

ARCHIVED REPORT

For data and forecasts on current programs please visit

www.forecastinternational.com or call +1 203.426.0800

Scout/Seeker

Outlook

- Production has ceased
- No further orders for the Scout UAV or the Seeker UAV are anticipated
- Israel and South Africa have moved on to new unmanned aircraft designs for domestic and foreign customers
- Both countries remain involved in the development of unmanned air vehicles, though South African programs have suffered from funding shortages

Orientation

Description. Unmanned air vehicle (UAV).

Sponsor. Israeli and South African ministries of defense.

Status. Both the Scout and Seeker remain available. Seeker production was restarted to meet an order from Algeria but has since ended. Both Israel and South Africa are proceeding with development and production of other unmanned aircraft systems.

Total Produced. Approximately 199 Scouts and 137 Seekers (including numerous air vehicles for testing) were manufactured.

Application. Remotely piloted vehicle for battlefield target identification, and strike force command and control. Civil applications include disaster control, border patrol, and sea traffic detection and tracking.

Price Range. A Scout air vehicle costs \$108,000 per unit (in FY87 dollars). IAI says an entire Scout system costs \$3.5 to \$4 million. The price of a Seeker has been estimated at \$4.1 million for a complete system and roughly \$225,000 for an air vehicle.

Contractors

Prime

Denel Dynamics, (formerly Kentron)

<http://www.deneldynamics.co.za>, PO Box 7412, Nelmapius Ave, Centurion, 0046 South Africa, Tel: + 27 12 671 1911, Fax: + 27 12 671 1779, Email: market@deneldynamics.co.za, Prime

Comprehensive information on Contractors can be found in Forecast International's "International Contractors" series. For a detailed description, go to www.forecastinternational.com (see Products & Samples/Governments & Industries) or call + 1 (203) 426-0800.

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Scout/Seeker

Technical Data

	<u>Metric</u> Scout	<u>Metric</u> Seeker	<u>U.S.</u> Scout	<u>U.S.</u> Seeker
Dimensions				
Length	368 cm	400 cm	12.07 ft	13.12 ft
Weight (launch)	159 kg	200 kg	349.8 lb	411 lb
Wingspan	496 cm	600 cm	16.27 ft	19.68 ft
Performance				
Speed	176 kmph	120.46 kmph	95.03 kt	65 kt
Altitude (max)	4,575 m	5,486 m	15,009 ft	18,000 ft
Payload	38.0 kg	40 kg	83.6 lb	90 lb
Range	N/A	200 km	N/A	124.20 mi
Endurance	7 hr	9 hr ^(a)	7 hr	9 hr ^(a)

^(a) A 9-hour endurance with 2.5 hours over the target area.
N/A = Not Available.

Propulsion. Scout has one 16.41 kW (22 hp) Sachs air-cooled, two-cylinder piston engine, which drives a two-bladed pusher propeller. Under a research contract, Denel (formerly Kentron) is studying the optimization of UAV engines. ATE has developed the Apex TJ-350, a low-cost expendable gas turbine engine for target drones. Static thrust at sea level is 3,500 newtons. Work commenced in 1985, and the turbojet is available for production.

Control & Guidance. A radio command/autopilot guidance system activated from a remote ground control station (GCS). Aerodynamic control is via ailerons, elevator, and rudder, which are electrically actuated.

Scout carries modular payloads for television surveillance and reconnaissance, having telescopic abilities and 360-degree field of view. Panoramic cameras can also be fitted.

Launcher Mode. Catapult-launched from pneumatic truck-mounted rail. A compressor on the truck provides the needed pressure. Fixed tricycle landing gear can be fitted for operations from paved areas.

Recovery. The vehicle is guided semi-automatically into a retrieval net, which contains an optical device to allow a dead-center hit. The Scout can also land on the optional tricycle landing gear.



Variants/Upgrades

Israel developed the Scout, which was later license-produced in South Africa by ARMSCOR. ARMSCOR, which also developed the Seeker UAV system, later turned over responsibility for its UAV programs to Denel. AAI Corp in the United States also license-manufactured the Scout UAV.

South Africa has since developed its own line of unmanned air vehicles using the expertise gained from its cooperation with Israel.

Program Review

Background. Israel Aircraft Industries designed the Scout remotely piloted vehicle (RPV) as a total system, with low cost and survivability as the principal design criteria. The complete system consists of four to six vehicles, a GCS, a launcher and retrieval net, and spares for the support and payload equipment. The cost of a total system ranges from \$3.5 to \$4 million. Scout was operationally evaluated with the Mastiff vehicle through early 1983. Scout provides the field commander with real-time reconnaissance data on border areas. Survivability features include low visual, noise, and radar signatures.

