



軍事科技

The Military Potential of the AG-600 Amphibious Aircraft 鯤龍AG-600型水陸兩棲航機之軍事潛能

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A Well-planned Development Approach 研發策略經過完整規劃

The largest amphibious aircraft now in the world that still under development stage but already passed first test flight on December 24, 2017, in Zhuhai Guangdong is the AG600 with the code name of Kunlong(鯤龍), a mythical creature in the traditional Chinese legendary stories, designed and pro-



中國大陸自主研製全球最大水陸兩棲飛機AG600，別號「鯤龍」取自中時電子報。



duced by the Aviation Industry Corporation of China (AVIC).

全世界目前最大型，但卻仍處於研發階段之水陸兩棲航機，業於2017年12月7日，在廣東珠海通過其首次飛航測試。該機訂名為鯤龍，係指中國傳奇故事中之神秘瑞獸，其係由中國航空工業集團所設計與產製。

This type of large-scale amphibious aircraft is an item of the Chinese ambitious “Three Big-Plane Project” that also including Y-20 military transportation aircraft and C919 civil narrow-body twinjet airliner directly instructed and approved by the PRC State Council. Nevertheless, unlike the other two items in the same project, the AG600 obviously has both civil and military roles. Further, given its potential service flexibility, it has successfully acquired certain amount orders from domestic market even before its flight trail. Several inquiries from the possible customers of the international market are also well-known so far. However, the development progress of the AG600 remains quite cautious that following its own existing test and evaluation program.

此型大型兩棲飛機係屬中國大陸社會通稱為“中國大飛機三劍客(三兄弟)”研發計畫其中之兩棲型航機，而另外兩型則還包括運-20軍用運輸機以及C919民用窄體雙引擎噴射區域性客機。該計畫係由國務院核定，並受其直接指導。但是與同項計畫另外兩型機對比來說，顯然AG600型是能夠兼具民用與軍用兩方面之潛在職能。此外基於其所具備服勤彈性之潛力，甚至在其試飛之前，其就已成功獲得國內市場相當數量之訂單。而國際市場亦有潛在客戶提出詢問，並遭各界廣為注意。但AG600型機仍然是以穩紮穩打發展步調，推動其本身現有測試與評估計畫之進度。

The basic design of the AG600 for the civil role is serving as the aerial firefighter capable of dropping massive amount water to put off any fire far from the reach of the normal fire brigade. On the other hand, the maritime search and rescue is another mission area already identified for this amphibious aircraft. As already noticed by the military observers and political commentators around the world according to the unsolved territorial and maritime disputes in the South China Sea, the AG600 should be a highly possible option to signify the PRC's sovereign claim by conducting law-enforcement functions and maritime patrol operations within the waters around those islets and reefs already stationed so far.



AG-600型航機最基本民用構造型式是擔任空中救火機，其可自空中投下大量消防用水，以便撲滅任何位於荒野，救火隊無法到達處之火災。但從另個面向來說，海洋搜索與救難亦是水陸兩棲飛機業已被確認之任務領域。誠如全球諸多軍事觀察家以及政治評論者指出，依據目前在南海尚未解決之領土與海域爭議來看，AG-600型機將很有可能被選擇，用來在目前中國大陸所控領各個島礁周邊海域，遂行執法任務與海洋巡邏作業，以便彰顯其主權聲索立場。

Based on the research and development directives on the AG600 known as “amphibious for serving both sea and land, one base framework with multiple variants as well as developing to a series with various options”, we may naturally expect the military applications of this type of amphibious aircraft after appropriate modifications and equipped with associated systems. The military potential of the AG600 will be inevitably significant though many possible mission roles have not been noted and discussed yet.

基於AG-600型機所遵奉之研究發展指導為：“能夠同時使用於海洋與陸地之兩棲航機，一個基本構型多個衍生機種，同時發展成多種選項之系列性產品”，無人自然可以預期此型水陸兩棲航機，能夠透過適當改裝並配備相關系統後，就能夠應用於軍事任務。儘管到目前為止，許多AG-600型機可能發揮之軍事職能尚未被人提出或研討，但其必然具有顯著之軍事潛能。

Significant Military Potential 顯著之軍事潛能

Frist, we should review its basic function of maritime search and rescue. The AG600 may well support the persistently emphasized distant maritime deployment and operations aspirations of the People's Liberation Army Navy by serving as the platforms of combat search and rescue mission. It is an essential element to sustain personnel morale by providing assurance of search and rescue capabilities in the maritime theaters. It is also extremely important to preserve the qualified combatants after engagements in the battlefield as the case already proven by the efforts of rescuing those Royal Air Force pilots in the English Channel during the Battle of Britain and the loss of valuable Japanese Imperial Navy aircraft carrier pilots after serval Pacific maritime campaigns in the World War Two.



