

TELERAD

Aeronautical and Maritime Radiocommunication Systems

TELERAD

Company Presentation

By Ventura Rigol

Reliability

Innovation

High-quality



Complete Telecommunication Systems from take-off to landing



Extended Range "En route" Communications



NDB GBAS/VDB

Take-off



From Take off.....

ACC "En route control" "VCSS Back-up

Approach To Landing...

Telecommunication Systems for CNS/ATM

The image shows an aerial view of an airport with various communication systems and equipment highlighted in callout boxes. The background features a control tower, runways, taxiways, and several aircraft, including a commercial jet, a fighter jet, and a helicopter. A satellite is also visible in the sky. Concentric circles represent communication signals emanating from the ground stations.

9000 2G series
RE 9000A 2G
EM 9000A 2G

700W

9009 GBAS series
RE 9009
EM 9009

VHF

UHF

Daisy Antenna NDB 9300P series

V/UHF EMRY 904 transceivers

NDB transportable 9300 MS series

TELERAD key features

- TELERAD SA – Private Company established in 1950
- Located in Anglet, France
- In operation in more than 70 different countries

- Our mission
 - Design, manufacture, commissioning and marketing of radio systems for Air Traffic Control and maritime communications
 - World market, both civil and military

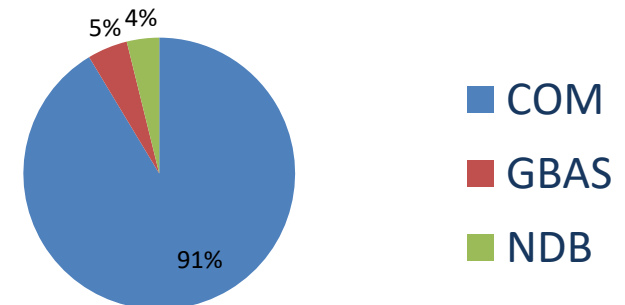
- Number of employees : 82 persons
 - 40% technicians and engineers

- Turnover
 - 9.8 M€
 - Exportation: 70 %
 - Defense Market: 18%

- 10% of the annual turnover invested in R&D every year

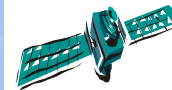
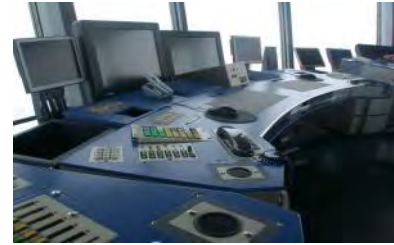


Sales revenue 2014



Our core activity

- Aeronautical Radio communication Systems - COM
 - VHF, UHF and V/UHF radios (TWR & ACC)
 - Mobile and portable radios mobiles
 - Peripherals, redundancy units...
 - Remote Control and Monitoring Systems
- GBAS - NAVAIDS
 - VHF Data Broadcast (Tx / Rx)
 - Antenna
 - Airborne VDB receiver
- NDB - NAVAIDS
 - Locators
 - Offshore NDB
 - Transportable NDB



TELERAD

From innovation to international market

100% TELERAD radios made in Anglet, France

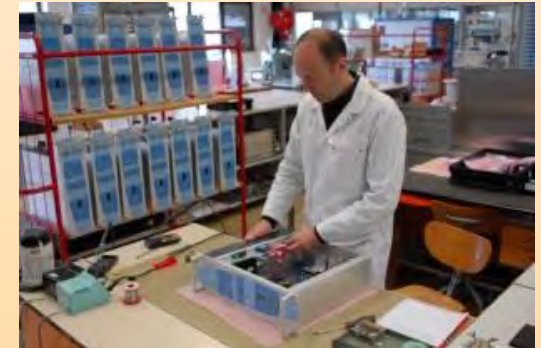
R&D

Design and development of TELERAD product line.
Specific products for industrial integrators.



Production

Manufacturing of radio products and ancillary equipment
Complete Radio Communication Systems offer including RCMS



Services

Site survey
Technical architecture definition
Installation
Commissioning
Training – Technical training center



Some references of our 9000-2G



Software defined radios (Mode2)

Civil Bands – VHF

Military Band – UHF

Native IP Technology - Voice & Data

In phase with SESAR, NextGen and Carats Roadmap



FRENCH CAA
DGAC/DSNA
Renewal of the
national radio parc
« 3000 radios »

300 radios
delivered to AENA
For Barcelona
and Madrid

FAA – USA by
transfert of
technology to
General Dynamics
« 40 000 radios »

SkyGuide
Switzerland
Renewal of the
national radio parc
« 750 radios »

