

GNSS CALIBRATION REPORT

WTZA - WTZS

Prepared by: Uwe Hessels

1. CALIBRATION TRANSFER FROM IF14 TO IF20

From MJD 59018 until 59020 we made a calibration transfer from WTZA (IF14) to WTZS (IF20)
The signal distribution to receivers WTZA and WTZS is illustrated in Figure 1-1.

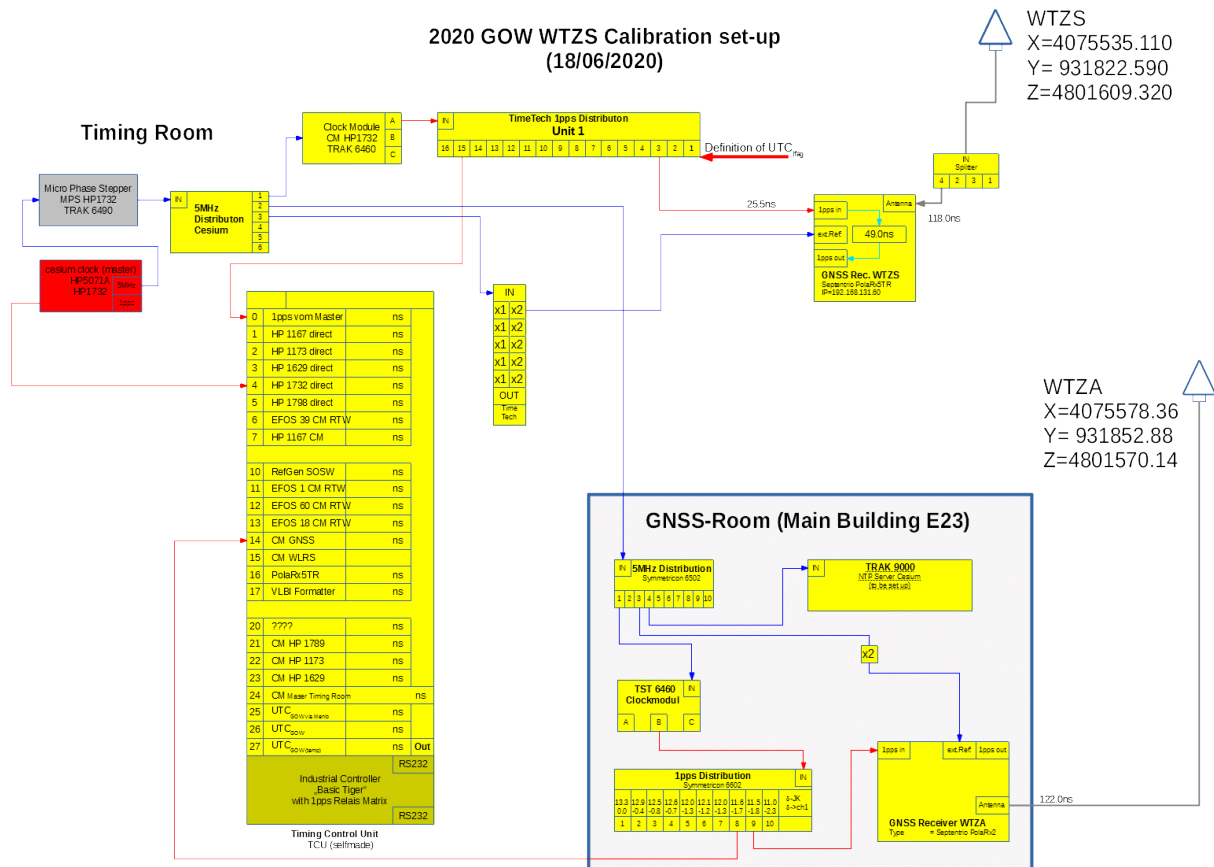


Figure 1-1 Signal distribution at GOW to the receivers WTZA and WTZS

CGGTTS Header of WTZA

CGGTTS GPS/GLONASS DATA FORMAT VERSION = 02
REV DATE = 2002-07-01
RCVR = SEPT POLARX2 1219 2005 2.6.0 R2CGGTTS v5.1
CH = 12 (GPS)
IMS = SEPT POLARX2 1219 2005 2.6.0
LAB = IFAG
X = +4075578.36 m (GPS)
Y = +931852.88 m (GPS)
Z = +4801570.14 m (GPS)
FRAME = ITRF, PZ-90->ITRF Dx = 0.0 m, Dy = 0.0 m, Dz = 0.0 m, ds = 0.0, Rx = 0.0, Ry = 0.0, Rz = 0.000000
COMMENTS = Cal_Id=1016-2017 Frame=ITRF2000
INT DLY = 210.5 ns (GPS P1), 220.5 ns (GPS P2)
CAB DLY = 122.0 ns (GPS)
REF DLY = 221.4 ns
REF = UTC(Ifag)