首先吾人必須檢討其最基本之海洋搜索與救難功能；AG-600型機透過擔任作戰搜索救難任務載臺，將可適切支持目前解放軍海軍所最重視之遠海部署與活動企圖心。對於海洋戰區活動來說，提供可靠之搜索救難能量，事關人員士氣實為戰力重要因素。誠如在二次大戰時期不列顛空戰期間，英國皇家空軍在英吉利海峽不遺餘力地搜救其飛行員，方能維持其戰力與士氣；以及日本帝國海軍在太平洋數次會戰後，損失極為寶貴之航空母艦飛行員，嚴重影響其後續戰力所證明，戰場接戰後搜救保存合格戰鬥人員極為重要。

Particularly, the battlefield search and rescue capabilities assured by the combat support units may also provide much more space for the commanders to choose more aggressive operational decisions since the concern of fail to retrieve treasured military manpower from risky battlefield can be effectively alleviated. The search and rescue units are always the most precious assets to the military commanders at any maritime theater. This is exactly the reason why the AG600 can be so strategically significant that included in the “Three Big-Plane Project” though its military role has never openly addressed by the designer at the moment.

特別是由戰鬥支援單位所提供之戰場搜索援救能力，更可提供指揮官更大用兵空間，使其敢於下達較為積極大膽之作戰決心；此因從充滿危險之戰場上，無法援救寶貴軍事人力資源之顧忌，可被有效化解所致。對於在任何海洋戰區之軍事指揮官來說，搜索與援救單位永遠是最珍貴之資產。這正是為何AG-600型機在戰略價值上是如此重要，因此才會被大陸國務院納入“中國大飛機三劍客(三兄弟)”研發計畫；儘管其軍事職能在當時從未被其設計師所公開討論，但各方其實都是心照不宣。

As viewed from the loading capacity and transportation service range, the AG600 can also be a proper platform for long term maritime resupply mission. It may have the potential to provide supplies at specific rendezvous points for supporting any single submarine stationed at designated mission waters. This mission is traditionally conducted by the surface vessels defined as the submarine tenders. Nonetheless, the relatively finite scale submarine resupply-at-sea missions conducted by the amphibious aircrafts with better mobility, maneuverability and deployment flexibility at hostile waters may elevate the security and safety of both suppliers and receivers



with more concealed and secretive processes. This can be an evolutionary scheme to create operational surprise in the future.

當從其裝載量及運輸服勤距離來看，AG-600型機將是遠程與長期海洋再補給任務適當載臺。其具有潛能在特定會合點提供補給，以便支援任何派遣進駐在指定任務水域之單一潛艦；此項任務在傳統上係由稱作潛艦母艦之水面船隻所擔任，但是相對規模有限之潛艦海上再補給任務，若是由具備較佳機動性、運動性以及兵力部署彈性之水陸兩棲航機，在具有敵情威脅水域遂行此項作業，透過較為隱密與機密之作業流程，將可同時提升補給載臺與受補單位安全性；此種革新性之作法，未來將可產生作戰上之奇襲效應。

Moreover, it is already well known that the amphibious aircraft is the ideal platform to deploy special operations forces or intelligence agents for clandestine operations. By employing its landing and take-off capability near littoral waters and coasts as necessary for sending and retrieving personnel, the AG600 may perfectly support unconventional warfare and sometimes even including forceful law enforcement operations as well as anti-terrorist operations.

此外兩棲飛機是眾所皆知，最適於運送及部署特種部隊兵力或情報特工人員，以遂行秘密顛覆行動之載臺。藉由其餘近岸水域與必要時在海岸陸地起降，以便運送及收回作業人員，AG-600型機將完善支持非傳統性作戰，此種能量有事甚至可以支援強力執法作業，以及反擊恐怖主義作戰。

The AG600 may also be equipped with mine-sweeping gears and rafts for mine-hunting to engage with mine warfare. It can be a suitable candidate for minelaying platform as long as those main-laying gears may not affect its maneuverability in low altitude. As for the EOD (Explosive Ordnance Disposal / Demolition) units, the AG600 amphibious aircraft may support the transportation function to the mission locations and acted as an operational command and control platform during the mine counter-measure and sweeping operations.

AG-600型機亦可配備掃雷機具與膠筏進行獵雷作業，俾在水雷戰中發揮功能；只要佈雷機具不會影響到低空運動性能，確實其亦可作為佈雷作業載臺。至於對水中械彈處理單位來說，AG-600型兩棲飛機可以擔任支援往返任務作業地點運輸工具，並在水雷反制與掃雷作業期間，該機亦可作為現場指揮與管制平臺。



It is necessary to remind the readers that the Aviation Arms of the People's Liberation Army Navy had a type of amphibious aircraft served as aerial anti-submarine warfare platform know Harbin SH-5. This type of amphibious aircraft may also serve as the maritime search and rescue, patrol and signal intelligence collection platform. Certain information source also indicated that one SH-5B was refitted for firefighting duties. Nonetheless, its major mission role as the ASW platform seemed quite unsuccessful and the whole fleet of SH-5 had never actually engaged in any combat mission.

