



## Electronic Systems Guide

This guide takes you through the process that you need to take as you prepare for your event. It does not tell you how to plan the event. See [Event Planners Guide](#) on the LEI [www.leioc.org.uk](http://www.leioc.org.uk) website.

Don't read this document through. Follow the check lists below. Each check list takes you through the steps you to take for your role. Follow the hyperlinks if you need to know more about a step.

Planner – Level C – [Start here](#)

Planner – Level D - [Start here](#)

Controller - [Start here](#)

## Planner – Level C

Time	Action
Thinking of being a planner	Understand the SI system and its limitations <a href="#">More details here</a>
During planning process	Check for any changes to the SI control process Ensure you think about how the SI kit is to be deployed. <a href="#">More details here</a>
2 weeks before event	Advise treasurer of controls to be left out overnight (time details and number of controls). Check arrangements to collect necessary SI kit
2 weeks before event	Maps to printer
	Obtain SI kit(s) and check correct number of stakes, kites. Obtain gripples (if required) Check required on time for controls
1 week before event	<a href="#">Send XML course files to Download</a> <a href="#">Prepare the control boxes for the event</a>
48 hours before event	<a href="#">Synchronise the clocks in the control boxes</a>
Day before event	Site any controls you need to deploy earlier. Ensure any controls not to be visited on event day are woken
Day of event	Site your controls - <a href="#">On the day</a> Ensure all event controls are woken Enjoy the event <a href="#">Supervise collection of controls</a> Ensure all controls are switched off <a href="#">Send RouteGadget files</a>

## Planner – Level D

Time	Action
Thinking of being a planner	Understand the SI system and its limitations <a href="#">More details here</a>
During planning process	Check for any changes to the SI control process Ensure you think about how the SI kit is to be deployed. <a href="#">More details here</a>
2 weeks before event	Advise treasurer of controls to be left out overnight (time details and number of controls). Check arrangements to collect the SI kit
1 week before event	Maps to printer
	Obtain SI kit and check correct number of stakes, kites. Obtain print station Obtain gripples (if required) Check required on time for controls
2 days before event	<a href="#">Prepare the control boxes for the event</a> <a href="#">Synchronise the clocks in the control boxes</a>
24 hours before event	<a href="#">Charge and clear print station</a>
Day of event	Site your controls - <a href="#">On the day</a> Ensure all event controls are woken Enjoy the event <a href="#">Supervise collection of controls</a> Ensure all controls are switched off Ensure the print station has been downloaded by the results team <a href="#">Send RouteGadget files</a> to download group.

## Controller

Time	Action
Check you are up to date with the SI controls	Understand the SI system and its limitations <a href="#">More details here</a>
During planning process	Ensure the planner is happy with SI process and has requested the kit they need. <a href="#">More details here</a>
2 weeks before event	Ensure Treasurer advised of controls to be left out overnight.
2 weeks before event	Obtain the controller's SI box ( <a href="#">details here</a> )
1 week before event	Ensure the planner is setting the correct on time so you can visit all controls before the event.
48 hours before event	Agree set-out route with planner
Day before event	Visit any controls that you need to
Day of event	Visit the rest of the control sites ( <a href="#">Controller's responsibilities</a> ) Ensure all event controls are woken Enjoy the event

## Introduction

The SI (SportIdent) system is a sophisticated timing system. Each competitor carries a 'card' which contains a small memory device. That memory holds a unique serial number together with a list of the controls visited and the time of that visit.



There is a range of SI cards, from the original type 5 through to the SIAC card. It is important for the planner to appreciate the limitations of the cards (see table below). Most of the LEI hire cards are the older type 5 or type 8 together with a number of SIAC cards. If any planned course has more than 30 controls the planner must consider the provision of hire cards and possibly an exchange system for competitors with the older cards. The competitor must not be penalised because they have not purchased the correct card.

