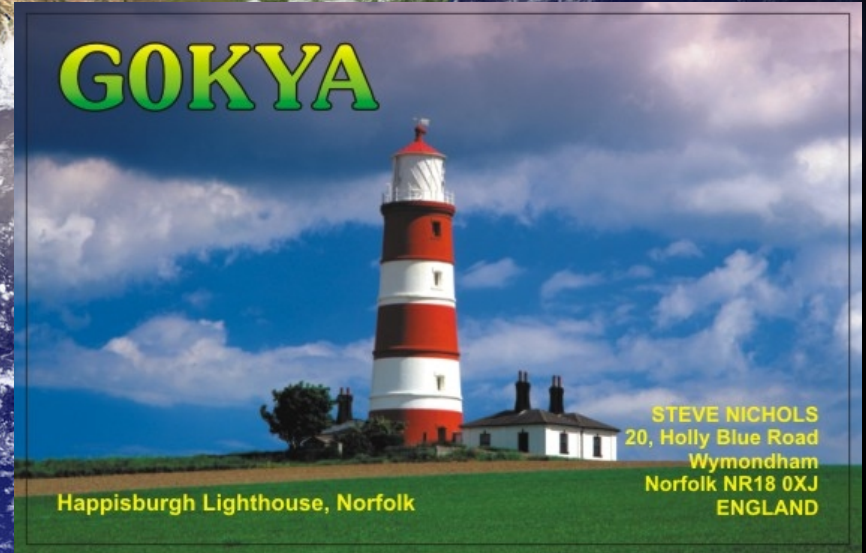


Eliminating EMC issues

Steve Nichols G0KYA
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What is EMC?

Electro-Magnetic Compatibility

“The branch of electrical sciences that studies the unintentional generation, propagation and reception of electromagnetic energy with reference to the unwanted effects (electromagnetic interference, or EMI) that such energy may induce.



Three things we can concentrate on:

- You causing interference to your own amateur radio set-up
- You causing interference to other people's electronic equipment eg TVs, radios, broadband
- Other people causing interference to you

First stop – RSGB's EMC website



Radio Society of Great Britain

100 YEARS 1913 - 2013

RSGB - Working for the future of Amateur Radio

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EMC

**Suffering from or causing Interference ?
We can help you and you can help us!!
Services Provided by RSGB on EMC Issues are:**

- **Advice on Electro Magnetic Compatibility (EMC) issues**
 1. How to [track down interference](#)
 2. How to [avoid causing breakthrough](#)
 3. Individual help from EMC Technical Advisors
 4. Problem reporting & collation for enforcement action
- **Protecting the Spectrum**
 1. Representation on [Standards Committees](#)
 2. [Lobbying regulators](#), suppliers and service providers
 3. [Investigations](#) & recommendations for new threats
- **Publishing information and updates**
 1. Regular EMC column in Radcom – “[EMC Matters](#)”
 2. RSGB website self-diagnosis plus [EMC leaflets](#)

With a little care, and significant diplomacy, EMC problems can be minimized or eliminated.

The RSGB EMC committee leads the Society's work in this area, and there is a [network of regionally-based advisors](#) who can provide hands-on advice.

For the latest news on the RSGB's campaign against emissions from PLA/PLT devices, see our [PLA/PLT pages](#).

Section Navigation

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 - EMC filters / components from RSGB
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How your own transmissions can affect your station

