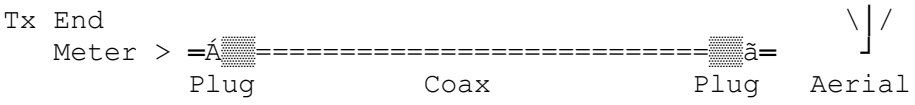
Coax Feeder Tests

By John G8MNY (Updated Feb 11)
(8 Bit ASCII graphics use code page 437 or 850, Terminal Font)

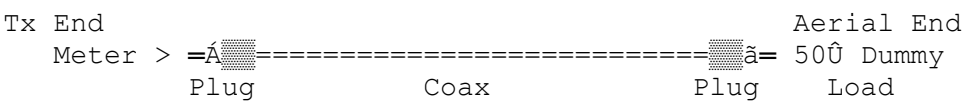
When putting up a new aerial system (fixed, /P or /M) it is generally worth while testing the feeder. RF SWR testing seems the best as far as the Tx goes, but it is not always fool proof!

DC TEST

With an Ohm meter it is quite simple to measure the coax & if there are no copper whiskers across the Tx or Aerial coax ends an open circuit will be seen.



But this is not the most efficient DC test, by putting a dummy load at one end e.g. instead of the aerial, Short, Open circuits & then RF tests can be done.

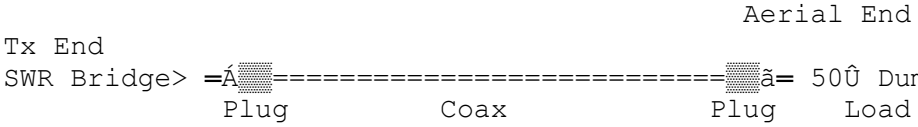


Here the meter should reads 50Û + cable DC resistance.

LOG AERIAL DC TEST

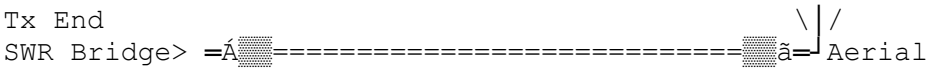
It is worth noting (in your log book for example) if the aerial is a DC short or not, as this will cut down a lot of hassle later if there is a problem.

RF TESTING



After the DC test, this RF test will reveal if there is problem that will affect the Tx. Try sliding your hand along the coax to see if there are changes! If there is RF is leaking out! E.g. too long an unscreen tail into the plug, screen earthed at wrong part of plug (UHF).

Now putting the aerial in should give the same results.



It is possible to get a good DC & RF SWR indication on a faulty installation, where say the braid is bypassed by other earths & the coax outer then becomes the aerial. This is a safety issue in cars, where say 50W of 70cms is fine to an external aerial, by might cause brakes or airbags to go off if radiated inside the car!

CONNECTORS
The most common is PL259, with its 4mm wander plug centre it is rated at 500V & 10A, it is hardy plug usable to 200MHz (400W). The Z is not 50Û on the cheap Versions & generally the mismatch length is so short compared to a 1/4 wave it is quite irrelevant as is the loss, fully waterproof 50Û version are made but for a price! To waterproof the cheap ones it is best to fill them with grease (Vaseline) & then clean off the outside & tape over with amalgamating tape. Making a good shield connection in some designs can be difficult & some have white nylon insulators that melt easily when soldering up, while others have brown ones that burn & char on very high voltages. Small cable bore plugs or adaptors are needed for thin coax. There are "in line female SO239" made, if you can find them, otherwise you need barrel joiners.

N connectors are used above 200MHz, these are made to be 50Û & 75Û, & are fairly rugged, but the thin centre pin, socket & small 6mm surrounding shield connection (not the screw up bit) must give good RF connection to maintain 50Û & low losses. The thin centre pin & mating leafed pin are quite fragile & are not rated to carry heavy current like the 259 so high SWR & high power can potentially damage it. There are many designs of plug/socket with loads of fiddly bits to put on the coax in the right order, but the principle is to keep the Z constant, so the outer connection is made close to the front of the plug as possible, until the centre conductor size alters. Be aware the waterproof seal not only keeps water out, but keep it in too!

BNC connectors use the same small 50 or 75Û pin N plug system, but with small bayonet locking arrangement. Normally made for 5mm & 7mm coax, but larger cable types are made.

TNC connectors are as BNC, except have a smaller screw outer than the N type.

All 3 types plug into each other to make a good RF link when the outer screw/ bayonet/larger screw parts do not foul.

SMA/SMB/SMC series of small connecters are use on UHF small QRP kit. My advice is to get a wander lead to a sensible plug/socket, to take the cable strain off the tiny connectors & kit.

See Tech buls on "PL259 Losses", "Cable Tester", "Coax Faulting" & "A Versatile Pulse Tester".

Why don't U send an interesting bud?

73 de John G8MNY @ GB7CIP