OSM 6
User's manual
3085-503

T A B L E   O F   C O N T E N T S

1. INTRODUCTION

The OSM 6 is a timing computer specially adapted to swimming competitions.

It has been designed for:

- 25m, 50m pools, and others
- pools equiped with a maximum of 10 lanes
- individual races (all swimming events)
- relay races with false start control

The possibility of introducing plug-in program modules enables the OSM 6 to:

- increase its functions
- be used for new applications

The OSM 6 comes in a black portable case composed of:

- one control panel with connection plugs
- one board with 39 function keys
- an LCD display with 16 characters
- an electrosensitive printer with 21 characters per line
- an electronic circuit with two micro-processors
- an optional plug-in module

The choice of the peripherals enables the OSM 6 to be used in many fields, from local competitions (clubs, schools), to Olympic Games.

The OSM 6 features 3 timing programs

AUTO   Automatic timing for individual and relay races, without false relay control.

- arrival times given through touch pad
- back-up system possible with one push button per lane.

AUTO FD   Automatic timing for relay races, with false start con-
           trol.

             - arrival times given through touch pad
             - backup system possible with one push button per lane
             - starting time given through starting blocks

MANUAL   Manual timing for individual and relay races, without
           false relay control.

             - arrival times given by 3 push buttons per lane

1.1   Installation layout

The OSM 6 is the heart of a timing installation composed of:

- one OSM 6   1
- watertight wiring system (HARNESS)   2
- 1 starting system   3
- 1 arrival detection system   4

At any time an installation can be completed with:

- timing peripherals

    . starting blocks, for false relay control   5
    . acoustic starting signal   6

- data handling peripherals

    . 1 line or multiline scorebaord   7
    . video display (information to the speaker)   8
    . diffusion of information to national TV network   9
    . data handling computer for preparation of star-   10
       ting lists

TV

OSM6

1	2	00.57.29
2	3	00.58.38
3	1	00.58.71
4	4	00.59.54
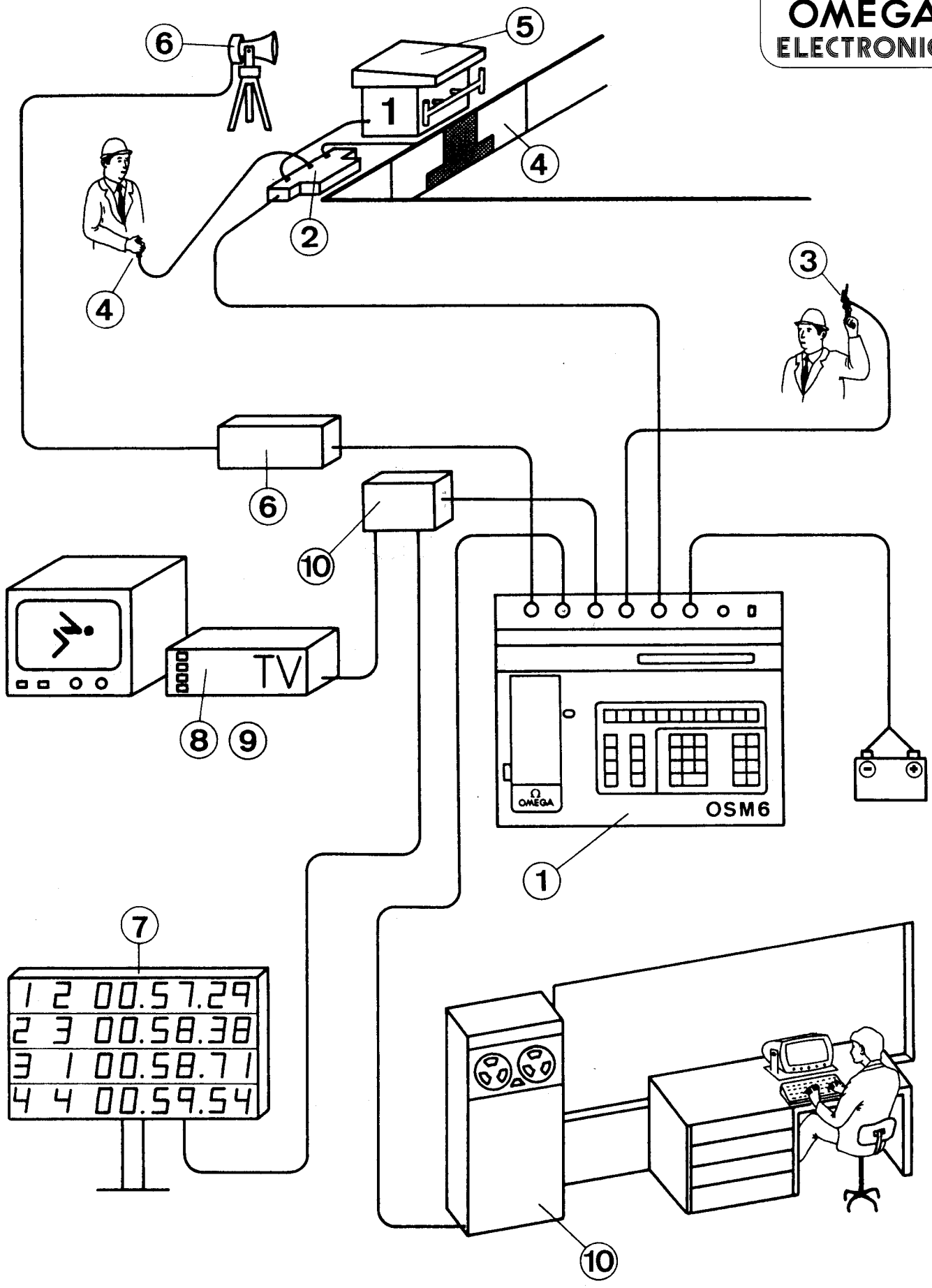
2.   Technical characteristics

2.1   General characteristics

        See data sheet E 0013-0140

2.2   Electrical characteristics

        See data sheet E 0013-0140

        Other characteristics:

        Power supply   Built-in display shows if
                                    voltage is too low

2.3   Keyboard characteristics

Composed of: 39 keys, divided into 5 groups
                        and protected against water droplets.
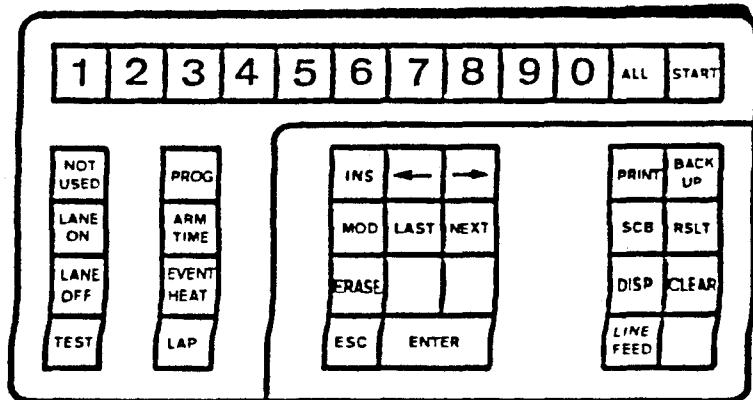
2.3.1 Numerical Keyboard

Figures from 0 to 9: choice of lanes or introduction of values

ALL   : same as pressing the 10 keys, (0 to 9)
                            together

START   : selection of the start

2.3.2 Lane control keyboard

NOT USED   : lane not used for one heat

LANE ON   : manual arming of the LANE or of the START

LANE OFF   : manual disarming of the LANE or the START

TEST   : manual arrival impulse on one lane, on all
                            the lanes simultaneously, or start impulse

While introducing the lane number on the numerical board, all
the lane keys must be pressed down.

2.3.3 Keyboard for the introduction of race parameters

PROG   : program selection

ARM TIME   : automatic lane arming selection

EVENT HEAT   : input of a race number, heat number

LAP   : input of number of laps
                            (length of the race)

2.3.4 Correction keyboard

INS	: insertion of a missing time
MOD	: modification of a recorded time
ERASE	: erasing of an erroneous recorded time
___	: on the display, shifting the cursor one character to the left. The character blinks to signal the position of the cursor.
---	: cursor to the right
LAST	: to display the last section
NEXT	: to display the next section
ESC	: to cancel a function already started
ENTER	: to execute a function already started

2.3.5 Printout keyboard

PRINT	: printing of the information on the built-in printer
SCB	: display of the information on the scoreboard
DISP	: display of the information on the built-in display unit
LINE FEED	: printer paper feed
BACK UP	: selection of results with backup time
RSLT	: selection of final results
CLEAR	: holding a running distribution erasing the scorebaord

2.4   Printer characteristics

Type   : electrosensitive

Printing   : matrix 5 x 7 dots
                          21 characters per line

Character type   : alphanumerics, symbols

Speed   : approx. 2 lines/sec

Characters
height   : 2,7 mm

Paper   : metallized

Width   : 60 mm

Length   : 30 m (sufficient for 6000 lines)

Diameter   (ext.)   : 40 mm

Examples   : R. Bosch RMP 8146-24V
                          Silverno 890-2B
                          Omega reference 9051-6002

Automatic
printing: - of a title to separate the races

                        - of all data manually input or modi-
                          fied

                        - of the race valid parameter

                        - of the race number, heat number

                        - of the starting time

                        - of the date

                        - of the final or intermediate times in
                          chronological order

Printing
on request: - of the final classification, with or without
                          backup time, in rank order
                          (arrival order)

Specific
Printing: - (-.---) if there is no recorded time

                             - FD   printed on Auto FD classification, if
                                    there was a false start in relay

                             - M   if an arrival or a start was given
                                    manually, on the keyboard

                             - *   if a time was introduced on the keyboard
                                    (INSERTION)

                             - D   Program AUTO FD to mark the starting block
                                    lane, when it is the difference between
                                    the starting block time and the touch pad
                                    time which is printed

                                    If false start, time preceded by a - sign
                                    if not, preceded by + sign

                             - T   printed on the MANUAL program if a time is
                                    missing from one or more push buttons

2.5   Display characteristics

Type   LCD (Liquid Crystal Display)
                             7 segments
                             16 characters

Character type: numerical, symbols

Vision: reflective, unmagnified

Character height: 12,7 mm

Protection: anti-reflexive plexiglas

Control: - mains "ON" indicator
                             - low battery indicator

Symbol display for lane control

|$8\,8\,8$| Lane unused   (no segment)

|$8\,8\,8$| Lane unarmed

|$9\,8\,8$| Lane armed

|$8\,8\,8$| Activated touch pad

|$\overline{8\,8\,8}$| Final arrival

Information display for race control

| - - - - - - - | | $5 t \, R \, r \, t$ | Equipment ready for next start

| - - - - - - - | | $L. \; I$ | Race in lap one

| display | | $L. \; I \; 2$ | At the end of lap one, the swimmer of lane 2 is first

| display | | $R. \; 2$ | Race in last lap

| display | | $R. \; 2 \; 4$ | Final arrival in lane 4

2.6   Input   Output characteristics

See data sheet E 0013-0140

Supplementary characteristics:

START OUT
- repetition of the START impulse opening contact absent of any polarity
- opening, less than 100 ms

- Maximum load:
  V max = 50 Vdc
  I max   = 0.3 A
  load   = 5 W

- time lag between START IN & START OUT
  3 ms typical

2.7 Functional characteristics

2.7.1 Initialisation of the OSM 6

Only when switching on the equipment

Type of board: - choice of the scorebaord

                      Can be:
                      . Best Time (1 line)
                      . Multiline (max. 10 lines)

                      Can display results in
                      . place order
                      . lane order

Number of lanes   - 1 to 10

Time unit   - 1/1000 or 1/100 sec

                      If 1/1000, we have:

                      . 1/1000 printing
                      . 1/1000 display
                      . 1/100 scoreboard display
                      . swimmer ex-aequo if their times are
                        the same to 1/100 (FINA)
                      . relay error if starting block time
                        + 9 ms is less than touch pad time

Date   - 3 fields of 2 figures for day/month/year

Time of day   - input & synchronisation

2.7.2 Race definition

Choice of program: - AUTO

                      Inputs
                      x 1 : touch pad
                      x 2 : manual push button (back-up)
                      x 3 : unused

                      official time = x 1

- AUTO FD

    inputs
    x 1 : touch pad
    x 2 : manual push button (back-up)
    x 3 : starting block

    official time = x 1

- MANUAL

    inputs:
    x 1 : manual push button time-keeper 1
    x 2 : manual push button time-keeper 2
    x 3 : manual push button time-keeper 3

    official time =
    . with 3 manual push buttons, median time
    . with 2 manual push buttons, 2nd time
    . with 1 manual push button, 1st time

    Time can be recorded under the condition
    that:
    Time gap between input x1, x2,x3, related
    to the same event, do not exceed 2 seconds