Scout Competitive Evaluations. From 1981 to early 1983, the Israeli armed forces evaluated both the Scout and the Mastiff in operational use and selected the Mastiff as the best performing system. In mid-1984, IAI and Tadiran formed a joint company named Mazlat Ltd to develop and produce the next-generation RPV for Israel and, at the same time, continue marketing and producing the Scout and Mastiff.

Taking Note of Israeli Experiences

Scout Use in Lebanon. In 1982, Israel demonstrated to the world that it was a leader in the innovative operation of RPVs. Using the Scout and Mastiff vehicles, field- and higher-level commanders gained valuable intelligence of Syrian and PLO troop and equipment movements almost instantly. In addition, these vehicles were often invaluable in locating Syrian surface-to-air missile batteries. Since the action in Lebanon, intense interest has been directed toward the Scout and Mastiff. Some of this interest has even come from the United States, which already had a much more advanced RPV – the Aquila – in development (see “Additional Worldwide UAV Programs” report [Tab C] for details on the Aquila and Mastiff). However, except for a possible small export sale, few actual sales of the Scout (in proportion to generated interest) are expected to result from this worldwide attention.

Seeker & Internal Security. The Seeker was used for the first time during South Africa’s national elections in

1994. The UAV, originally designed for military use, was reconfigured with a radar transponder and radio link (appeasing air traffic controllers and the local civil aviation authorities). This UAV was used by the South African National Defence Forces to provide additional surveillance assets to law-enforcement units. Seeker was used to overfly and observe areas of potential conflict. This reduced the normal level of policing required, which otherwise might have been considered intimidating. After a short period, the Seeker became a recognized (and eventually ignored) feature over Johannesburg and Pretoria.

New South African Requirement. South Africa is interested in acquiring a new UAV system. Operation of the Seeker II UAV by the South African Air Force (SAAF) has been concluded due to maintenance problems. A new UAV program could be launched soon. This system is expected to be more capable than those previously operated by South Africa, with greater endurance and payload capacity. The South African government would like a local company to head up this project.

Air Vehicle Models. The following provides a brief look at the Israeli Scout and South African Seeker UAV systems.

Scout. The Scout system is extremely versatile, highly mobile, and independent. Minimal training is required of the operators. The vehicle is set up without the aid of tools. The pilot does not actually fly the vehicle but has merely to transmit flight path demands, such as altitude or direction changes, through the autopilot. The autopilot contains the needed control logic to translate the demands into the appropriate control surface movement. This is a major advantage over competing systems.

The primary payload is a gyroscope-stabilized television camera with a 151 zoom lens. The camera can be panned or zoomed by the operator via the datalink. The transmitted picture employs 625 lines and is transmitted at 50 frames per second. This yields a high-quality

Scout/Seeker

real-time picture in the control vehicle. The position of the vehicle is known and plotted continuously while the target is located and displayed. An autopilot is standard. At the typical altitude of 914 meters (3,000 ft), an area of 50 square kilometers (20 sq mi) can be surveyed. At this same altitude, if the zoom lens is employed, an area of 40 x 50 meters (130 x 160 ft) can be seen. All-weather, day and night operation is standard.

Seeker. The Seeker remotely controlled reconnaissance aircraft was displayed publicly for the first time by ARMSCOR at the Feria Internacional del Aire (FIDA) 1988 exhibition in Chile. The Seeker has been in service with the South African National Defence Forces for more than two years – its forerunner being the RC2 – according to South African officials. The name *Gharra* has also been associated with this early Seeker version.

Seeker is said to provide real-time reconnaissance of targets up to 200 kilometers from a base area. The system consists of four to eight air vehicles and a GCS supported by a field support subsystem. The RPV relays video images of the target via a stabilized video camera, mounted internally, to the ground station, where they are displayed and interpreted. The camera weighs approximately 14 kilograms and has a 360-degree field of view (pan and tilt parameters are +5 degrees to -105 degrees). The real-time images can be transmitted through directional and nondirectional datalinks, which also carry control commands back to the vehicle from the two pilots on the ground. If the system encounters jamming, it immediately shuts down and returns to base automatically.

The Seeker is powered by an unspecified South African two-stroke, 6.5-horsepower pusher engine and is

capable of cruising at 65 knots. The Seeker can be launched from a 250-meter runway within 15 minutes of notification and can land within a 70-meter strip, using an arrester hook system. South Africa continues to market the Seeker UAV system on the international market; its most recent success was a sale to Algeria. No other overseas customers for the Seeker have been identified, although Denel officials admit that the air vehicle has been exported.

Denel is offering an upgraded version of Seeker, known as the E Variant. Improvements to the system include additional wing-lift mechanisms and a full digital management system for the engine. According to the company, those improvements will help lower operational costs.

