

Tips 'N' Tricks

How Not to Blow Stuff Up

(Safety, IT Security, Maintenance, etc.)



Agenda

Overview

✓ Safety

- Fewer resources does not mean taking risks!
- Useful tools

✓ Grounding

- Protecting equipment and engineers
- How much is too much?

✓ IT security

- More connected equipment
- Protecting the license

✓ Maintenance

- Sometimes it is easier to stop the fire from starting
- Spending a little to save a lot



Jeff Welton
Regional Sales Manager
Central U.S.

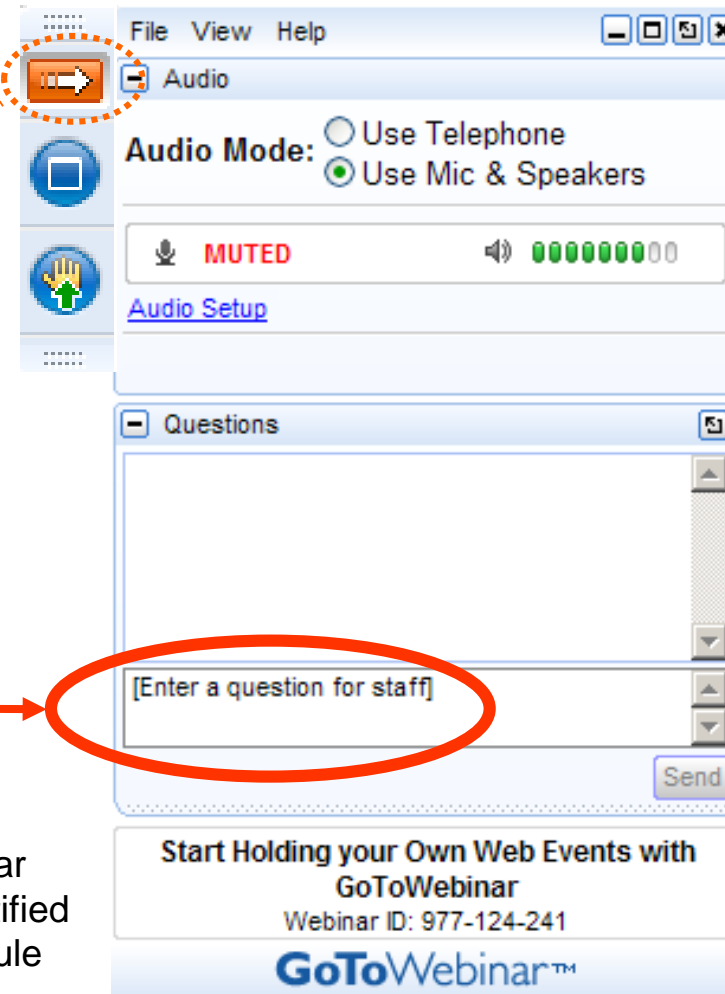
Your questions please?

(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)

