V1.0

APMP

Scoreboards For Schools

Electronic Assembly Guide

Email: questions@apmp.com.au
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Outline

Please read the Disclaimer and Guarantee before commencing construction.

Thanks for purchasing an APMP scoreboard. With a bit of care now, you will have a long lasting board for years to come. We have made this manual as concise as possible as we know you do not want to read through pages and pages of jargon. There is an information and construction video available at www.apmp.com.au that will aid in construction. But if this information does not help you, please do contact us directly, as each APMP scoreboard comes with unlimited technical support.

Your new scoreboard has the following features

99% Pre-built and tested receiver
99% Pre-built and tested wireless transmitter
Auto power - off
13 Large digits > 12" high
170 x 10mm ultra bright LEDs per digit (over 2000 LEDs)
Visible over 125m
Max dimensions 4m x 4m (12 feet by 12 feet)
High current 17A 12V switchmode power supply
Over current and over temperature protection

This manual should be used in conjunction with two videos:

How to assemble the digits:

http://www.apmp.com.au/downloads/7seg.wmv

How to assemble the ribbon cables:

http://www.apmp.com.au/downloads/ribcable.wmv

Packing list

13	7 segment display printed circuit boards
6	indicator printed circuit boards
1	pre-built and tested controller with receiver and high current 12V power supply
1	pre-built and tested remote receiver
1	Mains power cable
2004	Red high brightness 10mm 9000mcd LEDs
1000	330 ohm resistors
11	470uF 25V capacitors
11	0.1uF polyester capacitors
13	2m ribbon cables
11	ULN2003 IC
11	CD4511 binary to 7 segment driver IC
14m	light duty cable
1	siren
1	pre-built and tested transmitter PCB
1	Enclosure and label for transmitter
1	9V switchmode regulated power adaptor (for transmitter)

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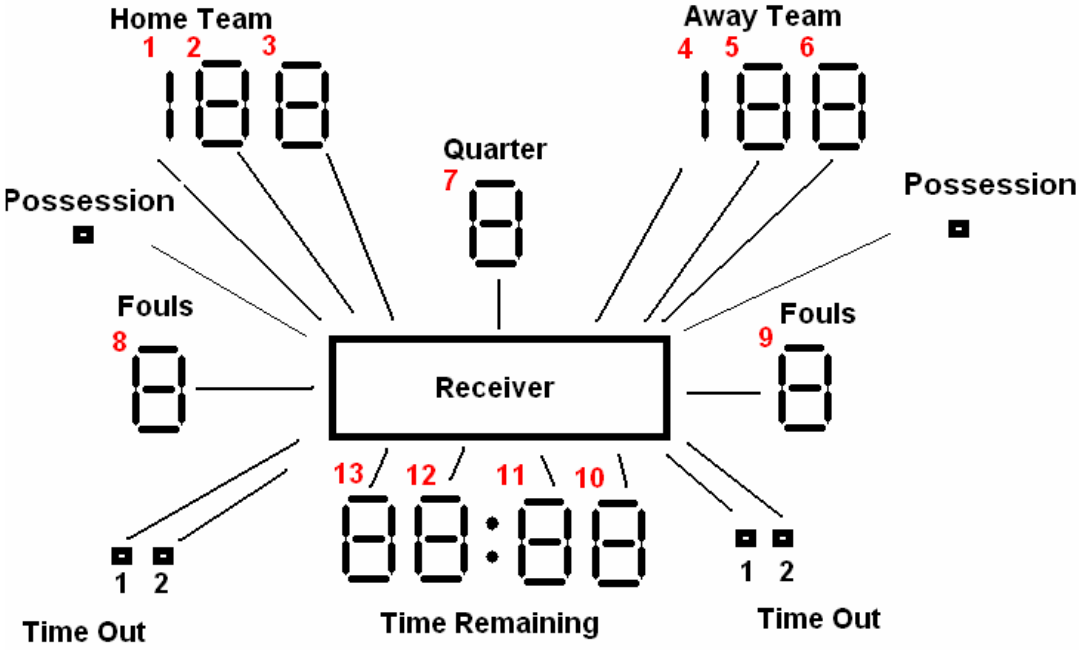
Construction:

