



**British Swimming  
Swimming Officials Group**

**Referee**

**Race Results Workbook**

## INTRODUCTION

These guidelines are to be used so that the areas of the syllabus can be covered with practical examples and solutions which will be developed by the candidates with the help of the tutor. This workbook has been compiled with the assistance of many individuals from the various home countries which together comprise to form British Swimming.

The Swimming Officials Group would value your feedback on the style and content of this document. There is little point in further development if it does not meet the candidates, i.e. your, needs.

This booklet is not intended to be a definitive guide to passing the examination. In conjunction with the World Aquatics Swimming Rules and any home country advice it will assist.

Determining race results is a primary task of the Referee and whether manual or AOE is a mechanical process. Once mastered, identifying and interpreting the race result from various sources of information will become a relatively standard procedure.

How is it done?

Whilst the process when broken down maybe relatively straight forward the World Aquatics rules surrounding results are not, for instance:

*SW 2.1.3 states .....When using finish judges without 3 digital watches, the Referee shall determine placing....*

*SW 2.8.1 states .....When using digital watches, final time and place is determined by time.*

*SW 11.3 states ..... manual times must be taken by 3 timekeepers.....*

*SW 11.3.1/2/3 these rules assume that more than one watch will be used*

*SW 13.3.2 only permits the time from 3 watches to determine placing if the AOE fails*

All in all, it would be fair to say that if taken in isolation each rule causes some degree of conflict with each other.

The constant is the fall back position set out in

*SW 2.1.3 When using finish judges without three digital watches, the Referee shall determine placing where necessary. Automatic Officiating Equipment, if available and operating shall be consulted as stated in SW 13..*

Success within swimming races is achieved on a time basis – the fastest swimmers progressing. It is only proper then that the Referee ensures that he has as much information as possible upon which to make reasoned decisions on the time and position of each individual swimmer in a race.

*SW 2.8.1 The chief timekeeper shall assign the seating positions for all timekeepers and the lanes for which they are responsible. It is advisable that there shall be three (3) timekeepers for each lane. If Automatic Officiating Equipment is not used there shall be two (2) additional timekeepers designated, either of whom shall be directed to replace a timekeeper whose watch did not start or stopped during an event, or who for any other*

*reason is not able to record the time. **When using digital watches, final time and place is determined by time.***

Therefore taking the sentence highlighted above it would not be illegal to operate a swim meet with a single timekeeper alone on each lane and place by those times. However, would it be fair to the swimmers? What would happen if a timekeeper was distracted at either the start or finish and produced a wildly inaccurate time?

Historically swimming has used a multi-part process to determine the placings for swimmers in a race, Automatic Officiating Equipment (AOE) manual placings and manual times depending upon what is available. In the absence of AOE then we rely upon manual times and placings.

Prior to July 2013 manual placing would have taken preference over times in determining the result of races. Since that date it is open to the Referee to place on the official times, using the manual placings to act as a checking mechanism.

For example:

In a race where AOE was not in use there was a blanket finish over 8 lanes, on examination of the official manual times of a single timekeeper on each lane it was seen that there were only several 1/100ths of a second separating all swimmers. The result by time did not agree with the manual placings of two Finish Judges or the Referee and each of them did not agree with each other.

In such circumstances by comparing the placings to the times there is clearly no evidence to suggest the times are inaccurate and on that basis it would be fair to all swimmers to place by the official times.

Compare that to a long distance race where the swimmers finished in a clearly defined order identified by both Finish Judges and the Referee who all recorded the same finish order. However when the times were collected they produced a different finish order. In these circumstances it would not be fair to all swimmers to place by time as there has been a mistake.

**The Referee has to utilise all available information and use it in accordance with the rules to determine the fairest result to each and every race and produce a result which has to be able to withstand scrutiny.**

**Bear in mind that it is sometimes impossible to separate swimmers in a race. The calling of a 'dead heat' is quite permissible in races where AOE is not in use and swimmers cannot be separated. Dead heats are not uncommon in races with AOE, but remarkably few in human observed finishes.**

## MANUAL RESULTS

The process:

The official times are determined for each lane, collected and handed to the Referee.

The Finish Judges independently record their observed order of finish and then report their agreed finish order to the Referee.

Where they disagree on a finish order the Referee shall determine the position of the affected swimmer(s).

Ideally there should be either 3 Finish Judges or the Referee may record a finish order in addition to 2 Finish Judges.

See following section for the process to be employed.

Having gathered the available information the Referee determines the race result by first assessing the finish by time order against the observed finish order, if there is a discrepancy the Referee has to decide which result either by time or place is most appropriate in the circumstances.

### Determining a majority placing order

In order to establish the agreed manual observed finish, if the Finish Judges disagree in any way, their results and that of the Referee shall be considered. The relative order of any two swimmers shall be determined by a majority decision.

Examples of this process are shown below:

#### **Example 1.**

Judge A	5 6 8 4 3 1 2 7
Judge B	5 6 8 4 1 3 2 7
Referee (R)	5 6 8 4 1 3 2 7

The three Officials only disagree on lanes 1 and 3. The Referee and Judge B have Lane 1 before Lane 3, so that is their relative order.

Result is                    5 6 8 4 1 3 2 7

#### **Example 2**

Judge A	5 6 8 4 3 1 2 7
Judge B	5 6 4 8 1 3 2 7
Referee (R)	5 6 4 3 8 1 2 7

The places in doubt are Lanes 1, 3, 4 and 8. Judge B and the Referee have Lane 4 before Lane 8. All three have Lane 4 before Lane 3, and Lane 4 before Lane 1, so Lane 4 is the first in the group. Judge A and Judge B have Lane 8 before both Lane 3 and Lane 1, so Lane 8 is second in the group. Judge A and the Referee have Lane 3 before Lane 1, so that is their relative order.

The result is                    5 6 4 8 3 1 2 7

### Example 3

Judge A                    8 4 3 1 7 6 2 5  
Judge B                    3 4 1 8 5 6 7 2  
Referee (R)                4 3 8 1 5 6 7 2

Judge A and the Referee have Lane 4 before Lane 3, Judge B and the Referee have Lane 3 before Lane 8, Judge A and the Referee have Lane 8 before Lane 1, all three have Lane 1 before Lane 5, Judge B and the Referee have Lane 5 before Lane 6, Lane 6 before Lane 7, Lane 7 before Lane 2.

The result is                4 3 8 1 5 6 7 2

### Determining a Finish Order

Examples of determining a finish order based on the information available:

#### Example 1

Judge A	1 5 6 3 8 7 4 2	Lane	Time
Judge B	5 1 6 3 7 8 4 2	1	00:57.16
Referee	6 1 5 3 4 7 8 2	2	00:59.30
		3	00:57.89
Majority Placings	1 5 6 3 7 8 4 2	4	00:58.36
		5	00:57.14
		6	00:57.17
		7	00:58.39
		8	00:58.35

#### Official Result

Position	Lane	Time
1	5	00:57.14
2	1	00:57.16
3	6	00:57.17
4	3	00:57.89
5	8	00:58.35
6	4	00:58.36
7	7	00:58.39
8	2	00:59.30

By comparing the finish order by time to the majority placings it can be seen that the difference in time between various lanes is in some cases a matter of 1/100ths of a second. What evidence is there to determine that to place by times is not fair and accurate?

## Example 2

Judge A	1 5 6 3 8 7 4 2	Lane	Time
Judge B	5 1 6 3 7 8 4 2	1	00:57.16
Referee	6 1 5 3 4 7 8 2	2	00:59.30
		3	00:58.91
Majority Placings	1 5 6 3 7 8 4 2	4	00:58.32
		5	00:57.10
		6	00:57.17
		7	00:58.34
		8	00:58.31

## Official Result

Position	Lane	Time	
1	5	00:57.10	
2	1	00:57.16	
3	6	00:57.17	
4	3	00:58.30	RD
5	8	00:58.31	
6	4	00:58.32	
7	7	00:58.34	
8	2	00:59.30	

In this example it can be seen that when comparing the result by time to the majority placing order there is a large discrepancy in respect of lane 3 who is placed a clear 7<sup>th</sup> on times but the placing order puts lane 3 in 4<sup>th</sup> position by both Judges and the Referee. Placing lane 3 in 4<sup>th</sup> position would show that the swimmer had beaten a time of 00:58.31 whereas they were given a time of 00:58.91, considerably slower.

The Referee has to make a determination based on the information before him.