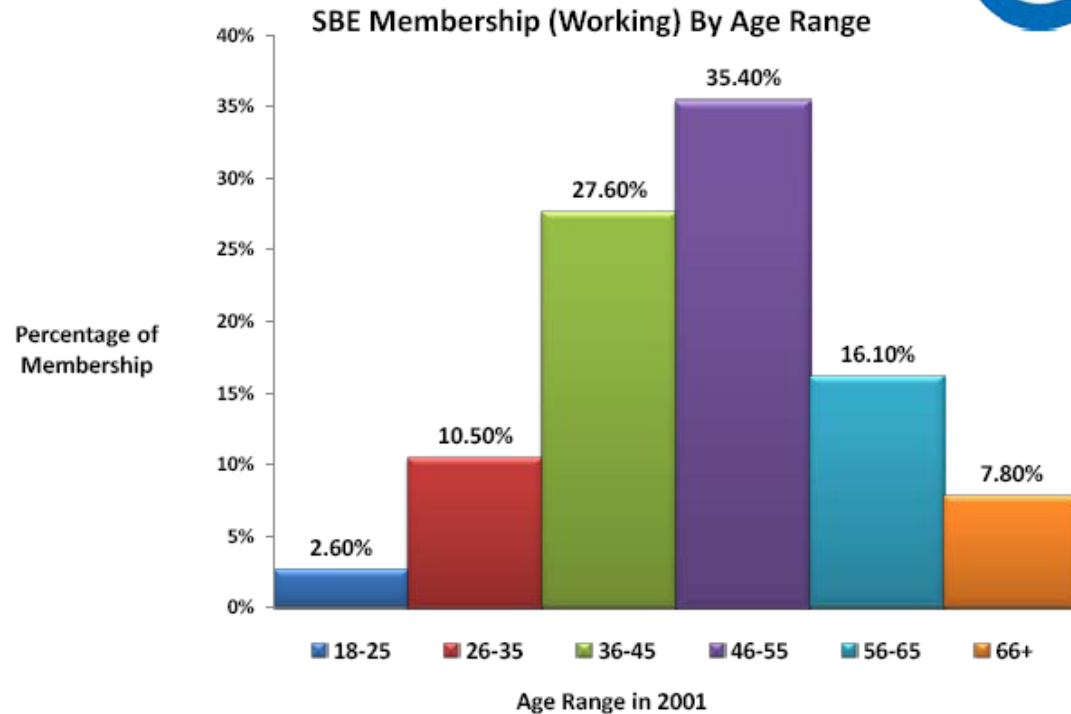


Remember: The completion of a Nautel webinar qualifies for ½ SBE re-certification credit, identified under Category I of the Re-certification Schedule for SBE Certifications.

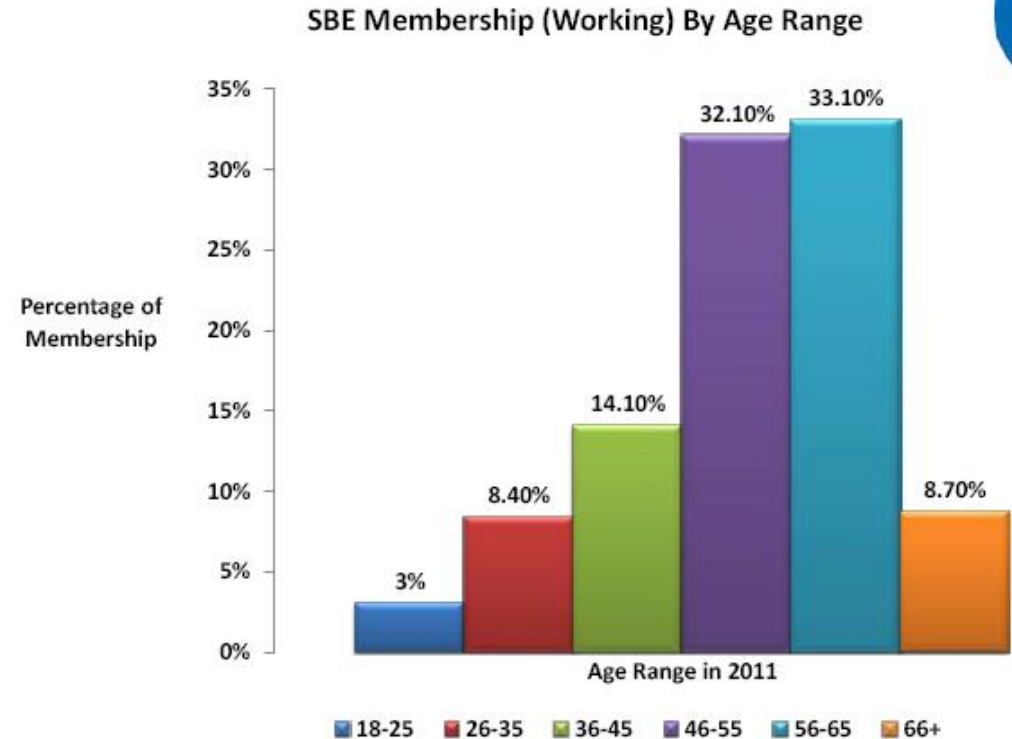


Graying Talent

Aging Demographic



Copyright 2012 Society of Broadcast Engineers, Inc.



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From the paper, *The Shortage of Broadcast Engineers – is there, or do we just need to know where to look?* by John L. Poray, CAE, Executive Director, Society of Broadcast Engineers, 2012 NAB Broadcast Engineering Conference.