Incheon Airport
South Korea
Renewal of all
radio for VOIP
new equipment

2011

2012

2013

2014

2015

Some partnership with Air Navigation Service Providers

TELERAD Software designed radios



Switzerland

- 26 radio sites
- More than 7550 radios
- Remote control and monitoring



France

- More than 3000 radios



South Korea

- 2 sites
- More than 120 radios



TELERAD partnership with industrial integrators

**R&D TELERAD
Customized products**



THALES

Honeywell **THALES** **SNC** SIERRA NEVADA CORPORATION
AEROSPACE SYSTEMS INTEGRATION
PRODUCTS & CASE STUDIES

GENERAL DYNAMICS

- CM-300 (V2) VHF Receiver
- CM-300/350 (V2) VHF 12/50W Transmitter
- CM-300 (V2) UHF Receiver
- CM-300/350 (V2) UHF 12/50W Transmitter

TELERAD radios over the world



TELERAD radio systems are operated in more than 70 countries

New Generation 9000-2G

VoIP Multimode Software Defined Radios (VHF or UHF)

Main VHF Features :

- Frequency range: 118-144 MHz (Opt. 108 MHz)
- AM-DSB voice 25 kHz and 8.33 kHz (Climax)
- Transmitter output power: 5-50W (0.5 dB steps)
- Option: 100 W AM with CPE 9000
- 2 Ethernet ports
- Remote Management: RS485 JBUS and SNMP
- VoIP ATM interface
- Low heat => Fanless Radios
- Reboot in less than 6 seconds

VDL Modes :

- Mode A (AM-MSK - Internal modem)
- Mode 2
- Provision for Mode 3 (D8PSK, 31.5k)
- Mode 4 (GFSK, 19.2 k)



- ICAO SARPS: AM and VDL Modes
- ETSI - EN 300 676: AM 8.33 and 25 kHz channel spacing
- ETSI - EN 301 841 Part 1: VDL Mode 2 Ground Standard
- ETSI - EN 301 842 Part 1: VDL Mode 4 Ground Standard
- ETSI - EN 301 489 (-1/-22): EMC for AM and D8PSK
- RTCA DO 224 A: VDL2 and VDL3



VoIP ED-137-b Compliant - ETSI Plug test performed

NDB Products – Portable NDB



RBT9300MS CABINET

- Width : 535 mm
- Depth : 690 mm
- Height : 400 mm
- Weight : 41 kg

DAA9400MF CABINET

- Width : 535 mm
- Depth : 830 mm
- Height : 820 mm
- Weight : 35 kg



RF ANTENNA BAG

- Length : 1100 mm
- Width : 430 mm
- Height : 220 mm
- Weight : 22 kg

GROUND SYSTEM BAG

- Length : 470 mm
- Width : 360 mm
- Height : 220 mm
- Weight : 25 kg



Power supply voltage: 24 V.d.c. (typical)

Frequency range: 200-535 kHz - 100 Hz step

Output power: Adjustable up to 50W (200W peak) on 50ohms load.

Consumption for 50W carrier: < 3.5 A (carrier non keyed)

Modulation mode: NON/A1A - NON/A2A

Modulation frequency in NON/A2A: 1020Hz + 50Hz, 400Hz + 25Hz

Distortion: < 5% at 95% of modulation

Harmonic frequency: < -45 dBc at the Tx output < -65 dBc after antenna

Spurious frequency: < -45 dB compared with the carrier

Code signal programming: Up to 3 letters

Keying cycle: 20s in NON/A1A and 10s in NON/A2A

Signaling: Battery operation

Operating temperature: -20°C to +55°C

Storage temperature: -40°C to +70°

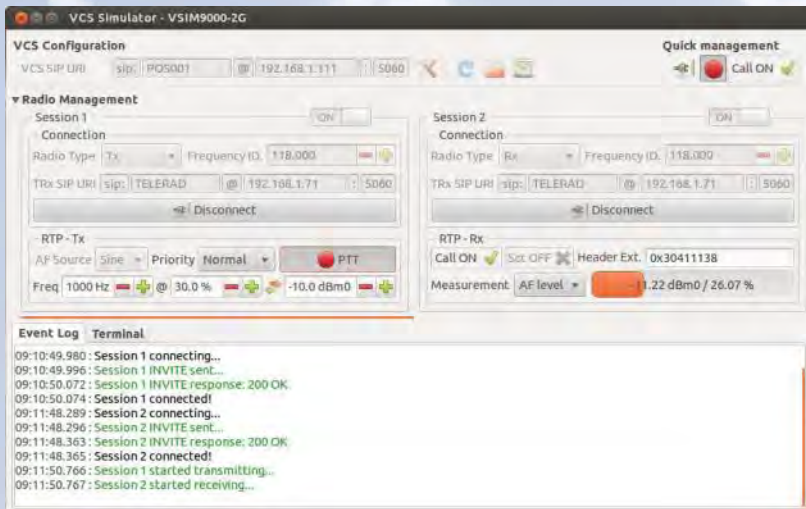
VSIM9000-2G

VoIP NETWORK TEST TOOL

The VSIM9000-2G has been especially designed to meet 3 needs:

