

The “Grey Nomad’s” Guide to Australian TV Reception.

Compiled and written by

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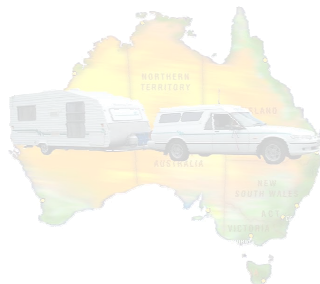
of

The Wandering Tews

Issue 15, 25th June 2009.

Web site: www.wanderingtews.com

The Wandering Tews



About this Document.

It is the intention that this document be a rough guide only to hopefully give the Grey Nomad, and other caravanners, an insight into TV aerials, configuration set-ups and some problems associated with them. My intention is not to give exact technical details with this document, and it is hopeful that I may be able to provide some URL's for web sites that can provide the detailed information if anybody requires it.

About Me.

As of beginning to compile this document my wife, Linda, and I have been among the many 'Grey Nomads' touring this great land of ours in a caravan for 5 1/2 years. In this period I have discovered that there are many varied configurations of TV transmissions in different areas of the country. I have also noticed that there are a lot of fellow travellers out there that do not have a very good perception of these transmission configurations and put up with some very poor reception in some areas.

It has become very apparent to me that with the upcoming turning off of the analogue system, forcing everybody to start using the new digital system, TV reception could be a bigger bugbear for many if they do not receive some perception of reception principals. Therefore it is hopeful that this document may be of some assistance to many of those fellow travellers.

My background.

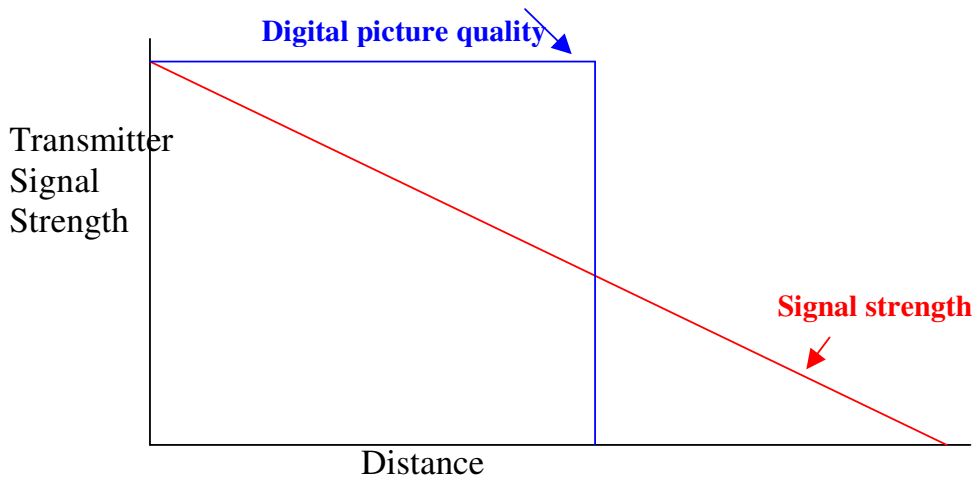
During the 35 years prior to our travelling I was employed by Telstra (Australia), giving me a fair range of experience in the electrical and electronic fields. Over these years I received training and knowledge in many and varied fields including TV transmission and reception principals. Although much of my learning in the TV area was of a theoretical nature I didn't have a great deal of practical experience until we started our travels.

It didn't take me long to realise that if I wanted to get a good reception I would have to experiment with different aerial configurations with the equipment I had on hand, and transmission information I managed to download from the internet. My wife will readily relate her stories of how I would be persistently fiddling with our aerials and their configurations to obtain a better picture.

Then came along digital reception by the installation of a Set Top Box and I could see this could create more problems for those who have limited, or very little knowledge, on this subject.

Transmission Theories.

Below is an explanation of how aerials can effect analogue and digital reception.



The left hand line represents the transmitter signal strength.

The bottom line represents the distance one is from the transmitter.

The **red line** represents signal strength, analogue and digital, received and consequently the analogue picture quality. As one can see the further one is from the transmitter, the lower the received signal strength is, hence the lower the quality of an analogue picture.

The **blue line** represents the resultant picture quality of a digital signal. One can see that the resultant picture quality is at a maximum until one is at a distance when the signal strength, or quality, becomes too low for the STB to recognise. When at or beyond this distance there will be no resultant picture at all.

