Cambridge Aero Instruments 302, 302A, 303, 306 and 300 Utility Training

Paul Remde

Cumulus Soaring, Inc.

Introductions

- Paul Remde
  - Cumulus Soaring, Inc.
    - Sales and support
    - #1 dealer in the USA
- Gary Kammerer
  - Cambridge Aero Instruments
- Arthur Chapman
  - Cambridge Aero Instruments

Product Overview

- 302
  - Most popular soaring flight computer in the the world?
  - Audio Variometer with averager
  - Speed-to-fly director
  - IGC Approved GPS Flight Recorder
  - NMEA data and 5V power output for PDAs
  - Sends wind, airspeed and Vario data to PDA

- 302A
  - IGC Approved GPS Flight Recorder
  - NMEA data and 5V power output for PDAs

Product Overview

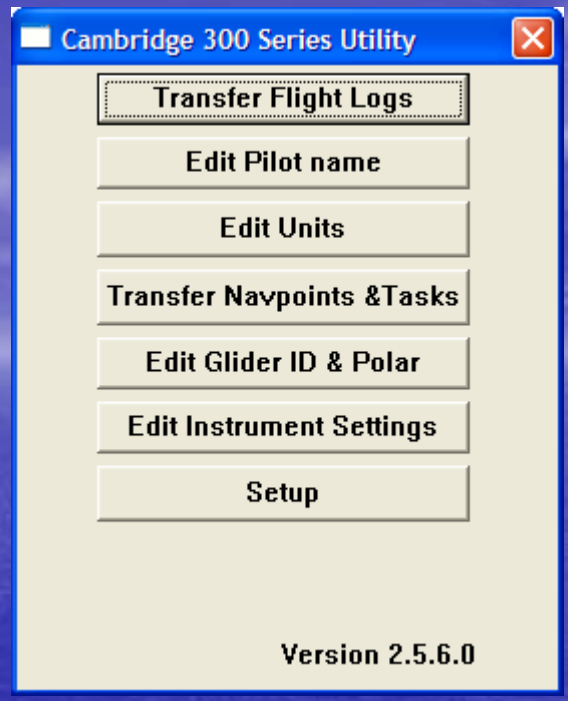
- 303 LCD Navigation Display
  - When used with 302A
    - Navigation with left and right turn arrows
    - Task Entry and declaration
    - Select from existing pilot names, or edit pilot name and preferences (goal height, etc.) - great for gliders with multiple pilots
    - Edit water ballast and view wing loading
    - Edit Polar
    - Simple user interface
  - When used with 302
    - Everything above, plus:
    - Final Glide computer with Differential Final Glide
    - Receives MacCready and wind data from the 302

Product Overview

- 306 2nd Seat Repeater
  - Displays the same information found on the connected 302.
  - Two 303 LCD Navigation displays can also be used with the 302 and 303 at the same time (one for the 302 and one for the 306 repeater).
  - It is **not** compatible with the 302A
  - Simple connection

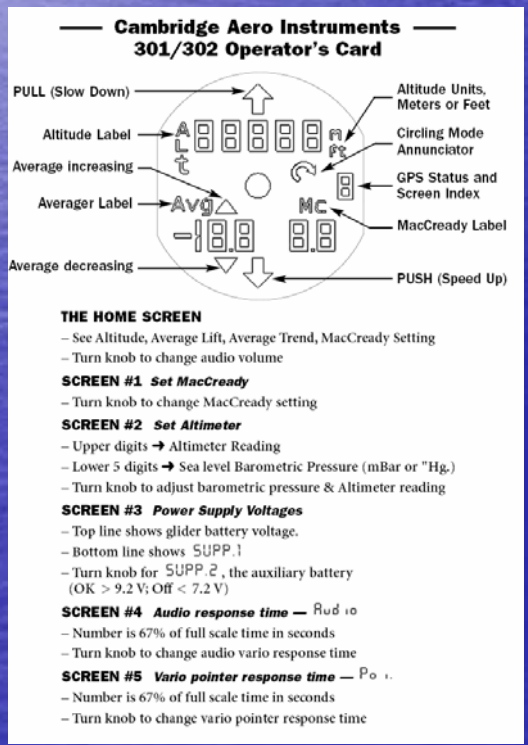
Product Overview

- Cambridge 300 Utility
  - Free
  - Simple
  - Dowload and check security of flight logs
  - Works with:
    - 302
    - 302A
  - Versions for:
    - PC
    - Compaq Aero 1500 Pocket PCs
    - Later model Pocket PC (iPAQs)



