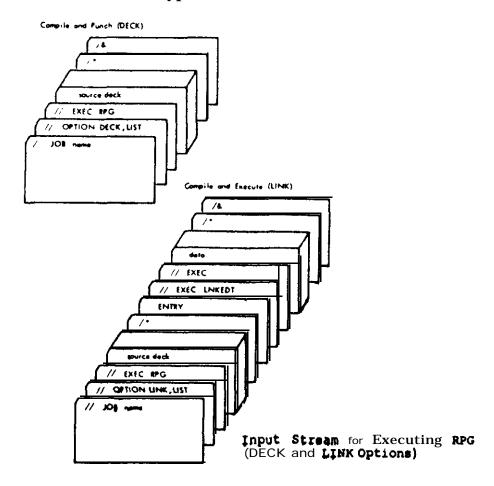
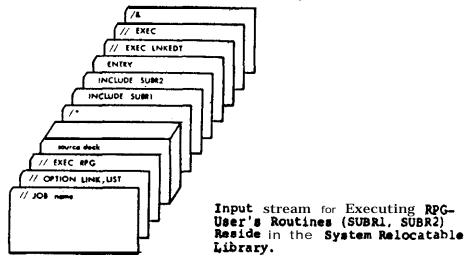


Typical Job Control Cards



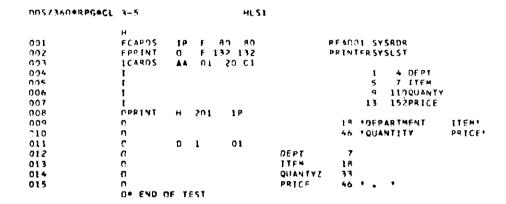
When date is in input streem it should always follow the EXEC (blank) aged,



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Test Programs With Printouts

TEST PHASE 1



RPG Program Listing

DEPARTMENT	[TEM	QUANTITY	PRICE
FURN	123	121	4.55
LAMP	124	120	2.00
TV	125	354	3.00

RPG Program Printout

003/36	50*RPC*C{	7-5	HL\$2		
	01 01	ч			
201	al C2	F [N] P	F 80 89	READOL SYSRDR	
002	FO 10	FOUT ()	F 132 132	PRINTFRSYSLST	
003	5 01 01	TIN AA	01 1 CR		
004	ሳይ ሶን	1		2 3 DEPT	
005	02 03	Ţ		5 7JSER#	
006	5 01 04	I		9 111HRS	
007	02 05	Ī		13 152RATE	
0.0.8	02 06	Ī		22 39 NAME	
იიფ	02 07	\$ B#	03		
010	03.01	C 01	RATE MULT		
ort	ሰን ሳ2	C 91	TPAY ADD	PAY TPAY 67	
212	04 01	COUT 4	201 1P		
013	04 02	n		IR TNUMBER NAME!	
014	04 03	u		46 THOURS RATE PAY	•
215	94 94	0 0	1 01		
014	04 35	Ç		DEPT 2	
717	04 06	r		SEP# Z 6	
018	04 07	ภ		NAME 25	
019	04 63	D		HRS 31 1 . 1	
020	04 09	n		RATE 37 ' . '	
021	04 10	ú		PAY 49	
022	04 11	n r	1 (R		
023	04 12	0		TPAY 49 ,	
	04 13	OF THE THE	EST		

RPG **Program** Listing

NUMBER	NAME	HOURS	RATE	PAY
34 135	ADAMS JEREMY	40.0	2.50	100.00
57 246	BACH HILDA	35.0	2.00	70.00
68 312	GRANT LEGNARD	42.0	2.00	84.00
89 475	LEE LAURA	25.0	2.25	56.25
				310.25

