

The "project Tragschrauber" was ordered by a decision of the Interior Minister of the Federal State of Brandenburg  
The decision being made on 07/22/2007.

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## **„Project Tragschrauber (Gyro-Plane)“**

**Ministry of the Interior  
Federal State of Brandenburg, Germany**



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Version A:

### ***Introduction***

The police force of the German Federal State of Brandenburg is currently equipped with ultra-modern and versatile operating resources for the daily operational procedures as well as for special operations (e.g., police cars (squad car), bikes, boats, police helicopters).

In spite of this the police of the State Brandenburg continue to play an active part in the development of innovative concepts for a better performance of police duties (to fulfil the police tasks).

With the search for other innovative operational procedures to improve police performance the AutoGyro (Tragschrauber) – as an ultra-light Two-Seat-Aircraft – was brought into focus. The AutoGyro would close a tactical niche during operation between police radio control, police ground patrols and the police helicopters.

The "Project Tragschrauber (AutoGyro)" was ordered by the decision of the Minister of Interior of the Federal State of Brandenburg, Germany, on 22<sup>nd</sup> July 2007.

### ***Project phases***

The project was divided by the project managers into two phases. In the first phase (40 flying hours) the Gyro should be considered and tested for being suitable for general use in the field of police duties. In order to provide for the required flights a Gyro "MT-03" was rented with pilots. As co-pilots (2<sup>nd</sup> airman) police officers from different sections of the uniformed police and criminal investigation departments on voluntary basis were used (assigned).

The results showed that the Gyro generally is highly suitable to assist and complete various police duties.

In phase II of the project a comprehensive check of the Gyro was carried out. The Gyro was set up to perform under real operational conditions of daily police duties including shift work conditions at the police station, "Brandenburg a.d.H" and at "Teltow-Flaeming".

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### ***Representation of the Gyro***

AutoGyros are equipped with a rotor instead of having a stiff wing. This rotor is driven by airstream instead of an engine. An air-screw in the rear of the machine generates propulsion (the driving). Should it come to (in case of) a failure of this rear engine, the Gyro would float by autorotation of the rotor safely to the ground, comparably with the seeds of a maple tree.

The Gyro is also fully steerable during this process of NIL DRIVEN DESCENT.

The pilot project was carried out using the Two-Seat AutoGyro MT-03 which are built by the company HTC / Autogyro in Hildesheim, Germany. The gyroplane MT-03 is optionally equipped with a 100 HP or 115-HP engine.



The Gyro used for Trial Phase 1 with Pilot and Police observer.

### ***Licensing of the GyroPlane***

In Germany GyroPlanes (CyroCopter) are considered as aerial sport devices and are not subject to licensing and supervision of the German Aviation Federal Office. There is an Aerial Sport Associations for the Gyro, the German ultralight association (DULV).

The "MT-03" Gyro does however possess a design patent as well as a traffic license. It is constructed according to the German "Design Specification for Ultra-Light Gyro-Planes" (BUT 2001). The Design has the following "pattern license No.'s Nr.526/01-11 to Nr.526/01-16. Craft that are built and checked to the license are deemed to comply to the standard so as to ensure a consistency in product. The noise report was completed accordingly to the German standards of noise protection for Ultra-light planes".

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### ***Examples of the practical tests:***

The police officer on board logged on to the control radio in the police presidium of the city of Potsdam before starting the flight-patrol. The police officers in command at the station were therefore informed about the Gyro operations at all times. As result it was guaranteed that the Gyro could be requested when required also if necessary even beyond planned procedures for special operation.

### ***Traffic supervision on motorways***

The flight-patrol the motorways A 10, A115, A9 and A2 formed a main focus of the (police) test in the phase II.



Traffic violation: Trucks in the extreme left lane of the Autobahn is not permitted

During Gyro-operation the control station of the police respectively the staff being in operation received exact information (e.g., overview mapping from scenes of an accident, detailed pictures, and information for traffic warning announcements).

