

## Station GPS permanente

IPG Paris

DGF Uchile

Site Name: North Radomiro Tomic Mine (North of Calama)	Author : <b>Carrizo / Bejar</b>
Site Code : <b><u>RADO</u></b>	Date installation : <b>2007 12 08</b>
Coordinates : RADO :    -22.08295    - 68.92680	

### DESCRIPTION

North Chile II region, semi-permanent GPS station from IPGP / DGF network

### MONUMENTATION

Station located in the Pre-cordillera zone, on top of hill located in the south side of the miner track. Implanted in bedrock (high silica alteration of volcanic rock) Inox (short) 30 cm rod (Delmont type) sealed in bedrock with epoxy-glue. Receptor TRIMBLE NetRS, TRIMBLE Antenna Zephyr geodetic and autonomous energy (battery and solar panel).

### HISTORIC

Semi-permanent GPS station installed since 08-DEC- 2007.  
Tying measurements between TO3 and TO4 performed during the Tocopilla intervention by Marta Bejar and Daniel Carrizo in Dec. 2007

### PRACTICAL INFORMATIONS

state property		<b>NO</b>	
private property	<b>YES</b>		Radomiro Tomic Mine Property CODELCO
access restricted	<b>YES</b>		(If is taked) Mine permission route access
telephone nearby		<b>NO</b>	
Electric power nearby		<b>NO</b>	
equipment storage available	<b>YES</b>		
possibility of leaving the equipment without watching	<b>YES</b>		?
person in charge		<b>NO</b>	Prof. Manuel Olcay ( UNAP Iquique) 093701220 (cel.), (57) 310716 , (57) 394369, <i>molcay@unap.cl</i>
person to contact		<b>NO</b>	

# COORDINATES

## RADO\_ Site Information Form \_\_ International GPS Service for Geodynamics

### 0. Form

Prepared by (full name) : Daniel Carrizo, Marta Béjar  
Date Prepared : 08-DEC-2007  
Report Type :

### 1. Site Identification of the GPS Monument

Site Name : Radomiro Tomic tracking station  
Four Character ID : **RADO**  
Monument Inscription :  
IERS DOMES Number :  
CDP Number : (XXXX)  
Date Installed : 08-DEC-2007  
Geologic Characteristic : IGNEOUS  
Bedrock Type : HIGH SILICA ALTERATION IN VOLCANIC ROCK  
Bedrock Condition : FRESH  
Fracture Spacing : 0

Notes : installed on the top of the hill located to the west side of Radomiro Tomic Mine – Quebrada Onda route. Access using mining exploration (drill-hole) routes and perforation platforms.

No auxilliary point ;

Additional Information : Geological Province: Andean Precordillera  
: Local Geology: :  
: Geological information from xxx  
: Program:.

### 2. Site Location Information

City or Town : Radomiro Tomic mine property  
Country : Chile  
Tectonic Plate : South American  
X coordinate (m) :  
Y coordinate (m) :  
Z coordinate (m) :  
Latitude (deg) : -22.08295  
Longitude (deg) : 68.92680  
Elevation (m) :

Additional Information : Latitude, Longitude and Elevation derived from Gamit calculation

### 3. GPS Receiver Information

3.1 Receiver Type : TRIMBLE / NetRS  
Serial Number : 4625209647  
Firmware Version :  
Date Installed : 04-DEC-2007  
Date Removed : (dd-MMM-yyyy hh:mm UT)  
Additional Information : (multiple lines)

3.2 Receiver Type :  
Serial Number :  
Firmware Version : 0  
Date Installed :  
Date Removed : (dd-MMM-yyyy hh:mm UT)

### 4. GPS Antenna Information

5.

