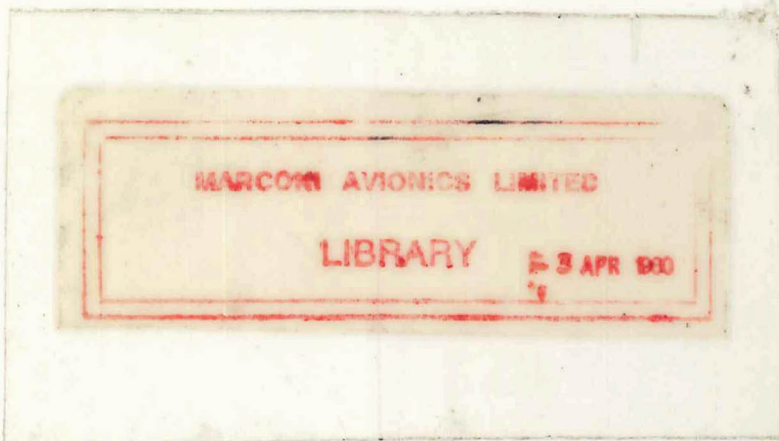
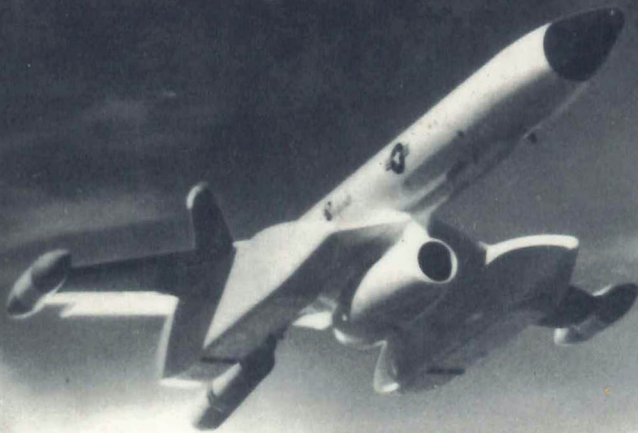


Brassey's
**UNMANNED
AIRCRAFT**



ARTHUR REED

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FOREWORD

by V. H. B. MACKLEN
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A comprehensive account of the history of the development and possible uses of unmanned aircraft has been hard to find and Arthur Reed and Brassey's Publishers Limited are to be congratulated on filling the gap which has long existed. The author attempts, and largely succeeds, in covering all the many research and development activities in this field in the Western world. It is clear that he is an enthusiast for remotely piloted aircraft, which as the book explains is not quite the same thing as an unmanned aircraft. The German flying bomb V1 was clearly an unmanned aircraft, but it could not be called remotely piloted. It was however a first major use of the unmanned concept in war, and perhaps it is not without significance that once element of surprise had worn off the V1 proved to be extremely vulnerable to the anti-aircraft and fighter defences of that era. Defence success rates of over 90% were often exceeded towards the end of the attack.

Much has changed over the last 35 years both in respect of offence and defence capabilities and it would be quite wrong to suppose that the latest unmanned and remotely piloted vehicles are easy targets. Like most other defence equipment there has been a long history of increasing complexity and cost with manned aircraft. They have now become extremely complex and while this complexity does help to reduce their vulnerability, the manned aircraft is a very valuable piece of equipment to put at risk. Thus the opportunity for RPVs is likely to increase in the future. However, for a long time there will clearly remain a major role for the manned aircraft, particularly in times of tension, when the flexibility of having a man right at the sharp end is very difficult to replace by a data link.

It is perhaps surprising to read that RPVs made so little progress or impact in the Vietnam war. The stress of war operations usually sorts out the worthwhile technical developments from the not so good. However,

this particular war was a very oddly constrained affair, and the constraints have certainly cast doubt on the validity of extending the lessons of the Vietnam conflict to a more general war. In view of this, it would I suggest be wrong to conclude from the experiences of Vietnam that RPVs add no worthwhile operational capabilities to modern military forces.

For some time the role of RPVs as targets has been well established in most countries. They are the cheapest and the best way of producing the realism which is so necessary to train modern missile defences of all kinds. The use of RPVs, particularly mini-RPVs for reconnaissance, is increasing rapidly and is likely to increase much further yet. It is however worthwhile pointing out that in fact the cost of such systems is not particularly cheap except perhaps in the direct comparison with a modern strike reconnaissance aircraft. The use of the Harrier dispersed to forward site in the reconnaissance role is a very fast system with a great deal of flexibility. It is however important in attempting to make these cost comparisons not to fall into the error of merely comparing the costs of the vehicles. A full costing of the whole system to produce the intelligence information at the point where it is required is necessary before a fair comparison can be made. The extension of the role for RPVs to the more active area of anti-radar missiles, heat seeking missiles, or ECM carriers is well within the grasp of modern technology and is beginning to develop rapidly. Quite how the counter-measure, counter-counter-measure trade-off will turn out in this particular area is difficult to forecast and in fact may never be proven until an actual conflict has begun. Although, without a homing pilot, realistic exercises can be mounted, these, too, become very expensive and do not always shed much clarity on the effectiveness estimations.

The book does list a bewildering array of experimental projects, development projects, and operational vehicles, and may well be right in drawing the conclusion that the confusion of thought that lies behind this array has held back the development of full potential of RPVs. Undoubtedly the enthusiasts for this or that role have confused the picture, but also, in peacetime, it is difficult to invest heavily in a new branch of the defence armoury which has not really had the opportunity of proving itself in real operations. It is doubly difficult to do this at a time when defence spending in many Western countries is severely constrained, for to adopt the new in these circumstances, one has to give up some of the older, tried and trusted concepts. The tendency in this situation has been towards spending a little to explore new concepts to see if they are feasible, and I suspect that this is what has happened even in the much larger RPV programmes of the United States. Military thinking always tends to be

conservative, and probably rightly so. The disbanding of special units conceived in the immediate stress of war is a commonplace event after the conflict has terminated, particularly when it is very difficult to exercise a capability in any meaningful way in peacetime. RPVs are not an isolated example of being early in the queue for peacetime cuts, the same happens regrettably to other important areas such as electronic counter-measures and deception aids.

What of the future? Some brave and perhaps rather optimistic claims are made for RPVs and perhaps the definition of an RPV gets rather wider than it should. Besides the reconnaissance and tactical missile roles which are currently with us there are bound to be further interesting developments in the use of RPVs, but they will I think take rather longer than is suggested. I am certain that the military role with RPVs will pre-date any major civil application, particularly the passenger aircraft. It will I think be very difficult to persuade the general public at large as well as all the passengers concerned, that remotely piloted passenger aircraft can be regarded as an acceptable everyday risk. The future automated battlefield scenario is perhaps somewhat far fetched. The current major development in the unmanned aircraft field is the cruise missile and cruise missiles fly by aerodynamic forces rather than purely thrust. They are not as yet remotely piloted, and as they currently exist they are more related to a development of the original German V1 concept although with much less vulnerability, much higher accuracy and longer range. The cruise missile systems are expensive, but when they are allied with high precision homing techniques several battlefield roles as opposed to strategic roles are likely to arouse considerable interest. The sensitivity of cruise missiles to defence improvements may again turn out to be a long term disadvantage. However, the alliance of this already existing technology with a really jam proof data link would open up even wider battlefield uses.

V. H. B. MACKLEN

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