



Kestrel[®]

Pocket Weather[®] Tracker
with **HORUS[®]** Atrag[™] Ballistics Software

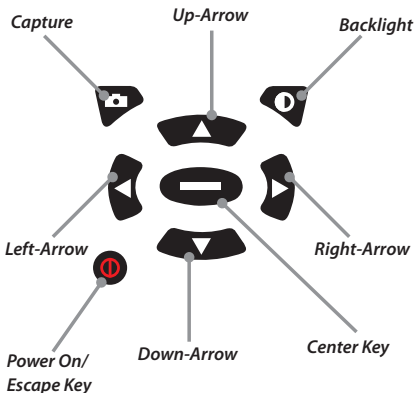
Instruction Manual For:
**Kestrel[®] Pocket Weather[®] Tracker with
Horus[®] ATRAG[™] Ballistic Calculator**



Made in the USA 


BASIC NAVIGATION

The Kestrel has seven navigation keys:





QUICK TIPS:

Compass must be calibrated in order for directional features to work in Horus mode, and it can only be calibrated in Weather mode.

Pressing  will allow you to exit out of a particular screen.

When a ballistics parameter is underlined, this means that the value is unable to be changed manually on the current screen either because it is a calculated value or one determined by the sensors.

Press and hold  for 2 seconds will power down the Kestrel regardless of current screen.

Press  twice in rapid succession to instantly change between Weather mode and Horus mode.

Any changes in information are automatically saved upon exiting the current screen. There are 3 exceptions to this rule where an "accept" screen appears upon exiting: the Target Range estimator, the Target Speed estimator, and the Drop Truing screen.


GETTING STARTED WITH KESTREL ATRAG BALLISTICS

The three main data input groups are gun, target and environment. The aiming solutions for Elevation, Windage, and Coriolis are displayed on the Main Horus screen.


1. Gun Information

GUN	▶ <u>Laru308</u>
MV	2550fps
BC	0.470
BW	175gr
BD	0.308in
ZR	100m
BH	2.50in
RT	11.00in
RTd	Right
Click	1/mil
True Drop	
Delete this gun	

2. Target

TARGET	
Active	Yes
TR	1000
DoF	000"
<u>Ide9</u>	0"
Icos	1.000"
TS	0mph
TD	L-R
WD	12oc
WS1	5mph
WS2	10mph

A box indicates amount of data shown on display.

Data below box indicates additional information available by pressing .

3. Environment



ENVIRONMENT	
Auto	No
Lat	42°F
Temp	75°F
SP	29.48inHg
RH	50%
Dalt	1729ft
Coriol	Yes
Wdir	Onetgt

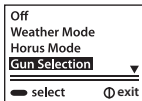
These three main data groups determine an accurate firing solution. The first step in getting a firing solution is selecting your gun.


GUN SELECTION

The Gun Selection screen allows you to choose a preconfigured gun or build your own. You may create and store up to 9 user-created guns. A user-created gun is defined as a gun that has been modified for one or more parameter values of the New Gun or any of the library guns.




When a New Gun is modified, the name instantly changes to UserGunX (where X is a number suffix to ensure the name is unique). If a library gun (whose name ends in a letter) is modified, a number will appear at the end to create a unique name. If a library gun (whose name ends in a number) is modified, a letter will appear at the end to create a unique name.

- Turn on the unit. From the Main Horus screen, press  to access the Main Setup Menu.
- Press  to highlight "Gun Selection."




- Press  to enter Gun Selection Screen. Here, you may choose a preconfigured gun or build your own.

To Choose a Preconfigured Gun:

- Press  or  to scroll through the different guns.
- Press  to turn your selected gun "on" or "off". "On" means the gun is available to be selected in Horus mode. "Off" means the gun is not available to be selected. For example, setting multiple guns to "On" allows you to quickly switch gun configurations without going back to the Main Setup Menu.

Gun select	11
▶Laru308	On
▶User Gun2	On
▶User Gun	Off
▶300WinMag2	Off



- When the desired gun is highlighted, press  to enter the Gun Information screen.

To Build A Gun:

You can build and name your gun on the gun selection screen.







- Use  to highlight New Gun and press .

