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Personal Information

- Marital Status: married.
- Nationality: Argentine.
- Date of birth: 1st June 1980.
- Age: 40.
- Place of birth: City of Buenos Aires, Argentine.

Academic Achievements

- Electronic Technician on communications. 1993-1998. Technical school N°19 "Alejandro Volta", City of Buenos Aires.

Professional Experience

- Argentine Institute for Radio Astronomy, "IAR – CONICET", Buenos Aires, Argentina, 2004 to present; Principal Technician as part of technology support staff CONICET-CPA.
    - Current position: Head of IAR Radio Observatory.

- Translab, Buenos Aires, Argentina, 1999–2004; Development, maintenance and repair of 23GHz radio links and communication systems

International Training Courses

- **CONICET-CPA External Fellowship program. NOVA –Kapteyn Institute, University of Groningen, Netherlands**. September 2016–March 2017. To be trained on: use and technology of ALMA Sub/Millimeter receivers, through hands on training on direct receiver measurements; development and use of a downconverter unit for the LLAMA Sub/millimeter receives and tests on a complete Front-End –Back-End system by the use of a digital spectrometer and the development of engineering control software for the receiver.

- **IUCAF 4th School on Spectrum Management for Radio Astronomy.** Joint ALMA Observatory, Santiago, Chile, 7-13 April 2014.

- **Training for NASA-STD-8739.1** Staking, Coating and polymeric applications for space applications, Certification for Operator / Inspector, March 2008, Jet Propulsion Laboratory, California, United States.

- **Training for NASA-STD-8739.2** Surface Mount Technology for space applications, Certification for Operator / Inspector, March 2008, Jet Propulsion Laboratory, California, United States.

- **Training for NASA-STD-8739.3** Soldered Electrical Connections for space applications, Certification for Operator / Inspector, February 2008, Jet Propulsion Laboratory, California, United States.

- **Training for NASA-STD-8739.4** Crimp, Cable and Harness for space applications, Certification for Operator / Inspector, March 2008, Jet Propulsion Laboratory, California, United States.

- **Training for Electrostatic discharge ESD control**, Certification for Operator, March 2008, Jet Propulsion Laboratory, California, United States.

National Training Courses

- **Atmel Cortex-M3** - CASE 2012 – Argentine Congress of Embedded Systems, University of Buenos Aires, 15,16, 17, August 2012, City of Buenos Aires, Argentina.

- **Hands-on Cortex-M0** - CASE 2012 – Argentine Congress of Embedded Systems, University of Buenos Aires, 15,16, 17, August 2012, City of Buenos Aires, Argentina.

- **BeagleBoard & Embedded Linux** - CASE 2011 – Congress of Embedded Systems, National Technological University "UTN", 2, 3,4 March 2011, City of Buenos Aires, Argentina.

- **C Programming for embedded systems** - CASE 2011 – Congress of Embedded Systems, National Technological University "UTN", 2, 3,4 March 2011, City of Buenos Aires, Argentina.

- **Data acquisition systems for very high speed** - CASE 2011 – Congress of Embedded Systems, National Technological University "UTN", 2, 3,4 March 2011, City of Buenos Aires, Argentina.

- **Development of Embedded Linux Drivers** - CASE 2011 – Congress of Embedded Systems, National Technological University "UTN", 2, 3,4 March 2011, City of Buenos Aires, Argentina.

- **3rd Southern Conference on Programmable Logic**, 26-27-28 February 2007, University CAECE, City of Mar del Plata, Argentina.

- **Synthesis of Digital Systems in VHDL**, Computer Science School, ECI, 30Hs duration, July 2007, University of Buenos Aires, City of Buenos Aires, Argentina.

- **Digital Filter Design using FPGA**, 4 Hs duration, October 2006, CICOMRA, IEEE Argentina, City of Buenos Aires, Argentina.

- **Digital Filters for LabView 7**, 8 Hs duration, June 2004, IEEE Argentina, Buenos Aires, Argentina.

- **Modern Techniques of Design with VHDL and Altera**, 35Hs duration, August 2004, National University of La Plata, La Plata, Argentina.

Participation on Projects realized at I.A.R., Observatory Department.

