

The Nautel Difference

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

- Founded in 1969
- Over 11,000 systems shipped
- Systems installed in 177 countries
- Over 200 employees
- More than 40 engineers on staff
- 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 with product specific training programs and a RF basics training program.
- 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 9001:2008
- 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) Navtex Communications
- High Frequency (HF) Amplifiers for industrial RF applications
- Next Generation LORAN (Long Range Navigation) and Data Capable Low Frequency (LF) PNT transmitters
- VHF FM Weather Radio Transmitters
- LF Sonar amplifiers

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 navtex transmitters for shore based installations

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

Beacon monitor receiver

Battery chargers

For further information, please contact us at:

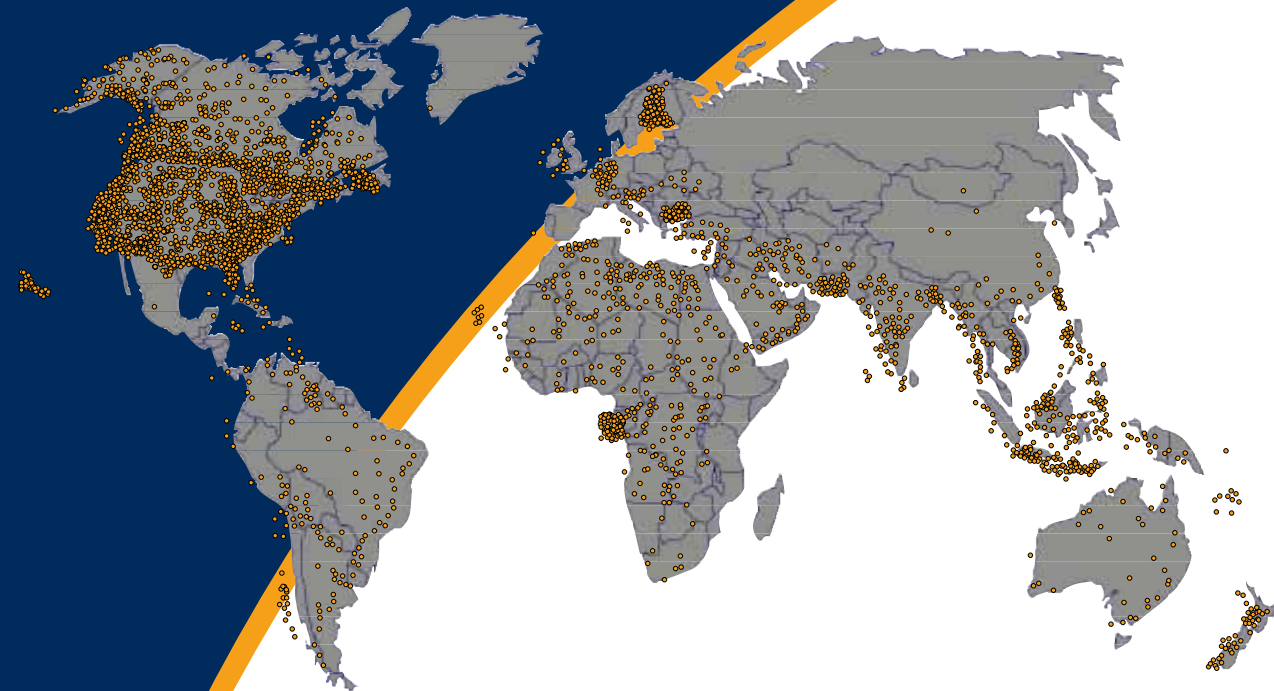
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• Nautel installed Beacon transmitters



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

UNLOCK A WORLD OF INFORMATION. JOIN THE NUG.

