

K9's retractable nose and simulated laser

Constructed from two tubes one that fits inside the another, outer tube is fixed to K9 head and the inner tube is linked to a servo.

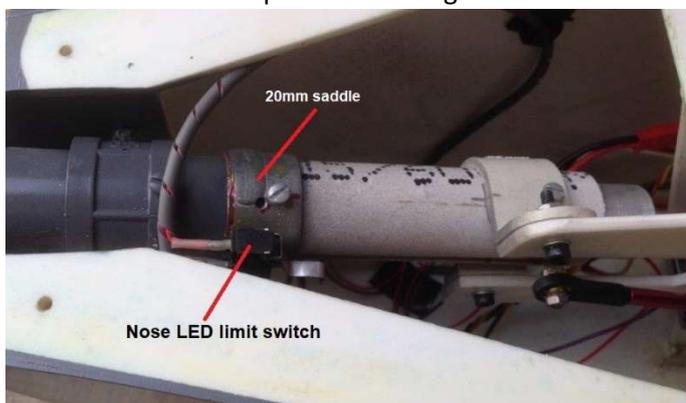
At full extension of the inner tube a limit switch is activated which applies a voltage to an LED mounted at the end of the nose to simulate K9's laser.

Constructed from 20mm PVC electrical conduit and 16mm aluminium tube, the aluminium tube slides easily inside the electrical conduit. Any tubes/ pipes of similar diameters could be used providing the inner tube slides smoothly.

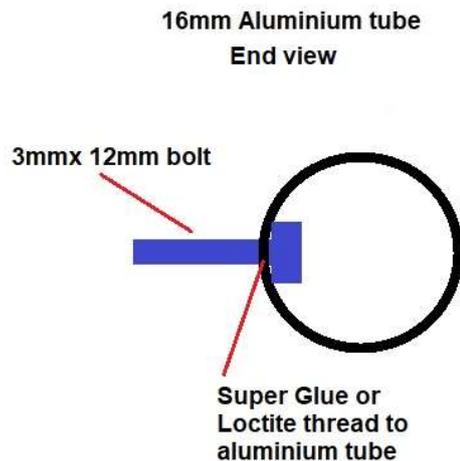
Build is based around a K9 built from Dave Everett Styrene K9 plans but the basic design could be used with other K9 builds.

Dimensions

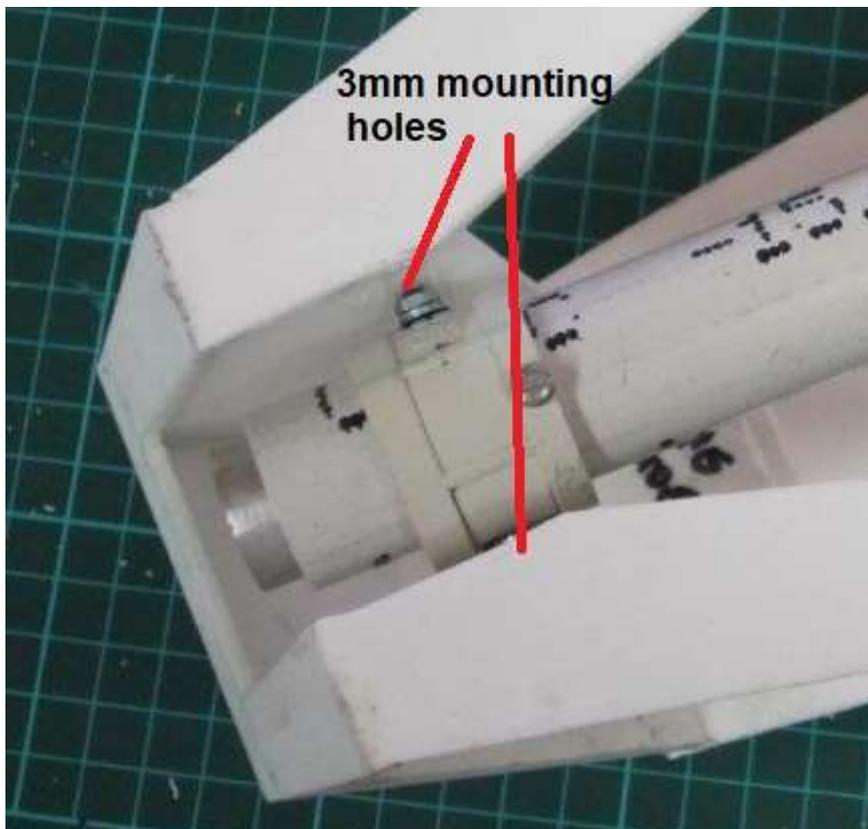
1. Cut conduit and aluminium tube to length.
2. Cut a 3mm groove in conduit, groove should have reasonably smooth side walls so 3mm screw slide easily in groove.
3. Cut threaded section off 20mm conduit adaptor (thread section not required)
Drill two diagonal 2.5mm holes in conduit adaptor and tap with 3mm tap.
4. Slide conduit adaptor onto outer tube leaving 15mm gap. With suitable size drill, drill through conduit adaptor and conduit and screw in self tapping screw to hold adaptor and conduit.
Note screw must not protrude through the conduit as this will prevent inner tube sliding.
5. Construct a mounting plate for limit switch from a 20mm conduit saddle, photo show a metal half saddle, but a PVC saddle could also be used.
Attach mount to 20mm conduit with self-tapping screw.
Note screw must not protrude through the conduit as this will prevent inner tube sliding.



