1.3 Short Distance Data Communication

These communication systems are for short distance networks such as within building, campus, and center-city sites. So far, no application of these services have been identified that have the potential to aid the ASI in the field though the research team will continue to investigate possible uses. These services have been briefly covered in the following sections.

1.3.1 Spread Spectrum

Metricom Inc. has offered a high speed wireless data service (77K bps), referred to as Ricochet, which operates in the unlicensed 902 - 928 MHz spectrum band. This system utilizes a meshed network of low-powered, microcellular radios located on street lights, utility poles, and buildings. The system users are required to use Metricom's low-powered, spread-spectrum modem technology to access the system. This system is intended to be used only in metropolitan areas so it is not intended to have complete nation-wide coverage. This system would not be a viable candidate for AFS usage since the majority of airports are not located in the center of large metropolitan communities.

1.3.2 Infrared

Infrared (IR) data transmission is becoming more prevalent now that the Infrared Data Association (IRDA) have established standards enabling a broader use of this technology. With IR line-of-site connections, users will be able to transfer data over a serial connection at speeds up to 115.2K bps between PDAs, notebook computers, and desktop computers. For example, this will allow information collected by an ASI on a notebook computer in the field to be synchronized with the desktop system when the ASI returns to the office. In addition, desktop peripherals can be connected, such as printers, without the use of cables. Hardware and software companies are now supporting the IR standard that will enable dissimilar devices from different manufactures to operate together. A infrared wireless system was purchased from National Semiconductor called Laplink Wireless to evaluate this technology.

1.3.2.1 LapLink Wireless Evaluation

LapLink Wireless can connect two computers to allow a user to access the disk drives and printers of the other. It uses the AirShare radio modules and the LapLink Remote Access Software. The following briefly describes the process of setting up the system and of the functions of the program and findings during the process.

System Setup

AirShare Modules

AirShare hardware is composed of two modules: an "Air" module and a "Share" module. The Air module is used with the laptop computer and the Share module is used with the desktop computer. The AirShare hardware can use one of three power supplies: an AC adapter, a battery pack, or the mouse port cable for PS/2 mouse port. There is one channel switch and two LED lights on each module. The channel switch is used to change the radio frequency of communication between the three channels available. The red LED light indicates the status of the port (enabled or disabled). The green LED light indicates whether the system is ready to connect or not.

The software can be configured to use either a DOS or Windows operating environment. The installation is straight forward and not complex. After loading the software, you can start Windows. There will be a program group called LapLink Wireless. All the programs you needed for connections are in this program group. There are three main programs. LapLink Wireless Control Center provides the status of the communications connection. LapLink Remote Access controls the linkage between the host and remote computer. Synchro Plus updates directories between the two computers when ever a connection is made.

Findings and Troubleshooting

One important issue when installing any program is the potential conflict over computer resources already allocated by previous applications and/or peripherals. This was an issue that was quickly resolved once the conflict was identified. In this case, network drivers and a sound card had to be worked around before the Laplink system operated properly.

Once the two machines were connected, the application operated properly. We were able to access the hard drives of other machine just as if they were network drives. We also tried to open and save files and did not encounter any problems.

To print remotely required additional modifications to the application. The user must first select how the local port is mapped to the remote computer's port. For instance, if the printer you want to print to is connected to LPT2 on the remote machine, you must specifically map this port to a local port (e.g., LPT1). The second option that must be changed is the Printer Setup on your Windows environment.

The performance of the host machine slowed down when there was extensive file access, such as copying files. The performance was similar to the access time for files from a floppydisk drive. Printing did not seem to appreciably slow the performance of the host computer though.