PROFESSIONAL TIMING

CHRONOPRINTER 520

OPERATING INSTRUCTIONS

1. KEYBOARD DESCRIPTION

ON	To switch on the device, (POWER ON). Press ON for 3 to 5 seconds (find POWER OFF through the MENU).
F	Enter and go out of the MENU.
R	Recall of memorized times for identification (RECALL). "**E1**" at start or "**E2**" at finish. RESET of the CP 520 to zero in sequential mode.
0 à 9	Enter time-of-day, a bib N°, a RUN or a TIME (INSERT).
✳	False entry (cancellation of what you entered). Validation or confirmation in the MENU.
#	Validation of the access to the various sub-menus. Validation (or confirmation) of a time or bib N° in the recall function **R**.
E1	Confirm a bib N° entered for a start.
E2	Confirm a bib N° entered for a finish.
▼	Key **DOWN** : To explore the Menu and memorized times. To disidentify a bib N° expected at the start.
▲	Key **UP**: To explore the Menu and memorized times. To disidentify a bib N° ready to start.
Red keys (2 x)	Block or unblock the external inputs (INPUT 1 and INPUT 2). Blocked = black bars (**- - -**) on the LCD display.
Green Key (1 et 2)	Manual keys for timing impulses or to start the time (SYNCHRO).

2. BACK CONNECTIONS DESCRIPTION

INPUTS 1 & 2   Inputs for timing impulses.
                       Working contact without potential (short circuit or open collector).
                       Ex: Manual contactor (HL 18) or photocell HL 2-31 / 2-35).
                       Respect the polarities!

COMPUTER   RS 232 / 9'600 baud data output.
                       For ON LINE or OFF LINE connection to a PC.
                       To drive a DISPLAY to show net and running times (HL 960 / HL 990 / HL 965).

POWER   For an external power supply by:
                       Adapter HL 520-1 (110 ÷ 220 VAC / 12 VDC) or
                       12V batteries via our connection cable HL 520-8.

ST / SP / RS   Auxiliary Input for:
                       START / STOP / RESTART. Start of the time, stop and restart it again (i.e. Horse jumping) or
                       RESET (Resets the CP 520 to zero).

Caution !	The START / STOP / RESTART and RESET functions are possible only with a synchronization at zero (for the SYNCHRO, the START function is always activated).

3. START UP OF THE CP 520

3.1 Batteries installation – Batteries replacement

➢ To open the battery cover, you can help you with your thumbs by strongly pushing it in the direction of the arrow.

➢ Introduce the batteries by respecting the polarities indicated at the bottom of the compartment.

3.2 Control if the paper capacity is still sufficient

➢ To change the paper roll, refer to chapter **7 - CHANGING OF THE PAPER ROLL**.

3.3 Switch on the CP 520 in pressing the key ON for 3 to 5 seconds

➢ Two possibilities: either the printer is not activated and the CP 520 does not print (point 3.3.1), or it is activated and the CP 520 prints (point 3.3.2).

3.3.1 The CP 520 does not print:

The display indicates:

```
          CP520
PRESS  *  TO  CHECK
PARAMETERS.
OR  #  TO  CONTINUE
```

➢ You can visualize the parameters in pressing ✶ and ▼ or continue directly in pressing **#**.

➢ Press **#**.

The display indicates:

```
   ENTER  TIME
   FOR  SYNCHRO

        00:00
```

➢ If you wish to use the printer, make sure the batteries are in good state.

➢ To switch on the printer, enter in the menu in pressing **F** and select PRINTER using the ▼, confirm with **#**. Select PRINTER ON, press **#**. The CP 520 prints "PRINTER ON".

The display indicates again:

```
   ENTER  TIME
   FOR  SYNCHRO

        00:00
```

➢ Please, continue in following the **Point 3.4 – Synchronization (SYNCHRO)**.

3.3.2   The CP 520 prints

➢ The memorized parameters used for the last timekeeping as well as the N° of the new run and the remaining memory capacity.

The display indicates:

	E	**N**	**T**	**E**	**R**		**T**	**I**	**M**	**E**				
	F	**O**	**R**		**S**	**Y**	**N**	**C**	**H**	**R**	**O**			
					0	**0**	**:**	**0**	**0**					

IMPORTANT !	The CP 520 default setting is in NET TIME mode. We advise to follow the start of the CP 520 in this mode in order to well understand the different CP 520 functions !
If necessary	…at this point, you can:
	Enter in the Menu to change parameters (PARAMETERS) or / and
	Clear the memory – all precedent runs will be cancelled, the timing will restart with RUN Nr 1 (CLEAR MEMORY) or / and
	To change the TIMING MODE (consult the menu description on page 17 – confirm every selection with **#**).