Whilst it is not expected of Referees to judge speed distance and time to the following degree it is worth noting that assuming this to be a 100m race Lane 3 on achieving a time of 58.91 would on average be travelling at almost 1.7m per second. The difference between that time and the swimmer placed behind him by the majority placing order is 0.6 second which relates to around 1 metre. Historically Finish Judges and Referees are proven to be accurate over far shorter distances.

It would be reasonable on this occasion to place lane 3 in 4<sup>th</sup> position. If satisfied that the time is incorrect, the swimmer would be allocated a time 1/100<sup>th</sup> second (the smallest measurable time in swimming) faster, to establish the ranking.

The indication 'RD' alongside the time for lane 3 indicates a 'Referees Decision'. This will be explained in the next section of the workbook.

## REFEREE'S DECISION

As previously mentioned a swimmer's performance is measured in the time taken to complete the event. Should there be a failure of AOE and human timekeeper then the swimmer will not have a time. Finish Judges may well be able to assist the Referee in providing a finishing position in the race for a swimmer but if the race was a heat then the swimmer will require a time in order to progress in the event.

In seeking a time for a swimmer there is a priority order of means to obtain an official time:

### AOE Primary time

Timing started automatically by the starting signal and stopped by the swimmer on contact with the timing pad on completion of the course.

### AOE Secondary time

Timing started automatically by the starting signal and stopped by the lane timekeeper activating the back-up button at the end of the race and as such is a 'manual time'.

### Digital watch time

A handheld digital stopwatch started by the timekeeper on the starting signal and stopped by the timekeeper on the swimmer completing the course, also a 'manual time'.

Should these three methods of obtaining a time fail then the Referee has to determine a suitable time for the swimmer. With the knowledge of the swimmers position the Referee will know that their time will be slower than that of the swimmer finishing in front of him but faster than the swimmer finishing behind him.

For example where AOE was in use the swimmer with no recorded time (either Manual or AOE) was by majority placed 4<sup>th</sup>. The swimmer placed 3<sup>rd</sup> had a time of 1:07.85 and the swimmer placed 5<sup>th</sup> had a time of 1:08.44. The 4<sup>th</sup> placed swimmer's time will therefore be between 1:07.85 and 1:08.44.

The Referee can then seek to obtain a real time for the swimmer in that range, this may be from a coach or any other suitable source.

If a suitable real time can be established then that should be inserted. However in the absence of a real time the Referee has to decide on an appropriate time for the swimmer – hence the term Referee's Decision (RD).

It is known that the swimmer in being placed 4<sup>th</sup> swam faster than the swimmer placed 5<sup>th</sup> with a time of 1:08.44. The Referee will have no means of knowing how much faster the swimmer swam so in order to rank the swimmers the 4<sup>th</sup> placed swimmer would be awarded a time 1/100<sup>th</sup> second faster than the 5<sup>th</sup> placed swimmer – in this case 1:08.43.

Meet Management software e.g. Hy-Tek or SportSystems has varying mechanisms to deal with RD allocated equal times. To remove the vagaries of these systems and in order to remove the possibility of unfair treatment of swimmers the ranking by time will be part of the Referee's RD process.

Recognition of the swimmer's relative ranking is important should the swimmers in question be placed 8<sup>th</sup> and 9<sup>th</sup> in the rankings towards an 8 lane final. Whilst the times are identical and would normally require a swim-off we know that one swimmer actually beat the other in the race and therefore a swim-off is not necessary.

Where manual times and majority placings are being used the Referee will normally place by time unless he has sufficient doubt as to the accuracy of placing by time to justify adjusting the finish order by using a majority placing. Where this is the case the real time of the faster swimmer shall be used and adjustments of 1/100<sup>th</sup> second used where necessary for conflicting places.

In adopting this method rather than averaging times at least one affected swimmer i.e. the one with the faster official time will retain a real time rather than an RD time.

Where the Referee will have particular difficulty is deciding upon a time for a swimmer who was placed last in a heat. In these circumstances the Referee will have to use any and all information available to arrive at the most accurate time, this may well involve consultation with coaches or anyone else who might have been timing the affected swimmer.



**Exercise 1.**

Placings		Manual Times
		Lane          Time
Judge A	4 3 5 1 2 6	1              1:23.67
Judge B	3 4 5 1 6 2	2              1:23.66
Referee	3 5 4 1 6 2	3              1:18.32
		4              1:18.31
Majority Placing	.....	5              1:19.01
		6              1:23.65

Official Result

Position	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

**Exercise 2.**

Placings		Manual Times
		Lane          Time
Judge A	4 3 5 6 2 1	1              1:06.01
Judge B	4 5 3 1 2 6	2              1:05.98
Referee	4 3 5 2 1 6	3              1:05.38
		4              1:05.29
<i>Lane 5 Disqualified at the start</i>		5              1:05.52
		6              1:06.09

Majority Placing          .....

Official Result

Position	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

**Exercise 3.**

Placings		Lane	Manual Times	
			Time	
Judge A	3 6 2 4 5		1	No time
Judge B	6 3 2 5 4		2	1:09.83
Referee	3 6 2 5 4		3	1:08.20
			4	No time
<i>Lane 1 did not finish</i>			5	1:09.52
			6	1:08.17
Majority Placing	.....			

Official Result		
Position	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

**Exercise 4**

Placings		Lane	Manual Times	
			Time	
Judge A	2 6 5 3 4 8 7 1		1	3:04.67
Judge B	2 5 6 3 8 4 7 1		2	2:56.79
Referee	6 5 2 3 7 4 8 1		3	3:05.54
			4	3:04.65
<i>Lane 3 disqualified at the start</i>			5	2:56.78
			6	2:56.77
			7	3:04.64
			8	No time
Majority Placing	.....			

Official Result		
Position	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....
7	.....	.....
8	.....	.....

**Exercise 5                      Finals**

On occasions where swimmers compete in heats followed by a final, the final competitors shall be allocated lanes in a 'spearhead' i.e. in a six lane pool the fastest qualifier allocated to lane 3 then 4,2,5,1,6 in the order fastest to slowest. In a pool with an odd number of lanes the centre lane would be allocated to the fastest qualifier.

**Heat 1**

Placings		Swimmer	Lane	Time
Judge A	5 6 4 1 3 2	A	1	1:05.06
Judge B	5 4 6 1 2 3	B	2	1:05.11
Referee	4 6 5 1 3 2	C	3	1:05.06
		D	4	1:03.52
Majority Placing	.....	E	5	1:03.55
		F	6	1:03.49

**Heat 2**

Placings		Swimmer	Lane	Time
Judge A	3 4 2 5 1 6	G	1	1:05.11
Judge B	3 4 2 1 5 6	H	2	1:05.08
Referee	3 4 2 1 6 5	I	3	1:03.22
		J	4	1:03.17
Majority Placing	.....	K	5	1:05.99
		L	6	1:05.96

**From the previous two heats arrange the swimmers in their Lanes for the final including the two reserves**

Lane	Swimmer
1	.....
2	.....
3	.....
4	.....
5	.....
6	.....
1 <sup>st</sup> Reserve	.....
2 <sup>nd</sup> Reserve	.....

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## Exercise 6

## Semi finals

This exercise requires the qualifying swimmers to be allocated lanes for semi-finals. The fastest swimmer is placed in the second semi-final in the fastest lane, the second fastest is placed in the fastest lane in the first semi-final, the third fastest swimmer is placed in the second semi-final in the second fastest lane and so on using the spearhead system.

Arrange the following swimmers below into two semi-finals

A	1:01.47
B	1:01.49
C	1:01.51
D	1:01.54
E	1:01.57
F	1:01.58
G	1:01.60
H	1:01.67
I	1:01.81
J	1:01.98
K	1:02.03
L	1:02.47
M	1:02.49
N	1:02.51
O	1:02.74
P	1:02.81

### Semi Final One

L1 ..... L2 ..... L3 ..... L4 ..... L5 ..... L6 ..... L7 ..... L8 .....

### Semi Final Two

L1 ..... L2 ..... L3 ..... L4 ..... L5 ..... L6 ..... L7 ..... L8 .....