4.1 Antenna Type : TRIMBLE / Zephyr geodetic  
Serial Number : 60145023  
Antenna Height (m) : 0.000 (to be verified)  
Antenna Reference Point : ARP = dhpab  
Degree Offset from North : 0.0  
Antenna Radome Type :  
Date Installed : 04-DEC-2007 hh:mm UT

Date Removed : (dd-MMM-yyyy hh:mm UT)

4.2 Antenna Type :  
Serial Number :  
Antenna Height (m) :  
Antenna Reference Point :  
Degree Offset from North :  
Antenna Radome Type :  
Date Installed : hh:mm UT  
Date Removed :

5. Local Site Ties :

5.1 Monument Name :  
Site Ref CDP Number :  
Site Ref Domes Number :  
Differential Components from GPS Mark to Site Reference (ITRS)  
dx (m) :  
dy (m) :  
dz (m) :  
Accuracy (mm) : (mm)  
Date Measured : (dd-MMM-yyyy hh:mm UT)  
Additional Information :

6. Frequency Standard : NO

6.1 Standard Type :  
Frequency :  
Effective Dates :

7. Collocation Information

7.x Instrumentation Type : No  
Status : SEMI-PERMANENT  
Effective Dates : (dd-MMM-yyyy - dd-MMM-yyyy)

8. Meteorological Instrumentation : No

8.1 Humidity Sensor Model :  
8.2 Pressure Sensor Model :  
8.3 Temperature Sensor Model :  
8.4 Water Vapor Radiometer :  
8.5 Other Instrumentation : (multiple lines) pm

9. On-Site, Point of Contact Agency Information

Agency : Department of Physics\_ Universidad Arturo Prat, Iquique, Chile  
Mailing Address :  
Primary Contact : Contact Name : Manuel Olcay, David Lazo  
Telephone (primary) : 447070 Fax :  
E-mail : molcay@cavanha.cec.unap.cl  
Secondary Contact : Contact Name : Socquet Anne  
Telephone (primary) : 0 33 1 44 27 24 99 Telephone (secondary) :  
Fax : 0 33 1 44 27 38 94 E-mail : socquet@ipgp.jussieu.fr

10. Responsible Agency (if different from 9.)

11. More Information

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

## ADDITIONAL INFORMATION

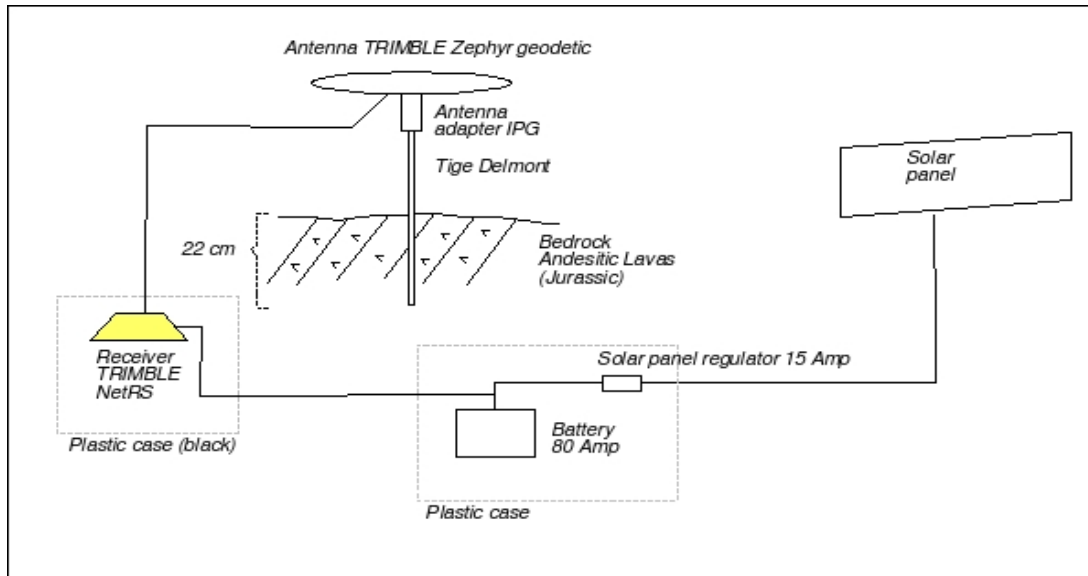
Battery : 80 Amp closed – free maintenance

Antenna cable: 15 m

Power energy: Autonomous Solar panel, solar panel regulator (15 Amp), battery 80 Amp.