There are basically three things with aerials, apart from faults and trees, that will effect signal reception, if **one or more** of these things are incorrect the result is to effectively increase the distance one is from the transmitter. If it is analogue one is receiving, then the picture quality will be reduced. If it is digital that one is receiving, then the result could be to effectively take one beyond the distance of good signal strength, hence no picture reception at all.

The three things are:

1. Aerial Type
 - a. VHF aerial.
 - b. UHF aerial.
2. Aerial polarization.
 - a. Horizontal.
 - b. Vertical.
3. Pointing aerial at Transmitter.

For an explanation of these things refer to terminologies following on next page.

Some Transmission Theories and terminologies.

Note: The following terms are meant to general only, for simplicity, and do not necessarily reflect genuine truisms.

There are several terminologies with TV transmission/reception that should be explained first.

1. VHF. (Very High Frequency)
 - This is the transmission on channels within the *lower* spectrum of the frequency range, consisting of bands 1-3.
 - Aerials for reception of this range need a bar, or several bars, of a length varying between something like 1-2 metres, generally the middle of the range will suffice.
2. UHF. (Ultra High Frequency)
 - This is the transmission on channels within the *upper* spectrum of the frequency range, consisting of bands 4 & 5.
 - Aerials for reception of this range need a bar, or several bars, of a length varying between something like 15-30 centimetres, generally about the middle of the range will suffice.
3. Horizontal Polarization transmission.
 - This requires the bars of the aerial to be laying in a horizontal position for best reception.
4. Vertical Polarization transmission.
 - This requires the bars of the aerial to be laying in a vertical position for best reception.
5. Analogue transmission.
 - This is the existing method of signal transmission. (Due to be turned off around 2008-2010 or so in major populated areas, but later in remote areas)
6. Digital transmission.
 - This is the new method of transmission and uses the same channel range as analogue. It gives a perfect picture. (Started a few years ago and now working in most major populated areas, but will be a little while in remote areas)
7. Aerial Signal Booster.
 - This is a signal amplifier placed either on the aerial masthead or inside close to the TV receiver. Some aerials (eg. Phaselink and roof mounted(Wineguard and similar) aerials) can have a booster installed inside the actual aerial.
 - It is important to note at this stage that these boosters require a power injector, mounted inside the caravan, consisting of a power supply (from 240V) connected to a small box that the aerial fly leads connect to. *I have noted over time that some people have the misconception that the power injector is the actual aerial booster, if this is inserted in the aerial line on its own, without the actual booster, absolutely no benefit will be gained.*

8. Aerial Fly Leads.

- These are the aerial leads that connect from the inside wall socket, via the power injector if installed, and the TV reception equipment.
- It is important to note at this time that I have proved that some shop purchased, pre-fabricated, fly leads are not of a good enough construction for digital signals, and if used will reduce signal quality by up to 10-15%. (This will later be shown to be very important) It is my recommendation that all fly leads be self constructed of the same quality cable that one would use externally from the aerial to the wall socket.

9. STB (Set Top Box).

- This is the unit required to receive the digital signals and convert them to a signal that can be played on an existing TV receiver. The other option is to purchase a new digital TV receiver.
- It should be pointed out at this time that one must be careful when buying an STB. Most sets are constructed with the house situation in mind and not the travelling situation, and retuning when arriving at a new destination can be rather difficult. (having the 'Grey Nomad' in mind) My research has shown a couple of models that are easy to use for the traveller. These are listed near the end of this document.

10. Bands 1-5. (Bands of channel transmission)

- There are 5 groups of channels in the VHF and UHF frequency spectrum, each listed as a Band. Some of these bands are not used in the existing analogue system, and likewise some are not used in the new digital system.
 - a. Band 1 is Channels 0-2 in the VHF spectrum.(Not used in digital system)
 - b. Band 2 is Channels 3-5A in the VHF spectrum. .(Not used in digital system)
 - c. Band 3 is Channels 6-12 in the VHF spectrum. (11 & 12 Not used in analogue system)
 - d. Band 4 is channels 28- 48 (or so) in the UHF spectrum.
 - e. Band 5 is channels 49- 69 (or so) in the UHF spectrum.

11.HDTV (High Definition Television)

- This is a digital transmission channel that is of a higher quality than normal digital transmission. The HD channels will be received by all STB's, but requires a HD compatible television and Set Top Box to be able to watch them.

12.EPG (Electronic Programme Guide)

- In some areas some digital broadcasters will transmit a channel with an EPG, so one can easily see what is on that broadcasters channel for that day.
- EPG is also a facility with Set Top Boxes that with a push of the EPG button one can view details of the programme presently running, and what programme is coming up next, depending on the STB used.

