USER SUPPORT SYSTEM FOR IMAGE ANALYSIS AND OBJECT IDENTIFICATION

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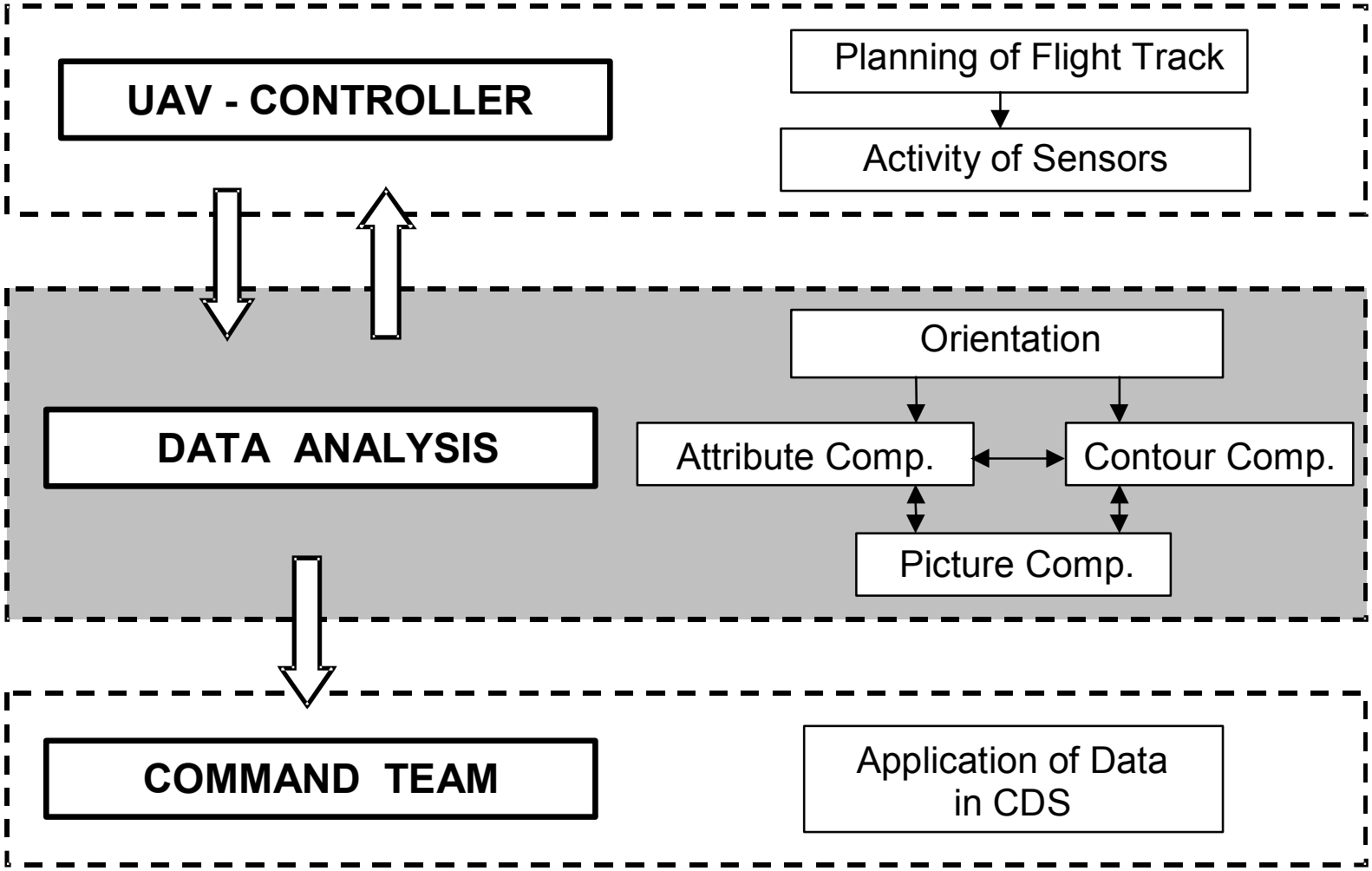
SURVEY

- Introduction
- Design of the User Support System
- Realization of the User Support System
- Evaluation of the User Support System
- Conclusion
- Further Steps