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Reporting of traffic Jams, position length, speed estimate

Additionally to the general traffic supervision the Gyro was furthermore integrated into the monitoring activity of the commercial transport of goods and passengers on the freeway.



Ability to view adequacy of load tie down from the air

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### ***Patrol flights over rural area***

In phase I it was found that the Gyro - as an airplane- is able to provide comprehensive information from the air with the ability to quickly provide clarification of specific details that would otherwise be difficult to assess within the time frame. Within the scope of the phase II the Gyro was tested over a longer time period, during day and night time as well as in different weather conditions. The test undertaker over the longer time frame provided conclusive results of the benefits of the craft.



Aerial Monitoring over small rural towns

As a result it could be ascertained that this job – operating over rural area – was fulfilled in the full extent. Operating the Gyro over urban area is currently not recommended because of the minimum flight altitude and because of the constant perceived noise pollution although it should be noted that newer models are considerable less noisy. The operation of the Gyro in urban area should be utilised in special situations.

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### ***Monitoring woodland (forest area)***

The federal state of Brandenburg is covered by 1.09 Mio hectares of forest area. This corresponds to 37 percent of the surface area. So (for this reason) Brandenburg is one of the federal states that is rich in woodland in Germany.

It is not always possible to perform a regular and (tactically) organized monitoring of these areas carried out by ground-staff with the present resource allocation and management techniques (managers, command, equipment and staff).



Observation of criminal acts in the woodland areas by Gyro aerial patrols

With the Gyro operating in this area the identification of criminal acts could be improved and the number of the (police) identifications of these acts could be increased. In this operational area the Gyro also has a resultant preventive-police effect.

After identification of suspicious people or vehicles in woodlands, the control station was informed and police cars were ordered to arrive at the scene. The result identified several illegal activities.

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### ***Theft of scrap metal***

Many objects (e.g., residential building, (former) industrial sites) are currently not managed or kept under surveillance in the administrative district of "Potsdam – Mittelmark". Theft of scrap metal is increasingly identified by the owners of these sites. These objects stolen are often not sufficiently observably off-site. Thus once this material is removed from the site the criminals have effectively gained a profitable position.



Surveillance of a site from which scrap metal is being stolen

In this situation the Gyro can continuously and - at a reasonable price – maintain the level of surveillance of these previously unnoticed and unobserved areas and acts. It can document the status quo and can initiate (the first) proof-protecting measures.

The surveillance information can be transmitted to other police forces (e.g., staff on duty), in a timely manner leading to positive outcomes to the criminal investigation department, district police.

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### ***Cannabis plantations / disguised greenhouses***

The illegal cultivation of drug crops in various open farm land or seemingly abandoned or inactive closed buildings (for hydroponic breeding arrangements) is a well known mode of operation for criminals which is already repeatedly detected in the administrative district of Brandenburg. Currently the police identification of these activities is a result predominantly after getting information and tip-offs from the public.

The present structural circumstances (e.g., former collective farm area and buildings that appear derelict or abandoned) close to Berlin offer excellent conditions for the producers of these drug crops.

On various sites even external to the buildings cannabis plants are planted in an area of fields or between other types of crop plants (tomato vegetables etc.).

These drug crops can not be recognised easily from the ground.



Large abandoned Farm building housing a very significant hydroponic cannabis crop

Currently in many other Federal German States police utilise various ways to operate surveillance operations on potential drug crop sites. These are often long term, clandestine and costly

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operations. The Gyro trial resulted in the identification of a major operation of hemp cultivation which was discovered in a corn field.

By ongoing and exhaustive operation using the Gyro the police is able to monitor areas where cultivation may be undertaken. The process that has been successful utilises dividing areas into sectors and recording observational data over time. This observational data is then used to focus on certain areas of interest.

In particular cases a police case can be successful closed after having performed suitable (pre) clarification of suspicious buildings, by aerial observation from the Gyro. Additional measures such as utilising the police helicopter at night equipped with thermal image cameras (infra red camera) and operating with special police staff for tracing (search) could lead to a successful clarification of the case. It was noted that it would be possible to fit the Gyro with this equipment and that would likely result in a significant cost saving.

