NORTHROP GRUMMAN

AN/APN-242

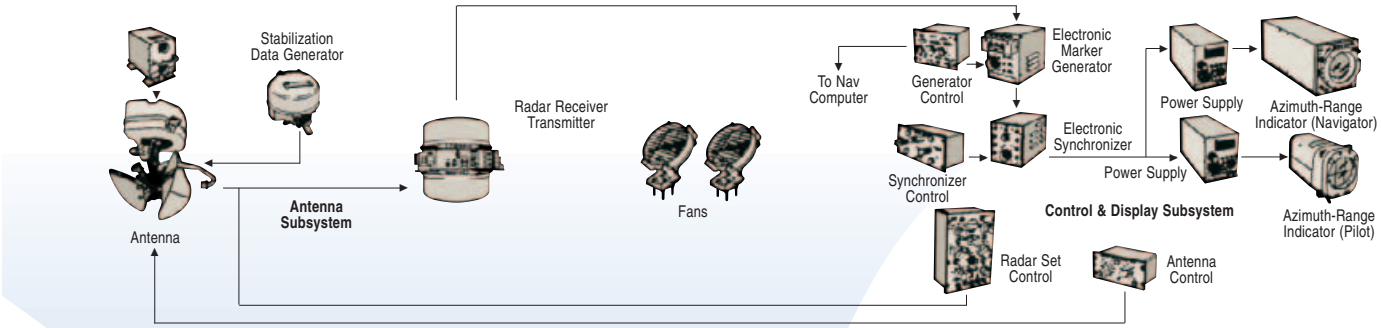
Color Weather & Navigation Radar

Sperry Marine

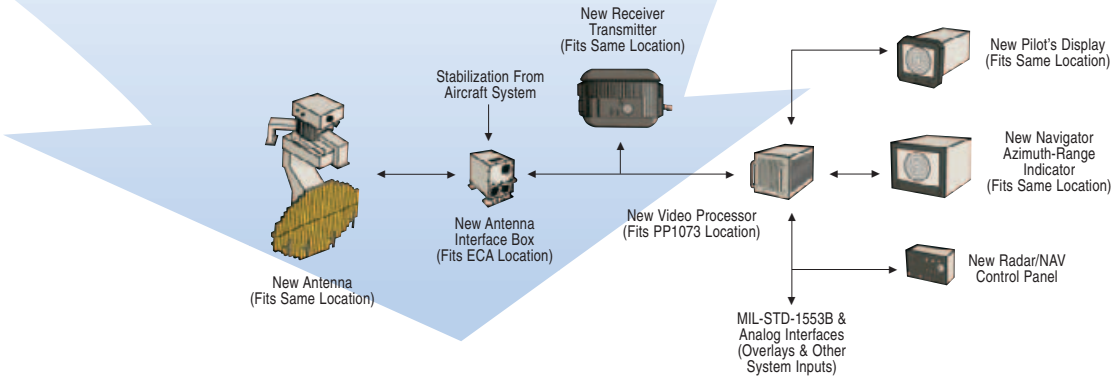
AN/APN-242 Color Weather & Navigation Radar

Form, Fit and Function Replacement for the APN-59 Radar

Previous Configuration: APN-59



Today's Consolidated Configuration: APN-242



Weather Detection and Avoidance

Detects weather with full color, black and white, or green displays of storms out to 240NM.

Terrain Mapping and Navigation

High resolution ground mapping mode with latitude/longitude stabilized electronic cursor to provide range and azimuth information to waypoint.

Aircraft Detection

Skin paints fighter aircraft at extended ranges through intervening rain showers concurrent with other operating modes.

Beacon and IFF Interrogation

Detects airborne and ground beacons and optionally interrogates IFF equipped aircraft out to 100NM.

Dramatically Improved System Mean-Time Between Failure Rate

As APN-59 systems age, radar failures are becoming a leading cause of C-130 and C-135 aircraft downtime. Today's APN-242 has half the number of line replaceable units (LRUs) and greater than an order of magnitude improvement in system mean-time between failures (MTBF).

Field Installation By Unit Level Maintenance In A Day

No depot required. APN-242 can be installed using existing radar cabling, connections and mounts without aircraft modification.

Pays for itself

From operations and maintenance (O&M) savings.

