AirClassics™

CX-2 Palm Pathfinder

Flight Computer for Palm Pilots

Instructions

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Visit the ASA website (www.asa2fly.com) for any manual revisions, technical support, and FAQs for this product as they become available.

CONTENTS

INTRODUCTION

ASA's CX-2 Palm is the next generation of aviation computers, taking advantage of the latest hand-held computer and personal digital assistant (PDA) technologies.

The features of the CX-2 Palm make it the most versatile and useful aviation calculator available.

1. *Numerous aviation functions.* You can calculate everything from true airspeed and Mach number, to headwind/crosswind components and center of gravity (CG), and everything in between. A menu of 34 aviation functions gives you access to 40 aviation calculations. The menu structure provides easy entry, review, and editing within each function.
2. *User-friendly*. The screen displays a menu of functions, or the inputs and outputs of a selected function, for easy-to-read menus and data displays. The inputs and outputs of each function are separated so it is clear which numbers were entered and which were calculated. Inputs and outputs are clearly labeled and the answers or results are displayed along with their corresponding units of measurement. The menu organization reflects how a flight is normally planned and executed. This results in a natural flow from one function to the next with a minimum of keystrokes: to plan a flight, simply work from the menus in sequential order as you fill in your flight plan form.
3. *Unit conversions.* The CX-2 Palm has 18 reciprocal unit-conversions: nautical and statute miles, nautical miles and kilometers, statute miles and kilometers, feet and meters, pounds and kilograms, gallons and liters, time in an hours:minutes:seconds format and time in decimal format, Fahrenheit and Celsius temperatures, and millibars and inches of mercury.
4. *Timers and clocks.* The CX-2 Palm has two timers: a stopwatch that counts up, and a count down timer with an audible alarm. The stopwatch can be used to keep track of elapsed time or to determine the time required to fly a known distance. The count down timer can be used as a reminder to switch fuel tanks, or to determine the missed approach point on a nonprecision instrument approach. Both UTC and local time are displayed.
5. *Interactive functions.* The CX-2 Palm is designed so the functions can be used together. You can perform "chain" calculations where the answer to a preceding problem is automatically entered in subsequent problems. Standard mathematical calculations and conversions can be performed within each aviation function.

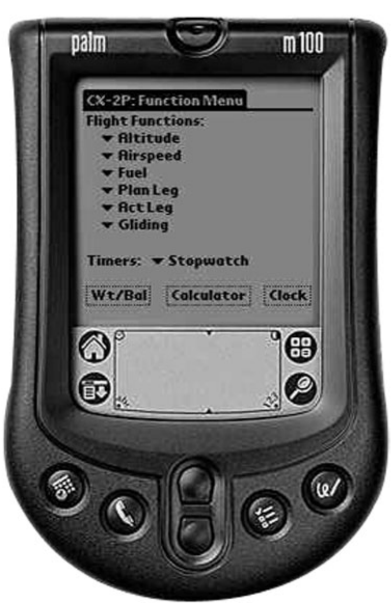

Figure 1: *The CX-2 Palm flight computer for Palm Pilots*

SYSTEM REQUIREMENTS

Palm or Palm-compatible device running Palm OS 3.1 or higher, with Palm Desktop software and HotSync cradle installed.

INSTALLATION

CX-2 Palm is distributed via e-mail and contains the following files: cx2p.prc, mathlib.prc, and this operating manual. Use the HotSync™ function of your Palm Desktop™ software to install the files onto your Palm device:

1. Select the Install Tool utility from your Palm Desktop and use it to load both the CX-2 Palm files.
2. After you have selected the CX-2 Palm files, place your palm device into the HotSync cradle and start the HotSync process.
3. When the HotSync is complete remove the palm device and check the HotSync log for errors.
4. The files that should be loaded into the Palm Device are as follows: cx2p.prc and mathlib.prc. Make sure these are loaded after the HotSync process has finished. To do this tap the "Menu" button on the lower left hand corner of the "Graffiti" pad on your Palm Device. Then select "Info" on the pull-down menu and scroll through the list looking for the files. If you do not see them, try HotSyncing again.

REGISTRATION

Registering the software is required to activate the software and provides you with free technical support, upgrade offers, and special product information. The first time you run the CX-2 Palm you will see the Registration window. The registration process automatically polls your device and plugs in the unit serial number: you do not need to type this in. Visit the MyASA portion of our website at www.asa2fly.com, and log in using the Username and Password you received with your order confirmation e-mail. Follow the instructions for Activating a product, and you will receive your Activation Code to unlock your software. If you've lost your login information, attempt to log in, and choose the link to "Please e-mail my Username and Password to me." If you still have problems, please contact Customer Service at 1-800-ASA-2-FLY or 425-235-1500 (Monday through Friday 8:00 – 5:00 PST.) If you are unable to visit our website, call Customer Service or fax us at (425) 235-0128 and give us your PDA's serial number, your name, address, e-mail, and purchase date, and an Activation number will be issued to you. Enter this Activation Code into the Registration window (in CX-2P on Palm). Write this number down for future reference should you need to reinstall the software. This process complete, you will not see this window again and will open to the Function Menu each time you access the CX-2 Palm in the future.

GETTING STARTED

Select (tap) the CX-2 Palm icon from your Palm desktop. When first turned on, the CX-2 Palm is at the main menu with CX-2 Palm Function Menu displayed at the top of the screen. The CX-2 Palm can be returned to this mode at any time by selecting the **f** button. Each of the menu items below **Flight Functions** provides a pull-down list of calculations applicable to planning or conducting a flight. A pull-down menu is also available for the Timers. The 3 menu items at the bottom of the screen provide direct access to the Weight/Balance calculations, Calculator, and Clock.

There are 5 options to navigate between terms on the CX-2 Palm:

1. Use the up/down arrow buttons.
2. Click any of the input/output fields with the stylus (or the cursor with the Palm emulator)
3. Use the Graffiti (palm handwriting recognition software) shortcut for next field (like a skinny V) and previous field (like a skinny upside-down V).

4. Use the page up/down hard keys.
5. Use the Graffiti character for a space (drawn like an underscore).

An “E” is displayed whenever the result of the arithmetic operation is a number that exceeds 8 digits. You may either press C to clear the display, or just type in a new number.

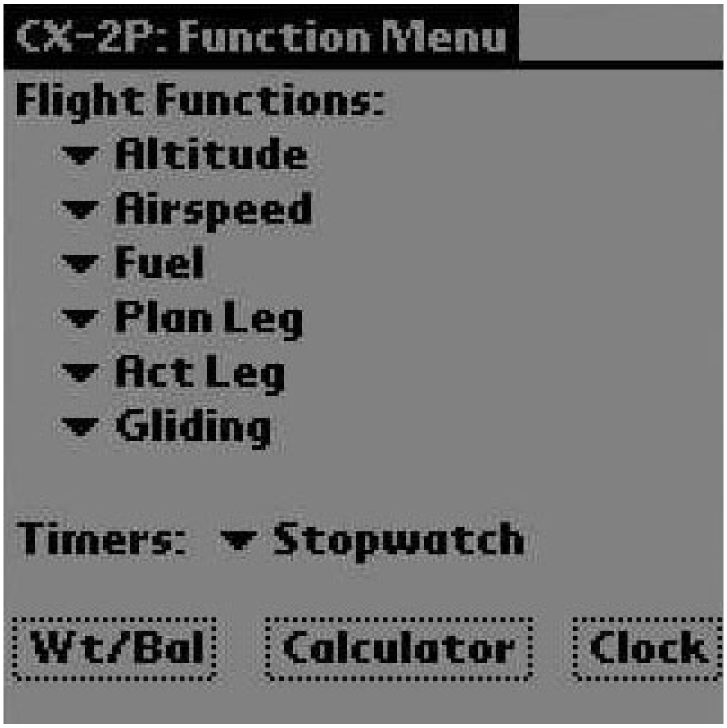

Figure 2: *CX-2 Palm Function menu.*

From any screen, you can tap the black menu title at the top (or select the pull-down menu button) to display the Help menu:
1. The CX-2 Palm User’s Guide
2. Information on ASA Product Support
3. About CX-2 Palm, to include software version number and contact information.

