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5000 REM ======= assembler ========
5010 REM By R.A.Waddilove
5020 REM(c)Computing With The Amstrad
5030 MODE 1:INK 0,0:BORDER 0
5040 GOSUB 5330:'initialise
5050 FOR pass=1 TO 2
5060 IF pass=2 AND printer=1 THEN lis
to=8
5070 CLS:RESTORE:READ text1$
5080 IF LEFT$(text1$,3)<>"ORG" THEN P
RINT "Origin ?":END
5090 x$=MID$(text1$,INSTR(text1$," ")
+1):GOSUB 7570:pc=x
5100 PRINT #listo,"RAW Assembler V.3"
:PRINT #listo:PRINT #listo,"Pass...";
pass;TAB(20);text1$:PRINT #listo
5110 WHILE text1$<>"END"
5120 PEN 1:READ text1$:textr$="":IF L
EFT$(text1$,1)="'" THEN PRINT #listo,
TAB(20)MID$(text1$,2):GOTO 5120
5130 PRINT #listo,HEX$(pc);":";:PEN 3
5140 byte1=-1:byte2=-1:byte3=-1:byte4
=-1:index=-1
5150 i%=-1
5160 FOR j%=0 TO 69
5170 IF INSTR(text1$,type$(j%))=1 THE
N i%=j%
5180 NEXT
5190 IF i%=-1 THEN PRINT:PRINT text1$
;"???":END
5200 IF i%<36 THEN ON i% GOSUB 6860,7
010,7230,6460,7110,6160,6380,6500,642
0,6420,6420,6420,6380,6380,6760,6380,
5980,6380,5900,6380,6380,6010,6060,67
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60,6420,6420,6420,6420,6260,6210,5590
,6420,6420,6420,6420
5210 IF i%)35 THEN i%=i%-35:ON i% GOS
UB 6420,6380,6510,6420,6420,6110,6420
,6420,5520,5520,7130,6340,6420,6420,6
650,6380,6380,6640,6420,6670,6380,666
0,6380,6420,5490,6990,6380,7140,6600,
6620,6630,6480,6490,5420
5220 IF index)-1 THEN x=index:GOSUB 7
350
5230 IF byte1)-1 THEN x=byte1:GOSUB 7
350
5240 IF byte2)-1 THEN x=byte2:GOSUB 7
350
5250 IF byte3)-1 THEN x=byte3:GOSUB 7
350
5260 IF byte4)-1 THEN x=byte4:GOSUB 7
350
5270 PEN 2:PRINT #listo,TAB(20);textl
$;:IF textr$="" THEN PRINT #listo ELS
E PRINT #listo,",";textr$
5280 WEND
5290 NEXT pass
5300 PEN 1
5310 END
5320 :
5330 REM === initialise ===
5340 DIM type$(69),label$(50),value(5
0),cond$(7)
5350 RESTORE 7810:FOR i%=0 TO 69:READ
 type$(i%):NEXT
5360 RESTORE 7830:FOR i%=0 TO 7:READ
cond$(i%):NEXT
5370 KEY 139,CHR$(13)+"DATA  "
5380 KEY 138,CHR$(13)+"REM   "
5390 num1=0
5400 RETURN
5410 :
5420 REM === def ===
5430 IF MID$(textl$,4,1)="S" THEN x$=
MID$(textl$,6):GOSUB 7570:pc=pc+x:RET
URN
5440 IF MID$(textl$,4,1)="$" THEN FOR
 j%=INSTR(textl$,"'")+1 TO LEN(textl$
)-1:POKE pc,ASC(MID$(textl$,j%)):pc=p
c+1:NEXT:RETURN
5450 x$=MID$(textl$,INSTR(textl$," ")
+1):GOSUB 7570
5460 IF MID$(textl$,4,1)="B" THEN byt
e1=x ELSE GOSUB 7480:byte1=lb:byte2=h
b
5470 RETURN
5480 :
5490 REM === rst ===