Card Type	5	6	8	9	10	11	SIAC
Number Range	1 - 499,999	500,000 - 999,999	2,000,000 - 2,999,999	1,000,000 - 1,999,999	7,000,001 - 7,999,999	9,000,001 - 9,999,999	8,000,001 - 8,999,999
Control Storage	30 + 6	64	30	50	128	128	128

The '+ 6' for type 5 controls means 6 additional controls stored with the code of the control visited but not the visit time.

SI also produces combined compass and card units (Comcards). These have either a Type 8 or a Type 10 chip

If additional cards are required contact the SI Co-ordinator who will provide the appropriate sets.

Each control station contains a precision electronic clock and an electronic circuit to communicate with the competitor's card. There are two types of card action

- For the non-SIAC card the competitor inserts their card into the control station which wakes up and sends power to the card unit. This allows the control station to send its number and the current time to the card and get the card's serial number from the card. A valid 'punch' is indicated by the control station beeping and a LED in the control station flashing.
- For the SIAC card the card is always powered during the event and picks up the time/control number signal broadcast by the control within 0.5m (about 18") of the control station. A successful punch is indicated by the card beeping and a LED flashing inside the competitor's card. Note that the SIAC card sends no information to the control station so its serial number is not recorded within the control and it cannot wake a control station. A SIAC card may be inserted into the control station causing it to behave like a type 10 card.

At the end of the event a competitor's card will contain a list of control numbers and the time at which those controls were visited. This list is uploaded by the results system and used to provide the event results.

The planner must remember that each control box is independent, so for the results to make sense the time clocks within each box must be synchronised. This is particularly important if two controls are close together, two controls are used to operate a time-out (for example at a road crossing) or if multiple controls boxes are used at a single control point (or start/finish).

At the start of the event the competitor's card must be prepared. This involves removing old events from the card memory. This is done by inserting the card into a clear station.

As the SIAC card contains a battery, competitors should be encouraged to check their battery before each event. The SIAC Battery Test control will be in the event assembly area (typically at the start of the route to the start). Do not place the battery test in the start area as this will confuse competitors and give them no opportunity to rectify any issues. When the SIAC card is inserted into this control it will:

- Normal beep to confirm the card battery is OK
- Multiple high-pitched beeping means the battery is marginal. (Display on control will show <2.72V)
- No beep means battery is flat. (Battery < 2.44V) The SIAC unit can still be used as normal card (similar to type 10) when out of power. The battery in the SIAC card can be replaced if the card is returned to SportIdent.

Competitors whose card has a flat battery should be able to hire a replacement card if they want to compete using contactless punching.

Competitors with SIAC cards **must** punch the 'Check' station during the start process as this activates the card. A slowly flashing green LED on the card indicates the ON state. A 'SIAC Test' station should be made available after the 'Check' station. This allows the competitor to check their card is active. Note that punching the 'SIAC Test' station will also activate the card. The planner must ensure the 'SIAC Test' station is started before the event by punching with any card. The competitor must not approach another course control until they start.

The card remains active until the competitor passes the finish control. For a punching finish competitors must punch the finish control as this switches their card off. If the finish is programmed as a contactless finish the finish time will be recorded and the card switches itself off as the competitor passes the control.

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## Controller's SI Kit (Level C and above)

The controller's box contains enough equipment to allow the controller to check the controls on the day.

- SIAC card
- Standard card (with sufficient capacity for all the controls to be visited)
- Clear control
- Check control

The clear control is provided to clear out the previous event's data. The check control is provided to start the SIAC card.

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## The Planning Process

Early in the planning process the planner should ensure sufficient control sets have been allocated for the event. If the number of controls allocated is causing restrictions contact the SI Systems Co-ordinator to request extra equipment. Level D events (Winter and Summer Leagues) are allocated 30 controls numbered 31-60. Level C events (East Midland League events and similar) have sixty controls numbered 31-96 but with missing numbers in the upper range to avoid the numbers that are confusable when inverted (66, 68, 81, 86, 89)

The control sets will have been checked by the SI Co-ordinator, however they may have been used by several planners since the last check, so the planner should aim to have custody of the controls at least one week before the event to allow their own checks to be made. For planners running a level D event they must also ensure they have the appropriate results equipment (print box or similar).