Gun select	11
▶MaruGun308	On
▶AR15a	On
▶300WinMag1	Off
▶New Gun	Off

- This will take you to the gun information screen where you may adjust all gun parameters. Press up or down to highlight the gun parameters.
- Use  and  to adjust each value.

- To name your gun, scroll up to highlight “Gun” and press .

GUN	New Gun
MV	2900fps
BC	0.533
BW	190gr
BD	0.308in

- You will see a cursor appear under the first letter of New Gun. Use the  and  buttons to scroll through the alphabet and numbers 0-9 and several symbols. Pressing  inserts a space between characters. You can choose between upper and lowercase letters.
- Once you're on the desired letter, use  to move the cursor to the next space in the gun name. Continue until the gun name is complete.
- When gun name is complete, press  button to save. (Gun will also automatically save upon exiting screen.)
- Press  to will exit from the current screen.






Gun Library

There is room in the Kestrel for up to 50 library guns. Several library guns are pre-programmed in each Kestrel, but this can be modified by building a new gun library on a computer using the Horus Gun Library software, and downloading the new gun library to the Kestrel (either via Bluetooth connection or the Kestrel wired interface). Downloading a new gun library will automatically overwrite the previous library guns in the Kestrel (but not any user-created guns).

GUN INFORMATION SCREEN






Once you have selected your gun. You're now ready to enter or modify all relevant parameters pertaining to the set-up

of your rifle. These parameters include muzzle velocity, ballistic coefficient, bullet weight, bullet diameter, zero range, bore height, rifle twist, rifle twist direction, and sight adjustment (click).

- On the Gun Information screen, press up or down to highlight the gun parameters.
- Use  and  to adjust the value.
- Press  to enter the highlighted parameter's screen. Here you are also able to adjust the parameter's value as well as the unit of measure. (For example, meters per second to feet per second.)
- On the Gun Information screen, you also have the option to delete the gun by highlighting “Delete this Gun” and pressing the  button.
- Press  to exit to Main Horus screen once all values are correct.

See below for more information on Muzzle Velocity and Ballistic Coefficient.

Muzzle Velocity

- Use  and  to highlight “MV”.
- Press  to enter MV screen.
- Use  and  to adjust the value.

Notes on Muzzle Velocity

- When a bullet is in the transonic range, a small dot will appear to the left of the muzzle velocity value (figure 1).
- When a bullet is in the subsonic range a larger dot will appear to the left of the muzzle velocity value. (figure 2)

GUN	▶ Laru308
MV	•1360fps
BC	0.470
BW	175gr
BD	0.308in



Figure 1




GUN	▶ Laru308
MV	•1103fps
BC	0.470
BW	175gr
BD	0.308in

Figure 2


- In cases where the bullet is supersonic, there are no dots next to the muzzle velocity value.

MV-Temp Table

This allows you to enter and maintain a table of muzzle velocities based on temperature. If an entry is input into the table, the muzzle velocity is applied at all temperatures (this means that the value is then locked and cannot be altered by using  and  on the gun information screen) If two or more entries are input into the table, the Kestrel uses the linear interpolation and the temperature sensor to determine the appropriate muzzle velocity (Note: this value will only change if the temperature changes and you exit and re-enter the gun information screen; once a muzzle velocity value is entered for a particular temperature, you can not make another muzzle velocity value for the same temperature.)

- To access MV-Temp table, scroll to MV (Muzzle Velocity) to highlight it and press , then use  to scroll to MV-Temp and press  to enter.

Muzzle velocity	
MV	2900fps
feet per sec	
MV-Temp	

- Press  while "New entry" is highlighted to enter the Table Item screen.












- Use  or  to scroll to "Temp" and "MV". Use  and  to adjust each value.

Table item	
Temp	10°F
MV	2900fps
Clear	

- To clear a Table Item, scroll down to Clear and press .
- Press  to exit to return to the Gun Information screen.

BC-Dist Table

This allows you to enter and maintain a table of ballistic coefficients based on distance. If only one entry is input into the table, the ballistic coefficient is applied at all distances (this means that the value is locked and cannot be altered by using  and  on the gun screen). If two or more entries are input into the table, the Kestrel uses the linear interpolation and the target range to determine the appropriate ballistic coefficient (Notes: this value will only change if the target range changes; once a ballistic coefficient value is entered for a particular distance, you cannot make another ballistic coefficient value for the same distance.)

