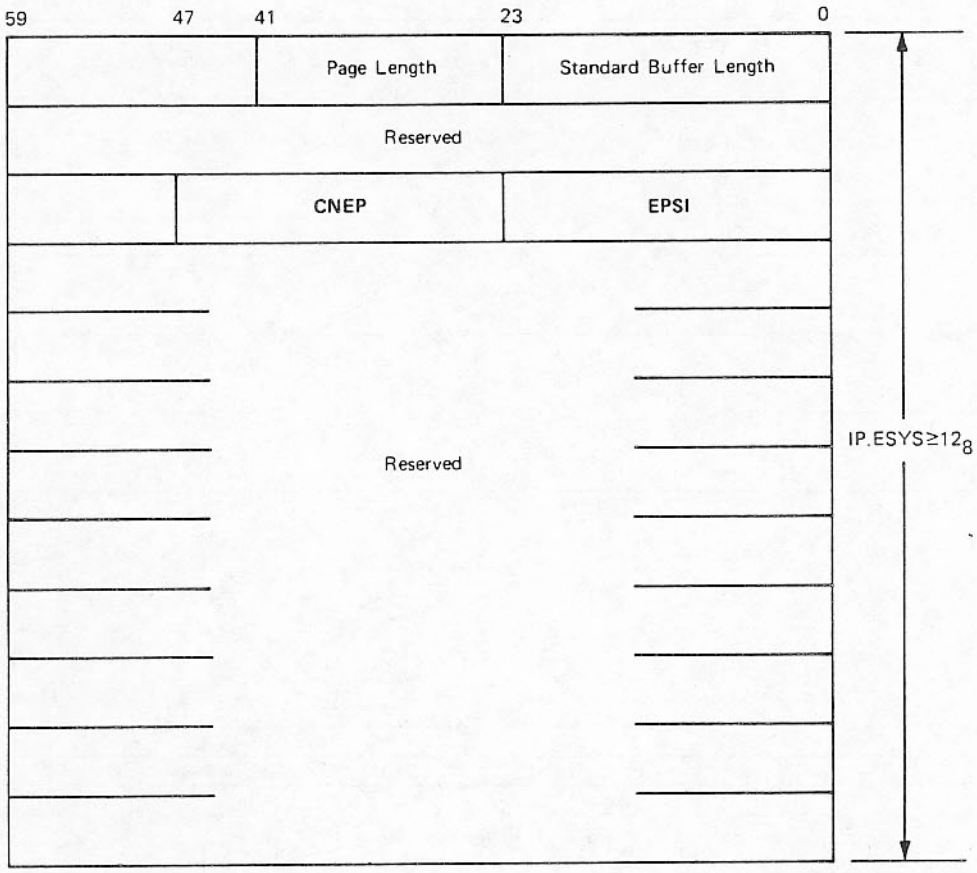
ICC is a subsection of the paged area.



† Bytes 3 and 4, word 11 of CMR contains the address for this ICC word.

PAGE ASSIGNMENT MANAGEMENT (PAM)

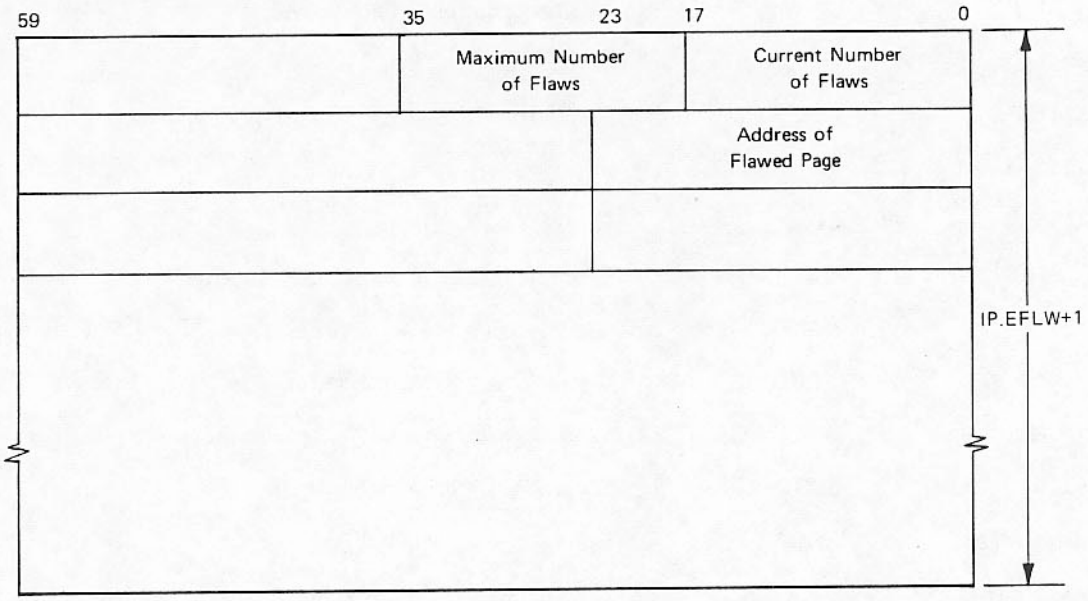
PAM is a subsection of the paged area. Currently only two words in this area are used in NOS/BE.



Field Name	Description
CNEP	Current number of empty pages in EM. Additional empty pages may be found in the CM window.
EPSI	Index into the empty page stack; EPSI is used to allocate EM pages. EM pages are first placed in the CM window and are assigned to users from the CM window. EPSI points to the next window of EM pages.

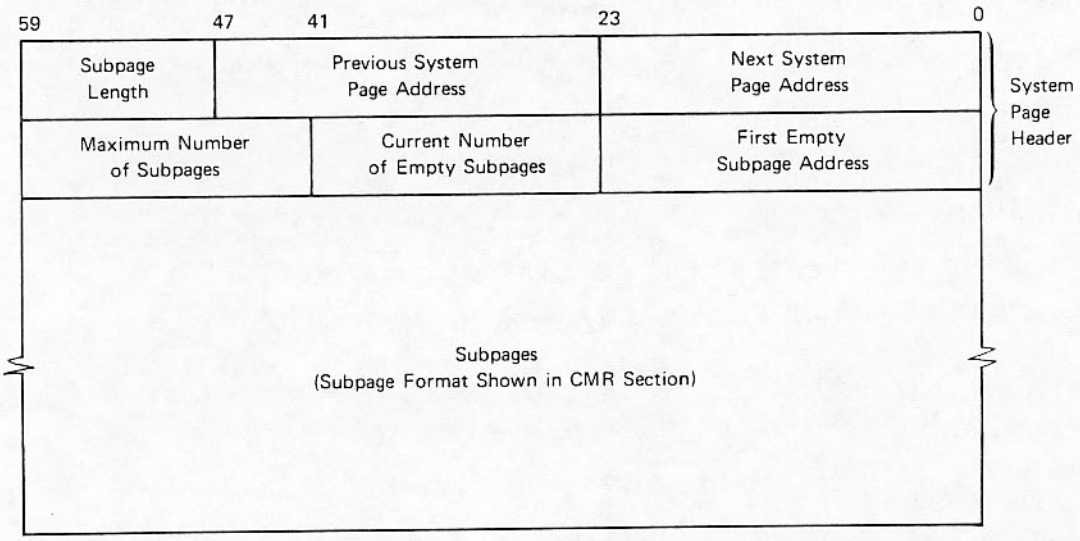
FLAW TABLE

The flaw table is a subsection of the paged area.



SYSTEM PAGES

System pages are a subsection of the paged area and are used to allocate space within a page. The EM manager allocates EM in page units; EM is further divided into subpage units of 100g words. Each subpage has several header words containing pointers to following subpages.



SEGMENTS IN AN EXTENDED MEMORY SYSTEM

Segment	Deck	Purpose
ADRB	SPM3	Add record blocks onto RBT.
BBJ	MMGR	Bring in a batch job.
CACT	ECLINK	Subroutine to change job activity count.
CALLDAM	SPM5	Initiate RBR update from DAM.
CBM	ECS	Circular buffer manager.
CBMEND	ECS	Circular buffer manager termination.
CCP	MMGR	Clean up control point area.
CHKPNT	SYSIDLE	Generate system checkpoint.
CHKSPAC	RACDAC	Subroutine to check if extended memory space is available.
CLRCEM	ECS	Clear CEM working flag.
CMDATA	ECDATA	Common data areas.
CMRDIR	CMRDIR	Direct LDCMR in assigning segment residence.
CONTDAM	SPM5	Continue DAM processing.
CPCIO	CPCIO	Central processor I/O control.
CPECSM	CPSM	Storage move (extended memory).
CPMTR	CPMTR	Identify reason for monitor mode execution.
CPPXT	ECS	Extended memory executive, central resident routines.
CPSCH	MMGR	Main loop - memory manager.
CPSM	CPSM	Storage move (CM).
CPSPM	SPM1	Stack processor manager.
CPSS	RESCH	Calculate system seconds - EX.SS.
CPSSF	SCPT	EX.SSF function processor.
CPUST	CPMTR	On/off CPU.
CP4ES	CPCIO	Enter stack request.
CSBS	ECLINK	Subroutine to check ECS link buffer space.
CSWP	MMGR	Call 1SI/1SO PP swappers.

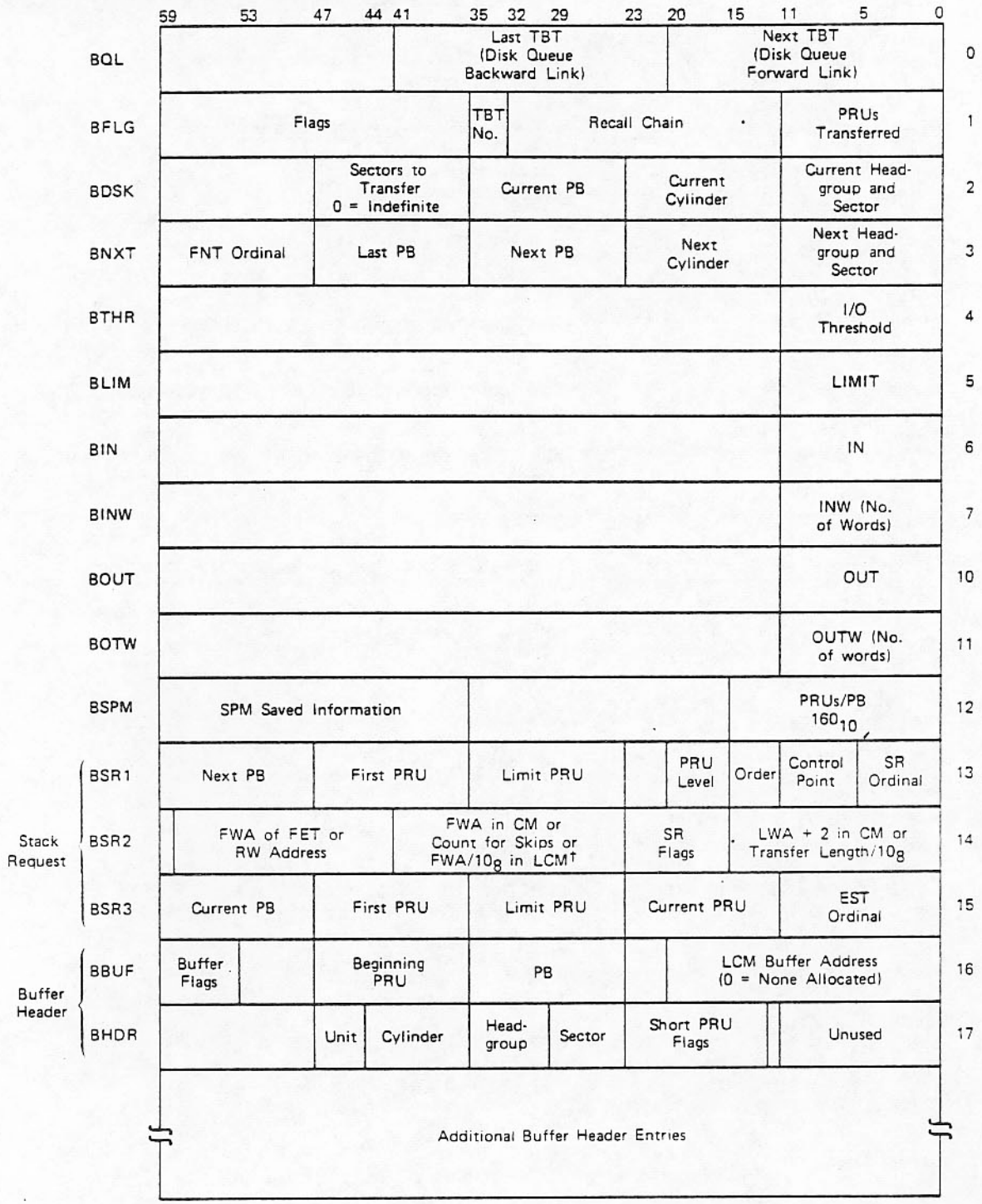
Segment	Deck	Purpose
DAC	RACDAC	Deallocate extended memory overlay pages.
DBS	MMGR	Define best swap.
DEAL	ECS	Deallocate PRUs of data in extended memory buffer.
DJD	MMGR	Subroutine to delink job descriptor.
DRVR	ECLINK	Extended memory link receive driver.
DRVRS	ECLINK	Subroutines for extended memory link receive driver.
DRVS	ECLINK	Extended memory send driver.
DRVSS	ECLINK	Subroutines for extended memory send driver.
ECPARTY	ECLINK	Extended memory link parity error processor.
ECSDSD	ECS	DSD extended memory commands CP helper.
ECSSWAP	ECSSWAP	Extended memory job swapper interface.
ECSUB	ECSSUB	Extended memory executive subroutines.
ELINK	ECLINK	Extended memory link restart.
EVICTCH	SPM4	Evict on user sets.
EVICTOW	SPM4	Evict on write.
EXBOOT	RESCH	Start extended memory system.
EXRBT	SPM4	PRU conversion - M.ICE function.
ERPEREC	ECSSUB	Extended memory read parity error recovery.
ERS	MMGR	Empty scheduler request stack.
FILLSTK	ECSSUB	Subroutine to fill CM extended memory page stack.
FLSHBUF	ECS	Flush extended memory buffer to disk.
FLUSHST	ECSSUB	Subroutine to flush CM extended memory page stack.
GETDAE	ECS	Direct access extended memory I/O (read).
GETDESC	ECS	Subroutine to read an extended memory PRU descriptor.
GETPRU	ECS	Get a PRU.
GETPRE	RACDAC	Subroutine to get preallocated page.
GETRAND	ECS	Extended memory read driver.
GETSUBP	ECS	Subroutine to get an extended memory subpage.

Segment	Deck	Purpose
ILINK	ECLINK	Initialize ECS link.
INDEX	SPM4	Subroutine to convert PRU index to RBT chain format.
INIT	LINKCMR	Initialize system.
LFMGR	LFMGR	I/O queue logfile manager.
LINK	RESCH	Subroutine to link a job into active control point ring.
LINKDST	SPM3	Subroutine to link stack request to DST chain.
LINKVAR	ECLINK	Subroutine for ECS link variables initiation.
OPECLO	CPCIO	CPCIO open/close executive.
OPM	MMGR	Optimize FL priority map.
PACKAGE	RESCH	Subroutine to update RA/FL.
PLBCNT	ECS	Continue loading PP overlay from extended memory.
PLBECS	ECS	Load PP overlay from extended memory.
PLBERR	ECS	Error while loading PP overlay from extended memory.
PLBREL	ECS	Release buffer after loading PP from extended memory.
PPLIB	RESCH	Search PP library and load PP overlay.
PREALLO	ECS	Preallocate extended memory.
PROCERR	ECLINK	Process driver detected errors.
RAC	RACDAC	Request preallocated extended memory space.
RAGET	ECLINK	Subroutine to fetch exchange package RA.
RAPLUS1	RAP1	Identification of RA+1 calls.
RBTRB	SPM5	Subroutine to convert RBT chain format to PRU index.
RCH	CPMTR	Request channel.
RCH3	CPMTR	Channel request subroutine.
READ	CPCIO	CPCIO read executive.
READDAM	SPM5	Prepare stack request to read DAM.
RELECS	ECS	Release extended memory buffer.
RELPRE	RACDAC	Subroutine to release preallocated extended memory pages.
RELSB	ECS	Subroutine to release system buffer.
RELSUBP	ECS	Subroutine to release an extended memory subpage.

Segment	Deck	Purpose
REQEBUF	ECS	Request extended memory buffer.
RESCH	RESCH	Select the next job for CPU execution.
RESET	CPCIO	Subroutine to logically rewind extended memory buffer.
REWIND	CPCIO	CPCIO rewind executive.
RMRLST	CPCIO	Subroutine to process PRU index list for READLS.
RTAFL	SPM3	Subroutine to request or terminate field access.
SCADDT	SPM4	Subroutine to scan DDT and RBR headers.
SCHRES	MMGR	Scheduler CM resident subroutines.
SCF	CPMTR	Set control point error flag.
SEGLINK	LINKCMR	Segment CALL/GOTO linkage processor.
SEGPAR	LINKCMR	Extended memory segment parity error processor.
SETST	CPMTR	CPU status bit manipulations.
SFCP	ECLINK	Subroutine to set file complete.
SKIPB	CPCIO	CPCIO skip backward executive.
SKIPF	CPCIO	CPCIO skip forward executive.
SPG	RESCH	Process system program request.
SPMBKSP	SPM3	Backspace related functions.
SPRBMGR	SPM4	Record block manager.
SSCSEG	SCPT	System control point calls from user control points.
SSFSEG	SCPT	Subsystem function processor.
SREQ	ECLINK	Subroutine to handle extended memory link subchannel requests.
SSFS2	SCPT	Secondary set of subsystem functions.
STODAE	ECS	Direct access extended memory I/O (write).
STOPRU	ECS	Store PRU.
STORE	ECS	Move data from users CM buffer to extended memory buffer.
SWAPCP	SYSIDLE	Swap out all control points.
SWCLEAN	ECS	Clean up after parity on extended memory swap file.
SYSIDLE	SYSIDLE	System idle control.
SYSPROG	RESCH	Check status of a user mode system program.
TDI	SYSIDLE	Subroutine to test delay interval.

