

SINEX_BIAS—Solution (Software/technique) INdependent EXchange Format for GNSS Biases Version 1.00

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0. Revision History

0.1. Major Update from V0.01 to V1.00:

- This major update includes generalizations, extensions, and a considerable number of added detailed definitions, descriptions, and examples.
- With this version (1.00), Bias-SINEX was completely decoupled from the SINEX format and corresponding format descriptions. This implies that only format blocks included in this format description are allowed for a Bias-SINEX file of V1.00.
- YY:DDD:SSSS time tags are an essential property of the established SINEX. The previously used 2-digit year tag (YY) was generally replaced by a 4-digit year tag (YYYY) for Bias-SINEX.

1. Foreword and Acknowledgment

In 2011, a preliminary bias data format, called *SINEX_BIAS V0.01*, was proposed by Tim Springer (ESA/ESOC) for handling of GNSS bias estimates as part of the TGVF (Time and Geodetic Validation Facility) and the OVF (Orbit Validation Facility) of Galileo [Springer, 2011]. This format proposal was made on the basis of the *SINEX_TRO Format for combination of TROpospheric estimates Version 0.01* [Gendt, 1997].

The *SINEX_BIAS Format Version 1.00* is the result of a substantial update made on the basis of the *SINEX_BIAS V0.01*. It includes generalizations, extensions, and a considerable number of added detailed definitions, descriptions, and examples. The *SINEX_BIAS* format description document was completely rewritten. The original bias format concept—using the *SINEX* formalism—as formed by Tim Springer is acknowledged.

2. The Philosophy and General Features

2.1. Bias Data Format

In the face of a steadily growing variety of GNSS signals and observables, an adequate data format for GNSS bias products became indispensable.

The files should have a simple, but flexible structure, so that the IGS Analysis Centers (ACs) can format their bias estimates in a straightforward manner as well as users of IGS products can easily read and handle the bias products.

The proposed format is based on syntax elements of the *SINEX* Format [SINEX 2.02]. The following (general) format blocks were taken over from [SINEX 2.02]:

FILE/REFERENCE	(Mandatory)
FILE/COMMENT	(Optional)
INPUT/ACKNOWLEDGMENTS	(Optional)

Dedicated format blocks are defined to provide all necessary information that is directly connected with GNSS bias estimates:

BIAS/DESCRIPTION	(Mandatory)
BIAS/RECEIVER_INFORMATION	(Optional)
BIAS/SOLUTION	(Mandatory)

Other *SINEX* format blocks (than those listed above) are not allowed.

Auxiliary comment lines may be added according to the rules specified in Section 4.5.1. For the clarity sake, beginning and ends of format blocks are preferable.

2.2. Main Features of SINEX_BIAS

The BIAS/SOLUTION format structure of SINEX_BIAS V1.00 does allow the following main features:

- biases are specified for a given time interval of validity, defined by start and end time;
- biases may be augmented by their slope parameters;
- support of biases corresponding to: (i) *system*, (ii) *satellite*, (iii) *receiver*, (iv) *satellite-receiver*, and even (v) biases attributed to (user-defined) *receiver groups*;
- *relative* (differential) or *absolute* (observable-specific) bias parameters.
- consideration of bias parameters with respect to *code* and *phase* observations;

The above listing of features shows a distinct flexibility for handling of any kind of GNSS bias values.

3. SINEX_BIAS File Naming

In the following, we provide a file naming convention for both *short* and *long* filenames. Filenames may be in *uppercase* or in *lowercase*. The filename extension should be: *.BIA* or *.bia* (conforming to the SINEX keyword “BIA” internally used).

3.1. Short Filenames

The SINEX_BIAS files are named:

CCCWWWD.BIA

where

CCC: 3-figure Analysis Center (AC) designator
WWW: GPS week
D: Day of week (0–6) or 7 for a weekly file

Example: COD18646.BIA[.gz]

3.2. Long Filenames

Based on a proposal for a new product naming convention worked out by colleagues from GFZ in analogy with the new RINEX naming scheme, SINEX_BIAS files should be named in the following manner:

The full filename specification is given with:

AAAVPPTTT_YYYYDDHHMM_LEN_SMP_CNT.FMT[.*]

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01-03 AAA 3-char AC name (e.g.: DLR for "Deutsches Zentrum f\r Luft- und Raumfahrt")
04 V 1-char version/solution identifier (here: nominally 0)
05-07 PPP 3-char campaign/project specification (e.g.: MGX)
08-10 TTT 3-char product type specification (FIN=final, RAP=rapid, ULT=ultra-rapid, NRT=near-real-time)
11 _ 1-char separator (underscore)
12-15 YYYY 4-digit year of start epoch
16-18 DDD 3-digit day-of-year of start epoch
19-20 HH 2-digit hour of start epoch (here: 00)
21-22 MM 2-digit minute of start epoch (here: 00)
23 - 1-char separator (underline)
24-26 LEN 2-digits+1-char intended (nominal) product period (units: Y=years, W=weeks, D=days, M=minutes, S=seconds)
      (here: 01D for 1-day)
27 _ 1-char separator (underline)
28-30 SMP 2-digits+1-char sampling interval (units: Y=years, W=weeks, D=days, M=minutes, S=seconds)
      (here: 01D for 1-day)
31 - 1-char separator (underscore)
32-34 CNT 3-char content type (REL or ABS for relative or absolute bias information)
35 . 1-char separator
36-38 FMT 3-char format extension (fixed: BIA)

Optional:
39 . extension
40-XX compression file type (here: ".gz")

```

Example: DLR0MGXFIN_20150010000_01D_01D_REL.BIA.gz

4. SINEX_BIAS Version 1.00—Detail Format Description

4.1. Header and Footer Lines (Mandatory)

Description:

The Header line must be the first line in a SINEX_BIAS file.
The Footer line must be the last line in a SINEX_BIAS file.

Contents:

H_E_A_D_E_R_L_I_N_E		
Field	Description	Format
File Identifier	%=BIA	A5
Format Version	Four digits indicating the version of SINEX_BIAS format used. '1.00' for this version.	1X,F4.2
File Agency Code	Identify the agency creating the SINEX_BIAS file.	1X,A3
Time	Creation time of this SINEX_BIAS file.	1X,I4.4,':', I3.3,':',I5.5
Agency Code	Identify the agency providing the data in the SINEX_BIAS file.	1X,A3
Time	Start time of solution in the this SINEX_BIAS file (see also 'TIME_SYSTEM' descriptor).	1X,I4.4,':', I3.3,':',I5.5
Time	End time of the solution in the this SINEX_BIAS file (see also 'TIME_SYSTEM' descriptor).	1X,I4.4,':', I3.3,':',I5.5
Bias Mode	Declare whether relative ('R') or absolute ('A') bias estimates are	1X,A1

	provided in the SINEX_BIAS solution (must be conform to the 'BIAS_MODE' descriptor).	
Number of Estimates	Number of bias estimates included in the SINEX_BIAS file. Note: Possible slope parameters are not counted. This count thus corresponds to the number of bias parameter lines.	1X,I8.8
		74

F_O_O_T_E_R_L_I_N_E		
Field	Description	Format
File Identifier	%=ENDBIA	A8
		8

4.2. FILE/REFERENCE Block (Mandatory)

Description:

This block provides information on the Organization, point of contact, the software and hardware involved in the creation of the file.

Contents:

F_I_L_E_R_E_F_E_R_E_N_C_E_D_A_T_A_L_I_N_E		
Field	Description	Format
Information Type	Describes the type of information present in the next field. May take on the following values: 'DESCRIPTION' - Organization(s) gathering/altering the file contents. 'OUTPUT' - Description of the file contents. 'CONTACT' - Address of the relevant contact. e-mail 'SOFTWARE' - Software used to generate the file. 'HARDWARE' - Computer hardware on which above software was run. 'INPUT' - Brief description of the input used to generate this solution. Any of the above fields may be and in any order.	1X,A18
Information	Relevant information for the type indicated by the previous field.	1X,A60
		80

4.3. FILE/COMMENT Block (Optional)

Description:

This block can be used to provide general comments about the SINEX data file.

Contents:

F_I_L_E__C_O_M_M_E_N_T__D_A_T_A__L_I_N_E		
Field	Description	Format
Comment	Any general comment providing relevant information about the SINEX file.	1X,A79
		80

4.4. INPUT/ACKNOWLEDGMENTS Block (Optional)

Description:

This block defines the agency codes contributing to the SINEX file.

Contents:

I_N_P_U_T__A_C_K_N_O_W_L_E_D_G_M_E_N_T_S__D_A_T_A__L_I_N_E		
Field	Description	Format
[Agency Code]	Agency(ies) contributing to this SINEX file.	1X,A3
Agency Description	Description of agency code.	1X,A75
		80

4.5. Some General SINEX Syntax Elements

4.5.1. Comment Lines

A comment line (not to be confused with the FILE/COMMENT Block) can be written anywhere within the header and the footer line. All comment lines must start with a “*” in the first column. With the use of this character information can be hidden from the software reading the file without deleting it from the file. A comment line is defined as follows:

C_O_M_M_E_N_T__D_A_T_A__L_I_N_E		
Field	Description	Format
Comment	Any general comment relevant to the SINEX file.	'*',A79
		80

4.5.2. YYYY:DDD:SSSS Time Tags

Please note that time tags are commonly given in a YYYY:DDD:SSSS formatted representation.

Field	Description	Format
Time	YYYY = 4-digit year, DDD = 3-digit day in year, SSSS = 5-digit seconds in day.	I4.4, '.:',I3.3, '.:',I5.5

4.5.3. Floating Number Exponent

For increased portability, the floating number exponent of “E” should be used rather than “D” or “d” which is not recognized by some compiler/installations.

4.6. BIAS/DESCRIPTION Block (Mandatory)

Description:

This block gives important parameters from the analysis and defines the fields in the block 'BIAS/SOLUTION'.

Contents:

BIAS/DESCRIPTION_D_A_T_A_L_I_N_E		
Field	Description	Format
Information Type	Describes the type of information present in the next field. May take on the following values:	1X,A39
	'OBSERVATION_SAMPLING'	
	- Observation sampling interval [sec] used for data analysis. Optional information.	1X,I12
	'PARAMETER_SPACING'	
	- Parameter spacing interval [sec] used for parameter representation. Optional information.	1X,I12
	'DETERMINATION_METHOD'	
	- Determination method used to generate the bias results. Recommended entries are:	1X,A39
	o 'INTRA-FREQUENCY_BIAS_ESTIMATION'	
	(analysis of differences between observables of the same frequency)	
	o 'INTER-FREQUENCY_BIAS_ESTIMATION'	
	(analysis of differences between observables of different frequencies relying on a ionosphere reduction model)	
	Note: Intra-frequency bias parameters are explicitly included here.	
	o 'CLOCK_ANALYSIS'	
	(analyzing the ionosphere-free linear combination)	
	o 'IONOSPHERE_ANALYSIS'	
	(analyzing the geometry-free linear combination)	
	o 'COMBINED_ANALYSIS'	
	(results from both clock	

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|         and ionosphere analysis) |
|         o 'CALIBRATION'          |
|         (hardware calibration)   |
|         o 'COMBINATION'         |
|         (results from a combination |
|         of various bias products) |
| Optional information.            |
| 'BIAS_MODE'                      |
| - The bias mode describes how    | 1X,A39
| the included GNSS bias values   |
| have to be interpreted and      |
| applied, respectively.          |
| Possible modes are:             |
| o 'RELATIVE'                   |
| o 'ABSOLUTE'                   |
| Obviously, this implies that    |
| inclusion of either             |
| o relative (differential) or    |
| o absolute (pseudo-absolute)   |
| GNSS bias values is allowed    |
| in a SINEX_BIAS file.          |
| Note: The bias mode is part     |
| of the SINEX_BIAS header line   |
| (encoded with 'R' or 'A').      |
| Mandatory information.           |
| 'TIME_SYSTEM'                   |
| - The time tags specified in    | 1X,A3
| the BIAS/SOLUTION block have   |
| be given in a common time      |
| system.                         |
| Possible time systems are:      |
| o RINEX GNSS system flag       |
| (e.g. 'G '),                   |
| o 'UTC' for Coordinated        |
| Universal Time,                |
| o 'TAI' for International      |
| Atomic Time.                   |
| Mandatory information.           |
| 'RECEIVER_CLOCK_REFERENCE_GNSS' |
| - Reference GNSS used for      | 1X,A1
| receiver clock estimation.      |
| System code according to       |
| RINEX3 standards.              |
| E.g.: 'G'                      |
| Mandatory if the provided bias  |
| results are consistent with the |
| ionosphere-free LC and if      |
| station biases are included    |
| (else unnecessary).            |
| 'SATELLITE_CLOCK_REFERENCE_OBSERVABLES' |
| - Each involved GNSS,          | 1X,A1,
| - reference code observable of  | 2X,A4,
| the first frequency,           |
| - reference code observable of  | 1X,A4
| the second frequency.          |
| NOTE: Observable codes have    |
| to be declared following       |
| RINEX3 standards.             |
| Supported GNSS are:            |
| G - GPS                        |
| R - GLONASS                    |
| E - Galileo                    |
| J - QZSS                       |
| C - BeiDou                     |
| I - IRNSS                      |
| S - SBAS payload               |
| Data record has to be         |
| repeated for multiple GNSS.    |
| NOTE: In case of biases       |
| considered specific to each    |
| station-satellite link, the   |
| two observable code fields     |
| should be blank.              |
| Mandatory if the provided bias  |
| results are consistent with the |
| ionosphere-free LC            |
| (else unnecessary).            |
|
| Any of the above fields may be |
| and in any order.

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4.7. BIAS/RECEIVER_INFORMATION Block (Optional)

Description:

The satellite bias characteristics may be considerably different among receivers. Therefore, it might make sense to group (for the computation of the satellite biases) the receivers of all involved stations according to a particular assignment scheme. The BIAS/RECEIVER_INFORMATION block may be used to provide a corresponding station list, giving the assignment of each involved station (and each constellation) to the appropriate receiver group.

Contents:

-----BIAS/RECEIVER_INFORMATION_D_A_T_A_L_I_N_E-----		
Field	Description	Format
Station Name Identifier	Station codes are encoded using a 9-character field. NOTE: For backward compatibility, left-aligned 4-character station codes are also permitted. REMARK: Blank station name fields are allowed to assign approximate receiver bias values just on the basis of the involved receiver type and receiver firmware.	1X,A9
Constellation	Constellation code: G - GPS R - GLONASS E - Galileo J - QZSS C - BeiDou I - IRNSS S - SBAS payload A blank field would indicate no constellation dependence.	1X,A1
Receiver Group Identifier	Left-aligned receiver group name with a leading '@' (specific to the given constellation). Mandatory field.	1X,A9
Time	Start time for the assignment of a station to a receiver group.	1X,I4.4, ' ',I3.3, ' ',I5.5
Time	End time for the assignment.	1X,I4.4, ' ',I3.3, ' ',I5.5
Receiver Type	Receiver type (c.f. the naming conventions for IGS equipment descriptions, rcvr_ant.tab) Mandatory field.	1X,A20
Receiver Firmware	Receiver firmware version (preferably left-aligned). Optional field.	1X,A20
		94

Example:

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+BIAS/RECEIVER_INFORMATION
*STATION__ C GROUP_____ DATA_START_____ DATA_END_____ RECEIVER_TYPE_____ RECEIVER_FIRMWARE___
MA00      G @MPO      2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
SINO      G @MPO      2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
SIN1      G @MP1TRI    2015:276:00000 2015:276:86399 TRIMBLE NETR9 5.10
STFU      G @MP1JAV-1 2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
TEST      G @MP1JAV-2 2015:276:00000 2015:276:86399 JAVAD TR_VS 3.6.4
XXYX      G @MP1TRI    2015:276:00000 2015:276:86399 TRIMBLE NETR5 4.93
WTZZ      G @MP_       2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
MA00      E @ALL      2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
SINO      E @ALL      2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
SIN1      E @ALL      2015:276:00000 2015:276:86399 TRIMBLE NETR9 5.10
STFU      E @ALL      2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
TEST      E @ALL      2015:276:00000 2015:276:86399 JAVAD TR_VS 3.6.4
WTZZ      E @ALL      2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
*-----
*LEGEND:   G @MPO      Receivers with disabled multipath (MP) mitigation.
*LEGEND:   G @MP1JAV-1 JAVAD TRE-G3TH receivers with MPNEW MP mitigation enabled.
*LEGEND:   G @MP1JAV-2 JAVAD TRIUMPH receivers with MPNEW MP mitigation enabled.
*LEGEND:   G @MP1TRI    TRIMBLE receivers with Everest MP mitigation enabled.
*LEGEND:   G @MP_       Extra group with unknown MP mitigation mode.
*LEGEND:   E @ALL      No grouping for the indicated system.
*-----
-BIAS/RECEIVER_INFORMATION
*-----
+BIAS/SOLUTION
*BIAS SVN_ PRN STATION__ OBS1 OBS2 BIAS_START_____ BIAS_END_____ UNIT __ ESTIMATED_VALUE_____ _STD_DEV_____ _ESTIMATED_SLOPE_____ _STD_DEV_____
DSB G001 G01 @MPO      C1W C2W 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
DSB G001 G01 @MP1TRI    C1W C2W 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
DSB G001 G01 @MP1JAV-1 C1W C2W 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
DSB G001 G01 @MP1JAV-2 C1W C2W 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
DSB G001 G01 @MP_       C1W C2W 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
DSB G002 G02 @MPO      C1W C2W 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
DSB G002 G02 @MP1TRI    C1W C2W 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
DSB G002 G02 @MP1JAV-1 C1W C2W 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
DSB G002 G02 @MP1JAV-2 C1W C2W 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
DSB G002 G02 @MP_       C1W C2W 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
DSB E001 E01 @ALL      C1X C5X 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
DSB E002 E02 @ALL      C1X C5X 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
-BIAS/SOLUTION
*-----

```

An adequate LEGEND has to be included using auxiliary comment lines. The above example gives an idea how such a LEGEND sequence could be arranged (preferably in a quasi-standardized, human readable format).

Please note that the BIAS/RECEIVER_INFORMATION block is, moreover, usable for specification of the receiver type and receiver firmware in the standard case (without extra receiver grouping):

Example:

```

*-----
+BIAS/RECEIVER_INFORMATION
*STATION__ C GROUP_____ DATA_START_____ DATA_END_____ RECEIVER_TYPE_____ RECEIVER_FIRMWARE___
MA00      2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
SINO      2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
SIN1      2015:276:00000 2015:276:86399 TRIMBLE NETR9 5.10
STFU      2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
TEST      2015:276:00000 2015:276:86399 JAVAD TR_VS 3.6.4
XXYX      2015:276:00000 2015:276:86399 TRIMBLE NETR5 4.93
WTZZ      2015:276:00000 2015:276:86399 JAVAD TRE-G3TH DELTA 3.6.4
-BIAS/RECEIVER_INFORMATION
*-----

```

4.8. BIAS/SOLUTION Block (Mandatory)

Description:

This block contains the GNSS bias estimates for all time intervals.

Contents:

BIAS/SOLUTION_D_A_T_A_L_I_N_E		
Field	Description	Format
BIAS	Bias type identifier. Available types are: 'DSB ': Differential Signal Bias (DSB); 'ISB ': Ionosphere-free (linear combination) Signal Bias (ISB); 'OSB ': Observable-specific Signal Bias (OSB). Mandatory field.	1X,A4
SVN	Satellite SVN code "CNNN": "C" - satellite system flag (according to RINEX3); "NNN" - SVN number (or GLONASS number).	1X,A4
PRN	Satellite PRN code "CNN": "C" - satellite system flag (according to RINEX3); "NN" - PRN number (or GLONASS slot number). IMPORTANT NOTE: To enable an unambiguous association of PRN and SVN numbers, BOTH values must be given if a bias refers to a specific satellite rather than a generic constellation.	1X,A3
Station Name Identifier Identifier	Station codes are encoded using a 9-character field (or a receiver group name). NOTE: For backward compatibility, left-aligned 4-character station codes are also permitted.	1X,A9
OBS1 and OBS2 Observable Codes	Observables used for estimating the biases. The observable codes have to be given according to the RINEX3 format definitions. The OBS2 field remains blank in case of absolute (OSB) estimates. IMPORTANT NOTE: Please be aware that distinction between - code (or pseudorange) and - phase biases is done on the basis of the given GNSS observable codes!	2(1X,A4)
Time	Start time for the bias estimate.	1X,I4.4, ' ','I3.3, ' ','I5.5
Time	End time for the bias estimate.	1X,I4.4, ' ','I3.3, ' ','I5.5
Unit	Bias estimates are given in the specified unit. Unit has to be 'ns' (nanoseconds) for code biases; phase biases may be given in 'cyc' (cycles).	1X,A4
Bias Parameter Estimate	Estimated (offset) value of the bias parameter.	1X,E21.15

Bias Parameter Standard Deviation	Estimated standard deviation for the bias parameter. NOTE: Bias values taken over from an external source should be indicated with a zero value.	1X,E11.6
Slope Estimate	Estimated value of the slope parameter (in ns/n). Optional (else blank).	1X,E21.15
Slope Standard Deviation	Estimated standard deviation for the slope parameter (in ns/s). Optional (else blank).	1X,E11.6
		137

5. General Notes on Bias Handling

5.1. Bias Parameter Representation in the Time Domain

- Biases are specified for a given time interval of validity, defined by start and end time.
- Biases may be augmented by their slope parameters.
- If a slope parameter is specified, the bias is referring to the middle of the given time interval.
- In case of open interval, when end time is indicated as undefined, the bias refers to the start time of the interval.
- In case of open interval, when start time is indicated as undefined, the bias refers to the end time of the interval.
- The unit of the slope has to be ns/s for code biases (or cyc/s for phase biases).

Figure 1 shows the situation with *offsets only* (top) and with *offsets and slopes* (bottom). The bottom subfigure of Figure 1 indicates that, in principle, Bias-SINEX V1.00 would allow to provide bias parameter information *without discontinuities* (at the time interval boundaries).

Finally, it should be obvious that, in the extreme case, provision of epoch bias parameters is possible (by shortening the time intervals accordingly). For an epoch-specific bias product, OBSERVATION_SAMPLING and PARAMETER_SPACING are assumed to be equal.

5.2. Notes on SVN/PRN and STATION Usage in BIAS/SOLUTION Block

The fields SVN/PRN and STATION may be used for coding of biases with four different characteristics:

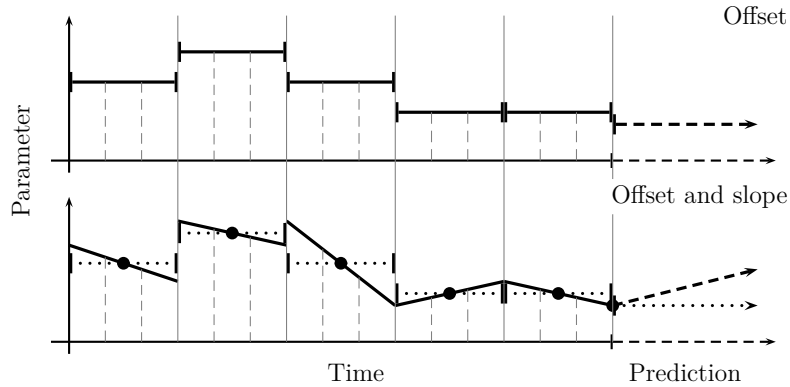


Figure 1: Bias parameter representation *without* (top) and *with* slopes (bottom), as supported by the Bias-SINEX V1.00.

- **Satellite bias:** If a bias depends only on a satellite, SVN/PRN should be filled, STATION may be left empty.
- **Station bias:** If a bias depends only on a station and a particular GNSS, STATION should be filled and SVN/PRN should have the system code only (e.g. “G”, “R”, “E”, “C”).
- **Satellite-station bias:** If a bias depends on both satellite and station, all three fields, SVN/PRN/STATION, should be used.
- **System bias:** If a bias depends only on a particular GNSS, SVN/PRN should have the system code only (e.g. “G”, “R”, “E”, “C”).

Examples for the four cases (listed above) may look like:

```

-----
+BIAS/SOLUTION
*BIAS SVN_ PRN STATION__ OBS1 OBS2 BIAS_START_____ BIAS_END_____ UNIT __ESTIMATED_VALUE_____ _STD_DEV___ __ESTIMATED_SLOPE_____ _STD_DEV___
DSB G063 G01 C1W C1C 2015:276:00000 2015:276:86399 ns 0.148022937908458E+01 .398201E-01
ISB C C ABMF C1I C7I 2015:276:00000 2015:276:86399 ns 0.240909461328850E+02 .835246E+00
ISB R730 R01 AUCC C1P C2P 2015:276:00000 2015:276:86399 ns 0.104868834341878E+02 .101419E+01
ISB G G C1W C2W 2015:276:00000 2015:276:86399 ns 0.000000000000000E+00 .000000E+00
-----

```

5.3. Order of BIAS/SOLUTION Data Records

BIAS/SOLUTION data records may be listed in any arbitrary order. However, we recommend to list the included bias parameters starting with those responding to (i) system, (ii) satellite, (iii) receiver, (iv) satellite-receiver, (v) other. Furthermore, to keep the bias parameters in chronological (and alphabetical) order may be helpful.

5.4. Definition of GNSS Receiver Groups

The need for a possibility to define *receiver groups* (or families) came up during the discussions at the IGS Bias Workshop 2015. In order to handle satellite bias information specific to individual receiver (or station) groups, a dedicated (optional) SINEX block, BIAS/RECEIVER_INFORMATION, was added to Bias-SINEX V1.00.

If receivers are distinguished not for all constellations, then one could introduce either (a) an accumulative group name (e.g. “All”) or (b) no group for such constellations. For better readability, variant (a) should be preferred.

Even though the SINEX_BIAS Format would allow to describe a *residual* satellite bias parameter, $\delta B_{\text{satellite}(\text{receiver_group})}$, following

$$B_{\text{total}} = B_{\text{satellite}} + \delta B_{\text{satellite}(\text{receiver_information})} + B_{\text{receiver}}, \quad (1)$$

the above given bias parameter representation should be avoided (as the separation of all components may become rather complicated). Based on receiver-group-specific satellite bias parameters, $B_{\text{satellite}(\text{receiver_group})}$, the total bias, B_{total} , should be represented as follows:

$$B_{\text{total}} = B_{\text{satellite}(\text{receiver_group})} + B_{\text{receiver}}. \quad (2)$$

6. Basic Definitions and Rules Concerning GNSS Biases

6.1. Sign Convention

The following sign convention is used for bias values:

$$\text{bias} = \text{observation} - \text{true (or unbiased) observation} \quad (3a)$$

$$\text{observation} = \text{true observation} + \text{bias} \quad (3b)$$

$$\text{true observation} = \text{observation} - \text{bias} \quad (3c)$$

Numerical example: ground truth 11, observed 7, bias (or error) -4 .

6.2. Bias Arithmetics

In the following, B is used to address a bias value (or parameter). O denotes an observation value.

6.2.1. Basic Bias Equation

Using this notation, we may write:

$$\tilde{O}_{\text{true}} = O_{\text{observed}} - B. \quad (4)$$

6.2.2. Satellite and Receiver Bias Components (and Total Bias)

The **total bias** (or overall bias), if a separation into a satellite component, $B_{\text{satellite}}$, and into a receiver component, B_{receiver} , is assumed, is defined as follows:

$$B_{\text{total}} = B_{\text{satellite}} + B_{\text{receiver}} \quad (5)$$

6.2.3. GNSS Signal Bias

We use the following notation to address a GNSS signal bias:

$$B_{(\text{constellation,observable})} \quad (6)$$

For example, $B_{(\text{G,C1W})}$ would correspond to a bias for the GPS (G) code (C) first-frequency (1) W-tracking (W) observable.

6.3. Three Types of Signal Biases

We distinguish between three types of signal biases:

- **Observable-specific Signal Bias**, labeled with **OSB**, or $B_{\text{O}(\text{constellation,observable})}$;
- **Differential Signal Bias**, labeled with **DSB**, or $B_{\text{D}(\text{constellation,observable1,observable2})}$;
- **Ionosphere-free linear combination Signal Bias**, or simply **Ionosphere-free Signal Bias**, labeled with **ISB**, or $B_{\text{I}(\text{constellation,observable1,observable2})}$.

The originally used term “Code” (present in the widely used acronym DCB) was replaced by “Signal” (thus leading to DSB) as the SINEX_BIAS Format now also covers biases with respect to phase observations. The term “Signal” may be used to address both code and phase observations and biases, respectively.

For consistency reasons, the term “ionosphere-free (linear combination) Signal Bias” (ISB) was introduced. This ISB may be interpreted as a generalization of the widely established “Inter-System Bias” (also abbreviated with ISB). Following the new, generalized ISB interpretation, a satellite bias component is also admitted by our bias model (in addition to the station bias component as described by the existing ISB interpretation). This means that a station ISB may be interpreted—independently of the terminology complied with—still in the same way.

6.3.1. Differential Signal Bias (DSB)

A Differential Signal Bias corresponds to the difference of two Signal Biases (that are commonly inaccessible in the absolute sense). An example for a DSB is:

$$B_{\text{D}(\text{G,C1W,C1C})} = B_{(\text{G,C1W})} - B_{(\text{G,C1C})} \quad (7)$$

Using Equation (7), we may show that direct estimation of $B_{D(G,C1W,C1C)}$ is possible by analyzing the difference of $O_{(G,C1W)}$ and $O_{(G,C1C)}$ observation data:

$$B_{D(G,C1W,C1C)} = (O_{(G,C1W)} - \tilde{O}_{(G,C1)}) - (O_{(G,C1C)} - \tilde{O}_{(G,C1)}) = O_{(G,C1W)} - O_{(G,C1C)} \quad (8)$$

where $\tilde{O}_{(G,C1)}$ is used to denote the true (or unbiased) observations.

Such a DSB correction may be applied in the following way:

$$O_{(G,C1W)} = O_{(G,C1C)} + B_{D(G,C1W,C1C)} \quad (9)$$

Differential Signal Biases between different signal frequencies are, of course, also foreseen, e.g.:

$$B_{D(G,C1W,C2W)} = B_{(G,C1W)} - B_{(G,C2W)}. \quad (10)$$

6.3.2. Ionosphere-free Signal Bias (ISB)

The Ionosphere-free Signal Bias (ISB) has to be interpreted as

$$B_{I(G,C1W,C2W)} = \kappa_1 B_{(G,C1W)} + \kappa_2 B_{(G,C2W)}, \quad (11)$$

where κ_1 and κ_2 are the two factor used for the computation of the ionosphere-free linear combination. To be more specific, $\kappa_1 = \nu_1^2/(\nu_1^2 - \nu_2^2) = 2.546$, $\kappa_2 = -\nu_2^2/(\nu_1^2 - \nu_2^2) = -1.546$ (for GPS); ν_i is the frequency of the i -th carrier. GPS C1W and C2W observables are assumed in this example.

6.3.3. Observable-specific Signal Bias (OSB)

Using Equations (11) and (10) we may write the following equation system:

$$B_{I(G,C1W,C2W)} = \kappa_1 B_{O(G,C1W)} + \kappa_2 B_{O(G,C2W)} \quad (12a)$$

$$B_{D(G,C1W,C2W)} = B_{O(G,C1W)} - B_{O(G,C2W)} \quad (12b)$$

The first equation describes the relationship of the Observable-specific Signal Biases (OSBs), $B_{O(G,C1W)}$ and $B_{O(G,C2W)}$, for the ionosphere-free case (clock analysis), the second equation in accordance with the geometry-free case (ionosphere analysis). The equation system describes the parameter transformation from OSB to ISB/DSB bias representation.

The inverse parameter transformation, from differential (relative) ISB/DSB to observable-specific (pseudo-absolute) OSB, may be derived by inversion of the matrix specified above:

$$B_{O(G,C1W)} = B_{I(G,C1W,C2W)} + \kappa_2 B_{D(G,C1W,C2W)} \quad (13a)$$

$$B_{O(G,C2W)} = B_{I(G,C1W,C2W)} - \kappa_1 B_{D(G,C1W,C2W)}. \quad (13b)$$

Let us give a numerical example. The following OSB values, $B_{O(G,C1W)} = +10.73$ ns and $B_{O(G,C2W)} = +15.73$ ns, are conform to the following ISB/DSB values, $B_{I(G,C1W,C2W)} = +3$ ns and $B_{D(G,C1W,C2W)} = -5$ ns.

For a user, consideration of an OSB bias correction would be very convenient, as just the observable type has to be known, e.g.:

$$O_{(G,C1(\text{ref}))} = O'_{(G,C1)} = O_{(G,C1C)} - B_{O(G,C1C)}, \quad (14)$$

where, assuming GPS C1W/C2W reference observables, $O'_{(G,C1)} = O_{(G,C1W)} - B_{O(G,C1W)}$.

A reader of this document should be aware of the fact that GNSS Signal Biases are commonly inaccessible in the *absolute* sense. This implies that, taking the example with $B_{O(G,C1C)}$, $B_{O(G,C1C)} \neq B_{(G,C1C)}$, meaning that that any OSB, B_O , may be expected to be shifted by an arbitrary offset, ΔB , with respect to the (commonly unavailable and thus unknown) true bias, B :

$$B = B_O + \Delta B. \quad (15)$$

Therefore, Observable-specific Signal Biases B_O have to be interpreted as *pseudo-absolute* bias information.

The same is obviously also valid for: $O' \neq \tilde{O}$. To be more specific, OSB-corrected observations are **not** conforming with true observations, meaning that, for the above chosen example, $O'_{(G,C1)} \neq \tilde{O}_{(G,C1)}$.

Important Notes:

For *pseudo-absolute* bias values, the selection of the reference observables is absolutely essential.

- **Pro:** A user may just consider bias correction values specific to the given observable types.
- **Con:** OSB-corrected observations are consistent to the original definition of the reference observables—and, consequently, consistent to a GNSS clock product relying on the same definition.

6.4. GPS Group Delay

It is worth mentioning that Equation (13a) actually corresponds to the relationship between the interfrequency “group delays,” τ_{GD} , broadcast by the GPS system and the interfrequency satellite DSB, $B_{(G,C1W,C2W)}$:

$$\tau_{GD} = \kappa_2 B_{(G,C1W,C2W)} + \tau_0. \quad (16)$$

There may be an arbitrary offset, indicated by τ_0 . Consequently, the size of τ_{GD} corresponds to the single-frequency pseudorange correction according to Equation (13a) (strictly speaking only for $O_{(G,C1W)}$, not for $O_{(G,C1C)}$ observations, assuming GPS satellite clock information being consistent to $B_{I(G,C1W,C2W)} = 0$).

6.5. Datum Definition for ISB Bias Parameters in Multi-GNSS Clock Analysis

ISB bias parameters of more than one GNSS considered are directly connected with respect to each other. A clear definition of the ISB bias datum is therefore needed. As a consequence of this, we suggest that those receiver ISB bias parameters which are assumed to be zero must be explicitly included and listed in a SINEX_BIAS file (see, e.g., Examples 0, 2B, 3B, 4B, 5, 7B). Note that this should concern all ISB bias parameters with respect to the given “RECEIVER_CLOCK_REFERENCE_GNSS” and stations/receivers with the given “SATELLITE_CLOCK_REFERENCE_OBSERVABLES” (of that reference system). Last but not least, we may argue that the inclusion of “zero-valued”, or “reference” receiver ISB bias parameters is not only a cosmetic issue. To have corresponding “reference” observable codes available (for the respective observation pair used) and to see whether a respective observation pair was actually used, respectively, are strong reasons that legitimate this requirement (of inclusion).

There seems to be no necessity for an inclusion of corresponding “reference” satellite ISB bias parameters. Nevertheless, the provision of corresponding satellite ISB information in SINEX_BIAS is self-evident and, therefore, actually may be strongly recommended—as the datum definition as imposed on the bias solution then becomes crystal-clear to a user of such a bias product. This is achieved, by the way, for all satellite ISB involving examples included in Appendix A (Examples 1B, 2B, 3B, 4B, 5, 7B).

6.6. GPS Observables From Cross-Correlation Receivers in RINEX2 and CC2NONCC

Cross-correlation receivers (or simply CC-receivers) provide under Antispoofing (AS) a particular code (or pseudorange) observable for the second frequency. Using the RINEX2 notation, the recorded observable, here called P2’, may be written as:

$$P2' = C1 + (P2 - P1) \quad (17)$$

However, such observables are labeled in RINEX2 observation files with P2 (in RINEX3 unambiguously with C2D). It is therefore necessary to apply corresponding DSB corrections to C1 and P2’ (in order to make them consistent to P1 and P2):

$$P1 = C1 + B_{P1-C1} \quad (18a)$$

$$P2 = P2' + B_{P1-C1} \quad (18b)$$

where B_{P1-C1} denotes the satellite P1-C1 DSB information (as provided, e.g. by CODE [Schaer, 2001]).

CC2NONCC, originally developed by Jim Ray, was a RINEX2 observation conversion utility for exactly this (P1-C1) bias correction. This utility program should no longer be used. P1-C1 bias information should be considered directly by the analysis software.

It should be emphasized that IGS ACs processing RINEX2 observation files (e.g. as part of a reprocessing effort) are actually forced to consider the list of concerned CC-receivers from a separate metadata file.

The list of known cross-correlation (CC) receivers (following the IGS naming convention as given in `rcvr_ant.tab`) includes:

```
AOA ICS-4000Z
ROGUE SNR-12
ROGUE SNR-12 RM
ROGUE SNR-8
ROGUE SNR-800
ROGUE SNR-8000
ROGUE SNR-8100
ROGUE SNR-8C
SPP GEOTRACER100
TOPCON GP-DX1
TOPCON TT4000SSI
TRIMBLE 4000SSE
TRIMBLE 4000SSI
TRIMBLE 4000SST
```

When using a wildcard character “*”, the CC-receiver list may be reduced to:

```
AOA ICS-4000Z
ROGUE*
SPP GEOTRACER100
TOPCON GP-DX1
TOPCON TT4000SSI
TRIMBLE 4000S*
```

CC-receivers behave differently if Antispoofing (AS) is turned off. Instead of C1/P2’, P1/P2 may be expected. For this reason, a list of AS-free periods might be useful (especially for reprocessings):

```
! Check whether time argument in a AS-free period
! -----
IF ((mjd > 0d0 .AND. mjd < 49383.00000d0) .OR. &
(mjd > 49826.87499d0 .AND. mjd < 49847.83334d0) .OR. &
(mjd > 49886.99999d0 .AND. mjd < 49909.00002d0) .OR. &
(mjd > 49999.99999d0 .AND. mjd < 50022.00001d0) .OR. &
(mjd > 50480.99999d0 .AND. mjd < 50503.00000d0)) THEN
  asmode = 0
ENDIF
```

7. How to Use a SINEX_BIAS File?

(Here, a corresponding section will be added, summarizing the most important steps when using the information from a SINEX_BIAS file.)

8. Additional Remarks

8.1. “_X” Observable Issue

RINEX3 includes a clear definition of 3-character observable codes with respect to each supported GNSS system. However, one may have a suspicion that some receiver manufacturer misuse the third character of the corresponding RINEX3 observable code, i.e., they give an “X”, independent of the tracking mode that was effectively used.

It will be one of the tasks for the IGS Bias and Calibration Working Group (BCWG) to identify such cases of misuse.

8.2. How to handle known GNSS observables with unknown tracking mode?

In the extreme case, one could think about treating affected observables in a **receiver-group** or even in a **GLONASS-like** mode, where pseudorange biases are treated **satellite-receiver-group-specific** and **satellite-receiver-specific**, respectively.

References

- Gendt, G. (1997): *SINEX_TRO—Solution (Software/technique) INdependent EXchange Format for combination of TROpospheric estimates Version 0.01*, March 1, 1997: https://igscb.jpl.nasa.gov/igscb/data/format/sinex_tropo.txt
- Ray, J. (2001): *Updated P1-C1 pseudorange bias corrections*, IGSMail #3160, January 5, 2001.
- Ray, J. (2002): *C1/P1 biases for Leica and Trimble 5700 receivers*, IGSMail #3737, February 13, 2002.
- RINEX: The Receiver Independent Exchange Format Version 3.03*:
<ftp://igscb.jpl.nasa.gov/igscb/data/format/rinex303.pdf>
- RINEX Extensions to Handle Clock Information Version 3.00/3.02*:
ftp://igscb.jpl.nasa.gov/igscb/data/format/rinex_clock300.txt
ftp://igscb.jpl.nasa.gov/igscb/data/format/rinex_clock302.txt
- SINEX—Solution (Software/technique) INdependent EXchange Format Version 2.02*:
<http://www.iers.org/IERS/EN/Organization/AnalysisCoordinator/analysis.html>
- Schaer, S. (2001): *CODE DCB archive initiated*, IGSMail #3212, February 23, 2001.
- Schaer, S. (2002): *TRIMBLE 4700*, IGSMail #3887, May 18, 2002.
- Schaer, S. (2012): *From differential to absolute code biases*. Workshop on GNSS Biases, Uni Bern, 18–19 January 2012.

Schaer, S. (2014): *Biases Relevant to GPS and GLONASS Data Processing*. IGS Workshop 2014, June 26, Pasadena, California, USA.

Springer, T. (2011): *SINEX_BIAS—Solution (Software/technique) INdependent EXchange Format for GNSS Biases Version 0.01*, June 29, 2011.

Appendix A Examples for Submissions of Bias Estimates in Bias-SINEX V1.00

The Bias-SINEX V1.00 example files included in extracts in this appendix may be shortly characterized as follows:

- EXAMPLE_0.BIA:** 2-GNSS (G/E) receiver ISB product from **clock analysis**.
- EXAMPLE_1A.BIA:** 2-GNSS (G/R) satellite OSB product from combined (clock and ionosphere) analysis.
- EXAMPLE_1B.BIA:** 2-GNSS (G/R) satellite ISB/DSB product from combined (clock and ionosphere) analysis.
- EXAMPLE_2A.BIA:** 2-GNSS (G/R) satellite and receiver OSB product from combined (clock and ionosphere) analysis.
- EXAMPLE_2B.BIA:** 2-GNSS (G/R) satellite and receiver ISB/DSB product from combined (clock and ionosphere) analysis.
- EXAMPLE_3A.BIA:** 2-GNSS (G/R) satellite and receiver OSB product from combined (clock and ionosphere) analysis (using a refined bias model for GLONASS).
- EXAMPLE_3B.BIA:** 2-GNSS (G/R) satellite and receiver ISB/DSB product from combined (clock and ionosphere) analysis (using a refined bias model for GLONASS).
- EXAMPLE_4A.BIA:** 4-GNSS (G/R/E/C) satellite and receiver OSB product from combined (clock and ionosphere) analysis.
- EXAMPLE_4B.BIA:** 4-GNSS (G/R/E/C) satellite and receiver ISB/DSB product from combined (clock and ionosphere) analysis.
- EXAMPLE_5.BIA:** 4-GNSS (G/R/E/C) satellite and receiver ISB/DSB product from **clock analysis**.
- EXAMPLE_6.BIA:** 4-GNSS (G/R/E/C) satellite and receiver DSB product from **ionosphere analysis**.
- EXAMPLE_7A.BIA:** 4-GNSS (G/R/E/C) satellite and receiver OSB product from combined (clock and ionosphere) analysis (using a refined bias model for GLONASS).
- EXAMPLE_7B.BIA:** 4-GNSS (G/R/E/C) satellite and receiver ISB/DSB product from combined (clock and ionosphere) analysis (using a refined bias model for GLONASS).
- EXAMPLE_8.BIA:** 4-GNSS (G(R)/E/C) satellite and receiver DSB product from **inter-frequency** (and intra-frequency) **bias estimation** (computed at DLR).

All examples included in this appendix are available as plain text files at:

<ftp://ftp.aiub.unibe.ch/bcwg/format/examples/>

Note that all *relative* (DSB/ISB) bias examples provided by CODE are directly derived from *absolute* (OSB) bias files. No further transformations with respect to datum definition are applied.

A.1 Example 0: Original Bias-SINEX V0.01 Example Updated to V1.00 Standards

```

%=BIA 1.00 PF2 2011:180:59736 PF2 2011:113:86385 2011:114:86385 R 00000024
*-----
* Bias Solution INdependent EXchange Format (Bias-SINEX)
*-----
+FILE/REFERENCE
REFERENCE FRAME      IGS08
DESCRIPTION          European Space Operation Center (ESOC)
INPUT                ESOC solutions in normal equation format
OUTPUT               ESOC solutions in Bias-SINEX format
CONTACT              Tim.Springer@esa.int.nospam
HARDWARE             Linux dgnl2 2.6.27.19-5-default #1 SMP 2009-02-28 04:40:21
SOFTWARE             Napeos 3.6 TAS 07/06/2011
-FILE/REFERENCE
*-----
+BIAS/DESCRIPTION
*KEYWORD_____ VALUE(S)_____
OBSERVATION_SAMPLING          300
PARAMETER_SPACING             86400
DETERMINATION_METHOD          CLOCK_ANALYSIS
BIAS_MODE                      RELATIVE
TIME_SYSTEM                   G
RECEIVER_CLOCK_REFERENCE_GNSS G
SATELLITE_CLOCK_REFERENCE_OBSERVABLES G C1W C2W
SATELLITE_CLOCK_REFERENCE_OBSERVABLES E C1C C7Q
-BIAS/DESCRIPTION
*-----
+BIAS/SOLUTION
*BIAS SVN_ PRN STATION__ OBS1 OBS2 BIAS_START_____ BIAS_END_____ UNIT __ ESTIMATED_VALUE_____ _STD_DEV___ _ESTIMATED_SLOPE_____ _STD_DEV___
ISB G G GIEN C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB G G GKIR C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB G G GKOU C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB G G GLPG C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB G G GMAL C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB G G GMIZ C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB G G GNNO C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB G G GNOR C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB G G GOUS C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB G G GTHY C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB G G GUSN C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB G G GVES C1W C2W 2011:113:86385 2011:115:00285 ns 0.000000000000000E+00 .000000E+00
ISB E E GIEN C1C C7Q 2011:113:86385 2011:115:00285 ns -.157174143960592E+03 .259286E+02
ISB E E GKIR C1C C7Q 2011:113:86385 2011:115:00285 ns -.153942459345551E+03 .259286E+02
ISB E E GKOU C1C C7Q 2011:113:86385 2011:115:00285 ns -.163243805130824E+03 .259285E+02
ISB E E GLPG C1C C7Q 2011:113:86385 2011:115:00285 ns -.151698143836368E+03 .259290E+02
ISB E E GMAL C1C C7Q 2011:113:86385 2011:115:00285 ns -.156472089904428E+03 .259285E+02
ISB E E GMIZ C1C C7Q 2011:113:86385 2011:115:00285 ns -.167156432084244E+03 .259321E+02
ISB E E GNNO C1C C7Q 2011:113:86385 2011:115:00285 ns -.156922861008147E+03 .259665E+02
ISB E E GNOR C1C C7Q 2011:113:86385 2011:115:00285 ns -.153679440866705E+03 .259285E+02
ISB E E GOUS C1C C7Q 2011:113:86385 2011:115:00285 ns -.101593337222667E+03 .259439E+02
ISB E E GTHY C1C C7Q 2011:113:86385 2011:115:00285 ns -.159918985571303E+03 .259356E+02
ISB E E GUSN C1C C7Q 2011:113:86385 2011:115:00285 ns -.149146613879327E+03 .259279E+02
ISB E E GVES C1C C7Q 2011:113:86385 2011:115:00285 ns -.156221372596643E+03 .259288E+02
-BIAS/SOLUTION
*-----
%=ENDBIA

```


A.2 Example 1: GPS/GLONASS 30-Day Bias Results for the Satellite Constellations

Please note that the duplicated entries for GLONASS satellite R802/R09 are due to a frequency switch that took place during this particular 30-day period.

A.2.1 Example 1A: GPS/GLONASS 30-Day Bias Results Using Absolute Parameter Representation

```

%=BIA 1.00 COD 2016:327:30548 IGS 2016:296:00000 2016:333:00000 A 00000194
*-----
* Bias Solution INdependent EXchange Format (Bias-SINEX)
*-----
* CODE'S 30-DAY BIAS SOLUTION (OBSERVED UNTIL 2016:325)          22-NOV-16 08:28
*-----
+FILE/REFERENCE
+INFO_TYPE_          INFO_-----
DESCRIPTION          CODE, Astronomical Institute, University of Bern
OUTPUT               CODE IGS 30-day bias solution for G/R satellites
CONTACT              code@aiub.unibe.ch
SOFTWARE              Bernese GNSS Software Version 5.3
HARDWARE              UBELIX: Linux, x86_64
INPUT                CODE IGS 1-day final and rapid bias solutions for G/R
-FILE/REFERENCE
*-----
+FILE/COMMENT
+PRODUCT_REFERENCE_-----
CODE final product series for the IGS.
Published by Astronomical Institute, University of Bern.
URL: http://www.aiub.unibe.ch/download/CODE
DOI: 10.7892/boris.75876
-FILE/COMMENT
*-----
+INPUT/ACKNOWLEDGMENTS
+AGY DESCRIPTION_-----
COD Center for Orbit Determination in Europe, AIUB, Switzerland
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS
*-----
+BIAS/DESCRIPTION
+KEYWORD_          VALUE(S)-----
OBSERVATION_SAMPLING          300
PARAMETER_SPACING              86400
DETERMINATION_METHOD          COMBINED_ANALYSIS
BIAS_MODE                      ABSOLUTE
TIME_SYSTEM                    G
SATELLITE_CLOCK_REFERENCE_OBSERVABLES  G  C1W  C2W
SATELLITE_CLOCK_REFERENCE_OBSERVABLES  R  C1P  C2P
-BIAS/DESCRIPTION
*-----
+BIAS/SOLUTION
+BIAS SVN_ PRN STATION__ OBS1 OBS2 BIAS_START_____ BIAS_END_____ UNIT __ESTIMATED_VALUE_____ _STD_DEV____ _ESTIMATED_SLOPE_____ _STD_DEV____
OSB G063 G01          C1C          2016:296:00000 2016:333:00000 ns          10.2472          0.0062
OSB G063 G01          C1W          2016:296:00000 2016:333:00000 ns          11.6848          0.0052
OSB G063 G01          C2C          2016:296:00000 2016:333:00000 ns          10.4707          0.0218
OSB G063 G01          C2W          2016:296:00000 2016:333:00000 ns          19.2442          0.0066
OSB G061 G02          C1C          2016:296:00000 2016:333:00000 ns          -12.8012         0.0063
OSB G061 G02          C1W          2016:296:00000 2016:333:00000 ns          -14.0674         0.0052
OSB G061 G02          C2W          2016:296:00000 2016:333:00000 ns          -23.1682         0.0067
OSB G069 G03          C1C          2016:296:00000 2016:333:00000 ns           6.6195          0.0062
OSB G069 G03          C1W          2016:296:00000 2016:333:00000 ns           7.9813          0.0052
OSB G069 G03          C2C          2016:296:00000 2016:333:00000 ns           6.8733          0.0216
OSB G069 G03          C2W          2016:296:00000 2016:333:00000 ns          13.1448          0.0066
...
OSB G064 G30          C1C          2016:296:00000 2016:333:00000 ns          10.2746          0.0062
OSB G064 G30          C1W          2016:296:00000 2016:333:00000 ns           9.8828          0.0051
OSB G064 G30          C2C          2016:296:00000 2016:333:00000 ns           9.9357          0.0226
OSB G064 G30          C2W          2016:296:00000 2016:333:00000 ns          16.2764          0.0065
OSB G052 G31          C1C          2016:296:00000 2016:333:00000 ns           -8.0699         0.0063
OSB G052 G31          C1W          2016:296:00000 2016:333:00000 ns           -7.1540         0.0052
OSB G052 G31          C2C          2016:296:00000 2016:305:00000 ns          -19.1332         0.0598
OSB G052 G31          C2W          2016:296:00000 2016:333:00000 ns          -11.7822         0.0067
OSB G070 G32          C1C          2016:296:00000 2016:333:00000 ns           5.3363          0.0063
OSB G070 G32          C1W          2016:296:00000 2016:333:00000 ns           6.8952          0.0052
OSB G070 G32          C2C          2016:296:00000 2016:333:00000 ns           4.9872          0.0246

```

OSB G070 G32	C2W	2016:296:00000	2016:333:00000	ns	11.3560	0.0066
OSB R730 R01	C1C	2016:296:00000	2016:333:00000	ns	8.9156	0.0071
OSB R730 R01	C1P	2016:296:00000	2016:333:00000	ns	9.0864	0.0055
OSB R730 R01	C2P	2016:296:00000	2016:333:00000	ns	15.0203	0.0074
OSB R747 R02	C1C	2016:296:00000	2016:333:00000	ns	-0.0239	0.0070
OSB R747 R02	C1P	2016:296:00000	2016:333:00000	ns	0.8287	0.0055
OSB R747 R02	C2P	2016:296:00000	2016:333:00000	ns	1.3699	0.0073
OSB R744 R03	C1C	2016:296:00000	2016:333:00000	ns	-4.1631	0.0070
OSB R744 R03	C1P	2016:296:00000	2016:333:00000	ns	-5.5382	0.0055
OSB R744 R03	C2P	2016:296:00000	2016:333:00000	ns	-9.1550	0.0073
...						
OSB R802 R09	C1C	2016:296:00000	2016:312:00000	ns	-5.8091	0.0085
OSB R802 R09	C1C	2016:323:00000	2016:333:00000	ns	-5.5794	0.0556
OSB R802 R09	C1P	2016:296:00000	2016:312:00000	ns	-4.2120	0.0063
OSB R802 R09	C1P	2016:323:00000	2016:333:00000	ns	-5.0339	0.0291
OSB R802 R09	C2P	2016:296:00000	2016:312:00000	ns	-6.9627	0.0089
OSB R802 R09	C2P	2016:323:00000	2016:333:00000	ns	-8.3213	0.0478
...						
OSB R731 R22	C1C	2016:296:00000	2016:333:00000	ns	1.1425	0.0070
OSB R731 R22	C1P	2016:296:00000	2016:333:00000	ns	1.3014	0.0055
OSB R731 R22	C2P	2016:296:00000	2016:333:00000	ns	2.1513	0.0073
OSB R732 R23	C1C	2016:296:00000	2016:333:00000	ns	12.8989	0.0070
OSB R732 R23	C1P	2016:296:00000	2016:333:00000	ns	11.4900	0.0055
OSB R732 R23	C2P	2016:296:00000	2016:333:00000	ns	18.9937	0.0073
OSB R735 R24	C1C	2016:296:00000	2016:333:00000	ns	-7.5262	0.0072
OSB R735 R24	C1P	2016:296:00000	2016:333:00000	ns	-8.2674	0.0056
OSB R735 R24	C2C	2016:296:00000	2016:323:00000	ns	4.5014	0.2309
OSB R735 R24	C2P	2016:296:00000	2016:333:00000	ns	-13.6665	0.0075
OSB R801 R26	C1P	2016:296:00000	2016:333:00000	ns	-0.2722	0.0158
OSB R801 R26	C2P	2016:296:00000	2016:333:00000	ns	-0.4500	0.0256

