

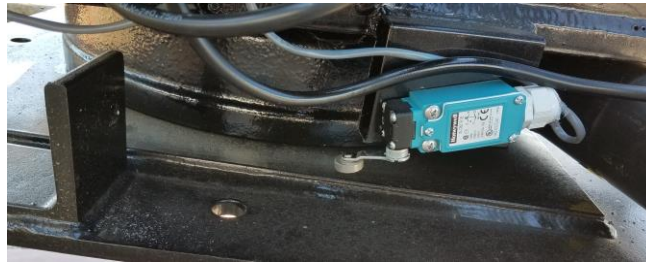
American Made Solar Prize Technical Assistance Request

1) Absolute encoders

STrackers are algorithm driven and do not use sun tracking transducers. Each morning at wake-up they rotate east until they hit a mechanical limit-switch which establishes point-0 for the control system. The tracker then keeps track of its exact position by counting the turns of each motor via Hall-sensors within the motors.

While effective and working well, these limit switches, their wiring and the motor Hall sensors are all potential problem points that will be eliminated when we can integrate an Absolute-encoder system on each axis. These could consist of magnetic strips or other that tell electric field proximity sensors where the slew drives are pointing.

We are seeking connectors to help guide us in the design, fabrication and implementation of these systems in time for the Go competition. Absolute encoders will add value to the trackers by eliminating at-risk exterior appurtenances and better protecting transducers/proximity sensors. Existing Limit-switch configurations-

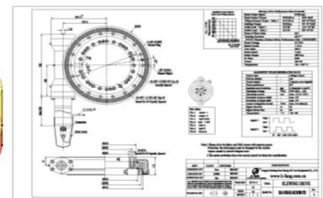
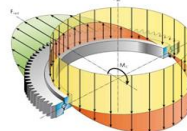
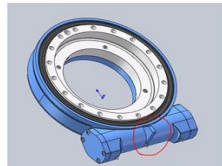


2) Domestic Slew-drives

Finding or developing a domestic source for the high-strength slew drives will be critical to the long-term success of STracker as it spreads across America. The only slew-drive assemblies of adequate strength¹ available to us have been from China. All STrackers to date have been produced with using slew-drives from HFang in Jiangsu, China.

Each (3) batch of slews we have ordered has required 50% upfront, an 8-week build time, the other 50% before shipping, 6-weeks in shipping, then another 35% in tariffs and portage fees. Each time it has been stressful each time wondering if they'll make it (and they always have). Two samples from each batch (~40-units) are load tested to confirm strength specs are met.

There are no American-made slew-drives readily available to American tracker manufacturers. These core mechanical gearing assemblies are used for most single and dual-axis trackers. Purchase options have been limited to Germany, Spain or Asia, and the lower-cost Asian offering present risk from both procurement and accountability perspectives. Regional economic benefits are reduced anytime capital is sent overseas for components that could be built regionally.



¹ Historical limiting factors- Holding Torque= 35kf, Overturning Moment= 45kf

3) Optimize Materials and Systems to reduce production costs by 20%

Currently STrackers are competing well with residential rooftop solar, but cost reductions will be necessary to compete in the small-utility market (at sites where the value of the ground is given very little to no value). There appear to be opportunities for cost savings in materials, systems and transportation.

Guidance in identifying, quantifying and implementing cost savings in these massive steel structure and the PV systems they hold is wanted to help us realize a 20% cost savings by early September in 2021. Around that time we planned to be on the path to a large deployment of 1MW (90) STrackers and to expand STrackers fabrication and distribution facilities to other communities.

Recent STracker Costing sheet-

Structural		S1B Cost	11.2
Steel Beams	\$ 1,400	updated 5.16.20	
Steel Rails	\$ 1,000		
Steel Poles	\$ 1,200	Weights- Wind Exp.C frame	pounds
Steel Plates	\$ 1,800	Frame/Slews/Drive Core	2,500
Bolts & Misc	\$ 600	Rails/Panels	2,200
Fab/Weld/QC		14'offset at 25'pick-ht Fly weight	4,700
Subtotal		pole/plates	850
		rebar/anchor bolting	150
Controls/Power platform			5,700
Labor/R&D Costs			
Controllor			
Adjuncts			
Pole Wiring & Misc		Bare S1B (no PV or install)- base	
Subtotal		Contingency	
		Sales Commission	
Actuators		Overhead & Profit	
(2)Slews w/extra mtrs		Sales Price	
incl.tariff & freight			
Warranty plan		S1Bw/mods-only- base	
Subtotal		Contingency	
		Sales Commission	
Other		Overhead & Profit	
Misc/Manual/Swag		Sales Price	
Assembly Labor/Permits			
Subtotal			
PV System and Interconnect		Bare Tracker	
(28) 72-cell PV Modules		PV Modules @ \$	\$ 0.38
Inverters (6-pack)		Balance of System	bid 8.15.20 & gc
Junctions/Disconnects		& Site contractos	
PV & Electrician			
PV/Elec Permits & Signage			
Subtotal			
		S1B Turnkey Package- base	
Total		Contingency	
		Sales Commission	
Subcontractors		Overhead & Profit	
Bore, Excavate, Conduit		Subcontractors	
UG and Control Electric		Sales Price	
Foundation		Turnkey per S1B (6 or more)=	
JB/ Boom etc			
Total w/ O&P			

Team-Stracker October, 2020 **TA-Request**