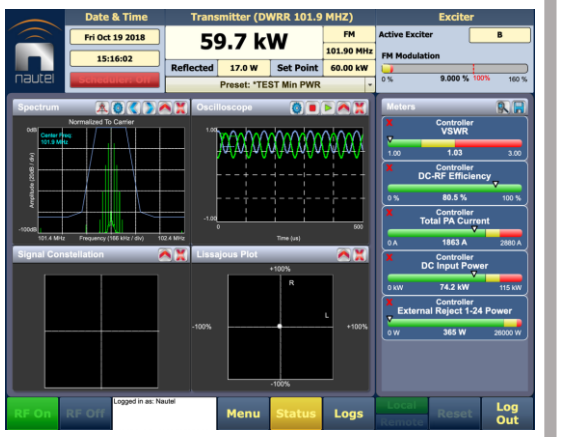


Ground-breaking GV Series keeps getting better

nautel

making digital broadcasting work

Agenda

- The Nautel GV Series – 3.5 kW to 88 kW
- What makes the GV special?
- What about liquid cooling?
- A tour through the AUI
- Questions / Comments

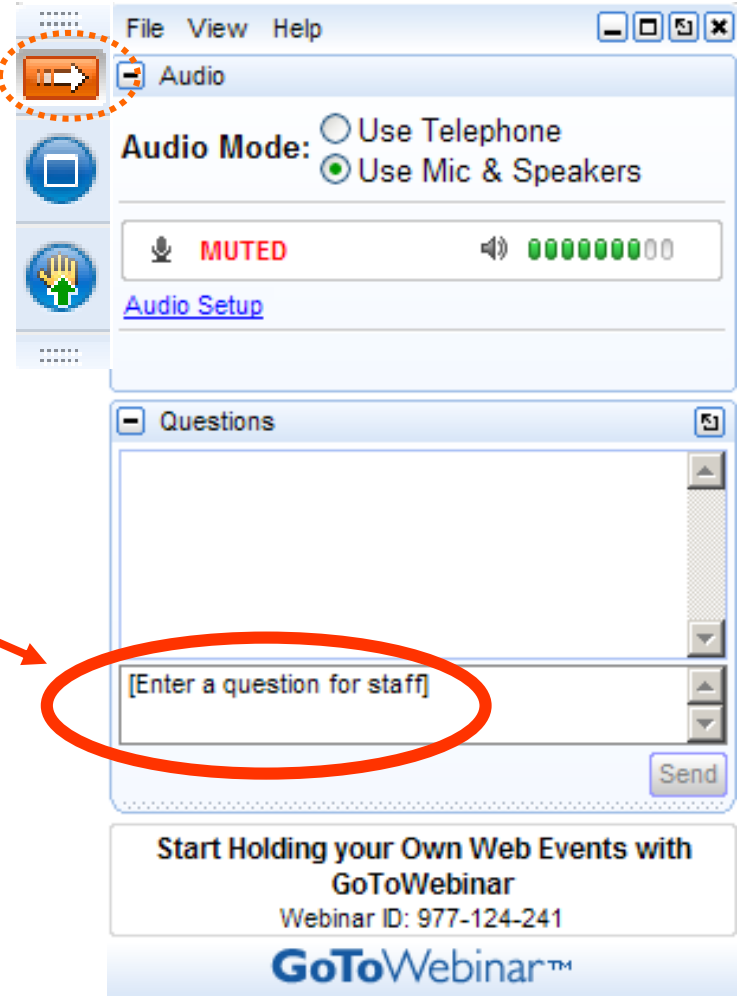
Chuck Kelly
Regional Sales Manager
Asia Pacific, Nautel

Jeff Welton
Regional Sales Manager
Central U.S., Nautel

Your questions please?

(If you don't see the control panel, click on the orange arrow icon to expand it)

Please enter your questions in the text box of the webinar control panel (remember to press send)



SBE.

Remember: The completion of a Nautel webinar qualifies for ½ SBE re-certification credit, identified under Category I of the Re-certification Schedule for SBE Certifications.

GV Series

2014 BEST of SHOW Radio

2014 BEST of SHOW RADIOWORLD

3.5 kW – 88 kW Digital/Analog FM

Since 2014: 517 units

Totalling 9.3 MegaWatts!

GV Series

Digital

Control

Efficient

Intelligent

Reliable

Support

- Asymmetrical Sidebands
- HD Powerboost
- MER instrumentation
- Constellation view
- Spectrum analyzer
- HD Reliable transport
- Even more HD power
- Even higher efficiency

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making digital broadcasting work

GV Series

- Digital
- **Control**
- Efficient
- Intelligent
- Reliable
- Support

- AUI Webserver
  - with in-depth monitor & control
- RF & MPX Spectrum Analyzer
- Email and SNMP
- Automatic logging
- Simple Site Control built in
  - monitor your doors
  - start your generator via the AUI
- Oscilloscope