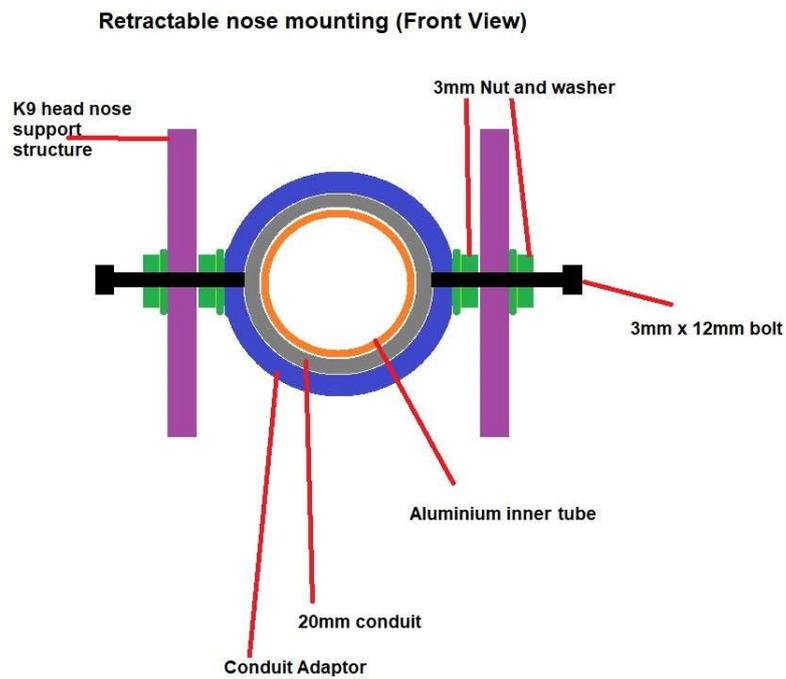
6. Drill and tap a single 3mm thread 20mm from end of aluminium tube.
7. Slide inner tube into conduit to confirm smooth sliding action. If required de-burr inside of conduit.
8. With inner tube inside conduit fit 3mmx 12mm bolt (into threaded hole created in step (6)) for inside of aluminium tube so thread extends outwards. Super Glue or Loctite bolt to inner tube.



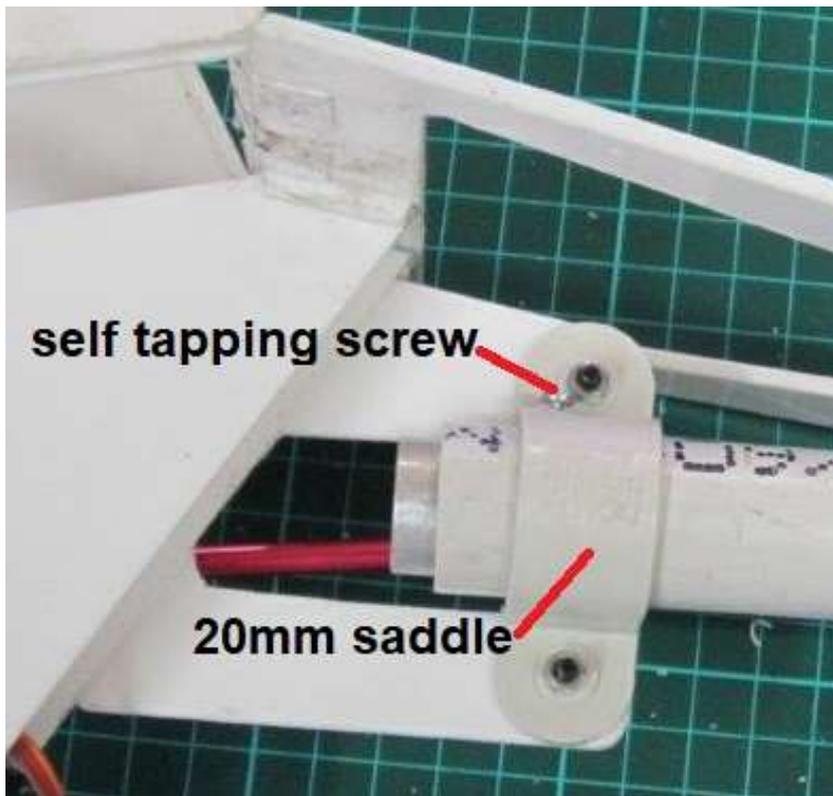
9. Place retractable nose assembly into head and align mounting holes in conduit adaptor created in step (3.).
Mark out and drill 3mm holes in K9 head.



