

The issues about using passive baluns ... ore perhaps not ... do think hard!

If or when you may think about to use a pair of passive baluns for a CCTV transmission line, whatever it is because you could save a little money, or that you have been told that it is a good solution to replace coax cable with this type of transmission and then using CAT5 cable, then I strongly suggest or recommend you to read the following material very carefully (...).

In some few situations it is for sure useable to choose a pair of passive baluns at some short distances of CAT5 cable. However, for a start it shall be told that most of the balun manufacturers - if not all - in general and very unfortunately are promissing much longer transmission distances than possible to achieve, and at the same time having an acceptable picture quality for security use.

In my optics this kind of sales or marketing is an unserious attitue - bad carma!

A very good sayings goes like this ... **“the trees do not grow into the heaven”** ... which also is very truthful words with respect to the “balun issue”.

In order to assure any useful color picture having good contrast and being acceptable detailed, which is necessary for security use, the following data must be a very impotant factor in your decision.

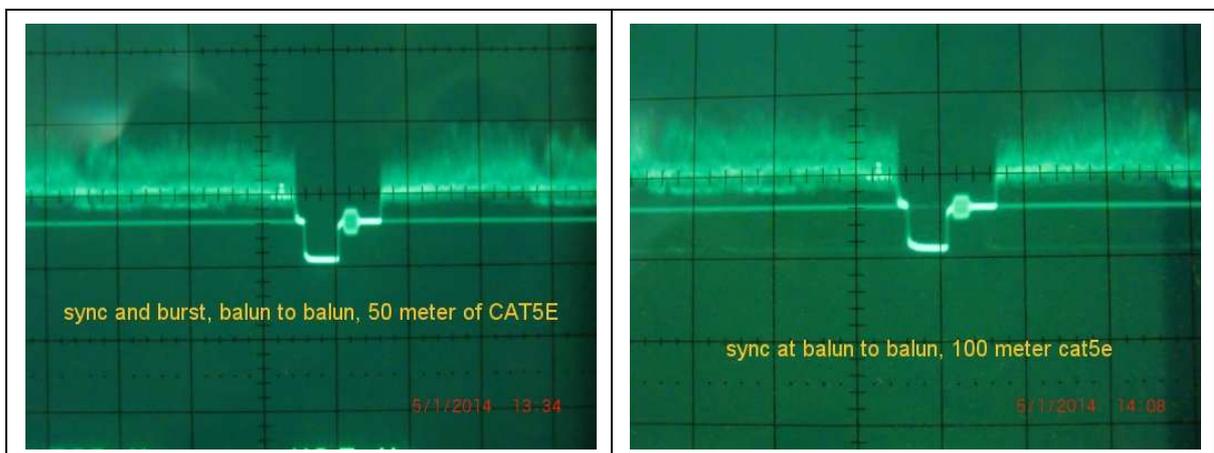
First, do remember that the lineary loss at the cable, may not exceed 3 dB total. Next, the HF loss may not exceed -4 dB for color signals and -6 dB for B/W (prefairable less), which means the condition of the burst and the singnal it self.

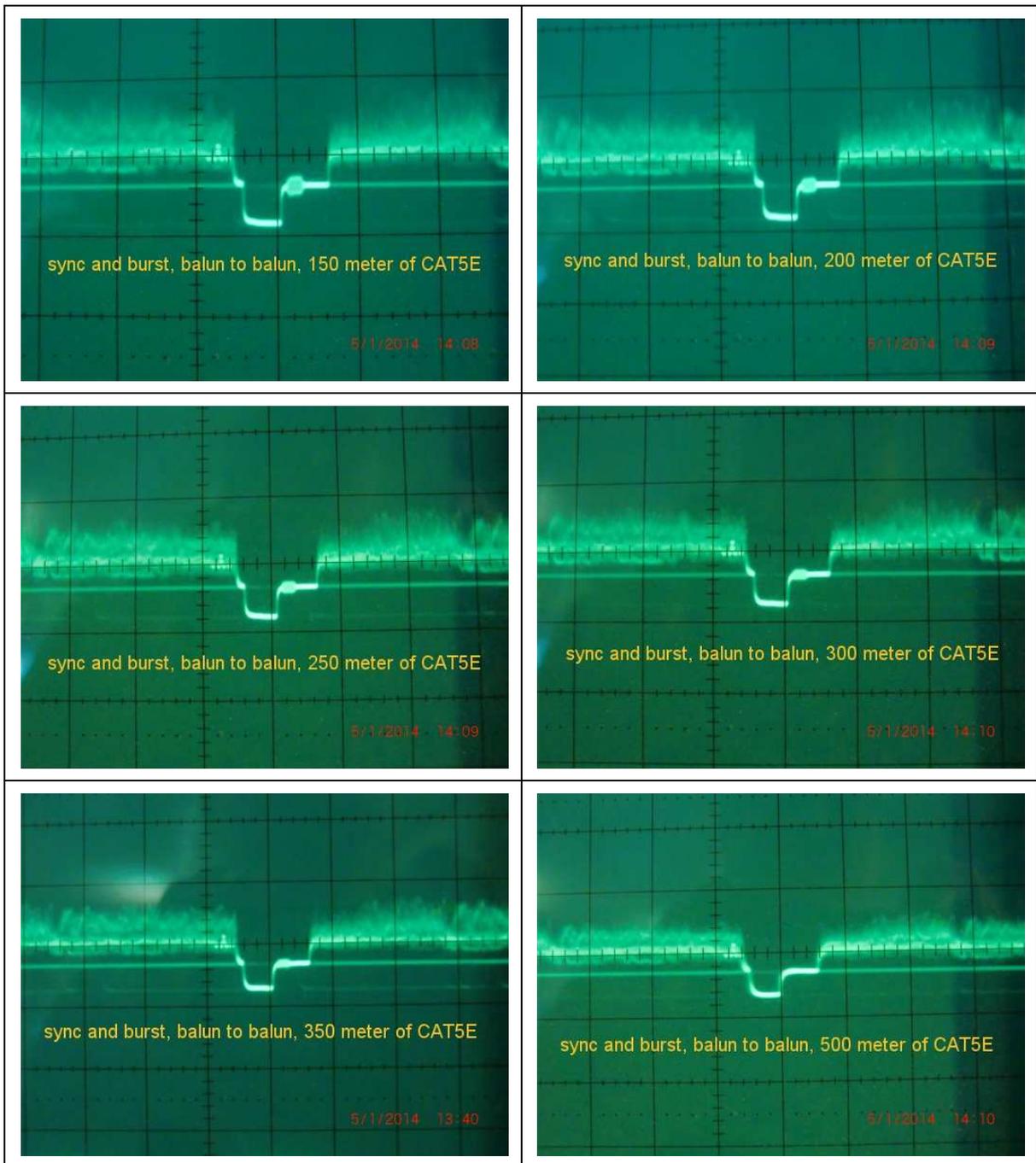
When using CAT5E, the linear loss is about -1,4 dB/100 meters or a little less, but the HF loss is -6 dB at 100 meter, -10 dB at 200 meter and close to -14 dB at 300 meter. I see no reason to mention loss for longer cable distances.