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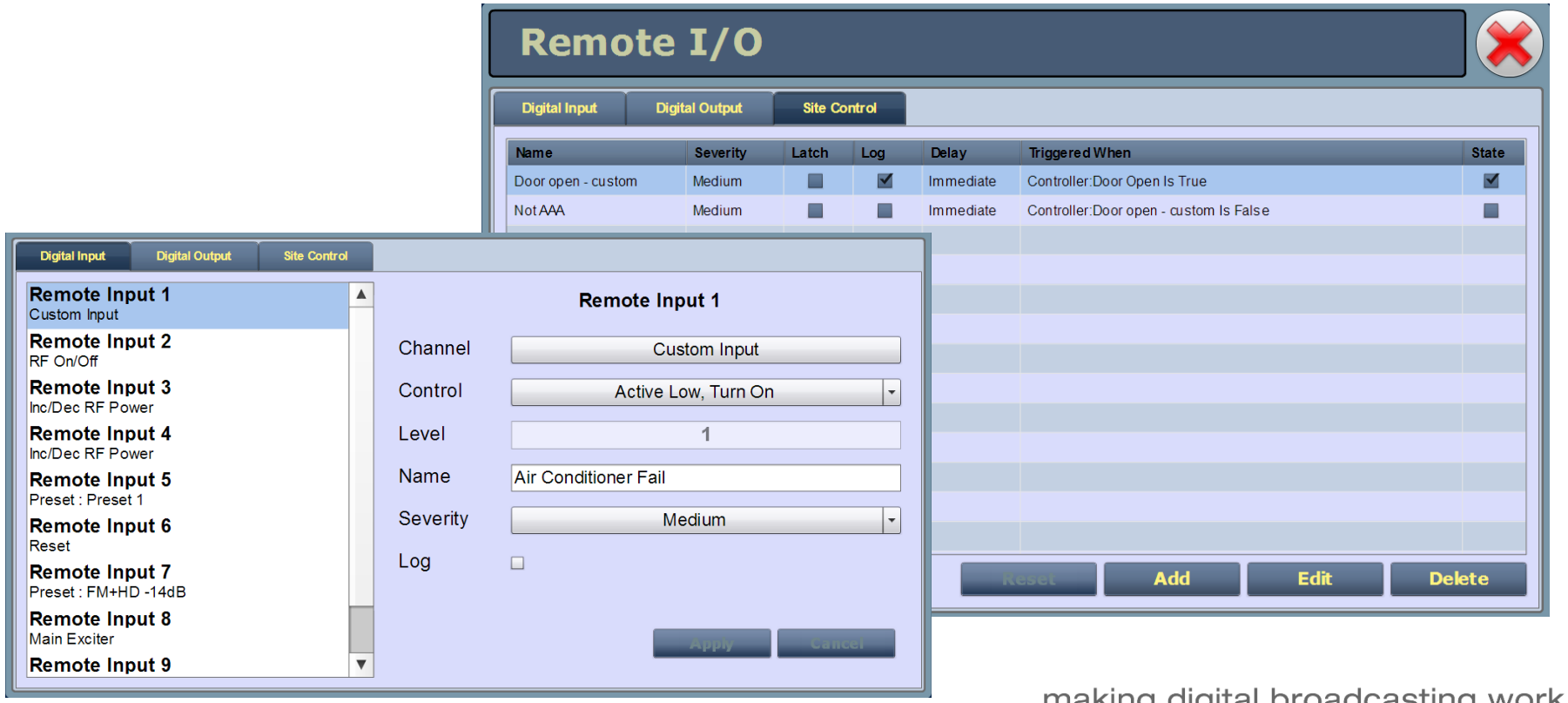
