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# Key-entry Guide

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Climsoft Version 3.0

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## Introduction to Key-entry Guide

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The Key Entry facility of the Climsoft program enables you to take climatic data that has been supplied on paper forms and input the data via the keyboard into the Climsoft system. A number of quality checks will be performed automatically as you enter the data to catch obvious errors. These may be caused, for example, by mis-typing on the keyboard, misreading of the paper records, or misrecording of the original observation. If a problem is detected, the program will display a suitable message, and will give you an opportunity to correct the problem.

The data that you input will be stored in a small database called the **Temporary Work File**. This database is “temporary” in the sense that it is a holding place for data before they are transferred to the main climatic database for permanent storage. However, the contents of the Temporary Work File are preserved when you exit from the Climsoft program. When you run the program again, you can look at (and if necessary change) the records that you entered previously, and of course you can add new records. Thus you can build up the contents of the Temporary Work File over several sessions.

From time to time, the contents of the Temporary Work File can be transferred to another database, so that further consistency checks on the data can be carried out. Generally, this operation will clear the contents of the Temporary Work File.

## Data Entry Form Layout

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The Climsoft standard Data Entry forms all have a similar layout, to make them easy to understand and to use. They are intended to reflect the structure of typical paper forms used to record climatic data. The general layout can be illustrated by one of the forms, “Data for one element for the whole month”, which allows daily data about a particular element to be entered for a whole month.

**Data for one element for the whole month**

Station name or identifier:  Element:

Year:  Month:

Set all values to default default value:

Day	Value	Flag	Period	Day	Value	Flag	Period	Day	Value	Flag	Period
1	<input type="text"/>	<input type="text"/>	<input type="text"/>	11	<input type="text"/>	<input type="text"/>	<input type="text"/>	21	<input type="text"/>	<input type="text"/>	<input type="text"/>
2	<input type="text"/>	<input type="text"/>	<input type="text"/>	12	<input type="text"/>	<input type="text"/>	<input type="text"/>	22	<input type="text"/>	<input type="text"/>	<input type="text"/>
3	<input type="text"/>	<input type="text"/>	<input type="text"/>	13	<input type="text"/>	<input type="text"/>	<input type="text"/>	23	<input type="text"/>	<input type="text"/>	<input type="text"/>
4	<input type="text"/>	<input type="text"/>	<input type="text"/>	14	<input type="text"/>	<input type="text"/>	<input type="text"/>	24	<input type="text"/>	<input type="text"/>	<input type="text"/>
5	<input type="text"/>	<input type="text"/>	<input type="text"/>	15	<input type="text"/>	<input type="text"/>	<input type="text"/>	25	<input type="text"/>	<input type="text"/>	<input type="text"/>
6	<input type="text"/>	<input type="text"/>	<input type="text"/>	16	<input type="text"/>	<input type="text"/>	<input type="text"/>	26	<input type="text"/>	<input type="text"/>	<input type="text"/>
7	<input type="text"/>	<input type="text"/>	<input type="text"/>	17	<input type="text"/>	<input type="text"/>	<input type="text"/>	27	<input type="text"/>	<input type="text"/>	<input type="text"/>
8	<input type="text"/>	<input type="text"/>	<input type="text"/>	18	<input type="text"/>	<input type="text"/>	<input type="text"/>	28	<input type="text"/>	<input type="text"/>	<input type="text"/>
9	<input type="text"/>	<input type="text"/>	<input type="text"/>	19	<input type="text"/>	<input type="text"/>	<input type="text"/>	29	<input type="text"/>	<input type="text"/>	<input type="text"/>
10	<input type="text"/>	<input type="text"/>	<input type="text"/>	20	<input type="text"/>	<input type="text"/>	<input type="text"/>	30	<input type="text"/>	<input type="text"/>	<input type="text"/>
								31	<input type="text"/>	<input type="text"/>	<input type="text"/>

Total:

Add New Delete Reset View Excel Update OK Cancel Help

Record: 1

## Data Entry Form Header Area

The frame at the top of the form contains general information about the record, in this case comprising the station name, element type and the year and month of the record. This information can be changed by typing into the boxes or by using the drop-down lists.