- To access the BC-Dist table, scroll to BC (Ballistic Coefficient) to highlight it and press , then use  to scroll to BC-Dist and press  to enter.

Ballistic coeff	
BC	0.533
BC-Dist	

- Use and to scroll to any existing parameters. Use and to adjust each value.
- To add a new entry, highlight "New Entry" and press .
- Use and to scroll to "Dist" and "BC". Use and to adjust each value.
- To clear a Table Item, scroll down to Clear and press .
- Press to exit to return to the Gun Information screen.

Table item	
Dist	0m
BC	0
Clear	

TARGET SCREEN:

You can customize up to five targets for location, distance, direction, declination, and wind.

- From the Main Horus screen, use or to highlight "Tgt" and press to enter the Target screen.

TARGET		A
Active	Yes	
TR	998m	
DoF	000°	
Ide9	0°	

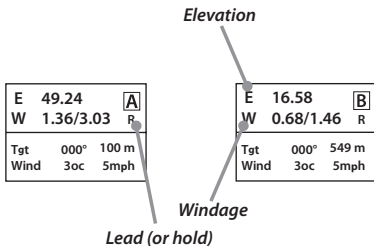
- Use up and down to highlight a parameter.
- Use and to adjust values for each parameter.
- Press to enter the highlighted parameter's screen. Here you are able to adjust the parameter values as well as the unit of measure. (For example, yards to meters.)

Multiple Targets

- You may create up to 5 targets (A-E) by using until "Target" is highlighted and then pressing or to move on to the next target. After changing targets the parameters can be changed by repeating the steps outlined above.

Active

- The "Active" status of Target A defaults to "Yes" because the Kestrel must have at least one active target at all times.
- To make a target active, on the Target screen use or to highlight "Active" and use or to change to "Yes." To make a target inactive, use or to change to "No".
- Setting a target's "Active" status to "Yes" allows you to view the firing solution for that target on the Main Horus screen.
- If multiple targets are active, you can use or to scroll between all active targets (and their respective firing solutions) on the Main Horus screen.



Target A is the current active target.

Target B is the current active target

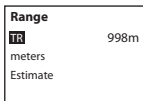
Target Range

- Use or to highlight "TR".
- Use and to adjust the value.

Target Range Estimator

This function estimates the range of a target based on size, image and calculated range.

- When "TR" is highlighted, press button to enter Range screen.



- Use to highlight "Estimate" and press to enter Range Estimate screen.
- Use or to highlight a parameter.

- Use and to adjust values for each parameter.
- When all parameters are set, press to escape.
- An "Accept" screen will appear, scroll to "Yes" if you would like to accept values. Use to select the highlighted option.

Wind Direction & Wind Speed

There are two wind speed measurements on the target screen (WS1 and WS2) for minimum and maximum wind speed as well as wind direction (WD). You have the option to manually adjust the wind speed and wind direction values or use the capture feature to automatically get a reading.

Manual mode

- Use or to highlight "WD", "WS1", or "WS2".
- Use and to adjust values for each parameter.

Capture mode

- In the Target screen, press to enter into either the "WD", "WS1", or "WS2" screen.
- Press to enter into the capture mode.
- Face the back of the Kestrel directly into the wind and press to start and stop the capture mode.



- The data collected in capture mode will automatically adjust the “WD”, “WS1”, and “WS2” values in the Target screen.

***Note:** *WS1 can never be greater than WS2 value. The WS2 value will automatically adjust to ensure that this remains true.*

Direction of Fire

Direction of Fire (DoF) is an absolute frame of reference to true north. The value is the direction the gun barrel is pointing with respect to the values on a compass. Direction of Fire can be manually adjusted or obtained using the “capture” feature.

Manual mode

- Use or to ensure that “DoF” is highlighted.
- Use and to adjust the value.

Capture mode

- When “DoF” is highlighted, press to enter the DoF screen.
- Use to scroll to “Capture”.
- Press to enter into the capture mode.
- Face the back of the Kestrel directly toward the target and press .
- The data collected in capture mode will automatically adjust the DoF value in the Target screen.

