

## **Amplifier Selection and Uses.**

Mast Head Amplifiers have traditionally been around the 20 to 25 db range of amplification. They were intended to raise a low level signal to a usable signal level for 1 or two points.

As TVs became cheaper and more points were put in to a house mast head amps became higher in gain up to an output of 108db with a gain of 35db. In effect they were being used as small distribution amps. Although they have attenuators to lower the output this does not make it equivalent to a smaller amplifier gain in terms of noise level generated. If the input level is too low for the rated amplifier then the amplifier will generate a lot of noise resulting in failed digital pictures or noisy analogue pictures. This noise can usually be seen in the noise floor on a spectrum analyzer.

### **So when selecting an amplifier you need to be aware of the following points:**

1. How much signal is going into the amplifier?
2. What is the weather and temperature like and would the signals likely to drop significantly at night or in the winter to a point where a lower input level would result in significant amplifier generated noise.
3. How much signal out of the amplifier is required?
4. What is the likely minimum input allowed for the amplifier you wish to use.
5. What is the output of the amplifier.
6. Is the output feeding into a distribution amplifier or head end?
7. What input level to the distribution amplifier or head end is required and can the mast head amplifier supply it without creating noise.

In general choose an amplifier with around 20 to 25 db gain for a house installation unless you need to feed many points and the off air signals are coming in at 50 db or better. In that case you can use a higher gain amplifier.

Always check the noise levels on the spectrum analyzer if in any doubt. More expensive and lower noise amplifiers are available that will accept a lower level input without creating noise.

### **Setting up and amplifier**

Setting up amplifiers is a matter of balancing the input and outputs as best you can. No amplifier can deal with signal levels that vary one from another in the same band especially of 9 db or more. Therefore positioning of and choice of antenna is important for achieving a good even input of signal level into the amplifier. Failure to do this will create cross modulation within the amplifier and noisy pictures.

### **Spurious Signals and amplifiers.**

Other signals such as mobile phone towers and the new digital radio or local radio stations such as community stations operating on frequencies that are on a harmonic can interfere with the TV channel frequencies. This is beginning to happen in the frequency range of around the high 80's and low 90's that interfere with channel's 6 and 8 in particular and result in pixilation or a noisy

analogue picture.

An amplifier when added can bring these spurious signals up to a level where they cause trouble.

Again a lower gain amplifier could, maybe be used, to fix this problem or more likely an amplifier with separate inputs for each band that has very good isolation from the area where these frequencies lie, should be used. Sometimes if the radio signal is strong the addition of an FM trap may not be sufficient as the performance of the trap is insufficient. Or an amplifier inbuilt FM trap performance is insufficient. It is better to have an antenna which is not efficient at picking up the spurious signals such as a band 3 antenna only and if need be also a trap. Or if you can choose an antenna with more forward gain if the signals are being picked up from behind. Some antennas work better at rejecting signals from the side than others so they also might be a good choice. Or a horizontal stack can be used to reduce the acceptance angle.

In any case the signals into an amplifier are important for the correct function of the amplifier. Therefore the performance of various amplifiers you use and observing the signal quality, levels and difference between signal levels entering an amplifier need to be known before making your choice.