LA75B : A powerful electronic that makes APA sing higher in volume and larger in frequency.

T. Maillard - CEDRAT TECHNOLOGIES.

Next May 2003, CEDRAT TECHNOLOGIES will release the **LA75B** from its electronic lab, a new and powerful linear amplifier for driving its whole range of piezo products. The max output current of **300 mAmp, under 150 Volt per channel**, allows the LA75B to explore a **10 times larger frequency range than the LA75A** (see table 1). The LA75B board takes its power from a new AC/DC converter, so called LC75B, delivering a continuous current of **600 mAmp**. As a consequence, each LA75B can be equipped with **two output channels** (see figure 1) in order to drive any kind of piezo mechanisms (APA, PPA, XY stages,...) presented in CEDRAT TECHNOLOGIES' catalogue. This new LA75B electronic is the first step of a larger project, aided by ANVAR, for developing future powerful versions. Nevertheless, the LA75B already offers relevant solution for **high frequency actuation, scanning and fast shutter** based applications (spectrometry, X ray diffraction, optical switch,...).

Figure 1: View of a LA75B-2 rack.

Actuator	Unit	APA25XS	PPA10M	APA100S	APA60SM	APA200M	APA120ML	APA500L
Capacitance (*)	µF	0.25	0.7	1	1.55	3.2	22	32
Load time	ms	0,14	0,40	0,57	0,88	1,81	12,4	18,1
Max. triangle freq.	Hz	3 529	1 261	882	569	276	40	28
Max. sine frequency	Hz	2 246	802	561	362	175	25	17

(*) the capacitance values are those at low frequency and room temperature.

Table 1: Frequency range of some APAs and PPA driven by LA75B.

Smart Actuators for Aircraft applications. (continue)

F. Claeyssen, R. Le Letty, F. Barillot, N. Lhermet - CEDRAT TECHNOLOGIES.

They pass various life time tests, thermal-vacuum tests, radiation tests... In addition they offer a low power consumption and short time response. The concept can be declined from micro-actuators (u=35µm, F=20N, m=2gr) to large actuators (u=1mm, F=1kN, m=0.6kg) see APA 750XL figure 6. Thanks to all these specifications, the applications of these actuators, especially APAs, are expending in space (up to NASA & JPL !) both for payload (optical devices, instruments) and for platform (propulsion valves). Benefiting from their space qualification and their high output energy density, they also found a serious interest in aircraft, for direct-drive of flaps in helicopters and airplanes mock-up, as well as for valves in Electro Hydraulic Actuators. First specific aircraft qualifications such as wind tunnel and centrifugation being successful open large application fields in aircraft.

Acknowledgement

The authors would like to thank the French Space Agency CNES and the European Space Agency ESA/ESTEC as well as ONERA CERT, ONERA IMFL and European Commission.

Referenced paper

F. Claeyssen & G. Rajeev, Amplified Piezoelectric Actuators for Air & Space Applications, AERO INDIA 2003 conferences.

Figure 5: View of the APAs family.

Figure 6: View of the APA 750XL.