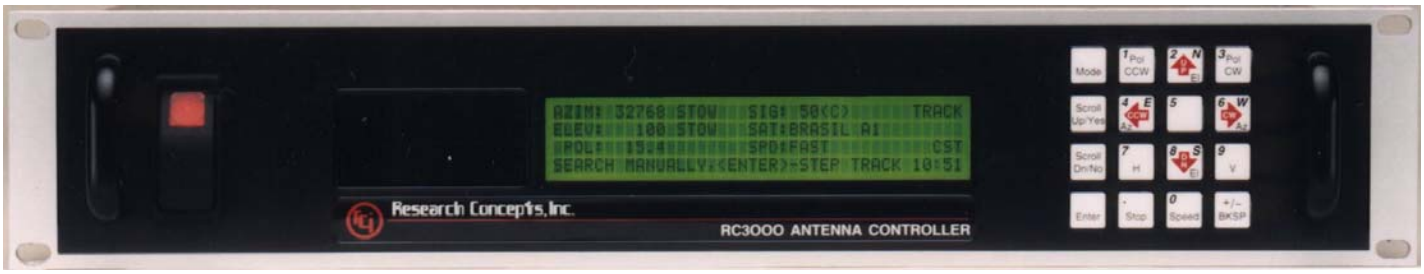
RC3000D

Satellite Locator / Inclined Orbit Tracking Controller for ANDREW Trifold®



Avoid the time consuming tasks of manually positioning your ANDREW 3.7/4.5m Transportable Antenna driven by the VS-1 Motor Controller. The RC3000 allows even non-technical personnel to automatically locate and position the antenna within minutes from power up.

Features

- **Automatic Pointing Solution**
  Calculates azimuth, elevation & polarization angles from any position and heading
- **Automatic Positioning**
  Precisely positions antenna with the press of a single key, automatic stowing
- **Automatic Recall of Stored Satellites**
  Inclined orbit tracking automatically initiated
- **Non-volatile Memory**
  Store position and polarization data (including inclined orbit track data) for 50 satellites
- **Optional GPS Receiver**
  Battery backup for fast position fix, one pulse pulse per second clock synch pulse
- **Optional Fluxgate Compass**
  Calibrate by driving in circle
- **Optional Inclined-Orbit Tracking**
  Step Track, Memory Track & Intelli-Search™ *modes*
- **Optional Waveguide Switch Control**
  Interfaces to many DC or AC driven waveguide switches with position feedback.
- **Slim 2U Rack Panel**
  Uses less space than RC8097 predecessor
- **Friendly User Interface**
  Operator interaction similar to industry standard RC2000 fixed base controllers
- **Continuous Antenna Status Monitoring**
  Motion limits, jammed and runaway sensing
- **Multi-Band Operation**
  Supports C, Ku, L and X-band satellites
- **Resolver-Based Position Sensing** *High resolution 2-pole resolver interface (16 bit) ensures accurate tracking,*
- **Inclinometer for True Elevation**
  no need for precise trailer leveling
- **Optional RS-422 Control Interface**
  Remote control from many popular PC software packages
- **Works with any VS-1 Driven Antenna**
  connects to the standard Andrew Motor Controller VS-1
- **Interface Kit Eases installation……**
  RC3KDTRIKIT contains inclinometer module and required interface cables

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OPERATIONAL OVERVIEW

The RC3000 allows easy antenna operation via its menu based user interface. The following example highlights the basic modes of operation provided by the RC3000.

POWER UP. Upon arriving on site and powering up, the RC3000 enters MANUAL mode. In MANUAL mode the user may jog the antenna in azimuth, elevation and polarization. Upon power up, the fluxgate compass and GPS receiver initialize and begin providing data.