The control sets come with combination padlocks to allow the control boxes to be secured.

With SIAC cards the 'on time' of the control box becomes more important. A traditional card will wake up the control and register the time however a SIAC card requires the control to be awake to record the time. Note that the first competitor arriving at a sleeping box should notice that their SIAC card does not buzz/flash on arrival at the control; they can still punch in the traditional manner, however it is unfair to that first competitor who stands to lose several seconds each time this occurs. Therefore, it is important to ensure the control is on when the first competitor arrives. For events where the controls are put out on the day of competition the 'on time' should be 12 hours. For events where controls are placed the day before the competition and not visited by the controller on the day of the competition the 'on time' should be set to 24 hours (this will only happen for level C events and above). This can be done as part of the Time-Master step.

The planner must be aware that competitors may use the standard cards or contactless cards in an event. Users of standard cards may be at a disadvantage to those using the SIAC (contactless) card because of the speed through the control site. The planner must ensure that the control sites do not allow the competitor to punch on the wrong side of an uncrossable barrier. For example, in an urban event if the control box is placed against an uncrossable fence the competitor can achieve a successful punch from either side of the fence.

Despite all precautions taken by the organiser, it might occur that a runner enters the start box without having activated his/her SIAC card. This can easily be verified with the SIAC Test station. When coming in range of the station (50 cm), the card should react as for a normal punch. The SIAC Test station will not write any data on the card. The card remains empty and is thus still able to register the start time (the START will not work when a card is not empty). The same test is also useful for allocated start times. A BSF7/8/9 Station programmed as SIAC Test can also be used to switch on the card (SIAC ON).

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## Control Box Preparation

The table below details the contents of each control set:

Set	Controls	Start	Finish	Clear	Check	TimeMaster	SIAC Battery Check	SIAC Air Test
A1	31-60 (BSF9)	✓	Punch	2	✓	Clear/12 hour on	✓	✓
A2	31-60 (Red)	✓	Punch	2	✓	Clear/12 hour on	✓	✓
C	62-111 (40)	✓	Punch	2	✓	Clear/24 hour on		
Maze	62-96	✓	✓	✓	✓	Clear/12 hour on		

- Set A1 or A2 are used for Level D events
- Set A1 together with set C are used for level C+ events.
- Set C has 30 blue BSF9 controls and 10 red BSF8 controls with attachment loops

### Set C control numbers

62, 63, 64, 65, 67, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 82, 83, 84, 85, 87, 88, 90, 91, 92, 93, 94, 95, 96, 97, 100, 101, 102, 103, 104, 105, 107, 110, 111

Omitting 61, 66, 68, 81, 86, 89, 98, 99, 106, 108, 109 (these numbers can be read upside down to give misleading information, the numbers are automatically omitted by Purple Pen when the upside-down numbers box is ticked)

All numbered control boxes are programmed as 'Beacon' controls as required by SIAC cards. Some controls in the Maze set may not be set to beacon mode so care should be taken when using them.

The Time-Master box will have a service key, instructions and a connector attached via a cord.

The Time-Masters in sets A1 and A2 have an on-time of 12 hours, the one in set C has an on-time of 24 hours (see label on box).

### The Time-Master

- Upon receipt of the control sets lay the controls out on a table.
- Use the purple service key to power up each control. If the box beeps several times rapidly when woken the battery is dangerously low and the box should not be used. The display on the underside of the control box will sequentially show a series of values.
  1. Control number (preceded by 'BC' which means beacon) – Should match the number printed on the control box
  2. Time – This displays the last 3 digits of the off time in minutes (OFF720 = 12 hours)
  3. Battery – this should show a value greater than 310
  4. Software version – ignore
- Use the purple service key to power down all boxes.

Any control box which has a low battery must not be used for the event and must be returned to the SI coordinator who will attempt to supply replacements.

