



VIA MESSENGER

RECEIVED
DEC 22 1994
FCC MAIL ROOM

December 19, 1994

Honorable Reed E. Hundt
Chairman
Federal Communications Commission
1919 M Street, N.W. Room 222
Washington, DC 20554

DOCKET FILE COPY ORIGINAL

**Software
Publishers
Association**

Attn: **Karen Brinkman - Room 814**

Re: **Allocation of Spectrum Below 5 GHz Tranferred
from Federal Government Use
ET Docket No. 94-32**

Dear Commissioner Hundt:

The Software Publishers Association respectfully requests the Commission's consideration of the enclosed comments in connection with the proceeding identified above, which affects the adoption of unlicensed wireless data communications services. Please do not hesitate to contact us if you have any questions.

Sincerely yours,


Mark Traphagen
Counsel

Enclosure: Comments and Appendix

cc: Gerald Vaughn - Wireless Telecommunications Bureau
✓ William F. Caton - Office of the Secretary

No. of Copies rec'd 0
List ABCDE



Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

RECEIVED
DEC 22 1994
FCC MAIL ROOM

In the Matter of)
)
Allocation of Spectrum Below)
5 GHz Transferred from)
Federal Government Use)
_____)

ET Docket No. 94-32

Software

Publishers

Association

TO: The Commission

COMMENTS OF
THE SOFTWARE PUBLISHERS ASSOCIATION

The Software Publishers Association ("SPA") is the principal trade association of the personal computer software industry. SPA has over 1100 members, including major business, consumer, leisure, and education software developers and publishers, as well as many smaller software firms and hardware system manufacturers. SPA is committed to promoting the software industry, and to providing information about it to the public and policy decision-makers.

SPA and its members have a vital interest in the success of the personal computer software industry. Because wireless data communication systems hold tremendous potential, both for consumer, education, and business software, SPA supports the Commission's recent efforts to allocate spectrum for advanced

wireless data communications technologies ("Data-PCS").¹ The current proceeding,² in which the Commission has sought comment regarding the allocation of 50 MHz of spectrum, offers the Commission an opportunity to augment its earlier allocation and to provide the spectrum necessary for the rapid initial deployment of Data-PCS.

For the reasons set forth below, SPA urges the Commission to allocate the 2390-2400 MHz band for unlicensed Data-PCS and reject the proposal to introduce licensed services into the 2402-2417 MHz band.

DISCUSSION

A. The Development of Data-PCS Will Revolutionize the Way We Use Personal Computers.

We are in the midst of a revolution in microcomputing. The power of today's personal computer is not confined within the user's machine, but is in the machine's ability to access and transmit information on a variety of networks. Unfortunately, networking capability is in tension with another feature that has become increasingly popular with consumers — portability.

Today, millions of people use their portable computers anytime and in any place. The portable computer user, however, largely is still tethered to a wire. If the user wishes to access a network, he or she must have a modem and an interconnection point (most commonly, a telephone jack). Thus, portable

¹ See Amendment of the Commission's Rules to Establish New Personal Communications Services, 9 FCC Rcd 4957, 5037 (1994) (allocating 10 MHz of spectrum at 1910-1920 MHz for unlicensed asynchronous PCS services).

² Allocation of Spectrum Below 5 GHz Transferred from Federal Government Use, Notice of Proposed Rulemaking, ET Docket No. 94-32 (rel. Nov. 8, 1994).

computers remain "portable" only until the user wishes to communicate, at which time they must be "hardwired" to a network.

This limitation must be overcome. Users need a computer that they can use to communicate anywhere, anytime. Whether they are doctors, school teachers, university professors, service technicians, scientists, or business people, the ability to connect to other computer users or to networks must be available by wireless means.

Fortunately, technological developments promise a solution. High-speed wireless data transfer systems — Data-PCS — currently are being developed that will allow for true ubiquitous wireless access. Data-PCS will enable users of all types of personal computers -- whether desktop, notebook, or palmtop -- to communicate with the local area networks in their schools, hospitals, or businesses, with significantly less need for cable connections and other communications hardware. By providing a cost-effective means to connect with local area networks, Data-PCS will also provide users with access to remote networks and the Internet.