**Tip:** If you type the first letter (or first few letters) of the station or element name, and then click on the drop down arrow, the list will be displayed starting at the letter(s) that you typed. This makes it easier to find the name that you want in the list. Alternatively, you can type the station/element code. On pressing the Enter key, the station/element name will be displayed in the box.

## Entering Data

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The central area of the form contains boxes for entering the data values. The number of boxes and their arrangement will vary depending on the purpose of the form. You can use the Enter or Tab keys to move between boxes, or you can click on another box with the mouse. Error checking will be invoked whenever you leave a box, and a message will be displayed if it contains an incorrect value. See the section on [QC During Key-entry](#).

In most of the forms, a Flag field is associated with each data value. Normally this is blank, but a code letter (the “flag”) may appear in this field for certain data values. The codes are:

**E** The data value is an estimated value rather than an observed value.

**G** The data value has been generated from other values.

**M** The data value is missing (i.e. blank).

**T** The data value has been recorded as zero, but a very small trace was observed.

You cannot enter values directly into the flag field. To record flags E and G, type the data value immediately followed by the flag letter into the value box, for example 12.3E. You can type the letter in either upper or lower case. Climsoft will recognise this as an estimated value, and insert E into the flag box. A trace is recorded by typing 0T into the value box. Climsoft will only accept the trace flag if the data value is zero. Climsoft automatically inserts an M into the flag box if the data value box is left blank.

A Total field is included in some of the data entry forms. You can use this to enter the total value of all the data values that you have entered. If you type a value into the Total field, Climsoft will check that the total is correct and display an error message if it is not. This provides a simple check against typing mistakes.

## Key-entry Command Buttons

<b>COMMAND BUTTON</b>	<b>FUNCTION</b>
<b>AddNew</b>	Inserts a new record at the end of the table. Unless the System administrator has specified otherwise, the station name has the same value as the previous record, and the date is updated to the next in sequence (e.g. the next day if this is a daily record).
<b>Delete</b>	Deletes the current record.
<b>Reset</b>	Clears all the data and flag fields in the form. The header fields are not affected.
<b>View</b>	Displays all the records corresponding to this form that are currently in the Temporary Work File. The data are displayed as an Excel worksheet, which you can modify or otherwise handle using Excel.
<b>Excel Update</b>	Updates any changes you would have made in Excel after viewing the form data in Excel.
<b>OK</b>	When you have input all the required records for this type of form, then use the <b>OK</b> button to exit from the form. This inserts the current record into the Temporary Work File before exiting from the form.
<b>Cancel</b>	Exits from the data entry form without writing the current record to the temporary work file . Any data that you have entered or changed in the current record will be lost, so be careful!
<b>Help</b>	This gives help about the current form.

## Data Entry Forms

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The following data entry forms are supplied with the standard Climsoft system, and are associated with the supplied **Temporary work file**:

- [Data for one element for 24 hours](#): hourly values of a single element in a specified day.
- [Data for one element for the whole month](#): daily values for a whole month of a single element.
- [Data for some elements for one day](#): summary values of several elements on a specified day.
- [Synoptic data for one hour for one element for the whole month](#): values of a single element at a specified time of day in a specified month.
- [Synoptic data for many elements for one observation time](#): values of several elements at a specified time on a specified day.
- [Synoptic data for all hours for one element](#): values of a single element at 3-hourly intervals on a specified day.
- [Rainfall Data](#): Sample rainfall data used in ZimMet
- [Upper air data for several elements for one day](#): summary values of several upper air elements at a specified level on a specified day.
- [Upper air data for one element and one level for the whole month](#): daily values for a whole month of a single upper air element at a specified level.
- [Hourly Wind Data](#): Wind direction and speed for 24 hours. This data typically comes from a wind clock instrument e.g. Dines Anemograph.
- [Temperature Data](#): This is a sample data entry form for temperature data used in Uganda.
- [Agromet Data](#): Sample data entry form to capture Agro-meteorological data and is used in the Kenya Meteorological Department.