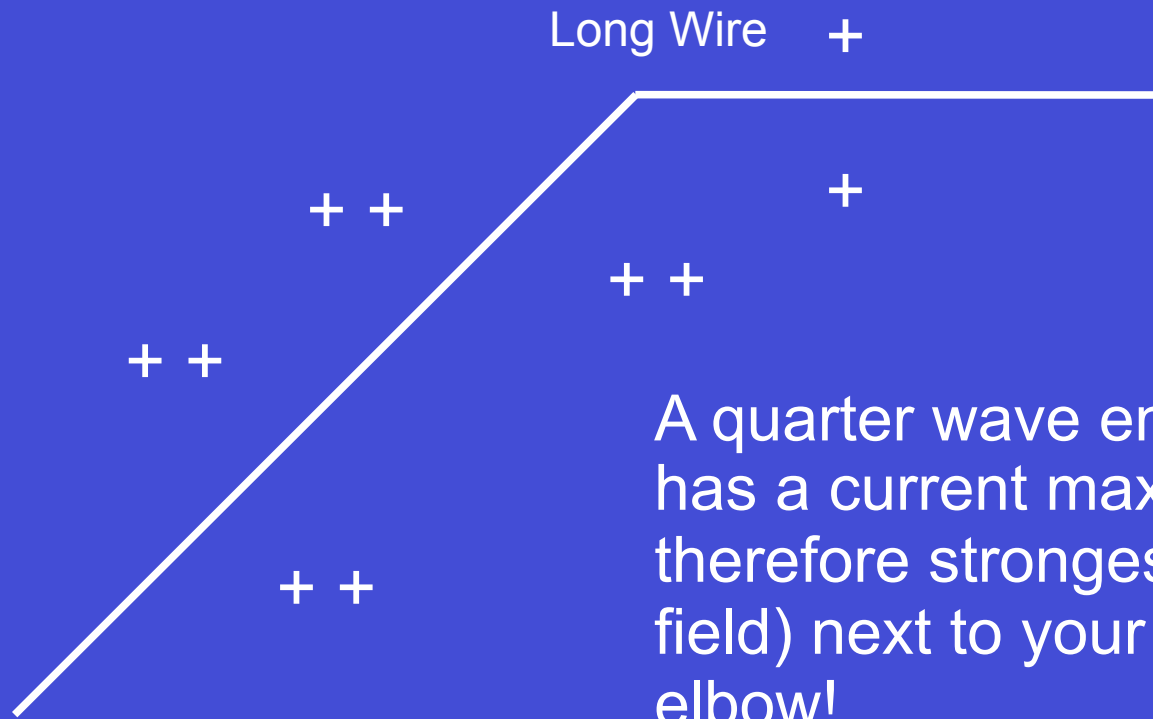
1. “Hot” morse keys, microphones and cases, resulting in RF burns (even at 10W)
2. Distorted transmitted audio
3. Patterning on computer monitors
4. Poor data TX/RX quality eg PSK31/ RTTY
5. USB ports “disconnecting”



Things you can do to help yourself:

1. Avoid long wire antennas, especially where the feedpoint is right next to you.
2. Keep antennas as far away from the house and TV antennas as possible
3. Verticals WILL generally be noisier than horizontal antennas

With an end-fed YOU are in the RF field!

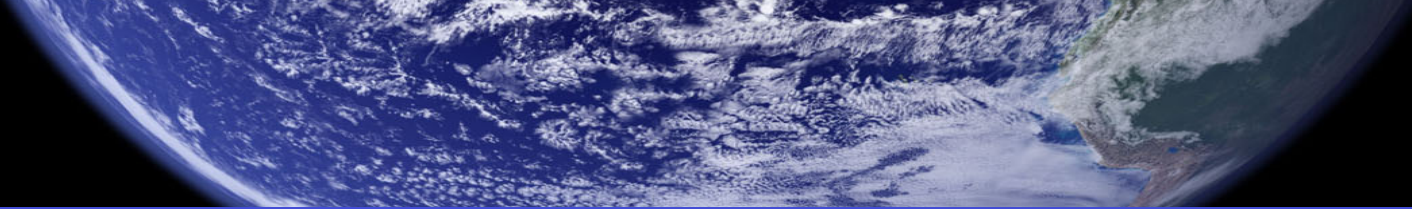


A quarter wave end fed has a current maxima (and therefore strongest RF field) next to your left elbow!



