



FIRING OVER LONG CABLES

While EBW detonators have many advantages over conventional blasting caps, particularly in the areas of safety, simultaneity and reliability, they do have some disadvantages. One area which concerns some users is the limitation on firing over long distances. We do not recommend firing our EBW's over 100 feet (module to detonator) with RISI High Voltage Twin Lead (P/N 167-8559) or over 300 feet with RISI High Voltage Coax (P/N 167-2669). It always amazes us how many people desperately need to fire a few feet more than 100 feet with twin lead or a little longer than 300 feet with coax.

In the past, we would give the customer some mumbo jumbo about "if his fireset was in good condition, and the batteries were fresh and good cabling was used he might be able to shoot over slightly longer distances - maybe." This answer always bothered us and surely must have bothered the customer. So recently we did some thinking on how to fire safely and reliably over longer than recommended cable lengths.

As frequently happens, the solution turned out to be quite simple.

As a first approximation, an EBW fireset is only concerned with the resistance and inductance of the load i.e. the detonator and firing cable. It also turns out very nicely, that the resistance and inductance of two equal length cables in parallel is one half the inductance and resistance of one cable of the same length. Or in other words, a cable bundle 200 feet long with two twin lead cables hooked in parallel has the same inductance and resistance as a single twin lead cable 100 feet long. Or a cable bundle 600 feet long with two coax cables hooked in parallel has the same inductance and resistance as a single coax cable 300 feet long. Therefore, if you need to shoot distances longer than recommended, just start paralleling cable until you get the resistance and inductance equal to less than one recommended cable length.



300ft = 100ft (Electrical)

We tried this in various combinations and it works great. There appears to be a slight loss with larger groups of cables but not enough to worry about. One caution - all of a sudden polarity becomes very important. Mixed polarities will lead to detonator failures in a hurry. (our high voltage twin lead has a "ridge line" along one conductor's insulation to aid in keeping track of polarity). Please go to page 2



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This would also work if you don't want to leave your module out in the weather next to the shot. Just make up a large cable bundle to get you to the shot vicinity, add a short length of sacrificial twin lead to the end of the bundle and keep your module in the comfort of the firing bunker.

This can also work for EFI's. These devices typically require very low inductance, which usually forces one to use flat cables. By paralleling coax cables, the inductance can be reduced to levels at which inexpensive coax cables can be used for reasonable firing distances with an EFI. If flat cables are paralleled in order to increase the firing distance, the capacitance of these stacked "plates" could also be used as the energy source for firing the EFI. If configured in a long narrow geometry this would make an excellent firing set for downhole applications which would have the added advantage of removing the switch, converters, etc. away from the immediate vicinity of the shot.

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