

Position, Navigation & Timing Products



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Corporate History



- Design, manufacture, sales and support of 3 product lines
 - **Navigational Products**
 - **AM and FM transmitters for radio stations**
 - **Industrial RF products**
- Established in 1969
- Products installed in over 170 countries
- Exceptional field reputation for reliable products
- Dedicated, long-term staff
- Nautel is registered by International Quality System Registrars to **ISO 9001:2000.**

Making Digital Radio **Work.**

History of Nautel's Innovations



- NV Series High Power FM – 2008
- Next Generation LORAN technology - 2008
- HD Power Boost technology - 2008
- NX Series High Power MW - 2007
- WEB based remote control - 2007
- Space Propulsion applications - 2007
- Vector NDB/DGPS series with Patented Antenna Current Stabilisation – 2005
- Adaptive Pre-Correction– 2005
- XR Series – 4th Generation AM Transmitters 3 – 50 kW - 2005
- Reliable HD Radio Transport Protocol for FM Digital Broadcast– 2006
- NX Link – TCP/IP Based Control - 2006
- HD Radio FM Transmitters
- Direct-to-Channel Digital FM Exciter – 2004
- DRM 200 kW, MW transmitter goes on-air in Europe - 2003
- 2002 - DRM and IBOC Digital Compatible AM Transmitters
- 2000 - Nautel launches 20 kW and 40 kW FM Transmitters
- 1994-1996 – Nautel launches super efficient 12 kW - 60 kW FM Transmitters
- 1993 – Nautel launches first 10 kW FM Transmitter
- 1990 – Nautel launches first solid state 100 kW & 200 kW AM Transmitters
- 1982 – Nautel launches first solid state 10 kW & 50 kW AM Transmitters
- 1974 – Nautel launches first solid state 2 kW AM Transmitter
- 1970 – Nautel introduced first solid state Radio Beacon Transmitter

