

Dialling Tones

An acoustic coupler will convert digital data into audible tones and back again. Plugged into a telephone handset, it can be used to communicate with other computers

Connecting your home computer to a printer or a set of disk drives is relatively easy as they will usually be in the same room, if not on the same table. To connect your computer to its bigger brothers in your office or halfway round the world is a slightly different proposition. Fortunately, we already have a means of global communication — the telephone system. All that is needed is a means of connecting our computers to it.

Because the telephone system is so widely used by large computer systems (airline booking systems, for example), the technology is already well established. All the home computer user needs is a simpler and cheaper version of it. The conventional method of connecting computers to the telephone system is a device called a modem. This odd name is simply an acronym formed from the words modulator/demodulator.

The device works in much the same way as the cassette interface on a micro. The patterns of binary 1s and 0s are converted into electrical signals at two different audible frequencies and then sent down the telephone lines (this is the modulation process). At the other end they are 'demodulated' from audible frequencies back to 1s and 0s. The modem sends a constant frequency (called the 'carrier tone') whether or not data is actually being sent, which is how the receiving computer knows that the line is still connected.

The main disadvantage of a modem is that it has to be permanently wired into the telephone system, monopolising its use, which is something of an inconvenience for the home user.

An alternative method of communication is an acoustic coupler. Because the system uses tones that can be heard, there is nothing to stop these being generated acoustically, using a loudspeaker. This could then be coupled to the telephone handset and transmitted in that way. At the other end, a microphone placed in contact with the handset's earpiece could pick up the transmitted signal. This is what an acoustic coupler was designed to do. Unlike the modem, it does not need to be permanently attached to the telephone.

There are several types of acoustic coupler available, ranging from the device shown in the illustration, which is compact enough to be used with a portable computer, to large table-top units. Sophisticated units may be used to answer incoming calls automatically, without the need for a computer operator to be present, by constantly listening for the carrier tone. Just as cassette interfaces vary in the speed at which they can store

and retrieve the information, so do acoustic couplers. The range of speeds is, however, strictly limited. The transmission characteristics of a telephone cable prevent any signal faster than 1,200 characters per second (cps) being transmitted with reasonable reliability.

Low-cost units may work at speeds as low as 30 cps, with more expensive models featuring a switch to select a variety of speeds. The important thing to remember, however, is that the devices at both ends of the telephone line must be operating at the same speed — otherwise no transmission can take place.

The tremendous increase in the use of personal computers in business and the removal of British Telecom's monopoly on the production of modems has resulted in the development of a large number of new products. Devices like the Sendata and its near relatives allow portable computers like Tandy's Model 100 and Epson's HX-20 to be used as remote computer terminals by anyone from sales representatives to journalists. Orders, articles and correspondence can be entered into the computer's memory and then sent down the telephone lines to head office.



Microphone

This picks up the signal from the telephone's speaker and feeds it to the circuit board

Power Socket

Supplies power to the coupler from a suitable transformer. It is also used to re-charge internal Ni-Cad batteries

Interface Cable

Connects to the computer's RS232 (serial) interface socket

Phone Boxes

Light-weight acoustic couplers allow the travelling computer user to be in communication with any other computer, anywhere in the world by means of the public telephone network

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