Things you can do to help yourself:

4. Try to have coax drop vertically down from dipoles and along ground – a balun may help
5. Use RF chokes on feedlines to stop common mode currents
6. Use the minimum amount of power needed to make the contact



Things you can do to help yourself:

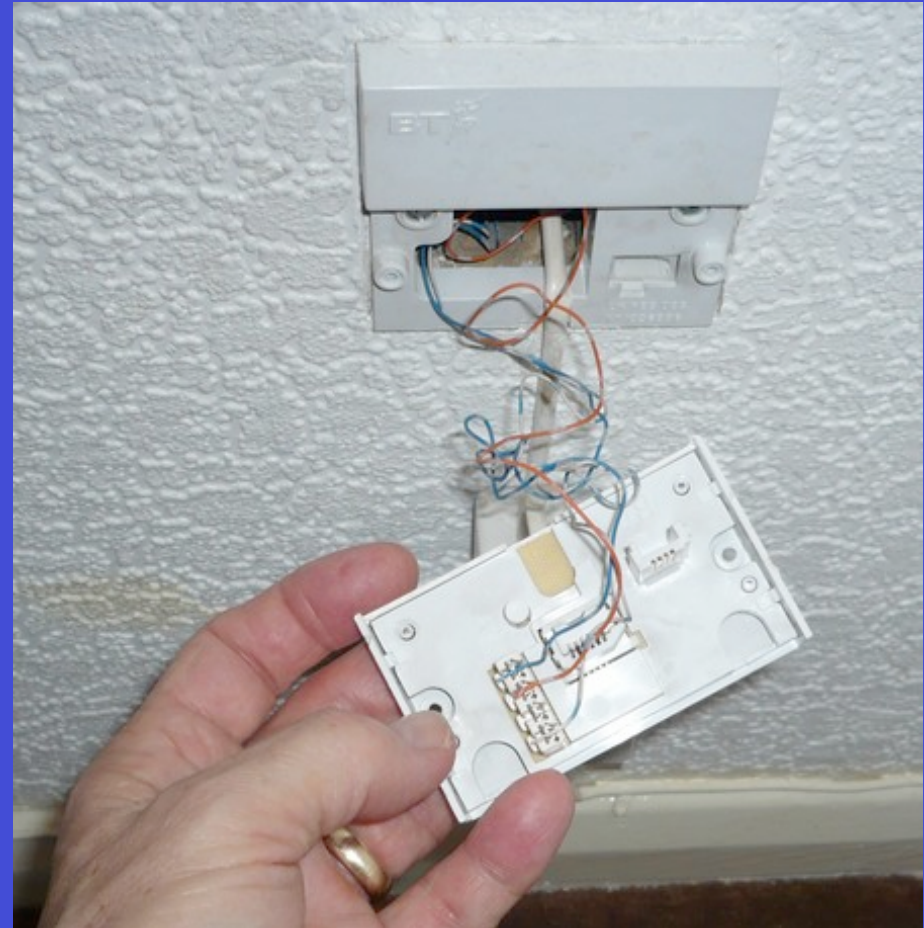
7. A quarter-wave piece of wire attached to the back of the rig/ATU will stop it being “hot”, *but only at that frequency and 3x the frequency.*
8. Use RF chokes on leads to power supplies used around the house
9. Don't put antennas near to mains cabling

Does your broadband disconnect on 80m?