Resulting Safety Concerns

██████████ chief engineer found dead

██████████ sends thoughts and prayers to the family and friends of ██████████, who was chief engineer at ██████████ in ██████████. The station plays "lite" contemporary Christian music and has many translators including ██████████

██████████ was found dead last Friday in the station's remote mountain transmitter shack.

Technical engineer for ██████████ Radio, ██████████, was found dead at the station's transmitter site

Title: **Engineer Electrocuted Making Repairs At ██████████**
Post by: ██████████ on August 20, 2010, 06:06:28 PM

It is with sadness that I pass along a report seen on the evening news today out of ██████████, Mississippi. Engineer ██████████ died yesterday while working on the station's transmitter

More frequently, engineers are working alone, often after a full day at another job, bringing fatigue into the equation.

Proper Protection is Important

- ESR (EH in the U.S.) rated footwear can keep you alive if you come in contact with a live circuit.



Electric Shock Resistant Boot / Electric Shock Resistant Footwear (ESR)

Boots labeled "ESR" are manufactured to protect you from electric shock when working near electrical hazards. Testing concluded the leakage current did not exceed 1 mill ampere when applying an 18,000 volt / 60HZ electrical discharge to ground for one continuous minute.



Safety is Key



Lockout/tagout – it can save your life

Safety is Key

- Even after you've locked out the power source, a fast verification is a good idea (breakers can weld closed)



Safety is Key

- Ensure use of proper safety equipment is mandatory
 - Ladders rated for working with electricity (and make sure ladders are used, don't stand on chairs!)
 - Equipment should be secured when not in use.