- **"Pulsar Monitoring in Argentina, PuMA Collaboration"**, IAR 2016 (on going)

Technical Project Manager for the PuMA (Pulsar Monitoring in Argentina) collaboration. This project is a collaboration of scientists and technicians from the IAR and the Rochester Institute of Technology (RIT). The collaboration has been working for 2 years with both antennas, including the implementation of a dedicated back-end, the construction of a brand new front-end for Antenna 2, and formation of human resources for observations, data analysis, and pulsar astrophysics. This project represents the first systematic pulsar observations in South America and the beginning of pulsar science in Argentina

- **"Repair and Upgrade of the Antena II of the IAR",** IAR2018.

Technical Project manager for the startup of the IAR, second Radio telescope through the organization of the different working groups that participated in the project, being these mainly the mechanical sector, electrical maintenance, control & pointing electronics, and the Front end & Back end development and assembly. The project end up in November 2018 with the Radio telescope First Light and starting its fully operation.

- **"LLAMA Project, Front End Implementation",** IAR 2017.

Implementation through mechanical and electrical integration of two ALMA Sub/millimeter receivers, 207GHz & 670GHz, on a cryostat that will be installed on the LLAMA Radiotelescope on the province of Salta, Argentina at 4500 meters above sea level. Verification And validation measurements of Sub/millimeter receivers. Development of Engineers Software for control and use of the Front-End.

- **"LLAMA Project, Back End Implementation",** IAR 2017.

Design and development of a Back-End system to be used on the LLAMA project to process the signals from the ALMA Sub/millimeter receivers. The Back-End Development consists of the design of the modules denominated: "Local Oscillator 2", "IF Downconverter", "IF Switch Module".Back-End implementation thru mechanical integration in a 19"inch Analog Rack Cabinet.Verification And validation measurements of Back-And System. Electrical Integration between the Front -End and Back-End. End to End measurements for the Front-End –Back-End, thru the spectrometer or digitizer unit.Development of Engineers Software for control and use of the Back-End.

- **"Development of a Pulsars Receiver"** IAR 2015.

Implementation of two channel digital receiver based on low cost Software Defined Radio installed on the I.F. of the HI 30 meter parabolic dish radio telescope.
Software development for the acquisition and detection of radio pulsars in 1410 MHz
Observations of different well known pulsars to be compared with external databases.

- **"Calibration observations of the HI radio telescope of 30 meters"** IAR 2014.

Continuum observation in 1410 MHz used for pointing calibration.
Spectral Line observations in 1420 MHz of Radio Calibration Sources, used for systems parameter determination.
Test and data analysis of a low cost Software Defined Radio back-end, by comparing new observations of HI Lines profiles (1420MHz) with profiles from the IAR database.
Acquisition Software development, used for profiles reduction scripts.

- **"Antenna position acquisition and control"** IAR 2014.

Design and implementation with verification of electronics; used in the reading of absolute position encoders, used for the measurement of the pointing for the 30 meters parabolic dish antenna.
Software development used for control the 30 meters parabolic dish antenna.

- **"Development of a HI Spectral line receiver"** IAR 2015.

Implementation of dual polarization channel digital receiver based on low cost Software Defined Radio installed on the I.F. of the HI 30 meter parabolic dish radio telescope.
Software development for the acquisition and processing of HI Spectral lines in 1420.405MHz

- "**Laboratory for assembly and inspection of printed circuit boards and harness construction**" IAR 2013**.**

Head of the assembly laboratory, through the maintenance and periodic review of instrumental and support for the necessary materials for its operation, the laboratory provides all the needed facilities for assembly, testing and inspection of printed circuit boards and harness construction/inspection, according to NASA-STD-8739.x standards.
Staff in charge:

CONICET – CPA. Technician: Eliseo Diaz.
CONICET – CPA. Technician: Facundo Aquino.

- "**RFI measurement equipment**". IAR-2013,2014.

Design, implementation and verification for a new RFI monitor for automated measurements, the equipment is designed to be transportable and covering frequencies from 1 GHz to 18GHz and a low system temperature, the RF electronics is mounted over an antenna rotor covering 360° over the horizon for RFI direction identification.
The complete system is being mounted on the IAR. control rom performing automated measurements, the software for acquisition and analysis was developed on C based on a Linux Host.

- "**RFI measurement campaign in the IAR**". IAR-2012.

