

CHRONOTAR

CF-2 Mode

MANUAL

(PRELIMINARY RELEASE)

This is a supplement for CE Manuals.
The CF functions found in this release
of CE-2 are an experimental bonus.
CF-2 will be released in the near future.



This and other manuals are
posted on our website

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Table of contents

QUICK REFERENCE	4
Adaptive Calibration	4
Turning the unit Off	4
One Key functions	4
Two-key functions	5
Data Menu List	6
Data Menu List & Description	6
DATA menu functions	7
[AR]: System data group	7
[Sho]: Shots data group	7
[Str]: Strings data group	8
[Fol]: Folders data group	8
[DDR]: Disk data group	8
[Err]: Errors status group	8
[Con]: Communications control group	8
Stats Menu List	9
Stats Menu List & Description	9
STATS menu functions	10
[OFF]: System setup group	10
[Stat]: Statistics group	10
[Str]: Strings settings group	10
[Chr]: Chronograph settings group	10
[Un]: Units selection group	11
[Upr]: User parameters group	11
[Frr]: Test fire, load test shots group	11
KEY FUNCTIONS	12
Basic Key Functions	12
Enter key Warning	12
DATA – Key	13
Extended Data-Key functions	13
Decrement String Data-mode	13
Increment String Data-mode	14
Velocity-Temperature Data-mode flip	15
USA-Metric Data-Units flip	17
STATS – Key	21
Statistics List	21
Extended Stats Key	23
Increment String Stats-mode	23

Decrement String Stats-mode	24
USA-Metric Stats-Units flip	25
Find Low or High Data Position	25
MENU – Key	26
Data-Menu Mode	26
Stats-Menu Mode	26
ENTER – Key	27
Data Mode	27
Stats Mode	27
Data-Menu Mode	27
Stats-Menu Mode	27
Error Mode	28
Alarm Mode	28
MODE – Key, (also Up key)	29
UNITS – Key, (also Down key)	29

Quick Reference

Adaptive Calibration

This unit **must be calibrated** before you start your shooting session, light conditions have changed, or it was relocated. Calibration is done from Data Menu as follows.

Press **<DATA>** key, then **<MENU>** key to get **CAL.** menu, Now press **<ENTER>** to execute calibration. In order for the unit to accept shots you must exit **CAL.** menu by pressing either **<STATS>** key or **<DATA>** key.

When the unit is turned on it goes directly to **CAL.** menu to remind you that it needs to be calibrated.

Turning the unit Off

The unit is turned off from Stats Menu. Press **<STATS>** key then **<MENU>** key to get **OFF.** menu. Now press **<ENTER>** to execute power off, **OFF.** Next time **<POWER>** is pressed the unit turns on again. Another way to turn the unit off is to flip the unit to CE-2 mode with **<MENU>+<UNITS>** keys then press **<POWER>** key.

One Key functions

<POWER> If the unit is **off** this key turns it **on** again.

<MODE> In **Data mode** - moves to the previous shot
 In **Stats mode** - moves to the previous stats
 In **Menu mode** - move back one vertical menu

<UNITS> In **Data mode** - moves to the next shot
 In **Stats mode** - moves to the next stats
 In **Menu mode** - moves forward one vertical menu

<MENU> Starts **Stats** or **Data** menu.

<ENTER> In **Data** or **Stats** mode - displays lower digits.
 In **Menu** mode - displays value or executes function.

<STATS> Sets **Stats** mode, for **Stats** review and **Stats** menu.

<DATA> Sets **Data** mode, for **Data** review and **Data** menu.

The following functions may appear in Level-3. These are factory test functions. They will not harm user operation if executed.

CS: Factory Interface, do not use

ACC: Factory Interface, do not use

SPP: Factory Interface, do not use

Lc : Factory Interface, do not use

br : Factory Interface, do not use

L1 : Factory Interface, do not use

DATA menu functions

(X) Indicates that by pressing **<ENTER>** key you execute this function.

(D) Indicates that this is a data value. Holding down **<ENTER>** key will display current value. To change the value you hold down **<ENTER>** key and press either **<MODE>** or **<UNITS>** key. This increases or decreases the value.

CAL: System data group

CAL: (X) Start adaptive calibration.