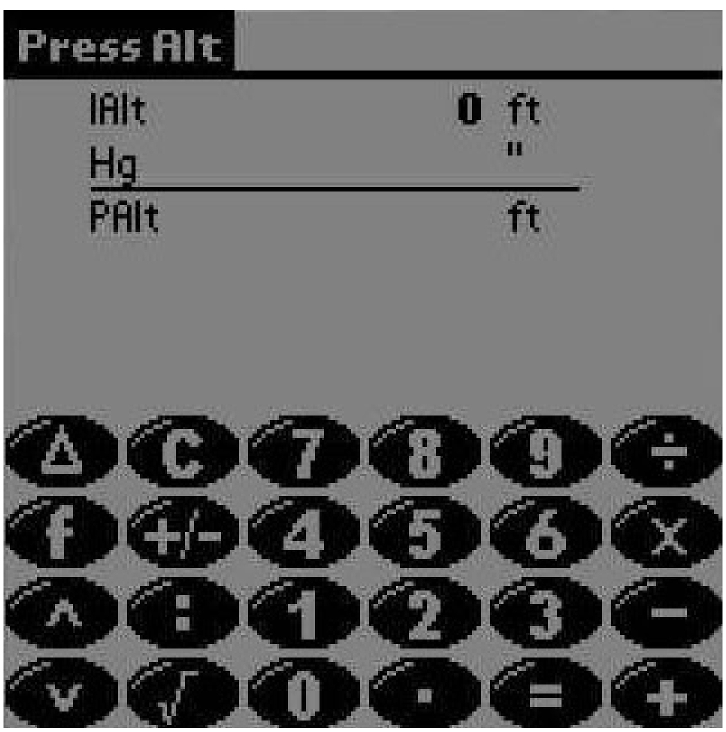

Figure 3: *CX-2 Palm keypad*

KEYPAD

The CX-2 Palm’s simple “keypad” was made possible because of the sophisticated menu structure and flexibility of the Palm technology.

Δ Provides access to the available conversions. After selecting a number, you can select the conversion menu and choose a unit of measure.

C Clears current input line. In calculator mode, clears the math completely.

f Selects the Function menu, providing access to all functions, calculator, clock, and timers.

+/- Changes sign (positive or negative) of current input line.

^ v

: Separates hours from minutes and minutes from seconds on time inputs. For example, 2 hours, 38 minutes and 45 seconds will display as 02:38:45.

_

Used to navigate about the sceen within a calculation (to move from one input/output line to another).

√ Activates the square root function.

÷ x – + Standard arithmetic operators.

0 1 2 3 4 5 6 7 8 9 Keys for selecting numbers.

. Decimal point.

= Completes the calculation.

Most keypad characters can also be entered with their corresponding Grafitti symbols. For example, you can clear the active field both by pressing the **C** key on the keypad and by using Grafitti shortcut for the letter **C** in the Grafitti silkscreen area.

CONVERSIONS

Often it is necessary to convert from one unit of measurement to another. The CX-2 Palm has 18 conversion functions that are activated by selecting the Δ, followed by one of the conversion relationships. Once a unit is selected, the CX-2 Palm will return to the previous menu and place the computed value in the active field. Select **Cancel** to return to the previous menu without executing a conversion calculation.

Nautical to Statute, Statute to Nautical

Many of the aviation functions of the CX-2 Palm require distance inputs in nautical miles or speed inputs in knots (nautical miles per hour). Many aircraft, especially older ones, have their airspeed indicators and flight manual set up for statute miles. The CX-2 Palm allows you to convert to nautical easily. For example, to convert 180 MPH to knots, enter:
180 Δ and select “SM to NM”
You will get an answer of 156.4157 knots.

The CX-2 Palm converts nautical to statute miles in much the same way. To convert 200 knots to MPH, enter:
200 Δ and select “SM to NM”
You will get a result of 230.1559 MPH.

Nautical to Kilometers, Kilometers to Nautical

These reciprocal conversions are performed in the same way as for

nautical and statute. To convert 100 KM to nautical miles, enter:
100 Δ and select "KM to NM"
You will get 53.99568 NM.

To convert 200 knots to KPH (kilometers per hour), enter:
200 Δ and select "NM to KM"
The answer is 370.4 KPH.

Kilometers to Statute, Statute to Kilometers

These reciprocal conversions are performed in the same way as for nautical to kilometers. To convert 10 kilometers to statute miles, enter:
10 Δ and select "KM to SM"
The answer is 6.213712 SM.

To convert 55 MPH to KPH, enter:
55 Δ and select "SM to KM"
The answer is 88.51392 KPH.

Feet to Meters, Meters to Feet

To convert 100 meters to feet, enter:
100 Δ and select "M to FT"
The answer is 328.084 feet.

To convert 10,000 feet to meters, enter:
10000 Δ and select "FT to M"
The answer is 3,048 meters.

Pounds to Kilograms, Kilograms to Pounds

To convert 2,000 pounds to kilograms, enter:
2000 Δ and select "LB to KG"
The answer is 907.1847 kilograms.

To convert 160 KG to pounds, enter:
160 Δ and select "KG to LB"
The answer is 352.7396 pounds.

Gallons to Liters, Liters to Gallons

To convert 50 gallons to liters, enter:
50 Δ and select "GAL to L"
The answer is 189.2706 liters.

To convert 100 liters to gallons, enter:
100 Δ and select "L to GAL"
The answer is 26.4172 gallons.

H.h to HH:MM:SS, HH:MM:SS to H.h

The CX-2 Palm can display time in two formats: hours, minutes and seconds separated by colons (HH:MM:SS), or hours only (H.h, e.g., 2 hours, 30 minutes is displayed as 2.5 hours), and it can convert from one mode of display to the other.

Start by entering 2 hours, 30 minutes and 30 seconds. Clear the display, if necessary, by selecting **C**. Next, enter:
2 : 30 : 30
The display will be 02:30:30.
Add 30 seconds to the display by entering:
+ 0 : 0 : 30 =
The display will be 02:31:00. The HH:MM:SS display can be easily converted to an H.h format. To convert the 02:31:00 in the current display, key in:
Δ and select "HMS to H"
The display will be 2.516667 hours.

The maximum time in HH:MM:SS mode is 99:59:59. For times greater than 99:59:59, the screen will display **E**. Time entries of 100 or more hours must be made in the H.h format.