CGGTTS Header of WTZS

CGGTTS GENERIC DATA FORMAT VERSION = 2E
REV DATE = 2020-01-01
RCVR = PolaRx5TR (5.3.2) SN3022895
CH = 80
IMS = PolaRx5TR
LAB = IFAG
X = 4075535.110 m
Y = 931822.590 m
Z = 4801609.320 m
FRAME = ITRF
COMMENTS = LS=18; EIMask=10deg;
INT DLY = 30.0 ns (GPS P1), 30.0 ns (GPS P2)
CAL_ID = 9999-9999
CAB DLY = 118.0 ns
REF DLY = 74.5 ns
REF = UTC(Ifag)

The previous WTZS receiver, Septentrio PolaRx4TR #3002042, failed in May 2020 and was replaced with an uncalibrated Septentrio PolaRx5TR #3022895 on 26.05.2020.

The a priori internal delays in the PolaRx5TR were set to 30.0 ns.

The PolaRx5TR #3022895 was operated with auto-compensation "off". The internal Delay X0 was determined as 49.0 nsec.

Andreas Bauch from PTB calculated the differences from CGGTTS files from WTZA and WTZS during MJD 59018 and 59020 with the following results:

$$\text{INT DLY} = 30.0 \text{ ns} - 2.122 \text{ ns} = \mathbf{27.878} \text{ ns (GPS P1)}, \quad 30.0 \text{ ns} - 2.025 \text{ ns} = \mathbf{27.975} \text{ ns (GPS P2)}$$

The complete list of delta's for the period of calculation is attached in the file: `deltap_stats_IF14_IF20.txt`.

The above calculated values are the mean of all delta's (P1,P2) during the period of examination.

These results will be validated and corrected during calibration campaign 1014-2020.

WTZA operation at GOW: Receiver WTZS

Laboratory:		Ifag (GOW)	
Date and hour of the beginning of measurements:		2020-06-18 00:00 UTC (59018)	
Date and hour of the end of measurements:		2020-06-20 24:00 UTC (59020)	
Information on the system			
	Local:	Local Reference:	
4-character BIPM code	WTZS IF20	WTZA IF14	
Receiver maker and type:	PolaRx5TR (5.3.2)	PolaRx2 (2.6.0)	
Receiver serial number:	3022895	1219	
1 PPS trigger level /V:			
Antenna cable maker and type:	Ecoflex 15	RG 214	
Phase stabilised cable (Y/N):			
Length outside the building /m:			
Antenna maker and type: Antenna serial number:	Leica AR25.R3 10020020	ASH700936C_M SNOW 12118	
Temperature (if stabilised) /°C	+/- 2	+/- 2	
Measured delays / ns			
	WTZS IF20:	WTZA IF14:	
Delay from local UTC to receiver 1 PPS-in (X_p) / ns	25.5	-3.6	
Delay from 1 PPS-in to internal Reference (if different): (X_o) / ns	49.0	225	
Antenna cable delay: (X_c) / ns	118.0	122.0	
Splitter delay (if any):	0	0	
Additional cable delay (if any):	0	0	
Data used for the generation of CGGTTS files			
	WTZS:	WTZA	
<input type="checkbox"/> INT DLY (or X_R+X_S) (GPS) /ns:	30.0 , 30.0	210.5 , 220.5	
<input type="checkbox"/> INT DLY (or X_R+X_S) (GLONASS) /ns:	30.0 , 30.0	-	
<input type="checkbox"/> INT DLY (or X_R+X_S) (GALILEO) /ns:	30.0 , 30.0	-	
<input type="checkbox"/> CAB DLY (or X_c) /ns:	118.0	122.0	
<input type="checkbox"/> REF DLY (or X_p+X_o) /ns:	74.5	221.4	
<input type="checkbox"/> Coordinates reference frame:	ITRF (WTZS)	ITRF (WTZA)	
X /m:	4075535.110		4075578.36
Y /m:	931822.590		931852.88
Z /m	4801609.320		4801570.14
Antenna Delta H/E/N [m]	0.056 / 0.0 / 0.0		0.077 / 0.0 / 0.0
General information			
<input type="checkbox"/> Rise time of the local UTC pulse:			
<input type="checkbox"/> Is the laboratory air conditioned:	yes		
Set temperature value and uncertainty:	+/- 2 deg		

Delta's for GPS P1 and P2 between IF14 and IF20:

59018.004167	-2.000000	-1.967650
59018.015278	-1.700000	-1.884857
59018.026389	-1.462500	-2.012450
59018.037500	-2.075000	-2.172050
59018.048611	-1.975000	-1.271388
59018.059722	-1.642857	-1.679829
59018.070833	-1.933333	-1.793150
59018.081944	-1.628571	-1.563871
59018.093056	-1.985714	-1.819343
59018.104167	-1.900000	-1.802950
59018.115278	-2.700000	-2.546337
59018.126389	-2.625000	-2.697787
59018.137500	-2.600000	-2.111156
59018.148611	-2.644444	-2.471911
59018.159722	-2.655556	-2.475833
59018.170833	-2.300000	-1.868667
59018.181944	-2.266667	-1.971922
59018.193056	-2.555556	-2.476478
59018.204167	-2.562500	-2.198563
59018.215278	-1.912500	-2.066163
59018.226389	-1.912500	-2.138950
59018.237500	-2.088889	-1.901978
59018.248611	-1.822222	-1.743144
59018.259722	-1.855556	-2.250944
59018.270833	-2.200000	-2.135300
59018.281944	-2.377778	-1.824233
59018.293056	-2.388889	-2.115711
59018.304167	-2.244444	-2.150989
59018.315278	-1.944444	-2.311078
59018.326389	-2.666667	-2.494133
59018.337500	-2.137500	-1.911050
59018.348611	-2.137500	-2.638925
59018.359722	-2.237500	-2.561000
59018.370833	-2.044444	-2.080389
59018.381944	-1.912500	-1.597087
59018.393056	-2.144444	-2.065367
59018.404167	-2.171429	-1.958843
59018.415278	-2.012500	-2.238950
59018.426389	-2.150000	-2.061038
59018.437500	-2.237500	-2.318375
59018.448611	-2.211111	-2.606500
59018.459722	-2.144444	-2.496700
59018.470833	-2.112500	-2.500700
59018.481944	-1.900000	-2.619787
59018.493056	-2.025000	-2.097788
59018.504167	-2.362500	-2.249275
59018.515278	-2.087500	-2.087500
59018.526389	-2.211111	-1.901989
59018.537500	-1.880000	-1.996460
59018.548611	-2.180000	-1.908260
59018.559722	-2.190000	-1.678870
59018.570833	-2.055556	-2.005233
59018.581944	-2.028571	-1.963871
59018.593056	-1.866667	-2.197356
59018.604167	-2.150000	-2.266460
59018.615278	-1.980000	-1.947650
59018.626389	-2.130000	-1.806500
59018.637500	-1.522222	-1.349689
59018.648611	-1.780000	-1.527670
59018.659722	-1.550000	-1.504710
59018.670833	-2.160000	-2.037070
59018.681944	-2.160000	-2.276460
59018.693056	-2.100000	-1.776500
59018.704167	-2.133333	-1.817022
59018.715278	-2.055556	-1.818322
59018.726389	-2.045455	-1.821945
59018.737500	-1.820000	-1.884700
59018.748611	-1.860000	-1.795300
59018.759722	-1.840000	-1.516500
59018.770833	-2.180000	-1.888850
59018.781944	-2.309091	-2.232627
59018.793056	-2.130000	-1.838850
59018.804167	-2.344444	-2.337256



Wir geben Orientierung.

59018.815278	-2.288889	-2.166678
59018.826389	-1.600000	-1.520922
59018.837500	-2.070000	-2.341740
59018.848611	-2.222222	-2.466644
59018.859722	-2.012500	-2.166162
59018.870833	-2.012500	-1.931625
59018.890278	-2.050000	-1.702237
59018.901389	-2.060000	-1.969420
59018.912500	-2.375000	-1.938275
59018.923611	-2.162500	-2.113975
59018.934722	-2.112500	-1.877962
59018.945833	-2.050000	-2.130875
59018.956944	-2.150000	-2.336012
59018.968056	-2.537500	-2.019900
59018.979167	-2.216667	-2.141183
59018.990278	-2.628571	-2.406743
59019.001389	-2.066667	-2.142150
59019.012500	-1.757143	-2.219286
59019.023611	-1.612500	-2.202888
59019.034722	-2.125000	-2.197787
59019.045833	-1.975000	-1.392700
59019.056944	-2.900000	-2.909243
59019.068056	-1.966667	-1.955883
59019.079167	-1.685714	-1.722686
59019.090278	-2.225000	-2.006637
59019.101389	-1.887500	-1.992637
59019.112500	-2.225000	-2.144125
59019.123611	-1.950000	-2.119838
59019.134722	-2.222222	-1.855589
59019.145833	-2.377778	-2.241189
59019.156944	-2.411111	-2.339222
59019.168056	-2.566667	-2.034689
59019.179167	-2.255556	-2.061456
59019.190278	-2.511111	-2.388900
59019.201389	-2.244444	-2.150989
59019.212500	-1.762500	-1.940425
59019.223611	-1.825000	-1.970575
59019.234722	-2.000000	-1.863411
59019.245833	-1.955556	-1.617678
59019.256944	-1.822222	-2.001944
59019.268056	-2.011111	-1.917656
59019.279167	-2.733333	-2.086333
59019.290278	-2.700000	-2.275856
59019.301389	-2.388889	-2.209167
59019.312500	-2.188889	-2.167322
59019.323611	-2.400000	-1.947100
59019.334722	-2.062500	-1.722825
59019.345833	-2.137500	-2.145588
59019.356944	-2.412500	-2.194138
59019.368056	-2.122222	-1.762778
59019.379167	-1.862500	-1.547088
59019.390278	-1.975000	-1.918388
59019.401389	-2.085714	-1.799186
59019.412500	-2.075000	-1.735325
59019.423611	-2.087500	-1.699300
59019.434722	-2.177778	-1.911789
59019.445833	-2.177778	-2.098700
59019.456944	-2.066667	-2.016344
59019.468056	-2.025000	-2.041175
59019.479167	-1.850000	-2.197762
59019.490278	-2.012500	-1.721350
59019.501389	-2.271429	-1.716857
59019.512500	-2.025000	-1.750025
59019.523611	-2.111111	-1.579133
59019.534722	-1.830000	-1.635900
59019.545833	-2.060000	-1.581220
59019.556944	-2.140000	-1.298900
59019.568056	-2.155556	-1.738600
59019.579167	-2.014286	-1.607600
59019.590278	-1.988889	-2.075156
59019.601389	-2.088889	-1.700689
59019.612500	-1.981818	-1.799482
59019.623611	-2.070000	-1.707680
59019.634722	-1.890000	-1.747660
59019.645833	-2.170000	-1.749450
59019.656944	-1.900000	-2.048810



Wir geben Orientierung.