Periodic Safety Checks

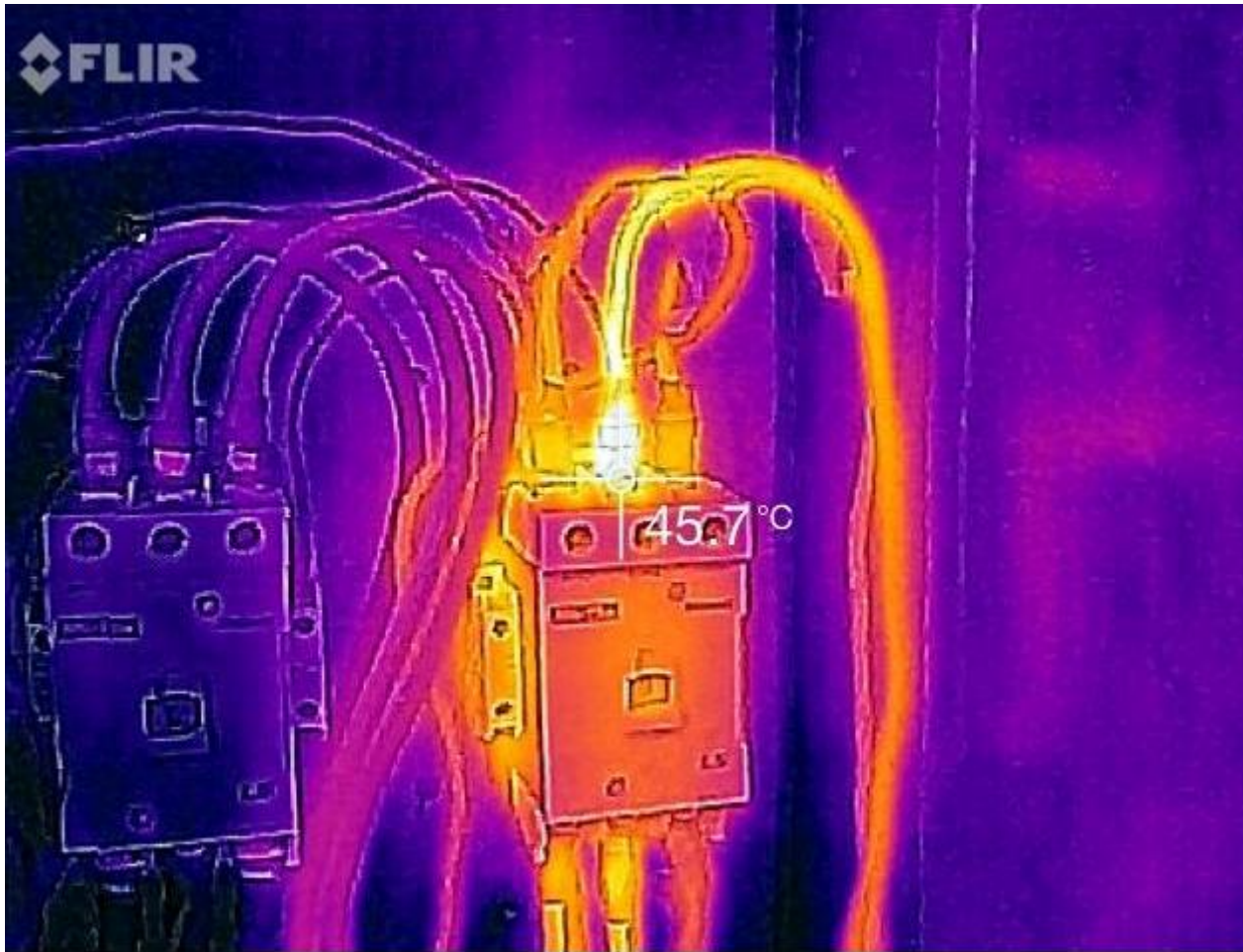


Photo credit: Guy West, Far East Broadcasting Company



Grounding

- Single Point
- Bonded connections
- Surge Protector
- Use ferrite
- Look for ground loops



Single Point

Bulkhead ground for coax cables

- Best done where cables enter building
- Connected to station reference ground
- Keep ground leads as short as possible



Bonding

- All connections should be soldered, brazed or CAD welded.
- Compression connections are not ideal, they can loosen over time, or become less effective as materials oxidize.



Bonding

Make certain your ground is
REALLY a ground!



Surge Protector

AC Power line protectors are a must – and they **MUST** be connected to your station reference ground.



Ferrites

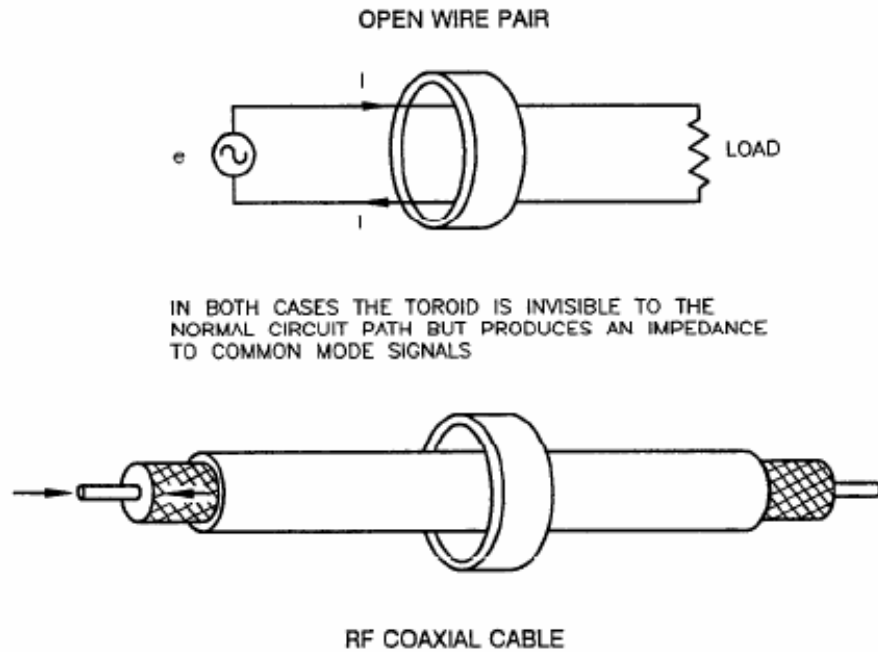


Figure F-4 Use of Toroids to Impede Common Mode Signals

Ferrites are good for reducing common mode signals

- Lightning surges
- Induced RF (especially at co-located AM and FM sites)
- Power line and power supply noise

Ferrites

- ON the coax near the transmitter
- ON the coax near the input to the antenna tuning unit (ATU)
- ON audio cables near their termination point only twisted pair, shielded cables should be used
- ON the AC to the transmitter all AC phases and AC ground go through the same ferrite
- ON the remote control cables only twisted pair, shielded cables should be used
- ON AC cables to any external equipment



