

ORANGE COUNTY FIRE AUTHORITY

Planning & Development Services Section

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Emergency Responder Digital Radio – (Radio Communications within Buildings)



Guideline E-03

Date: January 1, 2014

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Emergency Radio Coverage

PURPOSE

This guideline establishes framework to provide effective “in-building” radio coverage in communities served by the OCFA and by local law enforcement agencies utilizing the Countywide Coordinated Communication System.

SCOPE

The regulatory authority for the provisions contained within this Guideline are found in Section 510 of the 2013 California Fire Code as locally adopted. If a local agency (City/ County) has adopted a separate ordinance governing in-building emergency radio coverage, the provisions contained within that ordinance shall take precedence over the Fire Code and this Guideline.

This Guideline shall apply to every building, structure and subterranean parking or storage except the following:

1. Existing buildings or structures for which a building permit has been issued.
2. Elevators.
3. Buildings and structures that have three (3) stories or less and that do not have subterranean storage or parking.
4. Any building or structure where coverage consistent with the minimum level of service as set forth in the Specifications is naturally provided.
5. Any existing building unless the building is undergoing extensive remodel and/or expansion and the building exceeds 3 stories or contains subterranean parking or storage.

Note: When these conditions exist, prior to placing any requirement for the installation of any in-building emergency radio communication equipment, OCFA staff will as early in the construction approval process as practical:

- i. Determine if radio communications has historically been problematic for emergency response personnel (fire and police)
- ii. Communicate and coordinate with the Building Official, and the property owner.

Definitions

Amplification System: An in-building public safety radio amplification system composed of FCC-certified bi-directional 800 MHZ amplifier(s), associated distribution system, and subcomponents.

FCC Certified Technician: An individual who is qualified with a General Radiotelephone Operator License (GROL/PG), or equivalent, to review design plans and perform tests in affected structures to measure compliance with the specifications set forth in this article.

Countywide Coordinated Communication System: The radio system used by local law enforcement, fire, lifeguard and public works departments within the County of Orange for emergency and non-emergency radio communication on the 800 MHz radio band.

OCFA: Orange County Fire Authority

The owner of any building or structure to which this article applies shall be responsible for all costs associated with compliance with the County of Orange Public Safety Radio System Coverage Specifications.

REQUIRED SPECIFICATIONS

The following levels of coverage are required for public safety radio communication on the Countywide Coordinated Communication System:

- A. A delivered audio quality of level 3 on each floor of the building or structure, which constitutes audio quality that makes speech understandable with slight effort with occasional repetition required due to noise or distortion.
- B. A minimum signal strength of (-95dBm) in 90% of the area of each floor of the building or structure from both the Countywide Coordinated Communication System and from within the building or structure.
- C. A frequency range supported *from* the Countywide Coordinated Communication System of 851 - 869 MHz (base transmitter frequencies), and a frequency range supported *to* the Countywide Coordinated Communication System of 806 - 824 MHz (radio field transmit frequencies) on each floor of the building or structure.
- D. All new buildings or structures shall be constructed with a two-inch (2") conduit installed between the first floor or the bottom subterranean floor, as applicable, and said conduit shall extend along the center of the building to the roof. At each floor and the roof, an opening shall be made to afford easy access to the conduit from the ceiling. Access in either the form of drop ceiling or conduit shall be made available along hallways and through firewalls. All floors of subterranean parking garages shall have a similar conduit installation.

OPTIONS FOR COMPLIANCE

Buildings and structures that cannot be constructed to provide the performance specified above shall be equipped with an amplification system or an active device that complies with the following criteria or any other system approved in writing by the OCFA, Building Department and the local law enforcement agency.

A. Amplification System Specifications.

- 1. The amplification system shall include filters to reject frequencies below 851 MHz and frequencies above 869 MHz by a minimum of 35 dB.