Measurements of electromagnetic interference (RFI) during the months of June, July, August and September of 2012 in the grounds of the IAR, by developing a custom measurement equipment, in order to understand and evaluate the radio spectrum regarding interference levels, facing the possibility of installing an international radio telescope for VLBI Geodetic measurements as a result of the transfer of "Transportable Integrated Geodetic Observatory" (TIGO) to Argentina.
http://www.iar-conicet.gov.ar/rfi-eng.htm

- "**Design of a sidereal clock based on FPGA platform and uClinux**". IAR 2011.

Some part of I.A.R instrumentation is devoted to the pointing system of an antenna of 30 meters in diameter, which makes radio astronomy observations in the 1420 MHz band (HI). One module is responsible for providing a time reference and a frequency standard that is synchronized with the movement of the stars, this module is called "sidereal time reference".

- "**Software development for monitoring temperature and power levels of the HI receiver"**. IAR 2010.

Based on National Instruments/CVI environment, the software was developed for continuous monitoring of certain parameters of the receiver, which operates at the frequency of 1420MHz, installed on the antenna front end; it provides information on the status and performance aiding to detect possible failures.

- "**Updating and verification of the Time and Frequency Standard**". IAR 2010.

Design a new frequency distribution module using programmable logic "CPLD", monitoring the modules that make the basis of time and frequency standard, and a secondary.
Installation of two GPS for redundancy time distribution (a third one was installed on 2014).

- "**Updating the Automatic Gain Control development working on 30 MHz**". IAR 2009.

A redesign of the system "Automatic Gain Control" based on new hardware available at the IAR. As basis it uses a CPLD programmable logic device, it was decided to perform this update to improve the performance and communication with other systems of the 1420MHz radio telescope (HI).

- "**Analog Back-End Development for a 5.5 GHz receiver** " IAR 2007.

Development of a subsystem called "analog to digital channel" which takes weak analog signals from the RF detector of the 5.5 GHz continuum receiver, and convert them to digital counts, to be processed by the data acquisition unit.

- "**Characterization of RF components for a 5.5 GHz continuum receiver** " IAR 2007.

Functional verification of a phase discriminator operating at frequencies of 5.5GHz
Functional verification of detector diodes operating in the 2.3GHz frequency, through the development of software for automatic measurements

- "**Development of instruments for use in radio astronomy, Automatic Gain control at 30Mhz**". IAR 2005.

For measurements of spectral lines in HI 1420MHz, its requirement to maintain the same level of power at the input of the 1024 channel auto-correlator, for that purpose a module was developed with the ability to make this adjustment, which is synchronized with the radio astronomical observations.

- "**HI Observations for calibration and error detection in the radio telescope**". IAR 2004.

Observations from different astronomical calibration profiles are made on the neutral hydrogen line, (1420 MHz) in order to detect small fluctuations in the baseline from the receiver back end.

- "**Development of printed circuit boards for signal distribution of the Time & Frequency Standard**". IAR 2004.

From a Time & Frequency GPS Standard, a 10 MHz signal is acquired, which must be distributed maintaining its integrity in amplitude and phase to the different radio astronomical instruments, in order to maintain the synchronization between them.

Participation on Projects realized at I.A.R., Technology Transfer Department.

- "**Tronador II project, Phase I - Experimental Vehicle VEX-5**" – CONAE 2015.

Coordination for the construction, inspection and integration, aboard the vehicle of flight harness for the experimental launcher vehicle VEX-1
Coordination of task with personnel in charge

- "**Tronador II project, Phase I - Experimental Vehicle VEX-1**" – CONAE 2013.

Construction, inspection and integration aboard the vehicle of flight harness for the experimental launcher vehicle VEX-1.
Coordination of task with personnel in charge

- "**STAN NIRST 5**" – CONAE 2012.

Assembly and inspection of printed circuit boards. For the CCD acquisition electronics under NASA STD-8739.x standards

- Document: NIRST-ST5-00116-PR-R00 EM Proximidad Procedimiento de Armado.

Authors: M. Salibe – G. Gancio – L.M. García- M.E. Benítez – J.J. Larrarte IAR Agosto 2012.

- "**Verification and Quality Assurance of RF and Digital Instrumentation**" – CONAE 2011-2012.