-BIAS/SOLUTION
%=ENDBIA

A.2.2 Example 1B: GPS/GLONASS 30-Day Bias Results Using Relative Parameter Representation

```

%=BIA 1.00 COD 2016:327:30548 IGS 2016:296:00000 2016:333:00000 R 00000194
*-----
* Bias Solution INdependent EXchange Format (Bias-SINEX)
*-----
* CODE'S 30-DAY BIAS SOLUTION (OBSERVED UNTIL 2016:325)          22-NOV-16 08:28
*-----
+FILE/REFERENCE
+INFO_TYPE_____INFO_____
DESCRIPTION      CODE, Astronomical Institute, University of Bern
OUTPUT           CODE IGS 30-day bias solution for G/R satellites
CONTACT         code@aiub.unibe.ch
SOFTWARE        Bernese GNSS Software Version 5.3
HARDWARE        UBELIX: Linux, x86_64
INPUT           CODE IGS 1-day final and rapid bias solutions for G/R
-FILE/REFERENCE
*-----
+FILE/COMMENT
+PRODUCT_REFERENCE_____
CODE final product series for the IGS.
Published by Astronomical Institute, University of Bern.
URL: http://www.aiub.unibe.ch/download/CODE
DOI: 10.7892/boris.75876
-FILE/COMMENT
*-----
+INPUT/ACKNOWLEDGMENTS
+AGY DESCRIPTION_____
COD Center for Orbit Determination in Europe, AIUB, Switzerland
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS
*-----
+BIAS/DESCRIPTION
+KEYWORD_____VALUE(S)_____
OBSERVATION_SAMPLING          300
PARAMETER_SPACING             86400
DETERMINATION_METHOD          COMBINED_ANALYSIS
BIAS_MODE                     RELATIVE
TIME_SYSTEM                   G
SATELLITE_CLOCK_REFERENCE_OBSERVABLES  G  C1W  C2W
SATELLITE_CLOCK_REFERENCE_OBSERVABLES  R  C1P  C2P
-BIAS/DESCRIPTION
*-----
+BIAS/SOLUTION

```

*BIAS SVN_ PRN STATION__	OBS1	OBS2	BIAS_START_____	BIAS_END_____	UNIT	__ESTIMATED_VALUE__	_STD_DEV_	__ESTIMATED_SLOPE__	_STD_DEV_
ISB G063 G01	C1W	C2W	2016:296:00000	2016:333:00000	ns	0	0		
DSB G063 G01	C1W	C1C	2016:296:00000	2016:333:00000	ns	1.4376	0.0081		
DSB G063 G01	C2W	C2C	2016:296:00000	2016:333:00000	ns	8.7736	0.0228		
DSB G063 G01	C1W	C2W	2016:296:00000	2016:333:00000	ns	-7.5594	0.0084		
ISB G061 G02	C1W	C2W	2016:296:00000	2016:333:00000	ns	0	0		
DSB G061 G02	C1W	C1C	2016:296:00000	2016:333:00000	ns	-1.2662	0.0082		
DSB G061 G02	C1W	C2W	2016:296:00000	2016:333:00000	ns	9.1008	0.0085		
ISB G069 G03	C1W	C2W	2016:296:00000	2016:333:00000	ns	0	0		
DSB G069 G03	C1W	C1C	2016:296:00000	2016:333:00000	ns	1.3618	0.0081		
DSB G069 G03	C2W	C2C	2016:296:00000	2016:333:00000	ns	6.2715	0.0226		
DSB G069 G03	C1W	C2W	2016:296:00000	2016:333:00000	ns	-5.1635	0.0084		
...									
ISB G064 G30	C1W	C2W	2016:296:00000	2016:333:00000	ns	0	0		
DSB G064 G30	C1W	C1C	2016:296:00000	2016:333:00000	ns	-0.3918	0.0081		
DSB G064 G30	C2W	C2C	2016:296:00000	2016:333:00000	ns	6.3406	0.0235		
DSB G064 G30	C1W	C2W	2016:296:00000	2016:333:00000	ns	-6.3936	0.0083		
ISB G052 G31	C1W	C2W	2016:296:00000	2016:333:00000	ns	0	0		
DSB G052 G31	C1W	C1C	2016:296:00000	2016:333:00000	ns	0.9159	0.0082		
DSB G052 G31	C2W	C2C	2016:296:00000	2016:305:00000	ns	7.3510	0.0602		
DSB G052 G31	C1W	C2W	2016:296:00000	2016:333:00000	ns	4.6282	0.0085		
ISB G070 G32	C1W	C2W	2016:296:00000	2016:333:00000	ns	0	0		
DSB G070 G32	C1W	C1C	2016:296:00000	2016:333:00000	ns	1.5589	0.0082		
DSB G070 G32	C2W	C2C	2016:296:00000	2016:333:00000	ns	6.3687	0.0255		
DSB G070 G32	C1W	C2W	2016:296:00000	2016:333:00000	ns	-4.4608	0.0084		
ISB R730 R01	C1P	C2P	2016:296:00000	2016:333:00000	ns	0	0		
DSB R730 R01	C1P	C1C	2016:296:00000	2016:333:00000	ns	0.1707	0.0090		
DSB R730 R01	C1P	C2P	2016:296:00000	2016:333:00000	ns	-5.9339	0.0092		
ISB R747 R02	C1P	C2P	2016:296:00000	2016:333:00000	ns	0	0		
DSB R747 R02	C1P	C1C	2016:296:00000	2016:333:00000	ns	0.8526	0.0089		
DSB R747 R02	C1P	C2P	2016:296:00000	2016:333:00000	ns	-0.5412	0.0091		
ISB R744 R03	C1P	C2P	2016:296:00000	2016:333:00000	ns	0	0		
DSB R744 R03	C1P	C1C	2016:296:00000	2016:333:00000	ns	-1.3751	0.0089		
DSB R744 R03	C1P	C2P	2016:296:00000	2016:333:00000	ns	3.6168	0.0091		
...									
ISB R802 R09	C1P	C2P	2016:296:00000	2016:312:00000	ns	0	0		
DSB R802 R09	C1P	C2P	2016:323:00000	2016:333:00000	ns	0	0		
DSB R802 R09	C1P	C1C	2016:296:00000	2016:312:00000	ns	1.5971	0.0105		
DSB R802 R09	C1P	C1C	2016:323:00000	2016:333:00000	ns	0.5455	0.0627		
DSB R802 R09	C1P	C2P	2016:296:00000	2016:312:00000	ns	2.7507	0.0109		
DSB R802 R09	C1P	C2P	2016:323:00000	2016:333:00000	ns	3.2874	0.0559		
...									
ISB R731 R22	C1P	C2P	2016:296:00000	2016:333:00000	ns	0	0		
DSB R731 R22	C1P	C1C	2016:296:00000	2016:333:00000	ns	0.1589	0.0089		
DSB R731 R22	C1P	C2P	2016:296:00000	2016:333:00000	ns	-0.8499	0.0091		
ISB R732 R23	C1P	C2P	2016:296:00000	2016:333:00000	ns	0	0		
DSB R732 R23	C1P	C1C	2016:296:00000	2016:333:00000	ns	-1.4089	0.0089		
DSB R732 R23	C1P	C2P	2016:296:00000	2016:333:00000	ns	-7.5037	0.0091		
ISB R735 R24	C1P	C2P	2016:296:00000	2016:333:00000	ns	0	0		
DSB R735 R24	C1P	C1C	2016:296:00000	2016:333:00000	ns	-0.7412	0.0091		
DSB R735 R24	C2P	C2C	2016:296:00000	2016:323:00000	ns	-18.1679	0.2311		
DSB R735 R24	C1P	C2P	2016:296:00000	2016:333:00000	ns	5.3991	0.0093		
ISB R801 R26	C1P	C2P	2016:296:00000	2016:333:00000	ns	0	0		
DSB R801 R26	C1P	C2P	2016:296:00000	2016:333:00000	ns	0.1778	0.0301		

-BIAS/SOLUTION
%=ENDBIA

A.3 Example 2: GPS/GLONASS 1-Day Bias Results for the Satellites and Stations

This is an example, where the GLONASS biases are treated in a GPS-like manner (composed of a station and a satellite component).

Note: More than two observable types (per GNSS) are considered for the stations: IRKJ (R), MORP (G), NOVW (R), STHL (G), UNB3 (R), YSSK (G).

A.3.1 Example 2A: GPS/GLONASS 1-Day Bias Results Using Absolute Parameter Representation

%=BIA 1.00 COD 2016:327:06748 IGS 2016:323:00000 2016:324:00000 A 00001078

```

-----
* Bias Solution INdependent EXchange Format (Bias-SINEX)
-----
* CODE'S BIAS COMBINATION RESULTS FOR DAY 323, 2016          22-NOV-16 01:51
-----
+FILE/REFERENCE
*INFO_TYPE_          INFO
DESCRIPTION          CODE, Astronomical Institute, University of Bern
OUTPUT              CODE IGS 1-day final bias solution for G/R
CONTACT             code@aiub.unibe.ch
SOFTWARE            Bernese GNSS Software Version 5.3
HARDWARE            UBELIX: Linux, x86_64
INPUT              CODE IGS 1-day final bias solution for G/R
-FILE/REFERENCE
-----
+FILE/COMMENT
*PRODUCT_REFERENCE_
CODE final product series for the IGS.
Published by Astronomical Institute, University of Bern.
URL: http://www.aiub.unibe.ch/download/CODE
DOI: 10.7892/boris.75876
-FILE/COMMENT
-----
+INPUT/ACKNOWLEDGMENTS
*AGY DESCRIPTION_
COD Center for Orbit Determination in Europe, AIUB, Switzerland
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS
-----
+BIAS/DESCRIPTION
*KEYWORD_          VALUE(S)
OBSERVATION_SAMPLING      300
PARAMETER_SPACING         86400
DETERMINATION_METHOD      COMBINED_ANALYSIS
BIAS_MODE                  ABSOLUTE
TIME_SYSTEM               G
RECEIVER_CLOCK_REFERENCE_GNSS G
SATELLITE_CLOCK_REFERENCE_OBSERVABLES G C1W C2W
SATELLITE_CLOCK_REFERENCE_OBSERVABLES R C1P C2P
-BIAS/DESCRIPTION
-----
+BIAS/SOLUTION
*BIAS SVN_ PRN_ STATION_ OBS1 OBS2 BIAS_START_ BIAS_END_ UNIT_ ESTIMATED_VALUE_ STD_DEV_ ESTIMATED_SLOPE_ STD_DEV_
OSB G063 G01 C1C 2016:323:00000 2016:324:00000 ns 10.2669 0.0257
OSB G063 G01 C1W 2016:323:00000 2016:324:00000 ns 11.7118 0.0174
OSB G063 G01 C2C 2016:323:00000 2016:324:00000 ns 1.4388 0.1059
OSB G063 G01 C2W 2016:323:00000 2016:324:00000 ns 19.2886 0.0281
OSB G061 G02 C1C 2016:323:00000 2016:324:00000 ns -12.9423 0.0261
OSB G061 G02 C1W 2016:323:00000 2016:324:00000 ns -14.1561 0.0176
OSB G061 G02 C2W 2016:323:00000 2016:324:00000 ns -23.3143 0.0286
OSB G069 G03 C1C 2016:323:00000 2016:324:00000 ns 6.7186 0.0255
OSB G069 G03 C1W 2016:323:00000 2016:324:00000 ns 8.0486 0.0173
OSB G069 G03 C2C 2016:323:00000 2016:324:00000 ns -2.0569 0.1068
OSB G069 G03 C2W 2016:323:00000 2016:324:00000 ns 13.2556 0.0279
...
OSB G064 G30 C1C 2016:323:00000 2016:324:00000 ns 10.0846 0.0253
OSB G064 G30 C1W 2016:323:00000 2016:324:00000 ns 9.7220 0.0171
OSB G064 G30 C2C 2016:323:00000 2016:324:00000 ns 0.8388 0.1169
OSB G064 G30 C2W 2016:323:00000 2016:324:00000 ns 16.0116 0.0276
OSB G052 G31 C1C 2016:323:00000 2016:324:00000 ns -7.9979 0.0262
OSB G052 G31 C1W 2016:323:00000 2016:324:00000 ns -7.1772 0.0177
OSB G052 G31 C2W 2016:323:00000 2016:324:00000 ns -11.8205 0.0287
OSB G070 G32 C1C 2016:323:00000 2016:324:00000 ns 5.3521 0.0259
OSB G070 G32 C1W 2016:323:00000 2016:324:00000 ns 6.8831 0.0175
OSB G070 G32 C2C 2016:323:00000 2016:324:00000 ns -4.2246 0.1270
OSB G070 G32 C2W 2016:323:00000 2016:324:00000 ns 11.3361 0.0284
OSB R730 R01 C1C 2016:323:00000 2016:324:00000 ns 8.3904 0.0295
OSB R730 R01 C1P 2016:323:00000 2016:324:00000 ns 8.7860 0.0197
OSB R730 R01 C2P 2016:323:00000 2016:324:00000 ns 14.5238 0.0322
OSB R747 R02 C1C 2016:323:00000 2016:324:00000 ns -0.2074 0.0291
OSB R747 R02 C1P 2016:323:00000 2016:324:00000 ns 0.6427 0.0195
OSB R747 R02 C2P 2016:323:00000 2016:324:00000 ns 1.0624 0.0318
OSB R744 R03 C1C 2016:323:00000 2016:324:00000 ns -4.2002 0.0295
OSB R744 R03 C1P 2016:323:00000 2016:324:00000 ns -5.6064 0.0196
OSB R744 R03 C2P 2016:323:00000 2016:324:00000 ns -9.2678 0.0320
...
OSB R731 R22 C1C 2016:323:00000 2016:324:00000 ns 1.1950 0.0295
OSB R731 R22 C1P 2016:323:00000 2016:324:00000 ns 1.3469 0.0197
OSB R731 R22 C2P 2016:323:00000 2016:324:00000 ns 2.2265 0.0321
OSB R732 R23 C1C 2016:323:00000 2016:324:00000 ns 12.5549 0.0293
OSB R732 R23 C1P 2016:323:00000 2016:324:00000 ns 11.2952 0.0196
OSB R732 R23 C2P 2016:323:00000 2016:324:00000 ns 18.6717 0.0319
OSB R735 R24 C1C 2016:323:00000 2016:324:00000 ns -8.0778 0.0300
OSB R735 R24 C1P 2016:323:00000 2016:324:00000 ns -8.6117 0.0200

```

OSB	R735	R24	C2P	2016:323:00000	2016:324:00000	ns	-14.2356	0.0326	
OSB	R801	R26	C1P	2016:323:00000	2016:324:00000	ns	-0.5690	0.0892	
OSB	R801	R26	C2P	2016:323:00000	2016:324:00000	ns	-0.9406	0.1474	
OSB	G	G	ABPO	C1W	2016:323:00000	2016:324:00000	ns	10.7019	0.0819
OSB	G	G	ABPO	C2W	2016:323:00000	2016:324:00000	ns	17.6255	0.1348
OSB	G	G	ADIS	C1W	2016:323:00000	2016:324:00000	ns	3.8142	0.0732
OSB	G	G	ADIS	C2W	2016:323:00000	2016:324:00000	ns	6.2817	0.1206
OSB	R	R	ADIS	C1P	2016:323:00000	2016:324:00000	ns	-77.0195	0.1347
OSB	R	R	ADIS	C2P	2016:323:00000	2016:324:00000	ns	-66.8570	0.1687
OSB	G	G	ALBH	C1W	2016:323:00000	2016:324:00000	ns	-21.7009	0.0524
OSB	G	G	ALBH	C2W	2016:323:00000	2016:324:00000	ns	-35.7401	0.0863
OSB	R	R	ALBH	C1P	2016:323:00000	2016:324:00000	ns	-85.8706	0.1141
OSB	R	R	ALBH	C2P	2016:323:00000	2016:324:00000	ns	-106.5825	0.1355
...									
OSB	G	G	IRKJ	C1W	2016:323:00000	2016:324:00000	ns	14.8010	0.0589
OSB	G	G	IRKJ	C2W	2016:323:00000	2016:324:00000	ns	24.3764	0.0970
OSB	R	R	IRKJ	C1C	2016:323:00000	2016:324:00000	ns	-65.2665	0.2023
OSB	R	R	IRKJ	C1P	2016:323:00000	2016:324:00000	ns	-62.7987	0.1241
OSB	R	R	IRKJ	C2P	2016:323:00000	2016:324:00000	ns	-53.0231	0.1512
...									
OSB	G	G	MORP	C1C	2016:323:00000	2016:324:00000	ns	32.5085	0.0530
OSB	G	G	MORP	C2C	2016:323:00000	2016:324:00000	ns	69.8325	0.0750
OSB	G	G	MORP	C2W	2016:323:00000	2016:324:00000	ns	53.5396	0.0873
...									
OSB	G	G	NOVM	C1W	2016:323:00000	2016:324:00000	ns	1.4209	0.0594
OSB	G	G	NOVM	C2W	2016:323:00000	2016:324:00000	ns	2.3402	0.0978
OSB	R	R	NOVM	C1C	2016:323:00000	2016:324:00000	ns	-82.7551	0.2011
OSB	R	R	NOVM	C1P	2016:323:00000	2016:324:00000	ns	-80.5400	0.1251
OSB	R	R	NOVM	C2P	2016:323:00000	2016:324:00000	ns	-79.8149	0.1524
...									
OSB	G	G	STHL	C1C	2016:323:00000	2016:324:00000	ns	-10.7345	0.1696
OSB	G	G	STHL	C1W	2016:323:00000	2016:324:00000	ns	-14.6278	0.0723
OSB	G	G	STHL	C2W	2016:323:00000	2016:324:00000	ns	-24.0912	0.1190
OSB	R	R	STHL	C1P	2016:323:00000	2016:324:00000	ns	-84.9543	0.1303
OSB	R	R	STHL	C2P	2016:323:00000	2016:324:00000	ns	-95.6580	0.1646
...									
OSB	G	G	UNB3	C1C	2016:323:00000	2016:324:00000	ns	17.9949	0.0531
OSB	G	G	UNB3	C2W	2016:323:00000	2016:324:00000	ns	29.6365	0.0875
OSB	R	R	UNB3	C1C	2016:323:00000	2016:324:00000	ns	28.8462	2.4819
OSB	R	R	UNB3	C1P	2016:323:00000	2016:324:00000	ns	24.8359	0.1144
OSB	R	R	UNB3	C2C	2016:323:00000	2016:324:00000	ns	25.3506	3.0497
OSB	R	R	UNB3	C2P	2016:323:00000	2016:324:00000	ns	35.5470	0.1367
...									
OSB	G	G	YSSK	C1C	2016:323:00000	2016:324:00000	ns	21.5268	0.1774
OSB	G	G	YSSK	C1W	2016:323:00000	2016:324:00000	ns	21.8867	0.0579
OSB	G	G	YSSK	C2W	2016:323:00000	2016:324:00000	ns	36.0461	0.0953
...									
OSB	G	G	ZIMJ	C1W	2016:323:00000	2016:324:00000	ns	-12.7744	0.0444
OSB	G	G	ZIMJ	C2W	2016:323:00000	2016:324:00000	ns	-21.0387	0.0731
OSB	R	R	ZIMJ	C1P	2016:323:00000	2016:324:00000	ns	8.8714	0.1162
OSB	R	R	ZIMJ	C2P	2016:323:00000	2016:324:00000	ns	23.0797	0.1350
OSB	G	G	ZIMM	C1C	2016:323:00000	2016:324:00000	ns	17.9427	0.0448
OSB	G	G	ZIMM	C2W	2016:323:00000	2016:324:00000	ns	29.5506	0.0738
OSB	G	G	ZWE2	C1W	2016:323:00000	2016:324:00000	ns	-0.3741	0.0469
OSB	G	G	ZWE2	C2W	2016:323:00000	2016:324:00000	ns	-0.6161	0.0771

-BIAS/SOLUTION
%=ENDEBIA

A.3.2 Example 2B: GPS/GLONASS 1-Day Bias Results Using Relative Parameter Representation

```

%=BIA 1.00 COD 2016:327:06748 IGS 2016:323:00000 2016:324:00000 R 00001078
*-----
* Bias Solution INdependent EXchange Format (Bias-SINEX)
*-----
* CODE'S BIAS COMBINATION RESULTS FOR DAY 323, 2016                22-NOV-16 01:51
*-----
+FILE/REFERENCE
*INFO_TYPE_----- INFO-----
DESCRIPTION      CODE, Astronomical Institute, University of Bern
OUTPUT           CODE IGS 1-day final bias solution for G/R
CONTACT          code@aib.unibe.ch
SOFTWARE         Bernese GNSS Software Version 5.3
HARDWARE        UBELIX: Linux, x86_64
INPUT           CODE IGS 1-day final bias solution for G/R
-FILE/REFERENCE
*-----
+FILE/COMMENT

```

```

*PRODUCT_REFERENCE-----
CODE final product series for the IGS.
Published by Astronomical Institute, University of Bern.
URL: http://www.aiub.unibe.ch/download/CODE
DOI: 10.7892/boris.75876
-FILE/COMMENT
*-----
+INPUT/ACKNOWLEDGMENTS
*AGY DESCRIPTION-----
COD Center for Orbit Determination in Europe, AIUB, Switzerland
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS
*-----
+BIAS/DESCRIPTION
*KEYWORD----- VALUE(S)-----
OBSERVATION_SAMPLING 300
PARAMETER_SPACING 86400
DETERMINATION_METHOD COMBINED_ANALYSIS
BIAS_MODE RELATIVE
TIME_SYSTEM G
RECEIVER_CLOCK_REFERENCE_GNSS G
SATELLITE_CLOCK_REFERENCE_OBSERVABLES G C1W C2W
SATELLITE_CLOCK_REFERENCE_OBSERVABLES R C1P C2P
-BIAS/DESCRIPTION
*-----
+BIAS/SOLUTION
*BIAS SVN PRN STATION OBS1 OBS2 BIAS_START BIAS_END UNIT ESTIMATED_VALUE STD_DEV ESTIMATED_SLOPE STD_DEV
ISB G063 G01 C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G063 G01 C1W C1C 2016:323:00000 2016:324:00000 ns 1.4448 0.0310
DSB G063 G01 C2W C2C 2016:323:00000 2016:324:00000 ns 17.8498 0.1096
DSB G063 G01 C1W C2W 2016:323:00000 2016:324:00000 ns -7.5769 0.0330
ISB G061 G02 C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G061 G02 C1W C1C 2016:323:00000 2016:324:00000 ns -1.2138 0.0315
DSB G061 G02 C1W C2W 2016:323:00000 2016:324:00000 ns 9.1582 0.0336
ISB G069 G03 C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G069 G03 C1W C1C 2016:323:00000 2016:324:00000 ns 1.3300 0.0308
DSB G069 G03 C2W C2C 2016:323:00000 2016:324:00000 ns 15.3125 0.1104
DSB G069 G03 C1W C2W 2016:323:00000 2016:324:00000 ns -5.2070 0.0328
...
ISB G064 G30 C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G064 G30 C1W C1C 2016:323:00000 2016:324:00000 ns -0.3626 0.0305
DSB G064 G30 C2W C2C 2016:323:00000 2016:324:00000 ns 15.1728 0.1201
DSB G064 G30 C1W C2W 2016:323:00000 2016:324:00000 ns -6.2896 0.0325
ISB G052 G31 C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G052 G31 C1W C1C 2016:323:00000 2016:324:00000 ns 0.8207 0.0316
DSB G052 G31 C1W C2W 2016:323:00000 2016:324:00000 ns 4.6433 0.0337
ISB G070 G32 C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G070 G32 C1W C1C 2016:323:00000 2016:324:00000 ns 1.5311 0.0313
DSB G070 G32 C2W C2C 2016:323:00000 2016:324:00000 ns 15.5608 0.1301
DSB G070 G32 C1W C2W 2016:323:00000 2016:324:00000 ns -4.4530 0.0333
ISB R730 R01 C1P C2P 2016:323:00000 2016:324:00000 ns 0 0
DSB R730 R01 C1P C1C 2016:323:00000 2016:324:00000 ns 0.3956 0.0355
DSB R730 R01 C1P C2P 2016:323:00000 2016:324:00000 ns -5.7378 0.0378
ISB R747 R02 C1P C2P 2016:323:00000 2016:324:00000 ns 0 0
DSB R747 R02 C1P C1C 2016:323:00000 2016:324:00000 ns 0.8501 0.0350
DSB R747 R02 C1P C2P 2016:323:00000 2016:324:00000 ns -0.4197 0.0373
ISB R744 R03 C1P C2P 2016:323:00000 2016:324:00000 ns 0 0
DSB R744 R03 C1P C1C 2016:323:00000 2016:324:00000 ns -1.4062 0.0354
DSB R744 R03 C1P C2P 2016:323:00000 2016:324:00000 ns 3.6613 0.0376
...
ISB R731 R22 C1P C2P 2016:323:00000 2016:324:00000 ns 0 0
DSB R731 R22 C1P C1C 2016:323:00000 2016:324:00000 ns 0.1519 0.0355
DSB R731 R22 C1P C2P 2016:323:00000 2016:324:00000 ns -0.8796 0.0377
ISB R732 R23 C1P C2P 2016:323:00000 2016:324:00000 ns 0 0
DSB R732 R23 C1P C1C 2016:323:00000 2016:324:00000 ns -1.2597 0.0352
DSB R732 R23 C1P C2P 2016:323:00000 2016:324:00000 ns -7.3765 0.0374
ISB R735 R24 C1P C2P 2016:323:00000 2016:324:00000 ns 0 0
DSB R735 R24 C1P C1C 2016:323:00000 2016:324:00000 ns -0.5339 0.0361
DSB R735 R24 C1P C2P 2016:323:00000 2016:324:00000 ns 5.6240 0.0382
ISB R801 R26 C1P C2P 2016:323:00000 2016:324:00000 ns 0 0
DSB R801 R26 C1P C2P 2016:323:00000 2016:324:00000 ns 0.3716 0.1723
ISB G G ABPO C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G ABPO C1W C2W 2016:323:00000 2016:324:00000 ns -6.9236 0.1578
ISB G G ADIS C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G ADIS C1W C2W 2016:323:00000 2016:324:00000 ns -2.4675 0.1411
ISB R R ADIS C1P C2P 2016:323:00000 2016:324:00000 ns -92.5808 0.4276
DSB R R ADIS C1P C2P 2016:323:00000 2016:324:00000 ns -10.1625 0.2158
ISB G G ALBH C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G ALBH C1W C2W 2016:323:00000 2016:324:00000 ns 14.0393 0.1010
ISB R R ALBH C1P C2P 2016:323:00000 2016:324:00000 ns -54.1556 0.3557
DSB R R ALBH C1P C2P 2016:323:00000 2016:324:00000 ns 20.7119 0.1772
...
ISB G G IRKJ C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G IRKJ C1W C2W 2016:323:00000 2016:324:00000 ns -9.5754 0.1135

```

```

ISB R R IRKJ C1P C2P 2016:323:00000 2016:324:00000 ns -77.7676 0.3902
DSB R R IRKJ C1P C2P 2016:323:00000 2016:324:00000 ns -9.7756 0.1956
DSB R R IRKJ C1P C1C 2016:323:00000 2016:324:00000 ns 2.4677 0.2373
...
ISB G G MORP C1C C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G MORP C1C C2W 2016:323:00000 2016:324:00000 ns -21.0312 0.1022
DSB G G MORP C2W C2C 2016:323:00000 2016:324:00000 ns -16.2928 0.1151
...
ISB G G NOVVM C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G NOVVM C1W C2W 2016:323:00000 2016:324:00000 ns -0.9193 0.1144
ISB R R NOVVM C1P C2P 2016:323:00000 2016:324:00000 ns -81.6503 0.3932
DSB R R NOVVM C1P C2P 2016:323:00000 2016:324:00000 ns -0.7251 0.1971
DSB R R NOVVM C1P C1C 2016:323:00000 2016:324:00000 ns 2.2151 0.2368
...
ISB G G STHL C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G STHL C1W C2W 2016:323:00000 2016:324:00000 ns 9.4634 0.1392
DSB G G STHL C1W C1C 2016:323:00000 2016:324:00000 ns -3.8933 0.1843
ISB R R STHL C1P C2P 2016:323:00000 2016:324:00000 ns -68.5644 0.4151
DSB R R STHL C1P C2P 2016:323:00000 2016:324:00000 ns 10.7036 0.2099
...
ISB G G UNB3 C1C C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G UNB3 C1C C2W 2016:323:00000 2016:324:00000 ns -11.6417 0.1024
ISB R R UNB3 C1P C2P 2016:323:00000 2016:324:00000 ns 8.4345 0.3574
DSB R R UNB3 C1P C2P 2016:323:00000 2016:324:00000 ns -10.7111 0.1783
DSB R R UNB3 C1P C1C 2016:323:00000 2016:324:00000 ns -4.0103 2.4846
DSB R R UNB3 C2P C2C 2016:323:00000 2016:324:00000 ns 10.1964 3.0528
...
ISB G G YSSK C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G YSSK C1W C2W 2016:323:00000 2016:324:00000 ns -14.1595 0.1115
DSB G G YSSK C1W C1C 2016:323:00000 2016:324:00000 ns 0.3598 0.1866
...
ISB G G ZIMJ C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G ZIMJ C1W C2W 2016:323:00000 2016:324:00000 ns 8.2643 0.0856
ISB R R ZIMJ C1P C2P 2016:323:00000 2016:324:00000 ns -12.8850 0.3596
DSB R R ZIMJ C1P C2P 2016:323:00000 2016:324:00000 ns -14.2083 0.1782
ISB G G ZIMM C1C C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G ZIMM C1C C2W 2016:323:00000 2016:324:00000 ns -11.6079 0.0864
ISB G G ZWE2 C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G G ZWE2 C1W C2W 2016:323:00000 2016:324:00000 ns 0.2420 0.0903
-BIAS/SOLUTION
%=ENDBIA

```

A.4 Example 3: GPS/GLONASS 1-Day Bias Results for the Satellites and Stations

This is an example, where the GLONASS biases are treated specific to each station-satellite link.

Note: More than two observable types (per GNSS) are considered for the stations: IRKJ (R), MORP (G), NOVVM (R), STHL (G), UNB3 (R), YSSK (G).

A.4.1 Example 3A: GPS/GLONASS 1-Day Bias Results Using Absolute Parameter Representation

```

%=BIA 1.00 COD 2016:327:08338 IGS 2016:323:00000 2016:324:00000 A 00009549
*-----
* Bias Solution INdependent EXchange Format (Bias-SINEX)
*-----
* CODE'S BIAS COMBINATION RESULTS FOR DAY 323, 2016 22-NOV-16 01:51
*-----
+FILE/REFERENCE
*INFO_TYPE----- INFO-----
DESCRIPTION CODE, Astronomical Institute, University of Bern
OUTPUT CODE IGS 1-day final bias solution for G/R
CONTACT code@aib.unibe.ch
SOFTWARE Bernese GNSS Software Version 5.3
HARDWARE UBELIX: Linux, x86_64
INPUT CODE IGS 1-day final bias solution for G/R
-FILE/REFERENCE

```

```

*-----
+FILE/COMMENT
*PRODUCT_REFERENCE_-----
CODE final product series for the IGS.
Published by Astronomical Institute, University of Bern.
URL: http://www.aiub.unibe.ch/download/CODE
DOI: 10.7892/boris.75876
-FILE/COMMENT
*-----
+INPUT/ACKNOWLEDGMENTS
*AGY DESCRIPTION_-----
COD Center for Orbit Determination in Europe, AIUB, Switzerland
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS
*-----
+BIAS/DESCRIPTION
*KEYWORD_----- VALUE(S)-----
OBSERVATION_SAMPLING 300
PARAMETER_SPACING 86400
DETERMINATION_METHOD COMBINED_ANALYSIS
BIAS_MODE ABSOLUTE
TIME_SYSTEM G
RECEIVER_CLOCK_REFERENCE_GNSS G
SATELLITE_CLOCK_REFERENCE_OBSERVABLES G C1W C2W
SATELLITE_CLOCK_REFERENCE_OBSERVABLES R
-BIAS/DESCRIPTION
*-----
+BIAS/SOLUTION
*BIAS SVN PRN STATION OBS1 OBS2 BIAS_START BIAS_END UNIT ESTIMATED_VALUE STD_DEV ESTIMATED_SLOPE STD_DEV
OSB G063 G01 C1C 2016:323:00000 2016:324:00000 ns 10.2979 0.0111
OSB G063 G01 C1W 2016:323:00000 2016:324:00000 ns 11.7277 0.0075
OSB G063 G01 C2C 2016:323:00000 2016:324:00000 ns 1.4288 0.0455
OSB G063 G01 C2W 2016:323:00000 2016:324:00000 ns 19.3149 0.0121
OSB G061 G02 C1C 2016:323:00000 2016:324:00000 ns -12.8354 0.0113
OSB G061 G02 C1W 2016:323:00000 2016:324:00000 ns -14.0975 0.0076
OSB G061 G02 C2W 2016:323:00000 2016:324:00000 ns -23.2178 0.0124
OSB G069 G03 C1C 2016:323:00000 2016:324:00000 ns 6.6791 0.0110
OSB G069 G03 C1W 2016:323:00000 2016:324:00000 ns 8.0355 0.0075
OSB G069 G03 C2C 2016:323:00000 2016:324:00000 ns -2.1231 0.0459
OSB G069 G03 C2W 2016:323:00000 2016:324:00000 ns 13.2340 0.0121
...
OSB G064 G30 C1C 2016:323:00000 2016:324:00000 ns 10.1714 0.0110
OSB G064 G30 C1W 2016:323:00000 2016:324:00000 ns 9.7539 0.0074
OSB G064 G30 C2C 2016:323:00000 2016:324:00000 ns 0.8872 0.0502
OSB G064 G30 C2W 2016:323:00000 2016:324:00000 ns 16.0642 0.0120
OSB G052 G31 C1C 2016:323:00000 2016:324:00000 ns -8.0684 0.0113
OSB G052 G31 C1W 2016:323:00000 2016:324:00000 ns -7.2040 0.0076
OSB G052 G31 C2W 2016:323:00000 2016:324:00000 ns -11.8646 0.0124
OSB G070 G32 C1C 2016:323:00000 2016:324:00000 ns 5.3565 0.0112
OSB G070 G32 C1W 2016:323:00000 2016:324:00000 ns 6.9019 0.0076
OSB G070 G32 C2C 2016:323:00000 2016:324:00000 ns -4.2758 0.0545
OSB G070 G32 C2W 2016:323:00000 2016:324:00000 ns 11.3670 0.0123
OSB G G ABPO C1W 2016:323:00000 2016:324:00000 ns 10.9184 0.0355
OSB G G ABPO C2W 2016:323:00000 2016:324:00000 ns 17.9819 0.0585
OSB G G ADIS C1W 2016:323:00000 2016:324:00000 ns 3.9598 0.0317
OSB G G ADIS C2W 2016:323:00000 2016:324:00000 ns 6.5216 0.0522
OSB R730 R01 ADIS C1P 2016:323:00000 2016:324:00000 ns -68.5694 0.2246
OSB R730 R01 ADIS C2P 2016:323:00000 2016:324:00000 ns -52.5603 0.2702
OSB R747 R02 ADIS C1P 2016:323:00000 2016:324:00000 ns -73.6348 0.2150
OSB R747 R02 ADIS C2P 2016:323:00000 2016:324:00000 ns -62.0217 0.2523
OSB R744 R03 ADIS C1P 2016:323:00000 2016:324:00000 ns -88.9341 0.2140
OSB R744 R03 ADIS C2P 2016:323:00000 2016:324:00000 ns -78.9872 0.2539
...
OSB R731 R22 ADIS C1P 2016:323:00000 2016:324:00000 ns -70.7452 0.2322
OSB R731 R22 ADIS C2P 2016:323:00000 2016:324:00000 ns -64.1090 0.2727
OSB R732 R23 ADIS C1P 2016:323:00000 2016:324:00000 ns -67.8707 0.2605
OSB R732 R23 ADIS C2P 2016:323:00000 2016:324:00000 ns -51.7869 0.3202
OSB R735 R24 ADIS C1P 2016:323:00000 2016:324:00000 ns -86.2275 0.2640
OSB R735 R24 ADIS C2P 2016:323:00000 2016:324:00000 ns -78.3718 0.3220
OSB G G ALBH C1W 2016:323:00000 2016:324:00000 ns -21.6200 0.0226
OSB G G ALBH C2W 2016:323:00000 2016:324:00000 ns -35.6070 0.0371
OSB R730 R01 ALBH C1P 2016:323:00000 2016:324:00000 ns -78.3478 0.1941
OSB R730 R01 ALBH C2P 2016:323:00000 2016:324:00000 ns -90.4057 0.2290
OSB R747 R02 ALBH C1P 2016:323:00000 2016:324:00000 ns -86.5767 0.2158
OSB R747 R02 ALBH C2P 2016:323:00000 2016:324:00000 ns -103.1267 0.2573
OSB R744 R03 ALBH C1P 2016:323:00000 2016:324:00000 ns -89.2557 0.2110
OSB R744 R03 ALBH C2P 2016:323:00000 2016:324:00000 ns -119.3690 0.2553
...
OSB R731 R22 ALBH C1P 2016:323:00000 2016:324:00000 ns -87.0721 0.1870
OSB R731 R22 ALBH C2P 2016:323:00000 2016:324:00000 ns -103.0162 0.2215
OSB R732 R23 ALBH C1P 2016:323:00000 2016:324:00000 ns -75.8298 0.1777
OSB R732 R23 ALBH C2P 2016:323:00000 2016:324:00000 ns -89.4746 0.2120
OSB R735 R24 ALBH C1P 2016:323:00000 2016:324:00000 ns -93.4667 0.1884
OSB R735 R24 ALBH C2P 2016:323:00000 2016:324:00000 ns -120.4333 0.2231

```



```

...
OSB G G ZIMJ C1W 2016:323:00000 2016:324:00000 ns -12.6915 0.0191
OSB G G ZIMJ C2W 2016:323:00000 2016:324:00000 ns -20.9022 0.0315
OSB R730 R01 ZIMJ C1P 2016:323:00000 2016:324:00000 ns 17.3268 0.1845
OSB R730 R01 ZIMJ C2P 2016:323:00000 2016:324:00000 ns 37.3232 0.2180
OSB R747 R02 ZIMJ C1P 2016:323:00000 2016:324:00000 ns 11.9682 0.1857
OSB R747 R02 ZIMJ C2P 2016:323:00000 2016:324:00000 ns 24.6734 0.2190
OSB R744 R03 ZIMJ C1P 2016:323:00000 2016:324:00000 ns 1.9201 0.2566
OSB R744 R03 ZIMJ C2P 2016:323:00000 2016:324:00000 ns 15.2821 0.3115
...
OSB R731 R22 ZIMJ C1P 2016:323:00000 2016:324:00000 ns 11.6387 0.1889
OSB R731 R22 ZIMJ C2P 2016:323:00000 2016:324:00000 ns 24.8991 0.2224
OSB R732 R23 ZIMJ C1P 2016:323:00000 2016:324:00000 ns 18.9889 0.2605
OSB R732 R23 ZIMJ C2P 2016:323:00000 2016:324:00000 ns 42.0121 0.3163
OSB R735 R24 ZIMJ C1P 2016:323:00000 2016:324:00000 ns 0.5682 0.1969
OSB R735 R24 ZIMJ C2P 2016:323:00000 2016:324:00000 ns 11.1736 0.2352
OSB G G ZIMM C1C 2016:323:00000 2016:324:00000 ns 18.0267 0.0193
OSB G G ZIMM C2W 2016:323:00000 2016:324:00000 ns 29.6889 0.0317
OSB G G ZWE2 C1W 2016:323:00000 2016:324:00000 ns -0.3192 0.0202
OSB G G ZWE2 C2W 2016:323:00000 2016:324:00000 ns -0.5258 0.0332
-BIAS/SOLUTION
%=ENDBIA

```

A.4.2 Example 3B: GPS/GLONASS 1-Day Bias Results Using Relative Parameter Representation

```

%=BIA 1.00 COD 2016:327:08338 IGS 2016:323:00000 2016:324:00000 R 00009549
*-----
* Bias Solution INdependent EXchange Format (Bias-SINEX)
*-----
* CODE'S BIAS COMBINATION RESULTS FOR DAY 323, 2016 22-NOV-16 01:51
*-----
+FILE/REFERENCE
+INFO_TYPE INFO
+DESCRIPTION CODE, Astronomical Institute, University of Bern
+OUTPUT CODE IGS 1-day final bias solution for G/R
+CONTACT code@aiub.unibe.ch
+SOFTWARE Bernese GNSS Software Version 5.3
+HARDWARE UBELIX: Linux, x86_64
+INPUT CODE IGS 1-day final bias solution for G/R
-FILE/REFERENCE
*-----
+FILE/COMMENT
+PRODUCT_REFERENCE
CODE final product series for the IGS.
Published by Astronomical Institute, University of Bern.
URL: http://www.aiub.unibe.ch/download/CODE
DOI: 10.7892/boris.75876
-FILE/COMMENT
*-----
+INPUT/ACKNOWLEDGMENTS
+AGY DESCRIPTION
COD Center for Orbit Determination in Europe, AIUB, Switzerland
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS
*-----
+BIAS/DESCRIPTION
+KEYWORD VALUE(S)
OBSERVATION_SAMPLING 300
PARAMETER_SPACING 86400
DETERMINATION_METHOD COMBINED_ANALYSIS
BIAS_MODE RELATIVE
TIME_SYSTEM G
RECEIVER_CLOCK_REFERENCE_GNSS G
SATELLITE_CLOCK_REFERENCE_OBSERVABLES G C1W C2W
SATELLITE_CLOCK_REFERENCE_OBSERVABLES R
-BIAS/DESCRIPTION
*-----
+BIAS/SOLUTION
+BIAS SVN_ PRN STATION__ OBS1 OBS2 BIAS_START_____ BIAS_END_____ UNIT __ESTIMATED_VALUE___ _STD_DEV___ __ESTIMATED_SLOPE___ _STD_DEV___
ISB G063 G01 C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G063 G01 C1W C1C 2016:323:00000 2016:324:00000 ns 1.4298 0.0134
DSB G063 G01 C2W C2C 2016:323:00000 2016:324:00000 ns 17.8861 0.0471
DSB G063 G01 C1W C2W 2016:323:00000 2016:324:00000 ns -7.5872 0.0143
ISB G061 G02 C1W C2W 2016:323:00000 2016:324:00000 ns 0 0
DSB G061 G02 C1W C1C 2016:323:00000 2016:324:00000 ns -1.2621 0.0136
DSB G061 G02 C1W C2W 2016:323:00000 2016:324:00000 ns 9.1203 0.0145
ISB G069 G03 C1W C2W 2016:323:00000 2016:324:00000 ns 0 0

```

DSB	G069	G03	C1W	C1C	2016:323:00000	2016:324:00000	ns	1.3564	0.0133	
DSB	G069	G03	C2W	C2C	2016:323:00000	2016:324:00000	ns	15.3572	0.0474	
DSB	G069	G03	C1W	C2W	2016:323:00000	2016:324:00000	ns	-5.1985	0.0142	
...										
ISB	G064	G30	C1W	C2W	2016:323:00000	2016:324:00000	ns	0	0	
DSB	G064	G30	C1W	C1C	2016:323:00000	2016:324:00000	ns	-0.4174	0.0132	
DSB	G064	G30	C2W	C2C	2016:323:00000	2016:324:00000	ns	15.1770	0.0516	
DSB	G064	G30	C1W	C2W	2016:323:00000	2016:324:00000	ns	-6.3103	0.0141	
ISB	G052	G31	C1W	C2W	2016:323:00000	2016:324:00000	ns	0	0	
DSB	G052	G31	C1W	C1C	2016:323:00000	2016:324:00000	ns	0.8644	0.0136	
DSB	G052	G31	C1W	C2W	2016:323:00000	2016:324:00000	ns	4.6606	0.0145	
ISB	G070	G32	C1W	C2W	2016:323:00000	2016:324:00000	ns	0	0	
DSB	G070	G32	C1W	C1C	2016:323:00000	2016:324:00000	ns	1.5454	0.0135	
DSB	G070	G32	C2W	C2C	2016:323:00000	2016:324:00000	ns	15.6429	0.0559	
DSB	G070	G32	C1W	C2W	2016:323:00000	2016:324:00000	ns	-4.4651	0.0144	
ISB	G	G	ABPO	C1W	C2W	2016:323:00000	2016:324:00000	ns	0	0
DSB	G	G	ABPO	C1W	C2W	2016:323:00000	2016:324:00000	ns	-7.0636	0.0684
ISB	G	G	ADIS	C1W	C2W	2016:323:00000	2016:324:00000	ns	0	0
DSB	G	G	ADIS	C1W	C2W	2016:323:00000	2016:324:00000	ns	-2.5618	0.0611
ISB	R730	R01	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-93.0832	0.7032
DSB	R730	R01	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-16.0091	0.3514
ISB	R747	R02	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-91.4172	0.6673
DSB	R747	R02	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-11.6130	0.3315
ISB	R744	R03	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-104.1653	0.6667
DSB	R744	R03	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-9.9469	0.3320
...										
ISB	R731	R22	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-80.9069	0.7210
DSB	R731	R22	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-6.6362	0.3582
ISB	R732	R23	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-92.4990	0.8217
DSB	R732	R23	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-16.0838	0.4128
ISB	R735	R24	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-98.2566	0.8303
DSB	R735	R24	ADIS	C1P	C2P	2016:323:00000	2016:324:00000	ns	-7.8557	0.4163
...										
ISB	G	G	ALBH	C1W	C2W	2016:323:00000	2016:324:00000	ns	0	0
DSB	G	G	ALBH	C1W	C2W	2016:323:00000	2016:324:00000	ns	13.9869	0.0435
ISB	R730	R01	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	-59.8841	0.6037
DSB	R730	R01	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	12.0579	0.3002
ISB	R747	R02	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	-61.2345	0.6734
DSB	R747	R02	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	16.5500	0.3358
ISB	R744	R03	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	-43.1446	0.6618
DSB	R744	R03	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	30.1134	0.3312
...										
ISB	R731	R22	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	-62.6576	0.5823
DSB	R731	R22	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	15.9441	0.2899
ISB	R732	R23	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	-54.9362	0.5546
DSB	R732	R23	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	13.6448	0.2766
ISB	R735	R24	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	-52.1741	0.5867
DSB	R735	R24	ALBH	C1P	C2P	2016:323:00000	2016:324:00000	ns	26.9666	0.2921
...										
ISB	G	G	ZIMJ	C1W	C2W	2016:323:00000	2016:324:00000	ns	0	0
DSB	G	G	ZIMJ	C1W	C2W	2016:323:00000	2016:324:00000	ns	8.2107	0.0368
ISB	R730	R01	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-13.2926	0.5741
DSB	R730	R01	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-19.9964	0.2856
ISB	R747	R02	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-7.4866	0.5773
DSB	R747	R02	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-12.7052	0.2871
ISB	R744	R03	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-18.5405	0.8059
DSB	R744	R03	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-13.3620	0.4036
...										
ISB	R731	R22	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-8.6662	0.5871
DSB	R731	R22	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-13.2604	0.2918
ISB	R732	R23	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-16.2655	0.8182
DSB	R732	R23	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-23.0233	0.4098
ISB	R735	R24	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-15.6713	0.6150
DSB	R735	R24	ZIMJ	C1P	C2P	2016:323:00000	2016:324:00000	ns	-10.6054	0.3068
ISB	G	G	ZIMM	C1C	C2W	2016:323:00000	2016:324:00000	ns	0	0
DSB	G	G	ZIMM	C1C	C2W	2016:323:00000	2016:324:00000	ns	-11.6623	0.0371
ISB	G	G	ZWE2	C1W	C2W	2016:323:00000	2016:324:00000	ns	0	0
DSB	G	G	ZWE2	C1W	C2W	2016:323:00000	2016:324:00000	ns	0.2065	0.0389
-BIAS/SOLUTION										
%-ENDBIA										

A.5 Example 4: GPS/GLONASS/Galileo/BeiDou 1-Day Bias Results for the Satellites and Stations

Note: The GLONASS biases are treated in a GPS-like manner (composed of a station and a satellite component).

A.5.1 Example 4A: GPS/GLONASS/Galileo/BeiDou 1-Day Bias Results Using Absolute Parameter Representation

```

%=BIA 1.00 CDD 2016:330:30148 IGS 2016:271:00000 2016:272:00000 A 00001915
*-----*
* Bias Solution INdependent EXchange Format (Bias-SINEX)
*-----*
* CODE'S MGEX BIAS COMBINATION RESULTS FOR DAY 271, 2016          25-NOV-16 08:21
*-----*
+FILE/REFERENCE
*INFO_TYPE_____INFO_____
DESCRIPTION      CODE, Astronomical Institute, University of Bern
OUTPUT           CODE IGS MGEX 1-day bias solution for G/R/E/C
CONTACT          code@aib.unibe.ch
SOFTWARE         Bernese GNSS Software Version 5.3
HARDWARE        UBELIX: Linux, x86_64
INPUT           CODE IGS MGEX 1-day bias solution(s) for G/R/E/C
-FILE/REFERENCE
*-----*
+FILE/COMMENT
*PRODUCT_REFERENCE_____
CODE product series for the IGS MGEX project.
Published by Astronomical Institute, University of Bern.
URL: http://www.aib.unibe.ch/download/CODE_MGEX
DOI: 10.7892/boris.75882.
-FILE/COMMENT
*-----*
+INPUT/ACKNOWLEDGMENTS
*AGY DESCRIPTION_____
COD Center for Orbit Determination in Europe, AIUB, Switzerland
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS
*-----*
+BIAS/DESCRIPTION
*KEYWORD_____VALUE(S)_____
OBSERVATION_SAMPLING          300
PARAMETER_SPACING             86400
DETERMINATION_METHOD         COMBINED_ANALYSIS
BIAS_MODE                     ABSOLUTE
TIME_SYSTEM                   G
RECEIVER_CLOCK_REFERENCE_GNSS G
SATELLITE_CLOCK_REFERENCE_OBSERVABLES G C1W C2W
SATELLITE_CLOCK_REFERENCE_OBSERVABLES R C1P C2P
SATELLITE_CLOCK_REFERENCE_OBSERVABLES E C1C C5Q
SATELLITE_CLOCK_REFERENCE_OBSERVABLES C C2I C7I
-BIAS/DESCRIPTION
*-----*
+BIAS/SOLUTION
*BIAS SVN_ PRN STATION__ OBS1 OBS2 BIAS_START_____BIAS_END_____UNIT __ESTIMATED_VALUE____ _STD_DEV____ _ESTIMATED_SLOPE____ _STD_DEV____
OSB G063 G01          C1C      2016:271:00000 2016:272:00000 ns          10.1185      0.0154
OSB G063 G01          C1W      2016:271:00000 2016:272:00000 ns          11.5480      0.0099
OSB G063 G01          C2C      2016:271:00000 2016:272:00000 ns          10.7923      0.0224
OSB G063 G01          C2S      2016:271:00000 2016:272:00000 ns          10.6411      0.0469
OSB G063 G01          C2W      2016:271:00000 2016:272:00000 ns          19.0189      0.0154
OSB G063 G01          C2X      2016:271:00000 2016:272:00000 ns          11.0136      0.0299
OSB G061 G02          C1C      2016:271:00000 2016:272:00000 ns          -12.5805     0.0167
OSB G061 G02          C1W      2016:271:00000 2016:272:00000 ns          -13.8916     0.0106
OSB G061 G02          C2W      2016:271:00000 2016:272:00000 ns          -22.8786     0.0167
OSB G069 G03          C1C      2016:271:00000 2016:272:00000 ns           6.3292      0.0152
OSB G069 G03          C1W      2016:271:00000 2016:272:00000 ns           7.7680      0.0098
OSB G069 G03          C2C      2016:271:00000 2016:272:00000 ns           6.3726      0.0222
OSB G069 G03          C2S      2016:271:00000 2016:272:00000 ns           6.4530      0.0455
OSB G069 G03          C2W      2016:271:00000 2016:272:00000 ns          12.7935      0.0153
OSB G069 G03          C2X      2016:271:00000 2016:272:00000 ns           5.8428      0.0279
...
OSB G064 G30          C1C      2016:271:00000 2016:272:00000 ns          10.2336      0.0150
OSB G064 G30          C1W      2016:271:00000 2016:272:00000 ns           9.8797      0.0097
OSB G064 G30          C2C      2016:271:00000 2016:272:00000 ns           9.5838      0.0216
OSB G064 G30          C2S      2016:271:00000 2016:272:00000 ns           9.8167      0.0459
OSB G064 G30          C2W      2016:271:00000 2016:272:00000 ns          16.2713      0.0151
OSB G064 G30          C2X      2016:271:00000 2016:272:00000 ns          10.0010      0.0284
OSB G052 G31          C1C      2016:271:00000 2016:272:00000 ns           -8.1839     0.0158
OSB G052 G31          C1W      2016:271:00000 2016:272:00000 ns           -7.2561     0.0102
OSB G052 G31          C2C      2016:271:00000 2016:272:00000 ns          -18.4654     0.0223
OSB G052 G31          C2S      2016:271:00000 2016:272:00000 ns          -18.7563     0.0515
OSB G052 G31          C2W      2016:271:00000 2016:272:00000 ns          -11.9504     0.0159
OSB G052 G31          C2X      2016:271:00000 2016:272:00000 ns          -18.0693     0.0294
OSB G070 G32          C1C      2016:271:00000 2016:272:00000 ns           5.1753      0.0156
OSB G070 G32          C1W      2016:271:00000 2016:272:00000 ns           6.8556      0.0100
OSB G070 G32          C2C      2016:271:00000 2016:272:00000 ns           4.5923      0.0216
OSB G070 G32          C2S      2016:271:00000 2016:272:00000 ns           4.7685      0.0529
OSB G070 G32          C2W      2016:271:00000 2016:272:00000 ns          11.2908      0.0157

