

PA 8 Electronically Steerable Array



PA8-470



PA8-225

The PA8 series auto-tracking antenna systems feature a **steerable 11 dBi gain beam**, created by an octagonal array of antenna panels with a PIN diode switching circuit which enables the beam to be pointed in one of 8 azimuth directions. These antennas have an **integrated internal control system** comprising a microprocessor with system software, GPS receiver and electronic compass. User interface is through a hand-held display terminal enabling entry and selection of a target site that the beam will automatically point toward as the helicopter (or airplane or other vehicle) changes its location and heading. The terminal also displays information such as lat/long coordinates, compass reading, and bearing and distance from target site.

The **main array** comprises 8 antenna panels, each two tiers high, featuring wideband vertically (or circularly) polarized radiating elements, symmetrically arranged to create an octagonal array. These panels are driven from a central PIN diode RF switching circuit which creates a beam by driving 2 adjacent panels at once. This arrangement creates a well optimized beam to cover 45 degree sector, makes the antenna optimally compact, and the overlap of elements used in adjacent beams allows for a rapid and seamless change-over as the beam steps around. The elevation beamwidth is 35 degrees from the two tier panels, and this allows leeway for aircraft banking, whilst keeping the depth of the antenna a compact 225 mm (9").

When no DC power is supplied, or Omni mode is chosen, all 8 panels are driven at once creating a low gain omnidirectional antenna. The system can optimally feature an integrated circularly polarized **downlook** antenna, with a separate RF connector on the top plate. An external GPS antenna is provided with the system and there is an RF connector on the top plate for the GPS input.

See page 3 of the data sheet for more control system details.

The design is particularly suitable for airborne applications owing to its **light weight, low power consumption and absence of moving parts.**

PEAK ANTENNAS

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Designation Frequency Band

PA8-225	1.98-2.50 GHz
PA8-250	2.30-2.70 GHz
PA8-350	3.30-3.70 GHz
PA8-470	4.40-5.00 GHz
PA8-495	4.70-5.30 GHz
PA8-675	6.40-7.10 GHz



External GPS antenna

Specifications:

Gain:	11 dBi
No. of beams:	8
Beamwidth:	45 degree azimuth, 35 degree elevation
Polarization:	Vertical (or RHCP)
Downlook antenna:	5 dBi, 90 degree B/W, RHCP
Return loss:	14 dB
Power:	10 watts RF
Size:	< 235 mm (9.25") radome diameter < 225 (9.0") radome height
Weight:	4 kg (9 lbs)
Radome:	Fibreglass
Mounting:	Brackets on Top Plate
Voltage:	7-28 VDC unregulated
Current draw:	0.5A at 20VDC
Connectors:	Array N socket Downlook SMA socket GPS (ext. ant.) TNC socket Control 19 pin circular (KPT07A14-19P)



Pro-Term and Oyster hand-held terminals.

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Control Functions:

A total of 10 target sites can be entered and edited, and this data is held permanently in memory. When **Directional** mode is selected the control system will point the antenna's beam toward the currently selected target site. Other operational modes are **Manual**, where the user can select which of the 8 beams is energised, **Omni**, where all the array panels are energised creating a low gain omnidirectional antenna and **Nearest**, where the beam will automatically be pointed toward the nearest target site in the memory. When the helicopter is closer than 1.5 km from the selected target site in Directional mode, the system automatically changes to Omni mode in order not to risk overloading the receive site.

GPS Receiver:

The integrated GPS receiver provides the current location of the helicopter to the processor (for use in the pointing calculations). It also has a look-up library of magnetic declination values worldwide, and also provides the local declination (for output in RS232 format, see 'ground data'). The current lat/long is displayed on the terminal screen.

Electric Compass:

A high performance compass module is mounted inside the pod. It features enhanced accuracy and stability, with liquid-filled bubble pitch/roll sensors backed up by mems rate gyros, separate filtering of pitch/roll sensors and magnetometers for output stability in vibrating environments and a sophisticated and proven calibration routine to remove errors caused by permanent magnetic fields generated by the airframe and associated hardware.

Ground Data:

Lat/long and associated position information from the integrated GPS receiver is available as an output at the control connector. It can be added to the transmission to provide position data to a tracking receive site at the other end of the link. Various formats can be selected; RS232 NMEA at 4800 baud or 1200 baud and there is an option to include an FSK (Bell) modem as a separate parallel output.

Hand-held Terminals:

The control system software supports two different terminals. The Trans-Tech Pro-Term is standard, but the Oyster OT-40 is available on request. The pods can also interface with a PC running terminal emulation software.

External GPS Antenna:

An external GPS Antenna with inbuilt 20 dB gain LNA is provided with the system. The LNA is powered from a DC voltage on the inner of the GPS connector on the top plate of the pod. External cabling is not provided with the system.

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