3.4   Synchronization (SYNCHRO)

The time can be started from **00:00** or with the **time-of-day**. Therefore, you must:

➢ Insert the desired time (or 00:00 for a start at zero) and confirm with **#**

➢ When the display indicates " READY FOR SYNCHRO ", give an impulse on INPUT 1 or INPUT 2, manually or by the external inputs. Caution!! unblock the external inputs to receive the impulses (unblocking = red keys). You are now ready to start your timekeeping !!

4.   NET TIME MODE (default setting)

Registration of start and finish times with competitor N°s (alpine ski, cross-country, rally, etc). If your device is not in NET TIME mode (see the timing sleeve), we advise you to configure it now:

➢ When the display indicates ENTER TIME FOR SYNCHRO, press **F**.

➢ Select TIMING MODE and confirm with **#** ; select NET TIME and confirm with **#**.

➢ Select the desired precision for the net time result (ex. 1/100th for Alpine Ski – refer to definition programmable in the chapter 9 – TECHNICAL SPECIFCATIONS).

➢ Select your needed numbering mode at the start (NUMBERING):

AUTOMATIC UP this option automatically presents bib numbers at the start in sequential order, or

MANUAL if race start numbers will appear in random order.

➢ Proceed to the synchronization (see point **point 3.4**).

CAUTION !	If the synchronization (SYNCHRO) has been carried out before the Timing mode selection, you must create a NEW RUN in the menu **F**.

4.1   LCD explanations in NET TIME mode

In this example, the CP 520 is in NET TIME MODE – AUTOMATIC UP.

The display indicates: *Explanations:*

```
- - -   1 1 : 2 3 : 4 5   - - -
        1 <           >
```
- External inputs blocked and time-of-day
- Bib N° 1 ready to start

```
    2   1 1 : 5 2 : 2 2   A U T
        2 <           >         1
        1 >               2 5 . 8
```
- External inputs unblocked
  (Run 2 / automatic mode)
- Bib N° 1 started and expected at the finish
  with running time
- Bib N° 2 ready to start

```
    2   1 1 : 5 3 : 1 4   A U T
        3 <           >         2
        2 >               1 4 . 5
        1 <     1 > 1 : 1 8 . 5 2
```
- Bib N° 2 started and expected at the finish
  with running time
- Bib N° 3 ready to start
- Finish of bib N°1 with actual ranking

4.2   Possible actions during the timekeeping in NET TIME mode

The display indicates:

	2		1 2	:	0 5	:	5 0		A U T
1 0 0	<		1 2 1		>				9 8
	9 9	>				3 7	.	5	
	9 8	>			1 :	0 6	.	3	

Explanations / **Actions** *:*

- Bib N° 100 ready to start
- Bib N° 98 and 99 are expected at the finish
- Bib N° 121 is ready to start instead of the bib N° 100…
- ***Insert the bib N° 121 on the keyboard and press E1 to confirm it at the start.***

	2		1 2	:	0 5	:	5 4		A U T
1 2 1	<				>				∇
	9 8	>			1 :	1 1	.	6	

- Bib N° 98 and 99 can not be identified before the finish…
- ***Press ▲ to memorize the finish times without identification***
- The identification will then be made by "recall of unidentified times (memorized times)" **R**
  Press ▲ again to return in the automatic mode

4.3 Keyboard shortcuts of the NET TIME mode

Keyboard shortcut:	Explanation:
N° + E1	To enter or change a bib N° expected at the start.
N° + E2	To enter or change a bib N° expected at the finish.
✳ + E1	To disidentify the last bib N°(s) started (ex: False impulse(s) received at the start). The supposed bib N° started is ready to start again. Its previous time is disidentified (–).
✳ + E2	To disidentify the last bib N°(s) finished. (ex: False impulse(s) received at the finish). The supposed bib N° finished is back in the race. Its previous time is disidentified (–).
▼	Start times without bib N°
▲	Finish times without the bib N°
R + E1	To RECALL unidentified or disidentified start time(s) (memorized times)
R + E2	To RECALL unidentified or disidentified finish time(s) (memorized times)
N° + R + E1	To RECALL a start time for a bib N° (for modification or cancellation)
N° + R + E2	To RECALL a finish time for a bib N° (for modification or cancellation)
F + #	Direct ranking

You also find also these information at the back of your CP 520 !

