

Reunión Técnica Proyecto SIRGAS

Costa Rica, Noviembre 2006

Estándares para Estaciones SIRGAS

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ANTECEDENTES

- Nombramiento de sub-comision en Caracas, Dic. 2005
- Presentación Tomas Marino, Río de Janeiro 2006
- Borrador Melvin Hoyer, Río de Janeiro 2006
- Resoluciones, Río de Janeiro 2006

CRITERIOS PARA LA INCORPORACIÓN DE ESTACIONES GPS DE MEDICION CONTINUA EN SIRGAS

- La incorporación de nuevas estaciones GPS de observación continua por parte de los centros de procesamiento SIRGAS, presupone que la ubicación y selección del lugar ha sido estudiada y que cumple con parámetros lógicos ya formulados y publicados por diversas instituciones. Al respecto se presentan mas adelante unas recomendaciones.
- Una vez garantizada la confiabilidad de la estación en cuanto al ambiente, monumento e instrumentación, se deben definir criterios con respecto a la presentación y disponibilidad de los datos: identificación de archivos, formato de los datos (RINEX), intervalo de captura, entre otros. Estos aspectos deben ser discutidos en la reunión del Grupo de Trabajo I, considerando la opinión de los responsables de los centros de procesamiento, de igual forma debe discutirse si el mismo GTI o una subcomisión debe evaluar las solicitudes de incorporación de las estaciones mediante un procedimiento y criterio similar al de NGS/NOAA para las estaciones CORS en Estados Unidos. Estos son puntos que deben ser discutidos.

- **ALGUNAS RECOMENDACIONES CON RESPECTO A LA SELECCIÓN Y UBICACIÓN DE SITIOS PARA ESTACIONES GPS PERMANENTES**
- 1. -DISTRIBUCIÓN GEOGRAFICA
- 2.- SEGURIDAD Y SERVICIOS
- 3.- MONUMENTO
- 4.-AMBIENTE
- 5.-INSTRUMENTO



REQUERIMIENTOS PARA ESTACIONES CONTINUAS. SIRGAS

Objetivo del grupo de trabajo 1:
Establecimiento y mantenimiento de una red de
referencia: SISTEMA DE REFERENCIA.

Un sistema de referencia debe de contener una base sólida para que, a partir de éste, se generen datos (GPS) con una estabilidad geodésica confiable. Por consiguiente los requerimientos de las estaciones continuas en el marco del proyecto SIRGAS debe de contener lo siguiente:

Consideraciones en cuanto la escogencia del sitio:

- Es importante recabar toda la información disponible en cuanto a redes horizontales, verticales y estudios de gravimetría, existentes en cada país.
- Contar con la información geodésica de países vecinos, para no duplicar, estaciones continuas en fronteras.
- Contar con todos los estudios (fallas, deslizamientos, área cercana a volcanes, área de riesgo) que se tengan a nivel de movimiento del suelo. O hacer un estudio geológico. La estación debe de estar en suelo o terreno firme.
- tomar en cuenta lugares que hayan tenido mediciones geodésicas.

- Tomar en cuenta lugares que hayan tenido mediciones geodésicas.
- el lugar debe contar con energía eléctrica (fluctuaciones en fluido eléctrico) y la seguridad del equipo debe ser considerada. Y la facilidad del acceso a la estación.
- Debe garantizarse un horizonte libre, mínimo 10 grados.
- No debe haber superficies reflectantes cerca de las estaciones. (techos metálicos, espejos de agua, etc.

Consideraciones en cuanto el tipo de amojonamiento

- Recomendable un pilar de concreto
- En terrenos inestables, pantano, arenas, área de riesgos, debe considerarse una estructura que garantice la estabilidad del pilar, generalmente suele hacerse un diseño estructural tipo cruz, con el pilar integrado.
- Debe considerarse en las estaciones de referencia, un punto alternativo en donde se monitorear, la estación de referencia. Estos puntos a observar debe considerase fuera del área inestable.

