

## IGS antenna files

This file summarizes information concerning the various IGS antenna files available at <ftp://ftp.igs.org/pub/station/general/>. Each receiver antenna type in use within the IGS network should be contained in three different files (satellite antennas are only contained in the first two of them):

- rcvr\_ant.tab: naming convention
- \*.atx: phase center corrections
- antenna.gra: reference points and dimensions

Phase center corrections are provided in the Antenna Exchange Format (ANTEX) which is defined in a separate format specification. Information on the other files can be found in the respective headers. A general description of all files is given below:

### 1) rcvr\_ant.tab

**purpose/content:** IGS naming conventions for GNSS equipment (receivers, antennas, radomes, satellite antennas); only valid names to be used in IGS site logs, RINEX headers, SINEX files, etc.

**responsibility:** IGS Central Bureau

**contact:** support@igs.org

**requirements for new entries:**

- geodetic equipment relevant to the IGS and users of IGS products with cm-level capabilities
- unique hardware model
- unique description
- unchangeable naming
- consideration of format specifications
- agreement with naming of calibration institutions, if possible
- authorization of manufacturer, if possible

**checklist:** <https://kb.igs.org/hc/en-us/articles/204200287-Checklist-for-Requesting-Additions-to-rcvr-ant-tab>

### 2) igs14\_www.atx (www = GPS week of the last file change)

(latest version is symbolically linked to the generic filename **igs14.atx** for convenience)

**purpose/content:** absolute IGS phase center corrections for satellite and receiver antennas; to be used with the IGS14 terrestrial reference frame which is closely related to, but not identical with ITRF2014 because the latter is based on igs08.atx antenna phase center corrections

**responsibility:** IGS Antenna Working Group

**contact:** awg@igs.org, arturo.villiger@aiub.unibe.ch

**requirements for new entries (receiver antennas):**

- antenna name contained in rcvr\_ant.tab
- definitions of antenna reference point (ARP) and north reference point (NRP) contained in antenna.gra
- consistent phase center offsets (PCOs) and variations (PCVs)
- consideration of ANTEX format specifications (e.g., IGS sign convention)
- availability of zenith- AND azimuth-dependent calibration values down to the horizon (with a resolution of at least 5 and 10 degrees, respectively)
- availability of consistent calibration values for multiple GNSS (at least GPS and GLONASS)
- in order to guarantee high accuracy for low elevations, the antenna should be tilted during the calibration procedure
- addition of calibrations not matching the above criteria is only possible in a few exceptional cases (e.g., if a calibration for a combination of an antenna with a specific radome became available whose effect was ignored within the IGS before then)
- replacement of existing values is only allowed in a few exceptional cases (e.g., major model update, reference frame change, etc.) in cooperation with the IGS Reference Frame Working Group
- radome calibrations can only be added for combinations that are not (yet) in use within the IGS (otherwise the addition is a matter of a replacement, as the calibration for the antenna without the radome was used within the IGS before then)
- Geo++ GmbH only permits its type mean calibrations to be published in the public domain for the antenna types used within the IGS and EPN networks; calibrations for other antenna types are generally not openly available
- antenna manufacturers are encouraged to provide type mean calibrations for all their models using one of the available calibration services

**where to get approvable calibrations?**

(list will be extended as soon as additional institutions meet the requirements)

- Geo++ GmbH  
<http://www.geopp.de/gnpcv-absolute-antenna-calibration-type-correction>
- Leibniz Universität Hannover, Institute of Geodesy  
<http://www.ife.uni-hannover.de/antenna-calibration.html>
- Senatsverwaltung für Stadtentwicklung Berlin, GNSS-Landeskalibriereinrichtung  
[http://www.stadtentwicklung.berlin.de/geoinformation/landesvermessung/landeskalibriereinrichtung/de/kalibrierung\\_gnss.shtml](http://www.stadtentwicklung.berlin.de/geoinformation/landesvermessung/landeskalibriereinrichtung/de/kalibrierung_gnss.shtml)
- University of Bonn, Institute of Geodesy and Geoinformation  
[http://www.gib.uni-bonn.de/forschung/bew\\_obj/antennenmesskammer](http://www.gib.uni-bonn.de/forschung/bew_obj/antennenmesskammer)

**procedure for newly launched satellites:**

- antenna name contained in rcvr\_ant.tab
- as soon as launch date, satellite designations (PRN/SVN number, slot/GLONASS number, etc.) and COSPAR ID are known, a rounded block mean PCO is added together with the corresponding block mean PCVs, if available
- in the case of a new antenna/block generation, manufacturer values have to be applied for the PCO together with zero PCVs
- no earlier than six months after the satellite launch, the block mean PCO is replaced by an individual offset value from the combination of weekly IGS Analysis Center SINEX solutions
- PCVs for new satellite antenna type: procedure tbd.

**intended procedure for major model update:**

- compilation of an unofficial file containing the best possible receiver antenna corrections (regardless of any consistency problems) and updated satellite antenna PCVs
- reprocessing campaign of the IGS Analysis Centers with receiver antenna corrections kept fixed
- estimation of consistent satellite antenna z-offsets with the latest reference frame kept fixed
- release of the complete antenna phase center model together with the corresponding reference frame

**3) antenna.gra**

**purpose/content:** antenna reference point (ARP) definition, north reference point (NRP) definition, physical antenna dimensions

**responsibility:** IGS Central Bureau

**contact:** support@igs.org

**requirements for new entries:**

- antenna name contained in rcvr\_ant.tab
- authorization of manufacturer, if possible
- either an antenna drawing or the necessary information for the creation of the drawing have to be provided

**4) antex14.txt**

**purpose/content:** ANTEX format definition, IGS antenna file naming convention, IGS sign convention for PCOs and PCVs

**responsibility:** IGS Antenna Working Group

**contact:** awg@igs.org, [arturo.villiger@aiub.unibe.ch](mailto:arturo.villiger@aiub.unibe.ch)

## 5) Old IGS phase center corrections files (no longer maintained)

- **igs08\_www.atx (www = GPS week of the last file change)**

(latest version is symbolically linked to the generic filename **igs08.atx** for convenience)

**purpose/content:** absolute IGS phase center corrections for satellite and receiver antennas; to be used with the IGS08/IGb08 terrestrial reference frame which is closely related to, but not identical with ITRF2008 because the latter is based on igs05.atx antenna phase center corrections

**file is no longer maintained!**

- **igs05\_www.atx (www = GPS week of the last file change)**

(latest version is symbolically linked to the generic filename **igs05.atx** for convenience)

**purpose/content:** absolute IGS phase center corrections for satellite and receiver antennas; to be used with the IGS05 terrestrial reference frame which is aligned to, but not identical with ITRF2005 that is based on relative antenna phase center corrections

**file is no longer maintained!**

- **igs\_01.atx**

**purpose/content:** relative IGS phase center corrections for satellite and receiver antennas (former IGS antenna model igs\_01.pcv converted into the ANTEX format)

**file is no longer maintained!**

- **igs\_01.pcv**

**purpose/content:** relative IGS phase center corrections for receiver antennas only (former IGS format)

**file is no longer maintained!**