

```

*****
*****
JJ EEEEEEEEEEEE ZZZZZZZZZZZ MM MM AAAAAAAAAA CCCCCCCCCC RRRRRRRRRR 0000000000
JJ EEEEEEEEEEEE ZZZZZZZZZZZ MMM MMM AAAAAAAAAA CCCCCCCCCC RRRRRRRRRR 000000000000
JJ EE ZZ ZZ MMMM MMMM AA AA CC CC RR RR 00 00
JJ EE ZZ MM MM MM MM AA AA CC CC RR RR 00 00
JJ EE ZZ MM MM MM MM AA AA CC RR RRRRRRRRRR 00 00
JJ EEEEEEEE ZZ MM M MM AAAAAAAAAA CC RRRRRRRRRR 00 00
JJ EEEEEEEE ZZ MM MM AAAAAAAAAA CC RR RR 00 00
JJ JJ EE ZZ MM MM AA AA CC CC RR RR 00 00
JJ JJ EE ZZ ZZ MM MM AA AA CC CC RR RR 00 00
JJJJJJJJJJJJ EEEEEEEEEEEE ZZZZZZZZZZZ MM MM AA AA CCCCCCCCCC RR RR 000000000000
JJJJJJJJJJJJ EEEEEEEEEEEE ZZZZZZZZZZZ MM MM AA AA CCCCCCCCCC RR RR 0000000000

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JJ 0000000000 BBBB BBBB 2222222222 6666666666 6666666666 11
JJ 000000000000 BBBB BBBB 222222222222 666666666666 666666666666 111
JJ 00 00 BB BB 22 22 66 66 66 1111
JJ 00 00 BB BB 22 66 66 66 11
JJ 00 00 BBBB BBBB 22 6666666666 6666666666 11
JJ 00 00 BBBB BBBB 22 666666666666 666666666666 11
JJ 00 00 BB BB 22 66 66 66 66 11
JJ JJ 00 00 BB BB 22 66 66 66 66 11
JJ JJ 00 00 BB BB 22 66 66 66 66 11
JJJJJJJJJJJJ 000000000000 BBBB BBBB 222222222222 666666666666 666666666666 111111
JJJJJJJJJJJJ 000000000000 BBBB BBBB 222222222222 666666666666 666666666666 111111

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BBBBBBBBBBBBB IIIIIIIIIII NN NN 0000000 11 0000000
BBBBBBBBBBBBB IIIIIIIIIII NNN NN 000000000 111 000000000
BB BB II NNNN NN 00 00 1111 00 00
BB BB II NN NN NN 00 00 11 00 00
BB BB II NN NN NN 00 00 11 00 00
BBBBBBBBBBBBB II NN NN NN 00 00 11 00 00
BBBBBBBBBBBBB II NN NN NN 00 00 11 00 00
BB BB II NN NN NN 00 00 11 00 00
BB BB II NN NN NN 00 00 11 00 00
BB BB II NN NNNN 00 00 11 00 00
BBBBBBBBBBBBB IIIIIIIIIII NN NNN 000000000 111111 000000000
BBBBBBBBBBBBB IIIIIIIIIII NN NN 0000000 111111 0000000

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ISV40 JOB ORIGIN FROM GROUP=LOCAL , DSP=IJP, DEVICE=SYA , 9F8
//JEZMACRO JOB JEZ$CG,CLASS=E 0.
//MCS8 EXEC ASMFC,ASMPGM=ASMBLR,ASMTIM='(,25)', 0.002
// ASMPRM='XREF(SHORT),TERM,LINECOUNT(99)', 0.004
// ASMLB5='SYS1.DUMMYC',ASMLB6='WYL.CG.MCS.MACLIB' 0.006
//ASM.SYSGO DD UNIT=SYSDA,DSN=&&PNCH,DISP=(,PASS),SPACE=(TRK,(9,5)) 0.008
//ASM.SYSPRINT DD UNIT=SYSDA,DSN=&&LIST,DISP=(,PASS),SPACE=(CYL,(2,1)) 0.01
//ASM.SYSTEM DD SYSOUT=A 0.012
//ASM.OBJCT DD DSN=WYL.CG.JEZ.CLOBJECT,DISP=(MOD,DELETE), 0.014
// UNIT=2314,VOL=SER=SCFEV5,SPACE=(TRK,(10,5)) 0.016
//ASM.SYSIN DD * 0.018
/* 2.004
//CLEANUP EXEC PGM=CLEANUP,REGION=76K 2.006
//STEPLIB DD DSN=WYL.CG.PUB.LOADMODS,DISP=SHR 2.008
//IN DD DSN=&&LIST,DISP=(OLD,DELETE) 2.01
//OUT DD SYSOUT=A,DCB=BLKSIZE=1936 2.012
//OBJIN DD DSN=&&PNCH,DISP=(OLD,DELETE) 2.014
//OBJOUT DD DSN=WYL.CG.JEZ.CLOBJECT,UNIT=SYSDA, 2.016
// VOL=SER=SCFEV5,DISP=(NEW,KEEP),SPACE=(TRK,(10,5),RLSE), 2.018
// DCB=BLKSIZE=1600 2.02

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LOCATE' 2661WYL.CG.MCS.MACLIB
AL26610E001/WYLO110003
ARIX51 MCS8 ASM SYSPUNCH SYSOUT BLOCKSIZE CHANGED TO 0080.
ARIX51 MCS8 ASM SYSTEM SYSOUT BLOCKSIZE CHANGED TO 1452.
LOCATE' 2661WYL.CG.PUB.LOADMODS
AL26610E001/WYLO060004

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AMDS01 JOB 2661 (JEZMACRO) IN SETUP ON MAIN=SYA
AMDS02 SYSLIB USING D WYLO11 ON 852
AMDS02 OBJCT USING D SCFEV5 ON 232
AMDS02 STEPLIB USING D WYLO06 ON 233
JEZMACRO IEF403I JEZMACRO STARTED TIME=17.19.34
JEZMACRO IEF234E D 924,ASP924
*JEZMACRO*94 IECASPO 92A IS JEZMACRO ASM MCS8 ASPI0001
JEZMACRO IEC202E K 92A,012661,NL,JEZMACRO,ASM
*JEZMACRO*02 IECASPO 926 IS JEZMACRO A ASM MCS8 SYSTEM
*JEZMACRO*17 IECASPO 90F IS JEZMACRO A CLEANUP OUT
JEZMACRO IEF404I JEZMACRO ENDED TIME=17.21.43