Segment	Deck	Purpose
TOVSH	SPM5	Subroutine to test overflow of a shared device.
TTS	MMGR	Try to schedule.
TRAUTEB	ECS	Terminate automatic extended memory buffer allocation.
TIMSEG	RAP1	Process TIM calls.
UPM	MMGR	Update FL priority map.
USERMOD	CPMTR	Initiate execution of user mode system programs.
USERR	RESCH	Resident user mode entry/exit routines.
WOR	SYSIDLE	Wait for operator to type RESUME.
WRITE	CPCIO	CPCIO write executive.
XJRSEG	RAP1	Process XJR or SAC calls.
XSPM	SPM2	Extension of stack processor manager.

TRANSFER BUFFER TABLE (CYBER 176)



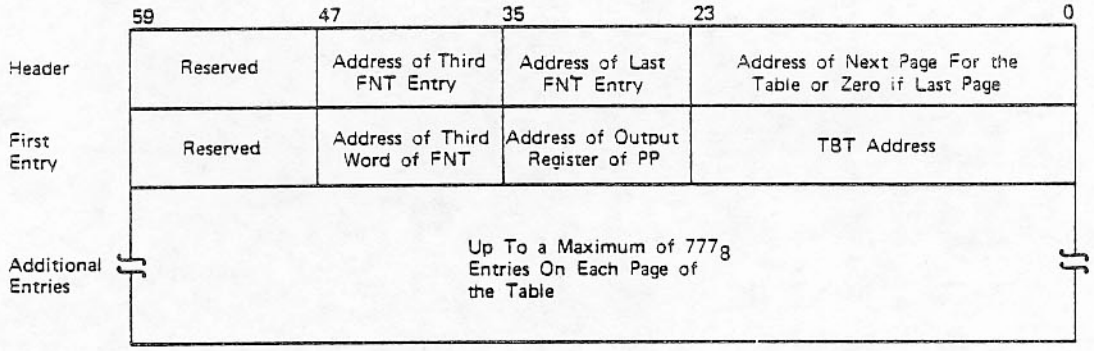
Word	Bit	Description
0	42	TBT is on queue if set.
1	59-36	Flags.

Bit Set	Significance
59	Read/write mode. 0 Read. 1 Write.
58	Stack request completed.
57	Stop flag; set to stop disk transfers on read requests due to new position requirements.
56	Positioning forward flag; set by READSKIP or O.SKF. This flag tells HDC to call HSP when request is complete.
55	Flush flag; set if file switched from write to read (or vice versa).
54	PPIO request.
53	Preread flag; set when prereading on a write request.
52	Postread flag; set when read-filling last sector on write request.
51	Positioning reverse flag.
50	XP bit.
49	Unrecovered error.
48	Evict request.
47	Switch to next PB.
46	Skip first three CM words to read; O.RDPNP or O.RCMPR set flag to skip 77 table.
45	Write in place request.
44	Skip backward over PB.
43	SCB not available.
42	Unrecovered read checkword error.
41	CEM called.
40	CEM complete.
39	Direct access LCM I/O.

Word	Bit	Description
		Bit Set — Significance
		38 — Buffer argument error.
		37 — Special processing for O.RDSK request.
2	59	Wait.
	58	Empty/full.
	35-24	Current PB.
3	47-36	Last PB.
	35-24	Next PB.
13	21-18	PRU level.
	17	Interlock stack request.
	16-12	Order code.
	11-8	Control point.
	7	SPM recall.
	6-0	Stack request ordinal.
14		Same as second word of stack request.
16	59-56	Buffer flags.
		Bit Set — Significance
		59 — Data has been written to disk.
		58 — Data has been read from disk.
		57 — Sector could not be read.
		56 — Sector read with unrecovered checkword error.

Current PB is the PB being read/written from the disk. When IH switches to the next PB on the same request, it sets last PB equal to current PB and current PB equal to next PB. When a disk request is queued, the desired PB from the stack request is put in current PB by HSP. If this is different from the previous current PB value, the last PB is set to the previous current PB. For read requests, the data in the TBT buffer pertains to last PB or current PB. For write requests, the data in the TBT buffer pertains to current PB or next PB.

TBT ADDRESS TABLE



Header entry:

Bit	Description
59-48	Reserved.
47-36	Address of first FNT entry which has a corresponding entry in this table.
35-24	Address of last FNT entry which has a corresponding entry in this table.
23-0	Address of next page for the table or zero if this is the last page of the table.

Entry:

Bit	Description
59-48	Reserved.
47-36	Address of the third word of the FNT during processing of the flush function issued with byte 2 of the PP output register equal to 1.
35-24	Address of the PP output register during processing of the flush function issued with byte 2 of the PP output register equal to 0.
23-0	TBT address.

SYSTEM SYMBOLS

SCPTEXT contains system macros, micros, and symbols used by COMPASS CPU and PP programs that comprise the operating system. SCPTEXT contains the following common decks:

Deck	Contents
ACTCOM	CPU program system action request macros.
COMAFET	File environment table generation macros.
COMSRAS	System communication (RA) symbols.
CPSYS	CPU input/output macros using the Central Program Control (CPC) library routines.
PPSYS	PP program system macros, micros, and symbols.

SCPTEXT is made up of CPCTEXT and PPTEXT. CPCTEXT may be used when only user mode CPU programs are assembled, and PPTEXT may be used when only PP programs are assembled.

Common deck COMSRAS contains definitions of symbols of the form RA.xxx which are addresses of words in the communication area (RA+0 through RA+100).

A listing of system symbols can be obtained with the following job deck:

```
job statement (including a request for MT01)
REQUEST(OLDPL,E,HY) PL1A.
UPDATE(Q)
COMPASS(S=0,I=COMPILE)
7/8/9
*COMPILE PPTEXT
6/7/8/9
```

Refer to the NOS/BE Reference Manual, section 7, for a list of common decks and text overlays.

PPSYS IDENTIFIERS

Common deck PPSYS contains definitions of symbols of the form:

i.mn

i Identifier; one or two alphabetic characters specifying the category to which the symbol belongs.

i	Category
C	Byte number in CM word (0 through 4). C identifiers are used for flags and parameters of 12 bits or less.
CH	Pseudo channel assignments.

i	Category
D	Direct cells.
EX	M.ICE or M.SPM subfunctions.
F	Error flag values.
L	Length of tables.
LE	Length of table entries.
M	PP request of monitor.
N	Number of predefined entries in table.
O	Stack processor orders.
OV	PP overlays; mn is the overlay name.
P	CM location of pointer words.
R	PP resident entry points.
S	Number of bits to right shift a parameter to right justify it in a PP word. Some symbols, notably those related to the scheduler, are the number of bits to right shift a parameter to right justify it in a CM word.
SF	Subsystem function.
T	First word address of CM tables. The system programmer should use the P. definition rather than access the table directly with the T. definition.
W	Relative positions in CM tables.

mn Mnemonic; one to six alphanumeric symbols suggesting the use of the symbol. For example, P.ZERO identifies CMR pointer area word 70_8, which contains binary zeros.

ABBREVIATIONS AND ACRONYMS

ACN	Activate channel
AFL	Anticipated field length
APF	Attached permanent file table
APR	Automatic program sequencer
ASCII	American Standard Code for Information Interchange
ATS	Advanced tape system (67x)
ASTIM	Asynchronous stimulator
AUT	Auxiliary user table
BAM	Basic access methods
BASIC	Beginner's all-purpose symbolic instruction code
BCD	Binary coded decimal
BOI	Beginning of information
BSN	Block serial number
CBM	Circular buffer manager
CCL	CYBER control language
CEJ	Central exchange jump
CFO	Comment from operator
CHT	Channel table
CID	CYBER Interactive Debug
CIO	Circular input/output (processor)
CM	Central memory
CMR	Central memory resident
CMU	Compare move unit
COBOL	Common business-oriented language
COMPASS	Comprehensive assembler language
CPC	Central program control
CPCIO	Central processor circular input/output
CPMTR	Central processor monitor
CPU	Central processor unit
CRM	CYBER record manager
CST	Channel status table
CTI	Common test and initialization
DAM	Device allocation map
DAT	Device activity table
DDL	Data description language
DDP	Distributive data path
DDT	Dismountable device table
DID	Destination identification
DOT	Device overflow table
DPT	Device pool table
DST	Device status table

EBCDIC	Extended binary coded decimal interchange code
ECS	Extended core storage
EDD	Express deadstart dump
ELM	Error log messages
EM	End of media
EOF	End of file
EOI	End of information
EOJ	End of job
EOR	End of record
EOT	End of tape
EP	Error processing
EPNT	Entry point name table
ERT	External reference table
ESM	Extended semiconductor memory
EST	Equipment status table
FDB	File definition block
FDT	Fixed section of dismountable device table
FET	File environment table
FID	File identifier
FIFO	First in first out
FIT	File information table
FL	Field length
FLO	Field length override
FM	File marker
FMD	Fixed module disk (885)
FNT	File name table
FORM	File organization and record manager
FORTRAN	Formula translation
FSN	Find set name
FST	File status table
FWA	First word address
HASP	Houston Automatic Spooling Program
HID	Host identifier
ICC	Inter-computer communication (extended memory)
IDT	Logical identification table
IH	Interrupt handler
ILR	Interlock register
IRG	Inter-record gap
ITABL	INTERCOM table
IUT	INTERCOM user table
JCA	Job control area
JDT	Job descriptor table

LCM	Large core memory
LCME	Large central memory extended
LCN	Loosely coupled network
LFT	Logical flaw table
LNT	Library name table
LWA	Last word address
MEJ	Monitor exchange jump
MLRS	Maximum logical record size
MMF	Multimainframe (usually means two)
MR	Multiple record
MST	Mounted set table
MTR	Monitor (PP monitor program)
MUJ	Multiuser job
MUX	Multiplexer table
NAD	380 network access device
NFL	Nominal field length
NOS/BE	Network operating system/batch environment
NPU	Network processing unit
PAM	Permanent file catalog allocation matrix
PB	Physical block
PFC	Permanent file catalog
PFD	Permanent file directory
PFL	Program field length
PFM	Permanent file manager
PFT	Physical flaw table
PID	Physical identifier
PIDC	Physical identification character
PL	Program library
PNT	Program name table
PNUT	Program number table
PP	Peripheral processor
PPIR	Peripheral processor input register
PPNT	Peripheral processor program name table
PPOR	Peripheral processor output register
PPS	Peripheral processor subsystem
PPU	Peripheral processor unit
PRU	Physical record unit
PUF	Permit user files
RA	Reference address
RB	Record block
RBR	Record block reservation
RBT	Record block table
RBTC	Record block table catalog (=PFC)
RDF	Remote diagnostic facility
RHF	Remote host facility

RMS	Rotating mass storage
RPE	Read parity error
RQS	Request stack
RST	Request scheduling table
SAAM	System advanced access method
SCHTS	Subchannel table
SCP	System control point
SCR	System control register
SEQ	Sequencer table
SID	Source identification
SIDT	Station identification table
SMT	Set member table
SNT	Spot name table
SPM	Stack processor manager
SPT	Scheduler performance table
SSCODE	Subsystem code
SSPN	Subsystem program name
STF	System table find
STG	Tapes staging table
TAT	Transfer buffer table address table
TBT	Transfer buffer table
TID	Terminal identifier
UBC	Unused bit count
UCP	User control point
UEM	Unified extended memory
UQT	Unit queue table
URT	Unit recovery table
UT	User table
VDT	Variable section of dismountable device table
VSN	Volume serial number

INTRODUCTION TO REMOTE HOST FACILITY (RHF) TABLES

The Remote Host Facility (RHF) for NOS/BE is a software package that links NOS/BE to the loosely coupled network (LCN). RHF will allow transfer of permanent files and queue files among linked mainframes, access to NOS/BE magnetic tape drives from CYBER 200 jobs, and communication between NOS/BE INTERCOM users and the CYBER 200.

RHF consists of two major portions - the RHF subsystem and application programs. The RHF subsystem acts as an interface between an application program and the LCN. An application program offers the user a service via the LCN such as file transfers between hosts. Control Data-supported application programs include the PTF/QTF file transfer facilities (MFLINK, FTFS, QTF, and QTFS), and the interactive transfer facility (ITF). (Refer to the Remote Host Facility Access Method Reference Manual for information about writing your own application programs.)

The RHF subsystem comprises the following major components.

- Dedicated RHF system control point (discussed in this manual and in the RHF Access Method Reference Manual).
- The facilities interface program (FIP) which acts as an interface between the application program and the rest of the RHF subsystem (discussed in this manual and in the RHF Access Method Reference Manual).
- The Remote Host Helper (RHH) (discussed in this manual).
- The 380-170 NAD PP driver (NDR) (discussed in this manual).
- Initialization/maintenance components:
  - A maintenance facility to load and dump controlware on local and remote NADs and for logging local and remote NAD errors in the CE error file (discussed in Volume 1 of this manual, and in the NOS/BE Operator's Guide). Maintenance functions are provided by PP programs (NLD and 5CV), and CP programs (MHF, DMPNAD, MLTF/NETLOG, and BCLOAD).
  - Support for running diagnostics on local and remote NADs (discussed in this manual).
  - A utility (RCFGEN) to create RHF configuration records, from which the RHF system control point tables are constructed (refer to the NOS/BE Installation Handbook).

RHF SYSTEM CONTROL POINT JOB

The RHF system control point job contains CP code and tables. The two major tables at the RHF control point are the application table and the network description table. The application table defines the name and characteristics of each application that may communicate with RHF. Additionally, the table is used while the application is active to control communication with that application. (Refer to Application Table, later in this section, for complete table structure). The network description table defines the structure of the LCN from the point of view of the local host. (Refer to Network Description Table, later in this section, for complete table structure).

Code at the RHF control point performs the following major functions.

- Provides operator interface with RHF tables.
- Processes application requests (made through FIP).
- Controls NDR.

The RHF control point code is written primarily in SYMPL and is extensively overlaid. Because RHF is a system control point, it is dedicated at a control point while it is up. To help counter the negative effects of being a dedicated control point, if there are no applications that have performed a NETON, RHF reduces its field length to an idle package. (Refer to RHF Control Point Field Length Overview, later in this section, for RHF field length layout.)

FACILITIES INTERFACE PROGRAM (FIP)

Facilities interface program (FIP) is a set of programs that is loaded into the field length of each application program. The purpose of FIP is to provide easy, yet secure access to the RHF subsystem from an application program.

Use of FIP is documented in the Remote Host Facility Access Method Reference Manual. For most of the FIP application calls, FIP simply passes the request on to the RHF system control point for processing. For the file transfer request (NETXFR), FIP handles all level 7 protocol and controls the file transfer, but calls RHF to do the actual network I/O. This interface is fairly secure because all application calls are validated by RHF.

NAD PP DRIVER (NDR)

NAD PP driver (NDR) is directly under the control of the RHF control point. NDR is solely responsible for driving the local NADs for most normal processing. NDR is not responsible for NAD communication for the following functions.

Function	PP Responsible
Loads and dumps NAD controlware.	NLD
Copies NAD error log into the CE error file.	NLD
Supports execution of local and remote NAD diagnostics.	CVL/5CV

RHF calls NDR to check the status of a path, to transfer data, and to accept incoming connect requests. While there is activity associated with the NADs being driven, NDR is dedicated. When there is no activity, RHF asks NDR to drop out. When there are no applications active, RHF periodically calls NDR to check for incoming requests.

The RHF configuration record specifies the maximum number of copies of NDR that can be active at a given time for a given local NAD, and the total number of NDR copies that can be active for all local NADs.

RHF INITIATION

RHF can be initiated directly by the operator using the n.X RHF command or a site-supplied CCL procedure file. It can also be initiated automatically by SYSPROC if so desired by the installation. When RHF begins execution, the startup code in RHF is executed, after which RHF enters the active state, remaining active until there is no more network activity. RHF then enters the idle state to wait until there is more network activity.

RHF/NDR CONTROL FLOW

RHF is the manager of all NDR functions. Thus, RHF directly controls all network communication, with the exception of NAD maintenance functions, which are controlled by the other NAD PP routines (5CV and NLD).

Based upon network activity and network definition parameters, RHF decides how many NDRs are to be active for a given NAD and the sum of NDRs that are to be active. When RHF decides to start another NDR, RHF makes an RA+1 request for NDR specifying a communication area address for communication between RHF and NDR. Idle, status, and dropout functions are among those given to NDR by RHF to perform. Additional functions include read or write path data and send and receive control messages.

RHF/FIP CONTROL FLOW

FIP makes SCP calls (using the CALLSS macro) to pass application program requests to RHF. RHF will in turn process the request or issue an NDR function to cause NDR to process the request. In either case, RHF is responsible for setting the CALLSS complete bit (via SF.ENDT) to indicate that the request has completed.

Control flow for the NETXFR (file transfer) request is not as straightforward as for the other requests. In a simple case, the application program makes a NETXFR request. FIP processes the request by making calls to CIO and to RHF (to RHF using a CALLSS call). Calls to CIO use a FIP-generated FET (hereafter referred to as the CIO FET) to control the transfer of data between disk or tape and a circular buffer. Calls to RHF use a FIP-generated FET to control the transfer of data between a NAD and a circular buffer. This FET will be called the NDR FET because RHF calls NDR to transfer the file. FIP maintains both FETs. Depending on the data type and the file type, one or two circular buffers are used. If the DD parameter on the NETXFR call specifies binary data or if NAD code conversion is available, only one circular buffer is used. Thus, the CIO FET and the NDR FET reference the same buffer. If CPU code conversion is used or if the file is on tape, two circular buffers are used. The CIO FET references one of them and the NDR FET references the other. FIP transfers the data from one buffer to the other, doing any code conversion or other processing necessary during the transfer.