## Data for one element for 24 hours

The screenshot shows a software window titled "Data for one element for 24 hours". The window contains a form with the following fields:

- Station name or identifier: CHIBERO
- Element: Temperature, dry bulb
- Year: 2002
- Month: 6
- Day: 8

Below the form is a button labeled "Set all values to default" and a "default value" field containing "0".

The main data area is a table with 24 rows, each representing an hour of the day. The table has three columns: Hour, Value, and Flag. The values are as follows:

Hour	Value	Flag	Hour	Value	Flag
0	245		12	172	
1	226		13	192	
2	217		14	201	
3	212		15	213	
4	234		16	224	
5	241		17	237	
6	245		18	245	
7	251		19	231	
8	238		20	230	
9	229		21	212	
10	219		22	206	
11	187		23	213	

At the bottom of the table is a "Total" field containing the value "5320".

The window has a standard Windows-style title bar with a close button (X) in the top right corner. At the bottom of the window, there is a toolbar with buttons for "Add New", "Delete", "Reset", "View", "Excel Update", "OK", "Cancel", and "Help". Below the toolbar is a status bar showing "Record: 1" and navigation arrows.

This form allows you to enter hourly values for an element over the whole day. In this example, 23 hourly dry bulb temperatures were entered. Note that the temperature values are given in tenths of a degree Celsius, so that 212 means 21.2°C.



## Data for one element for the whole month

Station name or identifier: BUFFALO RANGE  
 Element: Temperature, daily maximum  
 Year: 2001  
 Month: 1  
 default value: 0

Day	Value	Flag	Period	Day	Value	Flag	Period	Day	Value	Flag	Period
1	268			11	357			21	256		
2	258			12	360			22	278		
3	267			13	334			23	291		
4	259			14	320			24	302		
5	320			15	298			25	334		
6	334			16	227			26	356		
7	305			17	216			27	331		
8	345			18	208			28	299		
9	348			19		M		29	287		
10	356			20	247			30	276		
								31	281		

Total: 8918

Buttons: Add New, Delete, Reset, View, Excel Update, OK, Cancel, Help  
 Record: 1

This form allows you to enter daily values for an element over the whole month. In this example, 31 daily maximum temperature values (in tenths of a degree) were entered for January. This form displays the number of days in a month e.g. if the month is February of a leap year, then 29 days will be shown.

## Data for some elements for one day

Station name or identifier  
BINGA

Year: 2003    Month: 1    Day: 1

	Value	Flag	Period
TMPMAX	347		
PRECIP	0	T	
W'	6		
EVAPPN	36		
SUNSHN	9		

Buttons: Add New, Delete, View, Excel Update, OK, Cancel, Help

Record: 1

This form allows you to enter summary values for certain elements for a particular day. *The form is suitable for entering data for daily elements (which require booking back) soon after an observation*. An example of such values is given below. Daily values which are not booked back e.g. minimum temperature and ground minimum temperature are best entered on [form synoptic2](#) which is suitable for entering many synoptic elements for the same observation time.

TMPMAX	Maximum temperature, expressed in tenths of a degree Celsius, omitting the decimal point. Thus 347 means 34.7°C
PRECIP	Total rainfall in tenths of a millimetre.
W'	24 Hour past weather code (0 to 9)
EVAPPN	Evaporation in tenths of a millimetre.
SUNSHN	Amount of sunshine recorded in hours.

The period fields can be used to indicate that the record spans more than one day. For example, a record for Monday might span the 3-day period from Saturday to Monday if the observers do not

work at weekends. In this case, the value 3 should be entered. If the period boxes are left blank, the default value of 1 day is assumed.

**Synoptic data for one hour for one element for the whole month**

	Value	Flag		Value	Flag		Value	Flag	
1	4		11	4		21	7		
2	3		12	5		22	6		
3	7		13	6		23	7		
4	2		14	4		24	7		
5	1		15	8		25	5		
6	4		16	4		26	4		
7	7		17	1		27	6		
8	6		18	2		28	7		
9	3		19	4		29	4		
10	5		20	6		30	3		
							Total	142	

This form allows you to enter values for an element measured daily at a particular time over the whole month. In the example above, 30 cloud cover values (in oktas) taken at 12:00:00AM were entered.

## Synoptic data for many elements for one observation time

Station name or identifier  
 HARARE KUTSAGA

Year: 2005    Month: 12    Day: 3    Hour: 06:00

Inland Station: Elevation (1479 metres) >= threshold (300 metres)  
 Geopotential required instead of MSL pressure

	Value	Flag		Value	Flag		Value	Flag
Stn level Press	8548		Present Wx	60		Cloud amt lv2	8	
Sea level pressure	10135		Past Wx1	6		Cloud type lv2	4	
Geopotential Altitude	1527		Past Wx2	2		Cloud height lv2	9000	
Drybulb	187		Nh	1		Cloud amt lv3		
Wetbulb	175		Cl	7		Cloud type lv3		
Dewpoint	169		Cm	7		Cloud height lv3		
Relative Humidity	89		Ch		M	Cloud amt lv4		
Height of low cloud	1000		Tmin	161		Cloud type lv4		
Visibility	20000		Gmin			Cloud height lv4		
Total cloud cover	8		Cloud amt lv1	1				
Wind direction	090		Cloud type lv1	7				
Wind speed	05		Cloud height lv1	1000				

Buttons: Add New, Delete, Reset, View, Excel Update, OK, Cancel, Help

Record: 1

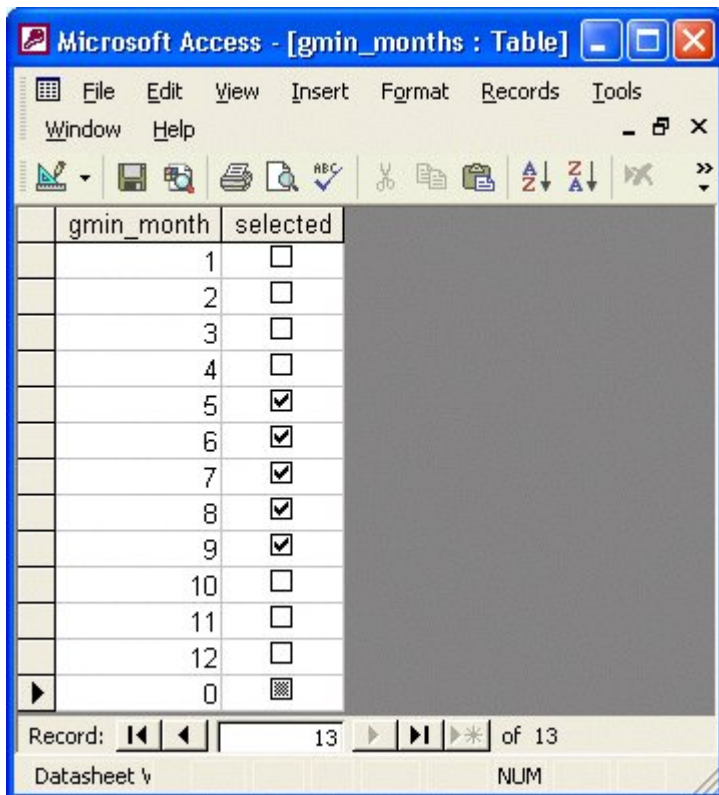
This form allows you to enter values for certain elements for a particular time on a specified day. *The form is suitable for entering data soon after a synoptic observation.* The elements are typically those contained in a synoptic report. One significant feature on this form is the automatic calculation of dewpoint temperature, relative humidity, pressure reduced to mean sea level and geopotential height. Once the station level pressure and drybulb temperature have been entered, there is automatic calculation of pressure reduced to mean sea level and the geopotential height. Depending on the altitude of a station, either mean seal level pressure or geopotential height is required to be included in a synop message. Low lying stations are

required to report mean sea level pressure while high altitude stations are required to report geopotential height.

Data from this form can be coded into a [synop message in CREX format](#).

The key-entry form requires visibility to be entered in metres and cloud height to be entered in feet. The cloud height will be converted to metres by the ClimSoft software. Likewise, total cloud cover entered in oktas will be converted to percentage as required by the CREX format.