RPG **Program** Printout

236 IT 254

005/36	0 + R P (#CL	3-5	•				н	LS3						
	01		н												
001	01	02	F D	ATA	Ţ		F 8				READ				
002	01	0.3	FRE	POR'	. 0		V 13	2 13	2		PRINT	TERSY	SLST		
003	02	01	104	TA	Α.	A.	10	l C	D						
004	0.5	0.7	1									2	3 ()EPT	
035	0.2	02	t									5	301	TEM	
006	0.2	04	ſ									9	1108	NJ BRUN	
007	0.2	C5	1									13	1724	MCUNT	
008	0.2	06	I		2.	Z	05								
	0.3	01	C.		C.	ALC	ULAT	EUNS							
009	03	O2	C	10		N	JAMBE	ĸ	MULT	TAUGMA	Δ (MISAL	72		
010	0.3	0.3	Ü	10		A	MTSA	L	MUL T	.02	S.	ALETX	62		
011	0.3	04	C	10		S	ALET	X	ADD	AMTSAL	T /	APT	8.2		
012	04	CI	ORE	POR	TН	2	01	l P							
013	.34	0.2	Ó								20	*DEP	1 [1	TEM N	JMdERT
014	J4	ú3	r)								42	·AMO	UNT	EXTENS	Dry •
015	04	035	Ω								49	*SAL	123		
016	04	04	Ð.								72	'T A X		TUTAL	AMCUNT*
017	04	C4	n		Q	ı		10							
018	04	05	C							O ⊦PT	3				
019	04	C6	ŋ							ITEM 2	10				
020	04	07	0							NUMBERZ	18				
021	04	C.	Ð							AMOUNT	29	• 9			
022	04	CY	O.							APTSAL	41	٠.	ű.	•	
023	04	10	0							SALFIX	52	٠,	v.	•	
024	04	i.	n							TAMT	70	•	, 0.	. •	
025	04	12	O		Đ	1		05							
026	04	12	0			-					- 5	PERK	OR*		
027	04	13	C		T	2		LR							
028	04	4	6								16	1++8	ND DI	F D414**	•
	04	15	0.0	END	1.F	P 4 C	GRAM								

RPG Program Listing

DEPT	ĮTEM	NUMBER	AMUUNT	EXTENSION	SALES TAX	TOTAL AMOUNT
49	1107	10	47.50	475.CC	9.50	484.50
52	2912	1	152.16	152.16	3.04	155.20
ERKOR	1					
82	101	5	83.10	415.50	8.31	423.81

END OF DATA

RPG Program Printout

IT 254 2 3 7

202/3	I6∩≉R Pi	C +C L	3-5			٠	1L S 4						
	01	o t	н										
001	0.1	0.2	FOATA	10	F B	0 1	30			READOL	SYSRDA	Į.	
002	n t	03	FREPORT	G	V 13	7 13	12			PRINTER	SYSLS	г	
003	0.2	0.1	ATACI	AA	10	1 (R			•			
004	S 01	n?	t								2 3	DEPT	
005	0.2	03	1									DITEM	
ዕባሪ	0.5	P4	Ŧ									THAUDE	
907	0.2	96	1							1		PRICE	
008	ä2	C6	ŧ							,		ISMEN	
999	0.7	9.7	1							2		CHARGE	05
010	0.7	Ç a	Ī	CC	20	1 (T						**
110	9.2	09	1	nn	3.0								
012	∩ 3	OΙ	C 10		QUANT		MUL T	PRIC	E	SALE	Α;	?	
013	-0.3	0.7	C 10		SALF		ADD	TSAL	F	TSAL	ç a;	?	
014	04	91	CREPORT	μ	201	10							
015	04	ウァ	0							24 10	FPT	I TEM	QUANTITY
016	.04	0.3	0							44 19	RICE	EXTENSI	
017	0.4	04	С	Ď	1	10				•			
810	71.4	95	r					DEPT		2			
019	0.4	065	ū					SMEN	Z	. 7			
020	04	056	0					1754	2	1 1			
051	0.4	0.7	Ü					CUANT	7	21			
022		€3	ن					PRICE		32 *	9.	,	
023		99	ŋ					SALE		43 1), +	
024	94	10	0			05				47 101	Hg•		
025	0.4	11	B	n	1	30							
026	74	12	n							13 'F	RAMR	N CARD	
027	04	13	C	Ŧ	2	20						_	
950	Λ4	14	a					TSALE		43 1	, ,	. 50	
	04	15	OF END O	F P	ROGRAM								

RPG Program Listing

DEPT	[TEM	QUANTITY	PRICE	EXTENSION
49 4162	1107	10	47.50	475.00
52 5311	2912	1	152.16	152.16 CHG
76 2347	514	4	2-11	8.44
				\$635.60

RPG Program Printout

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005734	50*RPG*CL	3-5			ΗĮ	\$ 5		
	01 01	н						
001	01 02	FCARDS	10	AF 80	9.0	1		READAD SYSROR
002	01 01		n	V 132			DE	PRINTERSYSLST
003	02 01	ICARDS	ΑZ	03				
004	02 02	i						1 4 TYEMS MI
005	02 03	Í						7 A DEPT LI
006	02 04	1						TT T200NHAND
007	02 05	Ī						t5 1600PDPPT
ኅዕድ	02.06	1						21 242CNST
009	02 01	ŧ						26 270REDAMT
010	10 80	C				SETO	7	0510
011	03 62	C 03		OPAH-4"1		SUB	ፀዳካዊዎሽ	PEGROR 20 1010
012	03 03	C 10		REDAMT		MULT	COST	CHARGE 62
013	03 04	c 10		CHARGE		400	TCHARG	TCHARG 72
014	03 05	C 10		CHARGE		AD D	SCHARG	SCHARG 72
015	03 06	C. HO				SETO	¥	0.5
016	03 97	с но				SETO	=	но
017	04 01	CRECORD	н	101	lΡ			
018	04 02	0 0	R	(٦F			
019	04 03	n				1	PAGE 7	60
020	04 04		14		ĮΡ			· -
071	04 05	0	R	C	3F			
022	04 06	0						16 *ITEM DEPT*
023	04 67	ด						36 FOR HAND UNIT COST!
024,	04 08	n						61 'TOTAL COST NUMBER'
025	04 09		D	1 () 3			
026	04 10	0					ITEMS	10
027	04 11	ถ			. 1		DEPT	15
028	04 12	n			LO	1	RENAMT	60 * 0*
029	04 13	0		1	10	(COST	35 ° 0. •
030	04 14	ภ		1	١0	(CHARSE	49 . 0
031	04 15	0				(STEPANO	24
032	04 16	n)5			65 'ERR'
0.33	04 11		T	2 1	. 1			
034	04 10	0	_			•	CHARG B	48
035	04 19	-	T	2 l	R			
036	04 20	O				1	CHARG	48 * * *0. *

RPG Program Listing

ITEM	DFPY	ON HAND	UNIT COST	FOTAL COST	} Құмқ⊏қ
1579 1782	77	18 20	8.50 17.50	85.00 35.00 \$120.00	19
1754 1997	15	35 20	11.00	77.00 \$77.00	ERA 7
				\$197.00	

RPG Program Printout

005/36	O*RPG*CL	3-5	н	L S6	
	01 01	н			
00 L	01 02	FCRDERS LP	F 80 %	0	READOL SYSRING
202	01 03	FOUT 5	V 132 13:	2	PRINTERSYSLST
993	0.2 0.1	TORDERS AA	01 20 0	מ	
904	92 92	ī			1 600ATE
005	0.1 (0.3)	I CO	10 20NC	า	
306	02 04	Ţ			3 50AR16
007	02 05	1			9 LOONEM
008	02 06	1			14 150SPESHL
009	02 07	ſ			16 19 ITFM
010	Q3 O1	C 10	OR 1G	ADD NEW	RECROR 30
011	03 02	C 10	REDRAR	SUB SPESHL	REDROR
012	33 63	C 10	REDROR	COMP 12	95 97
013	å 1 - 04	C 10 95		GOTO HERE	
014	ሰብ ጠና	C 10N97	REGROR	CCMP 5	979697
015	03 06	C 10 97		NOVE 5	REDROR
016	03 9 <i>1</i>	C 10 96N9	7	MOVEL 010	REGROR
917	03 08	C	HER€	TAG	•
018	93 09	C 10	REDROR	ADD TORDER	TORDER 50
019	04 GL	nout H	1 19	-	
020	04 02	0			67 *A.B.C. COMPANY*
921	04 03	ŋ		PAGE	120 * *
022	04- 04	0 н	2 01		
023	04 05	n		DATE	63 1
024	04 06	0 #	2 01		
025	04 07	0	,		70 'ON HAND RE-DROERS'
026	74 08	O D	1 10		
027	04 09	ō		ORIG 9	A 56 1 01
028	04 10	Ö.		REDROR 1	
CZ9	04 11	Ö		TTEM	49
030	04 12	0 t	l LR	- · · - · ·	•
031	04 13	ö		TORDER?	67