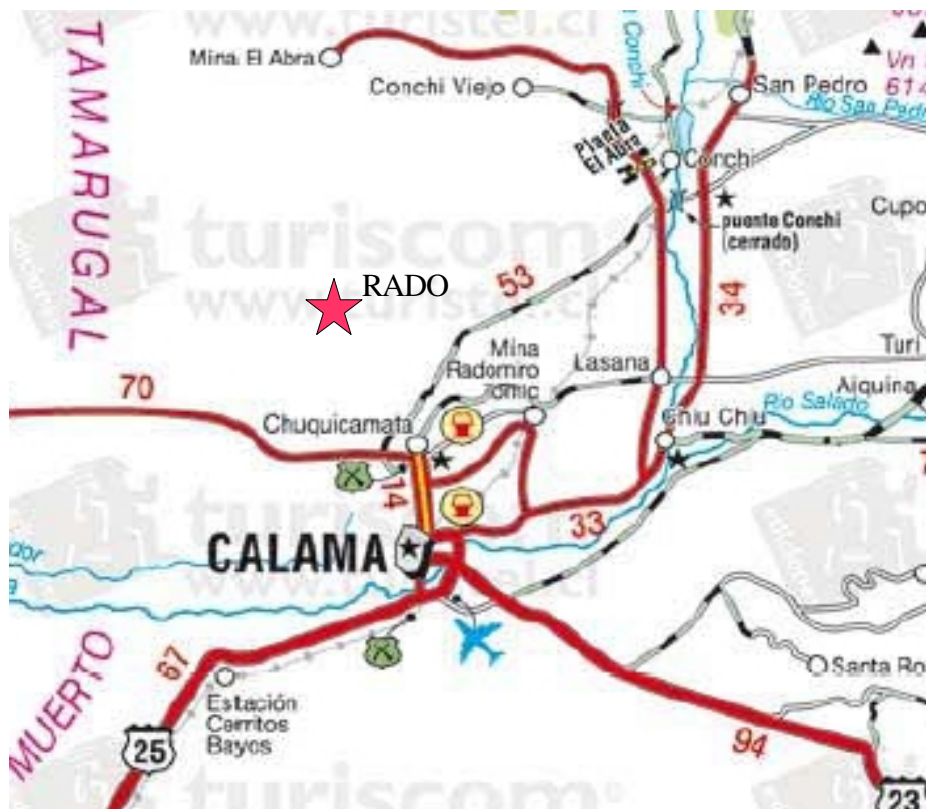
Communication: configuration data in receiver cover.

### Station sketch



### Locations

<http://www.turistel.cl/v2/secciones/mapas/ruteros/tarapaca.htm>





Photography N°1 : View of RADO semipermanent station. The case and solar panel are fixed to the bedrock.



Photography N°2 : Detail of the antenna placement in high silica alteration rocks (tige Delmont + adapter).