Inclination Angle

Inclination angle is the angle between the target and the horizontal as seen by the shooter. This variable is expressed in the Target screen as “ldeg” or “lcos” where ldeg is in degrees, and lcos is the cosine angle. These can be manually adjusted by highlighting one and using the and to

change the value. Changing one will automatically change the other appropriately.

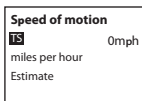
Target Speed

- Use or to highlight “TS”.
- Use and to adjust the value.

Target Speed Estimator

This function estimates the speed of a target based on range, movement, and time.

- When “TS” is highlighted, press button to enter Speed of Motion screen.





- Use to highlight “Estimate” and press to enter Speed Estimate screen.
- Use or to highlight a parameter.
- Use and to adjust values for each parameter.
- When all parameters are set, press to escape.
- An “Accept” screen will appear, scroll to “Yes” if you would like to accept values. Use to select the highlighted option.

Target Direction





- Use to highlight “TD”.
- Use and to adjust “L-R” (left to right) or “R-L” (right to left).

* For information on "True Drop", please see page 19.

ENVIRONMENT SCREEN:

The Environment screen contains all atmospheric parameters such as temperature, station pressure, and relative humidity. Setting the "Auto" parameter to "Yes" automatically imports the Kestrel's sensor data into the Environment screen. The "Auto" parameter can also be set to "Manual" when it is highlighted by using  or  while in the Manual setting the temperature (Temp), station pressure (SP), and relative humidity (RH) can be manually adjusted.

ENVIRONMENT	
Auto	No
Lat	42° N
Temp	75° F
SP	29.48inHg

- Use  or  to highlight a parameter.
- Use  and  to adjust the values for each parameter.





Coriolis will default to "Yes" unless you manually change it to "No". While it's on the "Yes" setting, this means that coriolis is taken into account for the ballistics solutions.


Density altitude will automatically adjust according to the adjustment of the relevant environmental parameters. This parameter cannot be manually changed because it is a calculated value.


***Note:** station pressure ("SP") is pressure reading is unadjusted for sea level. Sometimes this is mistakenly called barometric pressure in ballistics software. Barometric pressure is a pressure reading adjusted for sea level. When shooting, station pressure is required. Station pressure can be measured with the Kestrel by setting the reference altitude to zero on the Barometric Pressure screen in weather mode.

RANGE CARD SCREEN

The Range Card screen shows detailed information about the ballistic solution at various ranges that apply to the currently selected target and gun. The screen displays three columns comprised of the Range (in the left column) and two other variables. The other variables that can be displayed are ballistics solutions based on "Wnd1"; "Wnd2"; "Lead"; "Elev"; or further information on bullet flight characteristics such as remaining velocity ("RemV"); remaining energy ("RemE"); time of flight ("ToF"); and maximum ordinate, or height above the line of sight to the target ("MaxO"). Please see Page 26 for a sample Range Card.





- Use  or  to scroll to a particular range.
- Use  and  to scroll across and view all available parameters.

RANGE CARD 		
Rng	Elev	Wnd1
300	5.50	L0.13
400	9.42	L0.19
500	14.06	L0.27

RANGE CARD 		
Rng	Lead	RemV
300	0.00	1991
400	0.00	1823
500	0.00	1666

Example of "Rng" column remaining fixed while 2 other columns can be changed.

Range Increment

- Use  while in the Range Card to enter the Range Settings screen.
- Use  and  to adjust the range increment to the desired value. You may adjust the increments to show in 10, 20, 25, 50 or 100 units of measure (yards or meters).
- Press  to exit "Range Increment" screen.



Note: The Range Card will display range values up to 4000 yards, or the closest equivalent in meters, depending on the range increment.





Remaining Velocity

- A small dot will appear to the left of the muzzle velocity value to indicate the bullet is in the transonic range.
- A larger dot will appear to the left of the muzzle velocity value to indicate the bullet is in the subsonic range.

