

# Troubleshooting and Repairing Your 900GTO or 1200GTO Servo "Y" Cable (GTOCP2 or 3 only)

The Servo "Y" cable on your Astro-Physics 900GTO or 1200GTO is a vital part of your mount's servo drive system, and is much more complex than it looks at first glance. The "Y" cable is, of course, two separate cables joined at the plug that connects the cable to the GTOCP2 or 3 control box. The cabling that is used is 8 conductor, and every one of them is used. Two pairs of conductors supply the power to each of the servo motors (++ & - - for each motor), and each encoder has 3 wires of its own. For those of you who have been counting, the remaining conductor in each cable is a common ground. All conductors are soldered into the heavy duty plug connectors. With time and continued use, one or more of these soldered connections can break or lose continuity causing a number of different problems depending on which wire is involved.

These instructions are intended to help you find and possibly repair a problem with your "Y" cable. Note that actual repair of the cable requires proficiency in electrical soldering techniques which are beyond the scope of these instructions. If you do not have the necessary skills or equipment, we encourage you to return your cable to Astro-Physics for service.

Prior to 2006, all of our cables were assembled with leaded solder. In late 2006, we began to phase in lead-free solder. Leaded solder joints can be repaired using lead-free solders and vice versa, but you will have easier success if you use the same solder that was on the cable originally. By all means, follow all of your local rules and regulations regarding the use of lead-based solder.

The first step is, of course, to find the problem. There are two approaches, both with their own respective advantages and limitations. The first approach is to visually inspect the solder connections. The principal advantage to visual inspection is that it normally gives the most reliable results. Roland prefers the visual inspection approach. The second approach is to use an Ohm meter to test for continuity across the pins. This can be relatively quick and easy, but doesn't always give reliable results. Its main advantage is that you can diagnose a problem without disassembling the cable connectors.

The instructions are divided into three parts:

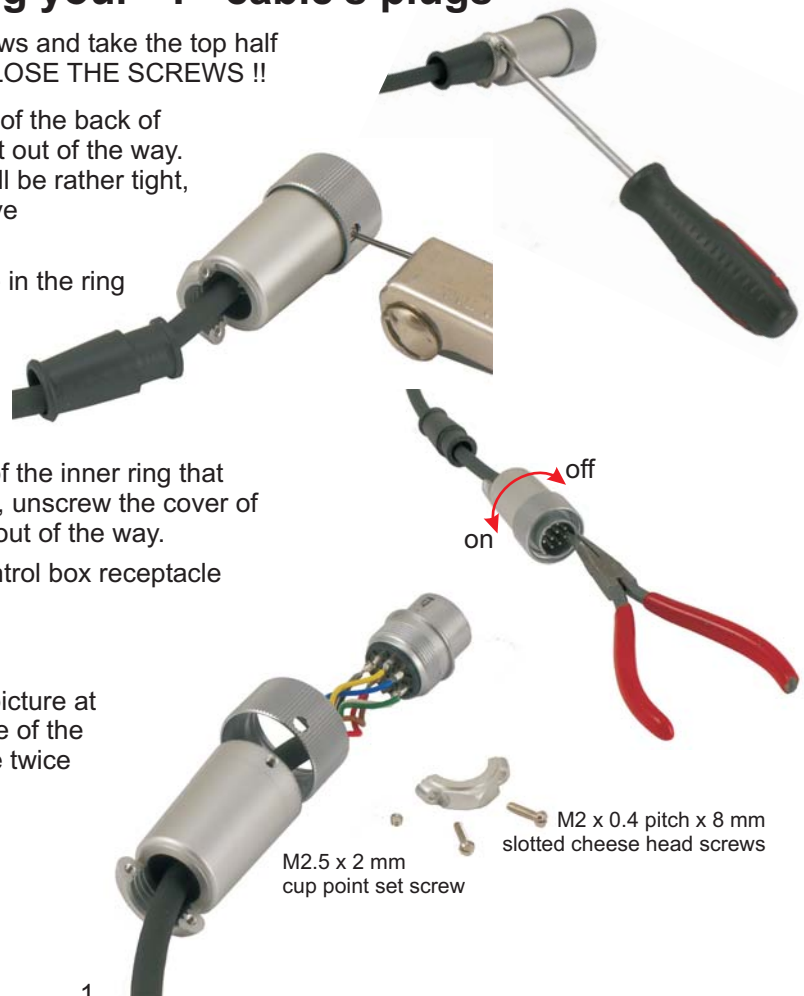
1. How to disassemble the plugs for servicing
2. Wiring diagram for visual inspection and for effecting correct repairs
3. External Continuity Pinout Diagram for testing with an Ohm meter