Each digit is numbered, and referred to according to the following diagram:



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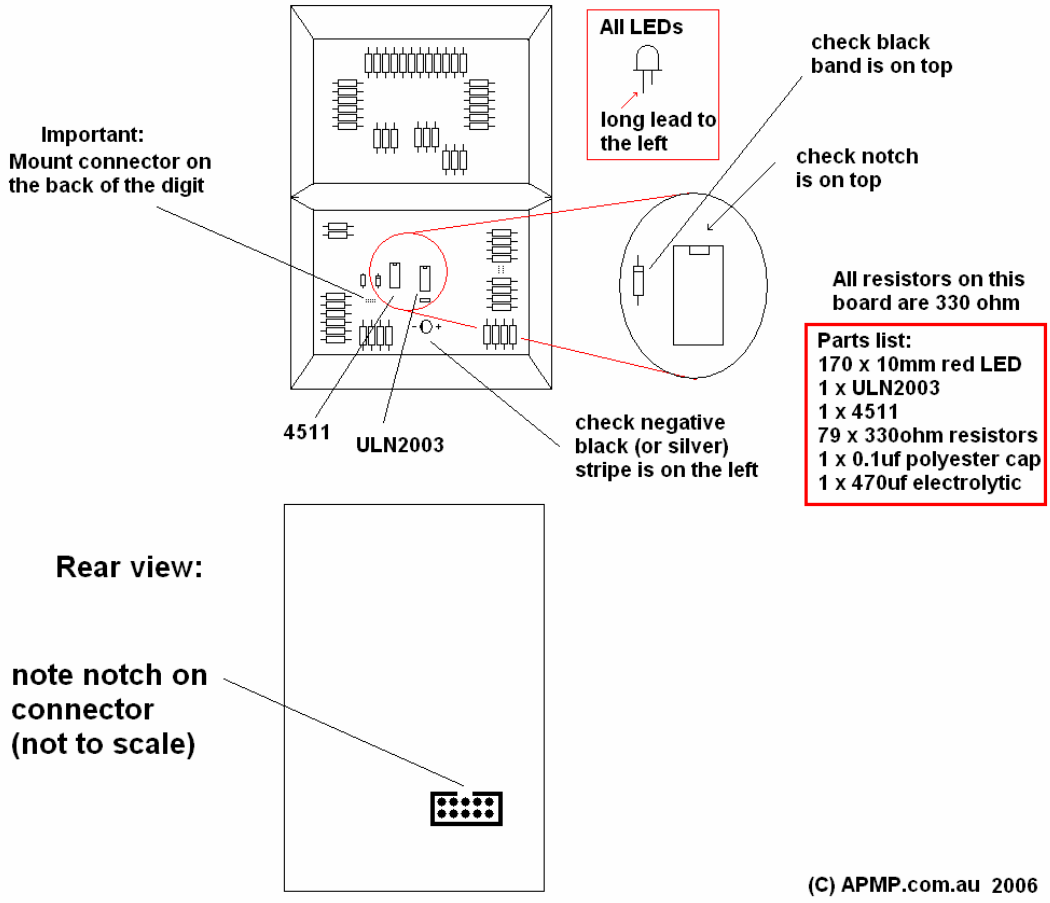
As you can see, there are 13 digits in total as well as 6 indicators to indicate time-out and possession.

11 digits should be assembled according to this diagram: Note that the diagram is not to scale.



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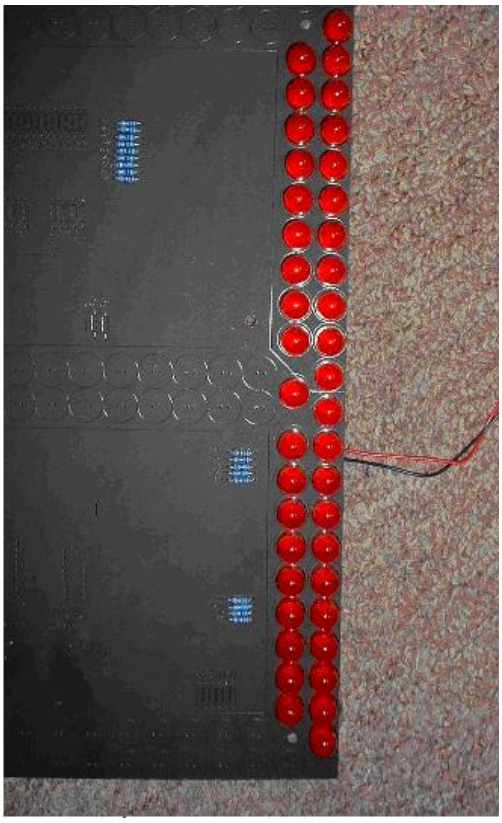
There are 13 circuit board digits in the pack which are identical, however, the home team and the away team scores can only show up to 199, and hence two of the 100's digits only need the right hand side LEDs mounted:



