

Geodetic Observatory TIGO in Concepción

*Hayo Hase, Armin Böer, Stefan Riepl, Eduardo Carvacho, Roberto Aedo, Gonzalo Remedi,
Marcos Moreno, Matias Sanchez, Gonzalo Hermosilla*

Abstract

In January 2002 the Transportable Integrated Geodetic Observatory (TIGO), a fundamental station for geodesy, arrived in Concepción - Chile. The VLBI operation began after the installation of the radiotelescope and the VLBI backends in May 2002. A team of Chilean operators was trained and is now in charge of the VLBI operation.

1. General Information

On January 11, 2002, BKG's seven TIGO containers arrived from Germany at Puerto Lirquen near Concepción in Chile (Fig. 1). Two days later all the containers were carefully set to their final position at the TIGO platform on the campus area of the Universidad de Concepción in order to become *the* fundamental station for geodesy in Latin America (Fig. 2).

The cooperative operation of TIGO is realized by the German Bundesamt für Kartographie und Geodäsie (BKG), the Universidad de Concepción (UdeC), Universidad del Bío Bío (UBB), Universidad de la Santísima Concepción (UCSC) and the Instituto Geográfico Militar of Chile (IGM).

These partners provided 14 staff (3 BKG, 5 UdeC, 3 UBB, 2 UCSC, 1 IGM) for the challenge to install a geodetic observatory and to do the operation with so far unknown equipment.

The installation of infrastructure (power, telephone, internet distribution) and the instruments (radiotelescope, laser telescope, GPS receiver) took place from January to April 2002 (Fig. 3, 4). Since May 2002 TIGO provided data on a regular base to the IVS and ILRS, and since June 2002 TIGO is present in the IGS (Fig. 5). Since December 2002 TIGO was recognized as the first Chilean contributor for the generation of Universal Time by the Bureau International de Poids et Mesures (BIPM) in Paris.

Also since December 2002 TIGO operates the first super conducting gravity meter in Latin America, which is the fourth in the southern hemisphere.

2. Component Description

The technical parameters of the TIGO radiotelescope have not been changed and have been published in [1].

In May 2002 the S2 VLBI system for TIGO arrived and was installed. It is used in the IVS E3 series. TIGO records since then with its VLBA4 or its S2 backend alternatively.

3. Staff

The TIGO VLBI-group consists of the persons listed in table 1.



Figure 1. January 12, 2002. The TIGO containers are leaving Puerto Lirquen in order to arrive at their final destination at the TIGO platform, about 15km distant.



Figure 2. January 13, 2002. Unloading action at TIGO platform without crane. TIGO-3 contains the time and frequency laboratory, TIGO server and electronic workshop.



Figure 3. January 24, 2002. GPS measurements are carried out over the central marker for the TIGO radiotelescope. The measurement served for the orientation of the platform and the a priori coordinates of TIGOCONC.



Figure 4. February 4, 2002. The radiotelescope is being installed. The 18-ton main part of the radiotelescope had been moved only with muscle power. The reference marker of the VLBI monument is now occupied by the radiotelescope static part.

4. Current Status and Activities

During 2002 TIGO was participating in 43 experiments and 1 successful fringe test. Table 2 gives an overview about the observed experiment series.

5. Future Plans

The VLBI activities in 2003 will focus on

- official inauguration of TIGO on January 15, 2003;



Figure 5. December 2002. The Geodetic Observatory TIGO is being installed and operational. In the foreground TIGO's SLR system, in the background TIGO's VLBI radiotelescope. Not in view is the GPS/Glonass IGS-Station which is in the back of the photographer. The Pacific Ocean can be seen at the horizon.

Staff	Function	Email
Hayo Hase	head	hayo.hase@tigo.cl
Eduardo Carvacho	chief engineer	eduardo.carvacho@tigo.cl
Roberto Aedo	electronic engineer	roberto.aedo@tigo.cl
Gonzalo Remedi	programmer	gonzalo.remedi@tigo.cl
Marcos Moreno	student	marcos.moreno@tigo.cl
Matias Sanchez	student	matias.sanchez@tigo.cl
Gonzalo Hermosilla	student	gonzalo.hermosilla@tigo.cl
any VLBI-operator	on duty	vlbi@tigo.cl
all VLBI-operators		vlbistaff@tigo.cl

Table 1. TIGO-VLBI support staff in 2002.

- execute the IVS schedule 2003 with a more than doubled observational load for TIGOCONC;
- design a new antenna control unit to avoid spare part problems in the future - the ACU replacement is scheduled for 2003/04;

Name	# of exp.	ok	failed
R10xx	30	28	2
T20xx	2	2	0
E30xx	6	5	1
RDVxx	3	3	0
OHIGxx	2	2	0
Total	43	40	3

Table 2. TIGO's IVS observation statistic in 2002.

- develop a new receiver monitoring system due to the lack of available spare parts;
- education and training on geodetic VLBI operations;
- geodetic control measurements regarding site stability and the determination of excentricities to other geodetic monuments (e.g. SLR, GPS, PRARE).

References

- [1] Vandenberg, N. R., "IVS Coordinating Center Report", in International VLBI Service for Geodesy and Astrometry 1999 Annual Report, edited by N. R. Vandenberg, NASA/TP-1999-209243, 1999.