59019.668056	-2.140000	-1.971780
59019.679167	-2.140000	-2.165880
59019.690278	-2.100000	-1.898711
59019.701389	-2.244444	-2.050344
59019.712500	-1.977778	-2.056856
59019.723611	-2.036364	-1.918727
59019.734722	-1.950000	-1.962940
59019.745833	-1.850000	-1.895290
59019.756944	-1.780000	-1.605310
59019.768056	-2.310000	-2.070610
59019.779167	-2.400000	-2.423527
59019.790278	-2.130000	-2.045890
59019.801389	-2.277778	-2.392800
59019.812500	-2.300000	-2.170600
59019.823611	-2.444444	-2.422878
59019.834722	-1.990000	-2.313500
59019.845833	-2.322222	-2.552267
59019.856944	-2.075000	-2.236750
59019.868056	-1.975000	-1.983087
59019.887500	-1.950000	-1.650763
59019.898611	-2.140000	-1.978250
59019.909722	-2.425000	-2.020625
59019.920833	-2.087500	-2.103675
59019.931944	-2.125000	-1.922812
59019.943056	-2.062500	-2.127200
59019.954167	-2.300000	-2.413225
59019.965278	-2.942857	-2.425257
59019.976389	-2.183333	-2.183333
59019.987500	-2.485714	-2.467229
59019.998611	-1.966667	-2.063717
59020.009722	-1.771429	-2.011743
59020.020833	-1.650000	-2.175687
59020.031944	-2.125000	-2.141175
59020.043056	-2.000000	-1.482400
59020.054167	-1.885714	-1.811771
59020.065278	-2.000000	-2.000000
59020.076389	-1.771429	-1.595814
59020.087500	-2.287500	-1.996350
59020.098611	-2.037500	-1.883837
59020.109722	-2.137500	-2.032363
59020.120833	-2.012500	-2.093375
59020.131944	-1.922222	-1.505267
59020.143056	-2.155556	-1.975833
59020.154167	-2.233333	-2.118311
59020.165278	-2.566667	-2.207222
59020.176389	-2.222222	-2.020933
59020.187500	-2.566667	-2.581044
59020.198611	-2.612500	-2.280912
59020.209722	-2.000000	-2.121312
59020.220833	-1.950000	-2.079400
59020.231944	-2.033333	-1.839233
59020.243056	-1.944444	-1.700022
59020.254167	-1.900000	-2.194744
59020.265278	-1.977778	-2.114367
59020.276389	-2.544444	-2.012467
59020.287500	-2.311111	-2.160144
59020.298611	-2.188889	-2.138567
59020.309722	-1.955556	-2.221544
59020.320833	-2.111111	-1.988900
59020.331944	-1.862500	-1.765450
59020.343056	-2.050000	-2.324975
59020.354167	-2.187500	-2.462475
59020.365278	-1.977778	-2.020911
59020.376389	-1.900000	-1.689725
59020.387500	-2.255556	-2.133344
59020.398611	-2.171429	-2.069757
59020.409722	-2.050000	-2.090437
59020.420833	-2.137500	-1.902963
59020.431944	-2.350000	-2.196338
59020.443056	-2.400000	-2.529400
59020.454167	-2.122222	-2.445722
59020.465278	-2.062500	-2.280863
59020.476389	-1.887500	-2.485975
59020.487500	-2.187500	-2.009575
59020.498611	-2.312500	-2.118400
59020.509722	-2.075000	-2.107350

59020.520833	-2.155556	-1.803300
59020.531944	-1.950000	-1.833540
59020.543056	-2.140000	-1.881200
59020.554167	-2.120000	-1.608870
59020.565278	-2.088889	-1.909167
59020.576389	-2.071429	-1.775657
59020.587500	-1.933333	-2.033978
59020.598611	-2.155556	-1.824867
59020.609722	-2.054545	-1.983964
59020.620833	-2.090000	-1.870020
59020.631944	-2.700000	-2.491522
59020.643056	-2.880000	-2.601790
59020.654167	-2.600000	-2.716460
59020.665278	-2.770000	-2.595310
59020.676389	-1.980000	-2.083520
59020.687500	-2.166667	-1.771278
59020.698611	-2.211111	-1.887611
59020.709722	-1.988889	-1.823544
59020.720833	-1.936364	-1.842255
59020.731944	-1.930000	-1.910590
59020.743056	-1.840000	-1.742950
59020.754167	-1.750000	-1.458850
59020.765278	-2.090000	-1.895900
59020.776389	-2.354545	-2.342782
59020.787500	-2.250000	-1.945910
59020.798611	-2.300000	-2.264056
59020.809722	-2.088889	-1.894789
59020.820833	-1.611111	-1.603922
59020.831944	-1.610000	-1.655290
59020.843056	-2.233333	-2.298033
59020.854167	-2.075000	-2.034563
59020.865278	-2.000000	-1.838250
59020.884722	-1.937500	-1.662525
59020.895833	-1.990000	-2.009410
59020.906944	-2.237500	-1.865475
59020.918056	-2.125000	-2.036037
59020.929167	-2.150000	-1.891200
59020.940278	-2.037500	-2.021325
59020.951389	-2.200000	-2.297050
59020.962500	-2.550000	-2.056662
59020.973611	-2.283333	-2.121583
59020.984722	-2.614286	-2.309271
59020.995833	-2.016667	-2.059800

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