



PERIODIC MAINTAINENCE LOG

GALACTIC HEADQUARTERS
6025 Schumacher Park Drive
West Chester, OH 45069

ANTENNA DIVISON
353 Science Drive
Moorpark, Ca 93201

PURPOSE

This form provides instructions necessary for monthly inspection, preventive and corrective maintenance, and alignment of the antenna system in accordance with warranty requirements. This form/log is to be executed monthly and sent to Quasonix to maintain the warranty agreement. This form should be executed by personnel who are thoroughly familiar with safety processes required for the site and equipment. The personnel shall be knowledgeable with the equipment, the installation, and operating procedures, as well as theory of operation contained within documentation provided with the antenna system. Refer to the documentation package provided for parts lists and schematic diagrams used to support maintenance procedures.

Preventive maintenance procedures contained herein are intended to be performed in the sequences and at the calendar intervals listed. However, the inspection schedules shown may be adjusted where necessary to coincide with inspection schedules for other electronic and electromechanical equipment used with the system, especially where unusual environmental conditions dictate more frequent inspections of areas subject.

When and where possible insert screen captures and or pictures of equipment or test equipment screens and insert them into the last column of the table.

TEST EQUIPMENT

TABLE 1 TEST EQUIPMENT	
EQUIPMENT/TOOL	DESCRIPTION
Oscilloscope	Capable of dual trace, sweep speed 1, 0.5, 0.2 and 1 ms/cm
Digital Voltmeter (DVM)	Capable of 0-250 volts AC and DC ranges
General Hand Tools	Screw Drivers, Allen Wrench's (Hex Keys), Socket Set, Pliers etc.
Torque Wrench(es)	Capable from 0-100 ft-lbs range

NOTE: all tools should meet calibration requirements and be of good working order.

SYSTEM IDENTIFICATION INFORMATION

TABLE 2 SYSTEM IDENTIFICATION INFORMATION	
System Part Number	
System Description	
System Serial Number	
System Manufacture Date	
Current System Software Revision	
System Location	
Owner/Customer	

TABLE 3 PERIODIC MAINTAINENCE LOG						
Period of Performance	Assembly/Function	Action	Result	Date	Performed By	Verification (Screen Cap/Pictures)
Safety						
Monthly	Run/Safe Switch(es)	Verify: the run safe switch on the following assemblies disables movement and engages the brakes. <ul style="list-style-type: none"> Servo Amplifier Assembly Person on Platform Switch Assembly (Remote Run/Safe) 				
Monthly	Hand-Held Controller	Verify: The interlock defeat plug is present, and connector, casing and pins are in good working state. Connect the Hand-Held Controller and verify all functionality before allowing a full team to work within swing radius of the antenna system.				
Controls (Operations)						
Monthly	HyperTrack™ Antenna Control Unit (HTAC)	Apply power and check display. (Only applicable on the HTAC 4U unit PN QSX-HTAC-4U)				
Monthly	HTAC	Verify that the HTAC Graphical User Interface (GUI) boots up and does not display any faults in the status window. If any errors are present, verify that they can be cleared by the clear fault button. Screen capture faults or issues and attached them here.				
Monthly	Azimuth Limits	Manually move the system using the Handwheels, Joystick or Keyboard into their limits (applies to cable wrap system only). Screen capture the screen showing the positioner in the CW and CCW directions attach pictures here.				
Monthly	Elevation Limits	Manually move the system using the Handwheels, Joystick or Keyboard into their limits. Screen capture the screen showing the positioner in the UP and DOWN directions attach pictures here.				
Monthly	Electrical Limits	Using the manual control box assembly, while at the servo amplifier assembly ensure that the elevation electrical limit switches indicate limit condition when, and only when, the antenna is in a limit position.				
Monthly	Scanner	Verify that the track error indicator display turns green with the scanner on command (Conscan system only)				
Monthly	Signal strength indicator	Verify that when the LNA LOW/MED/HIGH button is selected, the noise floor indicator rises indicating the LNAs are active and gain stages are working.				
Monthly	Video camera	Verify that the computer connected to HTAC has control over the camera function, and that the video picture is acceptable quality. Auto focus should work as zoom function is invoked.				
Monthly	Display Zero Position	Position antenna at the stow position. Verify that the system can be stowed at that angle by inserting the stow pin.				
	Drive Motor Assemblies	Azimuth Load Table and Elevation Yoke backlash are less than 0.15 degrees. If not, ensure that motor mounting hardware is properly torqued.				
Monthly	Sun Designate	Using the immediate designate function, command the antenna to point at the Sun, showing that the ACU's True North and clock are both correct. Verify that all signal indicators change as the antenna moves towards the Sun and peak on the Sun. Note: Do not point at the Sun more than 2 minutes.				