If the event has multiple start locations the planner must ensure that start, check and clear stations are available for each start location.

If you need to leave control boxes out overnight the following guidelines must be observed:

- The control site must be away from any public area (e.g., not on foot path)
- The control box must be locked to something solid
- The treasurer must be informed at least 2 weeks before the event to ensure the insurance is validated.

We have NO insurance cover for any equipment left in cars overnight. So please keep in your house and load the expensive boxes, printer and cards just before you leave.

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## Control Box Synchronisation

A maximum of 2 days before the event the controls should be synchronised. This time scale is important as the clocks in each control can drift out of sync

- Lay all the controls out on the table.
- For level C and above where both an A set and C set are in use choose the Time-Master with the desired 'on time' (12/24 hours as explained above).
- Place all other Time-Master controls to one side. IT IS IMPORTANT THAT ONE TIME-MASTER IS NOT USED TO SYNCHRONISE ANOTHER.
- The Time-Master has a purple Service Key and a black coupling stick attached by a cord.
- Check the selected Time-Master is correctly programmed.
  - Insert the Purple Service key once into the TimeMaster. The display will show 'SERVMO'.
  - Wait for the display to cycle through to the 'OFFxxx' value. 'xxx' is the last 3 digits of the off-time for the control in minutes. So if a 12 hour on time is selected the display will show 'OFF720', for 24 hours it will show 'OFF440'.
  - If the value is not as expected please contact the SI kit coordinator.
- Insert the service key repeatedly into the Time-Master until the display shows 'EXT MA'.
- At each control place the Time-Master on top of the control. Insert the coupling stick through the card hole of the Time-Master and into the hole of the control. Wait till the control box beeps twice and flashes its red light. This indicates the control's clock and 'on time' are synchronised to the Time-Master and the backup memory is cleared.



- If the Time-Master fails to beep, try the following actions:
  - Remove and re-insert the coupling stick
  - Remove the Time-Master, turn the control box over and re-insert the Time-Master.
  - Remove the Time-Master, use the 'Service Off' card to wake up the control box before re-inserting the Time-Master
- Repeat this step for all control, start and stop boxes.
- Any boxes that fail to start or synchronise must be isolated and returned to the SI Equipment Officer for repair. As the maps will have been printed at this stage take another control not required for the event and temporarily label it with the number of the failed control. Inform the download team who will create an alias in the results software. (Remember to remove the temporary label after the event)
- **As a final check view the time display on the Start, Finish and at least 1 control to ensure they are in sync**
- Use the purple 'Service Off' key to switch all controls off to save the batteries.

There is a purple 'Clear Backup' card in each set. This is not needed if the Timemaster is used in ExtMA mode. If you need to use it insert this into the start, check and clear boxes in turn. Each box should beep when it has cleared. This clears the list of cards seen by the box.



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### Additional Preparation – Level C and above

The Planner must send the XML course file to the download operator so that the download software knows the courses. Refer to the planning software guide (e.g. Purple Pen) for instructions how to obtain the XML file.

### Additional Preparation – Level D

The Planner must send the XML course file to the person preparing the results. Refer to the planning software guide (e.g. Purple Pen) for instructions how to obtain the XML file. It may not be clear until the day of the event which member of the results team requires the file.

### Download Printer

The Download Printers are housed in waterproof “Peli” boxes. The printers consist of a printer and an SI print station. There are two types of printer as shown in the photos below (a black printer and a red SI printer). The print station records the time from each card and prints the results. It does not check the course.

The box should also contain a charging lead, a spare paper roll, a ferrite coupling stick and four purple keys labelled: Clear Backup, Print Results, Service Off & Start.



### Before The Event

Charge the printer battery. The printer box contains a mains lead that plugs into a socket on the right hand side of the case.

Black printer – When charging the light on the printer will alternate green/yellow. Leave for a few hours then unplug. The printer will revert to a very low power idle mode. There is no way to tell whether the unit is fully charged. If the light flashes red the batteries have failed.