South Africa has also developed the Seeker II. This air vehicle has greater range and endurance than the original Seeker. The Seeker II's endurance is 10 hours, compared with the Seeker's two hours. The new air vehicle is outfitted with digital avionics and an improved communications link that will help increase the system's range to 250 kilometers. The Seeker II's airframe is the same shape as the original but with a larger diameter.

The air vehicle will carry the Denel Kenis third-generation forward-looking infrared (FLIR) sensor as part of its electronic surveillance system. Future payloads could include a synthetic aperture radar, a laser designator, and electronic warfare systems.

The first Seeker II flew in 2000. Denel reportedly has an overseas customer for the Seeker II. The South African Air Force had planned to procure this system, but sources say this is no longer true. The Seeker I UAV system has been withdrawn from service due to obsolescence.

Funding

Israel and South Africa are continuing to spend money on unmanned aircraft systems. The UAV budget for the former is much higher than the latter. Nevertheless, no money is available for Scout or Seeker procurement.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
	1976 ^(a)	Scout project begun
	1978 ^(a)	First flight of Scout prototype
Jun	1979	Scout unveiled at Paris Air Show
	1980 ^(a)	Scout production begun in South Africa
Mid-	1981	Scout becomes operational
Mid-	1982	Scout used extensively in Lebanon
Mar	1983	Mastiff selected after competitive evaluation
Mar	1983	AAI licensed to build Scout in U.S.

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Aug	1984	IAI and Tadiran form joint venture
	1984-1985	Scout evaluations in U.S.
	1986	Minimal Scout production continues
	1989	Scout remains available for production
	1980-1990	South Africa slowly expands its indigenous UAV design efforts
	1990-1992	Seeker production continues in South Africa
	1997	Vulture purchased by South Africa
	1998	Algeria purchases Seeker
	2004	South Africa ceases operation of Seeker II

^(a) Estimate

Worldwide Distribution/Inventories

Israel and South Africa are attempting to increase their respective shares of the UAV market. The **Chilean Army** may have acquired the South African Vulture UAV to spot targets for its multiple launch rocket systems.

Kuwait could be interested in purchasing South African-made UAVs. The Kuwaiti government could procure the AS2000 Artillery Target Engagement System. South Africa also could supply Kuwait with aerial target systems.

Spain is said to be interested in the Vulture UAV, and there are rumors that **Syria** has signed an agreement with South Africa that includes the provision of unmanned air vehicles.

User Countries. The Scout was purchased by **Israel** and **South Africa**, a so-called Super Scout UAV system was acquired by **Sri Lanka**, and the Seeker was procured by **South Africa** and **Algeria**.

Forecast Rationale

Israel is the largest supplier of unmanned air vehicles (UAVs) in the Middle East. The Israeli defense industry has sold unmanned aircraft to nations in every region of the world, with its systems operational in Afghanistan and Iraq.

The Scout was an early Israeli-built unmanned air vehicle. While the rest of the world was sleeping, Israel was developing battlefield UAVs with Tadiran and IAI locked in a fierce competition. Eventually, the Israeli military purchased the Scout UAV, and this system saw action over Syria and Lebanon during Operation Peace for Galilee (1982). This unmanned aircraft supported the Israeli Ground Forces and Air Force. After years of service, the Scout was retired; an example is on display in the Israeli Air Force (IAF) Museum at Hatzerim.

The success achieved by Israel with its UAVs caught the attention of other countries, including South Africa. During the apartheid years, South Africa was hard-pressed to find allies. At that time, Israel was also challenged to find allies. Consequently, a cooperative defense relationship between Israel and South Africa quickly developed, and lasted for decades. With few trustworthy friends in a world full of enemies, this mutually beneficial affiliation did not cool until the mid-1990s.

These countries traded equipment and technology for years, helping each in its development of armored vehicles, artillery, aircraft, missiles, and UAVs.

Now, to maintain their defense industries, Israel and South Africa are pursuing foreign production orders. Both hope the new interest in unmanned air vehicles, thanks largely to their performance in Afghanistan and Iraq with U.S. and allied troops, could mean contracts for local companies.

Out with the Old, In with the New

South Africa, with help from Israel, developed the Seeker unmanned air vehicle. Besides use by the South African military, the Seeker has worked with local police units and supported disaster relief missions.

Israel and South Africa continue to work on UAVs, although the level of cooperation has ebbed (some say it has ended). Neither is providing monies for the Scout or Seeker programs. Newer systems have since appeared with capabilities far superior to those offered by Scout and Seeker. No further production of these systems will take place, and many systems sold are no longer operational.

Scout/Seeker

Ten-Year Outlook

No further production of the Scout or Seeker UAVs, or support equipment, will take place. Both Israel and South Africa have moved on to other development and production efforts.

* * *