

## § 1204.3

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### § 1204.3 Requirements.

All omnidirectional CB base station antennas are required to comply with the following requirements.

(a) *Field joints.* Parts or accessories intended to protect a field joint so that it will meet any other requirement of this standard, and that must be put into place by the person assembling the antenna system, shall be integral with, or not readily removable from, at least one of the antenna sections or parts involved in the joint or shall be necessary in order to complete the joint.

(b) *Feed cable.* When compliance with the requirements of this standard depends on the insulating or other properties of the feed cable, at least 50 feet of the cable shall be supplied by the manufacturer with the antenna system.

(c) *Electrical protection.* Antenna systems shall be manufactured so that if all points within the protection zone of an antenna system were tested by the Insulating Material Effectiveness Test of §1204.4(d) of this subpart, and the Antenna-Mast System Test of §1204.4(e) of this subpart, the current measured by the current monitoring device connected to the mast would be no greater than 5.0 milliamperes rms and no electrical breakdown of the antenna system's insulating material would occur.

### § 1204.4 Electric shock protection tests.

(a) *Safety precautions.* For tests involving high voltage, the following recommended minimum safety precautions should be followed:

(1) At least one test operator and one test observer (preferably one with cardiopulmonary resuscitation (CPR) training) should be present at every test.

(2) The test area (outdoors or indoors) should secure against accidental intrusion by other persons during tests.

(3) Test areas located indoors should be ventilated to avoid buildup of potentially hazardous concentrations of gaseous byproducts which may result from the tests.

(4) Fire extinguishers should be easily accessible in case materials on the test specimen ignite.

(5) "High Voltage Test" warning devices should be activated before start of a test.

(6) Emergency phone numbers should be posted.

(b) *Test conditions*—(1) *Specimens.* All specimens shall be tested as supplied by the manufacturer, following assembly in accordance with the manufacturer's instructions except as provided in paragraph (e)(2) of this section.

(2) *Temperature.* Ambient temperature shall be in the range from 32 °F (0 °C) to 104 °F (40 °C)

(3) *Relative humidity.* Ambient relative humidity shall be in the range of from 10 to 90 percent.

(4) *Voltage.* Voltage, phase to ground, of the power line or test probe shall be 14.5 kilovolts rms, 60 hertz.

(5) *Conditioning.* Prior to testing, all specimens shall be exposed for at least 4 hours to the ambient test area environment.

(c) *Test equipment.* (1) High voltage source capable of delivering at least 15 mA rms at 14.5 kV rms, 60 Hz. The source should have an automatic internal cut-off actuated by a preset current level.

(2) Instrumentation to measure the rms voltage applied to the antenna system.

(3) Current monitoring device to indicate hazardous components of the total rms current flowing to ground through the mast. One configuration of the circuitry for the current monitoring device (shown in Figure 1) consists of three parallel branches as follows. One branch consists of a resistor in series with a true-rms milliammeter with a maximum error of 5% of the reading in the frequency range of 50Hz to 10MHz (the total of the resistor and the internal resistance of the milliammeter is to be 1000 ohms). A parallel branch consists of a 1000 ohm resistor in series with a 0.08 microfarad capacitor. Another parallel branch should consist of a spark gap rated at 50 to 100 volts as a meter protection device. A different current monitoring device may be used if the measured value of the rms current corresponds to that indicated by the configuration described above.

(4) For the Insulating Material Effectiveness Test:

(i) High voltage electrode or test rod consisting of ¼ in. (6.4 mm) diameter aluminum rod.

(ii) Support jig, structure, or hanger made of insulating material which is capable of holding antenna system test specimens electrically isolated from all surrounding structures or ground.

(5) For the Antenna-Mast System Test, a high voltage test facility, as shown in Figures 2 and 3, which includes a single power line spanning between two poles 95 to 105 feet (29 to 32 meters) apart, a tensioning device to adjust the cable sag to from 9 to 12 inches (23 to 30 cm), and a pivot fixture (Figure 2), for holding the base of an antenna-mast system, which can be moved horizontally to adjust the distance to the cable. The cable consists of ¼ in. diameter 7 by 19 galvanized steel aircraft cable. The low point of the cable shall be between 28 and 29 feet (8.5 to 8.8 meters) above a horizontal plane through the pivot axis of the pivot fixture.

(d) *Insulating Material Effectiveness Test procedure.* (1) A short piece of typical tubular mast shall be attached to the antenna system to be tested, in accordance with mounting instructions provided with the antenna system by the manufacturer.

(2) If a feed cable is provided with the antenna system, it shall be used in the test. If no cable is provided with the antenna system, a RG-213 cable shall be used in the test (Mil Spec. MIL-C-17/75C, 15 March 1977). In either case, the cable shall be connected to the antenna system, installed parallel to the mast, and secured by taping or similar means at one point on the mast. The side of the bottom end of the cable also shall be secured to the mast.

(3) With the antenna system properly supported and isolated from ground and with the current monitoring device connected to the mast, the test rod shall be connected to the high voltage source and brought into contact with the antenna system at any point within the protection zone (see §1204.2(k) of this subpart). For each contact point, the voltage shall be increased from 0 to 14.5 kV at a rate of at least 2 kV per second and held at 14.5 kV for 5.0 minutes. Current shall be monitored and the maximum recorded.