Arming time
- 1 to 99 sec.
- if 0 : no automatic arming, must be done
            manually

Race number
- 3 figures
- if 0 : the race number will not be printed
            there is a space handwriting

Heat number
- 2 figures
- if O : the heat number will not be printed,
            there is a space for handwriting

- heat number automatically increased by 1
    after each start, as long as the race number
    is not changed

Number of laps
- 1 to 99
- if 0 : the race will have 100 laps

- the number of laps is automatically controlled
    to determine the final positions

2.7.3 Timing

START	- start - printing the time of day
Intermediate time	- display of lap number - display of lane number of the leading swimmer - printing of official times in chronological order - automatic increase of lap number - control of activated touch pads
Final arrival	- same as intermediate arrival, but, - no automatic increase of lap number

Lanes control	- automatic arming
	- on the display, control of:
	  . activated lane
	  . armed lane
	  . unarmed lane
	  . lane ready for final arrival
	- order given through the keyboard
	  . unused lanes
	  . armed or unarmed
	  . manual start and arrival

Memory	- of all events which happened during the race including when lanes were unarmed or when the competition was normally over. Times are not printed, but can be recalled for later corrections
Next START	- fucntion which separates two events - function which keeps the final arrivals times from the last face in memory - erasing of the main memory area, for the recording of the next race events

2.7.4 Preliminary corrections

Steps the operator can take to keep the OSM 6 from recording erroneous information

- NEXT START function
- Control of lanes
- Race parameters

Note: manual times given from the keyboard are recorded, even if lanes are unarmed


2.7.5 Later corrections

Erasure   – of an unnecessarily recorded time, e.g. due to wave, with restitution of the number of laps and arming conditions

Modification   – replacement of a memorized time by another memorized time, or modification of a time through the keyboard
(the number of laps is not affected by this operation)

Insertion   – insertion of a missing time, which will be inserted according to the chronological order
(number of laps is increased, arming condititions remain the same)

False start   – erasure of the starting time, return to the event number, and heat number which preceded START

Missed start   – equipment not ready for the next race Starting time can be recovered and timing will be successful

Next start   – if this function is activated at the wrong time, possibility to go back to "previous" or present race

2.7.6 Display, printing of the results

Display
- to check the race
- to display the time of day

Printer
- ranking according to official time in arrival order
- ranking according to official time, with a record of back-up times

1-line board
- the first 2 sections depend on the initialisation
  . place-line if ranking order
  . line-place if lanes order
- 0.00 sec display after next start function
- display of running time during the race
- on each lap, the display for 10 seconds of the time of the best swimmer
- winner's time display at finish
- upon request: sequential display of all times, one every 4 seconds, and then display of winner's time

Multilines scoreboard
- the first two sections depend on the initialisation
  . place-line
  . line-place
- after NEXT START function:
  . 1st line   : 0.00 sec
  . other lines : erased
- during the race
  . 1st line   : running time
  . other lines : erased
- on each lap the display for 10 seconds of the previous lap time for each swimmer
- time of each swimmer displayed at finisn

2.8   Plug-in module characteristics
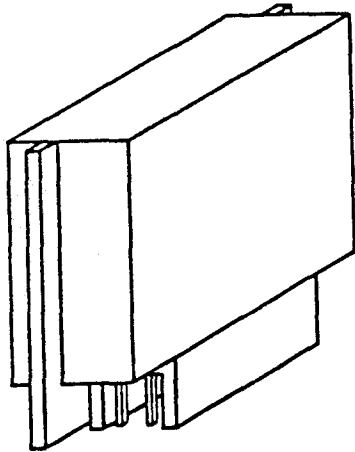
The 3 programs, MANUAL, AUTO, AUTO FD, for the timing of swimming competitions are included in the OSM 6 basic version and therefore no plug-in modules are necessary

The plug-in modules are options which increase the OSM 6 performance and make it suitable for other sports.

The plug-in module is located in the printer's cover.
It can be removed or inserted without tools. (When the OSM 6 is disconnected)

Memory capacity:: 8 K Bytes

2.9   Equipment layout
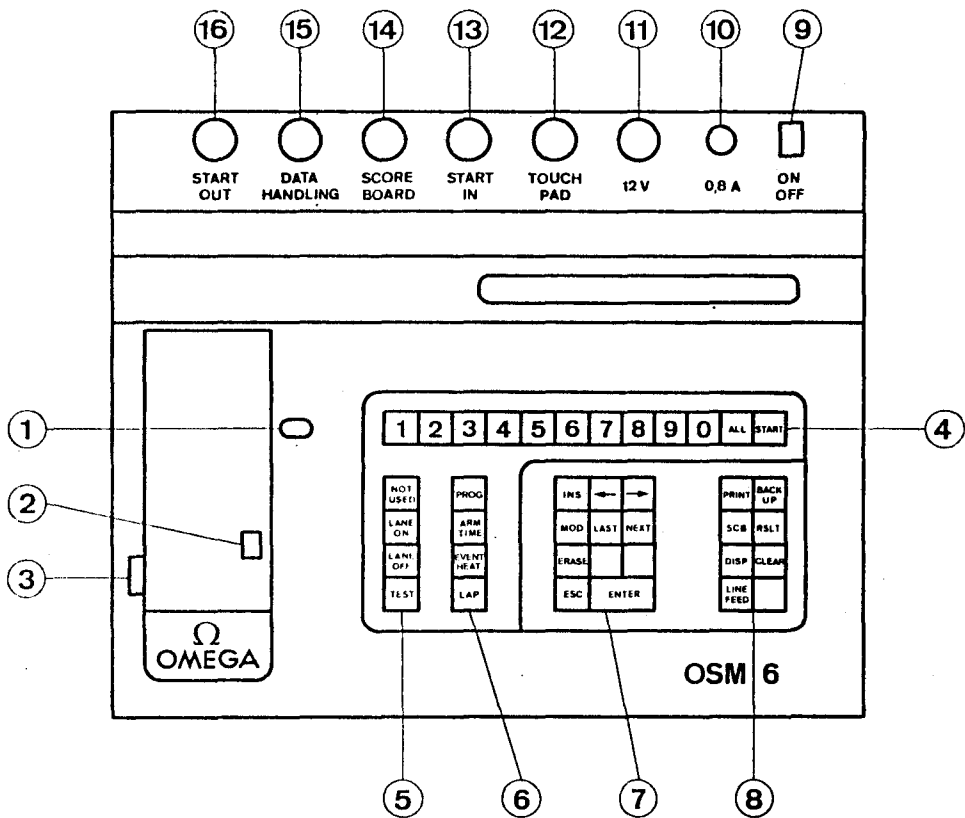
1. Opening of printer cover

2. Allows removal of the ribbon

3. Manual advance of the ribbon

4. Numerical keyboard

5. Control key-board for the lanes

6. Key-board for introducing race parameters

7. Correction key-board

8. Keyboard for displaying results

9. ON/OFF switch

10. 0,8 A slow blowing fuses

11. 12 V battery connector

12 Harness connector

13. Starting system connector

14. Scoreboard connector

15. Data handling computer connector

16 Acoustic start connector

3. Commissioning and maintenance of the OSM 6

3.1 Putting into operation
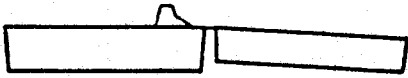
- Take the OSM 6 out of the box

- Keep the box, it may be useful for future transportation of the OSM 6

- Open the OSM 6
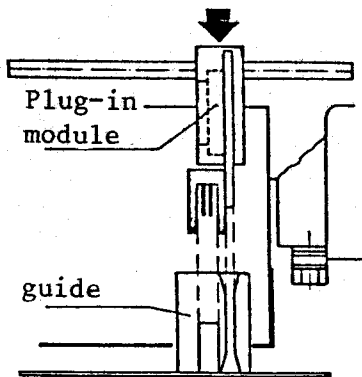
- If necessary, connect the plug-in module

  . open the printer cover with ①

  . push on ② to remove paper

  . pull out the dummy module

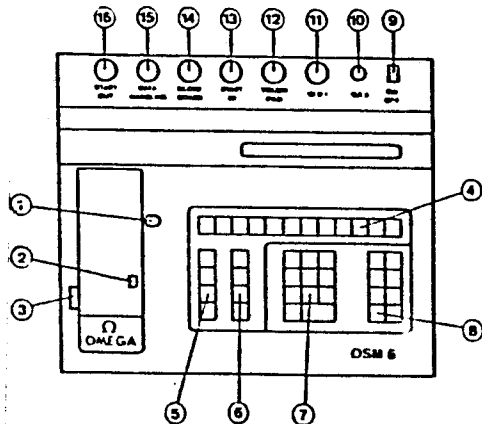 . insert module between guide, and push it home completely

metallized surface
must be on top
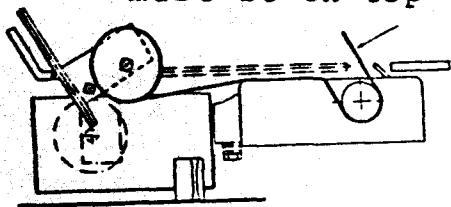
- Puting paper roll in place

  . the roll is fixed to the cover by 2 grips

  . metallized surface must be on top

  . cut the end of the paper so that it is square

  . insert paper into feeding head

  . advance paper manually with ③

  . prior closing the cover, check that the small chromed strap is tilted backward

- When changing paper roll do not forget to push on ② to remove ribbon

  Attention: do not touch buttons when printing is in process

- If paper in not cut after each race, protect it with the winding spool provided in the box of accessories
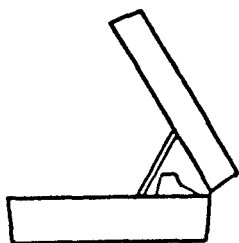
- Keep the cover open with the supports

Provide adequate shelter against water and sun. If necessary, protect the OSM 6 with a sun-shade.

The operator must have good visual contact of the finishing line.

3.2   Connection of the OSM 6

- Install all peripherals according to installation instructions

  . touch pad
  . starting blocks
  . OSM 6 and battery
  . starting system and its tripod (if appropriate)

- Opposite each lane, place a connection module, with corresponding number. (regardless of the OSM 6 position)

- To make the connections refer to the installation documents. For example refer to diagrams 1-A and 2 -A

- Connect the 24 m cable (312)   to the connection module, nearest to the OSM 6

- Connect intermodule cables (311)

- Fix the last module with an end plug (313)

- Note. When connecting the OSM 6:

  . avoid getting sockets wet
    be careful to respect connectors polarity
  . (plugs have various diameters)
    do not bend or twist cables

- Connect timing peripherals to connection modules

          MANUAL   AUTOMATIQUE

  . 3 manual push buttons   . touch pad
                                         . manual push buttons
                                         . starting block

- set switch ⑨ to OFF position

- connect the battery to 12 V power plug with cable ⑩④

- note battery polarity
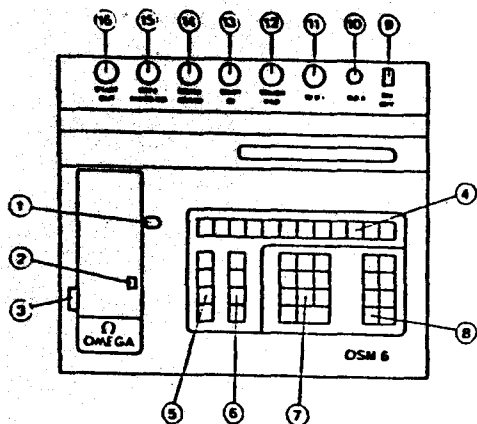
If necessary, recharge battery overnight