RPC Program Listing

	#.8.C. 12-0	COMPANY 8-70
	ON HAND	RE-ORDER'S
1340	6	5
1552	4	13
1784	3	10
1926	4	5
		33

RPG Program Printout

2 4 0 IT 254

Device Names of Input/Output Devices

DEVICE CODE INPUT/OUTPUT UNIT

IBM S/360 and IBM 1130

READ01 IBM 2501 CARD READER
READ02 IBM 1402 CARD READER
READ20 IBM 2520 CARD READ/PUNCH
READ40 IBM 2540 CARD READ/PUNCH
READ42 IBM 1442 CARD READ/PUNCH

PUNCH20 II---520 CARD PUNCH, MODEL A2 or A3

PUNCH42 IBM 1442 CARD PUNCH, MODEL 5

PRINTER IBM 1403 PRINTER, or IBM 2203 PRINTER (STANDARD

OR LOWER FEED)

PRINTLF IBM 2203 PRINTER, LOWERFEED IBM 2203 PRINTER. UPPERFEED

PRINTKB IBM 2152 PRINTER-KEYBOARD USED AS I/O DEVICE IBM 2152 PRINTER-KEYBOARD USED AS AN INQUIRY DEVICE

CRP20 IBM 2520 A1, CARD READ/PUNCH

MFCM1 IBM 2560 MFCM. HOPPER I IBM 2560 MFCM. HOPPER 2

TAPE IBM 2415 TAPE

DISK IBM 2310 DISK or IBM 1131 INTERNALDISK

DISK II I DISK STORAGE DRIVE IBM 231 I DISK. MODEL II or I2

DISK14 IBM 2314 DIRECT ACCESS STORAGE FACILITY

CELOI IBM 2321 DATA CELL DRIVE W/MASTER AND CYLIN-DER INDICES (MI/CI) ON SAME DEVICE AS DATA FILE

CELOIII [BM 2321 DATA CELL DRIVE WITH MI/CI ON IBM 2311

DISK STORAGE DRIVE

CEL0114 IBM 2321 DATA CELL DRIVE WITH MI/CI ON AN IBM

2314 DIRECT ACCESS STORAGE FACILITY

BSCA BSC TELECOMMUNICATIONS DEVICE

IBM SYSTEM/3

MFCU1 PRIMARY HOPPER OF THE MFCU
SECONDARY HOPPER OF THE MFCU

PRINTER PRINTER HAS THE DUALCARRIAGE

FEATURE, THIS ENTRY REFERS TO THE LEFT CAR-

RIA 3E

PRINTR2 RIGHT CARRIAGE OF THE PRINTER. THIS ENTRY

APPLIES ONLY TO PRINTERS THAT HAVE THE DUAL

CARRIAGE FEATURE

CONSOLE PRINTER-KEYBOARD

DISK DISK UNIT

RCA SPECTRA 70

DISK64 DIRECTACCESS STORAGE DEVICE

PUNCH34 MODEL 234CARD PUNCH
PUNCH36 MODEL 236 CARD PUNCH
70/565 DRUM MEMORY UNIT
70/568 MASS STORAGE UNIT

PRINTER PRINTER

TAPE MAGNETIC TAPE CARD READER

UNIVAC 9000 SERIES

CCPRI 1001 CARD CONTROLLER, PRIMARY FEED CCSEC 1001 CARD CONTROLLER, SECONDARY FIELD

READER CARD READER
PUNCH COLUMN PUNCH

CRP COLUMN READ/PUNCH

ROWPNCH ROW PUNCH

RRP ROW READ/PUNCH

PRINT63 PRINTER-63 CHARACTERS
PRINT16 PRINTER--16CHARACTERS

TAPE MAGNETIC TAPE-9 or 7 CHANNEL WITH DATA

CONVERSION

DISC 84 IO DAS

TAPE7 7 CHANNEL MAGNETIC TAPE WITHOUT DATA CON-

VERSION

IBM 1130

PRINTER 1132PRINTER
PRINTO3 1403 PRINTER
PUNCH42 1442 PUNCH

READ42 1442 READER/PUNCH

READOI 2501 READER

CONSOLE CONSOLE PRINTER

DISK 2310 DISK UNIT OR 1131 INTERNAL DISK

2 4 2 IT 254

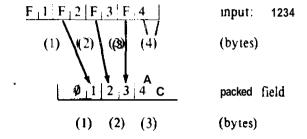
How the Computer Packs Numeric Fields

Packing a 4 byte (even number of bytes) field, using Hexadecimal notation

A 4 'byte field packs into 3 bytes

$$(4 \div 2 = 2; 2 + , \# 3)$$

Sign changes from HEY F to HEX C

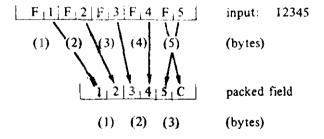


