Model dynamics and control of the searching and tracking head placed on a moving object

I. Krzysztofik [1], Z. Koruba[2]

Abstract – **The paper presents the concept of searching, location and tracking of low-flying air targets through the head placed on a moving object, such as a self-propelled anti-aircraft missile system or a ship. Moreover, equations of motion of this type control head are derived.**

Keywords – **dynamics and control, searching and tracking head, missile launcher.**

I. INTRODUCTION

Considered in the work head is intended for searching, location and tracking of targets from the deck of a moving objects, such as combat vehicles, ground vehicles or warships. In many cases, the head should do its task during large disturbances of the deck on which it is located – vehicle traveling over uneven terrain or the movement of the ship on a stormy sea [2, 3]. This requires the selection of such dynamic parameters of the head and its automatic control system, to the process of searching and tracking of the detected target to be able to proceed stably and reliably irrespectively of these disturbances [1].

II. MODEL OF DYNAMICS AND CONTROL OF HEAD

Figure 1 shows a general view of the head placed on a moving base. The basic element of the head is tracking device (TV/ infrared camera or optical coordinator) suspended on Cardan joint.

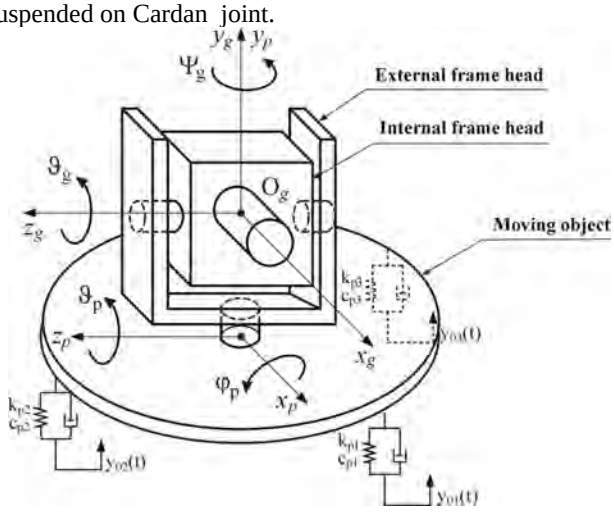

Fig.1. General view of the searching and tracking head

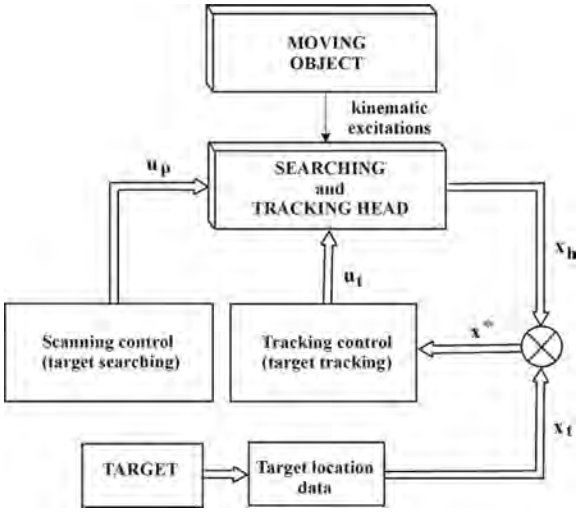

Fig.2. Control scheme of the searching and tracking head

All movements of a base around individual axes Ox_p, Oy_p and Oz_p are the disturbances to the pre-set movements (while searching) and tracking movements (while tracking the detected target) of the head. The control moments of the head must be selected to minimize the impact of these disturbances. Figure 2 shows the performance of a process of searching and tracking of target for the automatic control system of the head.

III. REFERENCES

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[1] Kielce University of Technology, Al. 1000-lecia PP 7, 25-314 Kielce, POLAND, E-mail: E-: pssik@ tu.kielce.pl
[2] Kielce University of Technology, Al. 1000-lecia PP 7, 25-314 Kielce, POLAND, E-mail: ksmzko@tu.kielce.pl