Ubiquitous wireless computing represents a paradigm shift from the technologies of the past, as the final obstacle to full-fledged portability will have been overcome. Data-PCS promises to change the way most people work, especially those who are often away from their desks, as shown by the following illustrations:

- Doctors using personal digital assistants can review patient histories stored in hospital computers, and update recommendations for treatment, while making daily rounds.
- Schoolteachers, even those in classrooms without phones, can use desktop or palmtop computers to exchange lesson plans with colleagues, request materials from the school library, and send attendance reports and grades to the school's administrative computer.
- Business people using palm top computers and personal digital assistants can be in the warehouse or the boardroom, or even off-site, and still have access to the records in the desktop computers in their offices.

Data-PCS will reduce the physical tether needed to link users with their local area networks, and thus to wider networks like the Internet. The technology will facilitate network access in locations, like classrooms and hospital wards, where fully installing communications equipment would be too expensive and disruptive.³ Moreover, unlike licensed communications services, wireless data communications services using unlicensed spectrum promises to untether these users from charges for access to their own local networks based on user connect time.

B. The Development of Data-PCS Will Open New Markets for Personal Computer Software Developers and Publishers.

SPA expects the development of Data-PCS to foster a new generation of software titles as industry rushes to keep pace with user demand and advances in computer hardware. Of over 1000 software companies recently surveyed, 80 percent primarily develop and publish software for personal computers, such as

³ The advantages of wireless computing technology over traditional network infrastructure in educational settings is explained in the appendix entitled "Wireless Computing: Another Step in the Evolution of Educational Technology."

desktop, notebooks, and palmtops⁴ -- the equipment that uses Data-PCS for remote access to computer networks. Nearly one-third of these are smaller companies with annual revenues under \$10 million.⁵ Because over 70 percent of software companies surveyed believe they will be adding jobs this year, Data-PCS could be an important investment in one of the most promising industries in the United States.

SPA anticipates that the expansion of Data-PCS will have a direct effect of opening new markets for core applications like communications and networking software. For example, 25 percent of companies surveyed develop and publish software for communications and networking.⁶ These companies, many of whom will be new market entrants,⁷ expect to develop an average of three and one-half communications titles this year.⁸

Moreover, Data-PCS also promises to improve access to, and user acceptance of, other software applications by liberating users from desk-bound network access. About 45 percent of companies surveyed plan to develop software for education and medicine,⁹ fields in which network access has thus far been limited because of a shortage of phone lines in classrooms and hospital wards. Software companies are predicted to create an average of over 5 new titles in multimedia and in education this year.¹⁰

⁴ Price Waterhouse, *A Current View of the Industry: 1994 Software Business Practices Survey*, at 35.

⁵ *Id.*, at 86 *et seq.* (Detailed Results - Question 10).

⁶ *Id.*, at 33.

⁷ Nearly 50 percent of software companies will pursue a new market with their next title. *Id.*, at 30.

⁸ *Id.*, at 29.

⁹ *Id.*, at 86 *et seq.* (Detailed Results - Question 10).

¹⁰ *Id.*, at 29.

SPA believes that even greater effects would be generated from widespread acceptance of Data-PCS using unlicensed spectrum. Because, in contrast to licensed spectrum, there would be no exclusive licensees, there would be no obstacle for any company to manufacture personal computers and other devices operating at the allocated frequencies. So long as these devices complied with standard protocols for interoperating, the unlicensed spectrum would be open to wireless data communications. The history of the software industry strongly suggests that such an environment fosters product development, spurs competition based on product features, and results in a greater number of choices for consumers.

