

```

/*
File: Running fix.c

Running fix. Advancing celestial circles of position

Fuente:
Dependability of Position Solutions in Celestial Sight-Run-Sight Cases, Part 1.
K. H. Zevering.
THE JOURNAL OF NAVIGATION (2006), 59, 155-166. The Royal Institute of Navigation

Resultado test: NOOK

This file contains proprietary information of Andrés Ruiz Gonzalez

Andrés Ruiz. San Sebastian - Donostia. Gipuzkoa
Copyright (c) 2006
*/

#include <ansi_c.h>
#include "angulos.h"

void RunningFix_RhumblinFormulas( double GHA, double Dec, double R, double d, double
*GHA_t2, double *Dec_t2 )
{
*Dec_t2 = Dec + (d/60)*COS( R );

*GHA_t2 = GHA - (d/60)*SIN( R )/COS( (Dec+*Dec_t2)/2.0 );
}

void RunningFix_CosineFormula( double GHA, double Dec, double R, double d, double
*GHA_t2, double *Dec_t2 )
{
double beta;

*Dec_t2 = ASIN( COS( R )*COS( Dec )*SIN( d/60.0)+SIN( Dec )*COS( d/60.0 ) );

beta = ACOS( (COS( d/60.0 )-SIN( Dec )*SIN( *Dec_t2))/(COS( Dec )*COS( *Dec_t2 )) );
printf( "%.15lf\n", beta );

beta = ASIN( SIN( d/60.0 )*SIN( R )/COS( *Dec_t2 ) );
printf( "%.15lf\n", beta );

*GHA_t2 = GHA - beta;
}

void TestRunningFix(void)
{
double d = 31.5602;
double R = 79.5949;

// GP
double GHA = 15.2600;
double Dec = 19.8730;

// transferred GP
double GHA_t2, Dec_t2;

```

```

printf( "RunningFix:\n" );
RunningFix_RhumblinFormulas( GHA, Dec, R, d, &GHA_t2, &Dec_t2 );
printf( "RhumblinFormulas: GP(t2) = %lf, %lf\n", GHA_t2, Dec_t2 );

RunningFix_CosineFormula( GHA, Dec, R, d, &GHA_t2, &Dec_t2 );
printf( "CosineFormula:      GP(t2) = %lf, %lf\n\n", GHA_t2, Dec_t2 );

// [04/07/2006 20:00:00]
// Lat, Lon = 43.317, -2.000
// Dubhe 56° 39.4' 61° 43.2' 319.5 53° 28.2'

d = 31.5602;
R = 79.5949;

GHA = 56.65666667;
Dec = 61.72;

printf( "RunningFix:\n" );
RunningFix_RhumblinFormulas( GHA, Dec, R, d, &GHA_t2, &Dec_t2 );
printf( "RhumblinFormulas: GP(t2) = %lf, %lf\n", GHA_t2, Dec_t2 );

RunningFix_CosineFormula( GHA, Dec, R, d, &GHA_t2, &Dec_t2 );
printf( "CosineFormula:      GP(t2) = %lf, %lf\n\n", GHA_t2, Dec_t2 );

// [04/07/2006 20:00:00]
// Lat, Lon = 43.317, -2.000
// Alkaid 15° 44.0' 49° 17.1' 307.0 78° 49.0'

d = 31.5602;
R = 79.5949;

GHA = 15.73333333;
Dec = 49.285;

printf( "RunningFix:\n" );
RunningFix_RhumblinFormulas( GHA, Dec, R, d, &GHA_t2, &Dec_t2 );
printf( "RhumblinFormulas: GP(t2) = %lf, %lf\n", GHA_t2, Dec_t2 );

RunningFix_CosineFormula( GHA, Dec, R, d, &GHA_t2, &Dec_t2 );
printf( "CosineFormula:      GP(t2) = %lf, %lf\n\n", GHA_t2, Dec_t2 );

//high altitudes.txt
d = 31.5602;
R = 79.5949;

GHA = 46.372;
Dec = 55.928;

printf( "RunningFix:\n" );
RunningFix_RhumblinFormulas( GHA, Dec, R, d, &GHA_t2, &Dec_t2 );
printf( "RhumblinFormulas: GP(t2) = %lf, %lf\n", GHA_t2, Dec_t2 );

RunningFix_CosineFormula( GHA, Dec, R, d, &GHA_t2, &Dec_t2 );
printf( "CosineFormula:      GP(t2) = %lf, %lf\n\n", GHA_t2, Dec_t2 );

// George Huxtable - Zevering
d = 60.0;
R = 0.0;

GHA = 0;
Dec = 0;

```

```
printf( "RunningFix:\n" );
RunningFix_RhumblinFormulas( GHA, Dec, R, d, &GHA_t2, &Dec_t2 );
printf( "RhumblinFormulas: GP(t2) = %lf, %lf\n", GHA_t2, Dec_t2 );

RunningFix_CosineFormula( GHA, Dec, R, d, &GHA_t2, &Dec_t2 );
printf( "CosineFormula:      GP(t2) = %lf, %lf\n\n", GHA_t2, Dec_t2 );
}
```