Assume you plan to fly 63 nautical miles at a ground speed of 120 knots and need to calculate the time required. The formula is:
Distance ÷ Speed = Time
Enter:
63 ÷ 120 =
This is 0.525 hours. To convert to HH:MM:SS, key in:
Δ and select "H to HMS"
The display will be 00:31:30.
Note: This calculation and conversion may be performed automatically by the "Leg Time" function in the Plan Leg menu.

Fahrenheit to Celsius, Celsius to Fahrenheit

To convert 59° Fahrenheit to its Celsius equivalent, enter:
59 Δ and select "F to C"
The answer is 15°C.

To convert -20° Celsius to Fahrenheit, enter:
20 +/- Δ and select "C to F"
The answer is -4°F.

Millibars to Inches, Inches to Millibars

To convert 970 mb pressure to inches of mercury, enter:
970 Δ and select "MB to IN"
The answer is 28.64408 inches.

To convert 29.78 inches of mercury to mb, enter:
29.78 Δ and select "IN to MB"
The answer is 1008.467 mb

MENU SYSTEM

The CX-2 Palm menu system is organized to reflect the natural order of flight. Simply work through the menus in sequential order as you complete your flight plan.* An upside-down triangle indicates a pull-down menu, from which you may choose the specific function. Use the **f** key to return to the main menu at any time. You can go directly to the Wt/Bal, Calculator, and Clock menus by selecting the hot keys of the same name (at the bottom of the Flight Function menu). You can reach any CX-2 Palm function with a maximum of 3 taps.

The CX-2 Palm will prompt you for the inputs, and the answers will display below the line. The formulas used for these functions require that inputs for speed be made in knots, temperature in degrees Celsius, altitude in feet, and time in the hours:minutes:seconds format. Fuel is displayed as Xph, where X can be gallons, liters, or pounds as long as the same unit is used for the Rate and Fuel. The CX-2 Palm will convert any headings exceeding 360 to remain within 360°. For example, if you

* See Appendix C for a quick guide to names and abbreviations of the various functions.

enter 390 for any heading, the CX-2 Palm will change this to 30 once you leave this input line. All math and conversion functions can be carried out on any input line. You may convert an output (answer) through the calculator mode.

The CX-2 Palm remembers the most recent display of variables, whether it was an input or an answer. The CX-2 Palm will offer these again for any subsequent function requiring the same variables for a solution. This allows for “chains” of problems, where a value that is an answer in one function will be automatically entered as input in a succeeding function. If a function is repeated, any and all input lines will be re-entered automatically. This allows you to repeat a calculation where only one or two inputs are changed, with a minimum of effort. You may delete the inputs to be changed by pressing **C** or simply typing in replacement numbers. Reinstall the CX-2 Palm software to reset all variables to zero.

The numbers displayed as inputs are the numbers used in the calculations. The CX-2 Palm will round each input variable to a number of decimal places appropriate for the variable. Similarly, each function output variable is also rounded to a number of decimal places appropriate for the variable. This rounding procedure means the display will always be accurate for the numbers displayed, will keep numbers manageable, yet allows for precise answers.

CALCULATOR

Standard mathematics is conventional in the CX-2 Palm. The computer performs the four standard arithmetic operations (addition, subtraction, multiplication and division), as well as the square root function. It will accept input numbers up to a maximum of 7 digits and dispay results with a maximum of 8 digits with a floating decimal point and a minus sign. The sign of any number can be changed with the +/- button.

With the CX-2 Palm in Calculator mode (from any menu screen, press the **f** key followed by the Calculator button), add the numbers 123 and 456 by entering:
123 + 456 =
The number 579 will be displayed. Now press +/- to change the number to:
-579
As a final step, multiply -579 by 6.5 by keying in:
X 6.5 =
resulting in the answer:
-3763.5

Refer to Appendix A for additional practice problems.

FLIGHT FUNCTIONS

Altitude

Press Alt

In aviation calculations, air pressure is normally specified by an altitude in a standard atmosphere, instead of pounds per square inch or inches of mercury. The altitude corresponding to a given pressure is called the pressure altitude (PAlt). An aviation altimeter displays PAlt when the altimeter setting window is adjusted to the standard atmospheric pressure at sea level, 29.92" Hg. PAlt is required to calculate true airspeed (TAS) and density altitude (DAlt).

The Press Alt function calculates PAlt, given the indicated altitude (IAlt) and altimeter setting (Hg) obtained from the automated flight service station (AFSS) or Air Traffic Control (ATC). An altimeter adjusted to this setting will indicate the altitude of the airfield when the aircraft is on the ground.

Problem: You are planning to fly at 4,500 feet IAlt and the current altimeter setting is 30.15" Hg. What PAlt should you use to calculate the TAS?
Solution: Press the **f** key. Select the Altitude submenu. Select the Press Alt function. The Press Alt function will position the curser for you to enter IAlt. Enter:
4500 [down arrow]
The curser will then be positioned to enter the altimeter setting Hg. Enter:
30.15 [down arrow]
The display will show 4,288 feet PAlt.

Problem: What is the PAlt at an airport with a field elevation of 5,900 feet and a 29.75" Hg altimeter setting?
Solution: Select the Press Alt function and enter 5900 for IAlt and 29.75 for Hg. The display will show 6,058 feet PAlt.

Density Alt

In aviation calculations, air density is normally specified by an altitude in a standard atmosphere, instead of pounds per cubic foot. The altitude corresponding to a given density is called the density altitude (DAlt). The Density Alt function computes DAlt based on PAlt and the outside air temperature (OAT).

Problem: What is the DAlt at an airport with a field elevation of 5,900, 29.75" Hg altimeter setting, and 75°F OAT?
Solution: First, calculate PAlt as shown in the previous problem. Press the **f** key to return to the Flight menu. Select Altitude then Density Alt. The Density Alt function will automatically display 6,058 feet PAlt, just computed. Enter [down arrow] to accept this input. Next you are prompted for the OAT in degrees Celsius. Enter:
75 Δ and select “F to C”
to enter 75° Fahrenheit, convert to Celsius, and enter the result as the OAT input. Press the down arrow. The display will show 23.89°C OAT and 8,426 feet DAlt.

Std Atmos

Since air pressure and air density are specified by an altitude in a standard atmosphere, you may want to find the standard atmosphere for a given altitude. The International Civil Aviation Organization (ICAO) has established standard conditions for temperature and pressure. You can enter an altitude (Alt) in the Std Atmos function and obtain OAT in Celsius; pressure in inches of mercury (Hg); and pressure in millibars (mb) for the standard atmosphere. The Std Atmos function is valid up to 200,000 feet.

Problem: What are the standard atmospheric conditions at sea level?
Solution: Press the **f** key. Select the Altitude submenu then select the Std Atmos line. You are prompted for the altitude. Enter:
0 [down arrow]
to enter 0 feet, or sea level. The display will show 15.00°C OAT, 29.92" Hg, and 1013.3 mb.

Problem: What are the standard atmospheric conditions at 20,000 feet?
Solution: Select the Std Atmos function. You are prompted for the altitude. Enter:
20000 [down arrow]
to enter 20,000 feet. The display will show -24.62°C OAT, 13.75", and 465.6 mb.

Cloud Base

The Cloud Base function computes the altitude of the cloud base above ground level (AGL). The function prompts for the dew point and OAT at the airfield, both in degrees Celsius. If you want the elevation of the cloud base above mean sea level (MSL), you must add the elevation of the airfield to the result from the Cloud Base function.