RANGE CARD A		
Rng	RemV	RemE
800	-1272	629
900	+1177	538
1000	+1101	471

BALLISTICS SCREEN

The Ballistics screen displays complete information about the ballistic solution that pertains to the currently selected target and gun. The only parameter whose value can be altered in this screen is the "Range" (this can be done by using  and  to adjust the value).

- Use  or  to scroll to a particular parameter.
- Use  to enter into a parameter screen for further information about it or change unit of measure.
- Use  to return to the Ballistics screen.

Note: An R or an L will appear beside each solution to indicate which side of the target you should aim.






ATrag Signature Feature

TRUE DROP

In an ideal world, shooters would go into the field knowing exactly how their chosen combination of gun and ammuni-

tion will perform, calculated ballistic solutions would always be correct, and a properly delivered shot would always hit the target. In the real world, ballistic data is often imperfect, and even well delivered shots often miss.


The best way to deal with this is to allow ballistic parameters to be adjusted to reflect what is actually observed. When this is done correctly, overall accuracy can be significantly enhanced. The Horus Kestrel includes a Drop Truing screen to support this valuable function.



- When all parameters are set, press  to escape.
- On the Gun screen, use  to highlight the "True drop" item
- Press  to enter the Drop truing screen.
- In the Drop Truing Screen, use  or  to highlight the parameter you wish to change.
- The parameters that can be adjusted are "BC" (ballistic coefficient), "MV" (muzzle velocity), or "Range".
- This adjustment is made so that the calculated elevation correction matches what is actually observed.

QUICK KEYS: DIRECTION OF FIRE & WIND SPEED

The Direction of Fire (DoF) and Wind Speed (WS1 & WS2) Quick Key feature allows you to quickly and easily change the values of these parameters from the Main Horus screen without entering into the Target screen. It minimizes the number of button presses and time by instantly capturing these values from one screen- the Main Horus screen.




Direction of Fire Quick Key

- Pressing the  button while Tgt is highlighted will enter the DoF setting mode.

- The Tgt heading will change to  to indicate the setting mode.
- The direction will be continuously updated on the target line.
- Pressing the  button again will capture the current direction as DoF.
- The Tgt heading will return to its normal state.

Note: *If the compass is not calibrated, a new screen will pop up to alert you that capture won't work until compass is calibrated.*

Wind Speed Quick Key

- Pressing the  button while Wind is highlighted will enter the Wind setting mode.
- The Wind heading will change to  to indicate the setting mode.
- The moving 5-second average for windage and wind speed will be continuously updated on the wind line.
- The moving 5-second average for wind solution will be continuously updated.
- Pressing the  button again will capture the current wind speed.
- The Wind heading will return to its normal state.
- The Wind line will show the captured relative wind direction and wind speed.

Note: *If the compass is not calibrated, a new screen will pop up to alert you that capture mode won't work until compass is calibrated.*

GLOSSARY OF TERMS

Active gun: When a gun is made active, ballistic solutions for that gun pertaining to all active targets are readily displayed. Ballistic solutions for guns that are inactive are not displayed.

Aiming/Ballistic solution: This consists of sight corrections for windage, elevation (and in the case of a moving target, lead) for a selected active gun and target, along with other calculated values such as bullet velocity and energy. On the main Horus screen, only elevation and windage are displayed. On the Range Card and Ballistic Info screens, detailed ballistic solution data is available.

Subsonic: The speed at which the bullet is slower than the speed of sound. Bullet velocities in this range will be displayed with a large dot to the left of the value.

Target: A target is characterized by its direction, range, inclination angle, and applicable wind; a moving target has a direction and speed of motion. Targets are identified by a single letter: up to five can be described, designated by the letters A through E. It's important to note that wind is specific to a target – each active target has its own wind specification.

Transonic: The speed at which the bullet slows to the speed of sound. This is also seen as the boundary between supersonic and subsonic. Bullet velocities in this range will be displayed with a small dot to the left of the value.

BALLISTIC & ENVIRONMENTAL QUICK REFERENCE

Target Screen

- Active** – tells whether this target is currently active
- TR** – target range
- DoF** – direction of fire (relative to true north)
- Ideg** – inclination angle (negative means the target is below the shooter)
- Icos** – inclination cosine (cosine of the inclination angle)
- TS** – target speed
- TD** – target direction of movement
- WD** – current wind direction (direction from which wind is blowing, relative to DoF)
- WS1** – typical current wind speed
- WS2** – maximum current wind speed

Gun Screen

- MV** – muzzle velocity
- BC** – bullet ballistic coefficient
- BW** – bullet weight
- BD** – bullet diameter
- ZR** – zero range
- BH** – bore height
- RT** – rifling twist rate (distance in which bullet achieves 360 degrees of rotation)
- RTd** – rifling twist direction (right = clockwise from the shooter's perspective)
- Click** – assigns an angular value to sight clicks

Environment Screen

- Auto** – controls whether values for temperature, barometric pressure, and relative humidity are obtained automatically (from the Kestrel's weather-meter functions) or are manually set by the user.
- Lat** – allows the user to specify the latitude (north or

south of the equator) that will be used when calculating Coriolis corrections.

- Temp** – temperature
- SP** – station pressure (actual pressure at the gun's location)
- RH** – relative humidity
- Dalt** – density altitude (calculated from pressure, temperature & humidity)
- Coriol** – controls whether Coriolis corrections are included in ballistic calculations.
- Wind** – controls whether wind direction is controlled manually or automatically.

Range Card Screen

- Elev** – the elevation sight correction
- Wndg** – the windage sight correction based on WS1 (see Target screen, above)
- Wdg2** – the windage sight correction based on WS2 (see Target screen, above)
- Lead** – the lead sight correction (for a moving target)
- RemV** – the downrange bullet velocity
- RemE** – the downrange bullet energy
- ToF** – the bullet's time of flight
- MaxO** – the bullet's maximum ordinate (height above the line of sight to the target)

Ballistics Data Screen

- Range** – the range for which the ballistic solution is calculated
- Elev** – elevation correction
- Wndg** – windage correction (based on WS1)
- Wdg2** – windage correction (based on WS2)
- Lead** – lead correction, based on specified target motion
- vCori** – vertical Coriolis correction
- hCori** – horizontal Coriolis correction
- Drift** – bullet drift correction

RemV – remaining velocity

RemE – remaining energy

ToF – time of flight

MaxO – maximum ordinate (highest point the bullet reaches in flight)