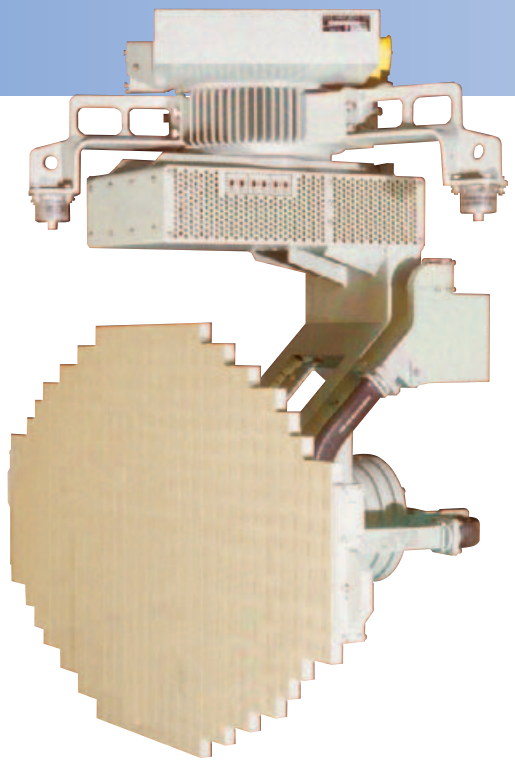
In production

Off the shelf and in inventory for immediate deliveries.

	APN-59E/F	APN-242
System MTBF	Under 100 Hours	Greater than 1000 hours
Weight	244 lbs.	205 lbs.
Power Consumption	1600W	800W
Antenna Beam Switching	Mechanical	Electronic (Instantaneous)
Antenna Stabilization	Internal Gyro	Inertial Reference System
Cooling	External Fans	None Required
Daylight Viewable Non-Fade Display	None	Standard
Electronic Cursor with Integrated Graphics Overlay	None	Standard
Color Weather Contour Map	None	Standard
Built-In Test	None	Standard

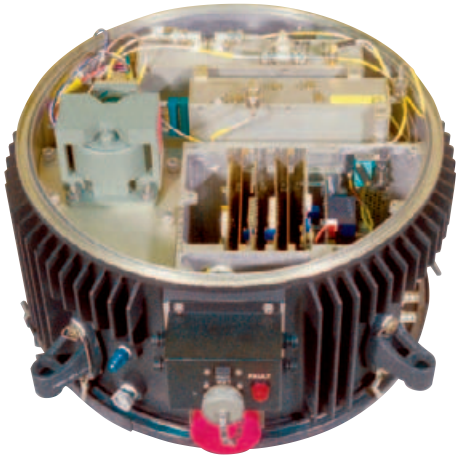
The Antenna Unit

The APN-242 Antenna Unit consists of a flat plate array and mounting pedestal and uses the existing APN-59 installation and mounting brackets. The array element improves target detection ranges and is electronically controlled to permit instantaneous fan/pencil beam switching. The antenna rotates freely through 360º and is connected to existing aircraft attitude reference systems to provide antenna stabilization throughout the normal range of aircraft maneuvers. High reliability is achieved through the elimination of all gears, improving antenna MTBF by a factor of fifty.



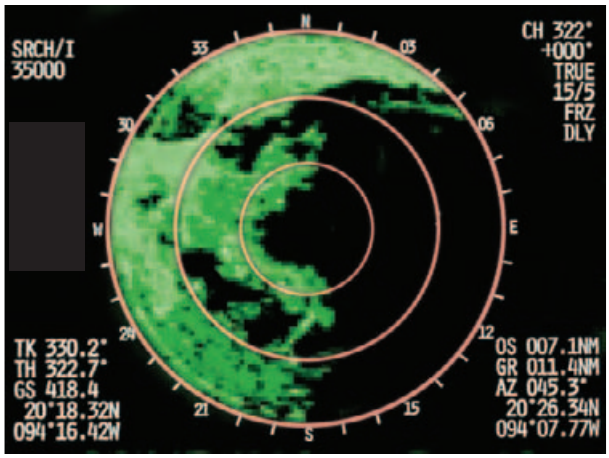
The Receiver/Transmitter

The APN-242 Receiver/Transmitter uses a lower power solid state design, a low-noise receiver and a three to one component reduction to improve system performance and greatly increase reliability. Transmit power is generated by a 10,000 hour service life state-of-the-art magnetron with digitally controlled pulse width, pulse repetition rates, intermediate frequency (IF) and video amplification, mode switching and built-in-test (BIT).