```

OSB G070 G32	C2X	2016:271:00000	2016:272:00000	ns	4.0940	0.0297
OSB R730 R01	C1C	2016:271:00000	2016:272:00000	ns	8.5536	0.0178
OSB R730 R01	C1P	2016:271:00000	2016:272:00000	ns	8.6866	0.0111
OSB R730 R01	C2C	2016:271:00000	2016:272:00000	ns	11.6278	0.0201
OSB R730 R01	C2P	2016:271:00000	2016:272:00000	ns	14.3594	0.0176
OSB R747 R02	C1C	2016:271:00000	2016:272:00000	ns	0.4449	0.0173
OSB R747 R02	C1P	2016:271:00000	2016:272:00000	ns	0.8567	0.0108
OSB R747 R02	C2C	2016:271:00000	2016:272:00000	ns	1.7145	0.0198
OSB R747 R02	C2P	2016:271:00000	2016:272:00000	ns	1.4161	0.0171
OSB R744 R03	C1C	2016:271:00000	2016:272:00000	ns	-5.1898	0.0172
OSB R744 R03	C1P	2016:271:00000	2016:272:00000	ns	-5.9092	0.0108
OSB R744 R03	C2C	2016:271:00000	2016:272:00000	ns	-9.4988	0.0199
OSB R744 R03	C2P	2016:271:00000	2016:272:00000	ns	-9.7682	0.0170
...						
OSB R731 R22	C1C	2016:271:00000	2016:272:00000	ns	1.1577	0.0173
OSB R731 R22	C1P	2016:271:00000	2016:272:00000	ns	1.0525	0.0108
OSB R731 R22	C2C	2016:271:00000	2016:272:00000	ns	1.9180	0.0201
OSB R731 R22	C2P	2016:271:00000	2016:272:00000	ns	1.7399	0.0171
OSB R732 R23	C1C	2016:271:00000	2016:272:00000	ns	12.2262	0.0191
OSB R732 R23	C1P	2016:271:00000	2016:272:00000	ns	11.1258	0.0119
OSB R732 R23	C2C	2016:271:00000	2016:272:00000	ns	15.8499	0.0216
OSB R732 R23	C2P	2016:271:00000	2016:272:00000	ns	18.3916	0.0189
OSB R735 R24	C1C	2016:271:00000	2016:272:00000	ns	-7.8472	0.0180
OSB R735 R24	C1P	2016:271:00000	2016:272:00000	ns	-8.5037	0.0112
OSB R735 R24	C2C	2016:271:00000	2016:272:00000	ns	-12.1577	0.0205
OSB R735 R24	C2P	2016:271:00000	2016:272:00000	ns	-14.0572	0.0178
OSB R801 R26	C1C	2016:271:00000	2016:272:00000	ns	-1.2352	0.0789
OSB R801 R26	C1P	2016:271:00000	2016:272:00000	ns	-0.7177	0.0399
OSB R801 R26	C2C	2016:271:00000	2016:272:00000	ns	-0.5809	0.0655
OSB R801 R26	C2P	2016:271:00000	2016:272:00000	ns	-1.1865	0.0657
OSB E208 E08	C1C	2016:271:00000	2016:272:00000	ns	-9.9791	0.0336
OSB E208 E08	C1X	2016:271:00000	2016:272:00000	ns	-9.8329	0.1289
OSB E208 E08	C5Q	2016:271:00000	2016:272:00000	ns	-17.8953	0.0601
OSB E208 E08	C5X	2016:271:00000	2016:272:00000	ns	-18.6430	0.1340
OSB E208 E08	C7Q	2016:271:00000	2016:272:00000	ns	-18.8698	0.0550
OSB E208 E08	C8Q	2016:271:00000	2016:272:00000	ns	-18.9366	0.0555
OSB E209 E09	C1C	2016:271:00000	2016:272:00000	ns	-5.0047	0.0244
OSB E209 E09	C1X	2016:271:00000	2016:272:00000	ns	-5.3069	0.1098
OSB E209 E09	C5Q	2016:271:00000	2016:272:00000	ns	-8.9749	0.0434
OSB E209 E09	C5X	2016:271:00000	2016:272:00000	ns	-9.7429	0.1162
OSB E209 E09	C7Q	2016:271:00000	2016:272:00000	ns	-9.8429	0.0384
OSB E209 E09	C8Q	2016:271:00000	2016:272:00000	ns	-9.5748	0.0389
OSB E101 E11	C1C	2016:271:00000	2016:272:00000	ns	-20.0952	0.0258
OSB E101 E11	C1X	2016:271:00000	2016:272:00000	ns	-19.3054	0.1137
OSB E101 E11	C5Q	2016:271:00000	2016:272:00000	ns	-36.0361	0.0460
OSB E101 E11	C5X	2016:271:00000	2016:272:00000	ns	-36.0619	0.1197
OSB E101 E11	C7Q	2016:271:00000	2016:272:00000	ns	-36.1338	0.0419
OSB E101 E11	C8Q	2016:271:00000	2016:272:00000	ns	-36.0161	0.0422
...						
OSB E205 E24	C1C	2016:271:00000	2016:272:00000	ns	37.5494	0.0929
OSB E205 E24	C1X	2016:271:00000	2016:272:00000	ns	38.6664	0.3540
OSB E205 E24	C5Q	2016:271:00000	2016:272:00000	ns	67.3362	0.1665
OSB E205 E24	C5X	2016:271:00000	2016:272:00000	ns	70.9915	0.3674
OSB E205 E24	C7Q	2016:271:00000	2016:272:00000	ns	69.0560	0.1387
OSB E205 E24	C8Q	2016:271:00000	2016:272:00000	ns	69.0810	0.1439
OSB E203 E26	C1C	2016:271:00000	2016:272:00000	ns	-0.8064	0.0254
OSB E203 E26	C1X	2016:271:00000	2016:272:00000	ns	-0.8570	0.1037
OSB E203 E26	C5Q	2016:271:00000	2016:272:00000	ns	-1.4461	0.0453
OSB E203 E26	C5X	2016:271:00000	2016:272:00000	ns	-1.7902	0.1085
OSB E203 E26	C7Q	2016:271:00000	2016:272:00000	ns	-2.1133	0.0398
OSB E203 E26	C8Q	2016:271:00000	2016:272:00000	ns	-1.9841	0.0403
OSB E206 E30	C1C	2016:271:00000	2016:272:00000	ns	-3.9773	0.0279
OSB E206 E30	C1X	2016:271:00000	2016:272:00000	ns	-3.6541	0.1140
OSB E206 E30	C5Q	2016:271:00000	2016:272:00000	ns	-7.1323	0.0498
OSB E206 E30	C5X	2016:271:00000	2016:272:00000	ns	-7.8418	0.1194
OSB E206 E30	C7Q	2016:271:00000	2016:272:00000	ns	-8.6446	0.0453
OSB E206 E30	C8Q	2016:271:00000	2016:272:00000	ns	-8.5730	0.0457
OSB C005 C06	C2I	2016:271:00000	2016:272:00000	ns	-8.5994	0.0233
OSB C005 C06	C6I	2016:271:00000	2016:272:00000	ns	-5.9723	0.2247
OSB C005 C06	C7I	2016:271:00000	2016:272:00000	ns	-14.3818	0.0387
OSB C007 C07	C2I	2016:271:00000	2016:272:00000	ns	-13.5612	0.0257
OSB C007 C07	C6I	2016:271:00000	2016:272:00000	ns	-17.4573	0.2495
OSB C007 C07	C7I	2016:271:00000	2016:272:00000	ns	-22.6801	0.0427
OSB C008 C08	C2I	2016:271:00000	2016:272:00000	ns	-10.9001	0.0256
OSB C008 C08	C6I	2016:271:00000	2016:272:00000	ns	-11.6079	0.2756
OSB C008 C08	C7I	2016:271:00000	2016:272:00000	ns	-18.2295	0.0426
...						
OSB C013 C12	C2I	2016:271:00000	2016:272:00000	ns	1.4981	0.0217
OSB C013 C12	C6I	2016:271:00000	2016:272:00000	ns	9.2455	0.3034
OSB C013 C12	C7I	2016:271:00000	2016:272:00000	ns	2.5055	0.0359
OSB C015 C14	C2I	2016:271:00000	2016:272:00000	ns	-1.4346	0.0236
OSB C015 C14	C6I	2016:271:00000	2016:272:00000	ns	2.0533	0.3538
OSB C015 C14	C7I	2016:271:00000	2016:272:00000	ns	-2.3993	0.0391
OSB C017 C15	C2I	2016:271:00000	2016:272:00000	ns	25.0763	0.0198

OSB	C017	C15	C7I	2016:271:00000	2016:272:00000	ns	41.9380	0.0328	
OSB	G	G	ABPO	C1C	2016:271:00000	2016:272:00000	ns	10.7111	0.1291
OSB	G	G	ABPO	C1W	2016:271:00000	2016:272:00000	ns	11.1623	0.1247
OSB	G	G	ABPO	C2W	2016:271:00000	2016:272:00000	ns	18.3837	0.2054
OSB	G	G	ADIS	C1C	2016:271:00000	2016:272:00000	ns	1.8458	0.1030
OSB	G	G	ADIS	C1W	2016:271:00000	2016:272:00000	ns	1.3745	0.0970
OSB	G	G	ADIS	C2W	2016:271:00000	2016:272:00000	ns	2.2638	0.1598
OSB	R	R	ADIS	C1C	2016:271:00000	2016:272:00000	ns	-78.9895	0.1440
OSB	R	R	ADIS	C1P	2016:271:00000	2016:272:00000	ns	-79.8247	0.1370
OSB	R	R	ADIS	C2P	2016:271:00000	2016:272:00000	ns	-70.0032	0.1859
OSB	G	G	ALBH	C1C	2016:271:00000	2016:272:00000	ns	-17.9825	0.0902
OSB	G	G	ALBH	C1W	2016:271:00000	2016:272:00000	ns	-21.1692	0.0837
OSB	G	G	ALBH	C2C	2016:271:00000	2016:272:00000	ns	-26.6337	0.1396
OSB	G	G	ALBH	C2W	2016:271:00000	2016:272:00000	ns	-34.8646	0.1378
OSB	R	R	ALBH	C1C	2016:271:00000	2016:272:00000	ns	-84.0298	0.1295
OSB	R	R	ALBH	C1P	2016:271:00000	2016:272:00000	ns	-85.8746	0.1231
OSB	R	R	ALBH	C2C	2016:271:00000	2016:272:00000	ns	-104.7213	0.1623
OSB	R	R	ALBH	C2P	2016:271:00000	2016:272:00000	ns	-105.5521	0.1630
...									
OSB	G	G	ALIC	C1C	2016:271:00000	2016:272:00000	ns	-33.1066	0.0850
OSB	G	G	ALIC	C2S	2016:271:00000	2016:272:00000	ns	-45.2484	0.1422
OSB	G	G	ALIC	C2W	2016:271:00000	2016:272:00000	ns	-54.5247	0.1400
OSB	R	R	ALIC	C1C	2016:271:00000	2016:272:00000	ns	-27.6935	0.1292
OSB	R	R	ALIC	C2C	2016:271:00000	2016:272:00000	ns	-29.8687	0.1697
OSB	R	R	ALIC	C2P	2016:271:00000	2016:272:00000	ns	-33.1632	0.1696
OSB	E	E	ALIC	C1C	2016:271:00000	2016:272:00000	ns	42.8437	0.1686
OSB	E	E	ALIC	C5Q	2016:271:00000	2016:272:00000	ns	41.8360	0.2200
OSB	E	E	ALIC	C7Q	2016:271:00000	2016:272:00000	ns	34.6993	0.2120
OSB	E	E	ALIC	C8Q	2016:271:00000	2016:272:00000	ns	37.6232	0.2142
OSB	C	C	ALIC	C2I	2016:271:00000	2016:272:00000	ns	33.0258	0.1458
OSB	C	C	ALIC	C7I	2016:271:00000	2016:272:00000	ns	6.6430	0.1885
...									
OSB	G	G	ZIM3	C1C	2016:271:00000	2016:272:00000	ns	21.7697	0.0782
OSB	G	G	ZIM3	C2W	2016:271:00000	2016:272:00000	ns	35.8534	0.1287
OSB	G	G	ZIM3	C2X	2016:271:00000	2016:272:00000	ns	42.0040	0.1294
OSB	R	R	ZIM3	C1C	2016:271:00000	2016:272:00000	ns	29.7776	0.1235
OSB	R	R	ZIM3	C1P	2016:271:00000	2016:272:00000	ns	26.5470	0.1169
OSB	R	R	ZIM3	C2C	2016:271:00000	2016:272:00000	ns	37.6099	0.1527
OSB	R	R	ZIM3	C2P	2016:271:00000	2016:272:00000	ns	37.6654	0.1534
OSB	E	E	ZIM3	C1X	2016:271:00000	2016:272:00000	ns	16.8441	0.1550
OSB	E	E	ZIM3	C5X	2016:271:00000	2016:272:00000	ns	29.8820	0.2015
OSB	C	C	ZIM3	C2I	2016:271:00000	2016:272:00000	ns	10.4639	0.2658
OSB	C	C	ZIM3	C6I	2016:271:00000	2016:272:00000	ns	-42.8452	0.5952
OSB	C	C	ZIM3	C7I	2016:271:00000	2016:272:00000	ns	-7.7160	0.3132
OSB	G	G	ZIMJ	C1C	2016:271:00000	2016:272:00000	ns	-10.7730	0.0925
OSB	G	G	ZIMJ	C1W	2016:271:00000	2016:272:00000	ns	-12.6255	0.0847
OSB	G	G	ZIMJ	C2W	2016:271:00000	2016:272:00000	ns	-20.7935	0.1395
OSB	G	G	ZIMJ	C2X	2016:271:00000	2016:272:00000	ns	-12.5430	0.1385
OSB	R	R	ZIMJ	C1C	2016:271:00000	2016:272:00000	ns	8.2543	0.1313
OSB	R	R	ZIMJ	C1P	2016:271:00000	2016:272:00000	ns	8.6199	0.1237
OSB	R	R	ZIMJ	C2C	2016:271:00000	2016:272:00000	ns	22.8947	0.1630
OSB	R	R	ZIMJ	C2P	2016:271:00000	2016:272:00000	ns	23.7439	0.1639
OSB	E	E	ZIMJ	C1X	2016:271:00000	2016:272:00000	ns	-8.3411	0.1919
OSB	E	E	ZIMJ	C5X	2016:271:00000	2016:272:00000	ns	6.0309	0.2355
OSB	G	G	ZIMM	C1C	2016:271:00000	2016:272:00000	ns	18.4106	0.1059
OSB	G	G	ZIMM	C2W	2016:271:00000	2016:272:00000	ns	30.3212	0.1744
OSB	G	G	ZIMM	C2X	2016:271:00000	2016:272:00000	ns	39.2877	0.1741
OSB	G	G	ZWE2	C1C	2016:271:00000	2016:272:00000	ns	2.9704	0.1144
OSB	G	G	ZWE2	C1W	2016:271:00000	2016:272:00000	ns	-0.1800	0.1093
OSB	G	G	ZWE2	C2W	2016:271:00000	2016:272:00000	ns	-0.2964	0.1801

-BIAS/SOLUTION
%=ENDBIA

A.5.2 Example 4B: GPS/GLONASS/Galileo/BeiDou 1-Day Bias Results Using Relative Parameter Representation

```

%=BIA 1.00 COD 2016:330:30148 IGS 2016:271:00000 2016:272:00000 R 00001915
-----
* Bias Solution INdependent EXchange Format (Bias-SINEX)
-----
* CODE'S MGEX BIAS COMBINATION RESULTS FOR DAY 271, 2016          25-NOV-16 08:21
-----
+FILE/REFERENCE
*INFO_TYPE_____INFO_____
DESCRIPTION      CODE, Astronomical Institute, University of Bern
OUTPUT           CODE IGS MGEX 1-day bias solution for G/R/E/C
CONTACT          code@aib.unibe.ch
SOFTWARE         Bernese GNSS Software Version 5.3

```

HARDWARE UBELIX: Linux, x86_64
 INPUT CODE IGS MGEX 1-day bias solution(s) for G/R/E/C
 -FILE/REFERENCE

*-----
 +FILE/COMMENT

*PRODUCT_REFERENCE
 CODE product series for the IGS MGEX project.
 Published by Astronomical Institute, University of Bern.
 URL: http://www.aiub.unibe.ch/download/CODE_MGEX
 DOI: 10.7892/boris.75882.
 -FILE/COMMENT

*-----
 +INPUT/ACKNOWLEDGMENTS

*AGY DESCRIPTION
 COD Center for Orbit Determination in Europe, AIUB, Switzerland
 IGS International GNSS Service
 -INPUT/ACKNOWLEDGMENTS

*-----
 +BIAS/DESCRIPTION

*KEYWORD VALUE(S)
 OBSERVATION_SAMPLING 300
 PARAMETER_SPACING 86400
 DETERMINATION_METHOD COMBINED_ANALYSIS
 BIAS_MODE RELATIVE
 TIME_SYSTEM G
 RECEIVER_CLOCK_REFERENCE_GNSS G
 SATELLITE_CLOCK_REFERENCE_OBSERVABLES G C1W C2W
 SATELLITE_CLOCK_REFERENCE_OBSERVABLES R C1P C2P
 SATELLITE_CLOCK_REFERENCE_OBSERVABLES E C1C C5Q
 SATELLITE_CLOCK_REFERENCE_OBSERVABLES C C2I C7I

-BIAS/DESCRIPTION
 *-----

+BIAS/SOLUTION

*BIAS SVN_ PRN STATION_	OBS1	OBS2	BIAS_START_	BIAS_END_	UNIT	_ESTIMATED_VALUE_	_STD_DEV_	_ESTIMATED_SLOPE_	_STD_DEV_
ISB G063 G01	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB G063 G01	C1W	C1C	2016:271:00000	2016:272:00000	ns	1.4295	0.0183		
DSB G063 G01	C2W	C2C	2016:271:00000	2016:272:00000	ns	8.2266	0.0272		
DSB G063 G01	C2W	C2S	2016:271:00000	2016:272:00000	ns	8.3778	0.0494		
DSB G063 G01	C1W	C2W	2016:271:00000	2016:272:00000	ns	-7.4709	0.0183		
DSB G063 G01	C2W	C2X	2016:271:00000	2016:272:00000	ns	8.0053	0.0336		
ISB G061 G02	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB G061 G02	C1W	C1C	2016:271:00000	2016:272:00000	ns	-1.3111	0.0198		
DSB G061 G02	C1W	C2W	2016:271:00000	2016:272:00000	ns	8.9871	0.0197		
ISB G069 G03	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB G069 G03	C1W	C1C	2016:271:00000	2016:272:00000	ns	1.4388	0.0181		
DSB G069 G03	C2C	C2C	2016:271:00000	2016:272:00000	ns	6.4209	0.0269		
DSB G069 G03	C2W	C2S	2016:271:00000	2016:272:00000	ns	6.3405	0.0480		
DSB G069 G03	C1W	C2W	2016:271:00000	2016:272:00000	ns	-5.0255	0.0181		
DSB G069 G03	C2W	C2X	2016:271:00000	2016:272:00000	ns	6.9507	0.0318		
...									
ISB G064 G30	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB G064 G30	C1W	C1C	2016:271:00000	2016:272:00000	ns	-0.3539	0.0179		
DSB G064 G30	C2W	C2C	2016:271:00000	2016:272:00000	ns	6.6874	0.0263		
DSB G064 G30	C2W	C2S	2016:271:00000	2016:272:00000	ns	6.4545	0.0483		
DSB G064 G30	C1W	C2W	2016:271:00000	2016:272:00000	ns	-6.3916	0.0179		
DSB G064 G30	C2W	C2X	2016:271:00000	2016:272:00000	ns	6.2703	0.0321		
ISB G052 G31	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB G052 G31	C1W	C1C	2016:271:00000	2016:272:00000	ns	0.9278	0.0188		
DSB G052 G31	C2W	C2C	2016:271:00000	2016:272:00000	ns	6.5150	0.0274		
DSB G052 G31	C2W	C2S	2016:271:00000	2016:272:00000	ns	6.8059	0.0539		
DSB G052 G31	C1W	C2W	2016:271:00000	2016:272:00000	ns	4.6943	0.0189		
DSB G052 G31	C2W	C2X	2016:271:00000	2016:272:00000	ns	6.1189	0.0334		
ISB G070 G32	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB G070 G32	C1W	C1C	2016:271:00000	2016:272:00000	ns	1.6803	0.0185		
DSB G070 G32	C2W	C2C	2016:271:00000	2016:272:00000	ns	6.6985	0.0267		
DSB G070 G32	C2W	C2S	2016:271:00000	2016:272:00000	ns	6.5223	0.0552		
DSB G070 G32	C1W	C2W	2016:271:00000	2016:272:00000	ns	-4.4352	0.0186		
DSB G070 G32	C2W	C2X	2016:271:00000	2016:272:00000	ns	7.1968	0.0335		
ISB R730 R01	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0		
DSB R730 R01	C1P	C1C	2016:271:00000	2016:272:00000	ns	0.1329	0.0210		
DSB R730 R01	C2P	C2C	2016:271:00000	2016:272:00000	ns	2.7316	0.0267		
DSB R730 R01	C1P	C2P	2016:271:00000	2016:272:00000	ns	-5.6729	0.0208		
ISB R747 R02	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0		
DSB R747 R02	C1P	C1C	2016:271:00000	2016:272:00000	ns	0.4118	0.0204		
DSB R747 R02	C2P	C2C	2016:271:00000	2016:272:00000	ns	-0.2984	0.0262		
DSB R747 R02	C1P	C2P	2016:271:00000	2016:272:00000	ns	-0.5595	0.0203		
ISB R744 R03	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0		
DSB R744 R03	C1P	C1C	2016:271:00000	2016:272:00000	ns	-0.7194	0.0203		
DSB R744 R03	C2P	C2C	2016:271:00000	2016:272:00000	ns	-0.2694	0.0262		
DSB R744 R03	C1P	C2P	2016:271:00000	2016:272:00000	ns	3.8590	0.0201		
...									
ISB R731 R22	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0		
DSB R731 R22	C1P	C1C	2016:271:00000	2016:272:00000	ns	-0.1051	0.0204		
DSB R731 R22	C2P	C2C	2016:271:00000	2016:272:00000	ns	-0.1781	0.0264		