### Exercise 7.

From the following three heats select the swimmers for the semi-finals

#### Heat 1.

Place	Swimmer	Time
1	A	57.61
2	B	57.81
3	C	57.91
4	D	58.13
5	E	58.14
6	F	58.91
7	G	59.17
8	H	59.19

#### Heat 2

Place	Swimmer	Time
1	J	57.65
2	K	58.01
3	L	58.13
4	M	58.76
5	N	58.87
6	O	59.91
7	P	59.98
8	Q	1:01.01

#### Heat 3.

Place	Swimmer	Time
1	R	56.40
2	S	56.47
3	T	57.10
4	U	58.13
5	V	58.14
6	W	59.63
7	X	59.71
8	Z	59.81

#### Semi-finals

Semi-Final 1	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
Swimmer								

Semi-Final 2	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
Swimmer								

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# AUTOMATIC OFFICIATING EQUIPMENT (AOE)

## GENERAL INFORMATION

In the main there are three suppliers of AOE within British Swimming, Omega who supply the OSM6, which is dated but still in existence, ARES 21 and QUANTUM their latest system, together with Colorado and Daktronics. Whilst the internal workings and facilities they offer may vary in capabilities remember the basics which, as the saying goes, 'ain't rocket science'.

- They start ***automatically*** when the starting signal is given (either acoustic start or transducer with a starting pistol).
- They stop ***automatically*** when the swimmer exerts sufficient pressure to activate the pad.
- They work out the time elapsed between start and finish.
- They place by elapsed time.
- As a 'back-up' there is often the facility for human operators to operate a secondary system when the swimmer finishes a race. This operation is carried out ***manually*** as the name implies, by the lane timekeepers pressing back-up buttons.

Please note the highlighted elements of the points – **if a human had a hand in the time it is MANUAL.**

Provided that the Referee is satisfied with the operation of the AOE it shall be used to determine the order of finishing and the times of the competitors, subject only to the elimination of competitors who are disqualified.

### **Order of times**

**Primary ===== Back-up ===== Hand Held Watch**

In the event of the primary timing system on a lane apparently not functioning correctly the back-up time or if not available the handheld time will be used to place the swimmer unless the Referee has sufficient evidence to overrule the position by time.

If there is evidence to overrule the time and place by the manual placing order any adjustment in time will be marked RD (Referee's decision) as described later. This time cannot be used for British record purposes. An accepted AOE time cannot be changed.

AOE systems can be set to record to 1/100<sup>th</sup> second or 1/1000<sup>th</sup> second. Swimming operates to 1/100<sup>th</sup> second, if you see a printout timed to 1/1000<sup>th</sup> second ignore the third decimal point and tell the operator to change the setting.



## Colorado Time Systems

### General Information

Times can be recorded to either 1/1000<sup>th</sup> second or in the normal case 1/100<sup>th</sup> second. This is done during the set-up procedure prior to the gala. It should be set up to record to 1/100<sup>th</sup> second

**1:26.547**

**1:35.60**

Like the Omega system the Colorado can be started manually and this will be denoted on the print out by:

**Start Used : keyboard**

Located on the printout in the top right hand corner under the Race, Date and Time.

If there is a difference of +/-0.3 seconds between primary and back-up time this will automatically be displayed on the printout alongside the lane number on the result sheet. This value is a pre-set value

Place	Lane	Time
1	4	1:18.33
2	3	1:18.40
3	5	1:20.22
4	6	1:21.28 < 1:20.91 >

The later Colorado systems can be set up to denote an early activation of the back-up button by the lane timekeeper.

The printout can either be in Lane order, or Place order, or both.

All the information a Referee requires is on the A4 printout sheet except when the automatic relay judging system is being employed and this will be on a separate sheet to the race result.

Sample results sheet

```

====>RACE HISTORY<=====>Race 0013<====
                                                Saturday 07-13-XX  11:15.34
|-----< Lane Number
| |-----< Lengths
| | |-----< Time

3) 02  29.13   4) 02  30.02   2) 02  30.07   1) 02  30.17   6) 02  30.38   5) 02  31.35
3) 04  59.55   5) 04  1:00.91  2) 04  1:01.10  4) 04  1:01.17  1) 04  1:01.61  6) 04
1:02.41

                Lane 1    Lane 2    Lane 3    Lane 4    Lane 5    Lane 6
BACK-UP        1:01.25   1:01.09   59.52    1:01.45   1:00.62   1:02.40
=====

```

```

==>RACE SUMMARY(byplace)<=====>Race 0013<====
                                                Saturday 07-13-XX  11:15.34

                        Colorado Time Systems

100 Meters
EVENT:           10      Heat: 6
[0013] Saturday 07-13-XX  11:13.45

Place  Lane  Time
1      3      59.55
2      5      1:00.91
3      2      1:01.10
4      4      1:01.17
5      1      1:01.61<1:01.25>
6      6      1:02.41
=====

```

The above printout illustrates the layout of the Colorado system of how the results are recorded of a race.

In the Race History you have all the information of what occurred during the race, even the lap times for each lane. This is dependent upon whether the swimmer activates the pad at the turn and finish. In the race above there were no problems.

The backup times for each lane are recorded and displayed in the race history section thus giving the Referee all the information that is required from the system. However, any disqualifications will be made by the Referee and any changes to the result.

The race is summarised as shown above, the result being displayed in place order,

=>RACE HISTORY<=====>(Race 0013)=====

Sunday 07-14-XX 12:45.56

|-----<Lane Number  
| |-----Lengths  
| | |-----Time

3) 02 30.00 4) 02 30.02 2) 02 30.09 1) 02 30.21 6) 02 30.50  
3) 04 58.99 5) 02 1:00.91 2) 04 1:01.08 4) 04 1:01.15 1) 04 1:02.13  
6) 04 1:02.57

	Lane 1	Lane 2	Lane 3	Lane 4	Lane 6
Backup	1:01.72	1:01.01	58.78	1:01.05	1:02.50

=>RACE SUMMARY(byplace)<===== (Race0013)=====

Sunday 07-14-XX 12:45.56

Colorado Time Systems

100 Meters	Place	Lane	Time
Event 20 Heat 1	1	3	58.99
(0013) Sunday 07-14-XX 12:45.46	2	2	1:01.08
	3	4	1:01.15
	4	1	1:02.13<1:01.72>
	5	6	1:02.57

The AOE Operator failed to notice that the swimmer in lane 5 failed to activate the touch pad at the 50m distance. There is also no backup time recorded for lane 5.

If the swimmer does not activate the pad at a turn and the operator does not manually record the touch, the finish end pad will not arm and will not record a time at the end of the race. Without a primary time the swimmer will not be placed.

It is up to the Referee to decide where that swimmer finished by consulting the manual placings. In the case above lane 5 time recorded for the second lap (02) is the time for the 100m distance so this is actually the primary time and will place lane 5 in second place.

Note the AOE places swimmers on their primary time, if there is no primary time then that swimmer will not be placed.

In this instance, there is no Lane 5 Backup because the system thinks there are two lengths to go. The time at 2 lengths in the history would also be followed by an EARLY/LATE indication if the T/K pressed the button at the end of the race.

The same race but the AOE operator has manually inserted a touch at the 50m distance

```
====>RACE HISTORY<=====>(Race 0013)=====
                                     Sunday 07-14-XX      12:45.56
```

```
|-----<Lane Number
|      |-----Lengths
|      |      |-----Time

3) 02   30.00  4) 02  30.02   2) 02  30.09   1) 02  30.21   6) 02   30.50
5) 02           3) 04  58.99   5) 04  1:00.91  2) 04  1:01.08  4) 04   1:01.15
1) 04  1:02.13  6) 04  1:02.57

                Lane 1      Lane 2      Lane 3      Lane 4      Lane 5      Lane 6
Backup      1:01.72      1:01.01      58.78      1:01.05                1:02.50
```

```
====>RACE SUMMARY(by place)<======(Race0013)=====
                                     Sunday 07-14-XX      12:45.56
```

Colorado Time Systems

100 Meters			Place	Lane	Time
Event	20	Heat 1	1	3	58.99
			2	5	1:00.91
			3	2	1:01.08
			4	4	1:01.15
(0013)	Sunday 07-14-XX	12:45.46	5	1	1:02.13<1:01.72>
			6	6	1:02.57

When the operator inserts a touch there is no time recorded as indicated above but the swimmer is placed second due to the primary time being recorded at the finish.

**Modification of Primary Times**

The operator can modify the primary time by inserting the backup time in its place. The time will have an (\*) asterisk at the side of it, this an edited time.

1:23.56\*

This time is not an automatic time but will still be used to place the swimmer unless the Referee has evidence that he should insert a manual placing. The time will be a manual time amended as the case may be.