Functional verification and quality assurance of the measuring instruments concerned to this agreement, for each instrument a report of its functional status is generated.
The instruments involved are:

- Power supplies.
- RF equipment.
- Digital Equipment.
- General equipment and infrastructure.

- "**Integrated Navigation System**" – CONAE 2010-2011.

Participation by the following work in the development of "SNI" project (Integrated Navigation System) , which consists of a navigation system onboard an aircraft to be implemented together with a SAR (Synthetic aperture radar) radar, the project was assembled and operated successfully onboard.

- **Design and development of the subsystem called "PWR"**, Power unit to provide the voltages required for the operating systems called "DIMU" (Digital Inertial Measurement Unit) and module "PPR" (Processing Platform).
- **Design, assembly and functional testing of printed circuit boards corresponding to subsystem called "PWR"**.
- **Design and development of subsystem called "DHS"** (Data Handling System), it corresponds to the processing platform and communication of the different modules of the system called "DIMU" based on FPGA technology and data buses RS- 422.

- **Design, assembly and functional testing of printed circuit board corresponding to subsystem called "DHS**".
- **Development of the firmware implemented in the FPGA subsystem called CPU**, it has an embedded processor, Ethernet and serial communication buses, it allow the implementation of an embedded operating system based on uCLinux platform.
- **Installation and functional verification for the subsystem called "CPU".**
- **Design and development of the subsystem called "MIM"** (Internal Measurement Modules), it has the implementation of a 3-axis magnetometer for the magnetic field vector of the Earth and the implementation of a GPS positioning system.
- **Installation and functional verification for the subsystem called "MIM" circuit.**
- **Mechanical assembly for DIMU system**, mounting and harness was done maintaining the same quality standards for products of space or ground segment, applying NASA -STD-8739.x standards.

- **Satellite Mission: "Aquarius / SAC-D", Instrument: Micro Wave Radiometer "MWR":** IAR - CONAE 2006-2010.

Participation by the following works in the instrument development:

- **Development of the acquisition stage and analog / digital conversion:** converters based on "voltage to frequency", selected for their use in radio astronomy and projects within the IAR.
- **Development of automatic measuring software:** to evaluate and verify the operation of detector diodes for 23GHz and 35GHz frequencies, in different environmental temperature conditions.
- **Quality assurance applying NASA-STD-8739.x standards**: on the flight printed circuit assembly´s.
- **Quality assurance applying the NASA-STD-8739.x standards:** on the distribution and assembly of flight harness used to connect the different modules and subsystems of the "MWR" instrument.

- **"Development of an automated system for patch antenna measurement".** IAR - CONAE 2005.

The automatic meter for subpanels (patch antennas array) is a system to perform a quick check of satisfactory operation for the flight model of the SAR antenna (Satellite SAOCOM project).
The complete system is operated from a PC, a set of RF switches are controlled using CPLD technology, and the measurement is synchronized with a network analyzer which performs RF measurements from the different antenna subpanels.

Direction and / or Co-Direction of students Scholarships

- **2019 - Direction, Thesis for degree, Faculty of Engineering, University of La Plata**:Szeinfeld, Alan; Saidman, Ariel. Development of CASPER Software tools for digital receivers in radio astronomical instrumentation.
- **2018 - Direction, Supervised Professional Practice, Faculty of Engineering, University of La Plata**: Garcia Zambon, Martin. Development of telemetry system for radio astronomical receivers.
- **2018 - Direction, Supervised Professional Practice, Faculty of Engineering, University of La Plata**: Szeinfeld, Alan; Saidman, Ariel. Software development for digital radio astronomical receivers.
- **2017 - Direction, Supervised Professional Practice, Faculty of Engineering, University of La Plata**: Valdez, Gaston. Development of position system for radio telescope targeting.
- **2017 - Direction, Thesis for degree, Faculty of Engineering, University of La Plata**: Cipollone, Franco; Marchueta, Juan. Design and development of an SBC monitoring and control system for the LLAMA project.
- **2016 - Co-direction, Thesis for degree, Faculty of Engineering, University of La Plata**: Garcia Redondo, Manuel. Design of Low noise amplifiers design for scientific use.
- **2015 - Co-direction, Supervised Professional Practice, Faculty of Engineering, University of La Plata**: Garcia Redondo, Manuel. Design, construction and measurement of an electromagnetic emission monitoring system.

