

OPERATIONS  
STORAGE ALLOCATION.

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## ADDRESS LENGTH BINARY CONTROL CARDS.

0	350	IDENT	OPERATE
350		END	

BLOCKS	TYPE	ADDRESS	LENGTH
ABSOLUTE*	ABSOLUTE	0	170
PROGRAM*	LOCAL	0	350
EOPER	COMMON	0	173

## ENTRY POINTS.

ACAP	=	51	UCAP	=	77	MKOPRN	=	0	E.DSPPOP	=	147
UDAT	=	54	RDAI	=	75	E.ADORD	=	12	L.DSPPOP	=	17
OROPT	=	65	BCAP	=	76	L.ADORD	=	102	DLOPR	=	51
FCAP	=	73	E.MKUPN	=	0	E.COPOP	=	114	E.DLOPR	=	166
FDAT	=	74	L.MKUPN	=	12	L.COPOP	=	33	L.DLOPR	=	5

## EXTERNAL SYMBOLS.

SYSRET	E.ERROR	CAPAB	DELOBJ	DISASTR
REALLOC	MAKEOBJ	PUTCAP	OBJSIZ	E.ECS

		IDENT	OPERATE
		ENTRY	ACAP,UDAT,OROPT,FCAP,FDAT,UCAP,BDAT,BCAP
		EXT	SYSRET,REALLOC,E,ERROR
	INTSYS	XTEXT	
	PROCSYM	XTEXT	
	TYPES	XTEXT	
	RECS	MACRO	A
		RE	A
		RJ	=XE,ECS
		ENDM	
	WECS	MACRO	A
		WE	A
		RJ	=XE,ECS
		ENDM	
	ECSMAC	XTEXT	
	CBLOCK	MICRO	1,*/*EOPER/*
	ECSACT	XTEXT	
	* MAKEOPN	= MAKE A NEW ORDER=1 OPERATION	
	*	# PARAMETERS:	AP1 = C: AN ALLOCATION BLOCK
	*		AP2 = D: INDEX IN THE FULL C-LIST
	*		AP3 = D: TYPE OF ACTION, 0 OR NOT 0 FOR CALL OR JUMP
	*		AP4 = C: CLASS CODE
	*		AP5 = D: NUMBER OF PARAMETER SPECIFICATIONS
	*		
L	51 515100067	ECSCODE	MKOPN
	502500001	MAKEOPN	B1+P,PARAM+1 . C: ALLOCATION BLOCK
L	52 511100073		SA2 A5+1
	5141000074		SA1 B1+P,PARAM+5 . C: CLASS CODE
L	53 0334000321 *		SA4 B1+P,PARAM+6 . D: NUMBER OF PARAMETER SPECS
	5131000071		NG X4,NGCNT . ERROR
L	54 0303000056		SA3 B1+P,PARAM+3 . D: TYPE OF ACTION
	7160000036		ZR X3,MV1 . IS CALL
L	55 0400000057		SX6 J,JUMSUB . ACTION NUMBER
			EQ M02
L	56 7160000035		
			M01 SX6 J,CALSUB
L	57 7170000000 X		
	0332000340 *		M02 SX7 SYSRET
L	60 7130000020		
	20366		NG X2,NGIX . NEGATIVE C-LIST INDEX
	12336		SX3 20B ACTION TYPE,0..NEEDS BIT MASK
L	61 10644		LX3 54
	21621		BX3 X3+A6
	0316000325 *		BX6 X4
L	62 0400000000 *		AX6 17
			NZ X6,BIGOPRN
L	63		EQ MKOPN . CREATE OPERATION
			ENDECS MKOPN

\* MKOPRN MAKES AN OPERATION OF ORDER 1  
 \*  
 \* ENTRY: X7 = RETURN  
 \* X5 = UNIQUE NAME, MOT INDEX FOR ALLOCATION BLOCK  
 \* X4 = NUMBER OF PARAMETER SPECIFICATIONS  
 \* X3 = ACTION TYPE (UPPER 6 BITS) + ACTION NUMBER (LOWER 18 BITS)  
 \* X2 = C-LIST INDEX IN FULL LIST FOR RESULTANT CAPABILITY  
 \* SAVES: X1 = CLASS CODE IF NEEDED  
 \* B1  
 \*

		ENTRY	MKOPRN	
0	6140000020 +	EXT	MAKEOBJ,CAPAB,PUTCAP	
	21722	SB4	MKOPRN6	. RETURN FROM MAKEOBJ
	12774	LX7	1A	
1	5171000066	BX7	X7+X4	
	0314000003 +	SAT	B1+P+TEMP1	. SAVE RETURN, NUMBER OF PS
	2 43701	NZ	X4,MKOPRN0	
	12373	MX7	1	
3	1-422	BX3	X7+X3	. PARAMETERLESS BIT
	1-733	BX6	X2	
	5161000157	BX7	X2	
4	5131000160	SA6	B1+P+TEMP2	. SAVE C-LIST INDEX
	53331	SA3	B1+P+CLIST	
	37223	SA3	B1+X3	
	5 7100000001	IA2	X2-X3	
	0332000010 +	SX0	1	
6	5e33000002	NG	X2,MKOPRN2	. INDEX OK
	0303000341 +	SA3	A3+2	
7	37223	ZR	X3+BGIX	. INDEX TOO LARGE
	4322000006 +	IX2	X2-X3	
10	5171000060	PL	X2,MKOPRN1	
	6120000005	SAT	B1+P+TEMP3	. SAVE ACTION TYPE AND NUMBER
		SB2	I+PS+MASKL+3	. LENGTH OF: HEADER, MASK BITS, AND
				. POINTERS
11	20701	LX7	1	
	0327000013 +	PL	X7,MKOPRN3	. NO CLASS CODE NEEDED
	1 611	BX6	X1	
12	5161000061	SA6	B1+P+TEMP4	. SAVE CLASS CODE
	6122000001	SB2	B2+1	. SPACE FOR CLASS CODE
13	7264777754	SX6	X4=19	. NUMBER OF PS BYTES/WORD
	0336000015 +	NG	X6,MKOPRN4	
14	63202	SB2	X0+B2	. INCREMENT LENGTH
	1-466	BX4	X6	
	0400000013 +	EQ	MKOPRN3	
15	0304600016 +	ZR	X4,MKOPRN5	
	6122000001	SB2	B2+1	ROUND UP
16	6130000052	SB3	P+SCRL+1+PS+MASKL	
	0732000326 +	LT	B3,B2,BIGORDER	. THIS ORDER IS TOO LARGE FOR THE
		SX7	AT,OPER	. SCRATCH AREA
17	7170000004	EQ	MAKEOBJ	. ALLOCATION TYPE
	0400000000 X	*		
20	43601	MKOPRN6	MX6	1

OPERATIONS  
SUBROUTINE TO MAKE A SINGLE ORDER OPERATION

	21623
21	10411
	21144
	12616
	5610
22	56614
	10055
	5111000056
23	43506
	73210
	21122
	63610
24	5111000060
	11351
	43564
25	15615
	76520
	20101
26	0321000031 *
	7244777776
27	6132777776
	5111000061
30	10711
	56713
31	21444
	12734
	5171000002
32	10722
	21522
	5077000001
33	12656
	43571
	5067000001
34	7170000000
	5171000001
	000000
35	0302000044 *
	5130000347 *
36	10633
37	6232777754
	0603000042 *
40	5066000001
	7123000000
41	2400000037 *
42	63320
	66433
	66343
	22535
43	11656
	5066000001
44	0122000000