Colorado Time Systems

100 Meters			Place	Lane	Time
Event:	12	Heat: 7	1	3	58.44
			2	2	59.68
			3	4	1:02.21*
			4	1	1:02.31
[0023]	Saturday 07-13-XX	10:58.43	5	6	1:04.68
	(* =edited time)		6	5	1:06.88

=====

The edited time may be the backup time

**Automatic Judging of Relays**

This piece of equipment judges the take-off in relay events. It records the time difference from when the incoming swimmer touches and the outgoing swimmer leaves the starting platform.

In the following example a decision has to be made by the Referee as to which lanes' take-offs were legal.

A Referee should ascertain if the equipment has been calibrated before the start of the competition.

Equipment manufacturers calibrate equipment differently. Unless otherwise advised Omega is only illegal if the takeover time is more negative than -0.03 seconds (e.g-0.04). Any negative takeover time is considered illegal for both Colorado and Daktronics.

==>RACE HISTORY<=====Race0004<=====  
 Sunday 07-14-XX 10:10.34

200 METERS BOYS MEDLEY RELAY

Event: 4 Heat: 3

Lane Number		Lengths		Time	
1) 02	31.54	1) LATE	.09	2) 02	33.94
2) LATE	.02	3) 02	36.46	3) RELAY OK	5) 02 39.23
4) LATE	.01	5) LATE	.03	4) 02	40.90
4) LATE	.01	1) 04	1:14.82	1) LATE	.01
2) 04	1:20.07	2) LATE	.01	3) 04	1:24.36
3) LATE	.03	5) 04	1:30.14	5) LATE	.10
4) 04	1:35.88	4) LATE	.03	6) 04	1:42.18
6) LATE	.02	1) 06	2:10.64	1) LATE	.03
2) 06	2:20.12	2) LATE	.03	3) 06	2:26.08
3) LATE	.09	5) 06	2:31.98	5) EARLY	.04
4) 06	2:36.81	4) EARLY	.02	6) 06	2:35.80
6) RELAY OK	1) 08 2:49.34	2) 08	2:52.80	4) 08	2:53.01
3) 08	2:56.37	5) 08	2:57.04	6) 08	3:00.02

	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
Backup	2: 49.15	2: 52.65	2:56.20	2:52.83	2:56.90	2:59.91

=====  
 ==>> RelayJudging Exchanges<=====Race0004<=====  
 Sunday 07-14-XX 10:10.34

200 METERS BOYS MEDLEY RELAY

Event: 4 Heat: 3

Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
OK	OK	OK	EARLY	EARLY	OK

=====  
 ==>>>RELAY EXCHANGE SUMMARY<=====Race 004<=====  
 Sunday 07-14- XX 10:10.34

200 METERS BOYS MEDLEY RELAY

Event: 4 Heat: 3

	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
50m	+.09	+.02	+.00	+.01	+.03	+.01
100m	+.01	+.01	+.03	+.03	+.10	+.02
150m	+.03	+.03	+.09	-.02	-.04	+.00
Place	<1>	<2>	<4>	<3 >	<5>	<6>
Finish	2:49.34	2:52.80	2:56.37	2:53.01	2:57.04	3:00.02
Xchange	OK	OK	OK	EARLY	EARLY	OK

In the above case Lanes 4 & 5, being the only lanes with a negative takeover, should be disqualified.

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### Exercise 8

=>RACE HISTORY<===== >(Race0009)< =  
Sunday 07-14-XX 12:00.34

----Lane Number										
-----Lengths	START USED : keyboard									
-----Time										
4) 02 34.67	3) 02 34.70	5) 02 35.12	2) 02 36.06	6) 02 36.74						
1) 02 37.78	4) 04 1:10.45	3) 04 1:14.35	2) 04 1:16.33	6) 04 1:17.67						
5) 04 1:18.24	4) 06 1:50.87	3) 06 1:56.44	2) 06 1:59.01	6) 06 2:00.01						
5) 06 2:00.03	1) 04 2:01.87	4) 08 2:22.45	3) 08 2:26.45	5) 08 2:30.13						
6) 08 2:35.67	1) 06 2:40.40	1) EARLY 0.16	2) 08 2:40.54							

	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
Backup	2:40.36	2:26.04	2:22.32	2:30.00	2:35.50

==>Race Summary (by place)===== > Race 0009<====  
Sunday 07-14-XX 12:00.34

200 Meters Backstroke		Place	Lane	Time
Event : 7	Heat: 4	1	4	2:22.45
		2	3	2:26.45 <2:26.04>
		3	5	2:30.13
(0009) Saturday 07-14-XX 12:00.34		4	6	2:35.67
(<backup time>) (*edited time)		5	2	2:40.54
			1	

Given the above printout together with the majority placings and times below what is the official result?

**Majority Placings and Manual Times**

Place	Lane	Time
1	4	2:22.22
2	3	2:25.99
3	5	2:29.90
4	6	2:35.57
5	1	2:40.30
6	2	2:40.30

**Official Result**

Place	Lane	Time
1	.....	.....
2.	.....	.....
3.	.....	.....
4.	.....	.....
5.	.....	.....
6.	.....	.....



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**Exercise 9**

====>Race History<=====>Race 0003<===  
 Sunday 07-14-XX 09:45.67

|-----Lane Number  
 | |-----Lengths  
 | | |-----Time

5) 02 27.95 4) 02 28.80 8) 02 29.01 2) 02 29.09 7) 02 29.87 3) 02 30.17  
 1) 02 30.24 4) 04 58.81 5) 04 58.84 8) 04 59.30 6) 02 59.31 6) EARLY .12  
 7) 04 59.31 2) 04 1:01.29 1) 04 1:02.35 3) 04 1:02.49

	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 7	Lane 8
Backup	1:02.23	1:01.10	1:02.40	58.71	58.80	59.25	59.25

=====

====>RACE SUMMARY<=====>Race 0003<===

Colorado Time Systems

100 METERS Freestyle

Event 4 Heat 3

Place	Lane	
Time	1	4
		58.81
2	5	58.84
3	8	59.30
4	7	59.31
5	2	1:01.29
6	1	1:02.35
7	3	1:02.49

=====

Official Result

Place	Lane	Time
1	.....	.....
2.	.....	.....
3.	.....	.....
4.	.....	.....
5.	.....	.....
6.	.....	.....
7.	.....	.....
8.	.....	.....

Explain how you came to your answer

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 .....  
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**Exercise 10**

No disqualifications had been reported to the Referee. The AOE operator informed the Referee that the swimmer in lane 6 had failed to register a 50m time but in his opinion no other problems had occurred with the AOE.

Manual Times

Lane	Time	Manual Placings:	
1	1:02.47	Judge A	5 4 8 6 7 2 1 3
2	1:01.39	Judge B	5 4 6 7 8 2 1 3
3	1:02.61	Referee	4 5 7 6 8 2 1 3
4	58.99		
5	58.95		
6	59.29		
7	59.38		
8	59.42		

====>RACE SUMMARY (by place)=====

Saturday 12-11-XX 18:39.28

				Colorado Timing Systems		
		100 Meters		Place	Lane	Time
Event	16	Heat	5	1	4	58.81
				2	5	58.84
				3	8	59.30
				4	7	59.31
(0023)	Saturday	12-11-XX	18: 39.28	5	2	1:01.29
				6	1	1:02.35
				7	3	1:02.49

====>Splits Summary<=====

Saturday 12-11-XX

				Colorado Timing Systems							
		100 Meters									
Event	16	Heat	5								
				Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
50 Meter				30.24	29.09	30.17	28.80	27.95	59.31	28.97	29.01
100 Meter				32.11	32.20	32.32	30.01	30.89		30.34	30.29
50 Meter				30.24	29.09	30.17	28.80	27.95	59.31	28.97	29.01
				1:02.35	1:01.29	1:02.49	58.81	58.84		59.31	59.30
Place				<6>	<5>	<7>	<1>	<2>		<4>	<3>
				1:02.35	1:01.29	1:02.49	58.81	58.84		59.31	59.30

Official Result

Place	Lane	Time
1.	.....	.....
2.	.....	.....
3.	.....	.....
4.	.....	.....
5.	.....	.....
6.	.....	.....
7.	.....	.....
8.	.....	.....