Participation in external campaigns

- "**Campaign visit to TIGO**" – Concepción, Chile, November 2012.

In order to know the functions, requirements and facilities of the "Transportable Integrated Geodetic Observatory (TIGO)" a visit of one week to the observatory located in Concepción, Chile, was realized.
All the key instruments of the geodetic observatory were studied in order to assess the needs and requirements for the transfer and relocation of the observatory to the IAR area.
"Plan Design and Specification of facilities" IAR-2012/2013, 39 pages.

- "**Campaign for MWR Instrument Commissioning**" August-2011

Was conducted in the CONAE ground station in Falda del Carmen, Córdoba, the commissioning of the MWR instrument for the Aquarius / SAC-D mission, it consisted of the turn on of the instrument in orbit and the verification of its nominal operation with the analysis of its telemetry sent in real time.

- "**Campaign for quality assurance and functional testing**" October-2008

Was conducted at the company DTA.SA at Cordoba, a quality assurance control, based on the NASA-STD-8739.x standards, for the flight printed circuit boards assembled at the company for the MWR instrument, Aquarius / SAC-D mission from CONAE.

- "**Site search campaign in Argentina for the SKA project**" San Juan Argentina, February 2005

Installation, operation and verification of an interference monitoring equipment, located in the pampas of lion (Pampa del Leoncito) in the province of San Juan, the automatic measuring equipment developed in the IAR for monitoring RFI signals operates in a range of 100MHz to 20GHz and was installed in February 2005, operating with periodic checks until March 2006, generating a year of measurements from interference, allowing detailed knowledge of electromagnetic interference in that area.

Publications, Presentations and Technical Reports

- **"Upgraded antennas for pulsar observations in the Argentine Institute of Radio astronomy".** Resumen: Context.The Argentine Institute of Radio astronomy (IAR) is equipped with two single-dish 30 m radio antennas capable of perform-ing daily observations of pulsars and radio transients in the southern hemisphere at 1.4 GHz.Aims.We aim to introduce to the international community the upgrades performed and to show that the IAR observatory has becomesuitable for investigations in numerous areas of pulsar radio astronomy, such as pulsar timing arrays, targeted searches of continuous gravitational waves sources, monitoring of magnetars and glitching pulsars, and studies of a short time scale interstellar scintillation.Methods.We refurbished the two antennas at IAR to achieve high-quality timing observations. We gathered more than 1000 h of observations with both antennas in order to study the timing precision and sensitivity they can achieve.Results.We introduce the new developments for both radio telescopes at IAR. We present daily observations of the millisecond pulsarJ0437−4715 with timing precision better than 1μs. We also present a follow-up of the reactivation of the magnetar XTE J1810?197and the measurement and monitoring of the latest (Feb. 1, 2019) glitch of the Vela pulsar (J0835?4510).Conclusions.We show that IAR is capable of performing pulsar monitoring in the 1.4 GHz radio band for long periods of time with daily cadence. This opens up the possibility of pursuing several goals in pulsar science, including coordinated multi-wavelength observations with other observatories. In particular, daily observations of the millisecond pulsar J0437−4715 would increase the sen-sitivity of pulsar timing arrays. We also show IAR?s great potential for studying targets of opportunity and transient phenomena, such as magnetars, glitches, and fast-radio-burst sources.
  https://doi.org/10.1051/0004-6361/201936525

- **"Technical reports on the operation and design of the IAR 30 meter Radio telescopes"**.
  - IAR-ELT-OBS-IntroduccionObservatorio-DG-R00: Description of the Radio Observatory Antennas and Instruments. Author G. Gancio, 2019.

- IAR-ELT-OBS-BackendDigital-DG-R00: Description of the Digital Back end developed for pulsar observations. Author G. Gancio F. Hasucarriaga, 2019.
- IAR-ELT-OBS-SalaControl-DG-R01: Description of the electronic modules at the Radio Telescopes control room, their functions and connections, 2019.
- IAR-ELT-OBS-SistemaElectricoMecanico-DG-R00: Description for the mechanical and electrical systems at the Antennas.

- **"Fellowship End Term Review, NOVA-Kapteyn Institute"**. To present a review of the activities completed by the CONICET – Technician Guillermo M. Gancio as a part of the LLAMA Work Plan for the CONICET Fellowship at NOVA. Author G.Gancio. 2017, RUG University, The Netherlands.

