A Time-Domain Reflection (TDR) tester* detailedly analyses the response and impedance match of a cable and the connectors used, using a pulse that rises in 50 pS**.

In pictures 2 to 5, the 2nd step-up shows the effect of the 75 ohm (video standard) cabling and connectors operating in a standard 50 ohm test system. In 2 & 3, the tidy 'rectangularity' of the step shows that the impedance of the 75 ohm section is quite purely resistive, i.e. nearly ideal.

Pict. 1 shows reference with special GR-connectioned 50 ohm load, acting as a near pure resistance at all frequencies to above 2GHz (high RF).

Pict. 2 shows the response of Supra Trico. See below for explanation of the 2nd step.

Pict. 3 shows the response of Supra AV-3. See below also.

Pict. 4 shows response of RG179, a top-grade, 75 ohm coax made to US Military standard MIL-C-170. Note that the two Supra cables perform similarly cleanly. Note also that all are fitted with 75 ohm BNC plugs.

The timing of the steps (10ns** per L-R div) shows that the electrical length of the Supra cables (in pictures 2 & 3) is shorter than the reference, by about 14%. As the cable lengths were physically matched to within 0.2%, this shows that signal speed in the Supra cables must be higher - meaning closer to the speed of E-M waves in air.

BNC is better than RCA on digital interconnects.
The physical dimensions of the RCA connector prevent it from having exactly 75 Ohm characteristic impedance. Therefore the BNC connected version is always preferred when there is a choice.

Pict. 5 shows Trico with phono/RCA plugs fitted. It could be any of the other cables. The RCA plugs' inconstant impedance match at high RF causes reflections (seen as 'positive spiking'), this kind of behaviour being precisely why BNC plugs were invented in the 1940s as serious RF coax connectors, to replace the 'failed' first generation plugs, namely RCA and UHF types. Thus the RCA was re-cycled as an audio plug.

The tested Supra Cables

Supra Trico

Supra AV-3

*Originally devised & made in 60s by HP, today known as Agilent.

** pS = picoseconds = millionth-millionth's (1/1000,000,000,000th's) of 1 second). In air and ideal, air-insulated cables, EM waves travel 1m in about 3300pS (3.3ns). In all plastic-insulated cables, the lower speed increases the time to travel 1m by some 140 to 150%.

Tests originally performed by Ben Duncan Research in UK.