2. All amplification system components must be 100% compatible with analog and digital modulations after installation without additional adjustments or modifications. The system must be capable of encompassing the frequencies stated above and capable of future modifications to a frequency range subsequently established by the City (County of Orange if within unincorporated Orange County). If the system is not capable of modification to future frequencies, then a new system must be installed to accommodate the new frequency band.
3. All electrical components must be equipped with independent auxiliary battery power or generators to function at full capacity for at least twelve (12) hours. The auxiliary battery systems shall be replaced per manufacturer's specifications at least every two (2) years.
4. The amplification system shall be installed by a City (County of Orange if within unincorporated Orange County) approved, manufacturer-trained and certified installer.

B. Active Device Specifications.

1. Active devices shall have a minimum of -50 dB 3rd order intermodulation protection.
2. All active devices shall be FCC Part 90 Type Certified.
3. All electrical components must be equipped with independent auxiliary battery power or generators to function at full capacity for at least twelve (12) hours. The auxiliary battery shall be replaced per manufacturer's specifications at least every two (2) years.
4. Active devices shall be alarmed with a phone line that will provide dial tone to an alarm device. The alarm device will be programmed to activate a pager on the County of Orange's 900 MHZ paging system. Access to the active device is required twenty-four (24) hours a day by City/County and Police/Sheriff Department technicians/engineers. The minimum alarms will indicate loss of AC failure and operational failure. The device shall also have modem access to allow remote monitoring.
5. Any AC operated power supplies shall have a UL listing,

TESTING AND SYSTEM DESIGN PROCEDURE

A. Initial Tests.

1. Prior to issuance of a building permit for a building or structure to which these specifications apply, the applicant shall:
 - a. Retain an FCC-certified technician to review, sign, and stamp construction plans in order to ensure that such plans satisfy these specifications, and recommend, if needed, an amplification system or an active device for reliable radio communication;

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- b. Submit copies of plans certified by an FCC-certified technician to the City's (County of Orange if within unincorporated Orange County) Chief Building Official, the OCFA Planning & Development Services Section, and the Police Department.
 2. Prior to the issuance of a certificate of occupancy for any building or structure to which these specifications apply, the applicant shall:
 - a. Retain an FCC-certified technician to test all areas of the building or structure in accordance with subsection b, below, and certify by stamp and signature compliance with these specifications.
 - b. For purposes of testing, each floor of the building shall be divided into a grid of approximately twenty (20) equal areas. A maximum of two (2) nonadjacent areas will be permitted to fail the test on each floor. In the event that three (3) of the areas fail the test, and to provide greater statistical accuracy, the floor may be divided into forty (40) equal areas. In such an event, a maximum of four (4) nonadjacent areas will be permitted to fail the test. The test shall be conducted with a Motorola XTS 3000/XTS 5000 or equivalent portable radio talking through the Countywide Coordinated Communication System. The test shall be conducted from a spot located approximately in the center of each grid area. The radio will then be keyed to verify two-way communication to and from the outside of the building through the Countywide Coordinated Communication System. Once the spot has been selected and tested, prospecting for a better spot within the grid area is prohibited.
 - c. All auxiliary power systems shall be tested under load for a period of one (1) hour to verify that the system will operate properly in the event of a power outage. The testing technician reserves the discretion to determine whether or not the battery exhibits symptoms of failure. The FCC-certified technician will ultimately decide if the auxiliary system needs to be replaced or upgraded.

B. Periodic Tests.

The OCFA will perform periodic tests on each floor of each building or structure to which these specifications apply to confirm continued compliance with the specifications set forth in this article. This test is not intended to replace any required maintenance and testing that is the responsibility of the property owner.

C. Record Retention.

The owner of any building or structure to which these specifications apply shall retain all records of initial and annual tests performed pursuant to this section and shall submit copies to the City's (County of Orange if within unincorporated Orange County) Chief Building Official, The Police Department and the OCFA within thirty (30) days of completion of such tests.