In order to show what happen, we have established a simple but very trusty test of a given signal transmitted throug a numbers of different length of CAT5E, in order to show what happen with the signal.

Below you have a numbers of scope pictures taken with a good digital pocket camera. The signal has been established by means of a high quality CCD color camera pointing at an outdoor scenario with good light conditions. The transmission is performed by means of a pair of quality baluns, and you have to look carefully at the sync **but especially the color burst**.

Below picturers show the result of distances from 50 meter to 350 meter plus 500 meter!





As you will find, the sync is changing form but not harmed very much by the increasing distances up to about 350 meter. That is expected because it is a low frequency signal. However, and what is much more important, the color burst is for sure being decreased very much, and that is *one* of the “dark horses” when using simple passive balun transmission.

Think about that the balun is just a simple impedance transformer, already introducing a small insertion loss around -0.2 dB for the best and up to about -0.5 dB for the worst. Next is, that using a CAT5 cable do not really form a proper balanced transmission line by using passive baluns, but act close to.

Next, the other “dark horse” is, that the signal at the same time is being decreased like the burst signal, consequently causing decreased contrast and sharpness, and by that you are losing important details in the picture.

Now, think about when the light condition at the same time is poor, whatever the reason might be, then the quality of the picture, the sharpness and the contrast, will be even further decreased and for the most to a quality causing that the picture is no longer useful for a serious security use - if useful at all.

Looking at the sync and burst pictures, it is very clear that the burst is close to be not existing at about 250 to max. 300 meters, and beyond that distances it is honestly not existing at all, and so with the signal.

If you at the same time is having less good light condition if any at all, you can forget all about to have a useful picture. You will not be able to recognize or even find useful details in the picture, and even the general picture will be very bad and close to not readable.

VIDATRONIC is acting very honest to our customers, by just promising distances up to 75 meter for color signal and up to 150 to no more than 200 meter for B/W signal, and kindly remember - at the same time the light conditions must be good to very good, all the time.

Establishing a good - and from a security point of view useful CCTV transmission line - and at the same time having best possible noise reduction, will at any time call for an active transmission, using an active transmitter and receiver, and of course using a proper UTP cable installation.

However, an alternative solution to this way to arrange the transmission, could be by using a passive balun as the transmitter, and then using an active and dedicated balun receiver, if there is no really noise problems. Using this combination is for sure not the same as a full active transmission set, and the transmission distances is of course limited.

This type of a special active balun receiver has been designed and developed by VIDATRONIC, having a very high quality balun transformer at the input, to assure perfect impedance match and linearity.

Furthermore the receiver is offering easy adjustment of both the linear signal gain and the HF signal. The receiver has been established as a DIN frame mountable unit for single low voltage supply of 12 to 18 Vdc, regulated or unregulated and unpolarized connection.

The story behind ...

The balun receiver has been developed after VIDATRONIC has been asked to assist to find the reason to bad signal quality at a number of CCTV installations, where the customers for one or another reason were convinced to use low price sets of baluns, and not an active transmission.

Afterwards they all found, that the recorded pictures was unusable, and further that the installer did not had the knowledge to assist with solving the problems.

The "learning" out of this is; When trying to save money in the first way by using low quality products and installers having less CCTV knowledge, will cause higher total costs in the end, when you have to acknowledge, that it is necessary to replace more or less of the installation with the right equipment. That might also include more skilled technical assistance by a trustworthy installer - honestly, kindly realize that in general you just get what you pay for!

The above mentioned product combination, a quality passive balun whether it is from VIDATRONIC or another reliable manufacturer and/or dealer, and then combined with our dedicated balun receiver, will clearly provide you a transmission distances up to at least 500 meter of CAT5E, and at the same time performing a perfect result, and that for a very fair price.

At our website, under the menu "PRODUCTS" and then press at "TWISTED PAIR TRANSMISSION", kindly look for TVR-110D and find full data in PDF.

If further information is needed, do not hesitate to contact our sales office either by e-mail or Fax.

January 2014