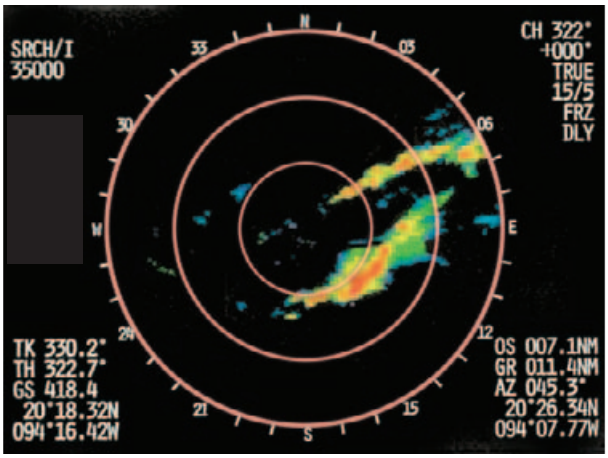


The Display Group

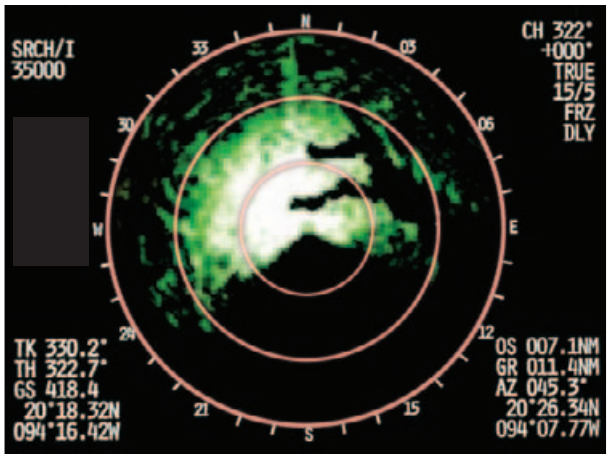
The ASN-165 Display Group provides a vivid color or monochrome radar image in ambient lighting. These high resolution displays are overlaid with aircraft navigation data such as true heading, ground speed and track angle error. A latitude/longitude stabilized cursor is provided to aid drop zone and waypoint identification. Depending on the aircraft mission design series, data from the station keeping equipment (SKE), self-contained navigation system (SCNS) and traffic collision avoidance system (TCAS) can be integrated and displayed. In the green mode, the displays are night vision goggle compatible.



