

```

1 **** 2 'Zambas 2.2 1994-05-29 3 'Manter Elektronik HB 4 'Uppsala
Sweden 5 **** 121 GOTO5000 130 GOSUB280:t$=INPUT$(1)
140IFt$=CHR$(13)THENex=t:GOSUB290:se=8:RETURN
150IFt$<"1"ORt$>"9"THENGOSUB250:GOTO130 160se=VAL(t$):PRINTt$::RETURN
170t$=INPUT$(1) 180IFt$="Y"ORt$="y"THENys=t:no=f:PRINT"Y";:RETURN
190IFt$="N"ORt$="n"THENno=t:ys=f:PRINT"N";:RETURN 200 GOSUB250:GOTO170
210RETURN 220 GOSUB280:LOCATE31,0:PRINTCHR$(134);CHR$(29);
230t$=INPUT$(1):IFt$=CHR$(13)THENex=t:GOSUB290:RETURN
240IFt$="Q"ORt$="q"THENqu=t:GOSUB290:RETURN 242RETURN 250IFbn
THENBEEP:RETURN 260FORtm=1 TO7:nl=SIN(1):NEXTtm:RETURN
270LOCATE0,0:PRINTm$::RETURN 280r=f:ex=f:qu=f:u=f:ec=f:RETURN 290u=ex
ORqu:ec=u ORr:RETURN 300 GOSUB280 310IFASC(t$)=81 ORASC(t$)=113
THENqu=t:GOTO420 320IFt$=""THENex=t:GOTO420 330IFLEN(t$)>12
THENr=t:GOTO420 340IFNOTnt THEN420 350c$=LEFT$(t$,1):IFc$=+"ORc$=-"ORc$="
"ORc$=".THEN370 360IFc$<"0"ORc$>"9"THENr=t:GOTO420 370IFc$=".THENdc=t
ELSEdc=f 380FORi=2 TOLEN(t$):c$=MID$(t$,i,1) 390IFc$>="0"ANDc$<="9"THEN410
400IFc$=".THENIFdc THENr=t:i=20 ELSEdc=t ELSEr=t:i=20 410NEXTi
420nu=VAL(t$):GOSUB290:IFr THENGOSUB250 422RETURN 500 GOSUB280:IFNOTnt
THEN570 510 GOSUB300:IFec THENRETURN 520v=VAL(t$):d=FIX(v):IFABS(d)>re
THEN560 530m=FIX(FRAC(v)100):IFABS(m)>=60 THEN560
540s=FRAC(FRAC(v)100)100:IFs>=60 THEN560 550v=DEG(d,m,s):v$=DMS$(v):RETURN
560r=t:GOSUB250:GOSUB290:RETURN 570IFt$=""THENex=t:GOSUB290:RETURN
580IFASC(t$)=81 ORASC(t$)=113 THENqu=t:GOSUB290:RETURN
590v=VAL(t$):d=FIX(v):m=FIX(FRAC(v)100)
600s=FRAC(FRAC(v)100)100:v=DEG(d,m,s):v$=DMS$(v):RETURN
610si=SGN(v):v=ABS(v):d=FIX(v):m=FIX(FRAC(v)60):s=ROUND((FRAC(v)-m/60)3600,-3)
615IFNOT(s<60)THENm=m+1:IFNOT(m<60)THENd=d+1:m=0 ELSE618 ELSE620
618s=ROUND((FRAC(v)-m/60)3600,-3)
620v$=STR$(sid)+".":+MID$(STR$(m/100+.0001),4,2)+MID$(STR$(s/100+.000001),4,4):RETURN
630si=SGN(v):v=ABS(v):d=FIX(v):m=FIX(FRAC(v)60):s=ROUND((FRAC(v)-m/60)3600,-5)
635IFNOT(s<60)THENm=m+1:IFNOT(m<60)THENd=d+1:m=0 ELSE638 ELSE640
638s=ROUND((FRAC(v)-m/60)3600,-5)
640v$=STR$(sid)+CHR$(223)+MID$(STR$(m),2)+CHR$(39)+MID$(STR$(s+.0000001),2,7)
:RETURN 650IFABS(v)>=re THENv=v-(SGN(v)re):GOTO650 660IFv<0 THENv=v+re
662IFY<0 THENY=Y+re:RETURN 670IFABS(v)>=re THENv=v-(SGN(v)re):GOTO670
680RETURN 690mu=f:IFFRE1<125 THENGOSUB1400 700IFFRE1<25
THENmu=t:GOSUB65000 710m$="Storing ":GOSUB270:GOSUB260
720RESTORE#:READ#np:RESTORE#"ENDDATA",1,750
730WRITE#"@"+"p$+","+STR$(ROUND(yi,-4))+","+STR$(ROUND(xi,-4)):WRITE#"ENDDAT
A" 740np=np+1:RESTORE#:WRITE#np:RETURN 750PRINT"Error in database, program
stop"::GOSUB250:GOSUB220:END 760m$="Searching...":GOSUB270:GOSUB260
770RESTORE# 780s$="@ "+p$ 790RESTORE#s$,1,830 800READ#pn$,yd,xd 810IFNOTwc
THENIFpn$<>s$THEN790 820pe=t:pn=f:RETURN 830pn=t:pe=f:yd=0:xd=0:RETURN
840m$="Deleting pt ":GOSUB270:GOSUB260 860pn=f:s$=@ "+p$:RESTORE#
870RESTORE#s$,1,910 880IFNOTwc THENREAD#pn$:IFpn$<>s$THEN870 890WRITE#
900RESTORE#:READ#np:np=np-1:RESTORE#:WRITE#np:RETURN 910pn=t:RETURN

```

920*i*=1:CLS:PRINT"Erasing... Please wait Deleting line"; 930ONERRORGOTO960
 940RESTORE#:WRITE#:READ#n\$ 950*i*=*i*+1:LOCATE14,1:PRINT*i*;:GOTO940
 960RESUME970 970ONERRORGOTO65000:*np*=0 980CLS:PRINT"Enter dbase name
 (max 8 chars) Name.>"; 990INPUT"",*dn\$*:LOCATE0,0:IFLEN(*dn\$*)>8
 THENGOSUB250:GOTO970 1000WRITE#*np,nd,sf,fn,vo,nt,uo*
 1010WRITE#"STARTDATA "+"+"\$"+*dn\$* 1020WRITE#"ENDDATA":dok=t:RETURN
 1030mu=f:IFFRE1<125 THENGOSUB1400 1040IFFRE1<10 THENmu=t:GOSUB65000
 1050RESTORE#:RESTORE#"ENDDATA",1,750
 1060WRITE#"#+*n\$*+STR\$(*n*)+"#", "+STR\$(*ha*)+", "+STR\$(*w*)+", "+STR\$(*va*)
 1070WRITE#"ENDDATA":RETURN 1080s\$="#"#+*n\$*+STR\$(*n*)+"#"
 1090RESTORE#s\$,1,1100:GOTO1110 1100RESTORE#:RESTORE#s\$,1,1120
 1110READ#p\$,*ha,w,va:pe*=t:*pn*=f:RETURN 1120*pn*=t:*pe*=f:RETURN
 1130*pn*=f:*s\$*="#"#+*n\$*+STR\$(*n*)+"#":RESTORE#:RESTORE#s\$,1,4640
 1140WRITE#:RETURN 1150*pn*=t:RETURN 1160s\$="#"#+*n\$*
 1170RESTORE#:RESTORE#s\$,1,1190 1180WRITE#:GOTO1170 1190RETURN
 1200CLS:PRINT"Checking database, please wait."; 1210ONERRORGOTO1320
 1220RESTORE#:READ#*np,nd,sf,fn,vo,nt,uo* 1230READ#*ha\$*,*dn\$*
 1240IF*ha\$*<>"STARTDATA"THEN1330 1250*j*=0:w=0
 1260READ#p\$:IFp\$#"ENDDATA"THEN1310
 1270IFLEFT\$(*p\$*,1)=@"THENREAD#x,y:*j*=*j*+1:GOTO1290
 1280IFLEFT\$(*p\$*,1)="#"THENw=w+1:READ#y,x,v
 1290LOCATE0,1:PRINTCHR\$(5);Line",*j*;" Ptno: ";MID\$(*p\$*,2); 1300 GOTO1260
 1310ONERRORGOTO65000:dok=t:*dn\$*=MID\$(*dn\$*,2):RETURN 1320RESUME1330
 1330ONERRORGOTO65000:dok=f:*dn\$*="":RETURN
 1340ONERRORGOTO1385:RESTORE#:READ#*np,nd,sf,fn,vo,nt,uo* 1350READ#*ha\$*,*dn\$*
 1360IF*ha\$*<>"STARTDATA"THEN1390 1370RESTORE#"ENDDATA",1,1390
 1380ONERRORGOTO65000:dok=t:RETURN 1385RESUME1390
 1390ONERRORGOTO65000:dok=f:RETURN 1400m\$="Mem
 warning!":GOSUB270:GOSUB250:GOSUB220:RETURN 1410CLS:IFhn THEN1420
 ELSEPRINT" Ptno: ";*p\$*; 1420SETFnd 1430LOCATE0,1:IFuo
 THENPRINT"E=";ELSEPRINT"Y="; 1435IFpd ORNOThx THENPRINTy; 1440IFhx
 THEN1460 1450LOCATE16,1:IFuo THENPRINT"N=";ELSEPRINT"X="; 1455IFpd
 THENPRINTx; 1460SETN:LOCATE0,0:PRINTm\$::RETURN 1470CLS:PRINTm\$;
 1480SETFnd:LOCATE0,1:PRINT"Dst:":IFpd ORdi ORz ORvo THENPRINTw; 1490IFvo
 THENLOCATE16,0:PRINT"Va:":*va\$*; 1500IFz
 THENLOCATE16,1:PRINT"Be:":*ha\$*::LOCATE0,0:GOTO1520 1510IFdi
 THENLOCATE16,1:PRINT"Di:":*ha\$*::LOCATE0,0 1520SETN:RETURN 1530
 GOSUB280:LOCATE18,0:INPUT"",*wp\$*:LOCATE0,0 1540IFASC(*wp\$*)=81
 ORASC(*wp\$*)=113 THENqu=t:GOTO1570 1550IFLEN(*wp\$*)=0 THENex=t:GOTO1570
 1560IFLEN(*wp\$*)>12 THENGOSUB250:GOTO1530 1570 GOSUB290:RETURN
 1580hx=t:GOSUB1410 1590LOCATE3,1:INPUT"",*t\$*:LOCATE0,0 1600 GOSUB300:IFu
 THENRETURN 1610IFr THEN1580 1620yi=nu:y=yi:hx=f 1630
 GOSUB1410:LOCATE19,1:INPUT"",*t\$*:LOCATE0,0 1670 GOSUB300:IFu THENRETURN
 1680IFr THEN1630 1690xi=nu:x=xi:pd=t:GOSUB1410:RETURN
 1700tv=vo:vo=f:td=di:di=f:tb=z:z=f 1710 GOSUB1470:LOCATE5,1:INPUT"",*t\$*:LOCATE0,0
 1720 GOSUB300:IFu THEN1792 1730IFr THEN1710 1740w=nu:vo=tv:GOSUB1800:IFu
 THEN1792 1750z=tb:di=td:GOSUB1470
 1760LOCATE20,1:INPUT"",*t\$*:LOCATE0,0:GOSUB500 1770IFu THEN1792 1780IFr

THEN1750 1790ha=v:ha\$=v\$:GOSUB1470:RETURN 1792vo=tv:di=td:z=tb:RETURN
 1800IFvo THEN1810 ELSEva=re/4:RETURN 1810
 GOSUB1470:LOCATE20,0:INPUT",t\$:GOSUB500 1820IFu THENRETURN 1830IFr
 THEN1810 1840va=v:va\$=v\$:RETURN
 1850ns=f:hn=f:p\$=""hx=f:pd=t:wc=f:y=0:x=0:GOSUB1410 1860 GOSUB1530:IFqu
 THENRETURN 1870IFex THENhn=t:ns=t:pd=f:GOTO1900 1880p\$=wp\$:GOSUB760:IFpe
 THEN1940 1890pd=f:m\$="New pt":GOSUB270 1900 GOSUB1580:IFu THENRETURN
 1910IFns THEN1930 1920 GOSUB690 1930py=yi:px=xi:RETURN
 1940py=yd:px=xd:RETURN 1950ns=t:hx=f:hn=f:pd=t:wc=f:yi=y:xi=x:c\$=m\$
 1960m\$=c\$:p\$=""GOSUB1410 1970 GOSUB1530:IFu THENns=t:RETURN
 1980p\$=wp\$:GOSUB760 1990IFpn THENGOSUB690:ns=f:RETURN 2000m\$="Rep Mean
 Esc":GOSUB270:GOSUB250:GOSUB220
 2010IFt\$="R"ORt\$="r"THENGOSUB860:GOSUB690:RETURN
 2020IFt\$="M"ORt\$="m"THENm\$="Meanvalue
 ":GOSUB270:GOSUB260:yi=(y+yd)/2:xi=(x+xd)/2:GOSUB860:GOSUB690:RETURN
 2030IFt\$="E"ORt\$="e"THENRETURN 2040 GOTO1960
 2050RESTORE#:WRITE#np,nd,sf,fn,vo,nt,uo 2060RETURN
 2410SETN:ANGLE0:PRINTCHR\$(9);
 2420aa=6378249.145:fl=1/293.465:e2=f(2-fl):am=6360000
 2430PC\$="COM0:6,E,8,1,N,N,N,B,N":dn\$=""":n\$=""":
 2440rd=180/PI:dr=PI/180:tm=0:nl=0:dok=0:mu=0 2450a\$="Enter pt A ":b\$="Enter pt B
 ":d\$="Enter pt C ":e\$="Enter pt D " 2460g\$="Result ":f\$="Give reading":c\$=""":s\$=""":
 2470c=0:e=0:g=0:h=0:j=0:l=0:o=0:p=0:q=0:a=0:b=0:c=0:e=0:d=0:m=0:s=0
 2480np=0:ns=0:X=0:Y=0:pr=0:si=0:k=0 2500tb=0:td=0:tv=0:vc=0:va=0:ha=0
 2510sf=1:nd=3:re=360:hr=180:f=0:t=NOTf 2520vo=t:bn=t:d=0:m=0:s=0:v=0:wc=f
 2530ax=0:ay=0:bx=0:by=0:cx=0:cy=0:dx=0:dy=0:px=0:py=0
 2540xx=0:yy=0:x0=0:x1=0:y0=0:y1=0:xr=0:yr=0 2550y=0:x=0:yd=0:xd=0:z=f:di=f
 2560se=0:pn=f:pe=f:ys=f:no=f 2570n=0:yi=0:xi=0:w=0
 2580m\$=""":t\$=""":p\$=""":wp\$=""":va\$=""":ha\$=""":pn\$=""": 2590uo=f:hx=f:hn=f:pd=t:dc=0:v\$=""":