Packing a 5 byte (odd number of bytes) field, using Hexadecimal notation

A 5 byte field packs into 3 bytes

$$(5 \div 2 = 2\frac{1}{2}; 2\frac{1}{2} + \frac{1}{2} = 3)$$

Sign changes from HEX F to HEX C



If a packed field is longer than minimum required length, zeros are inserted on the high-order (left) end of the field.

1T 254 2 4 3

The object program:

- . Read an input record that was not defined on the Input Specifications sheet (columns 21-41).
- Found an input record out of the predetermined sequence of card type specified by the entry in Sequence (columns 15-16) on the Input Specifications sheet.
- Found an input record out of sequence when the entry in *Matheing Fields* (columns 61-62) on the Input Specifications sheet was used for sequence checking a single input file.
- Encountered a chaining field in the chaining file that does not appear in the chained file duringrandom processing of multiple input files.
- Did not find a record with the correct key at the designated track address during random processing by record key of a directly organized file.
- . Did not find the record key that designates the lower limit (obtained from the RAF) during sequential processing between limits of an indexed sequential file.
- Found a wrong length during processing of a indexed-sequential file,
- Found an invalid length record (zero or too long) during random processing by record identification of a file on a DASD.
- Found a difference between the key length of a DASD record in a indexed-sequential file and the length as specified in *Length* of *Record Address Field* (columns 29-30) on the File Description Specifications sheet during processing with RAF support (random, ADDROUT, or between limits).
- . Found a difference between the key length in the chained indexed-sequential file and the length as specified (columns 44-51) on the Input Specifications sheet during chaining of multiple input files.
- Encountered a data check on the DASD during random processing of a directly organized file
- Encountered a DASD error during sequential or random processing of a indexed-sequential file.
- . Found the prime data area was filled while creating an indexed-sequential file.
- . Found the cylinder and/or master index areas were filled while creating an indexed sequential-file.
- Found a duplicate record when creating or adding to an indexed-sequential file.
- . Found a sequence error in record keys when creating an indexed-sequential file.

2 4 4 IT 254

• Found the overflow area was filled when adding to an indexed-sequential file.

Note: Unless the HO indicator is turned off by a SETOF operation entry on the Calculation Specifications sheet (see Turning Indicators On or Off) the program terminates before the next input record is read.