Problem: At approximately what altitude above the surface can the pilot expect the base of cumuliform clouds if the surface air temperature is 82°F and the dew point is 38°F?
Solution: Press the **f** key. Select the Altitude submenu and then select the Cloud Base line. You are prompted for the OAT. Enter:
82 Δ and select "F to C"
to convert 82°F to Celsius. Press the down arrow key. You are then prompted for dew point (Dewp). Press:
38 Δ and select "F to C" and then press the down arrow key.
The answer is 10,002 feet AGL.

Airspeed

The difference between Plan and Actual TAS and Mach number is in the temperature input. Plan airspeeds require the use of OAT, obtainable from the preflight weather briefing or from what you read on a thermometer on the ground. Actual airspeeds require the use of total air temperature (TAT), which is obtained by a probe having velocity with respect to the air (essentially, the thermometer in your aircraft). TAT is warmer than OAT, because of kinetic heating due to compression on the upstream side of the probe. Since the "Act" airspeed functions use a correction for temperature rise, and "Plan" airspeed functions do not, it is important to use the function appropriate to the type of temperature available. As a general rule, use "Plan" airspeeds for preflight planning, where OAT is available during ground operations, and use "Act" airspeeds for in-flight calculations, where TAT is available.

Plan TAS

The Plan TAS function computes the true airspeed (TAS) for a planned calibrated airspeed (CAS). The inputs to this function are Planned CAS, OAT, and PAlt.

It is important to use the OAT and PAlt at the planned flight altitude. OAT may be obtained from winds aloft forecasts. OAT can also be determined from the TAT during flight as described in the Act TAS function. PAlt is normally obtained from the Press Alt function. The Plan TAS function calculates TAS, TAT (which can be used as a cross-check with the in-flight TAT), and Mach Number (MACH).

Problem: You plan to fly 125 knots CAS, 8,500 feet PAlt, and -5°C OAT. Compute TAS and TAT.
Solution: Press the **f** key. Select the Airspeed submenu and then the Plan TAS function. Enter:
125 [down arrow]
to enter 125 knots for the planned CAS. Enter:
5 +/- [down arrow]
to enter -5°C OAT. Enter:
8500 [down arrow]
to enter 8,500 feet PAlt. The display will show 141.0 kts TAS, -2.38°C TAT, and 0.2210 MACH.

Act TAS

The Act TAS function computes true airspeed using information from instruments during an actual flight. The inputs to this function are CAS, TAT, and PAlt. The Act TAS function calculates TAS, OAT (which can be used as an input to Plan TAS and Req CAS functions), and Mach Number (MACH).

Problem: Compute the TAS at 6,500 feet PAlt, +10°C TAT, at a CAS of 150 MPH.
Solution: Press the **f** key. Select the Airspeed submenu then select the Act TAS function. The function will prompt for the CAS in knots. Enter:
150 Δ and select "SM to NM"
to enter 150 MPH; convert from statute miles per hour to nautical miles per hour, and enter the result 130.3 kts CAS. Use the down arrow key then press:
10 [down arrow] then 6500 [down arrow]
to enter 10°C TAT and 6,500 feet PAlt. The display will show 144.8 kts TAS, 7.24°C OAT, and 0.2218 MACH.

Req CAS

The Req CAS function computes the calibrated airspeed required to achieve a given true airspeed. The inputs to this function are TAS, OAT, and PAlt. The Req CAS function calculates CAS, TAT, and MACH.

Problem: What is the required CAS or MACH to obtain 150 knots TAS with 6,500 feet PAlt and -5°C OAT?
Solution: Press the **f** key. Select the Airspeed submenu then the Req CAS function, enter:
150 [down arrow]
to enter 150 knots TAS, then:
5 +/- [down arrow]
to enter -5°C OAT, and enter:
6500 [down arrow]
to enter 6,500 feet PAlt. The display will show 138.1 kts CAS, -2.04°C TAT, and 0.2351 MACH.

Plan MACH#

The Plan MACH# function computes true airspeed for a planned MACH. The inputs to this function are Planned MACH and OAT.

It is important to use the OAT at the planned flight altitude. The Plan MACH# function computes TAS, and TAT (to be used as a cross-check against the in-flight TAT).

Problem: Compute TAS for 0.72 MACH and -35°C OAT.
Solution: Press the **f** key. Select the Airspeed submenu then the Plan Mach# function and enter:
.72 [down arrow]
to enter 0.72 MACH. Next, enter:
35 +/- [down arrow]
to enter -35°C OAT. The display will now show 433.0 kts TAS and -10.31°C TAT.

Act MACH#

The Act MACH# function computes true airspeed using information from instruments during an actual flight. The inputs to this function are Actual MACH, and TAT. The Act MACH# function calculates TAS, and OAT.

Problem: Compute the TAS given 0.82 MACH with -20°C TAT.
Solution: Press the **f** key. Select the Airspeed submenu then the Act MACH# function and enter:
.82 [down arrow]
to enter 0.82 MACH. Next, press:
20 +/- [down arrow]
to enter -20°C OAT. The display will show 477.3 kts TAS and -50.01°C OAT.

Fuel

Fuel Burn

The Fuel Burn function calculates the amount of fuel (Fuel) consumed over a specified time Duration (Dur) at a specified rate (Rate).

Problem: How much fuel will burn in 1 hour, 14 minutes, and 38 seconds at a rate of 9.5 gallons per hour?
Solution: Press the **f** key. Select the Fuel submenu then the Fuel Burn function, and press:
1 : 14 : 38 [down arrow]
to enter 1:14:38 Dur, and then:
9.5 [down arrow]
to enter 9.5 Xph Rate. The display will show 11.8X Fuel. The unit X can be gallons, liters, or pounds as long as the same unit is used for the Rate and Fuel. In this problem, the rate was 9.5 gallons per hour so the answer is 11.8 gallons.

Fuel Rate

The Fuel Rate function calculates the fuel rate (Rate) from the amount of fuel (Fuel) consumed over a given time duration (Dur).

Problem: What is rate of fuel consumption if 9,500 pounds of fuel were burned in the last 2 hours, 30 minutes?
Solution: Press the **f** key. Select the Fuel submenu then the Fuel Rate function and press:
2 : 30 [down arrow]
to enter 2:30 Dur, and then:
9500 [down arrow]
to enter 9,500X Fuel. The display will show a 3,800 Xph Rate. Since the amount of fuel was given in pounds, the answer is in pounds per hour.

Endurance

The Endurance function calculates the duration of time (Dur) a specified amount of fuel (Fuel) will be consumed at a specified rate (Rate).

Problem: How much flight time do you have with 38 gallons of fuel on board, and a power setting that gives a fuel burn rate of 9.5 gallons per hour?
Solution: Press the **f** key. Select the Fuel submenu then select the Endurance function. Press:
38 [down arrow]
to enter 38X Fuel, and
9.5 [down arrow]
to enter 9.5 Xph Rate. The display will now show 4:00:00 Dur. (4:00:00 is 4 hours, 0 minutes, 0 seconds.) The units for Fuel and Rate must match. In this problem, Fuel was in gallons and Rate was in gallons per hour.

Plan Leg

Hdg/GS

The Hdg/GS function computes the true heading (THdg) required to maintain a desired true course (TCrs), given the TAS and wind conditions. The inputs to this function are TCrs, TAS, wind direction (WDir), and wind speed (WSpd). The outputs are THdg, and GS.