It is strictly forbidden and dangerous to connect the charger to the battery, whilst the peripherals are connected

to the OSM 6

- connect harness cable ③⑫ to TOUCH PAD ⑫

- connect start tranducer ②⓪① to START IN ⑬

- if necessary, connect display board 14   to SCORE BOARD
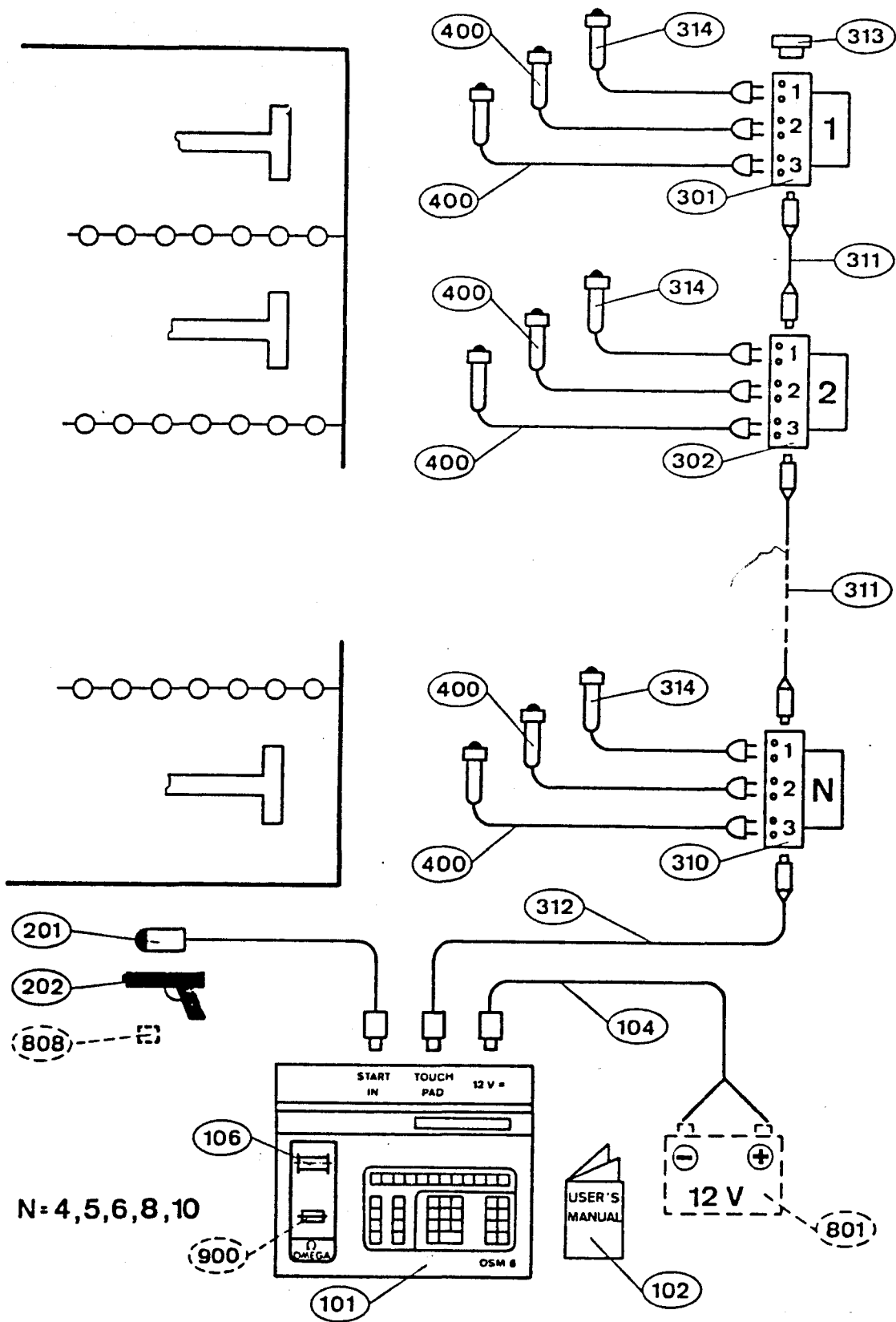
Installation diagram 1-A
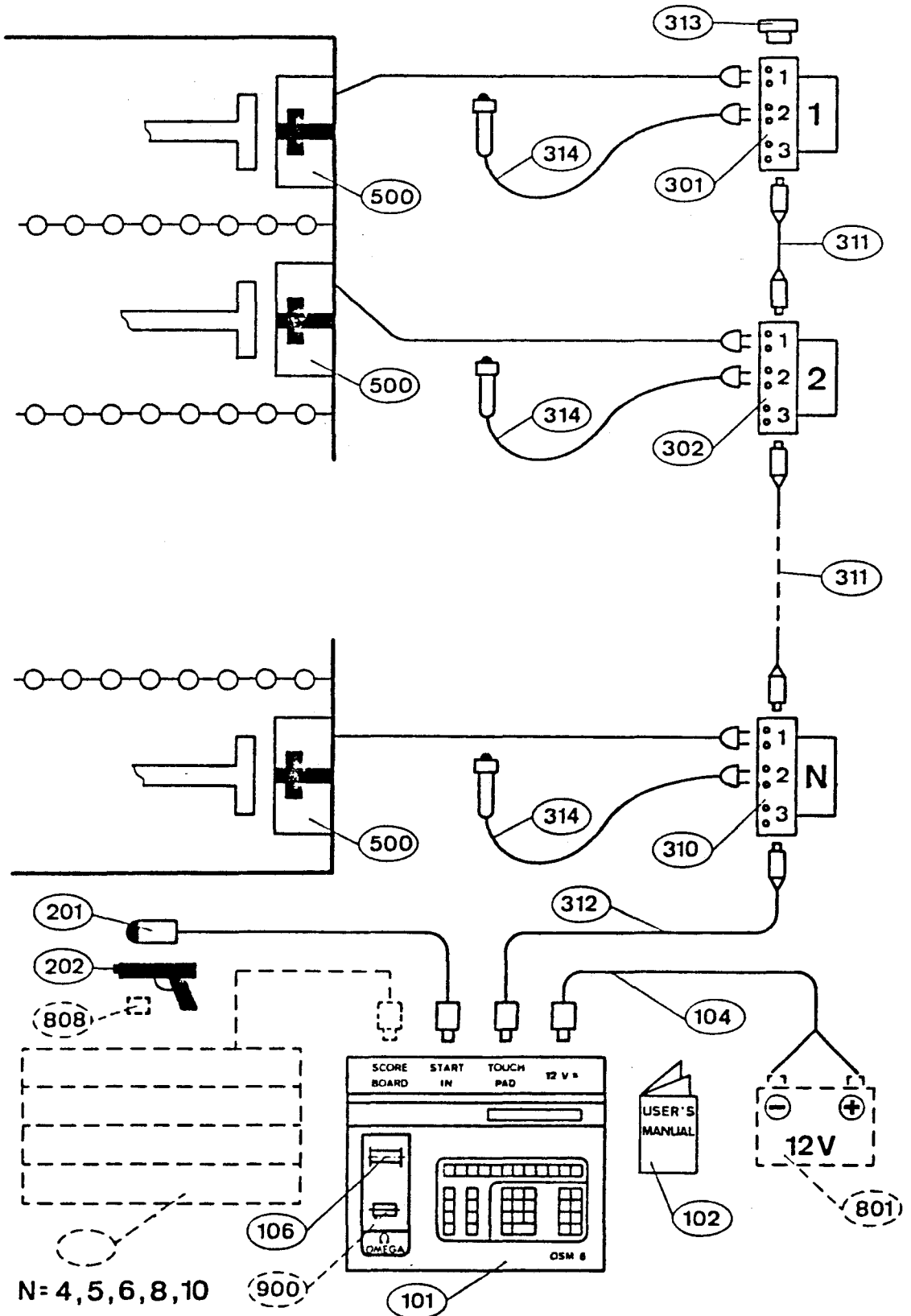
Installation diagram 2-A

3.3   <u>Maintenance</u>

- protect the OSM 6 against heat and humidity

- protect from the sun, if necessary, with a
  sunshade

- protect it against water droplets

  . by setting it away from starting blocks

  . with a transparent shield

- after a race, clean the OSM 6 and make sure it
  is dry before you store it.

3.4   Trouble-shooting

The equipment
does not work

- switch ⑨ is not ON

- battery connected with wrong polarity

- bad contact

- fuse ⑩ defective

The printer
does not work

See our local agent
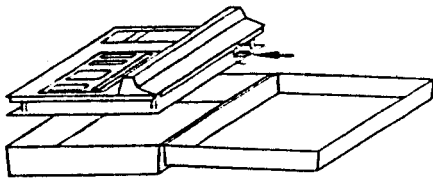
- check printer fuse

- unscrew and take out all connecting
  plugs

- unscrew the ④ rubber feet

- take the console out of the case

- change defective fuse
  (1.5 A slow blowing 5 x 20 mm)

Paper jammed
in the printer
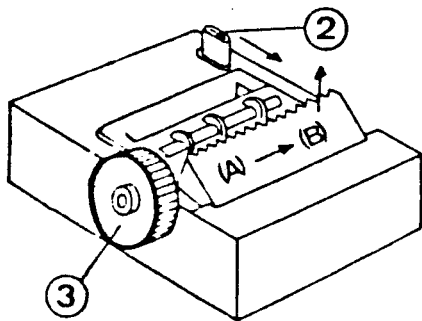
- cut paper between the roll and feeding
  head so that it is square

- feed fresh paper
  with wheel ③   by pushing on ②

- remove paper cutter by moving it to=
  ward Ⓐ then pulling it toward Ⓑ

- lightly push on printing head toward Ⓒ

- pull out paper waste with a tweezer
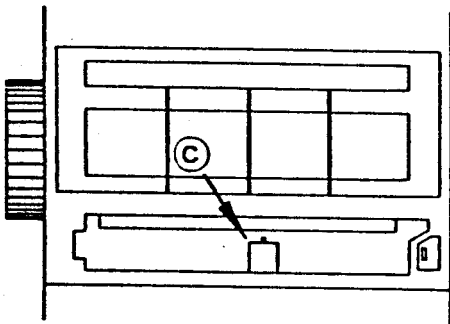
- put back the paper cutter
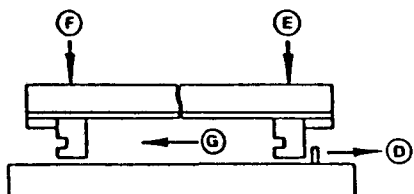
    . push the right side against the
      small metallic lever (D) and
      push on (E)

    . push (F) to set the other side

    . move paper cutter toward (G) to put
      it back to its original place

Bad printing

- proceed as above

- clean the printing head with a
  brush

For other breakdown or problems, see our local agent

4. Utilisation

Your OSM 6 is a computerized high-precision instrument automatically performing a great number of programmed timing functions.
The operation of the OSM 6 is very simple and apart from the knowledge of the competition rules no particular skill is required.

Long experience suggests the following ten points should be observed in order to feel confident with the OSM 6 timing system and to ensure the perfect timing of all competitions:

1. Install the OSM 6 in sight of the finishing line and if necessary provide a sunshade for the instrument. Wire the installation and connect the prescribed power supply according to the operating manual.

2. Acquaint yourself with the various functions of all the switches on the OSM 6 control panel.

3. Check-out the installation prior to all competitions. Ensure that the battery is charged, you have sufficient paper and that the peripheral equipment supplies timing pulses.

4. Operate the OSM 6 as indicated in the different sections of the operating manual.

5. Establish a good visual contact with the starter, reset the OSM 6 and be prepared for the start when the starter calls the competitors.

6. Once started, follow the meeting with attention - don't become bored by the repetitive routine.

7. Remain alert in order to correct any irregularitiy you may become aware of.

8. The printer is a piece of miniaturized high-precision equipment, therefore take care when loading fresh paper and tearing off printed tickets.
Remember that the timing process goes on even when paper is blocked. The stored final results can always be printed once the printer is back to its normal working condition.

9. After a race, check the OSM 6 ranking against the referee's. If you operate two OSM 6 in parallel, compare the times prior to handing them over to the officials.

10. After the competition, dismantle and store the equipment carefully.

If you are a beginner

. **carefully** read the operator's manual

. **practice** the OSM 6 functions

. **choose** the AUTO program

. **practice** all the functions described in the following chap-
   ter. You can simulate start and arrival with the keyboard.

If you have little experience

. practice the OSM 6 function during training

. use correction functions, e.g. false start

. use the scoreboard and observe its functions

With a little experience, you can be a good time keeper, because
the operation of the OSM 6 is straight forward

As long as there are no unexpected events, the operator does not
have to interfere.

After each race, to display the results, follow these 3 steps

- PRINT RSLT   printing of the results

- PRINT BACK UP   results + back-up time

- LANE ON + START   equipment ready for NEXT START

With LANE OFF + START, you can always go back to the last race

5. Use of the OSM 6

5.1 Connection of the OSM 6
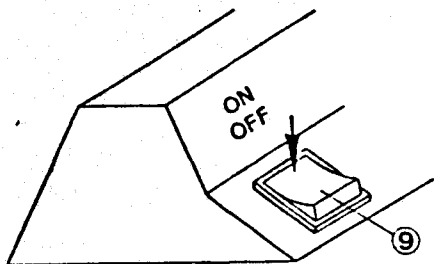
Press on switch (9) ON - OFF, in the indicated direction

```
OMEGA SWIMM-O-MATIC
       OSM 6
   SWIMMING 01
```

When connecting the OSM 6
printing of heading and program number
01 : basic program

The parameters to be inserted are:

- type of board
- number of lanes (1 to 10)
- time unit
- date
- time of day
- time synchronisation

Once these parameters are inserted, they cannot be modified. If other values are needed, switch the OSM 6 OFF, then ON

All inserted parameters are printed so the operator can check these values at any time

5.2   Insertion of the type of scoreboard

There are 4 possibilities. Check the display to select the cor-
rect type of board

| 5Cb. 1 PL | | 1 LInE | 1 line board called "Best Time",
according to swimmers rank, displays
the lane number and the time

| 5Cb. 2 LA | | 1 LInE | 1 line board called "Best Time"
according to lane number displays the
rank and time of the swimmer

| 5Cb 3 PL | | 10 LInES | Multiline board (Max. 10)
according to swimmers rank, displays the
lane number and time

| 5Cb 4 LA | | 10 LInES | Multiline board (Max.10)
according to lane number, displays the
rank and time of the swimmer

The cursor blinks on the parameter to be inserted, here, number
of the type of board. (a figure from 1 to 4)

To insert: - press the corresponding figure on the
                                   numerical key-board
                                 - check the type of board on the display
                                 - press ENTER

Other method: - press NEXT or LAST, to check the diffe-
                                   rent possibilities on the board
                                 - stop when the display corresponds to
                                   the type of board
                                 - press ENTER

Basic value: - if no scoreboard in the installation
                                   press ESC to leave this section

                                 - the OSM 6 will then act as if function
                                   SCB 1 was introduced

If by mistake you press a wrong key, the OSM 6 will give a loud
BEEP and will wait until the operator presses the correct key.
Only keys ESC and ENTER allows you to go from one section to the
other.