5500 x$=MID$(textl$,5):x=VAL("&"+x$)\
8:byte1=VAL("&X11"+BIN$(x,3)+"111"):R
ETURN
5510 :
5520 REM === push/pop ===
5530 x$=RIGHT$(textl$,2)
5540 IF x$="IX" OR x$="IY" THEN index
=-&DD*(x$="IX")-&FD*(x$="IY"):x$="HL"
5550 IF x$="AF" THEN byte1=-&F5*(INST
R(textl$,"U")>0)-&F1*(INSTR(textl$,"O
")>0):RETURN
5560 GOSUB 7730:IF INSTR(textl$,"POP"
) THEN byte1=VAL("&X11"+x$+"0001") EL
SE byte1=VAL("&X11"+x$+"0101")
5570 RETURN
5580 :
5590 REM === ld ===
5600 READ textr$
5610 IF INSTR(textl$,"IX")+INSTR(text
r$,"IX") THEN index=&DD
5620 IF INSTR(textl$,"IY")+INSTR(text
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r$,"IY") THEN index=&FD
5630 IF INSTR(textl$,"(")+INSTR(textr
$,"(")=0 GOTO 5810:'no brackets
5640 IF INSTR(textl$,"(") GOTO 5720:'
left bracket
5650 IF textr$=" (HL)" THEN x$=RIGHT$(
textl$,1):GOSUB 7690:byte1=VAL("&X01"
+x$+"110"):RETURN
5660 x$=textr$:IF x$=" (BC)" OR x$=" (D
E)" THEN byte1=-&A*(x$=" (BC)")-&1A*(x
$=" (DE)"):RETURN
5670 IF INSTR(textl$,"HL")+INSTR(text
l$,"I") THEN byte1=&2A:x$=MID$(textr$
,2,LEN(textr$)-2):GOSUB 7570:GOSUB 74
80:byte2=lb:byte3=hb:RETURN
5680 IF INSTR(textr$,"I") THEN x$=RIG
HT$(textl$,1):GOSUB 7690:byte1=VAL("&
X01"+x$+"110"):x$=MID$(textr$,5,LEN(t
extr$)-5):GOSUB 7570:byte2=x:RETURN
5690 IF LEN(textl$)=4 THEN byte1=&3A:
x$=MID$(textr$,2,LEN(textr$)-2):GOSUB
 7570:GOSUB 7480:byte2=lb:byte3=hb:RE
TURN
5700 byte1=&ED:x$=RIGHT$(textl$,2):GO
SUB 7730:byte2=VAL("&X01"+x$+"011"):
x$=MID$(textr$,2,LEN(textr$)-2):GOSUB
 7570:GOSUB 7480:byte3=lb:byte4=hb:RE
TURN
5710 :
5720 IF LEFT$(textr$,1)="I" OR textr$
="HL" THEN byte1=&22:x$=MID$(textl$,5
,LEN(textl$)-5):GOSUB 7570:GOSUB 7480
:byte2=lb:byte3=hb:RETURN
5730 IF INSTR(textl$,"(I") THEN GOTO
5790
5740 x$=MID$(textl$,5,1):IF x$="B" OR
 x$="D" THEN byte1=-&2*(x$="B")-&12*(
x$="D"):RETURN
5750 x$=textr$:IF x$="BC" OR x$="DE"
OR x$="SP" THEN byte1=&ED:GOSUB 7730:
byte2=VAL("&X01"+x$+"0011"):x$=MID$(t
extl$,5,LEN(textl$)-5):GOSUB 7570:GOS
UB 7480:byte3=lb:byte4=hb:RETURN
5760 IF INSTR(textl$,"H")=0 THEN byte
1=&32:x$=MID$(textl$,5,LEN(textl$)-5)
:GOSUB 7570:GOSUB 7480:byte2=lb:byte3
=hb:RETURN
5770 x$=textr$:IF x$)="A" AND x$<="L"
 THEN GOSUB 7690:byte1=VAL("&X0110"+
x$):RETURN
5780 byte1=&36:GOSUB 7570:byte2=x:RET
URN
5790 IF textr$)="A" AND textr$<="L" T
HEN x$=textr$:GOSUB 7690:byte1=VAL("&
X0110"+x$):x$=MID$(textl$,8,LEN(text
l$)-8):GOSUB 7570:byte2=x:RETURN