Values for some elements are required only at a particular observation time e.g. minimum temperature is required only at the time scheduled for daily elements, while ground minimum may be required only for winter months, but at the same observation time with minimum temperature. Months for which ground minimum temperature is required are selected in table **gmin\_months** in the **Temp work file**. See Fig .1 below. The time for daily elements is set in the **Options** accessed via **Tools** on the main menu. Pressure reduced to mean sea level is required for coastal stations while geopotential is required for high altitude inland stations. The threshold elevation and the reference pressure level are also set on the **Options** dialogue.



The screenshot shows a Microsoft Access window titled "Microsoft Access - [gmin\_months : Table]". The window contains a table with two columns: "gmin\_month" and "selected". The "gmin\_month" column lists months from 1 to 12, plus a row for 0. The "selected" column contains checkboxes. Months 5, 6, 7, 8, and 9 have their checkboxes checked, while months 1, 2, 3, 4, 10, 11, and 12 have theirs unchecked. The row for month 0 has a different icon in the "selected" column. The status bar at the bottom indicates "Record: 13 of 13" and "Datasheet v NUM".

gmin_month	selected
1	<input type="checkbox"/>
2	<input type="checkbox"/>
3	<input type="checkbox"/>
4	<input type="checkbox"/>
5	<input checked="" type="checkbox"/>
6	<input checked="" type="checkbox"/>
7	<input checked="" type="checkbox"/>
8	<input checked="" type="checkbox"/>
9	<input checked="" type="checkbox"/>
10	<input type="checkbox"/>
11	<input type="checkbox"/>
12	<input type="checkbox"/>
0	<input type="checkbox"/>

**Fig 1. Selection of ground minimum months**

## Synoptic data for all hours for one element

The screenshot shows a software window titled "Synoptic data for all hours for one element". The window contains a form for entering station and element information, a table for entering hourly values, and a set of control buttons at the bottom.

Station name or identifier: BEITBRIDGE  
Element: Temperature, wet bulb  
Year: 2004  
Month: 8  
Day: 5

Hour	Value	Flag
0	187	
3	175	
6	182	
9	167	
12	169	
15	183	
18	182	
21	181	

Buttons: Add New, Delete, Reset, View, Excel Update, OK, Cancel, Help

Record: 1

This form allows you to enter values for an element every three hours over the whole day. In the example above, 8 3-hourly wet bulb temperature values have been entered.

## Upper air data for several elements for one day

Upper air data for several elements for one day

Station name or identifier: BULAWAYO GOETZ

Year: 1996

Month: 3

Day: 19

Time: 12:00:00

Level: 850

	Value	Flag
Geopotential	1492	<input type="checkbox"/>
Temp	242	<input type="checkbox"/>
Depression	72	<input type="checkbox"/>
dd	12	<input type="checkbox"/>
fff	003	<input type="checkbox"/>

Add New Delete Reset View Excel Update OK Cancel Help

Record: 1

This form allows you to enter summary values for certain upper air elements for a particular day and time. It also records the level at which the readings were taken (generally in units of hectopascals or millibars).

The summary values are:

geopotential	Height
temp	Temperature.
depression	Dew point depression.
dd	Wind direction
fff	Wind speed.

Upper air data for one element and one level for the whole month

Station name or identifier: HARARE BELVEDERE  
 Element: Wind direction at pressure level  
 Year: 2001  
 Month: 8  
 Time: 12:00:00 A  
 Level: 700

Day	Value	Flag	Day	Value	Flag	Day	Value	Flag
1	12		11	07		21	07	
2	07		12	04		22	11	
3	04		13	11		23	04	
4	15		14	14		24	06	
5	06		15	07		25	18	
6	04		16	03		26	17	
7	07		17	18		27	09	
8	11		18	22		28	16	
9	18		19	08		29	13	
10	21		20	03		30	09	
						31	16	

Total: [ ]

Buttons: Add New, Delete, Reset, View, Excel Update, OK, Cancel, Help

Record: 1

This form allows you to enter daily values for an upper air element over the whole month. For example, 31 daily wind direction at pressure level 700 hPa values were entered for August 2001.