 2600nu=0:ex=f:qu=f:u=f:r=f:ec=f:nt=t:dc=0:c\$=""":i=0 2690RETURN
 3000m\$="Station"+STR\$(n) 3010IFpd THEN3030 3020w=0:ha\$=""":va\$=" 90" 3030
 GOSUB1700:IFu THENRETURN 3040RETURN 3060w=wABS(SIN(va))sf:l=l+w 3070
 GOSUB3200 3080xx=xx+wCOS(o+g)+xrw 3090yy=yy+wSIN(o+g)+yrw
 3100x=ax+xx:y=ay+yy 3110RETURN 3200IFdi THENg=g+ha+vc+hr:GOTO3220
 3210g=ha+nvc 3220v=g:GOSUB670:g=v 3230RETURN
 3300g=0:CLS:LOCATE0,1:PRINT"Computing bearing at endpoint"; 3310FORn=1 TOq 3320
 GOSUB1080 3330 GOSUB3200 3340m\$="Station"+STR\$(n):GOSUB270 3350NEXTn
 3360RETURN 3400CLS:INPUT"Edit station nr/EXE: ",t\$:GOSUB300:IFu THENRETURN
 3410IFt\$>="A"ANDt\$<="D"THEN3500 3420n=nu:IFn<1 THEN3470 ELSEGOSUB1080:IFpn
 THEN3470 3430pd=t:v=ha:GOSUB610:ha\$=v\$ 3440v=va:GOSUB610:va\$=v\$ 3450
 GOSUB3000:IFu THENRETURN 3460 GOSUB1130:GOSUB1030:GOTO3400
 3470CLS:PRINT"Nonexistant":GOSUB250:GOSUB220:GOTO3400
 3500n=64-ASC(t\$):GOSUB1080:IFpn THEN3470 3510m\$="Edit pt
 "+t\$:y=ha:x=w:b=va:hx=f:hn=t:pd=t 3520 GOSUB1580:IFu THENRETURN
 3530ha=yi:w=xi:va=b 3540 GOSUB1130:GOSUB1030:GOTO3400 5000
 GOSUB2410:GOSUB1340:IFNOTdok THENGOSUB2410:GOSUB7010 5010CLS:PRINT"
 *** Zambas ver 2.2 **"; 5020LOCATE0,1:PRINTnp;" pts in dbase";FIX(FRE(1)/25);"
 pts free";:GOSUB220 5030 GOSUB6120 5100CLS:PRINT"1:init 2:rad,area 3:re,int 4:trv5:trf

6:conv 7:dbase sel:";:GOSUB130 5110ONse
 GOSUB5200,5300,5400,5500,5600,5700,5800,5920,5920 5120 GOTO5100
 5200CLS:PRINT"1:vert 2:dec 3:beep 4:check num 5:scale factor 9:X sel:";:GOSUB130
 5210ONse GOSUB6000,6060,6030,6090,6120,5920,5920,5920 5220IFse=9
 THENRETURNSEGOTO5200 5300CLS:PRINT"1:r be 2:r di 3:r ecc 4:seto be 5:seto di
 6:area 9:X sel:";:GOSUB130 5310ONse
 GOSUB10000,10010,10020,10410,10400,10700,5920,5920,5920 5320IFse=9
 THENRETURNSEGOTO5300 5400CLS:PRINT"1:res dir 2:res dist 3:inter di 4:inter be 9:X
 sel:";:GOSUB130 5410ONse
 GOSUB15010,15030,15040,15020,5920,5920,5920,5920 5420IFse=9
 THENRETURNSEGOTO5400 5500CLS:PRINT"1:+/- ang 2:u be 3:u di 4:cld be5:cld di
 6:ed 7:c 8:d 9:X sel:";:GOSUB130 5510ONse
 GOSUB19000,19110,19100,5530,5530,5530,5530,5530,5920 5520IFse=9
 THENRETURNSEGOTO5500 5530n=se:CLS:PRINT"1:A 2:B 3:C 4:D 5:E 9:X Select
 traverse:";:GOSUB130 5540IFse=9 THENGOTO5500 5550n\$=CHR\$(64+se) 5560ONn-3
 GOSUB20010,20000,20600,20700,22800 5570 GOTO5500 5600CLS:PRINT"1:helm pts
 2:helm param 3:Losca 4:UTMsca 5:slopesea 9:X sel:";:GOSUB130 5610ONse
 GOSUB24000,24600,27000,27100,27200,5920,5920,5920,5920 5620IFse=9
 THENRETURNSEGOTO5600 5700CLS:PRINT"1:Lo-UTM 2:UTM-Lo 3:geo-Lo
 4:geo-UTM 9:X sel:";:GOSUB130 5710ONse
 GOSUB30000,30005,30010,30015,5920,5920,5920,5920 5720IFse=9
 THENRETURNSEGOTO5700 5800CLS:PRINT"1:view 2:new-ed 3:del 4:del all 5:print
 6:status 9:X sel:";:GOSUB130 5810ONse
 GOSUB7200,7400,7700,7900,8000,7000,5920,5920,5920 5820IFse=9
 THENRETURNSEGOTO5800 5920RETURN 6000 GOSUB1340:CLS:PRINT"Ask for
 vertical angle ? Y/N"; 6010 GOSUB170:IFys THENvo=t ELSEvo=f 6020
 GOSUB2050:RETURN 6030 GOSUB1340:CLS:PRINT"Beep on error ? Y/N"; 6040
 GOSUB170:IFys THENbn=t ELSEbn=f 6050 GOSUB2050:RETURN 6060
 GOSUB1340:CLS:INPUT"Number of decimals (0-4)";t\$ 6070 GOSUB300:IFu
 THENRETURN 6080IFnu<0 ORnu>4 THENGOSUB250:GOTO6060
 ELSEEnd=nu:SETFnd:GOSUB2050:RETURN 6090 GOSUB1340:CLS:PRINT"Check for valid
 numbers ? Y/N"; 6100 GOSUB170:IFys THENnt=t ELSEnt=f 6110 GOSUB2050:RETURN
 6120CLS:PRINT"Old scalefactor:";sf:LOCATE0,1:INPUT>New scalefactor:",t\$:LOCATE0,0
 6130 GOSUB300:IFu THENLOCATE16,1:PRINTsf,:GOSUB260:RETURN 6140IFr
 THEN6120 6150sf=nu:LOCATE16,1:PRINTsf,:GOSUB260:GOSUB2050:RETURN 7000
 GOSUB1200:IFdok THEN7040 7010CLS:PRINT"Database not present or invalid.Start new
 database Y/N ?"; 7020 GOSUB170:IFno THENCLS:PRINT"Program stop";:END 7030
 GOSUB920:RETURN 7040IFnp<>j THENCLS:PRINT"Number of points not correct,
 program stop";:GOSUB220:END 7050CLS:PRINT"Name:";dn\$;" ";np;"pts";:IFw
 THENPRINTw;"trv stat"; 7060LOCATE0,1:PRINTINT(FRE(1)/25);"pts free.Change name?