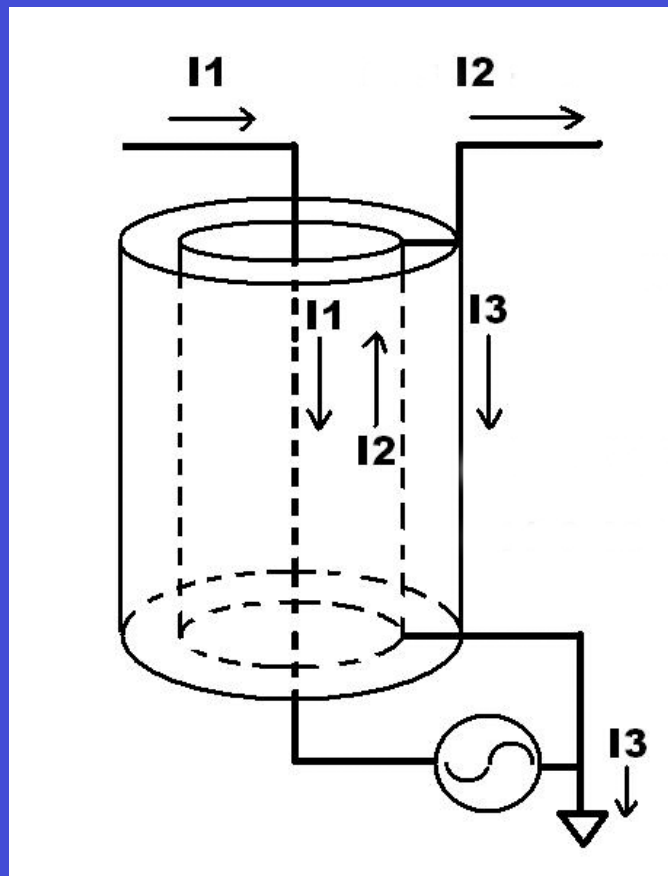
Try disconnecting the bell or ring wire, (usually orange/white on terminal 3) at the master socket.

Carefully pull it out and put insulation tape over it.

Note: If in doubt get BT to do it!