C. Allocation of the 2390-2400 MHz Band for Data-PCS Would Provide Necessary Spectrum.

The only impediment to the realization of ubiquitous wireless computing is the current lack of spectrum for Data-PCS. The Commission recognized this fact and recently allocated 10 MHz of spectrum (1910-1920 MHz) for unlicensed wireless data communications services. However, this initial allocation is inadequate, as the Commission has recognized.¹¹

As noted above, unlicensed Data-PCS systems must be capable of operating anywhere, anytime. As a result, the band within which such systems will function must be clear nationwide. The 1910-1920 MHz band is currently used by numerous fixed microwave facilities. Clearing this band for Data-PCS may require many years, which would substantially delay the introduction of new

¹¹ See Amendment of the Commission's Rules to Establish New Personal Communications Services, 9 FCC Rcd 4957, 5037 (1994) (Commission will allocate additional spectrum "to meet the long term spectrum requirements for unlicensed PCS devices").

services. Also, because of co-channel interference problems, the actual usable spectrum at 1910 MHz will be much less than that needed for Data-PCS. Thus, although the technology is being developed that will satisfy the market demand for ubiquitous wireless computing, the spectrum necessary for such services is still lacking.

The transfer of the 2390-2400 MHz band from government use offers the Commission an opportunity to provide an initial allocation for Data-PCS. Under the current allocation, amateur radio operators are the only private users permitted on this band. Thus, the Commission could provide the necessary spectrum for Data-PCS without displacing a large number of current users. In addition, the 2390-2400 MHz band is adjacent to the 2400-2483.5 MHz band, which is currently being used by the present generation of wireless data communications devices. By allocating the 2390-2400 MHz band for Data-PCS, the Commission would provide a continuous block of spectrum in which myriad data communications systems might operate.

These benefits will likely not accrue, however, unless the Commission rejects the proposal to auction licenses for fixed and mobile radio services in the 2402-2417 MHz band. The addition of licensed users to the 2402-2417 MHz band would severely limit the ability of current wireless data systems to function.

In short, the principal obstacle to wireless computing is the lack of adequate spectrum. The allocation of the 2390-2400 MHz band for Data-PCS would remove this obstacle and would facilitate the realization of wireless computing. Such an advance would lead to countless consumer benefits and would engender

Federal Communications Commission
ET Docket 94-32
December 19, 1994

a new generation of microcomputing products and services. The Commission should not pass on this opportunity.

CONCLUSION

Data-PCS will be an important tool for improving access to local area networks with less expense and disruption than traditional means for building network infrastructure -- laying cable and installing phone jacks. Moreover, unlicensed wireless data communications will permit local network communication without the expense of connect time charges. By providing a cost-effective means for schools, hospitals, and businesses to connect with local area networks, Data-PCS will also provide users with access to remote networks and the Internet.

The benefits of Data-PCS will not be limited to end-users. Data-PCS will encourage software developers and publishers to create new software for communications, networking, and multimedia in education, medicine, and business. Moreover, unlicensed wireless data communication will create an open environment that will permit computers and other devices to operate at the allocated frequencies with fewer legal obstacles.

For these and the reasons cited above, SPA urges the Commission to allocate the 2390-2400 MHz band for unlicensed Data-PCS and reject the proposal to introduce licensed services into the 2402-2417 MHz band.

Respectfully submitted,



Kenneth A. Wasch
Executive Director

December 19, 1994

DEC 22 1994**Another Step in the Evolution of Educational Technology**

For generations, text-based learning has been the basis of education. Students learned by reading books, and they demonstrated what they knew by writing reports. Now, with the aid of technology, teachers are able to create multisensory learning environments, and students have the opportunity to explore and communicate using the medium that's most meaningful. For example, students who learn best visually can gain understanding from pictures, and they can also use pictures and graphics to document their understanding.

FOG MAIL ROOM

When students use technology to collaborate on solving real-world problems, their experience is more relevant than it would be if they simply read about the situation. They also retain more of what they learn. Both the collaboration and the real-world aspect of learning are important, and both are facilitated by technology. Of course, good teachers have always created environments in which their students could learn together and could work on projects that had real-world significance. With technology, however, teachers can more easily provide such experiences for their students, and they can do so in ways never before imagined.

Technology also has the potential for changing the ways in which teachers and students interact. When students use technology to identify and collect information, for example, they're no longer dependent on the teacher as the source of all knowledge. At the same time that technology expands the students' sources of information, it also sets the stage for the teacher to become a facilitator of learning—the "guide on the side" rather than a lecturer in center stage. And that fundamentally changes the traditional model of learning.

