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APN-169C/243(V)

Outlook

- The last known APN-243 contract was issued in May 2004

Orientation

Description. Airborne, stationkeeping radar for Lockheed Martin C-130 and C-141, and Boeing C-17 aircraft.

Sponsor

U.S. Air Force
AF Systems Command
Aeronautical Systems Center
ASC/PAM
Wright-Patterson AFB, OH 45433-6503
USA
Tel: + 1 (513) 255-3767
Web site: <http://www.wpafb.af.mil>

Status. APN-169C and APN-243(V) in service.

Application. Grumman C-1A (Japan), Lockheed Martin C-130E/H/J, Lockheed Martin C-141B, and Boeing C-17.

Price Range. Based on the contract signed in 2004 between Lockheed Martin and DRS Technologies, the average cost of an APN-243 is \$235,000.

Contractors

Prime

DRS C3 Systems, Inc	http://www.drs.com , 485 Cayuga Rd, Buffalo, NY 14225 United States, Tel: + 1 (716) 631-6200, Fax: + 1 (716) 631-7849, Prime
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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

APN-169C/243(V)

Technical Data

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
Weight	59 kg	130 lb
Characteristics		
Power output		
APN-169C	1 kW peak	
APN-243(V)	25 W max	
MTBF	200 hr rated	
Proximity threshold	500 - 4,500 ft slant range	
	500-ft increments	
APN-243(V)		
Range	185.3 km	100 nm
Capacity	100 aircraft	
Interfaces with	TPN-27B	

Design Features. The APN-169(V) was designed to provide transport aircraft such as the C-130, C-141, and C-17 with an air-to-air stationkeeping capability regardless of visibility. It allows a pilot to maintain position relative to a selected aircraft in the formation.

The system includes a radome, relative range indicator, flight command indicator, azimuth range indicator, and two intra-formation position set controls. It can handle up to 36 aircraft at once and has a track-while-scan mode to display the position of a selected aircraft while presenting range and bearing information on the rest of the formation.

The APN-169C/243(V) interfaces with the APN-241(V) radar on newer C-130s, with data stationkeeping equipment (SKE) incorporated into the APN-241(V) display.

With the APN-243(V), aircraft can perform instrument meteorological condition (IMC) and formation approaches using the upgraded TPN-27B mini-zone marker as a navigational aid. These can be accomplished without the aid of other external aids, such as Global Positioning Satellite (GPS) or ground-mapping radar. The SKE system's low power can be an

asset, reducing the likelihood of detection by ground electronic support measures sensors.

Operational Characteristics. Using this stationkeeping radar, aircraft at a typical air speed of 250 knots can maintain a 10-second or 4,000-foot separation, as opposed to a 5-minute or 126,000-foot spacing pattern mandated without the system. Holding patterns during multi-ship takeoffs can be eliminated, allowing departing aircraft to take off at 4,000-foot intervals and to rendezvous with other aircraft more readily. It is also useful in airdrop or cargo insertion missions, especially in darkness or adverse weather.

When the APN-169(V) is used in conjunction with a ground-based TPN-27(V) zone marker, the aircraft can perform accurate airdrops. Using one or two radio channels (3,390 to 3,510 MHz), multiple aircraft can maintain their respective positions. This is accomplished using a master aircraft and follower concept. Positions are aligned via a Time Ordered System (TOS). When the TPN-27(V) zone marker is employed, up to 34 aircraft can fly in formation, with the zone marker providing an accurate ground reference point for airdrops.

Variants/Upgrades

Early units had a problem with radio frequency interference, and often displayed false targets. The equipment gave false proximity warnings and incorrect fault indications. The Air Force installed modification kits to eliminate these problems.

APN-169C. Replaced older models in C-130Hs and some C-141s, and were used as replacement units in older aircraft.

APN-243(V)/SKE-2000. Formerly the APN-169E, the APN-243 is being installed on C-130Js and C-17s. The system adds a wideband network capability using a low-power (25W max), frequency-agile, spread-spectrum waveform. SFO will extend the capability of the system to 100 aircraft and the maximum range to 100 nautical miles, while retaining backward compatibility with existing stationkeeping equipment.



The C-17 is a primary platform of the APN-243(V).