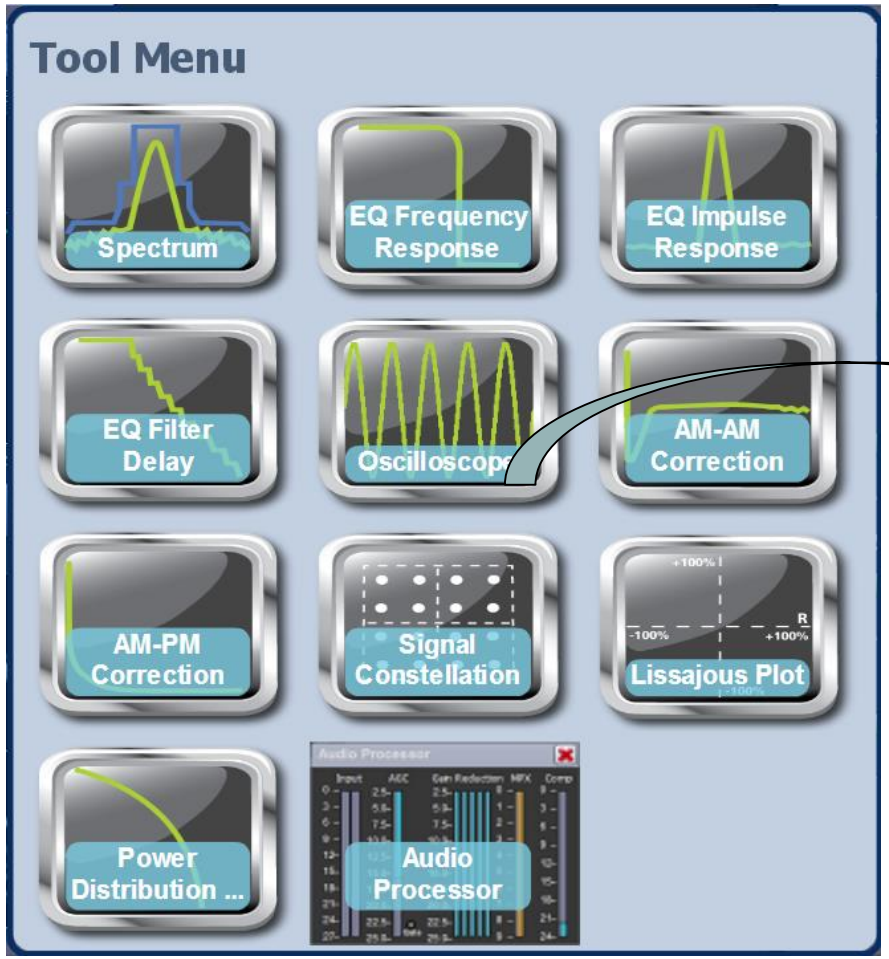
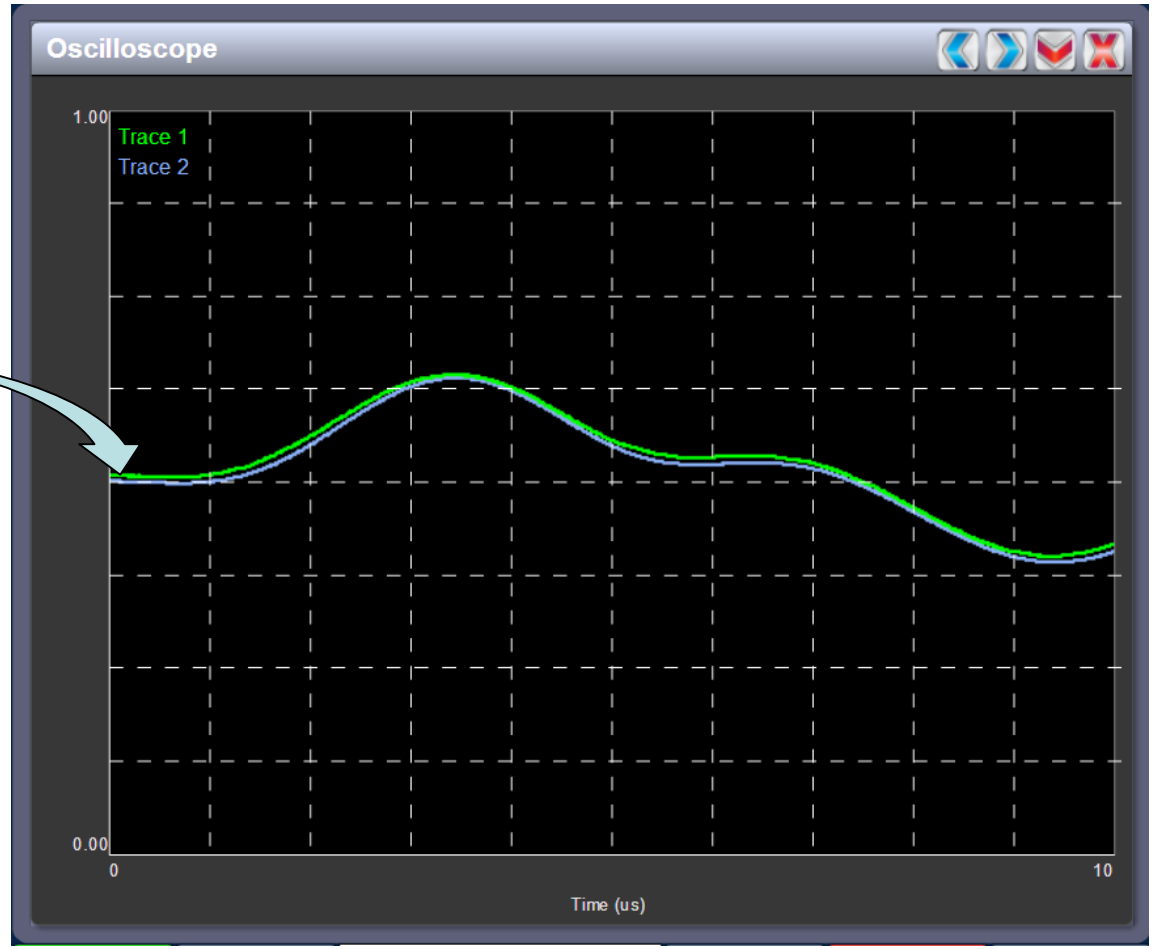
GV Series – Simple Site Control

