Anechoic Test Cabinets

Anechoic test cabinets and antenna measurement systems

ZETA designs and integrates anechoic test cabinets and the measurement systems inside them. A typical configuration measures AESA antenna prototypes in the far field: the array under test sits on a positioner in the quiet zone, a standard gain horn acts as the probe, and a vector network analyser and control computer measure the 3D radiation pattern and build the calibration map in receive and transmit modes. A benchtop cabinet sized to the array replaces a full-size chamber where space and cost matter.



Figure 1. Anechoic test cabinet with pyramidal absorber lining

AT A GLANCE

BANDS
X, Ku, Ka

EXAMPLE CABINET SIZE
About 2.5 m long × 1.2 m wide × 1.2 m high (X-band 4 × 8 sub-array)

ABSORBER REFLECTIVITY
−40 to −50 dB across X band

POSITIONER
2- or 3-axis, −180° to +180° azimuth and elevation

MAXIMUM TEST ITEM
300 mm wide, 3 kg (benchtop positioner)

APPLICATIONS

- Radiation pattern measurement of AESA antenna prototypes
- Receive and transmit calibration of phased arrays
- Radiated testing of RF sensors and seekers

Key Features

- Cabinet sized to the test item
- 3D radiation pattern measurement
- Channel calibration
- Positioners, horns and absorbers

Capabilities

Cabinet sized to the test item

Cabinet length, cross-section and absorber height follow from the far-field distance and the lowest test frequency. For an X-band 4 × 8 sub-array this gives a benchtop cabinet of about 2.5 m × 1.2 m × 1.2 m.

3D radiation pattern measurement

The array is rotated in azimuth and elevation in front of a standard gain horn probe to measure its 3D radiation pattern and beam steering in receive and transmit modes.

Channel calibration

Element-on measurements with a vector network analyser give the amplitude and phase of each channel, from which the array's receive and transmit calibration tables are built.

Positioners, horns and absorbers

Two- or three-axis positioners, standard gain horns for X, Ku and Ka bands and pyramidal absorbers are selected and integrated for the measurement.

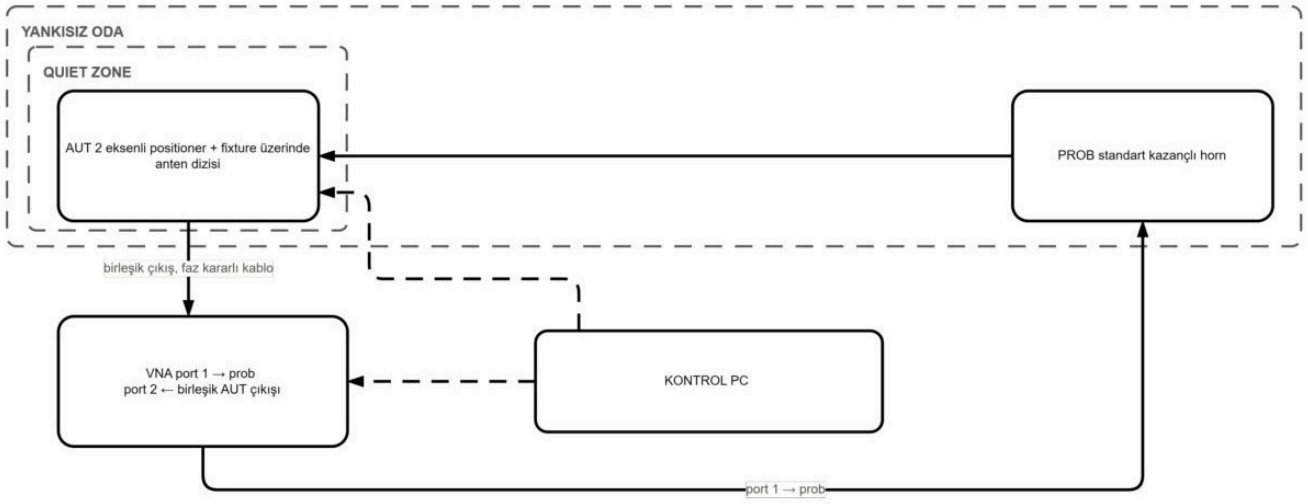


Figure 2. Far-field measurement system: array on a positioner in the quiet zone, horn probe, VNA and control PC

Specifications

General	
Bands	X, Ku, Ka
Example cabinet size	About 2.5 m long × 1.2 m wide × 1.2 m high (X-band 4 × 8 sub-array)
Absorber reflectivity	−40 to −50 dB across X band
Positioner	2- or 3-axis, −180° to +180° azimuth and elevation
Maximum test item	300 mm wide, 3 kg (benchtop positioner)
Measurement	Vector network analyser; multi-channel DAC/ADC for digital beamforming

Warranty

All hardware and software procured from Zeta is under warranty against manufacturing or design failures for 2 years. Customer-specific warranty terms may be arranged.

Disclaimer

Due to ongoing research and development, Zeta reserves the right to change product specifications without notice.

About Zeta

Zeta Defence develops electronic intelligence (ELINT) and communication intelligence (COMINT) equipment and radar / electronic warfare simulators. Its capabilities include RF transceiver system design, digital design and large-scale software development.

Contact

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