USA: (D) Imperial units set, **on** or **OFF**.

MEC: (D) Metric units set, **on** or **OFF**.

Ar: (D) Archery mode set, **on** or **OFF**.

SCL: (D) Sensitivity level select, **01%** to **99%**, default is **35%**

CAP: (X) Non stop calibration scan, **-500** to **+500**.

CS: (D) Slow calibration set, **on** or **OFF**.

ACC: (D) Manual calibration set, **on** or **OFF**.

SPP: (D) Calibration point manually set, **0.0** to **100.0**

Sho: Shots data group

Sho: (D) Position of the next shot in the string.

CL: (X) Clear current shot as shown by the **<DATA>** key.

UNC: (X) Undo clear shot action from above.

Srn: Strings data group

Srn: (D) Display current string and number of shots are in it.

dEL: (X) Delete current string.

Und: (X) Undo delete string action. Do not undelete empty string.

Unu: (X) Restore all shots from trash bin, including bad shots.

Fol: Folders data group

Fol: (D) Display current folder and number of strings in it.

dEL: (X) Delete current folder.

Und: (X) Undo last delete action.

ddr: Disk data group

ddr: (D) Display current Disk and number of folders in it.

FdS: (X) Display free disk space in shots.

For: (X) Format current disk drive. CF-2 has only RAM drive.

Ucl: User data group

Ucl: (D) Display current Level, from **0** to **3**. Default is **2**.

bAr: (X) Display Battery voltage in real time, **5.00** to **9.50** volts.

CEL: (X) Display temperature in real time, in **Celsius**.

FAH: (X) Display temperature in real time, in **Fahrenheit**.

Err: Errors status group

Err: (X) Display last error.

Crn: (X) Display last velocity capture error number.

Crc: (X) Display number of velocity errors up to date.

CL: (X) Clear all errors and alarms.

Con: Communications control group

Con: (X) Display communications status, none for CF-2.

dlD: (X) Upload data to PC, not available in CF-2.

Lc: (X) Local or remote link, not available in CF-2.

br: (X) Byte received test, not available in CF-2.

L1: (D) Data link rate, not available in CF-2.

Units selection group

- [Unit]** (D) No action.
- [USA]** (D) Imperial units set, **on** or **OFF**.
- [MET]** (D) Metric units set, **on** or **OFF**.
- [CE]** (D) Celsius forced set, **on** or **OFF**.
- [ME]** (D) Meters forced set, **on** or **OFF**.

Alarms setup group

- [Err]** (D) Display last alarm or Error.
- [Pwr]** (D) Battery low power repeat alarms set, **on** or **OFF**.
- [Errc]** (D) Set number of velocity errors allowed, **00** to **255**.
- [Hor]** (D) Set hold errors displayed, **on** or **OFF**.

User parameters group

- [U..]** (D) Display current access level, **0** to **3**.
- [ESS]** (D) Activate Power Factor and Energy stats, **on** or **OFF**.
- [Pdc]** (D) Set power down time, **00:00** to **03:51** hours.
- [CrD]** (D) Set Fast Display mode for Calibration, **on** or **OFF**.
- [dud]** (D) Set dumb mode, **on** or **OFF**.
- [Pro]** (D) Set expert (pro) mode, **on** or **OFF**.
- [Lnu]** (D) Remember last menu entry, **on** or **OFF**.
- [dif]** (D) Differential Display mode set, **on** or **OFF** (not in CF).

Test fire, load test shots group

- [Frr]** (D) Set velocity range starting point. from **000** to **255** f/s.
- [Srn]** (X) Load current string with test shots.
- [Fol]** (X) Load the entire folder with test shots.

Key Functions

This unit has 6 keys; some keys have multiple functions when held pressed together. The display is a 4-Digits large LCD.



Basic Key Functions

These 6 keys perform a simple non-destructive operations, except when **<MENU>** key is pressed followed by the **<ENTER>** key. For more details see **Data Menu mode** and **Stats Menu mode**.

Enter key Warning

WARNING

<ENTER> key has a different function when in **Menu Mode**. Pressing **<ENTER>** key in **Menu Mode** will execute current **Data-Menu** or **Stats-Menu** command which may cause loss or change of data.

