



Site Maintenance Guide

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1.0 Introduction

This manual is intended for the designated individuals at each GONG sites (Learmonth, Udaipur, El Teide, Cerro Tololo, Big Bear, Mauna Loa, and Tucson) who are responsible for maintaining the GONG shelter.

The shelter requires weekly and monthly, inspections to assess its condition and maintain it properly. While this *Site Maintenance Guide* does not give detailed procedures for carrying out all these inspections, it does serve as a reminder for the maintenance routine.

GONG has provided each site with equipment, supplies, and tool kits for this maintenance.

This manual also includes the following appendices:

<i>Appendix</i>	<i>Purpose</i>
1A Site Maintenance Forms	Provides original set of checklist forms to copy for scheduled maintenance.
2A Emergency Power Shutdown	Emphasizes personal safety in the event of an emergency.
3A Non-Emergency Power Shutdown	Preserves equipment and data in the unusual situation of site shutdown.
4A Power Up	Re-powers the site after a shutdown.
5A Installing and Removing the Turret Cover	Protects the turret in severe weather.
6A Resetting the Instrument Control Power Supply Circuit Breaker	Restores control of the turret, rotator, and waveplate motors.

1.1. Maintenance Supplies

The following supplies are available at each GONG site:

- Broom, dustpan, shop vacuum and attachments.
- Duct seal
- Dow 4[®] silicone dielectric compound (protects electrical terminals)
- DLT cleaning tapes
- Blank DLT tapes
- Two tool kits: standard SAE and metric
- Windex[®] window cleaner
- Kimwipe[®] tissues

1.2. Weekly Maintenance Check

1.2.1. Outside Shelter, Weekly

Turret

Clean the entrance window weekly and after rain or snow:

Use the **gongTool** program window on the operator workstation to guide you through the process of cleaning the turret entrance window. From the **COMMAND MENU**, select **CLEAN TURRET WINDOW** and proceed. (See the *Operator Workstation Guide, Section 2.7.5*, for more information.)

Brush off dust from the entrance window with a soft brush, and then clean with a Kimwipe® and Windex® cleaner. (The window has a durable coating.)

Check for icing. De-ice if necessary.

Air Conditioners

Inspect units. Is the outside fan blowing air Ok?
Check for icing. De-ice if necessary, and report this condition to gong_ops.

Weather Station

Check the following equipment:

1. Temperature/relative humidity probe in the weather station box.
2. Wind vane and propeller on the instrument pole. If you notice a problem, use the site ladder for closer inspection and clean the radiometer dome if necessary.

1.2.2. Inside Shelter, Weekly

DLT Tapes

Use the operator workstation **gongTool** program window to guide you through the process of changing the two DLT tapes. From the **COMMAND** menu, select: **CHANGE TAPES** and proceed. See **gongTool** HELP for specific instructions on using the **CHANGE TAPES** command, or refer to the *Operator Workstation Guide*.

Check the Air Pump

Note the pressure gauge in the center of the manifold panel. Look down near the floor, and see three $\frac{1}{4}$ in Tygon tubes, the 2 on the right are output flow from the pump.

Pinch the **2 right tubes** in your fingers, the pressure gauge should immediately begin to go up, to at least **5 psi**. (Pressure relief is set to 10 psi) Upon release the flow meter balls should “bounce” before settling down again.

If there is no response then most likely the pump diaphragm is leaking and must be replaced. Find the diaphragm repair kit hanging in the plastic bag on the right side of the manifold assembly. Follow the instructions in the repair kit.

At the top of the desiccant container under a clear plastic cover is the “Desiccant Flag”. Please check the color (Blue = Ok, Pink = Wet) and note that on the Weekly Maintenance Checklist.

1.3. Monthly Maintenance Check

1.3.1. Inside Shelter, Monthly

Includes:

1. Cleaning the tape drives.
2. Replacing the Oven Desiccant.
3. Filter cleaning for the air conditioners and data chassis.
4. Switching the “primary” and “secondary” modes of the air conditioners.
5. Sweeping, dusting and vacuuming if necessary.

Cleaning the DLT tape Drives.

On a monthly schedule, follow the instructions on the operator workstation **gongTool** program window **CHANGE TAPES** , use the DLT cleaning cartridges provided.

Oven Desiccant

The oven has three ports (*from right to left*): the guider port, the laser port, and the inspection port. The guider assembly is plugged into the guider port. Two desiccant canisters are installed in the second and third ports to prevent the accumulation of moisture in the oven. This desiccant must be changed out on a monthly basis.

The dust from the desiccant is a minor health hazard in large quantities (consult the MSDS sheet that has been placed with the can of desiccant on the shelf above the optical table). When changing the desiccant, we recommend wearing powder-free latex gloves and a dust mask. Avoid crushing or breaking the spheres of desiccant and thus releasing fine, airborne dust.

Note: During the Monsoon at Udaipur the desiccant should be changed weekly.

1. Remove the plug from the laser port. Be careful not to disturb the oven position or the guider position.
2. The plug has two parts, a cap and a vial, which screw together. Unscrew the two parts. Be careful not to spill the desiccant.
3. Dispose of the desiccant into a waste container per local rules. Note that the desiccant (molecular sieve) can be deactivated with water.
4. Open the can of unused desiccant. The can should be opened and closed in the same manner as a paint can. It must be kept sealed against moisture between uses.
5. Fill the vial with new desiccant. Be careful not spill any desiccant, and be sure to clean up any spilled desiccant.
6. Screw the cap and vial together. Reinsert the plug into the port.
7. Repeat this process for the desiccant plug in the inspection port.