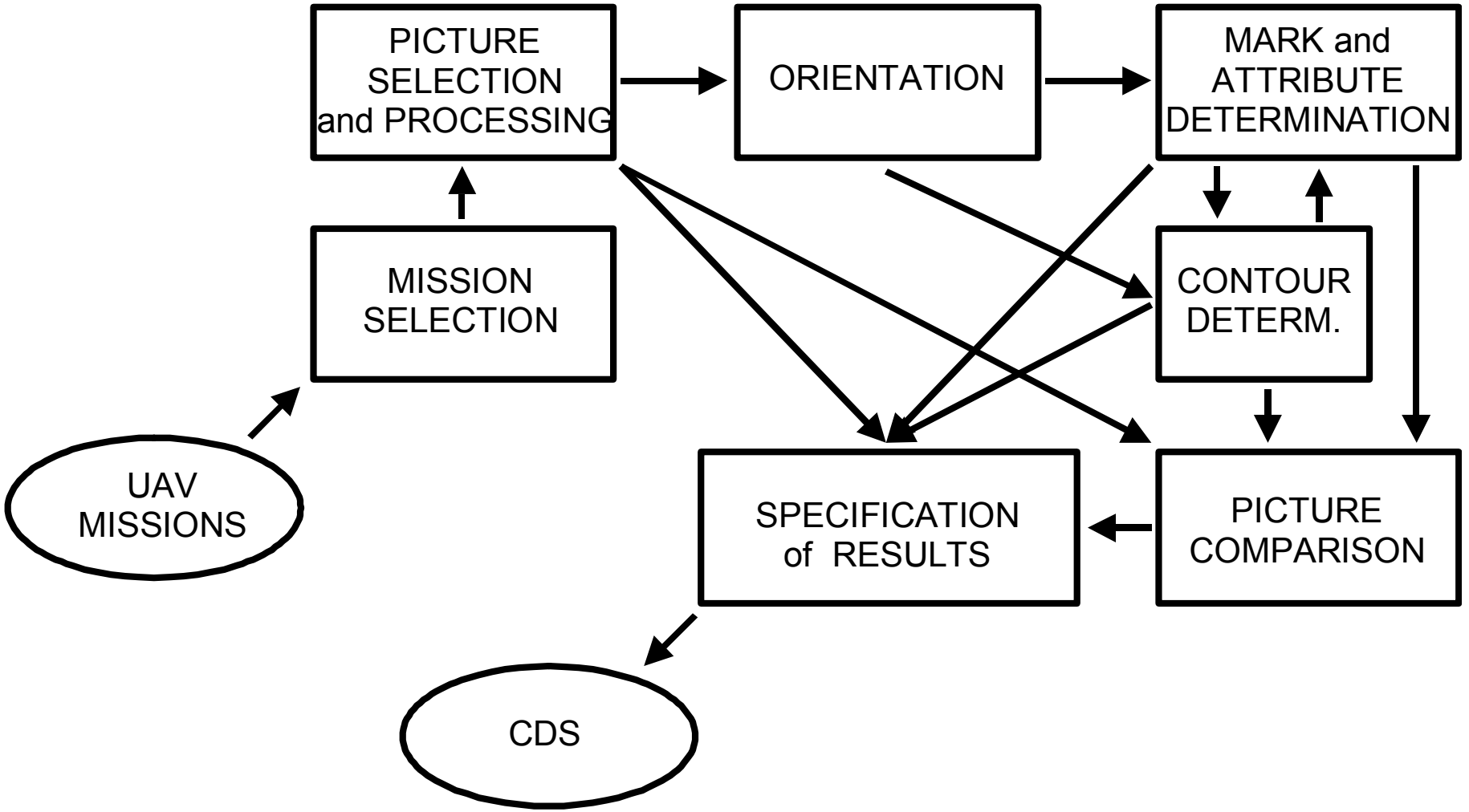
INTRODUCTION

- Importance of Reconnaissance is growing for German Navy
- Surface Reconnaissance with UAV
  - Jagged Coastlines cut off Lines-of-Sight
  - High Density of civil and military Objects
  - Passive Sensors avoid Provocations
- UAV with 2 Sensors (EO and ISAR)
- Results of Recannaissance as Pictures or Sequences
- Classification by comparing characteristic Marks and Contour with Database
- Identification by comparing Sensor-Pictures with Database-Pictures
- User Support for Classification and Identification
- User Support by an Ergonomic Operating Concept and User Interfaces

