# Pyrotechnic Firing System Polling Logic.

Polling is used to retrieve information about which Field Modules are online and the status information for all online modules. The operation retrieves the identification of the active modules as well as the status of the eMatch ports, the Logical address assigned to each module, the voltage measured at each module, the armed status of the module and the ID of any show that is currently loaded in each module.

Polling is done in several steps. The first step is to issue a Fast Poll, where the Fast Poll message contains the number of modules in each address group, as defined by the system Topology information.

Addressing is divided into separate address groups in the following address ranges:

003-099, 100-199, 200-299, 300-399, 400-499, 500-599, 600-699,700-799,800-899 and 900-999.

When defining the Network Topology in the VB controller program, the user enters the highest numbered module in each address group. It is important that modules be assigned addresses starting at the beginning of the address group and then in sequence. For example, modules in the 300 range are assigned 300, 301, 302 ….. 3nn, where 3nn is the highest address module in the address range.

When the Hand Controller is used, a maximum of 10 modules in each address group may be used. The Hand Controller logic is designed for this limitation.

Each Field Module responds to a single Fast Poll message after waiting for a module calculated delay. Each module calculates its own delay so that all modules respond the Fast Poll message in order from, from low address to highest address and in an orderly fashion.

The following chart depicts the message flow:

Fast Poll 🡪

🡨 Reply from module 101

🡨 Reply from module 102

🡨 Reply from module 300

🡨 Reply from module 301

🡨 Reply from module 302

🡨 Reply from module 501

🡨 Reply from module 502

Each module calculates its own delay as the (*number of preceding units* \* 10MS )+ (*number of preceding address banks* \* 50 MS).

The following delays are calculated:

101 50MS

102 60MS

300 120MS

301 130MS

302 140MS

501 200MS

502 210MS

The reason for the 50MS inter address bank delay is to allow for Radio Modem variable delays when multiple radio modems are used on different address banks. 50MS is required to prevent packet collisions when the radios transmit.

Following the Fast Poll, the PC calculates another set of Field Module delays and then broadcasts the SlowPoll Delay Message/s.

The SlowPollDelay message contains 1-24 tuples of AAADDDDD, where AAA is the module address and DDDDD is the module delay in MS. This is calculated to account for all the previous modules delays. The module delay is composed of a fixed delay portion and a variable portion, based on the number of ports.

If more than 24 modules exist, the PC broadcasts multiple SlowPollDelay messages.

Following the SlowPollDelay broadcast message, the PC broadcasts a SlowPoll message. The slow poll is used to collect all status information including the eMatch port status from the active field modules. The calculated delay, in the SlowPollDelay message, allows the field modules to report their port status information without collision.