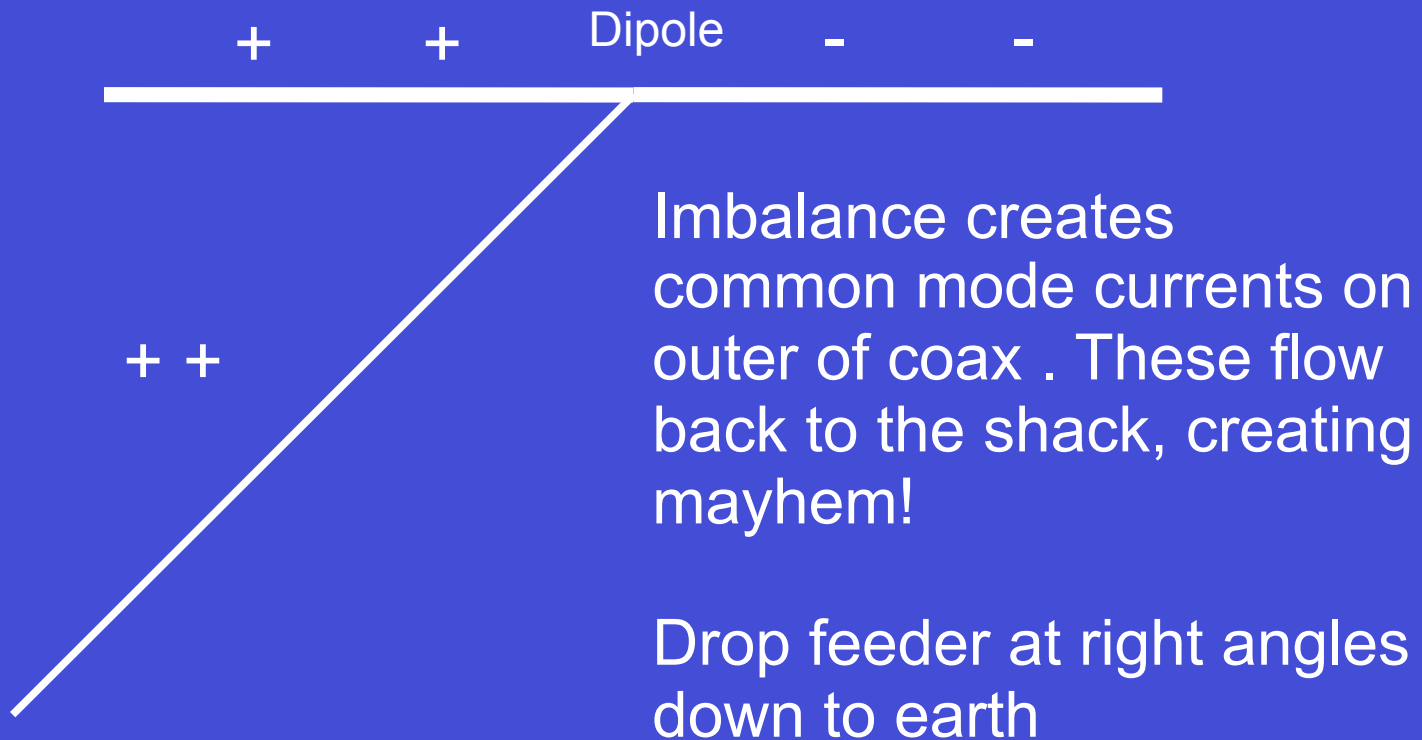


Common mode currents on coax





Things you can do to help yourself:





Things you can do to help yourself:

OCF Dipole (Windom)



- Imbalance creates common
mode currents on outer of
coax. These can flow back to
the shack, creating mayhem!
Choke it!



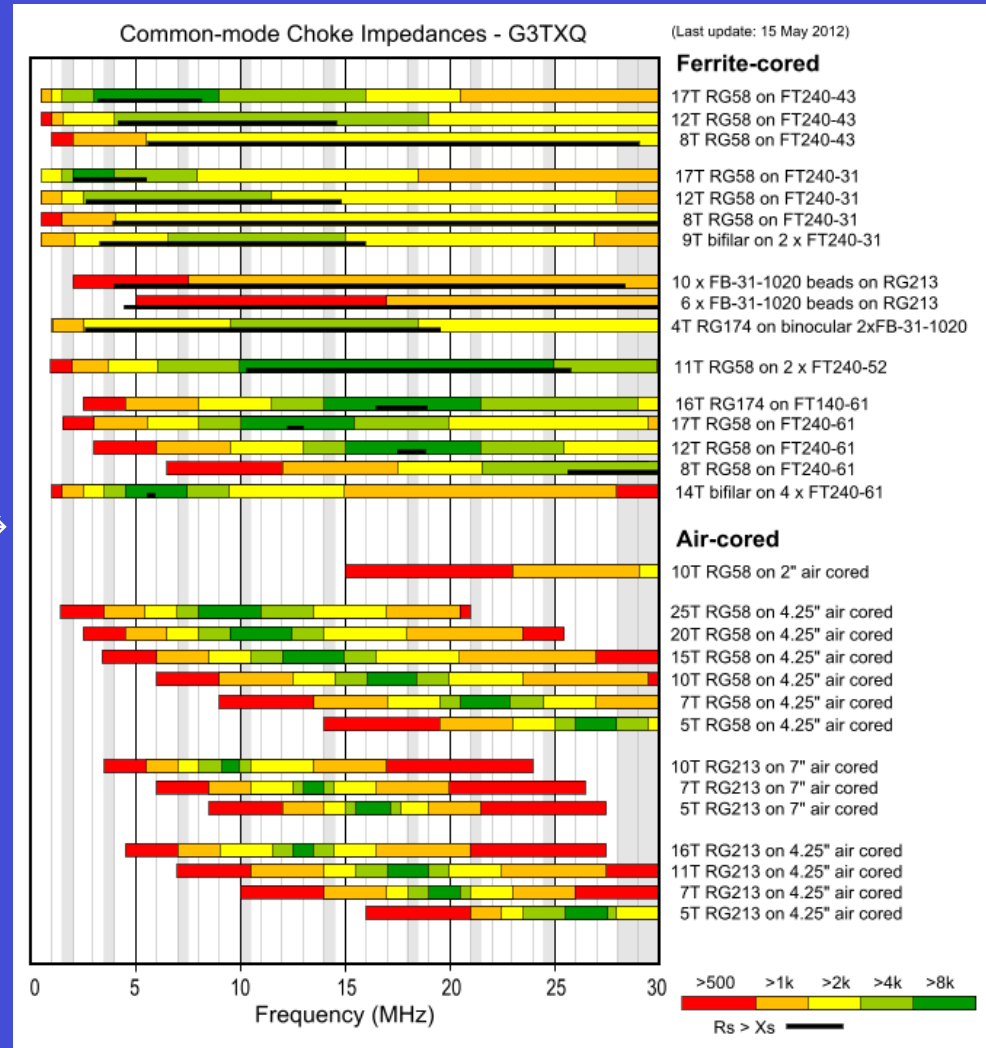
A choke or ugly “balun” -
note carefully wound on a
former, not “scramble
wound”

