

Nautel Vector Series

The Nautel Difference

NAUTEL HAS A LONG HISTORY AND THE RESOURCES TO DELIVER THE BEST SOLUTION

- Founded in 1969
- Over 7,500 systems shipped
- Systems installed in 170 countries
- 200 employees
- Staff of 20 in Research and Development
- Manufacturing facilities in The United States of America and Canada

NAUTEL HAS THE BEST CUSTOMER SERVICE AND POST-PURCHASE SUPPORT

- Emergency technical support is available 24 hours a day, 7 days a week.
- Nautel training programs provide the support you need. 3-day product specific training programs and a 5-day RF basics training program are available.
- A next day module exchange program is available in Canada and the US.
- Nautel's first priority is getting customers back on the air, even if the model in question was purchased in 1970.

NAUTEL HAS SIGNIFICANT TECHNICAL DEPTH AND MANUFACTURING EXPERTISE

- The Vector series is wholly Nautel designed and manufactured.
- Our manufacturing and design facilities are registered by International Quality System Registrars to ISO 9001:2000
- Nautel's broad product portfolio means we have a large technical pool for product design and product support.

- In-house design skills:
 - Solid state amplifier design from 100 kHz to 100 MHz
 - Antennas
 - 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
- Design, manufacture and support of high power, high reliability Radio Frequency ("RF") systems:
 - Medium wave AM & FM broadcast transmitters (analog & digital)
 - Navigational radio beacons
 - Differential Global Positioning System (DGPS) transmitters
 - Medium Frequency (MF) Telegraph and Navtex Communications
 - High Frequency (HF) Amplifiers for industrial RF applications

NAVIGATION PRODUCTS AVAILABLE FROM NAUTEL

Low, medium and high power non-directional radio beacon and DGPS transmitters

LF/MF transmitting antennas including heli-deck, whip, self supporting mast and horizontal T

LF/MF automatic antenna tuning units

MF telegraph and navtex transmitters for shore based installations

Remote control/monitor units and remote control/monitor software applications

Beacon monitor receiver

Battery chargers

Nautel Vector Series



ATU-HP
Antenna Tuning Unit

INTRODUCING NAUTEL'S NEW VECTOR SERIES OF NDB TRANSMITTERS AND ATUs

Since introducing the world's first totally solid state, high power radio-beacon in 1970, Nautel has supplied the highest quality and reliability in non-directional radio beacons. The new Vector Series Transmitters and Antenna Tuning Units continue this heritage and provide a dramatic improvement in system coverage.

The Vector series utilizes all of Nautel's 36 years of experience with beacons and adds "must have" features including:

- Constant field strength output for higher system availability.
- Automatic resistance matching for higher system availability.
- Remote control of the ATU to limit worker exposure to strong RF fields, in keeping with Safety Code 6 / IEEE C95.1-1999.
- Sophisticated graphic user interface (GUI) for easy maintenance and troubleshooting.
- Extensive automatic fault monitoring for faster troubleshooting.
- Extensive remote command and control capabilities for fewer site visits.

The Vector Series offers a unique solution (patent pending) to maintain system coverage regardless of undesirable antenna effects.

THE PROBLEMS

Antennas used for navigational aids are usually small and inefficient, for both practical and economic reasons. This results in the following undesirable antenna characteristics:

- Low antenna system efficiencies are common.
- ATU loading coil resistance can cause significant system losses.
- High ratio of reactance to resistance creates a narrow band filter effect which can attenuate the sidebands of the radiated signal.
- Automatic tuning of the loading coil is necessary to offset small changes of antenna capacitance to keep the antenna "ON TUNE" with changing conditions.
- Resistive changes in ground plane and insulator losses can cause increased reflected power and a reduction of forward power at the transmitter. The transmitter may reduce power or even shut down, to prevent equipment damage.
- Manual adjustments to the ATU matching transformer are often needed as weather conditions change to offset resistive changes, necessitating expensive field maintenance trips.
- Even if a perfect match is obtained, changes of the antenna loss resistance cause changes of antenna efficiency with a resulting change of coverage.

NAUTEL'S SOLUTION

- A new technique provides automatic operation of both the loading coil tuning and adjustment of a resistive matching network in the ATU such that a near perfect match is maintained – keeping the antenna tuned and its resistance matched under changing conditions.
- A 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. A 2:1 change of the total antenna resistance requires an associated 2:1 change of transmitter power to maintain a constant antenna current. The transmitter must have a suitable maximum power rating to realize the complete benefits of this solution. The Nautel solution offers confidence that consistent system coverage is achieved.
- Loading coil losses are reduced, improving antenna system efficiency.
- An optional resistor bank for the ATU adds additional resistance in series with the antenna, optimizing the trade-off between antenna bandwidth and efficiency.