- Controls and monitors external site equipment
- Uses pre-existing transmitter remote digital inputs/outputs
- Integrated with AUI for status/logging & notifications via email
- Configure more complex logical Boolean expressions



GV Series – The Engineer's Tool Box





Oscilloscope (time domain view):

- Forward/Reverse Waveforms (Linearity)
- L/R or MPX Audio Waveforms

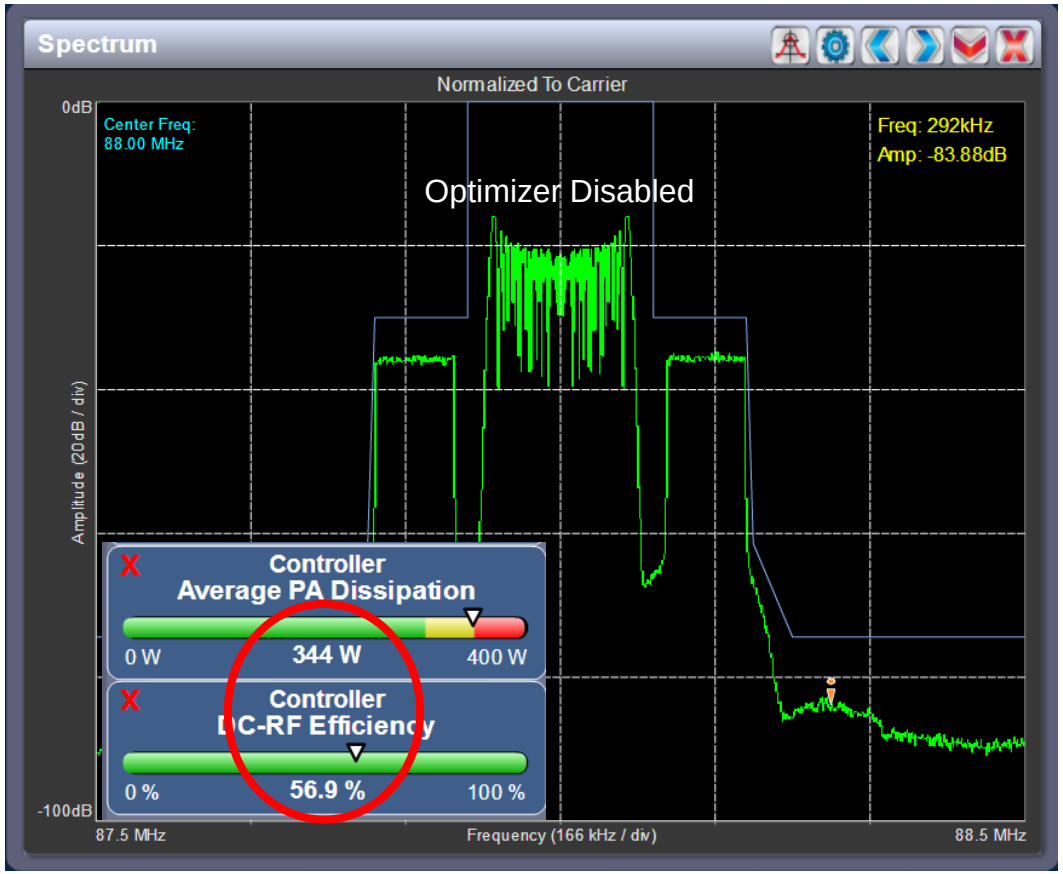
GV Series

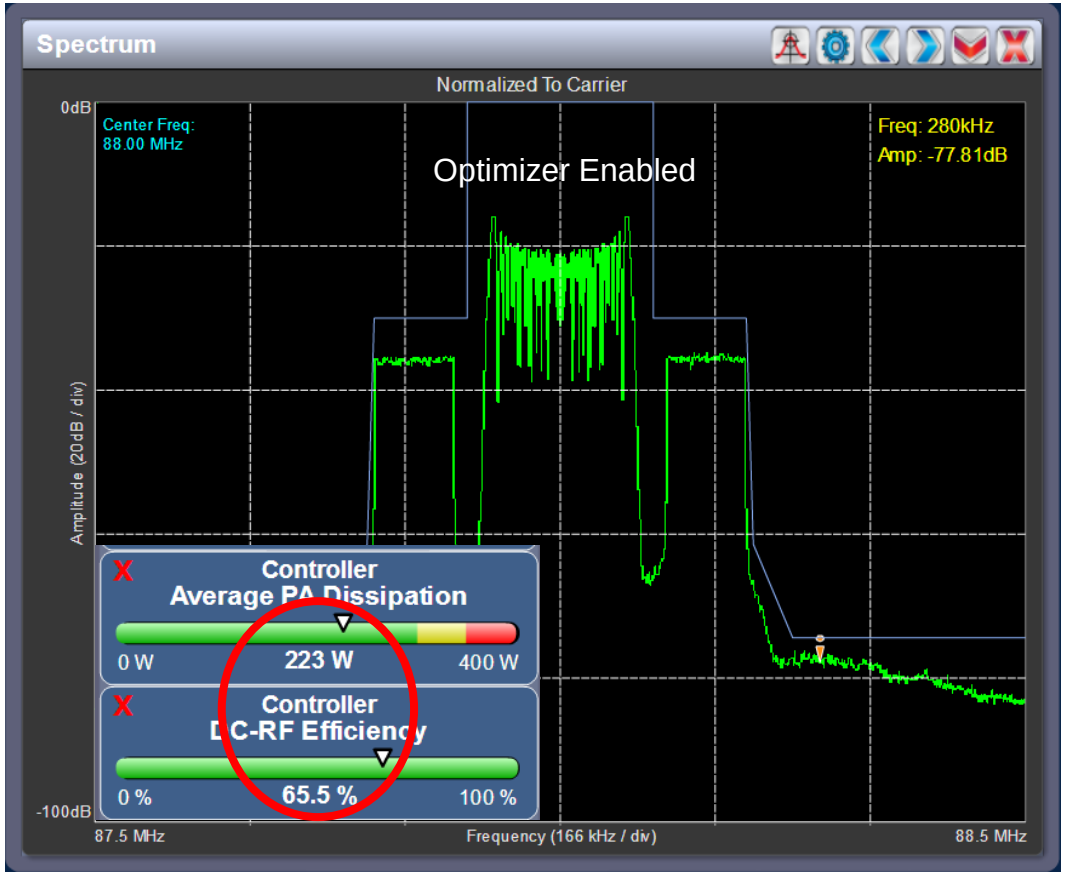
- Digital
- Control
- **Efficient**
- Intelligent
- Reliable
- Support

- High Efficiency LDMOS power amplifiers
- Platinum standard high reliability, high efficiency (94%+) power supplies
- Spectrum / Efficiency Optimizer
  - Dynamically adjusts parameters to meet the spectrum mask, while maximizing efficiency

GV Series – Spectrum/Eff. Optimizer

Automatically adapts to environmental changes (e.g. antenna VSWR or temperature) or transmitter configuration updates (e.g. HD injection or TPO)





E.g. GV20 @ 88 MHz 16 kW FM+HD -14 dBc Injection MP3 mode

With Optimizer: less 120 W Pdiss/FET and more than 8% higher efficiency

GV Series – Spectrum/Eff. Optimizer

Benefits of minimizing power consumption:

- Lower user operating costs (less kWhr = more $avings)
- Lower semiconductor device dissipation (100W/device or more) and lower junction temperature; higher MTBF
- Extends fan life; only operates at 63%
- Reduces external air conditioning costs (less BTU); doubles-up on savings
- Simplifies user setup and manual adjustments are now automated (but configurable)
- Integrates with AUI for non-compliance alarm notifications via email

