## SCOPE SIGNALS FOR TROUBLESHOOTING 81-180-n

The examples of correct signals shown here do not represent all of the signals on the 81-180-n mainboard, since most of the signals will be high-low toggles. A group of signals taken from a video clock divider (U66) are shown to illustrate the timing relationships between the various video signals.

The signal measurements were made using a Tektronix ocilloscope, model 2213. It has a bandwidth of DC-60 MHz, sensitivity of 2mV/cm, a sweep delay of 0.1 microseconds to 1 second, and a graticule display measuring 8 x 10 cm.

Each square of the representation is the equivalent of one square cm. on the graticule. The scope was set for 2V/div. and .2micro-secs/div. for all figures except figure 2, which was set at .5micro-secs/div.

Signal M1 from pin 27 of the CPU (U28) was triggered on. This signal is shown in the top half of each display and was channel 1. Ground for signals shown on channel 2 was established at the first graticule line above the bottom of the display.

State of the machine: The machine has just booted-up on the hard drive.

Figure 1: Pin 6 of U28, 4MHz clock signal.

Figure 2: Pin 24 of U74, 1MHz clock signal.

Figure 3: Pin 12 of U66, video, clock divider.

Figure 4: Pin 9 of U66, video, clock divider.

Figure 5: Pin 8 of U66, video, clock divider.

Figure 6: Pin 11 of U66, video, clock divider.