- **"MEMO: IFDC Prototype P-IFDC"**. To describe the prototype of the IF DownConverter that was assembled at NOVA for the LLAMA Front-End and LLAMA Back-End Functional Tests. The P-IFDC design is a subset of the full IAR-IFDC design, with the minimum setup to realize the required functions. Author G.Gancio. 2017, RUG University, The Netherlands.

- **"Fellowship Mid Term Review, NOVA-Kapteyn Institute"**. To present a mid term review of the activities completed by the CONICET – Technician Guillermo M. Gancio as a part of the LLAMA Work Plan for the CONICET Fellowship at NOVA. Author G.Gancio. 2016, RUG University, The Netherlands.

- **"Detection and measurements of RFI in radio astronomy, Yebes Observatory"**. Oral presentation "RFI Measurements at the Argentine Institute of Radioastronomy, IAR. Author G. Gancio. June 2017, Yebes, Spain.

- **"58 Annual Argentine Astronomy Meeting".** Oral presentation "**Electromagnetic pollution, Radio Astronomy simile of light pollution**". Author G.Gancio, September 2014, Cordoba, Argentina.

- **Oral** presentation at IAR **"Introduction to Spectrum Management for Radio Astronomy**" May 2014. Author: G.Gancio.

- **"IUCAF 4th School on Spectrum Management for Radio Astronomy**", Oral Presentation "**Radio Frequency Interference: Equipment and Measurements**" Author: G.Gancio, 7-13 April 2014, Joint ALMA Observatory, Santiago, Chile.

- **"21st Meeting of the European VLBI Group for Geodesy and Astrometry**", Oral presentation realized by H. Hase "**Radio Frequency Interference Observations at IAR La Plata**". Authors: H. Hase, G. Gancio, D. Perilli, J. J. Larrarte, L. Guarrera, L. García, G. Kronschnabl, C. Plötz. 5-8 March 2013, Espoo, Finland.

- **"21st Proceedings of the European VLBI Meeting**"

Paper on: "**Radio Frequency Interference Observations at IAR La Plata**".
Abstract: "The Wettzell RFI-Monitoring system was developed to monitor radio frequency interference at existing and potential VLBI sites. It is a transportable system which can be operated in a semi automated manner. It was used at the Instituto Argentino de Radioastronomía in La Plata to investigate a future site for the Transportable Integrated Geodetic Observatory (TIGO). With the help of an automated pedestal for the RFI-monitoring antenna a 24h/7d survey was conducted during September and October 2012. This data set is one of the densest RFI-monitoring samples known within the IVS. The results of this survey showed that most of the present RFI signals occurs sporadically and take away less than 5% of the observation time. Hence IAR is a suitable site for TIGO."
Autores: H. Hase, G. Gancio, D. Perilli, J. J. Larrarte, L. Guarrera, L. García, G. Kronschnabl, C. Plötz.
IAR & BKG, Marzo 2013, 5 páginas.

- Presentation at the IAR, "**Radio Frequency Interference. TIGO – IAR, Measurement Campaign - December 2012** ". Authors: G.Gancio, D. Perilli, J. J. Larrarte.

Summary: "An Introduction to the Geodetic Observatory TIGO and the realization and results from the electromagnetic interference measurement campaign, conducted in the IAR.".

- Internal Technical Report N°101 "**Criteria used in detection of RF interference : technical note**". Authors: Tech. G. Gancio. Eng. J.J. Larrarte.

Abstract: "The present document explains some criteria and international recommendations used to identify and detect radio frequency interference that could be detrimental to radio astronomy" IAR – 2012, 13 pages.

- Internal Technical Report N°100 **"Repair and verification of the antenna rotor IAR: technical note"**. author: Technician. G. Gancio, reviewers: Eng. D. Perilli, Dr. Hayo Hase.

Summary: "A brief description of maintenance performed on the IAR rotator is presented"
IAR & BKG – 2012, 6 Pages.

- Technical Report N°99 "**RFI monitoring station monthly data report: plan**". Author: Tech. G. Gancio, Reviewer: Eng. D. Perilli, Approved: Eng. J.J. Larrarte.