13.LCN. (Logical Channel Numbering)

- All digital channels are allocated a number (LCN) when tuned in, if LCN is turned on in the STB (which is generally defaulted to on). This number can be seen on the left of the

channel list, and is basically a programme number allocated so one can select each channel by the numeric pad on the remote control by entering the appropriate LCN. This can be related to the programme numbers that analogue channels are stored on the TV at present. The LCN numbers are always the same for respective channels at whatever location one is at. Below is a chart listing the LCN numbering system, column 2 shows the LCN's for the basic channels, the next column lists LCN's for (HD) High Definition channels, the next column is for Electronic Programme Guide (if transmitted) and then there are some miscellaneous channels transmitted by each broadcaster with non standard numbers. Seven country, for example, is the equivalent channel for Seven one tunes in when in a country district, eg NBN or PRIME, and the same applies for Nine and Ten.

Channel	LCN	HD	2 nd Channel	Misc Channels
ABC	2	20	ABC two 22	21>
SBS	3	30	SBS two 32	31>
Seven Country	6	60		61>
Seven Cap City	7	70		71>
Nine Country	8	80		81>
Nine Cap City	9	90		91>
Ten Country	5	50		51>
Ten Cap. City	10	1	1 HD (SD) 12	11>

Ten Cap. Cities in its wisdom has decided to be different than other channels.

14.MUX. (Multiplexer)

- **COMPUTING device for routing data:** a device for sending several different data streams down a single communications line.

I feel another analogue comparison happening: With analogue, when TV broadcasts are received they are each received on a particular channel. With digital the reception from each broadcaster is still received on a particular channel, but in this case the channel is referred to as a MUX as each broadcaster can, and do, transmit numerous channel (data) streams within the one channel.

15.RCA (AV(Audio/Vision)) connectors.

- The normal connection method between STB and TV, or VCR and TV, or STB and VCR and TV. The cable consists of three leads with plugs coloured yellow, white and red.

What is ahead in this document.

It would be my intention to provide some basic information only, on two subjects, TV aerial configurations, and Digital reception with Set Top Boxes.

TV aerials and configurations.

The issue of being able to receive a good picture in all, or most, areas where the 'Grey Nomad' might travel is a very complex one, so I am hopeful this explanation may be helpful.

Let's start by trying to explain why there is trouble receiving good pictures in different areas: Let it be noted that some VHF aerials will not pick up UHF channels and vice-versa.

TV transmission in different areas can be of many different configurations, and if you do not have an aerial system that is variable to suit these different configurations it stands to reason that you will not get good reception on all available channels in some areas.

Some of the configurations are:

- All channels being transmitted in the **VHF** range with **horizontal** Polarization.
- All channels being transmitted in the **UHF** range with **horizontal** Polarization.
- All channels being transmitted in the **VHF** range with **vertical** Polarization.
- All channels being transmitted in the **UHF** range with **vertical** Polarization.
- Some channels being transmitted in **VHF** range with **horizontal** Polarization, and some channels being transmitted in **UHF** range with **horizontal** Polarization.
- Some channels being transmitted in **VHF** range with **vertical** Polarization, and some channels being transmitted in **UHF** range with **vertical** Polarization.
- Some channels being transmitted in **VHF** range with **vertical** Polarization, and some channels being transmitted in **UHF** range with **horizontal** Polarization.

As you can see so far there are many different configurations, and there are more than are listed above. Some good further examples are:

- Winton, Queensland, ABC and Central 7 are **VHF** and **horizontal** from a transmitter 16 Km north of town, and with Imparja and SBS being **UHF** and **horizontal** from a transmitter on the water tower in the middle of town.
- Longreach, Queensland, ABC and Central 7 are **VHF** and **horizontal** from transmitter 10 Km east of town, and with Imparja and SBS being **UHF** and **vertical** from a transmitter on the water tower in the middle of town.

We can now see that in these cases not only do we need both a VHF and UHF aerials, but separate ones pointing in different directions, and sometimes with different polarizations, if we want the best reception.

When we discuss digital reception later it will be seen that in some areas it **will be essential** to be able to achieve these varied aerial configurations to get a good signal level so we can receive all channels.

Problems with buying TV aerials.

It doesn't matter whom one buys a TV aerial from they will always give you the same story:- "This aerial will give you good reception all round Australia". If the said aerial is not capable of meeting all the configurations as previously described, this statement cannot be a correct one. The aerial may be good in a lot of areas both analogue and digital, but may only give you some sort of low signal analogue reception in some areas and nothing for digital.

