

## Production Stages

Analysis of open sources indicates that production of TB2 and Akıncı UCAV systems follows a distinct pattern. The following stages are compiled from a January 2021 diagram of the TB2 production process,<sup>1</sup> the *AKINCI* documentary filmed in 2019,<sup>2</sup> a December 2017 architectural rendering provided by Etüd Mimarlık,<sup>3</sup> and a number of photographs taken inside the factory from 2019 to 2022.

### 1. Composite Parts Manufacturing

This function is included in the 2021 diagram within an apparent workshop on the northern side of the main factory floor. Composites manufacturing appears to also take place in the second factory building, where it may have supplanted the first. Unpainted composite parts such as wings, tails, and fuselages for the TB2 and Akıncı have been photographed in the area, and at least one spray booth, possibly used for the application of initial coatings to composite pieces, was sighted during a visit by Ukrainian officials in August 2020.<sup>4</sup> Satellite imagery indicates the presence of ventilation systems of the type needed to support multiple spray booths, and Etüd Mimarlık's rendition of the second factory seemingly includes three such booths.<sup>5</sup>

### 2. Composite Parts Trimming

This function is included in the 2021 diagram within a workshop on the northern side of the main factory floor. It may now have been wholly or partially moved to the second factory building. Satellite imagery analysis indicates the presence of large piles of irregular strips, possibly composite trimming, outside this building.

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<sup>1</sup> Baykar Technologies (2021, February 1). HALUK BAYRAKTAR: DÜNDEN BUGÜNE BAYKAR'IN YOLCULUĞU [HALUK BAYRAKTAR: BAYKAR'S JOURNEY FROM PAST TO PRESENT] [Video]. YouTube. Retrieved 07 Jul 2022 from <https://web.archive.org/web/20220808182528/https://www.youtube.com/watch?t=2913&v=o8KjauQO5il&feature=youtu.be>. The diagram can be found at 1:37:30.

<sup>2</sup> Baykar Technologies (2020, May 24). AKINCI [Video]. YouTube. Retrieved 07 Jul 2022 from [http://archive.today/2022.08.11-185938/https://www.youtube.com/watch?v=UEec\\_EbjgFU](http://archive.today/2022.08.11-185938/https://www.youtube.com/watch?v=UEec_EbjgFU)

<sup>3</sup> ETÜD Mimarlık Müşavirlik İnş San ve Tic Ltd Şti (2017, December). Yeni Yılınız kutlu olsun [Happy new year] (Facebook Post). Retrieved 07 Jul 2022 from <http://archive.today/2022.08.11-201945/https://www.facebook.com/EtudMimarlik/photos/a.1288689124530141/1591814670884250/>

<sup>4</sup> Baykar Technologies (2020, August 28). Ukrayna Başbakan Yardımcısı ve Stratejik Endüstrilerden Sorumlu Bakanı Oleg Uruskiy ve beraberindeki heyet, Baykar Milli S/İHA Ar-Ge ve Üretim Merkezi'ni ziyaret etti. Kendilerini ağırlamaktan memnuniyet duyduk. [Deputy Prime Minister of Ukraine and Minister responsible for Strategic Industries Oleg Uruskiy and his accompanying delegation visited Baykar National S/UAV R&D and Production Center. We were pleased to welcome them.]. Instagram. Retrieved 07 Jul 2022 from <http://archive.today/2022.08.11-201224/https://www.instagram.com/p/CEcARU-gd6x/>

<sup>5</sup> ETÜD Mimarlık Müşavirlik İnş San ve Tic Ltd Şti (2017, December). Yeni Yılınız kutlu olsun [Happy new year] (Facebook Post). Retrieved 07 Jul 2022 from <http://archive.today/2022.08.11-201945/https://www.facebook.com/EtudMimarlik/photos/a.1288689124530141/1591814670884250/>

### 3. Structural Integration

This function is included on the northern half of the main factory floor in the 2021 diagram, but may have been wholly or partially moved to the second factory. Structural integration appears to include the construction of interior frames within the fuselage, wings, and tail, as well as the integration of landing gear.

### 4. Painting

The 2021 diagram notes that painting occurs after structural integration in a workshop to the northeast of the production floor. It may have moved, as 2022 images show aircraft that have already been painted in this area.

### 5. Structural Load Test

This process is noted in the 2021 diagram as occurring at the far northwest of the main production floor. In a March 2021 ground-level image, equipment in this area included yellow metal test rigs and a gantry-based Coordinate Measuring Machine (CMM) bolted to the floor.<sup>6</sup> By 2019, a structural load test rig was also established in the second factory building for the Akıncı. All structural load testing equipment in the main building was disassembled by 2022 and possibly moved to the second factory.

### 6. Mechanical Systems Integration

This stage appears to include integration of the engine and major mechanical parts. Photos of the floor taken in March 2022 indicate that this takes place in the southwestern corner of the main factory production hall for the TB2 and in the northeastern corner for the Akıncı.

### 7. Electrical Systems Integration

This stage appears to include integration of avionics and cabling. It takes place in the southeastern corner of the production hall for the TB2 and possibly in the northeastern corner for the Akıncı. The avionics themselves are likely produced in workshops on the southern side of the main factory, off the production floor.

### 8. Wing-Tail integration

This is included as a separate step in the 2021 diagram, following electrical systems integration, but appears to take place at the same time or at least in the same areas as the previous two steps. It is

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<sup>6</sup> Baykar Technologies (2021, March 26). BayraktarTB2 Fonksiyonel Test Ekibi [Bayraktar TB2 Functional Test Team] [Video]. Instagram. Retrieved 07 Jul 2022 from <http://archive.today/2022.08.10-193954/https://www.instagram.com/p/CM5CczDgaVa/>

only a momentary integration, as the aircraft are disassembled again for shipment to flight testing facilities (Akinci is incapable of fitting through the rear factory door with its wings attached).

## 9. Functional Testing

This likely includes diagnostics and integration with ground systems to ensure that software and all aircraft systems are functioning as designed, activities which take place in the southeast corner of the production hall. For at least some aircraft, it also includes engine tests at the onsite engine test facility.