If you require any materials to change the desiccant, contact the GONG home office in Tucson.

Air Conditioners

The air conditioners are designated as primary and secondary. These designations alternate from month to month so that each unit runs in primary mode one month and then in secondary mode the next month.

The thermostats are located on the front wall.

1. Check that the temperature of whichever thermostat you designated as “**primary**” for the month is set at **70°F**, and the one you designated as “**secondary**” is **75°F**.
2. Check that both air conditioners are turned ON and that at least one is cycling.
3. Check that the unit control panels are set as follows:

OPERATION	MEDIUM (#7)
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4. Check the actual thermostat temperatures. (Temperatures are displayed on the bottom half of the thermostat).
5. Visually inspect the air conditioner filters, if necessary remove and clean the filters. The top unit’s filter pulls down and out from the bottom of the unit. The bottom unit’s filter is accessible by first removing the front panel’s mounting screws, and then removing the panel and filter together.

Sweep, Vacuum and Dust (if necessary)

If the interior of the shelter has accumulated excessive dust or debris, it should be vacuumed and dusted. Use caution when sweeping or vacuuming near the cables, connectors, workstation or any electronic equipment.

There is a small broom and dustpan hanging on the back wall of the shelter near the clean air system. This should be sufficient for cleaning the floor area. If conditions demand that the vacuum be used for a more through cleaning, keep the vacuum canister outside, and use only the suction attachments inside the shelter. The vacuum cleaner includes attachments for areas that are difficult to reach. Check the vacuum canister filter, and replace when necessary.

Data Collection Chassis Filter

Visually inspect the Data chassis air filter on the front of the chassis. If it is dirty remove the filter from the front of the chassis and vacuum it. To access the filter, unscrew the two screws on the front panel, pull out the chassis, and remove the side screws. The filter slides out for cleaning.

Note: There is a small arrow in the filter, it should be installed **UP** and to the front.

Sensaphone

Check the status of the Sensaphone and compare current settings to the parameters shown below. To hear all the current settings, press the **WHAT IS** button and then the **STATUS BUTTON** in succession. To check a specific parameter, press **WHAT IS**, then the button corresponding to that parameter.

Parameters:

Time = Local time @ shelter
Tone dialing; TAD = Off
Number of rings before answering = 5
Low Temp = 55 degrees; High Temp = 85 degrees
High Sound alarm = On
Listen in time = 15 seconds
Power failure recognition time = 180 seconds
Unit ID number = TC → 520-881-0389 Ext 215
LE → 011-61-8-9949-2470
UD → 011-91-294-245-3857
TD → 011-34-922-329-160
CT → 011-56-51-205-432
BB → 909-866-6370
ML → 808-933-6923

To acknowledge a sensaphone alert message:

- 1) Local - press any key on the left-hand side keypad. Avoid pressing the OFF key because that will disable the unit.
- 2) Phone - At the end of the alarm dial out message, the sensaphone will say "Indicate you have received warning message..." you have 5 sec. to enter code "**555**"

Emergency Light

The emergency light is mounted on the interior wall near the air conditioner. Check its operation by pulling the wall plug to simulate power loss. The light should turn ON and then turn OFF when the wall plug is replugged. The green LED indicates that the battery is fully charged. A red LED indicates the battery is charging.

1.3.2. Outside Shelter, Monthly

Locks

Locks include the entrance and rear door locks. Check locks for easy operation. Lubricate with graphite if necessary. Check that the rear double door padlock is covered with duct seal. Re-cover the padlock if necessary.

Check Cables

Check all exterior cables for:

1. Insulation cracking or fraying. Repair if necessary.
2. Tie wrap flexing. Secure if necessary so that cables are not flexing in the wind.

Exterior cables include the following:

- Ground straps at entrance to raceway
- Power lead-ins and communication, including fiber optics.
- Weather station, including wind speed/direction, outside temperature/relative humidity, and radiometer.
- GPS antenna.
- Turret, including light feed, calibration wheel 1, and ground strap.

Diesel Generator

Diesel maintenance applies *only* to the Udaipur site, which has a diesel generator. All other sites can ignore this procedure.

Check the following fluid levels, and add fluids when necessary:

- Anti-freeze
- Crankcase oil (change every six months or 250 hours of operation)
- Battery water
- Fuel level, Do NOT allow the fuel tank level to reach empty. Refill the tank whenever it is at $\frac{1}{4}$ full.

Check battery charge current. Under normal conditions, the battery charge current should indicate 100 mA to 200 mA.

Check the seven-day exerciser operation to confirm that the controls automatically start, transfer power, and run the generator for one-half hour on a weekly cycle.

1.4. Annual Maintenance Check

Once a year, members of the GONG maintenance team will visit each site to perform the annual maintenance program.

Diesel Generator Maintenance (for Udaipur site ONLY)

1. Change oil and filter (at 250 hours).
2. Lubricate the engine controls.
3. Replace the fan belts.
4. Check the battery.
5. Check the electrical connections.
6. Test the annunciator panel.
7. Transfer switch seven-day exerciser board: Change the battery.