Consideraciones en cuanto a los requerimientos propias de la estación

- Debe contar con un sistema alternativo de energía
- Debido a que la antena debe cumplir un horizonte libre, esto la hace susceptible a descargas eléctricas, por consiguiente es necesario un pararrayos.
- Complementar esta estación con una estación sismológica y un acelerómetro, que darán mayor información a los cambios que ocurren en la estación esto considerando Centroamérica que es un área altamente sísmica.
- Consideraciones de los receptores utilizados en estaciones continuas.
- Deben de ser los mejores receptores geodésicos del mercado, que garanticen la doble frecuencia y doble código, que trabajen en tiempo real, y que resuelvan con gran rapidez las ambigüedades.
- Con la utilización de receptores de las características anteriores agregándole “las multitareas”, pueden llevar muchas operaciones simultáneamente. Los archivos de datos pueden ser descargados mientras el receptor continúa obteniendo y registrando datos y mientras fluyen y se transmiten datos crudos, en este caso del DGPS. Estos son verdaderos receptores multitareas.
- Algunos aspectos meteorológicos se deben tomar en cuenta como la humedad, temperatura y presión.

Consideraciones para el mantenimiento de la estación.

- Verificación de las configuraciones de la estación (reflexiones engañosas o multipath).
- Verificación de las recepciones de la señal, verificación de que los archivos se están recibiendo.
- Verificación de la altura de la antena, y orientación.
- Verificación de las memorias disponibles.
- Verificación, por medio de un ajuste de la red geodésica contenida en estas estaciones.
- Descarga de datos a Internet.

GRACIAS!!!

Presentado por:

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Representante Nacional de SIRGAS- Costa Rica

Integrante del Grupo de Trabajo 1:

Enlace para Centroamérica y el Caribe.

Observatorio Vulcanológico y Sismológico de Costa Rica
(OVSICORI)

Universidad Nacional (UNA)

Agosto 2006

Brasil

Resoluciones Río de Janeiro, Agosto 2006

- Satisfacer requerimientos de estación permanente.
- Formato log file de acuerdo al IGS.
- Tener actualizado log file en pagina web.
- Mínimo performance de funcionamiento.
- Datos disponibles.
- Estación debe ser procesada por al menos 2 centros.



National Geodetic Survey - CORS



[National CORS](#) | [Cooperative CORS](#) | [Antennas](#) | [Questions/Comments](#)

NEW and OFFICIAL
[Guidelines for Establishing and Operating CORS - 2006 Feb 26](#)

Joining the Continuously Operating Reference Station (CORS) Network

[Required Receiver and Antenna Codes](#)
[Station Log Checker](#)

NOAA's National Geodetic Survey (NGS) invites organizations and individuals to share data from their permanent GPS base stations by including these stations in the National CORS and/or the Cooperative CORS networks. Each CORS must meet the following criteria. Detailed specifications are described in the [guidelines](#).

- Receiver/Antenna is at least dual frequency (L1 and L2)
- Receiver tracks at least ten satellites above 0 degrees
- Receiver provides L1 C/A-code pseudorange or P-code pseudorange
- Receiver provides L1 and L2 full wavelength carrier phase
- Receiver provides pseudorange precision to better than 0.5 meter RMS
- Antenna oriented to TRUE north ([Calculate Magnetic Declination](#))
- Antenna has NGS phase center variability model available (<http://www.ngs.noaa.gov/ANTCAL>)
- Photos must be supplied ([Sample](#))
- Equipment metadata including photographs and station log
- Data are freely available for distribution
- Data are recorded on a 30-second or shorter interval
- Provider has on-site Internet access
- Provider maintains all equipment
- Provider agrees to adopt positional coordinates sanctioned by NGS

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IGS New Site Checklist

IGS Central Bureau

Jet Propulsion Lab/Caltech

<<http://igscb.jpl.nasa.gov/organization/cb/contact.html>>

(Network Coordinator: Angelyn W. Moore)

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not constitute or imply its endorsement by the United States Government or the Jet Propulsion Laboratory, California Institute of Technology.

28 March 2006

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- Carefully review the IGS Station Guidelines at <http://igscb.jpl.nasa.gov/network/guidelines/guidelines.html>. The responsible agency must have every expectation that the station will operate for at least 3 years. Confirm that the proposed station meets the requirements and adds value to the IGS network.
 - Stations located in Europe must first join the EUREF Permanent Network (EPN), the regional densification network for Europe. See <http://www.epncb.oma.be/>. You may request that an EPN station be considered as an IGS station by emailing <http://igscb.jpl.nasa.gov/organization/cb/contact.html>. The IGS CB and EPN CB will confer on whether the station should be designated as an IGS station based on location, instrumentation, operational characteristics, and whether it is relevant to any IGS Pilot Project or Working Group.
 - Contact the Central Bureau <http://igscb.jpl.nasa.gov/organization/cb/contact.html> with a message addressing
 1. Where is the station located?
 2. Is the station currently operating, or planned? If planned, when is the projected date it will become operational?
 3. What agencies are responsible for installing, managing, operating, and maintaining the station?

