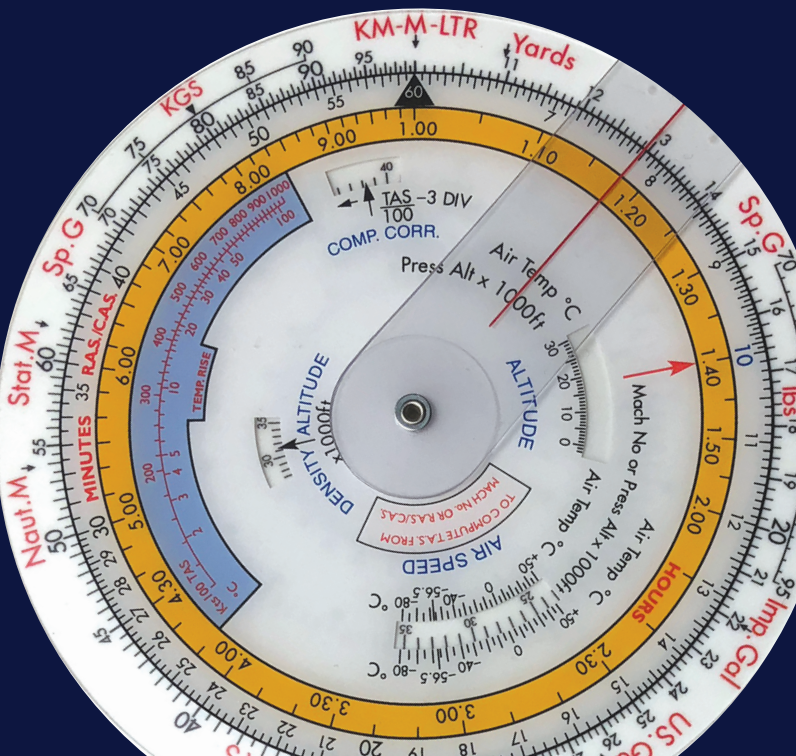
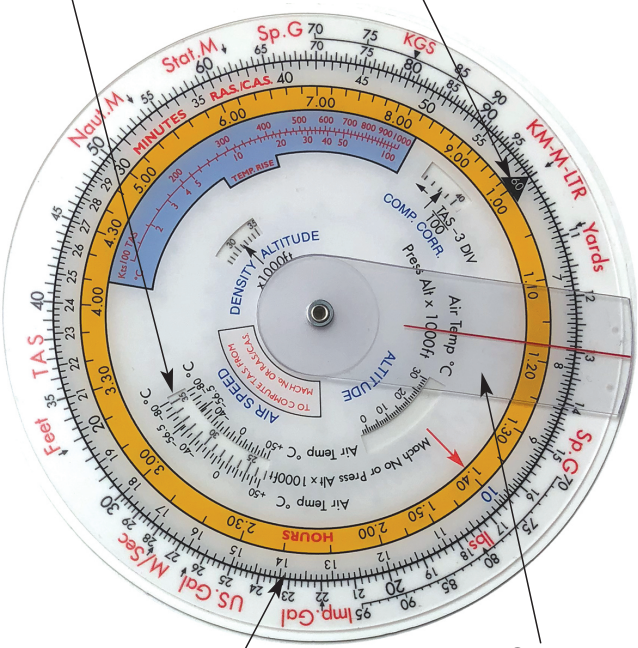
POOLEY'S™

CRP-9

COMPUTER HANDBOOK




Inner Scale
(Rotating)
Index Mark
(Inner Scale)
Cursor
Outer Scale
(Fixed)
Sp.G
KGS
Stat.M.
Naut.M.
RAS/CAS
MINUTES
KM-M-LTR
Yards
TEMP. RISE
COMP. CORR.
TAS -3 DIV
DENSITY ALTITUDE x1000ft
Press Alt x 1000ft
Air Temp °C
ALTITUDE
AIR SPEED
TO COMPUTE TAS MACH No. OR KNOTS
MACH No. OR KNOTS
Air Temp °C
Mach No or Press Alt x 1000ft
Air Temp °C
HOURS
Feet
TAS
Sp.G
lbs
Imp.Gal
US Gal
M/Sec

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FOREWORD

The Pooleys CRP Computers have been designed to supply a World Aviation Market with the finest Air Navigation Computers that can be made.

The **CRP-5, 5W Computers** have been designed for **Commercial Aviation Students and Pilots.**

Our computers are made of the best materials available and are guaranteed to withstand temperatures up to 60°C. They are stable, non-inflammable and resistant to mould and moisture. Every care is taken in manufacture to ensure that the resulting product is a high precision instrument both in accuracy and durability.

