APPLICATIONS FOR EXPLODING FOIL INITIATORS

Most explosive initiation systems use primary explosives which require only heating of the bridgewire to cause detonation. In concept this is clearly the simplest initiation approach. However, in reality other factors must be evaluated. The prime factor which must be considered is safety from accidental detonation. Most primary initiators incorporate some type of safety device to make the initiator less sensitive to accidental detonation. This may vary from something simple like requiring a high resistance bridgewire to something very involved like an electromechanical safe and arm system in conjunction with the explosive device. Both EBW and EFI ordnance eliminate the inherently unsafe component of the low energy hot wire initiator, which is the primary explosive.

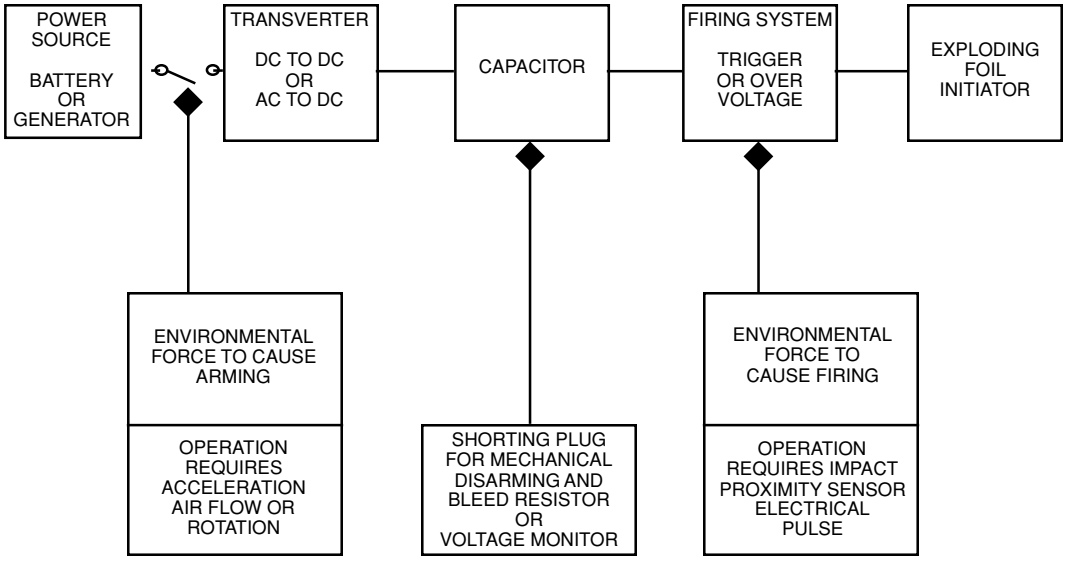
The prime advantage of EFI ordnance is that they will detonate the least sensitive explosives such as HNS. This is very difficult to do in a standard EBW configuration. Such an initiator opens up a great deal of possibilities since HNS is, in general, an "acceptable" explosive under MIL-STD-1316 for direct in-line explosive systems. All of RISI's EFI's use HNS exclusively as standard material because of its temperature and physical stability. It is either plastic bonded or 100% HNS. Other secondary explosives can be used if requested.

ADDITIONAL ADVANTAGES INCLUDE

1. High density explosives can be used for high shock applications.
2. The explosive is completely separated from all conductive parts providing additional safety from accidental detonation. Also, stability over long term storage is improved from that of a standard EBW detonator.
3. Higher temperature powders can be employed.
4. The initiator design is very simple and straight forward to fabricate. There is only one high density explosive pellet and three to four inert components.
5. The concept is presently being used as a tool to evaluate the sensitivity of explosives and explosive components.

The application of EFI's have evolved into two basic configurations. These are the coaxial cable configuration and the flat cable configuration. Generally, the coaxial configuration has used the more conventional separate firing module with a length of cable between the set and initiator. The flat configuration may have combined components of the electrical circuit being next to, or as part of the EFI. A block diagram of the system components for an EFI system is shown in Figure 10.

Figure 10
EFI SYSTEM COMPONENTS



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