If there is a pause in the data transfer between the circular buffer and disk or tape, or between the circular buffer and the NAD, CIO or NDR sets the complete bit in its corresponding FET. Such a pause might occur because there is no more space or no more data in one of the buffers (either of the CM circular buffers or the NAD buffer). FIP must make as many additional CIO and RHF calls as are necessary to transfer all the data in the file. FIP detects that all the data has been transferred when the EOI indicator has been set in the appropriate FET.

In a more complex case, the application program makes a NETXFR request specifying that FIP is to immediately return control to the application program. The application program might want to initiate additional file transfers or to do other processing. FIP processes the request until it must wait for a response from some request it has made. It then returns control to the application program. For the file transfer to continue, the application program must call NETXFRC. The application program can call NETXFRC directly or indirectly by calling NETGET, NETGETL, NETPUT, NETWAIT, or NETXFR, all of which, after completing their own processing, call NETXFRC if there are any file-transfers-in-progress. NETXFRC causes FIP to further process each file-transfer-in-progress until it has completed it or until FIP receives a wait response in processing the transfer. The application program must continue to call NETXFRC to complete all the transfers.

DATA FLOW

File Transfer Data Flow

Data is transferred from a circular buffer in the field length of the application program directly to the NAD by PP routine NDR. NDR reads a block of data from the circular buffer, obtains the channel of the NAD, and outputs the data to the NAD. For file transfers in the opposite direction, NDR obtains the channel, inputs a block of data from the NAD, drops the channel, and transfers the data to the circular buffer of the application program.

NETGET/NETPUT—Data Messages

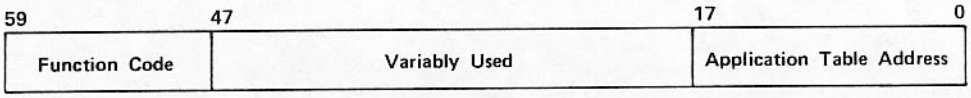
If input is available when RHF receives a NETGET, RHF will call an NDR. The NDR will input the data from the NAD and transfer it to the application program at the address specified by a text address in the NETGET call (Refer to the Remote Host Facility Access Method Reference Manual). NETPUT is handled similarly except that NDR will read the data from a text address and then output it to the NAD.

NETGET/NETPUT—Supervisory Messages

An application can issue a NETGET to RHF to receive an asynchronous supervisory message. If RHF has such messages queued for the application, it writes the requested message at ta in the application programs field length through the use of the SF.WRIT function. NETPUT for asynchronous supervisory messages is handled similarly. RHF issues an SF.READ request to read the asynchronous supervisory message from ta and queues it for later processing.

FIP AND RHF INTERFACE

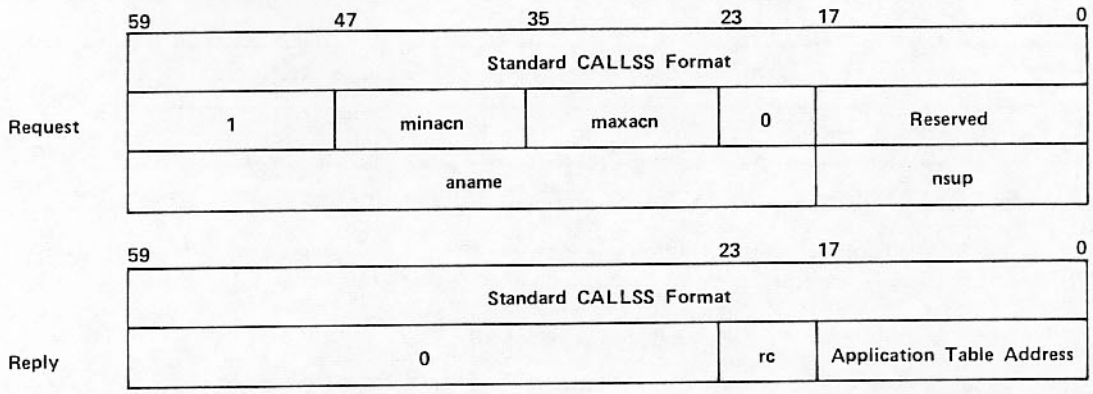
FIP communicates with RHF through the system control point (SCP) mechanism. FIP issues a CALLSS macro which points to a parameter block. The first word of the parameter block uses the format described for the CALLSS macro (refer to System Control Point section). The following format is used for the second word.



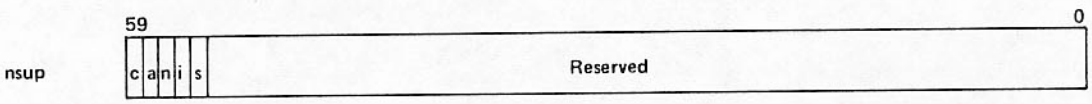
Function Code (Octal)	Meaning
0	Invalid
1	NETON
2	NETOFF
3	NETWAIT
4	NETGET
5	NETGETL
6	NETPUT
7	FET I/O (NETXFR/NETUXFR)

Application table address is a value returned by a NETON call; it should be specified on all subsequent calls to improve response time.

The following format is used for the CALLSS parameter block for a NETON call.



The following format is used for the status word at nsup.

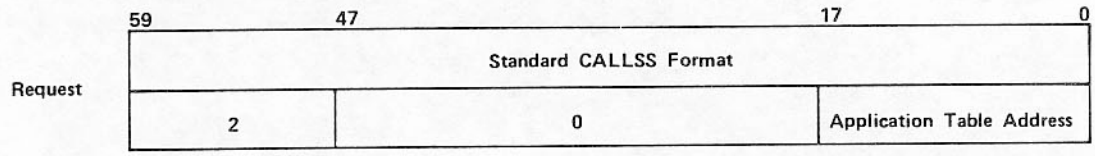


FIP returns the value in RC to the RHF NETXFR call status word.

The status word at nsup is updated for all functions except NETOFF and NETXFR. (Refer to the Remote Host Facility Access Method Reference Manual for the definition of nsup fields.)

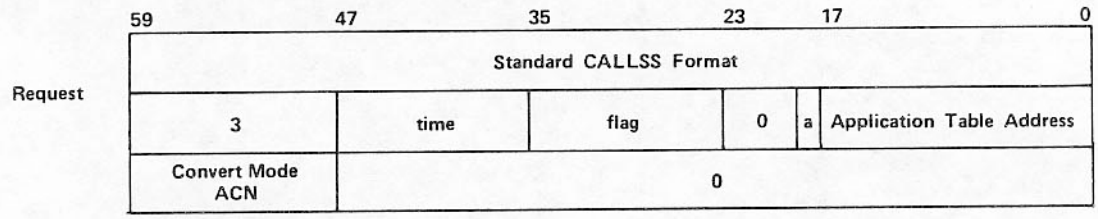
The application control point is aborted if it attempts any other function before successfully calling NETON.

Format of the CALLSS parameter block for a NETOFF call



Reply Standard CALLSS Format.

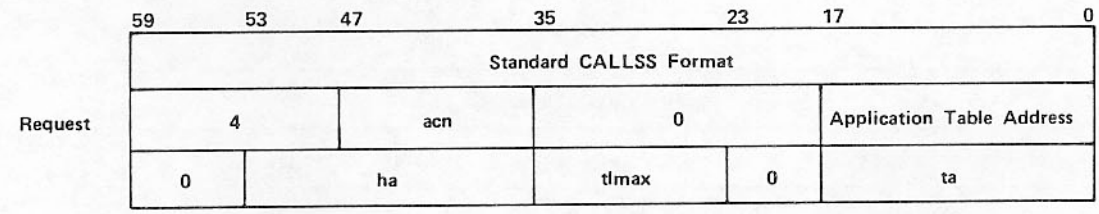
Format of the CALLSS parameter block for a NETWAIT call



Field	Bit	Meaning if set
a	18	Specified ACN is waiting for convert mode resources.

Reply Standard CALLSS format and nsup updated.

Format of the CALLSS parameter block for a NETGET call



Reply Standard CALLSS format, nsup updated, header updated, and text updated if required.

The header is set by FIP before the call to indicate a null text block being returned. Thus, if no input is available, RHF is not required to write the header to indicate that no data is available.

Format of the CALLSS parameter block for a NETGETL call

The format for the parameter block is the same as the format for NETGET except that parameter aln replaces acn.

Format of the CALLSS parameter block for a NETPUT call.

	59	53	47	35	17	0
	Standard CALLSS Format					
Request	6		acn	0	Application Table Address	
	0	ha		0	ta	

Reply Standard CALLSS format and nsup updated.

Format of the CALLSS parameter block for a FET I/O call

	59	47	35	17	0
	Standard CALLSS Format				
Request	7	acn	0	Application Table Address	
	Function Code	Conversion Mode	0	NDR FET Address	

Reply NDR FET updated.

The NDR FET address is an address of an area that contains control information in the standard FET format and is used by NDR for control of NAD I/O.

The NDR FET complete bit must be zero when the request is issued. The complete bit is set to one at request completion. (Refer to the Remote Host Facility Access Method Reference Manual for the definition of the NDR FET, function code, and conversion mode fields.)

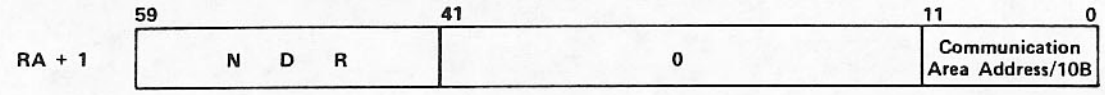
NOTE

The complete bit in CALLSS parameter block is not used. The FET complete bit indicates that I/O is done and that the CALLSS request area can be used.

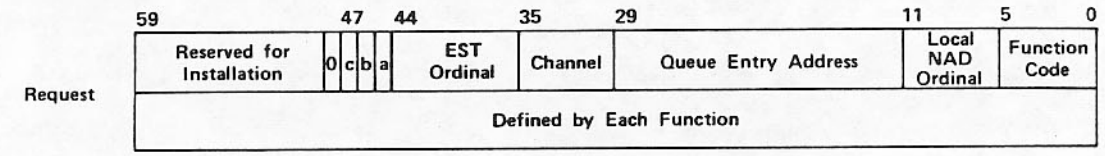
PAGES H-8 AND H-8.1/H-8.2 DELETED

NDR AND RHF INTERFACE

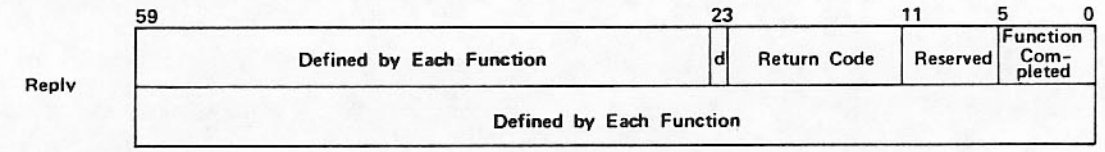
Each copy of NDR has a unique communication area within the RHF field length. RHF starts a copy of NDR with an RA + 1 call in the following format:



The first two words of the communication area are parameters passed to NDR. The remaining words are parameters passed to RHF. The communications area is eight words long. The standard format for the request is:



The standard format for the reply is as follows:



Field	Bit	Meaning if Set
a	45	NDR active.
b	46	Dedicated channel.
c	47	Request area is being changed (interlock).
d	23	Path error if return code is 1.

EST Ordinal

EST ordinal of the NAD.

Channel

Channel number on which the NAD is to be accessed.

Queue Entry Address

Address of a queue entry that contains additional information about the NDR request. Refer to RHF Queue Entry Format, later in this section.

Local NAD Ordinal

Ordinal of the entry in the RHF local NAD table (part of the network description table, described later in this section) that defines the NAD to which the request applies.

Function Code (Octal)	Meaning	Function Code	Meaning
0	No function.	13	Flush path.
1	Idle.	14	Initialize NAD.
2	Status.	15	FET I/O READ.
3	Dropout.	16	FET I/O WRITE.
4	Request connection.	17	FET I/O WRITER.
5	Obtain connect request.	20	FET I/O WRITEF.
6	Connect request reply.	21	FET I/O CLOSE.
7	Send control message.	22	FET I/O READC.
10	Read path data and send ACK.	23	FET I/O WRITEC.
		24	Select convert mode.
		25	Exit convert mode.
		26	Read data in convert mode.
		27	Write data in convert mode.
11	Write path data.	30	Start NDR.
12	Disconnect path.		

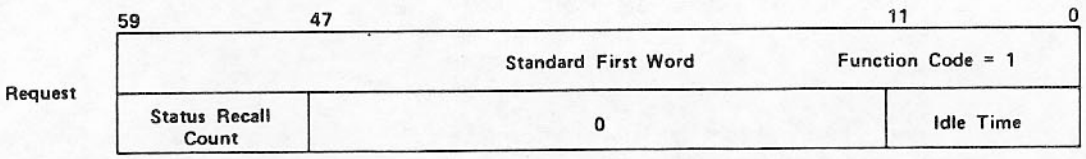
Return Code

The return code field is not used in the same manner by every function. Use of the return code field is described with the function to which it pertains.

The function completed field is updated by NDR to indicate that the function has completed. It is cleared by RHF when a new function is ready for processing.

Specific formats for individual functions follow.

Idle



Reply Standard reply

Idle Time

Number of milliseconds to remain idle. The system idle PP count is monitored after the first ten milliseconds of idle time. NDR monitors the request function code so that a nonidle function can be started at any time.

Return Code

0 End of idle time.

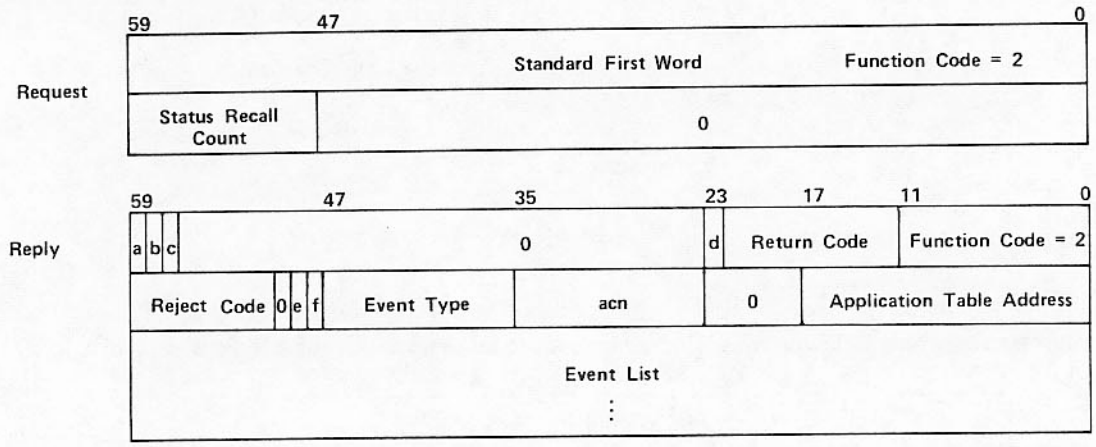
1 Idle PP count is zero for one millisecond.

Status Recall Count

Number of status recall and idle cycles with nothing found to process.

Status

Determine NAD status, path status, and availability of connect request. Obtain any control message or rejected control message.



Field	Bit	Meaning if Set	Field	Bit	Meaning if Set
a	59	Control message input.	d	23	Path error if return code is 1.
b	58	Connect request available.	e	49	Input available.
c	57	EST is OFF.	f	48	Output below threshold.

The second word of the reply diagram shows the format of an event list entry. The event list entry is repeated for each change in the status of any connection through the NAD, making up an event list.

The event list is terminated by a zero word or at the last word of the reply buffer. Any control message input is placed in the spare queue entry.

Event Type

1 Change in input available.

2 Change in output below threshold.

3 Path established (connecting changed to connected).

4 Path aborted.

5 Connect rejected by network.

6 Connect rejected by remote host.

Return Code

0 Normal.

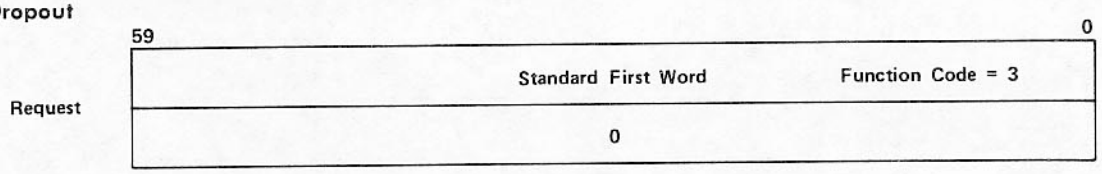
1 Hardware Error. NAD is off.

Reject Code

If event type is 5, reject code is the NAD network break reason code (refer to the 380-170 Hardware Reference Manual).

If event type is 6, reject code is the connection reject code supplied by the remote host software at the other end of the path.

Dropout

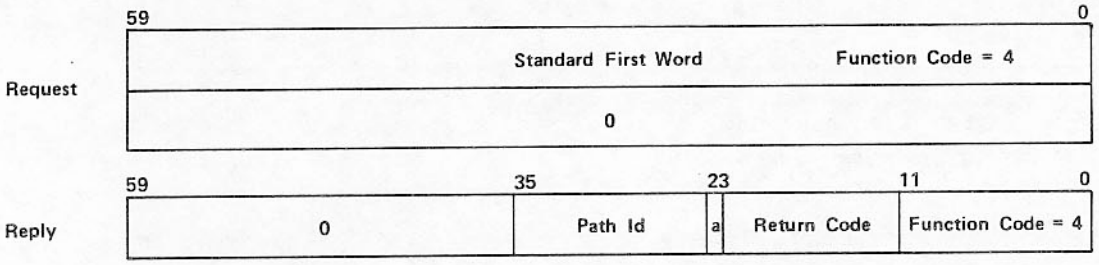


Reply Standard reply

NDR drops out after setting function complete.

