

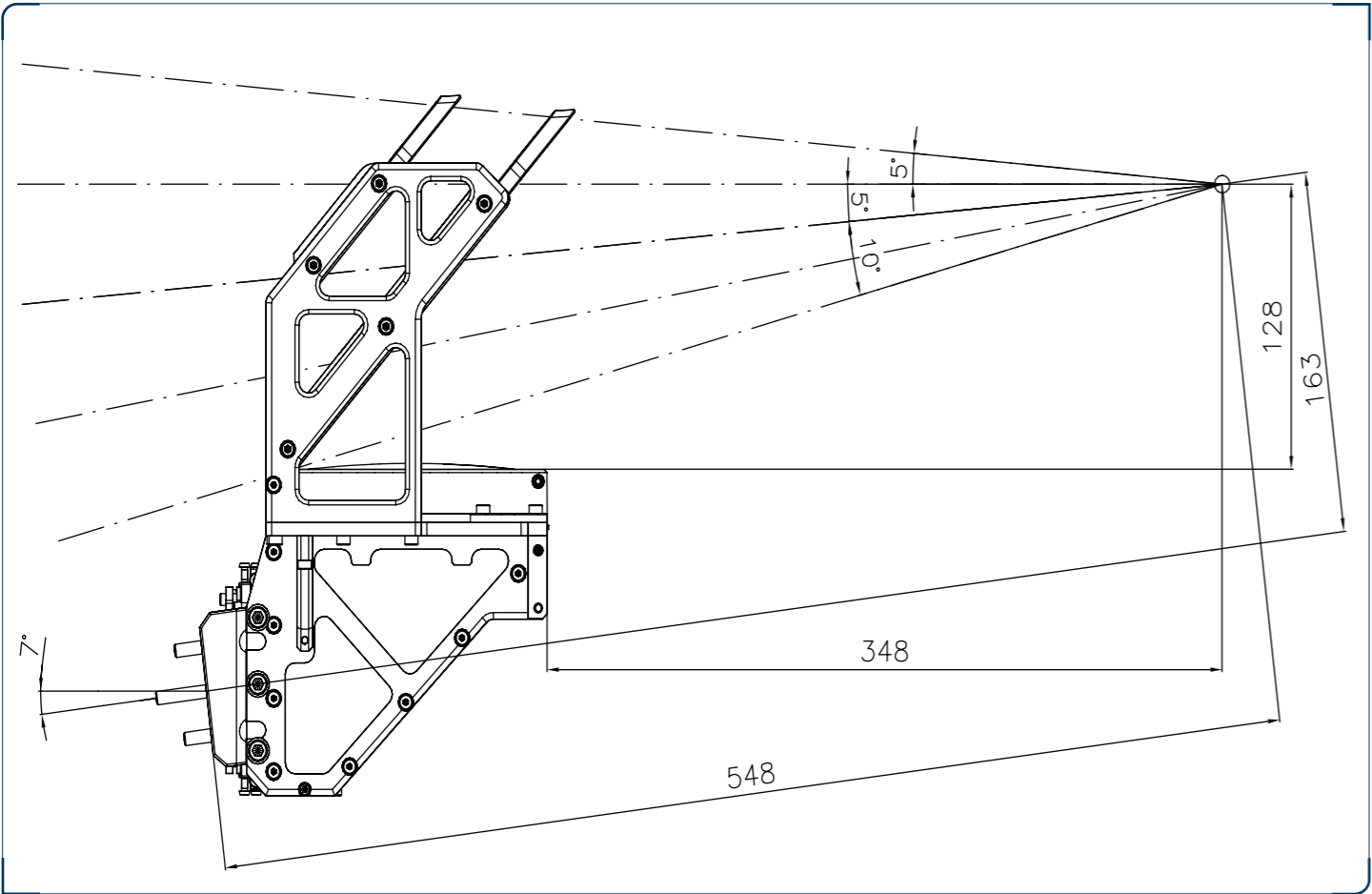
INTEGRATION WITH THE AIRCRAFT

A primary consideration must be given to a proper positioning of the Pilot Display Unit in reference to the actual position of pilot's eyes when he is sitting in the seat in a regular way.

The full performance of the PDU-39 can be reached only if this actual eye position corresponds to the Design Eye Position (DEP) of the display unit as depicted below.

For a detailed design of the cockpit layout, a 3D model of the PDU-39 in step format can be provided.