(e) *Antenna-Mast System Test procedure.* (1) The antenna system to be tested shall be attached to a mast in accordance with mounting instructions provided by the manufacturer. The mast shall be assembled of commercially available 1¼ inch outside diameter 16 gauge tubular steel sections, commonly sold for antenna-mast installations in 5 and 10 feet lengths. The slip joints between the mast sections shall be secured (as with screws) to prohibit rotational or longitudinal movement at the joint. The length of the mast shall be such that when it is mounted in the pivot fixture of the high voltage test facility, the distance from the pivot to the uppermost point on the antenna system is 41.75 to 42.25 feet (12.7 to 12.9 meters).

(2) If a feed cable is provided with the antenna system, it shall be used in the test. If no cable is provided with the antenna system, a RG-213 feed cable shall be used in the test for specification of an RG-213 cable see (Mil. Spec. MIL-C-17/75C, 15 March 1977). In either case, the cable shall be connected to the antenna system, installed parallel to the mast, and secured by taping or similar means every two feet along the length of the mast. The side of the bottom end of the cable also shall be secured to the mast.

(3) The antenna-mast system shall be mounted in the pivot fixture. The pivot fixture shall be adjusted so that the point of impact between the antenna and the power line takes place at any desired point within the antenna's protection zone. The antenna-mast system shall then be erected to a position of up to 5° from the vertical, leaning toward the simulated power line (see Figure 4). The antenna-mast system shall then be released and allowed to fall against the power line. The test may be performed with different test positions such that the antenna system flexes after impact and slides off the power line and or so that it remains in contact with the power line for 5.0 minutes. Current flow from the antenna-mast system to ground shall be monitored and recorded for each test.

(f) *Interpretation of Results.* An antenna shall pass the Insulating Material Effectiveness Test or the Antenna-Mast System Test if no electrical

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breakdown occurs and if no current reading exceeds 5 mA rms.

### § 1204.5 Manufacturer's instructions.

(a) For all antennas covered under this part 1204, the following statement shall be included in the manufacturer's instructions, in addition to the material required by 16 CFR 1402.4(a)(1)(ii):

Under some conditions, this antenna may not prevent electrocution. Users should keep antenna away from any overhead wires. If antenna contacts a power line, any initial protection could fail at any time. IF ANTENNA NEARS ANY OVERHEAD WIRES, IMMEDIATELY LET GO, STAY AWAY, AND CALL UTILITY COMPANY.

(b) This warning statement shall be in a separate paragraph immediately following the warning statement required by 16 CFR 1402.4(a)(1)(ii)(A).

(c) This warning statement shall be legible and conspicuous and shall be in type that is at least as large as the largest type used on the remainder of the page, with the exception of the logo and any identification of the manufacturer, brand, model, or similar designations, and that is preferably no smaller than 10 point type.

### § 1204.6 Findings.

As required by section 9 (b) and (c) of the Consumer Product Safety Act, 15 U.S.C. 2058 (b) and (c), the Commission makes the following findings:

(a) *The degree and nature of the risk of injury the rule is designed to reduce.* (1) The rule addresses the risk of injury or death caused by electric shock occurring when the antenna comes into contact with electrical power lines while the antenna is being put up or taken down.

(2) About 175 fatalities were estimated to be associated with omnidirectional CB antennas in 1976. The estimated number of fatalities declined to about 125 in 1977 and to about 55 in 1978. Since then, the number of fatalities appears to have leveled off at about 45–50 each year. In addition to the 45–50 deaths, it is estimated that a somewhat greater number of injuries occur annually and that about half of them are serious enough to require surgery, amputation, skin grafts, etc. It is common for multiple deaths or injuries to occur in a single accident.

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(3) The Commission's staff has estimated that since 1979 about 20 percent of the accidents involved antennas less than a year old, resulting in about 8 deaths in 1980.

(4) Since a substantial portion of the accidents associated with these antennas occur when the antenna is being taken down after it has been installed in an outdoor environment for a number of years, the standard recommends that materials selected to provide protection from shock be weather resistant.

(5) The standard specifies that protection shall be provided against voltages of 14,500 volts phase-to-ground. Voltages of this level or less are involved in 98 percent of the accidents and 95 percent of the total circuit mileage of distribution circuits.

(b) *The approximate number of consumer products, or types or classes thereof, subject to the rule.* (1) The standard applies to omnidirectional CB base station antennas. The Commission estimates that there were approximately 5 million omnidirectional base station antennas in use in 1981, and at that time as many as 75,000 of these antennas were expected to be sold each year for the next several years.

(2) [Reserved]

(c)(1) *The need of the public for the consumer products subject to the rule.* Omnidirectional CB base station antennas are used in non-mobile applications to obtain essentially uniform receiving and transmitting capabilities in all directions simultaneously. Although directional antennas can obtain greater reception and transmitting capabilities in one or more directions than can omnidirectionals, directionals are generally more expensive and must be oriented so that they point in the desired direction. Therefore, omnidirectional antennas are preferred by many base station operators, and they can also be used in conjunction with a directional antenna to locate another station to which the directional antenna can then be oriented.

(2) CB stations are used by individuals as a communications device for both practical and personal enjoyment purposes. Some operators volunteer to monitor the commonly used and/or emergency channels for distress calls