## Hourly Wind Data

Station name or identifier: HARARE BELVEDERE

Year: 2010

Month: 1

Day: 2

Symbol for faulty instrument: /

Flag for faulty instrument: F

Hour	ddff	dd	ff	Flag
0		13	05	
1		12	11	
2		10	10	
3		13	12	
4		09	07	
5		08	06	
6		11	09	
7		15	08	
8		22	02	
9		34	12	
10		30	08	
11		10	10	

Hour	ddff	dd	ff	Flag
12		14	13	
13		27	05	
14		22	04	
15		13	06	
16		11	03	
17		12	10	
18		19	07	
19		21	07	
20		12	12	
21		08	07	
22		11	05	
23		10	08	

Total: 187

Buttons: Add New, Delete, Reset, Delete Cell, Insert Cell, View/Export, OK, Cancel, Help

Status: Record: 2

This allows hourly wind data to be entered as one figure which would be automatically separated into direction and speed.

The administrator is free to change the symbol to represent faulty instrument and also the flag for faulty instrument.



## Temperature Data

Station name or identifier  
87320180 Name: **Abera Forest Station**

Year: 2001 Month: 1 Day: 2

	Value	Flag
Tmax	111	<input type="checkbox"/>
Tmin	22	<input type="checkbox"/>
DRDT06Z	111	<input type="checkbox"/>
DRBT12Z	222	<input type="checkbox"/>
WBT06Z	111	<input type="checkbox"/>
WBT12Z	111	<input type="checkbox"/>
DBT06Z	2222	<input type="checkbox"/>
DPT12Z	333	<input type="checkbox"/>

Buttons: Add New, Delete, Reset, View, Cancel, Help

Record: 2

Sample data entry form for temperature.

## Monthly Data

The form has been designed to be consistent with the Climsoft data model, which defines a daily observation as having a **period**, among other attributes. The default value for the observation period is one day. In the case of monthly data, the period is equal to the number of days in a given month. The day of observation is set to the last day of the month, which has the same value as the observation period, and the time of observation is taken to be the standard time for recording daily values in a given Met Service.

When entering monthly values on the form, the observation period is automatically calculated and placed in the corresponding 'period' field for a particular month (including February of a leap year). This means that the element selected should be the one for daily data e.g. element code "5" for precipitation. An appropriate flag may be added to further qualify the data value, though the period attribute may be considered to be sufficient. An example of suitable flags would be "A" for **accumulated** or "C" for **cumulative** and "A" for **averaged**, depending on how the flags have been defined in the "flags" table.

	Value	Flag	Period
January	456		31
February	521		28
March		M	
April	239		30
May	12		31
June	0		30
July	0		31
August		M	
September	173		30
October	256		31
November	301		30
December	293		31

Fig 1. Key-entry form for monthly data

## QC During Key-entry

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When you click the AddNew or OK buttons, or if you move to another record, Climsoft will perform validity checks on all the values in the current record before writing it to the Temporary Work File. If any of these checks fail Climsoft will remain in the current record, and will display an explanatory error message. It will also highlight the offending value with a coloured background.

An error message will also be displayed if you have typed an incorrect value in a data field and have tried to move to the next field by pressing Enter.

The following types of errors may occur:

- The specified station name or element are not defined. This should only occur if you have typed a name into the box, rather than selected a name from the drop-down list.
- The date (or time) is impossible, for example 31<sup>st</sup> November.
- The date lies outside the period that the station was active, or the period when the station was equipped to record the specified element.
- A non-numeric character has been typed into a numeric field (apart from valid flag codes).
- The value in a field lies outside the global range of values allowed for this element.
- The value in a field lies outside the local range of values allowed for this station. The allowable range may also depend on the month, for example to allow for different temperature ranges in cool and warm months.
- The total (if specified) is incorrect.

For some types of error (values that are valid but out of range), the message box gives you a choice of the action to take. If you click Cancel, the cursor will be placed back into the box to allow you to correct the error. If you click OK, the dubious value will be accepted, but the coloured background remains to indicate that this value needs further investigation. This may occur, for example, when a genuinely extreme value occurs (e.g. the lowest temperature ever recorded), or where the correct value cannot easily be determined.

For other types of error (values that are invalid), you can only click on OK, and Climsoft will not continue until you have corrected the error.