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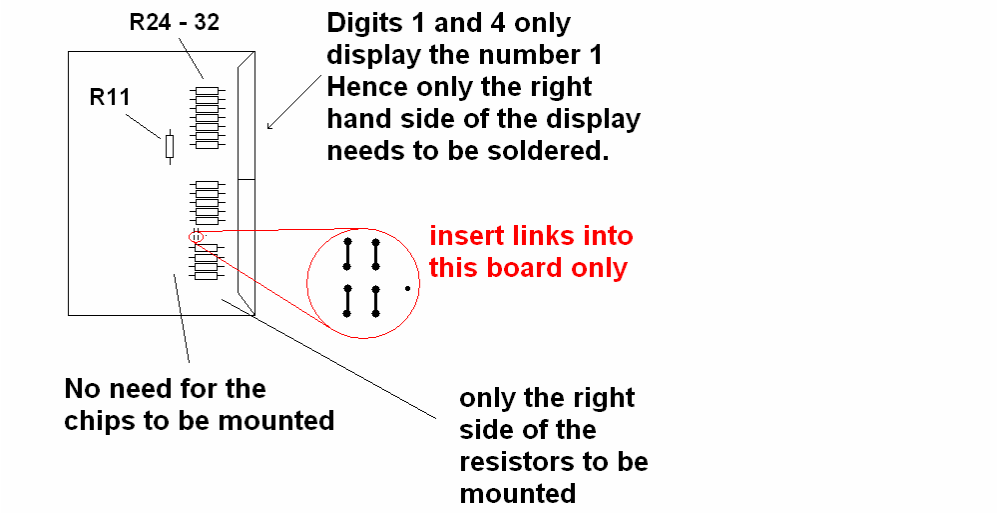
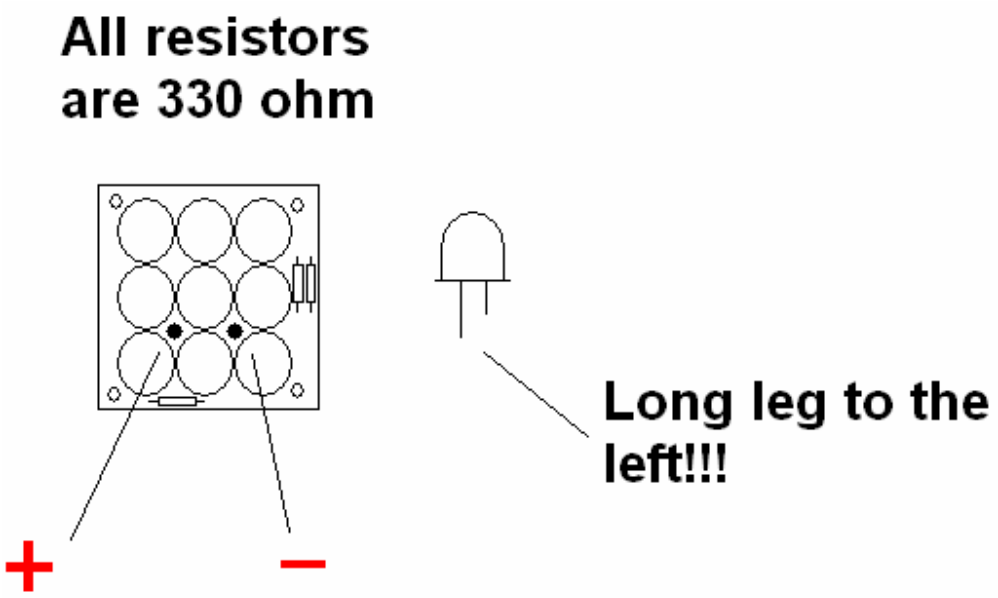
Note that this digit does not need any extra components such as the ICs, and capacitors found on other digits. It does, however, need the resistors found on the right hand side of the board. (as pictured above)

