INTEGRATED ELECTROMAGNETIC SEEKER

FIELD OF THE INVENTION

This invention relates to electromagnetic seekers.

BACKGROUND

An electromagnetic seeker includes a transmitter assembly for transmitting pulsed radiations and a receiver assembly for receiving reflections that surpasses an adjustable detection threshold. The electromagnetic seeker also includes a target reflection detection module for detecting a desired target as well as estimators for estimating various target parameters and trackers for implementing target tracking.

GENERAL DESCRIPTION

The presently disclosed subject matter includes a new electromagnetic seeker mountable on an airborne platform such as a missile or aircraft and capable of performing different operations such as: searching for a target; detecting the target; tracking the target; and homing on the target.

In general the transmitter assembly of an electromagnetic seeker transmits an electromagnetic signal (such as a laser signal) towards a search volume (area desired to be searched for targets). Signal portions reflected from a target are received by the receiver assembly and processed by a signal processing unit in the seeker. The ability of the seeker to detect signal portions reflected from a target depends, *inter alia*, on the signal to noise ratio (SNR) of the signal portions reflected from the target which are received by the seeker.

The SNR depends on various parameters some of which are related to the architecture and operation of the seeker. One parameter is the power of the signal transmitted by the transmitter assembly. Another parameter is the attenuation level of

the signals which are transmitted by the transmitter assembly and the attenuation level of the signals received by the receiver assembly.

Attenuation of transmitted signals occurs for example, during power combination from different power stages and during passage of the signals through cables and connectors directing the signal towards the antenna for transmission. Attenuation of received signals occurs during passage of the received signal through various seeker components (e.g. antenna, filter, isolator, limiter, cables, comparators, etc.) located between the seeker head and the seeker low noise amplifier.

Thus, in order to improve the efficiency of the seeker it is desirable to reduce the signal attenuation (radio frequency (RF) losses) caused by the seeker components.

SUMMARY

The presently disclosed subject matter includes an electromagnetic seeker with a new architecture which enables to reduce the RF losses and thereby improve the SNR.

According to some examples of the presently disclosed subject matter, there is provided an electromagnetic seeker comprising:

an antenna having multiple radiating elements; the antenna is divided into a plurality of sections each section comprising a group of radiating elements and is directly connected to a respective single power stage configured to provide power to the radiating elements; each section and a respective single power stage are configured to provide coherent combination of signals transmitted by different antenna sections over the air to thereby enable combination of power from all antenna sections over the air.

The seeker according to the above aspect of the presently disclosed subject matter can optionally comprise one or more of the features below in any technically possible combination or permutation: