

Courier Analog Synchronous Point to Point Applications

1. Synchronous operations can be accomplished with either character oriented protocols or bit oriented protocols.

The most common example of a character oriented protocol is IBM BISYNC (&M6 is similar to Bisync operation but with full duplex operation)

A sample frame looks like this.

Leading Char Hex Ascii 55	Synch Idle Hex Ascii 16	Synch Idle Hex Ascii 16	Start of Text Hex Ascii 02	Text	End of Text Hex Ascii 03	Error Check Info block	Trailing Char Hex Ascii FF
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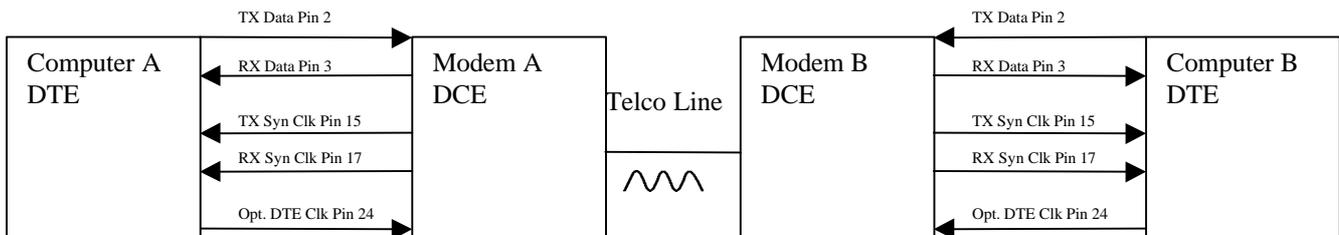
The most common example of a bit orientated protocol is IBM SDLC or HDLC (&M7)

A bit oriented protocol sample frame looks like this.

Beginning Flag 8 bits	Address Typical 8 bits	Control Field 8 bits	Information Field 8 bits	Frame Check Seq. 16 bits	Ending Flag 8 bits
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2. The dialing with synchronous mode can be accomplished via 5 different methods
 - a. Dialing a number stored in NVRAM upon DTR being raised from the DTE port (S13=8)
 - b. Dialing a number stored in NVRAM upon modem power up or reset (S13=16)
 - c. Dialing a number stored in NVRAM upon pressing the Talk / Data button (S32=4)
 - d. With ATDT commands, and switching to synch mode upon connection (&M1)
 - e. With V.25bis dialing commands (&M6 or &M7)

3. Synchronous data is referenced to a clock signal. There are three different Pins on the RS-232 interface used for clocking signals.
 - a. TX and RX Synch timing (always sent from DCE to DTE)
 - b. Optional DTE TX timing pin 24 on rs-232 interface



4. The Data rate synchronization is set with the &X# command
 - a. &X0 references a onboard PLL clock from the modem
 - b. &X1 references the DTE clock on pin 24 of the RS 232 interface to supply clocking. This is mainly used with multiplexer equipment or DTE equipment that must supply the clock.
 - c. &X2 References the modem receiver clock for timing information.

Proper operation typically includes one side of the connection referencing a onboard modem clock or DTE clock and the other side of the connection referencing the modems receiver clock.

Many customers experience acceptable performance by simply setting both clocks to the &X0 setting.

5. Offline modem clock speed is set with the %N command
Whenever the modem is offline and in synch mode (&m6 or &m7) it is sending TX and RX clocking signals to the DTE. This may be verified with a breakout box that can reference pins 15 & 17. The %N command sets the off line clock speed.

Upon going online, the clock speed may change depending on you &X# settings. To minimize changes in clock speed, it is good to set the off line clock speed to be as close to the actual phone line connect speed as possible with a combination of the %N# and &N# settings.

6. V.25bis specification calls for the DTE to raise DTR signal on the RS-232 interface to indicate a ready state. The DCE shall raise the CTS signal in response to indicate a ready state. The typical initialization string in the modem is using &R0 (cts follow rts) however in synch mode, the modem shall raise CTS upon DTR without the presence of RTS Signalling. The DRS signal from the modem is typically in normal mode &S1.