ANA *Tips*: No 1

October 1999

Gauge compatibility for the smaller coaxial line sizes

by Andy J. A. Smith and Nick M. Ridler

National Physical Laboratory

Concerning the checking of coaxial connector pin depths, several people have raised the question whether a K-connector gauge can be used to measure GPC-3.5 connectors and a V-connector gauge can be used for GPC-2.4 connectors (and vice-versa). We have addressed this question by performing a comparison of gauge measurements of male and female connectors of four precision attenuators fitted with GPC-3.5, K-connector, GPC-2.4 and V-connectors.

We used for the comparison gauges also fitted with these connector types. In the case of the GPC-3.5 and GPC-2.4 gauges, separate male and female gauges were used. The results of this comparison are shown in the table below.

Attenuator	**Readings (inches)**		
	K gauge	**3.5 gauge**	**Difference**
K male	-0.0019	-0.0019	0.0000
K female	-0.0010	-0.0012	0.0002
3.5 male	-0.0013	-0.0012	0.0001
3.5 female	-0.0014	-0.0013	0.0001
	V gauge	**2.4 gauge**	**Difference**
V male	-0.0022	-0.0024	0.0002
V female	-0.0013	-0.0015	0.0002
2.4 male	-0.0006	-0.0007	0.0001
2.4 female	-0.0007	-0.0007	0.0000

The GPC-3.5 and GPC-2.4 gauges were zeroed with respect to their own reference coaxial flats, whilst the K-connector and V-connector gauges were zeroed with respect to a reference flat surface.

It can be seen that for both pairs of compatible connector (i.e. the K and 3.5 gauges, and the V and 2.4 gauges) there is agreement to within 0.0002 (i.e. 0.2 thou). This is well within the acceptable degree of equivalence between gauges of 0.5 thou, as given in ANA*lyse* Note number 14. We conclude that it is acceptable to use K and V gauges to check 3.5 and 2.4 connectors, respectively