4.4   Keyboard shortcuts explanation

➢ ***The bib N° expected at the start or at the finish is not correct:***

Enter the new N° and confirm with the key **E1** (start) or **E2** (finish)

➢ ***False starts or False Finishes (false impulses or wrong N°s, i.e.):***

Disidentify the last bib N°(s) started with   ✳ **+ E1** or finished by ✳ **+ E2**
Recall unidentified start or finish time(s) (memorized times) with **R + E1** (start) or **R + E2** (finish)
Identify all times with the related bib N°(s)
The N° **0** cancels the considered time(s)

➢ ***The bib N°s at the start or at the cannot be identified (mass finish for ex.):***

Press ▼ for the start time(s) or ▲ for the finish time (s)
The times are memorized and can be recalled for identification with **R + E1** (starts) or with **R + E2** (finishes)

➢ ***Modification of the bib N°s already started or already finished:***

Recall the bib N° started or finished that you want to modify with **N° + R + E1** (starts) or with **N° + R + E2** (finishes)
Follow the LCD indications
The modified time of the competitor is disidentified (-)
This time is then registered in the memorized time(s)

➢ ***Abort of a competitor (DNF):***

N° + R + 0 : Quick function to cancel the start time of a bib N° to be aborted (C)

➢ ***Disqualification of a competitor (DSQ):***

N° + R + 0 : Quick function to cancel the start and the finish time of a bib N° to be disqualified (C)

IMPORTANT !	The CP 520 allows to accept the same bib number several times at the start and at the finish. The times taken into account in the ranking will be the last recorded times. At each start, the previous time will be disidentified (**-**), and at each finish, the previous time will be cancelled (C)

4.5   Rankings in the NET TIME mode

In order to obtain the desired ranking of your race, you should well organize your different runs.
Find herewith an alpine ski race example:

- **RUN Nr 1**   Women's run 1
- **RUN Nr 2**   Men's run 1
- **RUN Nr 3**   Women's run 2
- **RUN Nr 4**   Men's run 2

In the race described above, you have the possibility to obtain the various following classifications:

- **DIRECT RANKING**   For a provisional ranking or at the end of the run in progress.

- **RANKING RUN Nr**   For a ranking of any run:

    - **ONE RUN**   For a unique ranking. When the display indicates RUN Nr, enter the number of the desired run and confirm with **#**.

    - **TWO RUNS**   For a ranking of two added runs. When the display indicates 1st RUN and 2nd RUN, enter the number of the first run (in our example, for the ranking of the men's race: run 2) and confirm with **#**, then, enter the second run number (in our example: run 4) and confirm with **#**.

CAUTION !	Of course it is only possible to make the total time of two runs if the competitors N°s are in the two considered runs.

4.6   Mass starts or by groups

The mass or group starts can be given by a **start impulse** on the external input INPUT 1 (starting gate, gun, manual contactor…) or at a **predefined time-of-day**.

➢ **Start impulse**	Select the NET TIME – MANUAL mode,
	insert n° 1 at the start (**1 + E1**) and make it go (impulse),
	enter in the menu (**F**) and select DUPLICATE (confirm with **#**),
	use START NR if the n°'s to be duplicated are in a random order, or START GRP if they are in a chronological order,
	duplicate with the started competitor n° (n° 1 in our example).
➢ **Predefined time**	Select the NET TIME – MANUAL mode,
	enter in the menu (**F**) and select INSERT TIME (with #),
	select START to insert a starting time,
	enter n° 1 and confirm with # (the n° 1 will be the first started competitor of the group),
	enter the start time of n° 1 and confirm with **#**,
	press on **F**, to quit INSERT TIME and another time to re-enter in the principal menu, go to DUPLICATE,
	use START NR if the n°'s to be duplicated are in a random order, or START GRP if they are in a chronological order,
	duplicate related to the started competitor n° (n° 1 in our example).

CAUTION !	The predefined start times must be in reference with the official time-of-day of your CP 520 !

5.   REAL TIME MODE

The REAL TIME mode of the CP 520 includes 3 timing modes:

SEQUENTIAL	Sequential counting of the timing impulses. Start at zero or at the time-of-day. *Please consult point 5.1 – REAL TIME – SEQUENTIAL.*
START – FINISH	This mode is similar to the NET TIME mode. The difference is in the results calculation. *Please consult the point 5.2 – REAL TIME – START / FINISH.*
LAP TIME	This timing mode allows many uses. Before all, it is especially reserved for circuit races with lap times control of **several** competitors. *Please consult the point 5.3 – REAL TIME – LAP TIME.*

Each of the 3 REAL TIME modes offers several applications. Below, we give you an outline of the possibilities of each mode and its applications.

