

Appendix Q

Glossary

This glossary defines a number of terms used in this report. The definitions are specific to this report, and some of the terms may have a different or broader definition in other contexts.

Anchorage	Reinforced concrete block sitting on a hill and serving as anchor point for the ground-end sockets of backstay cables.
Auxiliary	(auxiliary cable, auxiliary main, auxiliary backstay) An auxiliary cable is a main or backstay cable installed during the second upgrade of the telescope, completed in 1997.
Azimuth Arm	Bow-shaped truss hung under the platform as part of the suspended structure. The azimuth arm can rotate about the platform's vertical axis to steer the telescope, and supports other moveable parts (Gregorian, line feed).
Back	(socket back) Socket end opposite to the connected cable.
Backstay	(backstay cable) Structural cable connecting the top of a tower to an anchorage on the ground.
Broom	(wire broom) Wires of a cable end splayed out inside a socket's cavity. The gaps between the wires of the broom are filled with zinc to form the socket's casting during cable socketing.
Cable	Single strand of high-strength galvanized steel wires, arranged in concentric layers woven helicoidally. The cables include the mains (between towers and platform) and backstays (between towers and anchorages).
Cable slip	Distance by which a cable end has displaced with respect to its socket, usually measurable as a zinc extrusion at the front of the socket.
Cable tension	Resultant in the cable's longitudinal direction of the wire stresses over the cable's cross-section, i.e. the cable's internal longitudinal force. The actual tension may vary along a cable. Any tension value provided in this report is the average over the cable length, unless noted otherwise.
Carriage house	Box-shaped enclosure containing equipment and serving as mount for some of the telescope's radio feeds. A carriage house can slide along the bottom of the azimuth arm. The original telescope had two carriage houses, one of which was replaced with the Gregorian during the second upgrade.
Casting	(socket zinc casting) Cone-shaped zinc block enclosing the broomed-out wires of a cable end, locking the cable end inside a socket cavity.
Cavity	(socket cavity) Cone-shaped volume inside a socket where the connected cable is broomed out before being filled with zinc to form a casting.
Core	(socket zinc casting core) Central part of a socket's casting, observed to have displaced towards the socket's front in the distressed sockets.
Core rupture	Socket failure mode where the crossing wires tend rupture as the cable slips.
Core shear	Resultant of the shear stresses acting on the surface of the core in a socket casting.
Core wire	Wire whose end is located inside the core in a socket casting.

Counterweight	Lead weight installed on the azimuth arm during the second upgrade of the telescope to balance the weight of the Gregorian. The counterweight was fixed on the azimuth arm, unlike the Gregorian.
Crossing wire	Wire located inside the core at the front of a socket, but whose end is located outside of the core. A crossing wire crosses the surface of the core between the front of the socket and the wire end.
Crossing wire tension	Total force that the crossing wires can develop to resist core pull-out.
Flow	(zinc flow) Large deformation of the zinc material in a socket casting due to plasticity and/or creep.
Flow-out	(core flow-out) Socket failure mode where the crossing wires tend to slip together with the core.
Front	(socket front) Socket end receiving through which the connected cable enters the socket.
Gregorian	Dome-shaped enclosure containing radio reflectors and receivers, installed as replacement for one of the two carriage houses during the second upgrade of the telescope. The Gregorian can slide along the bottom of the azimuth arm.
Ground screen	Inclined wire mesh wall built along the edge of the primary reflector to block off interference from surrounding terrain.
Layer	(wire layer) A cable is made on multiple wires arranged in concentric layers.
Line feed	Radio antenna mounted on a carriage house, which can slide along the bottom of the azimuth arm.
Main	(main cable) Structural cable supporting the suspended structure from the top of a tower.
Minimum Breaking Strength	Minimum tension that a brand new cable is expected to resist without rupturing.
Nominal wire strength	Maximum tension that a cable wire can resist before yielding and eventually fracturing, in the elastic-perfectly plastic idealized model of the wire behavior.
Normalized stress range	(cable normalized stress range, NSR) Measure of the fluctuation of a cable tension, calculated as the peak-to-peak amplitude of the fluctuation divided by the cable's Minimum Breaking Strength.
Original	(original cable, original main, original backstay) An original cable is a main or backstay cable installed during the original construction of the telescope, completed in 1963. Cable B12-3 was replaced in 1980, and the replacement cable is also considered an original.
Outrigger	Steel trusses and stay cables added to the platform during the second upgrade of the telescope, to connect the new vertical tiedowns
Primary reflector	see <i>Reflector</i>
Reflector	Large dish antenna located just above ground and below the telescope's suspended structure. The reflector is 1,000 feet in diameter and made of approximately 40,000 rectangular aluminum panels supported by a cable net.
Ring girder	Circular steel beam hung at the bottom of the platform and allowing the azimuth arm to rotate about the platform's vertical axis.
Rupture	see <i>Wire rupture</i> or <i>Core rupture</i>
Safety factor	(cable safety factor, SF)

	Measure of the stress level in a cable, calculated as the design, actual or estimated cable tension divided by the cable's minimum Breaking Strength.
Shoulder	(socket shoulder) Step in a socket's cavity shape between the front of the socket and the inclined wall forming the cone-shaped cavity.
Slip	see <i>Cable slip</i> or <i>Wire slip</i>
Socket	(zinc-filled spelter socket) Cable termination device allowing to connect a cable end to another structural element. A zinc-filled spelter socket contains a cone-shaped cavity where the cable end is inserted and broomed out, before filling the gaps with zinc.
Spelter socket	see <i>Socket</i>
Strand	see <i>Cable</i>
Suspended structure	Steel structure suspended above the reflector, comprised of the fixed platform and moveable azimuth arm, Gregorian and/or line feeds.
Tension	see <i>Cable tension</i> or <i>Crossing wire tension</i>
Tiedown	Cable or pair of cables tying the suspended structure directly to the ground. The original structure had six inclined tiedowns, which were replaced by three vertical tiedowns during the second upgrade of the telescope. Each vertical tiedown consists of two parallel cables.
Tower	Reinforced concrete tower from which the suspended structure is supported through main cables, and tied back to the ground with backstay cables.
Waveguide	Cable-supported structure used to carry personnel and radio waves to the suspended structure from the top of Tower 12.
Wire	(cable wire) High-strength steel wire composing a cable. A cable is made of several concentric layers of wire.
Wire rupture	Complete failure of a wire. Wire rupture can be ductile or brittle and due to tensions and/or shear stress.
Wire slip	Displacement of an individual cable wire with respect to the zinc outside of the casting's core.
Zinc-filled spelter socket	see <i>Socket</i>