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//JEZMACRO JOB JEZ$CG,CLASS=E 0.
//MCS8 EXEC ASMFC,ASMPGM=ASMBLR,ASMTIM='(,25)', 0.002
// ASMPRM='XREF(SHORT),TERM,LINECOUNT(99)', 0.004
// ASMLB5='SYS1.DUMMYC',ASMLB6='WYL.CG.MCS.MACLIB' 0.006
XXASM PROC ASMCND=, ASSEMBLER STEP CONDITIONS 00001000
XX ASMLB1='SYS1.DUMMYC', FIRST ASSEMBLER MACRO LIBRARY 00002000
XX ASMLB2='SYS1.DUMMYC', SECOND ASSEMBLER MACRO LIBRARY 00003000
XX ASMLB3='SYS1.DUMMYC', THIRD ASSEMBLER MACRO LIBRARY 00004000
XX ASMLB4='SYS1.MAC', FOURTH ASSEMBLER MACRO LIBRARY 00005000
XX ASMLB5='SYS1.MACLIB', FIFTH ASSEMBLER MACRO LIBRARY 00006000
XX ASMLB6='SYS3.MACLIB', SIXTH ASSEMBLER MACRO LIBRARY 00007000
XX ASMLVR=, ASSEMBLER LIBRARY VERSION 00008000
XX ASMPGM=ASMG, ASSEMBLER PROGRAM NAME 00009000
XX ASMPRM=, ASSEMBLER PARAMETERS 00010000
XX ASMPRT='SYSOUT=A', ASSEMBLER SYSPRINT OUTPUT 00011000
XX ASMRGN=150K, ASSEMBLER REGION = 150K 00012000
XX ASMSL1='SYS1.DUMMYL', ASSEMBLY STEP STEPLIB DATASET 00013000
XX ASMTIM='(,30)', ASSEMBLER DEFAULT TIME SEC 00014000
XX ASMTRM='SYSOUT=A', ASSEMBLER SYSTEM OUTPUT 00015000

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MACKOS

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IEF237I 92A ALLOCATED TO SYSIN
IEF142I - STEP WAS EXECUTED - COND CODE 0000
IEF285I SYS1.DUMMYL KEPT
IEF285I VOL SER NOS= SYSDV1.
IEF285I SYS1.LINK KEPT
IEF285I VOL SER NOS= SYSDV1.
IEF285I SYS74247.T171913.RV001.JEZMACRO.PNCH PASSED
IEF285I VOL SER NOS= WORK01.
IEF285I SYS1.DUMMYC KEPT
IEF285I VOL SER NOS= SYSDV1.
IEF285I SYS1.DUMMYC KEPT
IEF285I VOL SER NOS= SYSDV1.
IEF285I SYS1.DUMMYC KEPT
IEF285I VOL SER NOS= SYSDV1.
IEF285I SYS1.MAC KEPT
IEF285I VOL SER NOS= SYSDV1.
IEF285I SYS1.DUMMYC KEPT
IEF285I VOL SER NOS= SYSDV1.
IEF285I WYL.CG.MCS.MACLIB KEPT
IEF285I VOL SER NOS= WYL011.
IEF285I SYS74247.T171913.RV001.JEZMACRO.LIST PASSED
IEF285I VOL SER NOS= WORK01.
IEF285I SYS74247.T171913.RV001.JEZMACRO.ASPOA002 DELETED
IEF285I VOL SER NOS= ASP926.
IEF285I SYS74247.T171913.RV001.JEZMACRO.R0000710 DELETED
IEF285I VOL SER NOS= WORK01.
IEF285I SYS74247.T171913.RV001.JEZMACRO.R0000711 DELETED
IEF285I VOL SER NOS= WORK02.
IEF285I SYS74247.T171913.RV001.JEZMACRO.R0000712 DELETED
IEF285I VOL SER NOS= WORK02.
IEF283I WYL.CG.JEZ.CLOBJECT NOT DELETED 8
IEF283I VOL SER NOS= SCFEV5 1.
IEF285I SYS74247.T171913.RV001.JEZMACRO.ASPI0001 DELETED
IEF285I VOL SER NOS= 012661.
IEF373I STEP /ASM / START 74247.1719
IEF374I STEP /ASM / STOP 74247.1721 CPU OMIN 01.12SEC STOR VIRT 192K
SMF001I STEP ASM STEP NUMBER= 1 RETURN= 0 DEC
SMF002I DATE= 09/04/74 STRT= 17:19:34.05 STOP= 17:21:24.49 E.T.= 1:50.44 CPU= 0:01.12
SMF003I CPU ID= 168-A SYSTEM= VS2 01.6 CORE REQ= 150K CORE USED= 192K CHG FACTOR= 1.00
SMF004I CORE= VIRTUAL PAGE INS= 5 PGE OUTS= 0
SMF005I I/O COUNTS 2314/535= 26 2314/535= 0 3330/851= 0 2314/535= 0
SMF005I I/O COUNTS 2314/535= 0 2314/535= 0 2314/535= 0 2314/535= 0
SMF005I I/O COUNTS 3330/852= 0 3330/851= 60 CTC./924= 0 CTC./926= 1
SMF005I I/O COUNTS 3330/851= 75 3330/751= 23 3330/751= 5 2314/232= 0
SMF005I I/O COUNTS CTC./92A= 15
SMF006I I/O TOTALS OTHER= 16 7 TRK= 0 9 TRK= 0 DASD= 189
SMF007I STEP CHARGES OTHER= 0.08 7 TRK= 0.00 9 TRK= 0.00 DASD= 7.56
SMF008I STEP CHARGES CPU= 1.12 TOTAL= 8.74
//CLEANUP EXEC PGM=CLEANUP,REGION=76K 2.006
//STEPLIB DD DSN=WYL.CG.PUB.LOADMODS,DISP=SHR 2.008
//IN DD DSN=&&LIST,DISP=(OLD,DELETE) 2.01
//OUT DD SYSOUT=A,DCB=BLKSIZE=1936 2.012
//OBJIN DD DSN=&&PNCH,DISP=(OLD,DELETE) 2.014
//OBJOUT DD DSN=WYL.CG.JEZ.CLOBJECT,UNIT=SYSDA, 2.016
// VOL=SER=SCFEV5,DISP=(NEW,KEEP),SPACE=(TRK,(10,5),RLSE), 2.018
// DCB=BLKSIZE=1600 2.02
//
IEF236I ALLOC. FOR JEZMACRO CLEANUP
IEF237I 233 ALLOCATED TO STEPLIB
IEF237I 851 ALLOCATED TO IN

