INTERFACE AND SOFTWARE FOR OSCILLOSCOPE COMPARATOR

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ABSTRACT. For measurement of photographic spectrograms on the comparator with the oscilloscopic guidance on line are used photoelectric moire measuring detector of linear movement of carriage with measuring plate and reversible binary-decade digit counters, which interfaced with the personal computer IBM PC. Automatic input of the current comparator count and control of cutting slits motion are carried out by means of a parallel interface board. The comparator software works is designated to make reduction of ordinary and zeeman photospectrograms.

Key words: spectrograms, oscilloscope comparator.

To determine Doppler and Zeeman shifts of spectral lines in spectrograms, a precise determination of spectral stellar line position and their reference to the comparison spectrum are needed. A method of prospect for this purpose is the use of solid-state panoramic light detectors with respective computer hardware. However, formerly accumulated photographic spectrograms can be effectively processed on the comparator with automatic input of counts for linear displacement of the carriage with a plate measured into the personal computer with a successive complete mathematical reduction of measurements.

The comparator work principle is based on constructing an optical image of a photospectrogram part in the dissector photocathode, its scanning in two directions and obtaining two mirror-symmetrical profiles of the scanned part in the electron-beam tube screen for an oscilloscopic guidance. The current position of a linear coordinate of the carriage is read out by scanning moire sensors, is digitized by reversible binary-decade counters and enters the IBM PC personal computer parallel port, by means of an elaborated computer interface. According to the command of the computer control program the output code is latched and can be stored for an unlimited long time until the next latching command follows. Then by means of the comparator output bytes the twenty bit code is divided by three bytes with eight bits for an alternate input into the computer. The selection and input of a low, mid and high byte of the count is carried out by fixing respective addresses. The complete count restoring takes place in the computer memory by mids of a bit shifting of a mid and a high bytes to the respective number of bits or by multiplying by the constant. From commands of control program a slit displacement motor control permits to display a stellar spectrum or a comparison spectrum for measurements. For this purpose are executed commands of motor switching on and slit displacements, switching off and displacement halting, reversal. The data input and output are carried out from signals I0R and IOW formed by a processor computer. But in the computer these signals can be formed not only by a processor but also by a controller of direct access to the memory (DAM). To exclude failures, the signal AEN is transmitted to the decipherer of address access with blocks it at the work of the computer in the DAM regime.

The software is functioning under the MS-DOS operational system control. The control program has a block structure consisting of controller and execution parts. The controller program part contains subprograms of the number input and slit displacement motor control. To avoid the input of false numbers at accidental failures of the device or at the voltage jumps of the line supply, the simultaneous input of twenty values of the number is carried out, then the analyses of number values is made – in the case of considerable deviations of numbers from the average (rough undershoots), the input process is repeated anew on attaining the wanted precision set. Subprograms of slit displacement control comprise commands of setting the address of switching on or switching off the motor in the address buses of a parallel port and time delay for executing these commands.

The execution part of the program incorporates a block of initial settings and the main menu. Initial settings are needed for the selection of a comparator working regime, the kind of measurements and peripherals. In the main menu, options are selected by the operator for identification and measurement a comparison spectrum, a stellar spectrum, approximations of a dispersion curve from the linear measured, line deleting, computations of radial velocities and magnetic field, calculations of corrections and errors. For the work of

the program, catalogs are needed of spectral lines for the stellar spectrum and comparison spectrum produced adequately in the form of separate files. Approximation of dispersion dependence and computations of reference line wavelengths of comparison spectrum are carried out by virtue of n-degree of polynomial (the degree is chosen from minimum deviations, commonly, a polynomial from a square to the fifth power is used). Calculation of Zeeman and Doppler stellar line shifts is carried out by using a dispersion curve constructed. The computations of corrections and errors in measurements is made according to the standard procedure of spectrogram reduction.

LOW ENERGY TIMER

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ABSTRACT. It was describe the simplest scheme of low energy timer for founding of the CCD-matrix storage time.

Key words: timer, CCD-matrix.

For realising a lot of different astrophysical tasks with high resolution measurements some problems a rise, that connected with additional heat radiation in the measurement technics.

This timer has been designed as the devise for founding of the CCD-matrix storage time.

The scheme of this device is shown on the Fig.1. The device has been assemblyed on the base of two reversing counters CMOS series. The carrient at use $R_z - 7A472$ is $5mA$ at supply voltage is near $5V$ (the analog, that assembled on the found of TTL, has the dissipated power more then factor by 10). The timer generates low-level impulses in the output, and they are equal by the duration ones of input signals. Then the system works in the TV standart. It is simpliest regime for storaging drive. This scheme gives the possibility to drive the storage time to 256 TV frames. The storage time is istablished by the micro-connector (MC). Moreover, the timer may be used to telescop driving.