IGS Site Guidelines

IGS Central Bureau

Jet Propulsion Lab/Caltech

[<http://igscb.jpl.nasa.gov/organization/cb/contact.html>](http://igscb.jpl.nasa.gov/organization/cb/contact.html)

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30 June 2006

IGS Site Guidelines, Table of Contents

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 - 2.1. Strictly required equipment and operational characteristics
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 - 8.1. Strictly required
 - 8.2. Additionally desired
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 - 9.1. Strictly required
 - 9.2. Additionally desired
10. Acknowledgment
11. Revision history



Monumentation Design and Implementation Recommendations

Table 1: Considerations for Monumentation

Desired Monument Characteristics	Parameters Affecting Monument	Characteristics of a Good Monumentation Site	Good Practice in Design of Monument
• Stability with time • Stable to a certain degree of accuracy • Zero interaction with signal • Low cost • Simple design • Ease of installation • Corrosion resistance • Long term survivability	• Exposure to: ○ Climate ○ Impact ○ Frost Action ○ Shrinking and swelling of soil rock due to changes in moisture content ○ Soil expansion and contraction ○ Slope Instability ○ Compression of Soils ○ Presence of cavities due to karstic formations, such as found in dolomitic regions ○ Erosion ○ Diurnal and Seasonal Temperature variations ○ Human Tampering ○ Radio Frequency Interference • Presence of faults	• Shallow bedrock of high quality • Clear horizon • Safe from vandalism • Clear of reflecting surfaces (fences, metal poles etc.) • Not too far from receiver • Ease of access • Data accessibility via internet or phone line • Continuous electric power • No local crustal instabilities • Controlled vegetation (growing horizon elevators)	• Minimize multipath signals by choosing optimal above ground width and antenna height above ground level. • Test the multipath environment and the radio frequency interference present at the chosen site before installation of monument. • Minimize resonance cavities by minimizing empty space between top of monument and antenna. • Minimize amount of metal in close proximity of antenna. • Design monument to be higher than snowfall levels. • Choose depth of monument anchor such that it is unaffected by frost action. • Use materials with low coefficients of thermal expansion when high temperature variations are expected (Invar for example). • Attach to solid bedrock for extremely stable foundation. • Avoid mounting the GPS antenna within 24.4cm

Table 2: Types of monuments and examples of each

Monument Type	Description	Organizations	Characteristics	Links
Pier	C-Bar Reinforced Concrete	National Geodetic Society (NGS)	-Wide range of applications -Benign signal environment -High level of position stability -Inexpensive -Repeatability in antenna positioning -Long Term Survivability	National Continuously Operating Reference Station (National CORS) Site Monumentation Process Action Team 20 Final Report, U.S. National Geodetic Survey, December 20, 2000. Main report Installation Guidelines Additional Comments on NGS Design
	Rebar Reinforced Concrete	Bay Area Regional Deformation (BARD) Western Canada Deformation Array (WCDA) University NAVSTAR Consortium (UNAVCO)	-Most commonly used monument type	WCDA Concrete Pier Schematics UNAVCO Monument Installations
	H-beam	New Mexico State Highway and Transportation Department	-Excellent Stability	
	Helical	United States Geological Survey (USGS)	-Excellent Vertical and Horizontal Stability	Description

Instructions for filling out IGS site logs Jul 2003

See log form at <ftp://igscb.jpl.nasa.gov/pub/station/general/blank.log>

See <http://igscb.jpl.nasa.gov/network/sitelog-submissions.html> for parsing instructions. When ready, submit site logs by sending as a plain text email message to igscb@igscb.jpl.nasa.gov. Site logs are usually handled by the CB within about one business day.