302 Tips

- Operator's Card
  - Free download on Cambridge web site



Cambridge Aero Instruments
301/302 Operator's Card

PULL (Slow Down)
Altitude Label
Average increasing
Averager Label
Average decreasing
Altitude Units, Meters or Feet
Circling Mode Annunciator
GPS Status and Screen Index
MacCready Label
PUSH (Speed Up)

THE HOME SCREEN
– See Altitude, Average Lift, Average Trend, MacCready Setting
– Turn knob to change audio volume

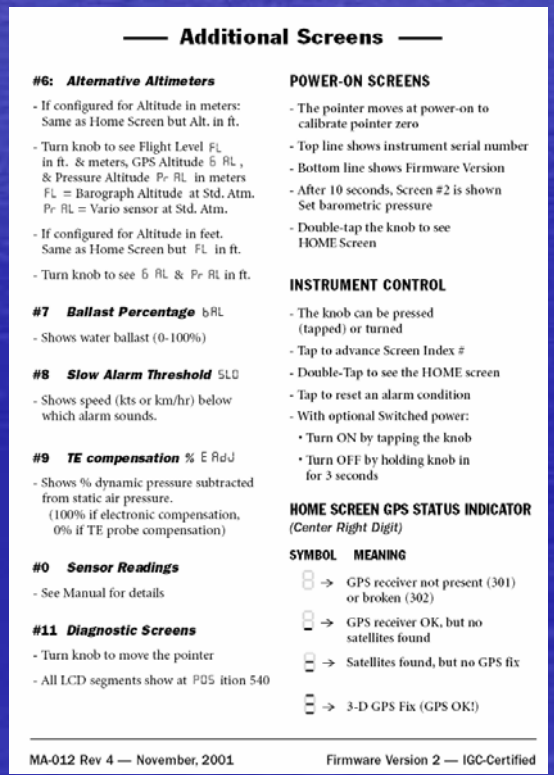
SCREEN #1 ***Set MacCready***
– Turn knob to change MacCready setting

SCREEN #2 ***Set Altimeter***
– Upper digits ➜ Altimeter Reading
– Lower 5 digits ➜ Sea level Barometric Pressure (mBar or "Hg.)
– Turn knob to adjust barometric pressure & Altimeter reading

SCREEN #3 ***Power Supply Voltages***
– Top line shows glider battery voltage.
– Bottom line shows SUPP.1
– Turn knob for SUPP.2, the auxiliary battery (OK > 9.2 V; Off < 7.2 V)

SCREEN #4 ***Audio response time*** — Aud.10
– Number is 67% of full scale time in seconds
– Turn knob to change audio vario response time

SCREEN #5 ***Vario pointer response time*** — Po.1
– Number is 67% of full scale time in seconds
– Turn knob to change vario pointer response time



Additional Screens

#6: ***Alternative Altimeters***
- If configured for Altitude in meters: Same as Home Screen but Alt. in ft.
- Turn knob to see Flight Level FL in ft. & meters, GPS Altitude G AL, & Pressure Altitude Pr AL in meters
  FL = Barograph Altitude at Std. Atm.
  Pr AL = Vario sensor at Std. Atm.
- If configured for Altitude in feet. Same as Home Screen but FL in ft.
- Turn knob to see G AL & Pr AL in ft.

#7 ***Ballast Percentage*** bAL
- Shows water ballast (0-100%)

#8 ***Slow Alarm Threshold*** SLO
- Shows speed (kts or km/hr) below which alarm sounds.

