

Holsen's DOS programs. The spheroid

Version 17.9.2009

See It's learning for a zip file containing the Holsen's programs.

NB: Create your own Shortcuts after you have unzipped the zip file:

Right hand click

and Create shortcut

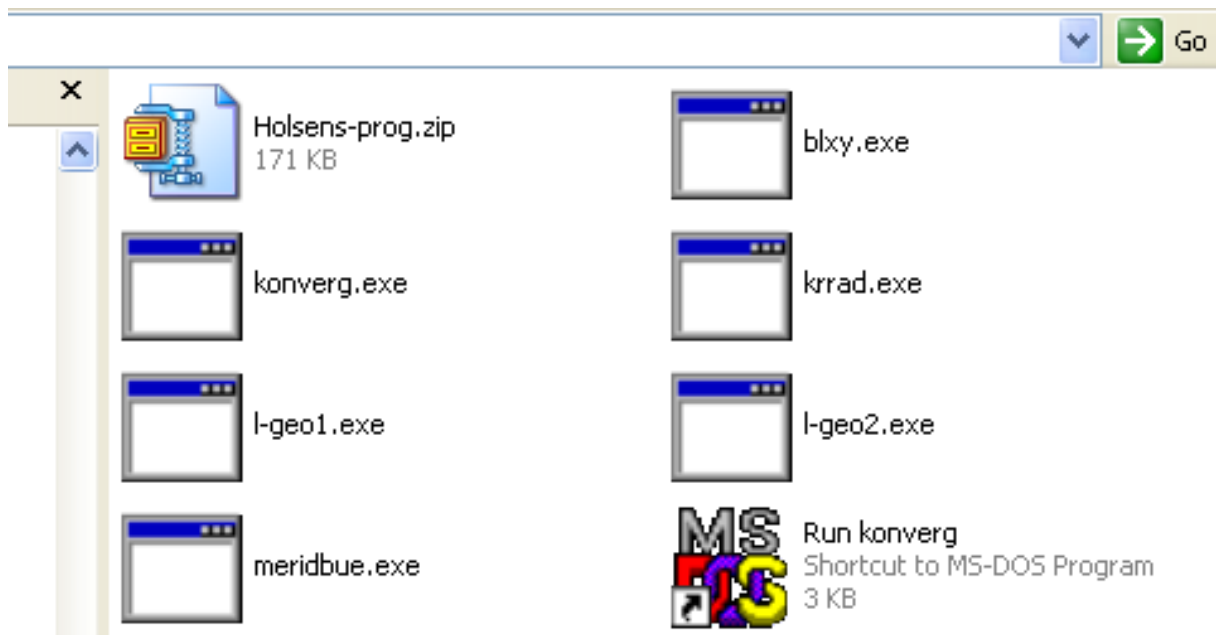
Choose Properties and then Program

Check if the box "Close at exit" is not ticked off (is turned off)

The Holsen's programs are DOS programs in Norwegian. Before computing you must answer with an integer your choice of datum, and for some programs your choice of which way to compute and what type of coordinates (UTM or latitude/longitude).

You have to enter the coordinates (for instance latitude and longitude) in decimal form and not as °, ' and ". And, use a decimal point and not a comma between the integer and the decimal numeral

Print screen is an alternative to copy the result to your report.



l-geo1: The 1st geodetic main task

l-geo2: The 2nd geodetic main task

krrad: The principle radii of curvature (M and N) and a radius of curvature in a direction with azimuth A

meridbue: The length of a meridian between two points, for instance from Equator to a point with a latitude equal B.

konverg: Compute the meridian convergence in a point.

