


SAFETY INFORMATION	 АВИАЦИОННАЯ АДМИНИСТРАЦИЯ КАЗАХСТАНА
PILOTS' ROLE IN COLLISION AVOIDANCE	
Date: 07.12.2023	SI №: AIRPROX 2023-0001
Flight Operations	Revision: 00

1. PURPOSE

This safety information is issued for the purpose of alerting all pilots to the potential hazards of midair collisions (MAC) and near midair collisions, and to emphasize those basic problem areas related to the human casual factors where improvement in pilot education, operating practices, procedures, and improved scanning techniques are needed to reduce midair conflicts.

2. BACKGROUND

Midair conflicts. From January to November 2023, the AAK operations center received 31 reports on the activation of a traffic collision awareness system warnings or midair collision precursors. In addition, the operations center received 56 messages related to the loss of radio communication, loss of GPS signal or other problems related to the operability of radio or navigation equipment.

As part of the midair collision prevention program, “Aviation Administration of Kazakhstan” JSC has released this safety information which is directed toward all pilots operating in the airspace of the Republic of Kazakhstan, with an emphasis on the need of recognition of other aircraft and maintaining visual separation, improved workload management, and the human factors associated with midair conflicts, particularly in high-volume traffic areas.

3. ACTIONS

The following areas warrant special attention and continuing action on the part of all operators, to avoid the possibility of becoming involved in a midair conflict.


3.1. The Flight Rules

3.1.1. Regulatory basis. The flight rules prescribed in Chapter 7 paragraph 1 “General rules” determine the procedures for preventing midair conflicts, including the responsibility of the captain for taking the most effective collision prevention actions, including prevention maneuvers in accordance with alerts issued by the TCAS.

3.1.2. Vigilant Lookout. Pilots should also keep in mind their responsibility for continuously maintaining a vigilant lookout regardless of the type of aircraft being flown. Remember that most midair collision accidents and reported NMAC incidents occurred during good VFR weather conditions and during the hours of daylight.

3.1.3. Preflight Planning. Pilots should review all airspace, Notices to Airmen (NOTAM), Special Use Airspace, and terrain information along their route of flight during preflight planning. Pilots should also note the forecasted visibility and any adverse meteorological conditions that would affect their ability to see other aircraft, such as smoke, haze, precipitation, sun angle, and position expected along the route of flight. Pilots are encouraged to use the Kazaeronavigatsia ([eAIP \(ans.kz\)](http://eAIP.ans.kz)) for accessing relevant information regarding NOTAMs and Special Use Airspaces along their planned route of flight. Information found on this Web site will help reduce the chances of midair collisions occurring between commercial, General Aviation (GA), and state aviation.

3.2. Visual Scanning

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3.2.1. Attention and Response to Traffic Movement. The pilot's responsibility is to fly the aircraft safely. All other duties should be secondary while flying. Pilots should remain constantly alert to all traffic movement within their field of vision, as well as periodically scanning the entire visual field outside of their aircraft to ensure detection of conflicting traffic. Remember that the performance capabilities of many aircraft, in both speed and rates of climb/descent, result in high closure rates limiting the time available for detection, decision, and evasive action. Research has shown that the average person has a reaction time of 12.5 seconds. This means that a small or high-speed object could pose a serious threat if some other means of detection other than see and avoid were not utilized, as it would take too long to react to avoid a collision. This is particularly important with small Unmanned Aircraft Systems (sUAS).

Event	Seconds
See Object	0.1
Recognize Aircraft	1.0
Become Aware of Collision Course	5.0
Decision to Turn Left or Right	4.0
Muscular Reaction	0.4
Aircraft Lag Time	2.0
TOTAL	12.5


Table 1. Aircraft Identification and Reaction Time

3.2.2. Refocusing Eyes. The probability of spotting a potential collision threat increases with the time spent looking outside, but certain techniques may be used to increase the effectiveness of the scan time. The human eyes tend to focus somewhere, even in a featureless sky. If there is nothing specific on which to focus, your eyes revert to a relaxed intermediate focal distance (10 to 30 feet). This means that you are looking without actually seeing anything, which is dangerous. In order to be most effective, the pilot should shift glances and refocus at intervals. Most pilots do this in the process of scanning the instrument panel, but it is also important to focus outside to set up the visual system for effective target acquisition.