Ground Loops

Clean up excess wiring

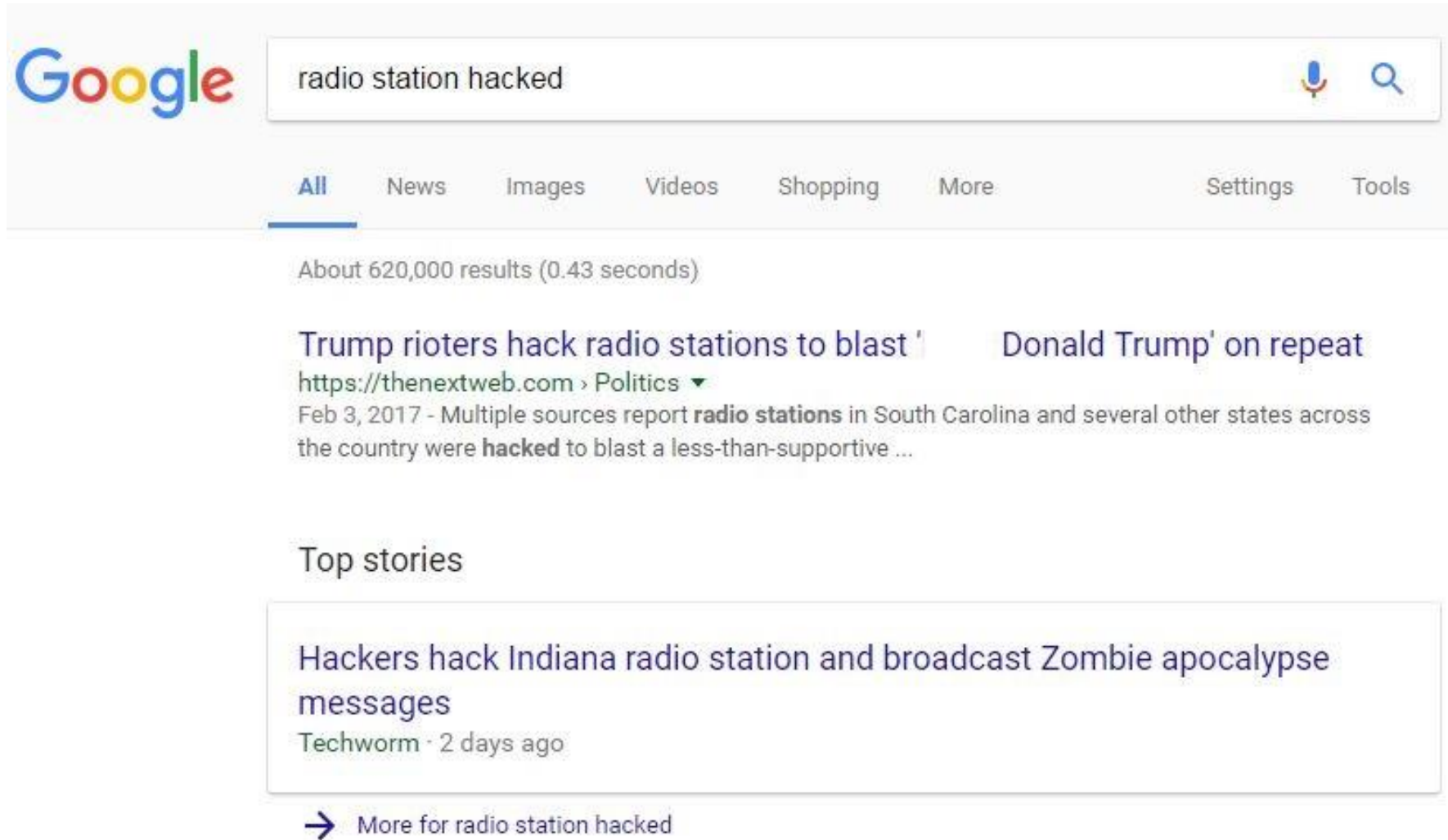
- previous installs
- broken connections that were replaced

Keep ground connections to a minimum

- one per piece of equipment



IT Security



Google

radio station hacked

All News Images Videos Shopping More Settings Tools

About 620,000 results (0.43 seconds)

Trump rioters hack radio stations to blast 'Donald Trump' on repeat
<https://thenextweb.com> > Politics ▼
Feb 3, 2017 - Multiple sources report **radio stations** in South Carolina and several other states across the country were **hacked** to blast a less-than-supportive ...



