X-BAND RADAR TRANSPONDER

MODEL MD400X

SUPPLYING HIGH PERFORMANCE, INNOVATIVE AND SOPHISTICATED RF, MICROWAVE, MILLIMETER WAVE COMPONENTS AND INTEGRATED ASSEMBLIES WORLDWIDE.

DESCRIPTION

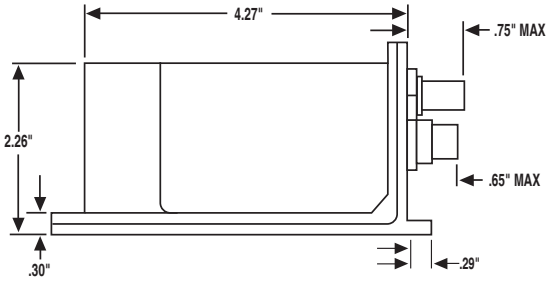
The MD400X Radar Transponder is a general purpose augmentation device used to enhance the tracking capability of X-band radars. Utilizable for ground and man pack, sea and airborne application, the MD400X is compatible with most tracking, navigation, and attack radars. Applications include: missile, aircraft, and drone tracking; aircraft rendezvous and refueling; ground target and drop zone location; close air support; navigation and landing aids; and identification.

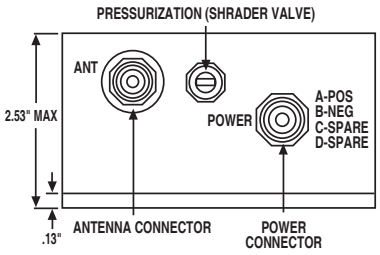
The design of the MD400X utilizes the latest in modern devices and circuitry. It is all solid-state, except for the magnetron, to provide a reliable product with extremely long operating life.

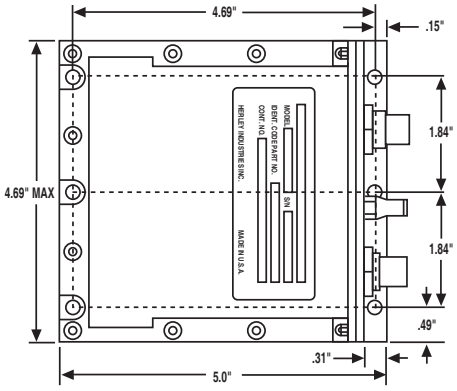
FEATURES

- 400 Watt typical peak power output
- Long life magnetron transmitter
- Sensitive superheterodyne receiver
- Small, less than 53 cubic inches (857 cubic cms)
- Lightweight, less than 43 ounces (1220 grams)
- Tunable over 9.0 to 9.5 GHz
- Adjustable internal delay
- Reverse polarity power lead protection
- Single and double pulse interrogations
- Adjustable code spacing
- Built-in duplexer for single antenna operation and protection from high antenna reflections

HERLEY | Ultra ELECTRONICS







ELECTRICAL

- Frequency Range: 9.0 to 9.5 GHz
- Frequency Separation: 50 MHz min.
- Impedance, Input/Output: 50 ohms nominal
- Reverse Polarity Protection: Built-in series diode protection against damage from DC input power reversal
- Voltage Transient Protection: Internal power supply stabilizes transients to the normal operating voltages
- Short and Open Circuit Protection: Built-in to provide antenna mismatch protection
- Input Voltage: 21 to 32 VDC, floating from ground
- Quiescent Current: 0.5 Amps nominal
- Input Current: 1.0 Amps maximum @ 3000 pps
- Power Consumption: 28 VDC, 0.6 Amps nominal @ 1000 pps
- Recovery Time: 50 µsecs maximum
- Blanking: Built-in circuitry prevents reply during recovery time

PHYSICAL

- Size: 5.0 x 4.65 x 2.5 inches (12.7 x 11.81 x 6.35 cms)
- Volume: 43 cubic inches (705 cubic cms) nominal displacement

