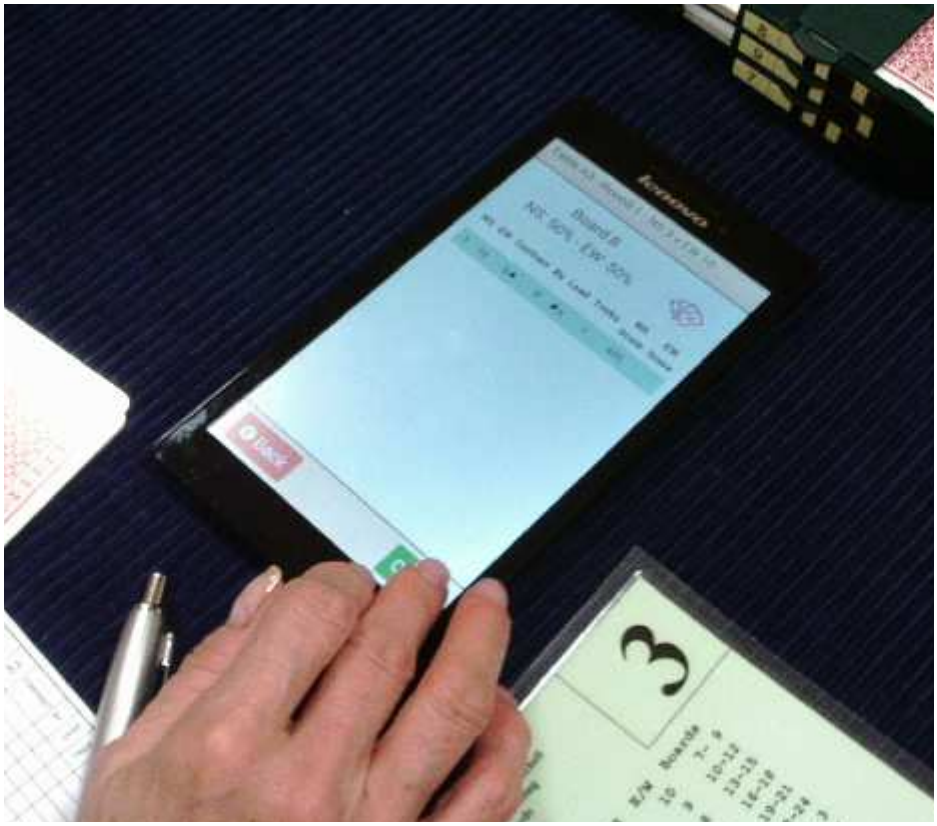
TabScore

User Guide

Version 1.6.2



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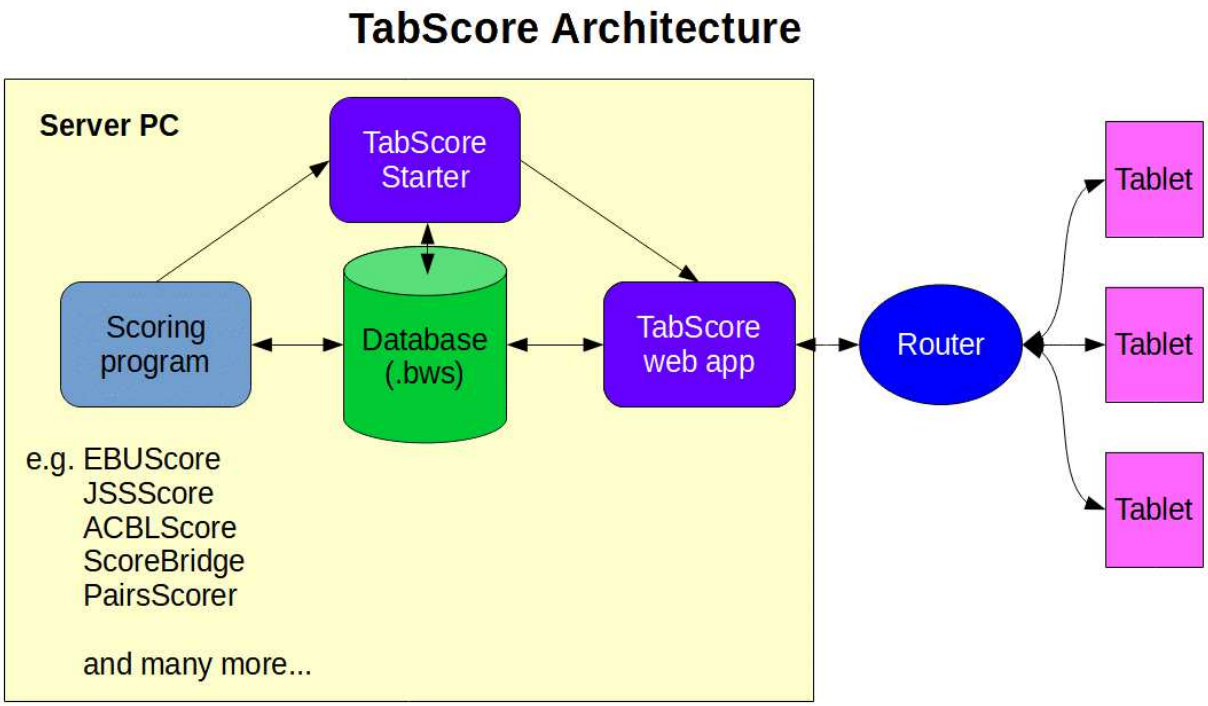
Description and Features

What is TabScore?

Over the years, Bedford Bridge Club has used a variety of scoring (ScoreBridge, EBUScore, JSSScore) and wireless scoring (BridgePad, BridgeTab) software. Having settled on EBUScore for our scoring program, we found that there was no wireless scoring software that met our requirements for functionality, ease of use, robustness and price. So Peter Flippant sat down and wrote TabScore to meet those requirements.

TabScore is primarily a web application that runs across a local wireless network. Unlike most wireless scoring systems, TabScore uses modern thin-client architecture that provides consistent data by using a single scoring database. That database is a Bridgemate .bws standard Access database, so TabScore is a direct replacement for BridgeTab (or Bridgemate, BridgePad etc) and it should work with any scoring software that can run Bridgemates.