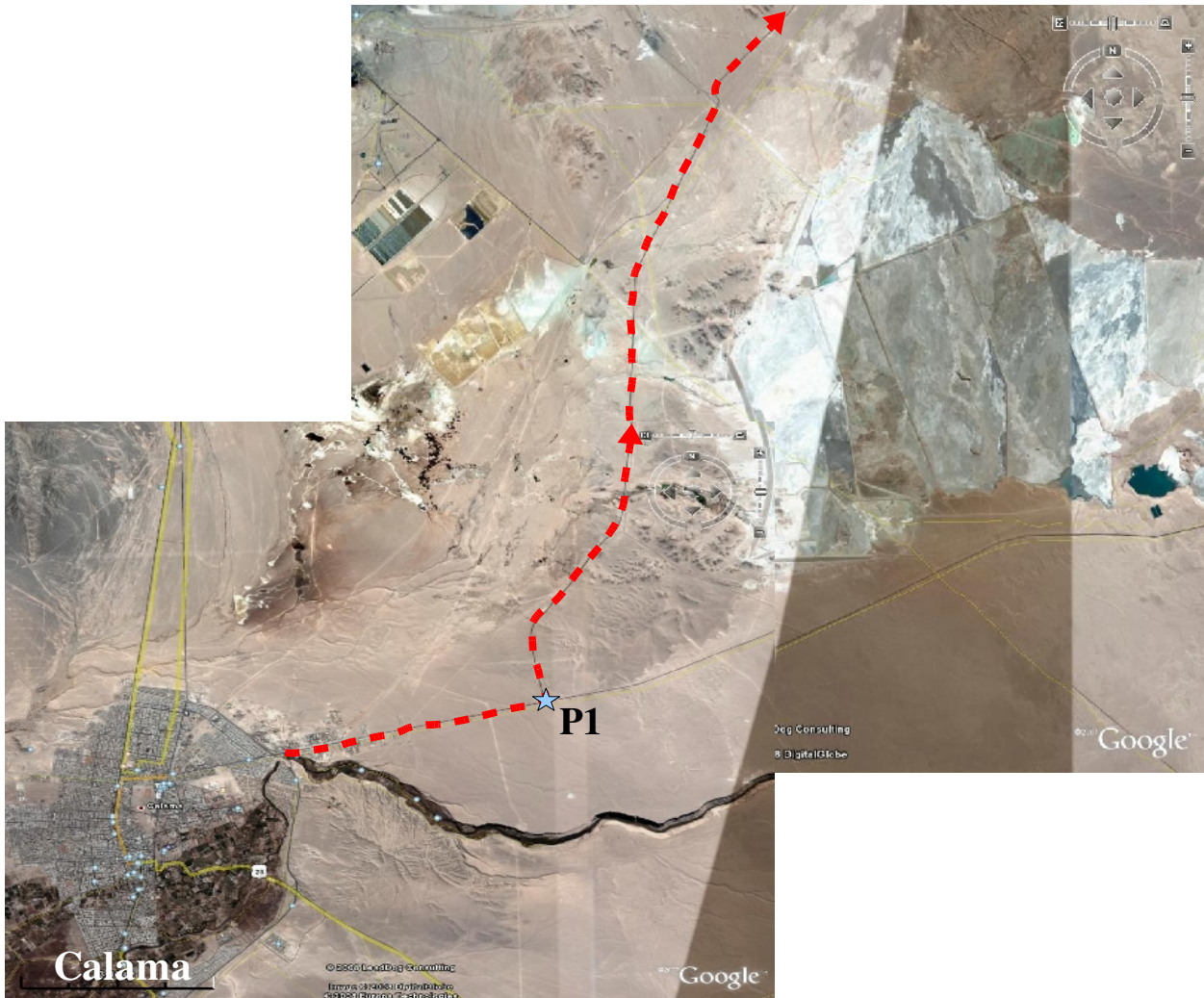


Photography N°3 : Detail of the antenna placement.



Photography N°4 : Details of the site placement. Outcrops located at side of a drill-hold platform.