blxy: From latitude/longitude to the x/y coordinates in the map projection plane. And visa versa, from the plane to the ellipsoid

l-geo1

The numerical example in chapter 2.7 in Geodesy part 2.

```
C:\ [Inactive l-geo1.exe]
One or more CON code pages invalid for given keyboard code
*****
BEREGNING AV GEOGRAFISKE KOORDINATER FOR PUNKT 2
OG ASIMUT FOR LINJEN I PUNKT 2.KOORDINATENE
<B1,L1>,GEODETISK LINJE S12 OG ASIMUT A12 GITT.
GJELDER OGSÅ FOR MEGET LANGE AVSTANDER
J.H. AUGUST 90
*****
LEGG INN B1,L1,S12,A12:
50.00000000
10.00000000
15000000.000
140.0000000
VALG AV ELLIPSOIDE.P SETTES LIK 1 FOR :
NORSK BESSELS ,LIK 2 FOR INTERNASJONAL:
OG LIK 3 FOR FOR WGS-84-ELLIPSOIDEN:
LEGG INN P:
2
        65.544062644540790
        32.820364752948780      167.881395359527200
        57.303970690612960      152.586112015202200
GEOGRAFISKE KOORDINATER:
B2: -62.950889964
NEGATIV B2 BETYR SYDLIG BREDDE:
L2: 105.093972133
ASIMUT FRA PUNKT 2 TIL PUNKT 1:
A2: 294.778189969
PROGRAMMET REGNER A2 I FORHOLD TIL NORD,OGSÅ PÅ
PÅ DEN SYDLIGE HALVEELLIPSOIDE
Stop - Program terminated.
```

LEGG INN B1, L1, S12, A12: Enter the latitude, B1, and longitude, L1, of point 1, the length of the geodesic between 1 and 2, S12, the azimuth from 1 to 2, A12

VALG AV ELLIPSOIDE: Choose the spheroid/ellipsoid by entering a value of P.

The Norwegian modified Bessel (in the datum NGO1948): Choose P = 1

The International (in the datum ED50): Choose P = 2

The WGS84 ellipsoid (in the datums EUREF89 and WGS84): Choose P = 3

LEGG INN P: Enter the value of P, here 2

Results:

GEOGRAFISKE KOORDINATER: Geographical coordinates

B2 (which in this case is negative as the point is on the southern hemisphere, “sydlig halvkule”).

L2: Longitude

ASIMUT FRA PUNKT 1 TIL PUNKT 2: The azimuth from 1 to 2. The azimuth is from the north pole also on the southern hemisphere.

l-geo2

The numerical example in chapter 2.7 in Geodesy part 2.

```
[Inactive l-geo2.exe]

J.H. AUGUST 90
*****
LEGG INN B1,L1,B2,L2 :
50.00000000
10.00000000
-62.950889964
105.093972133
VALG AV ELLIPSOIDE.P SETTES LIK 1 FOR :
NORSK BESSELS ,LIK 2 FOR INTERNASJONAL:
OG LIK 3 FOR FOR WGS-84-ELLIPSOIDEN:
LEGG INN P:
2
        65.544062644311710
        57.303970690222760        152.586112015012700
        32.820364752787240        167.881395359328600
        139.999999999577300        114.778189968694200
ASIMUT FRA 1 TIL 2 OG FRA 2 TIL 1, I FORHOLD
TIL NORD OGSÅ PÅ DEN SYDLIGE HALVELLIPSOIDE
A1: 140.000000000
A2: 294.778189969
GEODETISK LINJE FRA 1 TIL 2:
S:15000000.000
Stop - Program terminated.
```

LEGG INN B1, L1, B2, L2: Enter the latitude, B, and longitude, L, of point 1 and 2

VALG AV ELLIPSOIDE: Choose the spheroid/ellipsoid by entering a value of P.

The Norwegian modified Bessel (in the datum NGO1948): Choose P = 1

The International (in the datum ED50): Choose P = 2

The WGS84 ellipsoid (in the datums EUREF89 and WGS84): Choose P = 3

LEGG INN P: Enter the value of P, here 2

Results:

ASIMUT FRA PUNKT 1 TIL PUNKT 2 OG FRA 2 TIL 1: The azimuth from 1 to 2 and from 2 to 1.