TabScore requires a server PC or laptop computer, a wireless router, and some sort of table-top device with a browser on each table (tablet, Kindle, phone, etc). In the rest of this document, these table-top devices will be referred to as tablets. TabScore can run in 2 modes:

- **Traditional Mode** in which there is a dedicated tablet on each table, in the same way that Bridgemates operate. This works best if the bridge club has a set of scoring tablets and can put one on each table. Bedford Bridge Club has a set of 18 seven-inch tablets that are used only for scoring.
- **Personal Mode** in which the tablets move with the players. This is ideal for those clubs that don't want to invest in dedicated hardware, but whose members are willing to use their own

phones or tablets. A tablet or phone is required by every player who is involved in entering scores. This means that 2 tablets per table (ostensibly North and East) are required for one-winner pairs movements and 4 tablets per table are required for individual events. For teams and two-winner pairs movements, the 2 modes are identical and only one tablet per table (North) is needed.

Other than a browser, no special software is needed on the tablets, although some customization of the tablets will provide a better user experience. See later in this Guide for more details of how we do this at Bedford Bridge Club.

TabScore is currently available in English, Spanish and German. It will default to English if the Windows native language is not supported. If you would like to have TabScore in a different language and are willing to help with the translation, then please contact the developers.

For those interested in the technical specification, TabScore is written using C# and MVC, and the web pages use HTML5 and Bootstrap for formatting, and some basic JavaScript. The source code is available on GitHub.

Features

TabScore can be used to score pairs, teams, Swiss events, and individual events provided the scoring software supports them. It is currently configured for club use and is limited to 4 sections (A, B, C and D in that order) and 30 tables per section. It offers a range of options that can be set either via the scoring software or by using the Options button in TabScoreStarter. In particular, TabScore offers:

- The option to import deal files and display hand records on the tablets. A hand record can be viewed from different perspectives, depending on the Mode in use and the number of tablets being used at the table. The hand record display uses Bo Haglund's Double Dummy Solver (DDS) to analyse hand records, and can display the makeable contracts.
- The option to enter results as either total tricks won or +/-/= against the contract.
- The option to enter a lead card and validate that lead card against the hand record.
- The option to display the pairs or individual ranking list at the end of each round, or at the end of the event.
- The option to use either or both of an internal (provided by the scoring program) or external player database of names and ID numbers. This is useful if your national bridge organization, like the EBU, provides a database of membership ID numbers.
- The option to display a countdown timer to show the time left to the end of the round. The time per round can be set as a combination of Minutes per Board and Additional Minutes Per Round. The timer starts a round when the first table reaches the Show Boards screen for that round.

A full list of available options is at Appendix 1. Where necessary any option can be changed during a scoring session, and changes will take effect in TabScore within a minute or so.

As well as setting the options, TabScoreStarter has a button to allow the viewing and editing of previously entered results. This is useful if the scoring program either does not provide that facility, or if the scoring program does not write amended scores to the scoring database (and most do not).

If the tablet and browser support the functionality, TabScore will display a battery level indicator (in the top right of the screen).

Prerequisites

TabScore has been developed for a server PC running Windows 10 (which includes Internet Information Services (IIS) 10), .NET Framework 4.7.2 and ASP.NET 4.7. It should run on a Windows 7, 8 or 8.1 PC but it has not been fully tested on these platforms, and it may require a manual installation. It should also run under Windows 11, but again it has not been fully tested on that platform,

Bo Haglund's DDS requires the Microsoft Visual C++ Redistributable 2015 (or later) to be installed on the PC.

A local wireless (Wi-Fi) network, ideally using a dedicated router and network. However, the system should run over a pre-existing Wi-Fi network without any problem.

Tablets, phones or other devices with an internet browser that supports Javascript (ie any mainstream browser). For an Android full-screen locked-down browser, Fully Kiosk Browser (https://www.ozerov.de/fully-kiosk-browser/) has been used successfully at Bedford Bridge Club.

A scoring program that creates a Bridgemate-compatible scoring database (.bws file). Examples include EBUScore, JSSScore, ACBLscore, ScoreBridge, BridgeScorer, BridgeAce, CompScore3, and RuderSyv. For full TabScore functionality, EBUScore is recommended, and the most recent versions of EBUScore incorporate a 'TabScore' scoring option.

Words of Warning

TabScore is not an 'out-of-the-box' solution. To get the system up and running, you will need to install and configure IIS, configure your network, install the software, set up the tablets, and integrate TabScore with your existing scoring program. Doing all this requires some degree of IT competence.

TabScore comes with 2 Windows installer files (TabScoreIISSetup.msi and TabScoreSetup.msi) to make the installation and set-up process as automated and as straightforward as possible. But please make sure you read and understand the installation instructions thoroughly before proceeding.

Access to Database Files

Windows User Account Control (UAC) is a security feature that limits access to files on the PC. The TabScore web app uses a built-in IIS user account, so it has very limited access to files and folders. Most scoring programs create scoring database files in folders that are accessible to all users, so there should normally be no problem with reading from and writing to the scoring database file.

However, to be on the safe side, TabScoreStarter attempts to give IIS user accounts (the IIS_IUSRS group) full control of the scoring database file. This should ensure that TabScore can also access scoring database files located in user folders. However there may still be UAC issues if the scoring database file is in a more esoteric location, such as a system folder, application folder or a folder belonging to another user. In that case, you may need to give the IIS_IUSRS group access to the database file manually.

Charging Tablets

Another issue to consider with Traditional Mode using dedicated tablets is charging. The tablets in use at Bedford Bridge Club will generally last 2 sessions of bridge between charging, and it is worth investing in good quality tablets to obtain a long battery life. We have adopted a system using battery packs. We charge up the battery packs during the bridge session, and then use the battery packs to re-charge the tablets overnight. This avoids the need to leave the tablets charging unattended on mains power. The picture overleaf shows the charging boxes we use with tablets and battery packs.

Installation

IIS Installation

IIS provides the framework to run a web application on the server PC. It is a feature of Windows 10, but it is not installed by default. To install IIS and configure Windows Defender Firewall, either:

- **Automatic Installation**: Run the installer file TabScoreIISSetup.msi. If you have proprietary security software installed, please also see the section on Windows Defender Firewall.
- **Manual Installation**: Follow the steps below.

IMPORTANT: In either case, it will be necessary to restart the PC once this part of the installation is complete.

