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Analysis of Soviet Heavy Transport Aircraft: Condor A (U)

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**Analysis of Soviet
Heavy Transport Aircraft:
Condor A (U)**

Summary

Analysis of imagery suggests that the second prototype of the Condor A, a new Antonov-designed heavy transport aircraft similar in size to the Lockheed C-5A Galaxy, will be rolled out in early 1984. This aircraft is being assembled at the Antonov Experimental Design Bureau (OKB) in Kiyev where the assembly of the first prototype was completed in the fall of 1982. The first aircraft was flown to nearby Gostomel Airfield where it has been undergoing flight testing.

Structural testing of one of these two prototype aircraft will probably begin by early 1984 at the Gostomel Airfield. A probable static test stand that appears specifically configured for testing of the Condor A is under construction there.

We believe series production of the Condor will begin in 1988 or 1989 at Tashkent Airframe Plant 84, where the IL-76 Candid medium transport aircraft is currently being produced. We expect Candid production to wind down in the late 1980s, thus freeing up floor-space to support the startup of Condor production. A new assembly section under construction at Tashkent is expected to be completed by 1990. We believe that this new section will support peak production of Condor through the 1990s.

The above information is Secret

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Information available as of 1 September 1983 was used in this report. (U)

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Introduction

A new Soviet transport aircraft is under development by the Antonov Experimental Design Bureau (OKB) in Kiyev, USSR. Following a design effort that [redacted] 25X1 reporting has spanned more than a decade, the first flight test prototype was rolled out of the new assembly facility at Kiyev between 21 September and 7 November 1982. By January 1983, the aircraft had been flown to Gostomel Airfield, the Antonov flight test facility 12.5 kilometers (km) northwest of Kiyev. The aircraft was originally given the interim designator Kiyev B, and is currently designated Condor A. (S [redacted] 25X1

This report provides imagery-derived background data on the development of the Condor A, a general description of the new aircraft, a discussion of the test activity and production facilities believed to be associated with it, and a rectified 3-view drawing based on satellite imagery of the first prototype. (S [redacted] 25X1

Discussion

With its [redacted] fuselage and 73-meter wingspan, the Condor A is the largest Soviet aircraft ever built (figure 1). The Condor's overall dimensions and general appearance approximate those of the US-built C-5A Galaxy, currently the largest aircraft in the world (figure 2). The Condor has a high-mounted, moderately-swept wing and a fuselage-mounted horizontal tail. (S [redacted] 25X1

The Condor's horizontal tail represents a major design difference from the T-tailed C-5A. In addition, the first Condor A prototype differs from the C-5A by the absence of a visible hinge line in the nose section, suggesting that the Soviet aircraft does not have a front loading and unloading capability. In contrast, the nose section of the C-5A is able to raise, providing drive-through capability to the cargo area. The positioning of upper and lower personnel doors on the Condor, suggests that it, like the C-5A, contains an upper deck for troop transport and a lower deck for cargo. We presume that the Condor A has a large vehicle access door aft, although evidence of it has not been seen in imagery. (S [redacted] 25X1

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The Condor A has four engines mounted on pylons under the wings. The large diameter of the engine nacelle [redacted] strongly suggests that the engines are the large, high-bypass ratio types reported by several Soviet sources as being under development for more than a decade. Their dimensions place the engines in the same size class as the large, high-bypass ratio turbofans powering wide-body transports in the West. (S [redacted])

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Although the Condor's landing gear has not been seen on imagery, analysis of a probable static test stand under construction at Gostomel Airfield reveals what is almost certainly the landing gear "footprint" for the Condor A. An identical footprint is on a parking apron at Gostomel. Analysis and mensuration of these footprints indicate two main gear assemblies, each no larger than 3 meters wide and 9 meters long, and a nose wheel assembly that is a maximum of 4 meters wide and 2 meters long. Separation between the two main landing gear assemblies, measured from the center of each assembly, [redacted] Figure 3 shows the most likely positioning of the landing gear on the aircraft. (S [redacted])