5.3 Insertion of the number of lanes

| LAnE 12 | 34567890 | - the number of lanes is displayed

- for a non-existent lane number to disappear press the number of the non-existent lane once on the numerical board

- press the same key again, the lane number is back on the display

- the display gives the number of lanes in use
When these numbers correspond to your pool configuration, press ENTER

| LAnE 12 | 3456 | - example: display for a 6 lane pool

Basic value:
- press ESC if you want to avoid this section
The OSM 6 will act as if the pool has 10 lanes

5.4 Insertion of the time base

There are 2 possibilities, check the display to make your choice

| PrEC. 1 | 1 1000 | - timing, 1/1000 sec

- display and built-in printer 1/1000 sec.

- transmission to external peripherals 1/100 sec (FINA)

- 2 swimmers declared even, if their time is identical to 1/1000sec

| PrEC. 2 | 1 100 | - timing 1/100 sec

- display and built-in printer 1/100 sec

- transmission to external peripherals au 1/100 sec

- 2 swimmers are declared even, if their time is identical to 1/100 sec

To insert:
- press 1 or 2 on the numerical keyboard to choose the unit
- other methods: use LAST and NEXT to check the different possibilities

- make sure the display corresponds to the chosen unit
- press ENTER

Basic value:
- press ESC to avoid this section

The OSM 6 will work in PREC. 1 1/1000 sec

5.5   Insertion of the date

3 fields of 2 figures separated by a full stop are reserved for the date.
Day, month, year can be introduced in any order, the OSM 6 having no calendar.
The printer will show this information in the order in which it has been introduced.

| dAtE | 00.00.00 | - you can locate these fields on the display

- the cursor blinks on the first figure to be introduced

To insert:
- press the figure corresponding to the date on the numerical keyboard
- in case of mistake, the cursor can be moved from left to right
- make sure the display shows the correct date
- press ENTER

| dAtE | 09.02.83 | - example Feb. 9, 1983

Basic value:
- press ESC to avoid this section the OSM 6 will print 00/00/00

5.6   Insertion of the time of day

3 fields of 2 figures are reserved for the time of day display.
Insert figures in the following order only, hours, minutes,
seconds (the equipment does not accept erroneous values).

To have time for synchronisation introduce a value in advance,
10 - 60 sec depending on your experience in timing.

`tINE`	`00:00.00`	

- the : separates the hours from the minutes
- the . separates the minutes from the seconds
- the cursor blinks on the first figure to be introduced

To insert:

- press the value corresponding to the hour on the numerical keyboard
- in case of mistake the cursor can be moved
- check that display shows correct hour
- press ENTER

`tINE`	`11:25.00`	

- example 11 hours 25 minutes

Basic value:

- press ESC to avoid this section
  The OSM 6 will then assume that it has been set at this moment, 0 hour, 0 min.

5.7   Synchronisation of time of day

The initial time of day value is inserted, but the clock will not
work as long as the START order is not received.

`SYnC.`	`11:25.00`	

- keep the function key TEST down
- when it is time for the clock to go on, press function key START

`. . . . . . . .`	`StArt`	

- the equipment is synchronized, and ready for timing
  The display shows that the equipment is awaiting the NEXT start.
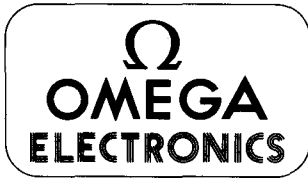
6. Definition of the race

The parameters give the following definition:

- program
- arming time
- event and heat number
- number of laps (length of the race)

The value of these parameters can be modified at any time, but the consequences of such changes are not always the same, they depend on the OSM state.

Once these 4 parameters are introduced, they are valid for all future events.
For each race, (but not each heat) the race number, number of laps and possibly the program, must be changed.

For the operator to know what is going on, each modification is printed.

6.1 Choice of program

3 possibilities.
Check the display to select the correct program.

| Pr06. 1 | AUto | - AUTOMATIC, for individual and relay (without false relay control) |

| Pr06. 2 | Fd AUto | - AUTOMATIC FD, for relay races (without false relay control) |

| Pr06. 3 | MAnUAL | - MANUAL, with 3 manual push buttons for individual and relay races (without false relay control) |

The program must be selected before the race starts.
To change program during a race, for example, between lap 1
and lap 2, makes no sense. However, this possibility exists but
you should only use it to correct an operator error.
If the correction happens during the first lap there will be no
consequences, times will be recorded on the right program.

To insert:
- press PROG
- the cursor blinks on the figure to
  be inserted
- press the figure on the numerical
  key-board
- other possibilities: use function
  keys LAST and NEXT to check the diffe-
  rent possibilities
- check the program's name on the dis-
  play
- press ENTER

To check:
- press PROG
- check the program's name on the dis-
  play
- press ESC
- this operation can be done at any
  moment

Basic value:
- when switched on, the equipment works
  with PROG 1 : AUTO

6.2   Introduction of arming time

Arming Time, A.T. is the time we have to wait for a lane to be
armed, that is, ready to register an arrival.
After each start, or any time a swimmer touches the pad and goes
to the next lap, the lane is disarmed.
For the swimmer's time to be registered, the lane must be armed.
A.T. must be adjusted according to the swimmers capacity.
A.T. must be between 1 & 99 seconds

We recommand:

        A.T. = 15 sec for 25 m pool
        A.T. = 45 sec for 50 m pool

When A.T. is changed, the new value is not taken into considera-
tion at once.
It will be after a START (start of the event) or after a pad
has been touched.
Example: A.T. is changed during an event.
For the present lap, it is still the old A.T. value which is
considered.
After the turn, (contact of a touch pad) the new A.T. value
will determine the arming of the lane.

To insert: - press ARM Time

                               - the cursor blinks on the first fi-
                                 gure to be inserted
                               - insert A.T by means of the nume-
                                 rical keyboard

| Ar Π.tI ΠE | | 54 SEC | - check the value on the display
                               - press ENTER

To check: - press ARM TIME

                               - check the value on the display
                               - press ESC
                               - this operation can be done at any
                                 time

Basic value: - 15 sec, the smallest value which
| Ar Π.tI ΠE | | IS SEC | can be used

Special cases: - if we introduce A.T = O, the OSM 6
                                 does not consider the arming time,
                                 there is no automatic arming.
                                 The operator must arm the lane
                                 by means of the keyboard

6.3   Introduction of the event number, heat number

The races can be marked (EVENT) by a number of 3 digits and
the heat (HEAT) by a number of two digits.
The first event number and heat number are inserted.
This information is printed at the time of START.

Every time the function NEXT START is called, (LANE ON + START) the heat number is automatically increased by 1 and this until the number of the race is modified.

It is not possible to modify the numbers after the race is started, so all the printed paper strips will have the same numbers.

Nevertheless, if new numbers are introduced during or after the race, they will only be considered for the next event.

To insert: - press   EVENT HEAT

`EUEnt000` `HEAt  00`   - the cursor blinks on the figure of the
                                 event number (EVENT)
                               - insert a three 3 digit number
                                 (example 1 2 3)
`EUEnt 123` `HEAt  00`   - the cursor blinks on the first figure
                                 of the heat number (HEAT)
                               - insert a two digit number
                                 (example 4 5)
                               - check the values on the display
`EUEnt 123` `HEAt  45`   - correct, if necessary, by means of
                                 the cursor
                               - press   ENTER

To check: - press EVENT HEAT

                               - check the values on the display
                               - press   ESC

Basic value: - the basic values are nil.
                                 In this case the printer writes down
                                 EVENT HEAT but not the numbers
                                 There is space to write with a pen

Special cases: - introduce nil values
                                 The OSM 6 will act as with Basic
                                 values
                               - if the race number is nil, but not
                                 the heat number, the heat number will
                                 be incremented

6.4   Introduction of the number of laps

The length of the race is expressed as a number of laps:

        50 m pool   :   100 m = 1 lap
        25 m pool   :   50 m = 1 lap

The **OSM6** automatically counts the number of laps between 1 & 100

When the number of laps is changed, the new value is automatically taken into consideration.

To insert:

| L A P S | 0 8 |

- press   LAP
- the cursor blinks on the first figure to be introduced
- introduce the value by means of the numerical keyboard
- check the value on the display
- press   ENTER

To check:

- press   LAP
- check the value on the display
- press   ESC

Basic values:

| L A P S | 1 5 |

- 15 laps = 1500 m, that is the longest race

Special cases:

- if 00 is inserted the OSM 6 considers the race to have 100 laps and indicates the final arrival at that time.

7.   Timing

The 3 resident programs (AUTO, AUTO FD, MANUAL) have the following similarities.

- the developments of the race are identical
- the timing procedure is the same
- the display information is identical
- the information printed during the race is similar
  There are some small differences depending on the program
- classifications with back-up times are appropriate to each
  program

The following is the timing of a race using the AUTO program, which is used more often.

7.1   Timing with the AUTO program

> 1. Prepare the OSM 6 as per chapter 3
>   Make the connections as per instal-
>   lation schematic
>
> 2. Connect the OSM 6 and initialise it
>   as per chapter 5

```
    OMEGA SWIM-O-MATIC          -   Printed heading when connected
          OSM 6
       SWIMMING 01              -   01: basic program

                                -   Data input
    SCB.  :   PL/ 1 LINE           . 1 line board, in place order
    LANE  :    123456
    PREC. :       1/1000           . 6 lanes pool
    DATE  :    20/04/83            . time unit
    TIME  :    13.54:00            . date, April 20, 1983
                                   . time of day

    SYNCHRO  13.54:00.000       -   synchronisation of time of day
```
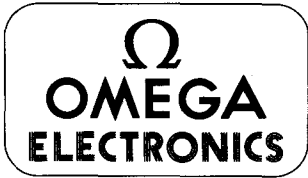
3. After synchronisation the equipment
   is automatically ready for the
   NEXT START

`[ - - - - - - ]`   `[    5tArt ]` - the display shows
   . that lanes are unarmed
   . that the equipment awaits a START

   - the printer indicates the value defi-
     ned by the program for the race
     parameters

```
OMEGA SWIM-O-MATIC          . a heading
        OSM 6

ARMING:        15 SEC        . arming time      : 15 sec
LAPS :            15         . number of laps   : 15 (1500 m)
PROG. :         AUTO         . program          : AUTO

  READY FOR NEW RACE         . ready for a new race
```

   - these parameters can now be modified

```
ARMING:        45 SEC          arming time      : 45 sec
                               (50 m pool)
EVENT : 123 HEAT : 45        . input of race and heat
                               number
LAPS :            02         . number of laps   : 2 (200 m)
```

   - skip point 4 and go directly to
     point 5.