1969

**Dennis Covill
Founds Nautel**

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Nautel Standard Products



AM



J1000



XR3 & XR6



XR12



XR25



NX50



NX100-NX800

FM



V1E



V3.5 & V5



V7.5 & V10/20



NV40

Navigation



Vector Series NDB/DGPS



ATU-LP & ATU-HP



NAVTEX



NL Series Next Generation Loran



LF Antennas



Industrial RF

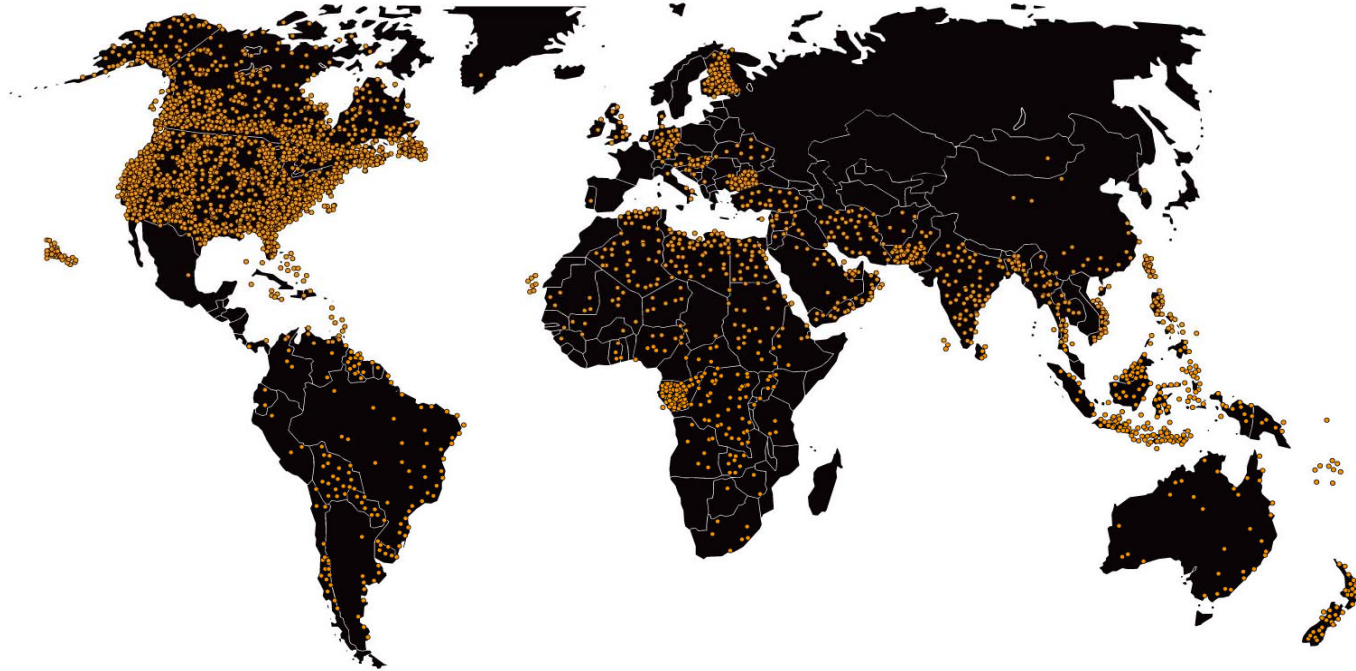


HF Amplifier



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Nautel is a World Leader



Nautel products in over 170 countries and every continent.

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Installed Base



- Solid State NDB and DGPS Transmitters
+3,600 units since 1970
- Solid State MF Telegraph Transmitters
+200 units since 1970
- Solid State VHF – FM Broadcast Transmitters
+1200 units since 1992
- Solid State MW – AM Broadcast Transmitters
+2,700 units since 1982

...over 7,700 transmitters shipped to date!

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Worldwide Navigation Customers



Canadian Coast Guard

World Wide Civil Aviation Authorities

ONGC

World Wide Offshore Systems Integrators

NAV Canada

Egyptian Air force

FAA

German Air force

USCG

INFRAERO

AIRSERVICES AUSTRALIA

Ministry of Defense Pakistan

AMSA

USAF

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Facilities



Maine:

- Wholly owned subsidiary
- Production
- 37 Employees
- + 36,000 sq.ft.

Nova Scotia:

- Headquarters
- Production
- 157 Employees
- + 70,000 sq. ft.



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Nautel Design Capabilities



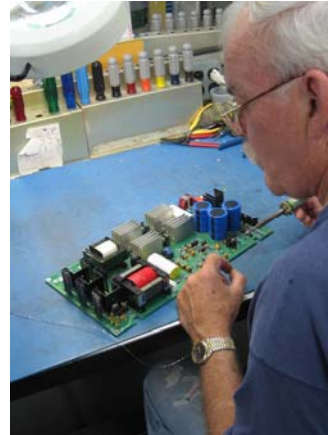
- **In-house design skills:**
 - **Solid state amplifier design from 100 kHz to 200 MHz**
 - **Antenna Design and Computer Simulation**
 - **Analog and Digital Communications theory**
 - **RF matching, combining and filtering at high power and high voltages**
 - **RF Magnetics**
 - **Power Supplies**
 - **Digital Hardware Design**
 - **Digital Signal Processing**
 - **Data Communications Systems**
 - **Networking and TCP development**

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Nautel Production Capabilities



Computerised Fabrication Shop



PWB Assembly



Light Assembly



Final Assembly



Final Production Test



Packing and Shipment

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Vector DGPS Systems



Vector D750 – D3000



Vector D200 & D375



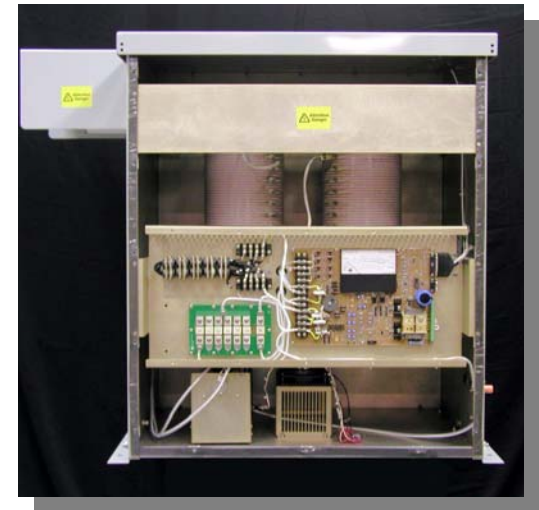
200 W & 375 W DGPS

ATU-LP



375 W DGPS Antenna Tuning Unit

ATU-HP



750 W – 3000 W DGPS Antenna Tuning Unit

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Vector DGPS Transmitters



- **Patented solution to maintain system coverage regardless of undesirable antenna effects such as ground resistance changes**
- **Built in Diagnostics allows the user to easily identify fault to Lowest Repairable Unit locally or remotely**
- **Non operational side can be tested locally or remotely without need for dummy load while main side remains on air**
- **Available in Single and Dual Configurations**
- **Vector enhanced Remote Control/Monitor via RSIM**