```

STMT SOURCE STATEMENT

ASM 0102 17.19 05

1	*				
2	*				
3	*	DEFINITION OF OPCODES AND MACROS			0.02
4	*				0.02
5	*				0.02
6	XORG	OPSYN	ORG	NEW OPCODE FOR ORG	0.03
7	ORG	OPSYN	,	UNDEFINE FOR MACRO-DEFINITION	0.03
8	NOP	OPSYN	,	UNDEFINE FOR MACRO-DEFINITION	0.03
9	XEQU	OPSYN	EQU	NEW OPCODE FOR EQU	0.03
10	XEQU	OPSYN	,	UNDEFINE FOR MACRO-DEFINITION	0.03
11		COPY	MACROS		0.04
12		MACRO			
13		XREG	&A		
14		GBLA	&XR	0-7 FOR A,B,C,D,E,H,L,M RESP.	
15		AIF	('&A'EQ').ERR		
16	&XR	SETA	0		
17		AIF	('&A'EQ'A').MEND		
18	&XR	SETA	1		
19		AIF	('&A'EQ'B').MEND		
20	&XR	SETA	2		
21		AIF	('&A'EQ'C').MEND		
22	&XR	SETA	3		
23		AIF	('&A'EQ'D').MEND		
24	&XR	SETA	4		
25		AIF	('&A'EQ'E').MEND		
26	&XR	SETA	5		
27		AIF	('&A'EQ'H').MEND		
28	&XR	SETA	6		
29		AIF	('&A'EQ'L').MEND		
30	&XR	SETA	7		
31		AIF	('&A'EQ'M').MEND		
32		MNOTE	4,'*** ERROR *** '&A'' IS NOT A LEGAL REGISTER'		
33	&XR	SETA	1		
34		MEXIT			
35	.ERR	MNOTE	4,'*** ERROR *** REGISTER SPECIFICATION MISSING'		
36	&XR	SETA	1		
37	.MEND	MEND			
39		MACRO			
40	&L	LOD	&A,&B,&W,&X,&Y,&Z		
41		GBLA	&XR	RETURN VALUE FOR 'XREG' MACRO	
42		LCLA	&F,&N		
43		LCLC	&S(8),&R1,&R2,&COMMA		
44		XCHK	&W,&X,&Y,&Z		
45	.LOOP	ANOP			
46	&N	SETA	&N+1		
47		AIF	(&N GT K'&A AND &N GT K'&B).GEN		
48		AIF	(&N LE K'&A AND &N LE K'&B).OK3		
49		MNOTE	4,'*** ERROR *** UNBALANCED OPERANDS'		
50		AGO	.SKIP		
51	.OK3	ANOP			
52	&R1	SETC	'&A'(&N,1)		
53	&R2	SETC	'&B'(&N,1)		
54	.SKIP	XREG	&R1		

```

55 &F      SETA   &XR
56         XREG   &R2
57         AIF    (&F NE 7 OR &XR NE 7).OK1
58         MNOTE  4, '*** ERROR *** BOTH REGISTERS CANNOT BE 'M'''
59         AGO    .OK2
60 .OK1    AIF    (&F NE &XR).OK2
61         MNOTE  *, '*** WARNING *** LOD &R1,&R2 IS A NOOP'
62 .OK2    ANOP
63 &F      SETA   X'CO'+8*&F+&XR
64 &S(&N)  SETC   '&COMMA'. '&F'
65 &COMMA  SETC   ','
66         AGO    .LOOP
67 .GEN    ANOP
68 &L      DC     AL1(&S(1)&S(2)&S(3)&S(4)&S(5)&S(6)&S(7)&S(8))
69         MEND

```

```

71         MACRO
72 &L      LODI   &A,&D,&F,&X,&Y,&Z
73 .*     &D RESTRICTED TO -255 LE &D LE +255
74         GBLA   &XR
75         XCHK   &X,&Y,&Z
76         XREG   &A
77 &XR    SETA   8*&XR+6          LODI OPCODE
78 &L      XRI   &D,&F,AL1(&XR)
79         MEND

```

```

81         MACRO
82 &L      INC    &A,&B,&W,&X,&Y,&Z
83         GBLA   &XR
84         XCHK   &W,&X,&Y,&Z
85         XREG   &A
86         AIF    (&XR NE 0 AND &XR NE 7).OK
87         MNOTE  4, '*** ERROR *** '&A'' CANNOT BE INCREMENTED'
88 .OK    AIF    ('&B' EQ '').ONE
89 &L      DC     (&B)AL1(8*&XR)
90         MEXIT
91 .ONE   ANOP
92 &L      DC     AL1(8*&XR)
93         MEND