<i>√</i>	System Code Reserved 14		A Character	indicates the year and the day of the year that the file was created.	Han Code Blank 60-99	4-6 001-366 Day of Year (e.g., Jonuary 3), 1965, would be	enthered os 0.5031). indicates the year and the Lay of the	year when the file may become a scrotch tope. The formal of this field is identical to fished Y. Or a multifile real, processed sequentially, all files are considered to expire on the same day.	indicates security status of the file. Of no security protection I security protection. Additional identification of the file is required before it can be processed.	Indicates the number of data blacks written on the file from the last header tabel to the first naties label, exclusive of tape merks. Count daes not include checkpoint recycle, This file is used in trailer labels.	uniquely identifies the programming tyshem.	Reserved. Should be recorded as bianks.
	Expiration 10]1) Expiration 10]1) Course 12 Course 13 Course 14 Course 15 Course 1	File Security	AAME AND LENGTH	CREATION DATE 6 bytes			EXPRATION DATE	Se Ág a	L byte	BOCK COUNT	SYSTEM CODE	RESERVED 7 bytes
	87 6 45 6 85 70 70 70		FIELD	·.			<u>6</u>		ż	ž.	ë	ź
	File		s follows: DESCRIPTION	identifies the type of label HDR = Header beginning of a data	File EQF = End of File and of a set of EQV = End of Volume and of the physical met	always a i	uniquely identifies the entire file, may control only printable Characters. Earns often in print will not occupit embanding bitmus in the file Identifier.	uniquely identifies a file/volume relationship. The field is identical to the Volume Serial Number in the volume label of the first or only volume for an in-volume file on the volume file.	be numeric 20000' to 999999' but mes- contain any us a premeric characteri- indicates the pose of a volume in a graet file or my 100' exect. The number risk to numeric 2000's Multiple volume flex pre-program in consecutive sections.	by the Office I make an output and checked in my makers on imput, assigns makeric measures to a file with a multi-file me.	numerically attending the various advious of the file.	indicotes the serson of o penetration of a file,
	File identifier		The standard tape file label format and contents are as follows: NAME AND VEHALE	LANEL IDENTIFIER 3 bytes, ERCDIC		FILE LABEL NUMBER	FILE IDE MITELER 17 bynes, ERCDIC	ELLE SENAL NUMBER 6 bytes, EBCDIC	YOLUME SECUENCE NUMBER 4 bytes	ELLE SCOUENCE NAMEE A bylos	GENERATION NUMBER	GENERATION & INIM
Field Number	5 7 5 6		The standard to FIELD	نـ		, ,	ë	₹	vi	ė	۲.	œ,