Problem: What is the THdg given a 155° TCrs, 125 kts TAS, with winds of 350° WDir and 15 kts WSpd?
Solution: Press the **f** key. Select the Plan Leg submenu then select the Hdg/GS function and press:
155 [down arrow]
to enter 155° TCrs, then press:
125 [down arrow]
to enter 125 kts TAS, then:
350 [down arrow]
to enter 350° WDir, and:
15 [down arrow]
to enter 15 kts WSpd.
The display will show 153.2° THdg and 139.4 kts GS.

Hdg/TAS

Occasionally it is necessary to arrive at a checkpoint at a specific time. To do this, the GS must be precisely controlled and the wind conditions will dictate the required TAS. The Hdg/TAS function computes the TAS and THdg required to maintain a desired TCrs given the GS and wind conditions. The inputs to this function are TCrs, GS, WDir, and WSpd. The outputs are THdg and TAS.

Problem: Determine the THdg and TAS to maintain a ground speed of 143 knots while flying on a true course of 010°. The winds aloft forecast indicates winds of 250° at 25 knots at cruise altitude.
Solution: Press the **f** key. Select the Plan Leg submenu then select the Hdg/TAS function and press:
10 [down arrow]
to enter 10° TCrs,
143 [down arrow]
to enter 143 kts GS, then press:
250 [down arrow]
to enter 250° WDir, and:
25 [down arrow]
to enter 25 kts WSpd. The display will show 0.6° THdg and 132.3 kts TAS. You should fly a heading of 001° at 132 knots.

Compass Hdg

This function is used to account for the inherent inaccuracies of the compass, caused by the difference between the direction indicated by the magnetic compass and the true north pole (magnetic variation), as well as magnetic disturbances within the aircraft (deviation). The inputs to this function are THdg, magnetic variation (Var), and deviation (Dev). The output is the compass heading (CHdg).

Problem: What is the compass heading for a flight on a true heading of 203°, where the compass deviation card indicates a 4° compass deviation and the sectional chart indicates the flight will have a 4° westerly variation?
Solution: Press the **f** key. Select the Plan Leg submenu then select the Compass Hdg function. Press:
203 [down arrow]
to enter the true heading, then:
4 [down arrow]
to enter the westerly variation (east is least, west is best: enter a positive number for a westerly variation and a negative number for an easterly variation), and press:
4 [down arrow]
to enter the deviation. The display will show 211.0° for the CHdg.

Leg Time

The Leg Time function computes the time duration of a leg given its distance (Dist) and ground speed (GS). In most cases, GS comes from the Hdg/GS function.

Problem: Compute the time required to fly 153 nautical miles at a ground speed of 123 knots.
Solution: Press the **f** key. Select the Plan Leg submenu then select the Leg Time function. Press:
153 [down arrow]
to enter 153 NM Dist, then:
123 [down arrow]
to enter 123 kts GS. The display will show 01:14:38 Dur.

ETA

The ETA function computes the estimated time of arrival (ETA), given the departure time (Dep) and flight duration (Dur). Typically, Dur comes from the Leg Time function.

Problem: What is your ETA if you plan to depart at 9:30 a.m., for a 2.5 hour flight?
Solution: Press the **f** key. Select the Plan Leg submenu then select the ETA function and press:
9 : 30 [down arrow]
to enter your departure time, then:
2.5 Δ and select "H to HMS" [down arrow]
to first convert your 2.5 hour flight to the HH:MM:SS format, and enter the 2 hour, 30 minute flight. The display will show 12:00:00 as the ETA. Remember, you may use the calculator on each input line, so you could add all your legs to find the ETA for your total flight.

To/From

The To/From function converts a course from (From) a location into the course to (To) the same location along the same radial, providing the reciprocal of any number.

Problem: What is the course TO the VORTAC if you are on the 150° radial?
Solution: Press the **f** key. Select the Plan Leg submenu then select the To/From function and press:
150 [down arrow]
The display will show 330° as the course FROM the station.

Act Leg

Dist Flown

The Dist Flown function computes how far you will fly (or have flown) given a ground speed and flight duration.

Problem: How far will you fly in 24 minutes at an average speed of 130 knots?
Solution: Press the **f** key. Select the Act Leg submenu then select the Dist Flown function and press:
0 : 24 [down arrow]
to enter 00:24:00 Dur. Next, press:
130 [down arrow]
to enter 130 kts GS. The display will now show 52.0 NM Dist.

GS

The GS function computes ground speed given a distance (Dist) and flight duration (Dur).

Problem: What is the ground speed if 5 nautical miles are flown in 2 minutes, 32 seconds?
Solution: Press the **f** key. Select the Act Leg submenu then select the GS function. Press:
0 : 2 : 32 [down arrow]
to enter 00:02:32 Dur, and press:
5 [down arrow]
to enter 5 NM Dist. The display will show 118.4 kts GS.

Unknown Wind

The Unknown Wind function allows you to compute the wind direction and speed during a flight. The inputs to this function are THdg, GS, TCrs, and TAS, and the outputs are WDir and WSpd.

Problem: Find the wind direction and speed given 350° THdg, 478 kts GS, 355° TCrs, and 500 kts TAS.
Solution: Press the **f** key. Select the Act Leg submenu then select the Unknown Wind function and press:
350 [down arrow]
to enter 350° THdg,
478 [down arrow]
to enter 478 kts GS,
355 [down arrow]
to enter 355° TCrs, and
500 [down arrow]
to enter 500 kts TAS. The display will show 289.8° WDir and 48.0 kts WSpd.

X/H-Wind

The X/H-Wind function computes the head- or tailwind component and the left or right crosswind component for a given wind and runway. The wind speed must be in knots. Since runways are numbered by their magnetic course, the wind direction must be magnetic as well (predicted winds aloft are given in true, rather than magnetic orientation, while airport wind advisories and runway headings are both magnetic). The runway number must be entered — not the course. The inputs are WDir, WSpd, and runway (RnWy) — it must be the runway number, not the heading. For example, runway 27 (not 270), and runway 9 (not 90). The outputs are crosswind (XWnd) — negative is a left crosswind, positive is a right crosswind; headwind (HWnd) — negative is a headwind, positive is a tailwind.

Problem: Assume a wind of 350° at 10 knots. What are the head/tailwind and crosswind components for a landing on runway 03?
Solution: Press the **f** key. Select the Act Leg submenu then select the X/H-Wind function and press:
350 [down arrow]
10 [down arrow]
3 [down arrow]
to enter the WDir, WSpd, and RnWy. The answer will be -6.4 XWnd (the negative sign indicates a left crosswind) and -7.7 HWnd (the negative sign indicates a headwind).

Gliding

Glide Dist

Glide Dist computes the horizontal distance (DIST) in nautical miles, given the glide ratio (RAT) and descent (DESC) in feet.

Problem: An aircraft has a best glide ratio of 30:1. What is the maximum number of nautical miles traveled while losing 2,000 feet?
Solution: Press the **f** key. Select the Gliding submenu then the Glide Dist function, then press:
2000 [down arrow]
30 [down arrow]
to enter the glide descent altitude and ratio. The answer is a distance of 9.9 NM.

Glide Desc

Glide Desc computes descent (DESC) in feet, given the glide ratio and horizontal distance in nautical miles.