Drop – total drop distance

Rtrns – range at which transonic velocity transition begins

Rt 75% – distance at which a bullet is 75% through the transonic range

Rsubs – range at which bullet velocity becomes subsonic

Range – the range at which test firing is being done

Drop – the elevation correction calculated for the specified range

BC – the ballistic coefficient used in the current elevation calculation

MV – the muzzle velocity used in the current elevation calculation

Sight Adjustments

TMOA – true minute of angle

MIL – USMC mils

Range Estimation Screen

Target – the size of the target on which estimation is based

Image – the apparent size of the target as it appears in a telescopic sight

Range – the calculated range, based on the target and image sizes

Speed Estimation Screen

Range – the range at which the speed estimation will be done

Mvmt – the apparent movement of the target as it appears in a telescopic sight

Time – the time (in seconds) during which movement was measured

Speed – the calculated speed, based on range, movement and time

True Drop Screen

Sample of full Range Card data relative to data seen on display

RANGE CARD			Wind2	Lead	RemV	RemE	ToF	MaxO
Rng	Elev	Wnd1	0.21	0.00	2355	2155	0.134	0.87
100	0.06	0.10	0.47	0.00	2169	1828	0.279	3.79
200	2.28	0.22	0.72	0.00	1991	1541	0.437	9.27
300	5.56	0.34	0.99	0.00	1823	1291	0.609	18.00
400	9.49	0.47	1.31	0.00	1666	1078	0.798	30.98
500	14.12	0.61	1.62	0.00	1520	897	1.004	48.99
600	19.33	0.75	1.96	0.00	1388	748	1.230	73.51
700	25.34	0.90	2.31	0.00	1272	629	1.477	106.0
800	32.25	1.06	2.67	0.00	1177	538	1.745	148.0
900	40.21	1.22	3.03	0.00	1101	471	2.034	201.0
1000	49.24	1.36	3.37	0.00	1042	422	2.340	266.2
1100	59.34	1.49	3.71	0.00	995	385	2.662	344.5
1200	70.40	1.63	4.04	0.00	955	354	3.000	437.3
1300	82.46	1.75	4.29	0.00	920	329	3.350	545.3
1400	95.35	1.82	4.57	0.00	888	307	3.712	667.9
1500	109.1	1.91	4.84	0.00	860	287	4.088	812.3
1600	123.7	2.00	5.00	0.00	833	269	4.477	973.9
1700	139.2	1.99	5.22	0.00	808	253	4.876	1155
1800	155.5	2.04	5.42	0.00	784	239	5.287	1359
1900	172.7	2.08	5.62	0.00	761	225	5.713	1586
2000	190.9	2.11	5.63	0.00	739	212	6.152	1839
2100	210.0	1.96	5.78	0.00	718	201	6.602	2118
2200	230.0	1.95	5.93	0.00	698	189	7.063	2424
2300	250.7	1.94	6.06	0.00	679	179	7.539	2762
2400	272.7	1.92	6.19	0.00	660	169	8.031	3134
2500	295.9	1.89	6.42	0.00	642	160	8.537	3542
2600	320.2	1.44	6.24	0.00	624	151	9.055	3985
2700	345.6	1.35	6.07	0.00	607	143	9.588	4468
2800	372.2	1.25	6.08	0.00	590	135	10.13	4990
2900	399.7	1.14	6.11	0.00	574	128	10.70	5560
3000	428.8	1.02	6.14	0.00	558	121	11.28	6182
3100	459.5	0.88	5.42	0.00	542	114	11.88	6855
3200	491.6	0.23	5.11	0.00	527	108	12.49	7581
3300	525.2	0.46	5.02	0.00	512	102	13.12	8363
3400	560.1	0.71	4.92	0.00	498	96	13.76	9206
3500	596.6	1.08	4.84	0.00	484	91	14.43	10119
3600	635.0	1.28	4.66	0.00	470	86	15.12	11110
3700	675.8	1.59						

Specifications

	Feature	Abbreviation	Units	Minimum	Maximum
Target	Active Targets	N/A	A through E	1	5
	Target Range	TR	yards	25	4000
			meters	23	3658
	Wind Direction	WD	o'clock	1	12
			degrees	0	360
	Wind Speed	WS1 or WS2	mph	0	50
			m/s	0	22
			km/h	0	80
			fps	0	73
			knots	0	43
	Direction of Fire	DoF	degrees	0	360
			o'clock	1	12
	Inclination Angle	ldeg	degrees	0	60
	Inclination Cosine	lcos	no units	1.000	0.500
	Target Speed	TS	mph	0	50
m/s			0	22	
km/h			0	80	
fps			0	73	
knots			0	43	
Target Direction of Movement	TD	Left to Right OR Right to Left			
Gun	Name Characters	N/A	0 through 9; A-Z; a-z; +/-.&* and space		
	Muzzle Velocity	MV	fps	300	4500
			m/s	91	1372
	Ballistic Coefficient	BC	no units	0.100	2.000
			grams	10	1500
	Bullet Weight	BW	grams	0.6	97.2
			inches	0.10	1.00
	Bullet Diameter	BD	mm	2.54	25.40
			yards	25	1000
	Zero Range	ZR	meters	23	914
			inches	0.10	5.00
	Bore Height	BH	cm	0.25	12.70
			inches/revolution	1.00	36.00
	Rifling Twist	RT	cm/revolution	2.54	91.44
	Twist Direction	RTd	Left OR Right		
Sight Adjustment	Click	/mil	1	10	
		/tmoa	1	10	
Temperature	Temp	degrees	905	90N	
		fahrenheit	-50	140	
		celsius	-46	60	
Station Pressure	SP	inHg	12.00	32.00	
		mb	406.4	1083.6	
		hPa	406.4	1083.6	
		psi	5.89	15.72	
Relative Humidity	RH	%	1	100	
Density Altitude (computed)	Dalt	ft	-10732	32767	
		meters	-3271	9987	
Coriolis	Coriol	Yes OR No			

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ATRAG Ballistic Calculator: Instruction
Manual v.2047**



**Kestrel® Pocket Weather® Meters are designed
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