Good for HF (20m-10m).
Less effective for LF (80m)

Make it with RG213, not
RG58 – otherwise you just
adding coax losses on the
higher bands.

Steve G3TXQ has a
web page on
chokes and their
effectiveness

www.karinya.net/g3txq/

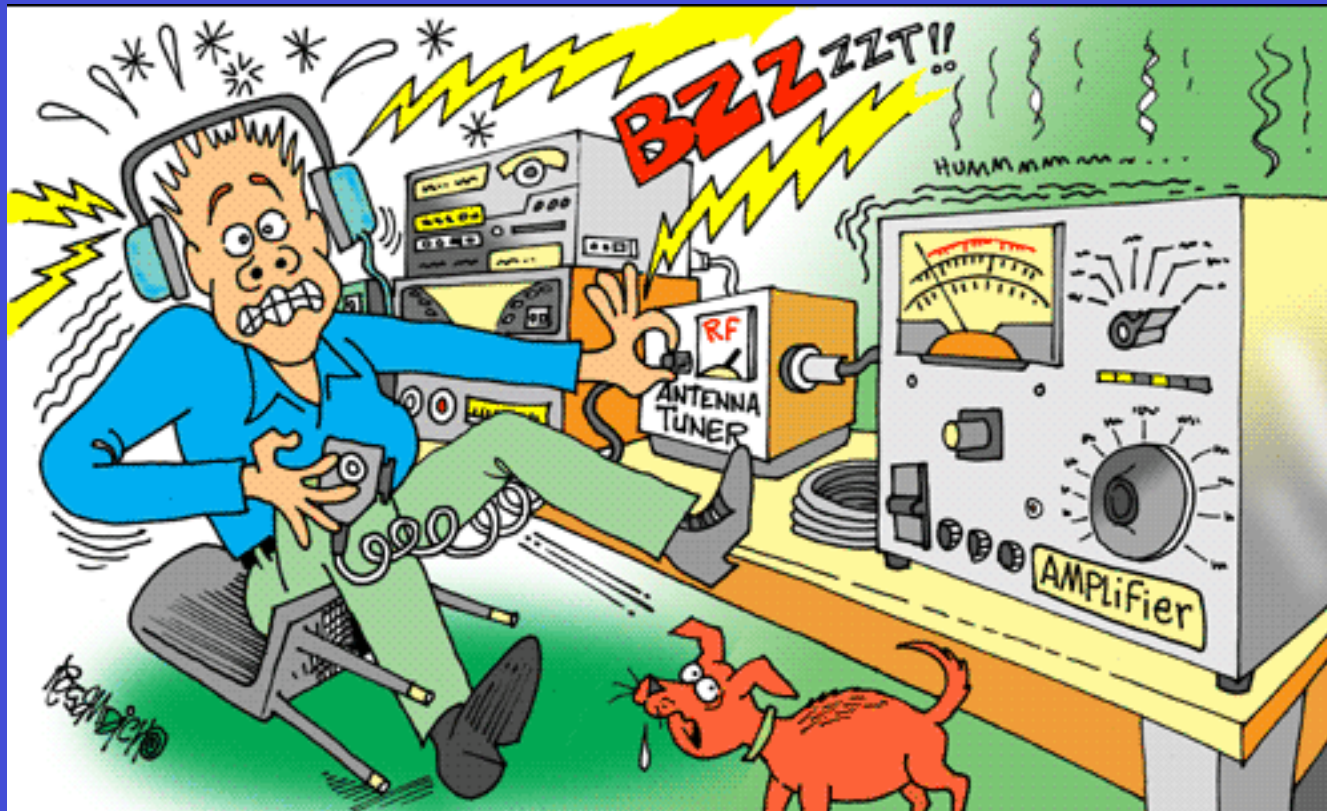




How can I check to see if I have common mode currents?

1. Does your SWR change if you pick up or move your coax?
2. If using an MFJ analyser does the SWR change if you touch the earth point with your finger?
3. Can you detect (much) RF off the coax with a cheap field strength meter?

If you are already causing interference a linear amplifier will make it worse



Are separate receiving antennas the answer?

Wellbrook ALA-1530S Loop

- Fantastic
- Low noise
- Hear stuff you didn't know existed
- Reviewed in RadCom



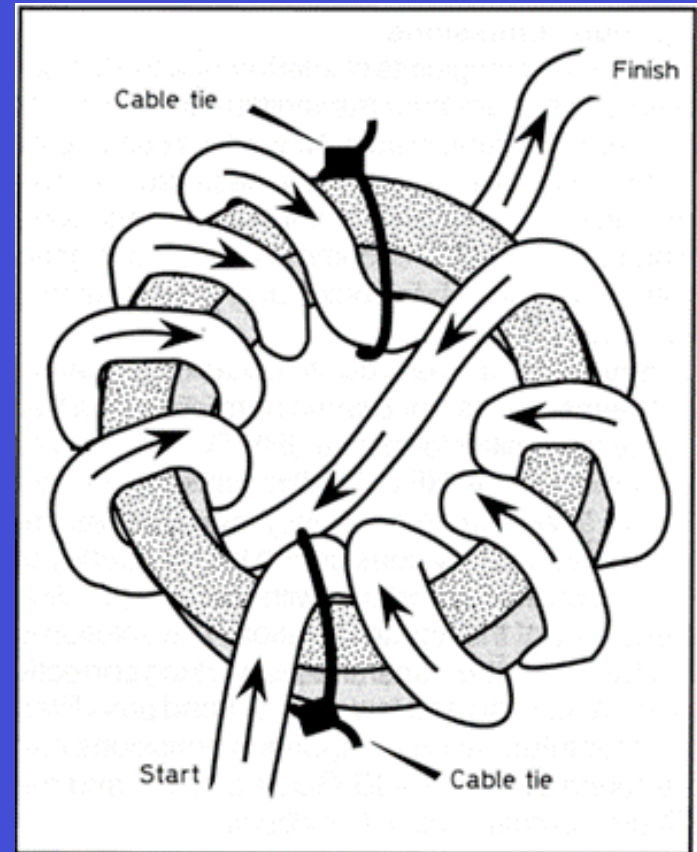
What about stopping interference to equipment?



Hi-pass or notch TVI
filters



What about stopping interference?



Ferrite rings – use on speaker, keyboard, mouse leads etc



Conclusion

1. Keep your antennas away from your house to reduce noise
2. If you use an end-fed, put the feed point /ATU outside, not next to you. Better to use a balanced antenna eg dipole, Yagi, doublet
3. Keep your dipoles properly balanced – drop the feeder to ground at right angles and run it along floor
4. Use chokes to reduce common mode currents
5. Search out noise sources in your house with a medium wave/ shortwave radio. If getting interference from neighbours go walkabout with a shortwave receiver or portable radio.