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LX6	1+18	• NUMBER OF ORDERS
SX1	B2=PS,MASKL-1	• LENGTH OF FIRST ORDER
BX4	X1	
LX1	18+18	
BX6	X1*X6	
SAC	B1	• ADDRESS OF SCRATCH AREA
SAB	B1	• OPERATION HEADER WORD
BX9	X5	• ECS ADDRESS OF OPERATION
SAC	B1+P,TEMP1	• RETURN, NUMBER OF PS
MXS	6	
SX2	X1	
AX1	18	
SAC	X1	• RETURN ADDRESS
SAC	B1+P,TEMP3	• ACTION TYPE AND NUMBER
BX3	X5*X1	
MXS	6=ACTLIM	• WANT MASK BIG ENOUGH FOR LARGE ACTIONL TABLE
BX6	-X5*X1	
SX5	B2	.. ORIGIN OF NEXT ORDER
LX1	X1+MKOPRN7	
PL	X1+MKUPRN7	• NO CLASS CODE
SX4	X4=1	.. CORRECT PS DATA POINTER
SAB	B2=1	.. OFFSET OF LAST WORD
SAC	B1+P,TEMP4	• CLASS CODE
BX7	X1	
SAC	B1+P3	
LX4	18+18	• PS DATA POINTER
BX7	X3*X4	• ACTION TYPE
SAC	B1+1+PS,MASKL	.. FIRST WORD OF ORDER PROPER
BX7	X2	.. VISIBLE NUMBER OF PS
LX5	18	
SAC	A7+1	.. SECOND WORD OF ORDER
BX6	X5*X6	.. ORIGIN OF NEXT ORDER, ACTION NUMBER
MXS	6=3	
SAC	A7+1	.. THIRD WORD
SAC	0	• PS BIT MASK SHOULD BE ZERO
DUP	PS,MASKL=1+1	
SAC	A7+1	• LIKEWISE
ZR	X2,MKOPRN10	• NO PS BYTES
MWORD	X3	
SAC	X2-19	
SB3	B0,B3,MKOPRN9	
GE	A6+1	
SAC	B3+0	
SAC	MKOPRN8	
SB3	X2	• N
SB4	B3+B3	• 2 * N
SB3	B4+B3	• 3 * N
LX5	B3,X5	• POSITION MASK
BX6	X5*X6	• MAKE ZERO BYTE
SAC	A6+1	
WECS	B2	
MKOPRN10		

OPERATIONS  
SUBROUTINE TO MAKE A SINGLE ORDER OPERATION

45	6150000000 X	S85	CAPAB	• ADDRESS OF CAPABILITY FROM MAKEOBJ
	5111000057	SA1	81-P TEMP2	• C=LIST INDEX
46	0400000000 X	EQ	PUTCAP	
47	12222	MKWORD	VFD	3/1,3/PS,NONE,3/PS,NONE,3/PS,NONE,3/PS,NONE
	22222		VFD	3/PS,NONE,3/PS,NONE,3/PS,NONE,3/PS,NONE
	22222		VFO	3/PS,NONE,3/PS,NONE,3/PS,NONE,3/PS,NONE
	22222		VFD	3/PS,NONE,3/PS,NONE,3/PS,NONE,3/PS,NONE
		*		

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\*  
\* ADDORDR ADDS A SUBPROCESS CALL OR JUMP ACTION TO AN OPERATION.  
\*

## \* PARAMETERS:

\*

		ORG	P.PARAM	
66	2	C1 EQU	? 2	• LENGTH OF A CAPABILITY PARAMETER
	1	D1 EQU	1	• LENGTH OF A DATUM PARAMETER
66		AO_AB BSS	C1	• AP1 = AN ALLOCATION BLOCK
70		AO_IX BSS	D1	• AP2 = AN INDEX IN THE FULL C-LIST
71		AO_OP BSS	C1	• AP3 = AN OPERATION
73		AO_CLSCD BSS	C1	• AP4 = A CLASS CODE
75		AO_NOPS BSS	D1	• AP5 = NUMBER OF NEW PARAMETER SPECS
72		USE ECSCODE	# ADDRD	
L 51	5111000073	ADDORDR	SA1	S1+AO_IX
	63310004340 +		NG	X1+NGIX
L 52	5121000162		SA2	S1+P.CLIST
	53221		SA2	B1+X2
	37112		IX1	X1-X2
L 53	7160000002		SX6	1+PS.MASKL
	6331000056		NG	X1+A02
L 54	5022000002	A01	SA2	A2+2
	63020000341 +		ZR	X2+BGIX
L 55	37112		IX1	X1-X2
	6321000054		PL	X1+A01
L 56	5111000072	A02	SA1	S1+A0_OP+1
	73610		SX2	X1
	56010		SA0	S1
L 57	0110000001		RECS	I
L 60	54200		SA2	A0
	13112		BX1	X1-X2
	43547		MX6	60+21
	11151		BX1	X5+X1
L 61	6311000331 +		NZ	X1,MISOPR
	15+25		BK0	=X5*X2
	16200		BX2	X0
L 62	0110000001		RECS	I
L 63	5010000000		SA1	A0+0
	21144		AX1	18+18
	63610		SB6	X1
L 64	6126000002		SB2	B6+1+PS.MASKL
	6150000001		SB5	I
L 65	36026	A03	IX0	X2+X6
L 66	0116000000		RECS	B6
L 67	5111000002		SA1	S1+2
	21122		AX1	18
L 70	21122		SX6	X1
	73610		AX1	18
	63610		SB6	X1
	66226		SB2	B2+B6
L 71	0560000065		NZ	B6+A03

- LENGTH OF A CAPABILITY PARAMETER
- LENGTH OF A DATUM PARAMETER
- AP1 = AN ALLOCATION BLOCK
- AP2 = AN INDEX IN THE FULL C-LIST
- AP3 = AN OPERATION
- AP4 = A CLASS CODE
- AP5 = NUMBER OF NEW PARAMETER SPECS

- D1 = INDEX IN THE FULL C-LIST
- ERROR (INDEX NEGATIVE)
- POINTER TO THE C-LIST TABLE
- LENGTH OF FIRST C-LIST
- LENGTH OF OPERATION PREFIX
- INDEX OK
- NEXT C-LIST LENGTH
- ERROR (INDEX TOO LARGE)
- C1 = AN OPERATION
- NOT INDEX
- SCRATCH AREA

- COMPARE UNIQUE NAMES
- ERROR (OPERATION HAS BEEN DELETED)
- ECS ADDRESS OF OPERATION
- SAVE ORIGIN
- HEADER WORD

- LENGTH OF FIRST ORDER
- ACCUMULATE LENGTH OF OPERATION
- S1
- START ADDRESS OF NEXT ORDER
- NEXT ORDER ORIGIN
- LENGTH
- ACCUMULATE TOTAL LENGTH
- STILL MORE

OPERATIONS  
ADD AN ORDER TO AN OPERATION

	37702		
L	72	12076	20752
		56115	
		51p1000075	
L	73	0332000322	+ 10322
L	74	0313000325	+ 21321
			13333
L	75	7150000020	
			7140000035
L	76	0303000077	
			7140000036
L	77	0312000100	A04
			7255000040
L	100	20566	A05
		4333	
		15113	
L	101	20322	12551
		56115	
		15313	
		12332	
L	102	6140000004	
		5161000002	
L	103	0302000113	
		5110000047	+ 10611
		6170000050	
		43171	
L	105	6232777754	A06
		0603000110	
L	106	54665	
		6144000001	
		76230	
L	107	0674000105	
		0400000326	+ 110
		63320	
		76233	
		63323	
		22131	
L	111	11616	
		6144000001	
		54665	
L	112	0774000326	+ 113
		5111000074	
		10611	
		54665	
L	114	76640	
		20630	
		12660	

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IX7	X0-X2	. RELATIVE ORIGIN OF LAST ORDER
LX7	24+18	
BX0	X7+X6	
SA1	B1	. FIRST WORD OF LAST ORDER
SA2	B1+A0+NOPS	. DI NUMBER OF PARAMETER SPECS
NG	X2+NGCNT1	. ERROR
BX3	X2	
AX3	17	
NZ	X3+BIGOPRN	
BX3	X3=A3	. ALWAYS ADD SUBP CALL ORDER
SX5	20B	. ACTION TYPE FOR CALL OR JUMP
SX4	J.CALSUB	. ACTION NUMBER FOR CALL
ZR	X3+A04	
SX4	J.JUMSUB	
NZ	X2+A03	. NOT PARAMETERLESS JUMP
SX5	X5+408	. ADD FLAG BIT
LA5	54	. POSITION ACTION TYPE
MX3	64=18=18	
BX1	=X3*X1	. CLIST, FL REQUIREMENTS
BX5	X5+X1	
LX3	18	
SA1	B1+B5	. SECOND WORD OF LAST ORDER
BX3	=X3*A1	. BLOCK, AP-LIST REQUIREMENTS
BX3	X3+X2	. ADD NUMBER OF VISIBLE PARAMS
S84	4	. INITIALIZE SIZE OF NEW ORDER
SA6	B1+2	. INITIALIZE A6 FOR LOOP
ZR	X2+A08	. BYTE WORDS NOT NEEDED
SA1	MKWORD	. EOW, ANY, ANY, ...
BX6	X1	
SB7	P,SCRL	
MX1	64=3	
SB3	X2-19	
LE	83+80+A07	
SA6	A6+B5	
SB4	B4+1	
SX2	B3	
LE	B4+B7,A06	
EQ	BIGORDER	. ERROR (NEW ORDER TOO BIG FOR SCRATCH AREA)
SB3	X2	
SX2	63+B3	
SB3	X2+B3	. 3 * REMAINDER
LX1	B3,X1	
BX6	X1*X6	
SB4	B4+1	
SA6	A6+B5	
GT	B4+B7,BIGORDER	. ERROR
SA1	B1+A0+CLS_CD+1	. C1 A CLASS CODE
BX6	X1	
SA6	A6+B5	
SX6	B4	. LENGTH OF NEW ORDER
LX6	24	
BX6	X6+X0	. ORIGIN OF ORDER

