GATESAIR

Connecting What's Next

Recommended Air & Liquid Cooled Transmitter Site Maintenance Routine



Service Bulletin



Service Bulletin

- GatesAir transmitters may be remotely accessed through secure network architecture ***but must not be directly exposed to the public internet! CHANGE DEFAULT PASSWORDS!!!***

  - Reasons Why:
    - Direct exposure increases the risk of unauthorized access, configuration changes, and service disruptions
    - Unauthorized access may affect RF output and system interlocks, posing risks to equipment and personnel.
    - Licensees are responsible for secure transmitter control to maintain regulatory compliance

Service Bulletin

- **What is supported**
  - **GatesAir transmitters may be internet-reachable only when access is mediated by security controls, such as:**
    - **VPN (client or site-to-site) ISP's offer this service at a slight premium. (Starlink)**
    - **Firewall with default-deny rules**
    - **Isolated management network or VLAN**
    - **Secure jump host / bastion PC**
    - **Centralized NOC systems behind protected infrastructure**
  - **In these cases:**
    - **The transmitter has no public IP**
    - **No ports are open to the internet**
    - **Access is authenticated, logged, and controlled**
  - **This is a supported and recommended architecture.**

Service Bulletin

- **What is NOT supported:**
  - **GatesAir does not support transmitters being internet-facing, including:**
    - **Direct public IP assignment**
    - **Port forwarding from the internet to transmitter interfaces**
    - **Exposing HTML GUI, SNMP, SSH, or service ports to the open internet**
  - **Even if:**
    - **Passwords are set**
    - **HTTPS is enabled**
    - **Access “seems to work”**
- **If the internet can initiate a session directly to the transmitter, the transmitter is internet-facing — and that configuration is not supported.**

Saftey Warnings and Precautions

- ***WARNING: Disconnect primary power prior to servicing when required to access High Voltages***
- ***CAUTION: Transmitter Power amplifier and RF components can hold electrical charges for extended period of time, accidental discharges are possible.***
- ***Transmitter components can get very hot caution should also be taken when handling hot components.***

- *Note: Always refer to the technical manual that was shipped with the transmitter for specific procedures on how to perform maintenance on that product. The list below contains maintenance items that may pertain to only tube type or multi-cabinet/power block transmitters.*

Weekly Maintenance & Checks

- Check TPO – Verify system power per license, if multi-cabinet/power blocks verify each block in the transmitter system
- Check reflected power – Verify that the reflected power is not trending higher
- Check reject load power – If present Reject loads should be close to 0 Watts. If not check the phasing of the system
- Check AC Mains voltages – The AC Mains should be within the specification for the transmitter, See the technical manual
- Check warning and fault status of transmitter and auxiliary equipment – If any faults or warnings are present, they should be corrected immediately
- Check ambient temperature of equipment/cabinets – GatesAir transmitters are specified to run in the range of 0 – 45° C

Weekly Maintenance & Checks (Continue)

- Check for cooling system – For air cooled equipment verify all fans are running, for liquid cooled equipment check all flow rates and pressure, verify no leaks in the system and check the drip pan for signs of leaks, check coolant temperatures.
- Check sideband levels for mask compliance - Modulation format dependent
- Check EVM or MER/Check TS (transport stream) error level - Modulation format dependent
- N+1 or Main – Alternate systems review the switch controller event log and GUI interface for warnings or faults.
- Check Event logs for events that may have accrued and were automatically reset or cleared. Download/ export the event log for reference. This should be done for the transmitter, exciters and switch/multi system controllers.
- Transmitters can provide warm places for rodents and other small creatures to live, inspect the transmitter cabinet for evidence of small creatures presents, exterminate or remove if evidence is found. (*Tip several stations use "dryer sheets" to discourage mice from taking up residency*)

Weekly Maintenance & Checks (Continue)

- Check transmission line pressure and pressurization system dehydrator for proper operation or Nitrogen tank levels
- Check the generator fuel and oil levels, has it exercised without issue? Last Load Bank test? Last Manufacturers Service?
- Check outside heat exchangers for proper airflow and clean as required. Summertime is upon us, TX Heat Exchangers are not 1/2in to 1in thick, they are 5-6in think therefore your typical HVAC Contractor's equipment will not clean enough.
- Check the condition of the building, doors for signs for attempted force entry, building walls for graffiti, security fences for signs of breach, look around the property for anything that changed.
- Keep a site log either paper or electronically of every visit. Pictures to document anything unusual.

Monthly Maintenance & Checks

- Check RF lines for hot spots or discoloration – Can use an infrared thermometer
- Switch liquid cooling pump for liquid cooled systems - This will ensure reserve pump operates as well as not wearing out 1 pump by constant operation
- Check operation/cleanliness of heat exchanger - verify all fans run at full speed, check the cleanliness of the fins especially on bottom where air intake is. Cleaning is suggested at least once per year using a chemical product that is designed for HVAC equipment. If in a dirty environment it may be necessary to clean more often. (APN-022 Heat Exchanger Maintenance)
- Check air filters – if dirty clean or replace. Clean reusable filters with water and dry before reuse or replace non-washable filters as needed.
- Check exciter switching – Switch to backup exciter and verify its on-air operation for MER and sideband levels

Monthly Maintenance & Checks (Continue)

- Check integrity and switchover of alternate transport stream
- Check operation of generator
- Check operation of UPS – If exciter or controller is on UPS, shut AC off and verify UPS operation
- Verify surge suppression - If there are LED's verify they are all lit
- N+1 or Main – Alternate systems check the operation of back up transmitter system, turn on run into the load, and verify operation at full power.

Quarterly Maintenance & Checks

- Check coolant PH level - should be >8.0 with PH paper or electronic PH instrument
- Check coolant 50/50 mixture - use hydrometer or refractometer for ethylene glycol
- Verify power calibration – Use a calibrated meter that is capable of measuring power for the modulation type Analog or Digital
- Check Phase Shifter Operation - Multi-transmitter systems only
- N+1 or Main / Alternate systems check operation of the Switch / Multi system controller for correct operation by switching the alternate transmitter into operation. In the case of the N+1 system one or more switches may be required to test the entire system. N+1 system verify the parameters change (channel/Frequency, power level...) to the +1 / alternate transmitter.
- Check operation of Patch panels and u-links.
- Check Antenna Main / Alternate switching or top half / bottom half feed switching.
- Check Operation of station test load, Liquid cooled loads review test load cooling for leaks, drips, and check operation of pumps.

Biannual Maintenance & Checks

- Inspect and clean top of and inside cabinet
- Inspect and clean top of and inside pump module
- Check transmission line pressurization equipment and dehumidifiers (desiccant, tank pressures, spares)
- For liquid cooled transmitters inspect and clean the cooling liquid screens or filters.

Annual Maintenance & Checks

- Inspect antenna (integrity of components, hardware presence and tightness)
- Inspect tower, see tower manufacture for maintenance schedule and inspection procedures
- Inspect and time domain sweep transmission line
- Replace time/date battery in Transmitter control system if required.
- Replace time/date battery in the systems Exciters or exciter low power drive units (LPU).
- Replace battery backup module in the exciter or exciter low power drive units (LPU) – this is an optional item that may not be installed in the exciter
- Check ground system integrity (visual inspection and or resistance measurement).
- Check and update safety telephone number list.
- Check for transmitter manufacture updates and software updates.
- Check for site safety, review all aspects of the broadcast site, gates, road, security and buildings.

Additional Extended Maintenance & Checks

- Check Cooling liquid for liquid cooled systems (transmitter and loads) the cooling fluid should be replaced every 5 years, if not replaced a sample should be provided to the cooling fluid manufacture for testing and recommendation.
- For Oil filled loads the Oil level should be checked, see the load manufacture for the recommend replacement of the Oil in loads.
- Check the tightness of the AC power feed to the cabinet and power Blocks. (remember to turn off the breaker)

Questions?

Thank You
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