Design Eye Position (DEP) of the Pilot Display Unit (PDU-39)



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IMPLEMENTATION SCHEMES OF THE

HUD SYSTEM

FIT WITH CUSTOMER NEEDS

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Virtual HUD-39 for integration testing and flight training available.

Fully Digital non-CRT HUD

In serial production. Proven performance in harsh operational environment.

DISPLAY MODES

The HEAD-UP system

The SPEEL's HUD-39 system is intended for presenting key mission data in the pilot's primary field of view. Three basic modes are used for the presentation:

- Navigation
- Air-to-Air
- Air-to-Surface

All modes share the most important flight information such as aircraft airspeed, altitude, heading, etc., supplemented with mission related symbols applicable to the selected Master mode and Sub-mode.

MULTIPLE display standards

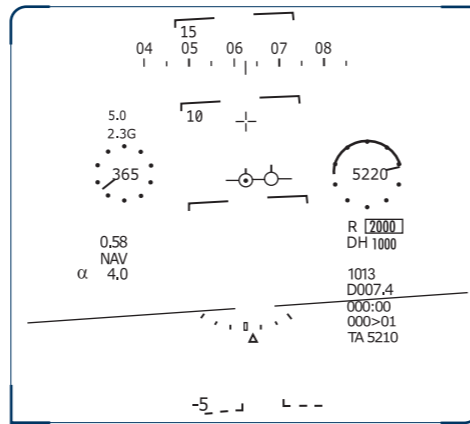
The applied symbology can be tailored to customer's requirements.

Currently, two versions of the symbology are available:

- MIL-STD-1787B based symbology.
- Su-27 like symbology; i.e., similar to that used on the Su-27 fighter.

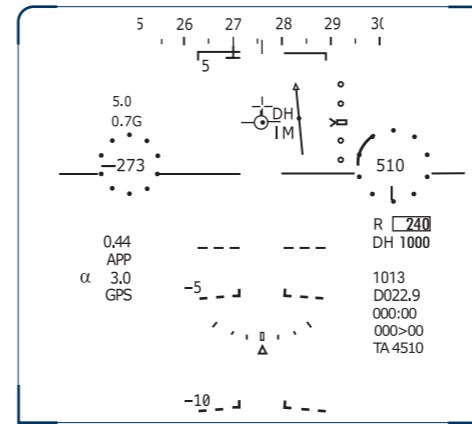
The figures in this handout depict page examples according the MIL-STD-1787B standard.

Navigation mode (MIL-STD-1787B)



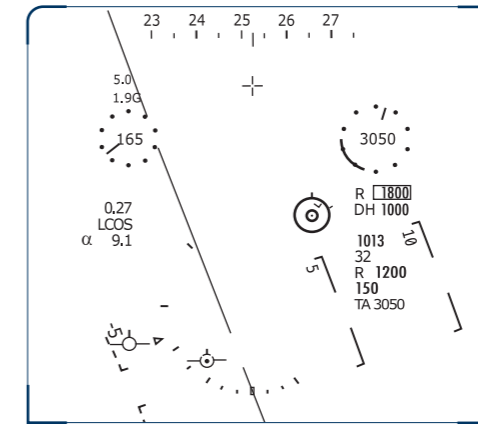
The Navigation mode provides steering information and positioning updates for aircraft navigation on the route.

Approach mode (MIL-STD-1787B)



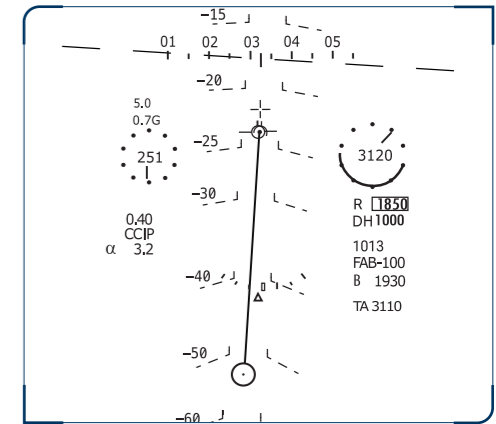
For landing, if APP mode is selected, the standard navigation symbology is supplemented with ILS/FMS data in terms of azimuth and glideslope deviation as depicted in the figures below.

Air-to-Air Gun LCOS (MIL-STD-1787B)



The Air-to-Air Master mode provides aiming capability used for Air-to-Air Missiles as well as for the Gun with the Lead Computing Optical Sight (LCOS) solution. In both A-A submodes, displaying a virtual target can be implemented if required.