Request Connection

The local application uses the following request to request a connection to a remote application.



Return Code

0 Local NAD accept, path ID returned.

1 Hardware error. NAD is off.

2 EST does not allow operation.

3 Local NAD reject.

4 Bad path TCU.

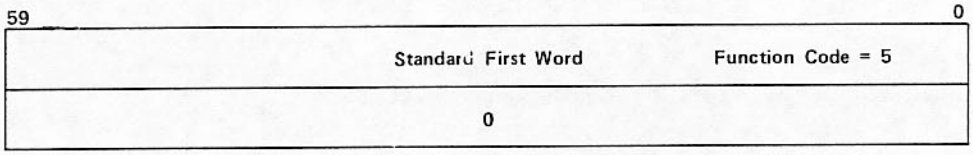
a

Path error if return code is 1.

Obtain Connect Request

The local application uses the following request to receive a request for a connection from a remote application.

Request



Reply Standard reply

Return Code

0 Message obtained.

1 Hardware error. NAD is off.

2 EST does not allow operation.

3 No message to obtain.

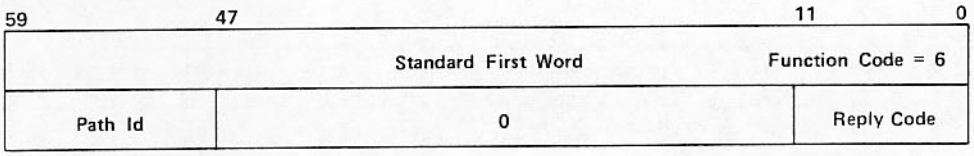
4 Invalid LID.

If a connect request is obtained, then NDR is holding the channel while waiting for a connect request reply.

Connect Request Reply

The RHF subsystem uses the following request to direct NDR in answering the remote application's request for a connection.

Request



Reply Code

0 Accept connection.

non-zero Reply code is the connection reject code to be supplied to the remote host.

Reply Standard reply.

Return Code

0 Done.

1 Hardware error. NAD is off.

NDR sets RHF active in the EST entry for an accepted connection.

Send Control Message

Request

59	47	11	0
Standard First Word		Function Code = 7	
Path Id	0	Text Length	

Reply Standard reply.

Return Code

0 Done.

1 Hardware error. NAD is off.

2 Reissue. No buffers available.

Read Path Data and Send Ack

Request

59	47	35	29	11	0
Standard First Word				Function Code = 10	
Path Id	JDT Ordinal	act	ACK Queue Entry Address		acn

Reply

59	35	23	11	0
	User Parameter Error Type	a	Return Code	Function Code = 10
Event List Entry				

ACK message placed within queue entry.

NOTE

The ACK queue entry has a formatted binary control message header supplied by RHF. NDR inserts the connection number from the received network block header into the second character of the control message name field.

Return Code

0 Path data block read, no ACK.

1 Hardware error. NAD is off.

2 Path data block read, ACK sent.

3 Path data block read, queue ACK.

4 Reissue. User swapped.

5 User parameter error.

6 Reissue. Input not available.

User Parameter Error Type

0 Header address invalid.

1 Text Address plus TLMAX invalid.

2 Invalid TLMAX.

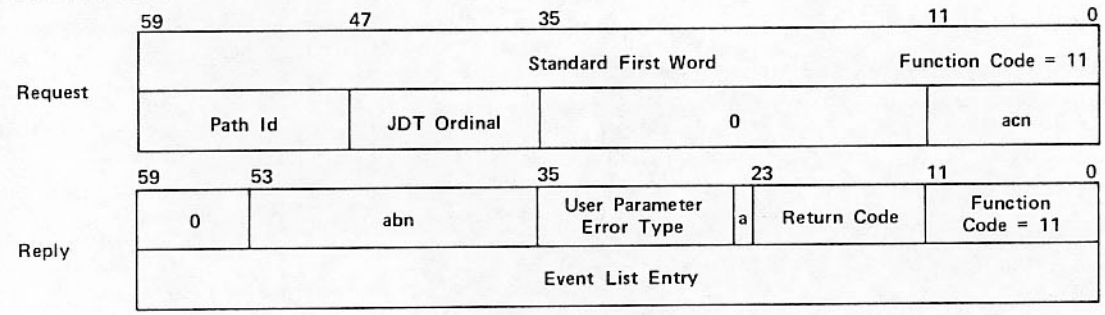
a

Path Error if return code is 1.

Event List Entry

This entry reflects an event on the path specified by path ID in the request. Refer to the status function, earlier in this section.

Write Path Data



Return Code

0 Path data block written.

1 Hardware error. NAD is off.

2 Reissue. User swapped.

3 Reissue. No buffers available.

4 User parameter error.

5 Path data block written, queue local ACK.

User Parameter Error Type

0 Header address invalid.

1 ACT invalid.

2 TLC invalid.

3 ABT invalid.

4 Text address invalid.

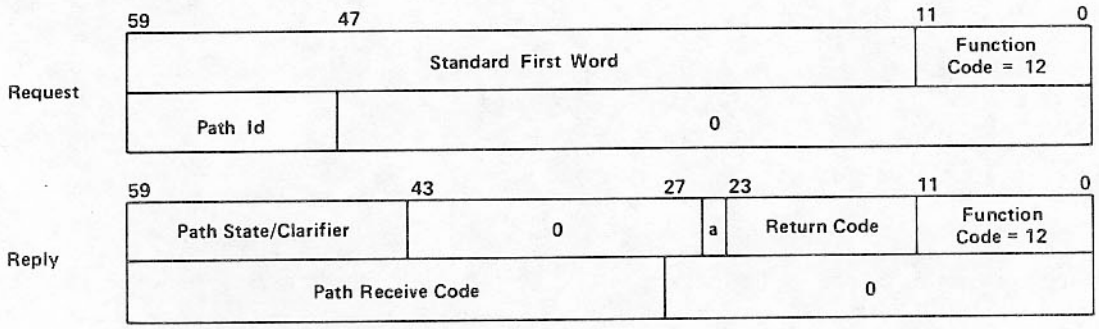
a

Path Error if Return code is 1.

Event List Entry

This entry reflects an event on the path specifed by Path ID in the request. Refer to the status function, earlier in this section.

Disconnect Path



Return Code

0 Path is disconnected.

1 Hardware error. NAD is off.

a Path error if return code is 1.

Path State/Clarifier

State of path before disconnect/flush/purge issued. (Refer to 380-170 Hardware Reference Manual for definitions).

Path Receive Code

If state/clarifier is remote host reject (0105_{16}), receive code is remote host connection reject code.
If state/clarifier is 0107_{16}, 0400_{16} or 0401_{16}, receive code contains NAD network break information.

Path is purged instead of disconnected if path status is ABT.

Flush Path

The format for the flush path is the same as that for the disconnect path, except that the function code is set to 13. Same as Disconnect Path, but with function code is 13. This function is used during a NETOFF.

INITIALIZE NAD

Request

59	35	23	11	0
Standard First Word				Function Code = 14
0	Subfunction	Number of Buffers	Number of Paths	

Reply

59	47	35	23		11	5	0
0	Number of Buffers Reserved	Number of Paths Reserved	c	Return Code	0	Func Comp	

Subfunction

0 Initialize NAD.

1 Initialize NAD and enable code conversion.

2 Initialize NAD and disable code conversion.

Return Code

0 NAD initialized.

1 Hardware error.

2 EST does not allow operation.

3 NAD initialized and code conversion enabled.

4 NAD initialized and code conversion not available.

5 Initial test failed. NAD should be reloaded.

If the EST entry indicates that there are no other accesses to the NAD, it will be master cleared and all paths will be reset to initial conditions. A simple test of NAD responses is executed to verify that the NAD is functioning.

Perform FET I/O

Request

59	47	35	29	11	0
Standard First Word				Function Code = 15	
Path Id	JDT Ordinal	0	NDR FET Address	Retry	

Reply

59	47	23	0
Standard First Word			Function Code = 15
0	Blocks Read	Blocks Written	
Event List Entry			

Return Code

0 FET I/O complete.

1 Hardware error. NAD is off.

2 Reissue. User swapped.

3 Reissue. Output threshold reached.

4 Reissue. No input available.

5 User parameter error. Invalid FET address or complete bit already set. (The UCP is aborted in this case).

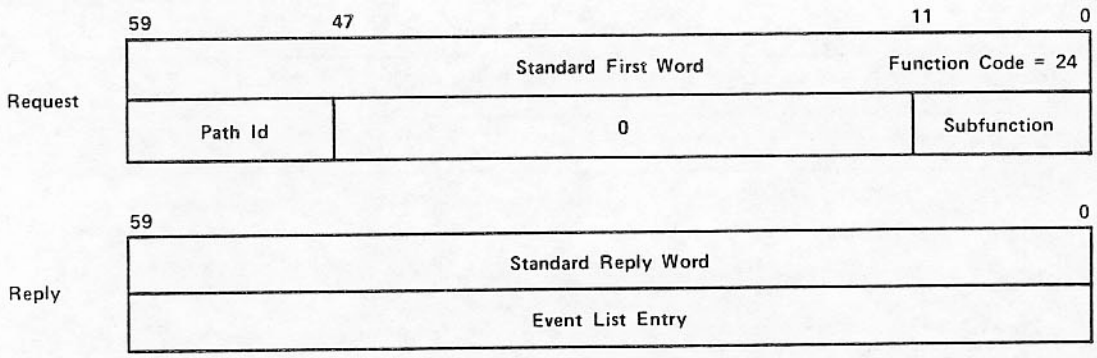
The fc field in the request specifies one of the following functions to be performed. The fc field in the reply indicates which function was performed.

fc Value	Function
15	FET I/O READ
16	FET I/O WRITE
17	FET I/O WRITER
20	FET I/O WRITEF
21	FET I/O CLOSE
22	FET I/O READC
23	FET I/O WRITEC

Event List Entry

Reflects an event on the path specified by path ID in the request. Refer to the status function, earlier in this section.

Select Convert Mode



Subfunction

1 Select ASCII write.

2 Select Display Code write.

3 Select ASCII read.

4 Select Display Code read.

Return Code

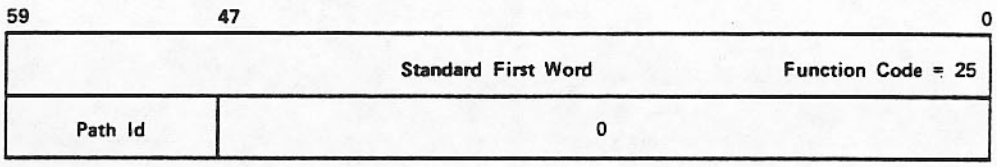
0 Convert mode selected.

1 Hardware error.

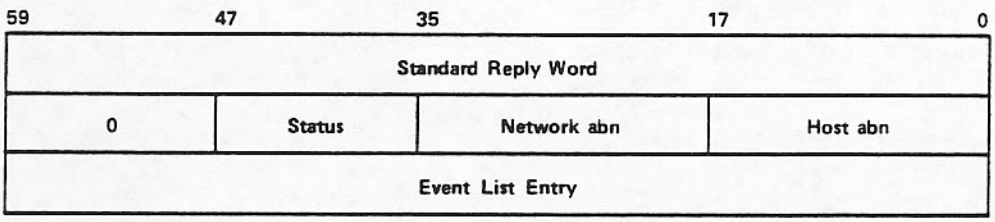
2 Convert mode not selected (see Event Entry).

Exit Convert Mode

Request



Reply



Status

0 Exit status normal.

1 Exit status showed partials discarded.

Return Code

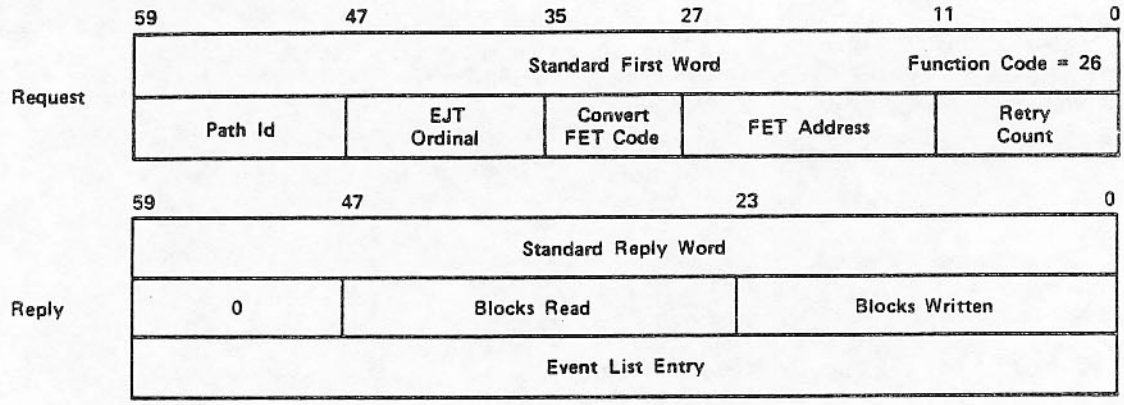
0 Convert mode exited.

1 Hardware error.

2 Convert mode exiting, reissue.

3 Convert mode not exited (see Event Entry).

Read Data in Convert Mode



Convert FET Code

0 READ.
1 READC.

Return Code

0 FET I/O done. Complete bit set.
1 Hardware error.
2 Reissue. User swapped.
3 Reissue. Output below threshold.
4 Reissue. No input available.
5 User parameter error.

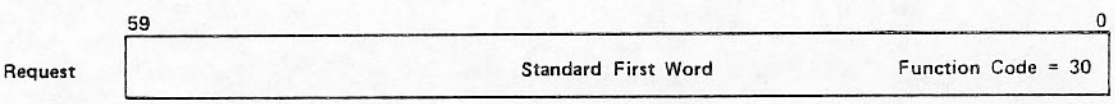
Write Data in Convert Mode

Same as Read Data in Convert Mode but with FC=27 and ;

Convert FET code

0 WRITE.
1 WRITER.
2 WRITEF.
3 CLOSE.
4 WRITEC.

Start NDR

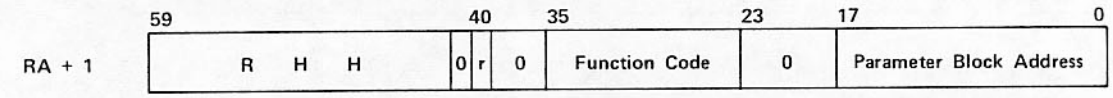


Reply Standard reply

This function is used as the first function with an RA+1 request for NDR.

REMOTE HOST HELPER (RHH) INTERFACE

RHH performs miscellaneous functions for the RHF subsystem and application programs that are well suited for a PP helper. RHH is called with an RA+1 call, as follows.



r

Auto recall.

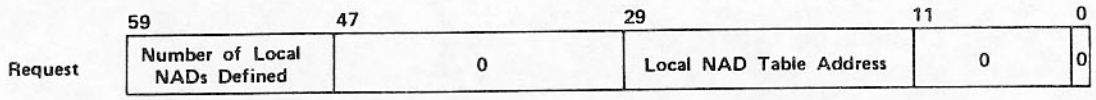
The function complete bit is bit position 0 of the first word in the parameter block. The remaining portion of the parameter block is defined for each function.

Function Code	Meaning	Called From
0	RHF Initialize. Determine NAD EST status.	RHF
1	Validate UCP.	RHF
2	Return physical identification (PID) of host mainframe.	RHF and Applications
3	Clear RHF active in NAD EST entry.	RHF
4	Set up local copy of job dayfile FNT (ZZZZZDF).	FTFS
5	Flush job dayfile.	FTFS
6	Increment job tape count.	FTFS
7	Set force exit processing bit in control point area.	FTFS
10	Initiate system dynamic dump of control point.	
11	Determine job origin.	
12	Return job name.	MFLINK/FTFS
60-77	Reserved for installation.	

For all functions, RHH will verify that it was called from a job loaded from the system library. For functions 0, 1, and 3, RHH will verify that it was called from the RHF system control point.

Following are the specific formats of the parameter block for each function.

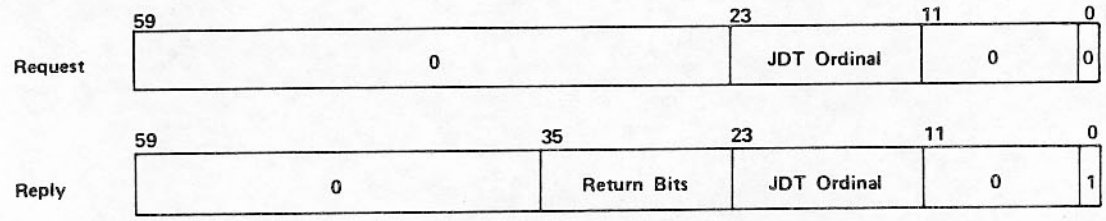
RHF Initialize



Reply Complete bit set. Local NAD table updated.

The local NAD table is updated to reflect the proper EST ordinal and channel correlation as well as the current EST status.

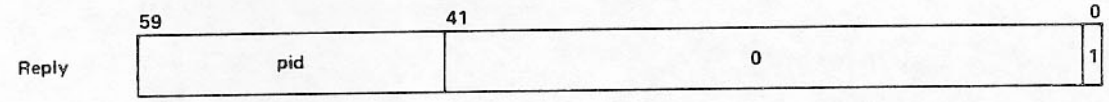
Validate UCP



Return Bits	Meaning if Set
24	Loaded from system library.
25	Special RHF SID ($RH).
26	UCP currently swapped out.
27	Invalid or unoccupied JDT or CP.

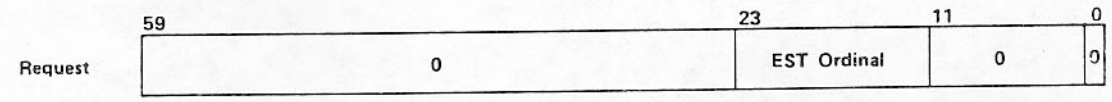
Return Physical Identification (PID) of Host Mainframe

The parameter block is one word of binary zeros for the request.