DSB	R731	R22	C1P	C2P	2016:271:00000	2016:272:00000	ns	-0.6874	0.0203	
ISB	R732	R23	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0	
DSB	R732	R23	C1P	C1C	2016:271:00000	2016:272:00000	ns	-1.1004	0.0225	
DSB	R732	R23	C2P	C2C	2016:271:00000	2016:272:00000	ns	2.5417	0.0287	
DSB	R732	R23	C1P	C2P	2016:271:00000	2016:272:00000	ns	-7.2658	0.0223	
ISB	R735	R24	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0	
DSB	R735	R24	C1P	C1C	2016:271:00000	2016:272:00000	ns	-0.6565	0.0212	
DSB	R735	R24	C2P	C2C	2016:271:00000	2016:272:00000	ns	-1.8995	0.0272	
DSB	R735	R24	C1P	C2P	2016:271:00000	2016:272:00000	ns	5.5535	0.0211	
ISB	R801	R26	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0	
DSB	R801	R26	C1P	C1C	2016:271:00000	2016:272:00000	ns	0.5175	0.0884	
DSB	R801	R26	C2P	C2C	2016:271:00000	2016:272:00000	ns	-0.6056	0.0928	
DSB	R801	R26	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.4687	0.0768	
ISB	E208	E08	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E208	E08	C1C	C1X	2016:271:00000	2016:272:00000	ns	-0.1462	0.1332	
DSB	E208	E08	C1C	C5Q	2016:271:00000	2016:272:00000	ns	7.9161	0.0689	
DSB	E208	E08	C5Q	C5X	2016:271:00000	2016:272:00000	ns	0.7478	0.1469	
DSB	E208	E08	C5Q	C7Q	2016:271:00000	2016:272:00000	ns	0.9745	0.0815	
DSB	E208	E08	C5Q	C8Q	2016:271:00000	2016:272:00000	ns	1.0414	0.0818	
ISB	E209	E09	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E209	E09	C1C	C1X	2016:271:00000	2016:272:00000	ns	0.3022	0.1124	
DSB	E209	E09	C1C	C5Q	2016:271:00000	2016:272:00000	ns	3.9701	0.0498	
DSB	E209	E09	C5Q	C5X	2016:271:00000	2016:272:00000	ns	0.7680	0.1240	
DSB	E209	E09	C5Q	C7Q	2016:271:00000	2016:272:00000	ns	0.8681	0.0580	
DSB	E209	E09	C5Q	C8Q	2016:271:00000	2016:272:00000	ns	0.6000	0.0583	
ISB	E101	E11	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E101	E11	C1C	C1X	2016:271:00000	2016:272:00000	ns	-0.7897	0.1166	
DSB	E101	E11	C1C	C5Q	2016:271:00000	2016:272:00000	ns	15.9409	0.0527	
DSB	E101	E11	C5Q	C5X	2016:271:00000	2016:272:00000	ns	0.0259	0.1283	
DSB	E101	E11	C5Q	C7Q	2016:271:00000	2016:272:00000	ns	0.0977	0.0622	
DSB	E101	E11	C5Q	C8Q	2016:271:00000	2016:272:00000	ns	-0.0200	0.0624	
...										
ISB	E205	E24	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E205	E24	C1C	C1X	2016:271:00000	2016:272:00000	ns	-1.1170	0.3660	
DSB	E205	E24	C1C	C5Q	2016:271:00000	2016:272:00000	ns	-29.7868	0.1906	
DSB	E205	E24	C5Q	C5X	2016:271:00000	2016:272:00000	ns	-3.6553	0.4034	
DSB	E205	E24	C5Q	C7Q	2016:271:00000	2016:272:00000	ns	-1.7198	0.2167	
DSB	E205	E24	C5Q	C8Q	2016:271:00000	2016:272:00000	ns	-1.7447	0.2200	
ISB	E203	E26	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E203	E26	C1C	C1X	2016:271:00000	2016:272:00000	ns	0.0506	0.1068	
DSB	E203	E26	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0.6397	0.0520	
DSB	E203	E26	C5Q	C5X	2016:271:00000	2016:272:00000	ns	0.3441	0.1176	
DSB	E203	E26	C5Q	C7Q	2016:271:00000	2016:272:00000	ns	0.6672	0.0603	
DSB	E203	E26	C5Q	C8Q	2016:271:00000	2016:272:00000	ns	0.5379	0.0607	
ISB	E206	E30	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E206	E30	C1C	C1X	2016:271:00000	2016:272:00000	ns	-0.3232	0.1173	
DSB	E206	E30	C1C	C5Q	2016:271:00000	2016:272:00000	ns	3.1551	0.0571	
DSB	E206	E30	C5Q	C5X	2016:271:00000	2016:272:00000	ns	0.7094	0.1293	
DSB	E206	E30	C5Q	C7Q	2016:271:00000	2016:272:00000	ns	1.5123	0.0673	
DSB	E206	E30	C5Q	C8Q	2016:271:00000	2016:272:00000	ns	1.4407	0.0676	
ISB	C005	C06	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C005	C06	C7I	C6I	2016:271:00000	2016:272:00000	ns	-8.4095	0.2280	
DSB	C005	C06	C2I	C7I	2016:271:00000	2016:272:00000	ns	5.7824	0.0452	
ISB	C007	C07	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C007	C07	C7I	C6I	2016:271:00000	2016:272:00000	ns	-5.2227	0.2531	
DSB	C007	C07	C2I	C7I	2016:271:00000	2016:272:00000	ns	9.1188	0.0499	
ISB	C008	C08	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C008	C08	C7I	C6I	2016:271:00000	2016:272:00000	ns	-6.6216	0.2789	
DSB	C008	C08	C2I	C7I	2016:271:00000	2016:272:00000	ns	7.3294	0.0497	
...										
ISB	C013	C12	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C013	C12	C7I	C6I	2016:271:00000	2016:272:00000	ns	-6.7400	0.3055	
DSB	C013	C12	C2I	C7I	2016:271:00000	2016:272:00000	ns	-1.0074	0.0419	
ISB	C015	C14	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C015	C14	C7I	C6I	2016:271:00000	2016:272:00000	ns	-4.4526	0.3560	
DSB	C015	C14	C2I	C7I	2016:271:00000	2016:272:00000	ns	0.9647	0.0457	
ISB	C017	C15	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C017	C15	C2I	C7I	2016:271:00000	2016:272:00000	ns	-16.8618	0.0383	
ISB	G	G	ABPO	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ABPO	C1W	C2W	2016:271:00000	2016:272:00000	ns	-7.2214	0.2404
DSB	G	G	ABPO	C1W	C1C	2016:271:00000	2016:272:00000	ns	0.4512	0.1795
ISB	G	G	ADIS	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ADIS	C1W	C2W	2016:271:00000	2016:272:00000	ns	-0.8892	0.1869
DSB	G	G	ADIS	C1W	C1C	2016:271:00000	2016:272:00000	ns	-0.4713	0.1415
ISB	R	R	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-94.8638	0.4487
DSB	R	R	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-9.8215	0.2310
DSB	R	R	ADIS	C1P	C1C	2016:271:00000	2016:272:00000	ns	-0.8352	0.1988
ISB	G	G	ALBH	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ALBH	C1W	C2W	2016:271:00000	2016:272:00000	ns	13.6953	0.1612
DSB	G	G	ALBH	C1W	C1C	2016:271:00000	2016:272:00000	ns	-3.1868	0.1231
DSB	G	G	ALBH	C2W	C2C	2016:271:00000	2016:272:00000	ns	-8.2308	0.1961
ISB	R	R	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	-55.7435	0.3993
DSB	R	R	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	19.6774	0.2042
DSB	R	R	ALBH	C1P	C1C	2016:271:00000	2016:272:00000	ns	-1.8448	0.1787

```

DSB R R ALBH C2P C2C 2016:271:00000 2016:272:00000 ns -0.8308 0.2300
...
ISB G G ALIC C1C C2W 2016:271:00000 2016:272:00000 ns 0 0
DSB G G ALIC C1C C2W 2016:271:00000 2016:272:00000 ns 21.4181 0.1638
DSB G G ALIC C2W C2S 2016:271:00000 2016:272:00000 ns -9.2763 0.1996
ISB R R ALIC C1C C2P 2016:271:00000 2016:272:00000 ns -19.3181 0.4176
DSB R R ALIC C1C C2P 2016:271:00000 2016:272:00000 ns 5.4697 0.2132
DSB R R ALIC C2P C2C 2016:271:00000 2016:272:00000 ns -3.2945 0.2399
ISB E E ALIC C1C C5Q 2016:271:00000 2016:272:00000 ns 44.1920 0.4919
DSB E E ALIC C1C C5Q 2016:271:00000 2016:272:00000 ns 1.0077 0.2771
DSB E E ALIC C1C C7Q 2016:271:00000 2016:272:00000 ns 8.1444 0.2709
DSB E E ALIC C1C C8Q 2016:271:00000 2016:272:00000 ns 5.2205 0.2726
ISB C C ALIC C2I C7I 2016:271:00000 2016:272:00000 ns 72.2615 0.4583
DSB C C ALIC C2I C7I 2016:271:00000 2016:272:00000 ns 26.3828 0.2383
...
ISB G G ZIM3 C1C C2X 2016:271:00000 2016:272:00000 ns 0 0
DSB G G ZIM3 C1C C2X 2016:271:00000 2016:272:00000 ns -20.2343 0.1512
DSB G G ZIM3 C2X C2W 2016:271:00000 2016:272:00000 ns 6.1505 0.1825
ISB R R ZIM3 C1P C2P 2016:271:00000 2016:272:00000 ns 9.5220 0.3778
DSB R R ZIM3 C1P C2P 2016:271:00000 2016:272:00000 ns -11.1184 0.1929
DSB R R ZIM3 C1P C1C 2016:271:00000 2016:272:00000 ns -3.2306 0.1700
DSB R R ZIM3 C2P C2C 2016:271:00000 2016:272:00000 ns 0.0556 0.2164
ISB E E ZIM3 C1X C5X 2016:271:00000 2016:272:00000 ns -0.6006 0.4517
DSB E E ZIM3 C1X C5X 2016:271:00000 2016:272:00000 ns -13.0380 0.2542
ISB C C ZIM3 C2I C7I 2016:271:00000 2016:272:00000 ns 37.5005 0.8087
DSB C C ZIM3 C2I C7I 2016:271:00000 2016:272:00000 ns 18.1799 0.4108
DSB C C ZIM3 C2I C6I 2016:271:00000 2016:272:00000 ns 53.3091 0.6519
ISB G G ZIMJ C1W C2X 2016:271:00000 2016:272:00000 ns 0 0
DSB G G ZIMJ C1W C2X 2016:271:00000 2016:272:00000 ns -0.0825 0.1623
DSB G G ZIMJ C1W C1C 2016:271:00000 2016:272:00000 ns -1.8525 0.1254
DSB G G ZIMJ C2X C2W 2016:271:00000 2016:272:00000 ns 8.2505 0.1966
ISB R R ZIMJ C1P C2P 2016:271:00000 2016:272:00000 ns -14.5386 0.4013
DSB R R ZIMJ C1P C2P 2016:271:00000 2016:272:00000 ns -15.1239 0.2053
DSB R R ZIMJ C1P C1C 2016:271:00000 2016:272:00000 ns 0.3656 0.1803
DSB R R ZIMJ C2P C2C 2016:271:00000 2016:272:00000 ns 0.8492 0.2312
ISB E E ZIMJ C1X C5X 2016:271:00000 2016:272:00000 ns -27.5709 0.5482
DSB E E ZIMJ C1X C5X 2016:271:00000 2016:272:00000 ns -14.3721 0.3038
ISB G G ZIMM C1C C2X 2016:271:00000 2016:272:00000 ns 0 0
DSB G G ZIMM C1C C2X 2016:271:00000 2016:272:00000 ns -20.8771 0.2038
DSB G G ZIMM C2X C2W 2016:271:00000 2016:272:00000 ns 8.9665 0.2464
ISB G G ZWE2 C1W C2W 2016:271:00000 2016:272:00000 ns 0 0
DSB G G ZWE2 C1W C2W 2016:271:00000 2016:272:00000 ns 0.1164 0.2107
DSB G G ZWE2 C1W C1C 2016:271:00000 2016:272:00000 ns -3.1504 0.1583
-BIAS/SOLUTION
%-ENDBIA

```

A.6 Example 5: GPS/GLONASS/Galileo/BeiDou 1-Day Bias Results From (Dual-Frequency) Clock Analysis

Note: The GLONASS biases are treated in a GPS-like manner (composed of a station and a satellite component).

```

%=BIA 1.00 COD 2016:318:60608 IGS 2016:271:00000 2016:272:00000 R 00001372
*-----
* Bias Solution INdependent EXchange Format (Bias-SINEX)
*-----
* CODE'S MGEX CLOCK ANALYSIS FOR DAY 271, 2016 13-NOV-16 16:49
*-----
+FILE/REFERENCE
*INFO_TYPE_____INFO_____
DESCRIPTION CODE, Astronomical Institute, University of Bern
OUTPUT CODE IGS MGEX 1-day bias solution for G/R/E/C
CONTACT code@aib.unibe.ch
SOFTWARE Bernese GNSS Software Version 5.3
HARDWARE UBELIX: Linux, x86_64
INPUT CODE IGS MGEX 1-day bias solution(s) for G/R/E/C
-FILE/REFERENCE
*-----
+FILE/COMMENT
*PRODUCT_REFERENCE_____
CODE product series for the IGS MGEX project.
Published by Astronomical Institute, University of Bern.
URL: http://www.aib.unibe.ch/download/CODE_MGEX
DOI: 10.7892/boris.75882.
-FILE/COMMENT
*-----

```


+INPUT/ACKNOWLEDGMENTS

*AGY DESCRIPTION-----
COD Center for Orbit Determination in Europe, AIUB, Switzerland
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS

*-----
+BIAS/DESCRIPTION

*KEYWORD----- VALUE(S)-----
OBSERVATION_SAMPLING 300
PARAMETER_SPACING 86400
DETERMINATION_METHOD CLOCK_ANALYSIS
BIAS_MODE RELATIVE
TIME_SYSTEM G
RECEIVER_CLOCK_REFERENCE_GNSS G
SATELLITE_CLOCK_REFERENCE_OBSERVABLES G C1W C2W
SATELLITE_CLOCK_REFERENCE_OBSERVABLES R C1P C2P
SATELLITE_CLOCK_REFERENCE_OBSERVABLES E C1C C5Q
SATELLITE_CLOCK_REFERENCE_OBSERVABLES C C2I C7I

-BIAS/DESCRIPTION

*-----
+BIAS/SOLUTION

*BIAS_SVN_	PRN	STATION_	OBS1	OBS2	BIAS_START_	BIAS_END_	UNIT	_ESTIMATED_VALUE_	_STD_DEV_	_ESTIMATED_SLOPE_	_STD_DEV_
ISB	G063	G01	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB	G063	G01	C1W	C1C	2016:271:00000	2016:272:00000	ns	1.4723	0.0155		
DSB	G063	G01	C2W	C2C	2016:271:00000	2016:272:00000	ns	1.5926	0.1327		
DSB	G063	G01	C1W	C2W	2016:271:00000	2016:272:00000	ns	-0.0000	0.0021		
ISB	G061	G02	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB	G061	G02	C1W	C1C	2016:271:00000	2016:272:00000	ns	-1.3099	0.0171		
DSB	G061	G02	C1W	C2W	2016:271:00000	2016:272:00000	ns	-0.0000	0.0021		
ISB	G069	G03	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB	G069	G03	C1W	C1C	2016:271:00000	2016:272:00000	ns	1.4089	0.0152		
DSB	G069	G03	C2W	C2C	2016:271:00000	2016:272:00000	ns	-0.7304	0.1282		
DSB	G069	G03	C1W	C2W	2016:271:00000	2016:272:00000	ns	-0.0000	0.0021		
...											
ISB	G064	G30	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB	G064	G30	C1W	C1C	2016:271:00000	2016:272:00000	ns	-0.3393	0.0152		
DSB	G064	G30	C2W	C2C	2016:271:00000	2016:272:00000	ns	-0.2521	0.1266		
DSB	G064	G30	C1W	C2W	2016:271:00000	2016:272:00000	ns	-0.0000	0.0021		
ISB	G052	G31	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB	G052	G31	C1W	C1C	2016:271:00000	2016:272:00000	ns	0.8103	0.0158		
DSB	G052	G31	C2W	C2C	2016:271:00000	2016:272:00000	ns	-0.0693	0.1912		
DSB	G052	G31	C1W	C2W	2016:271:00000	2016:272:00000	ns	-0.0000	0.0021		
ISB	G070	G32	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0		
DSB	G070	G32	C1W	C1C	2016:271:00000	2016:272:00000	ns	1.7331	0.0158		
DSB	G070	G32	C2W	C2C	2016:271:00000	2016:272:00000	ns	-0.9028	0.1341		
DSB	G070	G32	C1W	C2W	2016:271:00000	2016:272:00000	ns	-0.0000	0.0021		
ISB	R730	R01	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0		
DSB	R730	R01	C1P	C1C	2016:271:00000	2016:272:00000	ns	0.0339	0.0200		
DSB	R730	R01	C2P	C2C	2016:271:00000	2016:272:00000	ns	2.2959	0.1795		
DSB	R730	R01	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000		
ISB	R747	R02	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0		
DSB	R747	R02	C1P	C1C	2016:271:00000	2016:272:00000	ns	1.0759	0.0193		
DSB	R747	R02	C2P	C2C	2016:271:00000	2016:272:00000	ns	-1.4546	0.1919		
DSB	R747	R02	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000		
ISB	R744	R03	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0		
DSB	R744	R03	C1P	C1C	2016:271:00000	2016:272:00000	ns	-1.5743	0.0190		
DSB	R744	R03	C2P	C2C	2016:271:00000	2016:272:00000	ns	1.6890	0.1823		
DSB	R744	R03	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000		
...											
ISB	R731	R22	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0		
DSB	R731	R22	C1P	C1C	2016:271:00000	2016:272:00000	ns	0.4498	0.0189		
DSB	R731	R22	C2P	C2C	2016:271:00000	2016:272:00000	ns	-0.7661	0.1775		
DSB	R731	R22	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000		
ISB	R732	R23	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0		
DSB	R732	R23	C1P	C1C	2016:271:00000	2016:272:00000	ns	-1.7220	0.0211		
DSB	R732	R23	C2P	C2C	2016:271:00000	2016:272:00000	ns	2.5214	0.1804		
DSB	R732	R23	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000		
ISB	R735	R24	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0		
DSB	R735	R24	C1P	C1C	2016:271:00000	2016:272:00000	ns	-0.9716	0.0194		
DSB	R735	R24	C2P	C2C	2016:271:00000	2016:272:00000	ns	-1.3669	0.1810		
DSB	R735	R24	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000		
ISB	R801	R26	C1P	C2P	2016:271:00000	2016:272:00000	ns	0	0		
DSB	R801	R26	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000		
ISB	E208	E08	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0		
DSB	E208	E08	C1C	C1X	2016:271:00000	2016:272:00000	ns	-0.5731	0.0532		
DSB	E208	E08	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0.0000	0.0000		
ISB	E209	E09	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0		
DSB	E209	E09	C1C	C1X	2016:271:00000	2016:272:00000	ns	-0.1348	0.0449		
DSB	E209	E09	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0.0000	0.0000		
ISB	E101	E11	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0		
DSB	E101	E11	C1C	C1X	2016:271:00000	2016:272:00000	ns	-0.7131	0.0466		
DSB	E101	E11	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0.0000	0.0000		
...											
ISB	E205	E24	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0		

DSB	E205	E24	C1C	C1X	2016:271:00000	2016:272:00000	ns	0.9095	0.1462	
DSB	E205	E24	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0.0000	0.0000	
DSB	E205	E24	C5Q	C5X	2016:271:00000	2016:272:00000	ns	0.0000	0.0000	
ISB	E203	E26	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E203	E26	C1C	C1X	2016:271:00000	2016:272:00000	ns	-0.1575	0.0427	
DSB	E203	E26	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0.0000	0.0000	
ISB	E206	E30	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E206	E30	C1C	C1X	2016:271:00000	2016:272:00000	ns	-0.7945	0.0469	
DSB	E206	E30	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0.0000	0.0000	
ISB	C005	C06	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C005	C06	C2I	C7I	2016:271:00000	2016:272:00000	ns	0.0000	0.0000	
ISB	C007	C07	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C007	C07	C2I	C7I	2016:271:00000	2016:272:00000	ns	0.0000	0.0000	
ISB	C008	C08	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C008	C08	C2I	C7I	2016:271:00000	2016:272:00000	ns	0.0000	0.0000	
...										
ISB	C013	C12	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C013	C12	C2I	C7I	2016:271:00000	2016:272:00000	ns	0.0000	0.0000	
ISB	C015	C14	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C015	C14	C2I	C7I	2016:271:00000	2016:272:00000	ns	0.0000	0.0000	
ISB	C017	C15	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C017	C15	C2I	C7I	2016:271:00000	2016:272:00000	ns	0.0000	0.0000	
ISB	G	G	ABPO	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ABPO	C1W	C2W	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	G	G	ADIS	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ADIS	C1W	C2W	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	R	R	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-94.8476	0.2761
DSB	R	R	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	G	G	ALBH	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ALBH	C1W	C2W	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	R	R	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	-55.7377	0.2606
DSB	R	R	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
...										
ISB	G	G	ALIC	C1C	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ALIC	C1C	C2W	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	R	R	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	-19.4217	0.2771
DSB	R	R	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	E	E	ALIC	C1C	C5Q	2016:271:00000	2016:272:00000	ns	43.3178	0.3565
DSB	E	E	ALIC	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	C	C	ALIC	C2I	C7I	2016:271:00000	2016:272:00000	ns	40.5556	0.3134
DSB	C	C	ALIC	C2I	C7I	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
...										
ISB	G	G	ZIM3	C1C	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ZIM3	C1C	C2W	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	R	R	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	9.5410	0.2510
DSB	R	R	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	E	E	ZIM3	C1X	C5X	2016:271:00000	2016:272:00000	ns	-0.3950	0.3290
DSB	E	E	ZIM3	C1X	C5X	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	C	C	ZIM3	C2I	C7I	2016:271:00000	2016:272:00000	ns	5.7880	0.6481
DSB	C	C	ZIM3	C2I	C7I	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	G	G	ZIMJ	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ZIMJ	C1W	C2W	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	R	R	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-14.5380	0.2610
DSB	R	R	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	E	E	ZIMJ	C1X	C5X	2016:271:00000	2016:272:00000	ns	-27.2796	0.4313
DSB	E	E	ZIMJ	C1X	C5X	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	G	G	ZIMM	C1C	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ZIMM	C1C	C2W	2016:271:00000	2016:272:00000	ns	0.0000	0.0000
ISB	G	G	ZWE2	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ZWE2	C1W	C2W	2016:271:00000	2016:272:00000	ns	0.0000	0.0000

-BIAS/SOLUTION
%=ENDBIA

A.7 Example 6: GPS/GLONASS/Galileo/BeiDou 1-Day Bias Results From (Multi-Frequency) Ionosphere Analysis

Note: The GLONASS biases are treated in a GPS-like manner (composed of a station and a satellite component).

```

%=BIA 1.00 COD 2016:317:53400 IGS 2016:271:00000 2016:272:00000 R 00000747
*-----
* Bias Solution INdependent EXchange Format (Bias-SINEX)
*-----
* CODE'S MGEX IONOSPHERE ANALYSIS FOR DAY 271, 2016 12-NOV-16 14:49
*-----
+FILE/REFERENCE

```

```

*INFO_TYPE----- INFO-----
DESCRIPTION      CODE, Astronomical Institute, University of Bern
OUTPUT           CODE IGS MGEX 1-day bias solution for G/R/E/C
CONTACT          code@aiub.unibe.ch
SOFTWARE         Bernese GNSS Software Version 5.3
HARDWARE         UBELIX: Linux, x86_64
INPUT           CODE IGS MGEX 1-day bias solution(s) for G/R/E/C
-FILE/REFERENCE

```

```

+FILE/COMMENT
*PRODUCT_REFERENCE-----
CODE product series for the IGS MGEX project.
Published by Astronomical Institute, University of Bern.
URL: http://www.aiub.unibe.ch/download/CODE_MGEX
DOI: 10.7892/boris.75882.
-FILE/COMMENT

```

```

+INPUT/ACKNOWLEDGMENTS
*AGY DESCRIPTION-----
COD Center for Orbit Determination in Europe, AIUB, Switzerland
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS

```

```

+BIAS/DESCRIPTION
*KEYWORD----- VALUE(S)-----
OBSERVATION_SAMPLING      300
PARAMETER_SPACING         86400
DETERMINATION_METHOD      IONOSPHERE_ANALYSIS
BIAS_MODE                  RELATIVE
TIME_SYSTEM                G
-BIAS/DESCRIPTION

```

```

+BIAS/SOLUTION
*BIAS SVN_ PRN STATION__ OBS1 OBS2 BIAS_START_____ BIAS_END_____ UNIT __ESTIMATED_VALUE_____ _STD_DEV___ _ESTIMATED_SLOPE_____ _STD_DEV___

```

BIAS SVN_	PRN	STATION__	OBS1	OBS2	BIAS_START_____	BIAS_END_____	UNIT	__ESTIMATED_VALUE_____	_STD_DEV___	_ESTIMATED_SLOPE_____	_STD_DEV___
DSB	G063	G01	C1W	C1C	2016:271:00000	2016:272:00000	ns	1.4933	0.0406		
DSB	G063	G01	C2W	C2C	2016:271:00000	2016:272:00000	ns	8.5221	0.1138		
DSB	G063	G01	C1W	C2W	2016:271:00000	2016:272:00000	ns	-7.4615	0.0382		
DSB	G061	G02	C1W	C1C	2016:271:00000	2016:272:00000	ns	-1.2453	0.0445		
DSB	G061	G02	C1W	C2W	2016:271:00000	2016:272:00000	ns	8.9998	0.0419		
DSB	G069	G03	C1W	C1C	2016:271:00000	2016:272:00000	ns	1.2470	0.0400		
DSB	G069	G03	C2W	C2C	2016:271:00000	2016:272:00000	ns	6.0166	0.1068		
DSB	G069	G03	C1W	C2W	2016:271:00000	2016:272:00000	ns	-5.0692	0.0378		
...											
DSB	G064	G30	C1W	C1C	2016:271:00000	2016:272:00000	ns	-0.3173	0.0395		
DSB	G064	G30	C2W	C2C	2016:271:00000	2016:272:00000	ns	7.0553	0.1073		
DSB	G064	G30	C1W	C2W	2016:271:00000	2016:272:00000	ns	-6.3697	0.0373		
DSB	G052	G31	C1W	C1C	2016:271:00000	2016:272:00000	ns	0.8940	0.0417		
DSB	G052	G31	C2W	C2C	2016:271:00000	2016:272:00000	ns	6.5793	0.1581		
DSB	G052	G31	C1W	C2W	2016:271:00000	2016:272:00000	ns	4.6719	0.0394		
DSB	G070	G32	C1W	C1C	2016:271:00000	2016:272:00000	ns	1.5936	0.0410		
DSB	G070	G32	C2W	C2C	2016:271:00000	2016:272:00000	ns	5.9449	0.1159		
DSB	G070	G32	C1W	C2W	2016:271:00000	2016:272:00000	ns	-4.4494	0.0386		
DSB	R730	R01	C1P	C1C	2016:271:00000	2016:272:00000	ns	0.5332	0.0453		
DSB	R730	R01	C2P	C2C	2016:271:00000	2016:272:00000	ns	2.2418	0.1467		
DSB	R730	R01	C1P	C2P	2016:271:00000	2016:272:00000	ns	-5.6055	0.0417		
DSB	R747	R02	C1P	C1C	2016:271:00000	2016:272:00000	ns	0.5266	0.0438		
DSB	R747	R02	C2P	C2C	2016:271:00000	2016:272:00000	ns	-0.0338	0.1552		
DSB	R747	R02	C1P	C2P	2016:271:00000	2016:272:00000	ns	-0.6524	0.0405		
DSB	R744	R03	C1P	C1C	2016:271:00000	2016:272:00000	ns	-1.1271	0.0434		
DSB	R744	R03	C2P	C2C	2016:271:00000	2016:272:00000	ns	1.1673	0.1444		
DSB	R744	R03	C1P	C2P	2016:271:00000	2016:272:00000	ns	3.8998	0.0403		
...											
DSB	R731	R22	C1P	C1C	2016:271:00000	2016:272:00000	ns	0.1445	0.0436		
DSB	R731	R22	C2P	C2C	2016:271:00000	2016:272:00000	ns	-0.4808	0.1418		
DSB	R731	R22	C1P	C2P	2016:271:00000	2016:272:00000	ns	-0.7309	0.0406		
DSB	R732	R23	C1P	C1C	2016:271:00000	2016:272:00000	ns	-1.1545	0.0485		
DSB	R732	R23	C2P	C2C	2016:271:00000	2016:272:00000	ns	2.0525	0.1432		
DSB	R732	R23	C1P	C2P	2016:271:00000	2016:272:00000	ns	-7.2153	0.0451		
DSB	R735	R24	C1P	C1C	2016:271:00000	2016:272:00000	ns	-0.8244	0.0455		
DSB	R735	R24	C2P	C2C	2016:271:00000	2016:272:00000	ns	-1.9135	0.1419		
DSB	R735	R24	C1P	C2P	2016:271:00000	2016:272:00000	ns	5.5760	0.0426		
DSB	R801	R26	C1P	C2P	2016:271:00000	2016:272:00000	ns	0.4175	0.1395		
DSB	E208	E08	C1C	C5Q	2016:271:00000	2016:272:00000	ns	7.8875	0.1246		
DSB	E208	E08	C5Q	C5X	2016:271:00000	2016:272:00000	ns	-9.0287	0.1128		
DSB	E209	E09	C1C	C1X	2016:271:00000	2016:272:00000	ns	-9.4658	0.0538		
DSB	E209	E09	C1C	C5Q	2016:271:00000	2016:272:00000	ns	3.9917	0.0905		
DSB	E101	E11	C1C	C1X	2016:271:00000	2016:272:00000	ns	-36.8528	0.0555		
DSB	E101	E11	C1C	C5Q	2016:271:00000	2016:272:00000	ns	15.9612	0.0956		
...											
DSB	E205	E24	C1C	C1X	2016:271:00000	2016:272:00000	ns	62.6121	0.1871		
DSB	E205	E24	C1C	C5Q	2016:271:00000	2016:272:00000	ns	-29.7918	0.3499		
DSB	E205	E24	C5Q	C5X	2016:271:00000	2016:272:00000	ns	60.1022	0.3114		
DSB	E203	E26	C1C	C1X	2016:271:00000	2016:272:00000	ns	-1.7249	0.0528		
DSB	E203	E26	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0.6259	0.0945		

DSB	E206	E30	C1C	C1X	2016:271:00000	2016:272:00000	ns	-8.0813	0.0579	
DSB	E206	E30	C1C	C5Q	2016:271:00000	2016:272:00000	ns	3.0516	0.1032	
DSB	C005	C06	C2I	C7I	2016:271:00000	2016:272:00000	ns	5.7892	0.0916	
DSB	C007	C07	C2I	C7I	2016:271:00000	2016:272:00000	ns	9.0780	0.1014	
DSB	C008	C08	C2I	C7I	2016:271:00000	2016:272:00000	ns	7.3133	0.1019	
...										
DSB	C013	C12	C2I	C7I	2016:271:00000	2016:272:00000	ns	-0.9965	0.0860	
DSB	C015	C14	C2I	C7I	2016:271:00000	2016:272:00000	ns	1.0051	0.0929	
DSB	C017	C15	C2I	C7I	2016:271:00000	2016:272:00000	ns	-16.8447	0.0781	
DSB	G	G	ABPO	C1W	C2W	2016:271:00000	2016:272:00000	ns	-7.2511	0.5391
DSB	G	G	ADIS	C1W	C2W	2016:271:00000	2016:272:00000	ns	-1.0699	0.4168
DSB	R	R	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-9.9958	0.4106
DSB	G	G	ALBH	C1W	C2W	2016:271:00000	2016:272:00000	ns	13.6037	0.3644
DSB	R	R	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	19.5869	0.3501
...										
DSB	G	G	ALIC	C1C	C2W	2016:271:00000	2016:272:00000	ns	21.5845	0.3646
DSB	R	R	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	5.6251	0.3568
DSB	E	E	ALIC	C1C	C5Q	2016:271:00000	2016:272:00000	ns	1.2516	0.4370
DSB	C	C	ALIC	C2I	C7I	2016:271:00000	2016:272:00000	ns	26.5532	0.3890
...										
DSB	G	G	ZIM3	C1C	C2W	2016:271:00000	2016:272:00000	ns	-14.0309	0.3163
DSB	R	R	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	-11.0850	0.3033
DSB	E	E	ZIM3	C1X	C5X	2016:271:00000	2016:272:00000	ns	-13.0087	0.3651
DSB	C	C	ZIM3	C2I	C7I	2016:271:00000	2016:272:00000	ns	18.2243	0.5064
DSB	G	G	ZIMJ	C1W	C2W	2016:271:00000	2016:272:00000	ns	7.8852	0.3433
DSB	R	R	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-15.3237	0.3273
DSB	E	E	ZIMJ	C1X	C5X	2016:271:00000	2016:272:00000	ns	-14.6920	0.3905
DSB	G	G	ZIMM	C1C	C2W	2016:271:00000	2016:272:00000	ns	-11.9106	0.4571
DSB	G	G	ZWE2	C1W	C2W	2016:271:00000	2016:272:00000	ns	0.0871	0.4705

-BIAS/SOLUTION
%=ENDBIA

A.8 Example 7: GPS/GLONASS/Galileo/BeiDou 1-Day Bias Results for the Satellites and Stations

Note: The GLONASS biases are treated specific to each station-satellite link.

