

AUTOMATION OF THE PROCESS OF POSITIONING EXACT MECHANICAL ENGINEERING

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With growth of scientific and technical progress in the field of mastering high technologies all becomes sharper the task of creation of measuring systems with high resolution capability. Among their diversity one of main places is occupied by election-optical systems basing methods of a resonance angular filtering [1]. The application of election-optical precision sensor units of angular deflections operating the phenomenon of a resonance, allows to establish measuring systems distinguished by high accuracy, by sensitivity etc. the Developed two-channel election-optical system of positioning provides a range of measurement of deflections in each channel up to 1 degree with an error no more 15 angular seconds and permission - about 1 angular second.

The system switches on: the laser - optical quantum oscillator with a power supply unit; a shaping unit and stabilizations of a laser beam with a stabilization factor 105, consisting from devices of stabilization of the space - angular characteristics, stabilization of power and shaping of the space characteristics of a laser beam, modulator with the electric motor, collimator and polarizer; a prism coupled to the object, which positioning is metered; a polarizer; dividing elements; resonance sensor units; A-D converters; microcomputer; controllers of displays and indicating devices.

For handle of operation A-D converters, collection and data storage, their partial processing and mapping on indicating devices the system of positioning switches on the single-chip electronic - computer (microcomputer) KP1830EB51, buffers of dataways and handle, circuit of shaping of the trunk of the address, static RAM, emulating a program memory microcomputer, intended for the programs of the user, ROM of commands with the program - screen monitor.

If a hardware product and prism, rigidly coupled to it, have no the deflections from the tuned base surface, the voltages from outputs A-D converters, displayed on indicating devices, are equal to zero.

If there was a unbalance of surfaces, it calls an increment of voltages on outputs of photocells. The function of conversion A-D converter is selected such, that the deflection of a surface in seconds corresponds to linear variation of a voltage.

References

I.I. Sokolovsky, U.A. Pokrovsky. Applied radiooptics. The theory and methods of a resonance angular filtering. Kiev: Naukova dumka, 1986. - 220 pages.