

## Definitions

XP: From external reference to 1PPS in

XO: From 1PPS in to internal reference (i.e. 20 MHz in inverted, delayed by 15.8 ns (Meas 3.1) or 20 MHz out advanced by 2.4 ns (Meas 3.2), first positive zero crossing)

XC, XD: Cables etc... from antenna to receiver (typically XC is long cable, XD is short cable(s) + splitter if needed)

XR: receiver internal delay; XS antenna delay

BIPC values (TM116: June 2002): XR1=281.1 ns; XR2=295.4 ns; XR1+XS1=305.6 ns; XR2+XS2=321.9 ns)

## Set-up at NRC (report December 2003)

### WGS84

	X	Y	Z	1PPS DA to 1PPS in	Meas 3.1 / ns	Meas 3.2 / ns	Ant. Cable / ns
BIPC	1112799.058	-4341500.48	4522927.333	34.0 ns XP =34.0 ns	13.0 ns Int ref - 1PPSin (XO) = 29.2 ns	32.0 ns	XC = 235.9 ns; XD = 5.1 ns Short base: XC+XD = 241.0 ns Zero base: XC+XD = 241.0 ns
NR1C	1112801.42	-4341502.33	4522925.1	50.3 ns XP = 50.3 ns	42.0 ns Int ref - 1PPSin (XO) = 57.8 ns	Not available	Short base: XC = 262.9 ns; XD = 3.9 ns Short base: XC+XD = 266.8 ns Zero base: XC+XD = 239.4 ns (incl. 0.65 ns splitter and 2.88 ns cable)

## Observations

Short base (with splitter BIPC): doy 319-327 (15-23 Nov 2003)

Short base (without splitter): doy ( 2003)

Zero baseline: doy 330-336 (26 Nov - 2 Dec 2003)

## Measurement results

Preliminary: 04/12/2003 with R2CGGTTS (L. Tisserand)

Short base (with splitter BIPC)

Delta (-XP-XO+XR1+XC+XD+XS1) (NR1C - BIPC) = -13.7 ns

Delta (-XP-XO+XR2+XC+XD+XS2) (NR1C - BIPC) = -16.1 ns

Zero baseline

Delta (-XP-XO+XR1+XC+XD) (NR1C - BIPC) = -37.9 ns

Delta (-XP-XO+XR2+XC+XD) (NR1C - BIPC) = -41.5 ns

## Calibration results

Preliminary 11/12/2003 (G. Petit)

Short base (with splitter BIPC)

BIPC: -XP-XO+XR1+XC+XD+XS1 = 483.4 ns

BIPC: -XP-XO+XR2+XC+XD+XS2 = 499.7 ns

NR1C: -XP-XO+XC+XD = 158.7 ns

**Therefore**

**NR1C: XR1+XS1 = 311.0 ns**

**NR1C: XR2+XS2 = 324.9 ns**

Zero baseline

BIPC: -XP-XO+XR1+XC+XD = 458.9 ns

BIPC: -XP-XO+XR2+XC+XD = 473.2 ns

NR1C: -XP-XO+XC+XD = 131.3 ns

**Therefore**

**NR1C: XR1 = 289.7 ns**

**NR1C: XR2 = 300.4 ns**

**Therefore (using short base with splitter)**

**NR1C: XS1 = 21.3 ns**

**NR1C: XS2 = 24.5 ns**

Preliminary: 18/12/2003 with R2CGGTTS (L. Tisserand)

Short base (without splitter BIPC)

Delta (-XP-XO+XR1+XC+XD+XS1) (NR1C - BIPC) = -8.1 ns

Delta (-XP-XO+XR2+XC+XD+XS2) (NR1C - BIPC) = -11.5 ns

Preliminary 06/01/2004 (G. Petit)

Short base (without splitter BIPC)

BIPC: -XP-XO+XR1+XC+XD+XS1 = 478.3 ns

BIPC: -XP-XO+XR2+XC+XD+XS2 = 494.6 ns

NR1C: -XP-XO+XC+XD = 158.7 ns

**Therefore**

**NR1C: XR1+XS1 = 311.5 ns**

**NR1C: XR2+XS2 = 324.4 ns**

**Therefore (using short base without splitter)**

**NR1C: XS1 = 21.8 ns**

**NR1C: XS2 = 24.0 ns**