```

```

95         MACRO

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STMT SOURCE STATEMENT

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96 &L      DEC      &A,&B,&W,&X,&Y,&Z
97         GBLA    &XR
98         XCHK    &W,&X,&Y,&Z
99         XREG    &A
100        AIF     (&XR NE 0 AND &XR NE 7).OK
101        MNOTE   4, '*** ERROR ***   ''&A'' CANNOT BE DECREMENTED'
102 .OK     AIF     ('&B' EQ '').ONE
103 &L      DC      (&B)AL1(8*&XR+1)
104        MEXIT
105 .ONE    ANOP
106 &L      DC      AL1(8*&XR+1)
107        MEND

109        MACRO
110 &L      ADD     &A,&V,&W,&X,&Y,&Z
111        XCHK    &V,&W,&X,&Y,&Z
112 &L      XRR     &A,0
113        MEND

115        MACRO
116 &L      ADC     &A,&V,&W,&X,&Y,&Z
117        XCHK    &V,&W,&X,&Y,&Z
118 &L      XRR     &A,1
119        MEND

121        MACRO
122 &L      SUB     &A,&V,&W,&X,&Y,&Z
123        XCHK    &V,&W,&X,&Y,&Z
124 &L      XRR     &A,2
125        MEND

127        MACRO
128 &L      SBB     &A,&V,&W,&X,&Y,&Z
129        XCHK    &V,&W,&X,&Y,&Z
130 &L      XRR     &A,3
131        MEND

133        MACRO
134 &L      AND     &A,&V,&W,&X,&Y,&Z
135        XCHK    &V,&W,&X,&Y,&Z
136 &L      XRR     &A,4
137        MEND

139        MACRO
140 &L      XOR     &A,&V,&W,&X,&Y,&Z
141        XCHK    &V,&W,&X,&Y,&Z
142 &L      XRR     &A,5
143        MEND

```

```
145          MACRO
146 &L      IOR    &A,&V,&W,&X,&Y,&Z
147          XCHK  &V,&W,&X,&Y,&Z
148 &L      XRR   &A,6
149          MEND
```

```
151          MACRO
152 &L      CMP    &A,&V,&W,&X,&Y,&Z
153          XCHK  &V,&W,&X,&Y,&Z
154 &L      XRR   &A,7
155          MEND
```

```
157          MACRO
158 &L      XRR   &A,&OP
159          GBLA  &XR
160          XREG  &A
161 &L      DC    XL.2'2',XL.3'&OP',XL.3'&XR'
162          MEND
```

```
164          MACRO
165 &L      ADDI  &D,&F,&W,&X,&Y,&Z
166          XCHK  &W,&X,&Y,&Z
167 &L      XRI   &D,&F,X'04'
168          MEND
```

```
170          MACRO
171 &L      ADCI  &D,&F,&W,&X,&Y,&Z
172          XCHK  &W,&X,&Y,&Z
173 &L      XRI   &D,&F,X'0C'
174          MEND
```

```
176          MACRO
177 &L      SUBI  &D,&F,&W,&X,&Y,&Z
178          XCHK  &W,&X,&Y,&Z
179 &L      XRI   &D,&F,X'14'
180          MEND
```