5.1   SEQUENTIAL

This mode proposes a synchronization at 00:00 or at time-of-day. According to the time of synchronization, various possibilities exist:

> **Synchro at 00:00**
> *It is possible to restart the device at zero or to stop and start again time **only** if the synchronization has been done at 00:00!*
>
> Select START / STOP / RS in PARAMETERS – AUX. INPUT to be able to stop and restart the time again (jumping).
>
> Select RESET ACTIVE to be able to RESET the device at zero by pressing the key **R**. It is also possible to do an external RESET with the Input ST / SP / RS which can be programmed via the menu PARAMETERS (AUX INPUT-EXT. RESET).

> **Synchro at the time-of-day**
> Do the synchronization at the desired time-of-day.

The SEQUENTIAL mode includes 3 different functions:

> **SPLIT** Start at zero and finishes (athletics, popular races, jumping, etc). If Reset to zero in pressing the key **R** (RESET ACTIVE) if wished.
>
> Timing at time-of-day for start and finish time registration (official timing sleeve when you work with a PC or make race protocols).

> **SPLIT – LAP**
> Start at zero or at time-of-day. Lap time for two competitors with counting of the number of laps (partial and net times, lap time for 2 competitors, jumping).

> **LAP**
> Start at zero or at time-of-day. Lap times for two competitors with counting of the number of laps.

5.2 START / FINISH

This mode is similar to the NET TIME mode. The difference is in the results calculation (please, consult PROGRAMMABLE DEFINITION in technical specifications).

5.3 LAP TIME

This timing mode allows for many applications. It is mainly reserved for the circuit races with the lap control for **several** competitors.

For example, it is possible to:

➢ identify an impulse already received with the help of the short cut R + E1 (or E2).

➢ identify the competitor n° before its crossing n° + E1 (or E2).

Calculations of the lap times are then automatically done, even for previous unidentified times !

Several rankings can be printed in the LAP TIME mode:

➢ **DIRECT RANKING**   Best competitor lap time ranking of the current run.

➢ **DIRECT LISTING**   Listing of a competitors'lap times in chronological order of the current run.

➢ **RANKING RUN Nr**   Best competitor lap time ranking of a previous run.

➢ **LISTING RUN Nr**   Listing of a competitors'lap times in chronological order of any run.

SPECIAL APPLICATION !	When the function RECALL (R) is carried out for the first time, it is possible to remain in this one and to identify the received impulses on one or the other of the two inputs!
	Once identified the last memorized time, the device returns in its normal operating mode.

6. DESCRIPTION DU MENU

Press **F** to enter in the menu,.

To select the desired menu, move by using the ▼ and ▲, then, confirm with **#**. Read the LCD!

POWER OFF	Switch off the device.

TIMING MODE   Select the timing mode and the precision:

NET TIME   For starts and finishes (alpine ski, rally, cross-country, etc).

REAL TIME   for the sequential modes (parallel slalom), starts and finishes (autocross) as well as the lap time.

See the menu structure on page 16 and the technical specifications of chapter 8, page 20.

DIRECT RANKING   A direct ranking of the current RUN can be obtained any time during the race.

RANKING RUN Nr.   Ranking of a RUN or by addition of two RUNS.

DUPLICATE   Recall of a bib N° to duplicate one or several other(s) competitor(s) at its start or finish time (START N°/ FINISH N°).
Same principle as for the MASS START.

INSERT TIME   Insert a start or a finish time for a bib N°.

NEW RUN   Creation of a new RUN.
(When or if the previous RUN is finished)

PRINTER   Printer ON or OFF.

CLEAR MEMORY   Clear the memory or check the remaining memory capacity.

When you start a timing and you don't need to keep preceding runs in memory, you can make a CLEAR MEMORY (this option is possible before or after synchronization).

DOWNLOAD   Download of one or of all memorized RUNS to the printer (take care at the paper roll capacity) or to a PC (OUTPUT COMPUTER – in OFF LINE mode).

PARAMETERS		Changing of the parameters:
	LOCK TIME	Lock time of the Inputs (START / INPUT1 - FINISH / INPUT 2) 0.01 / 0.1 / 1.0 / 2.0 seconds. Minimum blocking 0.01 sec. (no blocking) should not be used with timing accessories with mechanical triggering. Many impulses could be received.
	AUX. INPUT	Programmable auxiliary input (ST / SP / RS) for STAR / STOP / RESTART, or RESET (only if the synchronization has been carried out at 00:00) for the reset of time.
	LCD DELAY	LCD delay adjustment. 5 / 7 or 10 seconds.
	LCD CONTRAST	LCD contrast adjustment (▲ = Plus ▼ = Minus)
	BUZZER	ON / OFF
	OUTPUT	Output RS 232 (COMPUTER) for the connection to a computer or a DISPLAY. DISPLAY DELAY at 7 / 10 or 15 seconds.
UPGRADE		Do not use, reserved for technical use by TAG Heuer.