OPERATIONS  
ADD AN ORDER TO AN OPERATION

		73004
L	115	5161000356
		20022
L	116	77645
		12704
		20644
		12656
		56610
L	117	10633
		54665
		54765
		66224
L	120	6140000122
		7170000004
L	121	5151000067
		0400000000 X
L	122	5111000072
		5121000056
L	123	73010
		54020
		63220
		43347
L	124	0110000001
L	125	54400
		56010
		13114
		11131
L	126	0311000050
		36052
L	127	6140000050
		21244
		63321
		76740
E	130	0123000000
E	131	15043
		10355
		0642000136
E	132	0110000050
E	133	36607
		6122777727
		10055
E	134	0120000050
E	135	36507
		10066
		0742000132
L	136	0112000000
E	137	10055
E	140	0122000000
E	141	20252
		10033

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SXC	X0+84	• ORIGIN OF NEW NEXT ORDER
SA6	B1+P TEMP1	• SAVE INFO
LX0	18	• POSITION ORIGIN OF NEXT ORDER
BX7	X0+X4	• LENGTH OF NEW ORDER WITHOUT THE
SK6	B4-B5	• CLASS CODE
		• POSITION PTR POINTER TO PS DATA
LX6	18+18	• FIRST WORD OF NEW ORDER
BX6	X5+X6	
SA6	B1	
BX6	X3	
SA6	A6+B5	.. SECOND WORD OF NEW ORDER
SA7	A6+B5	.. THIRD WORD OF NEW ORDER
SB2	B2+B4	• TOTAL LENGTH OF NEW OPERATION
SB4	A09	• RETURN FROM MAKEOBJ
SX7	AT.OPER	• ALLOCATION TYPE
SA5	B1+A0.AB+1	• C8 AN ALLOCATION BLOCK
EQ	MAKEOBJ	
SA1	B1+A0.OP+1	
SA2	B1+P TEMP1	
SX0	X1	
SAC	A2	
SB2	X2	• LENGTH OF OLD OPERATION (=ORIGIN OF
		• NEW ORDER)
MX3	60-21	
RECS	1	
SA4	A6	
SA0	B1	
BX1	X1-X4	• ***** IS THIS NEEDED *****
BX1	X3+X1	• ***** IS THIS NEEDED *****
NZ	X1+DISASTER	• ***** IS THIS NEEDED *****
IK0	X5+X2	• ECS ADDRESS FOR NEW ORDER
LX2	60-24	
SB4	P SCRL	
SB3	X2	• LENGTH OF NEW ORDER
SX7	B4	
WECS	B3	
BX0	=X3+X4	• ECS ADDRESS OF OLD OPERATION
BX3	X5	• SAVE START OF NEW OPERATION
GE	B4,B2,A011	• DO LAST (AND FIRST) TRANSFER
RECS	P SCRL	
IK6	X0+X7	• NEXT ADDRESS IN OLD OP
SB2	B2-P SCRL	
BX0	X5	
WECS	P SCRL	
IK5	X0+X7	• IN NEW OP
BX0	X6	
LTT	B4,B2,A010	• NOT READY FOR LAST TRANSFER
RECS	B2	
BX0	X5	
WECS	B2	
LX2	60-18	
BX0	X3	

OPERATIONS  
ADD AN ORDER TO AN OPERATION

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	43791	MX7	1	
L	142 0110000001	LX7	19	
L	143 54100	RECS	1	
	36717	SA1	A0	
	54700	IX7	X1+X7	
	76730	SA7	A0	
L	144 0120000001	SX7	B3	
L	145 7222000002	WECS	1	
	36123	SX2	X2+X2	.. PIR TO 3RD WORD OF OLD LAST ORDER
L	146 0110000001	IX0	X2+X3	.. ECS ADDR OF SAME
L	147 54100	RECS	1	
	21744	SA1	A0	
	12617	LX7	18+18	
	54600	BX6	X1+X7	.. INSERT NEW LENGTH OF LAST ORDER
L	150 0120000001	SA6	A0	
L	151 5111000070	WECS	1	
	6160000000 X	SA1	B1+A0, IX	.. C=LIST INDEX
L	152 6150000000 X	SB6	SYSRET	
	0400000000 X	SB5	CAPAB	
L	153	E9	PUTCAP	
	*	ENDECS	ADORD	
	50 0100000000 X	DISASTER	RJ	EXDISASTR
	*			

**CPYOPR COPIES AN OPERATION**

## PARAMETERS

C: AN ALLOCATION BLOCK TO BE CHARGED  
D: FULL C-LIST INDEX FOR NEW OPER  
E: THE OPERATION TO BE COPIED

			ECS CODE	COP POP	CAPABILITY INDEX
51	5111000070	CPYOPR	SA1	B1+P,PARAM+2	.CAPABILITY INDEX
	0331000337 +		NG	X1,NGIXX	.NEGATIVE C-LIST INDEX
52	5121000160		SA2	B1+P,CLIST	
	53221		SA2	B1+A2	
	37112		IX1	X1-X2	.CHECK INDEX
53	5101000000		SA0	B1+0	
	0331000056		NG	X1,CPYOPR2	.INDEX OK
54	5022000002	CPYOPR1	SA2	A2+2	.NEXT C-LIST LENGTH
	0302000324 +		ZR	X2,BGIXX	.INDEX TOO BIG
55	37112		IX1	X1-A2	
	321000054		PL	X1,CPYOPR1	
56	5111000072	CPYOPR2	SA1	R1+P,PARAM+4	.OPERATION NAME AND MOT PTR.
	43347		MX3	39	
	15013		BX0	=X3*X1	.ECS ADDR OF OPERATION MOT
57	0110000001		RECS	1	.PICK UP MOT ENTRY
60	5020000000		SA2	A0+0	.OPERATION MOT
	13421		BX4	X2-A1	
61	0314000331 +		BX4	X3*X4	
	11434		NZ	X4,MISOPR	.NAMES DON'T MATCH
	7170000004		SX7	AT,OPBR	. ALLOCATION TYPE FOR OPERATION
62	15023		BX0	=X3*X2	
	6130000064		SB3	CPYOPR21	. GET THE OBJECT SIZE FROM THE
63	0200000000 X		JP	EXOBUSIZ	. ALLOCATOR, DELIVERED IN X2
64	63221	CPYOPR21	SB2	X2	. MAY BE MORE THAN 18 BITS LATER
	5151000067		SA5	B1+P,PARAM+1	.ALLOC BLK NAME AND MOT INDEX
65	6140000046		SB4	CPYOPR3	.RETURN
	04000000000 X		EQ	MAKEUBJ	
66	5111000072	CPYOPR3	SA1	B1+P,PARAM+4	
	43247		MX2	39	
	15012		BX0	=X2*X1	
67	5101000000		SA0	B1+0	
	7140000050		SX4	P,SCRL	
70	0110000001		RECS	1	.OPERATION MOT
71	54100		SA1	A0	
	15012		BX0	=X2*X1	.ECS ADDR OF OPERATION
72	6132777727	CPYOPR4	SB3	B2=P,SCRL	
	0603000077		LE	B3,B0,CPYOPR5	.LESS THAN 1 BUFFER LONG
73	0110000050		RECS	P,SCRL	.READ SCRATCH AREA FULL
74	36104		IX1	X0+X4	.FIX READ ADDRESS
	10055		BX0	X5	.WRITE ADDRESS
	6123000000		SB2	B3+0	.REMAINING LENGTH
75	0120000050		WECS	P,SCRL	.WRITE OUT SCRATCH AREA
76	36504		IX5	X1+X4	.FIX WRITE ADDRESS
	10011		BX0	X1	.READ ADDRESS
	0400000072		EQ	CPYOPR4	.LOOP

OPERATIONS  
ACTION TO COPY AN OPERATION

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L 77	0112000000	CPYOPRS	RECS	B2	•READ PARTIAL BUFFER LOAD
L 100	10055		BX0	X5	•WRITE ADDRESS
	5111000070		SA1	B1+P,PARAM+2	•CAPABILITY INDEX
L 101	0122000000		WECS	B2	•WRITE PARTIAL BUFFER
L 102	6150000000 X		SB5	CAPAB	•CAPABILITY LOCATION
	6160000000 X		SB6	SYSRET	•RETURN
L 103	0400000000 X		EQ	PUTCAP	
L 104			ENDECS	COPOP	