DATA – Key

When this key is pressed the unit switches to **Data Mode**. In this mode the unit remembers your last data position. You can scroll through your data in memory with **<MODE>** or **<UNITS>** keys. New shots are added automatically at the end of the string. There is an exception when circular string mode is used, see **Circular String Mode**.

When you press **<DATA>** key the display will show your current data view position. For example, if last time you were reviewing shot number **03**, then this number will be displayed while you hold **<DATA>** key down. When you let it go, actual velocity or temperature value will be displayed. If you have just fired a shot then this takes precedence over your last data pointer.

Extended Data-Key functions

<DATA> key has extended function when held pressed followed by one of the keys listed below,

- **<MENU>** Decrements string number.
- **<ENTER>** Increments string number.
- **<UNITS>** Flips units, USA to Metric or vice versa.
- **<MODE>** Flips to Temperature or Velocity.

Decrement String Data-mode

When you hold down **<DATA>** key and press **<MENU>** key, then current string number and its size is displayed.

For example, let us assume that you are working with string number **2** which has **8** shots in it. While you hold down **<MENU>** key the display will show



After you release the **<MENU>** key then it returns to normal display, which is the velocity of shot number **8**.

If you do not let go of **<DATA>** key but release and press again **<MENU>** key the string is decremented by one number. In this case it moves to string number **1**. If string number **1** had **5** shots then the display would show as follows.



Note

When **<MENU>** key is pressed the first time, it displays current string number. Subsequent pressing of **<MENU>** key decrements string number by one.

Level-0 Access

String decrement function is disabled in Level-0 Access

Expert Mode Set to On

In this mode, it is assumed you are an expert and the string is decremented immediately by one number.

Increment String Data-mode

When you hold down **<DATA>** key and press **<ENTER>** key, then current string number and its size is displayed. This works exactly like **String Decrement** as described above, except that it increments the string instead of decrementing it. This function is also disabled in **Level-0 Access**.

Velocity-Temperature Data-mode flip

When **<DATA>** key is held pressed followed by pressing **<MODE>** key, the display will show one of the following data types,

- Velocity Display mode
- Temperature Display mode

This key function flips between data types, that is, if you are viewing velocity string it will then flip to temperature string and vice versa.

Note

When **<MODE>** key is pressed the first time, it displays current data mode, which is either Velocity or Temperature. Subsequent pressing of **<MODE>** key automatically changes display mode.

Level-0 Access

Data mode change is disabled in Level-0

Expert mode Set to On

In this mode, it is assumed you are an expert therefore the data mode is flipped immediately.

Here is an example of how this is used. Let us assume that you are viewing velocity data and that your last view position was shot number **8**. Now, when you press and hold **<DATA>** key, the unit will display your current data view location with data type indicator which is as follows,



The two lower bars on each side indicate that this is a velocity data. As you hold down **<DATA>** key and press **<MODE>** key then the display will show velocity identifier as follows,



The "Cr" text signifies that this is chronograph velocity. When you let go of the **<MODE>** key then actual velocity value is displayed. Now if you press **<MODE>** key again, while still holding down **<DATA>** key, then it will switch to the next data type, in this case it would switch to Temperature data. The display will then look like this,



The "TE" text indicates that this is a Temperature String. When you release **<MODE>** key then the temperature that belongs to the shot number **8** is displayed. If you press once more **<MODE>** key then it loops back to the Velocity. If you release all keys then it will stay in the Temperature string. You can view all the statistics on Temperature equally well as you can on the Velocities.

The triple bars on each side indicate that this is a temperature mode. You can still shoot in temperature mode, the velocities are still recorded, except that instead of seeing velocities you will see the associated temperature.

Our unit records ambient temperature with each shot. The temperature and the velocity are in synch at all times. When you delete or undelete either temperature or velocity the two will always be synchronized. So when you delete one you also delete the other, the same is true when you undelete any of them.

USA-Metric Data-Units flip

When **<DATA>** key is held pressed followed by pressing **<UNITS>** key, the display will show one of the following data types,

- Feet indicator
- Meters indicator

This key function flips between measurement units. If you were using USA-units then it will switch to Metric-units and vice versa. This function is fully automatic; for example:

- If you are in **Velocity** mode then it will switch between **Feet** and **Meters**.
- If you are in **Temperature** mode then it will switch between **Fahrenheit** and **Celsius**.