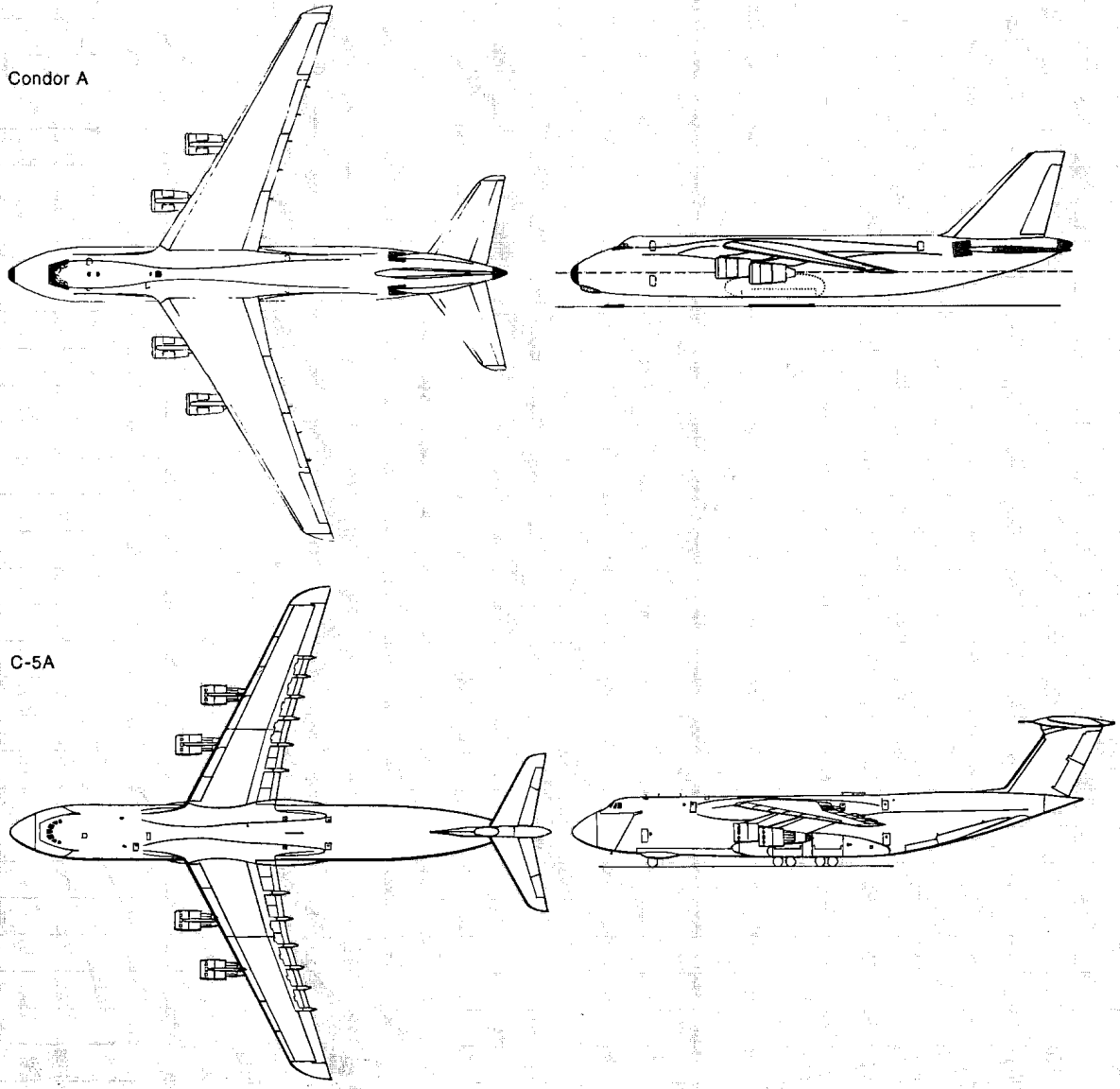
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Figure 2

Soviet Condor A and US C-5A Transport Aircraft



Note: C-5A drawing is copyrighted material from *Jane's All The World's Aircraft 1975-76*.
Each block is 5 meters.

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Prototype Development

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"AN-400" was the reported designation of the new aircraft. [Reference 2] This new aircraft was not seen on imagery, however, until November 1982, 12 years after its initial design phase reportedly had begun. The period between preliminary design and a completed prototype was lengthy compared to the four years needed to complete a C-5A prototype. (S [REDACTED] 25X1
[REDACTED] 25X1

The inability of the Soviets to produce or purchase a suitable engine for the Condor A is likely to have delayed development of the first prototype. The performance characteristics of the high-bypass ratio turbofan engine make it the most desirable engine for a heavy transport aircraft such as the Condor. The Soviets lag behind the West in development of high-bypass materials and associated production technologies for this engine. During the mid-1970s, the Soviets unsuccessfully attempted to purchase turbofan engines from General Electric and Rolls Royce; they may have been looking for an engine suitable for the Condor. (S [REDACTED] 25X1