\*  
 \* DISPLAY OPERATION IS AN ECS ACTION WHICH COPIES ALL OR PART OF AN  
 \* OPERATION INTO THE USER'S FL. THE AMOUNT COPIED = MIN(LENGTH OF OPERATION,  
 \* LENGTH OF USER-SUPPLIED BUFFER).  
 \*

## \* PARAMETERS:

\*

65		ORG	P,PARAM
66	DO.OPER	BSS	C1 .. OPERATION TO BE DISPLAYED
70	DO.AD	BSS	D1 .. ADDRESS OF USER BUFFER
71	DO.LEN	BSS	D1 .. LENGTH OF USER BUFFER
		USE	*

\*

## \* ECS CODES: DSPPOP

\*

L	51	5111000141	DISPOP	SA1	B1+P,XPACK+1 .. WORD WITH RA
		5121000001		SA2	A1+1 .. FL
L	52	21144		AX1	18+18 .. RIGHT JUSTIFY ..
		21244		AX2	18+18 .. .. WITH ZERO FILL
L	53	5141000071		SA3	B1+00,AD .. AP2
		0333000317 +		SA4	B1+00,LEN .. AP2
L	54	0334000316 +		NG	X3,NEGADD .. ERROR
		0304000316 +		ZR	X4,NOTPOS .. ERROR = BUFFER LENGTH MUST BE > 0
L	55	36534		IX5	X3+X4 .. LAST WORD ADDRESS + 1 OF BUFFER
		1335000320 +		NG	X5,BIGADD .. ERROR = ADDR + LENGTH IS TOO BIG
L	56	0335000320 +		IX5	X2-X5 ..
		37525		NG	X5,BIGADD .. ERROR = DITTO
L	57	56010		SA2	B1+00,OPER+1 .. UN, NOT INDEX OF API
		42547		SA0	B1 .. EP,SCR ..
		63240		MX5	60=21 .. HOLE 21
		15025		SB2	X4 ..
I	60	0110000001		BX0	=X5*X2 ..
L	61	56410		RECS	1 ..
		15045		SA4	B1 ..
		13424		BX0	=X5*X4 ..
		11454		SA4	X2-X4 .. COMPARE UNIQUE NAMES
L	62	0314000331 +		NZ	X5*X4 ..
		6130000064		SB3	X4,MISOPR .. ERROR = OPERATION HAS BEEN DESTROYED
L	63	0200000000 X		JP	DISPOP2 .. GET THE OBJECT SIZE FROM THE ALLOCATOR
L	64	63320	DISPOP2	SBS	=X0BJSIZ .. DELIVERED IN X2
		36113		IX1	X2 ..
		53010		SA0	X1+X3 .. ABS BUFFER ADDRESS
L	65	0632000066		GE	X1 .. CM ADDRESS FOR ECS TRANSFER
		66230		SB2	B3,B2,DISPOP1 .. BUFFER LEN <= OP SIZE
L	66	0112000000	DISPOP1	RECS	B3 ..
L	67	0200000000 X		JP	B2 .. MOVE IT
		70		ENDECS	SYSRET .. EXIT
				DSPPOP	

OPERATIONS  
FILL IN PARAMETER SPECIFICATIONS

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51	617000052 +	ACAP	SB7	ACAPI	. RETURN FROM OPERATION S(CAN)
	0400000100 +	*	EQ	OS	
52	13111 43552	ACAPI	BX1	X1-X1 .. TYPE = 0	
			MX5	42	
53	5141000071		SA4	B1+P.PARAM+3 .. OPTION BITS	
	0200000176 +		JP	UCAP2	
54	617000055 +	*UDAT	SB7	UDAT1	. RETURN
	0400000100 +	*	EQ	OS	
55	7233777775 0313000327 +	UDAT1	SX3	X3-PS.NONE	
56	5131000051 21322		NZ	X3,NUTANY . PS MUST HAVE BEEN ANY	
57	7233777742 0323000325 +		SA3	B1+P.SCR2+1	
58	7110000001 36721		AX3	18	
59	5072000000 0122000000		SX3	X3-P.APLL	
60	7110000001 22737		PL	X3,BIGOPRN .. WOULD EXCEED AP AREA	
61	10211		SX1	PS.UUAT=PS.NONE	
62	2222		IX7	X2+X1	
63	13333 13666		LX7	B3+X7	
	0200000273 +	*	SA7	A2+0 .. UPDATED PS BYTE WORD	
64	10211 2222		WECS	B2 .. WRITE OUT ORDER	
			SX1	1 .. =(0,0+1) : FIRST WORD DELTA	
			BX2	X1 .. =(0,1+0) : SECOND WORD DELTA	
			LX2	18 .. =(0,0+0) : THIRD WORD DELTA	
65	7233777766 0313000326 +	*OROPT	BX3	X3-X3 .. FLAG TO PREVENT SETTING PARAM TYPE BIT	
		*	BX6	JP .. UPDATE	
66	7233777770 0313000330 +	OROPT1	SB7	OROPT1	. RETURN FROM OPSCAN
67	5121000071 20222		EQ	OS	
	43352		SX3	X3-PS.UCAP	
68	54105 11622		NZ	X3,NUTUCAP .. MUST BE USER-SUPPLIED CAPABILITY	
	12661		SA2	B1+P.PARAM+3 .. OF AN OPTION MASK	
69	54610		LX2	18	
			MX3	42	
70	0122000000		SA4	A0+B5 .. PICK UP PS DATA WORD	
71	0400000000 X		BX6	X3*X2	
72			BX6	X6+X1	
			SAB	A1	
73	6170000147 +	*FCAP	WECS	B2 .. WRITE OUT UPDATED ORDER	
	0400000100 +	*	EQ	SYSRET	
74	6170000154 +	FDAT	SB7	FCAPI	
	0400000100 +	*	EQ	OS	
75	6170000157 +	*BDAT	SB7	FDAT1	. RETURN FROM OS
	0200000100 +	*	JP	OS	

OPERATIONS  
FILL IN PARAMETER SPECIFICATIONS

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76	6170000162 +	BCAP	S87	RCAPI
	0200000100 +	*	JP	OS
77	6170000173 +	UCAP	SB7	UCAPI
		*		• RETURN FROM OS
100	5111000067	OS	SA1	B1+P,PARAM+1
	73010		SXP	X1
	56010		SAO	01
101	0110000001		RECS	1
102	54200		SA2	A0
	43347		MX3	60-21
	13112		BX1	X1-X2
	11131		BX1	X3#X1
103	0311000331 +		NZ	X1,MISOPR
	15023		SAO	=X3#A2
	10500		BX5	X0
104	0110000001		RECS	1
105	54100		SA1	A0
	21122		AX1	18
	63610		SB6	X1
	21122		AX1	18
106	63210		SB2	X1
	43671		MX6	60-3
	5111000070		SA1	WHOLE 3
107	0331000343 +		NG	B1+P,PARAM+2
				X1,NGINDA

\* NOW THE ORDERS OF THE OPERATION WILL BE SCANNED TO DETERMINE THE  
 \* FOLLOWING:  
 \* 1) THE ACTUAL PARAMETER, OR AP, INDEX CORRESPONDING TO THE GIVEN,  
 \* VISIBLE PARAMETER SPECIFICATION INDEX. (VISIBLE INDEX +  
 \* N OF FIXED PARAMS BEFORE THE PS IN QUESTION). IS LEFT IN P,TEMPY  
 \* 2) THE LOCATION OF THE PS BYTE FOR THE GIVEN INDEX. IS LEFT IN A2,X2,X3,  
 \* AND B3  
 \* 3) THE LOCATION IN THE PS DATA AREA CORRESPONDING TO THE INDEX. IS LEFT  
 \* IN B5  
 \* 4) THE ORIGIN OF THE ORDER CONTAINING THE PS TO BE MODIFIED.  
 \* 5) THE ADDRESS OF THE LAST PRECEDING #NEXT LENGTH# FIELD.  
 \* 6) THE CONTENTS OF THE FIRST 3 WORDS OF THE LAST ORDER OF THE OPERATION  
 \* ARE RETURNED IN P,SCR2.  
 \*  
 \* NOTE: THE CODE IS DEPENDENT ON THE ORDER OF THE PS TYPE VALUES.