 Y/N";:GOSUB170 7070IFno THENRETURN 7080CLS:PRINT"Enter database name (max 8
 characters)"; 7090INPUT"",dn\$:LOCATE0,0:IFLEN(dn\$)>8 THENGOSUB250:GOTO7080
 7100RESTORE#:RESTORE#"STARTDATA",1,1200:WRITE#"STARTDATA","\$"+dn\$:RETUR
 N 7200m\$="Enter ptno ":p\$=""":x=0:y=0:hx=f:hn=f:pd=t:wc=f 7210
 GOSUB1410:GOSUB1530:IFu THENRETURN 7220IFRIGHT\$(wp\$,1)=""THEN7270
 7230p\$=wp\$:GOSUB760 7240IFpn THENm\$="Nonexist pt
 ":GOSUB270:GOSUB250:GOSUB220:GOTO7260 7250m\$="Pt exists
 ":y=yd:x=xd:GOSUB1410:GOSUB220 7260IFqu THENRETURNSEGOTO7200

7270wc=t:p\$=LEFT\$(wp\$,LEN(wp\$)-1) 7280CLS:i=0:GOSUB760:LOCATE0,1:IFpn
 THENm\$="Nonexist pt ":GOSUB270:GOSUB250:GOSUB220:GOTO7330
 7290i=i+1:PRINTi;CHR\$(2)::GOSUB790:IFpn THEN7300 ELSEGOTO7290
 7300CLS:PRINT"View";i;" pointno(s)
 starting"::LOCATE0,1:PRINT"with:"CHR\$(34);p\$;CHR\$(34);" Y/N"::GOSUB170:IFno
 THEN7330 7310CLS:i=0:GOSUB760
 7320i=i+1:ha\$p\$:p\$=MID\$(pn\$,2):m\$="no"+STR\$(i):y=yd:x=xd:GOSUB1410:GOSUB220:I
 Fqu THEN7330 7325p\$=ha\$:GOSUB790:IFpn THEN7330 ELSE7320 7330wc=f:RETURN
 7400m\$="New pt, edit":p\$=""":y=0:x=0:hx=f:hn=f:pd=t:wc=f:GOSUB1410 7410
 GOSUB1530:IFu THENRETURN 7420p\$=wp\$:GOSUB760 7430IFpe THENGOTO7500
 7440pd=f:m\$="New pt ":GOSUB1580:IFex THEN7400 7450IFqu THENRETURN 7460
 GOSUB690:GOTO7400 7500ha\$p\$:y=yd:x=xd 7510m\$="Edit
 ":GOSUB1410:GOSUB1530:IFu THENRETURN 7520p\$=wp\$:GOSUB1580:IFu
 THENRETURN 7530 GOSUB760:IFpn THENGOSUB690:p\$=ha\$:GOSUB860:GOTO7400
 7540m\$="Replace Y/N ":GOSUB270:GOSUB250:GOSUB170 7550IFno THEN7510 7560
 GOSUB860:GOSUB690 7570IFp\$<>ha\$THENp\$=ha\$:GOSUB860 7580 GOTO7400
 7700m\$="Delete pt ":y=0:x=0:p\$=""":hx=f:hn=f:pd=t:wc=f:GOSUB1410 7710
 GOSUB1530:IFu THENRETURN 7720IFRIGHT\$(wp\$,1)=""THENwc=t:GOTO7800
 7730p\$=wp\$:GOSUB760 7740IFpe THEN7770 7750m\$="Nonexist pt
 ":GOSUB270:GOSUB250:GOSUB220 7760IFqu THENRETURNELSE7700
 7770y=yd:x=xd:m\$="Del pt Y/N ":GOSUB1410 7780 GOSUB170:IFno THEN7700 7790
 GOSUB840:GOTO7700 7800CLS:p\$=LEFT\$(wp\$,LEN(wp\$)-1):PRINT"Delete all pointno(s)
 starting with: ";CHR\$(34);p\$;CHR\$(34);" Y/N"::GOSUB170 7810IFno THEN7850
 7820CLS:i=0:GOSUB860:IFpn THENm\$="Nonexist pt
 ":GOSUB270:GOSUB250:GOSUB220:GOTO7850 7830i=i+1:PRINT"Deleted";i;"
 point(s)":CHR\$(2)::GOSUB860:IFpn THENGOSUB250:GOSUB220:GOTO7850 7840
 GOTO7830 7850wc=f:RETURN 7900CLS:PRINT"Erase database Y/N ?"::GOSUB170:IFno
 THENRETURN 7910 GOSUB920:RETURN 8000CLS:PRINT"Print to screen Y/N
 ?"::GOSUB170:IFno THENpr=t:GOSUB8300:IFNOTpr THENRETURN 8040IFpr THEN8050
 ELSECLS:PRINT"Name: ";dn\$;" No of pts: ";np;
 8050RESTORE#:RESTORE#"STARTDATA",1,65000:READ#ha\$,n\$
 8060SETFnd:LOCATE0,1:IFpr THEN8070 ELSEPRINT"Start of data"::GOSUB220:IFqu
 THENSETN:RETURN 8070READ#p\$:IFp\$="ENDDATA"THEN8120
 8080IFASC(p\$)=ASC("#")THENREAD#nl,nl,nl:GOTO8070 8090READ#y,x:IFpr
 THENLPRINT:LPRINTMID\$(p\$,2);ELSECLS:PRINT"Ptno: ";MID\$(p\$,2); 8100IFpr
 THENLPRINT" Y=";y;" X=";x ELSELOCATE0,1:PRINT"Y=";y;" X=";x;:GOSUB220:IFqu
 THENSETN:RETURN 8110 GOTO8070 8101READ#p\$:IFp\$="ENDDATA"THEN8120
 8102IFASC(p\$)=ASC("#")THENREAD#nl,nl,nl:GOTO8070
 8103READ#y,x:LPRINTTAB(40)MID\$(p\$,2);ELSECLS:PRINT"Ptno: ";MID\$(p\$,2); 8104IFpr
 THENLPRINTTAB(50)"Y=";y;" X=";x ELSELOCATE0,1:PRINT"Y=";y;"
 X=";x;:GOSUB220:IFqu THENSETN:RETURN 8120CLS:PRINT"End of data"::IFpr
 THENLPRINT:LPRINT"End of data" 8130 GOSUB220:SETN:RETURN
 8300CLS:PRINT"Printer ready Y/N"::GOSUB170:IFno THENpr=f:RETURN