Source: Boeing

Program Review

Background. Development of the APN-169 began in the late 1960s. Early units had a problem with radio frequency interference, and often displayed false targets. The equipment gave false proximity warnings and incorrect fault indications. The Air Force installed modification kits to eliminate these problems.

Development of the APN-169E, later known as the APN-243(V), began in 1986.

C-130 AMP Selects APN-241

The C-130 Avionics Modernization Program (AMP) Systems Requirement Document detailed the requirements for a radar system to replace the APN-59(V), APN-122(V), APQ-170(V), and APQ-175(V) systems. The pilot's display had to be capable of displaying ground mapping, weather and windshear information, and the flight plan, and be equipped with stationkeeping equipment (SKE), a beacon, and TCAS, with the display stabilized relative to aircraft heading unless operating in slave mode. A stated requirement is that during SKE operation, display information shall be in accordance with the APN-169(C) Interoperability Requirements Document.

Boeing was awarded the C-130 AMP contract in June 2001 and selected the APN-241(V) as the weather/navigation radar. It interfaced with the enhanced stationkeeping system, the APN-243(V). The

Boeing AMP contract was protested however, the result had no impact on the APN-243(V) effort.

In 2004, Lockheed Martin contracted DRS Technologies to provide 40 sets of the APN-243 Station Keeping Equipment. Deliveries began later that year. When the Pentagon released Program Budget Decision 753 in December 2004, it terminated the Air Force procurement of C-130Js and directed that the remaining eight Marine Corps aircraft be procured in FY06.

A Change of Heart and Mind

In May 2005, Secretary of Defense Donald Rumsfeld announced a reconsideration and directed the DoD to finish out the remainder of the multiyear contract (42 USAF, 20 USMC) at a build rate of roughly 12 per year, from FY05 to FY09. Rumsfeld said that the original cancellation decision was based on less-than-adequate information. He also stated that planners did not realize termination costs would put the overall spending higher for cancellation than for completing the planned procurement.

C-130J Reinstated

In both the House and Senate FY06 Defense Appropriations bills, Congress reinstated the USAF C-130J program and brought the Marine procurement back in line with the original plan. The House also

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"recommended" the multiyear contract be continued as previously planned. The recommendation was that \$645 million be added to the Air Force budget for nine aircraft. The Marine Corps line would be cut \$800.9 million, reducing the FY06 procurement to four aircraft. The Senate transferred \$735 million from the

Navy's aircraft procurement line to the Air Force to continue the current multiyear contract. This reduced the FY06 acquisition for the Marine Corps from 12 aircraft to the original request of four. Nine C-130Js were added to the Air Force line.

Funding

The APN-243 is not listed in current U.S. Air Force budget documents.

Contracts/Orders & Options

(Contracts over \$5 million.)

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
DRS Technologies	9.4	May 2004 – Five-year production contract from Lockheed Martin to supply 40 APN-243 systems to support USAF C-130J aircraft.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Late	1960s	Development of APN-169 begun
Late	1970s	Development of APN-169C begun
	1982	Class V modifications to APN-169 begun
Late	1982	Installation of APN-169C begun
	1986	Development of APN-243(V) begun
Sep	1991	C-17 first flight
	1993	Initial production
May	2004	DRS Technologies contracted to provide 40 APN-243s

Worldwide Distribution/Inventories

Australia and **Canada** operate the APN-243 on C-17s. **Japan** operates the system on C-1As and C-130Hs. The **United Kingdom** operates it on C-130s and C-17s. The **United States** operates the APN-243 on C-130s, C-141Bs, and C-17s.

Forecast Rationale

Development of the APN-243 began in 1986, making the base system technology over 20 years old.

In 2004, Lockheed Martin signed a five-year production contract with DRS Technologies for 40 APN-243 systems to support USAF C-130J aircraft. Although it has not been confirmed in writing, more than likely this order has been completed. This is the last known contract for the APN-243.

A search of the DRS Technologies Web site produces a "no pages found for the query APN-243" error message. The DRS APN-243 data sheet is saved under an "archive DRS products" name, which indicates that the system is no longer in production.

Barring further information, this report will be archived in October 2011.

Ten-Year Outlook

Since all current orders have been fulfilled and there are no new known contracts, Forecast International has eliminated the **Ten-Year Outlook** chart.

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