STMT	SOURCE	STATEMENT
182		MACRO
183 &L	SBBI	&D,&F,&W,&X,&Y,&Z
184	XCHK	&W,&X,&Y,&Z
185 &L	XRI	&D,&F,X'1C'
186		MEND
188		MACRO
189 &L	ANDI	&D,&F,&W,&X,&Y,&Z
190	XCHK	&W,&X,&Y,&Z
191 &L	XRI	&D,&F,X'24'
192		MEND
194		MACRO
195 &L	XORI	&D,&F,&W,&X,&Y,&Z
196	XCHK	&W,&X,&Y,&Z
197 &L	XRI	&D,&F,X'2C'
198		MEND
200		MACRO
201 &L	IORI	&D,&F,&W,&X,&Y,&Z
202	XCHK	&W,&X,&Y,&Z
203 &L	XRI	&D,&F,X'34'
204		MEND
206		MACRO
207 &L	CMPI	&D,&F,&W,&X,&Y,&Z
208	XCHK	&W,&X,&Y,&Z
209 &L	XRI	&D,&F,X'3C'
210		MEND
212		MACRO
213 &L	XRI	&D,&F,&OP
214 .*		&D=IMM.OPERAND, &OP=OPCODE, &F=<,>,OR NULL
215 .*		&D RESTRICTED TO -255 LE &D LE +255
216	GBLA	&XIND,&a(256)
217	LCLC	&M,&OPC
218	LCLA	&V
219	AIF	('&OP'EQ''').F
220 &OPC	SETC	'&OP'.','
221 .F	AIF	('&F' NE '').HILOW
222	AIF	(K'&D EQ 3 AND '&D'(1,1) EQ ''').CHAR
223 .NOTCHAR	AIF	('&D'(1,1) NE '-').NOTMIN
224 &M	SETC	'0'
225 .NOTMIN	ANOP	
226 &L	DC	&OPC.AL1(&M&D),0AL((&M&D)/256*4+1)(0)
227	MEXIT	
228 .CHAR	AIF	('&D'(3,1) NE ''').NOTCHAR
229 &M	SETC	'&D'(2,1)
230	XINDX	&M
231 &V	SETA	&a(&XIND) ASCII VALUE


```

232      AIF      (&V NE 0 AND &V NE 999).OK
233      MNOTE 8,'*** ERROR *** ILLEGAL CHARACTER &D'
234 .OK      ANOP
235 &L      DC      &OPC.AL1(&V)
236      MEXIT
237 .HILOW   AIF      ('&F' NE '<').LOW
238      AIF      (T'&D EQ 'N' OR T'&D EQ 'U' OR T'&D EQ 'Z').HICONST
239 &L      DC      &OPC.AL1((&D-&SYSECT)/256)
240      MEXIT
241 .HICONST ANOP
242 &L      DC      &OPC.AL1((&D)/256)
243      MEXIT
244 .LOW     AIF      ('&F' NE '>').ERR
245      AIF      (T'&D EQ 'N' OR T'&D EQ 'U' OR T'&D EQ 'Z').LOCONST
246 &L      DC      &OPC.AL1(&D-&SYSECT-(&D-&SYSECT)/256*256)
247      MEXIT
248 .LOCONST ANOP
249 &L      DC      &OPC.AL1(&D-(&D)/256*256)
250      MEXIT
251 .ERR     MNOTE 8,'*** ERROR *** '&F'' IS NOT A LEGAL BYTE DESIGNATOR'
252      MNOTE *,'      USE '<' FOR THE LEFT BYTE OR '>' FX
                OR THE RIGHT BYTE'
253      MEND

255      MACRO
256 &L      RLC      &U,&V,&W,&X,&Y,&Z
257      XCHK      &U,&V,&W,&X,&Y,&Z
258      MNOTE 1,'*** WARNING *** ''ROT'' MIGHT BE A BETTER CHOICE'
259 &L      DC      X'02'
260      MEND

262      MACRO
263 &L      RRC      &U,&V,&W,&X,&Y,&Z
264      XCHK      &U,&V,&W,&X,&Y,&Z
265      MNOTE 1,'*** WARNING *** ''ROT'' MIGHT BE A BETTER CHOICE'
266 &L      DC      X'0A'
267      MEND

269      MACRO
270 &L      RAL      &U,&V,&W,&X,&Y,&Z
271      XCHK      &U,&V,&W,&X,&Y,&Z

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STMT	SOURCE	STATEMENT
272		MNOTE 1, '*** WARNING *** ''ROT'' MIGHT BE A BETTER CHOICE'
273	&L	DC X'12'
274		MEND
276		MACRO
277	&L	RAR &U, &V, &W, &X, &Y, &Z
278		XCHK &U, &V, &W, &X, &Y, &Z
279		MNOTE 1, '*** WARNING *** ''ROT'' MIGHT BE A BETTER CHOICE'
280	&L	DC X'1A'
281		MEND
283		MACRO
284	&L	ROT &A, &B, &W, &X, &Y, &Z
285		LCLC &OP
286		XCHK &W, &X, &Y, &Z
287	&OP	SETC '02'
288		AIF ('&A' EQ 'L').A
289	&OP	SETC '0A'
290		AIF ('&A' EQ 'R').A
291	&OP	SETC '12'
292		AIF ('&A' EQ 'LC').A
293	&OP	SETC '1A'
294		AIF ('&A' EQ 'RC').A
295		MNOTE 4, '*** ERROR *** ''&A'' IS NOT A LEGAL ROTATE OPERAND'
296	.A	AIF ('&B' EQ '').ONE
297	&L	DC (&B)X'&OP'
298		MEXIT
299	.ONE	ANOP
300	&L	DC X'&OP'
301		MEND
303		MACRO
304	&L	NOOP &A, &W, &X, &Y, &Z
305		XCHK &W, &X, &Y, &Z
306		AIF ('&A' EQ '').ONE
307	&L	DC (&A)X'CO'
308		MEXIT
309	.ONE	ANOP
310	&L	DC X'CO'
311		MEND
313		MACRO
314	&L	NOP &A, &B, &C
315	&L	NOOP &A, &B, &C
316		MEND
318		MACRO
319	&L	HLT &U, &V, &W, &X, &Y, &Z
320		XCHK &U, &V, &W, &X, &Y, &Z
321	&L	DC X'00'

322 MEND

324 MACRO
325 &L JMP &A,&B,&W,&X,&Y,&Z
326 XCHK &W,&X,&Y,&Z
327 &L XJMPCAL &A,&B,0
328 MEND

330 MACRO
331 &L CAL &A,&B,&W,&X,&Y,&Z
332 XCHK &W,&X,&Y,&Z
333 .* GENERATE A RESTART IF THE TYPE OF THE SYMBOL IS 'Z'
334 AIF ('&B'EQ'' AND T'&A EQ 'Z').RST1
335 AIF ('&B'NE'' AND '&A'EQ'U' AND T'&B EQ 'Z').RST2
336 &L XJMPCAL &A,&B,2
337 MEXIT
338 .RST1 ANOP
339 &L RST &A
340 MEXIT
341 .RST2 ANOP
342 &L RST &B
343 MEND

345 MACRO
346 &L XJMPCAL &A,&C,&T &T=0 FOR JMP, 2 FOR CAL
347 GBLA &XCC
348 AIF ('&C' EQ '').OMITTED
349 AIF ('&A'EQ'U').UNCOND
350 XSETCC &A SET &XCC FOR CONDITION
351 &XCC SETA X'40'+8*&XCC+&T CONDITIONAL OPCODE
352 &L XADR AL1(&XCC),&C
353 MEXIT
354 .UNCOND ANOP
355 &XCC SETA X'7C'+&T
356 &L XADR AL1(&XCC),&C
357 MEXIT
358 .OMITTED ANOP
359 &XCC SETA X'7C'+&T
360 &L XADR AL1(&XCC),&A
361 MEND

STMT	SOURCE	STATEMENT
363		MACRO
364		XSETCC &C
365		GBLA &XCC
366	&XCC	SETA 0
367		AIF ('&C'EQ'NC').MEND
368	&XCC	SETA 1
369		AIF ('&C'EQ'NZ').MEND
370	&XCC	SETA 2
371		AIF ('&C'EQ'NS').MEND
372	&XCC	SETA 3
373		AIF ('&C'EQ'PO').MEND
374		AIF ('&C'EQ'NP').WARN
375	&XCC	SETA 4
376		AIF ('&C'EQ'C').MEND
377	&XCC	SETA 5
378		AIF ('&C'EQ'Z').MEND
379	&XCC	SETA 6
380		AIF ('&C'EQ'S').MEND
381	&XCC	SETA 7
382		AIF ('&C'EQ'PE').MEND
383		AIF ('&C'EQ'P').WARN
384	.ERR	MNOTE 4, '*** ERROR *** '&C'' IS NOT A LEGAL CONDITION'
385		AGO .MEND
386	.WARN	MNOTE 1, '*** WARNING *** '&C'' IS OBSOLETE'
387	.MEND	MEND
389		MACRO
390	&L	XADR &B, &A
391	.*	&B IS THE OPCODE, &A IS THE ADDRESS
392		LCLC &M, &COMMA, &S, &T
393	&S	SETC '&A'
394	&T	SETC '&A'
395		AIF ('&B'EQ''').S
396	&COMMA	SETC ','
397	.S	AIF ('&S'(1,1) NE '*' AND '&S'(1,1) NE '#').T
398	&S	SETC '*-1'. '&A'(2, K'&A-1)
399	&T	SETC '*-2'. '&A'(2, K'&A-1)
400		AGO .RELOC
401	.T	AIF (T'&A EQ 'N' OR T'&A EQ 'U' OR T'&A EQ 'Z').CONST
402	.RELOC	ANOP
403	&L	DC &B&COMMA.AL1(&S-&SYSECT-(&S-&SYSECT)/256*256, (&T-&SYSECTX)/256)
404		MEXIT
405	.CONST	AIF ('&A'(1,1) NE '-').GEN
406	&M	SETC '0'
407	.GEN	ANOP
408	&L	DC &B&COMMA.AL1(&M&S-(&M&S)/256*256, (&M&T)/256)
409		MEND
411		MACRO
412	&L	RET &C, &V, &W, &X, &Y, &Z
413		GBLA &XCC
414		XCHK &V, &W, &X, &Y, &Z