Problem: How many feet will an aircraft sink in 15 nautical miles if the lift/drag ratio is 22:1?
Solution: Press the **f** key. Select the Gliding submenu then the Glide Desc function, then press:
15 [down arrow]
22 [down arrow]
to enter the glide distance and ratio. The answer is 4,143 feet.

Glide Ratio

Glide Ratio computes the glide ratio (RAT) given the horizontal distance in nautical miles and the descent in feet.

Problem: An aircraft has lost 2,000 feet in 9 nautical miles. What is the glide ratio for the aircraft?
Solution: Press the **f** key. Select the Gliding submenu then the Glide Ratio function, then press:
9 [down arrow]
2000 [down arrow]
for the gliding distance and altitude. The answer is a glide ratio of 27:1.

WT/BAL

The CX-2 Palm performs all of the calculations necessary for proper aircraft loading. First, define the number of entries and the moment reduction factor (#Items, RF). Then enter 2 variables for each item: weight, arm, or moment. The CX-2 Palm will automatically calculate the third variable. The gross weight and center of gravity (Totals) will be totaled with each entry. To display the Wt/Bal totals, tap the **Totals** button. You may enter up to 20 items for any given problem.

Standard weights used in aviation include:
AvGas . . . . .6 lbs/gal
Jet fuel . . . . .6.84 lbs/gal
Oil . . . . .7.5 lbs/gal
(Remember: there are 4 quarts in a gallon)

Problem: Find the gross weight (GW) and center of gravity (CG), given:

1. Aircraft empty weight, 1,495 lbs weight, 151,593 lb-in moment
2. Pilot and passengers, 380 lbs, 64" arm
3. Rear-seat passenger, 150 lbs, 75" arm
4. Fuel, 180 lbs, 96" arm

Solution: Press the **f** key and select the Wt/Bal button.

1. Define the number of items, using the pull-down menu on the upper left of the keypad. This step does not involve any calculations but is required to begin each weight and balance problem. This is where you define the parameters for the totals (weight, moment, and CG). For this problem, choose 4. Define the reduction factor (RF), using the pull-down menu on the upper right of the keypad. Reduction factors are used with aircraft that generate large moments for the purpose of keeping the numbers a manageable size. It does not affect the arms or weights involved in the calculation. An RF of 100 means each moment is divided by 100 before the calculator displays it or the operator enters it; this will be taken into account when the total and CG are computed. Use an RF of 1 for this problem, which means the moment entries will be taken at face value.
2. Enter the information for the first item (highlight any given field and then enter the data): Press 1495, for the weight, and 151593 for the moment. As soon as you move to a different field, the CX-2 Palm will automatically calculate the arm for Item 101.40".

3. Enter the data for Item 2. Press 380 for the weight and 64 for the arm. This results in a moment of 24,320.00 lb-in. Enter data for Item 3. Press 10 for weight and 75 for arm. This results in a moment of 11,250.00 lb-in. Enter the data for Item 4. Press 180 for weight and 96 for arm. This results in a moment of 17,280.00 lb-in and again returns the cursor to the top of the screen.
4. Press the Totals button in the upper right corner. This screen displays output only, accounting for the inputs for all the items. For this problem, the outputs are:

   #Items 4
   RF 1
   Wt . . . . .2,205 lbs
   Mom . . . . . .204,443 lb-in
   CG . . . . .92.72"

Click OK and you will return to the Wt/Bal table.

Problem: Given the information from the previous problem, find the GW and CG if a 150-lb passenger exits the aircraft, and 50 lbs of fuel is added.
Solution: Press **f**, followed by the Wt/Bal button. The #Items and RF is not changing.

1. Highlight the item you are changing: the 380 wt for Item 2. Press -150= to find the new passenger weight (230 lbs). As soon as you move to a different field, the new moment for this item is calculated to be 14,720.00 lb-in.
2. To change the fuel load, highlight 150 (weight for Item 4). Press +50= to find the new fuel weight (230 lbs). As soon as you move to a different field, a new moment for this item is calculated to be 22,080.00 lb-in.
3. Press the Totals buttons. This screen will display output only, accounting for the weight/load changes:

   #Items 4
   RF 1
   Wt . . . . .2,105 lbs
   Mom . . . . . .199,643 lb-in
   CG . . . . .94.84"

Problem: Continuing from the previous problems, now assume the 150-lb passenger moves to the front seat. Calculate the GW and CG given this weight shift.
Solution: Press **f**, followed by the Wt/Bal button. The #Items and RF is not changing.

1. To change the passenger load, highlight 230 (Weight for Item 2) to define which item you are changing. Press +150= to find the new passenger weight (380 lbs). Once you move to a different field, a new moment for this item is calculated to be 24,320.00 lb-in.
2. To change the rear-seat load, highlight 150 (weight for Item 3). Press -150= to find the new passenger weight (0 lbs). Once you move to a different field, a new moment for this item is calculated to be 0 lb-in.
3. Press the Totals button. This screen will display output only, accounting for the weight/load changes:

   #Items 4
   RF 1
   Wt . . . . .2,105 lbs
   Mom . . . . . .197,993 lb-in
   CG . . . . .94.06"

To calculate %MAC, choose the %MAC from the Wt/Bal pull-down menu. Large aircraft operations often require the CG be expressed as a percent of the mean aerodynamic chord (%MAC). This function calculates the %MAC given the CG, the length of the mean aerodynamic chord (MAC), and the leading edge of the mean aerodynamic chord (LMAC).

Problem: Determine the CG in percent of MAC given.

MAC . . . . 860.2 to 1040.9
CG . . . . .910.2"
LMAC . . . . 860.2"

Solution: Press **f**, followed by the Wt/Bal button and select the %MAC function from the pull-down menu (tap CX-2 Palm: Wt/Bal on the black bar at the top, select Wt/Bal, then tap %MAC). 1,040.9 - 860.2 = for the MAC, 910.2 for CG, and 860.2 for LMAC to find 27.7% for the CG in %MAC.

CLOCK

The CX-2 Palm clock displays the time set in the desktop Palm application. The CX-2 Palm displays a single clock representing Coordinated Universal Time (UTC), also known as Greenwich Mean Time (GMT) or Zulu Time. The CX-2 Palm displays both UTC and local time in a 24-hour format. Set the local time through your normal means on your Palm desktop. Use the pull-down menu to set the UTC clock. Tables 1 and 2 show the numbers of the time zones to specify when setting clock information. Once you select a time zone, the UTC time will adjust to reflect that zone, given the local time.

You can convert time using the Calculator.

Problem: The local time is 9:15 in the Eastern daylight region. What is the time in UTC?
Solution: Press **f**, then the Calculator button. Press 9 : 15 : + 19 : = to convert local to UTC (28:15:00). Press -24 : = to return the answer to a 24-hour clock format: 04:15:00.

Problem: You are currently flying in Mountain Standard time, the arrival airport is in the Central Standard zone. Convert your Mountain-time ETA of 16:30 to the local time:
Solution: Press **f**, then the Calculator button (or **C** to clear the screen if you are already at the Calculator). Press 16 : 30 + 1 : = to convert mountain to central (17:30:00), since there is only a 1-hour difference between the two zones.

TIMER

The CX-2 Palm has two timers: a stopwatch that counts up, and a count down timer. The stopwatch can be used to keep track of elapsed time or to determine the time required to fly a known distance. The count down timer can be used as a reminder to switch fuel tanks or to determine the missed approach point on a nonprecision instrument approach.