NAUTEL VECTOR REMOTE CONTROL/ MONITOR SOFTWARE APPLICATION

Nautel's latest generation of Non-Directional Radio Beacons (Vector) includes the resources for remote monitoring and control. The Vector NDB includes a serial port (RS-232) and a serial remote protocol that allows external equipment to control and monitor the Vector system including the Antenna Tuning Unit.

Once installed on a portable PC equipped with a modem, Nautel's Vector remote control/monitor software application provides password protected access to control and monitor the Vector system. When connected, the user has access to the vast array of control, status and alarms that are available with the Vector system. Functions such as maintenance checks, system status checks, and system troubleshooting to the lowest replaceable unit (LRU) are all available from the remote PC.



Nautel's Vector Remote Control/Monitor Software Application is ideal for those users who want an economical means to remotely control and monitor a single or multiple Vector NDB systems.

The set-up of Nautel's Vector Remote Control/Monitor Software Application is simple and can be completed by any PC user familiar with Windows™ processes.

Nautel's Vector remote control/monitor software application is Axess software, powered by Statmon Technologies Corporation

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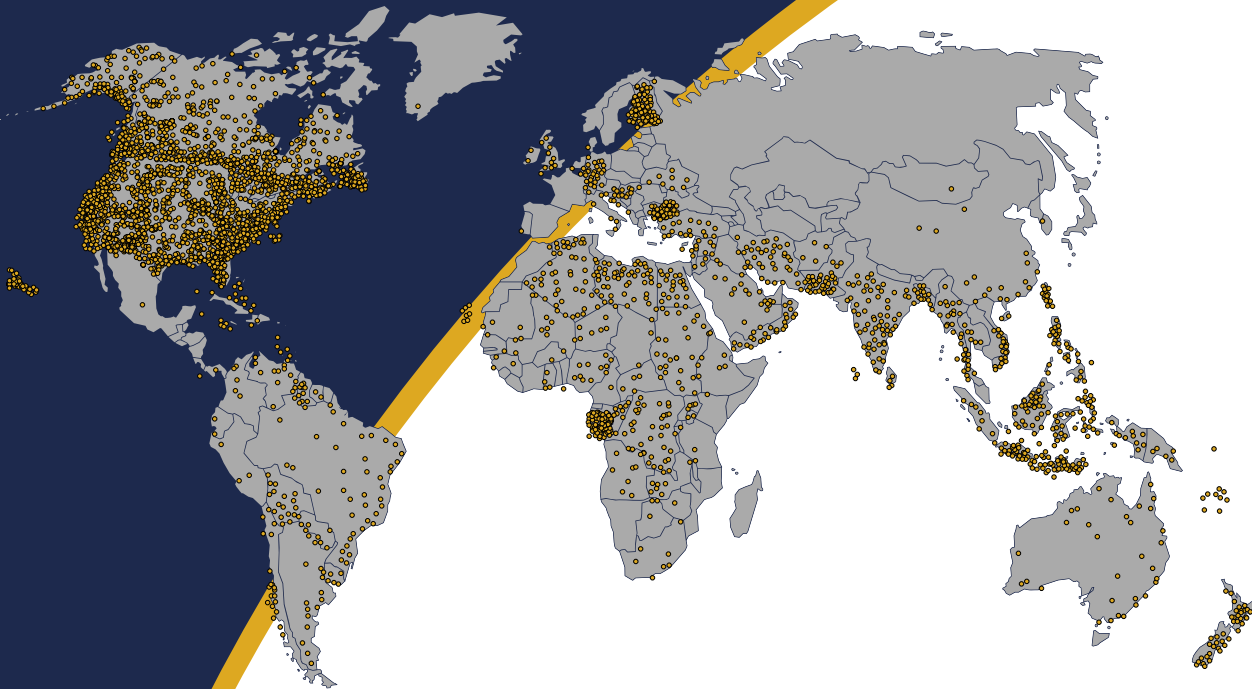
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• **Nautel installed Beacon transmitters**



Online access to Nautel's restricted BUG (Beacon Users Group) website:

UNLOCK A WORLD OF INFORMATION. JOIN THE BUG.

Membership in the Beacon Users Group is an excellent way to receive technical content, education and information on the Nautel platforms, products, and technologies that you are interested in.

- Technical FAQs
- Technical manuals
- Information sheets
- Field upgrade documents
- **Special BUG discounts on select Nautel training programs**

If you would like to become a BUG member you can register online by visiting our website at <http://beacon.nautel.com>

Making Digital Radio **Work.**

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