Amazing as it is to those of us who attended school with Big Chief tablets and Number Two pencils, what we've seen so far is just the beginning. As technology becomes increasingly available, and as more schools have the ability to access information networks, applications will be created that utilize these resources—specifically to enhance learning in the classroom.

One of the ways in which schools can become true learning environments is for them to provide students with easy and ready access to the wealth of multimedia information available throughout the world. The National Information Infrastructure (NII) has the potential to make this aspect of education reform a reality for all students.

However, there are barriers to bringing the NII to every classroom in America. The costs of wiring classrooms for computing are significant. In the state of Florida, for example, schools can apply for funds to retrofit their buildings—to put wire in their walls—through a competitive grant program. This year, the average cost per building under that program is \$221,000—and that just pays for bringing in the network cabling. It doesn't include the cost of giving students and teachers desktop access to computer networks. Currently, a majority of the estimated 115,000 schools in this country still need to be wired to support networked computing. What makes

wiring many of these buildings even more difficult and expensive is that potential asbestos problems complicate the task of working behind the walls.

Wireless communications technology offers an alternative solution to many of these problems. In addition, wireless technology has the potential for supporting educational restructuring by extending the learning environment beyond the four walls of the classroom.

Imagine a middle-school classroom in which students learning about global warming have access to a variety of technologies, including laptop and desktop computers, and to a multitude of information sources. One group of students, using a network to connect to the Internet, is downloading current weather information collected from sources all over the world. Outside, other students are gathering their own environmental data, using scientific probes connected to small, lightweight computers and sending the data, wirelessly, to a server on the network. Inside, several students, huddled around a computer with a large screen display, use a graphing program to plot data from the server—both their classmates' findings and those originating from other students in remote locations. The students are absorbed in discussing the effects of the newest data on their graphs, and a few of them are also taking notes on their observations to help in making new predictions. Others in the room are working individually, either writing, drawing, or thinking. From time to time, they get up to discuss their work with classmates or use electronic mail to send it to their collaborators in other schools. The teacher circulates quietly among the groups, offering suggestions or encouragement as needed.

With wireless technologies, the deserts and museums, the local bank, the veterinarian's office, and the school yard all have the potential to become additional classrooms. Students will be able to learn together, collaborating locally or at a distance. Learning will occur wherever the opportunity exists. Technologies such as wireless networking, which help make learning both location-independent and workgroup-sensitive, give us another way of thinking about changing education so that it becomes more relevant to the learner.

Wireless communications technology depends on the allocation of radio spectrum, and would fall under the category of the Personal Communication Services (PCS)—the subject of pending decisions at the Federal Communications Commission. In order to create an environment in which learning takes place anytime, anywhere, and to have students make the fullest use of the NII, adequate radio spectrum must be made available. That spectrum must be immediately usable on an unlicensed basis for the kind of "nomadic" use that students (and all of us, for that matter) would need.

Technology makes it easier for education to be authentic, interdisciplinary, and collaborative—and thus becomes a catalyst for educational reform. Using technology, more students will be able to learn how to think for themselves, and to find and use information that enables them to predict outcomes and to solve real problems. If we are really committed to producing an educated population—one

that is competitive with the rest of the world—we have to provide our schools with the technology tools they need.

Note: Wireless technology products are currently available for commercial information systems applications. Over the next several years, wireless products that can be easily integrated into educational environments will be available and reasonably priced.

VIA MESSENGER

December 19, 1994

Honorable Reed E. Hundt
Chairman
Federal Communications Commission
1919 M Street, N.W. Room 222
Washington, DC 20554

RECEIVED

DEC 22 1994

FCC MAIL ROOM

Attn: Karen Brinkman - Room 814

**Re: Allocation of Spectrum Below 5 GHz Transferred
from Federal Government Use
ET Docket No. 94-32**

Dear Commissioner Hundt:

The Software Publishers Association respectfully requests the Commission's consideration of the enclosed comments in connection with the proceeding identified above, which affects the adoption of unlicensed wireless data communications services. Please do not hesitate to contact us if you have any questions.

Sincerely yours,

Mark Traphagen
Counsel

Enclosure: Comments and Appendix

cc: Gerald Vaughn - Wireless Telecommunications Bureau
William F. Caton - Office of the Secretary