Date and time formats within the site log follow the basic format "CCYY-MM-DDThh:mmZ" from ISO 8061; see <http://www.iso.ch/iso/en/prods-services/popstds/datesandtime.html>

As a summary, CC=2 digit century

YY=2 digit year

MM=2 digit month

DD=2 digit day of month

T=date/time separator

hh=2 digit hour

mm=2 digit minutes of hour

Z=UTC indicator

/=separator when begin & end times are given

A date without a time is specified like "2003-07-30", not "2003-07-30Thh:mmZ"

Latitude/Longitude formats are aligned to ISO 6709:

Lat: +/-DDMMSS.SS

Long: +/-DDDMMSS.SS

A + or - sign is required. Leading zeroes must be used as appropriate to maintain the DDMMSS and DDDMMSS format.

Valid latitude range is from -180 degrees to (infinitesimally less than) +180 degrees. Valid longitude range is -90 degrees to +90 degrees.

"etc" indicates you may enter any relevant answer, not just a choice of the suggestions shown.

"F7.4," "A4" and so on indicate the FORTRAN-style format which the response should have.

Example 12345.7 = F7.1

ABCD = A4

Blocks which have a "N.x" definition (namely sections 3-10) should always have the complete historic set of information; when a change is made, the previous information is left (for example in section 3.1) and the new information is placed in a new block numbered 3.2. Please leave the .x sections uncompleted to remind yourself of the format when the next change occurs.

contact the IGS Central Bureau: igsch@igsch.jpl.nasa.gov

Special Instructions by section =====

0. Form -----

If Update:

Previous Site Log : (ssss_CCYYMMDD.log)

If the site already has a log at the IGS Central Bureau, enter the filename currently found under

<ftp://igsch.jpl.nasa.gov/pub/station/log/>

ssss = 4 character site name

If Update:

Modified/Added Sections : (n.n.n.n,...)

Enter the sections which have changed from the previous version of the log. Example: 3.2, 4.2

1. Site Identification of the GNSS Monument -----

IERS DOMES Number : (A9)

This is strictly required. See

<http://lareg.ensg.ign.fr/ITRF/domesreq.html> to obtain one.

Monument Description : (PILLAR/BRASS PLATE/STEEL MAST/FICTIVE/etc)

Enter one or more elements as necessary to describe the monument.

Additional Information : (multiple lines)

Suggestions: electrical isolation

2. Site Location Information -----

Approximate Position (ITRF)

This should be to a one meter precision.

The elevation may be given to more decimal places than F7.1. 7.1 is a minimum for the SINEX format.

3. GNSS Receiver Information

Receiver Type : (A20, from rcvr_ant.tab; see instructions)
Please find your receiver in
ftp://igsch.jpl.nasa.gov/pub/station/general/rcvr_ant.tab and use
the official name, taking care to get capital letters, hyphens,
etc. exactly correct. If you do not find a listing for your
receiver, please notify the IGS Central Bureau
(igsch@igsch.jpl.nasa.gov).

Serial Number : (A20)
Keep the 5 significant characters of the serial number field in
SINEX in mind: do not enter "S/N 12345" instead of "12345" since
valuable information will be lost.

Firmware Version : (A11)
Keep the 11 significant characters of the field in SINEX in mind.

Elevation Cutoff Setting : (deg)
Please respond with the tracking cutoff as set in the receiver,
regardless of terrain or obstructions in the area.

Temperature Stabiliz. : (none or tolerance in degrees C.)
This refers to the temperature of the room in which the receiver
is housed.

Date Removed : (CCYY-MM-DDThh:mmZ)
In the block for the receiver currently in operation, leave this
line as is to remind yourself of the format when the next receiver
change is made.

4. GNSS Antenna Information

Antenna Type : (A20 from rcvr_ant.tab; see instructions)

Please find your antenna in

ftp://igsch.jpl.nasa.gov/pub/station/general/rcvr_ant.tab and use the official name, taking care to get capital letters, hyphens, etc. exactly correct. If you do not find a listing for your antenna, please notify the IGS Central Bureau (igsch@igsch.jpl.nasa.gov). Please do not use antenna names from a "Previously valid" section. Choose the corresponding new antenna name. You may indicate a Radome code from rcvr_ant.tab in columns 17-20 of the Antenna Type if desired.

The antenna must have an entry in

ftp://igsch.jpl.nasa.gov/pub/station/general/igs_01.pcv. If not, notify the CB. If using a radome type new to the IGS, the antenna+radome pair must have an entry in igs_01.pcv.

Serial Number : (A20)

Keep the 5 significant characters of the serial number field in SINEX in mind: do not enter "S/N 12345" instead of "12345" since valuable information will be lost.

Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see instructions)

Locate your antenna in the file

<ftp://igsch.jpl.nasa.gov/pub/station/general/antenna.gra>

Indicate the three-letter abbreviation for the point which is indicated equivalent to ARP for your antenna. Contact the Central Bureau (igsch@igsch.jpl.nasa.gov) if your antenna does not appear.

Marker->ARP Up Ecc. (m) : (F8.4)

This is the antenna height measured to an accuracy of 1mm and defined as the vertical distance of the ARP from the marker described in section 1.

Marker->ARP North Ecc(m) : (F8.4)

Marker->ARP East Ecc(m) : (F8.4)

These must be filled in if nonzero.

Alignment from True N : (deg; + is clockwise/east)

The positive direction is clockwise, so that due east would be equivalent to a response of "+90"

Antenna Radome Type : (A4 from rcvr_ant.tab; see instructions)

Place a Radome code from

ftp://igsch.jpl.nasa.gov/pub/station/general/rcvr_ant.tab here.

5. Surveyed Local Ties

Local ties to other markers on the site should be determined in ITRF coordinates to 1mm precision in all 3 dimensions. Offsets are given in geocentric Cartesian coordinates (ITRF).

8. Meteorological Instrumentation

Height Diff to Ant : (m)

Positive numbers indicate met instrument is ABOVE GPS antenna.

12. Responsible Agency (if different from 11.)

The primary contacts listed here should always be the first choice for questions about operation of the site. This person will receive automated emails regarding site log or RINEX errors and should be someone who can answer questions about the configuration and data delivery for this site.

13. More Information

Primary Data Center :

Secondary Data Center :

Please list the DC where the station's data ordinarily goes first as "Primary." Use "Secondary" either for a second location where the station's data always goes, or would go in the case of a long-term failure with the Primary DC.

Select primary and secondary data centers via centers.html and enter the abbreviation of the DC name. A geographically- or functionally- related center is generally preferred. The secondary DC is where data would be sent if the primary were unavailable for an extended period. The switchover does not need to be automated, but data transfer procedures should be verified.

URL for More Information :

This will be linked on the igscb's page for this site. It is not necessary to include "<http://>"

Photos are especially helpful. Contact the CB if you have photos which cannot be hosted on a site web page.

XXXX Site Information Form (site log)
International GPS Service
See Instructions at:
ftp://igscb.jpl.nasa.gov/pub/station/general/sitelog_instr.txt

0. Form

Prepared by (full name) :
Date Prepared : (CCYY-MM-DD)
Report Type : (NEW/UPDATE)
If Update:
Previous Site Log : (ssss_ccyyymmdd.log)
Modified/Added Sections : (n.n.n.n....)

1. Site Identification of the GNSS Monument

Site Name :
Four Character ID : (A4)
Monument Inscription :
IERS DOMES Number : (A9)
CDP Number : (A4)
Monument Description : (PILLAR/BRASS PLATE/STEEL MAST/etc)
Height of the Monument : (m)
Monument Foundation : (STEEL RODS, CONCRETE BLOCK, ROOF, etc)
Foundation Depth : (m)
Marker Description : (CHISELLED CROSS/DIVOT/BRASS NAIL/etc)
Date Installed : (CCYY-MM-DDThh:mmZ)
Geologic Characteristic : (BEDROCK/CLAY/CONGLOMERATE/GRAVEL/SAND/etc)
Bedrock Type : (IGNEOUS/METAMORPHIC/SEDIMENTARY)
Bedrock Condition : (FRESH/JOINTED/WEATHERED)
Fracture Spacing : (1-10 cm/11-50 cm/51-200 cm/over 200 cm)
Fault zones nearby : (YES/NO/Name of the zone)
Distance/activity : (multiple lines)
Additional Information : (multiple lines)

2. Site Location Information

City or Town	:	
State or Province	:	
Country	:	
Tectonic Plate	:	
Approximate Position (ITRF)	:	
X coordinate (m)	:	
Y coordinate (m)	:	
Z coordinate (m)	:	
Latitude (N is +)	:	(+/-DDMMSS.SS)
Longitude (E is +)	:	(+/-DDDMMSS.SS)
Elevation (m, ellips.)	:	(F7.1)
Additional Information	:	(multiple lines)

3. GNSS Receiver Information

3.1 Receiver Type	:	(A20, from rcvr_ant.tab; see instructions)
Satellite System	:	(GPS/GLONASS/GPS+GLONASS)
Serial Number	:	(A20, but note the first A5 is used in SINEX)
Firmware Version	:	(A11)
Elevation Cutoff Setting	:	(deg)
Date Installed	:	(CCYY-MM-DDThh:mmZ)
Date Removed	:	(CCYY-MM-DDThh:mmZ)
Temperature Stabiliz.	:	(none or tolerance in degrees C)
Additional Information	:	(multiple lines)

3.x Receiver Type	:	(A20, from rcvr_ant.tab; see instructions)
Satellite System	:	(GPS/GLONASS/GPS+GLONASS)
Serial Number	:	(A20, but note the first A5 is used in SINEX)
Firmware Version	:	(A11)
Elevation Cutoff Setting	:	(deg)
Date Installed	:	(CCYY-MM-DDThh:mmZ)
Date Removed	:	(CCYY-MM-DDThh:mmZ)
Temperature Stabiliz.	:	(none or tolerance in degrees C)
Additional Information	:	(multiple lines)

4. GNSS Antenna Information

4.1 Antenna Type : (A20, from rcvr_ant.tab; see instructions)
Serial Number : (A*, but note the first A5 is used in SINEX)
Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see instr.)
Marker->ARP Up Ecc. (m) : (F8.4)
Marker->ARP North Ecc(m) : (F8.4)
Marker->ARP East Ecc(m) : (F8.4)
Alignment from True N : (deg; + is clockwise/east)
Antenna Radome Type : (A4 from rcvr_ant.tab; see instructions)
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

4.x Antenna Type : (A20, from rcvr_ant.tab; see instructions)
Serial Number : (A*, but note the first A5 is used in SINEX)
Antenna Reference Point : (BPA/BCR/XXX from "antenna.gra"; see instr.)
Marker->ARP Up Ecc. (m) : (F8.4)
Marker->ARP North Ecc(m) : (F8.4)
Marker->ARP East Ecc(m) : (F8.4)
Alignment from True N : (deg; + is clockwise/east)
Antenna Radome Type : (A4 from rcvr_ant.tab; see instructions)
Radome Serial Number :
Antenna Cable Type : (vendor & type number)
Antenna Cable Length : (m)
Date Installed : (CCYY-MM-DDThh:mmZ)
Date Removed : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

5. Surveyed Local Ties

5.x Tied Marker Name :
Tied Marker Usage : (SLR/VLBI/LOCAL CONTROL/FOOTPRINT/etc)
Tied Marker CDP Number : (A4)
Tied Marker DOMES Number : (A9)
Differential Components from GNSS Marker to the tied monument (ITRS)
dx (m) : (m)
dy (m) : (m)
dz (m) : (m)
Accuracy (mm) : (mm)
Survey method : (GPS CAMPAIGN/TRILATERATION/TRIANGULATION/etc)
Date Measured : (CCYY-MM-DDThh:mmZ)
Additional Information : (multiple lines)

6. Frequency Standard

6.1 Standard Type : (INTERNAL or EXTERNAL H-MASER/CESIUM/etc)
Input Frequency : (if external)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

6.x Standard Type : (INTERNAL or EXTERNAL H-MASER/CESIUM/etc)
Input Frequency : (if external)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

7. Collocation Information

7.1 Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

7.x Instrumentation Type : (GPS/GLONASS/DORIS/PRARE/SLR/VLBI/TIME/etc)
Status : (PERMANENT/MOBILE)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8. Meteorological Instrumentation

8.1.1 Humidity Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy (% rel h) : (% rel h)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.1.x Humidity Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy (% rel h) : (% rel h)
Aspiration : (UNASPIRATED/NATURAL/FAN/etc)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.2.1 Pressure Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (hPa)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)

8.2.x Pressure Sensor Model :
Manufacturer :
Serial Number :
Data Sampling Interval : (sec)
Accuracy : (hPa)
Height Diff to Ant : (m)
Calibration date : (CCYY-MM-DD)
Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
Notes : (multiple lines)


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8.3.1 Temp. Sensor Model :
    Manufacturer          :
    Serial Number         :
    Data Sampling Interval : (sec)
    Accuracy              : (deg C)
    Aspiration            : (UNASPIRATED/NATURAL/FAN/etc)
    Height Diff to Ant    : (m)
    Calibration date      : (CCYY-MM-DD)
    Effective Dates       : (CCYY-MM-DD/CCYY-MM-DD)
    Notes                 : (multiple lines)