A.8.1 Example 7A: GPS/GLONASS/Galileo/BeiDou 1-Day Bias Results Using Absolute Parameter Representation

```

%=BIA 1.00 COD 2016:318:64695 IGS 2016:271:00000 2016:272:00000 A 00010102
*-----
* Bias Solution INdependent EXchange Format (Bias-SINEX)
*-----
* CODE'S MGEX BIAS COMBINATION RESULTS FOR DAY 271, 2016          13-NOV-16 17:30
*-----
+FILE/REFERENCE
+INFO_TYPE_____INFO_____
DESCRIPTION      CODE, Astronomical Institute, University of Bern
OUTPUT           CODE IGS MGEX 1-day bias solution for G/R/E/C
CONTACT          code@aiub.unibe.ch
SOFTWARE         Bernese GNSS Software Version 5.3
HARDWARE         UBELIX: Linux, x86_64
INPUT            CODE IGS MGEX 1-day bias solution(s) for G/R/E/C
-FILE/REFERENCE
*-----
+FILE/COMMENT
+PRODUCT_REFERENCE_____
CODE product series for the IGS MGEX project.
Published by Astronomical Institute, University of Bern.
URL: http://www.aiub.unibe.ch/download/CODE_MGEX
DOI: 10.7892/boris.75882.
-FILE/COMMENT
*-----
+INPUT/ACKNOWLEDGMENTS
+AGY DESCRIPTION_____
COD Center for Orbit Determination in Europe, AIUB, Switzerland
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS
*-----
+BIAS/DESCRIPTION
+KEYWORD_____VALUE(S)_____

```

```

OBSERVATION_SAMPLING          300
PARAMETER_SPACING              86400
DETERMINATION_METHOD          COMBINED_ANALYSIS
BIAS_MODE                      ABSOLUTE
TIME_SYSTEM                    G
RECEIVER_CLOCK_REFERENCE_GNSS  G
SATELLITE_CLOCK_REFERENCE_OBSERVABLES  G C1W C2W
SATELLITE_CLOCK_REFERENCE_OBSERVABLES  E C1C C5Q
SATELLITE_CLOCK_REFERENCE_OBSERVABLES  C C2I C7I
-BIAS/DESCRIPTION

```

```

+BIAS/SOLUTION
*BIAS SVN_ PRN STATION__ OBS1 OBS2 BIAS_START_____ BIAS_END_____ UNIT  _ESTIMATED_VALUE_____ _STD_DEV_____ _ESTIMATED_SLOPE_____ _STD_DEV_____

```

*BIAS SVN_ PRN STATION__	OBS1	OBS2	BIAS_START_____	BIAS_END_____	UNIT	_ESTIMATED_VALUE_____	_STD_DEV_____	_ESTIMATED_SLOPE_____	_STD_DEV_____
OSB G063 G01	C1C		2016:271:00000	2016:272:00000	ns	10.3278	0.0138		
OSB G063 G01	C1W		2016:271:00000	2016:272:00000	ns	11.7029	0.0093		
OSB G063 G01	C2C		2016:271:00000	2016:272:00000	ns	10.8012	0.0463		
OSB G063 G01	C2W		2016:271:00000	2016:272:00000	ns	19.2740	0.0151		
OSB G061 G02	C1C		2016:271:00000	2016:272:00000	ns	-12.6159	0.0152		
OSB G061 G02	C1W		2016:271:00000	2016:272:00000	ns	-13.9221	0.0102		
OSB G061 G02	C2W		2016:271:00000	2016:272:00000	ns	-22.9289	0.0166		
OSB G069 G03	C1C		2016:271:00000	2016:272:00000	ns	6.4232	0.0137		
OSB G069 G03	C1W		2016:271:00000	2016:272:00000	ns	7.8228	0.0093		
OSB G069 G03	C2C		2016:271:00000	2016:272:00000	ns	6.9164	0.0442		
OSB G069 G03	C2W		2016:271:00000	2016:272:00000	ns	12.8838	0.0150		
...									
OSB G064 G30	C1C		2016:271:00000	2016:272:00000	ns	10.3236	0.0136		
OSB G064 G30	C1W		2016:271:00000	2016:272:00000	ns	9.8971	0.0092		
OSB G064 G30	C2C		2016:271:00000	2016:272:00000	ns	9.5525	0.0439		
OSB G064 G30	C2W		2016:271:00000	2016:272:00000	ns	16.2999	0.0148		
OSB G052 G31	C1C		2016:271:00000	2016:272:00000	ns	-8.0663	0.0143		
OSB G052 G31	C1W		2016:271:00000	2016:272:00000	ns	-7.1970	0.0096		
OSB G052 G31	C2C		2016:271:00000	2016:272:00000	ns	-18.3793	0.0660		
OSB G052 G31	C2W		2016:271:00000	2016:272:00000	ns	-11.8531	0.0156		
OSB G070 G32	C1C		2016:271:00000	2016:272:00000	ns	5.2391	0.0141		
OSB G070 G32	C1W		2016:271:00000	2016:272:00000	ns	6.8678	0.0095		
OSB G070 G32	C2C		2016:271:00000	2016:272:00000	ns	5.1718	0.0471		
OSB G070 G32	C2W		2016:271:00000	2016:272:00000	ns	11.3109	0.0154		
OSB E208 E08	C1C		2016:271:00000	2016:272:00000	ns	-9.9580	0.0319		
OSB E208 E08	C1X		2016:271:00000	2016:272:00000	ns	-9.7008	0.0746		
OSB E208 E08	C5Q		2016:271:00000	2016:272:00000	ns	-17.8574	0.0572		
OSB E208 E08	C5X		2016:271:00000	2016:272:00000	ns	-18.4332	0.0802		
OSB E209 E09	C1C		2016:271:00000	2016:272:00000	ns	-5.2116	0.0228		
OSB E209 E09	C1X		2016:271:00000	2016:272:00000	ns	-5.2992	0.0641		
OSB E209 E09	C5Q		2016:271:00000	2016:272:00000	ns	-9.3458	0.0407		
OSB E209 E09	C5X		2016:271:00000	2016:272:00000	ns	-9.6753	0.0707		
OSB E101 E11	C1C		2016:271:00000	2016:272:00000	ns	-20.2840	0.0242		
OSB E101 E11	C1X		2016:271:00000	2016:272:00000	ns	-19.6743	0.0661		
OSB E101 E11	C5Q		2016:271:00000	2016:272:00000	ns	-36.3747	0.0433		
OSB E101 E11	C5X		2016:271:00000	2016:272:00000	ns	-36.4661	0.0725		
...									
OSB E205 E24	C1C		2016:271:00000	2016:272:00000	ns	38.5336	0.0844		
OSB E205 E24	C1X		2016:271:00000	2016:272:00000	ns	38.5149	0.2032		
OSB E205 E24	C5Q		2016:271:00000	2016:272:00000	ns	69.1012	0.1513		
OSB E205 E24	C5X		2016:271:00000	2016:272:00000	ns	70.5856	0.2170		
OSB E203 E26	C1C		2016:271:00000	2016:272:00000	ns	-0.8090	0.0238		
OSB E203 E26	C1X		2016:271:00000	2016:272:00000	ns	-0.4850	0.0604		
OSB E203 E26	C5Q		2016:271:00000	2016:272:00000	ns	-1.4508	0.0426		
OSB E203 E26	C5X		2016:271:00000	2016:272:00000	ns	-1.3323	0.0656		
OSB E206 E30	C1C		2016:271:00000	2016:272:00000	ns	-3.8351	0.0263		
OSB E206 E30	C1X		2016:271:00000	2016:272:00000	ns	-3.3128	0.0661		
OSB E206 E30	C5Q		2016:271:00000	2016:272:00000	ns	-6.8774	0.0472		
OSB E206 E30	C5X		2016:271:00000	2016:272:00000	ns	-7.5079	0.0718		
OSB C005 C06	C2I		2016:271:00000	2016:272:00000	ns	-8.5051	0.0249		
OSB C005 C06	C7I		2016:271:00000	2016:272:00000	ns	-14.2241	0.0416		
OSB C007 C07	C2I		2016:271:00000	2016:272:00000	ns	-13.3816	0.0276		
OSB C007 C07	C7I		2016:271:00000	2016:272:00000	ns	-22.3796	0.0460		
OSB C008 C08	C2I		2016:271:00000	2016:272:00000	ns	-11.1308	0.0276		
OSB C008 C08	C7I		2016:271:00000	2016:272:00000	ns	-18.6153	0.0460		
...									
OSB C013 C12	C2I		2016:271:00000	2016:272:00000	ns	1.5571	0.0236		
OSB C013 C12	C7I		2016:271:00000	2016:272:00000	ns	2.6042	0.0394		
OSB C015 C14	C2I		2016:271:00000	2016:272:00000	ns	-1.3611	0.0256		
OSB C015 C14	C7I		2016:271:00000	2016:272:00000	ns	-2.2762	0.0427		
OSB C017 C15	C2I		2016:271:00000	2016:272:00000	ns	24.8429	0.0212		
OSB C017 C15	C7I		2016:271:00000	2016:272:00000	ns	41.5478	0.0353		
OSB G G ABPO	C1W		2016:271:00000	2016:272:00000	ns	10.2975	0.0350		
OSB G G ABPO	C2W		2016:271:00000	2016:272:00000	ns	16.9594	0.0576		
OSB G G ADIS	C1W		2016:271:00000	2016:272:00000	ns	0.5612	0.0338		
OSB G G ADIS	C2W		2016:271:00000	2016:272:00000	ns	0.9242	0.0557		
OSB R730 R01 ADIS	C1P		2016:271:00000	2016:272:00000	ns	-70.7927	0.2634		
OSB R730 R01 ADIS	C2P		2016:271:00000	2016:272:00000	ns	-59.0991	0.3144		
OSB R747 R02 ADIS	C1P		2016:271:00000	2016:272:00000	ns	-72.7564	0.2523		
OSB R747 R02 ADIS	C2P		2016:271:00000	2016:272:00000	ns	-67.6211	0.3000		
OSB R744 R03 ADIS	C1P		2016:271:00000	2016:272:00000	ns	-89.4622	0.2740		

OSB	R744	R03	ADIS	C2P	2016:271:00000	2016:272:00000	ns	-84.7405	0.3330
...									
OSB	R731	R22	ADIS	C1P	2016:271:00000	2016:272:00000	ns	-77.8769	0.2848
OSB	R731	R22	ADIS	C2P	2016:271:00000	2016:272:00000	ns	-68.8814	0.3448
OSB	R732	R23	ADIS	C1P	2016:271:00000	2016:272:00000	ns	-71.4845	0.3013
OSB	R732	R23	ADIS	C2P	2016:271:00000	2016:272:00000	ns	-56.7297	0.3688
OSB	R735	R24	ADIS	C1P	2016:271:00000	2016:272:00000	ns	-89.2835	0.2987
OSB	R735	R24	ADIS	C2P	2016:271:00000	2016:272:00000	ns	-87.7182	0.3551
OSB	G	G	ALBH	C1W	2016:271:00000	2016:272:00000	ns	-21.9000	0.0282
OSB	G	G	ALBH	C2W	2016:271:00000	2016:272:00000	ns	-36.0681	0.0465
OSB	R730	R01	ALBH	C1P	2016:271:00000	2016:272:00000	ns	-79.1270	0.2125
OSB	R730	R01	ALBH	C2P	2016:271:00000	2016:272:00000	ns	-91.6685	0.2512
OSB	R747	R02	ALBH	C1P	2016:271:00000	2016:272:00000	ns	-87.0687	0.2044
OSB	R747	R02	ALBH	C2P	2016:271:00000	2016:272:00000	ns	-104.0878	0.2370
OSB	R744	R03	ALBH	C1P	2016:271:00000	2016:272:00000	ns	-90.1912	0.2253
OSB	R744	R03	ALBH	C2P	2016:271:00000	2016:272:00000	ns	-119.5990	0.2661
...									
OSB	R731	R22	ALBH	C1P	2016:271:00000	2016:272:00000	ns	-87.7648	0.2360
OSB	R731	R22	ALBH	C2P	2016:271:00000	2016:272:00000	ns	-103.9171	0.2790
OSB	R732	R23	ALBH	C1P	2016:271:00000	2016:272:00000	ns	-76.7091	0.2386
OSB	R732	R23	ALBH	C2P	2016:271:00000	2016:272:00000	ns	-90.4797	0.2807
OSB	R735	R24	ALBH	C1P	2016:271:00000	2016:272:00000	ns	-96.1746	0.2225
OSB	R735	R24	ALBH	C2P	2016:271:00000	2016:272:00000	ns	-123.6701	0.2608
...									
OSB	G	G	ALIC	C1C	2016:271:00000	2016:272:00000	ns	-32.8312	0.0293
OSB	G	G	ALIC	C2W	2016:271:00000	2016:272:00000	ns	-54.0711	0.0483
OSB	R730	R01	ALIC	C1C	2016:271:00000	2016:272:00000	ns	-18.4693	0.3293
OSB	R730	R01	ALIC	C2P	2016:271:00000	2016:272:00000	ns	-17.5511	0.4007
OSB	R747	R02	ALIC	C1C	2016:271:00000	2016:272:00000	ns	-27.9960	0.2441
OSB	R747	R02	ALIC	C2P	2016:271:00000	2016:272:00000	ns	-31.9897	0.2896
OSB	R744	R03	ALIC	C1C	2016:271:00000	2016:272:00000	ns	-32.5636	0.2385
OSB	R744	R03	ALIC	C2P	2016:271:00000	2016:272:00000	ns	-43.5283	0.2865
...									
OSB	R731	R22	ALIC	C1C	2016:271:00000	2016:272:00000	ns	-27.6741	0.2538
OSB	R731	R22	ALIC	C2P	2016:271:00000	2016:272:00000	ns	-32.1567	0.3042
OSB	R732	R23	ALIC	C1C	2016:271:00000	2016:272:00000	ns	-16.2039	0.2643
OSB	R732	R23	ALIC	C2P	2016:271:00000	2016:272:00000	ns	-16.1039	0.3181
OSB	R735	R24	ALIC	C1C	2016:271:00000	2016:272:00000	ns	-36.1808	0.2552
OSB	R735	R24	ALIC	C2P	2016:271:00000	2016:272:00000	ns	-47.7822	0.3048
OSB	E	E	ALIC	C1C	2016:271:00000	2016:272:00000	ns	43.1103	0.0902
OSB	E	E	ALIC	C5Q	2016:271:00000	2016:272:00000	ns	42.3377	0.1111
OSB	C	C	ALIC	C2I	2016:271:00000	2016:272:00000	ns	33.2044	0.0754
OSB	C	C	ALIC	C7I	2016:271:00000	2016:272:00000	ns	7.1025	0.0898
...									
OSB	G	G	ZIM3	C1C	2016:271:00000	2016:272:00000	ns	21.1314	0.0242
OSB	G	G	ZIM3	C2W	2016:271:00000	2016:272:00000	ns	34.8023	0.0398
OSB	R730	R01	ZIM3	C1P	2016:271:00000	2016:272:00000	ns	35.3327	0.2269
OSB	R730	R01	ZIM3	C2P	2016:271:00000	2016:272:00000	ns	50.5692	0.2721
OSB	R747	R02	ZIM3	C1P	2016:271:00000	2016:272:00000	ns	29.7395	0.2448
OSB	R747	R02	ZIM3	C2P	2016:271:00000	2016:272:00000	ns	39.1639	0.2940
OSB	R744	R03	ZIM3	C1P	2016:271:00000	2016:272:00000	ns	16.9745	0.2316
OSB	R744	R03	ZIM3	C2P	2016:271:00000	2016:272:00000	ns	25.9818	0.2764
...									
OSB	R731	R22	ZIM3	C1P	2016:271:00000	2016:272:00000	ns	29.1750	0.2216
OSB	R731	R22	ZIM3	C2P	2016:271:00000	2016:272:00000	ns	38.9350	0.2644
OSB	R732	R23	ZIM3	C1P	2016:271:00000	2016:272:00000	ns	35.0787	0.2247
OSB	R732	R23	ZIM3	C2P	2016:271:00000	2016:272:00000	ns	54.0604	0.2672
OSB	R735	R24	ZIM3	C1P	2016:271:00000	2016:272:00000	ns	15.7359	0.2261
OSB	R735	R24	ZIM3	C2P	2016:271:00000	2016:272:00000	ns	21.0274	0.2697
OSB	E	E	ZIM3	C1X	2016:271:00000	2016:272:00000	ns	16.1695	0.0812
OSB	E	E	ZIM3	C5X	2016:271:00000	2016:272:00000	ns	28.6800	0.0968
OSB	C	C	ZIM3	C2I	2016:271:00000	2016:272:00000	ns	9.3773	0.1565
OSB	C	C	ZIM3	C7I	2016:271:00000	2016:272:00000	ns	-9.4678	0.1914
OSB	G	G	ZIMJ	C1W	2016:271:00000	2016:272:00000	ns	-12.9759	0.0257
OSB	G	G	ZIMJ	C2W	2016:271:00000	2016:272:00000	ns	-21.3706	0.0423
OSB	R730	R01	ZIMJ	C1P	2016:271:00000	2016:272:00000	ns	16.6035	0.2310
OSB	R730	R01	ZIMJ	C2P	2016:271:00000	2016:272:00000	ns	36.6292	0.2783
OSB	R747	R02	ZIMJ	C1P	2016:271:00000	2016:272:00000	ns	11.5609	0.2443
OSB	R747	R02	ZIMJ	C2P	2016:271:00000	2016:272:00000	ns	24.4054	0.2937
OSB	R744	R03	ZIMJ	C1P	2016:271:00000	2016:272:00000	ns	1.2235	0.2335
OSB	R744	R03	ZIMJ	C2P	2016:271:00000	2016:272:00000	ns	14.3774	0.2781
...									
OSB	R731	R22	ZIMJ	C1P	2016:271:00000	2016:272:00000	ns	11.1871	0.2238
OSB	R731	R22	ZIMJ	C2P	2016:271:00000	2016:272:00000	ns	24.2708	0.2663
OSB	R732	R23	ZIMJ	C1P	2016:271:00000	2016:272:00000	ns	18.0685	0.3168
OSB	R732	R23	ZIMJ	C2P	2016:271:00000	2016:272:00000	ns	40.9095	0.3842
OSB	R735	R24	ZIMJ	C1P	2016:271:00000	2016:272:00000	ns	-2.1929	0.2323
OSB	R735	R24	ZIMJ	C2P	2016:271:00000	2016:272:00000	ns	8.4616	0.2751
OSB	E	E	ZIMJ	C1X	2016:271:00000	2016:272:00000	ns	-8.7924	0.1016
OSB	E	E	ZIMJ	C5X	2016:271:00000	2016:272:00000	ns	5.2047	0.1140
OSB	G	G	ZIMM	C1C	2016:271:00000	2016:272:00000	ns	17.9179	0.0237
OSB	G	G	ZIMM	C2W	2016:271:00000	2016:272:00000	ns	29.5098	0.0391
OSB	G	G	ZWE2	C1W	2016:271:00000	2016:272:00000	ns	0.3888	0.0249
OSB	G	G	ZWE2	C2W	2016:271:00000	2016:272:00000	ns	0.6403	0.0410

```
-BIAS/SOLUTION
%=ENDBIA
```

A.8.2 Example 7B: GPS/GLONASS/Galileo/BeiDou 1-Day Bias Results Using Relative Parameter Representation

```
%=BIA 1.00 COD 2016:318:64695 IGS 2016:271:00000 2016:272:00000 R 00010102
*-----*
* Bias Solution INdependent EXchange Format (Bias-SINEX)
*-----*
* CODE'S MGEX BIAS COMBINATION RESULTS FOR DAY 271, 2016 13-NOV-16 17:30
*-----*
+FILE/REFERENCE
*INFO_TYPE_____ INFO_____
DESCRIPTION CODE, Astronomical Institute, University of Bern
OUTPUT CODE IGS MGEX 1-day bias solution for G/R/E/C
CONTACT code@aib.unibe.ch
SOFTWARE Bernese GNSS Software Version 5.3
HARDWARE UBELIX: Linux, x86_64
INPUT CODE IGS MGEX 1-day bias solution(s) for G/R/E/C
-FILE/REFERENCE
*-----*
+FILE/COMMENT
*PRODUCT_REFERENCE_____
CODE product series for the IGS MGEX project.
Published by Astronomical Institute, University of Bern.
URL: http://www.aib.unibe.ch/download/CODE_MGEX
DOI: 10.7892/boris.75882.
-FILE/COMMENT
*-----*
+INPUT/ACKNOWLEDGMENTS
*AGY DESCRIPTION_____
COD Center for Orbit Determination in Europe, AIUB, Switzerland
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS
*-----*
+BIAS/DESCRIPTION
*KEYWORD_____ VALUE(S)_____
OBSERVATION_SAMPLING 300
PARAMETER_SPACING 86400
DETERMINATION_METHOD COMBINED_ANALYSIS
BIAS_MODE RELATIVE
TIME_SYSTEM G
RECEIVER_CLOCK_REFERENCE_GNSS G
SATELLITE_CLOCK_REFERENCE_OBSERVABLES G C1W C2W
SATELLITE_CLOCK_REFERENCE_OBSERVABLES E C1C C5Q
SATELLITE_CLOCK_REFERENCE_OBSERVABLES C C2I C7I
-BIAS/DESCRIPTION
*-----*
+BIAS/SOLUTION
*BIAS SVN PRN STATION__ OBS1 OBS2 BIAS_START_____ BIAS_END_____ UNIT __ESTIMATED_VALUE____ _STD_DEV____ _ESTIMATED_SLOPE____ _STD_DEV____
ISB G063 G01 C1W C2W 2016:271:00000 2016:272:00000 ns 0 0
DSB G063 G01 C1W C1C 2016:271:00000 2016:272:00000 ns 1.3751 0.0167
DSB G063 G01 C2W C2C 2016:271:00000 2016:272:00000 ns 8.4729 0.0487
DSB G063 G01 C1W C2W 2016:271:00000 2016:272:00000 ns -7.5711 0.0177
ISB G061 G02 C1W C2W 2016:271:00000 2016:272:00000 ns 0 0
DSB G061 G02 C1W C1C 2016:271:00000 2016:272:00000 ns -1.3062 0.0183
DSB G061 G02 C1W C2W 2016:271:00000 2016:272:00000 ns 9.0068 0.0195
ISB G069 G03 C1W C2W 2016:271:00000 2016:272:00000 ns 0 0
DSB G069 G03 C1W C1C 2016:271:00000 2016:272:00000 ns 1.3996 0.0166
DSB G069 G03 C2W C2C 2016:271:00000 2016:272:00000 ns 5.9674 0.0467
DSB G069 G03 C1W C2W 2016:271:00000 2016:272:00000 ns -5.0609 0.0176
...
ISB G064 G30 C1W C2W 2016:271:00000 2016:272:00000 ns 0 0
DSB G064 G30 C1W C1C 2016:271:00000 2016:272:00000 ns -0.4265 0.0164
DSB G064 G30 C2W C2C 2016:271:00000 2016:272:00000 ns 6.7474 0.0463
DSB G064 G30 C1W C2W 2016:271:00000 2016:272:00000 ns -6.4028 0.0175
ISB G052 G31 C1W C2W 2016:271:00000 2016:272:00000 ns 0 0
DSB G052 G31 C1W C1C 2016:271:00000 2016:272:00000 ns 0.8693 0.0172
DSB G052 G31 C2W C2C 2016:271:00000 2016:272:00000 ns 6.5262 0.0678
DSB G052 G31 C1W C2W 2016:271:00000 2016:272:00000 ns 4.6561 0.0183
ISB G070 G32 C1W C2W 2016:271:00000 2016:272:00000 ns 0 0
DSB G070 G32 C1W C1C 2016:271:00000 2016:272:00000 ns 1.6287 0.0171
DSB G070 G32 C2W C2C 2016:271:00000 2016:272:00000 ns 6.1391 0.0496
DSB G070 G32 C1W C2W 2016:271:00000 2016:272:00000 ns -4.4431 0.0181
ISB E208 E08 C1C C5Q 2016:271:00000 2016:272:00000 ns 0 0
DSB E208 E08 C1C C1X 2016:271:00000 2016:272:00000 ns -0.2572 0.0811
DSB E208 E08 C1C C5Q 2016:271:00000 2016:272:00000 ns 7.8994 0.0655
```