#9 ***TE compensation*** % E AdJ
- Shows % dynamic pressure subtracted from static air pressure.
  (100% if electronic compensation, 0% if TE probe compensation)

#0 ***Sensor Readings***
- See Manual for details

#11 ***Diagnostic Screens***
- Turn knob to move the pointer
- All LCD segments show at POS ition 540

POWER-ON SCREENS
- The pointer moves at power-on to calibrate pointer zero
- Top line shows instrument serial number
- Bottom line shows Firmware Version
- After 10 seconds, Screen #2 is shown Set barometric pressure
- Double-tap the knob to see HOME Screen

INSTRUMENT CONTROL
- The knob can be pressed (tapped) or turned
- Tap to advance Screen Index #
- Double-Tap to see the HOME screen
- Tap to reset an alarm condition
- With optional Switched power:
  - Turn ON by tapping the knob
  - Turn OFF by holding knob in for 3 seconds

HOME SCREEN GPS STATUS INDICATOR
(Center Right Digit)

SYMBOL	MEANING
→	GPS receiver not present (301) or broken (302)
→	GPS receiver OK, but no satellites found
→	Satellites found, but no GPS fix
→	3-D GPS Fix (GPS OK!)

MA-012 Rev 4 — November, 2001 Firmware Version 2 — IGC-Certified

302 Tips

- Instrument Control
  - The knob can be pressed (tapped) or turned
  - Tap to advance Screen Index #
  - Double-Tap to see the HOME screen
  - Tap to reset an alarm condition
  - With optional Switched power:
    - Turn ON by tapping the knob
    - Turn OFF by holding knob in for 3 seconds

302 Tips

- Audio Response Time
  - Response time of audio variometer
  - Adjustable in screen 4 – Screen shows “Audio”
  - Number is 67% of full scale time in seconds
  - Turn knob to adjust

302 Tips

- Vario Pointer Response Time
  - Response time of pointer (meter)
  - Adjustable in screen 5 – Screen shows “Poi”
  - Number is 67% of full scale time in seconds
  - Turn knob to adjust

302 Tips

- Total Energy Setting
  - This parameter has led to some confusion and incorrect settings in many gliders (I'm guessing)
  - Set to 0% when using a total energy probe (recommended)
  - Set to 100% (plus or minus a bit) when using electronic compensation (no TE probe)
  - To Adjust
    - Press the knob on the 302 9 times (not too fast) to get to screen 9. There is a 9 on the display and also "E Adj".
    - Rotate the knob

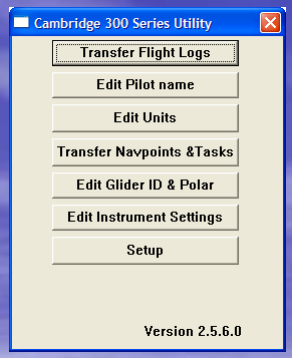
302 Tips

- Flight Log Download “Security Fail”
  - The OLC (Online Contest) checked all submitted flights for valid security. There were a few reports of flight log security fail errors with 302 and 302A units.
  - I believe that 99% of the failures were due to “operator error”.
  - If you have a problem
    - Please try the tips below
    - If they don’t work, contact Cambridge for help.
    - It is likely that the flight log can be retrieved in a secure form.

302 Tips

- Flight Log Download “Security Fail”
  - Check security seal in the logger
    - First thing to check when having problems downloading secure flight logs
    - Press knob 10 times (not too fast) to get to screen 10 (screen shows “0”)
    - Rotate knob one click to the left
    - Should show “GOOD SEAL” on 302 display
    - Seal status also shown at power-up on 303 display

302 Tips



- Flight Log Download “Security Fail”
  - Maker sure you are using the latest version of the Cambridge 300 Utility.
    Other programs can’t verify the security of the flight log file after download.
    - Version 2.56 for PC
    - Version 2.57 for Pocket PC
    - Available here:
      - http://www.cambridge-aero.com/300series.htm
      - http://www.cumulus-soaring.com/cai_downloads.htm
  - In the 300 Utility, be sure to verify that the security checks are all “OK”. Many issues aren’t noticed until the flight log is uploaded to the OLC.
  - If you get a failure – try re-downloading. That usually solves the problem on the 2nd or 3rd try.
  - Make sure the PDA is not turning off during the download (common problem)