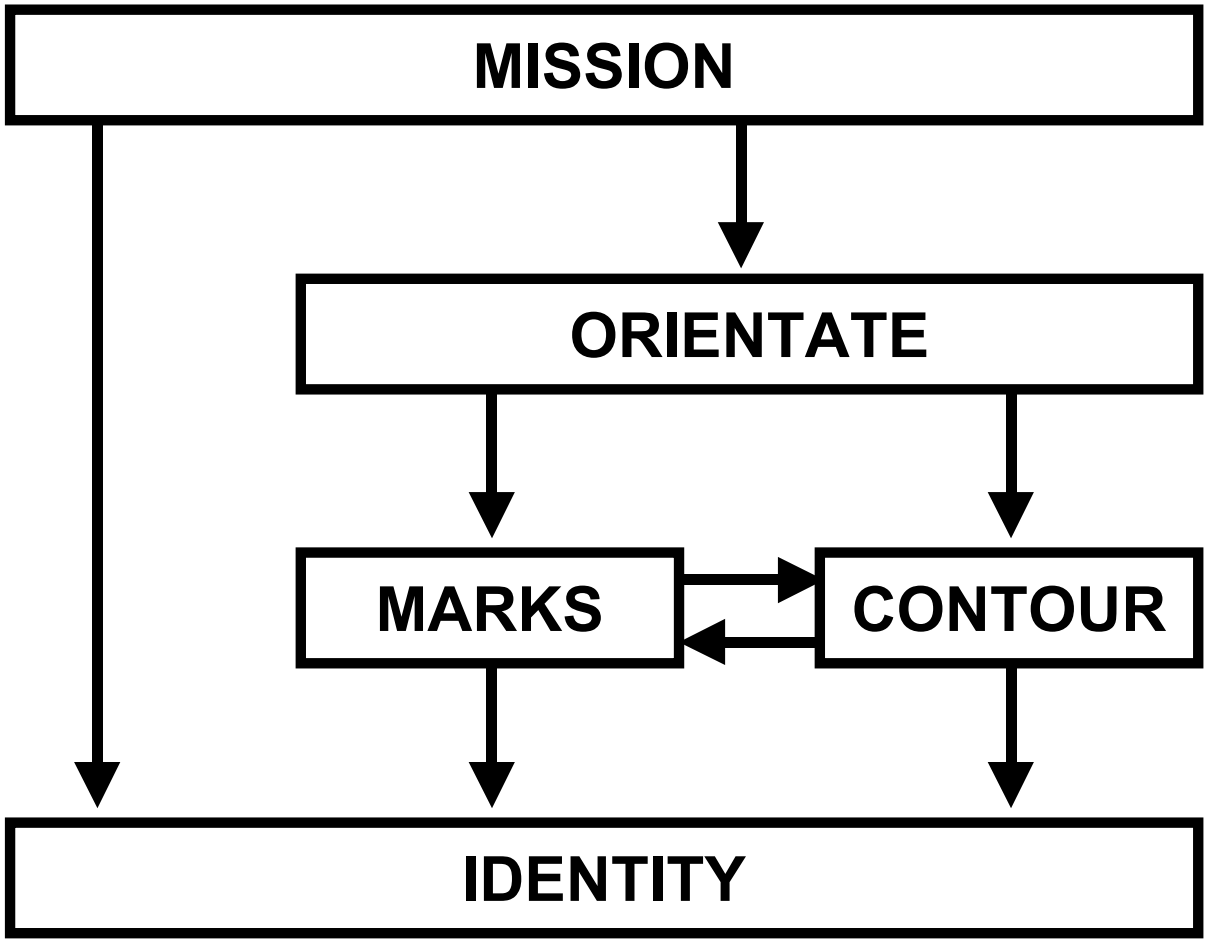
PROCESS ENVIRONMENT



PROCESS STRUCTURE