As explained later, there is no difference between an analogue and digital aerial.

I bet this is all starting to sound very confusing!! Well it does get worse.

What type aerials do I use?

To my knowledge there is not an individual aerial made by any manufacturer that will easily achieve all the configurations listed earlier, so generally two aerials will be needed to achieve this.

I use two type aerials, one is a 'Happy Wanderer' (Those one pole aerials in a white PVC conduit), I find this one is good for VHF, especially Bands 2-3, but not exceptional for UHF although it is reasonable for Band 4. The other is a 'Phaselink' (one of those square ones with metal reflectors on the back and the receiver bars on the front), this one is good for UHF Bands 4-5 and also reasonable for VHF Band 3. I only use the Phaselink UHF (front) section as I found the rear (VHF) section not as good as the Happy Wanderer and it was not easily turned to vertical polarization.

I also use a pole mounted 'GME Kingaroy' booster. This booster has the feature of connecting both a VHF and UHF aerial to combine both signals down one aerial lead (diplexing). When using this configuration I use the 'Happy Wanderer' connected to the VHF input, and the Phaselink connected to the UHF input.

I must mention here that some Phaselink aerial have a built in booster so be careful not to use one of these as well as any other booster, **if you do have two boosters the chances are that you will not get any reception at all** because one of the boosters will not receive any power so therefore it will not allow any signal through.

I also have the aerials mounted on my pole so each one can be mounted either horizontally or vertically, and can also point in different directions so I can meet any of the above configurations.

I also have a big advantage over most 'Grey Nomads', I have a laptop, Mobile internet access, and internet sites that give me all the information I need to configure my aerials accordingly when I arrive at a new destination.

The problem is that not many other travellers have access to this information, so how do they configure their aerials in the different locations, if they even have one they can configure. Some suggestions are provided later.

The best I can do at this stage is give you some web addresses. Bear in mind the information available on these web sites will only be of any use if you understand it all, good luck.

All nationwide transmitter details

http://www.acma.gov.au/ACMAINTER.65646:STANDARD:1579804827:pc=PC_9150

(if too long to type, try 'copy' and 'paste' the address into your browser, or go to the home page and one should find their way through)

ABC channels and coverage maps etc.

<http://abc.net.au/reception/freq/>

My site: For details of channels and Polarisation.

<http://wanderingtews.com>

I have compiled booklets of reception details for all areas, for each state, and are available for free download on this web site. See the TV Reception page.

Let's now talk digital.

It is the intention of introducing digital TV transmission Australia wide sometime over the next few years. It is also the intention that when digital is fully up and running to turn off the existing analogue system, so we will all eventually have to convert.

As the digital transmission uses the same channels and frequency ranges as the existing analogue system, and use the same configuration settings in each area, it will be necessary to be able to achieve the same variable configurations as explained above. If you have an aerial to cover all the configurations covered for analogue above, the same one will be sufficient to receive digital signals. ***Do not let anybody tell you that digital aerials are different from analogue ones, it is simply not true.*** What some people may have to do in their **houses** is change the aerials because some of the digital channels may be in a different band than the analogue for that area, and they may have a single band aerial only.

As explained on page 3 it will **actually be more critical** that one can achieve these configurations with digital transmission, so I can only envisage that a lot of 'Grey Nomads' are going to have much more difficulty in getting good TV reception on all available channels in a lot of areas when forced to use digital.

The only other easy alternative I could come up with is to convert to Satellite reception, it would make it a lot easier as you would always have only the one configuration to comply with, it being pointing the dish. All one would have trouble with is pointing the dish in the right direction, but with practice this would become very easy. The channels received would depend on what each individual wanted, but would ultimately be different than terrestrial reception. See 'The Grey Nomad's guide to Satellite' on my web site:- <http://wanderingtews.com>

Converting to digital.

Once you have sorted out your aerial, if you don't have a digital tuner in your TV, all you have to do is purchase a Set Top Box (STB) and connect it up to your existing TV, tune it in and you will receive a perfect picture (and I do mean perfect) on all channels available in any areas. The connection method to the TV can vary depending on requirements, but are generally via RCA (AV) connectors. Some STB recommendations come later.

The problem created with digital associated with aerials.

I will have to make several comparisons between analogue and digital reception methods so I hope it is not too confusing.

Tuning the existing analogue system.