DSB	E208	E08	C5Q	C5X	2016:271:00000	2016:272:00000	ns	0.5758	0.0985	
ISB	E209	E09	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E209	E09	C1C	C1X	2016:271:00000	2016:272:00000	ns	0.0877	0.0680	
DSB	E209	E09	C1C	C5Q	2016:271:00000	2016:272:00000	ns	4.1342	0.0466	
DSB	E209	E09	C5Q	C5X	2016:271:00000	2016:272:00000	ns	0.3295	0.0816	
ISB	E101	E11	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E101	E11	C1C	C1X	2016:271:00000	2016:272:00000	ns	-0.6097	0.0704	
DSB	E101	E11	C1C	C5Q	2016:271:00000	2016:272:00000	ns	16.0907	0.0496	
DSB	E101	E11	C5Q	C5X	2016:271:00000	2016:272:00000	ns	0.0915	0.0844	
...										
ISB	E205	E24	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E205	E24	C1C	C1X	2016:271:00000	2016:272:00000	ns	0.0188	0.2200	
DSB	E205	E24	C1C	C5Q	2016:271:00000	2016:272:00000	ns	-30.5676	0.1732	
DSB	E205	E24	C5Q	C5X	2016:271:00000	2016:272:00000	ns	-1.4844	0.2646	
ISB	E203	E26	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E203	E26	C1C	C1X	2016:271:00000	2016:272:00000	ns	-0.3240	0.0649	
DSB	E203	E26	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0.6418	0.0488	
DSB	E203	E26	C5X	C5X	2016:271:00000	2016:272:00000	ns	-0.1185	0.0782	
ISB	E206	E30	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0	0	
DSB	E206	E30	C1C	C1X	2016:271:00000	2016:272:00000	ns	-0.5223	0.0711	
DSB	E206	E30	C1C	C5Q	2016:271:00000	2016:272:00000	ns	3.0423	0.0540	
DSB	E206	E30	C5Q	C5X	2016:271:00000	2016:272:00000	ns	0.6305	0.0859	
ISB	C005	C06	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C005	C06	C2I	C7I	2016:271:00000	2016:272:00000	ns	5.7190	0.0485	
ISB	C007	C07	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C007	C07	C2I	C7I	2016:271:00000	2016:272:00000	ns	8.9980	0.0536	
ISB	C008	C08	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C008	C08	C2I	C7I	2016:271:00000	2016:272:00000	ns	7.4845	0.0537	
...										
ISB	C013	C12	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C013	C12	C2I	C7I	2016:271:00000	2016:272:00000	ns	-1.0471	0.0460	
ISB	C015	C14	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C015	C14	C2I	C7I	2016:271:00000	2016:272:00000	ns	0.9152	0.0498	
ISB	C017	C15	C2I	C7I	2016:271:00000	2016:272:00000	ns	0	0	
DSB	C017	C15	C2I	C7I	2016:271:00000	2016:272:00000	ns	-16.7049	0.0412	
ISB	G	G	ABPO	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ABPO	C1W	C2W	2016:271:00000	2016:272:00000	ns	-6.6619	0.0674
ISB	G	G	ADIS	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ADIS	C1W	C2W	2016:271:00000	2016:272:00000	ns	-0.3630	0.0651
ISB	R730	R01	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-88.6985	0.8224
DSB	R730	R01	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-11.6936	0.4102
ISB	R747	R02	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-80.6197	0.7867
DSB	R747	R02	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-5.1353	0.3920
ISB	R744	R03	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-96.6923	0.8608
DSB	R744	R03	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-4.7217	0.4313
...										
ISB	R731	R22	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-91.6512	0.8936
DSB	R731	R22	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-8.9955	0.4473
ISB	R732	R23	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-94.0777	0.9490
DSB	R732	R23	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-14.7547	0.4762
ISB	R735	R24	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-91.6802	0.9313
DSB	R735	R24	ADIS	C1P	C2P	2016:271:00000	2016:272:00000	ns	-1.5652	0.4640
ISB	G	G	ALBH	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ALBH	C1W	C2W	2016:271:00000	2016:272:00000	ns	14.1681	0.0544
ISB	R730	R01	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	-59.9230	0.6612
DSB	R730	R01	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	12.5414	0.3290
ISB	R747	R02	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	-61.0082	0.6321
DSB	R747	R02	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	17.0191	0.3130
ISB	R744	R03	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	-45.1605	0.7010
DSB	R744	R03	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	29.4078	0.3487
...										
ISB	R731	R22	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	-63.0314	0.7344
DSB	R731	R22	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	16.1524	0.3654
ISB	R732	R23	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	-55.6228	0.7412
DSB	R732	R23	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	13.7706	0.3683
ISB	R735	R24	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	-54.0720	0.6905
DSB	R735	R24	ALBH	C1P	C2P	2016:271:00000	2016:272:00000	ns	27.4955	0.3429
...										
ISB	G	G	ALIC	C1C	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ALIC	C1C	C2W	2016:271:00000	2016:272:00000	ns	21.2399	0.0565
ISB	R730	R01	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	-19.8752	1.0350
DSB	R730	R01	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	-0.9182	0.5186
ISB	R747	R02	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	-21.8808	0.7606
DSB	R747	R02	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	3.9936	0.3788
ISB	R744	R03	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	-15.7739	0.7462
DSB	R744	R03	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	10.9647	0.3728
...										
ISB	R731	R22	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	-20.8100	0.7936
DSB	R731	R22	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	4.4827	0.3962
ISB	R732	R23	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	-16.3569	0.8275
DSB	R732	R23	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	-0.0999	0.4135
ISB	R735	R24	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	-18.4162	0.7969
DSB	R735	R24	ALIC	C1C	C2P	2016:271:00000	2016:272:00000	ns	11.6014	0.3975
ISB	E	E	ALIC	C1C	C5Q	2016:271:00000	2016:272:00000	ns	44.1442	0.2581

DSB	E	E	ALIC	C1C	C5Q	2016:271:00000	2016:272:00000	ns	0.7727	0.1431
ISB	C	C	ALIC	C2I	C7I	2016:271:00000	2016:272:00000	ns	72.0222	0.2302
DSB	C	C	ALIC	C2I	C7I	2016:271:00000	2016:272:00000	ns	26.1019	0.1173
...										
ISB	G	G	ZIM3	C1C	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ZIM3	C1C	C2W	2016:271:00000	2016:272:00000	ns	-13.6709	0.0465
ISB	R730	R01	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	12.0018	0.7094
DSB	R730	R01	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	-15.2365	0.3542
ISB	R747	R02	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	15.3084	0.7659
DSB	R747	R02	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	-9.4244	0.3826
ISB	R744	R03	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	3.1819	0.7231
DSB	R744	R03	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	-9.0074	0.3606
...										
ISB	R731	R22	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	14.2299	0.6917
DSB	R731	R22	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	-9.7601	0.3449
ISB	R732	R23	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	6.0129	0.7007
DSB	R732	R23	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	-18.9817	0.3491
ISB	R735	R24	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	7.6333	0.7057
DSB	R735	R24	ZIM3	C1P	C2P	2016:271:00000	2016:272:00000	ns	-5.2915	0.3519
ISB	E	E	ZIM3	C1X	C5X	2016:271:00000	2016:272:00000	ns	-0.5695	0.2298
DSB	E	E	ZIM3	C1X	C5X	2016:271:00000	2016:272:00000	ns	-12.5105	0.1263
ISB	C	C	ZIM3	C2I	C7I	2016:271:00000	2016:272:00000	ns	37.4032	0.4823
DSB	C	C	ZIM3	C2I	C7I	2016:271:00000	2016:272:00000	ns	18.8451	0.2473
ISB	G	G	ZIMJ	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ZIMJ	C1W	C2W	2016:271:00000	2016:272:00000	ns	8.3947	0.0495
ISB	R730	R01	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-14.0608	0.7235
DSB	R730	R01	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-20.0257	0.3617
ISB	R747	R02	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-8.1072	0.7647
DSB	R747	R02	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-12.8445	0.3820
ISB	R744	R03	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-18.9185	0.7285
DSB	R744	R03	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-13.1539	0.3631
...										
ISB	R731	R22	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-8.8474	0.6980
DSB	R731	R22	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-13.0837	0.3479
ISB	R732	R23	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-16.9069	0.9946
DSB	R732	R23	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-22.8411	0.4980
ISB	R735	R24	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-18.5076	0.7232
DSB	R735	R24	ZIMJ	C1P	C2P	2016:271:00000	2016:272:00000	ns	-10.6545	0.3600
ISB	E	E	ZIMJ	C1X	C5X	2016:271:00000	2016:272:00000	ns	-27.5203	0.2824
DSB	E	E	ZIMJ	C1X	C5X	2016:271:00000	2016:272:00000	ns	-13.9971	0.1527
ISB	G	G	ZIMM	C1C	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ZIMM	C1C	C2W	2016:271:00000	2016:272:00000	ns	-11.5919	0.0457
ISB	G	G	ZWE2	C1W	C2W	2016:271:00000	2016:272:00000	ns	0	0
DSB	G	G	ZWE2	C1W	C2W	2016:271:00000	2016:272:00000	ns	-0.2515	0.0480

-BIAS/SOLUTION
%=ENDBIA

A.9 Example 8: Multi-GNSS Bias Results From Inter-Frequency Bias Estimation at DLR

```

%=BIA 1.00 DLR 2017:020:61958 DLR 2016:271:00000 2016:272:00000 R 00001375
*-----
+FILE/REFERENCE
DESCRIPTION      Multi-GNSS DCBs from RINEX/IONEX analysis
INPUT            Daily 30 s RINEX files, ehrg IONEX files
OUTPUT          DLR's daily DCB solution for satellites and receivers
HARDWARE        rt078 Linux x86_64 3.16.7-42-desktop
SOFTWARE        IONDCB
-FILE/REFERENCE
*-----
+FILE/COMMENT
- Multi-GNSS differential code biases (DCBs) in this product have been derived
  from observations of the IGS MGEX network. Details of the DCB estimation
  process are described in
  Montenbruck O., Hauschild A., Steigenberger P., "Differential Code Bias
  Estimation using Multi-GNSS Observations and Global Ionosphere Maps",
  Navigation - Journal of the ION 61(3):191-201 (2014).
  DOI 10.1002/navi.64
- A zero-mean constellation condition is applied to separate satellite and
  receiver biases on a daily basis.
- Standard deviations reflect the uncertainty of individual satellite and
  station biases adjusted from the observed set of satellite+station biases.
- This file provides the following DCBs
  GPS      C1C-C1W,C1C-C2W,C2W-C2S,C2W-C2L,C2W-C2X,C1C-C5Q,C1C-C5X
  GLONASS  C1C-C1P,C1C-C2C,C1C-C2P
  GALILEO  C1C-C5Q,C1X-C5X,C1C-C7Q,C1X-C7X,C1C-C8Q,C1X-C8X
  BEIDOU   C2I-C7I,C2I-C6I
-FILE/COMMENT

```

```

-----
*-----
+INPUT/ACKNOWLEDGMENTS
*AGY DESCRIPTION
DLR Deutsches Zentrum fuer Luft- und Raumfahrt, Oberpfaffenhofen, Germany
IGS International GNSS Service
-INPUT/ACKNOWLEDGMENTS
*-----
+BIAS/DESCRIPTION
*KEYWORD VALUE(S)
OBSERVATION_SAMPLING 30
PARAMETER_SPACING 86400
DETERMINATION_METHOD INTER-FREQUENCY_BIAS_ESTIMATION
BIAS_MODE RELATIVE
TIME_SYSTEM G
-BIAS/DESCRIPTION
*-----
+BIAS/SOLUTION
*BIAS SVN_ PRN STATION__ OBS1 OBS2 BIAS_START BIAS_END UNIT ESTIMATED_VALUE STD_DEV ESTIMATED_SLOPE STD_DEV
DSB G063 G01 C1C C1W 2016:271:00000 2016:272:00000 ns -1.2623 0.0057
DSB G063 G01 C1C C2W 2016:271:00000 2016:272:00000 ns -9.0228 0.0486
DSB G063 G01 C1C C5Q 2016:271:00000 2016:272:00000 ns 0.8652 0.0674
DSB G063 G01 C1C C5X 2016:271:00000 2016:272:00000 ns 1.2337 0.0581
DSB G063 G01 C2W C2L 2016:271:00000 2016:272:00000 ns 1.3722 0.0168
DSB G063 G01 C2W C2S 2016:271:00000 2016:272:00000 ns 1.3944 0.0132
DSB G063 G01 C2W C2X 2016:271:00000 2016:272:00000 ns 1.2461 0.0196
DSB G061 G02 C1C C1W 2016:271:00000 2016:272:00000 ns 1.2082 0.0065
DSB G061 G02 C1C C2W 2016:271:00000 2016:272:00000 ns 10.4595 0.0511
DSB G069 G03 C1C C1W 2016:271:00000 2016:272:00000 ns -1.7490 0.0058
DSB G069 G03 C1C C2W 2016:271:00000 2016:272:00000 ns -6.5377 0.0461
DSB G069 G03 C1C C5Q 2016:271:00000 2016:272:00000 ns -1.9954 0.0618
DSB G069 G03 C1C C5X 2016:271:00000 2016:272:00000 ns -2.5512 0.0567
DSB G069 G03 C2W C2L 2016:271:00000 2016:272:00000 ns -0.3590 0.0172
DSB G069 G03 C2W C2S 2016:271:00000 2016:272:00000 ns -0.2728 0.0165
DSB G069 G03 C2W C2X 2016:271:00000 2016:272:00000 ns -0.6500 0.0188
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DSB G064 G30 C1C C1W 2016:271:00000 2016:272:00000 ns 0.3219 0.0059
DSB G064 G30 C1C C2W 2016:271:00000 2016:272:00000 ns -6.1357 0.0478
DSB G064 G30 C1C C5Q 2016:271:00000 2016:272:00000 ns -0.6456 0.0615
DSB G064 G30 C1C C5X 2016:271:00000 2016:272:00000 ns -0.8242 0.0558
DSB G064 G30 C2W C2L 2016:271:00000 2016:272:00000 ns -0.2684 0.0179
DSB G064 G30 C2W C2S 2016:271:00000 2016:272:00000 ns -0.5506 0.0137
DSB G064 G30 C2W C2X 2016:271:00000 2016:272:00000 ns -0.4168 0.0167
DSB G052 G31 C1C C1W 2016:271:00000 2016:272:00000 ns -0.9221 0.0065
DSB G052 G31 C1C C2W 2016:271:00000 2016:272:00000 ns 3.5830 0.0488
DSB G052 G31 C2W C2L 2016:271:00000 2016:272:00000 ns -0.2124 0.0202
DSB G052 G31 C2W C2S 2016:271:00000 2016:272:00000 ns -0.7704 0.0164
DSB G052 G31 C2W C2X 2016:271:00000 2016:272:00000 ns -0.2291 0.0178
DSB G070 G32 C1C C1W 2016:271:00000 2016:272:00000 ns -1.7581 0.0060
DSB G070 G32 C1C C2W 2016:271:00000 2016:272:00000 ns -6.1630 0.0533
DSB G070 G32 C1C C5Q 2016:271:00000 2016:272:00000 ns 3.0644 0.0785
DSB G070 G32 C1C C5X 2016:271:00000 2016:272:00000 ns 3.2527 0.0572
DSB G070 G32 C2W C2L 2016:271:00000 2016:272:00000 ns -0.1437 0.0196
DSB G070 G32 C2W C2S 2016:271:00000 2016:272:00000 ns 0.0948 0.0201
DSB G070 G32 C2W C2X 2016:271:00000 2016:272:00000 ns -0.2913 0.0170
DSB R730 R01 C1C C1P 2016:271:00000 2016:272:00000 ns 0.1838 0.0654
DSB R730 R01 C1C C2C 2016:271:00000 2016:272:00000 ns -2.9537 0.1609
DSB R730 R01 C1C C2P 2016:271:00000 2016:272:00000 ns -5.9295 0.1377
DSB R747 R02 C1C C1P 2016:271:00000 2016:272:00000 ns -0.0850 0.0603
DSB R747 R02 C1C C2C 2016:271:00000 2016:272:00000 ns -1.2230 0.1519
DSB R747 R02 C1C C2P 2016:271:00000 2016:272:00000 ns -1.1490 0.1336
DSB R744 R03 C1C C1P 2016:271:00000 2016:272:00000 ns -0.4942 0.0675
DSB R744 R03 C1C C2C 2016:271:00000 2016:272:00000 ns 3.7317 0.1875
DSB R744 R03 C1C C2P 2016:271:00000 2016:272:00000 ns 4.1332 0.1638
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DSB R731 R22 C1C C1P 2016:271:00000 2016:272:00000 ns 0.6999 0.0598
DSB R731 R22 C1C C2C 2016:271:00000 2016:272:00000 ns -1.0580 0.1498
DSB R731 R22 C1C C2P 2016:271:00000 2016:272:00000 ns -0.6577 0.1332
DSB R732 R23 C1C C1P 2016:271:00000 2016:272:00000 ns 0.5033 0.0653
DSB R732 R23 C1C C2C 2016:271:00000 2016:272:00000 ns -3.7297 0.1989
DSB R732 R23 C1C C2P 2016:271:00000 2016:272:00000 ns -6.5267 0.1634
DSB R735 R24 C1C C1P 2016:271:00000 2016:272:00000 ns -0.2299 0.0915
DSB R735 R24 C1C C2C 2016:271:00000 2016:272:00000 ns 4.1652 0.2191
DSB R735 R24 C1C C2P 2016:271:00000 2016:272:00000 ns 6.3655 0.1629
DSB R801 R26 C1C C1P 2016:271:00000 2016:272:00000 ns -0.4673 0.0975
DSB R801 R26 C1C C2C 2016:271:00000 2016:272:00000 ns 1.1682 0.5762
DSB R801 R26 C1C C2P 2016:271:00000 2016:272:00000 ns 0.8455 0.4349
DSB E208 E08 C1C C5Q 2016:271:00000 2016:272:00000 ns 8.7878 0.0796
DSB E208 E08 C1C C7Q 2016:271:00000 2016:272:00000 ns 8.9239 0.0746
DSB E208 E08 C1C C8Q 2016:271:00000 2016:272:00000 ns 8.9346 0.0649
DSB E208 E08 C1X C5X 2016:271:00000 2016:272:00000 ns 8.6416 0.0597
DSB E208 E08 C1X C7X 2016:271:00000 2016:272:00000 ns 8.8926 0.0735
DSB E208 E08 C1X C8X 2016:271:00000 2016:272:00000 ns 8.8164 0.0754
DSB E209 E09 C1C C5Q 2016:271:00000 2016:272:00000 ns 4.3407 0.0668
DSB E209 E09 C1C C7Q 2016:271:00000 2016:272:00000 ns 4.7771 0.0648

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DSB E209 E09	C1C C8Q	2016:271:00000	2016:272:00000	ns	4.5292	0.0597
DSB E209 E09	C1X C5X	2016:271:00000	2016:272:00000	ns	4.5023	0.0642
DSB E209 E09	C1X C7X	2016:271:00000	2016:272:00000	ns	4.8211	0.0829
DSB E209 E09	C1X C8X	2016:271:00000	2016:272:00000	ns	4.5783	0.0834
DSB E101 E11	C1C C5Q	2016:271:00000	2016:272:00000	ns	16.6208	0.0656
DSB E101 E11	C1C C7Q	2016:271:00000	2016:272:00000	ns	16.1333	0.0609
DSB E101 E11	C1C C8Q	2016:271:00000	2016:272:00000	ns	16.0951	0.0561
DSB E101 E11	C1X C5X	2016:271:00000	2016:272:00000	ns	16.8986	0.0651
DSB E101 E11	C1X C7X	2016:271:00000	2016:272:00000	ns	16.4758	0.0807
DSB E101 E11	C1X C8X	2016:271:00000	2016:272:00000	ns	16.4771	0.0782
...						
DSB E205 E24	C1C C5Q	2016:271:00000	2016:272:00000	ns	-32.0209	0.0672
DSB E205 E24	C1C C7Q	2016:271:00000	2016:272:00000	ns	-31.7053	0.0641
DSB E205 E24	C1C C8Q	2016:271:00000	2016:272:00000	ns	-31.8710	0.0573
DSB E205 E24	C1X C5X	2016:271:00000	2016:272:00000	ns	-31.9837	0.0628
DSB E205 E24	C1X C7X	2016:271:00000	2016:272:00000	ns	-31.5128	0.0788
DSB E205 E24	C1X C8X	2016:271:00000	2016:272:00000	ns	-31.7273	0.0772
DSB E203 E26	C1C C5Q	2016:271:00000	2016:272:00000	ns	1.0149	0.0602
DSB E203 E26	C1C C7Q	2016:271:00000	2016:272:00000	ns	1.2124	0.0567
DSB E203 E26	C1C C8Q	2016:271:00000	2016:272:00000	ns	1.0943	0.0519
DSB E203 E26	C1X C5X	2016:271:00000	2016:272:00000	ns	0.8630	0.0558
DSB E203 E26	C1X C7X	2016:271:00000	2016:272:00000	ns	1.0388	0.0680
DSB E203 E26	C1X C8X	2016:271:00000	2016:272:00000	ns	0.9627	0.0696
DSB E206 E30	C1C C5Q	2016:271:00000	2016:272:00000	ns	4.3180	0.0746
DSB E206 E30	C1C C7Q	2016:271:00000	2016:272:00000	ns	4.4955	0.0703
DSB E206 E30	C1C C8Q	2016:271:00000	2016:272:00000	ns	4.4480	0.0658
DSB E206 E30	C1X C5X	2016:271:00000	2016:272:00000	ns	4.2607	0.0640
DSB E206 E30	C1X C7X	2016:271:00000	2016:272:00000	ns	4.5638	0.0796
DSB E206 E30	C1X C8X	2016:271:00000	2016:272:00000	ns	4.3718	0.0825
DSB C003 C01	C2I C6I	2016:271:00000	2016:272:00000	ns	10.2521	0.1033
DSB C003 C01	C2I C7I	2016:271:00000	2016:272:00000	ns	14.3876	0.1037
DSB C016 C02	C2I C6I	2016:271:00000	2016:272:00000	ns	-3.0786	0.1517
DSB C016 C02	C2I C7I	2016:271:00000	2016:272:00000	ns	4.6829	0.1545
DSB C004 C03	C2I C6I	2016:271:00000	2016:272:00000	ns	0.3736	0.1155
DSB C004 C03	C2I C7I	2016:271:00000	2016:272:00000	ns	3.7422	0.1174
...						
DSB C012 C11	C2I C6I	2016:271:00000	2016:272:00000	ns	0.2528	0.2225
DSB C012 C11	C2I C7I	2016:271:00000	2016:272:00000	ns	-7.4242	0.1431
DSB C013 C12	C2I C6I	2016:271:00000	2016:272:00000	ns	-0.0975	0.2274
DSB C013 C12	C2I C7I	2016:271:00000	2016:272:00000	ns	-6.0312	0.1348
DSB C015 C14	C2I C6I	2016:271:00000	2016:272:00000	ns	3.5404	0.2415
DSB C015 C14	C2I C7I	2016:271:00000	2016:272:00000	ns	-4.4217	0.1496
DSB G G AIRA	C1C C2W	2016:271:00000	2016:272:00000	ns	-19.4284	0.1489
DSB G G AIRA	C1C C5X	2016:271:00000	2016:272:00000	ns	-20.3950	0.1863
DSB G G AIRA	C2W C2X	2016:271:00000	2016:272:00000	ns	1.2090	0.0495
DSB R R AIRA	C1C C1P	2016:271:00000	2016:272:00000	ns	3.2185	0.1418
DSB R R AIRA	C1C C2C	2016:271:00000	2016:272:00000	ns	-11.7972	0.5280
DSB R R AIRA	C1C C2P	2016:271:00000	2016:272:00000	ns	-12.0523	0.5400
DSB E E AIRA	C1X C5X	2016:271:00000	2016:272:00000	ns	-15.6324	0.2760
DSB G G ALIC	C1C C2W	2016:271:00000	2016:272:00000	ns	21.1666	0.0867
DSB G G ALIC	C1C C5Q	2016:271:00000	2016:272:00000	ns	13.8693	0.1560
DSB G G ALIC	C2W C2S	2016:271:00000	2016:272:00000	ns	-2.2996	0.0339
DSB R R ALIC	C1C C2C	2016:271:00000	2016:272:00000	ns	1.9061	0.2493
DSB R R ALIC	C1C C2P	2016:271:00000	2016:272:00000	ns	5.1175	0.2577
DSB E E ALIC	C1C C5Q	2016:271:00000	2016:272:00000	ns	0.0636	0.1917
DSB E E ALIC	C1C C7Q	2016:271:00000	2016:272:00000	ns	7.7336	0.1808
DSB E E ALIC	C1C C8Q	2016:271:00000	2016:272:00000	ns	4.9499	0.1506
DSB G G AREG	C1C C2W	2016:271:00000	2016:272:00000	ns	-13.2222	0.1120
DSB G G AREG	C1C C5X	2016:271:00000	2016:272:00000	ns	-23.1050	0.1423
DSB G G AREG	C2W C2X	2016:271:00000	2016:272:00000	ns	0.8766	0.0303
DSB R R AREG	C1C C1P	2016:271:00000	2016:272:00000	ns	3.1099	0.1339
DSB R R AREG	C1C C2C	2016:271:00000	2016:272:00000	ns	-7.8661	0.4922
DSB R R AREG	C1C C2P	2016:271:00000	2016:272:00000	ns	-7.9545	0.4498
DSB E E AREG	C1X C5X	2016:271:00000	2016:272:00000	ns	-18.9376	0.1536
DSB E E AREG	C1X C7X	2016:271:00000	2016:272:00000	ns	-10.1820	0.1337
DSB E E AREG	C1X C8X	2016:271:00000	2016:272:00000	ns	-13.2978	0.1597
...						
DSB G G YEL2	C1C C1W	2016:271:00000	2016:272:00000	ns	1.0793	0.0080
DSB G G YEL2	C1C C2W	2016:271:00000	2016:272:00000	ns	5.8504	0.0802
DSB G G YEL2	C1C C5Q	2016:271:00000	2016:272:00000	ns	-3.0413	0.1237
DSB G G YEL2	C2W C2L	2016:271:00000	2016:272:00000	ns	-0.2192	0.0263
DSB R R YEL2	C1C C2C	2016:271:00000	2016:272:00000	ns	-6.1340	0.2986
DSB R R YEL2	C1C C2P	2016:271:00000	2016:272:00000	ns	-5.8990	0.2816
DSB E E YEL2	C1C C5Q	2016:271:00000	2016:272:00000	ns	-13.7796	0.1314
DSB E E YEL2	C1C C7Q	2016:271:00000	2016:272:00000	ns	-2.1732	0.1236
DSB E E YEL2	C1C C8Q	2016:271:00000	2016:272:00000	ns	-6.1892	0.1198
DSB C C YEL2	C2I C7I	2016:271:00000	2016:272:00000	ns	15.3839	0.4058
DSB G G ZIM3	C1C C2W	2016:271:00000	2016:272:00000	ns	-13.7039	0.0966
DSB G G ZIM3	C1C C5X	2016:271:00000	2016:272:00000	ns	-16.7538	0.1105
DSB G G ZIM3	C2W C2X	2016:271:00000	2016:272:00000	ns	0.6715	0.0356
DSB R R ZIM3	C1C C1P	2016:271:00000	2016:272:00000	ns	3.0797	0.1255
DSB R R ZIM3	C1C C2C	2016:271:00000	2016:272:00000	ns	-7.3293	0.3914
DSB R R ZIM3	C1C C2P	2016:271:00000	2016:272:00000	ns	-7.4327	0.3647
DSB E E ZIM3	C1X C5X	2016:271:00000	2016:272:00000	ns	-12.5791	0.1332

DSB	E	E	ZIM3	C1X	C7X	2016:271:00000	2016:272:00000	ns	-7.9414	0.1421
DSB	E	E	ZIM3	C1X	C8X	2016:271:00000	2016:272:00000	ns	-11.6255	0.1115
DSB	G	G	ZIMJ	C1C	C1W	2016:271:00000	2016:272:00000	ns	1.8261	0.1252
DSB	G	G	ZIMJ	C1C	C2W	2016:271:00000	2016:272:00000	ns	10.3006	0.1190
DSB	G	G	ZIMJ	C1C	C5X	2016:271:00000	2016:272:00000	ns	-4.3410	0.1144
DSB	G	G	ZIMJ	C2W	C2X	2016:271:00000	2016:272:00000	ns	-1.0418	0.0552
DSB	R	R	ZIMJ	C1C	C1P	2016:271:00000	2016:272:00000	ns	-0.4854	0.1628
DSB	R	R	ZIMJ	C1C	C2C	2016:271:00000	2016:272:00000	ns	-15.4303	0.6283
DSB	R	R	ZIMJ	C1C	C2P	2016:271:00000	2016:272:00000	ns	-14.9611	0.4616
DSB	E	E	ZIMJ	C1X	C5X	2016:271:00000	2016:272:00000	ns	-13.9267	0.1646

-BIAS/SOLUTION
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%=ENDBIA