同時在此亦必須提醒讀者，解放軍海軍曾經運用過由哈爾濱飛機製造廠所生產，編號為水轟五型水陸兩棲航機，擔任過反潛作戰職能。該型兩棲航機亦擔任海上搜索與救難、巡邏與信號監偵蒐集職能。亦有可靠來源指出，其中一架該型機曾改裝作為救火型機。但不論如何，該型機主任務職能看來是不算太理想，同時整個水轟五機隊從來就未曾實際執行過戰鬥任務。

From all of this type of amphibious aircrafts are operated by the People's Liberation Army Navy North Sea Fleet merely in one single base near Qingdao and no further massive order after the initial production batch was delivered for commission in 1980s, it is unlikely an ideal case as the ASW platform. The actual performances of the SH5 remain quite controversial. However, the potential for the AG600 ASW variant still could not be totally excluded by such a single failure history.

從此型兩棲航機整個機隊都是隸屬解放軍海軍北海艦隊，並且全數集中在青島附近基地，在1980年代初期批量產製交付部隊後，又無後續大量訂單，因此看起來並非反潛作戰職能理想個案。水轟五實際服役表現到現在仍然爭議不休；但是不能因為此項失敗之歷史案例，就完全排除掉AG-600型機產製反潛衍生型之可能性。

Moreover, if the SH5 had ever truly conducted maritime patrol mission before, then the potential of executing anti-surface warfare can also be existed for the AS600 after equipped with surface search radar and tactical data link as well as armed with anti-vessel missiles and associated fire control system. It is quite sensible to use the loading capacity owned by the amphibious aircraft for carrying either torpedoes or anti-ship missiles. As long as supported by proper sensors, data link and combat systems, the amphibious aircraft can be a very versatile combat platform.



此外若是水轟五以往曾經真正執行過海上巡邏任務，則AG-600型機只要適當配備反艦飛彈以及相關射控系統，則其執行反水面作戰潛能就仍然存在。運用該兩棲飛機之運載能量，裝載魚雷或是反艦飛彈，其實是相當合理。只要能夠配合適當感測偵搜裝備、資料鏈路以及戰鬥系統，該兩棲型機就將是非常機動靈活之作戰載臺。

Last but not the least, the most revolutionary military potential for the amphibious aircraft is to utilize its serving range and flexibility of landing and take-off at sea as the scouting or reconnaissance platform for supporting fleet operations. The amphibious aircrafts can coordinate with surface combatant formation and deploying along the threat axis to conduct long range advanced scout and reconnaissance missions. The amphibious aircraft can be equipped with long range surface search sensors and conducting OTH (over-the-horizon) tactics by pop-up maneuvers at sea. After acquiring any trace of hostile signatures, it can deliver all the real time intelligence and information of hostile activities to main force fleet formation for providing early warnings. The flexibility for employing amphibious aircrafts as the OTH platforms will significantly higher than any other platform.

最後則還是要強調，此型水陸兩棲型機最具革命性之軍事潛能，其實是運用其飛航距離及海上起降彈性，作為支援艦隊作戰之斥候與偵察平臺。此型兩棲飛機可與其他水面戰艦協同，並且沿著威脅軸向部署，執行遠程前進斥候與偵察任務。此型兩棲飛機可配備遠程水面搜索感測器，以便運用超越水平線戰術，以海上突然升降運動掌握敵情。當獲得任何敵方徵候時，其可傳送敵方動態即時情報與資訊，至艦隊主力編隊以便提供早期預警資訊。此種運用兩棲型機作為超越水平線偵搜平臺之戰術彈性，將會遠高於任何其他載臺。

Conclusion: No Clear Future Yet 結論：未來發展尚難斷言

As noted before, given the large scale loading capacity, the AG600 amphibious aircraft can also be the aerial platform for electronic reconnaissance, electronic warfare jamming, psychological broadcasting and air refueling platform after suitable modifications and equipped with proper gears or sensors. Although there are numerous possibilities for developing its



variants, yet, the core matter is whether these functions may best utilize its amphibious characteristics and maneuverability at sea.

誠如前述，基於AG-600型兩棲飛機之高度運載量，只要經過適當改裝，並配備適切裝備或感測器，其亦可作為電子偵察、電戰干擾、心戰廣播以及空中加油載臺。儘管就發展其衍生型來說，具有無數之可能性，但整個問題核心在於此等功能，是否最能夠運用其兩棲作業特性與海上運動能力。

There are many concepts seemingly promising so far. Nonetheless, rigid analysis, comprehensive design and subsequent operational tests and evaluations may eventually decide whether those conceptualized ideas can practically satisfy the operational demands. And we should never ignore the rules of market. There is no clear and firm market demand scale enough for supporting the AG600 on further developments of those aforementioned variants till now. More variants can be available only as the future orders substantially increase. After all, the future of the AG600 amphibious aircraft will eventually be decided by the balance and match of supply and demand for sure. This is still for us yet to see.

迄至目前為止，諸多概念看起來都具有發展潛力；但是嚴格分析、完整設計以及後續測試與評估，才能夠真正決定此等概念性想法能否實際滿足作戰要求。同時吾人絕對不能輕忽市場法則，到現在並無任何明確或堅定之市場需求，數量足夠到支持AG-600型機後續發展前述各項衍生機種。唯有當未來訂單確實增高時，才會更多衍生機種問世。最後要強調，AG-600型機未來前景最後還是要看市場供需平衡與配合來決定；此事尚待後續分曉！

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