 8310CLS:PRINT"Printing...."::LOCATE0,1:PRINT"Name: ";dn\$;" No of pts";np;
 8320LPRINT"Database: ";dn\$;" Number of points: ";np:LPRINT:LPRINT"Start of
 data":RETURN 10000z=t:di=f:c=f:GOTO10030 10010di=t:z=f:c=f:GOTO10030
 10020di=t:c=t:z=f 10030m\$=a\$:GOSUB1850:IFu THENRETURN 10040ay=py:ax=px:IFz
 THEN10070 10050m\$=b\$:GOSUB1850:IFu THENRETURN 10060by=py:bx=px:pd=f:IFc

THENGOSUB10200:IFqu THENRETURN 10070ha\$=""va\$=" 90":m\$=f\$:pd=f 10080
 GOSUB1700:IFu THENRETURN 10090w=wABS(SIN(va))sf 10100IFz
 THENY=0:GOTO10120 10110nl=POL(bx-ax,by-ay) 10120nl=REC(w,Y+ha)
 10130y=Y+ay:x=X+ax:m\$=g\$ 10140 GOSUB1950:IFqu THENRETURN 10150 GOTO10070
 10200w=0:va\$=" 90":ha\$=""m\$="Eccentric st" 10210 GOSUB1700:IFu THENRETURN
 10220w=wABS(SIN(va))sf 10230nl=POL(bx-ax,by-ay) 10240ha=ha+ASN(wSIN(ha)/X)-hr
 10250nl=REC(w,Y+ha):y=Y+ay:x=X+ax:ay=y:ax=x 10260 GOSUB1950:RETURN
 10400di=t:z=f:GOTO10420 10410z=t:di=f 10420tv=vo:vo=f:CLS:PRINT"Printer connected
 Y/N ";:GOSUB170 10430IFys THENpr=t ELSEpr=f 10440m\$=a\$:GOSUB1850:IFu
 THEN10600 10450IFpr THENLPRINT:LPRINT"Setting-out data from point:
 ";p\$:SETFnd:LPRINT"Y=";py;" X=";px:SETN 10460ay=py:ax=px:IFz THEN10490
 10470m\$=b\$:GOSUB1850:IFu THEN10600 10480by=py:bx=px 10490m\$="Enter pt P
 ":GOSUB1850:IFu THEN10600 10500b=py:a=px:IFz THENo=0:GOTO10520
 10510nl=POL(bx-ax,by-ay):GOSUB650:o=Y 10520nl=POL(a-ax,b-ay):GOSUB650
 10530Y=Y-o:GOSUB650 10540m\$="Setting-out data":w=X/sf:ha\$=DMS\$(Y):pd=t 10550
 GOSUB1470:IFNOTpr THEN10580 10560SETFnd:LPRINT:LPRINT"Pt: ";p\$.LPRINT"
 Dist:";w:;IFz THENLPRINT" Be:";ELSEPRINT" Di:"; 10570LPRINTha\$:SETN 10580
 GOSUB220:IFqu THEN10600 10590 GOTO10490 10600vo=tv:RETURN
 10700c=0:k=1:tv=vo:vo=f:z=t:di=f 10710m\$="Area pt 1":GOSUB1850:IFu THEN10870
 10720IFns THENGOSUB250:CLS:PRINT"First point must have
 ptno";:GOSUB220:GOTO10700 10730n\$=p\$:y1=py:l=0:b=y1:x1=px:a=x1
 10740k=k+1:m\$="Area pt"+STR\$(k):GOSUB1850:IFu THEN10870
 10750IFp\$=n\$THEN10810 10760nl=POL(px-a,py-b):v=Y:GOSUB650
 10770m\$="Pt"+STR\$(k-1)+" "+CHR\$(230)+" Pt"+STR\$(k):w=X/sf:ha\$=DMS\$(v) 10780
 GOSUB1470:GOSUB220 10790c=c+.5a(py-l) 10800a=px:l=b:b=py:GOTO10740
 10810IFk<4 THENCLS:PRINT"There must be at least 3
 points";:GOSUB250:GOSUB220:GOTO10870 10820nl=POL(x1-a,y1-b):v=Y:GOSUB650
 10830m\$="Pt"+STR\$(k-1)+" "+CHR\$(230)+" Pt 1":w=X/sf:ha\$=DMS\$(v) 10840
 GOSUB1470:GOSUB220 10850c=c+.5a(y1-l)+.5x1*-b
 10860CLS:SETFnd:PRINT"Area:";ABS(c)::SETN:GOSUB220 10870vo=tv:RETURN
 15010a=t:h=f:j=f:b=f:GOTO15050 15020j=t:h=t:a=f:b=f:GOTO15050
 15030b=t:h=f:j=f:a=f:GOTO15050 15040h=t:j=f:a=f:b=f 15050m\$=a\$:GOSUB1850:IFu
 THENRETURN 15070ay=py:ax=px 15080m\$=b\$:GOSUB1850:IFu THENRETURN
 15100by=py:bx=px:IFb THEN15500 15110IFj THEN15800 15120m\$=d\$:GOSUB1850:IFu
 THENRETURN 15140cy=py:cx=px 15150IFa THEN15190 15160m\$=e\$:GOSUB1850:IFu
 THENRETURN 15170dy=py:dx=px:q=v 15180 GOTO15800 15190m\$="Direction
 ":CLS:PRINTm\$+"A:":INPUT",",t\$:GOSUB500:IFu THENRETURN 15200IFr THEN15190
 15210l=v:LOCATE12,0:PRINTv\$::GOSUB260
 15220CLS:PRINTm\$+"B:":INPUT",",t\$:GOSUB500:IFu THENRETURN 15230IFr
 THEN15220 15240o=v:LOCATE12,0:PRINTv\$::GOSUB260
 15250CLS:PRINTm\$+"C:":INPUT",",t\$:GOSUB500:IFu THENRETURN 15260IFr
 THEN15250 15270p=v:LOCATE12,0:PRINTv\$; 15280v=o-l:tm=SIN(v):If tm=0 THEN15390
 ELSEc=COS(v)/tm 15290v=p-l:tm=SIN(v):If tm=0 THEN15390 ELSEe=COS(v)/tm
 15300a=bx-ax-(by-ay)c 15310xx=by-ay+(bx-ax)c 15320w=cx-ax-(cy-ay)e
 15330yy=cy-ay+(cx-ax)e 15340tm=yy-xx:If tm=0 THEN15390 ELSEb=-(w-a)/tm
 15350g=(a+xxb)/(1+bb) 15360x=ax+g:y=ay+gb 15370m\$=g\$:GOSUB1950:IFqu
 THENRETURN 15380 GOTO15190 15390CLS:PRINT"Cannot
 compute";:GOSUB250:GOSUB220:RETURN 15500di=f:z=f:tv=vo 15510pd=f:vo=f:va\$="

90":m\$="Dist to A ":GOSUB1470:LOCATE5,1:INPUT",t\$:LOCATE0,0:GOSUB300:IFu
 THEN15670 15520IFr THENGOTO15510 15530vo=tv:w=nu:GOSUB1800:GOSUB1470:IFu
 THEN15670 15540IFr THEN15530 15550c=wsfABS(SIN(va)):vo=f 15560m\$="Dist to B
 ":va\$=" 90":GOSUB1470:LOCATE5,1:INPUT",t\$:LOCATE0,0:GOSUB300:IFu THEN15670
 15570IFr THENGOTO15560 15580vo=tv:w=nu:GOSUB1800:GOSUB1470:IFu THEN15670
 15590IFr THENGOTO15580 15600e=wsfABS(SIN(va)) 15610nl=POL(bx-ax,by-ay)
 15620a=Y:xx=(XX+cc-ee)/(2X) 15630yy=SGN(c)SQR(ABS(cc-xxxx))
 15640nl=POL(xx,yy):nl=REC(X,a+Y) 15650y=ay+Y:x=ax+X:m\$=g\$:GOSUB1950 15660IFqu
 THENRETURNELSEGOTO15510 15670vo=tv:RETURN 15800IFj THENn\$=" Bearing
 "ELSEn\$="Direction " 15810CLS:PRINTn\$+"A:";:INPUT",t\$:GOSUB500:IFu THENRETURN
 15820IFr THEN15810 15830g=v:LOCATE12,0:PRINTv\$; 15840IFj
 THENLOCATE0,1:PRINTCHR\$(5);n\$+"B:";:INPUT",t\$:LOCATE0,0:GOTO15860
 15850LOCATE0,1:PRINTCHR\$(5);n\$+"C:";:INPUT",t\$:LOCATE0,0 15860 GOSUB500:IFu
 THENRETURN 15870IFr THENLOCATE0,0:GOTO15840
 15880h=v:LOCATE12,1:PRINTv\$;:LOCATE0,0 15890IFj
 THENc=g:g=0:e=h:h=0:cy=by:cx=bx:GOTO15920 15900nl=POL(bx-ax,by-ay):c=Y
 15910nl=POL(dx-cx,dy-cy):e=Y 15920xx=((cx-ax)TAN(e+h)-(cy-ay))/(TAN(e+h)-TAN(c+g))
 15930yy=xxTAN(c+g) 15940x=ax+xx:y=ay+yy 15950m\$=g\$:GOSUB1950:IFqu
 THENRETURN 15960 GOTO15810 19000c=0 19010CLS:m\$="Add/sub angles":GOSUB270
 19020LOCATE0,1:PRINTDMS\$(c); 19030LOCATE16,1:INPUT"ang:",t\$:LOCATE0,0 19040
 GOSUB500:IFu THENRETURN 19050IFr THENGOSUB220:GOTO19010
 19060c=c+v:LOCATE0,1:PRINTCHR\$(5);:GOTO19020 19100di=t:z=0:GOTO19120
 19110z=t:di=0 19120m\$="Uncl trv A ":"xx=0:yy=0:g=0:vc=0:xr=0:yr=0 19130
 GOSUB1850:IFu THENRETURN 19140ay=py:ax=px:IFz THENo=0:GOTO19180
 19150m\$="Uncl trv B ":GOSUB1850:IFu THENRETURN 19160by=py:bx=px
 19170nl=POL(ax-bx,ay-by):o=Y 19180n=1 19190pd=f:GOSUB300:IFu THENRETURN
 19200 GOSUB3060 19210m\$="Station"+STR\$(n+1):GOSUB1950:IFqu THENRETURN
 19220n=n+1:GOTO19190 20000di=t:z=f:GOTO20020 20010z=t:di=f
 20020n=0:GOSUB1080:IFpe THENCLS:PRINT"Traverse already in
 use";:GOSUB250:GOSUB220:RETURN 20050CLS:INPUT"Number of observed
 distances:",t\$:GOSUB300:IFu THENRETURN 20060IFr THEN20050
 20070q=nu:IF(q+20)>(FRE1/30)THENCLS:PRINT"Not enough
 memory";:GOSUB250:GOSUB220:RETURN 20100m\$="Closd trv A ":GOSUB1850:IFu
 THENRETURN 20110ay=py:ax=px 20120IFz THEN20150 20130m\$="Closd trv B
 ":GOSUB1850:IFu THENRETURN 20140by=py:bx=px 20150m\$="Closd trv C
 ":GOSUB1850:IFu THENRETURN 20160cy=py:cx=px 20170IFz THEN20250
 20180m\$="Cld D or EXE":GOSUB1850:IFqu THENRETURN 20190IFex THENb=t
 ELSEb=f:dy=py:dx=px 20250CLS:PRINT"Storing...";
 20260a=1:ha=q:w=a:va=di:n=0:GOSUB1030 20270ha=ay:w=ax:va=b:n=-1:GOSUB1030
 20280IFz THEN20300 20290ha=by:w=bx:n=-2:GOSUB1030
 20300ha=cy:w=cx:n=-3:GOSUB1030 20310IFz ORb THEN20400
 20320ha=dy:w=dx:n=-4:GOSUB1030 20400pd=f:IFdi ANDNOTb THENtm=q+1 ELSEtm=q
 20405FORk=a TOtm 20410n=0:GOSUB1130 20420ha=q:w=k:va=di:GOSUB1030
 20430IFk>q THENpd=t:w=999999:ha\$=""":va\$=" 999" 20440n=k:GOSUB3000 20450IFu
 THENk=q+10:GOTO20470 20460 GOSUB1030 20470NEXTk:IFu THENRETURN