*Note: The pin patterns on the wiring diagram and pinout diagram are mirror reversed from each other.*

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## 1. Disassembling your "Y" cable's plugs

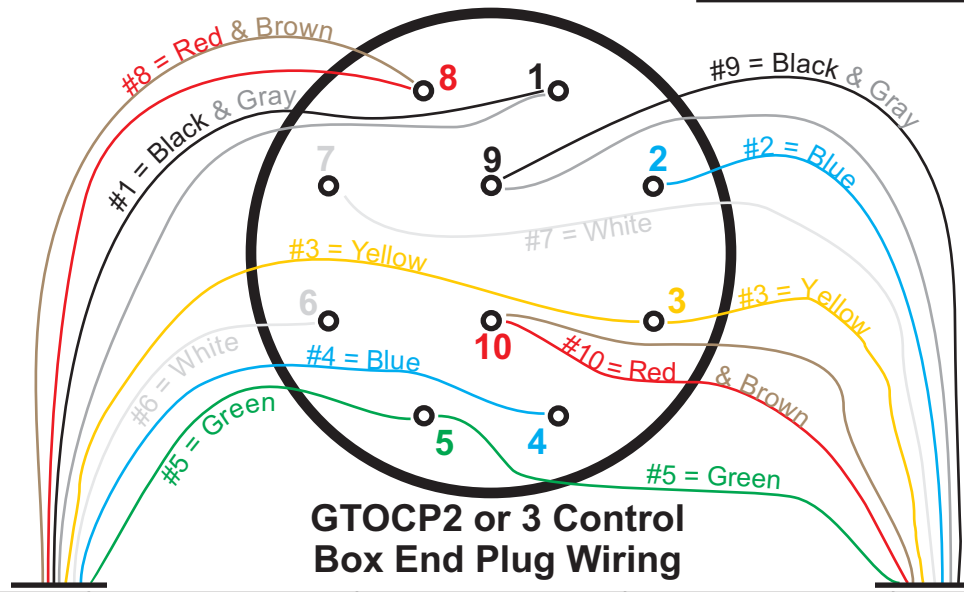
1. Remove the strain relief. Pull out the two screws and take the top half of the clamp off. **BE CAREFUL NOT TO LOSE THE SCREWS !!**
2. Carefully work the protective rubber piece out of the back of the plug and slide it down the cable to get it out of the way. The control box end, with its two cables, will be rather tight, and may be a bit challenging both to remove and to re-install.
3. Turn the plug's locking ring until the small hole in the ring is directly above the small allen set screw.
4. Remove the small allen set screw.  
(1.3 mm or 3/16" hex key)  
**BE CAREFUL NOT TO LOSE IT !!**
5. Using a pair of needle nose pliers, grab hold of the inner ring that surrounds the pins. While holding this ring, unscrew the cover of the plug from the front part and pull it back out of the way.
- 5-A. Alternatively, plug the cable end into the control box receptacle to hold it, and then unscrew the cover.
6. The disassembled cable should look like the picture at right. Please note that the picture is of one of the motor ends. The control box end will have twice as many wires!
7. Re-assembly is simply the reverse of this procedure.