RHH has returned the three-character physical identification of the host mainframe.

Clear RHF Active in NAD EST Entry



Reply Complete bit set.

Set Up Local Copy of Job Dayfile FNT (ZZZZZDF)

The parameter block is one word of binary zeros for the request. The complete bit is set for the reply.

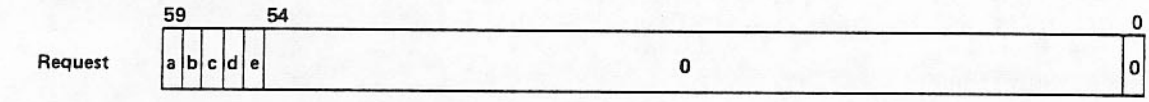
Upon completion, RHH has created a local copy of the job dayfile (ZZZZZDF) so that the copy may be read later by the job.

Flush Job Dayfile

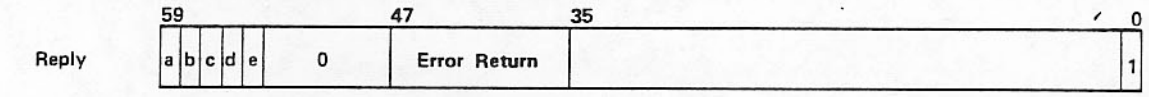
The parameter block is one word of binary zeros for the request. The complete bit is set for the reply.

Upon completion, RHH has flushed the job dayfile, making the local copy of the dayfile (ZZZZZDF) up to date.

Increment Job Tape Count



Field	Bit	Meaning if Set
a	59	Increment MT count.
b	58	Increment NT count.
c	57	Increment HD count.
d	56	Increment PE count.
e	55	Increment GE count.



a, b, c, d, e - as for request.

Error

0 Successful completion.

1 No action; more than one of fields a,b,c,d, and e set in request (or none set).

Processing For Increment Job Tape Count

If any of the counts MT, NT/HD, PE, or GE are nonzero in the control point area, they are cleared. If IP. SCHDE is 0, requests to increment HD, PE, or GE counts cause incrementing of the NT/HD count.

If IP.SCHDE is 1, a request to increment the NT count causes incrementing of the appropriate NT/HD, PE, or GE fields based on the installation defined nine-track density as follows.

IP.NDEN	Count Incremented
1	GE
2	NT
3	PE

In all other cases, the requested count is updated.

Set Force Exit Processing Bit

The parameter block is one word of binary zeros for the request. The complete bit is set for the reply. Upon completion, bit S.CPFEP (force exit processing) in byte C.CPFP of word W.CPFP, is set in the control point area. Also, the maximum pru limit, field C.CPMSLM of word W.CPMSLM, is set to zero.

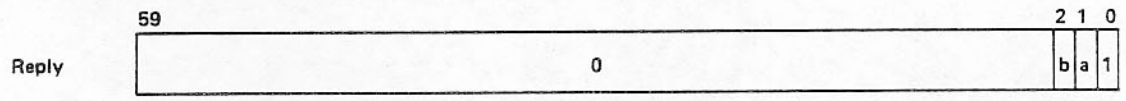
Initiate System Dynamic Dump of Control Point

The parameter block is one word of binary zeros for the request.

Upon completion, RHH has set the complete bit in the parameter block and it has called 1DD to dump the RHF field length and to catalog the dynamic dump.

Determine Job Origin

The parameter block is one word of binary zeros for the request.

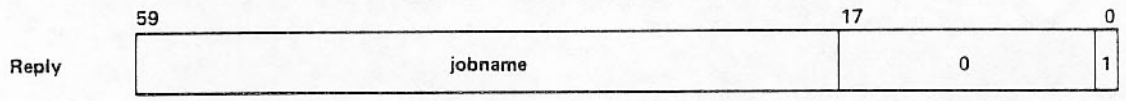


Flags returned by RHH are as follows:

Field	Bit	Meaning if Set
a	1	System-origin job.
b	2	Job source identification equals special RHF SID ($RH).

Return Jobname

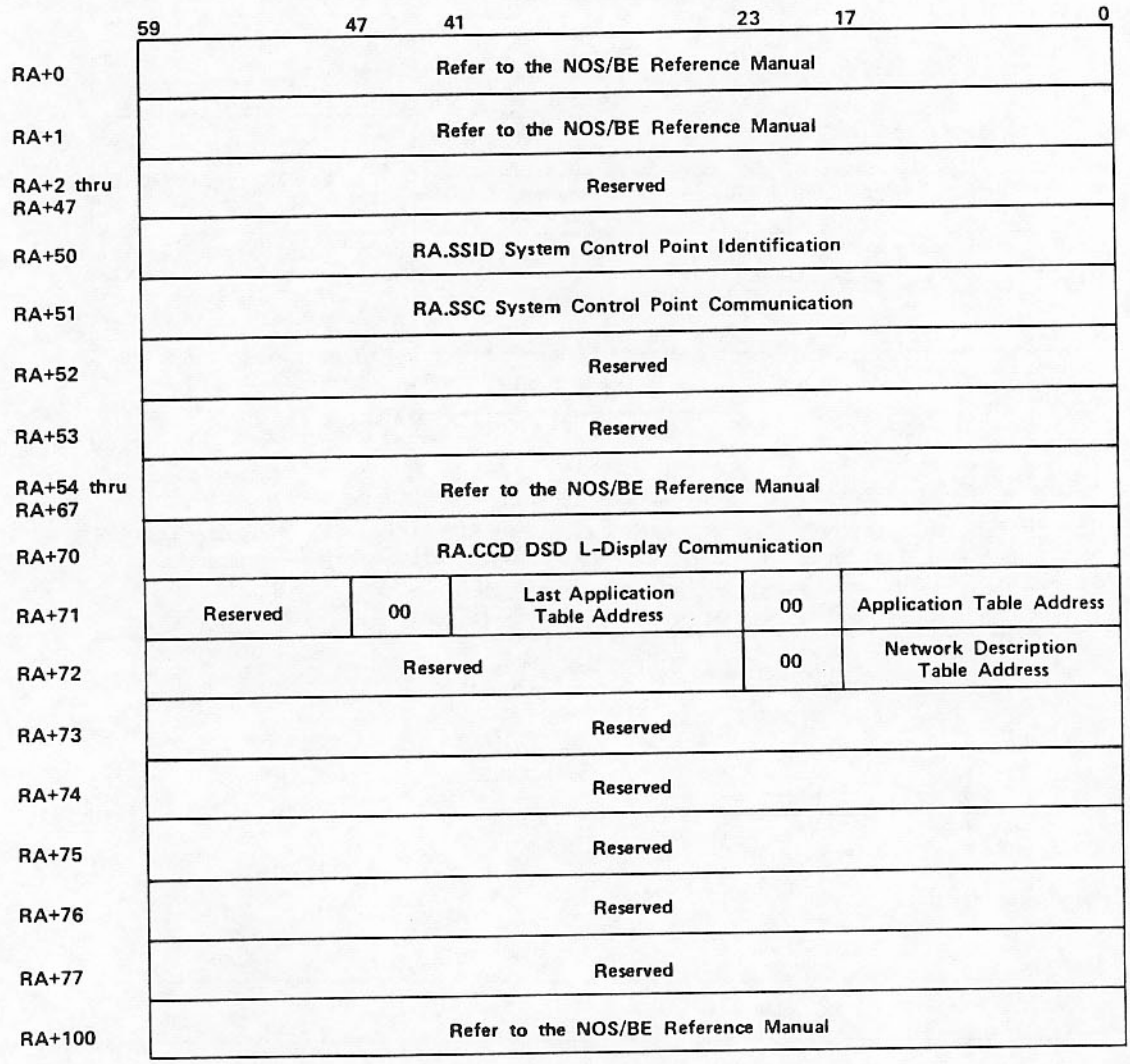
The parameter block is one word of binary zeros for the request.

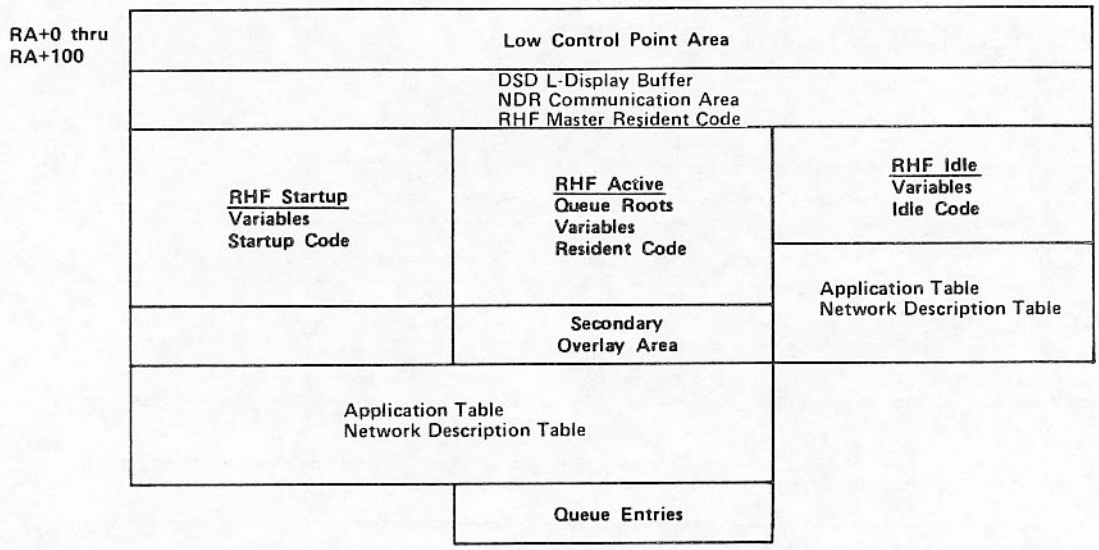


RHH has returned the job name from the control point area.

RHF CONTROL POINT FIELD LENGTH OVERVIEW

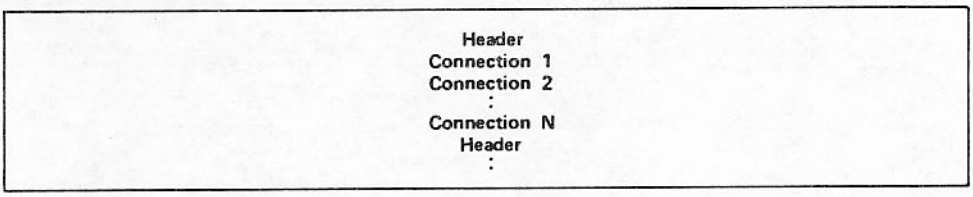
RA+0 THRU RA+100





APPLICATION TABLE

The application table has one entry for each allowable application that can NETON. This means multiple entries may exist with the same application name, but with different job names. Each entry has two subsections, each consisting of a header and allowed connections.



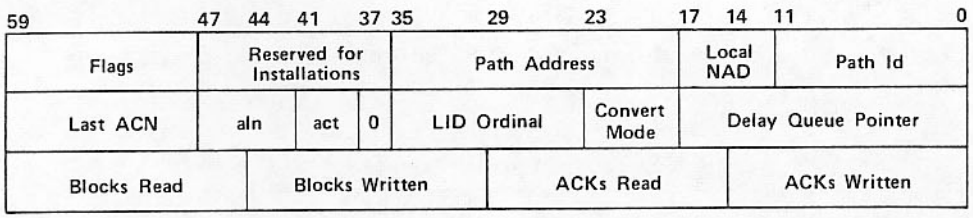
Application Table Header

59	47	35	23	17	11	0
Application Name					Flags	
Job Name					Job Ordinal	
Number of Possible Connections	minacn	maxacn		ERR/LGL Count	UCP Queue Pointer	
Timer	Total Message Queue Count	nsup Address			Message Queue Pointer	
Reserved for Installations	0	NETWAIT UCP Address			Swap Queue Pointer	

Field	Bit	Meaning if Set
a	17	Enabled.
b	16	Server application.
c	15	Auto-start application.
d	14	System origin required.
e	13	Active LID not required.
f	12	Reserved.
g	11	Discard ERR/LGLs.
h	10	Attempting to abort application.
i	9	Reserved.
j	8	Application table error message displayed.
k	7	End of job connection.
l	6	System origin.
m	5	NETOFF in progress.
n	4	NETWAIT flag parameter (1=forced NETWAIT).
p	3	NETWAIT for convert mode resources.
q	2	Reserved.
r	1	Starting.
s	0	NETON.

Fields g through s are zeroed upon completion of NETOFF. The range minacn to maxacn is always less than or equal to the number of possible connections. The ERR/LGL count is the number of logical error messages queued. Exceeding 200 messages causes an automatic NETOFF. UCP queue is a queue which requires UCP communication. Message queue is a queue of asynchronous supervisory messages. Swap queue is a queue of NDR requests which require UCP action. The NETWAIT UCP address points to the UCP CALLSS request block for an outstanding NETWAIT. If field n is zero, timer is the amount of time that RHF has been waiting since it asked for application to NETON (specified in seconds) since it submitted server startup job to system input queue. If field n is one, timer is the number of seconds remaining in a NETWAIT request.

Application Table Connection



Field	Bit	Meaning if Set
a	59	Connection initialized.
b	58	Input available.
c	57	Output below threshold.

Field	Bit	Meaning if Set
d	56	Connection broken.
e	55	CON/REQ/N received.
f	54	FC/INIT/N received.
g	53	FC/BRK processing in progress.
h	52	List processing turned on.
i	51	Connection shutdown in progress.
j	50	CON/REQ/R sent to application.
k	49	FC/BRK sent by this application.
l	48	Connection waiting for convert mode resources.

Path ID

Zero indicates that ACN is available for assignment.

Last ACN

Indexed by aln to determine the last acn serviced for a NETGETL call.

Convert Mode

0 No convert mode active

1 ASCII mode.

2 Display code write.

3 ASCII read.

4 Display code read.

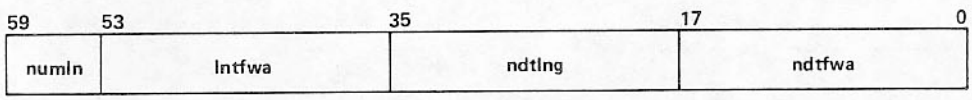
The parameters blocks read, blocks written, ACKs read and ACKs written are each 15 bits long.

NETWORK DESCRIPTION TABLE

The network description table provides a translation from a LID to a logical path description. The table is organized on a remote mainframe basis. A set of LIDs and paths is defined for each remote mainframe. Each path comprises a local NAD and a remote NAD. The table is physically organized so that all local NADs are defined together and all remote NADs are defined together.

The network description table has a one-word header which is used by subsystem programs to scan the table.

The header format follows.

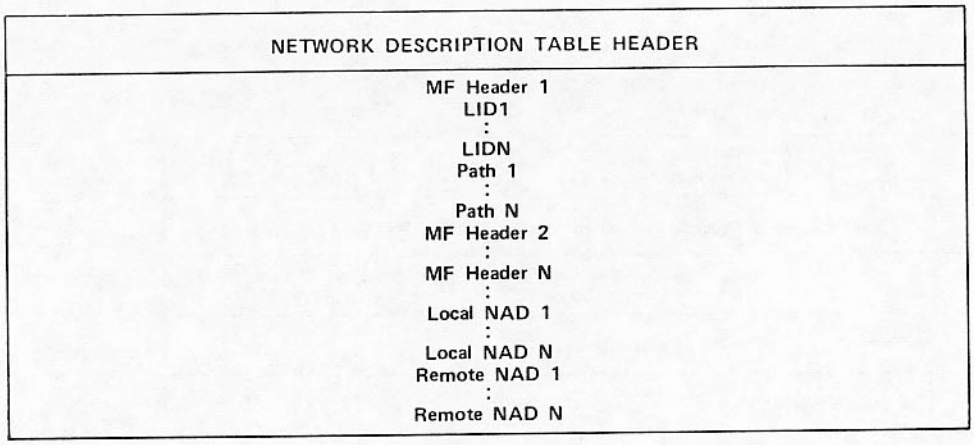


numln Number of local NAD entries.

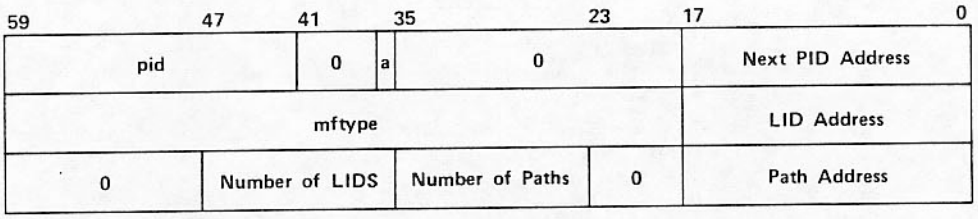
lntfa Address in RHF of first local NAD entry.

ndtlng Length of network description table (header word not included).

ndtfwa Address of the network description table in RHF.

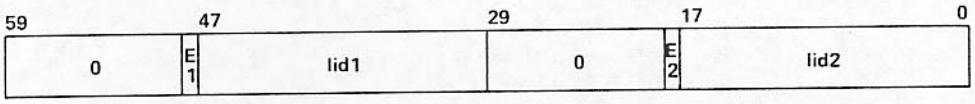


Network Mainframe Header



Parameters PID and MFTYPE are described in the NOS/BE Installation Handbook listed in the preface. The next PID address is zero when no more entries are on the list. Field a is the PID ENABLED flag.

LID Entry



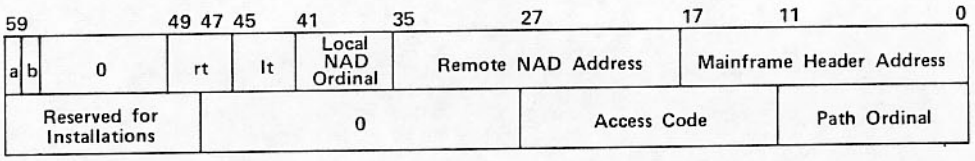
One LID entry is 30 bits.

E1 through En

Indicates that the corresponding LID is enabled.

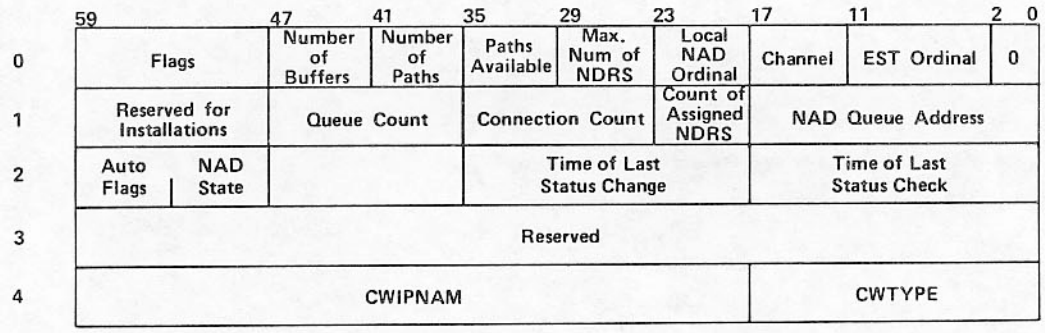
The upper 6 bits of each half-word are reserved for installations.

Path Entry



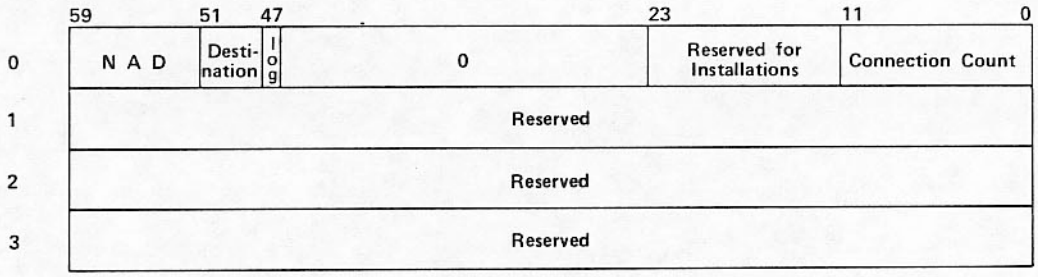
a Path Enabled. b Activity.

Local NAD Entry



Field	Word	Bit	Description
Flags	0	59	Dedicated channel.
		58	NAD status queued.
		57	EST entry off.
		56	Status taken.
		55	EST entry off previously.
		54	Controlware not loaded.
		53	Configuration error.
		52	NAD code conversion enabled.
Auto flags	2	59	Status-change interlock.
		58	Autoload enabled (NAD controlware).
		57	Autodump enabled (NAD memory).
NAD state	2	53-48	00 - Nad available. 02 - Controlware load required. 04 - NAD memory dump required. 77 - NAD disabled.
CWIPNAM	4	59-18	Controlware initialization parameter record name. One to seven-character name set when the RHF configuration record is built.
CWTYPE	4	17-0	Controlware type. Three-character name set when the RHF configuration record is built.

Remote NAD Entry



Field	Word	Bit	Description
log	0	47	NAD error log extraction enabled.

RHF QUEUE ENTRY FORMAT

RHF is an event-driven processor. The queue entry format is therefore the most important internal data structure. RHF has resident and overlay code. The resident code is structured in such a way that it will never wait on any one external event; this means the resident code is always able to handle new UCP requests and NDR function completions. The overlay code is structured so that it calls the WAIT routine whenever waiting on an external event. The current state of all work in progress is always saved within a queue entry. This allows the resident code to queue work for the overlay code or for NDR, whenever an external event is required. The queue entries are grouped into four main sections: UCP communication (1 through 10); NDR communication (20 through 32); miscellaneous resident to overlay communication (40 through 46); and reseved for installations (70 through 77).

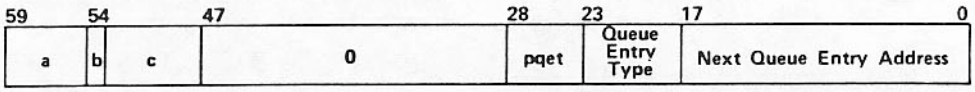
The UCP communication group of queue entries is defined to allow resident code to keep the UCP requests moving as quickly as possible, yet it still protects against the possibility of a swapped UCP.

The NDR communication group of queue entries is defined to allow resident code to keep NDR communication flowing by queueing work to each local NAD so the work list is available whenever a NDR completes a function.

The miscellaneous group of queue entries is defined to allow resident code to queue work for overlay code.

The NDR communication group of queue entries is also an external interface with NDR. NDR may read and write information from the queue entry. This external interface is noted where appropriate for each NDR queue definition.

Queue entries are each eight words long. The following format is used by the standard first word of every queue entry.

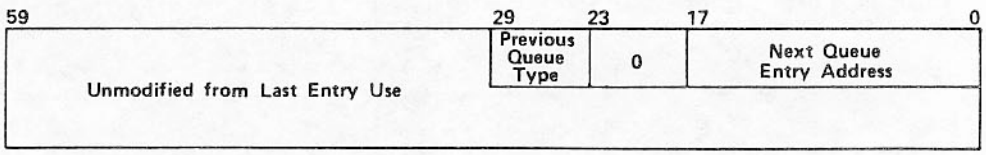


Field	Bit	Meaning if Set
a	59-55	Reserved for installations.
b	54	Release entry bit.
c	53-48	Reserved for CDC.
pqet	28-24	Previous queue entry type.

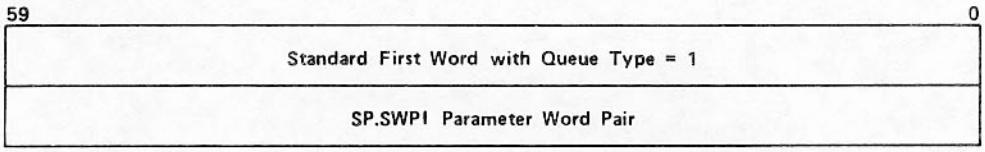
Queue Entry Type (Octal).

0 Empty queue entry.
1 UCP swap in request.
2 UCP nsup reply.
3 Request complete.
4 Asynchronous supervisory message reply.
5 UCP asynchronous supervisory message request.
6 UCP SSF call entry.
7 UCP message text for SSF call (UCP dayfile message).
10 UCP NETON reply words.
11 UCP error/logical entry.
20 FIP (UCP) request.
21 ACK message.
22 Outgoing control message.
23 NDR request connection.
24 NDR obtain connect request.
25 NDR disconnect path.
26 NDR flush path.
27 NDR initialize NAD.
30 NDR status.
31 NDR select convert mode.
32 NDR exit convert mode.
40 Status event.
41 Incoming control message.
42 Overflow counter.
43 NAD off.
44 Connect request available.
45 Remote connection request.
46 Connect request awaiting assignment.

Empty Queue Entry

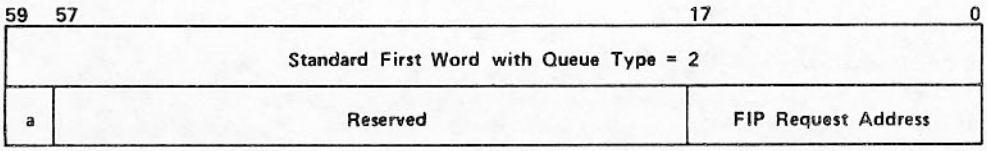


UCP Swap-In Request



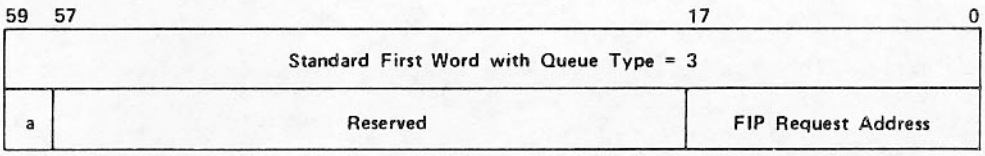
A swap-in request is queued in front of the UCP queue whenever a UCP communication discovers a swapped UCP.

UCP nsup Reply



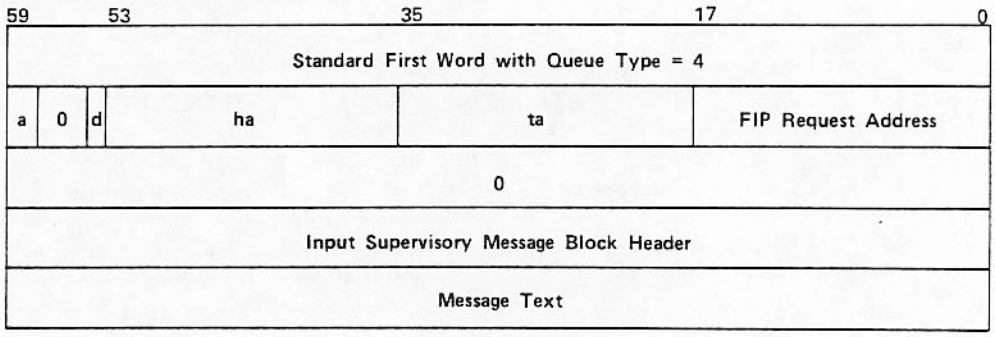
Field	Bit(s)	Meaning if Set
a	59-58	Charge type 1 Standard charge. 2 Search application table charge.

Request Complete



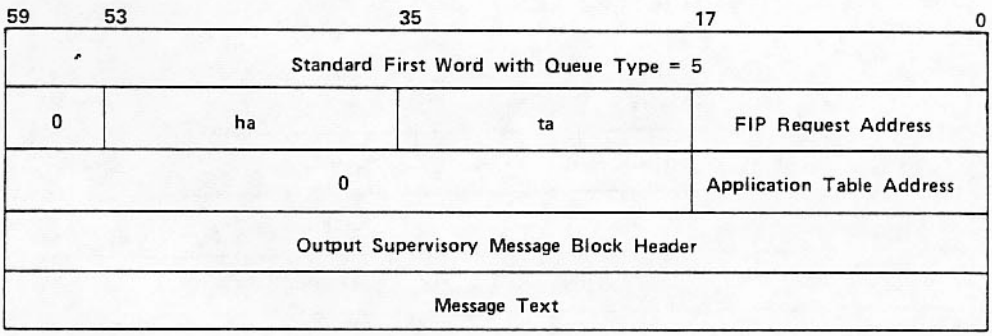
Field	Bit(s)	Meaning if Set
a	59-58	Charge type 1 Standard charge. 2 Search application table charge.

Asynchronous Supervisory Message Reply



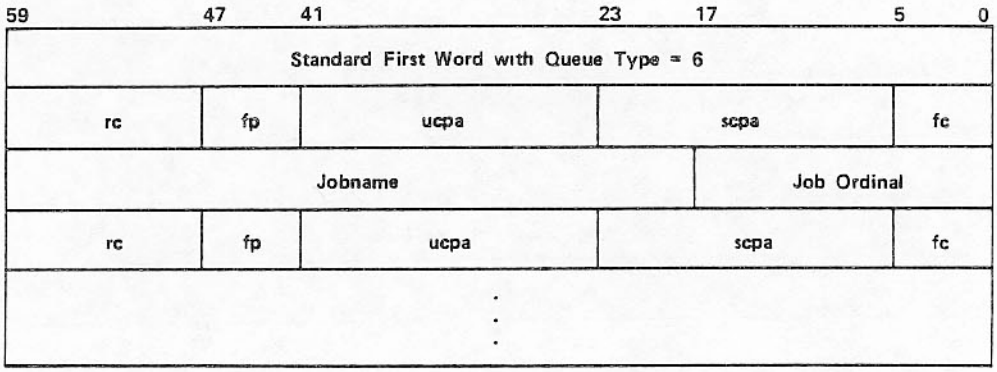
Field	Bit(s)	Meaning if Set
a	59-58	Charge type 1 Standard charge. 2 Search application table charge.
d		
	54	ERR/LGL message.

UCP Asynchronous Supervisory Message Request



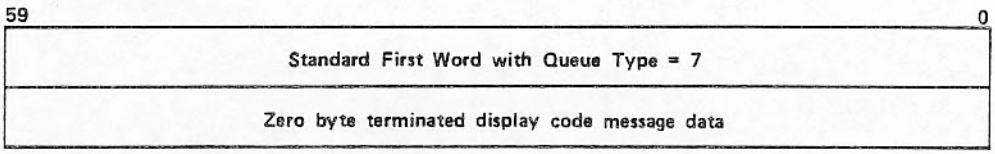
The output supervisory message block header and message text are inserted as a result of being on the UCP queue.

UCP SSF Call Entry



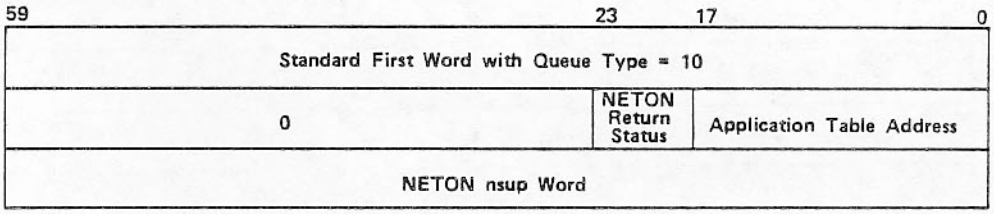
The standard SSF call format is used for words two through n of this queue entry. Words four through n use standard SF.LIST entries.

UCP Message Text for SSF Call

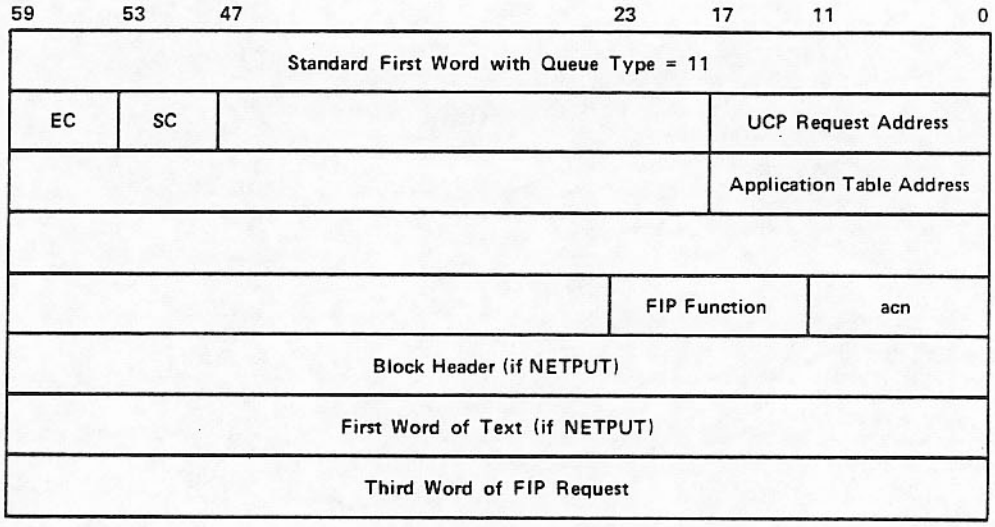


This is the text of a message to be sent to the UCP.

UCP NETON Reply Words



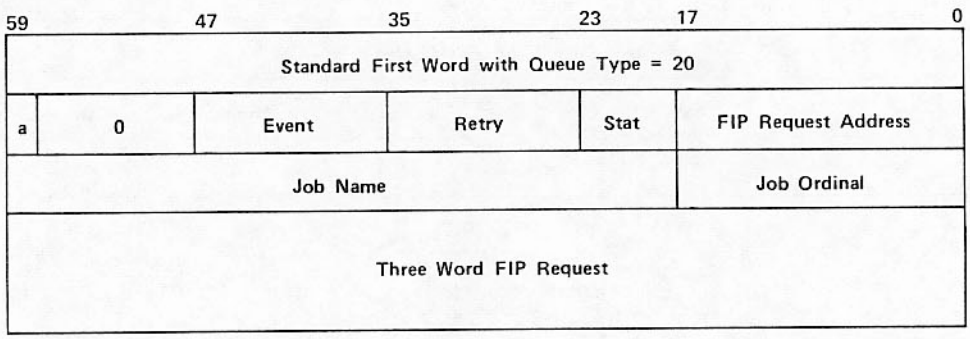
UCP ERROR/LOGICAL Entry



EC ERR/LGL Code

SC Subsystem Error Code (if EC=0)

FIP (UCP) Request



Stat

0 Call is from a user.

1 Normal termination.

2 Error termination of UCP.

RHF always zeroes the three-word FIP request area before accepting a FIP request from the monitor.

Retry

Retry count for NDR.

Event

0 Waiting for input available.

1 Waiting for output below threshold.

a

Charge type (bits 59 through 58)

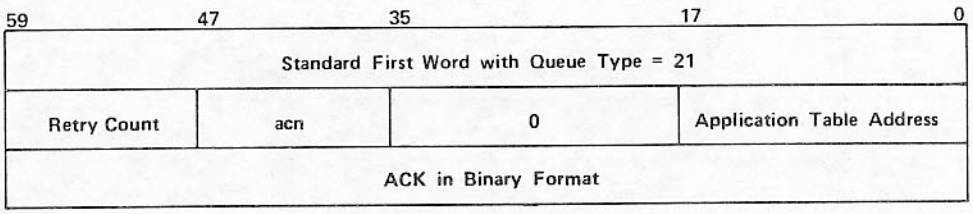
0 Standard charge.

1 Search application table charge.

NOTE

NDR reads the job ordinal and the three-word FIP request. NDR also reads the retry count when the request is for FET I/O.