The chronograph remembers the units last used for each data type. It permits mixing and matching units for either temperature or velocity. For example you may want to view Velocity in Meter/Sec but prefer Temperature in Fahrenheit.

Note

When **<UNITS>** key is pressed the first time, it displays current units used, which is either **USA** or **Metric**. Subsequent pressing of **<UNITS>** key automatically changes units.

Level-0 Access

Units change is not permitted in Level-0

Expert mode Set to On

In this mode, it is assumed you are an expert, therefore the units change immediately.

Here is an example of how this is used. Let us assume that you

are viewing velocity data and that your last view position was shot number **08** and you were using **USA** units.

Now when you press and hold **<DATA>** key the unit will display your current data view location is as follows,



The two lower bars on each side indicate that this is a velocity data mode. As you hold down **<DATA>** key and press **<UNITS>** key then the display will show current units used, in this case USA- units identifier, which is as follows (feet),



The "**_FE_**" text signifies that the units are in Feet/Sec. When you let go of the **<UNITS>** key, then the actual velocity is displayed in Feet/Sec. Now if you press **<UNITS>** key again, while still holding down **<DATA>** key, it will switch to the other units, in this case it would be Meter/Sec. The display will then look like this,



The "**_ME_**" text indicates that you are in Meter/Sec units mode. When you release **<UNITS>** key then Meters/Sec are displayed.

If you press once more the **<UNITS>** key, then it loops back to the USA-units. If you release all keys instead, then it will stay in Metric mode.

Next time you press **<UNITS>** key, the two dots on either side of number **08**, indicate that the units are metric. For example, the position of the shot number **08** will be displayed as follows,



As you have noticed all the information regarding data type and units used is displayed by the data pointer. In this case, **low-bar** and a **dot** on either side of the number.

If you are in Temperature data mode, then when you change the units, using **<DATA>** and **<UNITS>** key, the process is identical to the one described above. The only difference is that the units in consideration now will be Celsius and Fahrenheit. Indicators for temperature are as follows,

Fahrenheit indicator, 

Celsius indicator, 

In temperature mode the data view pointer will tell you what data mode you are in and what units are being used. For example if your last pointer was position **08** and you were in Temperature data mode then when you press **<DATA>** key one of the following will be displayed,

When Fahrenheit units used, 

When Celsius units used, 

The **triple bars** are a loud indicator that you are in Temperature data mode and the **double dots** indicate that you are using Celsius units (metric system).

Note

To find out what data mode you are using, and what the units are, all you have to do is press **<DATA>** key. As you hold down **<DATA>** key, the position pointer gives you **data type** and the **units** used.

When units are changed using **<DATA+UNITS>** key, this allows for a special feature called units conversion check.

This works as follows, if the chronograph has been set to work in **USA-system**, then whenever you press **<DATA+UNITS>** keys you only get one time **Metric-conversion** value. That is, all subsequent displays revert back to **USA-system**.

The same is true if the chronograph has been set to work in **Metric-system**. In that case you only get one time conversion to **USA-units**. All subsequent result then reverted back to **Metric-units**.

You do not have to be concerned about confusing the units, because the **Data** or **Stats** pointer tells you the units and the data type used.

The measurement system is selected from the **DATA Menu** command. In this menu you will find a **USA-system** select command and a **Metric-system** select command.

When both are selected, then USA takes the precedence and if none is selected then the units are in a wild card mode.

What the wild card mode means is that whatever you have chosen, using **<DATA+UNITS>** key, it stays that way. In this mode you can mix and match the units-type because the chronograph will not try to revert to any particular measurement system. The reason the unit does not revert to any system is that none have been selected.

STATS – Key

When <STATS> key is pressed the unit switches to **Statistics Mode** and it will remember your last statistics position. Stats and Data positions are independent of each other.

Note

Statistics are calculated in real time; therefore when in Stats Mode, you will see the results immediately on shot by shot basis as you shoot. Calculations have no visible delay.