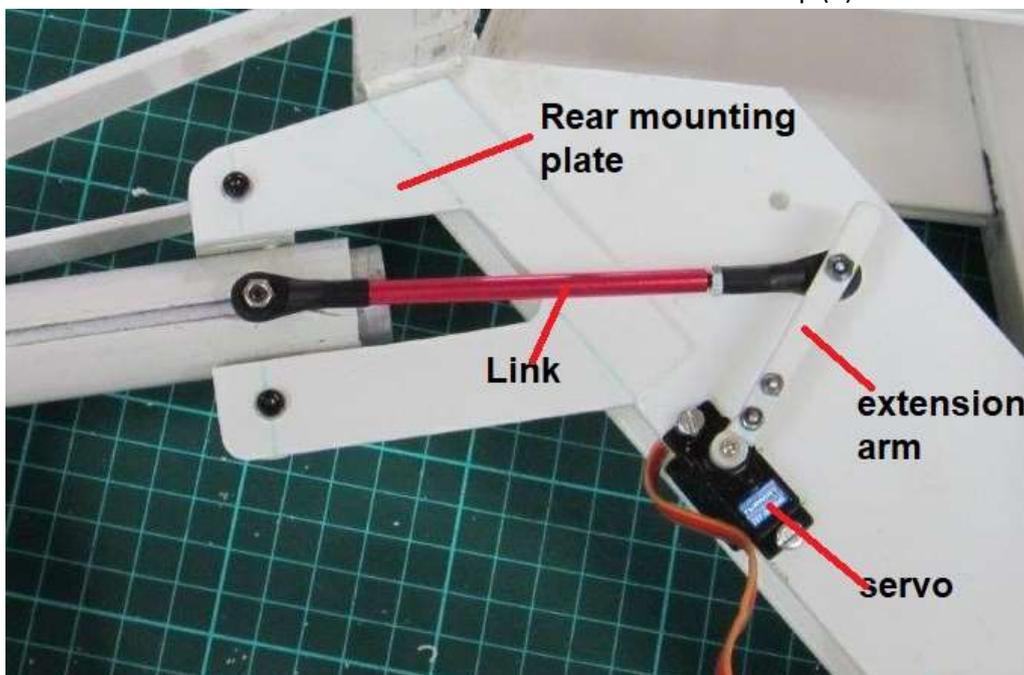
10. With retractable nose in place fit 3mm mounting bolts through K9 head and screw into Conduit adaptor.
Fit washer and nut between head and conduit adaptor to reduce sideways movement.



11. Rear mount manufactured from a 20mm conduit saddle and mounting plate that is glued or screwed to existing head support structure.
Single self-tapping screw used to hold saddle and conduit secure.



12. Mount servo on existing head support structure.
13. Manufacture servo extension arm and attach to servo arm supplied with servo.
14. Attach a Link between servo and aluminium tube bolt fitted in step (8)

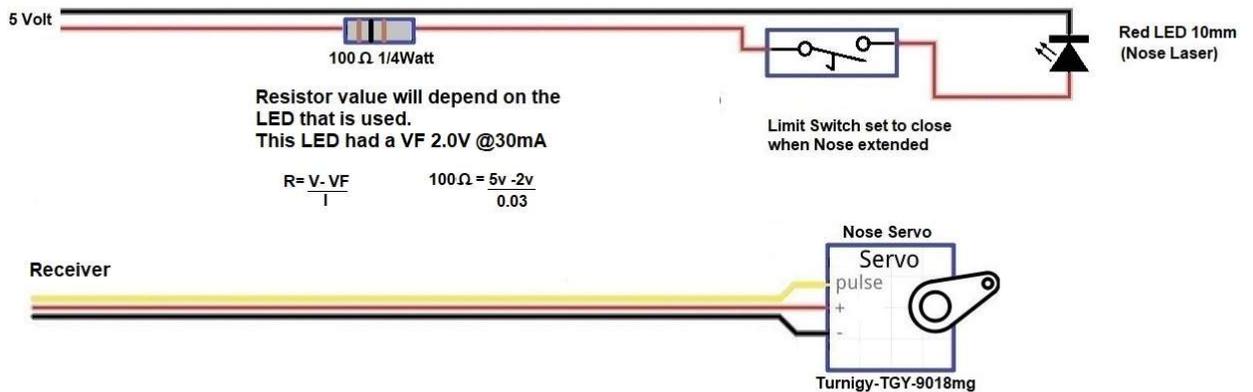


15. Many options for the simulated nose laser this one is a 10mm Red LED fitted into a chrome bezel



A resistor is required to limit current to the LED, the resistor value will depend on the LED used, and the LED supply Voltage.
 Some the LED bezels combinations are 12Volts so can be connected to the 12V main battery without the need for a resistor.

