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**Doc No.:** AN-274

**Version:** 1.0

**Date:** 30 April 2012

**Subject:** FILLET Function

## APPLICATION NOTE

### 1. Summary

The FILLET function allows the dimensions of an arc that fillets or blends 2 x 3-D vectors together to be easily calculated. The function calculates the start, end, midpoint and centre of the 3D arc. The arc may easily be converted into motion using the MSPHERICAL command.

### 2. FILLET

The FILLET(data\_in, data\_out, options)

|         |   |  |
|---------|---|--|
| data_in | - | location of the input data in TABLE memory |
| data_in | - | location of the input data in TABLE memory |
| options | - | 0 - unused                                 |

input data: (7 data values required)

x vector A, y vector A, z vector A, x vector B, y vector B, z vector B, radius

output data: (17 data values are output)

x A remain, y A remain, z A remain, end x, end y, end z, mid x, mid y, mid z, centre x, centre y, centre z, error, output radius, x B remain, y B remain, z B remain

A remain: the xyz position of the start of arc relative to the start of the incoming vector

mid: the xyz position of a mid-point on the fillet arc relative to the start of arc

centre: the xyz position of the arc centre relative to the start of arc

error: set to 0 if no error, 1 = one or both vectors is zero length, 2 = vectors are co-linear

output radius: If the vectors are not long enough to allow the requested radius to be filleted (taking into account the options value) the output radius value will show the maximum possible otherwise will reflect the input radius

B remain: the xyz position of the end of the outgoing vector relative to the end of the arc

### 3. EXAMPLE PROGRAM:

```

DEFPOS(150,0,0)
TRIGGER
TABLE(100,-150,0,0)
TABLE(103,50,200,0,70)

FILLET(100,200,0)

xin=TABLE(200):yin=TABLE(201):zin=TABLE(202)

MOVE(xin,yin,zin)

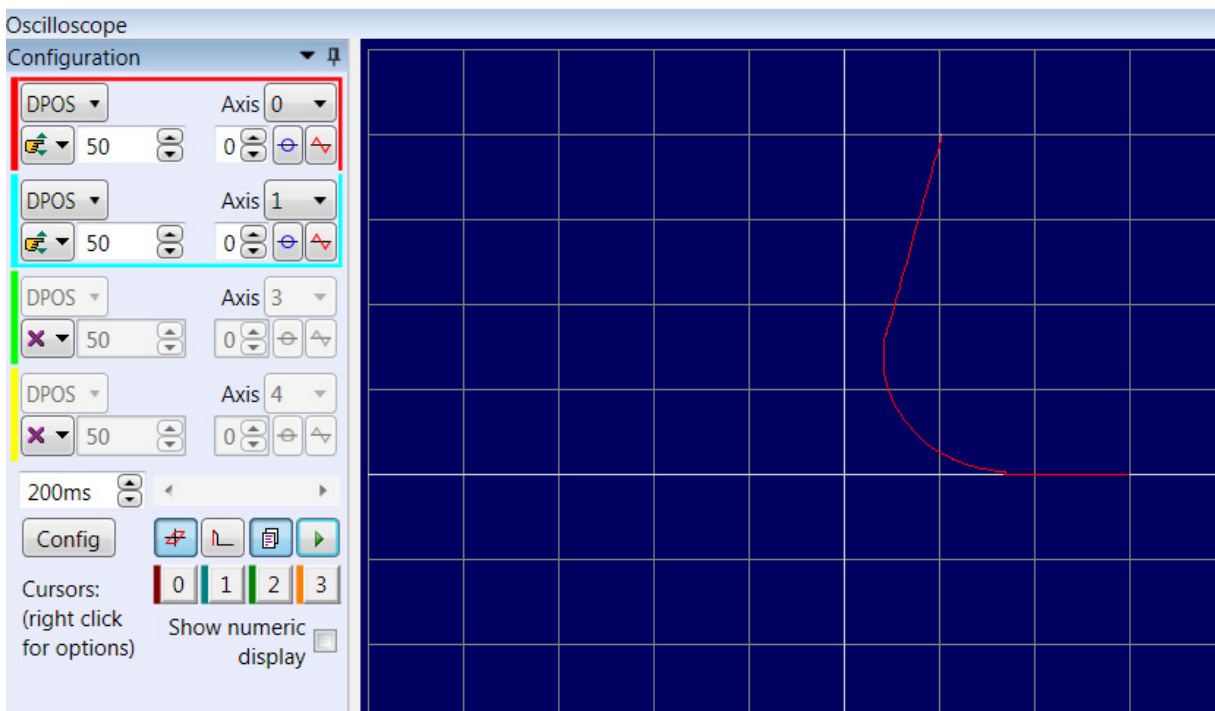
xend=TABLE(203):yend=TABLE(204):zend=TABLE(205)
xmid=TABLE(206):ymid=TABLE(207):zmid=TABLE(208)

MSPHERICAL(xend,yend,zend,xmid,ymid,zmid,0)

xout=TABLE(214):yout=TABLE(215):zout=TABLE(216)

MOVE(xout,yout,zout)

```



## 4. 3D EXAMPLE PROGRAM:

```
DEFPOS(150,0,0)
```

```
TRIGGER
```

```
TABLE(100,-150,0,0)
```

```
TABLE(103,50,200,200,70)
```

```
FILLET(100,200,0)
```

```
xin=TABLE(200):yin=TABLE(201):zin=TABLE(202)
```

```
MOVE(xin,yin,zin)
```

```
xend=TABLE(203):yend=TABLE(204):zend=TABLE(205)
```

```
xmid=TABLE(206):ymid=TABLE(207):zmid=TABLE(208)
```

```
MSPHERICAL(xend,yend,zend,xmid,ymid,zmid,0)
```

```
xout=TABLE(214):yout=TABLE(215):zout=TABLE(216)
```

```
MOVE(xout,yout,zout)
```