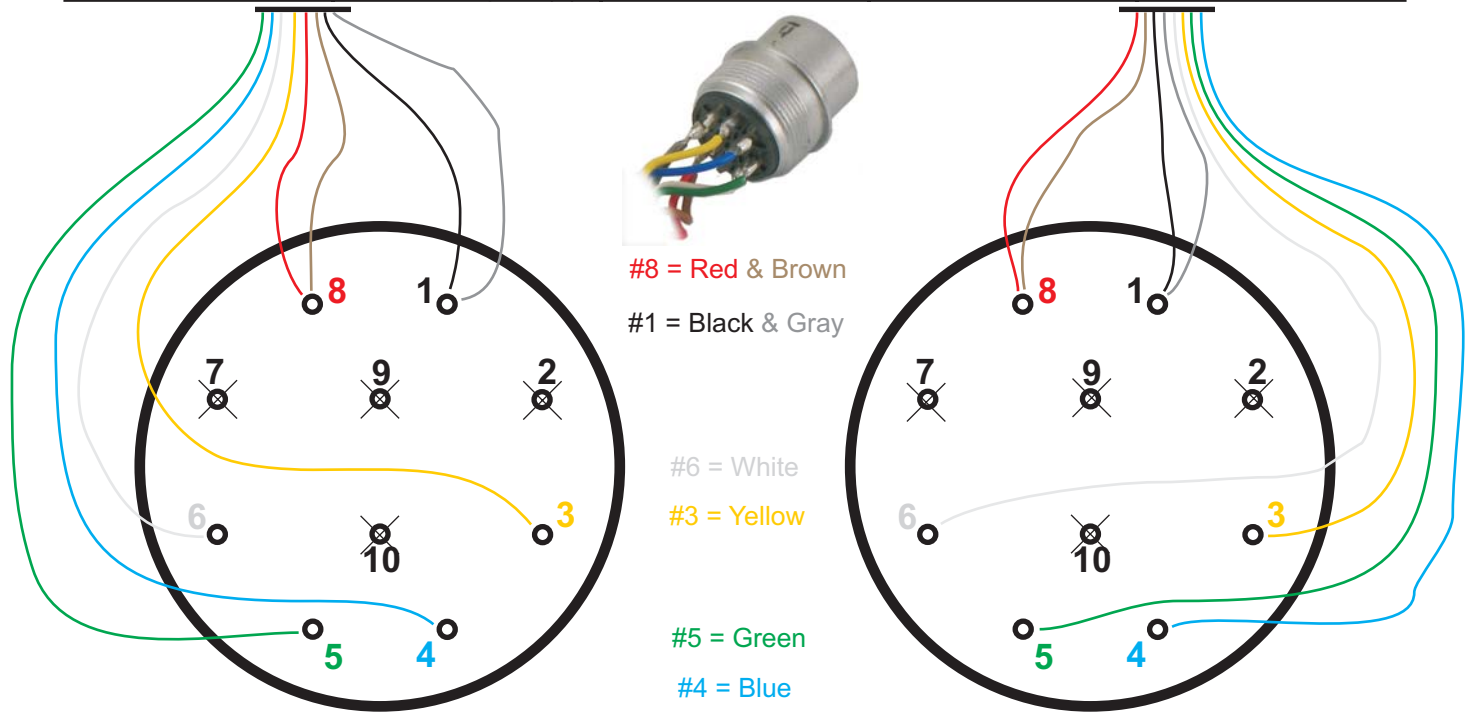
## 2. 900GTO & 1200GTO "Y" Cable Wiring Diagram

NOTE: Wiring diagram applies only to 900GTO and 1200GTO Mounts with either the GTOCP2 or GTOCP3 Servo Control Box

VIEW: Looking into solder-terminal end of 10 pin plug. Pin end will be mirror reversed - see p.3.



GTOCPx Plug Pin	Function	Wire Color(s)	RA Plug Pin	Dec Plug Pin
1	RA motor ground (-)	Black & Gray	1	
2	Dec encoder Ch. A	Blue		4
3	RA & Dec Ground	Yellow (2)	3	3
4	RA encoder Ch. A	Blue	4	
5	RA & Dec encoder 5 v	Green (2)	5	5
6	RA encoder Ch. B	White	6	
7	Dec encoder Ch. B	White		6
8	RA motor pos. (+)	Red & Brown	8	
9	Dec motor ground (-)	Black & Gray		1
10	Dec motor pos. (+)	Red & Brown		8



RA Plug Wiring

Dec Plug Wiring

### 3. 900GTO & 1200GTO "Y" Cable Continuity Pin-out Diagram



*VIEW: Looking into pin end of 10 pin plug - wiring end view will be mirror reversed - see p.2*