- Putting into service and maintaining VoIP radio equipments
- Test / development of ED137-1 implementations
- Training: Introduction to the ED137 standard as well as Telerad equipments possibilities.

Any failure during connection attempts is monitored and logged to facilitate the research of failure and putting the installation back into operation



Description:

- Its MOS analysis, as well as its signal generator, coupled to the reception measurements (AF/RF levels) permits to evaluate the quality of the VoIP communication with a high accuracy.
- QoS indicators such as packet loss and jitter are monitored during the communication to detect in real-time any dysfunction of the IP network.

TELERAD

Remote Control & Quality Monitoring

TopKapi 95/04/2013 15:48:06

TELERAD skyguide

GENEVA RCQMS CLIENT

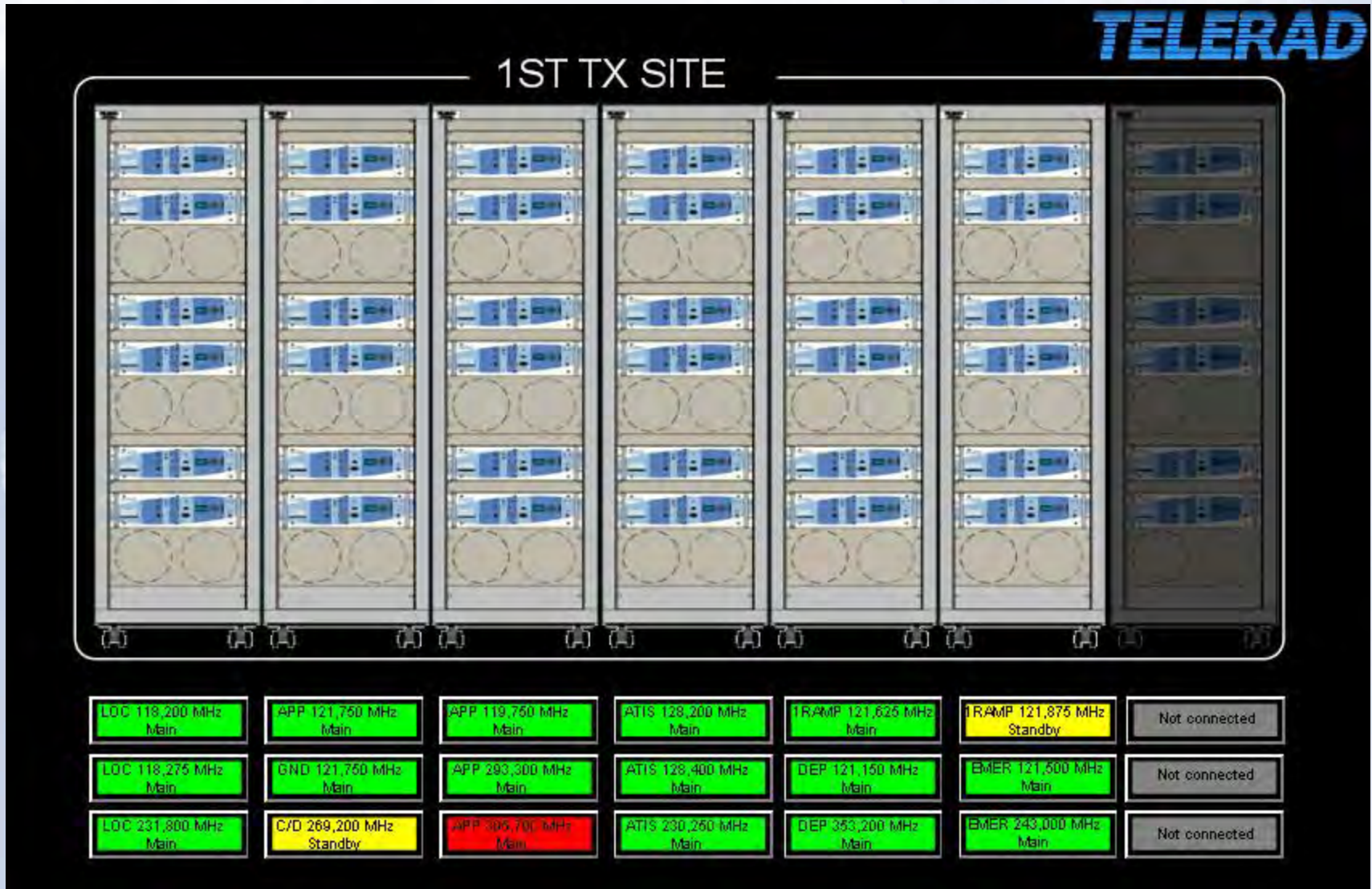
SKYGUIDE RCQMS NETWORK

The map displays the Skyguide RCQMS Network across Switzerland and its borders with France, Germany, Austria, and Italy. Key stations are highlighted with colored boxes: Unique, DUB, ZURICH, Höfli, Wädikon, Lägern, Albis, Lukmanier, Lenk, Gomergrat, Fonte-Lema, La Dôle 1, and GVA. Other locations marked include Genève, La Curney 1, and various regional stations like Soleure, Schaffhouse, and Lucerne.

ID	Date	Heur	S	Cel	Section	Label	Value	Failure	Date2	Heur2	Act.Date	Act.Heur	Oper	Op.Name
26032013	00:23:19		RX1	D08	Angle1	Zurich F1 RX line level	-30.3 dBm							
26032013	00:23:19		RX1	E26	Angle1	Zurich F1 RX Squelch RT level	125.525 MHz							
03042013	16:12:06		X1	B04	Angle1		2	MOOP						
03042013	16:12:45		X1	B04	Angle1		1	MOOP						