Manually Install IIS Features

To install the necessary IIS features on the server PC:

- Control Panel – Programs – Programs and Features - Turn Windows features on or off (requires Administrator privileges)
- Ensure that the following are selected:
  - .NET Framework 4.7 Advanced Services/ASP.NET 4.7
  - Internet Information Services
  - Internet Information Services/Web Management Tools/IIS Management Console
  - Internet Information Services/World Wide Web Services
  - Internet Information Services/World Wide Web Services/Application Development Features/ASP.NET 4.7

Manually Configure Windows Defender Firewall

You need to enable Port 80 on the server PC for incoming browser requests. If you have proprietary security software installed, then you may need to make the changes in that software. If using just Windows Defender Firewall, then:

- Control Panel – System and Security – Windows Defender Firewall
- Advanced settings (requires Administrator privileges)
- Inbound Rules – New Rule.
- Port, TCP, Specific Local Ports = 80

- Allow, Private
- Name the rule something meaningful (eg Tabscore Port 80) and Finish

Configure and Test Network

Configure Network

Various network configurations are possible, and this guide cannot consider all possibilities. The essential requirement is that the tablet browsers can consistently find the server PC across the router network. The simplest approach is to use a static IP address for the server PC, and the rest of this guide assumes this is the approach taken. An alternative would be to use a DNS server on your network, possibly in the router – if you choose this latter approach, we'll assume you know what you're doing!

A static IP address can often be set on the router:

- Log on to the router and set a DHCP device reservation (static IPv4 address) for the server PC. If there is no other network, an IP address something like 192.168.0.100 is probably suitable
- Setting a DHCP reservation may require the PC's physical MAC address. This can be found by opening a command prompt (cmd.exe) and typing 'ipconfig /all'

If your router does not support DHCP device registration (and many don't), you can go to the router network's settings via the PC's Control Panel, select Properties/Internet Protocol Version 4 (TCP/IPv4)/Properties and specify the IP address you require. When doing this, the default gateway is normally the IP address of the router, as is the preferred DNS server; setting 8.8.8.8 for the alternative DNS server usually works.

It is possible to have the server PC connected to the internet via one network and TabScore connected via another. This would require 2 networks cards (Wi-Fi or Ethernet). A configuration that has worked successfully at Bedford Bridge Club is internet on Wi-Fi (using subnet 192.168.0.xxx) and the TabScore router on Ethernet (using subnet 192.168.2.xxx and a static IP address of 192.168.2.100 for the PC).

Test Network Connection

Connect a tablet to the router network. This may require a password that is usually supplied with the router. Enter the IP address of the PC in address bar (or default URL) in the tablet browser (so it should look something like http://192.168.0.100). If IIS is working correctly, the tablet browser should display the default IIS webpage.

TabScore Installation

TabScore comprises 2 main components: a web application that runs under the default IIS website; and a Windows executable (TabScoreStarter.exe) that is called by the main scoring program. Again it is possible to do either:

- **Automatic Installation**: Run the installer file TabScoreSetup.msi. This copies the necessary files and configures IIS to run the web application.
- **Manual Installation**: Follow the steps below.

Manually Copy Files

Copy files and folders to the following locations, creating folders if necessary:

- TabScore folder to C:\Program Files (x86). This includes the WebApp subfolder.
- TabScoreDB.txt to C:\Users\Public\TabScore

Manually Configure IIS

Open the Internet Information Services (IIS) Manager:

- Application Pools – Add Application Pool...
  - Name = TabScoreAppPool
  - Start application pool immediately
- TabScoreAppPool – Advanced Settings...
  - Enable 32-Bit Applications = True
- Sites – Default Web Site – Add Application...
  - Alias: = TabScore
  - Application pool: = TabScoreAppPool
  - Physical path: C:\Program Files (x86)\TabScore\WebApp
  - Start Website immediately

Installation of Microsoft Visual C++ Redistributable

Bo Haglund's DDS needs the Microsoft Visual C++ Redistributable (x86) 2015 (or later) to be installed on the PC. To check if this is already installed, go to Control Panel/Programs/Programs and Features, and see if it is listed as an installed program.

If necessary, search the Microsoft website for a suitable installer (it will have a name like vc_redist.x86.exe). Download this file, run it and follow the instructions.

Complete the Set-up

TabScore Display Language

TabScore (including TabScoreStarter) is currently available in English, Spanish and German. If the Windows language is Spanish or German, TabScore should automatically be displayed in that language. In any other case, English is the default display language.

If the TabScore webapp does not display in the correct language, or you wish to change it manually, then use a text editor to open the file:

C:\Program Files(x86)\TabScore\WebApp\Web.config

There are instructions in this file showing how to change the language setting. If you upgrade TabScore to a newer version, you will need to repeat this step.

Test the TabScore Web Application

Enter the IP address of the PC in address bar (or default URL) in the tablet browser, followed by /TabScore (so the URL should look something like http://192.168.0.100/TabScore). If IIS is working correctly, the tablet browser should display the TabScore start screen.

Modify the Scoring Program

The scoring program needs to start TabScoreStarter.exe as its wireless scoring software. How this is done varies considerably by scoring program.

In EBUScore (provided you have a recent version), go to the Event menu for any event and then the Table Top Unit Scoring screen. This might be called something else if the program is currently configured for some other wireless scoring software. From here you can set the Table Top Unit to TabScore using the drop-down list. Then using the Admin tab and the Set TabScore Program Location button, set it to:

C:\Program Files(x86)\TabScore\TabScoreStarter.exe

For other scoring programs, please see your scoring program documentation.

Setting Up Tablets

As mentioned previously, the tablets do not need any form of special configuration to run TabScore – just a web browser. Each tablet's browser will need to point to the TabScore URL. This URL is the IP address of the server PC followed by /TabScore (so the URL should look something like http://192.168.0.100/TabScore).

If using Traditional Mode with dedicated tablets, it may help to configure and lock down the tablets to some extent, so that the user is presented with a simple start-up screen. For example, it makes sense to set the TabScore URL as the home page in the tablet's browser, or at least set a favourite that points to the TabScore URL. The tablets in use at Bedford Bridge Club have been set up with

the Fully kiosk browser to run in full screen mode. The configuration of this and other tablet software used at Bedford Bridge Club is given in Appendix 3.

Thanks to innovative work by Tony Ferneyhough, TabScore has also been set up to run on Kindle Fire tablets. Information on configuring Kindles is given in Appendix 4. The information in both Appendices is indicative only, and the best way to set up the tablets will depend very much on the make and model of tablet, and it's operating system.

If using Personal Mode, then every player who is going to do scoring will need to set up the browser in their personal tablet or phone to point to the TabScore URL. Again, the simplest approach would be for them to set a favourite that points to the TabScore URL. But if you can persuade your players to download, install and configure the Fully kiosk browser, it would give them a dedicated app to run TabScore.

