

3.2. Recording setup

Three commercial drives of different manufacturers and similar characteristics and quality have been compared. In those recordings done without a horn attached to the compression drive, a plane wave tube as described in [8] was attached to it. Signal register was done at different voltage levels (from 5 to 30V) at the drive input. All signals mentioned in section 3.1 were registered. In these cases the output was recorded using a B&K high pressure microphone as shown in figure 3. 01dB Symphonie hardware and software was employed in the recording tasks.



Figure 3 Recording setup of a drive without horn.

When attaching the horn to the drives, recordings were done using a B&K measuring microphone in an anechoic chamber. The same horn was attached to all drives under test.

3.3. Listening experiment

Simultaneously with these recordings analysis, a listening test was realized to an audience of 25 people using the music passages mentioned above. One passage was a classic guitar recording of 15 seconds of duration. The other one was a 45 seconds duration percussion and saxophone music passage with a wide dynamic range. The first one became more useful to realize the test. To the characteristic difficulties of a listening experiment [9] we must add in this case those ones introduced by our study objects, i.e. the compression drives: a standard audience is not used to hear music as it is emitted by a compression drive. In fact, these

devices are used to reproduce frequency ranges above 800 Hz. Music signals were also high pass filtered with $f_c=800$ Hz. When a listener hears a music passage emitted by this kind of sources usually qualifies it like 'bright' or 'shrill'. This unfamiliarity with the reproduced sound makes more difficult to compare or evaluate sound quality or distortion perception.

4. RESULTS

In this section the main results obtained will be presented in graphic form. We will name the three transducers as A, B and C with horn (WH) or without horn (WOH).

4.1. Psychoacoustic parameters

The following results were obtained applying the 01dB psychoacoustic parameters module to the 1 kHz modulated recorded signal.

Table one and two show the obtained values of roughness and tonality for each transducer at different input voltages.

	Vin	10	20	30
A WOH	T	0,9	0,87	0,86
	R	0,25	0,26	0,23
B WOH	T	0,89	0,89	0,87
	R	0,23	0,2	0,19
C WOH	T	0,89	0,89	0,85
	R	0,23	0,2	0,2

Table 1 Roughness and Tonality with no attached horn at different input voltages.

	Vin	10	20	30
A WH	T	1,23	1,07	1,02
	R	0,22	0,26	0,29
B WH	T	0,78	1,56	1,35
	R	0,28	0,28	0,29
C WH	T	1,12	1,12	0,88
	R	0,27	0,28	0,28

Table 2 Roughness and Tonality with attached horn at different input voltages.