# EAR-600
# Elevation/Azimuth Positioner

03-17-10

## EAR-600 Elevation over Azimuth Positioning System:

The EAR-600 consists of the Elevation-over-Azimuth Positioner (EAR), controller (ACU-3D-24) and cables required for power and control of the positioner.

The positioner is suitable for installations requiring up to a 4.3 meter antenna, weighing up to 1000 lbs that must fit inside an 18 foot radome. The entire configuration of the EAR -600 has been designed to facilitate this type of application. The elevation is a yoke configuration that allows mounting the antenna as close to the center of rotation as possible. The azimuth structure is configured to allow installation of slip rings and rotary joints along with a 6.00 inch diameter hole for the waveguide path to the elevation mechanism.

The control unit can be remotely located to facilitate integration with the end user's system. It features a fully digital motion control architecture that is very accurate, dependable and easily customized for specific applications. The front panel interface provides a simple, intuitive method for commanding the positioner and there is a well defined interface for remote control from the host system. There is also an optional GUI that runs on a Windows computer that can control the positioner.

RANGE of MOTION

| | |
|---|---|
| Azimuth: | Continuous |
| Elevation: | -5° to 185° |

POSITIONING ACCURACY

| | |
|---|---|
| Azimuth: | ±0.1° |
| Elevation: | ±0.1° |

CONTINUOUS TORQUE

| | |
|---|---|
| Azimuth: | 1,300 ft lbs |
| Elevation: | 7,300 ft lbs |

VELOCITY:

| | |
|---|---|
| Azimuth: | 0.5 - 36 deg/sec (6 rpm) |
| Elevation: | 0.2 - 6 deg/sec |

ACCELERATION:

| | |
|---|---|
| Azimuth: | 10 deg/sec² Max |
| Elevation: | 3 deg/sec² Max |

VOLTAGE INPUT:

| | |
|---|---|
| Controller | 120VAC/60Hz or 220VAC/50Hz |

WEIGHT:

| | |
|---|---|
| Positioner: | 1040 lbs (472 kg) |
| Controller: | 45 lbs ( 21 kg) |

POSITIONER:

| | |
|---|---|
| Operational Temperature: | -20° to 131°F (-28° to 55°C) |
| Relative Humidity: | 0 to 100% |

EAR-600 El / Az Positioner

ACU-3D-24 Position Controller

EAR-600 Positioner Highlights:

This unit is designed for reliable continuous operation, seven days a week, fifty two weeks a year. All structural elements are designed with generous safety margins and painted with high quality polyurethane enamel for protection from the environment. All mechanical and electrical components used in the positioner are carefully selected to ensure suitability for the application and use in outdoor environments.

For example, the positioner uses brushless DC servomotors with resolvers for the motor commutation and dual speed resolvers driven directly off the load through custom aluminum bronze and anti-backlash gears for position loop feedback. This provides reliable accurate motion control without placing any sensitive electronics in a potentially harsh environment, such as on a tower with potential lightning strikes and grounding issues.

Another significant difference between the EAR-600 and most positioners of this type is the ease of access to all the components. As can be seen in the photo, the base is open on both sides to allow access and the elevation is completely open. All components can be serviced with the positioner installed in the radome and it is simple for the customer to install or service rotary joints, slip rings or cables.

The azimuth and elevation axis both provide six (6”) inch diameter through holes that allow waveguide and cables to pass through. There is enough free space for additional slip rings to add circuits and versions are available with up to a dual channel WR-284 S-Band rotary joint in both axis.