Red printer – The blue ‘charge’ light on the printer will illuminate until the battery is charged.

Return the mains lead to the recess inside the box once charging is complete.

Insert the Purple “Clear Backup” key into the SI box to clear out the old data. The box will beep to indicate success. Multiple rapid beeps mean the SI box battery is low and must be replaced.

### At the Event

Black printer – The black printer will turn on automatically. The green light will illuminate. If unused the printer will switch off. Press the button on the printer to check paper is feeding.

Red printer – Press the ‘on’ button on the printer, the blue battery gauge will illuminate. A small amount of paper will feed. After 30s idle the printer will go into standby and the gauge will flash.

The competitor should insert their card into the SI box and wait till the box beeps. Remove the card. The printer will start.

Tear paper off by grasping it at one side and pulling it smoothly forwards and towards the middle of the printer so that the metal perforator starts to cut the paper at the edge.

Once all competitors have downloaded ensure a member of the results team has access to the printer to upload the results.

Ensure any red printer is switched off by pressing and holding the power button on the printer till the blue light goes out.

### Replacing the paper

#### Black Printer

- Open the lid and by sliding the middle button forwards.
- Insert the new paper roll so that the loose end protrudes.
- Close the lid until the button clicks
- Press the button on the right of the printer to check that the paper is advancing properly.

#### Red printer

- Open the lid and by grasping the front of the clear cover (2 recesses are provided in the foam), squeezing and lifting the lid.
- Insert the new paper roll so that the loose end protrudes from the front.
- Close the lid firmly
- Check the paper advances as the lid is closed

Extra printer paper can be obtained from the SI-Coordinator.

### Paper does not advance

Follow instructions for replacing the paper and remove any jammed paper

### Quick Results during or after the event

Use the "Print Results" key to list out finish times for each 'course' which the SI box identifies by the first six controls punched.

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## On the day

### Planner

The planner is responsible for setting up each control site prior the event start (though they may co-opt assistants).

The picture shows the ideal control with control box, (a separate control number card is not needed for our events) and kite. Back-up punches are not now included with the equipment but may be obtained from the SI Co-ordinator for level A and B events.

Note the kite is looped onto the control number card hooks.

- **Do not trap the kite cord between the control box and the stake clip.**
- **Do not press on the control box when pushing the stake into the ground.**

Both have been proved to strain the clip and be a contributory cause to control box LCD failure.



The planner must punch every control box as they site them to ensure they wakeup correctly. The planner should start with a cleared card of appropriate capacity (or multiple cleared cards). A second SIAC card is a useful check to ensure the woken control is in 'Beacon' mode. The planner can download the card(s) once all controls are sited as a final check the controls are correctly programmed. Important note: The SERVICE/OFF (purple) instruction card does NOT enable the beacon mode of the station but switches to service mode/standby only.

- If the control is being left overnight and being visited by the controller on the day of the event the planner should use the purple service key to switch the control off and save the battery.

Wherever possible all controls should be locked to something solid.

If a control box fails on the day:

- Simply replace the offending box with a spare.
- There are a number of sleeves and a marker pen in each control set which can cover up the incorrect control number of the replacement. Write the correct control number on the sleeve. The spare will upload the incorrect control number (when compared to the number in the download software).
- Do not attempt to get the box re-programmed, report the incorrect control number to the download staff who will setup an 'alias' so that the download software recognises the change.
- Segregate and label the failed control and pass it to the SI co-ordinator so it can be repaired.

A clearly labelled *SIAC Battery Check* control should be placed in the assembly area (preferably alongside the beginning of the route to the start, not in the start area itself). This allows a runner to obtain a replacement if their card has failed. A SIAC Test control must be placed in the start area after the Check station to allow competitors to test their card

Once starts have closed the start boxes should be taken to the download where the start box/boxes will be interrogated by the download staff to upload a list of starters. This list is compared (by the download software) with the list of those who have already downloaded to compile a list of runners still out on the course.