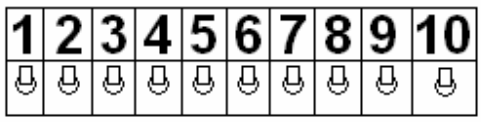
Also there are 4 links to be installed on this board **only**. See diagram below:



Wiring diagram for the 6 indicators is as follows:



The controller has a 10 way connector block as well as 13 ribbon cables for each digit. The connector block allows connection to the siren, and the six indicators. Wire the connector block as follows:

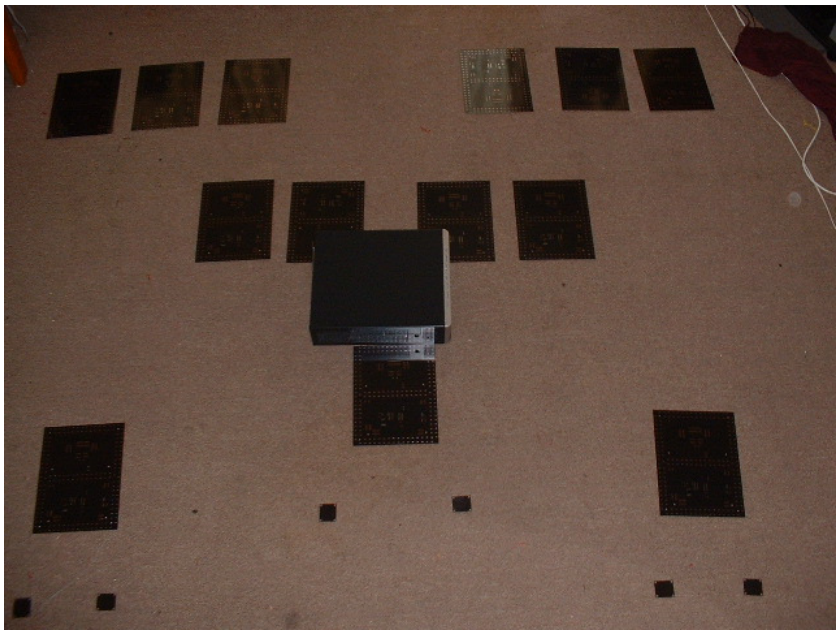


Wire all **positive** leads to any of connector numbers 8 9 or 10.

Wire the **negative** leads as follows:

1- Possession away
2- Timeout Home 2
3- Timeout Home 1
4- Possession Home
5- Timeout Away 1
6- Timeout Away 2
7- Siren

There is a 2m lead between each digit and the controller. Therefore, the maximum size the scoreboard can be, if the controller is mounted centrally, is 4m by 4m. That should be plenty of room for school logos, crests and team logos and colors. However, a more workable size is 250cm by 250cm. If you lay out the blank PCBs on the ground, you can get a good idea of what size works and what doesn't:



The board above will have dimensions of 250 x 250cm. Note the controller box will be mounted on the under side of the board but is pictured here under the "Time" digits.

A 10 way ribbon cable connects each digit with the controller. It is important that the ribbon cable is constructed as per the video at:

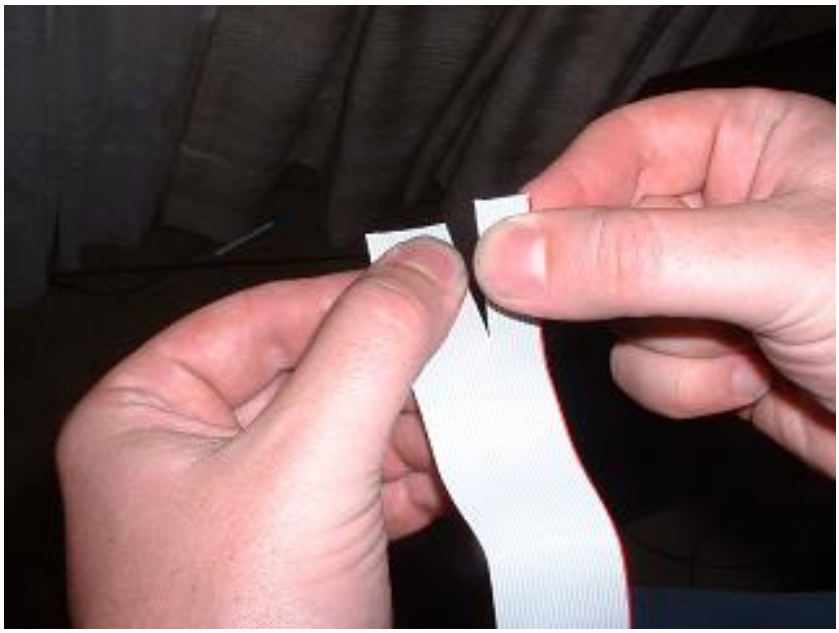
http://www.apmp.com.au/downloads/ribcable.wmv

Note that it is very easy to switch the orientation of either the cable or the plug while assembling it, with the result that the digit will not work!

Therefore please look at the following instructions very carefully:

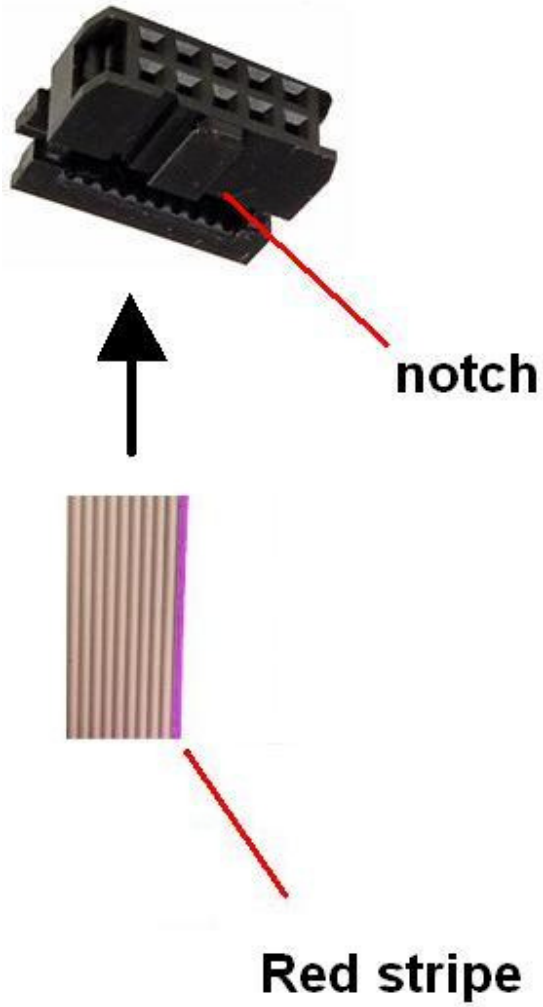
You will need a ribbon cable with 10 internal conductors.

If the ribbon cable supplied in the kit has more than 10 connectors, you can split the cable by hand as follows:



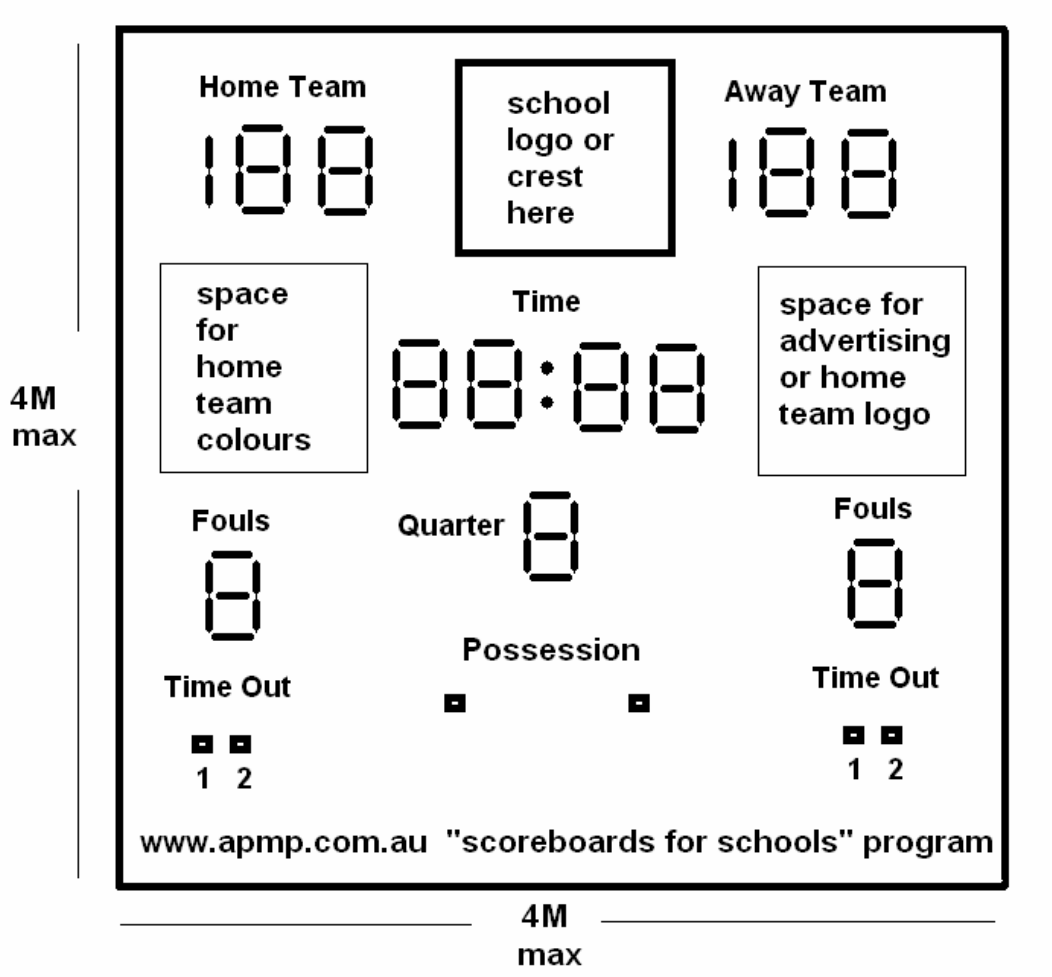
You can throw away the excess cable. Ensure that the red stripe remains on your 10 conductor cable.

Now position the 10 Way ribbon cable into an IDC connector, ensuring that the "notch" on the connector points down, and the red stripe on the ribbon cable is to the right as per this diagram:



Now fold the ribbon cable over itself and insert the retaining clip.

A suggested layout for the scoreboard is as follows:



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Notes on the above layout:

1. For a 4m x 4m board, the controller must be bolted centrally to the rear of the board, as each cable length is 2m maximum.
2. Each digit is spaced **AT LEAST 3 INCHES APART** with black or dark color underneath. This aids in reading the numbers from a distance.
3. It is your responsibility to ensure that the board is sturdy, and securely fitted to a sturdy section of wall with appropriate bolts suitable for the job. Failure to do so may cause the board to fall and cause injury or worse!
4. Perspex or Lexan™ plastic can be used to cover the display from accidental basketball strikes, but if the board is mounted reasonably high, this should not be necessary. Also, if the board is mounted centrally to the basketball court, away from the shooting areas, the probability of a solid strike to the board is further reduced.
5. Ensure that the roof and walls of the basketball court are not leaking and that the board can not get into contact with water. No part of this kit is water proof. This kit is NOT suitable for an external environment.
6. Mount the board away from direct sunlight.
7. Ensure the controller box is not covered or concealed in an air tight environment. The controller has a high current 17A 12V power supply and cooling fans which should be exposed to ambient air temperature.