LED is glued to the end of the Aluminium tube and the cable is ran through the aluminium tube.



The servo is connected to one of the receiver channels (in my case Channel 2), in the radio transmitter a switch of pot can be configured to control the servo.

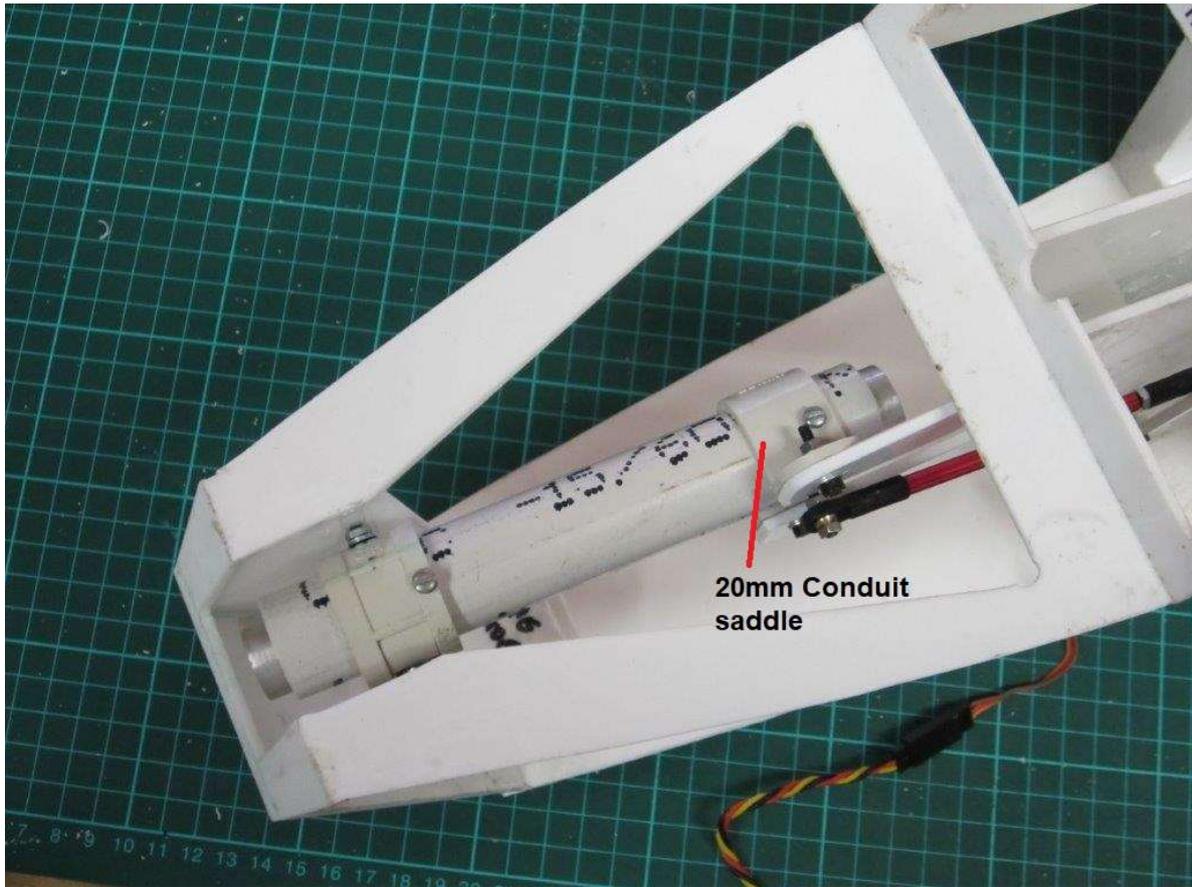
This is the mix I've used for a Taranis transmitter.

When switch (SA) is on a 110% command is sent to Ch 2, the slow statement means it will take 5 seconds to move the servo to 110%. When switch (SA) off servo will move back to 0%

CH2	MAX Weight (+110%) Switch (SA-) Slow(u5:d5)	Nose laser servo
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Video link of nose retraction <https://youtu.be/02ua43ASHqU>

Construction Photos



20mm Conduit saddle