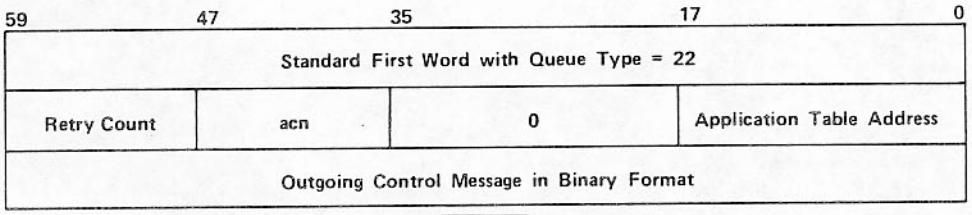
ACK Message



NOTE

NDR reads the preformatted ACK message from the queue entry. NDR adds the proper path id to the name field and inserts the ABN into the message. NDR will write the updated ACK message to the queue entry when it is unable to write the ACK message to the network. In this case, the ACK message is added to the NAD queue (the local NAD table has the queue root).

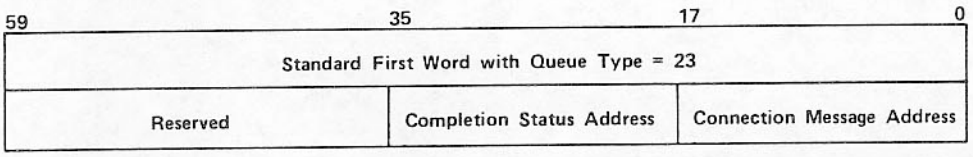
Outgoing Control Message



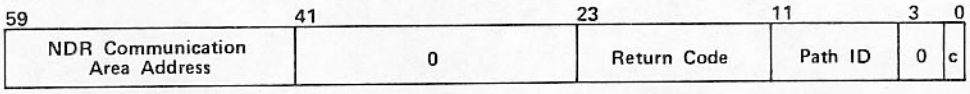
NOTE

NDR reads the preformatted control message from the queue entry. NDR adds the proper path id to the NAME field. It determines the length of the control message from the bit length field.

NDR Request Connection



Completion status is indicated by one word in the following format.



c

Completion bit; set by RHF at NDR completion.

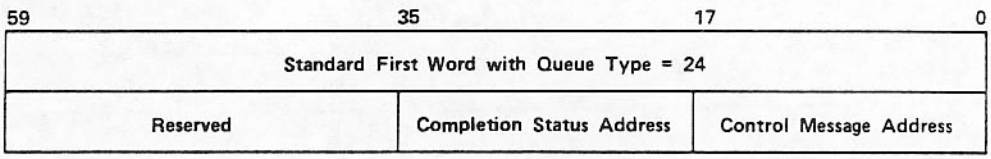
Path ID

Returned only on request connection.

NOTE

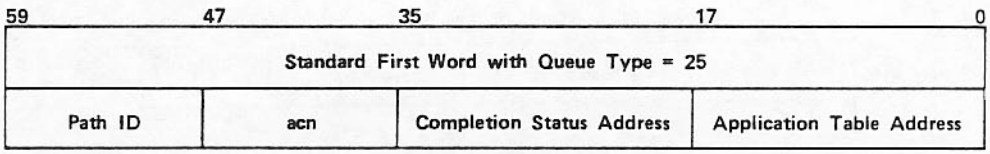
NDR reads the connection message address from the queue entry and the connection message from RHF memory.

NDR Obtain Connect Request



The RHF scan subroutine sets complete and immediately returns to the caller. The caller must reply to the NDR completion.

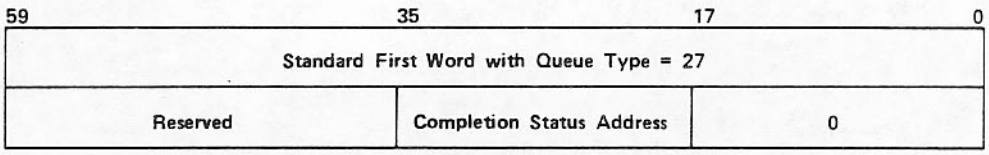
NDR Disconnect Path



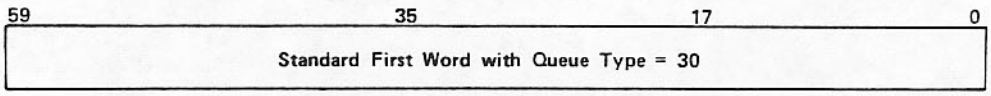
NDR Flush Path

Same as NDR disconnect path, but queue type is 26.

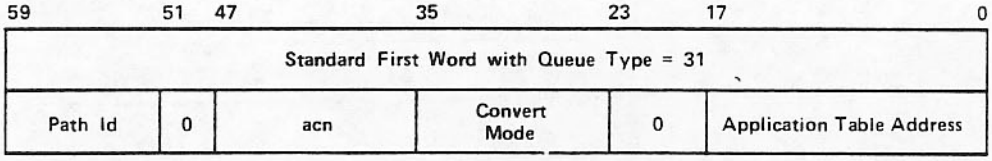
NDR Initialize NAD



NDR Status



NDR Select Convert Mode



NDR Exit Convert Mode

59	51	47	35	17	0
Standard First Word with Queue Type = 32					
Path Id	0	acn	0	Application Table Address	

Status Event

59	0
Standard First Word with Queue Type = 40	
Event List Entry	

Event List Entry

Refer to the status request earlier in this section.

Incoming Control Message

69	47	35	23	17	0
Standard First Word with Queue Type = 41					
a	0	acn	Byte Count	0	Application Table Address
Control Message in Binary Format					

a

Set to indicate rejected control message

Byte Count

Byte count of input data beyond the 192-bit header.

NOTE

NDR writes the control message and the control word above (containing ACN and application table address) into the queue entry in response to a status request.

Overflow Counter

59	47	35	23	17	0
Standard First Word with Queue Type = 42					
0	acn	Counter	0	Application Table Address	

Counter

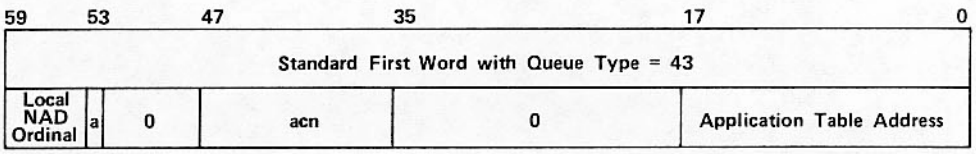
0 Blocks read.

1 Blocks written.

2 ACKS read.

3 ACKS written.

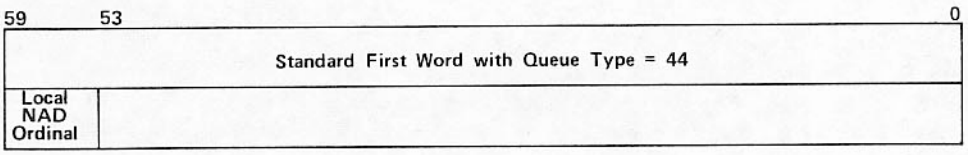
NAD Off



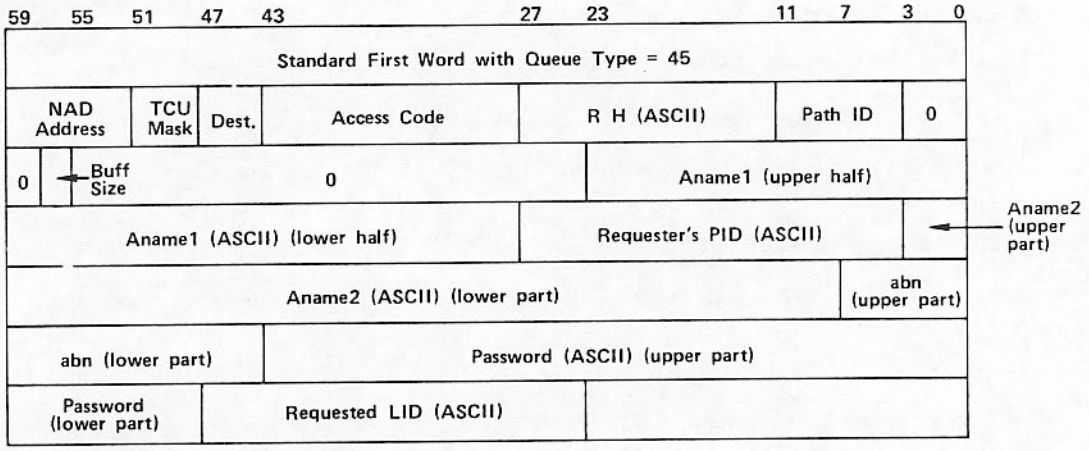
a

Path error.

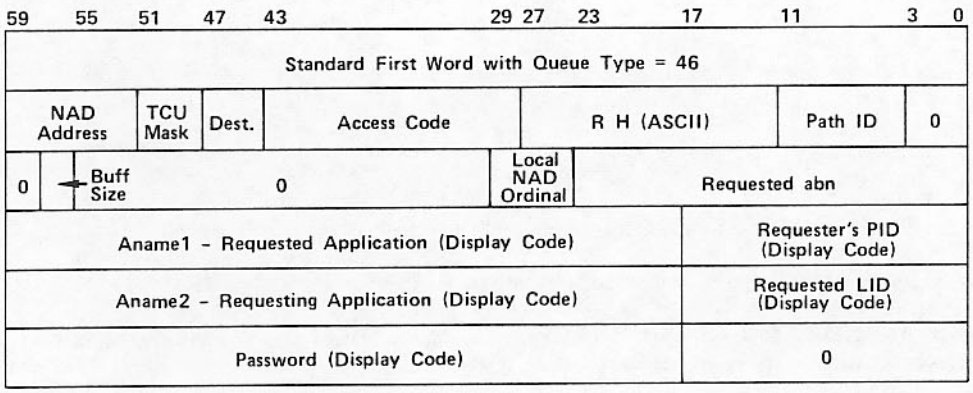
Connect Request Available



Remote Connection Request



Connect Request Awaiting Assignment



POINTERS TO RHF QUEUES

Pointers to the various queues can be found in several locations.

- RHF local variables - queue roots
- Application table header - queue roots
- Application table connection - queue roots
- Local NAD Table - queue roots
- NDR communication area
  - Request header
  - Second word of request area for some functions

RHF Local Variables—Queue Roots

The following pointers pertain to those queues that are to be processed by overlays (with the exception of the first queue listed).

- Empty queue root (entries of queue type 0).
- Unidentified request queue root. The UCP request was not one of the normal formats handled by resident code (entries of queue type 20).
- NETON queue root. The UCP requested NETON (entries of queue type 20).
- NETOFF queue root. The UCP requested NETOFF (entries of queue type 20).
- NETWAIT queue root. The UCP requested NETWAIT (entries of queue type 20).
- Error logical queue root. The UCP request requires an Error Logical reponse (entries of queue types 40 or 44).
- Control message. A rejected control message or an incoming control message which is not an ACK (entries of queue type 41).
- Overflow. A connection block counter overflowed (entries of queue type 42).
- Supervisory message. A supervisory message from a UCP (entries of queue type 5).
- NAD off. NDR has turned off a NAD due to hardware errors (entries of queue type 43). MHF is initiated, if necessary, to recover the NAD.
- Connect request available. New remote connection request is waiting to be read from the NAD.
- Wait assignment. Connection request is waiting for assignment to an application program.
- Wait UCP Swap in. Entries for UCPs for which swap in requests have been made.

Application Table Header — Queue Roots

The following queues are associated with UCP and are examined by the RHF resident code.

- UCP queue root. Immediate communication is required with UCP (entries of queue types 1 through 5).
- Message queue root. Queue of asynchronous supervisory messages for this application (entries of queue type 4).
- Swap queue root. NDR functions requiring a UCP that is swapped out are placed on this queue (entries of queue type 20).

Application Table Connection — Queue Roots

DELAY queue root. When output to the NAD cannot be completed for this ACN or when input is not available during a file transfer, an entry is added to this queue (entries of queue type 20). While a connection is being established, the DELAY queue will contain either the supervisory message CCN/ACRQ/R (queue type 5) or the remote connect request awaiting assignment (queue type 46).

Local NAD Table — Queue Roots

NAD queue root. Requests for NAD operations are added to this queue. When appropriate, RHF will assign a NAD operation to an NDR for one of these queue entries and will remove it from the NAD queue (entries of types 10 through 22).

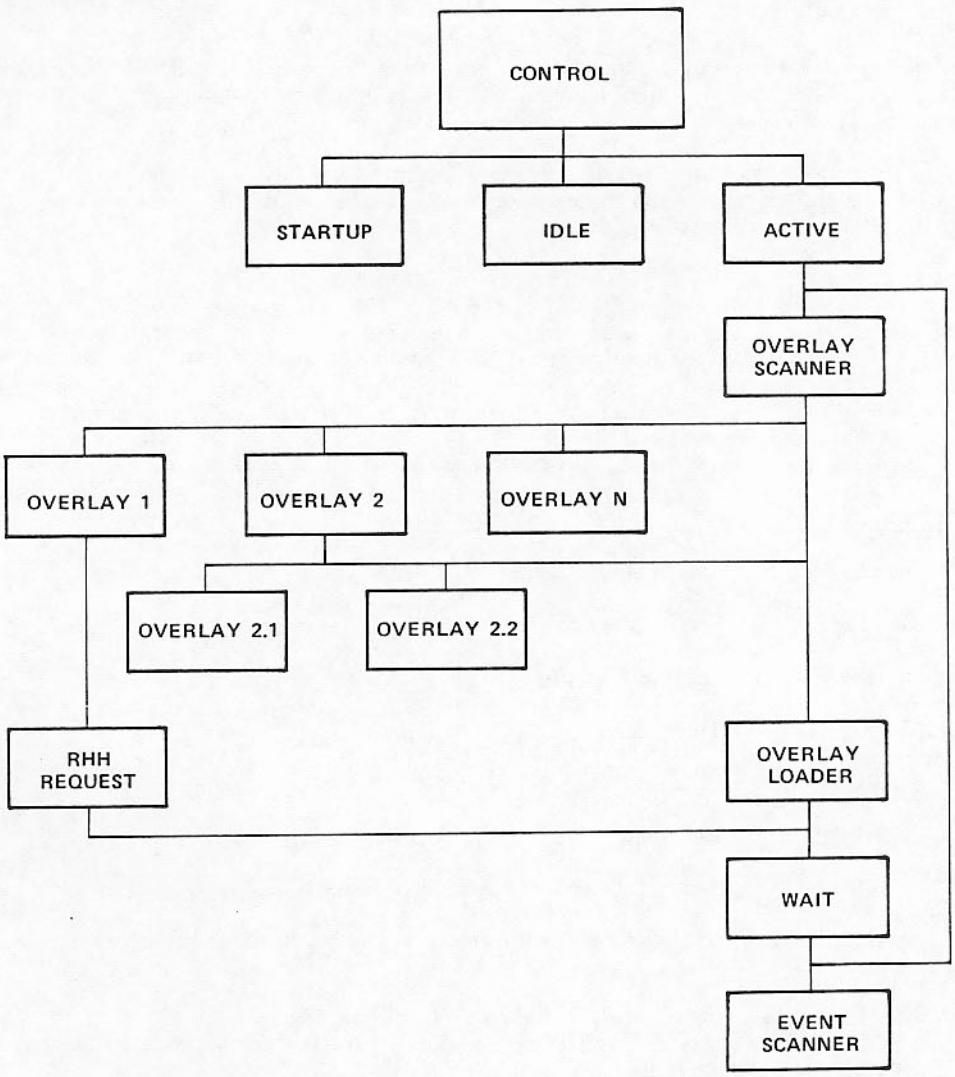
NDR Communication Area Queue Entry Pointer

The first word of the NDR/RHF communication area has a pointer to a queue entry. The queue entry pointed to by this header is dependent on the following NDR functions.

NDR	Function	Types of Queue Entry
0	No function	Ignored
1	Idle	Ignored
2	Status	30 NDR status
3	Dropout	Ignored
4	Request connection	23 NDR request connection
5	Obtain connect message	24 NDR obtain connect message
6	Connect request reply 1	24 Uses same entry as function 5
7	Send control message	21 ACK message or 12-control message
10	Read path data and send ACK	20 FIP (UCP) request†
11	Write path data	20 FIP (UCP) request
12	Disconnect path	25 NDR disconnect path
13	Flush path	26 NDR flush path
14	Initialize NAD	27 NDR initialize NAD
15	Perform FET I/O READ	20 FIP (UCP) request
16	Perform FET I/O WRITE	20 FIP (UCP) request
17	Perform FET I/O WRITER	20 FIP (UCP) request
20	Perform FET I/O WRITEF	20 FIP (UCP) request
21	Perform FET I/O CLOSE	20 FIP (UCP) request
22	Perform FET I/O READC	20 FIP (UCP) request
23	Perform FET I/O WRITEC	20 FIP (UCP) request
24	Select convert mode	31 NDR select convert mode
25	Exit convert mode	32 NDR exit convert mode
26	Read data in convert mode	20 FIP (UCP) request
27	Write data in convert mode	20 FIP (UCP) request
30	Start NDR	Ignored

†An additional queue entry for this function is pointed to by the second word of the request. This additional queue entry is queue type 21, ACK message.

RHF HIERARCHY



DESIGN RATIONAL

The main considerations in designing RHF were as follows:

- To remain as small as possible through the use of overlays.
- To remain reponsive in continuing flow of request processing.

Work that is not time-critical is placed in overlays. Only work that can continue immediately is performed by the event scanner. The PP routine NDR is used for all NAD functions. RHF is in control of functions to NDR. If NDR is placed in idle by RHF, RHF can give NDR a new function at any time. The RHH PP routine is used for miscellaneous system requests well-suited for PP processing.

FACILITIES INTERFACE PROGRAM (FIP)

DESIGN OVERVIEW

This section describes the design of the facility interface program (FIP). FIP is responsible for that portion of the level 6 protocol which handles the method of exchanging data and control messages between application programs and the RHF subsystem.

