

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
- University of Bonn, Institute of Geodesy and Geoinformation
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

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!