When one now arrives at a new destination not knowing anything about the transmission configuration and transmitter location, one would assemble his aerial and point it somewhere.

The next step would be to go and tune the TV. In a lot of cases most channels, if not all, will be received but in a poor condition due to the aerial being pointed in the wrong direction, so then one would go and turn the aerial around until the best picture is received. Some would then retune the TV to now receive the channels missed earlier.

After this all happens, in some cases, a reasonable but only just watchable picture will be received, so most will be happy to stick with what they have not realising that they then may only have to reconfigure their aerial for that area to receive a much better picture.

Let's now compare with digital.

Tuning a digital system (STB) is not quite this simple because the main difference with analogue and digital signals is:

An analogue signal will generally give you a picture of some sort no matter how low the signal strength is, to a limit anyway. The picture sometimes is basically unwatchable until you tune your aerial by turning it around, but at least it is there.

With digital reception this is not the case, as shown on page 3. If the signal strength is too low, I refer to about 50% or so or lower, in comparison to analogue, then you will not receive any picture (data for tuning) at all. This is a feature of digital, you either get a perfect picture or you get nothing at all, **so you must have your aerial pointed in a reasonably accurate direction to start with so you can get enough signal strength for the STB to receive the data required to tune it in.** A method to do this is covered shortly.

Once you have received something you can then turn your aerial to get the best signal strength, and tune it again. You might ask how you can see the difference in signal strength when all you get is a perfect picture anyway, well digital offers a lot of extra features as will be demonstrated when you do upgrade, and one of these is a signal strength, and quality, meter on the screen that gives a moving coloured bar indication, a percentage figure, or both. This does make it easier to tune the aerial than watching a picture. Refer to the handbook to access these meters, (most are accessible by pressing 'OK', or 'Info', on the remote).

Let's go back to the original positioning of your aerial.

What I am about to suggest to you is something all travellers should now be doing to position their aerials, but very few actually do. When you arrive at a new destination, while driving through town look at aerials on top of the houses. This will tell you not only the direction of where the transmitter is, but also the configuration required for an aerial for this district, after all it is the locals that know all about this district. When you arrive at a caravan park a better indication of direction would be from others in the immediate location.

Don't make the same mistake as many others at this point by looking at other travellers, because they are in the same boat as you, they don't know either. Try looking at permanent sites or cabins, they will have a much better idea. You might even get all the information about direction and configuration from the permanents rather than looking at houses on your way in.

Points to consider with a Set Top Box purchase.

- When, in the past, you tuned your analogue TV you would have noticed that all the tuning from the previous location is automatically erased. With digital tuners, STB's, the data for channel reception is permanently stored within the tuner. When retuning in a new location the digital tuner must have the option to delete the previous data. With some STB's on the market today this does not occur. With these sets, when you tune for a new area you must first delete all the data from the previous location (generally called 'set factory defaults' or similar), or you will end up with a very long list of channels on your list and you will have to decide which ones are the working ones and which aren't. This procedure will become apparent with practice using the STB.
- I should at this stage point out that all STB's are not as easy to use as your old TV, as they require one to navigate their way through a menu system, and it has become very apparent to me that many 'Grey Nomads' find it difficult to come to grips with this operation. Some STB's have extremely difficult menu systems to follow to be able to successfully operate them.
- It should also be noted that it will be imperative that the STB has an easily accessible signal and quality level meter for aerial tuning. Some STB's do not comply with this as they would normally only be used in a house situation and it doesn't really matter about meters. Some do have meters, but are stuck away somewhere in the operating menu system (generally in the manual scan menu) and can be difficult to find and use. Some do not have meters at all.
- Also to consider with a purchase is that the STB has a loop out aerial socket so an aerial fly lead can be provided from here to the TV so one can still use the analogue tuner in the interim when there is no digital reception.
- It would be hard for me to recommend any particular models as over the previous years models that I have recommended have been since superseded. The Dick Smith 'Bush' range would be the ones I would recommend as they can be purchased nation wide. These models have a user friendly menu system, give an option to delete previous data when a new fully automatic retune is performed, and has easily accessible level and quality meters, and are reasonably priced.
- Another brand I have recommended is Nextwave, generally purchased from "The Good Guys", but the models I have tested have since been superseded. I can only assume that the later models are as good as the earlier ones, but seem to be a larger physical size being a disadvantage for caravanners.

I hope this information can be of help to fellow travellers, as I do already see many people are having trouble getting good TV reception because of the aerial being used. **I will say again this problem could well be worse with digital reception.**

Notes: