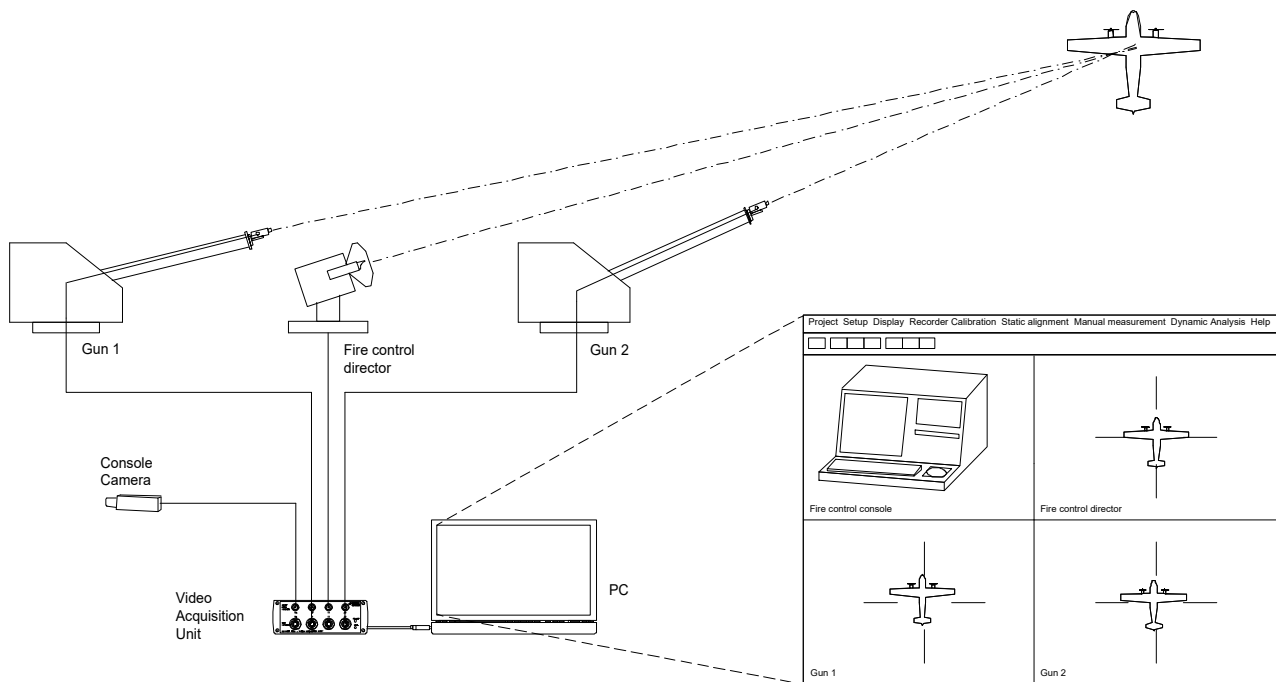


ALIGNER 224 MK4 OPTICAL TRACKING EVALUATION SYSTEM

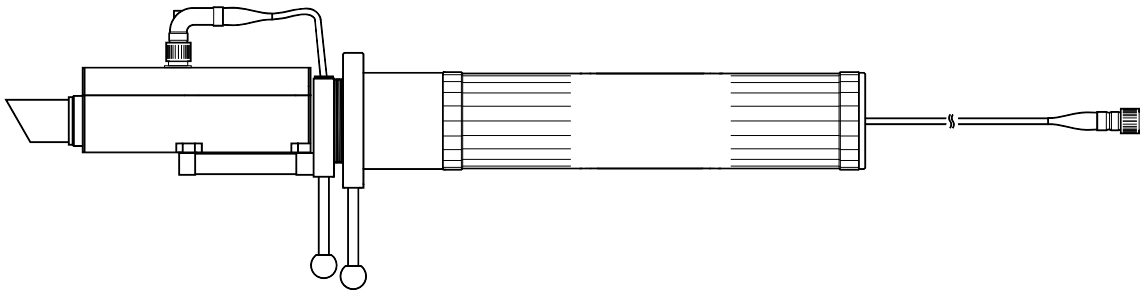
Tracking and shooting errors of a shipboard weapon system are often very hard and costly to investigate and require extensive and time-consuming testing at sea. The tests sometimes cause endless manoeuvring of ships and air targets, and still it is almost impossible to see what happens in real time. When the nature of the problem and the lack of analysing equipment call for repetitive shooting tests, the only certain result is that the total cost increases rapidly.

Aligner 224 Mk4 offers a most cost-effective and operationally advantageous solution resulting in the reduction of time and cost for sea trials to a minimum. The basic principle is simply to display video images from gun (boresight) cameras and the camera of the fire control director, side by side in separate windows on a computer screen. Latitude, longitude and UTC time from an optional GPS receiver can be displayed as well. The video sequences along with the operator's verbal comments can be stored on disk in real-time and replayed later for detailed analysis. The Aligner 224 Mk4 system applies a completely digital solution for image acquisition, storage and analysis, which means that the images always appear with the original sharpness and brilliance. The Aligner 224 Mk4 program is extremely user-friendly and runs under Windows® 7.



System Description

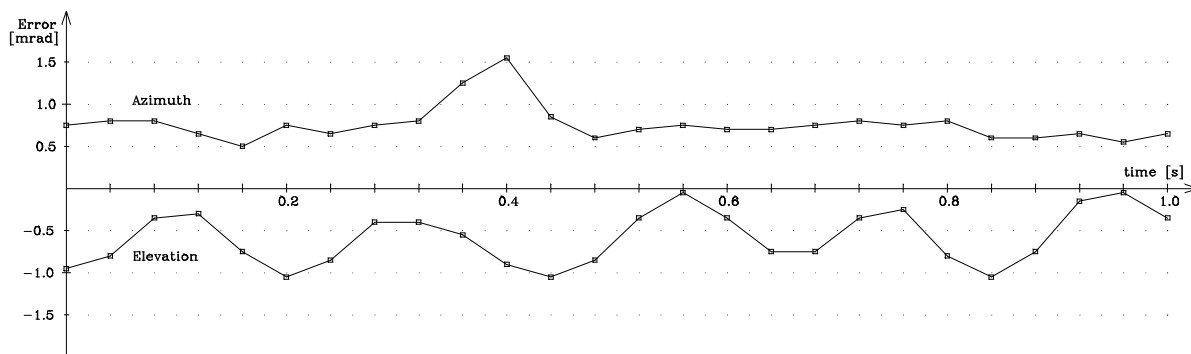
The Aligner 224 Mk4 system mainly consists of a Video Acquisition Unit, a laptop PC, a number of high-resolution rugged gun cameras and a range of boresight adapters. When inserted in the muzzle, the boresight adapter and the camera attached to it are self-aligned to the barrel axis and obtain the same direction as the shell. This operation is carried out in a few seconds and there is no requirement to turn the adapter upside down thanks to its extremely high repeatability and accuracy. Up to four gun cameras connect to the Video Acquisition Unit via twisted pair cables. Optional wireless links allow unrestricted movements of the guns. Another four video sources e.g. tracker director cameras can be connected as well. This means that a total of eight cameras can be connected at the same time and by a few clicks with the mouse the operator can select up to four of the connected cameras to be displayed simultaneously. By another click the operator can e.g. turn on storage of real-time video images on disk, or zoom individual windows, select or deselect cross hairs etc. And, by having an optional indoor camera to picture the fire control console during the tests, tracking data and similar information from the weapon system can be conveniently presented in a separate window, without using a data link.



Gun camera with boresight adapter (76 mm)



While some tracking or misalignment errors will be easily detected and distinguished as soon as the real-time images from different cameras appear side by side on the screen, many other errors require more thorough investigation. By replaying stored video sequences, with the same quality as the originals, such errors can be investigated in detail. Normally, just a few registrations are enough to obtain all necessary information in only a fraction of the time otherwise required. Step-by-step replay makes sure that not even the shortest transient error will pass undetected. Stored images can easily be exported and included in a report or investigated further in an image-processing program. An optional video tracker for automatic estimation of target position simplifies the investigation further and is especially useful when applied to long video sequences. Moreover, there are built-in software procedures for complete calculation of static alignment errors in roll, pitch, elevation and training, for surface targets as well as for air targets.



Result of the video tracker's evaluation of the angular errors of a gun

To summarise, Aligner 224 Mk4 is a complete optical tracking evaluation system, which is ideal for verification of static alignment and frequent faultfinding and analysis of tracking and weapon control. It is the natural supplement/extension to the Aligner 308 Ship Alignment System, which is used for static alignment of shipboard weapon systems without dry-docking.

Main Benefits

- Substantial time and cost saving.
- Video from up to four unsynchronised cameras can be simultaneously displayed on screen and saved on disk in real-time.
- Automatic estimation of target position by an optional built-in video tracker.
- Zoom, slow motion and step-by-step functions.
- Rugged, self-aligned gun (boresight) cameras and adapters can be attached in a few seconds and offer extreme stability and accuracy over time and temperature
- Cable lengths up to 150 m. Optional wireless (VHF) video transmission.
- Portable design.

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