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Vector Antenna Tuning Units

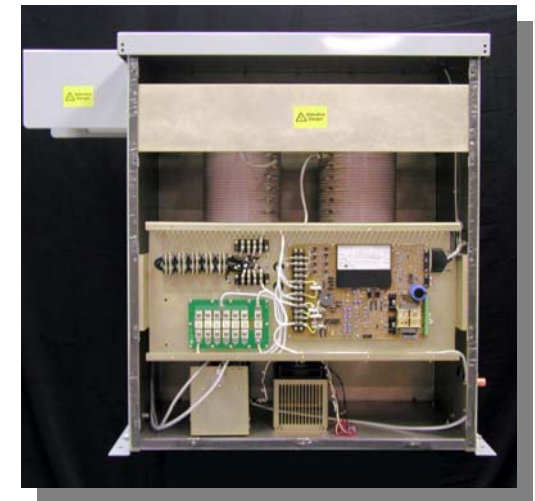


ATU-LP



- **Automatic Resistive Matching**
- **The serial data link between the ATU and the Vector transmitter stabilizes the antenna current, and the radiated power, by automatically adjusting the transmitter output power**
- **Remote control and monitor of the ATU limits worker exposure to strong RF fields**
- **An external resistor bank for the ATU adds additional resistance in series with the antenna, optimizing the trade-off between antenna bandwidth and efficiency**

ATU-HP



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Next Generation Loran



Compact Size

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Next Generation Loran



Power Amplifiers 60 | 120 | 180 | 240

Advanced Combining Techniques
and Scalable Design

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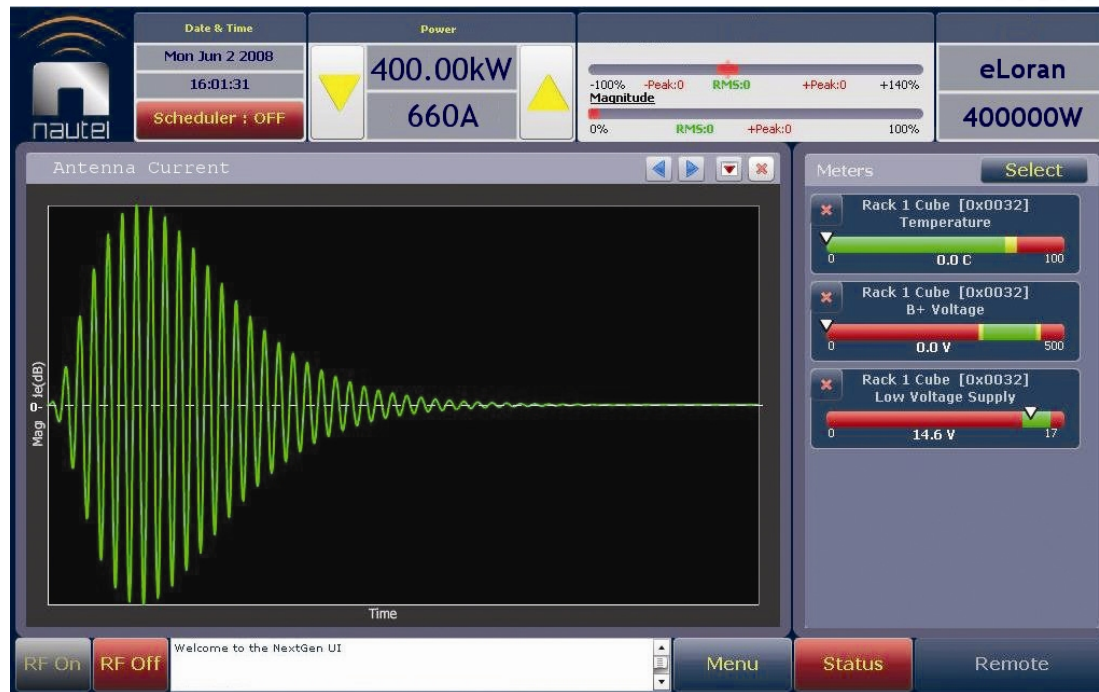
Next Generation Loran



Lightweight Redundant Hot-Swap
Power Modules

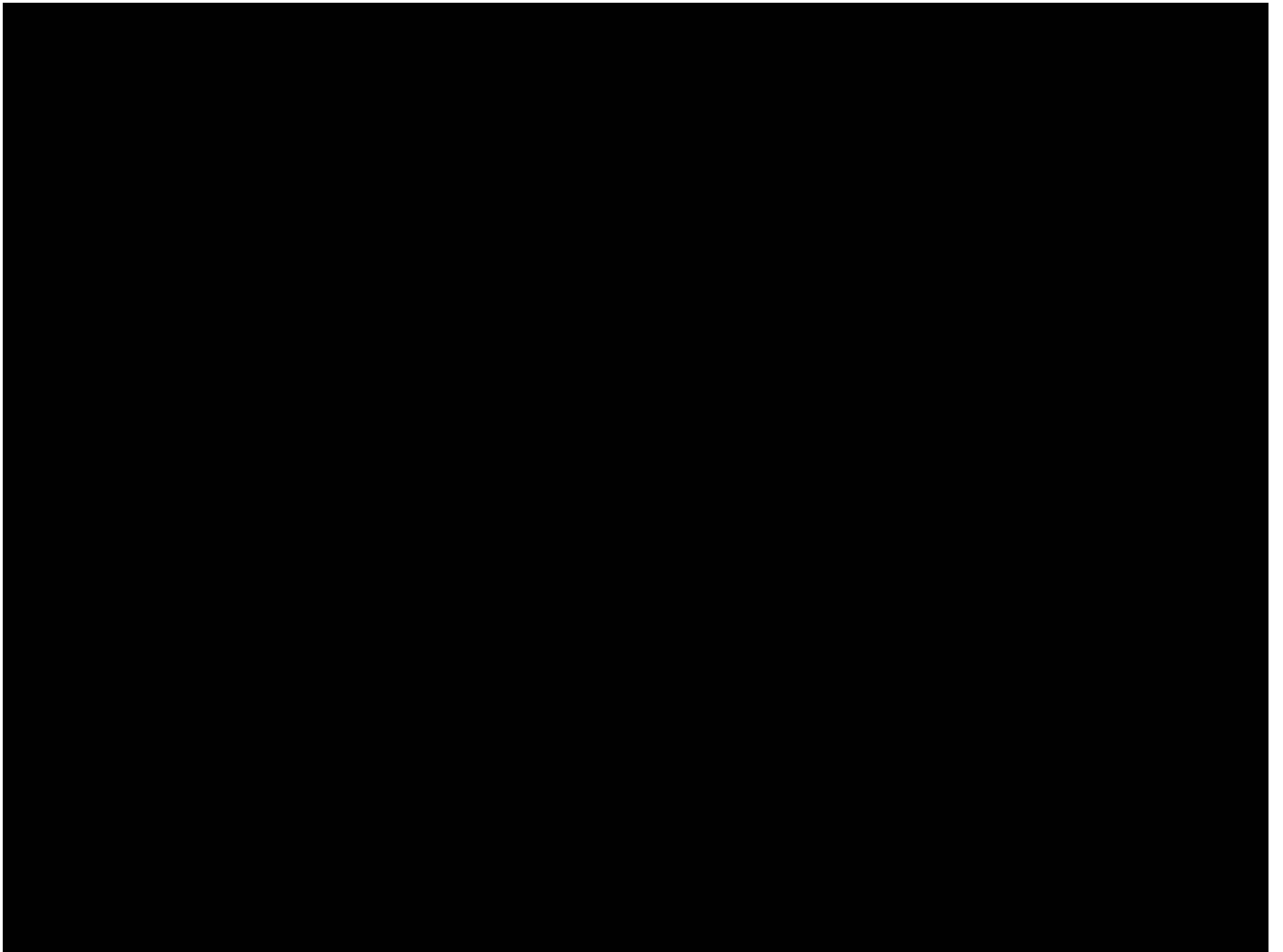
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Next Generation Loran



Intuitive Control and Monitoring with Nautel's Advanced User Interface (AUI)

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