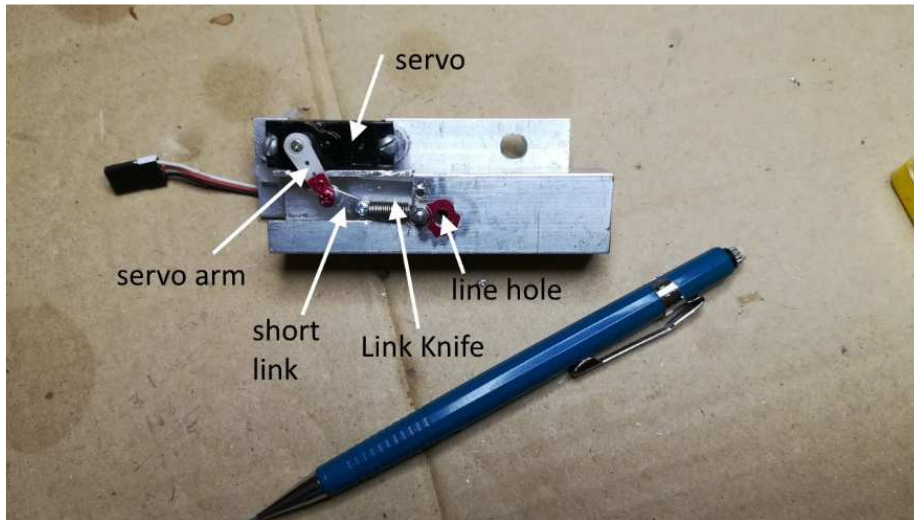# HyperCut User's Manual

Design and engineering – Had Robinson
RC setup – Lee Boone
Test pilot – Sam O'Donnell

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The HyperCut instantly ends a tow by disconnecting the towed pilot just in front of the drogue parachute.

Parts

HyperCut w/ Line Knife™ and control wiring assembly
Nylon electronics bag
Foam container
Small 4mm maillon
1" split foam pipe insulation and a sample 4 ¾" piece with a slit for the HC line.
masking tape (not supplied) used to secure pipe insulation to HC
RC radio
RC receiver
on/off switch assembly
battery container w/ (4) alkaline batteries (NiMH rechargeable batteries may be used instead)
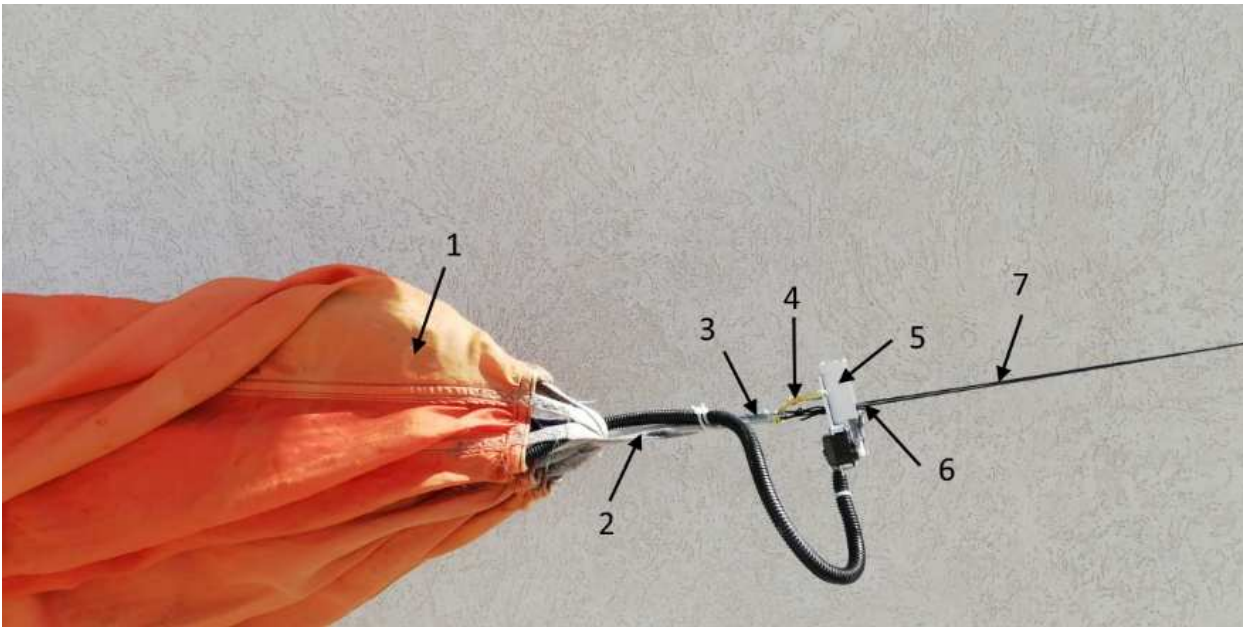spool of light duty polyester HC line w/ special threading tool
drogue parachute (not supplied)
nylon zip ties

Installation & Testing

Refer to the photos below when installing the HyperCut

A. Connect the light duty carabiner to the internal part of the nylon strap assembly (#10 in the photo above). The carabiner must adjacent to the knot (#9 in the photo above). Be certain that the knot in the strap assembly (#9 in the photo above) is in the internal part of the drogue as shown in the photo above. The bag containing the foam container will connect to this carabiner.