The menu differs before or after synchronization. Find below the differences while the device is switched on in NET TIME mode.

Before: *After:*

Before	After
POWER OFF	**POWER OFF**
TIMING MODE	**DIRECT RANKING**
PRINTER	**RANKING RUN Nr.**
CLEAR MEMORY	**DUPLICATE**
DOWNLOAD	**INSERT TIME**
PARAMETERS	**NEW RUN**
UPGRADE	**PRINTER**
	CLEAR MEMORY
	DOWNLOAD
	PARAMETERS
	UPGRADE

TIMING MODE   *" selected positioning > given as example only "*
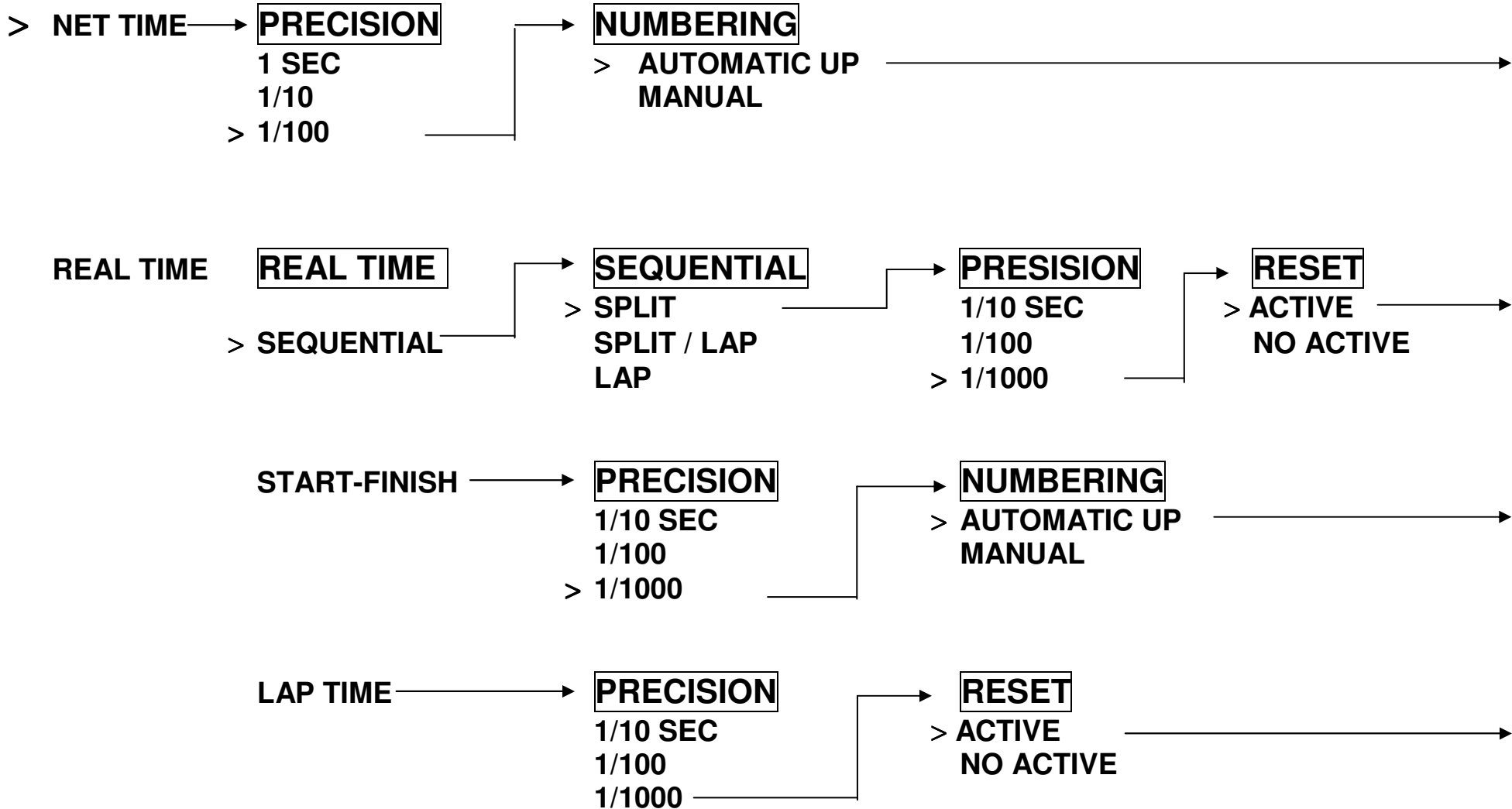
ENTER TIME FOR SYNCHRO / READY FOR SYNCHRO