```

415      AIF      ('&C' EQ '' OR '&C' EQ 'U').UNCOND
416      XSETCC &C
417 &L    DC      XL.2'0',XL.3'&XCC',BL.3'011'
418      MEXIT
419 .UNCOND ANOP
420 &L    DC      X'3F'
421      MEND

423      MACRO
424 &L    RST      &A,&V,&W,&X,&Y,&Z
425      XCHK     &V,&W,&X,&Y,&Z
426 .*   &A RESTRICTED TO 0 LE &A LE 63 AND MULTIPLE OF 8
427      AIF      (T'&A EQ 'N' OR T'&A EQ 'U' OR T'&A EQ 'Z').CONST
428      AIF      ('&A' EQ '').ERR1
429 &L    DC      XL.2'0',AL.3((&A-&SYSECT)/8),XL.3'5',OEL((&A-&SYSECT+8)/X
      8)S(99*(&A-&SYSECT-(&A-&SYSECT)/8*8))'0'
430      MEXIT
431 .CONST ANOP
432 &L    DC      XL.2'0',AL.3((&A)/8),XL.3'5',OEL((&A+8)/8)S(99*(&A-(&A)/X
      8*8))'0'
433      MEXIT
434 .ERR1 MNOTE 4,'*** ERROR *** MISSING OPERAND'
435      MEND

437      MACRO
438 &L    INP      &A,&V,&W,&X,&Y,&Z
439      XCHK     &V,&W,&X,&Y,&Z
440 .*   &A RESTRICTED TO 0 LE &A LE 7
441 &L    DC      XL.4'4',AL.3(&A),XL.1'1',OEL(&A+1)'0'
442      MEND

444      MACRO
445 &L    OUT      &A,&V,&W,&X,&Y,&Z
446      XCHK     &V,&W,&X,&Y,&Z
447 .*   &A RESTRICTED TO 8 LE &A LE 31
448 &L    DC      XL.2'1',AL.5(&A),XL.1'1',OAL((&A-2)/6)(0)
449      MEND

451      MACRO
452 &L    DLD      &A,&B,&W,&X,&Y,&Z

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STMT	SOURCE	STATEMENT
453		GBLA &XR
454		LCLC &C
455		LCLA &F
456		XCHK &W,&X,&Y,&Z
457		AIF (K'&A NE 2).ERR
458 &C		SETC '&A'(1,1) FIRST REG CHARACTER
459		XREG &C CONVERT TO A NUMBER
460 &F		SETA &XR SAVE FIRST REG NUMBER
461 &C		SETC '&A'(2,1) SECOND REG CHARACTER
462		XREG &C CONVERT TO A NUMBER IN &XR
463		AIF (&F EQ &XR OR &F GT 6 OR &XR GT 6).ERR
464		AIF (T'&B EQ 'N' OR T'&B EQ 'U' OR T'&B EQ 'Z').CONST
465 &L		DC XL.2'0',XL.3'&F',XL.3'6',AL1((&B-&SYSECT)/256),X XL.2'0',XL.3'&XR',XL.3'6',AL1(&B-&SYSECT-(&B-&SYSECT)/256*256)
466		MEXIT
467 .CONST		ANOP
468 &L		DC XL.2'0',XL.3'&F',XL.3'6',AL1((&B)/256),XL.2'0',XL.3'&XR'X ,XL.3'6',AL1(&B-(&B)/256*256)
469		MEXIT
470 .ERR		MNOTE 4,'*** ERROR *** '&A'' IS NOT A VALID DOUBLE REGISTER'
471		MEND
473		MACRO
474		XCHK
475		AIF ('&SYSLIST(1)'EQ''AND'&SYSLIST(2)'EQ''AND'&SYSLIST(3)'EQX 'AND'&SYSLIST(4)'EQ''AND'&SYSLIST(5)'EQ''AND'&SYSLIST(6X)'EQ''').MEND
476		MNOTE 4,'*** ERROR *** TOO MANY OPERANDS'
477 .MEND		MEND
479		MACRO
480 &L		ALIGN &B,&W,&FILL=X'00'
481 .*		ALIGNS TO &B BYTES PAST AN &W-BYTE BOUNDARY.
482 .*		SKIPPED BYTES ARE SET TO &FILL (OR UNSET IF &FILL IS NULL)
483 .*		NO MORE THAN 256 BYTES CAN BE SKIPPED.
484		AIF (&B LT &W).OK
485		MNOTE 1,'*** WARNING *** OFFSET IS LARGER THAN BOUNDARY'
486 .OK		ANOP
487 @&SYSNDX		EQU (*-&SYSECT+&W-&B-1)/(&W)*(&W)+&B-(*-&SYSECT)
488		AIF ('&FILL'EQ'').DS
489		DC (@&SYSNDX)&FILL
490		AGO .L
491 .DS		DS (@&SYSNDX)X
492 .L		AIF (K'&L EQ 0).MEND
493 &L		DS OX
494 .MEND		MEND
496		MACRO
497 &L		PAGE &N,&FILL=
498 .*		ADJUST ORG SO THAT THE NEXT &N BYTES WILL BE ENTIRELY CONTAINED
499 .*		IN ONE PAGE.

```

500          LCLC   &A
501          AIF    (&N LT 1 OR &N GT 256).ERR
502 &A       SETC   '256-(*-&SYSECT-(*-&SYSECT)/256*256)' BYTES LEFT ON PAGE
503 @&SYSNDX EQU    (&A)*((&N-(&A)+255)/256)
504          AIF    ('&FILL'EQ').DS
505          DC     (@&SYSNDX)&FILL
506          AGO    .L
507 .DS      DS     (@&SYSNDX)X
508 .L       AIF    ('&L'EQ').MEND
509 &L      DS     0X
510          MEXIT
511 .ERR     MNOTE  8,'*** ERROR *** ARGUMENT NOT BETWEEN 1 AND 256'
512 .MEND    MEND