110	36002	7120000002	SX2	1+PS,MASKL	.. LENGTH OF HEADER; MASK WORDS
	63410		IX0	X0+X2	.. ADDRESS OF FIRST ORDER
	13777		SB4	X1	.. INITIALIZE AP INDEX = VISIBLE INDEX
			BX7	X7-X7	.. INIT PTR (RELATIVE TO OPERATION) TO LAST #NEXT LENGTH# FIELD
111	0112000000	0S1	RECS	R2	.. READ UP NEXT ORDER
112	54200		SA2	A0	.. WORD WITH ACTION TYPE AT LEFT END
	4337000116 +		NG	X2,0S3	.. THIS ORDER IS PARAMETERLESS
	21244		AX2	18+18	.. RIGHT JUSTIFY DATA AREA POINTER
113	63521	5020000003	S85	X2	
			SA2	A0+3	.. FIRST WORD OF PS BYTES

OPERATIONS  
FILL IN PARAMETER SPECIFICATIONS

	66300	
114	15326	052
	21271	
	6133000003	
115	7243777771	0313000122
116	6166777776	0460000345
117	5020000002	21222
		73320
120	37705	7277000002
		36153
121	21222	63221
		0200000111
122	0324000131	054
		7243777773
123	0324000126	7243777775
124	0324000133	5022000001
125	66300	6200000114
126	6144000001	05. FIXED
		6155000001
127	0304000114	6155000001
130	0200000114	
131	0301000135	05. PSDAT
		6155000001
132	7211777776	
133	0301000135	05. NODAT
		7211777776
134	0200000114	
135	37405	055
		21722
		12774
136	5171000063	
		1^755
137	5171000057	
		5101000050
140	0110000003	056
141	6166777776	0460000144
142	5040000002	21422
		73040
143	36050	
		0200000140
144	20203	057

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SB3	B0	.. INITIALIZE BYTE WORD POSITION COUNTER
BX3	-X6*X2	.. EXTRACT NEXT BYTE
LX3	60=3	.. SHIFT TO NEXT BYTE
SB3	R3+3	
SX4	X3=PS.BLK	
NZ	X3,0S4	.. NOT TO END OF THIS ORDER
SB6	B6=1	.. DECREMENT NUMBER OF ORDERS
ZR	B6,0GINDEX	.. ERROR - PS INDEX TOO LARGE
SA2	AD+2	.. THIRD WORD OF ORDER
AX2	18	
SX3	X2	.. ORIGIN OF NEXT ORDER
IX7	X1=AS	.. PTR RELATIVE TO OPERATION
SX7	X7+2	.. OF THIS ORDER'S NEXT LENGTH FIELD
IX9	X5+X3	.. ABS ECS ADDRESS OF NEXT ORDER
AX2	18	
SB2	X2	.. LENGTH OF NEXT ORDER
JP	051	.. READ AGAIN
PL	X4,0S,PSDAT	.. BLK OR UCAP
SX4	X3=PS,FDAT	
PL	X4,0S,FIXED	.. FDAT OR FCAP
SX4	X3=PS,NONE	
PL	X4,0S,NODAT	.. NONE OR UDAT
SA2	A2+1	.. NEXT WORD OF BYTES
SB3	B0	.. RESET BYTE WORD POSITION
JP	052	.. KEEP GOING
SB4	B4+1	.. INCREMENT AP INDEX
SB5	B5+1	.. INCREMENT DATA AREA PTR
ZR	X4,0S2	.. FDAT = REQUIRES 1 DATA WORD
SB5	B5+1	.. FCAP = REQUIRES 2 DATA WORDS
JP	052	
OS2	X1=0S5	.. FOUND IT
ZR	B5+1	.. BLK AND UCAP REQUIRE 1 DATA WORD
SX5	X1=1	.. DECREMENT VISIBLE PS INDEX
JP	052	.. KEEP LOOKING
ZR	X1=0S5	.. FOUND IT
SX1	X1=1	
JP	052	
IX4	X1=AS	.. PTR TO RELEVANT ORDER
LX7	18	
BX7	X7+A4	
SA7	B1+P,TEMP6	
BX7	X5	.. ABS ECS ADDRESS OF OPERATION
SA7	B1+P,TEMP2	
SA0	B1+P,SCR2	.. ALTERNATE SCRATCH AREA
RECS	3	
SB6	B6=1	
ZR	B6,0S7	.. THIS IS LAST ORDER
SA4	AD+2	
AX4	18	
SX0	X4	.. ORIGIN OF NEXT ORDER
IX9	X5+X0	
JP	056	.. KEEP GOING
LX2	3	.. RIGHT JUSTIFY PS BYTE

OPERATIONS  
FILL IN PARAMETER SPECIFICATIONS

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	6133777774		SB3	B3=3 .. SET COUNT BACK
	76640		SX6	R4
145	516100064		SA6	B1+P,TEMP7 .. SAVE AP INDEX
	56010		SAP	B1
146	0270000000	*	JP	R7 .. RETURN
147	7233777774	0313000330 +	FCAP1	SX3 X3=PS,UCAP NZ X3,NOTUCAP
150	5111000071	54405		SA1 B1+P,PARAM+3 .. C1 A CAPABILITY A0+BS A0+BS .. PICK UP PS DATA WORD
	16414		SX4	=X4+X1
151	0314000334 +	5011000001	NZ	X4,BADCAP .. TYPE OR OPTIONS WRONG
152	6155000401	*	SA1	A1+1
	7140777775		SBS	B5+1 .. SECOND WORD OF CAPABILITY
153	6170000257 +	0400000203 +	SX4	PS,FCAP=PS,UCAP
		*	SB7	FCAP2
			EQ	FIXUP
154	7233777774	0313000330 +	FDAT1	SX3 X3=PS,UDAT NZ X3,NOTUDAT
155	5111000071	7140000201	SA1	B1+P,PARAM+3 .. D1 A DATA WORD
156	6170000261 +	0400000203 +	SX4	PS,FDAT=PS,UDAT
		*	SB7	FCAP3
			EQ	FIXUP
157	6170000263 +	5111000071	BDAT1	BDAT2 .. RETURN FROM FIXUP
			SA1	B1+P,PARAM+3 .. BLOCK LENGTH
160	0331000316 +	0301000316 +	NG	X1,NOTPOS
			ZR	X1,NOTPOS .. BLOCK SIZE SHOULD BE > 0
161	13444	16611	BX4	X4=X4 .. DATUM FLAG = 0
			BX6	X1 .. AP AREA REQUIREMENT DELTA
			JP	BCAP2
162	6170000267 +	5111000071	RCAP1	BCAP3 .. RETURN FROM FIXUP
			SA1	B1+P,PARAM+3 .. BLOCK LENGTH
163	0331000316 +	0301000316 +	NG	X1,NOTPOS
			ZR	X1,NOTPOS .. SHOULD BE > 0
164	36611	43401	IX6	X1+A1 .. CAPABILITIES REQUIRE 2 WDS EACH IN AP AREA
			MX4	I .. CAPABILITY FLAG = 1
			NG	X6,BIGOPRN .. ERROR = OVERFLOW
165	7233777775	0313000325 +	SX3	SX=PS,NONE
			NZ	X3,NOTANY .. ERROR
166	5131000051	21322	SA3	B1+P,SCR2+1 .. 2ND WORD OF SAVED LAST ORDER
			AX3	18
167	7253777742	0325000325 +	SX5	X3=P,APLL
			PL	X5,BIGOPRN .. ERROR
170	21322	36336	AX3	18
			IX3	X3+X6
			SX6	P,PBUFL .. BLOCK BUFFER LENGTH
			IX3	X6=X3
171	37363	7160000372	NG	X3,BIGOPRN .. ERROR
			BX1	X1+X4 .. WORD FOR FIXUP