FIP consists of a set of relocatable CPU modules which access the RHF network, initiate and control RHF network processing, and transmit and receive data and supervisory messages between the application program and the RHF network software.

SYSTEM FLOW

FIP is structured so that it can be separated or viewed as two sets of logically related modules. FIP modules contain all nonfile transfer functions; FIPXFR modules contain file transfer related code.

An application brings these modules into its field length at load time by referencing one of its entry points.

FIP entry points, equivalent entry points, and associated functions are described in the following list.

FIP Entry Points	Associated Function
NETON/RHFON	Establishes access to the network.
NETOFF/RHFOFF	Ends access to the network.
NETWAIT/RHFWAIT	Suspends appplication temporarily.
NETDBG/RHFDBG	Turns debugging on or off.
NETGET/RHFGET	Obtains data from specified connection.
NETGETL/RHFGETL	Obtains data from one of a list of connections.
NETPUT/RHFPUT	Sends data to a specified connection.

If an application is using an overlay structure, the overlay which contains NETON must remain in memory until NETOFF is called.

The FIPXFR module is also brought into the field length at load time, provided that the program overlay references one of the entry points of the FIPXFR module. FIPXFR entry points, equivalent entry points, and associated functions are described in the following list:

FIPXFR Entry Point	Associated Function
NETXFR/RHFXFR	Initiate a file transfer to/from a specified connection.
NETUXFR/RHFUXFR	Send/obtain unacknowledged data to/from a specified connection using the NDR FET interface.
NETXFRC/RHFXFRC	Update outstanding file-transfers-in-progress.

If an application is using an overlay structure, the overlay which contains NETXFR must remain in memory until all file transfers have been completed. Because NETXFR uses common memory manager (CMM), the CMM parameter must be used for any overlay loading and any memory management done by the application program must be done through calls to CMM.

SYSTEM FLOW FOR ALL FUNCTIONS EXCEPT NETXFR

All FIP functions, excluding NETXFR, basically take the parameters passed to them by the application program and format a corresponding call to the RHF subsystem via the CALLSS macro. The operating system passes the call to RHF if possible. If not, it will abort the control point of the application (NETON is an exception, as discussed later in this section). The RHF subsystem processes the function. If a fatal error is detected the control point of the application is aborted. Otherwise, return parameters, if any, are passed back to the application program and control is returned to FIP. FIP then completes its processing and returns control to the application program.

- If there is outstanding file-transfer activity, NETGET calls INTAMSG, a subroutine in the FIPXFR module, to intercept asynchronous supervisory messages destined for ACNs with outstanding file-transfers-in-progress.
- Four of the functions, NETPUT, NETWAIT, NETGET, and NETGETL, if there is outstanding file-transfer activity, will call NETXFRC to continue the processing of each active file transfer one step further, if possible.
- If the application program has set a debug flag, NETPUT, NETGET, NETGETL, and NETOFF will write debug information to the dayfile.
- When control is returned to NETON after the call to the RHF subsystem, NETON must check for error conditions and set an error status for the application program.

SYSTEM FLOW FOR FILE-TRANSFER FUNCTIONS

The FIPXFR module has three entry points, NETXFR, NETUXFR, and NETXFRC.

NETXFR is first called by an application to initiate a file transfer. To initiate the file transfer, NETXFR performs the following functions.

- Ensures that no more than the installation defined number of file transfers are active.
- Issues an LST/OFF/R asynchronous supervisory message to RHF to turn off list processing for this ACN.
- Calls CMM to obtain a CM block for the two file-transfer FETs, the file-transfer circular buffer(s), and the file-transfer common area.
- Builds the NDR FET.
- Builds the CIO FET.
- Initiates a CIO call to open the local file.

If immediate return is requested, NETXFR will then return control back to the application. Otherwise NETXFR will keep calling NETXFRC, place itself in RECALL and check for asynchronous supervisory messages until the file transfer is completed.

NETUXFR performs the following functions.

- Sets up RHF request block.
- Calls RHF without recall.
- Returns control to user.

NETXFRC may be called directly by an application program or by NETGET, NETGETL, NETPUT, NETWAIT, or NETXFR. NETXFRC performs the processing necessary to complete a file transfer. Each time NETXFRC is called, it attempts to move each active file-transfer-in-progress from one state to the next state. The states that an active file-transfer-in-progress may pass through are shown in table H-1.

Table H-1. State Descriptions

State	Description	Send	Receive
0	Initial state, inactive entry.	X	X
1	CIO open request outstanding.	X	X
2	SS† (start of data) command sent, waiting for FC/ACK/R reply.	X	
3	Waiting for SS† command.		X
4	CM/SEL/R issued wait for reply.	X	X
5	Delay, waiting for convert mode resources.	X	X
6	Data transfer in progress.	X	X
7	CM/EXIT/R issued wait for reply.	X	X
8	ES† (end-of-data) command issued, waiting for FC/ACK/R reply.	X	
9	EOI received, waiting for ES† command.		X
10	ES† command received, ER† (end acknowledge) command issued, waiting for FC/ACK/R reply. When received, this terminates a data transfer for the receive direction for both normal and error cases.		X
11	ES† command issued, FC/ACK/R received, waiting for ER† command. When received, this terminates a data transfer for the send direction for both normal and error cases.	X	
12††	QR† (quit, with error) command issued, waiting for FC/ACK/R reply. When received the next state will be 7.		X
13††	FC/NAK/R received, waiting for buffer space in NAD.	X	X

†Level 7 command used in the protocol exchange between applications.
††States 12 and 13 are only entered when an error condition (state 12) or a NAD buffer busy condition (state 13) occurs.

If NETXFR has been charged with completing the file transfer before returning control, it also intercepts asynchronous supervisory messages destined for ACNs with active file transfers. If the application program called NETXFR with immediate return specified, the application program must make periodic calls to NETGET or NETGETL so that asynchronous supervisory messages for active ACNs can be intercepted.

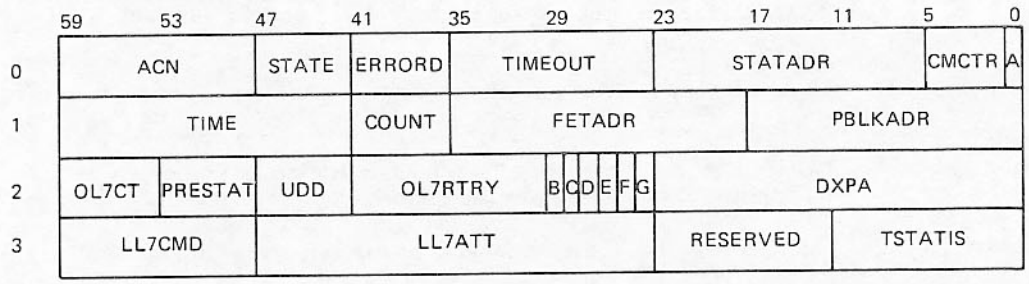
After each active file transfer has been updated (or completed) once, control is returned to the calling routine.

Global Variables	NUMFILEXFR	Number of outstanding file-transfers-in-progress.
	FTTINDEX	Index into file transfer table.
Global Flags	DBUGSUP	Controls logging of supervisory messages.
	DBUGDAT	Controls logging of data messages.
	IDLEDOWN	If TRUE, then in IDLEDOWN condition.

DATA FORMATS

Refer to the Remote Host Facility Access Method Reference Manual listed in the preface for formats of a synchronous supervisory message and of the network supervisory status record of the application program.

FILE-TRANSFER TABLE (FTT)

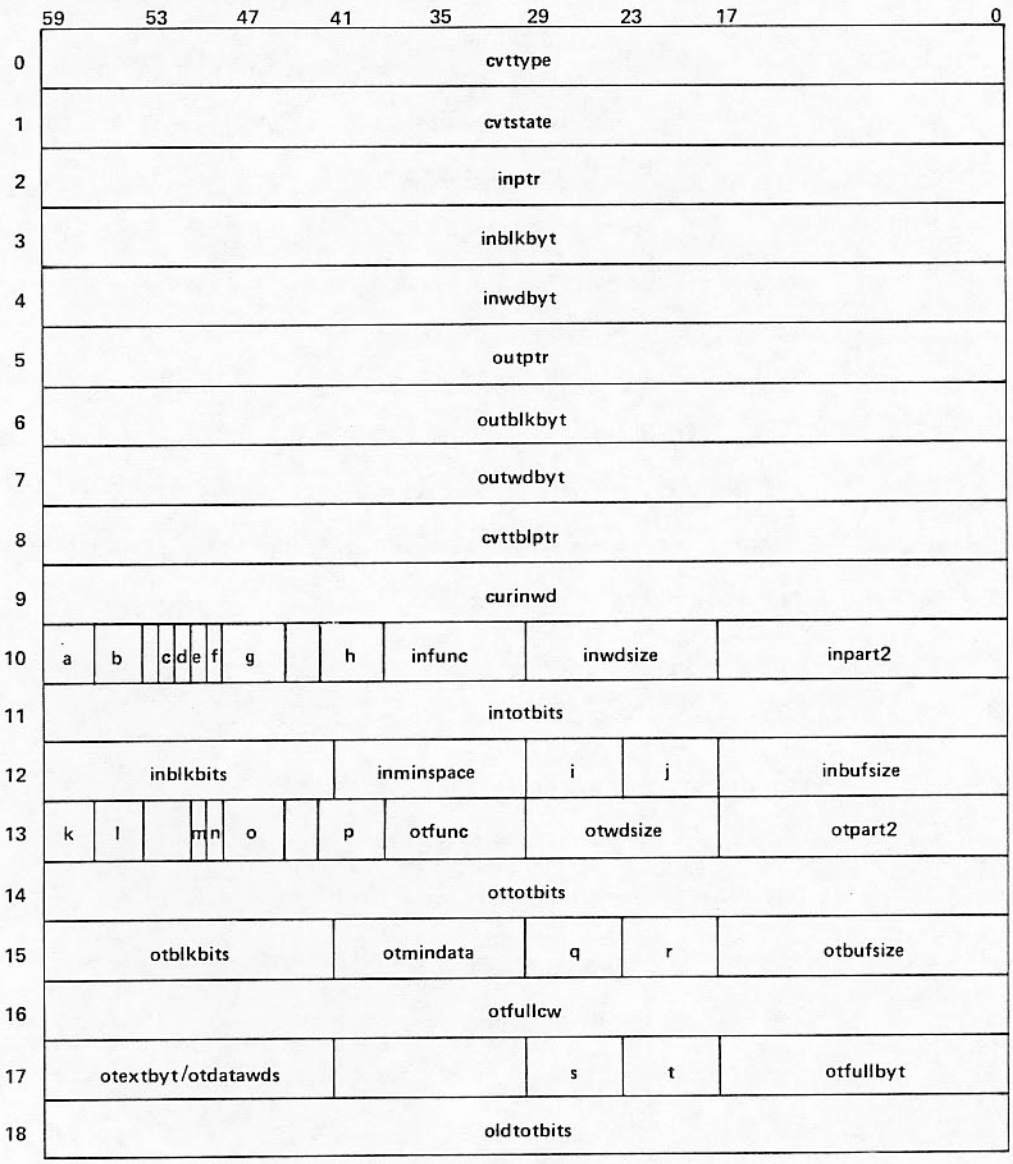


Field	Word	Bit	Description
ACN	0	59-48	Application connection number (NETXFR acn parameter). †
STATE	0	47-42	Current state of transfer.
ERRORD	0	41-36	File transfer error flag.
TIMEOUT	0	35-24	Maximum delay (in seconds) when waiting for a response from the network (NETXFR timeout parameter). †
STATADR	0	23-6	Address of caller's status reply word (NETXFR status parameter). †
CMCTR	0	5-1	Delay (in seconds) when waiting for NAD conversion-mode resources.
A	0	0	Direction flag: 0 = receive, 1 = send; (NETXFR op parameter). †
TIME	1	59-42	Time (binary hhmmss) of last state change.
COUNT	1	41-36	Count of NETXFR cycles in current state.
FETADR	1	35-18	Address of local file's FET.
PBLKADR	1	17-0	Address of CALLSS parameter block.
OL7CT	2	59-54	Count of NAD responses to level 7 commands.
PRESTAT	2	53-48	Previous state of transfer.
UDD	2	47-42	Data declaration (NETXFR dd parameter). †
OL7RTRY	2	41-30	Count of level 7 command sent and rejected.
B	2	29	Character conversion required.

† The Remote Host Facility Access Reference Manual describes the NETXFR parameters.

Field	Word	Bit	Description
C	2	28	US control words required.
D	2	27	Level 7 QUIT command sent.
E	2	26	NAD character-conversion-mode active.
F	2	25	Requesting NAD character-conversion-mode.
G	2	24	Releasing NAD character-conversion-mode.
DXPA	2	23-0	Data transfer phase attribute.
LL7CMD	3	59-48	Last level 7 command sent.
LL7ATT	3	47-24	Data transfer phase attribute sent with last level 7 command.
TSTATUS	3	11-0	Temporary NETXFR status.

FILE TRANSFER COMMON AREA (XFRHOLD)



Word	Bit(s)	Description	
0		cvttype	Conversion type

0 Word move (no conversion)
1 CN to C6
2 CN to C8
3 C6 to CN
4 C8 to CN

CN means LCN-normalized ASCII.
C6 means CDC internal display code.
C8 means CDC 2-byte 8/12 ASCII.

Word	Bit			Description
1			cvtstate	State of conversion 0 Normal. 1 Last character is a colon. 2 Zero-byte required. 3 Zero-byte possible.
2			inptr	Previous input word pointer.
3			inblkbyt	Number of valid bytes † in input block.
4			inwdbyt	Number of valid bytes † remaining in previous input word.
5			outptr	Previous output word pointer.
6			outblkbyt	Number of unused bytes † in output block.
7			outwdbyt	Number of bytes † used in previous output block.
8			cvttblprt	Pointer to conversion table.
9			curinwd	Previous input word with next character left-justified.
10	59-57	a	indatstate	Input data state 0 Null. 1 Full. 2 EOR. 3 EOI.
	56-54	b	iniostate	Input I/O state 0 Normal. 1 In progress. 2 Request write EOR. 3 In progress write record. 4 Done. 5 Flush.
	52	c	intape	Reading magnetic tape.
	51	d	intapertry	Rereading magnetic tape.
	50	e	incws	Input data has control words.
	49	f	inwrap	Input data wrap-around.

† Byte size is 60 bits for conversion type 0, 6 bits for conversion type 1, and 12 bits for conversion types 2, 3, and 4.

Word	Bit(s)			Description
(10)	48-45	g	inlevel	Input record level i range is 0 through 17_8.
	42-39	h	incharpwd	Number of input characters per word: 1 for cvttype 0. 5 for cvttype 2, 3, or 4. 10 for cvttype 1.
	38-30		infunc	Input function code (octal) 10 READ 12 READ (binary) 200 READC
	29-18		inwdsize	Number of words in input.
	17-0		inpart2	Number of words in second part of input block (inwrap is 1).
11	59-0		intotbits	Total input bit count.
12	59-42		inblkbits	Number of bits in input block.
	41-3	0	inminspace	Number of words unused before input request issued.
	29-24	i	inbitsbyt	Input bits per character.
	23-18	j	innumcws	Input number of control words.
	17-0		inbufsize	Input buffer size.
13	59-57	k	otdatstate	Output data state.
	56-54	l	otiostate	Output I/O state.
	50	m	otcws	Output data has control words.
	49	n	otwrap	Output block wrap-around.
	48-45	o	otlevel	Output record level.
	42-39	p	otcharpwd	Output characters per word.
	38-30		otfunc	Output function code (octal): 14 WRITE 16 WRITE (binary) 204 WRITEC
	29-18		otwdsize	Number of words in output block.
	17-0		otpart2	Number of words in second part of output block (otwrap is 1).

Word	Bit(s)			Description
14	59-0		ottotbits	Total output bit count.
15	59-42		otblkbits	Number of bits in output block.
	41-30		otmindata	Minimum output data available before output request issued.
	29-24	q	otbitsbyt	Output bits per character.
	23-18	r	otnumcws	Output number of control words.
	17-0		otbufsize	Output buffer size.
16	59-0		otfullcw	Output control word image.
17	59-42		otextbyt	Output block byte count (cvttype is 0).
			otdatawds	Output available word count (cvttype is 0).
	29-24	s	inbitschar	Input valid bits per character.
	23-18	t	otbitschar	Output valid bits per character.
	17-0		otfullbyt	Number of characters in output block.
18			oldtotbits	Previous value of ottobits (word 14). Used to check transfer activity and to initiate time-out process.

INDEX

This index contains entries for material in both volumes. Reference material for sections 1 through 12 are in volume 1.

Comments (continued from other side)

Please fold on dotted line;
seal edges with tape only.

FOLD

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATE

BUSINESS REPLY MAIL
First-Class Mail Permit No. 8241 Minneapolis, MN

POSTAGE WILL BE PAID BY ADDRESSEE

CONTROL DATA
Technical Publications
ARH219
4201 N. Lexington Avenue
Arden Hills, MN 55126-9983

COMMENT SHEET

MANUAL TITLE: CDC NOS/BE Version 1 System Programmer's Reference Manual, Volume 2

PUBLICATION NO.: 60457370 REVISION: U

NAME: _____

COMPANY: _____

STREET ADDRESS: _____

CITY: _____ STATE: _____ ZIP CODE: _____

This form is not intended to be used as an order blank. Control Data Corporation welcomes your evaluation of this manual. Please indicate any errors, suggested additions or deletions, or general comments below (please include page number references).

☐ Please Reply ☐ No Reply Necessary

NO POSTAGE STAMP NECESSARY IF MAILED IN U.S.A.

CUT ALONG LINE

AA3419 REV. 4/79 PRINTED IN U.S.A.

CORPORATE HEADQUARTERS, P.O. BOX O, MINNEAPOLIS, MINN 55440
SALES OFFICES AND SERVICE CENTERS IN MAJOR CITIES THROUGHOUT THE WORLD

LITHO IN U.S.A.

CONTROL DATA