> NET TIME ⟶ **PRECISION** ⟶ **NUMBERING**
                    1 SEC   > **AUTOMATIC UP** ⟶
                    1/10   **MANUAL**
                 > **1/100**

REAL TIME   **REAL TIME**   ⟶ **SEQUENTIAL** ⟶ **PRESISION** ⟶ **RESET**
                                      > **SPLIT**   **1/10 SEC**   > **ACTIVE** ⟶
                 > **SEQUENTIAL**   **SPLIT / LAP**   **1/100**   **NO ACTIVE**
                                         LAP   > **1/1000**

START-FINISH ⟶ **PRECISION** ⟶ **NUMBERING**
                    1/10 SEC   > **AUTOMATIC UP** ⟶
                    1/100   **MANUAL**
                 > **1/1000**

LAP TIME ⟶ **PRECISION** ⟶ **RESET**
                 1/10 SEC   > **ACTIVE** ⟶
                 1/100   **NO ACTIVE**
                 1/1000

7.   CHANGING THE PAPER ROLL

It is very easy to change it as long as you use it until the end (capacity of approximately 5000 times). A red zone announces the end of paper.

The change can also be carried out during the timing (even in emergency when there is no more paper) as the times memorized during the replacement are going to be printed on the new paper roll.

➢ **Before the end of the paper**   Enter the MENU, select PRINTER in OFF position. As soon as the change is carried out, don't forget to put again the PRINTER in ON position.

➢ **When there is no more paper**   The printer is automatically switched off.
It will print again automatically as soon as the new paper roll will be in place. We recommend the first method.

However, we advise you to change the paper roll before your timing!

Open the paper compartment

To open the paper compartment, you can help you with your thumbs to slide it at the back of the device.

To slide it back, place the cover well flat, 3÷4mm behind its closing position.

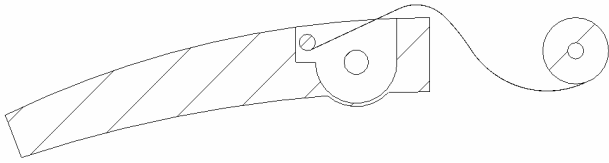|	
Caution!	The paper roll is firmly maintained by two lateral " half-moons " to prevent that this one does not move or unwind itself.

To remove a finished paper roll:
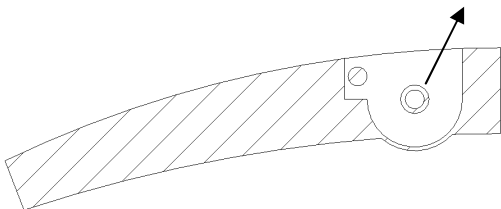
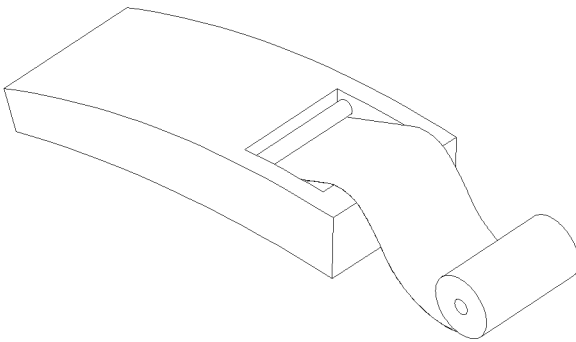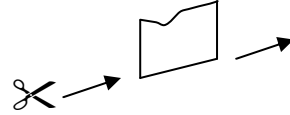Pull out the central part of the paper roll backwards to extract it as well as the paper that is still engaged in the printer.

To insert a new paper roll:

Unroll a few centimeters of paper until its surface is clean. Cut it perpendicularly.

Put the paper roll at the back of the device (See drawing). Introduce the paper under the cylindrical paper driver. Maintain a light pressure on the paper, press the paper feed ($\uparrow$). Ensure a good guidance of the paper. Put the paper roll in its compartment and strongly push it downwards. You will feel a click as soon as the paper roll will find its housing.