OPERATIONS  
FILL IN PARAMETER SPECIFICATIONS

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172	714000004		SX4	PS,BLK=PS,NONE
	0200000203 *		JP	FIXUP
173	5111000071	UCAP1	SA1	R1+P,PARAM+3 .. TYPE
	43552		MX5	42
	15115		BX1	=X5*X1
174	47611		CX6	X1
	7266777766		SX6	X6=9
175	0316000334 *		NZ	X6,BADTYPE .. OBJECT TYPE MUST HAVE 9 BITS SET
	5141000072		SA4	R1+P,PARAM+4 .. OPTIONS
176	7233777775	UCAP2	SX3	X3=PS,NONE
	0313000327 *		NZ	X3,NOTANY .. ERROR
177	2~422		LX4	18 .. POSITION OPTIONS
	11454		BX4	X5*X4
	12141		BX1	X4*X1 .. LEAVE WORD FOR FIXUP
200	5131000051		SA3	R1+P,SCR2+1 .. SECOND WORD OF SAVED LAST ORDER
	21322		AX3	18 .. RIGHT JUSTIFY AP LENGTH REQUIREMENT
201	7233777743		SX3	X3=P,APLL+1
	0323000325 *		PL	X3,BIGOPRN .. ERROR
202	7140000005		SX4	PS,UCAP=PS,NONE
	6170000255 *		SB7	UCAP3
203	6140000047	* FIXUP	SB4	P,SCRL=1
	0742000326 *		LT	B4,B2,BIGORDER .. TOO LARGE FOR SCRATCH AREA
204	76522		SX5	B2 .. LENGTH OF ORDER
	2~522		LX5	18
	75621		SX6	A2-B1 .. PTR TO PS BYTE WORD
	12656		BX6	X5*X6
205	5161000062		SA6	R1+P,TEMP5
	76650		SX6	65 .. PTR TO PLACE FOR NEW WORD
	76770		SX7	B7 .. RETURN LINK
206	20722		LX7	18
	12676		BX6	X7*X6
	5161000060		SA6	R1+P,TEMP3
207	10711		BX7	X1
	5171000056		SA7	R1+P,TEMP1 .. WORD TO ADD TO OPERATION
	22734		LX7	SS,X4 .. WORD TO CHANGE PS BYTE WORD
210	5171000061		SA7	R1+P,TEMP4
	5121000067		SA2	B1+P,PARAM+1 .. MOT INDEX FOR REALLOC
211	7160000213 *		SX6	FIXUPI .. RETURN LINK
	7110000001		SX1	1 .. INCREMENT
212	0400000000 X		EQ	REALLOC
213	5111000067	* FIXUP1	SA1	R1+P,PARAM+1 .. OPERATION AGAIN
	73010		SXC	X1
	56310		SAC	B1
214	0110000001		RECS	1 .. READ MOT ENTRY
215	43447		MX4	6~21
	56210		SA2	B1
	13112		BX1	X1-X2
	15224		BX2	-X4*X2
216	11141		BX1	X4*X1
	0311000050 *		NZ	X1,DISASTER

OPERATIONS  
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217	5131000063		S43	B1+P TEMP6	
	73531	63530	SX5	X3	. SAVE PTR TO RELEVANT ORDER
220	21322	36123	S85	X3	
	7170777776		AX3	18	
221	11477		IX0	X2+X3	. ADDRESS OF "NEXT LENGTH" FIELD TO U
	20444		SX7	=1	
222	0110000001		BX4	X7	
223	54300	27634	LX4	36	
	5060000000		RECS	1	
224	0120000001		SAS3	A0	
225	5131000062	36125	IX6	X3+X4	
	11722		SA6	A0+0	
226	5171000057	73331	WECS	1	
	36103		SAS3	B1+P TEMP6	. LENGTH OF ORDER, PTR TO PS BYTE #D
227	5131000061		IX0	X2+X5	. ADDRESS OF ORDER
230	0110000001		BX7	X2	
231	56510	26653	SAT	B1+P TEMP2	. . . SAVE (POSSIBLY NEW) ECS ADDRESS
	54650		SK3	X3	
232	0120000001		IXC	X1+X3	. PTR TO BYTE WORD
233	5141000060	73345	SAS3	B1+P TEMP4	. WORD TO FIX UP PS BYTE
	21422		RECS	1	. READ UP OLD BYTE WORD
234	63747	6130000236	SA6	B1	
	<	10022	WECS	IX6	
235	0200000000 X		SAS4	X5+X3	
236	7110000001	37221	IX3	AS	
		36102	SA4	1	
237	6120000050	37423	IX4	B1+P TEMP3	. RELATIVE ADDRESS OF NEW WORD
	76220		AX4	18	
240	6234000000	43773	S87	X4	. RESTORE RETURN LINK
	56010		SB3	FIXUP3.9	. GET THE OBJECT SIZE FROM THE ALLOCATOR
241	0623000246	< 37012	BX0	X2	. A(OBJECT) FOR OBJSIZ
	67332		JP	=XOBJSIZ	. DELIVERED IN X2
242	0112000000		SX1	1	
243	10100	37007	IX2	X2-X1	
			IX1	X0+X2	. LWA OF OPERATION (NEW)
244	0122000000		SB2	P SCRRL	. LENGTH OF SCRATCH AREA
245	0400000241	<	IX4	X2-X3	
246	76230	37012	SX2	S2	
			SA0	X4+0	. TOTAL AMOUNT TO MOVE
247	0113000000		MX7	59	. . . =1
250	10100		SAS3	81	
			IX0	B3+B2+FIXUPS	. DO DO LAST TRANSFER
			IX0	X1=X2	. START ADDR: OLD POSITION
			SB3	B3-B2	. DECREMENT OTTAL WORD COUNT
			RECS	B2	
			SX1	X0	
			IX0	X0-X7	. START ADDR: NEW POSITION
			WECS	B2	
			EQ	FIXUP4	
			SX2	B3	
			IX0	X1-X2	
			RECS	B3	
			BX1	X0	

OPERATIONS  
FILL IN PARAMETER SPECIFICATIONS

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	37007		IX0 X0-X7
251	0123000000	WECS	B3
252	10011	BX0	X1
	5101000056	SA0	B1+P <sub>o</sub> .TEMP1 . ADDRESS OF WORD TO ADD TO OPERATION
253	0120000001	WECS	I
254	0270000000	JP	B7 .. RETURN
	*		
255	43173	UCAP3	MX1 59 .. =1
	14311		BX3 -X1
	21322		LX3 18 .. = (0,1 <sup>0</sup> ) : DELTA FOR THIRD WORD
	16131		BX1 -X1+X3 .. = (0,1 <sup>1</sup> ) : DELTA FOR FIRST WORD
256	36233		IX2 X3+X3 .. = (0,2 <sup>0</sup> ) : DELTA FOR SECOND WORD
	43471		MX6 1 .. FLAG TO CAUSE PARAM TYPE BIT TO BE SET
	0200000273 *	JP	UPDATE
	*		
257	36207	FCAP2	IX0 X1+X7 GET BACK TO THE OPTION BIT/TYPE
	5101000071	SA0	B1+P <sub>o</sub> .PARAM+3 WORD AND WRITE THE ONE THE
260	0120000061	WECS	I USER SUPPLIED
261	13111	BX1	X1-X1 .. = (0,0 <sup>0</sup> ) : DELTA FOR FIRST WORD
	43273	MX2	59 .. = (0,0 <sup>1</sup> -1) : DELTA FOR SECOND WORD
	14322	BX3	LX3 18 .. = (0,1 <sup>0</sup> ) : DELTA FOR THIRD WORD
	21322	BX6	X6-X6 .. FLAG TO PREVENT SETTING PARAM TYPE BIT
262	13666	JP	UPDATE
	0200000273 *		
	*		
263	5111000071	BDAT2	SA1 B1+P <sub>o</sub> .PARAM+3 .. BLOCK LENGTH = M
	12211	BX2	X1
	21244	LX2	18+18
264	7130000002	SX3	2
	21322	LX3	18
	12223	BX2	X2+X3 .. = (M,2 <sup>0</sup> 0) : DELTA FOR SECOND WORD
265	7211000001	SX1	X1+1 .. = (0,0 <sup>0</sup> M+1) : DELTA FOR FIRST WORD
	21301	AX3	1 .. = (0,1 <sup>0</sup> 0) : DELTA FOR THIRD WORD
	43471	MX6	1 .. PARAM TYPE BIT FLAG
266	0200000273 *	JP	UPDATE
	*		
267	5111000071	BCAP3	SA1 B1+P <sub>o</sub> .PARAM+3 .. BLOCK LENGTH = L
	36211	IX2	X1+X1
	21244	LX2	18+18
270	7130000002	SX3	2
	21322	LX3	18
	12223	BX2	X2+X3 .. = (2*L+2*0) : DELTA FOR SECOND WORD
271	21301	AX3	1 .. = (0,1 <sup>0</sup> 0) : DELTA FOR THIRD WORD
	21122	LX1	18
	43473	MX4	59 .. =1
	16114	BX1	-X4+X1 .. = (0,L+1) : DELTA FOR FIRST WORD
272	43671	MX6	1 .. PARAM TYPE BIT FLAG
	0200000273 *	JP	UPDATE
	*		
	*		

\* UPDATE IS USED BY THE PARAMETER-SPECIFYING ACTIONS TO UPDATE THE  
\* CUMULATIVE TOTALS AND #ORIGIN OF NEXT ORDER# FIELDS OF THE MODIFIED AND  
\* SUBSEQUENT ORDERS. FOR THE USE OF FCAP AND FDAT, IF THE INCREMENT TO THE

\* VISIBLE PARAMETERS FIELD, IN THE LOWER 18 BITS OF THE SECOND WORD, IS  
 \* NEGATIVE, UPDATE WILL ZERO IT AFTER APPLYING IT TO THE FIRST UPDATED ORDER.  
 \* (THAT IS BECAUSE THIS FIELD IS NOT CUMULATIVE.) UPDATE ALSO SETS THE  
 \* PARAMETER TYPE BIT CORRESPONDING TO THE AP INDEX IN P TEMP7 IF CALLED WITH  
 \* X6 NE 0.