## Details for access

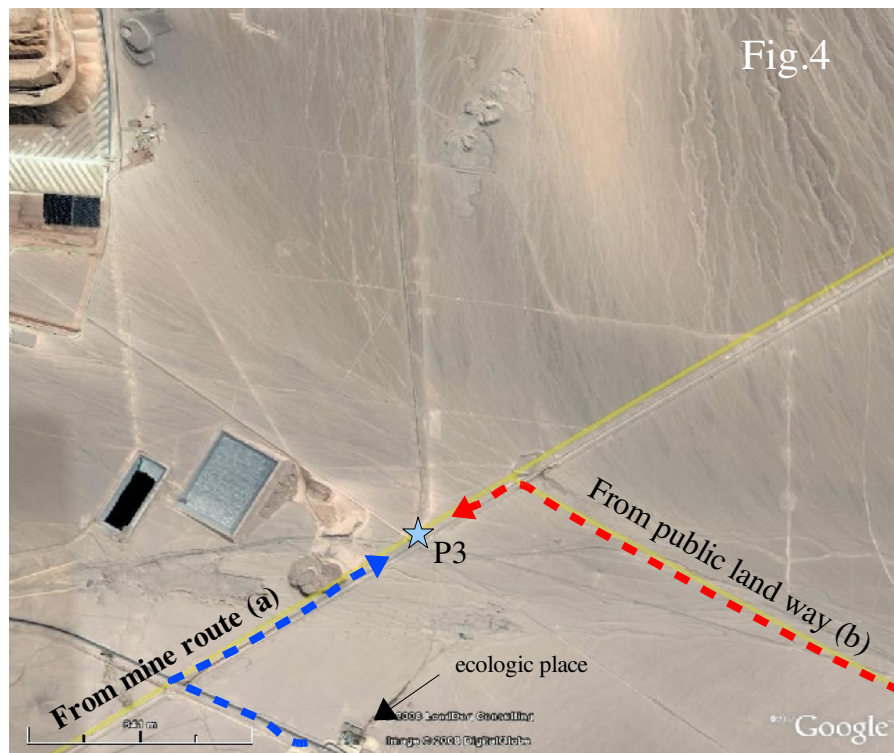


1. Access to RADO from Calama City. Takes the route to Chiu-Chiu (or directly to Radomiro Tomic Mine). Takes the left deviation to Radomiro Tomic Mine (P1 in Fig.1 – blue star).