B. Connect the small maillon to the external part of the nylon strap assembly (#2 in the photo above). (This end of the strap assembly is normally where the weak-link assembly would be connected.)

C. Using the short piece of Dyneema (#4 in the photo above), connect the HC via the mounting hole to the maillon. The HC must be firmly attached to the drogue when the HC is activated. The wire loom/cable assembly is not strong enough to keep the HC from breaking away from the drogue.

D. Feed the wire loom containing the control and battery monitoring cables through the narrow opening of the top of the drogue into the interior of the drogue.

E. Make a loop of the wire loom as shown in the photo above. Using a nylon zip tie, secure the loop to the nylon strap 1" towards the drogue from the maillon (#3 in the photo above).

F. Open the interior of the drogue. Using a nylon zip tie, secure the wire loom LOOSELY to the strap (#10 in the photo above). The wire loom must be able to move freely through the zip tie. The tie must be immediately adjacent to the knot in the strap (#9 in the photo above).

G. Make the connections from the (3) RC cables to the receiver per the photo below. The battery cable (black red wires) must be connected to the "Bind Batt" terminal with black wire on the bottom. The battery monitor cable (tan red brown wires) should be connected to the THRO terminal with the brown wire on the bottom. The servo control cable (white red black wires) must be connected to the GEAR terminal. These connections are all polarity sensitive.

Details of the R610 V2 receiver – the battery is connected to "BIND/BATT". The LED indicator is connected to "THRO" or any free space. The servo is connected to "GEAR".

It is important that the servo arm moves freely within the protective foam cover

Special threading tool used to pull the HC line through the HC.

H. Connect the battery and switch as shown.

I.   Place the electronics into the foam container. Start with the battery case which should be placed as far to the left in the slit as possible. When the drogue is released or the HC is activated the battery case must be against the middle-left side or it may slam around inside the case. Next, place the receiver to the middle right side of the case. Because of its light weight it will not tend to move around inside the container. Lastly, stuff the switch in the slot on the top of the container.
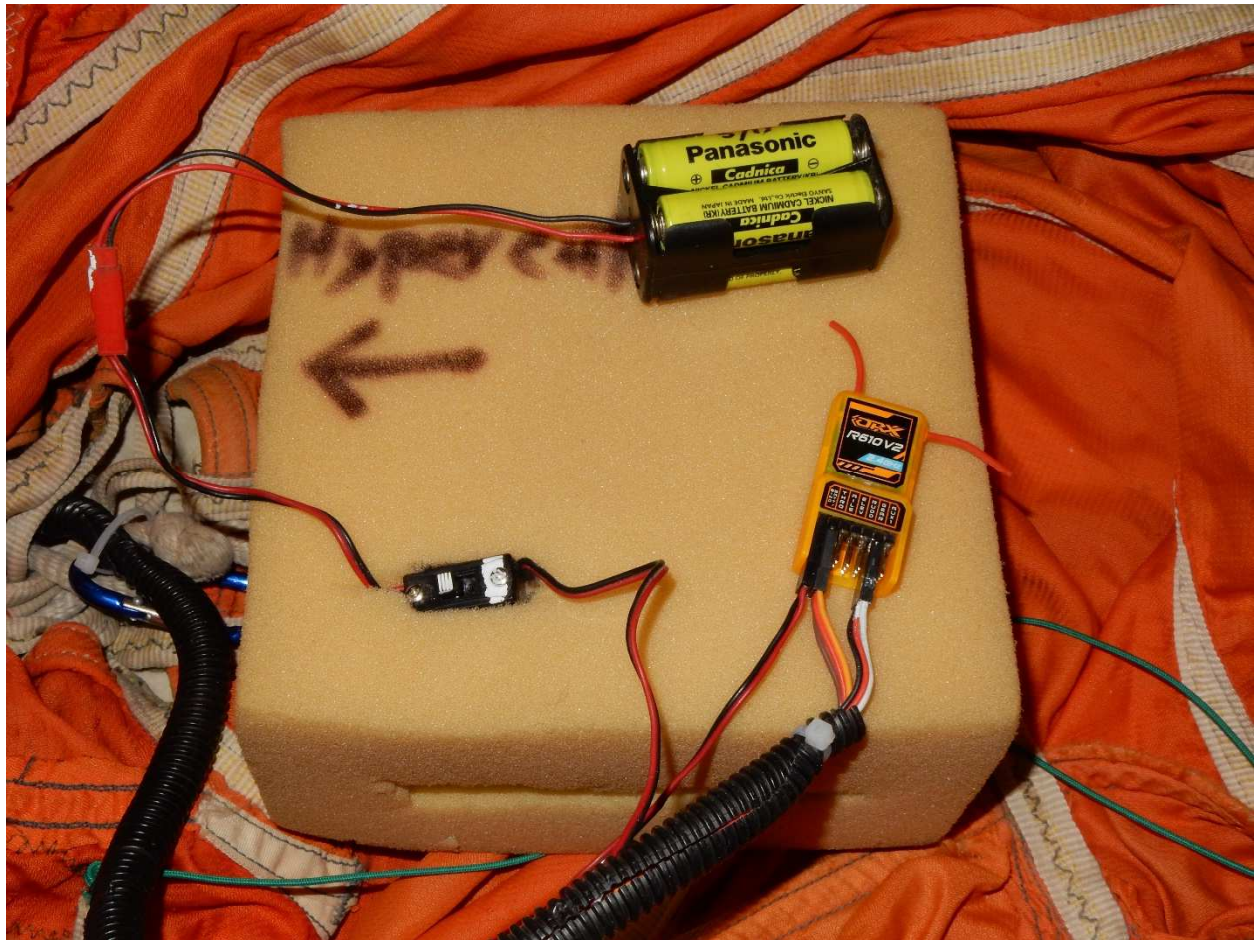
J. The opening of the foam container must be placed in the bag so that the opening to the container is at right angles to the opening of the bag. If this is not done, the sudden jerk on the bag when the pilot either releases from tow or the HC in activated may cause the contents of the container to be ejected. Secure the bag and container to the carabiner.