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### ***Operating during major fire***

The Gyro was operated during major fire cases to evaluate the general operational situation.

During the overflight it was found out that a dangerous situation became apparent for the staff operating on the ground.

The following picture shows that the fire spreads out in the direction of the freeway becoming more and more apparent a risky situation for the operating ground staff and other non-involved people.

It was obvious that - under circumstances - the operating ground staff could be enclosed by the fire.



Observation of Fire Front and Traffic flow on affected roadways was invaluable for on going traffic management and community safety.

In this particular situation there was no need to block or divert the movement of traffic. Therefore this fire did not impact the use of the freeway due to the quality information provided to fire fighting managers.

Therefore it was clear that other important issues were able to be resolved and aided during fires include those related to traffic management, particularly the need to divert or block traffic movements. This could be consulted and coordinated because of the information given by the Gyro to the control station.

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### ***Monitoring water bodies***

The Gyro is able to monitor complete water areas while the water/river police could reach tactical operational boundaries in certain areas (e.g., not navigable areas).

It was clear that one of the unexpected result of the trial of operating patrol flights with the Gyro over the water bodies in Brandenburg is the preventative-police aspect. This was observed by the positive reaction from boat owners and drivers after noting the presence of the patrol flights, (for example slowing down to speed limits).

Based on the very positive flight characteristics of the Gyro (ability to rapidly decelerate to slow flight, vertical descent, low level flight and high level of manouverability ) - it was found that the Gyro is especially well suited for searching for missing people in and around the water and vegetation, to search of stolen boats and (other) objects and for monitoring of the sports boat traffic. Depending on the water quality it is possible to recognise objects on the ground or respectively up to a certain water depth and to document this by photographical methods.



Observation of swimmers from the air

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### **Result**

The task force (project group) has found that the Gyro has proved itself as a significantly capable police operational measure.

Within the scope of the test a huge number of aerial pictures were taken which led to an efficient clarification of objects and served also to provide an additional level of protection for the police officers being on duty (e.g. search measures, enforcement of arrest warrants).



Pre-Trial Urban Observation from the Gyro Craft, may lead to additional trials in the future.

In addition it was found that the initial internal and external perceived problems and concerns of the police of the Federal State of Brandenburg were diffused to "normality" while operating the Gyro and by representation in the media. That is, there were significant sceptics to the concept of using the Gyro for police operations. However the trials answered all of the sceptics concerns.

At the start of the Phase I trial there was some level of rejection of the concept and some restraint shown by certain police officers. This was effectively overcome by successful targeted internal and external public relations through education.

An outcome of the end of the phase II operation was a large number of requests for orders for the Gyro from all departments of the police force. This by far exceeded all expectations. The clear response showed that the Gyro was very capable and effective for police use.

These (numerous) requests could not always satisfied due to the limited allocation of 160 flying hours being available during the trial.




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One of the projects groups additionally asserts that concerning the operation of the Gyro in the police service no legal restrictions and no security deficits could be noticed after evaluation of the whole results of the phase I and phase II.

On the subject of "Security" it is found that some police officers remarked having doubt and insecurity feeling before they start their flight. Nevertheless, these could be cleared extensively by the ability of the flight capabilities of the Gyro. The officers on board were surprised how quickly they got used to the situation flying with the Gyro and could exclusively concentrate upon to carry out their work.

At the end of the practical test of the phases I and II it was established (ascertained) that the requirements to the Gyro were fulfilled in full extent.

	<p>In the view of the project group the Gyro is an innovative and effective operational device as well as presents a safe and cost-effective supplement (addition) to the police helicopter. In principal the Gyro could be integrated into the "stand by service" of selected police service areas operated by helicopters. Additionally it could be placed at the disposal for the setting up (even state wide) special police organizations.</p>
	
	

Monitoring of the airspace could be preventively carried out with the Gyro because of the reasonable costs compared to the operation with the police helicopter.