

FHH Telecom Law
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Millimeter-Wave Spectrum
Opens for Business

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The FCC broke new ground this month by authorizing commercial use of the 71-76, 81-86, and 92-95 GHz bands -- the highest frequencies ever made available to non-Government users. Designing equipment for these upper reaches -- called "millimeter wave" bands, because their wavelengths are only a few millimeters -- presents a daunting technical challenge, and became practical only within the last few years.

The rulemaking is remarkable for the vast amounts of spectrum it provides. The 12.9 GHz authorized here -- by far the most ever handled in a single proceeding -- equals the total of all spectrum allocated to all FCC-regulated and Government services from the beginning of radio to just over a decade ago.

The 71-76 and 81-86 GHz bands are well suited for point-to-point communications over a few kilometers, and can deliver extremely high data rates -- well into the gigabit/second range. The FCC divided each of these bands into four segments 1.25 GHz wide. But a licensee is not restricted to one segment, and can aggregate segments to make use of all 10 GHz. The segments appear to have been adopted mainly as an aid to coordinating paired links. Pairing between the 71-76 and 81-86 GHz bands is permitted but not required. If paired, however, the bands must be paired in corresponding segments, *e.g.*, 71-72.25 GHz with 81-82.25 GHz.

The 92-95 GHz band is divided into two unequal segments, 92-94 and 94.1-95 GHz, which also may be aggregated. The gap at 94-94.1 GHz protects satellite-based cloud radars. There is no specific provision for pairing in this band.

The FCC has adopted an innovative licensing scheme. Every licensee will hold a non-exclusive nationwide license for the entire 12.9 GHz, and there is no limit on the number of such licenses. But frequency coordination is required for each link. According to preliminary reports, coordination will proceed in two steps. First, the user will coordinate with the federal agencies sharing the bands by entering proposed link data into a database maintained by the National Telecommunications Information Administration. A "green" response clears the user to proceed to the next stage, while a "yellow" response, expected to be rare, means the coordination must go through IRAC review -- a process that can take several weeks. Second, the user coordinates with other private users by entering the link data into a third-party database. If there are no conflicts, the coordination is cleared instantly, and the link is retained in the database for future coordinations. Priority is solely by date of entry in the database.

Neither of these automatic coordination mechanisms may be in place until four months after the new rules are published in the Federal Register -- that is, probably not before the second or third quarter of 2004.

Because these frequencies yield highly directional beams from a small antenna, and their propagation is relatively poor, even nearby systems are unlikely to interfere with each other. This permits a high level of frequency re-use within a small area. Coordination conflicts should be rare, except perhaps among links terminating on the same rooftop.

The FCC will permit indoor-only unlicensed operation at 92-94 and 94.1-95 GHz. There is no provision for unlicensed operation at 71-76 and 81-86 GHz.