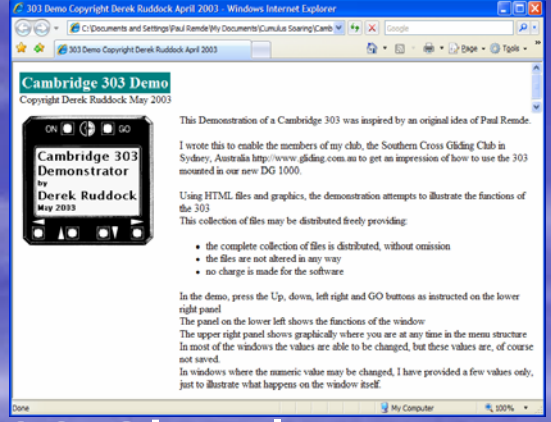
302 Tips

- Clear flight log memory
  - May help with flight log security issues on future flights – especially if the memory is full.
  - **This will erase all flight logs in memory.**
  - Connect the 302 to a terminal emulator program such as HyperTerminal (included with Windows). Gary Kammerer or I can help you out if you call one of us with the 302 connected to a laptop or PC.
  - Hit Ctrl-c to interrupt the flow of GPS data from the 302 and bring up a command prompt.
  - At the cmd> prompt type “clear log” and then hit enter.

302A Tips

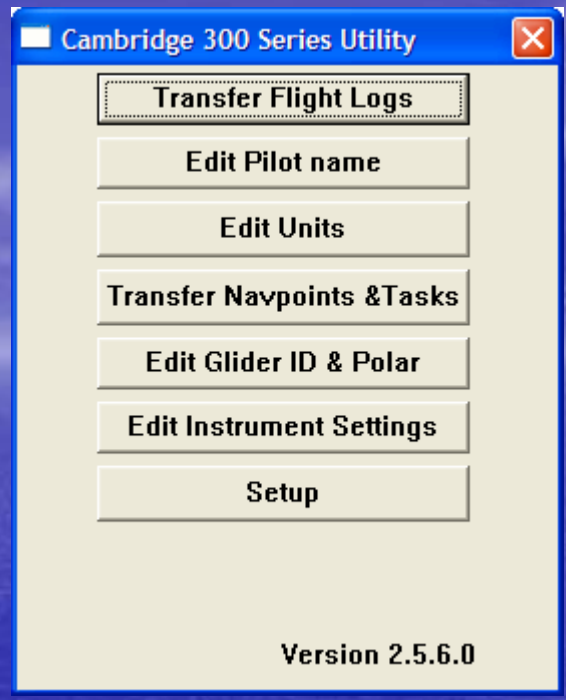
- Can be panel mounted, but often mounted in an inaccessible location.
- There is no need to be able to access the unit in flight.
  - Pilot Event button not used by most pilots

303 Tips



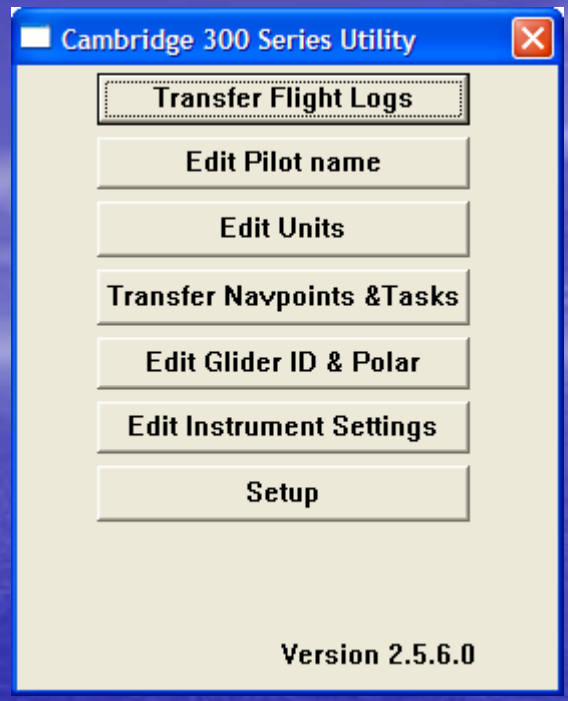
- Check-out the “303 Simulator” created by Derek Ruddock
- Explains how to navigate around the screens
- Describes every parameter shown on every screen
- A great spring refresher
- Runs in any browser
- Free Download from my Cambridge Downloads page:
  - http://www.cumulus-soaring.com/cai_downloads.htm