To maintain clarity and ensure maximum life, do not allow chemicals and particularly solvents to come in contact with the computer ie. nail varnish remover. The computer should not be exposed to extreme of temperature and should be protected from prolonged exposure to sunlight. It is better to mark the computer, when this is necessary, with a pencil as this can be easily erased with a soft rubber. Wiping off Chinagraph marks eventually destroys the clarity of the window.

Your computer is guaranteed against defective materials and workmanship and will be replaced free of charge should such faults occur. We trust that your Pooleys Computer will give you satisfactory service.

Robert Pooley

INTRODUCTION

The 1988 models of this range of CRP computers incorporate several changes from previous models. Heavier grade materials are now employed in their construction, the obsolete pressure pattern latitude scale has been deleted and the slide now has graduations along the edges for measuring in inches, millimetres and nautical miles (to scales of 1:250,000 and 1:500,000). Minor changes to the layout and clearer numerals make for easier reading and use.

The various ways of using the computer described in this handbook, particularly the solving of triangle of velocity problems, are those employed in Commercial Aviation. These ways of usage, evolved from vast experience and knowledge of the problems involved are consistent in their application and solve all known problems. Many alternative ways of solving problems on the computer exist; mostly they are one-off solutions involving non-standard use of datums. In experienced hands "short cuts" may be acceptable but newcomers are strongly advised not to try them as the end result is usually confusion and frequently they are left with long term hang-ups about the computer.

CRP-9 Wind Triangle Problems

The reverse side of the CRP-9 computer is arranged to solve the navigational triangle of velocities without the use of a slide. The principle is based upon 'similar triangles', the TAS being taken as unity (factor of 1) and the Wind and Ground Speeds are expressed as ratios of the TAS.

The large outer disc has compass rose around its edge. The smaller centre disc is grided in drift lines and GS ratios, at the top it has a HEADING INDEX either side of which is a drift scale showing from 0° to 30° Port and Starboard drift. The wind arm is graduated in Wind Speed ratios and has a WIND DIRN line on one end to enable the wind direction to be set up against the outer compass rose.

TO CONVERT SPEED (S) INTO (R) OF TAS AND VICE VERSA

Use the circular slide rule side of the CRP-9 for these conversions.

Set 1 on the inner scale opposite TAS on the outer scale (use 10 as 1.0)

(a) Opposite (s) on the outer scale read off (r) on the inner scale, (speed to ratio).
(b) Opposite (r) on the inner scale read off (s) on the outer scale, (ratio to speed).

Example: **(a) TAS 214 kts, wind speed 30 kts.**

Find the WV ratio.
Rough Check: 30 divided by 200 = 0.15.

Set 1 on inner scale opposite 214 on outer scale. Opposite 30 on outerscale read 14 on inner scale.

Rough Check: *0.15, therefore*
Answer: **WV ratio = 0.14.**
Example: **(b) TAS 1040 kts, GS ratio 1.13. Find the GS.**
Rough Check: 1050 x 1.1 = 1155 kts.

Set 1 on inner scale opposite 1040 on outer scale. Opposite 1.13 on inner scale read 1175 on outer scale.

Rough Check: 1155 kts, therefore
Answer: **GS = 1175 kts.**

SOLVING FOR TRACK (TRK) & GROUND SPEED (GS) Knowing HDG and TAS plus WV

Convert the WV into a WV ratio.

Rotate the wind arm to set the **WIND DIRN** line over the wind direction on the outer compass rose. Holding the wind arm in place rotate the grided disc until the **HEADING INDEX** is opposite the heading on the outer compass rose.

Under the WV ratio on the wind arm read off the drift and GS ratio. Opposite the drift on the drift scale read off the Trk on the outer compass rose.

Convert the GS ratio into a GS.

Example: **Hdg (T) 265, WV 210/35, TAS 290 kts. What is Trk and GS?**

Calculate WV ratio.

Rough Check: 30 divided by 300 = 0.1

Set 1 on the inner scale against 290 on the outer scale, against 35 on the outer scale read off WV Ratio 0.12 on the inner scale.

Rotate the wind arm until **WIND DIRN** line lies over 210° on the outer compass rose.

Holding wind arm in place rotate grided disc until HEADING INDEX points to 265° on outer compass rose.

Under the WV ratio on the wind arm read off drift 6° Starboard and GS ratio 0.93.

Against 6° Starboard on the drift scale read off Trk 271°(T) on the outer compass rose.