 20480n=0:GOSUB1130:ha=q:w=q+9:va=di:GOSUB1030 20490RETURN
 20600n=0:GOSUB1080:IFpn
 THENCLS:PRINT"Nonexistant";:GOSUB250:GOSUB220:RETURN

20610q=ha:a=w:di=va:z=NOTdi:n=-1:GOSUB1080:b=va 20620IFa>q+1
 THENGOSUB3400:RETURN 20630 GOTO20400
 20700xx=0:yy=0:g=0:l=0:vc=0:xr=0:yr=0:b=f:a=1:c=0 20720n=0:GOSUB1080:IFpn
 THENCLS:PRINT"Nonexistant":;GOSUB250:GOSUB220:RETURN
 20730q=ha:a=w:di=va:z=NOTdi 20740IFa<=q+1 THENCLS:PRINT"Not
 complete":;GOSUB250:GOSUB220:RETURN 20750CLS:PRINT"Computing";
 20760n=-1:GOSUB1080:ay=ha:ax=w:b=va 20770IFz THEN20790
 20780n=-2:GOSUB1080:by=ha:bx=w 20790n=-3:GOSUB1080:cy=ha:cw=20800IFz ORb
 THEN20900 20810n=-4:GOSUB1080:dy=ha:dx=w 20900IFz THENo=0:GOTO20960
 20910nl=POL(ax-bx,ay-by):GOSUB650:o=Y 20920IFb THENvc=0:GOTO21310
 20930nl=POL(dx-cx,dy-cy):GOSUB650:p=Y 20940 GOSUB3300:n=q+1:GOSUB1080:c=ha
 20950v=o+g+hr+c:GOSUB650:g=v:GOTO21030 20960CLS:INPUT"True be endp or
 EXE:",t\$:GOSUB500:IFqu THENRETURN 20970IFr THEN20960 20980IFex
 THENb=t:vc=0:GOTO21310 ELSEp=v:b=f
 21000LOCATE0,1:PRINTCHR\$(5)::INPUT"Observed be
 endp:",t\$:LOCATE0,0:GOSUB500:IFu THENRETURN 21010IFr THEN21000 21020g=v
 21030e=p-g 21100CLS:PRINT"Angular closure: ";DMS\$(e); 21110IFz
 THENLOCATE0,1:PRINT"Change bearing endpoint Y/N":;GOSUB170:IFys THEN20960
 ELSE21300 21120LOCATE0,1:INPUT>Edit station no or EXE:",t\$:LOCATE0,0:GOSUB300
 21130IFqu THENRETURN 21140IFr THEN21120 21150IFex THEN21300 21160
 GOSUB3410:IFqu THENRETURNELSEGOTO20700 21300IFdi
 THENvc=e/(q+1)ELSEvc=e/q 21310g=0:xx=0:yy=0:l=0
 21320CLS:LOCATE0,1:PRINT"Computing... Please wait"; 21330FORn=1 TOq
 21340m\$="Station"+STR\$(n):GOSUB270 21350 GOSUB1080:IFpn THENPRINT"Trv error,
 program stop":;STOP 21360 GOSUB3060 21370NEXTn 21900h=cy-y:g=cx-x
 21910CLS:PRINT"Closure y":;-h; 21920LOCATE0,1:PRINT"Closure
 x":;-g::LOCATE0,0:GOSUB220 21930i=SQR(hh+gg) 21940CLS:PRINT"Radial
 closure":;ROUND(i,-6); 21950LOCATE0,1:PRINT"Sum distance":;l::GOSUB220 21960IFI=0
 THENCLS:PRINT"Rel. accuracy: cannot compute":;GOTO21980 21970CLS:PRINT"Rel.
 accuracy: 1":;ROUND(l/i,1); 21980LOCATE0,1:INPUT>Edit station no or
 EXE:",t\$:LOCATE0,0:GOSUB300 21990IFqu THENRETURN 22000IFr THEN21980
 22010IFex THEN22600 22020 GOSUB3410:IFqu THENRETURNELSEGOTO20700
 22600yr=h/l:xr=g/l 22610g=0:xx=0:yy=0:l=0 22630FORn=1 TOq
 22640m\$="Station"+STR\$(n+1) 22650 GOSUB1080 22660 GOSUB3060 22670
 GOSUB1950 22680IFqu THENn=q+10 22700NEXTn:RETURN 22800CLS:PRINT"Erase
 traverse "+n\$+" Y/N":;GOSUB170 22810IFno THENRETURN 22820
 GOSUB1160:RETURN 24000c=0:e=0:g=0:h=0:j=0:l=0:o=0:p=0:q=0:a=0 24010b=0:d=0
 24020 GOSUB24500:IFu THENRETURN 24030 GOSUB24550:IFu THENRETURN
 24035x1=bx:y1=by 24040c=c+bx:e=e+bx-x1:g=g+by 24050h=h+by-y1:j=j+ax:l=l+ax-x1
 24060o=o+(ax-x1)(ax-x1):p=p+ay 24070q=q+ay-y1:o=o+(ay-y1)(ay-y1)
 24080a=a+(bx-x1)(ax-x1)+(by-y1)(ay-y1) 24090b=b+(bx-x1)(ay-y1)-(by-y1)(ax-x1)
 24100d=d+1 24105 GOSUB24500:IFqu THENRETURN 24110IFex THEN24120 24112
 GOSUB24550:IFu THENRETURN 24115 GOTO24040 24120tm=1/SQR(d)
 24130c=ctm:e=etm:g=gtm:h=htm 24140j=jtm:l=ltm:p=ptm:q=qtm
 24150o=o-(l/q):a=a-(le+qh) 24160b=b-qe:b=b+l/h 24170a=a/o:b=b/o
 24180x0=(c-ja-pb)/SQR(d):y0=(g-pa+bj)/SQR(d) 24190e=SQR(aa+bb)
 24200CLS:PRINT"Scale:";e;
 24210LOCATE0,1:PRINT"Rotation: ";DMS\$(ACS(a/e));:GOSUB220 24220CLS:PRINT"a:";a;

24230LOCATE0,1:PRINT"b:";b::GOSUB220 24240SETFd:CLS:PRINT"Y0:";y0;
 24250LOCATE0,1:PRINT"X0:";x0::GOSUB220:SETN 24260CLS:PRINT"Deviation, stand.