3.2.3. Refocusing When Switching Views. Pilots should also realize that their eyes may require several seconds to refocus when switching views between items in the cockpit and distant objects. Proper scanning requires the constant sharing of attention with other piloting tasks; thus, it is easily degraded by psychophysiological conditions, such as fatigue, boredom, illness, anxiety, or preoccupation.

3.2.4. Eye Movements. Effective scanning is accomplished with a series of short, regularly spaced eye movements that bring successive areas of the sky into the central visual field. Each movement should not exceed 10 degrees, and each area should be observed for at least 1 second to enable detection. Although most pilots seem to prefer horizontal back-and-forth eye movements, each pilot should develop a scanning pattern that is most comfortable and then adhere to it to assure optimum scanning.

3.2.5. Spotting Threats. Peripheral vision can be most useful in spotting collision threats from other aircraft. Each time a scan is stopped, and the eyes are refocused, the peripheral vision takes on more importance because it is through this element that movement is detected. Apparent movement is almost always the first perception of a collision threat, and probably the most important, because it is the discovery of a threat that triggers the events leading to proper evasive action. It is essential to remember, however, that if another aircraft appears to have no relative

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motion, it is likely to be on a collision course with you. If the other aircraft shows no lateral or vertical motion, but is increasing in size, take immediate evasive action.

3.2.6. Nighttime Searches. Visual search at night depends almost entirely on peripheral vision. This is due in part to the night-blind spot that involves an area between 5 and 10 degrees wide in the center of the visual field. By looking approximately 10 degrees below, above, or to either side of an object, “off center” viewing can compensate for this night-blind spot. To perceive a very dim lighted object in a certain direction, the pilot should not look directly at the object, but scan the area adjacent to it. Short stops of a few seconds in each scan will help to detect the light and its movement. Lack of brightness and color contrast in daytime and conflicting ground lights at night increase the difficulty of detecting other aircraft. Modern aircraft lighting and light pulse systems present a noticeable improvement toward detecting other aircraft in flight over previous legacy systems. Many of these systems and light-emitting diode (LED) bulbs use less power, last longer, and are brighter than minimum operating equipment, improving aircraft safety in poor lighting conditions or reduced visibility. Operators should consider installing these systems to improve operational safety.

3.2.7. Physical Obstructions. Pilots are reminded of the requirement to move one’s head in order to search around the physical obstructions, such as door and window posts. The doorpost can cover a considerable amount of sky, but a small head movement may uncover an area which might be concealing a threat.

3.3. Clearing Procedures

3.3.1. Pilots should:


- a) Prior to taxiing onto a runway or landing area for takeoff, scan the approach areas for possible landing traffic by maneuvering the aircraft to provide a clear view of such areas. It is important that this be accomplished even though a taxi or takeoff clearance has been received.
- b) During climbs and descents in flight conditions which permit visual detection of other traffic, execute gentle banks left and right at a frequency which permits continuous visual scanning of the airspace about them.
- c) Execute appropriate clearing procedures before all turns, abnormal maneuvers, or acrobatics.
- d) Following the AIM execute pattern entries and departures for the runway in use appropriate to the airport configuration and information depicted.

3.4. Airspace, Flight Rules, and Operational Environment.

3.4.1. Pilots should be aware of the type of airspace in which they intend to operate in order to comply with the flight rules applicable to that airspace. Aeronautical information concerning the national aviation standards is disseminated by three methods: aeronautical charts (primary); the AIM; and the NOTAM system. The general operating and flight rules governing the operation of aircraft within the Republic of Kazakhstan are contained in the Rules for the use of the airspace of the Republic of Kazakhstan, approved by Government Decree No. 506 dated May 12, 2011.

3.4.2. Use of Resources. Pilots should:

- a) Use currently effective aeronautical charts for the route or area in which they intend to operate.

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- b) Note and understand the aeronautical legend and chart symbols related to airspace information depicted on aeronautical charts.
- c) Use a current Airport/Facility Directory (A/FD). The A/FD is designed to be used in conjunction with charts and is published every 28 days. The A/FD also contains the Aeronautical Chart Bulletin. The purpose of the bulletin is to provide major changes in aeronautical information that have occurred since the last publication date of each VFR Sectional, Terminal Area, and Helicopter Route Chart listed.
- d) Develop a working knowledge of the various airspace segments, including the vertical and horizontal boundaries.
- e) Develop a working knowledge of the specific flight rules governing operation of aircraft within the various airspace segments.
- f) Use the AIM ([eAIP \(ans.kz\)](https://www.eaip.kz)).