April 1982 imagery of Ramenskoye Flight Test Center provided the first imagery evidence that a large high-bypass turbofan engine was in flight testing. The imagery showed that an IL-76 Candid had been modified at Ramenskoye--one of its four engines and a pylon had been replaced with a new pylon-mounted Condor-sized engine. This flight testing started only seven months before rollout of the first Condor A prototype, suggesting that the IL-76 was testing a follow-on or modified engine, rather than the one fitted on the first prototype of the Condor A. Undetected developmental testing for the Condor A engine was apparently conducted prior to April 1982. (S [REDACTED] 25X1

All prototype assembly of Condor has thus far been accomplished in a new production facility for experimental aircraft at Antonov's Kiyev OKB. The assembly building at Kiyev was started in 1978 and completed in 1982, but an adjacent checkout or testing hangar is still under construction. (S [REDACTED] 25X1
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At least a few major aircraft sub-assembly components are transported to this facility from Tashkent. Imagery from March 1982 indicates that a large wing panel was delivered from Tashkent to Kiyev atop a modified AN-22 Cock. It was imaged at Mozdok Airfield enroute to Kiyev (figure 4). The delivery of this wing panel was the first imagery evidence of the start of prototype assembly for the Condor A. Two months later, in May 1982, a probable wing carry-through structure--a single structure through the fuselage to which both wings are attached--was also imaged atop a modified Cock. Judging from this activity and the sighting of the Condor A [redacted], assembly of the first prototype took about six months. (S [redacted])

Imagery of another Condor wing panel, which was also flown on an AN-22 from Tashkent to Kiyev in March 1983, indicates that a second prototype is being assembled. Based on the chronology of similar activity associated with the assembly of the first prototype, we estimate that the second prototype could be complete in early 1984. We believe this second prototype may be for ground testing at Gostomel Airfield. Also, the prototype will apparently have to be flyable in order to get there. (S [redacted])

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Testing

The first observable testing of the Condor was imaged between May and July 1982. A large fuselage was seen inside a hydrostatic test basin at Antonov's Kiyev OKB. The test basin had previously been used to pressure-test the fuselage of the AN-22 Cock transport, and was subsequently lengthened to accommodate the Condor fuselage after the AN-22 test article was removed. (S [redacted] 25X1
[redacted] 25X1

Antonov accomplished most of his flight testing for transport aircraft at Gostomel Airfield, which until the mid-1970s had only a grass runway. Since the mid-1970s the runway at Gostomel Airfield has been surfaced with concrete. Only 2,700 meters of its 3,000-meter length was completed, however, before construction was halted. This runway upgrade was almost certainly in preparation for the Condor flight test program. Previously, all Soviet transport aircraft have had a soft-field landing capability. Paving the runway at Gostomel Airfield may indicate that the Soviets have eliminated the soft-field landing requirement for this aircraft. Without the soft-field landing requirement, the engineering complexity as well as the weight of the aircraft will be reduced. (S [redacted] 25X1

A new probable static test stand has also been under construction at Gostomel Airfield since mid-1980 (figure 5). An 88- by 78-meter concrete apron was recently fitted with two gantry cranes which span the apron. Their arrangement, relative to the anticipated position of the Condor prototype on the apron, indicates that the Soviets may conduct tests related to the structural integrity of the Condor's wing. Concrete foundations or jacking positions have been constructed on the apron in a pattern which suggests that they will be used to support load application devices. Four foundations on each side of the apron are positioned to lie directly below the Condor's wing mid-chord line when the aircraft is aligned on the apron. Besides these foundations, there are several similar positions forward of the wing positions that are not aligned with the engines. Another pattern of foundations surrounds the main landing gear positions. Only the wing foundations appear to correlate well with the Condor A airframe. The purpose of the other positions is unclear. (S [redacted] 25X1
[redacted] 25X1

Series Production

Based on past Soviet practices we expect full scale production of the Condor to begin in 1988 or 1989, depending on the progress made with prototype development and testing. Production will almost certainly take place at Tashkent Airframe Plant 84 which has served as the production facility for other Soviet heavy and medium transports, including the AN-22 Cock and the IL-76 Candid.

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Based on the Soviets' operational requirements for IL-76 aircraft as currently perceived within the Intelligence Community, we expect IL-76 production to wind down in the late 1980s. We believe the startup of Condor production will coincide with the winding down of IL-76 production and the resultant freeing of space for Condor production. The Soviets have broken ground for a third assembly section at Tashkent, which will probably support peak Condor production through the 1990s. The new facility will add 44,000 square meters of primary production floorspace by about 1990, raising the total production floorspace in this new production complex to about 160,000 square meters. (S [redacted])

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References



Documents

Document references are available upon request. (U)

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