PROCESS CONDITIONS AND TRANSITIONS



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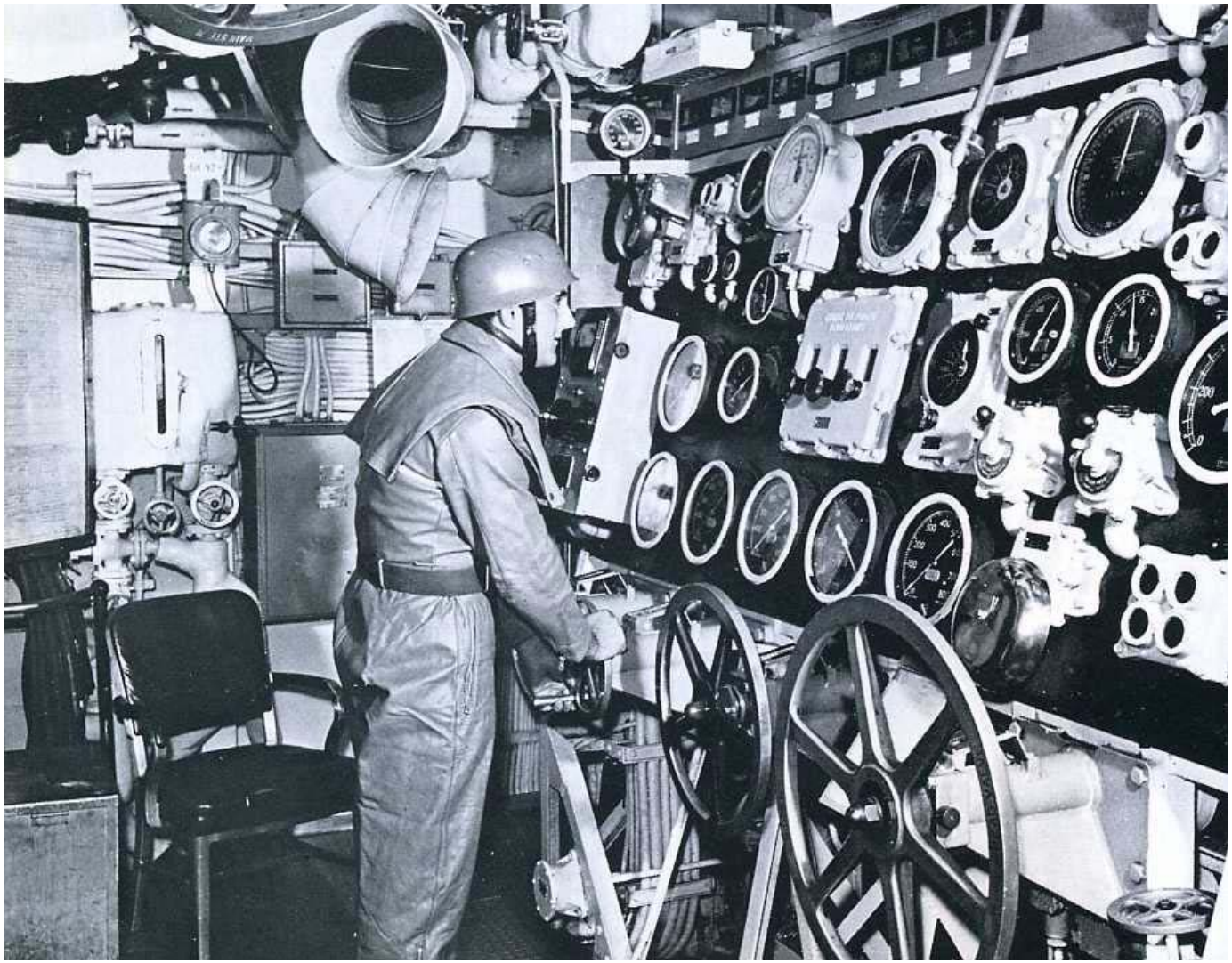
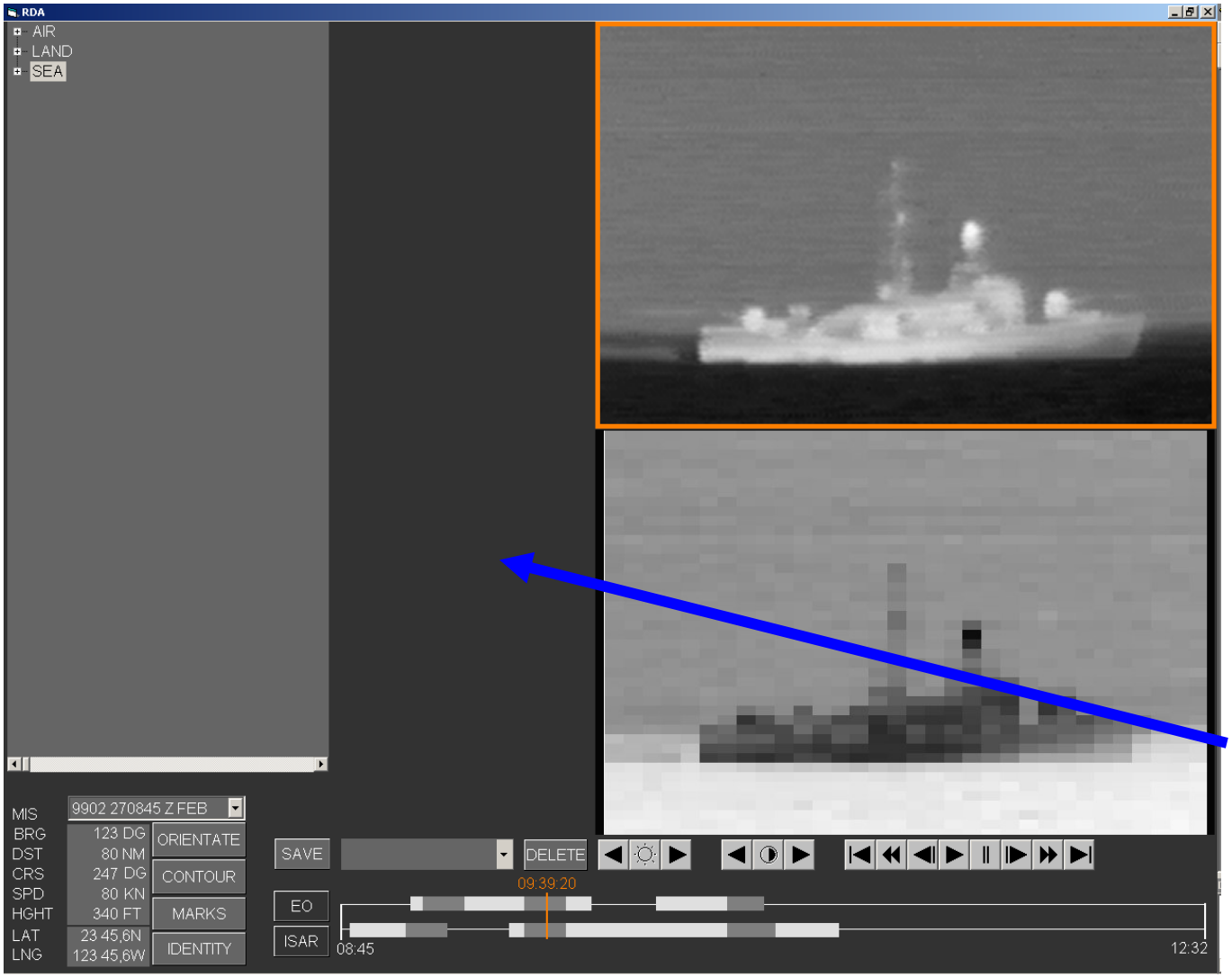


GUI DURING PROCESS CONDITION MISSION

tabase - Area



Picture - Ar

Disposal - Ar

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GUI DURING PROCESS CONDITION IDENTITY

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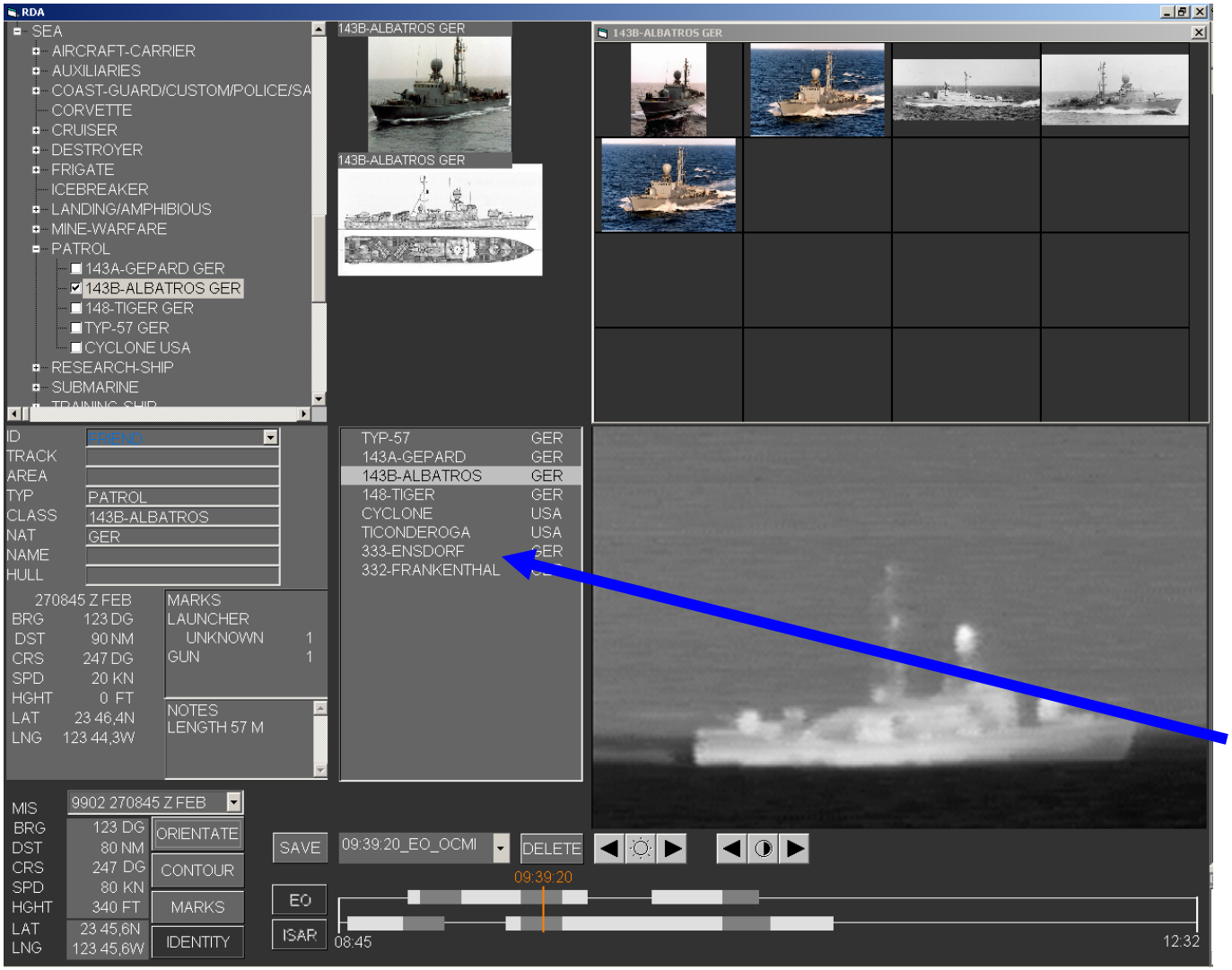

Picture - Ar

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VALUATION OF THE USER SUPPORT SYSTE

- Design of a Test Procedure (Performance)
  - Homogeneous Collective with high Level of Education/Training
  - Same Test Conditions for all Subjects
  - Questionnaire with Rating-Scale (ZEIS) and List of Questions

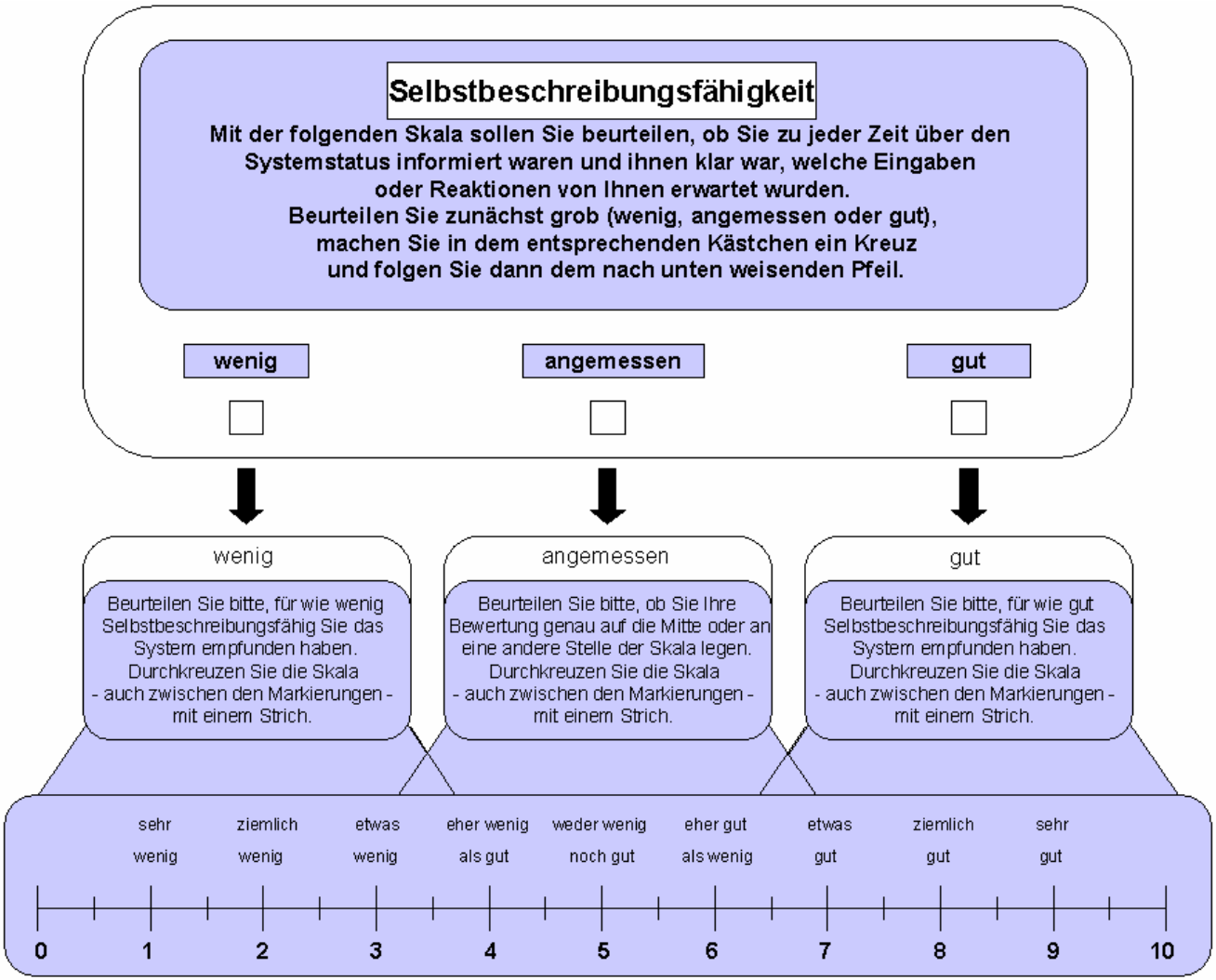
- Experimental Tests
  - 10 experienced Navy Officers
  - Processing a realistic Navy Scenario
  - Processing the Questionnaire

EVALUATION AND OPTIMIZATION

- Analysis of Results
  - Rating-Scales (ZEIS)
  - List of Questions

- Optimization of the User Support System
  - Structure/Concept of the User Support System
  - Details of the User Support System

RATING - SCALE (ZEIS)



ANALYSIS RATING - SCALE

Suitability for the Task:	low: 0	adequate: 0	high: **10**
Self-Descriptiveness:	low: 0	adequate: **2**	high: **8**
Cotrollability:	low: 0	adequate: 0	high: **10**
Conformity with User Expectations:	low: 0	adequate: 0	high: **10**
Error Tolerance:	low: 0	adequate: 0	high: **10**

ANALYSIS LIST OF QUESTION

- Criticism of Details
- ...
- No Criticism of Structure/Concept
- ...
- It is easy and uncomplicated to operate the System
- System supports a determined working on tasks
- Monochrome GUIs reduce Distraction
- Coloured Time-Marker supports Orientation on the Time-Axis

EVALUATION AND OPTIMIZATION

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OPTIMIZATION OF THE STRUCTURE/CONCEP

OPTIMIZATION OF DETAILS

- Optimized Clarity for the Names of the Data Files (M-O-C-M-I)
- Warning (Window) before Deleting Data Files (M-O-C-M-I)
- RESET-Functionality for Brightness and Contrast of Pictures (M-O-C-M)
- Fast Forward and Reverse Running on the Time-Axis (MISSION)
- Opitimized Positioning of the Ship-Model (ORIENTATE)

CONCLUSION

- User Support System is necessary
- User Support System is efficient
- User Support System is independent of the Kind of Sensors
- User Support System is independent of the Kind of Platform

FURTHER STEPS

- Evolutionary Development of the GUI
- Independance of specific Sensors
- Design and Integration of (partial-)automatic Method to outline the Contour
- Expansion of Functionalities
- Realization of operationally ready System

THANK YOU