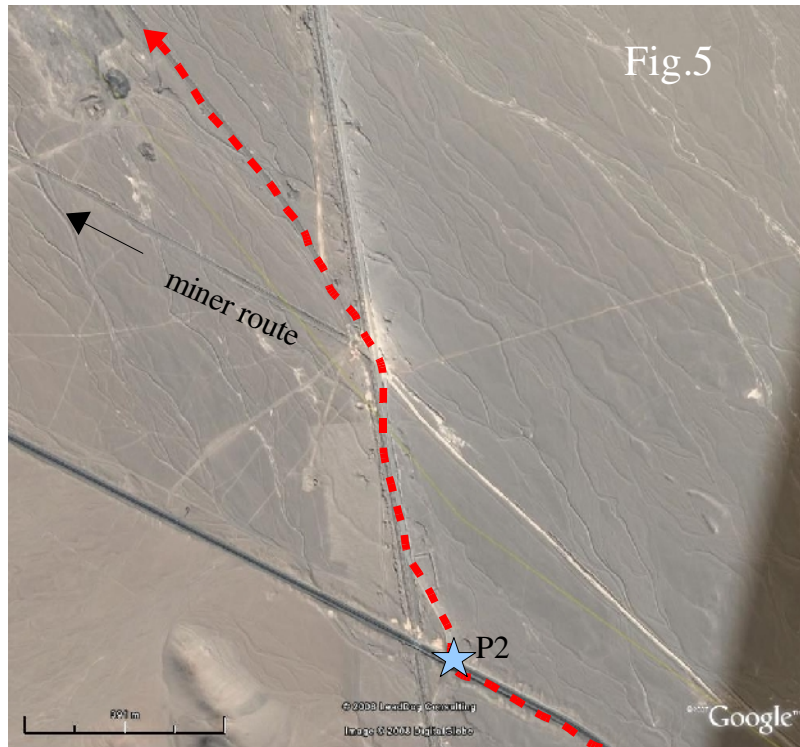


2. Once arrived to P2 there are two ways for RADO access:
  - a) Takes the Radomiro Tomic route (dark line in the figure) and is necessary to command permissions for using (not public way). If decide takes the miner route you will arrive to the miner control site called "punto 0" pointed out with a red circle in Fig.2. In there is necessary to solicit permission for use the miner route and access to RADO place. If the miner permission will be obtain is necessary continue ascending for the route, passing the ecological place located to the left side of route (surrounded by different colours wheels) and then taking the left deviation (see Fig.3 - 4) for then arrive to P3 deviation. Takes de land route (big route) that runs near to the mountain front, crossing the Miner deposits.





b) From P2 (Fig.2), the second way to RADO access is taking the deviation to north by a public land way (Fig.5). For this way you will arrive directly to a miner-duct route (yellow line in Fig.3) . Turn left (WSW) ~200 m for arrive to P3 (Figs.2 – 5), then take the big land route that runs near to mountain front, crossing the Miner deposits.



3. From P3 take the big land route that runs near to the mountain front, crossing the Miner deposits (Fig.6). Driving ~12 km from the last Miner deposits arrived to P4. Takes the deviation to west using a exploring trucks, going up to the red colours alteration hill (access made for drillhold platform) were is located RADO (Fig.6).

#### Access route points - WGS84

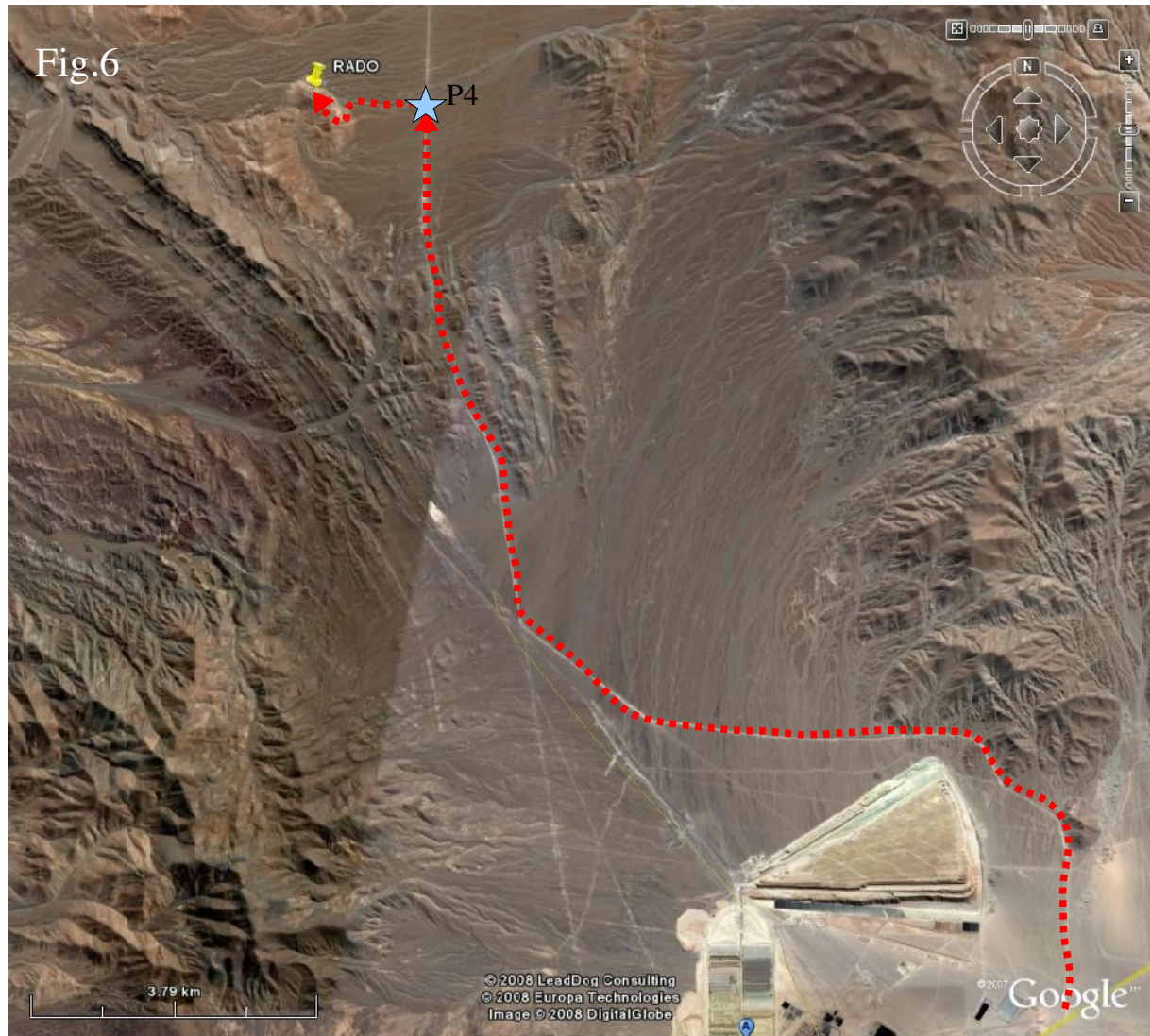
Point	South	West
P1	22°26'3.61"	68°51'20.56"
P2	22°13'54.46"	68°46'35.44"
P3	22°11'31.74"	68°50'9.46"
P4	22° 5'9.90"	68°54'47.10"
MICA	22° 4'58.62"	68°55'36.48"