## \* PARAMETERS:

\*  
 \* X1 = 60-BIT QUANTITY TO BE ADDED TO EACH ORDER'S FIRST WORD  
 \* X2 = DITTO FOR SECOND WORD  
 \* X3 = DITTO FOR THIRD WORD  
 \* X6 = NOT ZERO => PARAM TYPE BIT WILL BE SET

## \* EXITS TO SYSRET

273	5141000057 03060000304 +	UPDATE	S44 ZP	B1+P TEMP2 X6,UPDATE3	.. ABS ADDRESS OF START OF OPERATION .. DO NOT SET PARAM TYPE BIT
274	5151000064 7170000001		SAS SX7	B1+P TEMP7 1	.. AP INDEX OF MODIFIED SPEC .. START QUOTIENT := 1
275	62257777 3 0720000300 +	UPDATE1	SB2 NG	X5=60 B2,UPDATE2	.. TRIAL DIVIDEND := DIVIDEND - DIVISOR .. DONE
276	7277000001 76520		SX7 SX5	X7+1 B2	.. QUOTIENT := QUOTIENT + 1 .. NEW DIVIDEND
277	0200000275 +		JP	UPDATE1	
300	36047 436 1	UPDATE2	IX0 MX6 1	X4+X1 B2,X6 B1	.. ADDRESS IN ECS OF TYPE BIT WORD .. POSITION NEW TYPE BIT .. [ESP,SCR]
	23626 5610		AX6 SA0 RECS SA5		
301	0110000001		BX6 SA6	X5+X6 A5	.. OR IN NEW BIT
302	56510 12656 54650		WECS SAS	1 B1 B1	
303	0120000001	UPDATE3	SX5 IX0	B1+P TEMP6 X5 X4+X5	.. SAVED PTR TO RELEVANT ORDER .. ABSOLUTE ECS ADDRESS
304	5151000063 73550 36045		RECS SAS	3 A0	
305	0110000003 54500	UPDATE4	IX6 SAS	A0 X5+X1 A0+1	.. FIRST WORD OF THIS ORDER .. PLUS INCREMENTS .. SECOND WORD
306	36651 5050000001		SA6 IX6	A0 X5+X2	
307	54600 36652 5050000002		SA5 SA6	A0+2 A0+1	
310	5060000001 36653 54650		IX6 SA6	X5+X3 A5	
311	0120000003 73520		WECS SXS	3 X2	
312	0325000313 + 13222		PL BX2	X5,UPDATES X2-X2	.. VISIBLE PARAMS FIELD .. OK UNLESS NEGATIVE .. FCAP AND FDAT DO NOT CHANGE REST OF WORD
313	21622 7276000000	UPDATES	AX6 SX7 IX0	18 X6+0 X4+X7	.. ORIGIN OF NEXT ORDER
	36047				

OPERATIONS  
FILE IN PARAMETER SPECIFICATIONS

314 2162?

63260  
0520000305 \*

315 0200000000 X

AX6

18

SB2

X6

NZ

LENGTH OF NEXT ORDER  
B2,UPDATE4 ..  
.. NEXT LENGTH FIELD IS ZERO IN  
LAST ORDER OF OPERATION

JP

SYSRET

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#  
\* DLOPR  
\*

## DESTROY AN OPERATION

IP1 C: OPERATION TO BE DESTROYED (OR.DSTRY)

USER GETS 7,1,1 ERROR IF OPERATION DOESN'T EXIST

ENTRY DLOPR  
ECSCODE DLOPR  
EXT DELOBJ

166

I	51	5151000067 73050	DLOPR	SAS SX0 SA0 RECS MX0 SA1 SB3 BX1 BX1 NZ SB7 EQ ENDECS	B14P.PARAM+1 X5 .. MOT POINTER B1 .. READ MOT 60=21 B1 .. FETCH MOT 1 .. ERROR MODIFIER X1=X5 .. CHECK IF UNIQUE NAMES MATCH. DONNAT CARE X1=MX0 .. ABOUT LOWER 21 BITS X1,MOTERR .. ERROR: OPERATION GONE FROM MOT SYSRET DELOBJ .. DESTROY OPERATION DLOPR
L	52	0110000001			
L	53	43047 56110			
L	54	13115 11110 0311000332 +			
L	55	6170000000 X 0400000000 X			
L	56				

315

ERRNUMS XTEXT

\* 290 ERROR = PARAMETER TOO SMALL (CURRENTLY NO INDEX IS GIVEN)

316 7170000000

0200000347 \*

NOTPOS SX7 E.NEGPAR  
JP PARMERR .. SET ERROR CLASS AND JP TO E.ERROR

\* 292 ERROR = POINTER IS NEGATIVE (NO PARAM INDEX GIVEN)

317 7170000002

0200000347 \*

NEGADD SX7 E.NEGPT  
JP PARMERR

\* 293 ERROR = POINTER IS TOO LARGE (NO INDEX GIVEN)

320 7170000003

0200000347 \*

BIGADD SX7 E.BIGPT  
JP PARMERR

\*

321 7120000004

0400000323 \*

NGCNT SX2 4  
EQ ERR20

322 7120000005

NGCNT1 SX2 5

323 7170000000

0400000346 \*

ERR20 SX7 E.NEGPAR

324 7170000005

0400000346 \*

BGIXX SX7 E.BIGIX

325 7170000007

0400000346 \*

BIGOPRN SX7 E.MANPAR

326 7170000006

0400000336 \*

CL2 EQ CL2

327 7170000004

0400000336 \*

BIGORDER SX7 E.BIGORD

328 7170000005

0400000336 \*

CL7 EQ CL7

329 7170000005

0400000336 \*

NOTANY SX7 E.NOTANY

330 7170000001

0400000336 \*

CL7 EQ CL7

331 7170000001

0400000336 \*

NOTUCAP SX7 E.USER

332 7633

24322

7170000001

CL7 EQ CL7

333 12773

0400000336 \*

NOTERR SX3 83 .. ERROR MODIFIER

334 7170000002

5111000070

LX3 SX7 E.NOOP

335 721177776

20122

LX3 SX7 E.NOOP

336 7160000007

04000000000 X

BX7 EQU BADCAP

337 7321

7170000004

CL7 SX6 E.OPER

340 7170000005

0400000346 \*

EQ E.ERROR

341 7170000005

54260

X1 NGIXX SX2

342 7170000005

54260

SX7 E.NEGIX

343 7170000005

54260

EQ CL2

344 7170000005

54260

SA2 E.BIGIX

345 7170000005

54260

A6

OPERATIONS  
ERROR CODE

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342	0400000346 +		EQ	CL?
343	7170000000	NGINDX	SX7	E.NEGPAR
	7120000001		SX2	1
344	0400000346 +		EQ	CL?
345	7170000001	BGindx	SX7	E.RIGPAR
	7120000001		SX2	1
346	20222	CL2	LX2	18
	43350		MX3	42
	11232		BX2	X3*X2
	12727		BX7	X2+X7
347	7160000002	PARMERR	SX6	E.PARMS
	6400000000 X		EQ	E.ERROR
350			END	
	36314	STORAGE USED		1559 STATEMENTS
		6600 ASSEMBLY		11.521 SECONDS

