

1. General

1.1 PROPOSED EQUIPMENT All users desiring to install new or additional equipment, antennas or feedline shall furnish site manager the following data to determine compatibility.

- Proposed Transmitter—brand, model, output power, and operation frequency
- Proposed Receiver—brand, model, frequency
- Proposed Isolator—cavity and feedline losses
- Proposed Antenna—brand, model, specified gain, anticipated radiation pattern
- Proposed Computer, Control or Monitor Facilities—complete description of system, method of access, etc.

The site manager will review the data and will respond normally within seven business days. Additional data may be required, which may delay the proposed installation. Providing the most complete data will insure prompt review.

1.2 PROHIBITED PRACTICES The following will not normally be permitted, unless technical review by site manager determines acceptance:

- Any equipment that does *not* have FCC Type Acceptance or Approval
- Any unshielded radio-frequency or computer assembly
- Any inferior grade of coaxial cable, such as RG-8, RG-213, RG-58, RG-59, etc.
- Nickel-plated RF connectors (such as the type generally available at Radio Shack and other such outlets)
- Any *modified* RF equipment that may affect Type Acceptance
- Any ferrite device directly “looking at” any antenna.

2. RF Interference Protection Devices

In general, the following *minimum* specifications will apply:

FREQUENCY BAND ISOLATOR B/P CAVITY NOTES

FREQUENCY BAND	ISOLATOR	B/P CAVITY	NOTES
30–76 MHz	Note 1	Required	1. Isolator may replace cavity*
108–174 MHz	25 dB	Required	
216–225 MHz	25 dB	Required	
406–512 MHz	25 dB	Required	
806–960 MHz	25 dB	Required	
960 MHz and up	Note 2	Note 2	2. Determined by application

*When using an isolator *without* a cavity, a simple harmonic filter is required on the antenna side

In some cases two-stage isolators, harmonic or notch filters, or other such devices may also be required. Changes in antenna type or physical placement of equipment may also be required, depending on circumstances.

3. Antennas and Mounting Considerations

3.1 ANTENNAS Unless a written exception has been granted by site manager, the following rules will apply:

- Antennas with high V_{SWR} will not be permitted; when the ratio is in question, the site manager’s decision will be final.
- Antennas must be designed for 100 mph wind and radial ice loads.

3.2 MOUNTING Unless a written exception has been granted by site manager, the following rules will apply:

- One antenna *only* shall be affixed to each provided mounting position.
- Only designated mounting positions shall be used.
- Mounting hardware shall be of noncorrosive and non-corroding material such as galvanized steel, stainless steel, or other comparable metal.
- Extending, drilling, or otherwise modifying the mounting are is not permitted.

4. Transmission Line Considerations

4.1 FEEDLINES Unless an exception is authorized by the site manager, the following rules will apply:

- Feedline must be of jacketed Helix[®] or its equivalent, no less than 1/2" diameter.
- No kinked or otherwise damaged cable may be installed.
- Feedlines must be grounded at the building entry point.
- Feedlines must be color coded at building entry point *and* at the antenna with at least 3 bands (using Scotch plastic tape or equivalent).
- Exposed jumpers shall be of high grade double shielded cable not exceeding 24" in length.

4.2 FEEDLINE & JUMPER HARDWARE & MOUNTING

- Exposed fasteners shall be stainless clamps such as Andrew clips or Band-It attached with beam clamps.
- Don’t use “tie-wrap” strapping outdoors.
- Fasteners must be used to clamp feedline to tower or tray at intervals of not less than 4 ft.
- Feedline must be firmly secured at antenna mounting area.
- Outside building at cable entry point, feedline must be weatherproofed and formed into a drip loop.
- Exposed jumpers shall be strain relieved and shielded from ice and snow.

4.3 FEEDLINE ROUTING

- Feedline must be routed to avoid stepping on or bending by tower personnel.
- Feedline must be routed so as not to cross other lines on cable ladder or tray area.

5. Connectors

In general, mil spec or crimp-type silver plated connectors are required for all RF carrying cables, including jumpers. Where Helix cable is used, only OEM connectors are acceptable.

6. Transmitters

- Type Acceptance identification placard must be visible from front or rear of unit.
- All shielding and protective covers must remain in place except during service.
- Output power shall not exceed manufacturer’s output rating.
- In addition to the easily readable name and telephone number of the individual responsible for proper transmitter operation, the following must be plainly visible from front of unit:
 - Operating frequency
 - Output power
 - User call sign

7. Receivers

Receivers must use 100% shielded cable on the input and must be designed for operation in a high-RF environment. Depending on circumstances, VHF users may be required to install a crystal filter to preclude interference.

8. Combiners & Duplexers

These must provide at least 65 dB isolation between transmit port and other ports. See Item 9 below for mounting guidelines.

9. Cabinets & Racks

In general, racks should be permanently affixed to flooring; this will minimize likelihood of movement during earthquake activity. Users of exclusive rooms may arrange equipment as they like and may utilize open-frame racks and such. Users in shared rooms must adhere to the following requirements.

- All electronic assemblies must be housed within a cabinet with locking doors.
- Overall rack size may not exceed 24"L x 24"W x 8"H.
- Cavities and combiners may be wall mounted so long as the lowest protruding portion is above a clearance of 7 ft.

10. Installation Procedures

All installation plans must be approved in advance and the actual installation itself inspected before use by the site manager. The sequence is as follows:

- Submit installation plan to site manager for approval.
- Upon approval, perform installation in strict accordance with plan.
- After installation call site manager for inspection, approval of workmanship, and verification of adherence to plan.
- If installation is approved, commence normal operation.
- If installation is not approved, make recommended upgrade alterations. Workmanship review by site manager may require user to improve antenna, feedline, or equipment installation if at any time it becomes necessary.

11. Interference Diagnosis Procedures

Call site manager and advise of problem, identifying source (if known). All users must cooperate when called upon to investigate an interference source regardless of whose equipment is causing the problem.

GENERAL RULES

1. Local loudspeakers must be turned off except during service.
2. Cabinets and racks may not be relocated without prior approval from site manager.
3. Excess feedline, spare parts, antennas, or other gear may not be stored outside your cabinets.
4. All antennas and equipment must be maintained in a neat, orderly, and professional manner at all times.
5. Safety belts are *required* for any tower work performed, regardless of height, proximity to building, etc. No exceptions to this rule will be permitted.
6. Remove all your trash when you leave the site. Don't litter ever.
7. Tower work during windy periods is prohibited. Bear in mind that gusty winds are unpredictable and may occur at any time.
8. No tower work is to be performed unless two or more trained professionals are present.
9. Children and untrained personnel are not permitted at the site without prior written authorization from the site manager.
10. ALWAYS look around for hazards when you enter the area where you plan to work, whether it is the building, the grounds, or the tower. Be on guard for snakes indoors and out. Watch for signs of falling ice, loose or broken mounting hardware, and the like. Your personal safety must come first. Notify the site manager of any potentially unsafe condition you see.