AUTOMATIC LOCATION OF SATELLITE. In LOCATE mode, azimuth and elevation pointing angles are automatically calculated based on position (lat/lon), heading and the selected satellite. Position may be obtained automatically from the optional GPS, selected from a preset list of user defined positions or entered manually. Heading may be automatically obtained from the optional fluxgate compass or entered manually. The user selects which satellite to locate from either a preset user defined list or by manually entering satellite data. The RC3000 checks that the pointing solution is within the mount's range of movement and automatically positions the antenna.

STORING SATELLITE LOCATION. After verifying the antenna is precisely on the satellite, the user may STORE the satellite's azimuth and elevation angles along with horizontal and vertical polarization data. If the satellite has been identified as having an inclined orbit, the TRACK mode will be automatically entered as described below.

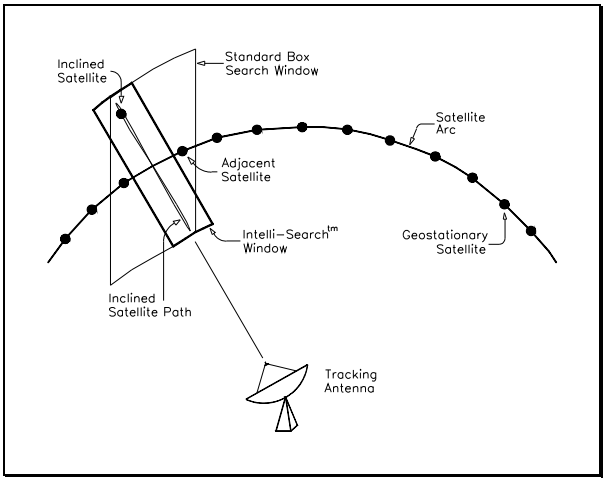
RECALLING STORED SATELLITES. The user may quickly and precisely move between previously stored satellites via RECALL mode.

AUTOMATIC ANTENNA STOWING. From STOW mode, the user may ask for the antenna to be automatically moved to the stow position.

TRACKING ALGORITHM (optional)

The RC3000 tracking algorithm can be divided into three distinct stages - STEP_TRACK, MEMORY_TRACK, and SEARCH.

In **STEP_TRACK**, the controller periodically peaks the receiver's AGC signal strength by jogging the antenna. The time and position are recorded in a track table maintained in the controller's non-volatile memory. The interval between peakups is determined by antenna beamwidth (determined from antenna size and frequency band), satellite inclination and a user specified maximum allowable error (in dB). When a track table entry exists for the current sidereal time, STEP_TRACK switches to MEMORY_TRACK.



In **MEMORY_TRACK**, the controller smoothly moves the antenna to azimuth and elevation positions derived from entries in the track table. The time between movements is determined by the same factors which govern the time between peakup operations in STEP_TRACK. By increasing the maximum allowable error, antenna movements can be performed less frequently. In MEMORY_TRACK, the accuracy of the track table is monitored by periodically peaking up the receiver AGC signal. If the error exceeds a level set by the user, all entries in the track table are flagged for update.

SEARCH is entered when the satellite signal has been lost. The RC3000 utilizes Intelli-Search, an efficient search algorithm that minimizes errors associated with traditional box searches and frees the user from having to update vague search window parameters. This scheme accounts for the specific mount geometry, calculates the nominal trajectory for the satellite, and then searches in an area that coincides with the satellite's expected path. When the satellite is located, the controller re-enters the STEP_TRACK mode.

SPECIFICATIONS

PHYSICAL

Size:	19.0" x 3.5" x 16.5" (rack)
Weight:	15.0 lbs.
Temperature:	0° -50° C
Input Power:	115/230 VAC, 50/60 Hz. 50 W typical
Display:	4 x 40 LCD

INTERFACES

Position:	elevation inclinometer, azimuth,elevation & polarization resolvers,
Serial:	RS-232 (GPS, fluxgate, and remote control) RS-422 (remote control)
AGC Inputs (2):	0 - 10 VDC input range,2MΩ input Z
Autopeak:	Full L-Band power detector for peaking
Drive Output:	Low-Voltage Solid-State Optocouplers