Stopwatch

The Stopwatch will count from zero to 99:59:59. Press **f** then use the pull-down menu next to “Timers” and select Stopwatch.

1. Press Start to start the Stopwatch.
2. Press Stop to stop the Stopwatch. If you then press Start, the stopwatch will begin again from where it left off.
3. Press Reset to return the Stopwatch to 00:00:00. Press Start to begin the stopwatch again.

Count Down

The count down will run from any preset value (as high as 99:59:59) down to zero. Press **f** then use the pull-down menu next to “Timers” and select Countdown.

1. Select Set. Highlight each field and use the up/down arrow keys on the right side of the screen to select the value you want to begin the count down from. Press OK when you are done establishing the time. Press Run for the count down timer to start running.
2. Use the Stop key to stop the timer at any time.
3. The timer will continue counting down after zero is reached. In this case, a negative sign will precede the time.
4. Place a checkmark in the box if you want to enable the sound alarm. The timer will appear to stop when the sound is playing, then “speed up” once the alarm ceases. This is the result of the Palm technology—the count down remains accurate during this time (and will not display this anomaly when the sound is turned off).
5. Press Back to return to the Flight menu.

Table 1. *United States standard UTC time zones*

Eastern Standard Time	19
Central Standard Time	18
Mountain Standard Time	17
Pacific Standard Time	16

Note: add 1 hour for daylight time.

Table 2. *Worldwide time zones*

Input	Location
0	(GMT) Casablanca, Monrovia, Dublin, Edinburgh, Lisbon, London
1	Amsterdam, Berlin, Bern, Rome, Stockholm, Vienna, Belgrade, Bratislava, Budapest, Ljublijana, Prague, Brussels, Copenhagen, Madrid, Paris, Vilnius, Sarajevo, Skopje, Sofija, Warsaw, Zagreb
2	Athens, Istanbul, Minsk, Bucharest, Cairo, Harare, Pretoria, Helsinki, Riga, Tallinn, Israel
3	Baghdad, Kuwait, Riyadh, Moscow, St. Petersburg, Volgograd, Nairobi
3.5	Tehran
4	Abu Dhabi, Muscat, Baku, Tbilisi
4.5	Kabul
5	Ekaterinburg, Islamabad, Karachi, Tashkent
5.5	Bombay, Calcutta, Madras, New Delhi
6	Almaty, Dhaka, Colombo
7	Bangkok, Hanoi, Jakorta
8	Beijing, Chongqing, Hong Kong, Urumqi, Perth, Singapore,Teipei
9	Osaka, Sapporo, Tokyo, Seoul, Yakutsk
9.5	Adelaide, Darwin
10	Brisbane, Canberra, Melbourne, Sydney, Guam, Port Moresby, Hobart, Vladivostok
11	Magadan, Solomon Is., New Caledonia
12	Auckland, Wellington, Fiji, Kamchatka, Marshall Is., Eniwetok, Kwajalein
13	Midway Island, Samoa
14	Hawaii
15	Alaska
16	Pacific Time (U.S., Canada), Tijuana
17	Arizona, Mountain Time (U.S., Canada)
18	Central Time (U.S., Canada), Mexico City, Tegucigalpa, Saskatchewan
19	Bogota, Lima, Quito, Eastern Time (U.S., Canada), Indiana
20	Atlantic Time (Canada), Caracas, LaPaz
20.5	Newfoundland
21	Brasilia, Buenos Aires, Georgetown
22	Mid-Atlantic
23	Azores, Cape Verde Is.

APPENDIX A: Sample Problems

Problems *Solutions*

Math Review

(2 + 63) · 3 = ______________________ 195
17 ÷ 6 = ______________________ 2.833333
5 – 12.5° = ______________________ -7.5

Time

2:30:00 + 00:37:30 = ______________ 03:07:30
8:30:00 – 5:15:00 = ______________ 03:15:00

Conversions

52 SM =	________	NM	45.18676
175 MPH =	________	NM	152.0708
600 KTS =	________	MPH	690.4677
600 KTS =	________	KPH	1,111.2
200 MPH =	________	KMH	321.8688
11,000 Meters =	________	Feet	36,089.24
5,280 Feet =	________	Meters	1,609.344
0°F =	________	°C	-17.77778
20°C =	________	°F	68
-40°F =	________	°C	-40
200 Gal =	________	Liters	757.0824
500 Liters =	________	Gal	132.086
120 lb =	________	kg	54.43108
90 kg =	________	lb	198.416
29.92 in =	________	mb	1,013.208
1,016.6 mb =	________	in	30.02018

Altitude

Press Alt
Determine the pressure altitude with an indicated altitude of 1,380 feet MSL with an altimeter setting of 28.22 at standard temperature.
2,990 ft

Density Alt
Determine the density altitude for these conditions: altimeter setting 29.25, runway temperature 81°F, airport elevation 5,250 ft MSL.
8,563 ft

Std Atmos
The maximum temperature limitation for takeoff is International Standard Atmosphere (ISA) +34°C. Which is the highest temperature that will allow a takeoff from a 7,000-foot pressure altitude airport?
95.234°F

Cloud Base
At approximately what altitude above the surface would the pilot expect the base of cumuliform clouds if the surface temp. is 82°F and the dew point is 38°F? 10,002 ft

Airspeed

Plan TAS
What is your plan true airspeed given the following conditions: pressure altitude 35,000 feet, OAT -55°C, CAS 285 kts?
TAS 480.3 kts, TAT -24.62°C, MACH 0.8345

Act TAS
What is your actual true airspeed with a total air temperature of 0°C, CAS 150 knots, and pressure altitude 25,000?
TAS 234.1 kts, OAT -7.22°C, MACH 0.3684

ReqCAS
What is the required calibrated airspeed with the TAS 145 knots, OAT 45°F, and pressure altitude 3,000?
CAS 139.3 kts, TAT 9.99°C, MACH 0.2222

Plan MACH#
What is the true airspeed at OAT -40°C and MACH .72?
TAS 428.4 kts, TAT -15.83°C

Act MACH#
What is the true airspeed at TAT °C -17° and MACH .84?
TAS 490.4 kts, OAT -48.68°C

Fuel

Fuel Burn
How much fuel will burn if you fly 02:45:00, at a fuel rate of 17.8 gal/hr?
48.9 gal

Fuel Rate
What is the fuel rate if you burn 35 gallons in 1.2 hours?
29.2 gal/hr

Endurance
What is the endurance if you burn 9,500 lbs at a rate of 1,500 lbs/hr?
06:20:00

Plan Leg

Hdg/GS
What is your true heading and ground speed given the following conditions: Wind 330° at 16 knots, course 165°, and TAS 145?
THdg 166.6°, GS 160.4 kts

Hdg/TAS
What is your heading and TAS given the winds 250° at 20 knots, a course of 210°, and ground speed of 180 knots?
TAS 195.7 kts, Hdg 213.8°

Compass Hdg
What is the compass heading given a true heading of 203°, 5° westerly variation, and 4° deviation?
CHdg 212.0°

Leg Time
What is the estimated time enroute for a distance of 75 KM, at a ground speed of 115 MPH?
Dur 00:24:19

ETA
What is the estimated time of arrival for a trip departing at 10:00, with a leg time of 33 minutes?
ETA 10:33:00

To/From
A CDI is centered with the OBS set to 210° with a TO indication. What radial is the aircraft crossing?
To 30.0°

Act Leg

Dist Flown
How far have you traveled if you have a 138-knot ground speed, and have been flying for 40 minutes?
Dist 92.0 NM

GS
What is your ground speed if you traveled 10 NM in 00:01:22?

