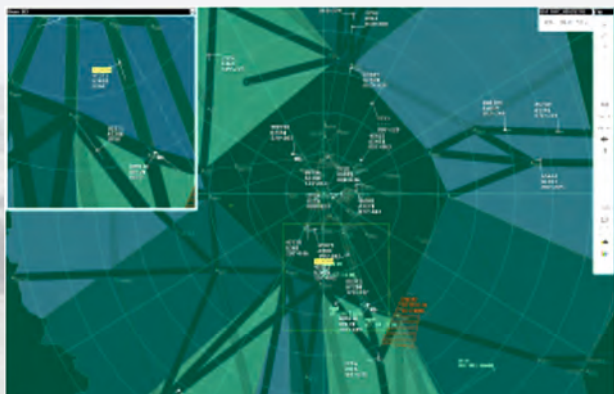




TOPAZ AUTOMATED SYSTEM FOR AIR TRAFFIC MANAGEMENT



Topaz Automated System for Management of Air Traffic Control is intended for ensuring support of air traffic in airspace of consolidated, terminal-areal and areal centers of Air Traffic Management Consolidated System.

ATMAS comprises:

- TOPAZ Complex of automated facilities for planned usage of airspace of zonal/consolidated centers;

- TOPAZ ATM Complex of automated facilities of air situation processing and displaying for the purpose to ensure fulfillment of air traffic planning and control procedures;

- AVIATOR complex for voice data and air situation data recording and replaying;

- TOPAZ Time Synchronization Complex;

- Simulation and Training Complex for target flow simulation and for training of controllers;

- TOPAZ Voice Communication Equipment Complex;

- TOPAZ Control Consoles.

TOPAZ Complex of automated facilities for planned usage of airspace of zonal/consolidated centers is intended for automation of daily and current planning procedures of airspace usage including arrangement of air traffic flow, as well as for data support of ATC automated facilities complex, for bringing daily flight plans to the notice of

airdrome controllers' post, local control post and independent areal center, and for automated interaction based on air-navigational and reference data with AAD units within a zone of ATM Consolidated System.

TOPAZ ATM Complex of Automated Facilities

is intended for automation of flight planing functions on the stage of current planning and for multi-radar processing and displaying of radar data. This complex ensures automated functions of reception, processing and combined displaying of radar data, bearing, planning, meteorological, NOTAM, coordinate, map-graphic, reference data, and system of state-belonging identification data.

TOPAZ ATM CAF comprises the following:

- Central computative complex, i.e. the set of duplicated servers for processing of various types of data, and for ensuring communication and information security;

- Automated workstations for controllers (AWS-C). Functional purpose of controller's workstation is variable depending on tasks to be resolved (areal center, airdrome control center, circle/approach, take-off / taxing); automated workstation of AFTN operator; flight director's automated workstation;

- Group cross-communication equipment;

- Data transfer equipment;

- Remote automated workstations for installation on sites located remotely from area control centers.

TOPAZ Time Synchronization Complex is intended for defining, storage and output of values of current time synchronized with the scale of UTC (Universal Coordinated Time). TOPAZ Time Synchronization Complex ensures providing users with values of current world time with the accuracy of 1×10^{-12} , measuring and outputting of geographic coordinates.

Simulation and Training Complex for target flow simulation and for training of controllers is intended for training of controllers personnel as well as for testing TOPAZ ATC AFC on a test stand. Simulation and Training Complex comprises server, target flow simulator, controller's workstation and instructor's (systems operator pilot) workstation.



AVIATOR Complex for recording and replaying of voice data and air situation data ensures solution of the following tasks:

- Recording of voice conversations, as well as digital and analogue radar data regarding air situation, and storage of data recorded;
- Association of data recorded to signals of unified time;
- Listening point-to-point channels in real time without interruption of data recording procedure;
- Synchronous replaying of voice data and digital radar data from online archive and long-storage archive.

AVIATOR Complex comprises the following: recording rack, automated workstation for remote monitoring and automated workstation for replaying voice data and air situation data.

Number of recording channels: from 8 up to 64 with 8-channels set or from 16 up to 128 with 16-channels set.

Voice communication equipment complex is intended for establishing voice data interchange among ATC processes servicing personnel via channels of radio communication, internal and external telephone communication and loudspeaker communication.

Voice communication equipment complex comprises the following: central equipment with control modules; communication terminal with access to radio-communication, internal and external telephone communication; remote communication terminal; technical monitoring and control terminal.

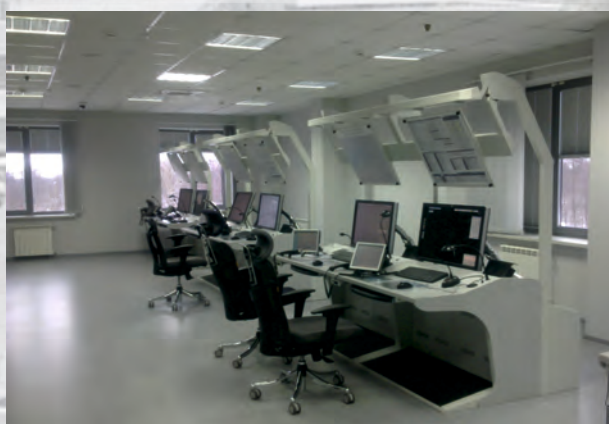
Voice communication equipment complex can be interfaced with on-duty communication aids of ATC centers and stations.

Control consoles have modern design and ergonomic composition. Following three types of consoles are offered:

- Consoles of the type of Areal Center for equipping ATC controllers' (navigators') workstations;
- Consoles of the type of Aerodrome Control Command Post for equipping workstations for control-command posts of aerodromes;
- Consoles of the type of Flight Director's Console for equipping workstations of flight directors (shift supervisors), controllers of aerodrome controllers' post (air traffic flow management group), technical and administrative personnel.



Controller's Console of the Type of ACCP



Console of the Type of Areal Center



Flight Director's Console