

The Serial Port—Breakfast of Champions

If you have a computer in your station, chances are it has a serial port. Find out how these clever devices work.

Suppose there could really be such a thing as a “cereal port.” When my daughter was an infant, her mouth was most definitely a cereal port, and a bi-directional port at that. Cereal went in, and also came out, often in spectacular fashion and at the worst possible moments.

But for the purpose of this article, we’re talking about those multipin (9 or 25) sockets on the back of your station computer that are used to communicate with various devices in the outside world, such as your radio, antenna rotator control, sound card interface and more. These are the *serial* ports, also known as *COM* (communication) ports.

Truth to tell, serial ports are becoming an endangered species. The Universal Serial Bus (USB) is rapidly replacing them. USB proliferation has already reached the point where serial ports have become as rare as hen’s teeth on new laptops. Desktop computers will likely follow.

Until that happens, however, serial ports will be common animals. They get their name from the fact that they *serialize* data. A serial port sends each byte of data in a series of individual chunks, one bit at a time (there are eight bits in a byte). Before sending each byte of data, the serial port sends a start bit, which is a single bit with a value of 0. After each byte of data, it sends a stop bit to signal that the byte is complete. It may also send a parity bit.

A serial port is bidirectional, which means that it can send *and* receive data. A serial port uses different pins to accomplish this task simultaneously in *full duplex* (yes, infants can occasionally operate in full duplex as well).

To Every Pin a Purpose

Newer computers sport 9-pin serial ports, but you’ll still run into the 25-pin variety from time to time. The main use for a serial port in the ancient days of yore was to communicate with modems, and the pin functions still reflect this early purpose. When you see the word “modem” in the list below, think “device” (such as your radio).

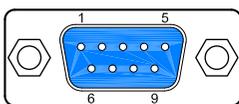
Voltage sent over the pins can be in one of two states: On or Off. On (binary value “1”) means that the pin is transmitting a signal between -3 and -25 V, while Off (binary value “0”) means that it is transmitting a signal between $+3$ and $+25$ V.

You might recognize the Data Terminal Ready and Request to Send pins, better known as DTR and RTS, respectively. These are the two pins that most software applications use to key your transceiver through an interface (either commercial or homebrew).

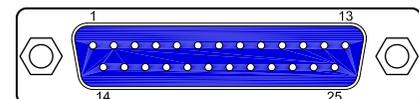
Steve Ford, WB8IMY, is the Editor of QST. You can contact him at sford@arri.org.

9-Pin Serial Port (top)

1. Carrier Detect—Determines if the modem is connected to a working phone line.
2. Receive Data—Computer receives information sent from the modem.
3. Transmit Data—Computer sends information to the modem.
4. Data Terminal Ready—Computer tells the modem that it is ready to talk.
5. Signal Ground—Pin is grounded.



OS0502-Ford01



6. Data Set Ready—Modem tells the computer that it is ready to talk.
7. Request To Send—Computer asks the modem if it can send information.
8. Clear To Send—Modem tells the computer that it can send information.
9. Ring Indicator—Once a call has been placed, computer acknowledges signal (sent from modem) that a ring is detected.

25-pin Serial Port (bottom)

1. Not Used
2. Transmit Data—Computer sends information to the modem.
3. Receive Data—Computer receives information sent from the modem.
4. Request To Send—Computer asks the modem if it can send information.
5. Clear To Send—Modem tells the computer that it can send information.
6. Data Set Ready—Modem tells the computer that it is ready to talk.
7. Signal Ground—Pin is grounded.

8. Received Line Signal Detector—Determines if the modem is connected to a working phone line.
9. Not Used: Transmit Current Loop Return (+)
10. Not Used
11. Not Used: Transmit Current Loop Data (–)
12. Not Used
13. Not Used
14. Not Used
15. Not Used
16. Not Used
17. Not Used
18. Not Used: Receive Current Loop Data (+)
19. Not Used
20. Data Terminal Ready—Computer tells the modem that it is ready to talk.
21. Not Used
22. Ring Indicator—Once a call has been placed, computer acknowledges signal (sent from modem) that a ring is detected.
23. Not Used
24. Not Used
25. Not Used: Receive Current Loop Return (–)