Explanation

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**Exercise 11**

```
====> RACE HISTORY <=====> Race 0002 <=
                                     Saturday 06-01-XX   19:08.00
                                     START USED   : keyboard
Backup   Lane 1   Lane 2   Lane 3   Lane 4   Lane 5   Lane 6   Lane 7   Lane 8
        25.86  26.61  24.99  26.22  24.97  25.90  25.49  25.55
```

```
====> RACE SUMMARY (by place) <=====> Race 0002 <=
```

Saturday 06-01-XX 19:08.00

Colorado Time Systems

```

50 METERS
Event 02 heat
Place  Lane  Time
1      3      25.10
2      5      25.18
3      8      25.55
4      7      25.56
5      1      25.90
Saturday 06-01-XX   19:09.42
6      6      26.00
7      4      26.20
8      2      26.30 <26.61>
```

Manual Results

Official Result

Place	Lane	Time			
1	5	25.95	1	.....	.....
2	3	26.00	2	.....	.....
3	7	26.42	3	.....	.....
4	8	26.51	4	.....	.....
5	1	26.86	5	.....	.....
6	6	26.98	6	.....	.....
7	4	27.17	7	.....	.....
8	2	27.29	8	.....	.....

What is the reason for the two times being recorded for lane 2 in the race summary?

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**Exercise 12**

```

=====> RACE HISTORY <===== > RACE 0003 <===
                                     Saturday 12-12-XX   16:08.00
                                     START USED :Keyboard

Backup      Lane 1  Lane 2  Lane 3  Lane 4  Lane 5  Lane 6  Lane 7  Lane 8
            24.87  25.62  24.00  25.23  23.98  24.91  24.50  24.56
    
```

```

===== > RACE SUMMARY (by place) ===== > Race 0003 <===
                                     Saturday 12-12-XX   16:08.00

                                     Colorado Time Systems

                                     50 METERS
                                     Event 03 Heat 04

Saturday 12-12-XX   16:46.42
(* edited time)

                                     Place  Lane  Time
                                     1      3    24.11
                                     2      5    24.19
                                     3      7    24.50*
                                     4      8    24.57
                                     5      1    24.91
                                     6      6    25.01
                                     7      4    25.21
                                     8      2    25.31 <25.62>
    
```

=====

Manual Result			Official Result		
Place	Lane	Time	Place	Lane	Time
1	5	24.06	1	.....	.....
2	3	24.11	2	.....	.....
3	8	24.49	3	.....	.....
4	7	24.50	4	.....	.....
5	1	25.57	5	.....	.....
6	6	25.99	6	.....	.....
7	4	26.18	7	.....	.....
8	2	26.30	8	.....	.....

Why is there an asterisk at the side of lane 7 in the results summary?

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**Exercise 13**

====>RACE HISTORY<=====> Race 021 <==  
 Monday 10-14-XX 12:11.47

Lane Number		Lengths		Time										
3)	02	29.13	5)	02	29.76	4)	02	30.02	2)	02	30.07	1)	02	30.17
6)	02	30.38	3)	04	59.55	2)	04	1:01.10	1)	04	1:01.61	4)	04	1:01.62
6)	04	1:02.41	5)	04	1:02.91									

	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
Backup	1:01.35	1:01.11	59.52	1:01.11	1:02.86	1:02.40

====>RACE SUMMARY<=====> Race 021 <==

Monday 10-14-XX 12:11.47

Colorado Time Systems

100METERS			Place	Lane	Time
Event:	34	Heat: 1	1	3	59.55
			2	2	1:01.10
			3	1	1:01.61
			4	4	1:01.62<1:01.11>
(0021) Monday	10-14-XX	12:11.47	5	6	1:02.41
			6	5	1:02.91

Manual Placings

Judge 1	3 4 2 1 6 5
Judge 2	3 4 2 1 6 5
Referee	3 4 2 1 6 5

Manual Times

Lane	Time
1	1:01.51
2	1:01.05
3	59.48
4	1:01.12
5	1:08.85
6	1:02.85

Official Result Place	Lane	Time
1.	.....	.....
2.	.....	.....
3.	.....	.....
4.	.....	.....
5.	.....	.....
6.	.....	.....

Explanation

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**Exercise 14**

=====> RACE SUMMARY (by place)<=====>Race0022<=  
 Saturday 07-20-XX 19:46.42

Colorado Time Systems

100 METERS		Place	Lane	Time
Event 27	Heat 02	1	6	2:09.55<2:09.22>
		2	2	2:11.10
		3	4	2:12.18
		4	1	2:13.61*
[0022]	Saturday 07-20-XX 19:46.42	5	3	2:13.71
	[* edited time <back-up time>]	6	5	2:14.91

=====

Manual Results

Official Result

Place	Lane	Time	Place	Lane	Time
1	6	2:09.26	1	.....	.....
2	2	2:11.00	2	.....	.....
3	4	2:12.27	3	.....	.....
4	3	2:13.64	4	.....	.....
5	1	2:13.72	5	.....	.....
6	5	2:14.88	6	.....	.....

Explanation

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**Exercise 15**

=====>RACE HISTORY<=====>Race 0030<===  
 Saturday 07-27-XX 20:46.31  
 START USED : keyboard

-----Lane Number		-----Lengths		-----Time								
3)	02	29.13	5) 02	29.76	4) 02	30.02	2) 02	30.07	1) 02	30.17	6) 02	30.38
3)	04	59.55	2) 04	1:01.10	4) 04	1:01.17	1) 04	1:01.61	6) 04	1:02.41	5) 04	1:02.91

Back-up	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
	1:01.25	1:01.09	59.52	1:01.45	1:02.86	1:02.40

=====>RACE SUMMARY (by place)=====>Race 0030<===  
 Saturday 07-27-XX 20:46.42

Colorado Time Systems

100 METERS				Place	Lane	Time
Event	34	Heat	01	1	3	0:59.55
				2	2	1:01.10
				3	4	1:01.17
[0030]	Saturday	07-27-XX	20:46.42	4	1	1:01.61
				5	6	1:02.41
				6	5	1:02.91

Manual Results			Official result		
Place	Lane	Time	Place	Lane	Time
1	3	59.61	1	.....	.....
2	2	1:01.17	2	.....	.....
3	4	1:01.23	3	.....	.....
4	1	No Time	4	.....	.....
5	6	1:02.37	5	.....	.....
6	5	1:02.96	6	.....	.....

Explanation

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 .....  
 .....  
 .....  
 .....

**Exercise 16**

====>RACE HISTORY<=====>Race 0013<==  
Monday 11-04-XX 11:19.24

```

|-----<Lane number
| |-----< Lengths
| | |-----< Time
  
```

3) 02 39.70 4) 02 44.50 2) 02 45.49 5) 02 46.09 1) 02 46.38 6) 02 46.60

	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
Back-up	45.95	45.49	39.68	44.37	46.04	46.71

====>RACE SUMMARY (by place)<=====>Race 0013<==  
Monday 11-04-XX 11:19.24

Colorado Time Systems

50 METERS				Place	Lane	Time
Event 23	Heat 01			1	3	39.70
				2	4	44.50
				3	2	45.49
				4	5	46.06
[0013]	Monday 11-04-XX	11:19.24		5	1	46.38 <45.95>
	[ <back-up time >]			6	6	46.60

Manual Results

Official Result

Place	Lane	Time	Place	Lane	Time
1	3	39.46	1	.....	.....
2	4	44.21	2	.....	.....
3	2	45.44	3	.....	.....
4	1	45.67	4	.....	.....
5	5	46.00	5	.....	.....
6	6	46.51	6	.....	.....

Explanation

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 .....  
 .....  
 .....

**Exercise 17**

====> Race History <=====> Race 0002 <====  
 Saturday 12-08-XX 16:08.00

	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
Back-up	44.63	42.76	42.69	43.14		42.78

=====> Race Summary (by place) <=====> Race 0002 <====  
 Saturday 12-08-XX 16:08.00

Colorado Time Systems

50 METERS

Event 15 Heat 04

Place	Lane	Time
1	3	42.66
2	6	42.74
3	2	42.80
4	4	43.12
5	1	44.61
6		

Manual Results

Place	Lane	Time
1	3	42.64
2	6	42.68
3	5	42.69
4	2	42.74
5	4	43.02
6	1	44.51

Official result

Place	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

Explanation

.....

.....