 error Y/N:";:GOSUB170 24270IFno THEN24400 24300j=0 24310 GOSUB24500:IFqu
 THENRETURN 24315IFex THEN24380 24320 GOSUB24550:IFqu THENRETURN
 24330x=ayb+axa+x0:y=y0+aay-bax 24340g=x-bx:c=y-by 24350j=j+gg+cc
 24360SETFd:CLS:PRINTCHR\$(238)+"Y:";c;
 24370LOCATE0,1:PRINTCHR\$(238)+"X:";g::GOSUB220:GOTO24310
 24380l=SQR(j/(2*(d-2))) 24390CLS:PRINT"Standard error:";l::GOSUB220:GOTO24400
 24400 GOSUB24500:IFu THENRETURN 24410x=ayb+axa+x0:y=y0+aay-bax
 24420m\$="New system ":GOSUB1950:IFqu THENRETURN 24430 GOTO24400
 24500m\$="Old system ":GOSUB1850:IFu THENRETURN 24510ay=py:ax=px:RETURN
 24550m\$="New system ":GOSUB1850:IFu THENRETURN 24560by=py:bx=px:RETURN
 24600CLS:INPUT"Y0:",t\$:GOSUB300:IFu THENRETURN 24610IFr THENGOTO24600
 24620y0=nu 24630LOCATE0,1:PRINTCHR\$(5)::INPUT"X0:",t\$:LOCATE0,0:GOSUB300:IFu
 THENRETURN 24640IFr THENGOTO24630 24650x0=nu
 24660CLS:INPUT"a:",t\$:GOSUB300:IFu THENRETURN 24670IFr THENGOTO24660
 24680a=nu 24690LOCATE0,1:PRINTCHR\$(5)::INPUT"b:",t\$:LOCATE0,0:GOSUB300:IFu
 THENRETURN 24700IFr THENGOTO24690 24710b=nu 24720 GOTO24400
 27000CLS:INPUT"Y mean (km): ",t\$:GOSUB300:IFu THENRETURN 27010IFr THEN27000
 27020h=nu:LOCATE13,0:PRINTh::GOSUB260 27030c=1+.01237hh1E-6)
 27040CLS:PRINT"Lo scale : ";c::LOCATE0,1:PRINT" Set scalefactor Y/N ":";:GOSUB170
 27050IFys THENsf=c:GOSUB2050 27060RETURN 27100CLS:INPUT"E mean (km):"
 ",t\$:GOSUB300:IFu THENRETURN 27110IFr THEN27100
 27120h=nu:LOCATE13,0:PRINTh::GOSUB260 27130h=h-500:c=.9996(1+.01237hh1E-6))
 27140CLS:PRINT"UTM scale : ";c::LOCATE0,1:PRINT" Set scalefactor Y/N ":";:GOSUB170
 27150IFys THENsf=c:GOSUB2050 27160RETURN 27200CLS:INPUT"Height pt A
 (m):",t\$:GOSUB300:IFu THENRETURN 27210IFr THENGOTO27200 27220a=nu
 27230LOCATE0,1:PRINTCHR\$(5)::INPUT"Height pt B (m):",t\$:LOCATE0,0:GOSUB300:IFu
 THENRETURN 27235IFr THENGOTO27230 27240b=nu 27250CLS:INPUT"Slope dist
 :",t\$:GOSUB300:IFu THENRETURN 27260IFr THENGOTO27250
 27270s=nu:c=-s(a+b)/(2am)-((a-b)^2)/(2s)+(s^3)/(25.6am^2)
 27280SETFd:LOCATE0,1:PRINT"corr=";csf;" dist=";(s+c)sf::GOSUB220:IFqu
 THENSETN:RETURN 27290 GOTO27250 30000dx=t:x1=f:p=f:GOTO30020
 30005x1=t:dx=f:p=f:GOTO30020 30010dx=t:x1=f:p=t:GOTO30020 30015x1=t:dx=f:p=t
 30020ANGLE1:a=6367386.644:b=16300.7:c=17.387:e=.023
 30025l=0.9996:k=500000:dy=10000000 30030IFx1 ANDp THEN30050
 ELSECLS:PRINTCHR\$(168)+"0 Lo:";:INPUT"",t\$:GOSUB500:IFu THEN30290 30040IFr
 THEN30030 30042cx=vdr:ax=v 30045IFp ANDdx THEN30600
 30050CLS:PRINTCHR\$(168)+"0 UTM:";:INPUT"",t\$:LOCATE0,0:GOSUB500:IFu
 THEN30290 30060IFr THENGOTO30050 30070cy=vdr:ay=v 30080IFx1 ANDNOTp
 THEN30200 30085IFx1 ANDp THEN30700
 30100uo=f:m\$="Lo"+STR\$(ABS(ax)):GOSUB1850:IFu THEN30290
 30110y=-py:x=-px:q=1:y0=0:x0=0:by=cx:GOSUB30800:GOSUB30400:IFqu THENRETURN
 30120x0=dy:y0=k:q=l:by=cy:GOSUB30900
 30130uo=t:m\$="UTM"+STR\$(ABS(ay)):GOSUB1950:IFqu THEN30290 30140 GOTO30100
 30200uo=t:m\$="UTM"+STR\$(ABS(ay)):GOSUB1850:IFu THEN30290
 30210y=py:x=px:q=l:x0=dy:y0=k:by=cy:GOSUB30800:GOSUB30400:IFqu THENRETURN
 30220o=-o:q=1:y0=0:x0=0:by=-cx:bx=-bx:GOSUB30900

```

30230uo=f:m$="Lo"+STR$(ABS(ax)):GOSUB1950:IFqu THEN30290 30240 GOTO30200
30290uo=f:ANGLE0:RETURN
30400v=ABS(bxrd):GOSUB630:CLS:PRINTCHR$(168);";";v$;" E";
30410v=ABS(ord):GOSUB630:LOCATE0,1:PRINTCHR$(143);";";v$;" S";:GOSUB220:RETURN 30500CLS:PRINTCHR$(168)+":";:INPUT"",t$:GOSUB500:IFu
THENRETURN 30510IFr THEN30500 30520bx=vdr:GOSUB630:LOCATE2,0:PRINTv$;
30530LOCATE0,1:PRINTCHR$(5);CHR$(143)+":";:INPUT"",t$:LOCATE0,0:GOSUB500:IFu
THENRETURN 30540IFr THEN30530
30550o=vdr:GOSUB630:LOCATE2,1:PRINTv$;:LOCATE0,0:GOSUB260:RETURN
30600by=-vdr:ax=v:q=1:y0=0:x0=0:uo=f:m$="Lo"+STR$(ABS(ax)) 30610 GOSUB30500:IFu
THEN30290 ELSEbx=-bx:GOSUB30900:GOSUB1950:IFqu THEN30290 30620
GOTO30610 30700by=vdr:ay=v:q=l:x0=dy:y0=k:uo=t:m$="UTM"+STR$(ABS(ay)) 30710
GOSUB30500:IFu THEN30290 ELSEo=-o:GOSUB30900:GOSUB1950:IFqu THEN30290
30720 GOTO30710 30790z=aa/SQR(1-e2SIN(o)^2):RETURN 30800ec=(x-x0)/q:o=(ec/a)
30810w=(ao-bSIN(2o)+cSIN(4o)-eSIN(6o)) 30820g=(ec-w)/(a-2bCOS(2o))
30830IFABS(g)<1E-10 THEN30850 30840o=(o+g):GOTO30810 30850 GOSUB30790
30860h=(y-y0)/(qz):u=(e2COS(o)^2)/(1-e2):i=(TAN(o)^2)
30870bx=by+(1/COS(o))(h-(h^3/6)(1+2i+u)+(h^5/120)(5+28i+24ii+6u+8ui)-(h^7/5040)(61+66
2i+1320ii+720iii))
30880o=o-(1+u)(TAN(o))((h^2/2)-(h^4/24)(5+3i+u-9ui-4uu)+(h^6/720)(61+90i+45ii+46u-252u
i-90uii)) 30890RETURN 30900j=(bx-by)COS(o):u=(e2COS(o)^2)/(1-e2):i=(TAN(o)^2)
30910w=(ao-bSIN(2o)+cSIN(4o)-eSIN(6o)) 30920 GOSUB30790
30930y=y0+(qz)(j+(j^3/6)(1-i+u)+(j^5/120)(5-18i+ii+14u-58ui)+(j^7/5040)(61-479i+179ii-i^3))
30940x=x0+q(w)+(qzTAN(o))(j^2/2+(j^4/24)(5-i+9u+4uu)+(j^7/5040)(61-479i+179ii-6i^3))
30950RETURN 65000SETN:CLS:PRINT"ERR=";ERR;" ERL=";ERL;:END"

```