03042013	17:24:36		X1	B04	Angle1		2	MOOP						
03042013	17:37:44		X1	B04	Angle1		3	MOOP						
03042013	17:41:26		X1	B04	Angle1		4	MOOP						
03042013	17:41:34		X1	B04	Angle1		5	MOOP						
03042013	17:41:52		X1	B04	Angle1		6	MOOP						

Outils

Example from Incheon's RCMS



Remote Control & Quality Monitoring

TopKapi 05/04/2013 14:11:21

skyguide **TELERAD** LA DÔLE 1 **F1 SECT WEST** **F = 118.700 MHz** LE CUNAY 1 skyguide

GENERAL VIEW

Frequencies

- F1 118.700 MHz
- F2 128.000 MHz
- F3 119.150 MHz
- F4 135.025 MHz
- F5 170.700 MHz
- F6 132.505 MHz
- F7 133.010 MHz
- F8 121.500 MHz
- F9 122.000 MHz
- F10 123.400 MHz
- F11 177.900 MHz
- F12 129.900 MHz
- F13 NO DEFINED
- F14 NO DEFINED
- F15 NO DEFINED
- F16 NO DEFINED

TXA INFORMATION

UNIT: TX 9000 2G
MODEL: EM 90002G
VERSION: Version 0.01
MIB: Version 0.02
IP: 172.16.249.125
Mask: 255.255.255.224
Gateway: 172.16.92.4

TXB INFORMATION

UNIT: TX 9000 2G
MODEL: EM 90002G
VERSION: Version 0.01
MIB: Version 0.02
IP: 172.16.249.126
Mask: 255.255.255.224
Gateway: 172.16.92.4

RXA INFORMATION

UNIT: RX 9000 2G
MODEL: RE 90002G
VERSION: Version 0.01
MIB: Version 0.02
IP: 172.16.249.127
Mask: 255.255.255.224
Gateway: 172.16.92.4

RXB INFORMATION

UNIT: RX 9000 2G
MODEL: RE 90002G
VERSION: Version 0.01
MIB: Version 0.02
IP: 172.16.249.128
Mask: 255.255.255.224
Gateway: 172.16.92.4

F = 118707.5 kHz F = 118707.5 kHz F = 118700 kHz F = 118700 kHz

TXA STATUS

TXA CONTROLS

TXB CONTROLS

TXB STATUS

RXA STATUS

RXA CONTROLS

RXB CONTROLS

RXB STATUS

TXA MEASURES

SNR: 0.02 % Mod: 0% RF line: +43 dBm RF Power: 0.0W RF temp: 100% ACDC temp: 100%

