

Usage of the 4.4-4.99 GHz Band in the USA

4.4-4.5 GHz

FG: FIXED, MOBILE

Non-FG: None

The Federal 4 GHz spectrum spans 4.4 GHz to 4.99 GHz. This spectrum is designated in the U.S. and NATO countries for military fixed and mobile communications. Typical uses include point-to-point microwave, drone vehicle control and telemetry.

The Department of Energy uses this band for telemetry, video, and mobile communications in support of the little-known, anti-terrorist *Nuclear Emergency Search Team* (NEST). Its radios tune 4.4-4.99 GHz. Dubbed the “Nation’s Nuclear Fire Department,” NEST must search for Nuclear materials and respond to nuclear extortion or accidents in any location. The organization is said to be based at Nellis Air Force Base, Nevada (Area 51?).

The Treasury Department operates tethered radar balloons (aerostats) in this band, deployed along the southern border and Caribbean areas to detect aircraft suspected of carrying drugs.

4.5-4.8 GHz

FG: US245 FIXED, MOBILE

Non-FG: US245 FIXED-SATELLITE (space-to-Earth) 792A

By Presidential action under the 1993 *Omnibus Budget Reconciliation Act*, the 4.635-4.66 GHz segment was reallocated to the private sector in February 1997 for future commercial uses. However, in March 1999, he withdrew the entire 4.635-4.685 GHz spectrum from commercial availability after conflicts appeared with the Navy’s *Cooperative Engagement Capability* (CEC), a radar information distribution network, in this spectrum. He made a nearby band available to the FCC for commercial use instead (4.94-4.99 GHz).

The 4.635-4.66 GHz segment was to have been combined with the 4.66-4.685 GHz band to form a 50 MHz wide *General Wireless Communications Service* (GWCS) with no specific use. The new 4.94-4.99 GHz service will not be called GWCS.

The 4.5-7.5 GHz spectrum is used in microwave radiometry from aircraft to measure ocean wind speed and rain characteristics in hurricanes and storms.

The 4.5-5.15 GHz spectrum is one of many restricted bands in which the FCC Part 15 rules permit unlicensed devices to emit only very low level emissions.

4.8-4.94 GHz

FG: S5.149 US203 FIXED, MOBILE

Non-FG: S5.149 US203

Footnote US203 provides the *Radio Astronomy Service* (RAS) uses. The 4.8-4.99 GHz spectrum is allocated worldwide to the RAS on a secondary basis, with primary allocations to RAS in some countries. The 4.5-5.15 GHz spectrum is one of many restricted bands in which FCC Part 15 rules permit unlicensed devices to emit only very low level emissions.

4.94-4.99 GHz

FG: S5.149 S5.339 US257 (proposed to be replaced with US311)

FIXED, MOBILE

Non-FG: S5.149 S5.339 US257 (proposed to be replaced with US311)

(4940-4900 MHz became non-Federal government exclusive spectrum in March 1999.)

Historically, the Defense Department was the largest user of 4.94-4.99 GHz. The Air Force uses the band to train aircrews in electronic combat, to send radar data over microwave links, and for such uses as missile testing, drone aircraft control, and tropospheric scatter communications—the only part of the spectrum used by U.S. military for this propagation mode.

Army and Navy uses are similar. An important Navy system in this band is the *Light Airborne Multipurpose System* (LAMPS), a wideband link between helicopters and ships. Other Major federal users include the Justice Department, which uses the band in video surveillance, and the Treasury Department in border interdiction.

Footnote US257 recognized the Radio Astronomy Service (RAS) in this spectrum. It authorized astronomical observation at certain locations and attempts to avoid interference to these passive (non-transmitting) operations, which are used to study the brightness of objects such as supernovas.

The 4.8-4.99 GHz spectrum is allocated worldwide to the RAS on a secondary basis, with primary allocations to RAS in some countries. The 4.95-4.99 GHz segment is allocated worldwide to the Space Research Service (SRS) and Earth Exploration Satellite Services (EESS), both for passive (reception) uses, on a secondary basis.

The 4.94-4.99 GHz spectrum was reallocated to the private sector as previously describes. It may become the new home of fixed and mobile services in what was formerly called the *General Wireless Communications Services* (GWCS). That service has been eliminated as a distinct identity. The FCC has announced an examination of licensing and service rules for 4.95-4.99 GHz in the context of the *Wireless Communications Service* (WCS, Dockets WT 00-32 and ET 98-237). Importantly, the FCC proposed to pair 4.95-4.99 GHz with 3.65-3.7 GHz Mobile to base operations, however, would not be permitted in 3.65-3.7 GHz in order to protect incumbent satellite stations. Mobile to base use would have to be limited to 4.94-4.99 GHz.

The FCC proposes to permit the 4.9 GHz spectrum to be used for any service within the categories of “fixed” and “mobile,” including land and maritime mobile. Except for aeronautical mobile (to avoid RAS interference), it is subject to international requirements and frequency coordination.

The Federal Government (FG) fixed and mobile allocations, shown previously, would be deleted. All FG frequency assignments, except for RAS observatories, would be withdrawn or limited in the band, with FG agencies expected to relocate their operations to the 4.4-4.94 GHz spectrum.

The 4.5-5.15 GHz spectrum is one of many restricted bands in which the FCC Part 15 rules permit unlicensed devices to emit only very low level emissions.

Usage of the 14.7145-15.1365 GHz Band in the USA

14.5-14.7145 GHz

FG: FIXED, MOBILE, Space Research

Non-FG: None

Military uses of this band include electronic warfare, radar microwave links, cross-section measurement, and threat simulation.

NASA's Tracking and Data Relay Satellite System (TDRSS) has uplinks at 14.5-15.35 GHz.

This is part of the FAA television microwave link band that relays video between aviation facilities.

14.7145-15.1365 GHz

FG: US310 MOBILE, FIXED, Space Research

Non-FG: US310

NASA's Tracking and Data Relay Satellite System (TDRSS) has uplinks at 14.5-15.35 GHz.

15.1365-15.35 GHz

FG: S5.339 US211 FIXED, MOBILE, Space Research

Non-FG: S5.339 US 211

Air traffic control links, electronic warfare, government data and control links, radio astronomy, and satellite-based rain and water vapor sensors use this band.

NASA's *Tracking and Data Relay Satellite System* (TDRSS) has uplinks at 14.5-15.35 GHz.