Upgrading TabScore

When upgrading TabScore to a new version, it is better not to do an automatic installation using the TabScoreSetup.msi installer file. This is because the Windows Installer will not do a simple upgrade to already installed software. So, once you have downloaded the new installation zip file, all that is needed is to copy the entire TabScore folder (which includes a WebApp subfolder) to C:\Program Files (x86), overwriting all the existing files and folders.

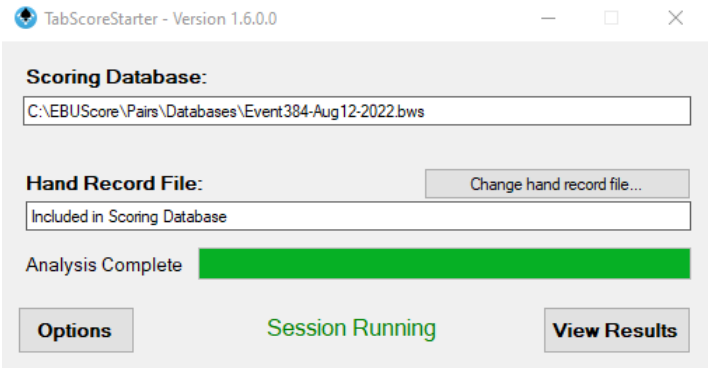
If you have changed the language setting manually by amending the Web.config file (see TabScore Display Language above), you will need to do that again after the upgrade.

Using TabScore

Overview

Compared to installing TabScore, using it is pretty straightforward. The tablets will sit at the Start Screen until the event organizer has set the movement, created the scoring database, and launched TabScoreStarter using the scoring program. See your scoring program documentation for how to do all this.

Once TabScoreStarter is running, players will then be able to register their tablets, enter their player ID numbers, and then proceed to enter contract details and results for each round of the movement and each board. A diagram showing the flow through the various TabScore screens is at Appendix 2.

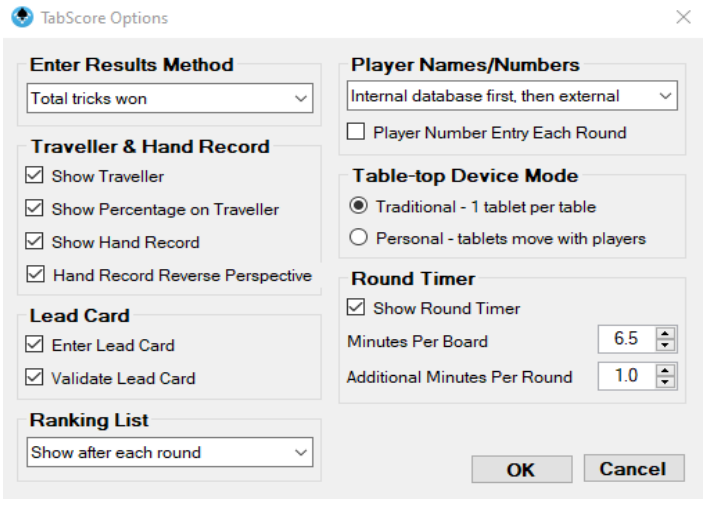


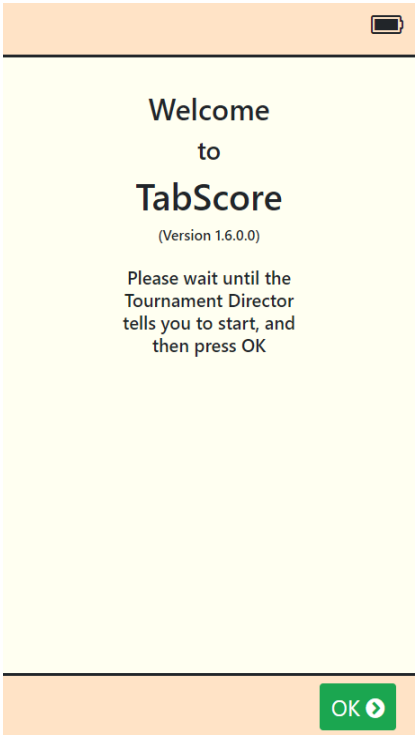
In general, a TabScore Enter or Edit button allows users to enter or change details, a View button allows viewing but not editing, and the OK button moves on to the next screen when all details have been entered. In many cases, there is also a Back button that goes back to the previous screen.

Event and Scoring Options

The event organizer would normally set the hand record file and options for the event by using the scoring program. However, a hand record file (in PBN format) can also be added or changed from the TabScoreStarter screen. Once the hand record file is available, TabScoreStarter does a background calculation of makeable contracts.

TabScore will use any options set by the scoring program, but there is also an Options button in TabScoreStarter that can be used to override applicable options. There are 2 options which can only be set via the Options button: Traditional or Personal Mode, and the Round Timer. The values set for both of these options will persist from session to session, so if needed they only need to be set once.





Registering Tablets

From the Start Screen on the tablets, players will be able to register their tablets by entering their section and table numbers (TabScore defaults to Section A if there is only one section). If in Personal Mode with moving tablets, players will also be prompted to enter their direction. TabScore uses the movement information in the database to allocate pair numbers (or individual numbers for individual events).

Player ID Numbers and Names

Player ID numbers and/or names can be set within the scoring program before creating the scoring database. However, it is normally easier to let the players enter their own player ID numbers into TabScore at their tables.

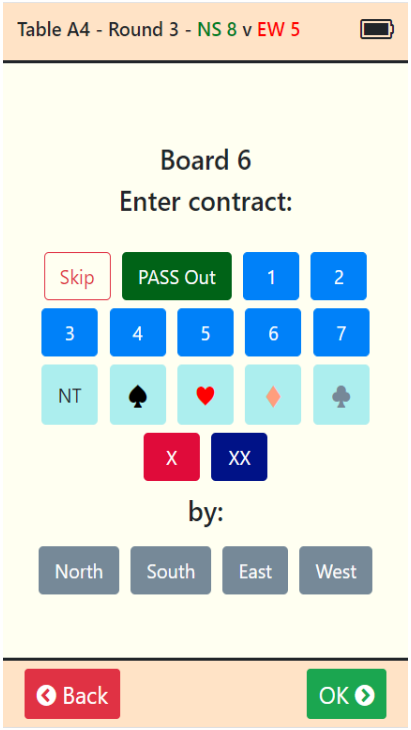
How TabScore resolves player ID numbers to names is determined by an option that is set by the scoring program. Names can come from either an internal database of player names/numbers set up within the scoring program, or from an external database (as, for example, provided by your national bridge organization), or both. It is usual for numbers in the internal database to be in the range 1-9999 and for 10000+ for the external database.