Forward power: 0.0W Pwr supply voltage: 37.20 V

Reflected power: 0.0W DC supply voltage: 37.30 V

In-service time: 234 H AC/DC supply voltage: 26.00 V

ETH1 - P Jitter: 0.00 ms ETH2 - P Jitter: 0.00 ms

ETH1 - Packet loss: 0.10 % ETH2 - Packet loss: 0.10 %

TXB MEASURES

SNR: 0.02 % Mod: 0% RF line: +43 dBm RF Power: 0.0W RF temp: 100% ACDC temp: 100%

Forward power: 0.0W Pwr supply voltage: 37.20 V

Reflected power: 0.0W DC supply voltage: 37.30 V

In-service time: 234 H AC/DC supply voltage: 26.00 V

ETH1 - P Jitter: 0.00 ms ETH2 - P Jitter: 0.00 ms

ETH1 - Packet loss: 0.10 % ETH2 - Packet loss: 0.10 %

RXA MEASURES

SNR: 0% Received field: -120.0 dBm RF line level: -39.3 dBm SNR: 40 dBm

Pwr supply voltage: 37.20 V

DC supply voltage: 37.30 V

In-service time: 234 H AC/DC supply voltage: 26.00 V

ETH1 - P Jitter: 0.00 ms ETH2 - P Jitter: 0.00 ms

ETH1 - Packet loss: 0.10 % ETH2 - Packet loss: 0.10 %

RXB MEASURES

SNR: 0% Received field: -120.0 dBm RF line level: -39.3 dBm SNR: 40 dBm

Pwr supply voltage: 37.20 V

DC supply voltage: 37.30 V

In-service time: 234 H AC/DC supply voltage: 26.00 V

ETH1 - P Jitter: 0.00 ms ETH2 - P Jitter: 0.00 ms

ETH1 - Packet loss: 0.10 % ETH2 - Packet loss: 0.10 %

RECORDERS AND GLOBAL TESTS

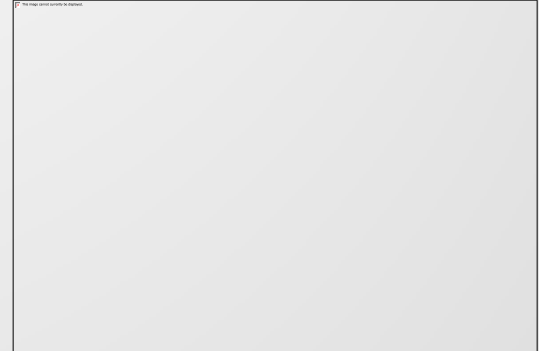
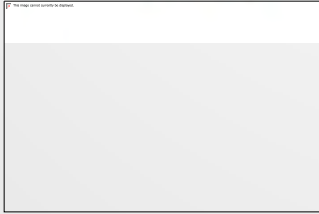
Decoupling TX/RX: **TX/RX Decoupling - OK** Modulation rate TX/RX:

ID	Date	Hour	S	Cell	Section	Label	Value	Failure	Date2	Hour2	Ack Date	Ack Hour	Oper	Op Name
28	03/03/2013	09:23:19	TX1	D09	Anglet	Zurich F1 TX Reflected power	0.0 W							
29	03/03/2013	09:23:19	TX1	D10	Anglet	Zurich F1 TX Forward power	0.0 W							
30	03/03/2013	09:23:19	TX1	E25	Anglet	Zurich F1 TX Frequency (MHz)	132.525 MHz							
31	03/03/2013	09:23:19	RX1	D03	Anglet	Zurich F1 RX voltage supply	24.20 V							
32	03/03/2013	09:23:19	RX1	D04	Anglet	Zurich F1 RX AC/DC	7.84 V							
33	03/03/2013	09:23:19	RX1	D05	Anglet	Zurich F1 RX field	-120.0 dBm							
34	03/03/2013	09:23:19	RX1	D06	Anglet	Zurich F1 RX line level	-39.3 dBm							
35	03/03/2013	09:23:19	RX1	E26	Anglet	Zurich F1 RX Squeeze RF level	125.525 MHz							
36	03/04/2013	16:12:06	X1	B04	Anglet		2							MODIF
37	03/04/2013	16:12:45	X1	B04	Anglet		1							MODIF
38	03/04/2013	17:24:36	X1	B04	Anglet		2							MODIF
39	03/04/2013	17:37:44	X1	B04	Anglet		3							MODIF
40	03/04/2013	17:41:28	X1	B04	Anglet		4							MODIF
41	03/04/2013	17:41:34	X1	B04	Anglet		5							MODIF
42	03/04/2013	17:41:52	X1	B04	Anglet		6							MODIF

Our Productions Means



Our Production Means



TELERAD

Aeronautical and Maritime Radiocommunication Systems

Reliability

Innovation

High-quality

Thank You!

Ventura Rigol

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