GS 439.0 kts

Unknown Wind
What are the winds aloft if you are flying a 222° heading for a 215° course, with a TAS of 145 knots, and ground speed of 159.4 knots?

WDir 346.2°, WSpd 23.5 kts

X/H-Wind
The winds are at 280° at 12 knots, and you are landing on runway 32. What will the headwind/crosswind component be on landing?

XWnd -7.7 (Left), HWnd -9.2 (Headwind)

Gliding

Glide Dist
A glider has a best glide ratio of 27:1. How many nautical miles can it travel while losing 2,000 feet?

8.9 NM

Glide Desc
How many feet will a sailplane sink in 10 NM if its lift/drag ratio is 30:1?

2,025 ft

Glide Ratio
A sailplane has lost 4,100 feet in 15 NM; therefore, glide ratio for this aircraft is approximately _________.

Rat 22:1

Wt/Bal

What is the CG and gross weight for the following conditions? (Use an RF of 1):

	WT	Arm
EW	1,830	41.8
Front Seats	290	35.5
Rear Seat	85	70.7
Bags	100	95.5
Fuel (75 gal)	450	48.59

Answer: #Items 5, RF 1, Wt 2,755 lbs, Mom 124,214 lb-in, CG 45.09"

What is the CG and gross weight for the following conditions? (Use an RF of 1,000):

	WT	Mom/1000
Empty Wt	88,350	80486.8
Fwd Pass.	3,280	1570
Aft Pass.	7,140	6631.6
Fwd Cargo	2,200	1278
Aft Cargo	4,450	4744
Fuel Tank #1	12,000	10770
Fuel Tank #3	12,000	10770
Fuel Tank #2	12,000	9793

Answer: #Items 8, RF 1,000, Wt 141,420 lbs, Mom 126,043 lb-in, CG 891.27"

% MAC

What is the CG in %MAC given following conditions:

MAC . . . . .180.7"
CG . . . . .891.27"
LMAC 860.2

Answer: %MAC 17.2%

APPENDIX B:

Product Support

ASA offers a variety of support options to help you get the most from your ASA product. If you have a question about your ASA product:

1. Look in the product documentation.
2. Review the FAQs on ASA's website.
3. If you cannot find the answer, contact ASA Technical Support at (800) 272-2359 or (425) 235-1500 or via email: support@asa2fly.com.

Visit the ASA website often — this is our way of keeping you informed of updates to the program. As with all products, we appreciate your feedback. Let us know what features you like, what features you'd like to see in future versions, and what we can improve upon to better meet your needs. Write, fax, or e-mail:

Fax 425-235-0128
E-mail support@asa2fly.com
Mail ASA, Inc. 7005 132nd Place SE, Newcastle, WA 98059-3153

Contact ASA through the Internet
ASA Product Support is available through the ASA website: www.asa2fly.com

Call ASA Product Support
ASA Product Support is available between 8:00 a.m. and 5:00 p.m. Pacific Time, Monday through Friday. For assistance with ASA's CX-2 Palm, dial (425) 235-1500.

Before you call ASA Product Support, be at your computer and have the product documentation at hand. Be prepared to give the following information:

- The version of ASA's CX-2 Palm you are using
- The type of hardware you are using
- The exact wording of any messages that appeared on your screen
- A description of what happened and what you were doing when the problem occurred
- How you tried to solve the problem

Product Support is subject to ASA prices, terms, and conditions in effect at the time the service is used.

Limited Warranty

Aviation Supplies & Academics, Inc. (ASA) warrants CX-2 Palm, (that, if) when properly installed and operated on a computer for which it is designed, the program will perform substantially in accordance with the accompanying written materials for a period of 45 days from the date of purchase. ASA warrants CX-2 Palm to be free from defects in materials and workmanship under normal use. This Limited Warranty is void if failure of the software has resulted from accident, abuse, or misapplication. ASA will replace the software with the same version once the entire package (CD, manual, packaging) is received by ASA during the warranty period. All returns shall be sent to ASA, Software Warranty, 7005 132nd Place SE, Newcastle, Washington 98059-3153. ASA cannot accept responsibility for lost or damaged parcels.

ASA License Agreement

By installing the software, you indicate your acceptance of the following ASA License Agreement. If you do not agree to the terms of this agreement, promptly return the complete product with the CD packet unopened to your place of purchase.

1. You may use this program on a single computer limited to a single user.
2. The software is owned by Aviation Supplies & Academics, Inc. (ASA) and is protected by United States copyright laws and international treaty provisions. Therefore, the software may not be copied except to transfer the software to a single hard disk provided you keep the original for backup or archival purposes only.
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4. In no event shall Aviation Supplies & Academics, Inc. (ASA) be responsible for any indirect, special, incidental, consequential or similar damages or lost data or profits. The purchaser is entitled to the benefit of the warranties provided by this license and warranty agreement only if the enclosed product registration card is completed and returned to ASA within 30 days of purchase. You agree to the Limited Warranty stated in this Quick Start Guide.
5. This license shall remain in effect until terminated as set forth in the Agreement. You agree that this Agreement will be governed by the laws of the State of Washington.

Please contact ASA if you have any questions concerning this Agreement. Write to:

Aviation Supplies & Academics, Inc.
7005 132nd Place SE
Newcastle, Washington 98059-3153

Purchase Date: ________________________________

APPENDIX C: Abbreviations Guide

Act . . . . .actual
CAS . . . . .calibrated airspeed
CG . . . . .center of gravity
Compass Hdg (CHdg) . . . . .compass heading
Density Alt (DAlt) . . . . .density altitude
Dep . . . . .departure time
Desc . . . . .descent
Dev . . . . .deviation
Dist Flown . . . . .distance flown
Dur . . . . .duration
ETA . . . . .estimate time of arrival
Glide Desc . . . . .glide descent
Glide Dist . . . . .gliding distance
GMT . . . . .Greenwich Mean Time
GS . . . . .ground speed
GW . . . . .gross weight
Hdg . . . . .heading
HWnd . . . . .headwind
IAlt . . . . .indicated altitude
#Items/RF . . . . .number of entries/reduction factor
LMAC . . . . .leading edge MAC
MAC . . . . .mean aerodynamic chord
MACH . . . . .Mach number
OAT . . . . .outside air temperature
Plan . . . . .planned
Press Alt (PAlt) . . . . .pressure altitude
ReqCAS . . . . .required CAS
RnWy . . . . .runway
Std Atmos . . . . .standard atmosphere
TAS . . . . .true airspeed
TAT . . . . .total air temperature
TCrs . . . . .true course
THdg . . . . .true heading
UTC . . . . .Universal Coordinated Time
Var . . . . .magnetic variation
WDir . . . . .wind direction
WSpd . . . . .wind speed
Wt/Arm . . . . .weight/arm
WT/BAL . . . . .weight and balance
Wt/Mom . . . . .weight/moment
X/H-Wind . . . . .crosswind, head- or tailwind component
XWnd . . . . .crosswind

INDEX