K. When placing the protective foam tubing around the HC do not close so tightly with the masking tape that the foam interferes with the operation of the servo arm (red arrow in the photo above).

Turn on and test the HyperCut

Turn on the radio and wait for it to initialize. THEN turn on the receiver. The receiver must always be the last to turn on and the first to turn off.

Radio programming notes:

*   Turnigy transmitter – Right tab hold -> tab to Mixer -> down tab to Ch5 -> press menu, edit, press menu again -> edit mix Ch5 page: Source P1, Weight 125, Offset -25, Switch GEA, Warning 1, Multpx Add, Trim off, rest are defaults -> press Exit until back at ready screen.
*   Orange RV610V2 receiver – a.) Install a bind plug into BIND connector b.) Apply power to the receiver c.) You will see the orange LED rapidly blinking. That means the receiver is in Bind mode d.) Follow the procedures of your specific transmitter to enter Bind Mode, the system will connect within a few seconds. Once connected, the orange LED on the receiver will blink several times and go solid indicating the system is connected. e.) Remove the bind plug from the BIND and THRO ports on the receiver before you power off the transmitter and store it in a convenient place.

If the receiver loses signal from the RC radio, it may move enough to cut the line. When the receiver is turned on, the red LED at the HC should blink every ½ second. If it is dim or not blinking after turning on the receiver, change/charge the batteries or check the wiring. It is easy to make the connections to the receiver, upside down.

Operate the GEAR switch on the radio. The servo and Link Knife™ should operate smoothly and fully.

Routine live testing of the HC should be done every towing day. I suggest testing it during the last tow of the day. Inform the pilot that you will disconnect him from the tow rather than he do it. Remind him NOT to pull the handle on the bridle after he disconnects from tow as this will free the weak-link assembly and it will likely be lost. Upon the signal from the pilot, activate the HyperCut. When the pilot lands collect the weak-link assembly. The polyester HC line can be reconnected later at the TO's leisure using the special threading tool.

THE HYPERCUT IS NOT A SUBSTITUE FOR OTHER REQUIRED SAFETY MEASURES USED FOR SURFACE TOWING!

THE HYPERCUT WILL NOT CUT A SLACK LINE – THERE MUST BE TENSION ON THE LINE IN ORDER FOR THE HYPERCUT TO FUNCTION CORRECTLY!

Activation of the HyperCut

1. The HC should ONLY be activated at the beginning of a lockout or other mishap that happens close to the ground where there is insufficient altitude for the pilot to recover from the surge without input. Even experienced pilots have been so shocked at towline breaks that it may take them too much time to collect themselves and make the necessary correction in time. TO's must always assume that the pilot will not provide the correct inputs during a crisis experienced while under tow. In some cases, the pilot may be injured from the recoil of even small hardware parts (maillons) associated with the tow. It is possible that he may be dealing with another more important equipment failure such as the beginnings of an accidental reserve deployment. It may take him time to assess the situation. Captain Sulley had to take time to assess things when his aircraft was struck by geese. The NTSB failed to consider this in re-enactments of the accident.

   If the lockout or other mishap is too far along when the pilot is near the ground, it is safer to stop the tow then let the winch line pay-out under light tension (the default when the tow pressure is reduced to "zero" in a hydraulic system). There will be some drag but no surge. This is where the training and experience of the TO comes into play. He should recognize the beginnings of a lockout and activate the HC so there is little or no surge.

2. Once the pilot is above 75' or so, the HC can be safely activated at any time. Care must be taken so that the HC is activated when there is tension on the line.

3. A hook knife must ALWAYS be ready in case the HyperCut malfunctions!