4. At the end of a race, after printing the various classifications or at any time the equipment is not ready for the NEXT START
press

   LANE ON + START

`[ - - - - - - ]`   `[    5tArt  ]` - the display shows
   . that lanes are disarmed
   . that the equipment is awaiting a START

   - the printer indicates the defined para-
     meter of the race

```
  OMEGA SWIM-O-MATIC
        OSM 6
```
. heading

```
ARMING:        45 SEC
LAPS :           02
PROG. :        AUTO
```
. arming time   :   45 sec
. number of laps :   2 (200m)
. program   :   AUTO

```
  READY FOR NEW RACE
```
. ready for a new race

   - following can still be done:

     . check the values on the display
     . modify these 3 values as well as the
       event and heat number

5. The start is given through the starting device

```
.......          L.1
```

- the display shows:
  . that the lanes are disarmed
  . that the race is in lap 1

- the printer shows:

```
EVENT : 123 HEAT : 45
```

event and heat number

```
P            14.43:11.290
L L
A A  L       20/04/83
C H  A
E E  P
```

. time of START

. date

The 3 colums show:
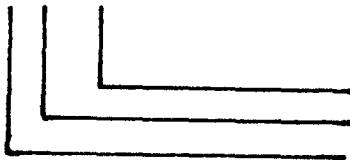
- the lap number
- the lane number
- the place (rank) of the swimmer

After the START, all the defined parameters of the event can be checked and modified except the event and heat number

This makes the inversion of the results of two events impossible

```
::::::          L.1
```
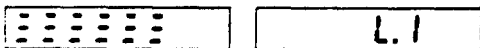
6. after arming time the lanes are automatically rearmed

7. Intermediate time 1 (1st swimmer)

```
::8:::          L.1 3
```

- the display shows:

  . no. of lane where the first swimmer is
  . that the touch pad is activated

    (the symbol is displayed for 0,5 sec)

```
1 3  1       50.645
```

- the printer shows:
  . the actual time of the touchpad

8. Next intermediate times

- the display shows
  - . that lane 3 is unarmed
  - . that other swimmers are arriving

`88-888`   `L.I 3` - the printer shows
  - . all actual touch pad times in arrival order

```
1 3  1      50.645
2 1  1      50.891
3 6  1      50.910
4 5  1      50.930
5 4  1      50.931
6 2  1      50.935
```

9. After arming time, lanes are automatically armed

`A.2` - the display shows
  - . that race is in lap 2
  - . A : for final time
        it is the last lap

10. Final time (1st swimmer)

`A.2 4` - the display shows

  - . no. of the winner's lane
  - . on this lane the race is over

```
1 4  2      1:40.476
```
  - the printer shows

  - . the actual time of the touchpad

11. Next final times

```
┌──────────┐   ┌──────────┐
│ oooooo   │   │    R.2  4│
└──────────┘   └──────────┘
```

- the display shows that the race is over

```
1  4  2      1:40.476
2  3  2      1:40.819
3  5  2      1:41.116
4  2  2      1:41.272
5  6  2      1:41.441
6  1  2      1:41.641
```

- the printer shows
  . all actual touchpad times in arrival order

12. Printing of the results after the race

```
OMEGA SWIM-O-MATIC
      OSM 6

EVENT : 123 HEAT : 45

P        14.43:11.290
L L
A A  L    20/04/83
C N  A
E E  P      RESULT

1  4  2      1:40.476
2  3  2      1:40.819
3  5  2      1:41.116
4  2  2      1:41.272
5  6  2      1:41.441
6  1  2      1:41.641
```

- press PRINT then RSLT

. heading

. event and heat number

. time of start

. date

. title for results

chronological classification of official times
(printed as actual time of event)

13. After the race, printing of the re-
    sults with back-up time

    - press   PRINT   then   BACK UP

OMEGA SWIM-O-MATIC   . heading
        OSM 6

EVENT : 123 HEAT : 45   . number of event, heat

P   14.43:11.290   . time of START
L L
A A   L   20/04/83   . date
C N   A
E E   P   BACK UP   . title for back-up time

1 4   2   1:40.476   . official touchpad time
  4   2   1:40.472
2 3   2   1:40.819   . back-up time with manual push
  3   2   1:42.506   buttons
3 5   2   1:41.116
  5   2   1:42.534
4 2   2   1:41.272   The place number is prin-
  2   2   1:42.551   ted with reference to offi-
5 6   2   1:41.441   cial times
  6   2   1:42.518
6 1   2   1:41.641
  1   2   1:42.532

14. Get ready for the next race,

    Back to point 4

8. Display of the results

8.1 Display on the built-in printer

Reminder: Function   NEXT START   LANE ON + START

        separates the two races.

The race which takes place before this function is monitored is called:

        PREVIOUS EVENT

The race which is taking place or going to take place after is called

        CURRENT EVENT

The OSM 6 allows storage of the final results of the previous event in the memory and to print them during the current event.

There are 4 printing options

PRINT   11   :   intermediate or final results of the current event

PRINT   12   :   intermediate or final results, with back-up time, of the current event

PRINT   21   :   final results of the previous event

PRINT   22   :   final results, with back-up time, of the previous event

To print: - press PRINT

| Prl nt l. | run. rACE |

                - the cursor blinks on the first figure to be inserted
The numbers beginning with 1 allow the choice of the current event

                - the keys LAST & NEXT allow to see the various possible printing options

| `Print 2.` | `Old rACE` | - To print the results of the previous event, the number must begin with 2 |

- After choosing between current event and previous event, move the cursor onto the second figure by means of the right cursor key

- Example for current event

| `Print 1.` | `run. rACE` | . the cursor blinks on the second figure |

. with keys LAST NEXT we can choose:

| `Print 11` | `rESULE` | . to print the results |

| `Print 12` | `bACH UP` | . to print the results with back-up time |

- Example for previous event

| `Print 2.` | `Old rACE` | . the cursor blinks on the second figure |

. with keys   LAST   NEXT we can choose:

| `Print 21` | `rESULE` | . to print the results |

| `Print 22` | `bACH UP` | . to print the results with back-up time |

- When display corresponds to the desired printing option, press ENTER

Direct method

- For current event, to print the results

  . press   PRINT
  . press   RSLT

- For current event, to print the results

  . press   PRINT
  . press   BACK UP

- For the previous event, to print the results

  . press   PRINT
  . press   LAST
  . press   RSLT

- For the previous event, to print the results with back-up time

  . press   PRINT
  . press   LAST
  . press   BACK UP

Interruption of
printing:

- If a classification printing must be interrupted

  . press   PRINT
  . press   CLEAR

- This function affects only the printing controlled by the operator, it is not possible to suppress or interrupt the automatic printing
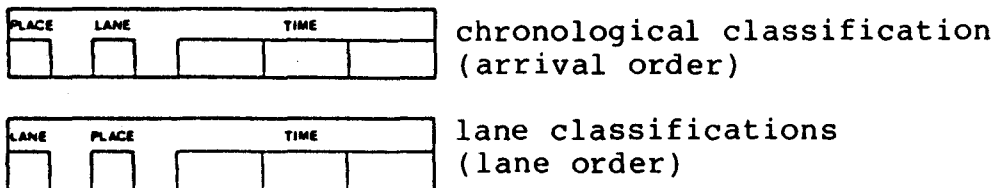

Printing examples can be seen in chapter 7 regarding the AUTO program and in chapter 9, regarding the AUTO FD and MANUAL program.

8.2   Control of the displays on the board

When the clock is running, the OSM 6 transmits the messages to the display board every 0,1 sec.
The time of event will be displayed in seconds or in tenths of a second, depending on the type of board (electromecanical unit or lampbox)

There are two ways of presenting the information:

PLACE	LANE		TIME	

chronological classification (arrival order)

LANE	PLACE		TIME	

lane classifications (lane order)

There are 4 control functions of the board:

SCb. 1 :   - display of the current event

                                   . transmission of the event time 0.1 sec (running time)

                                   . display of intermediate times for 10 sec, then back to the running time

                                   . display of the final times until the operator calls the NEXT START function

SCb. 2 :   - dispatch of characters "SPACE" which erases the board

SCb. 3 :   - dispatch of characters to the board, to display final results

SCb. 4 :   - allows the display of time of day on the board, during competition interruptions
                                     For example, lunch break

These 3 functions are permanent, i.e. we stay in one of these modes until the operator decides to change.

To display: - press   SCB

| SCb. 1 | | run. rACE | - the built-in display allows the con-
trol of the type of display
Here, display of the current event

- the cursor blinks on the figure to
be inserted

- the various possibilities can be tes-
ted by means of keys   LAST   &   NEXT

| SCb. 2 | | CLEAr | - erasure of the board

| SCb. 3 | | rESULt | - display of final results
  . if by the time this function is
    called, the instrument hasn't regis-
    tered any time, the board is erased

| SCb. 4 | | dAY tiME | - display of the time of day
  . this system does not allow the dis-
    play of race results, therefore it
    must only be used during competition
    interruptions

- check the type of display on the built-
in display

- press   ENTER

Direct method

- to make the control of the board easier, the keyboard has function keys

- SCb 1   current event
  . press   SCB
  . press   ENTER

- SCb 2   erasure of the board
  . press   SCB
  . press   CLEAR

- SCb 3   final results
  . press   SCB
  . press   RSLT

- SCb 4   time of day
  . press   SCB
  . press   4
  . press   ENTER

Basic value

- SBb 1   current event

Special cases

- Let's assume that a race has just ended, example 104 heat 02

- If we call SCB RSLT the board displays the final results of event 104/2

- If the equipment is prepared for the NEXT START, and if we call LANE ON + START, then SCB RSLT, the board will still display the results of the event 104/2

  This is useful when starts of the different heats are very close.
  We can prepare the equipment for the next race while we display the results of the race which just ended

- If the start of the event is given and we call SCB RSLT before the OSM 6 registers a time, the board will be erased
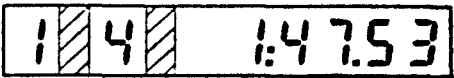
8.3   Display on a 1 line board

We shall examine the various messages displayed during the event:

```
 _____
|///|   |///|       ___  ___ |
|///|   |///|   :  |   ||   ||
|///|   |///|      |___||___||
|___|___|___|_____|
```
– after LANE ON + START
  NEXT START

```
 _____
|///|   |///|    ___   ___   |
|///|   |///|   |   | |     |
|///|   |///|   |:  | |___. |
|___|___|___|_____|
```
– after START, display of the running
  time

```
 _____
| | |///|  |///|   ___  ___ ___ |
|   |///|  |///|  |   ||  ||__ |
| | |///| |///|  |:|  ||._||._||
|___|___|___|_____|
```
– at intermediate times 10 sec. dis-
  play of best swimmer's time

```
 _____
|///|   |///|    ___   ___   |
|///|   |///|   |   | |     |
|///|   |///|   |:__| |__. |
|___|___|___|_____|
```
– back to running time display

```
 _____
| | |///| |  |///|  ___ ___ ___ |
|   |///| |__|///| |   ||__||  ||
| | |///| |  |///| |:__||._||__||
|___|___|___|_____|
```
– final times

The function SCB RSLT allows the display of all results in
sequence :

– one sequence allows all times to be displayed one after the
  other

– the time of each swimmer is displayed for 4 sec.

– at the end of the sequence, the display again gives the time
  of the first swimmer

– this function can be used after every lap and for the final
  times

Direct method

- to make the control of the board easier, the keyboard has function keys

- SCb 1 current event
  . press SCB
  . press ENTER

- SCb 2 erasure of the board
  . press SCB
  . press CLEAR

- SCb 3 final results
  . press SCB
  . press RSLT

- SCb 4 time of day
  . press SCB
  . press 4
  . press ENTER

Basic value

- SBb 1 current event

Special cases

- Let's assume that a race has just ended, example 104 heat 02

- If we call SCB RSLT the board displays the final results of event 104/2

- If the equipment is prepared for the NEXT START, and if we call LANE ON + START, then SCB RSLT, the board will still display the results of the event 104/2

  This is useful when starts of the different heats are very close.
  We can prepare the equipment for the next race while we display the results of the race which just ended

- If the start of the event is given and we call SCB RSLT before the OSM 6 registers a time, the board will be erased

8.3   Display on a 1 line board

We shall examine the various messages displayed during the event:

```
┌─────────────────────────┐
│ ▨   ▨         : 0.00 │     - after LANE ON + START
└─────────────────────────┘       NEXT START
```
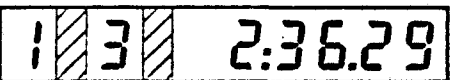
```
┌─────────────────────────┐
│ ▨   ▨     1:2 2.     │     - after START, display of the running
└─────────────────────────┘       time
```

```
┌─────────────────────────┐
│ 1 ▨ 4 ▨   1:4 7.53  │     - at intermediate times 10 sec. dis-
└─────────────────────────┘       play of best swimmer's time
```

```
┌─────────────────────────┐
│ ▨   ▨     1:5 7.     │     - back to running time display
└─────────────────────────┘
```

```
┌─────────────────────────┐
│ 1 ▨ 3 ▨   2:36.29   │     - final times
└─────────────────────────┘
```

The function SCB RSLT allows the display of all results in
sequence :

- one sequence allows all times to be displayed one after the
  other

- the time of each swimmer is displayed for 4 sec.

- at the end of the sequence, the display again gives the time
  of the first swimmer

- this function can be used after every lap and for the final
  times

Direct method — to make the control of the board easier, the keyboard has function keys

- SCb 1   current event
  . press   SCB
  . press   ENTER

- SCb 2   erasure of the board
  . press   SCB
  . press   CLEAR

- SCb 3   final results
  . press   SCB
  . press   RSLT

- SCb 4   time of day
  . press   SCB
  . press   4
  . press   ENTER

Basic value — SBb 1   current event

Special cases — Let's assume that a race has just ended, example 104 heat 02

- If we call SCB RSLT the board displays the final results of event 104/2

- If the equipment is prepared for the NEXT START, and if we call LANE ON + START, then SCB RSLT, the board will still display the results of the event 104/2

  This is useful when starts of the different heats are very close.
  We can prepare the equipment for the next race while we display the results of the race which just ended

- If the start of the event is given and we call SCB RSLT before the OSM 6 registers a time, the board will be erased
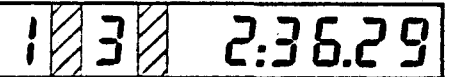
8.3   Display on a 1 line board

We shall examine the various messages displayed during the event:

`▨ ▨        :  0.00`	– after LANE ON + START NEXT START
`▨  ▨      1:2 2.`	– after START, display of the running time
`1▨4▨     1:4 7.5 3`	– at intermediate times 10 sec. display of best swimmer's time
`▨  ▨      1:5 7.`	– back to running time display
`1▨3▨    2:3 6.2 9`	– final times

The function   SCB   RSLT   allows the display of all results in sequence :

- one sequence allows all times to be displayed one after the other

- the time of each swimmer is displayed for 4 sec.

- at the end of the sequence, the display again gives the time of the first swimmer

- this function can be used after every lap and for the final times

9. Event examples

We shall examine timing with AUTO FD and MANUAL programs
We already have seen timing with AUTO program, see chapter 7.
and therefore we shall simplify.

- We skip development of the event on the display, as it is the same for each program.
- We skip the OSM 6 initialisation and definition parameters
- We shall see only printed messages in order to count up the results.

9.1 Example: AUTO FD program

Relay, 4 x 100 m Individual Medley
Only 4 lanes are used

```
OMEGA SWIM-O-MATIC
        OSM 6
```
- printed heading at time of
  LANE ON + START

```
ARMING:        45 SEC
LAPS :            04
PROG. :      FD AUTO
```
. arming time   : 45 sec (50 m pool)
. number of laps : 4   (4 x 100m)
. program   : FD AUTO Relay

```
READY FOR NEW RACE
```
- ready for a new race

- start is given, we print:
  . event no.   : 100 heat no.   : 4

```
EVENT : 100 HEAT : 04
```
. time of start

```
P         14.43:47.939
L L
A A  L    26/04/84
C N  A
E E  P
```
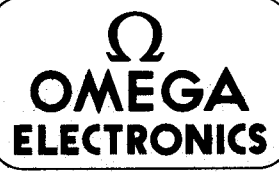. date: April 26, 1984

- intermediate arrival lap 1

```
 1 3  1     1:01.641
 2 4  1     1:02.413
 3 2  1     1:02.607
 4 1  1     1:02.892
 D 3  1     + 0.539
 D 4  1     + 0.806
 D 1  1     + 0.485
 D 2  1     + 1.064
```
touchpad registered times in chronological order

D: start from starting blocks, the printed time is the interval between starting block and touchpad time

			- intermediate times lap 2
1 4 2	2:01.034	Touchpad registered times
2 3 2	2:01.566	
3 2 2	2:02.083	
4 1 2	2:02.411	
D 4 2	+ 0.267	D: start from starting blocks
D 3 2	+ 0.260	on lane: 1 the time is not recorded,
D 1 2	-.---	as interval between block and touchpad
D 2 2	+ 0.261	is more than 2 sec.

```
  1 4  2       2:01.034      Touchpad registered times
  2 3  2       2:01.566
  3 2  2       2:02.083
  4 1  2       2:02.411
  D 4  2         + 0.267     D: start from starting blocks
  D 3  2         + 0.260     on lane: 1 the time is not recorded,
  D 1  2         -.---       as interval between block and touchpad
  D 2  2         + 0.261     is more than 2 sec.


  1 3  3       3:01.455      - intermediate times lap 3
  D 3  3         + 0.523
  2 2  3       3:03.698      Touchpad registered time
  3 4  3       3:04.267
  4 1  3       3:04.331
  D 2  3         - 0.347     D: start from starting blocks
  D 1  3         + 0.518     On lane 2: false start, the interval
  D 4  3         + 0.499     between block and pad is negative


  1 3  4       4:01.348
  2 2  4       4:01.811      - final time lap 4
  3 4  4       4:02.263
  4 1  4       4:02.860      Touchpad registered time




      OMEGA SWIM-O-MATIC
             OSM 6          Printing of the results
                           PRINT   RSLT

  EVENT : 100 HEAT : 04     . event no. and heat no.

  P        14.43:47.939     . time of start
  L L
  A A  L       26/04/84     . date
  C N  A
  E E  P       RESULT       . heading for final results

  1 3  4       4:01.348      Touchpad registered times
  2 2  4 FD    4:01.811
  3 4  4       4:02.263      On line 2: false start indication
  4 1  4       4:02.860      This indication appears only when
                           T block + 9 ms is less than T  touch
                           pad
```
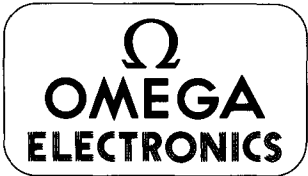
```
    OMEGA SWIM-O-MATIC
           OSM 6

EVENT : 100 HEAT : 04

  P       14.43:47.939
  L L
  A A   L     26/04/84
  C N   A
  E E   P     BACK UP

  1 3   4     4:01.348
    3   4     4:01.321
  2 2   4 FD  4:01.811
    2   4     4:01.799
  3 4   4     4:02.263
    4   4       -.---
  4 1   4     4:02.860
    1   4     4:02.845
```

- printing of results with back-up time

  PRINT   BACK UP

. event no.   heat no.

. time of start

. date

. heading for back-up time

- touchpad final times
- back-up manual push button
  (place not printed)

- back-up manual push button
  (place not printed)

- back-up manual push button on line 4
  has not been pressed

9.2   Example: MANUAL program

200 m race, timing with 3 manual push
buttons per lane

```
    OMEGA SWIM-O-MATIC
           OSM 6

ARMING:        05 SEC
LAPS  :           02
PROG. :        MANUAL

  READY FOR NEW RACE


EVENT : 200 HEAT : 03

  P       14.55:21.571
  L L
  A A   L     26/04/84
  C N   A
  E E   P



  1 2   1     1:02.078
  2 1   1     1:03.498
  3 4   1     1:04.846
    3   1     1:04.154
```

- printed heading at time of
  LANE ON + START

  . arming time   : 45 sec (50 m pool)
  . number of laps : 2   (200 m)
  . program   : MANUAL

- ready for a new race

- start is given we print
  . event no. 200 heat no. 3

  . time of start

  . date: April 26, 1984

- intermediate times lap 1

- official registered times

- official time = median time

- 58 -

```
OMEGA SWIM-O-MATIC
       OSM 6                    - PRINT  RSLT, printing of the results

EVENT : 200 HEAT : 03           . event no.  heat no.

P         14.55:21.571          . time of start
L L
A A  L      26/04/84            . date
C H  A
E E  P         LAP  1           . heading for lap 1


 1 2  1        1:02.078
 2 1  1 T      1:03.498         Official time:. for lanes 1 & 3 the sym-
 3 3  1 T      1:04.154         bol  T  shows that not all 3 manual push
 4 4  1        1:04.846         buttons have been pressed
                                The detail will show on the next print
                                out
OMEGA SWIM-O-MATIC
       OSM 6                    - PRINT  BACK UP , printing of the results
                                  with back-up time

EVENT : 200 HEAT : 03           . event no.  heat no.

P         14.55:21.571          . time of start
L L
A A  L      26/04/84            . date
C H  A
E E  P         LAP  1           . heading for lap 1

 1 2  1        1:02.078         - time keeper  1     line 2
   2  1        1:01.831         - time keeper  2     line 2
   2  1        1:02.782         - time keeper  3     line 2


 2 1  1        1:03.498
   1  1        -.---            One manual push button is missing
   1  1        1:03.482         Official time  = 2nd time


   3  1        -.---            Two manual push buttons are missing
 3 3  1        1:04.154         Official time  = the only registered time
   3  1        -.---


   4  1        1:04.869         Three manual push buttons are missing
   4  1        1:04.831         Official time  = median time
 4 4  1        1:04.846
                                Ranking is printed in order of the
                                official time



 1 1  2        2:03.984         - final time lap 1
 2 2  2        2:05.554
 3 3  2        2:06.020         Official times
 4 4  2        2:06.418
                                  - 59 -
```
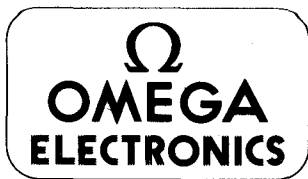
```
OMEGA SWIM-O-MATIC       - PRINT  RSLT  print out of the results
      OSM 6

EVENT : 200 HEAT : 03    . event no.  heat no.

P         14.55:21.571   . time of start
L L
A A   L    26/04/84       . date
C N   A
E E   P      RESULT       . marking for final results

1 1   2    2:03.984      Official time : The 3 manual push buttons
2 2   2    2:05.554      have all been pressed
3 3   2    2:06.020
4 4   2    2:06.418
```

```
OMEGA SWIM-O-MATIC       - PRINT  BACK UP  print out of the re-
      OSM 6                sults with back-up times

EVENT : 200 HEAT : 03    . event no.  heat no.

P         14.55:21.571     time of start
L L
A A   L    26/04/84       . date
C N   A
E E   P     BACK UP       . heading for back-up times

  1   2    2:03.994      - time keeper  1     line 1
1 1   2    2:03.984      - time keeper  2     line 1
  1   2    2:03.964      - time keeper  3     line 1

  2   2    2:05.580
2 2   2    2:05.554      Ranking is  printed  in  order  of  the
  2   2    2:05.547      official times

  3   2    2:06.030
3 3   2    2:06.020
  3   2    2:05.995

  4   2    2:06.434
4 4   2    2:06.418
  4   2    2:06.413
```

10.   Corrections "a posteriori"

These are corrections made after the occurrence of an erroneous
event. The corrections can be made after the race.

There are 3 correction functions:

Insertion   :   Insertion of a missing time
                            Time is inserted as per chronologi-
                            cal order.
                            This operation increases the number of
                            laps but does not modify the automatic
                            arming conditions.

Modification :   If a time is registered but not at the
                            right moment it must be modified to the
                            right value.
                            This operation increases the number of
                            laps but does not modify the automatic
                            arming conditions.

Erasement   :   If an extra lap has been registered,
                            it must be erased.
                            This operation reduces the number of
                            laps and the automatic arming condi-
                            tions return to their values as if no-
                            thing had happened.

These functions will not often be used as the reliability of the
timing peripherals is such that most of the timekeeping will take
place without erroneous events.
This is true for the important competitions like National Cham-
pionships or World Championships.

But experience shows that an important number of unforeseen
events always will occur during events contested by children .
In this case, the functions of corrections will be really appre-
ciated.

We give you some examples:

- missed Start, as the equipment is not ready for the next
  race.

- during a relay competition, a swimmer hits a touchpad when
  leaving the pool.

- during manual timing a judge presses the push button too early
  and presses it again when the swimmer arrives.

As the OSM 6 memorized all the events, the necessary corrections
can be made, and the exact timing still be assured.

These functions ask for a little experience in the field of ti-
ming, so carefully read this chapter and try it out.

Practice the explained manipulations.

Do not forget that in order to make the corrections properly
it is necessary to be in the position to identify the unexpec-
ted events.

Keep an eye on the development of the race, so that you can
make the right corrections.

10.1 Insertion of a time

Let's take a 200 m event (2 laps) as example.
At the intermediate arrival (after lap 1) the OSM 6 does not
register a time for lane 2.Therefore a time must be inserted so
that all swimmers stay on the same lap. This will restore the
situation for the final times.

```
EVENT : 100 HEAT : 01    -  START is given

P          11.05:47.467     . event no.  heat no.
L L
A A  L        27/04/83      . time of START
C N  A
E E  P                      . date



1 3  1        1:02.028
2 4  1        1:02.267
3 1  1        1:02.569   Intermediate time lap 1
                        No time for lane 2
   OMEGA SWIM-O-MATIC
         OSM 6
                        - PRINT  RSLT  to print the results
EVENT : 100 HEAT : 01      after lap 1

P          11.05:47.467
L L
A A  L        27/04/83
C N  A
E E  P          LAP  1
                          . Heading for lap 1
1 3  1        1:02.028
2 4  1        1:02.267
3 1  1        1:02.569
   2  1          -.---     . No time for lane 2
```

```
┌──────────────┐  ┌──────────────┐
│ - .- - -     │  │     A.2      │
└──────────────┘  └──────────────┘
```

- The display shows that the OSM 6
  did not register a time for lane 2.