300 Utility Tips



- Get the latest version!
  - Version 2.56 for PC
  - Version 2.57 for Pocket PC
  - Available here:
    - http://www.cambridge-aero.com/300series.htm
    - http://www.cumulus-soaring.com/cai_downloads.htm

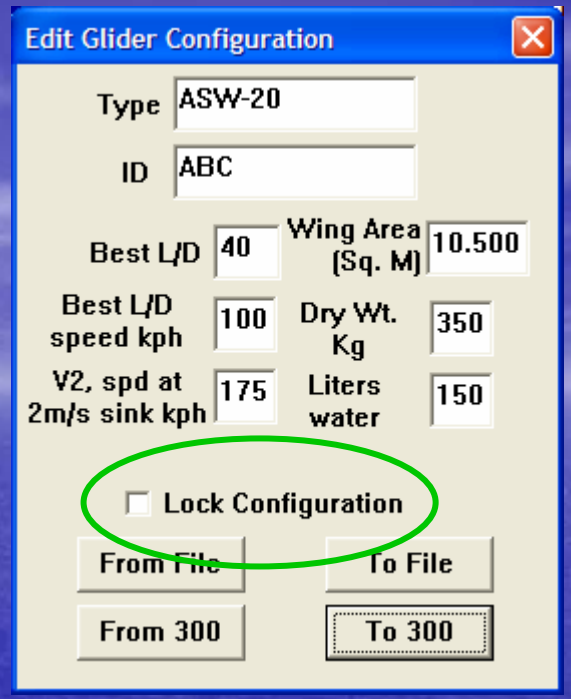
300 Utility Tips

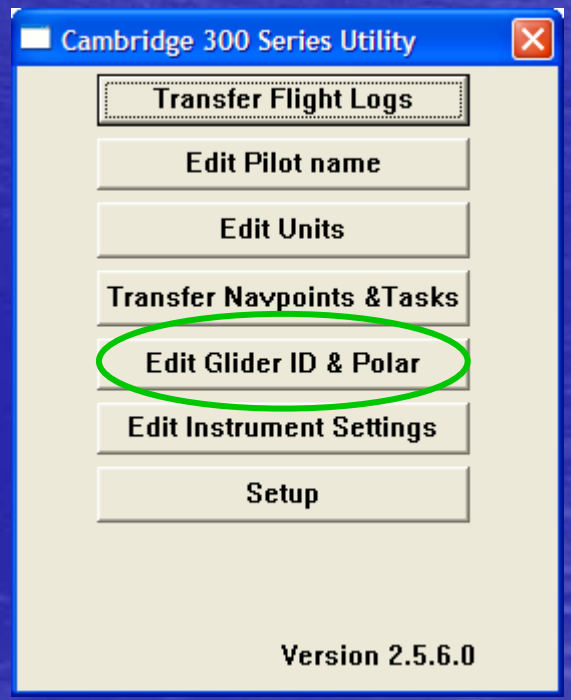


- Verify that the security checks are all “OK”.
- They are displayed at the end of the download.
- Make sure the PDA is not turning off during the download (common problem)

300 Utility Tips

- Lock Configuration
  - "I can't edit the Electronic TE Adjustment, Slow Alarm or polar data!"
  - Uncheck the "Lock Configuration" checkbox
  - Press the "To 300" button





Conclusions

- The Cambridge Aero Instruments 302 is still my #1 selling instrument
- It is very small and powerful and works great with a PDA and/or the 303 LCD display
- Gary Kammerer at Cambridge offers excellent support.

Questions

- Any questions?

Thank You

- Thank you for investing the time to learn more about the products from Cambridge Aero Instruments.