Parts List: Most parts (except 35mm film can) can be found at any good electronics store or your local Radio Shack.

Main Box:
12 volt 5 amp (or larger) relay
12 volt piezo buzzer
12 volt Nicad or Gel Cell battery
Dual banana jack
Dual banana plug
micro clips
RC charging jack, panel mounted, three conductor (J2)
Project box big enough for battery, relay, buzzer and other parts
Heavy gauge (18 or better) wire for all connections
small push button for continuity check (SW2) (optional)

Remote Controller:
one plastic 35 mm film can
two conductor stranded wire of desired length
RC charge plug (P2)
3.5mm phono plug (P1)
3.5mm phono jack (J1) (for Safety Key) (if desired spring loaded SPST switch may be used instead)
small pushbutton launch switch (SW1)

(Editors Note: if you substitute components for J2 and P2, use only non-shorting polarized plugs and jacks. Accidentally shorting the Fire and Charge leads will cause the relay to close and ignite the rocket while you are at the pad. You also don't want to short the battery through the launch controller.)

The KGB Aerospace Relay Launcher for HPR

By Bob Kaplow

Relay launchers are neat because they reduce the length of heavy gauge wire you need to a bare minimum. A relay switches current through the igniter, while a lighter weight control cable is strung between the pad and your controller. Current losses due to wire length are minimized, resulting in faster, more reliable ignitions and lighter equipment. The latter is a big plus if you have to carry your range box far to the launch site.

The original relay launcher used in NIRA was designed by Ric Gaff for Bunny. Ric's design used two relays and a three wire cable. The first wire does the continuity check remotely, and the second fires the rocket. I did my relay launcher design using only one relay, eliminating the remote continuity check. When the launcher is ON, it fires the rocket. At 150 feet from the pad, you can't hear the continuity buzzer anyway, so it seemed logical and saved me a relay for another system. (Ah, but Bob. You forgot something. The people who REALLY need to be warned by the buzzer about the impending launch are the ones CLOSE to the pad. Hence the location of the buzzer in my system. - Bunny)

My relay is a SPDT (single pole, double throw) device. I originally used the other pole as a buttonless continuity check. As soon as you hook up the igniter, the buzzer tells you all is OK. If that becomes annoying, you can install the optional continuity check button. The Button also eliminates the need for a SPDT relay, so you can use the more common SPST (single pole, single throw) device.

I really need to use a heavier duty relay. The ones used by Ric were only rated at 5 amps. I'm obviously way over that. Radio Shack has a heavy duty 30 amp, 12 volt SPST relay for car stereo applications that should work fine. (Relays are generally rated for the continuous current they can safely handle; if you can't find relays larger than 5 amps rating don't worry too much. It's generally safe to run momentary loads higher than rated capacity thru them. - Bunny via Ric)

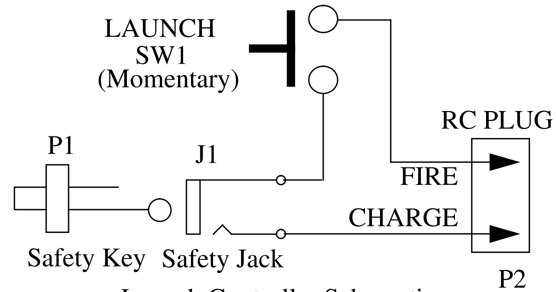
The system is built into a plastic project box, 2x4x6. I used a dual banana jack for the output, so I can connect NIRA or NARAM launch system clips to the output. I can also connect all my igniter leads from home that use the dual banana jack. There is also an RC jack that serves as both charge and launch cable connector.

My launch cable is 150' long. Make yours as long as you need for the engines you intend to fly often. At the other end of the cable is a 35mm film can. We've been using plastic 35mm film cans for launch controllers for about 10 years now. Mine contains a mini pushbutton switch and a mini phono jack for a removable interlock. (The contacts are shorted on the phono plug to create the safety key.- Editor) Run your wire through the bottom of the film can, and don't forget to tie a knot in the wire for strain relief.

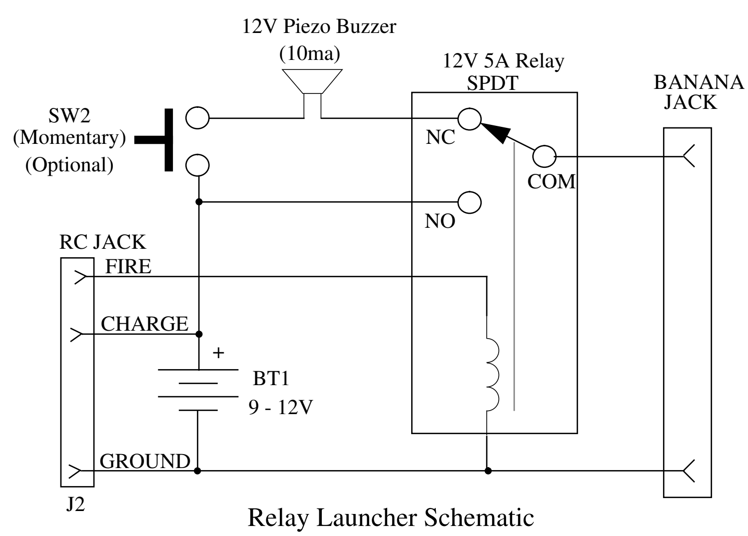
Ric's versions of launchers contain a spring loaded switch for a safety key, but the safety code requires a removable interlock. (Yeah, yeah. But having a spring loaded switch means you've got to use two hands to launch the rocket. As soon as you let go of the controller, you will disable the circuit, removable or not. And as a technical point, my removable interlock is at the battery. If you disable power to the pad, you'll never get an accidental launch, a point I argued at length in the 1985 Board meeting that got us the current safety code. - Bunny)

Construction was pretty easy. Drill holes in the plastic box for the banana jack, cable/charging jack and optionally, for the continuity check button. I used hot melt glue to attach the relay, piezo buzzer and my Ni-cads. My Ni-cad cells were a very tight fit. You can use a holder if yours are looser. All connections were point to point wired, except the connections to the banana jack. Those are attached to terminal lugs bolted into place. The larger 30 amp relay has spade lugs, so you wouldn't need to solder those connections if you went with the larger relay.

Build yourself a reliable, rugged relay launcher today!



Launch Controller Schematic



Relay Launcher Schematic