JIMS

Station for boresight large multi-sensor systems

Fig. 1.Photo of the JIMS800 boresight station

Fig. 2.Exemplary large multi sensor EO systems that can be tested using JIMS

BASIC INFORMATION:

JT stations are Inframet main product for boresight of multi-sensor imaging/laser systems. These stations are image projectors combined with a set of laser image sensors that can be used to align almost all EO surveillance systems to a reference optical axis, a reference mechanical axis, or a reference mechanical plane. These station enable high accuracy boresight because all sensors can see the same image projector/receive optics.

Aperture of on axis reflective collimator used as image projector it the main limiting factor of JT stations and determines if the station can be used for boresight of a specific EO system. It is required that collimator aperture overlaps at least 50% of area of every optical sensors of tested EO system. It means that collimators of extremely big aperture are needed to test EO systems where thermal imager is separated by long distance from other imaging/laser sensors.

Inframet manufactures JT boresight stations built using on-axis reflective collimators of aperture up to 600mm. JT600 stations is a station built using a very big collimator and enables boresight of great majority of multi sensor EO systems. However, there are on market EO systems for long distance surveillance built using big imaging/laser sensors separated from each other up to 1000mm. Such rare EO systems cannot be tested using biggest of typical JT station: the JT600 station. The problem can be overcome by building optional JT station built using bigger collimators of aperture up to 1000mm. However, such optional JT stations of aperture over 600mm are extremely large, heavy and expensive.

JIMS boresight stations can be treated as a special modified version of JT station optimized for testing EO systems of ultra large aperture up to 1000mm. From design point of view JIMS is practically a typical JT400 station with additional block called CEB collimator expander block. This block can increase apparent collimator aperture up to 1000mm in one direction (typically horizontal). However, it should be noticed that boresight accuracy using JIMS station is slightly worse comparing to boresight accuracy using typical JT station because the CEB block generates a small internal boresight error. Anyway JIMS can be considered as a near perfect budget saving solution for boresight of ultra large EO surveillance systems having the imaging/laser sensors located on a large horizontal platform.

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VERSIONS

JIMS station is built from two main blocks: JT400 boresight station and CEB collimator expander block. Both blocks are offered in different versions of different design and test capabilities.
The basic division of JIMS station is based on max distance between centers of two sensor of tested EO system that can be tested. This distance is indicated by number after JIMS letters (see Table 1).

Table. 1. Division of JIMS stations based on the maximal distance

Aperture code	Max distance between centers of two sensor of tested EO system
JIMS 600	600 mm
JIMS 800	800 mm
JIMS 1000	1000 mm

Three digit code gives information about max distance between centers of two sensor of EO system that can be tested. There are also other criterion used to describe JIMS station like computerization, boresight capabilities, testing capabilities.

Table. 2. Versions of JIMS system

Code	Computerization/Boresight/test capabilities	Modules
X1	Non computerized test system Boresighting of typical set of imaging systems (thermal imagers, TV cameras, optical sights) Test range: measurement of resolution of VIS-NIR cameras and thermal imagers	CJT400 collimator, VIR-A light source, CVIR-A controller, USAF 1951 target, IR-USAF 1951 target, multi-pattern target, CEB expander
X2	Non computerized test system Boresighting of typical set of imaging systems (thermal imagers, TV cameras, optical sights) and mono-pulse laser range finders Test range: as mentioned as in X1	CJT400 collimator, VIR-A light source, CVIR-A controller, USAF 1951 target, IR-USAF 1951 target, multi-pattern target, set of MON cards, set of MOG cards, set of TEG cards, set of TEP cards, set of OA attenuators, AH1 holder, CEB expander
X3	As in level X2 but multipulse LRF and laser pointers can be aligned too. ABS card, LIC card, and two ILU cards are added	CJT400 collimator, VIR-A light source, CVIR-A controller, USAF 1951 target, IR-USAF 1951 target, multi-pattern target, set of MON cards, set of MOG cards, set of TEG cards, set of TEP cards, set of OA attenuators, AH1 holder, ABS card, FOS card, and two ILU cards, CEB expander
Y1	Computerized test system Boresighting of typical set of imaging systems (thermal imagers, TV cameras, optical sights) and mono-pulse laser range finders Test range of imaging systems: measurement of resolution of VIS-NIR cameras/optical sights, and of thermal imagers. Rough measurement of divergence angle of LRFs is possible, too.	CJT400 collimator, VIR-A light source, CVIR-A controller, USAF 1951 target, IR-USAF 1951 target, multi-pattern target, set of MON cards, set of TEG cards, set of TEP cards, set of OA attenuators, AH1 holder , frame grabber, laptop, BOR software, CEB expander
Y2	As per level Y1 but multipulse LRFs and laser pointers can be aligned, too.	CJT400 collimator, VIR-A light source, CVIR-A controller, USAF 1951 target, IR-USAF 1951 target, multi-pattern target, set of MON cards, set of MOG cards, set of TEG cards, set of TEP cards, set of OA attenuators, AH1 holder , frame grabber, laptop, BOR software, ABS card, FOS card, two ILU cards, CEB expander
Y3	As in Y2 but optical axis of JT station can be aligned perpendicular to reference mechanical plane of platform where tested system is fixed.	As in Y2 but CJT station with auto-collimation capabilities relative to a reference plane is delivered. BRL camera is included.
Y4	As per level Y4 but divergence angle of tested LRFs can be accurately measured.	As in Y2 but SR10 camera and modified BOR software are delivered.

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Additional options:

1. Any version of JIMS station can be expanded to test and boresight of SWIR imager. Please add letter *S* to chosen version.
2. Inframet can deliver special Borex stage to support professional boresight of EO systems to reference mechanical plane or axis. Please add option Borex.

To summarize, version of JIMS system is described by a code composed from two components: three digit aperture code shown in Table 1; letter/digit test capabilities code shown in Table 2.

Example **JIMS 800-Y3** means JIMS system of following features:

1. maximal acceptable distance equal to 800mm
2. type of system: computerized,
3. boresighting capabilities: thermal imagers, VIS-NIR cameras, mono-pulse laser range finders, multi-pulse laser range finders, designators, pointers, and to a reference mechanical plane of the platform
4. test range: measurement of resolution of VIS-NIR cameras/optical sights, and of thermal imagers. Measurement of divergence angle of LRFs, designators, and laser pointers.

Blocks of JIMS800-Y4 are: CJT400 collimator, VIR-A light source, CVIR-A controller, USAF 1951 target, IR-USAF 1951 target, multi-pattern target, set of MON cards, set of MOG cards, set of TEG cards, set of TEP cards, set of OA attenuators, AH1 holder, frame grabber, laptop, BOR software, ABS card, FOS card, and two ILU cards, BRL camera, SR10 camera, CEB expander.

In case of any problems with choosing suitable version of JIMS boresight system please send Inframet detail information about multi-sensor system to be aligned and tested. Inframet engineers then choose version of JIMS system optimal for your application.

Version: 6.1

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