#### RECOMMENDATIONS

Access with 4x4 vehicle, check the route with google earth before to access, introduce the key points in GPS navigator, takes a planing considering approximately 6-8 hrs. for access, visit the station and return to Calama.

Equipments required:

1. Bring the case-lock keys for access to receiver.
2. Bring a laptop with windos XP environment (hyperterminal and internet explorer or similar installed) with ethernet (LAN) port.
3. Bring a crossover cable PC-PC.
4. Voltage tester.
5. \*just in case bring NetRS communication connectors (ethernet and serial). Also it's recommended bring a serial-USB adapter (if the laptop do not have a serial port).



### PROCEDURE DE COMMUNICATION & DOWNLOAD (RECEIVER - PC\_WINDOWS)

1. Make a Intranet between the receiver and the laptop.

- check the internet configuration in the receiver cover (IP, mask and Getway)
- configure the laptop communication parameters with the same receiver parameters (just the last number of the laptop-IP must be major than receiver-ip last number) expl.

	RECEIVER	LAPTOP
IP	192.168.96.47	192.168.96.50
Mask	255.255.0.0	255.255.0.0
GW	192.168.0.1	192.168.0.1

2.1 Establish the communication via http (data downloading)

- One time configured the laptop ip, connect the receiver with the laptop LAN port (using an crossover cable).
- Reboot the laptop for update the configuration. Then make de connection using internet explorer software or similar. Make the connection to the address:

http://<receiver-ip>  
expl.  
<http://192.168.96.47>

The receiver web page graphic interface will be open (see NetRS manuals).

- For download the GPS data go to “Data Logging/Data Files”\*

\* Do not forget that the data directory was organized for two sampling rates (1Hz and 30 s) identifying the daily files as

????YYYYMMDD0000s.T00

RADO200801120000y.T00 ~8900 kb (session 1 Hz)

RADO200801120000z.T00 ~430 kb (session 30 s)

The receiver makes a monthly directory also:

Data Logging/Data Files/YYYYMM/

Data Logging/Data Files/200801 (for data registered during 2008-Janvier )

- Always check the connection parameter in the receiver (IP – FTP – TELNET) before to make the communication. (See NetRS communication manual in INSU webpage).