Summary: "The document is divided into two sub-reports indicating two different configurations of the instrument, showing the measurements results" IAR & BKG – 2012, 18 pages.

- Technical report N°98 "**1-14 GHz TIGO RFI monitoring system**". Authors: Tech. G. Gancio. Eng. J.J. Larrarte.

Abstract: "The present document introduces a first approach of the design of a RFI monitoring station with the objective of making a long term interference measurement in order to study a geographical location, for the possible installation of a radio-astronomical instrument" IAR & BKG – 2012, 24 pages.

- Technical report N°97 "**RFI BKG & IAR measurement campaign**". Author: Tech. G. Gancio, Reviewer: Dr. Hayo Hase, Eng. D. Perilli, Approved: Eng. J.J. Larrarte.

Abstract: "Results from the RFI BKG measurement campaign for the TIGO site survey, realized at the IAR during August 2012" IAR & BKG – 2012, 47 pages.

- Technical report N°96 "**BKG RFI month report**". Author: Tech. G. Gancio, Reviewer: Dr. Hayo Hase, Eng. D. Perilli, Approved: Eng. J.J. Larrarte.

Abstract: "Monthly report from RFI BKG automatic measurement campaign for the TIGO site survey, realized at the IAR during September & October 2012" IAR & BKG – 2012, 23 pages.

- **"CASE- Argentine Congress of Embedded Systems 2012**", Work book ISBN 978-987-9374-82-5.
  - *Poster*: "Signal Acquisition implemented in VHDL and FPGA" Author: G.Gancio.

Summary: "The I.A.R. has in one of their 30m diameter antennas a radio astronomical receiver to observe some phenomena in the spectral line HI at 1420Mhz, this receptor type has a cryogenic main stage with an RF output to a quadratic power detector, which delivers a small voltage proportional to the received power level, this small signal is acquired and processed by an ADC - FPGA system as a status monitoring tool. The analog section of the acquirer is composed by a signal conditioning and an analog to digital converter, the digital section is implemented using programmable logic arrays (FPGA) from the firm XILINX®, which allows acquisition tasks and operation of the ADC, the system is serially controlled through a RS- 232 interface with PC for monitoring.
In this presentation a description of the code implemented in the FPGA is exposed, it was written in VHDL using XILINX tools ®. The implementation of the code was divided into several modules that allow evaluating more easily and improving the performance of the design; these assessments were conducted by simulating each of them prior to their implementation in hardware, also are presented some preliminary measurements and radio astronomical observations."

  - *Poster*: "Frequency counter in VHDL". Author: G.Gancio.

Summary: "the development of a frequency counter implemented in VHDL is described on this presentation, it was decided to deploy in this language given the advantages of programmable logic devices such as FPGAs as they allow different applications operating simultaneously on the same device, providing greater integration and performance on the final application. The counter module developed in

VHDL will be implemented on a hardware based on FPGA, which should have the ability to work directly with frequencies up to 150 MHz, with a resolution of 10Hz, capacity for RS- 232 serial communication and can be used with a frequency reference both external and internal. To show that this development is able to function as expected, the VHDL description code, simulations of different sub-modules and module measurements implemented on a development board designed in the IAR, will be presented.
As a final note the implementation is shown as a tool for monitoring a frequency synthesizer working as a second local oscillator, at a frequency of 120 MHz. As a part of the radio telescope operated by the IAR in one of its antennas of 30 meters in diameter, used for radio astronomical observations in the spectral line of neutral hydrogen (HI, 1420 MHz)".

- **"CASE- Argentine Congress of Embedded Systems 2011**", Work book ISBN 978-987-9374-69-6.
    - *Distinguished work, CASE-2011 - Poster* "Automatic Gain Control on a CPLD". Author: G.Gancio.

