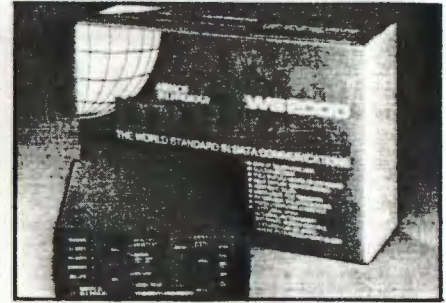# MIRACULOUS!

Jeff Ashurst tests the WS2000

Thoughtful design, excellent performance

THE WS2000 from Miracle Technology is a functional-looking unit measuring 155 × 160 × 68mm. The test model was a version 7 example, and had a beige ABS outer casing with front and rear panels in matt black. Modem controls and status indicators are mounted on the front panel, while at the rear are connection ports, power in, line out and an on/off switch. A Ring Equivalence Number (REN = 1) is quoted in accordance with current BT practice. This and other legends are marked clearly in white on the matt black surfaces.

User selection of operating mode of this multi-standard unit is by three rotary controls in the front panel. These allow selection between:
- 1200/75 V23 and 300/300 V21 speeds
- 300 full duplex orig/ans, 600 or 1200 half duplex
- on/off line

Each switch has duplicate function. The speed selector is also used in the '300' position when working at 600 or 1200 half duplex; the mode selector has a V23 test setting; and the off-line position doubles as the 'local test' setting for checking modem functions.

As the positional combinations in use are difficult to convey with clarity in words, Miracle Technology prefers to use a picture in its instruction manual. For each application described, a bold block diagram of the front panel is provided with switch settings shown clearly.

Before leaving the control area of the front panel, I must mention that around the mode selector are marked, in a less prominent red, the positions for selection of Bell frequencies, although these are not used in the green sticker units approved for connection to BT apparatus. For use with non-BT systems, the modem can be modified to operate on both CCITT & Bell frequencies. (No multi-standard modem has been awarded the BABT seal of approval with its Bell options operable.)

To the left of the front panel is the status area, with five red LED indicators marked, from top to bottom: Power, Tx Data, Rx Data, Carrier and On Line.

Study of the business end (the rear panel) reveals just what a serious piece of equipment this is.

Pin no.	Signal
1	Protective ground
2	Transmitted data
3	Received data
4	Request to send
5	Clear to send
6	Data set ready
7	Signal ground (Common return)
8	Data carrier detector
20	Data terminal ready
22	Ring indicator

Table 1. RS232 wiring for the D connector

The serial interface employs a 25-pin D connector with 10 pins wired according to standard RS232 recommendations (table 1). Of these signals, the 5-pin DIN port of the BBC micro's RS423 interface handles pin numbers 1, 2, 3, 5 and 7.

Alongside the serial port is a 20-pin user port, through which the modem can be operated under software control when the appropriate hardware extensions are fitted. A software control kit, an auto-dial kit and an auto-answer board are available. In addition, provision is made for a TTL port to be added to the panel to enable unspeak-

able things like the Commodore 64/Vic20 to be interfaced to the WS2000. With this extension fitted, two devices can be connected to the modem simultaneously.

Finally, an accessory port in the form of a 5-pin DIN socket sits to the left of the array. This is for future expansions, said to include a battery back-up pack and an acoustic coupler.

A nice touch, and one which I feel is indicative of the obvious thought and attention to detail in this design, is that each port has the first and last pins numbered as part of the legend.

In use, the WS2000 lived up to the expectations that the casing and manual had generated. I found it useful to have the bank of status LEDs, either to confirm that things were happening as they should or, more importantly, as an aid to fault-finding – like when a wire pulled off my RS423 DIN plug.

Altogether an excellent modem. The WS2000 I tested was the standard manual version, but my appetite is now whetted to try a software controlled, auto-dial and auto-answer example of the same machine.

	SCM	Night'ale	Telemod	Prestel	Protek	PAC	WS2000
Price including VAT	£149.95	£136.85	£84.95	£113.85	£59.95	£99.95	£149.45
BT green sticker	★	●	●	●	●	●	●
protocols: CCITT V21 (BTG)	●	●					●
CCITT V23 (Prestel)	●	●	●	●	●	●	●
reverse V23		●					●
1200 half-duplex	●		●		●		●
600 half-duplex							●
Bell	●	●					●
originate and answer modes	●	●	●		●		●
self test	●	●	●				●
auto-dial	●	E		●			E
auto-answer	●	E					E
telephone socket	●	●	●				●
sized to telephone	●	●	●				
on/off switch					●	●	●

Table 2. The facilities offered by each modem   *E: optional extras   ★ BT approval applied for*

	SCM	Night'ale	Telemod	Prestel	Protek	PAC	WS2000
ease of use	4	8	7	8	5	7	7
documentation	7	6	5	9	4	3	6
range of protocols	8	8	4	2	4	2	9
range of features	8	4	4	4	—	—	9
overall useability	5	6	6	7	5	5	7
overall rating	32	32	26	30	18/40 × 2	17/40 × 2	38

Table 3. How they score out of a possible 50 points (acoustic couplers out of 40)

	SCM	Night'ale	Telemod	Prestel	Protek	PAC	WS2000
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CCITT V23 (Prestel)	●	●	●	●	●	●	●
reverse V23		●					●
1200 half-duplex	●		●		●		●
600 half-duplex							●
Bell	●	●					●
originate and answer modes	●	●	●		●		●
self test	●	●	●				●
auto-dial	●	E		●			E
auto-answer	●	E					E
telephone socket	●	●	●				●
sized to telephone	●	●	●				
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