If a player doesn't have or doesn't know their ID number, TabScore provides the option to enter Unknown. Internally, this sets a value of 0, so 0 should not be used as an actual player number. Names can be updated or corrected within the scoring program at any time (see Correcting Player Names below).

In Traditional Mode, all player ID numbers at the table are entered by the scorer (usually North). In Personal Mode, each player with a tablet is responsible for entering their own (and for pairs, their partner's) player IDs. TabScore won't allow any player at the table to move past the Enter/Edit Players screen until all players at the table have been entered.

If using a movement where not all players are seated at tables for the first round (such as a rover, or an incomplete individual), TabScore will capture the player numbers for any additional players at the first opportunity (usually the second round) and add them to the database. However, some scoring programs (such as EBUScore) may also need to have these additional players added manually.

For certain events (such as pivot teams and teams events where team members can be swapped in and out), you may need to change player names during the course of the event. TabScore can do this via an option set within the scoring program or by using the TabScoreStarter Options button to set player ID number entry for each round. Whilst TabScore will update the database with the new names, it is worth checking that your scoring program correctly retrieves these names.



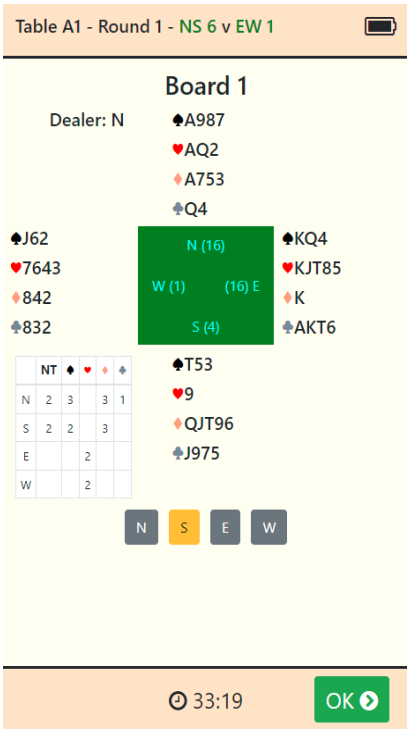
Entering Contracts and Results

TabScore shows a screen with all the boards to be played in the current round. Contract details, optionally lead cards, and results can be entered for these boards in any order by tapping on the appropriate Enter button. Previously entered contract details and results can be viewed or amended up until the end of the round by tapping on a View or an Edit button. This allows players at the table to confirm all the results for the round.

To skip a board (ie not play the board in the current round), tap the Skip button from the Enter Contract screen and OK. This might be necessary if the Tournament Director decides to remove a board or plans to make a subsequent manual or artificial adjustment. You have to enter a result (or skip) for each board before you can proceed to the next round.

In Personal Mode, only one tablet per table (North) is actually used for entering scores. The tablets for other directions will only allow players to view results once they have been entered.

If the option to show the traveller has been selected, TabScore will show the traveller (all the results entered so far for this board). TabScore can only show results from the database, so results that have been entered or manually adjusted within the scoring program and not written to the database may not show correctly on the traveller. If you wish players to see manually adjusted results in the traveller (including artificial adjusted percentages), you can use the View Results button in TabScoreStarter to make the score adjustments (see the section on Making Manual Score Adjustments below).



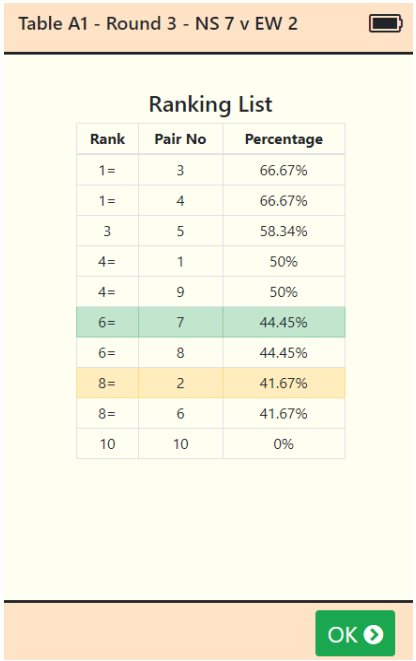
Viewing Hand Records

If you have imported a hand record file and have selected the option from within the scoring program to view hand records, TabScore will allow you to view the hand records and makeable contracts (TabScore uses Bo Haglund's double dummy solver to do the analysis). On the Traveller Screen, you will see a cards symbol – tap this to open the Hand Record screen.

The hand record will normally be shown from the perspective of the presumed scorer (North in Traditional Mode; North and East in Personal Mode for Pairs/Teams). There is an option to reverse this behaviour, and there are buttons on the screen to change the perspective at any time. For an individual event in Personal Mode, the hand record will always be shown from the player's own perspective.

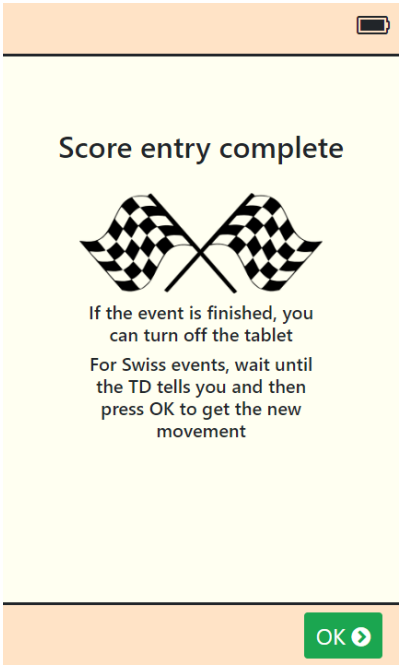
Viewing the Ranking List

TabScore provides the option to view a ranking list, either at the end of each round or at the end of the event. Obviously this is only useful for pairs and individual events, and it is recommended that this option not be used for teams or Swiss events. For pairs, some scoring programs (such as EBUScore) populate a database table with the ranking list data; TabScore uses this and so will show exactly the same ranking list that the scoring program does. The ranking list will automatically refresh every 10 seconds.



If ranking list data is not available, TabScore will make an attempt to calculate rankings based on a matchpoint calculation using the Neuberg formula. This ranking list may therefore differ from the one shown by your scoring programme if simple match-pointing or some alternative scoring method is being used. Also, TabScore can only take account of any manually adjusted or artificial scores in its ranking calculations if these have been written to the database, either by the scoring program or by using the TabScoreStarter View Results button. Nonetheless, the calculated ranking list can be a useful indicative guide to players during the event.