Top stories

Hackers hack Indiana radio station and broadcast Zombie apocalypse messages
Techworm · 2 days ago

→ More for radio station hacked


IT Security

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 **SHODAN**  [Explore](#) [Enterprise Access](#) [Contact Us](#)

[Exploits](#) [Maps](#)

TOP COUNTRIES





| | |
|--------------------|-----|
| United States | 915 |
| Israel | 56 |
| Argentina | 46 |
| Russian Federation | 43 |
| Canada | 37 |


TOP SERVICES


| | |
|--------------------|-------|
| SNMP | 1,424 |
| 8081 | 58 |
| HTTP | 25 |
| NAS Web Interfaces | 4 |
| GlassFish Server | 4 |


Total results: 1,543





University of California, Los Angeles
Added on 2017-03-03 16:48:41 GMT
 United States, Los Angeles
[Details](#)



Cogent Communications
Added on 2017-03-03 16:43:34 GMT
 United States, Hackensack
[Details](#)



Hughes Network Systems
Added on 2017-03-03 16:38:59 GMT
 United States
[Details](#)



Barix Instreamer Snr: 02.0b6 (060731)

Barix Instreamer Snr: 04.0b4 (151028)

Barix Streaming Client Snr: 03.1b3 (140408)

Barix Instreamer Snr: B1.0b2 (120718)

IT Security

192.168.0.1/adv_virtual.asp

ce.com - Cu... Recipes Tech Stuff Sales Imported How to use BlackBerry... Seven Essential Tim... Family tree view Outlook Web App NAS

DIR-810L

VIRTUAL SERVER

PORT FORWARDING

APPLICATION RULES

QOS ENGINE

NETWORK FILTER

ACCESS CONTROL

WEBSITE FILTER

INBOUND FILTER

FIREWALL SETTINGS

ROUTING

ADVANCED WIRELESS

WI-FI PROTECTED SETUP

ADVANCED NETWORK

GUEST ZONE

IPV6 FIREWALL

IPV6 ROUTING

VIRTUAL SERVER

The Virtual Server option allows you to define a single public port on your router for redirection to an internal LAN IP Address and Private LAN port if required. This feature is useful for hosting online services such as FTP or Web Servers.

Save Settings Don't Save Settings

24-- VIRTUAL SERVERS LIST

| | Name | Application Name | Port | Traffic Type | Schedule |
|--------------------------|------------|------------------|------------------|---------------|---------------------------|
| <input type="checkbox"/> | SSH Access | NAUTEL-C77ZTM | Public Port: 22 | Protocol: TCP | Schedule: Never |
| | IP Address | | Private Port: 22 | 6 | Inbound Filter: Deny All |
| <input type="checkbox"/> | http | NAUTEL-C77ZTM | Public Port: 80 | Protocol: TCP | Schedule: Always |
| | IP Address | | Private Port: 80 | 6 | Inbound Filter: Allow All |
| <input type="checkbox"/> | email | NAUTEL-C77ZTM | Public Port: 843 | Protocol: TCP | Schedule: Always |
| | IP Address | | Private Port: | | Inbound Filter: |

Helpful Hints ...

Check the **Application Name** drop down menu for a list of predefined server types. If you select one of the predefined server types, click the arrow button next to the drop down menu to fill out the corresponding field.

You can select a computer from the list of DHCP clients in the **Computer Name** drop down menu, or you can manually enter the IP address of the computer at which you would like to open the specified port.

Select a schedule for when the virtual server will be enabled. If you do not see the schedule you need in the list of schedules, go to the **Tools -- Schedules** screen and create a new schedule.

Select a filter that restricts the Internet hosts that can access this

IT Security

A Virtual Private Network (VPN) is a good way to improve security

- There are many available, local or remotely hosted, free or subscription based, with various levels of flexibility and support.
- One resource for learning about the VPN options is techradar.com
 - <http://www.techradar.com/news/the-best-free-vpn>
 - <http://www.techradar.com/news/the-best-vpn-services-and-vpn-deals-of-2017>

IT Security

- At the very least, use a router for a firewall, and assign different ports and port forward through the router
- Ideally, tunnel in through VPN
- Do NOT use default usernames and passwords – these should be deleted (or at least change the password to something complex)
- PW= “12345” is not complex

Maintenance

- Air Filters / Air Conditioning Systems
- Hardware – power supplies
- Air Handling – belts and blowers
- Ground System - integrity
- Housekeeping – clean up!