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## Controller

The controller must visit each site immediately before the event to ensure that each box is correctly sited and working. Double check that the control box is labelled with the correct number. Punch the control with the standard card to wake it. Your SIAC card should also respond. (Note that if the control has been left on by the planner your SIAC card will respond as you approach the control. You should still punch with the standard control as this will restart the 'power-off' timer in the control). The last control you visit should be the finish. Here you should punch both the standard card and the SIAC card to switch the SIAC off.

The standard card should now contain the code for each control. Ask the download team for a printout of the card's contents. You should now check this list against the deployment schedule. This tells you that the boxes have been correctly programmed.

The controller should check:

- The SIAC Battery Test is located in the assembly area at the start of the route to the start so competitors can check their card (and deal with any problems) well before they enter the start area.
- A SIAC Test control has been placed after the Check control at the start.

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## After the Event

### Collect the controls

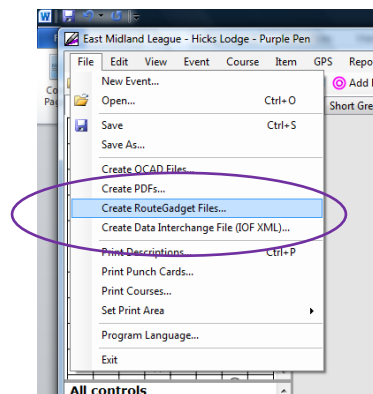
The planner is responsible for gathering all the equipment used on the course and returning it to the SI Co-ordinator (or if instructed the planner of the next event). Except for night events, equipment should not be left out for collection the following day. The planner must notify the SI co-ordinator and the treasurer as soon as possible of any missing or failed equipment particularly if this will affect the next event.

The planner must check all controls are switched off using the 'Service Off' key. This is particularly important with the extended on-times required by SIAC cards.

If it is clear that equipment has been stolen or vandalised the planner must report this to the Police and obtain a crime number. The planner must also talk to the Treasurer to provide details for an insurance claim.

### RouteGadget files

As soon as possible after the event the planner should send the RouteGadget files to the download contact. See [Useful Contacts](#). The files are obtained in Purple Pen by selecting File -> Create RouteGadget Files.



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## Useful Contacts

Role	Name	Email	Phone
SI Equipment Monitor & Coordinator	Chris Phillips	<a href="mailto:onecp47@gmail.com">onecp47@gmail.com</a>	07801 653896
SI Equipment Repairs	Simon Starkey	<a href="mailto:simon.starkey@gmail.com">simon.starkey@gmail.com</a>	07963 124139
Minor Events Coordinator	Jane Dring-Morris	<a href="mailto:Janedringmorris@gmail.com">Janedringmorris@gmail.com</a>	
Treasurer	Simon Ford	<a href="mailto:si.ford1943@btinternet.com">si.ford1943@btinternet.com</a>	
Results	Kevin Bradley	<a href="mailto:kjbradley@gmail.com">kjbradley@gmail.com</a>	01664 424163
Results Printer Team	John Marriott Iain Phillips Alastair Paterson Roger Phillips	<a href="mailto:john.marriott@gmail.com">john.marriott@gmail.com</a> <a href="mailto:iain@phillips4.co.uk">iain@phillips4.co.uk</a> <a href="mailto:abpaterson@hotmail.com">abpaterson@hotmail.com</a> <a href="mailto:rogerphillips34@gmail.com">rogerphillips34@gmail.com</a>	07891 730258 07813 013911
RouteGadget	David Cladingboel	<a href="mailto:dec421@yahoo.com">dec421@yahoo.com</a>	07914 192074
Purple Pen Support	Simon Starkey	<a href="mailto:simon.starkey@gmail.com">simon.starkey@gmail.com</a>	07963 124139

### Changes to process

- V4.0 Introduction of BSF9 controls
  - Revised TimeMaster technique
- V4.1 Add on time check
- V4.2 Add photo of sync process
- V4.3 Change set listings
- V4.4 Add beacon check. Correct battery check. New set configuration