The azimuth is from the north pole also on the southern hemisphere.

A1:

A2:

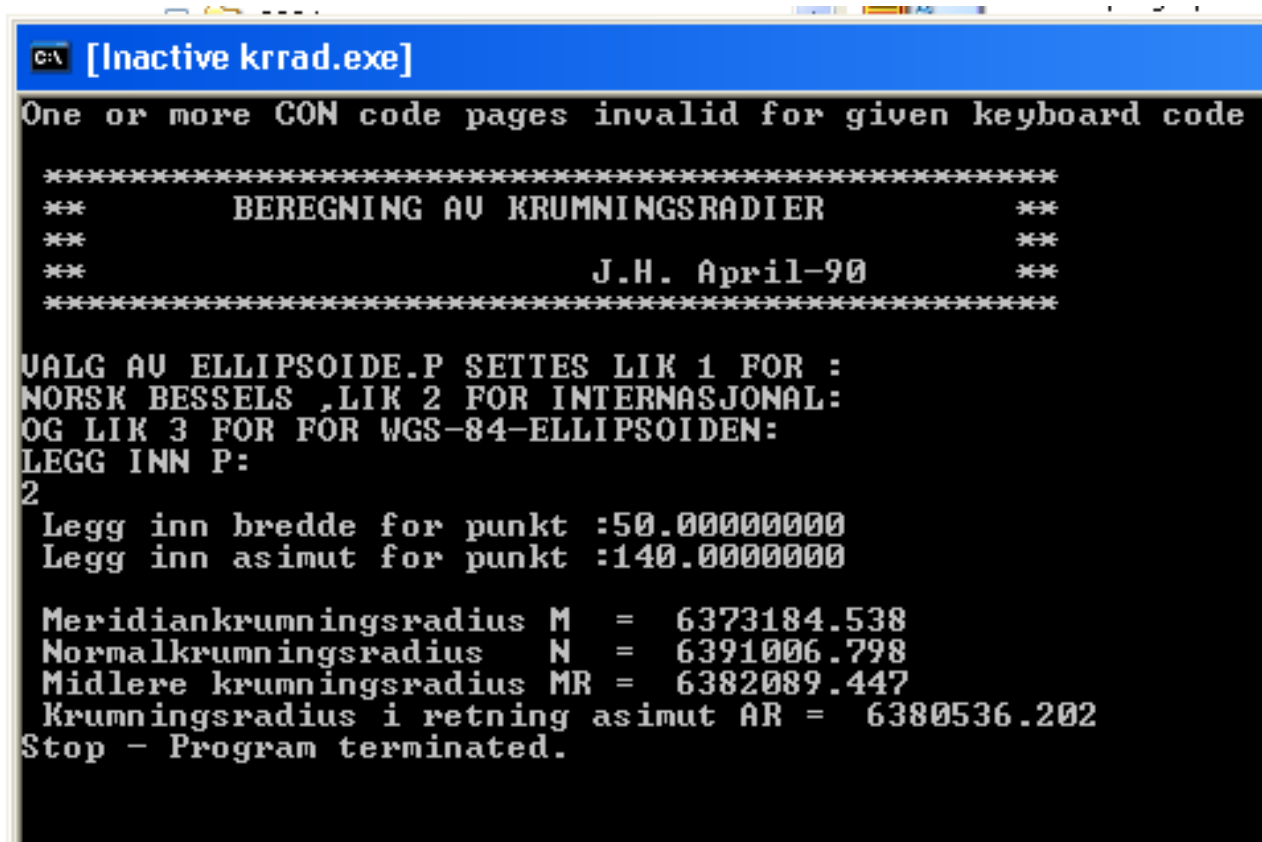
GEODETISK LINJE FRA ! TIL 2: The geodesic between 1 and 2, S12

S:

krrad

The numerical example in chapter 2.7 in Geodesy part 2.

If wrong keyboard, try Caps Lock



```
C:\ [Inactive krrad.exe]
One or more CON code pages invalid for given keyboard code

*****
**          BEREGNING AV KRUMNINGSRADIER          **
**                                                    **
**                      J.H. April-90              **
*****

VALG AV ELLIPSOIDE.P SETTES LIK 1 FOR :
NORSK BESSELS ,LIK 2 FOR INTERNASJONAL:
OG LIK 3 FOR FOR WGS-84-ELLIPSOIDEN:
LEGG INN P:
2
Legg inn bredde for punkt :50.00000000
Legg inn asimut for punkt :140.00000000

Meridiankrumningsradius M  =  6373184.538
Normalkrumningsradius   N  =  6391006.798
Midlere krumningsradius MR =  6382089.447
Krumningsradius i retning asimut AR =  6380536.202
Stop - Program terminated.
```

VALG AV ELLIPSOIDE: Choose the spheroid/ellipsoid by entering a value of P.

The Norwegian modified Bessel (in the datum NGO1948): Choose P = 1

The International (in the datum ED50): Choose P = 2

The WGS84 ellipsoid (in the datums EUREF89 and WGS84): Choose P = 3

LEGG INN P: Enter the value of P. Here 2

Legg inn bredde for punkt: Enter the latitude of the point, here 50.00000000

Legg inn asimut for punkt: Enter the azimuth to another point, here 140.00000000

Results:

Meridiankrumningsradius, M: Radius of curvature in the meridian

Normalkrumningsradius, N: Radius of curvature in the prime vertical

Midlere krumningsradius, MR: The mean radius of curvature, MR (see Geodesy part 1, page 2.12)

Krumningsradius i retning asimut AR: The radius of curvature of a normal section with azimuth A: AR

meridbue

The old Norwegian datum NGO1948 is chosen here. 58 degrees north is where the origins of the axes are.

R SETTES LIK 0 NÅR <B1,B2> ER GITT. I MOTSAIT FALL SETTES R LIK 1 NÅR B1 OG G ER GITT:

Enter R = 0 when the latitudes B1 and B2 are known.

Enter R = 1 if the latitude B1 and the length of the meridian between 2 points, G, are known

Here R = 0

VALG AV ELLIPSOIDE: Choose the spheroid/ellipsoid by entering a value of P.

The Norwegian modified Bessel (in the datum NGO1948): Choose P = 1

The International (in the datum ED50): Choose P = 2

The WGS84 ellipsoid (in the datums EUREF89 and WGS84): Choose P = 3

LEGG INN P: Enter the value of P. Here 1

LEGG INN BREDDENE B1 OG B2: Enter the latitudes of point 1 and 2, B1 and B2.

Here: 0

58

Result:

MERIDIANBUE: The length of the meridian between the 2 points (latitudes)

If you choose R = 1, the result is the latitude of point 2. (not shown here)

konverg

A point somewhere close to Trondheim. Datum: WGS84/EUREF89

```
C:\ [Inactive konverg.exe]
KONFORME PROJEKSJON OG UTM.<B,L> ELLER <X,Y> MÅ VÆRE
GITT I DET AKTUELLE PUNKT.TRE FORSKJELLIGE
ELLIPSOIDER KAN VELGES UNDER BRUK AV PROGRAMMET.
      FEBRUAR -91
      J.H.
*****
I SETTES LIK 1 NÅR <B,L> ER GITT OG 2 NÅR <X,Y>
ER GITT
1
VALG AV ELLIPSOIDE.P SETTES LIK 1 FOR:
NORSK BESSELS, LIK 2 FOR INTERNASJONAL:
OG LIK 3 FOR WGS-84-ELLIPSOIDEN:
LEGG INN P:
3
LEGG INN LENGDEGRADEN FOR FOR X-AKSEN
9
LEGG INN BREDDE OG LENGDE
63.12345678
10.12345678

C ER MERIDIANKONVERGENS I GON
C: 1.1134782
Stop - Program terminated.
```

I SETTES LIK 1 NÅR <B,L> ER GITT OG 2 NÅR <X,Y> ER GITT: Enter I = 1 when the latitude, B, and the longitude, L, of a point are known. Enter I = 2 when the coordinates of a point in the plane are known (for instance the UTM coordinates)

VALG AV ELLIPSOIDE: Choose the spheroid/ellipsoid by entering a value of P.

The Norwegian modified Bessel (in the datum NGO1948): Choose P = 1

The International (in the datum ED50): Choose P = 2

The WGS84 ellipsoid (in the datums EUREF89 and WGS84): Choose P = 3

LEGG INN P: Enter the value of P. Here 3

LEGG INN LENGDEGRADEN FOR X-AKSEN: Enter the longitude of the x axis. In this case the point is in UTM zone no 32, and the north axis is 9 degrees east of Greenwich. Enter 9

LEGG INN BREDDE OG LENGDE: Enter the latitude and the longitude of the point

Here:

63.12345678

10.12345678

Result:

C ER MERIDIANKONVERGENSEN I GON: The meridian convergence in gon (grads)

blxy

Here the results *from* the spheroid *to* the plane are shown

```
[Inactive blxy.exe]
*** OG OMUENDT ***
***
***          JON HOLSEN, APRIL 90          ***
***          IKO, NTH                      ***
*****
S SETTES LIK 0 FOR NGO-SYSTEM OG 1 FOR UTM
LEGG INN S:1
R SETTES LIK 0 NÅR <B,L> ER GITT I MOTSATT FALL
SETTES R LIK 1
LEGG INN R:0
VALG AV ELLIPSOIDE.P SETTES LIK 1 FOR
NORSK BESSELS, LIK 2 FOR INTERNASJONAL
OG LIK 3 FOR WGS-84-ELLIPSOIDEN
LEGG INN P:3
LEGG INN BREDDEN FOR X-AKSENS NULLPUNKT:0
LEGG INN GEOGRAFISK LENGDE FOR X-AKSEN:9
LEGG INN GEOGRAFISK BREDDE:63.12345678
LEGG INN GEOGRAFISK LENGDE:10.12345678
HER STARTER BEREGNINGEN MED B OG L SOM KJENT
X: 6999840.0254

Y: 556663.3607
Stop - Program terminated.
```

S SETTES LIK....: Choose 0 for coordinates the NGO1948 datum, choose S = 1 for the UTM coordinates

LEGG INN S: 1 Enter S Here: S = 1 is entered

R SETTES LIK 0 NÅR <B,L> ER GITT I MOTSATT FALL SETTES R LIK 1:

Choose 0 if the latitude, B, and the longitude, L, are known.

Choose 1 if the coordinates in the plane are known, x, y or N, E.

LEGG INN R: Enter R. Here R = 0

VALG AV ELLIPSOIDE: Choose the spheroid/ellipsoid by entering a value of P.

The Norwegian modified Bessel (in the datum NGO1948): Choose P = 1

The International (in the datum ED50): Choose P = 2

The WGS84 ellipsoid (in the datums EUREF89 and WGS84): Choose P = 3

LEGG INN P: Enter the value of P. Here 3

LEGG INN BREDDEN FOR X-AKSENS NULLPUNKT: Enter the latitude of the origin of the north axis Here 0 (Equator)

LEGG INN GEOGRAFISK LENGDE FOR X-AKSEN: Enter the longitude of the x axis. In this case the point is in UTM zone no 32, and the north axis is 9 degrees east of Greenwich. => Enter 9

LEGG INN GEOGRAFISK BREDDE: Enter the latitude of the actual point

LEGG INN GEOGRAFISK LENGDE: Enter the longitude of the point

HER STARTER....: The computation starts

Results:

X: The north coordinate

Y: The east coordinate

Computing *from* the plane *to* the spheroid is not shown.