Hi there.

There have been quite a few bulletins recently about the RS-232C interface, so
I thought I'd send one out stating the necessary connection details.

First, there are two common connectors being used for RS-232C, the 'standard'
25-way D-type connector, and IBM's 9-way D-type connector. Both carry all 9
of the signals commonly implemented, as follows:

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                                          Connection leads required
                                          =======================================
9-pin  25-pin  Name  Description          Computer->Modem    Computer->Computer
=====  ======  ====  ===================  =================  ====================
          1           Chassis Ground       Do not connect     Do not connect
  3       2     TxD   Transmit Data         TxD <=> TxD        TxD <=> RxD
  2       3     RxD   Receive Data          RxD <=> RxD        RxD <=> TxD
  7       4     RTS   Ready To Send         RTS <=> RTS        RTS <=> CTS
  8       5     CTS   Clear To Send         CTS <=> CTS        CTS <=> RTS
  6       6     DSR   Data Set Ready        DSR <=> DSR        DSR <=> DTR+DCD
  5       7     Gnd   Signal Ground         Gnd <=> Gnd        Gnd <=> Gnd
  1       8     DCD   Data Carrier Detect   DCD <=> DCD        DTR+DCD <=> DSR
  4      20     DTR   Data Terminal Ready   DTR <=> DTR        DTR+DCD <=> DSR
  9      22     RI    Ring Indicator        RI  <=> RI         No connection
=====  ======  ====  ===================  =================  ====================
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For the rest of this bulletin, I will be referring to the signals by the name
given above. They are as follows:

Gnd This signal defines the reference level for the other signals. The rest are
    defined as being at voltage levels in excess of 3v away from ground for any
    input, and 5v away from ground for an output (ie, voltage levels of between
    -3v and +3v are undefined for inputs).

    Note that this is NOT the same as the pin labelled CHASSIS GROUND. Although
    in theory, it should also be connected through, in practice doing so often
    causes excessive amounts of RFI (due to a phenomenon known as ground loops)
    and, for this reason, I recommend that you leave it alone.

TxD This signal contains data being sent FROM a computer TO a modem (on which
    the modem RECEIVES data - very confusing).

RxD This signal contains data being sent TO a computer FROM a modem (on which
    the modem TRANSMITS data - also very confusing).

RTS This signal is sent out from the computer to the modem, and tells the modem
    that the computer is ready to send some data.

CTS This signal is sent out from the modem to the computer and tells the latter
    that the modem is ready to receive any data the computer wishes to send.

DTR This signal is sent out from the computer to the modem, and tells the modem
    that the computer is switched on, and has a communications program loaded,
    or that the computer is ready to make use of the modem as the user requests
    it to.

DSR This signal is sent out from the modem to the computer and tells the latter
    that the modem is switched on and has completed its startup routine.

DCD This signal is sent out from the modem to the computer and tells the latter
    that the modem can hear a valid data carrier.

RI This signal is sent out from a telephone modem to the computer, and tells
    the computer when the modem hears ringing tones. It pulses in direct line
    with the ringing tones.

There are some other signals defined for the 25-pin connector. However, they are very rarely implemented, and so have not been described (primarily to keep this bulletin to a reasonable length).

Note that, in the above, I have assumed the connection goes between a computer and a modem. This is the purpose for which RS-232C and V24 were defined, but other devices are regularly connected to this interface.

Two in particular which are regularly found, are connections between a computer and (a) another computer, or (b) a printer. With a connection between any two computers, you use the wiring listed in the above table for this situation when possible. When, as with some computers, DTR, DSR and DCD are not implemented, you link these three pins together at the other computer's end.

When the connection is between a computer and a printer, you first have to work out whether the printer was connected up as a computer or a modem, and treat it as such. Even then, there are likely to be some surprises as most printers are connected with some of the 'other' pins used for functions which the printer is in need of, but which are not defined for an RS-232 interface.

The easiest way to determine whether a printer is wired as a computer or modem is to determine whether it is asserting DTR or DSR. This is achieved by doing a comparison between the logic level on the computer's DTR pin and those on the printer's DTR and DSR pins. One or the other will change state when you switch the printer on and off line, the other won't, and it is the one which changes state which is being asserted.

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--- Slutt paa melding nr. 44479 til RS232 fra G7GOD ---