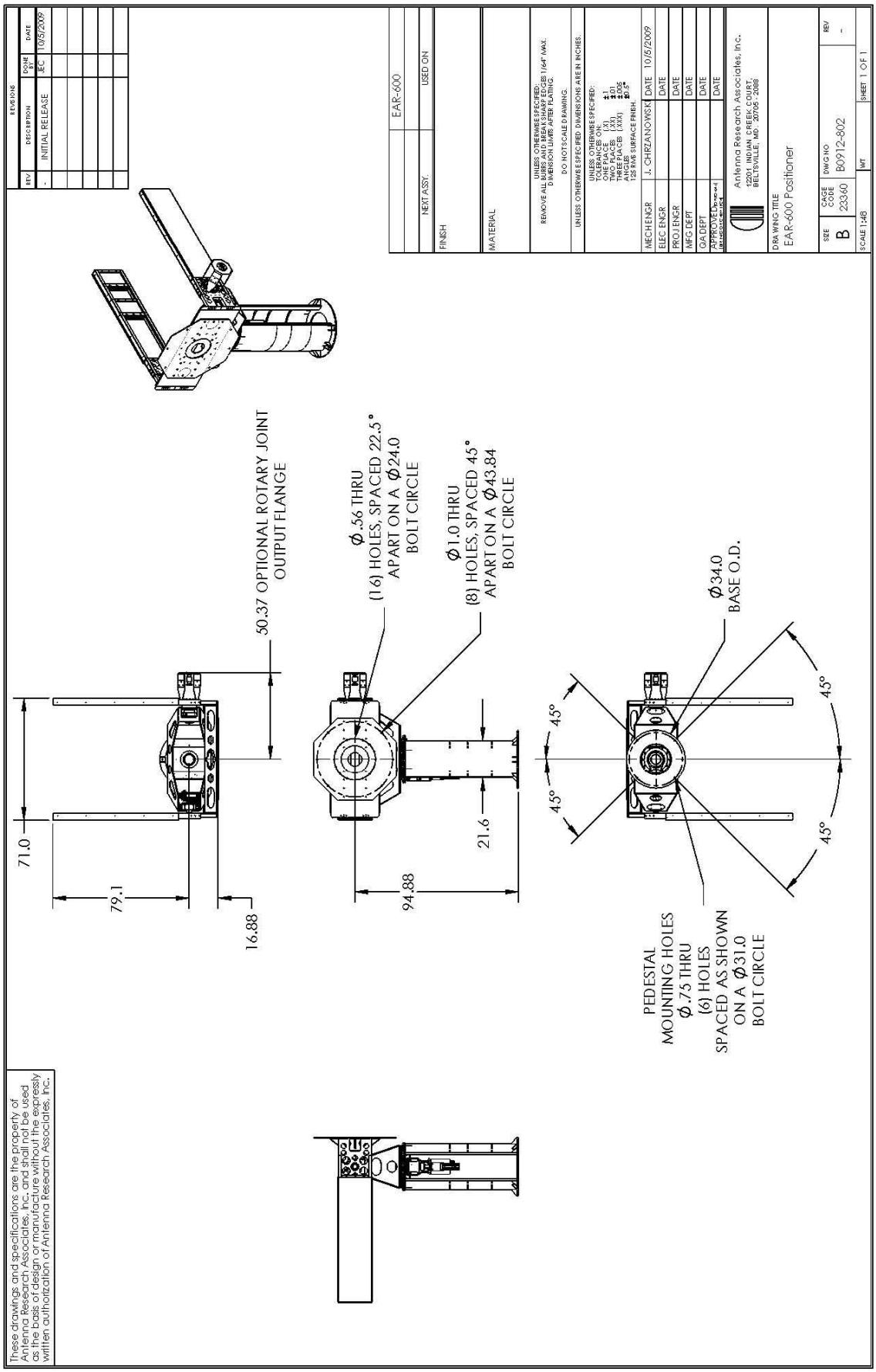
ACU-3D-24-CC / PR Highlights:

The Controller features an intuitive easy to operate, manual controls via the Front Panel interface. Additionally, there is a highly refined remote control interface using Serial I/O (RS-232/422/485) that provides the ability to perform any control, setup or monitoring function that is available through the Front Panel. Motion Commands are a common task for this interface but if properly equipped it is capable of controlling RF Front End switches and amplifiers.

The controller is based on a fully digital motion control architecture that very accurately controls the pedestal using a combination of custom and COTS motion control components. The digital servo control system architecture has been based around brushless servomotors with resolver motor commutation and separate absolute feedback devices to close position loops.

Additionally, the digital architecture provides a very flexible platform that is easily tailored to specific customer requirements. For example, in certain radar applications in addition to the normal serial commands the position data is streamed out of separate parallel ports at a 200 Hz data rate (less than 5msec) for display purposes.

Versions of these controllers have been integrated into several military systems and have been qualified to MIL-STD-810E/F, MIL-STD-461C/E for shipboard, airborne and ground based applications. All incorporate the grounding, bonding and filtering used on the military versions to ensure reliable operation.


REVISIONS
REV
DESCRIPTION
DONE BY
DATE
-
INITIAL RELEASE
EEC
10/5/2009
EAR-600
NEXT ASSY:
USED ON:
FINISH
MATERIAL
UNLESS OTHERWISE SPECIFIED:
REMOVE ALL BURRS AND BREAK SHARP EDGES 1/64" MAX.
DIMENSIONS APPLY AFTER PLATING.
DO NOT SCALE DRAWING.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
UNLESS OTHERWISE SPECIFIED:
TOLERANCE ON:
ONE PLACE (X) ±1
TWO PLACES (.XX) ±.01
THREE PLACES (.XXX) ±.005
ANGLES ±0.5°
125 RMS SURFACE FINISH
MECH ENGR
J. CHRZANOWSKI
DATE
10/5/2009
ELEC ENGR
DATE
PROJ ENGR
DATE
MFG DEPT
DATE
QA DEPT
DATE
APPROVED (Optional)
DATE
Antenna Research Associates, Inc.
12201 INDIAN CREEK COURT
BELTSVILLE, MD 20705-2068
DRAWING TITLE
EAR-600 Positioner
SIZE
B
CAGE CODE
23340
DWG NO
B0912-802
REV
-
SCALE 1:48
WT
SHEET 1 OF 1
These drawings and specifications are the property of Antenna Research Associates, Inc. and shall not be used as the basis of design or manufacture without the expressly written authorization of Antenna Research Associates, Inc.
50.37 OPTIONAL ROTARY JOINT OUTPUT FLANGE
Ø.56 THRU (16) HOLES, SPACED 22.5° APART ON A Ø24.0 BOLT CIRCLE
Ø1.0 THRU (8) HOLES, SPACED 45° APART ON A Ø43.84 BOLT CIRCLE
Ø34.0 BASE O.D.
71.0
79.1
16.88
94.88
21.6
45°
45°
45°
45°
PEDESTAL MOUNTING HOLES Ø.75 THRU (6) HOLES SPACED AS SHOWN ON A Ø31.0 BOLT CIRCLE