Movement and Finishing the Event



Between rounds TabScore will display the movement information, and a screen to confirm the players and boards for the next round. In Personal Mode, it is not possible to proceed beyond the Show Move screen until all pairs/players at the next table (or the current table if stationary) are ready to move.

Once the event is over, or the round is over for Swiss events, TabScore will display a score entry complete screen. This encourages the players to switch off the tablet, but the tablet can safely be switched off before reaching the End screen as all the data is stored on the server PC.

As the screen explains, for Swiss events, once the draw for the next round has been made and the movement information is available, tapping the End screen OK button will bring up the movement for the next round.

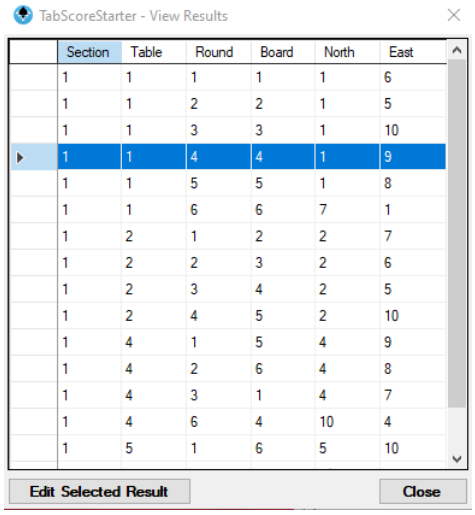
Making Corrections and Troubleshooting

Things can go wrong during the scoring process, either as a result of user error or a problem with the server PC or network connection. The thing to remember is that all the data is stored on the PC, and TabScore merely shows a view of that data. So, as long as the PC is still working, no data will be lost. Thus, for example, it is always possible to resume scoring a previously aborted session simply by loading an existing database into the scoring program and launching TabScore. Likewise, it is easy to replace a tablet (if the battery runs out, for example), just by registering at the same table (and direction in Personal Mode) with a new tablet.

Making Manual Score Adjustments

Once a result has been entered in TabScore (including a skip), it may be necessary to make a score adjustment, either to correct a scoring error or to implement a Tournament Director ruling. There are a couple of options for making manual adjustments to the score.

One option would be to use your scoring program to make the score adjustment, and most scoring programs have the facility to do this. However, be aware that some scoring programs (including EBUScore) do not update the scoring database with these adjustments by default (please see the documentation for your own particular scoring program). Thus any score adjustments would not show in TabScore, either in the Show Boards screen, the Traveller screen or in any calculation of the ranking list. Of course this may not matter as the scoring program will still be correct.



An alternative is to use TabScoreStarter to make changes directly to the scoring database. Clicking on the View Results button brings up a list of previously entered results. This list can be sorted by clicking on the appropriate column header. Selecting a result and clicking on the Edit Selected Result button allows a range of score adjustments to be made. Whilst these do not cover the full range of possible adjustments allowed under the Laws of Bridge, they cover the more usual adjustments including artificial adjusted scores of Average- (40%), Average (50%) and Average+ (60%), and also results accidentally played in the wrong direction (arrow switched). Artificial adjusted scores and wrong direction are set using the Remarks drop-down list. Adjustments made in this way will show in TabScore, and should also be read by the scoring program.

Correcting Player Names

If the user makes an error when entering a player ID, there is usually a chance to correct the entry before the data is committed (using the Edit button). However, once the user has moved past the Show Player IDs screen, any corrections will need to be done via the scoring program. However,

be aware that some scoring programs do not automatically update the scoring database by default, and so these name corrections may not be available to TabScore. In particular, in EBUScore, you will need to use the Write Names button on the TabScore Scoring screen to update any name changes to the database. Please see the documentation for your own particular scoring program.

Corrections and Errors Requiring Tablet Re-registration

There are a few user input errors that cannot be corrected using the software, for example entering the wrong section or registering to the wrong table (or section or direction). These issues can generally be resolved by returning the tablet or tablets to the TabScore Start Screen, and then re-registering correctly.

The procedure for getting to the Start Screen will depend on the browser. There may, for example, be a Home button or a favourite. For the full-screen version of the Fully Kiosk browser, the procedure is usually to swipe right to get to the menu, and then tap on Goto Start URL.

From the Start Screen, tapping OK allows you to re-select the table (and section and direction if appropriate). If you have already registered for a different location, you will get a warning; however, if you are re-registering at the correct location, it is safe to proceed. When you have re-registered, TabScore will take you to the beginning of the last round for which scores have been entered. This allows you to check, if necessary, that the scores have all been entered correctly before proceeding to the next round.

Network or Database Connection Problems

TabScore attempts to detect if there is any problem with the network or database connection for any one tablet. If this happens, TabScore will show an error screen, and it will prompt the user to re-register the tablet. Usually such problems are rare and temporary, so re-registering will resolve the issue. In Personal Mode, you should re-register at your current location (section, table and direction) and not your original starting location.

If the server PC is still running, when you have re-registered, TabScore will be able to resume at the correct place. If not, once the server PC has been restarted, TabScore will take you to the beginning of the last round for which scores have been entered. This allows you to check, if necessary, that the scores have all been entered correctly before proceeding to the next round.

Server or Wifi Connection Stops Working

The server PC or Wifi router may stop working for some reason. A common example is when a laptop left running on battery power decides to shut itself down. If this happens, the tablets may freeze. Once you have resolved the problem with the server/router and re-started, the tablets may just continue working. If not, it may be necessary for all the tablets to be re-registered using the procedure above on each tablet.

Advanced Debugging

Any http errors, including unhandled application exceptions that give rise to http 500-series errors, are handled by the Tabscore Error Screen controller. This allows a graceful recovery from any transitory network issues, but may mask an underlying problem within the TabScore application or its associated files. Those developing and testing scoring programs or others encountering repeated and persistent errors may need to get additional information about the nature of any unhandled application exceptions.

Errors and unhandled exceptions are logged in XML log files that are written to the C:\Users\Public\TabScore folder. Examining these with an XML editor may help to diagnose the problem.

Alternatively, it is possible to bypass the error screen controller, resulting in a verbose but possibly helpful Yellow Screen of Death (YSOD) on the tablets. To do so, manually edit the Web.config file in the TabScore/WebApp folder. The instructions in that file show you how to change the line:

```
<customErrors mode="On" defaultRedirect="~/ErrorScreen/Index" />
```

to:

```
<customErrors mode="Off" />
```

Appendix 1 – Options in TabScore

The following table compares the options in TabScore to the full list of BridgeMate and BridgeMate II options. It shows the TabScore-specific options first, and then shows whether any particular BridgeMate option is applicable to TabScore.