Coastal Navigation

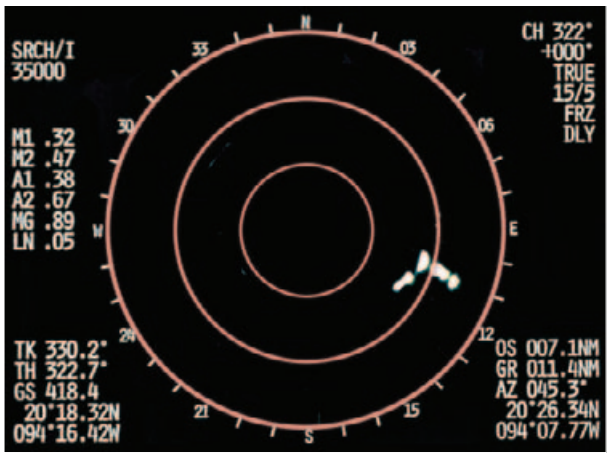


Weather and Storm Center Detection



Enhanced Terrain Mapping

Beacon and IFF Interrogation



Aircraft Detection

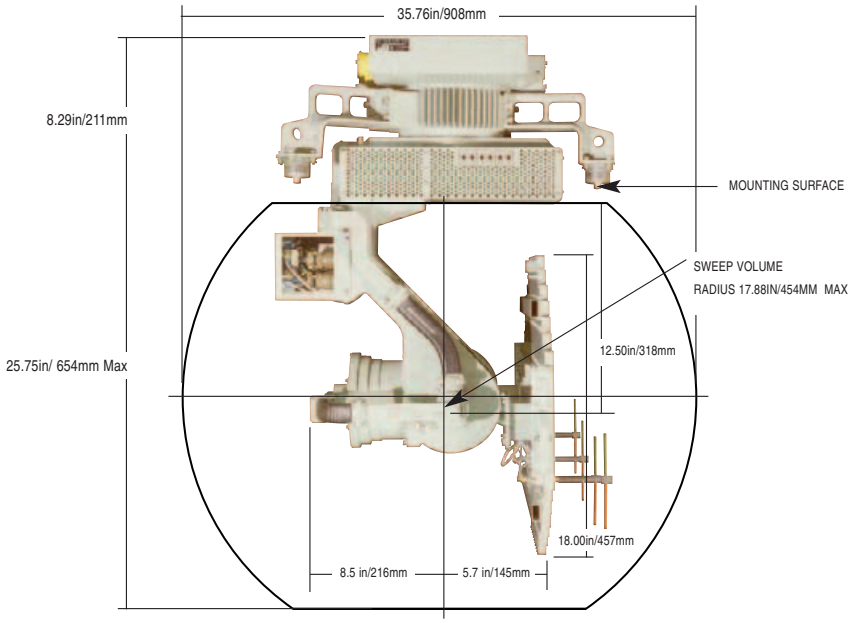
RC-135

In Production For USAF

All screens are actual video capture from cockpit videotape

APN-242
Modes of Operation

APN-242 Dimensions and Operating Parameters



ALL DIMENSIONS AND WEIGHTS ARE APPROXIMATE

Operating Parameters

Frequencies	Radar operation: X-band 9375 ±10 MHz; beacon reception 9310 MHz
Transmitted Power	25 kW nominal peak (new high reliability magnetron)
Receiver Noise Figure	6.5 db nominal
Range Scale	2.5 to 20 (2.5 NM increments), 25, 30, 50, 100 and 240 NM
Pulse Length	Multiple lengths (0.2, 0.8, 2.35 and 4.5 microseconds), automatically selected for different ranges and functions
Pulse Repetition Frequency	.2 µsec @ 1024 Hz .8 µsec @ 350 Hz 2.35 µsec @ 350 Hz 4.5 µsec @ 180 Hz
Scanning Features	360-degree scan rates: 12 rpm on long range functions; 45 rpm on short range functions Sector scan: approximately 90 degrees centered about forward position
Antenna Beam Selection	Pencil or fan beam, both with 3-degree azimuth beamwidth and instantaneous electronic switching
Antenna Stabilization	Stabilized to existing aircraft reference throughout a range of ±15 degrees pitch and ±30 degrees roll
Navigation Features	Manual electronic cursor with latitude/longitude or range/bearing readout; latitude/longitude stabilized for fly to waypoint capability

Maximum Operating Conditions

Operating Temperature (Internal Equipment)

Parameter	**Normal Operation**
Navigator & Pilot Indicators	-15 to +55° C
Antenna Interface Unit	-55 to +55° C
Video Processor	-40 to +55° C
Receiver/Transmitter & Antenna Operating Temperature	-55 to +55° C
Storage Temperature	-57 to +85° C
Aircraft Altitude (Uninhabited)	-1,500 to 50,000 feet
Cabin Pressure (Inhabited)	0 to 8,000 feet
Maximum Level Flight Speed	400 knots EAS
Vertical Speed	± 1,500 ft/min
Pitch Angle	± 15°
Bank Angle	± 30° (stabilized) ± 60° (unstabilized)

LRU Weight/Size

Unit	**Dimensions**			**Weight**
Antenna	35.8	x 35.8	x 34.0 in	69.0 lbs
	908.0	x 908.0	x 864.0 mm	31.4 kg
Antenna Interface	6.5	x 5.5	x 10.7 in	7.0 lbs
	165.0	x 140.0	x 272.0 mm	3.2 kg
Receiver/Transmitter	15.3 in dia.		15.1 in ht.	65.0 lbs
	387.0 mm dia.,		384.0 mm ht.	29.5 kg
Video Processor	7.75	x 7.75	x 12.3 in	25.0 lbs
	197.0	x 197.0	x 324.0 mm	11.3 kg
Pilot's Indicator	6.5	x 6.5	x 12.0 in	12.0 lbs
	165.0	x 165.0	x 305.0 mm	5.4 kg
Navigator's Indicator	8.5	x 10.0	x 12.8 in	21.0 lbs
	216.0	x 254.0	x 323.0 mm	9.5 kg
Navigator's Control	6.0	x 10.0	x 3.8 in	5.5 lbs
	152.0	x 254.0	x 95.0 mm	2.5 kg

NORTHROP GRUMMAN

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