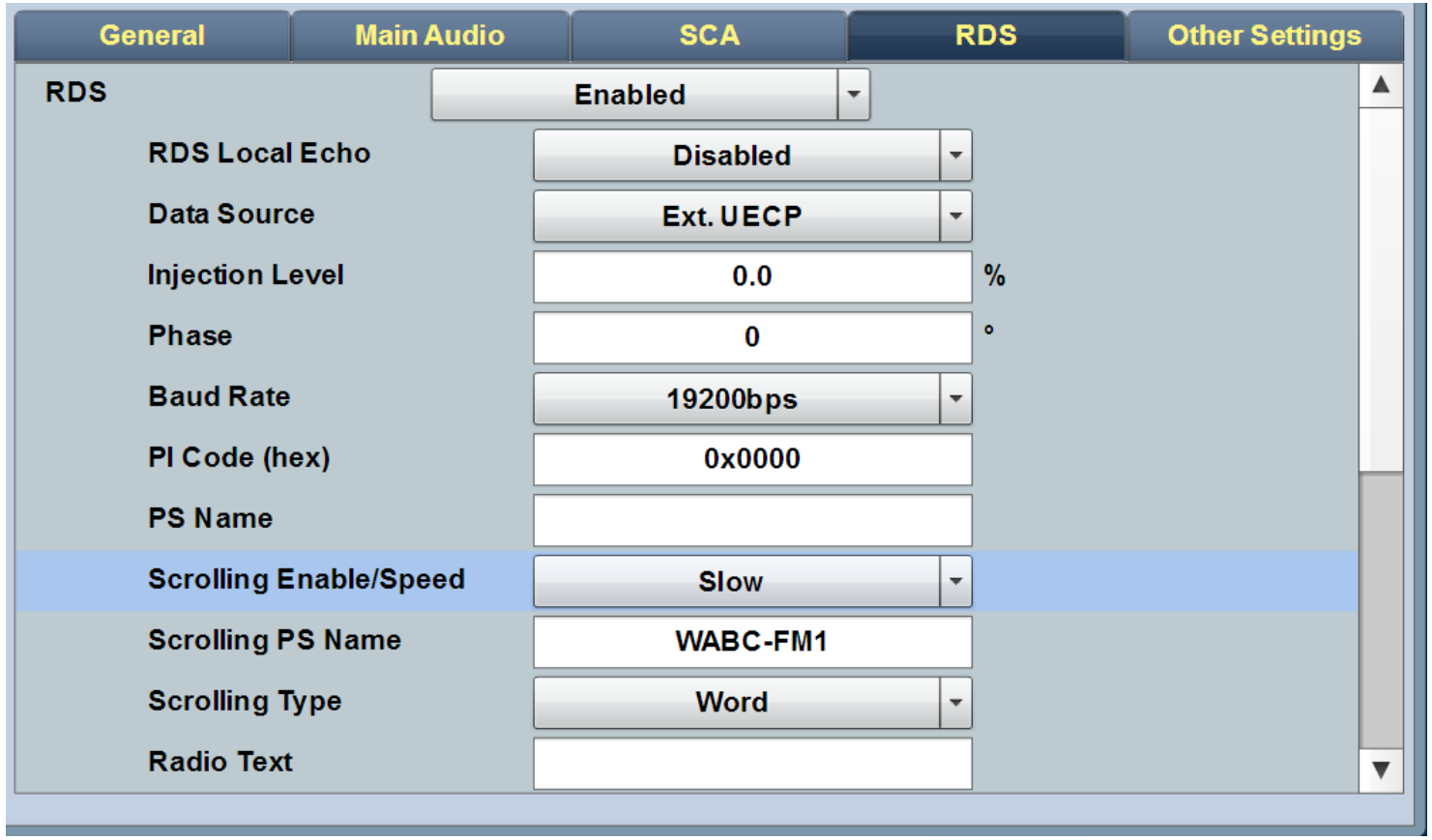
GV Series

- Digital
- Control
- Efficient
- **Intelligent**
- Reliable
- Support

- Orban Inside
- Omnia Direct (MPX over AES)
- Integrated Scheduler
- IceCast / Shoutcast input
- USB playlist system
- RDS PS scrolling for scrolling song title / artist display fed with RS232 or IP
- RDS Alt Freq Table now 25 positions

GV Series – RDS Enhancements

- Supports **PS Scrolling**
  - Speed (Fast/Slow), Type (Word/Character)
- Supports **Radio Text** (64-character)
- Alternate Frequencies increased from 6 to 25



GV Series

- Digital
- Control
- Efficient
- Intelligent
- **Reliable**
- Support

- Redundant power supplies
- 10% minimum headroom – over max power
- Optional UPS interface
- Audio loss switching
- Backup LCD UI standard
- 90 – 265 V Power supplies: Stay on-air through brown-out conditions
- 110V UPS now possible
- Audio Loss Switchback

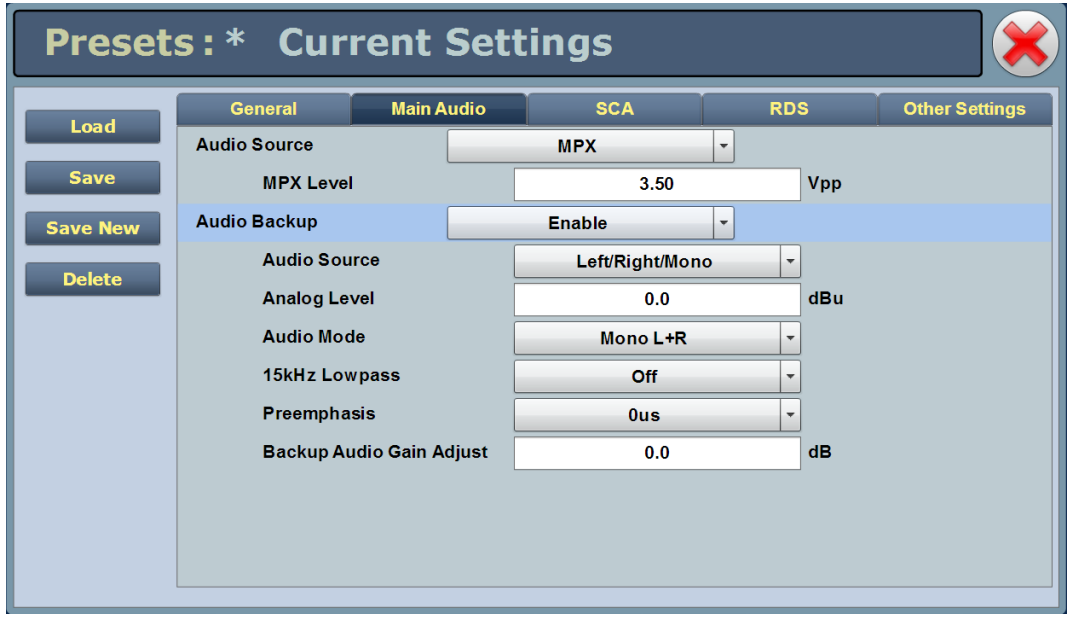
GV Series – Backup UI & 110 Vac UPS

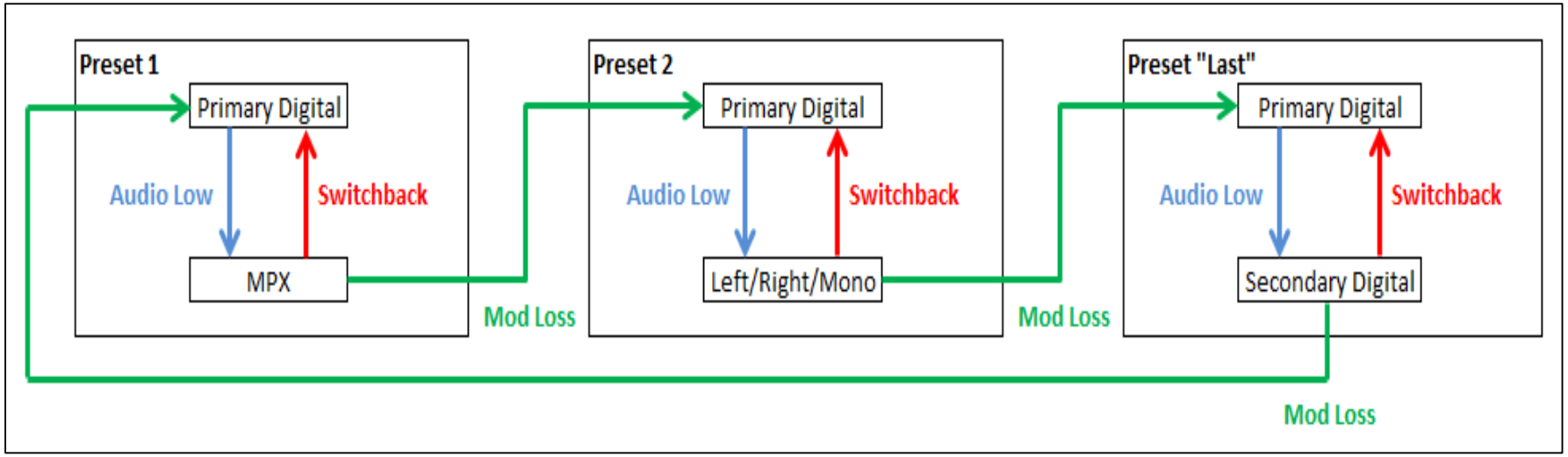
- Even more User Interface redundancy with the AUI, Remote Interface PWB and now backup UI
- Comprehensive list of available functions/menus

- Wide AC input range SMPS (90-265 Vac)
- Supports nom. 110 Vac or 208 Vac UPS

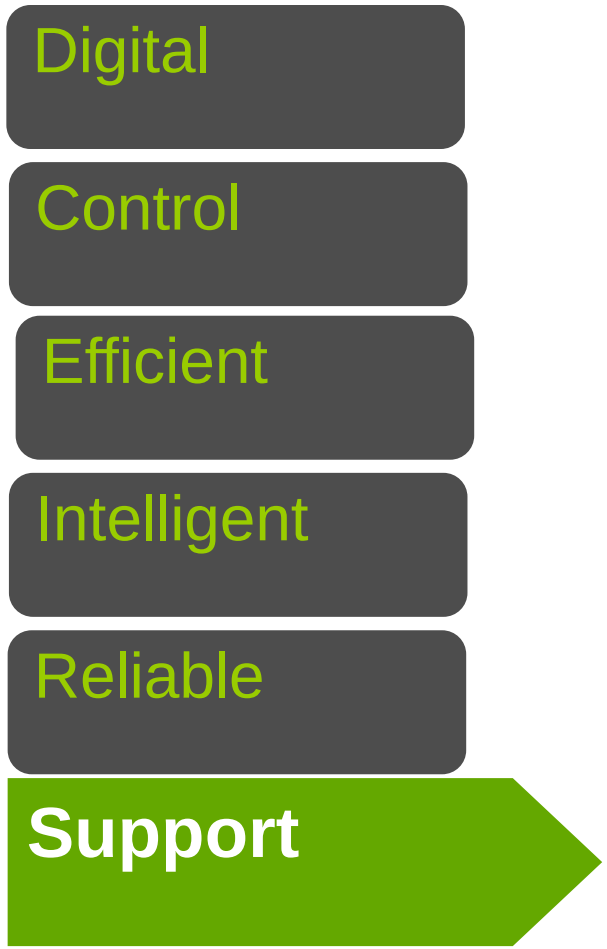
GV Series – Auto Audio Switchback

- Automatically returns to desired audio source if recovered
- Compliments “Audio Loss Switching” function
- More redundancy with multi-tier backup audio “loop”





And all backed with the best support in the industry



- **4 year standard warranty**
- **24/7/365 support**
- **Nautel Phone Home**
- **“We’ve never discontinued support on any product in our 49 years.”**
- **Nautel continuous improvement**

GV specs at a glance

	GV3.5	GV5	GV7.5	GV10	GV15	GV20	GV30N	GV30	GV40	GV60	GV80
ANALOG POWER	4.13 kW	5.5 kW	8.25 kW	11 kW	16.5 kW	22 kW	33 kW	33 kW	44 kW	66 kW	88 kW
MODULES	2	2	4	4	8	8	12	16	16	24	32
POWER SUPPLIES	4	4	8	8	16	16	24	32	32	48	64
UPGRADEABLE TO NEXT POWER LEVEL	✓		✓		✓			✓			
-20 DB HYBRID (ANALOG)	3.75	5	7.5	10	15	20	20	30	40	60	80
-14 DB HYBRID (ANALOG)	3.38	4.5	6.75	9	13.5	18	27	27	36	54	72
-10 DB HYBRID (ANALOG)	2.5	3.3	5	6.6	10	13	20	20	26	40	52

Advantages of Air Cooling

- Cost
  - Purchase price
  - Installation cost
  - Can frequently re-use existing infrastructure

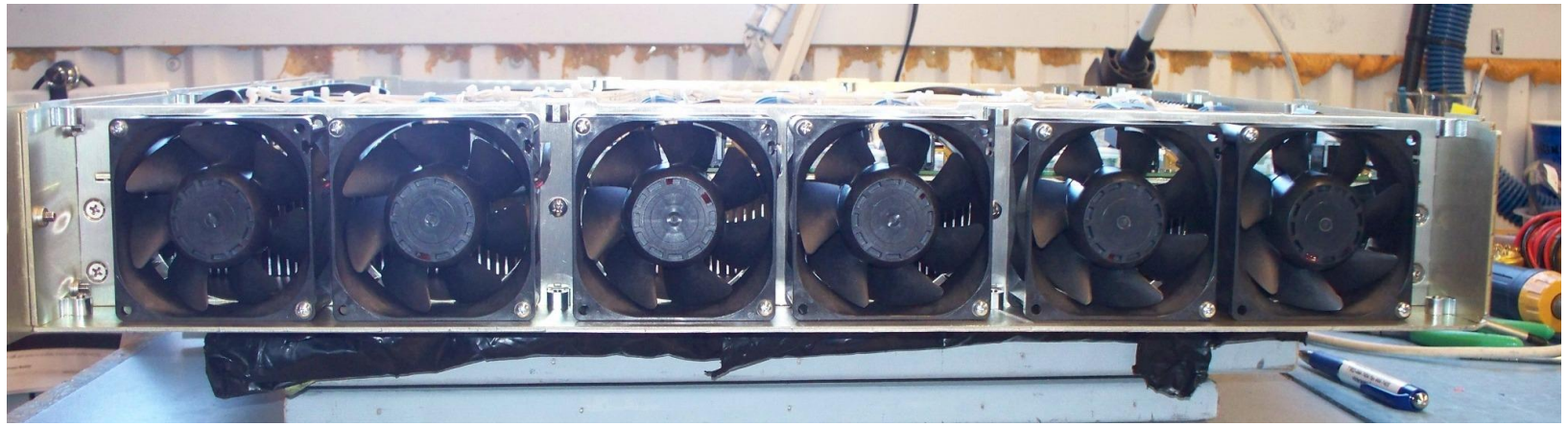
Advantages of Air Cooling

- Maintenance
  - Periodic filter changes
  - Occasional fan replacement
- ALL DONE ON AIR

Advantages of Air Cooling

Redundancy/Reliability

- Many fans, a failure has little to no impact.
- An air conditioned site can be easily configured for free air in the event of A/C failure
- Not as susceptible to higher ambient temperatures



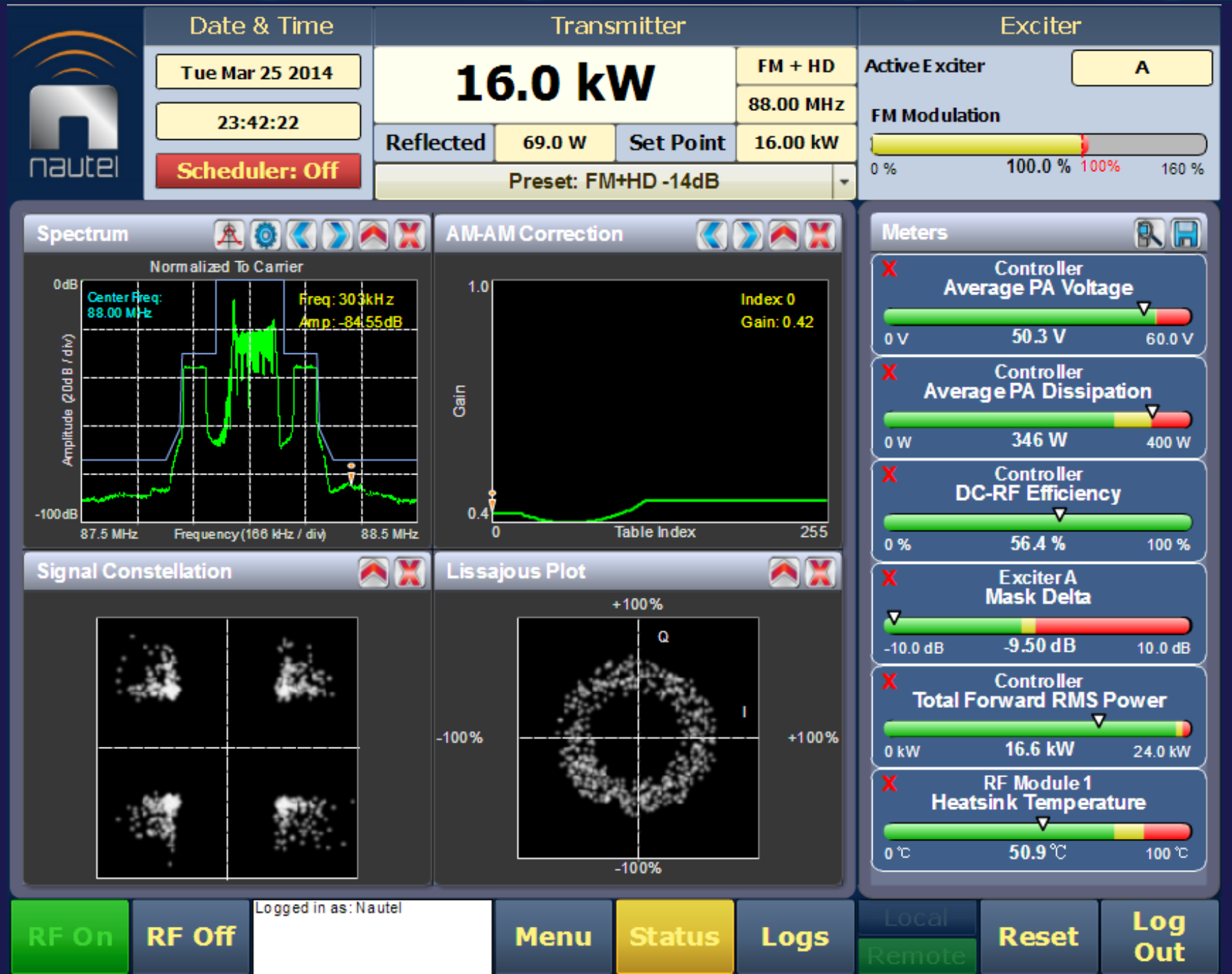
GV Cost of Operation

Up to 15% More Efficient

- $16,000/yr+ @ $0.12/kWhr
  - vs. NV @ 40 kW FM+HD -20 dBc
- 50% less temperature rise, approx. 10°C
  - Cool, Reliable Operation
- Auto Variable Fan Speed
  - Turns fans off if not needed
- Up to 10 dB Quieter than NV
  - As low as 63 dBA

Nautel Continuous Improvement

- Highest reliability power supplies – measured MTBF over 4.5 million hours.
- Highest reliability RF device measured over 3.5 million hours.
- Many software improvements:
  - Improved network reconnectivity
  - Improved exciter reset action on UPS
  - More MER readings
  - Improved fast VSWR shutback
  - Improved Icecast robustness
  - Other user suggested improvements


Date & Time
Tue Mar 25 2014
23:42:22
Scheduler: Off
Transmitter
16.0 kW
FM + HD
88.00 MHz
Reflected
69.0 W
Set Point
16.00 kW
Preset: FM+HD -14dB
Exciter
Active Exciter
A
FM Modulation
0 %
100.0 %
100%
160 %
Spectrum
Normalized To Carrier
0dB
-100dB
Center Freq:
88.00 MHz
Freq: 303kHz
Amp: -84.55dB
Amplitude (20dB / div)
87.5 MHz
Frequency (166 kHz / div)
88.5 MHz
AM-AM Correction
1.0
0.4
Gain
Index 0
Gain: 0.42
0
Table Index
255
Signal Constellation
Lissajous Plot
+100%
Q
I
-100%
+100%
-100%
Meters
Controller
Average PA Voltage
0 V
50.3 V
60.0 V
Controller
Average PA Dissipation
0 W
346 W
400 W
Controller
DC-RF Efficiency
0 %
56.4 %
100 %
Exciter A
Mask Delta
-10.0 dB
-9.50 dB
10.0 dB
Controller
Total Forward RMS Power
0 kW
16.6 kW
24.0 kW
RF Module 1
Heatsink Temperature
0 ℃
50.9 ℃
100 ℃
RF On
RF Off
Logged in as: Nautel
Menu
Status
Logs
Local
Remote
Reset
Log Out

Your questions please?

(If you don't see the control panel, click on the orange arrow icon to expand it)

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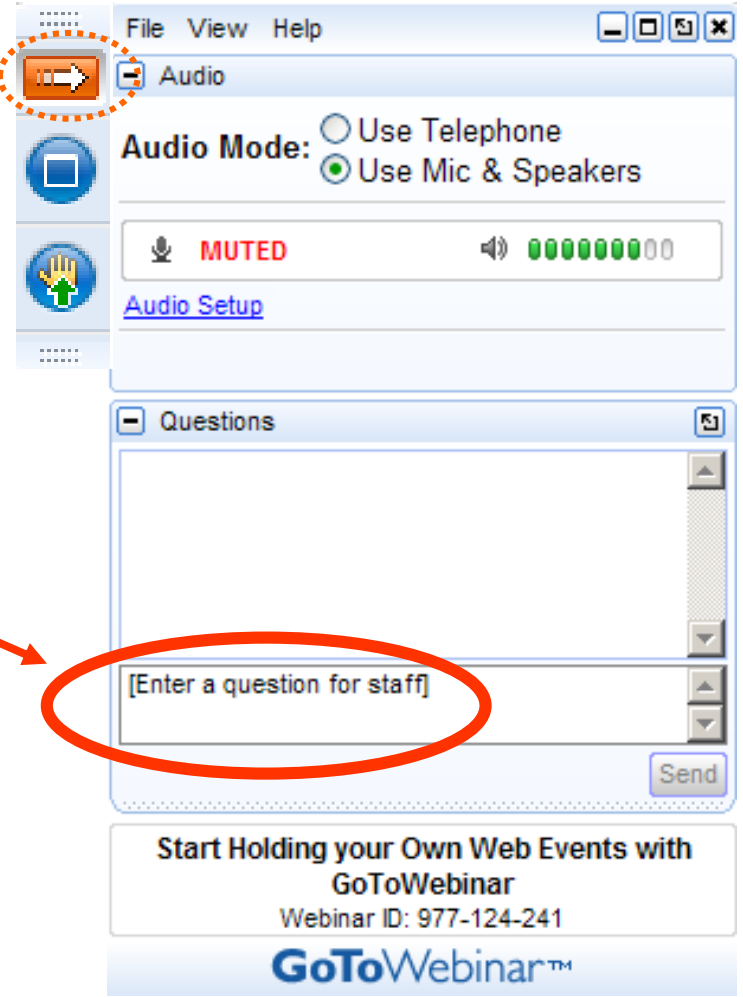

For additional information:

Current Brochures:
https://www.nautel.com/brochures/

Spec Sheets:
https://www.nautel.com/spec-sheets/

Chuck Kelly: ckelly@nautel.com

Nautel Support: http://support.nautel.com/

Tech Manuals (Need NUG Login):
http://support.nautel.com/technical-documentation/

Nautel Webinars
https://www.nautel.com/resources/webinars/

Jeff Welton: jwelton@nautel.com

49 years of NAUTEL 1969 2018

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