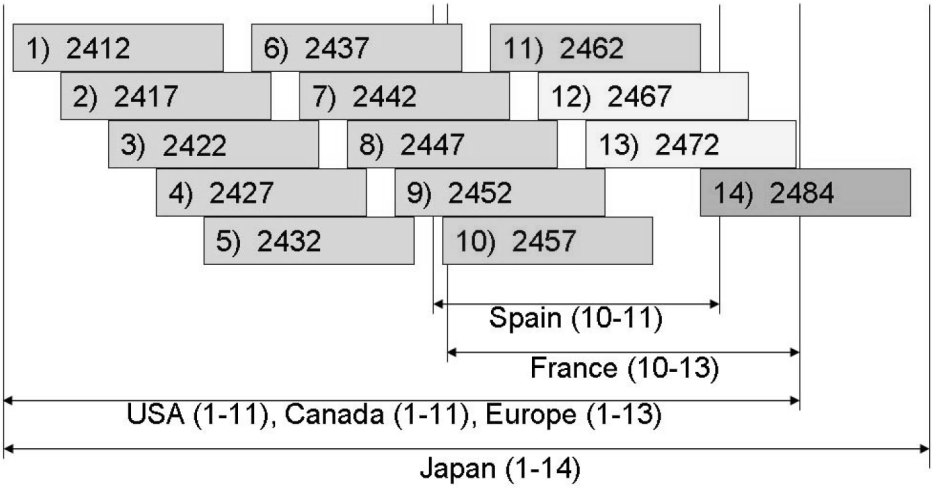

Figure 2.12 2400 MHz channelization scheme for IEEE 802.11b throughout the world.

the interference and propagation environment—prudent WLAN deployment dictates that the placement of transmitters and their frequency assignments be done systematically to minimize impact. Even though WLAN networks are designed to work in an interference-rich environment, and manufacturers may downplay the importance of planning, the fact is that the ability to measure or predict the coverage and interference effects caused by specific placements of access points can provide *orders of magnitude* of improvement in cost and end user data throughputs in a heavily loaded system. Research conducted in [Hen01] showed that the user throughput performance changes radically when access points or clients are located near an interfering transmitter or when frequency planning is not carefully conducted.

Using new computer-aided design (CAD) measurement and prediction software such as *SitePlanner* by Wireless Valley [Wir01], WLAN deployments can be done very rapidly without any trial and error. By loading the blueprint of the building or campus within a computer, propagation modeling techniques can now predict user data throughput based on radio signal strength and interference prediction algorithms [Hen01]. Figure 2.13 illustrates how the proper placements for WLAN access points can be rapidly found before ever setting foot in the building. By using an interactive computer program, the network operator can rapidly provision and plan the channelization scheme, as well as the locations of the access points, before doing an actual network deployment. In fact, email and Internet correspondence can be done to rapidly provision any physical environment. When the deployment is complete, the same CAD environment is able to archive the exact physical locations, cost and maintenance records of the network, and the specific channelization schemes for future use and modification as network growth occurs.

Figure 2.13 shows the result of coverage for an actual WLAN installation made in a large modern lecture hall on a university campus. The design was first conducted blind in less than ten minutes, over the Internet, using a CAD design product. Then, the student used his complete