

Scanning Television Optical Microscope for Research of Biological Microobjects

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Abstract - Ways of construction of a scanning television microscope which can be used for research of biological microobjects are analyzed. Opportunities of a microscope are expanded due to formation of a raster in television and little-frame mode. Ways of change of the size of a raster are offered at preservation of the resolution of the image of microobject.

Key words - Scanning microscope, Electron beam tube, Microobject.

INTRODUCTION

Scanning television optical microscope (STOM) developed by authors on the basis of electron beam tube (EBT) of the high resolution will enable to investigate microobjects which size exceeds 0,1 - 0,2 microns. Use of change of the sizes of a scanning raster will provide change of the sizes of the image of microobject without loss of the resolution of the image.

SCANNING MICROSCOPE

The structural scheme of the STOM is submitted on fig. 1. Into its structure enter: the block of forming of scanning raster BFSR, the block of management of operating modes scanning EBT BMOM, block EBT of the high resolution with a ultra-violet luminescence of screen BEBT, the block of the optical channel BOC, the block of photoelectronic multiplier BPEM, the block of formation of video signal BFVS, the block of processing of video signal BPVS, the block of interface to personal computer BIPC, a personal computer PC and the monitor M on which screen the image of researched microobject is formed.

The internal structure of separate units of the STOM will be determined by a place of its possible use: a) research laboratories of the small medical organizations (the cheapest and simple STOM); b) research laboratories of the medical organizations (rather cheap with more wide opportunities); c) branch research laboratories for which the STOM should have the widest functionalities.

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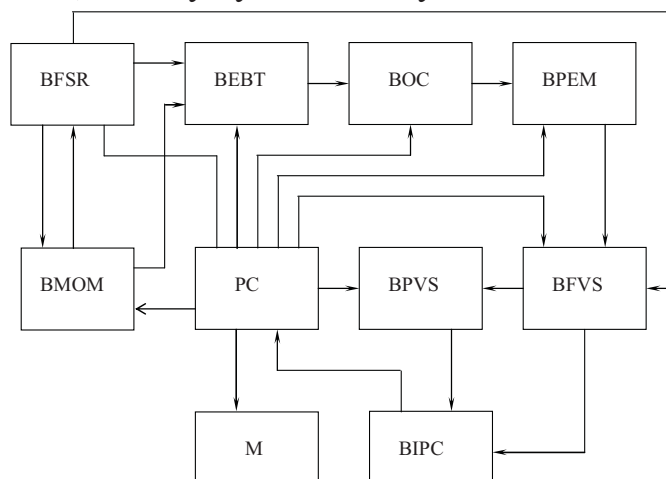


Fig. 1. The structural scheme of the STOM for research of biological microobjects

For maintenance of wide functionalities of the STOM provides:

- formation of signals of a scanning raster in the television standard and little-frame mode;
- change of the sizes of a scanning raster for scaling the image of microobject;
- moving a scanning raster of the reduced sizes to any point of screen EBT with the purpose of research of a fragment of the image;
- change of frequency of formation of a scanning raster by change of duration of formation of one element of the image and change of quantity of elements of the image;
- input of the image of researched microobject in a personal computer through the videoblaster at work of the STOM in the television standard;
- input of the image of researched microobject in a personal computer through USB-port in a discrete mode of formation of a raster.

CONCLUSIONS

The STOM will considerably expand functionalities at research of biological microobjects in real time in comparison with television microscopes and at much smaller cost in comparison with electronic microscopes.