To extract a paper roll partially started:
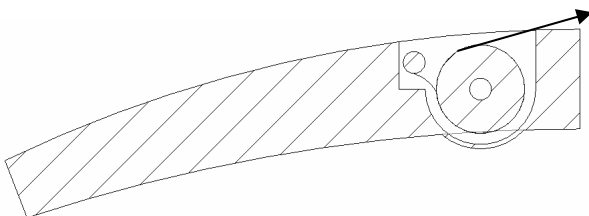
Turn the paper roll to release a little bit of paper.
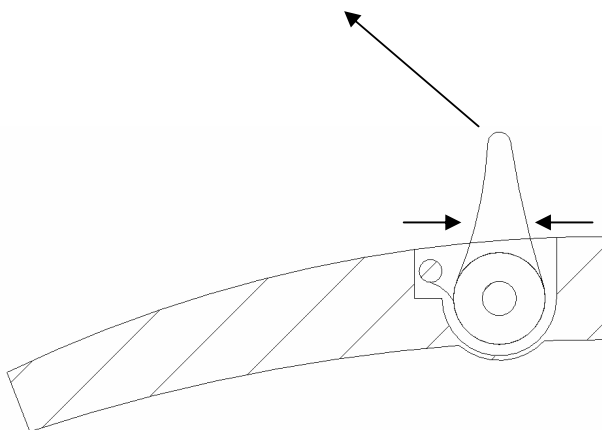
Extract 3 to 4 cm of paper.

Firmly hold the unrolled paper with your index finger and thumbs on each side. Pull it vertically

We advise the use of good quality batteries.

The autonomy can change a lot depending on the type of batteries.

The tests carried out below refers to impulses given every 6 seconds in REAL TIME mode SEQUENTIAL SPILT.

Number of impulses at:	0 °C	20C °
	(32 °F)	(68 °F)
Energizer. Alkaline standard	1'000	5'000
Energizer. Alkaline Titanium (New)	2'500	11'000
Duracell. Alkaline ULTRA m3	2'500	11'000
Energizer. LITHIUM (expensive)	12' 000	16'000

The CP 520 is delivered with Energizer TITANIUM batteries

Use in low temperatures

The CP 520 is able to print until temperatures close to – 25 °C!
However, it is necessary to use an external power supply to take advantage of a sufficient autonomy.
We advise the use of a simple battery lead (ref. HL 520-8 accumulator 2.1 Ah delivered with charger and carry-bag). The autonomy is guaranteed at least for 1 day (at -20 °C).

The CP 520 printer

Equipped with an electronic control in order to save batteries when those are used.

➢ **New batteries** – Fast print speed.

➢ **Used batteries** – Print speed reduced by 4 times.

➢ **Flat batteries** – Printing of LOW BATT and printer off.

When the printer is off , you can switch it on again (menu PRINTER / ON) only if you have an external power supply connected. The change batteries can also be done after the timekeeping (timing information will be keep in the memory!).

The print speed is reduced when you switch the CP 520 on.
 If the batteries state is good, the printing switch automatically in fast mode.

Caution !   Maximum consumption when a long ranking is required, be sure of the good state of the batteries.

Memorized information

The CP 520 is equipped with a small accumulator in order to save memorized information even if you temporarily extract the batteries.

It is recommended to leave batteries in the CP 520 if you wish to save information in memory.

If the accumulator is partially or completely discharged, it is possible that the Chronoprinter does not work correctly any more, in this case, use the " RESET" function described below.

To recharge a discharged accumulator, it is necessary to leave the CP 520 working during 14 hours with its internal batteries or external power supply.

This can happen after having removed the batteries for a long period. When you will switch the CP 520 on, all default settings are memorized.

Special functions

To reset the CP 520, press on key **0** when you switch the device on.

9. MAIN TECHNICAL SPECIFICATIONS

TIMING MODES

NET TIME with manual or automatic bib numbering from 1 to 9'999

REAL TIME

➤ **SEQUENTIAL**
with sequential numbering of information from 1 to 9'999 (independent for each input)
Function SPLIT / SPLIT - LAP / START - STOP - RESTART / RESET.

➤ **START-FINISH**
with competitors' N° from 1 to 9' 999.