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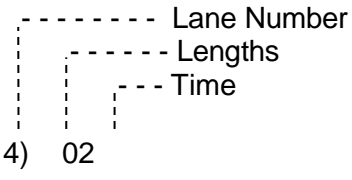
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Summary of printout indications between OSM6 & Colorado

<b>OMEGA OSM6/Ares</b>	<b>COLORADO</b>
<b>AOE not started by starting signal</b>	
EVENT 00003 HEAT P L . L            13:22:54.02M A . A . L        07/10/XX C . N . A E . E . P	START USED:    keyboard
<b>Lap Time not recorded by pad</b>	
EVENT 00003 HEAT P L . L            13:22:54.02M A . A . L        07/10/XX C . N . A E . E . P  1. 4. 1            1:24.20M	 <p style="text-align: right;">                         ----- Lane Number                          ----- Lengths                          ----- Time                          4) 02                     </p>
<b>Finish not recorded</b>	
EVENT 00003 HEAT P L . L            13:22:54.02M A . A . L        07/10/XX C . N . A E . E . P  1. 4. 2            3:36.06M	Finish cannot be simulated from the keyboard <p style="text-align: right;">&lt;3:04.48&gt;</p> <back-up time>
<b>Edited Time</b>	
OSM6 3:24.78* ARES 3:24.78B(back-up) ARES 3.24.78E(edited)	3:24.78* (* = edited time)
<b>Difference of 0.3 between AOE and semi AOE</b>	
Not available(OSM6) Time highlighted on computer screen (Ares)	1:56.49 <1:56.18> <back-up time>
<b>No primary time</b>	
:--:--	<2:46.79> <back-up time>



# OMEGA OSM6

## OMEGA PRINTOUT

Example printout – set to 1/1000<sup>th</sup> second and to 1/100<sup>th</sup> second

EVENT : 010 HEAT : 02				EVENT : 010 HEAT : 02			
P			10.09:20.25	P			10.09:20.25
L	L			L	L		
A	A	L	01/04/XX	A	A	L	01/04/XX
C	N	A		C	N	A	
E	E	P	RESULT	E	E	P	RESULT
1	2	2	2:41.656	1	2	2	2:41.65
2	3	2	2:42.542	=2	3	2	2:42.54
3	4	2	2:42.547	=2	4	2	2:42.54
4	6	2	2:45.611	4	6	2	2:45.61
5	5	2	2:50.622	5	5	2	2:50.62
6	1	2	2:50.752	6	1	2	2:50.75

### Explanation of an Omega AOE timing slip

EVENT 004 HEAT : 03			
P			11 . 10 : 42. 20 ←Time
L	L		
A	A	L	02/06/XX ←Date
C	N	A	
E	E	P	BACK-UP
1	4	1	1: 09. 87
2	2	1	1: 11. 08
3	3	1	1: 11. 32
1	4	2	2: 24. 09
2	2	2	2: 24. 50
3	3	2	2: 25. 50
1	4	2	2: 24. 09
	4	2	2: 24. 17
2	2	2	2: 24. 50 M
	2	2	2: 24. 62
	3	3	2: 25. 32 *
	3	2	2: 25. 32

M ---- time inserted by operator

\* -----edited time i.e. back-up time

Operators should ensure that the equipment is set to record to 1/100<sup>th</sup> of a second

**System Started by the Operator**

In the event of the system not started by the starting signal then if told to do so the operator can set the system in motion. This applies to both Omega and Colorado systems. This then enables the places to be recorded but the times cannot be used and the manual times obtained from the lane timekeepers will be required. To identify that this has happened the following will be found on the printed slip for that race.

**Event : 019 Heat : 03**

**P 10 . 53: 25 M ← System started by the operator**  
**L L**  
**A A**

Example

P  
L L  
A A L  
C N A Back-up  
E E P

1	4	1	1:05.57
	4	1	1:05.63
2	2	1	1:06.16
	2	1	1:06.26
3	5	1	1:06.89
	5	1	1:06.99
4	6	1	1:07.24
	6	1	1:07.29
5	1	1	1:07.38
	1	1	1:07.46
6	3	1	1:06.164M
	3	1	1:06.19

Manual Results

Place	Lane	Time
1	4	1:05.44
2	3	1:06.05
3	2	1:06.12
4	5	1:06.80
5	1	1:07.32
6	6	1:07.34

Official Result		
Place	Lane	Time
1	4	1:05.44
2	3	1:06.05
3	2	1:06.12
4	5	1:06.80
5	6	1:07.31 RD
6	1	1:07.32

**Exercise 18**

P			
L	L		
A	A	L	back-up
C	N	A	
E	E	P	
1	4	2	2:14.11
	4	2	2:14.16
2	5	2	2:16.09
	5	2	2:16.09
3	3	2	2:17.23
	3	2	2:17.06
4	2	1	2:15.25
	2	1	2:15.18

Manual results

Place	Lane	Time
1	4	2:13.99
2	2	2:15.31
3	5	2:15.99
4	3	2:17.10

Complete the official result

Place	Official Result	
	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....

### Exercise 19

Event 19 Heat 01

P L A C E	L A N E	L A N E	Result	Place	Lane	Time
1	4	2	00.58.20	1	.....	.....
2	2	2	00.58.46	2	.....	.....
3	1	2	00.59.15	3	.....	.....
4	3	2	00.59.20	4	.....	.....
5	6	2	01.00.20	5	.....	.....
6		-	... ..	6	.....	.....

### Manual Results

Place	Lane	Time	Complete the race result
1	4	58.15	
2	2	58.40	
3	5	59.20	
4	1	59.25	
5	3	59.40	
6	6	01:00.10	

### Exercise 20

At the end of a race you are given the following information on an AOE slip and confirmed that the AOE is operating correctly. Complete the official result

Event 20 Heat 02

P L A C E	L A N E	L A N E	RESULT	Place	Lane	Time
1	3	1	00:17.254	1	.....	.....
2	1	1	00:18.113	2	.....	.....
3	4	1	00:18.205	3	.....	.....
4	6	1	00:18.208	4	.....	.....
5	2	1	00:19.102	5	.....	.....
6	5	1	00:19.113	6	.....	.....

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**Exercise 21**

In this race the back-up times are available along with manual times. From the information provided give the official result.

Event 21      Heat 03

P			
L	L		
A	A	L	
C	N	A	
E	E	P	Back-up
1	5	2	00. 56. 24
	5	2	00. 56. 29
2	3	2	00. 56. 26
	3	2	00. 56. 39
3	4	2	00. 57. 28
	4	2	00. 57. 39
4	1	2	00. 57. 31
	1	2	00. 57. 37
5	2	2	00. 57. 46
	2	2	00. 57. 55
6	6	2	01. 03. 13M
	6	2	00. 57. 29

Manual Results

Place	Lane	Time
1	5	56.32
2	3	56.30
3	6	57.26
4	4	57.31
5	1	57.36
6	2	57.56

Official Result

Place	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

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**Exercise 22**

In a relay event the starting blocks are fitted with electronic take off equipment. The slips you have received, heat results and the lap 2 take offs shown below have been confirmed by yourself as satisfactory, and the equipment has functioned correctly.

The turn judge has reported an incorrect take off on lane 1 at the end of the second lap.

Give the official result.

Event 22 Heat 04			
P	L	L	
A	A	L	
C	N	A	
E	E	P	RESULT
	1	3	2 00.52.61
	2	6	2 00.53.40
	3	4	2 00.54.01
	4	2	2 00.55.11
D		3	2 +00.10
	5	7	2 00.56.20
D		6	2 +00.14
D		4	2 -00.11
	6	1	2 00.56.40
	7	5	2 00.57.23
D		2	2 +00.30
	8	8	2 00.57.80
D		7	2 +00.28
D		1	2 00.00
D		5	2 +00.21
D		8	2 +00.32

Event 22 Heat 04			
P	L	L	
A	A	L	
C	N	A	
E	E	P	Result
	1	3	4 01.45.26
	2	2	4 01.45.63
	3	6	4 01.46.35
	4	4	4FD 01.47.01
	5	5	4 01.47.26
	6	8	4 01.47.67
	7	7	4 01.48.10
	8	1	4 01.49.21

Official Result		
Place	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....
7	.....	.....
8	.....	.....



**Exercise 23**

The AOE equipment has provided the back-up times.

Complete the official result.

Event 24		Heat 05	
P			
L	L		
A	A	L	
C	N	A	
E	E	P	BACK-UP
1	1	2	00.52.14
	1	2	00.52.30
2	4	2	00.52.41
	4	2	00.52.50
3	3	2	00.53.76
	3	2	00.53.87
4	2	2	00.53.84
	2	2	00.53.87
5	5	2	00.53.87*
	5	2	00.53.87
6	6	2	00.56.03
	6	2	00.56.08

Manual Placings

Place	Lane	Time
1	1	52.10
2	4	52.37
3	3	53.70
4	5	53.80
5	2	53.84
6	6	55.98

Official Result

Place	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

**Exercise 24**

The AOE equipment did not start when the starting signal was given, but was started by the AOE operator.