All applicable options can be set using the Options button in TabScoreStarter. The TabScore-specific options settings will persist from session to session. However, the Bridgemate options that are available to TabScore are re-set by the scoring program when it creates the BCS database, and so will take whatever value the scoring program uses.

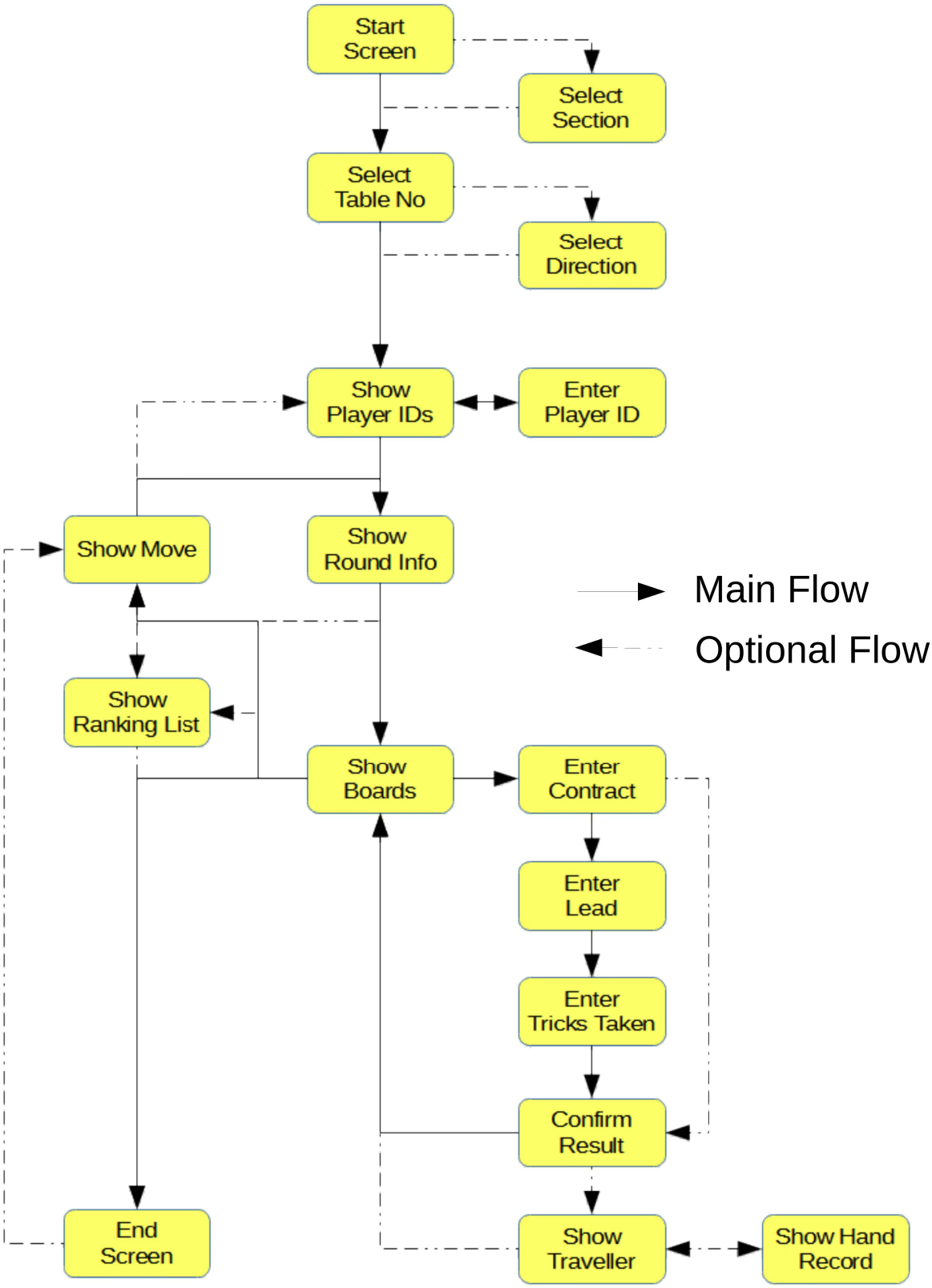
If any option is changed whilst TabScore is running, it may take a minute or so, or the start of a new round, for the change to take effect.

Database Field Name	**Status in TabScore**	**Effect in TabScore**
TabletsMove	Used	Not BridgeMate standard. Sets the TabScore Tablet Mode. False = Traditional Mode and True = Personal Mode.
HandRecordReversePerspective	Used	Not BridgeMate standard. Where applicable, shows the hand record from the perspective of the player opposite the presumed scorer (so from South's perspective in Traditional Mode)
ShowTimer	Used	Not BridgeMate standard. Determines if the round countdown timer is shown on applicable screens.
SecondsPerBoard	Used	Not BridgeMate standard. Used to set the number of seconds per board used by the countdown timer. TotalTimePerRound (in seconds) = SecondsPerBoard x BoardsPerRound + AdditionalSecondsPerRound. The countdown timer options are set in minutes and converted to an integer number of seconds in the database.
AdditionalSecondsPerRound	Used	Not BridgeMate standard. Used to set the number of seconds for the round used by the countdown timer. See above.
ShowResults	Used	Shows the traveller if True.
ShowOwnResult	Not used	
RepeatResults	Not used	
MaximumResults	Not applicable	
ShowPercentage	Used	Shows the percentage if True.
GroupSections	Not used	
ScorePoints	Not used	
EnterResultsMethod	Used	Determines if results are entered as total tricks won (=1), or as +/-/= against the contract (≠1; the TabScoreStarter Options button sets 0).
ShowPairNumbers	Not used	
IntermediateResults	Not used	
AutopoweroffTime	Not applicable	
VerificationTime	Not used	

