Fuel Rod Prop Operation

The prop has no visible switches – the main power switch is a pushbutton that requires a 1-2” pin to depress (thru a hole on the end). The unit senses shock and is programmed by “tapping” it during program mode. Other magnetic sensors are used to “charge” the fuel or discharge the fuel, and if the charging base isn't handy any high strength magnet can be used to trip the internal reed switches. By using hidden magnetic switches, the unit is more rugged, tamper-proof, and weather resistant. Note that it is not waterproof however and should not be used in heavy rain or immersed.

If the unit is ever in heavy rain or immersed, be sure to unscrew the key switch end of the device and unplug the battery as soon as possible.

The unit will provide feedback when a hidden switch is tripped by LED color changes or beeper sounds.

If the fuel rod has been modified to work with the BoomBox, there will be an additional high strength magnet in the top (the longer black part) of the unit on the same side as the magnet sensor. This is used to tell the BoomBox the fuel rod is present.

Theory of operation

The prop is designed to mimic a “fuel rod” or a “mutagen container” from popular movies. It does not explode, but it does challenge the players in other ways depending on game mode:

1. The prop can require “charging” before it can be used.
2. The prop can “decay” once charged, requiring players to complete a task within a specific number of minutes (this is set in programming and not easily changed in the field). If the unit decays it must be recharged. As it decays the LEDs change from a green “charged” state to a blue “cold/dead” state.
3. The prop can become “unstable” if shaken or shocked too much. As the prop becomes more unstable it changes from Green to Red color.
4. The prop can be set to go inert if it is pushed into the unstable zone too many times. Once it goes inert, it must be recharged to be used.
5. The prop can be set to “lost” mode where it blinks and beeps once every couple seconds, making it harder to find at night or in a search and recover game mode.
6. The sensitivity can be set to different levels to make it more or less challenging to players.

If players have problems remembering what colors do what, just remind them that “GREEN IS GOOD”. Meaning a GREEN fuel rod is charged and not unstable or blown. BLUE is COLD, meaning not charged or primed (this isn’t necessarily bad, it depends on the game mode). RED is BAD, cause it means the device is exploded or abused.

Programming Modes

There are several game modes. The second mode is DEMO mode, where charging, decay, shaking and making it go inert can be demonstrated quickly. The third mode is a sensitivity

setting mode, where the admin can bump or tap the prop harder or softer (or not at all) to set sensitivity to shock. All other modes differ in options – such as whether shaking can make it go inert or how long a decay takes, if decay is even enabled.

To enter program mode, turn on the device, let it initialize. It will quickly beep the number of times corresponding to the currently set game mode (i.e. 7 beeps = game mode 7, BoomBox Prop). The white LEDs will also show mode (in binary). After beeping stops, while the unit is still white, you can change the mode by tapping the unit. Each tap will advance in modes and beep the same number of times as the mode. The LED display will show (in binary) what number mode is active, with the power switch end as the lowest bit (right =1, middle=2, left =4, add the values to get your number).

Once you pass the last mode, the unit starts at mode 1 again. Once you reach the mode you want, leave the unit alone for 5 seconds and that mode will be set.

Note – This takes some practice to get used to. You should go thru the programming process a few times to get used to it. It is probably also in your best interest to hide the program modes and power switch from the players.

Mode Details

1. Resupply Safe Mode. Starts uncharged, Decays in 30 minutes, More than 5 red zones disables.
2. DEMO mode. Starts uncharged (BLUE). Place in charging base or hold magnet near charge sensor to 'charge' to GREEN. You have 1 minute to demonstrate the shock sensing (tap it to show it turning YELLOW then RED). As the time passes the unit decays from GREEN to BLUE. If you shake the unit enough it will become unstable and blink RED and flash and beep, then go inert (BLUE). You can recharge the unit if needed.
3. Sensitivity Setting. When the unit changes to 1 white LED color, you have 5 seconds to set the sensitivity by bumping the unit with harder or lighter force. Anything harder than how you bump the device will be seen as a valid shock and push the unit into instability. To set the unit to highest sensitivity, enter the sensitivity mode and do not bump or shock the prop at all.
4. Search N Rescue. Unit needs to be set to this mode (or powered up) then carefully set in the grass or on the ground, as it uses max sensitivity at first to detect being picked up. Unit beeps every so often to aid in location. When picked up, it senses this, and starts a countdown. Get the unit to a base to discharge it (or, deliver the goods before they expire). This mode might also be useful to give the BoomBox an initial charge. It will not, however, respond if used to disarm the BoomBox (but it will work for that).
5. Hot Potato – Unit starts charged, but cant be “discharged”. Unit counts down time and explodes, or explodes if mishandled more than 5 times. To prevent explosion, the unit must be placed in a base or can slot before it detonates. This resets the timer to the start of the countdown. In effect.. the players have to keep the unit from exploding by putting it in bases. Admins could move one base around the field agter it is used to prevent an explosion to make game play more active…
6. Rush – Unit starts charged. Players have to overtake the base, and insert the

fuel rod. They must then hold the base for 5 minutes to allow the rod to explode. Once exploded, the rod resets when removed from the base and is ready to be used on the next objective. Instead of “exploding” you could tell the players the fuel rod is a hacking tool that takes 5 minutes to complete, and they must take each building (order does not matter) across the field.

7. BoomBox Prop – Unit starts charged. When placed in the BoomBox slot (or a base) it discharges and waits for removal. 10 seconds after removal, it is ready to take the charge back from the BoomBox by being placed back into the fuel rod slot. While the BoomBox is disabled at this point, the fuel rod will continue to alternate between charged and discharged state. An admin could start this mode, discharge the rod with a magnet, then start a scenario with a charged BoomBox in the process of counting down and give the special team the fuel rod discharged, and ask them to disarm the bomb, then bring back the fuel (the rod will be green if charge is recovered). Or just use it to start the BoomBox prop by giving a charged rod to players to take to the device…

Mode	Initial Charge State	Decay	Shock Mode	Name
1	NOT Charged	30 Minutes	5 Red Zones disables it	ReSupply Risky
2	NOT Charged	1 Minute	2 Red Zones disables it	Demo Mode Sensitive
3	n/a	n/a	Starts at Max, tapping sets to that level.	Sensitivity Setting
4	Charged	30 Minutes	Reacts, but wont die.	Search n Rescue
5	Charged	30 Minutes	5 Red Zones disables it	Hot Potato
6	Charged	5 Minutes	Reacts, but wont die.	Rush
7	Charged	n/a	Reacts, but wont die.	BoomBox Prop

Battery Charging

The unit uses any LiPo or NiMh battery that will fit, from 7.2V to 12v. The battery connector is a normal Deans connector for reliability (but the current draw is at most 300mA which is fairly small). There is no protection against over discharge, so be careful when using LiPOs.

A NiMh 9.6V is recommended.

To open the unit, unscrew the key switch end and remove the battery carefully, trying not to damage or pull on wires and cables if possible. When reassembling, ensure wires and components are not pinched.

Fuse

The unit uses an internal small glass 1A fuse.