Complete the official result for the race

Event 25			Heat 06
P			
L	L		
A	A	L	
C	N	A	
E	E	P	Result
1	5	1	00.20.00
2	4	1	00.21.32
3	3	1	00.21.50
4	1	1	00.21.53
5	2	1	00.22.11
6	6	1	00.23.02

Manual Results		
Place	Lane	Time
1	5	56.09
2	3	57.47
3	4	57.50
4	2	58.30
5	1	58.33
6	6	59.40

**Official Result**

Place	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

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**Exercise 25**

In this event lane 6 received no primary, back-up or manual time.

Complete the official result.

Event 26			Final
P			
L	L		
A	A	L	
C	N	A	
E	E	P	Result
1	4	2	00.40.14
2	3	2	00.41.10
3	5	2	00.42.29
4	2	2	00.42.50
5	1	2	00.44.10
6	.	.	.. .. .

Manual Results		
Events 26	Final	
Place	Lane	Time
1	4	40.11
2	6	.
3	3	41.03
4	5	42.31
5	2	42.56
6	1	44.12

**Official Result**

Place	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

**Exercise 26**

The following are the results of the two heats of an event where only manual times and places are available, owing to the malfunction of the AOE.

The swimmer in lane 5 was disqualified for a faulty start.

Give the official results.

Placing			Official Result		
			Place	Lane	Time
Judge A	4	3 5 6 2 1			
Judge B	4	3 5 1 2 6	1	.....	.....
Referee	4	3 5 2 1 6	2	.....	.....
Times:			3	.....	.....
Swimmer	Lane	Time	4	.....	.....
A	1	1:06.01	5	.....	.....
B	2	1:05.98	6	.....	.....
C	3	1:05.38			
D	4	1:05.29			
E	5	1:05.52			
F	6	1:06.09			

The swimmer in lane 1 did not complete the course.

Placing			Official Result		
			Place	Lane	Time
Judge A	3	6 2 4 5			
Judge B	6	3 2 5 4	1	.....	.....
Referee	3	6 2 5 4	2	.....	.....
Times			3	.....	.....
Swimmer	Lane	Time	4	.....	.....
G	1	No time	5	.....	.....
H	2	1:09.83	6	.....	.....
I	3	1:08.21			
J	4	1:09.82			
K	5	1:09.78			
L	6	1:08.17			

Place the swimmers into a final selecting two reserves

Final	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6
Swimmer						

Reserves 1<sup>st</sup> ..... 2<sup>nd</sup> .....

**Exercise 27**

In the boys 100m Butterfly event both the AOE and manual results are given. Both turn judges report a stroke violation for lane 2 which is accepted by the Referee.

Decide and record the official result.

Event 110 Heat 08 14-04-03  
16:23.45.01 M

Manual Result

P	L	L	Result	Place	Lane	Time
L	L			1	6	1:04.26
A	A	L		2	8	1:05.31
C	N	A		3	2	1:05.73
E	E	P		4	7	1:08.79
				5	5	1:08.88
1	6	2	1:09.335	6	3	1:08.99
2	8	2	1:10.386	7	1	1:13.15
3	2	2	1:10.854	8	4	1:13.18
4	5	2	1:13.933			
5	7	2	1:13.937			
6	3	2	1:14.335			
7	4	2	1:18.154			
8	1	2	1:18.233			

Official Result

Place	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....
7	.....	.....
8	.....	.....

**Exercise 28**

Determine the official result of the results of the printout and manual times below. Explain how you came to your decision.

				Manual Result		
	L			Place	Lane	Time
A	A	L		1	4	2:33.30
C	N	A		2	5	2:35.50
E	E	P	Back-up	3	2	2:36.21
				4	1	2:36.21
1	4	2	2:33.39	5	6	2:41.00
	4	2	2:33.56	6	7	2:41.01
2	2	2	2:36.34	7	3	2:40.99
	2	2	2:36.37	8	8	2:46.45
3	7	2	2:41.01			
	7	2	2:41.25			
4	6	2	2:41.05			
	6	2	2:41.19			
5	3	2	2:41.21			
	3	2	2:41.20			
6	8	2	<del>2:46.72</del>			
	8	2	2:46.76			
	1	2	-----			
	1	2	2:36.33			
7	5	1	2:35.54			
	5	1	2:35.75			

Official Result

Place	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....
7	.....	.....
8	.....	.....
	.....	.....

Explanation

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# OMEGA ARES 21

Omega timing systems have superseded the OSM6 timing system with a replacement PC based timing system - ARES (Advanced Result Entry Station).

Whilst the ARES has increased functionality beyond the OSM6 its basic function is the same. It places swimmers based on the elapsed time between the starting signal and the swimmer exerting sufficient pressure on the touchpad at the end of the race to stop the timer.

Printouts from ARES can be in two forms.

- A till roll style similar to the OSM6 printed on plain paper rather than the grey thermopaper or
- A4 via a conventional text file sent to a PC printer.

The below example illustrates a typical A4 style layout. This would normally be laid out within a landscape format. The example also includes indicators of operator or back-up usage:

## ARES printout - A4 layout

National Age Groups

35 Final Boys 50m Freestyle

Started at 16:15:24.86M<-----Manual Start

Dist	Lane1	Lane2	Lane3	Lane4	Lane5	Lane6	Lane7	Lane8
50m	32.48	34.25	33.45E	35.62	38.34	36.75B	39.41	40.23

Rank	Lane	Time	Back-up time	
1	1	32.48	-----	No back-up time recorded
2	3	33.45E	34.10	E denotes edited time manually inputted
3	2	34.25	34.30	
4	4	35.62	35.71	
5	6	36.75B	36.75	B back-up time inserted as a primary time
6	5	38.34	38.45	
7	7	39.41	39.53	
8	8	40.23	-----	

Dependent upon the version of software in use, should the difference between the primary and back-up times exceed .3 second the rank lane and times line will be highlighted.

The following example shows the result of a 100m event. Intermediate distance times are entered line by line dependent upon the pool configuration and installation of touch pads.

Event 45	Heat 2							
Started at	12:10:11.45							
Dist	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
100m	-----	1:04.67	1:00.29	1:01.69	1:00.24E	59.34	1:00.36	-----
Rank	Lane	Time	Back-up time					
1	6	59.34	59.56					
2	3	1:00.29	1:00.30					
3	5	1:00.34E	1:00.28	Judge 1	635742			
4	7	1:00.36	1:01.43	Judge 2	653742			
5	4	1:01.69	1:01.68					
6	2	1:04.67	-----	Referee	653742			

**Official Result**

Place	Lane	Time
1	6	59.34
2	5	1:00.28
3	3	1:00.29
4	7	1:00.36
5	4	1:01.69
6	2	1:04.67

The edited time for lane 5 cannot be used – there is no origin for the time or reason given as to why the operator edited the time. The back-up time places lane 5 second, this is confirmed by the manual placing. The swimmer therefore is placed second.

If for example the back-up time was 1:00.30 then the Referee would have had to make a decision as to whether or not there was evidence not to place in third place based on time. With a difference of 1/100<sup>th</sup> second to change based upon manual placings would be difficult to justify if challenged.

The following example displays the information provided from a 800m race in a 50m pool with pads installed only at the start/finish end. Lanes 1,2,7 & 8 were not in use.

Event 67                      Womens 800m Freestyle  
 Started at                    10:19:57.30

Dist	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
100m	--	--	1:05.43	1:06.09	1:07.34	1:06.94	--	--
200m	--	--	2:18.01	2:20.55	2:19.85	2:18.79	--	--
300m	--	--	3:32.26	3:35.02	3:33.45	3:32.53	--	--
400m	--	--	4:47.85	4:49.90	4:47.44	4:45.92	--	--
500m	--	--	6:04.95	6:04.49	6:01.66	5:59.61	--	--
600m	--	--	7:21.16	7:28.58	7:15.94	7:14.22	--	--
700m	--	--	8:37.63	8:36.50	8:29.55	8:29.98	--	--
800m	--	--	9:52.92	9:49.01	9:40.76	9:42.49	--	--

Rank	Lane	Time	Back-up time
1	5	9:40.76	9:40.94
2	6	9:42.49	9:42.47
3	4	9:49.01	9:49.11
4	3	9:52.92	9:52.98

**Exercise 29**

The extract from a result below are from an event. It was suggested by the AOE operator that there could have been a malfunction of the system on Lane 4 at the finish.

