# CORDIC Fixed Point Simulation

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This document was produced by using OpenOffice and Octave.

Based on the following site:

drdobbs.com

“Implementing CORDIC Algorithms”, P. Jarvis, Dr Dobb's

ANSI-C version of the above  by P. Knoppers.

# Circular

```
void Circular (long x, long y, long z)
{
  int i;
  X = x;
  Y = y;
  Z = z;
  for (i = 0; i <= fractionBits; ++i)
    {
      x = X >> i;
      y = Y >> i;
      z = atan[i];
      X -= Delta (y, Z);
      Y += Delta (x, Z);
      Z -= Delta (z, Z);
    }
}
```

x ⇨ $x'_{i+1} = \left(x'_i - y'_i\,\sigma_i 2^{-i}\right)$

y ⇨ $y'_{i+1} = \left(x'_i\,\sigma_i 2^{-i} + y'_i\right)$

z ⇨ $\alpha_{i+1} = \alpha_i - \tan\left(\sigma_i 2^{-i}\right)$

x = X >> i; ⇨ $X \cdot 2^{-i}$

y = Y >> i; ⇨ $Y \cdot 2^{-i}$

X -= Delta (y, Z); ⇨ $X = \left(X - Y\,\sigma_i 2^{-i}\right)$

Y += Delta (x, Z); ⇨ $y'_{i+1} = \left(x'_i\,\sigma_i 2^{-i} + y'_i\right)$

# Delta

```
#define Delta(n, Z) (Z >= 0) ? (n) : -(n)
```

$-2\pi$ $-\pi$ $0$ $\pi$ $2\pi$

## References

[1] http://en.wikipedia.org/
[2] “Implementing CORDIC Algorithms”, P. Jarvis, Dr Dobb's
[3] ANSI-C version of [2] by P. Knoppers.