



Switch Adapted Nerf Gun

DESIGN RATIONALE

Introduction

The Switch Adapted Nerf Gun is designed to be a switch adapted toy for an older audience. The majority of switch adapted toys are designed for a younger audience, so this project aims to adapt a toy aimed at older users and make it switch accessible.

Research

Commercial			
Name	Image	Price	Link
Switch Adapted modified Dart Blaster. For special needs.		\$99.74	Link
Dart Gun – Switch Adapted		\$70	Link

Switch Adapted Nerf Gun

DESIGN RATIONALE

Switch Adapted NERF Rhino-Fire Elite foam dart gun		Price available upon email request	Link
DIY			
Name	Image	Price	Link
SWITCHED Adapted Toys - Nerf Rivals Khaos - Manual		Unavailable	Link
IATP- Switch adapted Nerf gun		Unavailable	Link

Requirements

Goals

G01	Allow a Nerf gun to be operated by an accessible switch
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Functional Requirements

F01	Add a mono jack to allow the primary user to control the feed motor
F02	Add a toggle switch to allow the secondary user to toggle the flywheel motor
F03	Add a stand that allows the gun to standalone on a surface and be mounted on a ¼-20 UNC system

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Non-functional Requirement

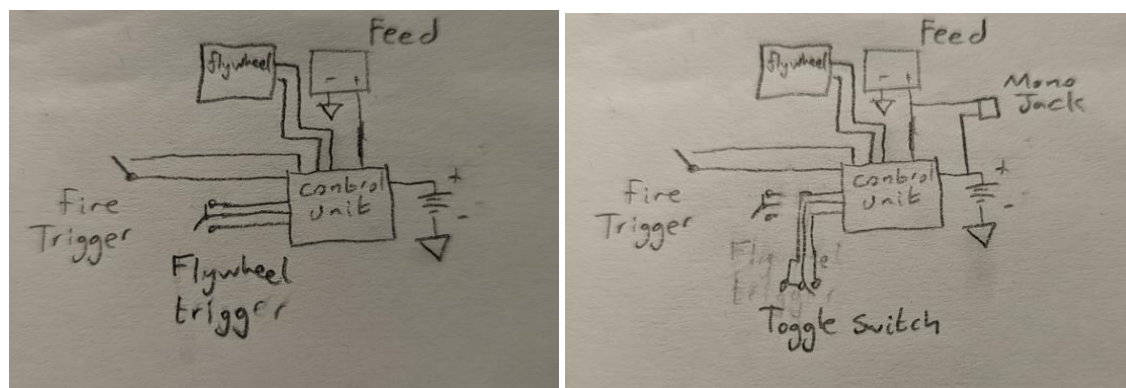
NF01	Add a second mono jack to allow the primary user to operate the flywheel motor.
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Constraints

C01	Design must still allow the gun to be used normally
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Prototyping

When opening the gun, the circuit was found to be different from the circuit in the gun in the tutorial video. Minor changes to the procedure had to be made to adapt the feed motor trigger. The initial circuit diagram can be seen on the left, while the modified circuit diagram is on the right.



Two stands were designed for the gun. One bipod style desk stand was designed to fit over the attachment rail and allow the gun to stand upside down on a flat surface, while a ¼-20 bolt stand was developed that attaches to the gun near the centre of gravity and allows the gun to be attached to a standard ¼-20 mounting system.

Testing

The successfully adapted toy was tested with a standard 3.5 mm switch using both the desk stand and the ¼-20 bolt stand. The gun was able to stand and support itself firing with both stands.

Opportunities for Improvement

Once the control circuit is better understood, a 3.5 mm jack can be put in parallel with the toggle switch to make the flywheel motor usable by the primary user.

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A system could be constructed to trigger both motors on the same switch, with a roughly one second delay on the feed motor to allow the firing motor to get up to speed.