Rank	Lane	Time	Back-up	Manual Placings	
1	5	32.81	32.83	Finish Judge A	567834
2	6	33.61	33.75	Finish Judge B	567483
3	7	33.63	33.71	Referee	576843
4	8	33.87	33.96		
5	3	34.47	34.50		
6	4	34.60	33.79	Hand held time for Lane 4	33.70

Using the information provided

- i. Decide the official result
- ii. Explain how you reached your decision

I Place	Official Result	
	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

ii.....  
 .....  
 .....  
 .....  
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**Exercise 30**

The result of the boys 50m Butterfly race is given below. There is only one timekeeper operating on each lane.

Dist 50m	Lane 1 56.74B	Lane 2 1:09.19	Lane 3 47.41	Lane 4 34.16E	Lane 5 31.39	Lane 6 41.67	Lane 7 56.82	Lane 8 34.17
-------------	------------------	-------------------	-----------------	------------------	-----------------	-----------------	-----------------	-----------------

Rank	Lane	Time	Back-up time
1	5	31.39	-----
2	4	34.16E	34.25
3	8	34.17	34.25
4	6	41.67	41.64
5	3	47.41	47.42
6	1	56.74B	56.74
7	7	56.82	-----
8	2	1:09.19	1:09.20

Manual Placings	
Judge1	58463712
Judge 2	54863712
Referee	58463172
Manual Times	
Lane 1	56.72
Lane 2	1:09.10
Lane 3	47.40
Lane 4	33.99
Lane 5	31.88
Lane 6	41.63
Lane 7	56.66
Lane 8	34.68

i. Determine the official result

Place	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....
7	.....	.....
8	.....	.....

ii. What do the letters E and B indicate at the side of the time for that swimmer

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.....

iii. Explain briefly how you arrived at your result

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**Exercise 31**

The following results are from a 100m freestyle event

Event 81	Heat 2							
Started at	10:15:06M							
Dist	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
100m	58.52	58.50	56.41	57.00	53.30E	53.27	--	--

Rank	Lane	Time	Back-up time
1	6	53.27	53.19
2	5	53.30E	53.28
3	3	56.41	56.40
4	4	57.00	56.92
5	2	58.50	58.29
6	1	58.52	58.50

Manual Result		
Place	Lane	Time
1	6	1:00.26
2	5	1:00.27
3	3	1:02.41
4	4	1:02.48
5	1	1:04.13
6	2	1:04.15

i. determine the official result

Rank	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

ii. What does the letter E indicate at the side of Lane 5

.....

.....

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iv. Explain briefly how you arrived at your result

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**Exercise 32**

Determine the official result from the information handed to the Referee below. Explain briefly how you arrive at your result.

Event 21		Heat 8						
Started at		09:00:26 M						
Dist	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
50m	--	42.86	40.42	43.24	47.35	48.07	--	--

Rank	Lane	Time	Back-up time
1	3	40.42	40.51
2	2	42.86	42.80
3	4	43.24	43.27
4	5	47.35	47.30
5	6	48.07	47.92
6	1	-----	44.41

Manual Placings	
Judge 1	321456
Judge 2	321456
Referee	324156
Manual Times	
Lane	Time
1	53.46
2	50.45
3	50.14
4	53.29
5	No Time
6	58.62

Determine the official result

Rank	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

Explanation

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**Exercise 33**

The result of a Girls 100m Breaststroke race are given below. Lane 6 did not complete the course.

Event 01		Heat 01						
Started at		10:04:65						
Dist	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
50m	--	32.475	33.001	34.146	33.478	33.716	--	--
100m	--	1:06.423	1:06.420	1:07.192	1:07.206	-----	--	--

Rank	Lane	Time	Back-up time
1	3	1:06.420	-----
2	2	1:06.423	-----
3	4	1:07.192	-----
4	5	1:07.206	-----

i. Determine the official result

Rank	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....

ii. What action, if any, should the Referee take prior to the start of the next race?

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**Exercise 34**

Below are the results of the Womens 400m Freestyle race

Event 301	Heat 02							
Started at	10:05:13							
Dist	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
100m	--	--	1:05.43	1:06.90	1:07.34	1:06.94	--	--
200m	--	--	2:18.01	2:20.55	2:19.85	2:18.17	--	--
300m	--	--	3:32.36	4:49.90	3:33.45	3:32.53	--	--
400m	--	--	4:47.45	-----	4:47.44	4:50.57	--	--

Rank	Lane	Time	Back-up time
1	5	4:47.44	4:47.51
2	3	4:47.45	4:47.99
3	6	4:50.57	4:50.67
4	4	-----	4:50.00

Manual Placings
Majority Placing 3546

i. Determine the official result

Rank	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....

ii Explain briefly how you arrived at your result

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**Exercise 35**

The result of the Mens 400m Individual Medley is shown below.

Event 201		Heat 05						
Started at		09:01.20.34						
Dist	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8
100m	1:02.20	1:00.32	1:00.94	59.64	1:01.00	59.70	58.82	58.95
200m	2:07.94	2:03.34	3:09.20	2:03.01	2:05.19M	2:03.03	2:02.61	2:03.30
300m	3:14.72	3:07.73	4:12.21	3:06.76	3:08.86	3:07.18	3:06.07	3:06.98
400m	4:22.33	4:13.39	-----	4:10.31	4:12.24	4:10.89	4:10.27E	4:10.70

Rank	Lane	Time	Back-up time
1	7	4:10.27E	4:10.31
2	4	4:10.31	4:10.34
3	8	4:10.70	4:10.79
4	6	4:10.89	4:10.98
5	5	4:12.24	4:12.30
6	2	4:13.39	4:13.40
7	1	4:22.33	4:22.37
8	3	-----	4:12.30

Manual Placings	
Judge 1	74863521
Judge 2	47863521
Referee	47865321

i. Determine the official result

Rank	Lane	Time
1	.....	.....
2	.....	.....
3	.....	.....
4	.....	.....
5	.....	.....
6	.....	.....
7	.....	.....
8	.....	.....

ii. Explain how you arrived at the result

.....  
 .....  
 .....

iii Explain what the letters E and M indicate adjacent to the time on particular lanes

.....  
 .....  
 .....

# OMEGA QUANTUM

Quantum is the most recent incarnation of the Omega timing system.

It has further increased functionality in relation to data storage and transmission but it still places swimmers based on the elapsed time between the starting signal and the swimmer exerting sufficient pressure on the touchpad at the end of the race to stop the timer.

Printouts from Quantum are A4 via a conventional text file sent to a PC printer.

The below example illustrates a typical A4 style layout.

## Official results

### 308 Heats 2: Women's 800 Freestyle Team

Pry - Start time: 43:44:21.3708

Rank	Lane	Time	Backup time	Name	Nation	Comp. Id.
1	6	<b>9:24.37</b>	9:24.55	Harrogate		34080206
2	2	<b>11:12.77</b>	11:12.89	St Albans Ma		34080202
3	3	<b>12:05.73</b>	12:05.67	Co Sheffield		34080203
4	5	<b>12:44.31</b>	12:44.44	Exe Masters		34080205
DNS	4			Spencer		34080204

Dist.	Lane 0	Lane 1	Lane 2	Lane 3	Lane 4	Lane 5	Lane 6	Lane 7	Lane 8	Lane 9
0										
50			37.73	41.00		41.36	32.99			
100			1:18.92	1:25.95		1:27.06	1:10.74			
150			2:00.49	2:14.76		2:14.80	1:48.70			
200			3:17.48	3:01.66		3:00.17	2:26.16			
250			4:01.52	4:29.56		3:44.81	2:59.61			
300			4:47.39			4:34.34	3:17.96			
350				6:07.98		5:26.10	4:12.61			
400			6:12.07	6:51.08		6:16.82	4:49.96			
450			6:55.96	7:38.67		7:03.19	5:22.81			
500			7:41.00	8:29.45		7:54.70	5:58.24			
550				9:19.42		8:46.80	6:34.35			
600			9:03.81			9:37.59	7:10.16			
650				9:55.86		10:18.87	7:40.03			
700			9:46.90	10:37.41		11:05.59	8:13.69			
750			10:30.66	11:21.48		11:54.80	8:49.27			
800			11:12.77	12:05.73		12:44.31	9:24.37			