Air Filters

Air Filters should be changed on a schedule, based on site conditions.

Metal mesh filters can be washed – make sure they are dry before reinstalling!



Hardware

- Compression connections (as AC entry points and circuit breakers) can loosen over time, as wires compress.
- Filter connections and grounds should also be checked (fan/blower vibration and heating/cooling cycles can also cause these to loosen)



Groundskeeping

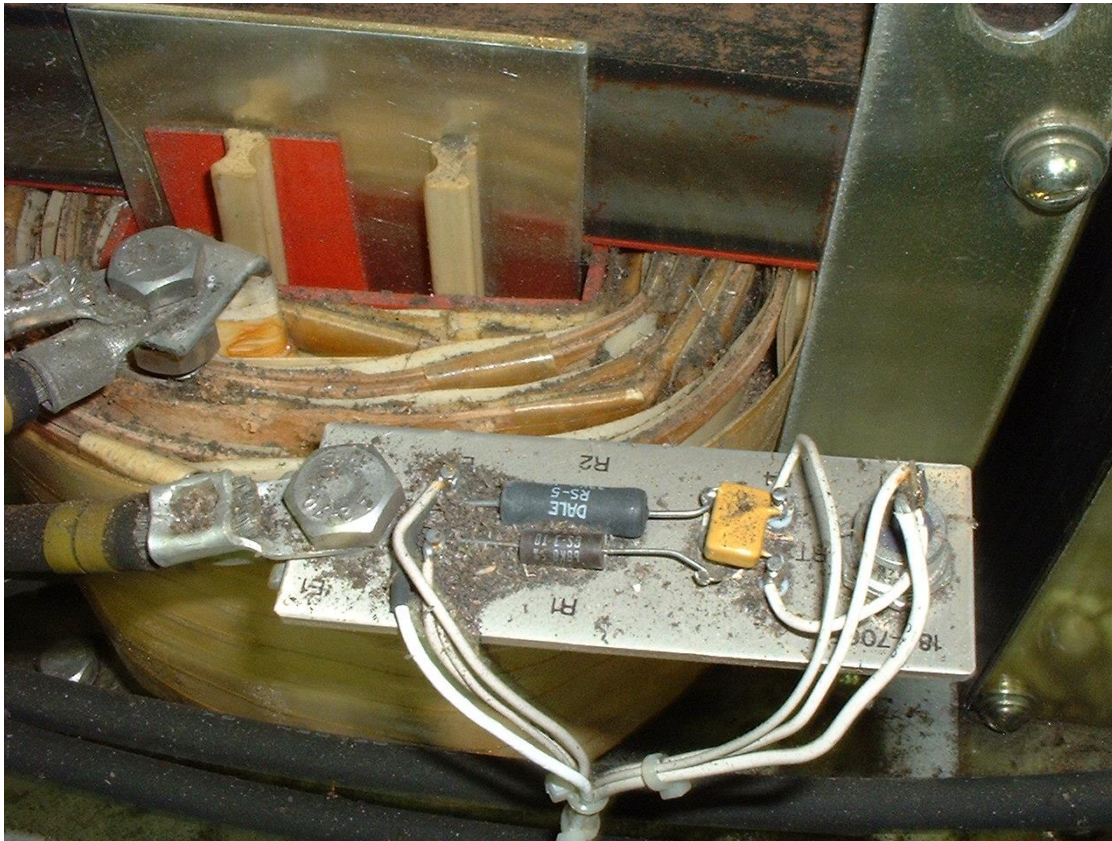
Make sure ground is grounded!



Remove unused cables



Housekeeping



Online Information

- **Nautel Waves Newsletter**
<http://www.nautel.com/newsletter/>
- **Webinars**
<http://www.nautel.com/webinars/>
- **YouTube**
<http://www.youtube.com/user/NautelLtd>

Thanks!

www.nautel.com