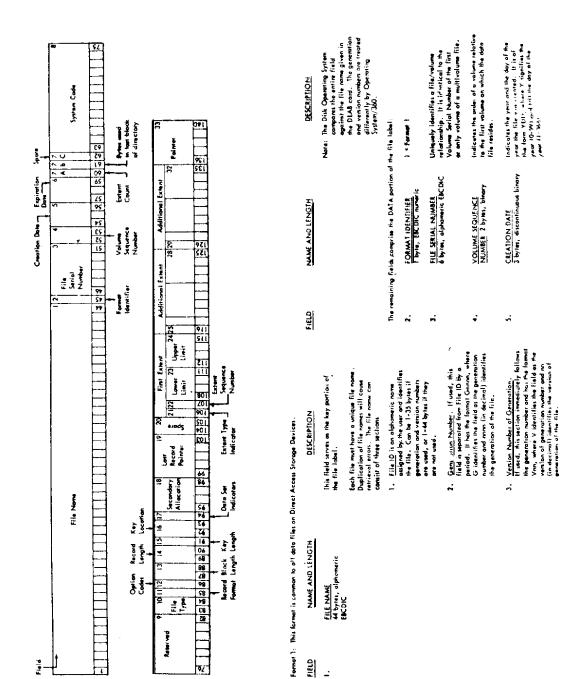


Figure D-2 Standard DASD file labels

DESCRIPTION	Bits within this field indicate various options used in building the file. Bit	0 m 0 1 = Reserved 2 = Moster index present (15FMS) 3 = Independent seerthow present (15FM) 4 = Cylinder overflow present (15FMS) 5 = Reserved 6 Used by Q/S.	7 Used by Q/S. Indicetes the block tenath for fixed	length records or maximum-block size for variable length blocks:	Indicates the record length for fixed length records or the maximum second length for variable length records.	badicates the bength of the key portion of the days	±0.	indicates the high order position of the data record	Bits within this field are used to indicate the following:	Bit	O If any indicates that this is the last volume on which this file	in a second distriction	1 - 7: 0 for DOS Used by O.5.	Used by O/S.	Used by O/S.
NAME AND LENGTH	OPTION CODES 1 byte		BLOCK LENGTH	2 bytes, binory	AECORD LENGIN	KEY LENGTH I byte, binary		KEY LOCATION 7 bytes, bingig	DATA SET INDICATORS					SECONDARY ALLOCATION & bytes, binary	LAST RECORD POINTER 5 bytes, discontinuous binory
FIELD	12.		<u> </u>		-	15.		2 .	17.					<u>s</u>	.6
DESCRIPTION	Indicates the year and the day of the year the file may be deleted. The form of this field is identical to that of field 5.	Contains a court of the number of extents for this file on this volume. If user labels are used, the count does not include the user label track. This field is maintained by the Disk Operating System pragrams.	Umed by O/S.	Reserved	Uniquely identifies the programming	system. The character codes that can be used in this field are limited to 0-9, A-Z, or blanks.	Reserved	The bearing the field of the bearing of	the Lonest or rus trea uniquesy beauty the lype of data file Hex 4000 = Consecutive organization	Hex 2000 = Direct - access organization	Hex 8000 - Indexed -sequential organ xation	Hex 0200 - Library organization	Hex 0030 Organization not defined in the file label.	Used by 0/5.	
NAME AND LENGTH	EXPIRATION DATE 3 bytes, discontinuous binary	EXTENT COUNT 1 byte	BYTES USED IN LAST BLOCK OF DIRECTORY 1 byte, binary	SPARE	SYSTEM CODE	13 bytes	RESERVED 7 bytes	FII F TYP!	2 bytes					RECORD FORMAT	
HELD	ý	.★.	Ŕ	κ,	œ.		ø.	Ċ	ż					Ë	

The cylinder and the track address specifying the starting point (lower limit) of this extent component.	This field has the format CCHH. The cylinder and the track address specifying the ending point (upper	limit) of this extent component. This field has the format CCHH.	These fields have the same format as the fields 21 - 24 above.	These fields have the same format as the fields 21 – 24 above.	The oddress (forma) (CHHR) of a	continuation label if reeded to further describe the file. If field 10 indicates Indexed Sequential	organization, this field points to a Format 2 file label within this label within this	e format 3 file label, and then only if the file contains more than three	extent segments. This field cortains all binary zeros if no additional file label is pointed to.
LOWER LIMIT 4 bytes, discontinuous binary	UPPER LIMIT 4 bytes		ADDITIONAL EXTENT	ADDITIONAL EXTENT	34 4 13 1 × 3 Z C F 97 T Z 1 C 9	WITHIN THIS LAFF FT 5 bytes, discontinuous binary			
ä	%	;	25-28.	29 - 32.		<u> </u>			
Reserved	Indicates the type of extent with which the following fields are associated: HEX CODE	00 Next three fields do not indicate any extent.	01 Prime data area (Indexed Sequential); or Consecutive area,	the user's data records.)	02 Overflow area of an Indexed Sequential file.	04. Cylinder index or master index orea of an Indexed Sequential file.	40 User lobel track ared.	80 Shared cylinder indicator.	Indicates the extent sequence in , multi-extent file,
SPARE 2 bytes	<u>EXTENT TYPE INDICATOR</u> 1 byte								EXTENT SEQUENCE NUMBER 1 byte, bingry
20.	21.								13 .

DESCRIPTION

NAME AND LENGTH

9131

DESCRIPTION

NAME AND LENGTH