Summary: "The I.A.R. has two dish antennas of 30 meters in diameter for radio astronomy use. One of them has a receiver cooled to cryogenic temperature of 150°K (-258 °C) operating at a center frequency of 1420 MHz (HI). These small radio signals must be conditioned to a predetermined power level needed by the receiver back end; the module responsible for this operation is the **automatic gain control** system. This module must control a number of digital attenuators; have the ability to receive an external reference signal to use for level adjustment and also the ability to be operated manually or remotely through a PC. In assessing the options we decided to perform this control using CPLD programmable logic implementing the solution in VHDL language.
The hardware is divided into 3 main sections: a) Attenuation Step; b) Analog Stage; c) digital Stage.
A fundamental part of the digital stage is the VHDL code, it was divided into smaller functions for the test- bench's to be more efficiently , these tasks are divided into a) user interface; b) External control; c) Control digital attenuators . Each module was simulated using VHDL and development tools from Xilinx. After verifying the simulations, it was proceeded with the implementation of a complete module that allowed achieving comparatively measurements that validate the expected performance of the module. Measurements made with the automatic gain control integrated in the radio telescope are presented."

- *Poster* "Design of a sidereal clock on uClinux - FPGA platform."Author: G.Gancio.

Summary: "Part of the instrumental that has the IAR is devoted to the pointing system of an antenna of 30 meters in diameter which makes radio astronomy observations in the 1420 MHz band (HI). One module is responsible for providing a reference signal for time and frequency that is synchronized with the movement of the stars, this reference is called sidereal time. For the sidereal time generation is required to obtain and maintain the local time accurately. This can be achieved using the SNTP protocol, for that is required to have an Ethernet connection, is also needed a control hardware that allows a partner to provide a serial communication with other devices.
For the development of this module and considering that must be integrated with other systems, an SBC platform (Single Board Computer) type which was developed in the IAR was selected, for a previous evaluation a development kit from the Digilentinc company was used (Spartan 3E Starter Kit).
This platform must provide some flexibility with respect to the associated hardware, so we decided to use a programmable logic FPGA Spartan3E-500 from Xilinx, a MicroBlaze soft processor was implemented. It was decided to use a uClinux operating system as an element of abstraction between the application development and associated hardware. This mechanism helps to standardize the development of software applications regardless of the evolution of the hardware platform".

- Presentation at CONAE, August - 2007 **"I-CDR (Critical Design Review-Instruments) describing the development made for the MWR Analog to Digital converter stage."**

Authors: Tech. G. Gancio, Engineer. J.J. Larrarte.

- Internal Technical Report N°89 "**Automatic gain control for spectral lines back end**". Author: Tech. G.Gancio, Reviewer: Eng. D. Perilli, Approved: Eng. J.C. Olalde.

Summary: On this presentation the design, construction and measurement of a device for the automatic gain control is described using digital attenuators over the second stage from the intermediate frequency receiver at 30 MHz on the spectral line back end for HI observations (1420 MHz).

Explanation of current devices of the second IF stage gain control and requirements for the new device will be given. Analysis of proposed measures related to CAG, to move to the design and construction of a prototype and the final model with its construction will design , measurements were carried out on the test , so that you can check the operation of the device and as a last step measurements were carried out in the second IF stage , which performance data will be obtained critical device , it ends with a review of the prototype telescope integration and integration of the final model . " IAR – 2006, 26 páginas.

Languages:

Native speaker of Spanish
English: Intermediate level of writing, intermediate level on reading and speaking.

Administrative and management skills:

- Preparation of documents for the report of scientific - technological projects.
- Development and preparation of plans and progress of project tasks.
- Preparation and planning schedules tasks.
- Development of specifications and technical requirements.
- Preparation of bills of materials and cost assessment.
- Development of action plans and / or validation of measurements.
- Preparation of technical reports, progress measurement and reporting tasks.
- Coordination of working groups.

Electronic measuring instruments and EDA software:

- Digital oscilloscopes (DSO 100 MHz).
- Spectrum analyzer (22GHz).
- Signal generators (40GHz).
- Network Analyzer (40GHz).
- Logic analyzer.
- Cadence Orcad - Pspice: for design and simulation of electronic circuits and printed circuit boards.
- Altium Design - Protel: for design and simulation of electronic circuits and printed circuit boards.

Programming Languages:

- Programming language for logical VHDL, CPLD and FPGA devices.
- Programming in C environments Windows / Linux.
- Programming in C environments NI / NI LabWindows / CVI.
- Assembler programming for microcontrollers (PIC families, ARM).
- Remote instrument control through GPIB (National Instruments / Matlab).

Complementary skills:

- Driver's license, Argentine Class "A2" for Motorcycles up to 150c.c. and "B1" for Automobiles and trucks up to 3500Kg.