➤ **LAP TIME**
with competitors' N° from 1 to 9' 999. (This mode will be implemented only at the beginning of 2001)

MEMORY

8'000 TIMES – 128 RUNS at disposal

MEASUREMENT CAPACITY

23h59'59''999

USER MODE (to be programmed)

➤ **NET TIME**   1 sec., 1/10th, 1/100'

Example with results to the 1/100 sec. (Alpine skiing)

Start time of the N° 121	12: 34: 56. 136
Finish time of the N° 121	12: 35: 59. 354
RESULT (NET TIME)	1: 03. 21

The calculation of the last digit is not taken into account (truncation)

➤ **REAL TIME** 1/10th, 1/100th, 1/1'000th

Example with " START - FINISH " to the 1/1000 of seconds (Auto-cross)

Start time of the N° 121	12: 34: 56. 136
Finish time of the N° 121	12: 35: 59. 354
RESULT (REAL TIME)	1: 03. 218

INPUTS

➤ 2 inputs for timing impulses (« banana » type Input 1 and Input 2)
➤ 1 auxiliary input for START-STOP-RESTART or RESET (to be programmed)
➤ The inputs are fed by "short-circuit" impulses (working or closing contacts without potential).   Ex: Manual contact (HL 18)
   Open collector (photocell HL 2-31/2-35)

An acoustic signal (buzzer) is given at each received impulse (to be programmed).

OUTPUT

A RS 232 at 9'600 Bds, to drive :
➤ a **COMPUTER** to transfer timing information in ON LINE or OFF LINE mode
➤ a **DISPLAY** to show net and running times (HL 960 / HL 990)

KEYBOARD

Well spaced professional quality keys.
➤ 1 button to turn the device ON (turn OFF : in the Menu)
➤ 1 numeric field to introduce bib numbers and/or times
➤ 2 validation buttons, for both Start and Finish (E1 and E2)
➤ 1 Recall button, to recall identified or non-identified times
➤ 1 Menu « Function » access button (F)
➤ 1 paper feed button (↑)

DISPLAY

➤ LCD « LOW Temperature » (-20℃)
➤ 4 lines of 16 alphanumeric characters each
➤ allows control of all timing information

PRINTER

➤ High tech thermal printer, capable of non-stop printing
➤ 24 characters per line
➤ Paper roll capacity of 5'000 times

OPERATING TEMPERATURE

From –20 C° to +70 C°

TIME BASE

➤ Thermo-compensated 8 MHz Quartz
➤ Precision better than ± 0.5 ppm at +20℃ (± 0.0018 sec. / h)
➤ Precision better than ± 2.5 ppm between –30℃ and +75℃

INTERNAL POWER SUPPLY

5 alcaline 1.5V batteries (UM3 – Energizer LR6)

EXTERNAL POWER SUPPLY

12V DC by adaptor (HL 520-1) or battery

AUTONOMY

5'000 times printed with one batteries set.

DIMENSIONS / WEIGHT

247 x 107 x 63 mm
Weight about 800 gr. without transport case.

SOME INFORMATION ON THE MENU

➤ Choice of the different timing modes and functions
➤ Individual starts or group starts
➤ Manual or Automatic bib numbering
➤ Direct Ranking, Run Ranking or 2 Added Runs Ranking
➤ Programming of Display/LCD Delay and Input Blocking Delay
➤ Download of all timing information to a Computer or re-printing by the timing device. All corrections done during the timing will be printed and memorized with a specific sign.
   « OFF » with saving of all timing information and parameters

10. PROTOCOL RS 232

Data Transmission – Technical Description

10.1 General

ON-LINE and OFF-LINE data transmissions from the **COMPUTER port** of the CP520 respect the following transmission format. This format always comprises 30 characters + CR under the RS232 protocol at **9600 bds.**

1 or 2	Characters for Data String Identification
3	Characters for the ranking
2	Space
4	Characters for Competitor Number
1	Space
2	Characters for Timing Input Channel
1	Space
15	Characters for Time
1	<CR> = End of Data String

Characters not used in the transmission of any value are replaced with a space.

10.2 Data String Identification Characters

S	Creation of a new RUN
S	Split time
L	Lap time
T	Time recorded on one of the input channels
R	Calculated Net Time for a Competitor
T-	False Start or False Finish (time disassociated)
T*	Any time modified through manipulation of start number
T+	Any time used if manually input using RECALL - INSERT
T=	Any duplicated time using FUNCTION - DUPLICATE
TC	Any discarded time rejected using "0# in RECALL"

10.3 Examples of Data Strings produced by the CP 520

Times taken for Competitor #2 on input channels 1 and 2 (Manually)
T   2 M1 09:09:15.608000<CR>
T   2 M2 09:09:27.277000<CR>

Net time for Competitor #2, ranked in position 1 at 11.669 seconds.
R   1 2   11.669000<CR>

10.4 Distinctive Characters Placed at the Start of Times Printed or Transmitted to PC

-	False Start of False Finish (disassociated times)
*	Competitor Number Modified with this time
+	Manually Entered Time using INSERT
=	Duplicated Time using function DUPLICATE
C	Any discarded time rejected using "0# in RECALL"

YOUR CONTACTS

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