482 SYMBOLS  
537 REFERENCES

## OPERATIONS SYMBOLIC REFERENCE TABLE.

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ACAP	51	PROGRAM*	2/02 E	13/01 L
ACAPI	52	PROGRAM*	13/01 4/16	13/04 L
ACTLIM	10		6/17 L	
ADDORDR	51		6/24 L	6/27
A01	54		8/41 L	8/48 L
A010	132		8/40 L	8/49 L
A011	136			
A02	56		6/23 L	6/26 L
A02	65		6/45 L	6/53
A04	77		7/13 L	7/15 L
A05	120		7/15 L	7/17 L
A06	115		7/32 L	7/37 L
A07	115		7/33 L	7/40 L
A08	113		7/27 L	7/48 L
A09	122		8/14 L	8/19 L
AO.AR	56		6/19 L	8/16
AO.CLSOD	73		6/12 L	7/48
AO.IX	70		6/10 L	6/17 9/17
AO.NOPS	75		6/13 L	7/05
AO.OP	71		6/11 L	6/28 8/19
AT.OPER	4		3/50 L	8/15 10/26
BADCAP	334	PROGRAM*	16/12	23/41 L
BADTYPE	334	PROGRAM*	17/09	23/46 D
BCAP	76	PROGRAM*	2/02 E	14/01 L
BCAP1	162	PROGRAM*	14/01	16/35 L
RCAP2	165	PROGRAM*	16/33	16/42 L
RCAP3	267	PROGRAM*	16/35	19/37 L
BOAT	75	PROGRAM*	2/02 E	13/51 L
BOATI	157	PROGRAM*	13/51	16/27 L
BDAT2	263	PROGRAM*	16/27	19/26
RGINDX	240	PROGRAM*	15/08	24/05 L
RGIX	341	PROGRAM*	3/29	6/25
RGIXX	324	PROGRAM*	10/17	23/23 L
BIGADD	220	PROGRAM*	12/26	12/28 23/15 L
RIGOPRN	325	PROGRAM*	2/46	7/09 13/17 15/41 16/47 16/52 17/19 23/25 L
RIGORDER	326	PROGRAM*	3/48	7/36 7/47 17/24 23/27 L
CAPAB	3	EXTERNAL*	5/01	9/19 11/05
CL2	346	PROGRAM*	23/22	23/24 23/51 24/01 24/04 24/07 L
CL7	336	PROGRAM*	23/26	23/26 23/30 23/32 23/35 23/40 23/47 L
CMRUFF	50		2/27	6/16 10/09 12/15 22/12
			2/49	9/22 11/09 12/50 22/26
CPYOPR	51		10/09 L	
CPYOPR1	54		10/16 L	10/19
CPYOPR2	56		10/15	10/20 L
CPYOPR21	64		10/30	10/32 L
CPYOPR3	66		10/34	10/36 L
CPYOPR4	72		10/44 L	10/53
CPYOPR5	77		10/45	11/01 L
Cz	2		6/07 D	6/09 6/11 6/12 12/09
DELORJ	6	EXTERNAL*	22/26	
DISASTER	50	PROGRAM*	8/31	9/23 L 17/53
DISASTR	0	EXTERNAL*	9/23	
DISPOP	51		12/16 L	

**OPERATIONS  
SYMBOLIC REFERENCE TABLE**

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OPERATIONS  
SYMBOLIC REFERENCE TABLE.

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MAKEOPN	51		2/27 L					
MISOPR	331	PROGRAM*	6/36	10/27	12/39	14/14	23/34 L	
MKOPRN	2	PROGRAM*	2/47	3/11 E	3/13 L			
MKOPRN2	3	PROGRAM*	3/17	3/20 L				
MKOPRN1	6	PROGRAM*	3/28 L	3/31				
MKOPRN10	44	PROGRAM*	4/39	4/53 L				
MKOPRN2	10	PROGRAM*	3/27	3/32 L				
MKOPRN3	13	PROGRAM*	3/36	3/40 L	3/44			
MKOPRN4	15	PROGRAM*	3/41	3/45 L				
MKOPRN5	16	PROGRAM*	3/45	3/47 L				
MKOPRN6	27	PROGRAM*	3/13	3/53 L				
MKOPRN7	31	PROGRAM*	4/20	4/26 L				
MKOPRN8	27	PROGRAM*	4/42 L	4/46				
MKOPRN9	40	PROGRAM*	4/43	4/47 L				
MWORD	47	PROGRAM*	4/40	5/05 L	7/28			
MOTERR	332	PROGRAM*	22/24	23/36 L				
MOT	56		2/33	2/37 L				
MO2	57		2/35	2/39 L				
NEGADD	317	PROGRAM*	12/22	23/10 L				
NGCNT	321	PROGRAM*	2/31	23/18 L				
NGCNT1	322	PROGRAM*	7/06	23/20 L				
NGTNDX	343	PROGRAM*	14/25	24/02 L				
NGIX	340	PROGRAM*	2/40	6/18 23/50 L				
NGIXX	337	PROGRAM*	10/10	23/49 L				
NOTANY	327	PROGRAM*	13/13	16/43 17/12	23/29 L			
NOTPOS	316	PROGRAM*	12/23	12/24 16/29	16/30 16/37	16/38	23/05 L	
NOTUCAP	330	PROGRAM*	13/34	16/08 23/31 L	23/33			
NOTUDAT	330	PROGRAM*	16/21	23/33 D				
OBJSIZ	6	EXTERNAL*	10/31	12/41 18/32				
OROPT	65	PROGRAM*	2/02 E	13/30 L				
OROPT1	66	PROGRAM*	13/30	13/33 L				
OS	100	PROGRAM*	13/02	13/10 13/31	13/46 13/49	13/52 14/02	14/06 L	
OS1	111	PROGRAM*	14/48 L	15/17				
OS2	114	PROGRAM*	15/02 L	15/25 15/28	15/30 15/34	15/37		
OS3	116	PROGRAM*	14/50	15/07 L				
OS4	122	PROGRAM*	15/06	15/10 L				
OS5	135	PROGRAM*	15/31	15/35 15/38 L				
OS6	140	PROGRAM*	15/45 L	15/52				
OS7	144	PROGRAM*	15/47	15/53 L				
OS_FIXED	126	PROGRAM*	15/20	15/26 L				
OS_NODAT	133	PROGRAM*	15/22	15/35 L				
OS_PSDAT	131	PROGRAM*	15/18	16/31 L				
PARMERR	347	PROGRAM*	23/06	23/11 23/16	24/11 L			
PS_RLK	6		15/05	17/01				
PS_FCAP	5		16/16					
PS_FDAT	4		15/19	16/23				
PS_MASKL	1		3/33	3/47 4/02 4/28 S	4/37 6/22 6/43 14/43			
PS_NONE	2		5/05	5/07 13/12 15/21	17/01 17/20			
PS_UCAP	7		5/06	5/08 13/18 16/42	17/11			
PS_UDAT	3		13/33	16/07 16/16 17/20				
PUTCAP	0	EXTERNAL*	13/18	16/20 16/23				
P_APPL	35		5/03	9/20 11/07				
			13/16	16/46 17/18				

OPERATIONS  
SYMBOLIC REFERENCE TABLE.

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P.CLIST	16		3/23	6/19	10/11				
P.PARAM	66		2/27	6/06	10/36	13/35	16/22	17/10	19/26
			2/29	10/09	11/03	14/06	16/28	17/39	19/37
			2/30	10/20	12/08	14/24	16/36	17/44	22/15
			2/32	10/33	13/06	16/09	17/04	19/17	23/42
P.PBUFL	372		16/50						
P.SCRL	50		3/47	8/34	8/43	10/40	10/46	17/23	
			7/30	8/41	8/45	10/44	10/50	18/36	
P.SCR2	50		13/14	15/44	16/44	17/16			
P TEMP1	56		3/16 S	4/09	8/02 S	8/20	17/36 S	19/04	
P TEMP2	57		3/22 S	5/02	15/43 S	18/17 S	20/16		
P TEMP3	60		3/32 S	4/14	17/34 S	18/26			
P TEMP4	61		3/38 S	4/23	17/38 S	18/20			
P TEMP5	62		17/29 S	18/14					
P TEMP6	63		15/41 S	18/01	20/34				
P TEMP7	64		16/03 S	20/18					
P YPACK	140		12/16						
REALLOC	0	EXTERNAL*	17/42						
SYSRET	0	EXTERNAL*	2/39	9/18	11/06	12/46	13/43	21/05	22/25
UCAP	77	PROGRAM*	2/02 E	14/04 L					
UCAP1	173	PROGRAM*	14/04	17/04 L					
UCAP2	176	PROGRAM*	13/07	17/11 L					
UCAP3	255	PROGRAM*	17/21	19/08 L					
UDAT	54	PROGRAM*	2/02 E	13/09 L					
UDAT1	55	PROGRAM*	13/09	13/12 L					
UPDATE	273	PROGRAM*	13/28	19/14	19/24	19/35	19/48	20/16 L	
UPDATE1	275	PROGRAM*	20/20 L	20/24					
UPDATE2	300	PROGRAM*	20/21	20/25 L					
UPDATE3	304	PROGRAM*	20/17	20/34 L					
UPDATE4	305	PROGRAM*	20/37 L	21/03					
UPDATES	313	PROGRAM*	20/49	20/51 L					