- It is time to insert a time
  - press INS

`InSErt` `LAnE: _`
  - the cursor blinks, as it is necessary to indicate the lane number for which we want to insert a time

  - insert the line number (2)

  - press ENTER

`1.01 2` `nO tIME`
  - The display confirms that there is no time for lane 2 at lap 1

  - lane number
  - lap number
  - first letter of INSERT

  - The cursor blinks on the number of laps

  - If the display is incorrect, press ESC to leave this function

  - If display (line,lap) is correct press ENTER to confirm the insertion

`1.01 2` `00:00.000`
  - The cursor blinks on the first figure of the time to be introduced
    The tens of minutes if it is an effective time, the tens of hours if the time is in time of day, as START for example

  - Let's insert 1 min 20 for example
    The value is not very important. What counts is to insert an intermediate time, so the number of laps will be correct

`1.01 2` `1:20.000`
  - The display enables us to check the inserted value

  - Press ENTER if the value is not correct

```
*INSERT LANE TIME*
 4 2 1      1:20.00*
```
  - The printer then types the corection

- We can now check the classification of lap 1

```
    OMEGA SWIM-O-MATIC          press  PRINT  RSLT
           OSM 6              . heading

  EVENT : 100 HEAT : 01       . event no.   heat no.

  P        11.05:47.467       . time of start
  L L
  A A   L      27/04/83        . date
  C N   A
  E E   P        LAP 1         . heading for lap 1
  1 3   1      1:02.028
  2 4   1      1:02.267
  3 1   1      1:02.569
  4 2   1      1:20.00*         . the time which has been inserted
                                 is marked by "*"
```

- As the race carries on during these modifications, check that the lanes are armed, when the swimmers are near the finish

```
  1 3   2      2:02.695       . End of the race
  2 2   2      2:02.957
  3 4   2      2:03.185       The 4 final arrivals are registered
  4 1   2      2:03.449
                             Winner is at lane 3
```

```
┌──────────┐   ┌────────────┐
│ o o o o  │   │     A.2  3 │
└──────────┘   └────────────┘
```

- the display shows that the race is over
- after the race, the results print out can be requested

```
    OMEGA SWIM-O-MATIC        . press  PRINT  RSLT
           OSM 6

  EVENT : 100 HEAT : 01       . event no.   heat no.

  P        11.05:47.467       . time of start
  L L
  A A   L      27/04/83        . date
  C N   A
  E E   P       RESULT         . heading for results

  1 3   2      2:02.695
  2 2   2      2:02.957
  3 4   2      2:03.185
  4 1   2      2:03.449
```

This is only an example. The operator could have put in a manual which would have given the same result.

10.2 Modification of a time
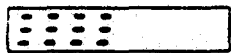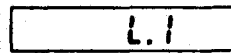
Let's take as an example a 200 m event (2 laps).
Let's imagine that after 1 lap the swimmer in lane 1 simultaneously triggers the touchpads in lane 1 and 2
Then, after approx. 2 seconds the swimmer in lane 2 makes his turn. There was a time recorded in lane 2 but not at the right time so it must be modified.

As the OSM 6 registers everything, even if lanes are unarmed, it will be possible to find the exact time of the swimmer at lane 2 and the timing can be corrected.

START is given

EVENT : 100 HEAT : 05   • event no.   heat no.

P   15.40:29.618   • time of START

L L
A A L   29/04/83   • date
C H A
E E P

| :::: | | L.1 |

– Just before the intermediate arrival the 4 lanes are armed

| --::: | | L.1 2 |

– The swimmer in lane 1 arrives at this moment and lane 2 also gets an impulse, it is no longer armed
The operator can see that the swimmer in lane 2 has one more meter to go before touching the pad

| - - - - | | L.1 2 |

– All swimmers have made their turn
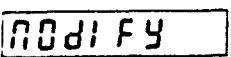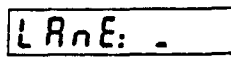
```
1 2 1      1:02.641
1 1 1      1:02.641
3 4 1      1:04.180
4 3 1      1:04.204
```

– It can be seen on the print out that lanes 1 and 2 have the same time
The correct time in lane 2 is not printed as the line was unarmed.

The modification procedure must be used to trace the correct time.

– Press MOD

– The display requires the introduction of the number of the lane to be modified.

| nOdi FY | | L AnE: _ |

The cursor blinks on this position.

`N.0 1. 2`   `1:02.641`   - Press 2

- The display shows for lane 2 the regis-
  tered time at lap 01.

  . no of lane
  . no of lap
  . first letter of MODIFY

- It must be confirmed that the event
  really happened at the first lap,
  therefore :
- press ENTER

`N.0 1 2`   `0 1:02.641`   - The cursor blinks on the first figure
  to be modified.
  But we do not want to modify the time
  by means of the keyboard, we want to
  trace a registered time.

- press NEXT

`N.0 1 2`   `n0 tI NE`   - There is no registered time in this
  case
  The complete indication "no time" blinks

- press LAST

`N.0 1 2`   `0 1:02.641`   - The display shows the existing value
  before pressing NEXT

- press LAST once again

`N.0 1. 2`   `0 1:04.190`   - The correct value for lane 2 is found

All the figures blink together to indicate
that this time was registered while the
lane was unarmed.

- press LAST to check that there is no
  other time registered

- No it is not the case

`N.0 1 2`   `n0 tI NE`
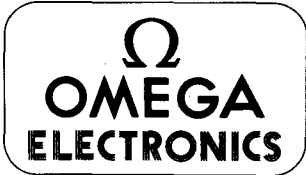
- Press NEXT to trace the time again

`n.0 l. 2`   `0 1:04.190`   - check the value

- press ENTER for the OSM 6 to re-
  gister this time as being the offi-
  cial time for the first lap

`: : : :`   `A.2`   - the display returns to the normal
  monitoring of the event

```
*MODIFY LANE TIME*
3 2  1         1:04.190
```
- the printer types an indication of
  the intervention of the operator

- our modification can be checked:

```
OMEGA SWIM-O-MATIC
       OSM 6

EVENT : 100 HEAT : 05

 P      15.40:29.618
 L L
 A A  L      29/04/83
 C H  A
 E E  P         LAP  1


 I 1  1      1:02.641
 2 4  1      1:04.180
 3 2  1      1:04.190
 4 3  1      1:04.204
```
- press PRINT RSLT

. the number of the lap
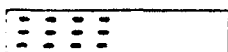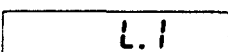
- lane no 2 really has the time that we
  have registered regularly through the
  OSM 6, so there is no characteristical
  sign as if edited on the keyboard.

- Afterwards the event ends normally with
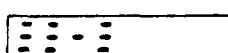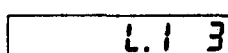 the final arrivals on lap 2

10.3 Erasing of a time

Let's take as example a 200 m event (2 laps). Let's imagine
that in the first lap while the lanes are already armed, a
swimmer in lane 3 leans over the water to wet his glasses and
triggers the pad. The OSM 6 has registered an extra event which
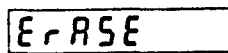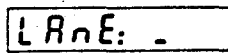must be erased before the intermediary arrival.

EVENT : 300 HEAT : 07   - start is given

```
P           15.50:45.943
L L
A A   L        29/04/83
C N   A
E E   P
```
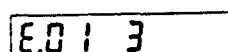
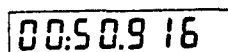`: : : :`   `L.1`   - automatic arming of the lanes
                              after 45 sec.

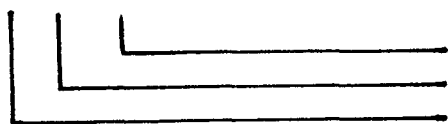`: : - :`   `L.1  3`   - extra time at lane 3 to be erased

1 3   1   50.916   - as the lanes were armed, time is
                              printed

                            - press ERASE

`ErASE`   `LAnE: _`   - the display requests the insertion of
                              the no of the lane to be erased.
                              The cursor blinks on this position
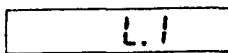
                            - press 3

`E.0 1 3`   `00:50.9 16`   - the display shows the time registered
                              by lane 3 at lap 1

                              . lane no
                              . lap no
                              . first letter of ERASE

                            - press ENTER to erase

`: : : :`   `L.1`   - the display returns to the normal moni-
                              toring of the event

ERASE LANE TIME   - the printer types an indication of the
LANE:3 LAP:01 ERASED   intervention of the operator

```
1 4 1        1:07.777      - then the event carries on normally
2 3 1        1:07.793        with the intermediate time at lap 1
3 2 1        1:07.802        and the final times at lap 2
4 1 1        1:07.855

1 3 2        2:18.343
2 2 2        2:18.532
3 1 2        2:18.760
4 4 2        2:18.807
```

11.   Correction of the fortuitous events

This chapter describes the best way to correct the most common
fortuitous events.
In chapter 10 we have already met three examples of corrections
in relation to the input of time. We shall now examine the way to
proceed when the modifications are in connection with the START.

11.1   False start of an event

The first shot of the pistol is registered as time of START.
The second shot is memorized and printed. But for the race, it
is the first shot which is valid. The erasing function of the
time of START allows to put the OSM 6 back to its earlier condi-
tions, without modification of the previous event result, and
 without modification of the current race event and heat number

                                    - start of the event is given

```
EVENT : 234 HEAT : 01          . event no, heat no

P           11.36:45.024        . time of the start
L L
 A A    L       02/05/83        . date
 C N    A
 E E    P


START       11.36:45.726      - second shot of pistol to advise a
                                false start  0,7 sec after the first
                                shot.
```

- 70 -

| `ErRSE` | `LRnE: _` | - press ERASE

- the display requests the insertion of the number of the lane to be erased It will be the START

- press START

| `E.St    11` | `36:45.024` | - the display shows the time of the first START

. time of day of the START

. mark for the START

. first letter of ERASE

- press ENTER to erase the data

```
     OMEGA SWIM-O-MATIC
            OSM 6

ARMING:           05 SEC
LAPS :               01
PROG. :            AUTO

 READY FOR NEW RACE
```

- the definition parameters of the event are printed again

. ready for a NEXT START

| `- - - -` | `StRrt` | - the erasing is confirmed on the display

11.2   False start as the apparatus is not ready

This happens if the equipment is not ready for the next START i.e the operator has not executed the function LANE ON + START . The START lane must be armed before the departure of a new event as the lanes must be armed before the arrivals. All the START impulses are printed and memorized, but this one will not be registered as official departure time as the instrument was not ready.
The function "INSERTION" must be used now to find this START. After this correction, one must be ready to load the lanes manually depending on the time necessary for this manipulation.

```
1  3  2      2:04.072
2  2  2      2:04.264
3  1  2      2:04.468
4  4  2      2:04.895
```

| oooo | | R.2 3 |

- A 200 m event has just ended, and the printer shows the final results

- the display corresponds to this situation

```
START      14.27:17.709
```

- the start of the next race is given. This time is printed. The display does not change, it corresponds to the previous event

- initialisation of the equipment for the new event

  There are 2 cases :

  . the number of the event remains the same, it is an extra heat, so there is nothing to do

  . the number of the event changes, the new number must be introduced at once as it cannot be changed again during the event

```
EVENT : 300 HEAT : 01
```

- press   LANE ON + START

    . this function prepares the OSM 6 for
    a new event

    . the results of the previous event are
    memorized

`- - - -`	`StArt`

  - the display shows that the instrument is
  ready for a NEXT START

- the time of START must be now recovered

- press   INS

`InSErt`	`LAnE: _`

  - the display requests the number of the
  lane to be inserted
  This will be the START

- press START

`1.  St`	`nO tIME`

  - the display shows that there is no time
  of departure for the current race

- press ENTER to confirm that it is really
  START that we want to insert

`1.  St 00`	`00:00.000`

  - time is null as it is not defined

The cursor blinks on the first figure
to be introduced.
But we do not want to edit the time by
means of the keyboard, we want to trace
a registered time
- press   LAST   to find the last value

| `1.  5t  14` | `27:17709` | – the display shows the day time of the last memorized START

- compare this value to the one which has been printed at the moment of start

- all the figures blink together to advise that this time was memorized while the lane was not armed

- press   ENTER to attribute this value to the time of START

| `- - - -` | `L.1` | . the event carries on normally, display shows that the event is on the first lap.

11.3   There is no START IMPULSE

This can happen if the "START" line is badly connected or if the transducer is defective .In these cases the operator will effect START manually by means of the keyboard and the times registered by the apparatus will be wrong. However the classification will be correct as well as the time difference between the swimmers.

If a second back-up equipment is used, the time of START can be read on it and can be inserted into the first one by means of the MODIFICATION function.
In this case time of START will be edited by means of a keyboard. This correction can be carried out during the event or even afterward.

11.4   There are several START IMPULSES

This can happen if the operator does not erase START and the real start of the event is given after an event for which we had a false start.