Templates:

A template for the letters can be quickly and easily made by printing out the file labelled "template design.doc" available at www.apmp.com.au

Otherwise, open your MS Word™ document, and create your own template by following these instructions:

1. Set font size to 700
2. Go to Format>Font and in the "effects" section, click on the "Outline" setting.

This will give you an outline of large letters, suitable to be transferred and cut out of opaque plastic, such as Contact™./

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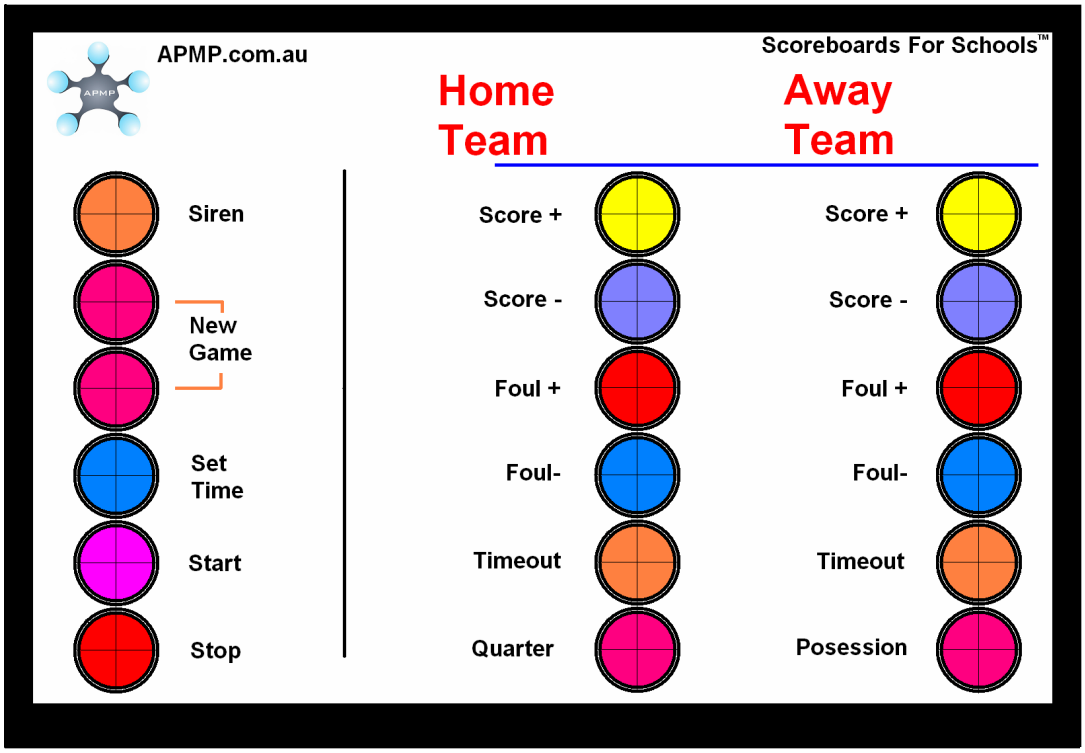
Operating features and functions:

1. The board will automatically power off after one hour and 15 minutes of the last button press. The score will not be lost. Pressing any transmitter button will wake up the board.
2. Press both "new game" buttons to reset all functions.
3. The "quarter" button cycles from 0 1 2 3 4 and 5. The 5 indicating "over time".
4. The "set time" button only functions while the timer is stopped. Therefore, press the "stop" button before altering the time.
5. An optional air horn siren assembly is available. Please contact www.apmp.com.au for more details.



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Disclaimer and Guarantee

The guarantee on this kit is limited to the replacement of faulty parts only. The guarantee cannot cover time expenses or loss of income due to incorrect assembly and/or fault finding and bug fixing. Note that all electronic components in this kit are from quality suppliers, and it is extremely unlikely that any part included in this kit is faulty. Check your soldering; check component placement, resistor values, and batteries carefully. An incorrectly placed component may not only harm the component, but also other components in the kit. Before applying power, double-check all placement of components carefully.

It is recommended that help be sought in the construction of this kit if the builder believes that the level of electronic knowledge required is out of his/her domain. Kits cannot be refunded or exchanged after construction has begun.

Operation of this device is not guaranteed. This device should not be used as a safety critical device. To the extent covered by law, use of and the building of this device expressly waives APMP of any liability for damage caused directly or indirectly to person or property from use.