```

```

514          MACRO
515 &L      DAD     &A,&V,&W,&X,&Y,&Z
516          XCHK   &V,&W,&X,&Y,&Z
517 &L      XADR    ,&A
518          MEND

```

```

520          MACRO
521          ASCII
522          GBLA   &@(256)
523          LCLA   &C
524          PUSH  PRINT
525          PRINT  OFF
526 .L          ANOP
527 &@( &C+1) SETA  999          INITIALIZE TO ABSURD VALUE
528 &C          SETA  &C+1
529          AIF    (&C LT 256).L
530          XASC   65,193,9      CAP A-I
531          XASC   74,209,9      CAP J-R
532          XASC   83,226,8      CAP S-Z
533          XASC   97,129,9      LOWER CASE A-I
534          XASC   106,145,9     LOWER CASE J-R
535          XASC   115,162,8     LOWER CASE S-Z
536          XASC   48,240,10     0-9
537 &@(C' ') SETA  32          BLANK
538 &@(C' !) SETA  33          EXCLAMATION POINT
539 &@(C' ") SETA  34
540 &@(C' #) SETA  35
541 &@(C' $) SETA  36

```

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542	&@('%)	SETA 37	PERCENT SIGN
543	&@('%%')	SETA 38	
544	&@('''')	SETA 39	
545	&@('()')	SETA 40	
546	&@('()')	SETA 41	
547	&@('*')	SETA 42	
548	&@('+')	SETA 43	
549	&@(',')	SETA 44	
550	&@(' -')	SETA 45	
551	&@(' .')	SETA 46	
552	&@(' /')	SETA 47	
553	&@(' :')	SETA 58	
554	&@(' ;')	SETA 59	
555	&@(' <')	SETA 60	
556	&@(' =')	SETA 61	
557	&@(' >')	SETA 62	
558	&@(' ?')	SETA 63	
559	&@(' @')	SETA 64	
560	&@(' [')	SETA 91	LEFT BRACKET
561	&@(' [')	SETA 92	LEFT BRACKET
562	&@(']')	SETA 93	RIGHT BRACKET
563	&@(' ^')	SETA 94	CARET
564	&@(' _')	SETA 95	
565	&@(' {')	SETA 123	LEFT BRACE
566	&@(' ')	SETA 124	
567	&@(' }')	SETA 125	RIGHT BRACE
568	&@(' ~')	SETA 126	
569	@NUL	EQU 0	
570	@SOH	EQU 1	
571	@STX	EQU 2	
572	@ETX	EQU 3	
573	@EOT	EQU 4	
574	@ENQ	EQU 5	
575	@ACK	EQU 6	
576	@BEL	EQU 7	
577	@BS	EQU 8	
578	@HT	EQU 9	
579	@LF	EQU 10	
580	@VT	EQU 11	
581	@FF	EQU 12	
582	@CR	EQU 13	
583	@SD	EQU 14	
584	@SI	EQU 15	
585	@DLE	EQU 16	
586	@DC1	EQU 17	
587	@DC2	EQU 18	
588	@DC3	EQU 19	
589	@DC4	EQU 20	
590	@NAK	EQU 21	
591	@SYN	EQU 22	
592	@ETB	EQU 23	
593	@CAN	EQU 24	
594	@EM	EQU 25	
595	@SUB	EQU 26	
596	@ESC	EQU 27	


```

597 @FS EQU 28
598 @GS EQU 29
599 @RS EQU 30
600 @US EQU 31
601 @DEL EQU 127
602     POP     PRINT
603     MEND

```

```

605     MACRO
606     XASC    &A,&E,&M           ASCII START, EBCDIC START, MAX
607     GBLA    &@(256)
608     LCLA    &C
609     .L     ANOP
610     &@(&E+&C) SETA    &A+&C
611     &C     SETA    &C+1
612     AIF     (&C LT &M).L
613     MEND

```

```

615     MACRO
616     &L     ADDR    &DEV
617     .*
618     .*     ADDRESS A DEVICE, GENERATES
619     .*     LODI     A,&DEV
620     .*     OUT      DAR
621     .*
622     &L     DC       AL1(6,&DEV,65+2*DAR)
623     MEND

```

```

625     MACRO
626     &L     CHAR    ,           &SYSLIST USED FOR ARGS
627     .*&L  DB      , (FROM 8080 VERSION)
628     LCLA    &N
629     LCLC    &LL
630     &N     SETA    1
631     &LL    SETC    '&L'
632     .TEST  AIF     (&N GT N'&SYSLIST).MEND
633     AIF     ('&SYSLIST(&N)'(1,1) EQ ''').STRING
634     &LL    XRI     &SYSLIST(&N,1),&SYSLIST(&N,2)
635     .NEXT  ANOP
636     &LL    SETC    ''
637     &N     SETA    &N+1

```

AIF ('&SYSLIST(&N)')

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```

638          AGO      .TEST
639 .STRING  ANOP      ,          NOT DONE WITH XRI B/C MANY BYTES POSSIBLE
640 &LL      XCHAR    &SYSLIST(&N)
641          AGO      .NEXT
642 .MEND    MEND

644          MACRO
645 &L      XCHAR    &S          (CALLED BY CHAR)
646          GBLA    &@ (256), &XIND
647          LCLC    &A(8), &T
648          LCLB    &D
649          LCLA    &M, &P, &C, &LEN
650 &M      SETA    K'&S          PTR TO END OF STRING
651          AIF    ('&S'(1,1) NE ''').LO SENT WITH QUOTES?
652 &M      SETA    &M-1        YES - REDUCE END PTR
653 &P      SETA    1          INCREASE START PTR
654 .LO      ANOP
655 &LEN    SETA    &M-&P        FIND THE ACTUAL LENGTH
656 .L1     ANOP
657 &C      SETA    1          RESET CHAR/LINE POINTER
658 .CHRLP  ANOP
659 &A(&C)  SETC    ''          INITIALIZE
660          AIF    (&P GE &M).SKIP BR IF ALL CHARS WERE DONE
661 &P      SETA    &P+1        INCREMENT SOURCE POINTER
662 &T      SETC    '&S'(&P,1) GET SOURCE CHARACTER
663          XINDX   &T
664 &A(&C)  SETC    ',&@(&XIND)'' STASH ASCII NUMBER
665          AIF    ('&A(&C)' NE ',0' AND '&A(&C)' NE ',999').SKIP
666          MNOTE  8, '*** ERROR *** ILLEGAL CHARACTER - '&T''
667 .SKIP   ANOP
668 &C      SETA    &C+1        INCREMENT CHAR/LINE COUNTER
669          AIF    (&C LE 8).CHRLP LOOP FOR 8 CHARS/LINE
670 &A(1)   SETC    '&A(1)''(2,7) REMOVE LEADING COMMA
671          AIF    (&D).L2
672 &D      SETB    1
673 &L      DC      0CL&LEN' ',AL1(&A(1)&A(2)&A(3)&A(4)&A(5)&A(6)&A(7)&A(8))
674          AGO      .L3
675 .L2     ANOP
676          DC      AL1(&A(1)&A(2)&A(3)&A(4)&A(5)&A(6)&A(7)&A(8))
677 .L3     AIF    (&P LT &M).L1 CONTINUE IF MORE CHARS
678          MEND

680          MACRO
681          XINDX    &C
682 .*      RETURNS EBCDIC VALUE OF '&C' IN &XIND
683          GBLA    &XIND
684          LCLC    &S
685          LCLA    &L, &U
686          AIF    ('&SYSLIST(2)'EQ''').OK ***TEMPORARY
687          MNOTE  8, '*** ERROR *** XINDX HAS BEEN CHANGED' ***TEMPORARY
688 .OK     ANOP      ,          ***TEMPORARY
689 &L      SETA    1
690 &U      SETA    255

```

```

691 &S      SETC  '
692 &S SETC  '&S'. '      .<(+|'. '&&'(1,1). '      $*);- / '
693 &S SETC  '&S'. '      ,%_>?      :#@'. ' ' ' '(1,1). '=' ABCDEFGHI '
694 &S SETC  '&S'. ' JKLMNOPQR      STUVWXYZ      ABCDEFG '
695 &S SETC  '&S'. 'HI      JKLMNOPQR      STUVWXYZ      0123456789 '
696 .L      AIF      (&L GT &U).FAIL
697 &XIND    SETA      (&L+&U)/2
698        AIF      ('&S'(&XIND,1)LT'&C').LOW
699        AIF      ('&S'(&XIND,1)EQ'&C').EQUAL
700 &U      SETA      &XIND-1
701        AGO      .L
702 .LOW     ANOP
703 &L      SETA      &XIND+1
704        AGO      .L
705 .FAIL   ANOP
706 &XIND    SETA      256
707 .EQUAL  MEND

```

```

709        MACRO
710 &L      ORG      &E,&V,&W,&X
711        XCHK     &V,&W,&X
712        AIF      ('&E'(1,1) EQ '*DR'&E'(1,K'&SYSECT) EQ'&SYSECT').STAR
713        AIF      (T'&E NE 'N' AND T'&E NE 'U' AND T'&E NE 'Z').STAR
714 &L      XORG     &SYSECT+(&E)
715        MEXIT
716 .STAR   ANOP
717 &L      XORG     &E
718        MEND

```

```

720 *      MACRO
721 *&L     EQU      &A,&V,&W,&X
722 *      LCLC     &T
723 *      XCHK     &V,&W,&X
724 *&T    SETC     T'&A
725 *      AIF      ('&A'(1,1) NE '*').NOTSTAR
726 *&T    SETC     'M'      FORCE * TO BE RELOCATABLE
727 *.NOTSTAR ANOP
728 *&L    XEQU     &A      ,,C'&T' ***** WHEN WE'RE READY
729 *      MEND

```

STMT SOURCE STATEMENT

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731 PRINT ON,GEN,NODATA
732 END

0.04
1.