PHYSICAL (CONTINUED)

- Weight: 43 ounces (1219 gms)
- Duplexer: Built-in circulator, 4-port ferrite
- Test Points: Internal test points are provided for alignment
- Antenna Connector: TNC Female
- Telemetry Connectors: TM Female
- Power Connector: MS3113H-8-4P (mates with PT06 E-8-4S)
- Pin Connections: A, +28v; B, 28v return; C, video test; D, gate

RECEIVER

- Design: Superheterodyne
- Sensitivity: -65 dBm minimum
- Frequency Tuning: One local oscillator and three preselector controls externally accessible upon removal of screws
- Tuning Range: 9.0 to 9.5 GHz
- Frequency Stability: ±3 MHz
- Dynamic Range: +20 to -65 dBm
- Bandwidth (3dB): 11 ±3 MHz
- Image Rejection: 60 dB minimum
- Pulse Decoder: Single or double, internally selectable
- Pulse Width: 0.25 to 5.0 µsecs. single; 0.25 to 1.0 µsecs. double
- Pulse Rise Time: 0.1 µsec maximum, single or double
- Double Pulse Coding: Spacing adjustable between 3.0 and 12.0 µsecs

RECEIVER (CONTINUED)

- Second Pulse Spacing: Accepts ±0.15 µsecs. Rejects ±0.3 µsecs
- Random Triggering: 10 pps maximum

TRANSMITTER

- Power Output: 400 Watts peak minimum
- Output Device: Magnetron
- Frequency Tuning: Single control externally accessible upon removal of seal screw
- Tuning Range: 9.2 to 9.5 GHz
- Frequency Stability: ±3.0 MHz plus ±50 KHz/°C
- Pulse Width: 0.5 ±0.1 µsec
- Pulse Width Jitter: 0.01 µsec. maximum
- Pulse Rise/Fall Time: 0.1/0.2 µsec. maximum (10 to 90%)
- Spectrum: The reply pulse RF spectrum bandwidth (in MHz) will not exceed 3.0/pulse width (in µsecs) measured at the $^1/_4$ power level points
- Reply Delay: Adjustable from 1.5 to 6.0 µsec
- Delay Variation: 0.05 µsec maximum for input signal levels between 0 and -60 dBm
- Delay Jitter: 0.02 µsec maximum 0 to -50 dBm, 0.05 µsec maximum -50 to -60 dBm
- Interrogation Replies: 99% minimum input signal levels between +20 and -65 dBm
  Duty Cycle: Up to 0.002 (0.2%)

ENVIRONMENTAL

- The transponder meets the requirements of MIL-STD-810
- Vibration Sine: 5 to 10 Hz, 0.20 inch double Amplitude; 10 to 18 Hz 1g; 18 to 81 Hz 0.06 inch double Amplitude; 81 to 2000 Hz, 20g
- Vibration Random: 16.9g rms, $0.008g^2$ rms/Hz at 20 Hz, $0.20g^2$ rms/Hz from 100 Hz to 1000 Hz, $0.05g^2$ rms/Hz at 2000 Hz
- Temperature, Operating: -40°F (-40°C) to +167°F (+75°C)
- Temperature, Storage: -80°F(-62.2°C) to +167°F(+75°C) for 3 days
- Shock: 100g (6 milliseconds) in any axis
- Altitude: 760 mm (sea level) to 0.04 mm of mercury (230,000 feet altitude)
- Humidity: Any, up to 100% including condensation due to temperature changes
- Acceleration: 30g applied along any axis for 1 minute
- RFI/EMI: MIL-STD-461, tested per MIL-STD-462
- Pressurization: Maintain 20 PSI ±1 pound for 8 hours

PRODUCT NUMBERS

- *P/N 500004-13* - Standard unit

Ultra ELECTRONICS

making a difference

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