ShowContract	Not used	
LeadCard	Used	Requests entry of a lead card if True.
MemberNumbers	Not used	
MemberNumbersNoBlankEntry	Not applicable	
BoardOrderVerification	Not applicable	
HandRecordValidation	Not applicable	
AutoShutDownBPC	Not applicable	
BM2PINcode	Not applicable	
BM2ConfirmNP	Not used	
BM2TDCall	Not applicable	
BM2RemainingBoards	Not used	
BM2NextSeatings	Not used	
BM2ScoreRecap	Not applicable	
BM2AutoShowScoreRecap	Not applicable	
BM2ScoreCorrection	Not applicable	
BM2AutoBoardNumber	Not applicable	
BM2FirstBoardManually	Not applicable	
BM2AutoBoardNumber	Not applicable	
BM2ValidateLeadCard	Used	Will validate lead card against the hand record if True and the hand record exists. Validation only occurs on the first attempt at lead card entry. On the second attempt, there is an option to skip lead card entry.
BM2ResultsOverview	Not applicable	
BM2ShowPlayerNames	Not used	
BM2Ranking	Used	Will show ranking according to: 0=don't show; 1=show after each round; 2=show at end of session. If the scoring program creates and populates a Results table in the database, that will be used. If not, TabScore will attempt to determine the number of Winners (1 or 2) from the movement and will then will attempt to calculate the ranking using data from the ReceivedData table. This may not match precisely the ranking shown by the scoring program (as TabScore uses Neuberg rather than simple matchpoints).
BM2GameSummary	Not used	
BM2SummaryPoints	Not used	
BM2ResetFunctionKey	Not applicable	
BM2RecordBidding	Not used	
BM2RecordPlay	Not used	
BM2ValidateRecording	Not used	
BM2ShowHands	Not applicable	
BM2NumberValidation	Not used	
BM2NumberEntryEachRound	Used	Will allow player number entry each round if True (eg for pivot teams, or team member changes). Should not normally be used for pairs.
BM2NumberEntryPreloadValues	Not applicable	

BM2NameSource	Used	Will change the source for player names data according to: 0=table “PlayerNames” in .bws file; 1=“C:\Bridgemate\BMPlayerDB.mdb” database lookup file; 2=no name source, names are preset/updated by the scoring program; and 3=first look in .bws file, then look in BMPlayerDB.mdb database.
BM2TextBasedNumber	Not used	
BM2ViewHandRecord	Used	Will show hand record and double-dummy analysis if True, provided that ShowResults is True and the hand record exists.
BM2EnterHandRecord	Not applicable	
BM2EnterHandRecordWhen	Not applicable	

Appendix 2 – TabScore Workflow Diagram

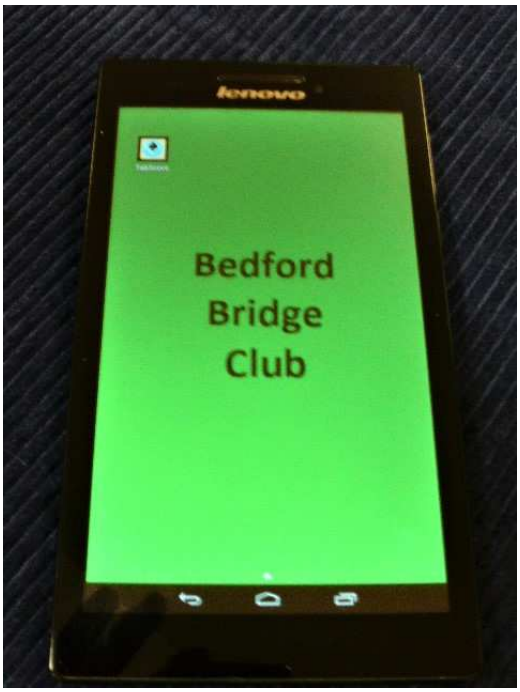


Appendix 3 – Setting Up Tablets

Bedford Bridge Club uses dedicated tablets with the following software: Fully-Kiosk-Browser-v1.28.1; Nova Launcher_v5.5.4 and Icon Changer_v2.0.

This has been configured as follows:

- Set Nova Laucher as the default start app.
- Set the following settings in Nova Launcher:
  - Desktop/Desktop grid 4x4
  - Desktop/Icon size/Font size = about 75%
  - Desktop/Wallpaper scrolling off
  - App & widget drawers/Frequently used apps off
  - Dock/Enable off
  - Look & feel/Normalize icon size off
  - Look & feel/Screen orientation Force Portrait
  - Look & feel/Show notification bar off
- Using Icon Changer, set the Fully icon to TabScore.png (included in zip file) and set label to TabScore.
- Delete all icons from desktop except TabScore'
- Set wallpaper to something suitable. Bedford Bridge Club has created it's own wallpaper as you can see in this image.
- Set Fully start URL to static IP address of laptop + /TabScore
- Set Fully/Web Zoom and Scaling/Set Font Size = 150% (or whatever best suits your device).



It is possible to use the Fully setting Device Management/Launch on Boot to start Fully automatically when the tablet is switched on. And you can also use Nova Launcher to lock the desktop to prevent users moving things around.

Appendix 4 – Setting Up Kindles

The information below has been provided by Tony Ferneyhough, and relates to Kindle Fire gen 5 upwards and Fully kiosk browser.

From Main Menu

- **Web Content Setting**

  Start URL (PC IP address - eg 192.168.20.50)

- **Web Browser Settings**

  Enable Tap Sound (optional)
  Animate Page Transitions (optional)
  Wait for Network Connection (optional – maybe)

- **Web Zooming and Scaling**

  View in Desktop Mode
  Set Font Size (135 in my case) (Font size can also be set on tablet)

- **Advanced Web Settings**

  Enable Touch Interaction
  Keep Screen on whilst in Full screen mode

- **Universal Launcher**

  All set to off

- **Web Auto Reload**

  Reload Current Page (not too sure how important this is)

- **Toolbar and Appearance**

  Show Action Bar
  Action Bar Title - preferred name - TabScore - about 40 spaces before name to help centre title up.
  ShowAction Bar in Settings
  Show Progress Bar

- **Screensaver (Plus)**

  Screensaver Timer (set to 10 seconds) (when running screen goes black only ’skeleton’ clock showing - this should help to save power). Tap screen to go back to TabScore.***

Play in Full Screen
Screensaver brightness (set to 60)
Fading Duration (set 50 mS)
Use Android Daydream - try turning this feature off if there are problems with Screensaver.***

- **Device Management**

  Keep Screen on
  Screen Brightness= 60
  Screen Orientation is Portrait
  Launch at Boot
  Bluetooth – disable

- **Power Settings**

  Set battery to 30%

- **Kiosk Mode - only use this when everything else is working okay !!!!**

  Kiosk exit (fast 5 taps)
  Disable Status Bar
  Disable Volume Buttons
  Disable Power Button (optional)
  Disable Home Button
  Disable Other Apps
  Advanced Kiosk Protection
  Diable camera

- **Motion Detection (Plus)**

  All set to off

- **Device Movement Detection (Plus)**

  All set to off

- **Remote Administration (Plus)**

  All set to off

- **Other Settings**

  All set to off