In this case the time of START is printed, memorized. To find the exact time of START, the function MODIFICATION , as in example 10.2 will have to be used.

## 11.5   NEXT START function before the end of the event

If the operator uses the function NEXT START
(LANE ON + START) during an event then :

- the display indicates to the operator that the instrument is
  ready for a new event
- the OSM 6 carries on acquisition of information automatically
  but the times are no longer printed.
This is to say, as far as the OSM 6 is concerned, the race continues until the moment of the next START

The function LANE OFF + START allows us to cancel the function NEXT START and the OSM 6 gets back to the last event (for us the current event) and the rest will go on normally.

If intermediate times (finish times) have taken place in the meantime, they can be printed out by means of PRINT RSLT.
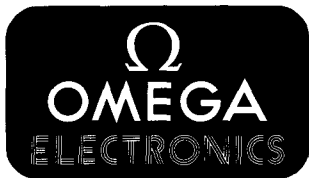
OMEGA
ELECTRONICS
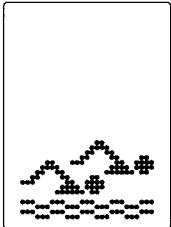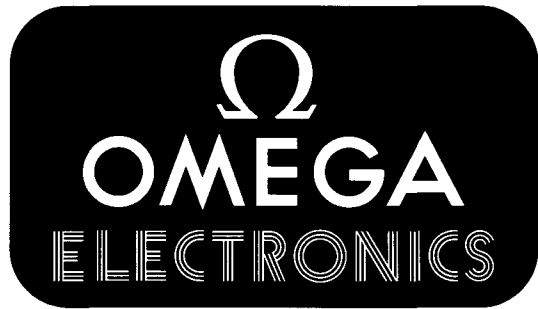
OSM 6
Data Sheet

OSM6 basic Characteristics without Plug-in Module

Introduction

The OSM6 is a timing computer for swimming competitions. The system adapted to individual and relay races is designed for 25 m, 50 m and other pools equipped with a maximum of 10 lanes. Thanks to the choice of peripherals the OSM6 can be used for timing local competitions (clubs, schools) as well as for timing Olympic games.

The possibility of introducing plug-in modules enables the OSM6 to adapt its functions to new applications and various training activities (ask for specifications).

The OSM6 computer is the heart of a timing system composed of:
– one OSM6
– one watertight wiring system (HARNESS)
– one starting system
– one arrival detection system.

At any time an installation can be completed with:
– starting blocks, for relay control
– one-line board (BEST TIME)
– one multiline board
– acoustic and flash start signal
– diffusion of information to TV network, Data Handling computer.

The OSM6 comes in a black portable case composed of:
– one control panel with connection plugs
– one keyboard with 39 keys
– one LCD display, 16 characters
– one electrosensitive printer, 21 characters per line
– one electronic circuit with micro-processors.

Timing Program

The OSM6 features 3 timing programs:

1. AUTO
Automatic timing for individual and relay races, without false start control
– arrival times given through touch pad
– back-up system with one push button per lane.

2. AUTO FD
Automatic timing for relay races, with false start control:
– arrival times given through touch pads
– back-up possible with one push button per lane
– starting times given through starting blocks.

3. MANUAL
Manual timing for individual and relay races, without relay false start control
– arrival times given by 3 push buttons per lane.

General Characteristics

Form:	black portable case
Dimensions:	
Length	480 mm
Width	380 mm
Height	150 mm
Weight:	5,8 kg
Temperature:	
Operating	0°C to +50°C
Storage	−40°C to +70°C
Relative humidity:	85% at 30°C non-condensing
Power supply:	– 12 V NiCd or lead battery (10,8 to 14,4 VDC)
consumption:	– average: 0,7 A
	– peak: 1,5 A during printing
autonomy:	– approx. 12 h at +20°C with 9,5 Ah battery

Switching on:	– ON/OFF switch on the console
fuse	– 0,8 A on the console

Counter:

time base	Quartz oscillator 6,144 MHz
capacity	23 h 59 min 59,999 sec
timing	$1/100$ or $1/1000$ sec. programmable
accuracy at 20°C	$\pm 3\ 10^{-6}$
stability between 0 and 50°C	$\pm 10\ 10^{-6}$ typical
aging	$\pm 2\ 10^{-6}$ per year

Printer:

type	– electrosensitive 5 × 7 dots 21 characters per line
character height	– 2,7 mm
speed	– approx. 2 lines per second
paper	– metallized, electrosensitive
width	– 60 mm
length	– 30 m (sufficient for 6000 lines)

Display:

type	– LCD (Liquid Crystal Display)
	– 16 characters 7 segments
	– character height: 12,7 mm
character types	– numerical, symbols
readability	– reflective, unmagnified

Keyboard:
39 keys, all protected against water drops:
– 29 function keys
– 10 numerical keys

Input/Output

Output	Type of connection plugs	Characteristics	Use
Battery	4 pole plastic male plug Cable with 2 plugs and 2 aligator clips	wiring, see 3085–506	Power supply 12 VDC external
Start	4 pole plastic female plug	– opening contact without voltage – power supply for LED on transducer; connection see 3085–508	– to initiate the timing – to connect the start transducer
Arrival	4 pole plastic female plug	– compatible with OMEGA harness; specification see 3085–507 – maximum distance between first module and OSM 6: 184 m	– to connect the harness which transmits the information and its identification to the OSM 6
Output Start	4 pole plastic female plug	– opening contact without voltage – repetition of start impulse; connection see 3085–511	– to initiate the acoustic starting device – to initiate the back-up timing
Display board	4 pole plastic female plug	– ASCII 20 mA current loop 9600 baud; transmission and connection see 3085–509 – maximum distance 300 m on $\varnothing$ 0,6 mm twisted shielded cable; spec., see 3085–510	display h. min. sec. and $\frac{1}{100}$ sec. – sequential on "Best Time" board – 2- to 10-line board – computer controlled information board
Data Handling	4 pole plastic female plug	– same as board or – defined by the plug-in module	Data Handling for the preparation of starting list according to FINA regulations

Transmission mode, see document

Functional characteristics

LCD display
– mains "ON" indicator
– low battery indicator
– control of introduced values
– control of the execution of an order

Lane control during the race
– armed
– unarmed
– activated (short circuited)
– unused

Race control
– display of the lap number of the race
– display of the lane number after each lap of the first swimmer
– on each line, symbol for final time

Printer
Printing before and during the race:
– heading
– any introduction or modification of parameters
– race number, heat number
– starting time
– date
– intermediate and final times in chronological order

Printing on request
– final and back-up times in chronological order.

Specific printing
– (—.——): if there is no recorded time
– FD: printed on Auto FD classification, if there was a false start in relay
– M: if an arrival or a start was given manually through the keyboard
– *: if a time was introduced through the keyboard (INSERTION)
– D: (program AUTO FD) to mark the starting block lane when the difference between the starting block time and the touch pad time is printed.
– T: printed on the MANUAL program if a time is missing from one or more push buttons.

Timing Function

For an easy understanding the functions are divided into 6 groups.
1. Initialization
2. Race definition
3. Control and printing of the race
4. Anticipated intervention
5. Intervention a posteriori
6. Display of the results

1. Initialization

Choice of the configuration

board:	– 1 line (Best Time) – 2 to 10 lines display in lane or ranking order
number of lanes:	1 to 10
Resolution:	● $\frac{1}{1000}$ or $\frac{1}{100}$ sec. If we choose $\frac{1}{1000}$ sec., we have: ● $\frac{1}{1000}$ printing ● $\frac{1}{1000}$ display ● $\frac{1}{100}$ scoreboard display (FINA) ● Swimmer ex-aequo if their times are the same to $\frac{1}{1000}$ ● relay error if starting block time + 9 ms is less than touch pad time
date:	day/month/year (3×2 figures)
time:	synchronization of the device with the time of day

2. Race definition

Program AUTO

Input on Harness module:
- No. 1 touch pad
- No. 2 manual push buttons (back up)
- No. 3 unused
Official time input No. 1

Program AUTO FD

Input on Harness module:
- No. 1 touch pad
- No. 2 manual push button (back-up)
- No. 3 starting block
Official time input No. 1
Input 2 and 3 are not printed if time difference with input 1 (touch pad) is over 2 seconds.

Program MANUAL

Input on Harness module:
- No. 1 push button No. 1
- No. 2 push button No. 2
- No. 3 push button No. 3

Official time:
with 3 manual push buttons: median time
with 2 manual push buttons: 2nd time

Arming time:
1 to 99 sec. or no automatic arming

Race number:
3 digits

Heat number:
2 digits
heat number automatically increased

Number of laps:
1 to 100, number of laps automatically counted.

3. Control of the race

Start:

Start given by starting pistol, printing of the time of day

Intermediate time:

Printing of official times in chronological order
all times are memorized, included back-up times

LCD display:
- lap number
- lane number of the leading swimmer
- touch pads control

False start in relay:

at each change, printing of the time difference between touch pad and starting blocks
(if false start, negative time)

Final arrival:

printing of official effective times in chronological order

LCD display:
- lap number
- lane number of the leading swimmer
- touch pads control (end of race)

Modification of parameters chosen:
All following parameters can be modified during the race:
- lane used
- length of the race
- arming, etc.

Memory:
- of all events which happened during the race, including events which happened when the lanes were not armed or when the race was normally over.
The times are not printed but they are retrievable for corrections later on.

4. Anticipated corrections

Steps the operator can take to keep the OSM6 from recording erroneous information
- arming, disarming of the lane
- definition of the race (all parameters can be modified)
- manual arrival impulse given through the keyboard

5. Intervention a posteriori

During and after the race, but after the event happened, the operator can make certain corrections.

These functions are:

erasure:
- of an unnecessarily recorded time with restitution of number of laps and arming conditions.

modification:
- replacement of a memorized time by another memorized time or modification of a time through the keyboard

insertion:
- insertion of a missing time which will be inserted according to chronological order.
This operation increases the number of laps.

missed start:
- equipment was not ready for the next race; the starting time can be recovered, therefore timing will be successful.

false start:
- erasure of a starting time when the race is cancelled
On the printer, all edited times are followed by a remark.

6. Transmission

Display on scoreboard according to the board chosen:

1-line board (BEST TIME)

- running time
- display of best time after every lap
- sequential display of all times in lane or ranking order for final results.

2 to 10-line boards

- display of all times in lane or chronological order
- intermediate times during 10 seconds
- running time on the first line with display of $1/10$ sec. however only during the race (except UNT 4 which displays seconds only).

Control and printing after the race

Printing
- final ranking
- final ranking with back up times
- ranking in arrival order, with false start indication

Ranking can still be printed during the next race. No intervention is possible once the new race has been started.

Transmission protocol for OTR-7 Omega Timing Unit for ski.

1. Technical characteristics for output "SCB"(scoreboard) and "DH"(datahandling).

- 20 mA current loop
- 9600 baud
- ASCII code (1 START BIT, 7 DATA BITS, 1 PARITY BIT, 1 STOP BIT)

Information output "SCB".

A message is sent every 1/10th of a second. The different messages consists of 1 line of 24 characters (control and information) and can be one of the following types:

- CLEAR :   send "SP" for all information digits. The clear-line is sent once every 1/10th of a second. Clear is sent at the start and on command from the operator.

- RUNNING TIME : This message contains the start-number of the participant (runner) expected at the arrival-line (under control by the operator). Output every 1/10th of a second.

- STOP TIME : This message contains the start-number and the effective time for the participant at the intermediate or arrival time. This message is output only once.

2.2 Output information "SCB".

CLEAR:

SOH	DC4	Time Status			STX	BS	Start-no			STX	Hours		Separ	Minutes		Separ	Seconds		Separ	Milliseconds			EOT
		R/s	Ø	2		(Home)	SP	SP	SP		SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	SP	

RUNNING TIME:

SOH	DC4	Time Status			STX	BS	Start-no.			STX	Hours		Separ	Minutes		Separ	Seconds		Separ	Milliseconds			EOT
		R	Ø	2		(Home)	10^2	$10'$	10^0		$10'$ or SP	10^0 or SP	0 or SP	$10'$ or SP	10^0 or SP	0 or SP	$10'$ or SP	10^0	0	10^2	SP	SP	

STOP TIME:

SOH	DC4	Time Status			STX	BS	Start-no			STX	Hours		Separ	Minutes		Separ	Seconds		Separ	Milliseconds			EOT
		S	Ø	2		(Home)	10^2	$10'$	10^0		SP	10^0	0 or SP	$10'$ or SP	10^0 or SP	0 or SP	$10'$ or SP	10^0	0	10^2	$10'$ or SP	10^0 or SP	

Remark: If the start-number expected at the arrival has not yet started, the running time is replaced by the stop time : 0.00

3. Information output "DH".

Identical to the output "SCB".