8.3.x Temp. Sensor Model :
    Manufacturer          :
    Serial Number         :
    Data Sampling Interval : (sec)
    Accuracy              : (deg C)
    Aspiration            : (UNASPIRATED/NATURAL/FAN/etc)
    Height Diff to Ant    : (m)
    Calibration date      : (CCYY-MM-DD)
    Effective Dates       : (CCYY-MM-DD/CCYY-MM-DD)
    Notes                 : (multiple lines)

8.4.1 Water Vapor Radiometer :
    Manufacturer          :
    Serial Number         :
    Distance to Antenna   : (m)
    Height Diff to Ant    : (m)
    Calibration date      : (CCYY-MM-DD)
    Effective Dates       : (CCYY-MM-DD/CCYY-MM-DD)
    Notes                 : (multiple lines)

8.4.x Water Vapor Radiometer :
    Manufacturer          :
    Serial Number         :
    Distance to Antenna   : (m)
    Height Diff to Ant    : (m)
    Calibration date      : (CCYY-MM-DD)
    Effective Dates       : (CCYY-MM-DD/CCYY-MM-DD)
    Notes                 : (multiple lines)

8.5.1 Other Instrumentation : (multiple lines)

8.5.x Other Instrumentation : (multiple lines)

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9. Local Ongoing Conditions Possibly Affecting Computed Position

- 9.1.1 Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)
 - Observed Degradations : (SN RATIO/DATA GAPS/etc)
 - Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
 - Additional Information : (multiple lines)
- 9.1.x Radio Interferences : (TV/CELL PHONE ANTENNA/RADAR/etc)
 - Observed Degradations : (SN RATIO/DATA GAPS/etc)
 - Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
 - Additional Information : (multiple lines)
- 9.2.1 Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)
 - Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
 - Additional Information : (multiple lines)
- 9.2.x Multipath Sources : (METAL ROOF/DOME/VLBI ANTENNA/etc)
 - Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
 - Additional Information : (multiple lines)
- 9.3.1 Signal Obstructions : (TREES/BUILDINGS/etc)
 - Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
 - Additional Information : (multiple lines)
- 9.3.x Signal Obstructions : (TREES/BUILDINGS/etc)
 - Effective Dates : (CCYY-MM-DD/CCYY-MM-DD)
 - Additional Information : (multiple lines)

10. Local Episodic Effects Possibly Affecting Data Quality

- 10.1 Date : (CCYY-MM-DD/CCYY-MM-DD)
 - Event : (TREE CLEARING/CONSTRUCTION/etc)
- 10.x Date : (CCYY-MM-DD/CCYY-MM-DD)
 - Event : (TREE CLEARING/CONSTRUCTION/etc)

11. On-Site, Point of Contact Agency Information

Agency : (multiple lines)
Preferred Abbreviation : (A10)
Mailing Address : (multiple lines)
Primary Contact
 Contact Name :
 Telephone (primary) :
 Telephone (secondary) :
 Fax :
 E-mail :
Secondary Contact
 Contact Name :
 Telephone (primary) :
 Telephone (secondary) :
 Fax :
 E-mail :
Additional Information : (multiple lines)

12. Responsible Agency (if different from 11.)

Agency : (multiple lines)
Preferred Abbreviation : (A10)
Mailing Address : (multiple lines)
Primary Contact
 Contact Name :
 Telephone (primary) :
 Telephone (secondary) :
 Fax :
 E-mail :
Secondary Contact
 Contact Name :
 Telephone (primary) :
 Telephone (secondary) :
 Fax :
 E-mail :
Additional Information : (multiple lines)

13. More Information

Primary Data Center :
Secondary Data Center :
URL for More Information :
Hardcopy on File
 Site Map : (Y or URL)
 Site Diagram : (Y or URL)
 Horizon Mask : (Y or URL)
 Monument Description : (Y or URL)
 Site Pictures : (Y or URL)
Additional Information : (multiple lines)
Antenna Graphics with Dimensions

(insert text graphic from file antenna.gra)

Próximas Acciones

- Redefinir alcance u objetivo del trabajo
- Evaluar material existente
- Adoptar los lineamientos de otras instituciones que mejor se adapten a SIRGAS
- Complementar con las necesidades propias del proyecto