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Monthly	Sun Track	Designate the antenna to the Sun, using the handwheels point the antenna a degree or two off the Sun in the azimuth axis and select track mode. Verify that the antenna tracks the Sun and settles without excessive overshoot or jitter. Note: SCM 6 foot system or smaller can not track the Sun in lower L-band. Use S-band for 6 foot system.				
Monthly	BIT Positioner velocity check	Using the speed test diagnostic function, verify that the antenna can drive at the speed and accelerations requirements. Screen capture the results and attach here.				
Quarterly	RF System	Using the original acceptance test, perform the G/T tests. Capture and attach the results here.				
Monthly	Dehydrator	Verify that the dehydrator cycles ≥ 3 minutes for a nominal 15 seconds. Capture and attach the results.				
Monthly	Dehydrator	With the compressor running, note the charging pressure of the high-pressure tank (should nominally be 50 pounds)				
Monthly	Dehydrator	Note the pressure of the low-pressure tank (should nominally be 0.4 pounds)				
Inspection/Maintenance						
Quarterly	Cables	Check all exposed cables/connectors for deterioration, cuts, cracks, etc.				
Quarterly	Positioner Connections	On the antenna feed, inspect all connectors for fit and cleanliness. Inside the antenna Positioner, inspect all connectors for fit and cleanliness. On elevation and azimuth connector panels, inspect all connectors for fit and cleanliness.				
Quarterly	HTAC Connections	On the ACU back panel, inspect all connectors for fit and cleanliness.				
Quarterly	Servo Amplifier chassis Condition	Check for any moisture and dirt from the Positioner interior.				
Quarterly	Antenna/Positioner Climate Control	Remove the azimuth and elevation access panels and verify that the Positioner heater assemblies are operational (this can only be verified when the ambient temperature is below 24°C degrees nominal for long periods of time). Note: PD300 & 450 elevation axis has thermostatically set strip heaters.				
Quarterly	Antenna/Positioner	Inspect the Antenna/Positioner exterior for signs of rust, corrosion, paint chipping/flaking, and contaminants. Remove and repair as needed.				
Quarterly	Positioner Access Panels.	Inspect O-rings: grease and or replace as necessary.				
Quarterly	Positioner Data Package	Inspect for signs of rust, corrosion, and contaminants. Remove and repair as needed.				
Quarterly	HTAC	Verify that the ACU fan is operating.				
Quarterly	HTAC Back Panel	Check the fan screen for dirt and/or obstructions.				
Annually	Servo Amplifier Assembly	All voltages present and within tolerances.				
Annually	Azimuth Positioner Heater	Verify by touching the azimuth access panel, when the azimuth heater fan is working there should be minor vibration felt on the panel.				
Annually	Dehydrator	Remove the dehydrator cover and inspect the dehydrator for signs of corrosion and or damage				
Bi-Annually	Dehydrator	Perform maintenance per MFR recommendations (see vendor manual)				

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Period of Performance	Assembly/Function	Action	Result	Date	Performed By	Verification (Screen Cap/Pictures)
Annually	HVAC(s)	Verify that the internal fan on the HVAC is always running.				
Annually	Airlines	Verify: No airline cracks visible, all air hose ends are securely connected and no visual or audible air leaks evident.				
Annually	External Cabling	Verify: No cracks visible in cable jacketing/insulation, no UV degradation apparent.				
Annually	Ground Cabling	Verify: All connected, and corrosion is not present (if present, remove corrosion or replace cable).				
Annually	Positioner Connectors	Verify: All cables are secure and or properly torqued, no surface corrosion visible on hardware, no damage or unusual degradation visible.				
Annually	Positioner Hardware	Verify: Positioner hardware is secure and or properly torqued, no surface corrosion visible on hardware, no damage or unusual degradation visible.				
Annually	Positioner Paint	Verify: No paint is missing from painted surfaces; paint has not become flakey or chalky.				
Annually	Reflector Assembly	Verify: No paint is missing from painted surfaces, paint has not become flakey or chalky, reflector paint is free of rust runs, no signs of damage (i.e., hail, birds etc.), camera reflector antenna drain clearance are unobstructed and damage free.				
Annually	Subreflector	Verify: No paint is missing from painted surfaces, paint has not become flakey or chalky, subreflector paint is free of rust runs, no signs of damage (i.e., hail, birds etc.).				
Annually	Camera	<ul style="list-style-type: none"> Verify: All cables are secure and or properly torqued, no surface corrosion visible on hardware, no damage or unusual degradation visible. The camera lens is unobstructed, damaged free and the lens is clean. 				
Annually	Feed Support Structure Prime Focus	Verify: All hardware is in place and torqued properly, support structure (Feed, Spars, Backup Structure) are corrosion or rust free, no signs of damage (i.e., hail, birds etc.) and in good working order.				
Annually	Feed Support Structure Prime Focus	Verify: All hardware is in place and torqued properly, support structure (Feed, Spars, Backup Structure) are corrosion or rust free, no signs of damage (i.e., hail, birds etc.) and in good working order.				
Annually	Feed(s) Assembly	Verify: All hardware is in place and torqued properly, support structure (Feed, Spars, Backup Structure) are corrosion or rust free, no signs of damage (i.e., hail, birds etc.) and in good working order. All cables are connected, torqued properly and free from corrosion or damage. Cables have no cracks visible in cable jacketing/insulation, no UV degradation apparent.				
Annually	Stow Pins	Verify: The detent button is free moving and the stow pin easily is removed and able to be inserted into both its "Safe" and "run" positions. Clean with a cleaning pad (i.e., light scotch brite) type pad and lube with oil (i.e., Tri-Flow TF0021060)				
Annually	Gearbox Assemblies	Sample grease from the gearboxes in each axis, Azimuth and Elevation verifying the grease is free from debris, i.e. metal flakes or shavings.				
3000 Hours	Dehydrator	Perform manufacture recommendation 3000 hour maintenance (see vendor manual).				