6173922; US 6116544; and US 6419191. Taken together, the tether design features disclosed in Hoyt's patent disclosures have significantly mitigated the potentially dire consequences of tether failure in space.

A problem not adequately addressed in the prior art was the fact that the transport of a fully functional tether into orbit is limited by the size and mass of the tether and the availability of transport rockets having the load capacity to transport the tether into space, particularly transport into a high altitude geosynchronous orbit. What was needed was a tether design that facilitated transport of the tether into space.

Summary of the Invention:

A tether having a fully modular design and employing modular components can be transported piecemeal into space and assembled *in situ*. The modular components are interchangeable with one another. In a preferred embodiment, the modular components are designed to facilitate robotic assembly *in situ* for constructing the entire tether while in orbit. In addition to solving the initial transport problem, the fully modular design also enables the replacement and removal of individual components, *in situ*, in the event of component damage or wear, and the reconfiguration of components, *in situ*, in the event a tether redesign or upgrade are desired. In a preferred embodiment, the replacement, removal, and reconfiguration are achieved robotically. Additionally, the interchangeability of components facilitates the storage of redundant components and/or the cannibalization of assembled components, as needed.

According to a first aspect, there is provided a modular tether for applying centripetal tension, the modular tether including: a plurality of tether modules; and a plurality of junctions for coupling said tether modules to one another end to end for forming the modular tether; said tether modules being attachable and detachable to and from said junctions while the modular tether applies centripetal tension.

According to a second aspect, there is provided a process for increasing the tensile strength of a modular tether, the process including the steps of: Step A: applying

centripetal tension by means of a modular tether having a series of tether modules coupled to one another by junctions; while simultaneously Step B: attaching a cable within one of the tether modules to the junction to which the tether module is coupled and tensioning the cable therewith for increasing the tensile strength of the tether module while the modular tether continues to apply the centripetal tension of said Step A.

According to a third aspect, there is provided a process for decreasing the tensile strength of a modular tether, the process including the steps of: Step A: applying centripetal tension by means of a modular tether having a series of tether modules coupled to one another by junctions; while simultaneously Step B: detaching a cable within one of the tether modules from the junction to which the tether module is coupled and de-tensioning the cable therefrom for decreasing the tensile strength of the modular tether while the modular tether continues to apply the centripetal tension of said Step A.

Brief Description of Figures:

Figures 1-5 illustrate a segment of a modular tether. The segment includes one full tether module in the center and two fragmentary tether modules, i.e., one above and one below the central tether module. The full modular tether has many