5800 byte1=&36:x$=MID$(textl$,8,LEN(t
extl$)-8):GOSUB 7570:byte2=x:x$=textr
$:GOSUB 7570:byte3=x:RETURN
5810 IF RIGHT$(textl$,1)="I" OR textr
$="I" THEN byte1=&ED:byte2=-&57*(text
r$="I")-&47*(textr$="A"):RETURN
5820 IF RIGHT$(textl$,1)="R" OR textr
$="R" THEN byte1=&ED:byte2=-&5F*(text
r$="R")-&4F*(textr$="A"):RETURN
5830 IF INSTR(textl$,"I") THEN byte1=
&21:x$=textr$:GOSUB 7570:GOSUB 7480:b
yte2=lb:byte3=hb:RETURN
5840 IF textr$="HL" OR LEFT$(textr$,1
)="I" THEN byte1=&F9:RETURN
5850 IF MID$(textl$,LEN(textl$)-1,1)>
" " THEN x$=RIGHT$(textl$,2):GOSUB 77
30:byte1=VAL("&X00"+x$+"0001"):x$=tex
tr$:GOSUB 7570:GOSUB 7480:byte2=lb:by
te3=hb:RETURN
5860 x$=RIGHT$(textl$,1):GOSUB 7690
5870 IF textr$>="A" AND textr$<="L" T
HEN byte1=VAL("&X01"+x$):x$=textr$:GO
SUB 7690:byte1=VAL("&X"+BIN$(byte1,5)
+x$):RETURN
5880 byte1=VAL("&X00"+x$+"110"):x$=te
xtr$:GOSUB 7570:byte2=x:RETURN
5890 :
5900 REM === ex ===
5910 READ textr$
5920 IF textr$="IX" THEN index=&DD
5930 IF textr$="IY" THEN index=&FD
5940 IF INSTR(textl$,"S") THEN byte1=
&E3:RETURN
5950 IF textr$="HL" THEN byte1=&EB EL
SE byte1=&8
5960 RETURN
5970 :
5980 REM === djnz ===
5990 byte1=&10:x$=MID$(textl$,INSTR(t
extl$," ")+1):GOSUB 7570:GOSUB 7520:b
yte2=x:RETURN
6000 :
6010 REM === im ===
6020 byte1=&ED:x=VAL(RIGHT$(textl$,1)
)
6030 byte2=-&46*(x=0)-&56*(x=1)-&5E*(
x=2)
6040 RETURN
6050 :
6060 REM === in ===
6070 READ textr$
6080 IF textr$="(C)" THEN byte1=&ED:x
$=RIGHT$(textl$,1):GOSUB 7690:byte2=V
AL("&X01"+x$+"000"):RETURN
6090 byte1=&DB:x$=MID$(textr$,2,INSTR
(textr$,")")-2):GOSUB 7570:byte2=x:RE
TURN
6100 :
6110 REM === out ===
6120 READ textr$
6130 IF INSTR(textl$,"C") THEN byte1=
&ED:x$=textr$:GOSUB 7690:byte2=VAL("&
X01"+x$+"001"):RETURN
6140 byte1=&D3:x$=MID$(textl$,6,INSTR
(textl$,")")-6):GOSUB 7570:byte2=x:RE
TURN
6150 :
6160 REM === call ===
6170 x$=RIGHT$(textl$,2):GOSUB 7410
6180 IF x=-1 THEN x$=MID$(textl$,6):G
OSUB 7570:GOSUB 7480:byte1=&CD:byte2=
lb:byte3=hb:RETURN
6190 byte1=VAL("&X11"+BIN$(x,3)+"100"
):READ textr$:x$=textr$:GOSUB 7570:GO
SUB 7480:byte2=lb:byte3=hb:RETURN
6200 :
6210 REM === jr ===
6220 x$=RIGHT$(textl$,2):GOSUB 7410
6230 IF x=-1 THEN x$=MID$(textl$,4):G
OSUB 7570:GOSUB 7520:byte1=&18:byte2=
x:RETURN
6240 byte1=VAL("&X001"+BIN$(x,2)+"000
"):READ textr$:x$=textr$:GOSUB 7570:G
OSUB 7520:byte2=x:RETURN
6250 :
6260 REM === jp ===
6270 IF INSTR(textl$,"X") THEN index=
&DD
6280 IF INSTR(textl$,"Y") THEN index=
&FD
6290 IF INSTR(textl$,"(") THEN byte1=
&E9:RETURN
6300 x$=RIGHT$(textl$,2):GOSUB 7410
6310 IF x=-1 THEN x$=MID$(textl$,4):G
OSUB 7570:GOSUB 7480:byte1=&C3:byte2=
lb:byte3=hb:RETURN
6320 byte1=VAL("&X11"+BIN$(x,3)+"010"
):READ textr$:x$=textr$:GOSUB 7570:GO
SUB 7480:byte2=lb:byte3=hb:RETURN
6330 :
6340 REM === ret ===
6350 IF textl$="RET" THEN byte1=&C9 E
LSE x$=RIGHT$(textl$,2):GOSUB 7410:by
te1=VAL("&X11"+BIN$(x,3)+"000")
6360 RETURN
6370 :
6380 REM === odds & ends ===
6390 x$=textl$:byte1=-&1F*(x$="RRA")-
&F*(x$="RRCA")-&37*(x$="SCF")-&3F*(x$
="CCF")-&2F*(x$="CPL")-&27*(x$="DAA")
-&F3*(x$="DI")-&FB*(x$="EI")-&D9*(x$=
"EXX")-&76*(x$="HALT")-&17*(x$="RLA")
-&7*(x$="RLCA")
6400 RETURN
6410 :
6420 x$=textl$:x=-&A9*(x$="CPD")-&67*
(x$="RRD")-&B9*(x$="CPDR")-&A1*(x$="C
PI")-&B1*(x$="CPIR")-&AA*(x$="IND")-&
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BA*(x$="INDR")-&A2*(x$="INI")-&B2*(x$
="INIR")-&A8*(x$="LDD")-&B8*(x$="LDDR
")-&A0*(x$="LDI")-&B0*(x$="LDIR")
6430 byte2=x-&44*(x$="NEG")-&B4*(x$="
OTDR")-&B3*(x$="OTIR")-&AB*(x$="OUTD"
)-&A3*(x$="OUTI")-&4D*(x$="RETI")-&45
*(x$="RETN")-&F8*(x$="RLD")
6440 byte1=&ED:RETURN
6450 :
6460 REM === and/sub/xor ===
6470 byte=&A6:GOTO 6530:'and
6480 byte=&96:GOTO 6530:'sub
6490 byte=&AE:GOTO 6530:'xor
6500 byte=&BE:text1$="CP "+MID$(text1
$,3):GOTO 6530:'cp
6510 byte=&B6:text1$="OR "+MID$(text1
$,3):GOTO 6530:'or
6520 :
6530 IF INSTR(text1$,"I") GOTO 6570
6540 IF INSTR(text1$,"HL") THEN byte1
=byte:RETURN
6550 x$=RIGHT$(text1$,1):IF (x$)="A"
AND x$(="L") AND INSTR(text1$,"&")=0
THEN GOSUB 7690:byte1=(byte AND &X111
11000)+VAL("&X"+x$):RETURN
6560 byte1=byte OR &X1000000:x$=MID$(
text1$,5):GOSUB 7570:byte2=x:RETURN
6570 IF INSTR(text1$,"IX") THEN index
=&DD ELSE index=&FD
6580 byte1=byte:x$=MID$(text1$,9,INST
R(text1$,")")-9):GOSUB 7570:byte2=x:R
ETURN
6590 :
6600 REM === sla/sra/srl/rlc/rl/rrc/r
r ===
6610 byte=&26:GOTO 6690:'sla
6620 byte=&2E:GOTO 6690:'sra
6630 byte=&3E:GOTO 6690:'srl
6640 byte=&6:GOTO 6690:'rlc
6650 byte=&16:text1$="RL "+MID$(text1
$,3):GOTO 6690:'rl
6660 byte=&E:GOTO 6690:'rrc
6670 byte=&1E:text1$="RR "+MID$(text1
$,3):GOTO 6690:'rr
6680 :
6690 IF INSTR(text1$,"I") GOTO 6730
6700 byte1=&CB
6710 IF INSTR(text1$,"HL") THEN byte2
=byte:RETURN
6720 x$=RIGHT$(text1$,1):IF x$)="A" A
ND x$(="L" THEN GOSUB 7690:byte2=(byt
e AND &X11111000)+VAL("&X"+x$):RETURN
6730 IF INSTR(text1$,"IX") THEN index
=&DD ELSE index=&FD
6740 byte1=&CB:x$=MID$(text1$,9,INSTR
(text1$,")")-9):GOSUB 7570:byte2=x:by
te3=byte:RETURN
6750 :
6760 REM === inc/dec ===
6770 IF INSTR(3,text1$,"I") THEN GOTO
 6820
6780 byte=-1*(text1$(*I")
6790 IF INSTR(text1$,"(H") THEN byte1
=&34 OR byte:RETURN
6800 IF RIGHT$(text1$,2)("!" THEN x$=
RIGHT$(text1$,1):GOSUB 7690:byte1=byt
e OR VAL("&X00"+x$+"100"):RETURN
6810 byte=-8*(text1$("I"):x$=RIGHT$(t
ext1$,2):GOSUB 7730:byte1=byte OR VAL
("&X00"+x$+"011"):RETURN
6820 IF INSTR(text1$,"IX") THEN index
=&DD ELSE index=&FD
6830 IF INSTR(text1$,"(") THEN byte=-
1*(text1$(*I"):byte1=&34 OR byte:x$=M
ID$(text1$,9,INSTR(text1$,")")-9):GOS
UB 7570:byte2=x:RETURN
6840 byte=-8*(text1$(*I"):byte1=&23 O
R byte:RETURN
6850 :
6860 REM === label ===
6870 PEN 1:kX=-1:x$=MID$(text1$,2)
6880 IF INSTR(x$,"=")>0 THEN x$=LEFT$
(x$,INSTR(x$,"=")-1)
6890 FOR j%=0 TO num1
6900 IF x$=label$(j%) THEN kX=j%
6910 NEXT
6920 IF kX=-1 THEN kX=num1:num1=num1+
1
6930 IF num1)50 THEN PRINT:PRINT "Too
 many labels":STOP
6940 label$(kX)=x$
6950 IF INSTR(text1$,"=")=0 THEN valu
e(kX)=pc:RETURN
6960 x$=MID$(text1$,INSTR(text1$,"=")
+1):GOSUB 7570:value(kX)=x
6970 RETURN
6980 :
6990 REM === sbc/adc ===
7000 byte=&X10011110:GOTO 7020:'sbc
7010 byte=&X10001110:GOTO 7020:'adc
7020 READ textr$
7030 IF INSTR(text1$,"HL") THEN x$=te
xtr$:GOSUB 7730:byte1=&ED:byte2=VAL("
&X01"+x$+"0010")+(8 AND text1$("S"):R
ETURN
7040 IF textr$)="A" AND textr$(="L" T
HEN byte=byte AND &X11111000:x$=textr
$:GOSUB 7690:byte1=byte+VAL("&X"+x$):
RETURN
7050 IF textr$="(HL)" THEN byte1=byte
:RETURN
7060 IF INSTR(textr$,"I") GOTO 7080
7070 byte1=byte OR &X1000000:x$=textr
$:GOSUB 7570:byte2=x:RETURN
7080 IF INSTR(textr$,"IX") THEN index
=&DD ELSE index=&FD
7090 byte1=byte:x$=MID$(textr$,5,INST
R(textr$,")")-5):GOSUB 7570:byte2=x:R
ETURN
7100 :
7110 REM === bit/set/res ===
7120 byte=&X1000000:GOTO 7150:'bit
7130 byte=&X10000000:GOTO 7150:'res
7140 byte=&X11000000:GOTO 7150:'set
7150 READ textr$:x=VAL(RIGHT$(text1$,
1)):byte2=byte+VAL("&X"+BIN$(x,3)+"00
0")
7160 IF INSTR(textr$,"I") GOTO 7200:'
ix/iy
7170 byte1=&CB
7180 IF textr$="(HL)" THEN byte2=byte
2+VAL("&X110"):RETURN
7190 x$=textr$:GOSUB 7690:byte2=byte2
+VAL("&X"+x$):RETURN
7200 IF INSTR(textr$,"IX") THEN index
=&DD ELSE index=&FD
7210 byte3=byte2+VAL("&X110"):byte1=&
CB:x$=MID$(textr$,5,INSTR(textr$,")")
-5):GOSUB 7570:byte2=x:RETURN
7220 :
7230 REM === add ===
7240 READ textr$
7250 IF INSTR(text1$,"Y") THEN index=
&FD
7260 IF INSTR(text1$,"X") THEN index=
&DD
7270 IF INSTR(text1$,"L") OR INSTR(te
xt1$,"I") THEN x$=textr$:GOSUB 7730:b
yte1=VAL("&X00"+x$+"1001"):RETURN
7280 IF textr$)="A" AND textr$(="L" T
HEN x$=textr$:GOSUB 7690:byte1=VAL("&
X10000"+x$):RETURN
7290 IF textr$="(HL)" THEN byte1=&86:
RETURN
7300 IF INSTR(textr$,"I") GOTO 7320:'
adc a,(ix/iy+n)
7310 byte1=&CB:x$=textr$:GOSUB 7570:b
yte2=x:RETURN
7320 IF INSTR(textr$,"Y") THEN index=
&FD ELSE index=&DD
7330 byte1=&86:x$=MID$(textr$,5,INSTR
(textr$,")")-5):GOSUB 7570:byte2=x:RE
TURN
7340 :
7350 REM === print hex$(x) ===
7360 POKE pc,x:pc=pc+1
7370 IF x(16 THEN PRINT #1isto,"0";
7380 PRINT #1isto,HEX$(x);" ";
7390 RETURN
7400 :
7410 REM === get code for condition x
$ -) x ===
7420 x=-1
7430 FOR j%=0 TO 7
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```
7440 IF x$=cond$(j%) THEN x=j%
7450 NEXT
7460 RETURN
7470 :
7480 REM === x -> lowbyte,hibyte ===
7490 lb=x-256*INT(x/256):hb=INT(x/256)
7500 RETURN
7510 :
7520 REM === calculate jump ===
7530 IF x>255 THEN x=x-pc-2:IF x>255
THEN PRINT text1$;" Too far":END
7540 IF x<0 THEN x=x+256
7550 RETURN
7560 :
7570 REM === x$,number/label -> x,num
ber ===
7580 WHILE x$<"!":x$=MID$(x$,2):WEND
7590 IF LEFT$(x$,1)="&" THEN x=VAL(x$
)-65536*(VAL(x$)<0):RETURN
7600 IF LEFT$(x$,1)>="0" AND LEFT$(x$
,1)<="9" THEN x=VAL(x$):RETURN
7610 IF LEFT$(x$,1)="%" THEN x=VAL("&
X"+MID$(x$,2)):RETURN
7620 IF pass=2 THEN x=-1 ELSE x=0:RET
URN
7630 FOR j%=0 TO num1
7640 IF label$(j%)=x$ THEN x=value(j%
)
7650 NEXT
7660 IF x<0 THEN PRINT text1$;" Label
??":END
7670 RETURN
7680 :
7690 REM === x$,register -> x$,binary
 code ===
7700 x$=BIN$(ASC(x$)-66-8*(x$="A")+2*
(x$="H")+5*(x$="L"),3)
7710 RETURN
7720 :
7730 REM === x$,register pair -> x$,b
inary code ===
7740 IF x$="BC" THEN x$="00"
7750 IF x$="DE" THEN x$="01"
7760 IF x$="HL" OR x$="IX" OR x$="IY"
 THEN x$="10"
7770 IF x$="SP" THEN x$="11"
7780 RETURN
7790 :
7800 REM === classes ===
7810 DATA END,.,ADC,ADD,AND,BIT,CALL,
CCF,CP,CPD,CPDR,CPI,CPIR,CPL,DAA,DEC,
DI,DJNZ,EI,EX,EXX,HALT,IM,IN,INC,IND,
INDR,INI,INIR,JP,JR,LD,LDD,LDDR,LDI,L
DIR,NEG,NOP,OR,OTDR,OTIR
7820 DATA OUT,OUTD,OUTI,POP,PUSH,RES,
RET,RETI,RETN,RL,RLA,RLCA,RLC,RLD,RR,
RRA,RRC,RRCA,RRD,RST,SBC,SCF,SET,SLA,
SRA,SRL,SUB,XOR,DEF
7830 DATA "NZ"," Z","NC"," C","PO","P
E"," P"," M"
7840 REM ****************************
*
7850 MODE 1
```