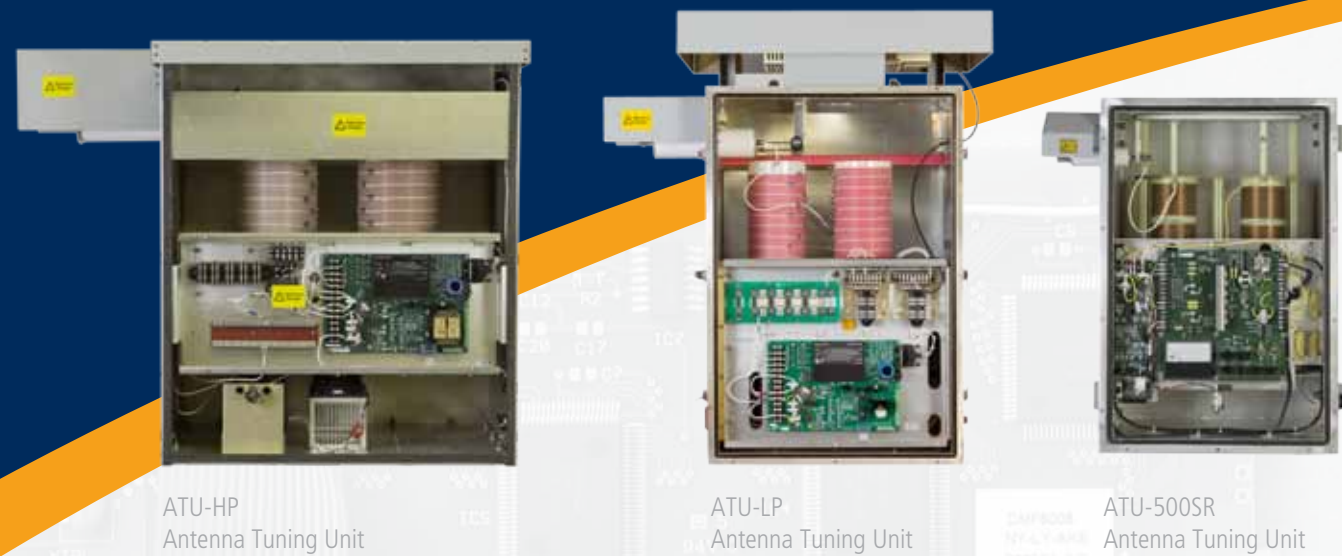
Membership in the Nautel Users Group is an excellent way to receive technical content, education and information on the Nautel platforms, products, and technologies that you are interested in.

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

If you would like to become a NUG member you can register online by visiting our website at www.nautelnav.com/



Nautel Vector Series



ATU-HP
Antenna Tuning Unit

ATU-LP
Antenna Tuning Unit

ATU-500SR
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 40 plus 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 patent pending solution to maintain system coverage regardless of undesirable antenna effects.*

*Features not available on ATU-500SR

THE CHALLENGES

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.



Vector NDB High Power

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 time+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.



Vector NDB Low Power

NAUTEL VECTOR REMOTE CONTROL/MONITORING

Nautel's latest generation of Non-Directional Radio Beacons (Vector) includes the resources for remote monitoring and control. The Vector NDB includes serial interfaces that allow a remote PC to control and monitor the Vector system including the Antenna Tuning Unit via the VR-Link remote control/monitoring interface.

Nautel's VR-Link Vector remote control/monitor 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.

Fig. 1: Vector NDB & VR-Link2 Interconnect Options (VR-Link2 Installed at Remote Location)

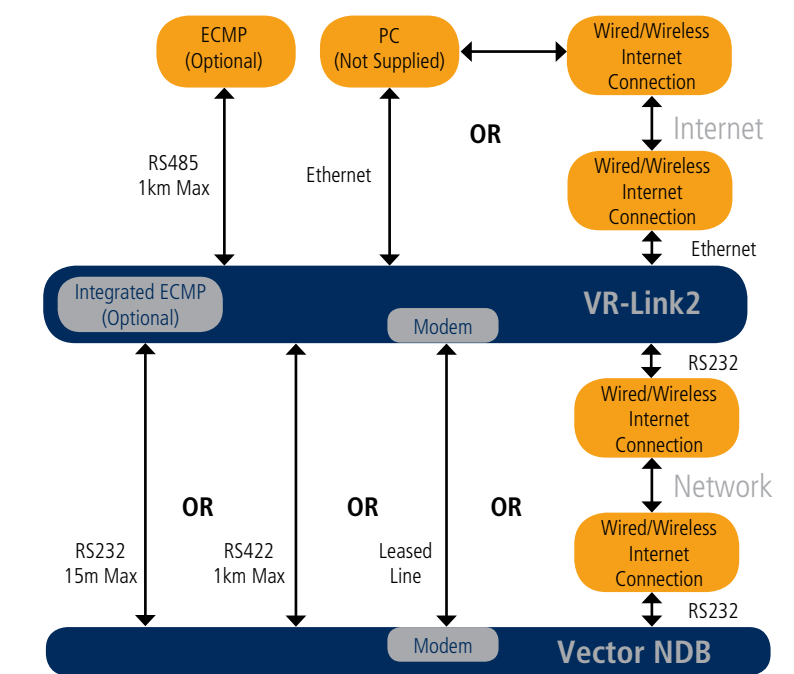


Fig. 2: Vector NDB & VR-Link2 Interconnect Options (VR-Link2 Co-located with Vector NDB)