Example: **Convert GS ratio to GS**
Rough Check: *0.9 x 300 = 270 kts*

Set 1 on the inner scale against 290 on the outer scale against 0.93 on the inner scale read of GS 271 kts on the outer scale.

Answer: **Trk 271° (T), GS 271 kts.**

SOLVING FOR WIND VELOCITY (WV) Knowing HDG and TAS plus Trk and GS

From known TAS and GS calculate the GS ratio. Rotate the grided disc until the HEADING INDEX is opposite the Hdg direction on the outer compass rose. Read off opposite the known Trk on the compass rose drift on the drift scale.

Rotate the wind arm until the WV Ratio Scale lies through the intersection of the drift and GS ratio on the grid. Read off the WV ratio at this intersection and the wind direction on the outer compass rose under the **WIND DIRN** line. Convert the WV ratio into a wind speed.

Example: **Hdg 229° (T), TAS 555 kts, Trk 239°(T), GS 577 kts. What is the WV?**
Calculate GS ratio.
Rough Check: *575 divided by 550 = 1.05*

Set 1 on the inner scale opposite 555 on the outer scale opposite 577 on the outer scale read off the GS ratio of 1.04 on the inner scale.

Rotate the grided disc until **HEADING INDEX** is opposite Hdg 229° (T) on the outer compass rose. Opposite Trk 239° (T) on the outer compass rose read off the drift of 10° Starboard on the drift scale.

Rotate the wind arm until the Wind Ratio scale lies through the intersection of 10° Starboard drift and the 1.04 G/S ratio on the grided disc. Read off the WV ratio 0.18 under this intersection, and Wind Direction 130°(T) on the outer compass rose under the **WIND DIRN** line.

Convert the WV ratio to wind speed.
Rough check: 0.2 x 550 = 110 kts.

Set 1 on the inner scale opposite 555 on the outer scale, opposite 0.18 on the inner scale read off wind speed of 100 kts on the outer scale.

Answer: **WV 130°(T)/100 kts**

SOLVING FOR HEADING (HDG) & GROUND SPEED (GS) knowing WV, TAS and required Trk

Convert the wind speed to WV ratio.

Rotate the wind arm to set the **WIND DIRN** line over the wind direction on the outer compass rose. Holding the wind arm in place rotate the grided disc until the **HEADING INDEX** is opposite the Trk direction on the outer compass rose.

Under the WV ratio on the wind arm read off the drift. Further rotate the grided scale until this drift on the drift scale is now opposite the Trk direction on the outer compass rose.

Check the drift now under the WV ratio on the wind arm, as the last adjustment may have altered it.

(a) If it is the same as the drift opposite the track direction on the outer compass rose the computer is correctly set up. Read off hdg opposite the **HEADING INDEX** and the drift and GS ratio under the WV ratio on the wind arm.

(b) If it is not the same as the drift opposite the track direction on the outer compass rose rotate the grided scale until the new drift is opposite the Trk direction on the outer compass rose and check the drift now under the WV ratio on the wind arm. If necessary repeat until the drifts match. The computer is now correctly set up. Read off Hdg opposite the **HEADING INDEX** and the drift and GS ratio index under the WV ratio on the wind arm. Convert the GS ratio to GS.

Example:	**TAS 230 kts, WV 000°(T)/40 kts, Trk 055°(T). What is Hdg°(T) GS and drift?**
	Calculate the WV ratio.
Rough check:	*40 divided by 240 = 0.133*

Set 1 on the inner scale opposite 230 on the outer scale, opposite 40 on the outer scale read off the WV ratio of 0.174 on the inner scale.

Rotate wind arm until **WIND DIRN** line lies over 000 on the outer compass rose.

Holding the wind arm in place rotate the grided disc until the **HEADING INDEX** is opposite 055 on the outer compass rose.

Under the WV ratio on the wind arm read off the drift of 9° Starboard.

Rotate grided disc so that 9° Starboard on the drift scale is opposite 055 on the outer scale.

Check drift now under index (8° Starboard). As it has changed from 9° to 8° Starboard rotate disc to position 8° Starboard opposite 055 on the outer scale. Check again, drift is still 8° Starboard and ties up with the 8° Starboard opposite the Trk direction of 055°(T). Read off Hdg of 047°(T) opposite the **HEADING INDEX** and the GS ratio of 0.89 under the WV ratio on the wind arm.

Convert the GS ratio to GS
Rough Check: 0.9 x 230 = 207 kts

Set 1 on the inner scale opposite 230 on the outer scale, opposite 0.89 on the inner scale read off the GS of 204 kts.

Answer: **Hdg to steer 047°(T) and GS 204 kts.**

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