Statistics List

As you press <STATS> key, <MODE> key or <UNITS> key, then a statistics identifier or a **Pointer** is displayed. When this key is released then the statistics calculation is displayed. Available statistics are listed below in the order as they would appear,

Pointer Statistics Description

	Low value , the lowest value.
	High value , the highest value.
	Average value , average value.
	Extreme Spread , highest minus lowest.
	Standard Deviation , with (n-1) population.
	Percent STD , See Percent Standard Deviation .
	Total shots , total shots in the current string.
	Power Factor , based on currently viewed shot.
	Energy , based on currently viewed shot.

Only the first 7 Stats items are accessible from Level-0.

To access  and  you must be in level 2 or higher. See Passwords in Stats Menu. Default level is 2.

When you press <STATS> key then current statistics identifier appears. For example if your last position was **Low Value** then the display will show



The two lower bars on each side indicate that you are in a Velocity mode. This number is displayed as long as you hold down <STATS> key. When you release this key then actual lowest velocity is displayed.

For example, if your lowest velocity was **135.37** then the display will show,



If you want to view the remaining low digits, which are **7**, then you press and hold down <ENTER> key.

In this example the display will show



If <UNITS> key is pressed then next stats comes up which is highest value,



You can scroll Up and Down the stats table with <MODE> and <UNITS> keys. When the top or the bottom is reached then it loops around in a circle.

Extended Stats Key

<STATS> key has extended function when held pressed followed by pressing one of the keys listed below,

- <MENU> Decrements string number.
- <ENTER> Increments string number.
- <UNITS> Flips units, USA to Metric or vice versa.
- <MODE> Flips to Temperature or Velocity.
- <DATA> Jump to Lowest or Highest Data position.

Increment String Stats-mode

When you hold <STATS> key pressed followed by pressing <ENTER> key then stats pointer and the string number is displayed as follows. For example, if the last stats viewed was **Average Value** and the string number was **03** then the display will show,



When the <ENTER> key is released, then actual average value of string number **03** is displayed.

Note

When <ENTER> key is pressed the first time, it displays current string used and stats pointer. Subsequent pressing of <ENTER> key automatically increments string number by one.

Level-0

This function is not permitted in Level-0

Expert mode On

In this mode, it is assumed you are an expert, therefore string number is incremented immediately.

This works for all statistics functions. It is easy to see how you can scroll through all the strings and compare the statistics from string to string.

This function is similar to **Increment String Stats-mode**, therefore all the rules concerning data type-used and units-used apply here as well.

For example in the case above, Metric-units and temperature data type would be identified as follows,

Velocity in Metric-units,



Temperature in Fahrenheit,



Temperature in Celsius,



Decrement String Stats-mode

When you hold down <STATS> key and press <UNITS> key then the string number is decremented. All the rules that apply to **Increment String Stats Mode** above, also apply to this function. The only difference is that the string number is decremented instead.

You can scroll back and forth throughout all the strings comparing stats results. Because we use very fast computer you will not notice any delay in Stats calculations. A resident multitasking system calculates stats results ahead of time as you scroll.

USA-Metric Stats-Units flip

When you hold down **<STATS>** key and press **<UNITS>** key, the data type is changed. If you were in Velocity display mode it will flip to Temperature display mode or vice versa.

All the rules that apply to **USA-Metric Data-Units flip** described above, also apply to this function. The only difference is that you are viewing Stats instead of Data. Please see to **USA-Metric Data-Units flip** for more details.

Find Low or High Data Position

When you hold down **<STATS>** key and press **<DATA>** key, you jump to the location of either Low or High data in the string. Models CE-2 only support **High** and **Low** position find. If you attempt this for other stats values it simply ignores the request.

For example: if the Stats is showing **Low** value,  then as you press **<DATA>** key it displays the location of the **Lowest** value in the current string. When you release this key, then it displays the actual data value. When you go back to **DATA-display** mode by pressing **<DATA>** key, then the data pointer is pointing to the Location of the Low value. This way you can locate your bad shots and delete them.

If the Stats is showing **High** value,  then as you press **<DATA>** key, it will display the location of the **High** data in the string. Also the Data view pointer is set to the location of the **High** value. You can return to **DATA-display** mode to delete the offending shot.