Air-to-Ground bombs CCIP (MIL-STD-1787B)

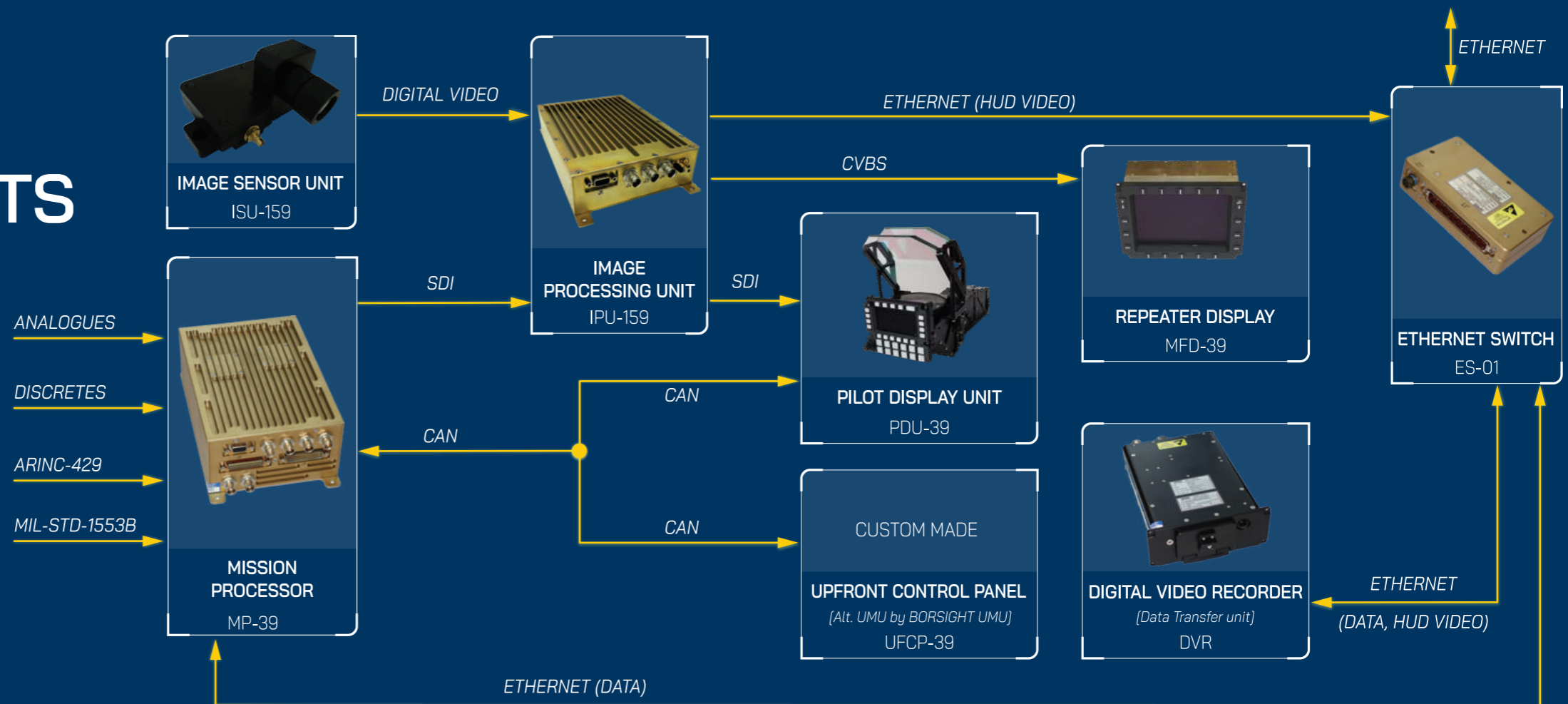


The Air-to-Ground Master mode assists the pilot in the delivery of air-to-ground weapons with the Continuously Computed Impact Point (CCIP) aiming cue. The appropriate solution is calculated for rockets, bombs, and the gun.

SYSTEM ARCHITECTURE AND COMPONENTS

The core of the HUD system by SPEEL consists of the components as follows:

- > Mission Processor, MP-39
- > Pilot Display Unit, PDU-39
- > Repeater Display for the rear cockpit, MFD-39
- > Up-Front Control Panel, UFCP-39
- > Image Sensor Unit, ISU-159
- > Image Processing Unit, IPU-159
- > Digital Video Recorder, DVR
- > Ethernet Switch, ES-01



The technical details of each product above can be found in its corresponding datasheet.