MENU – Key

When this key is pressed the unit goes into the **Menu Mode** and there are two possible Menu Modes,

Data-Menu Mode

If the unit was in Data Mode, that is **<DATA>** key was last pressed, then it goes into a **Data-Menu Mode**. This menu is primarily used to manipulate data in Memory, solid state Disk Drives, Communications, etc

Stats-Menu Mode

If the unit was in Stats Mode, that is **<STATS>** key was last pressed, then it goes into a **Stats-Menu mode**. This mode is for manipulating setup parameters, which is useful for customizing the unit. For more information see **Stats-Menu commands**.

The two menus consist of a group of pull down menus. You can not actually see the entire list because of the limited display size.

Once in the **Menu mode**, you can move to the next list by pressing **<MENU>** key. Once in the list, you can move up and down the list with **<MODE>** and **<UNITS>** keys. There is an undocumented function, that allows you to move backwards to the previous menu list by pressing and holding down **<MENU>** key and scrolling with **<ENTER>** key.

You exit Menu mode by pressing either **<DATA>** key of **<STATS>** key. Some menu commands may exit automatically.

Warning

When in Menu mode the chronograph is disabled. An attempt to measure velocity when in menu mode will result in lost shots. The unit does not exit menu mode automatically; you must do this yourself by pressing **<DATA>** key or **<STATS>** key.

ENTER – Key

This is a general purpose Enter key, and it has a different action depending on the mode that the unit is in. Here is a list of possible modes that affect this key,

<u>Mode</u>	<u>What Enter Key Does</u>
• Data mode	Displays the least 4 digits if present.
• Stats mode	Displays the least 4 digits if present.
• Data-Menu mode	Executes Menu command.
• Stats-Menu mode	Executes Setup command.
• Error mode	Acknowledges Current Error.
• Alarm mode	Acknowledges Current Alarm.

Data Mode

In this mode **<ENTER>** key when pressed displays the least significant four digits, These digits stay in view as long as you hold down this key, when you release it then it goes back to normal display.

Stats Mode

In this mode **<ENTER>** key has identical function as in the **Data Mode**, it displays the 4 least significant digits and in the same manner.

Data-Menu Mode

This is data management mode which is set by pressing **<MENU>** key when in **Data-Display mode**. In this mode a list of commands becomes available that are executed by pressing **<ENTER>** key. For details see **Data-Menu mode**.

Stats-Menu Mode

This is a setup management mode and is entered by pressing **<MENU>** key while in **Stats-Display mode**. In this mode you have access to all the available setup features. By pressing

<ENTER> key you execute current setup command or change current setup value. For details see **Stats-Menu mode**.

Error Mode

When an error occurs the unit goes into this mode and an error message is displayed. This message has to be acknowledged. The **<ENTER>** key is used to acknowledge these errors. There are some overriding features that turn some errors off. For details see **Error Messages**.

Alarm Mode

When an alarm occurs the unit enters into Alarm Mode and an alarm number is displayed. Alarms do not have to be acknowledged, they simply annoy you for about 1.8 seconds and then they disappear. You can get rid of this message earlier by pressing **<ENTER>** key. There are some overriding features available to turn off Alarms, see **Stats-Menu Mode**.

In **Data-Menu mode** or **Stats-Menu mode**, **<ENTER>** key has extended function when held pressed. If there are values to be set or changed then you press and hold **<ENTER>** key and use **<MODE>** and **<UNITS>** key to modify these values. This particular method of values change is cumbersome but it protects from accidental changes. In most cases when you press **<ENTER>** key you can only view the value.

Typical value changes that you may perform are,

- Flag selection, “On” or “Off”
- Data value change, such as Bullet Mass.
- Sensitivity choice 10% to 100%
- String number change
- Folder number change
- Disk drive change

For changing large numbers such as bullet mass a special feature kicks in as you hold down **<MODE>** or **<UNITS>** key. The number start to increment/decrement faster and faster. This way

you can select any number from 0.0 to 800.0 grains very quickly.
This feature is applied to all numbers that may be bigger than 10.

MODE – Key, (also Up key)

This key is used primarily as a scroll **Up** for most operations.

UNITS – Key, (also Down key)

This key is used primarily as a scroll **Down** key.