SILVER MOUNTAIN TARGETS

RANGE OFFICER'S GUIDE

S25 SERVER SYSTEM

PURPOSE OF THIS MANUAL

The purpose of this manual is to provide the Range Officer or Match Director the tools and training necessary to effectively manage shooters and scorekeepers, manage strings of fire, and generally run a competitive match or event. It does not cover hardware features, hardware setup, or installation.

DEFINITION OF RANGE OFFICER & DUTIES

The Civilian Marksmanship Program (CMP) defines the range office as such.
> The Chief Range Officer is appointed by the Match Director and is responsible for the actual conduct of range firing during the competition in accordance with applicable rules, range safety procedures…
> Range Officers may make decisions regarding the application of rules during the competition…
> Range Officers must be familiar with the rules and have received training regarding safe range firing procedures and their duties and functions0

The National Rifle Association (NRA) defines the range office as such.
> Chief Range Officer—Will have full charge of the range and will conduct the matches on the schedule approved by the Match Director and is responsible for range safety, and for enforcing all rules
> Range Officers—Each Range Officer is an assistant to the Chief Range Officer. He is responsible for the safety and discipline of range personnel, competitors and spectators in the sector of the range to which he has been assigned. He is responsible for seeing that competitors' equipment and positions are as authorized for the particular match being fired. It is his duty to be completely familiar with the program and with the National Rifle Association Rules.

In most smaller ranges, the "Range Officer" or "Match Director" is generally the person in charge of the match, calling commands, deciding challenges and incidents, and generally managing the progress of the match.

SOFTWARE BASIC OVERVIEW

2.1   Range Officer Features and Functions

Range Officer functions include all software features surrounding routine match operations, managing strings of fire, managing shooters, and other semi-protected features not accessible to the shooter & scorekeeper.

2.2   Menu Structure

There is only one main level to the menus when logged in as Range Officer. Range Officer functions are accessed from the main menu.

Main Menu

This menu is accessible to all users. This is the main screen for witnessing and recording shots fired on the target

Users

This icon looks like a man with a tie and is used to log into the system as an advanced user such as Admin or Range Officer, or as a competitor or scorekeeper when individual users are desired.

Notepad

This icon allows the user to enter Plot Mode, displaying horizontal and vertical shot dispersions

Folder

The Folder Icon provides access to saved strings of fire

Printer

Allows printing of displayed targets

Main Menu/Users

When the Users Icon is selected, the user is prompted to enter his/her competitor number or username. The Administrator (Admin) of this system has the capability to set up a generic Range Officer, or to assign the RO privilege to any user. Once a user has had the RO functions assigned to his profile, he may log in with his username.

RO LOG-IN

3.1   Logging in as a Range Officer User

The default system firmware defines a userid "ro" which has Range Officer privileges, with no initially assigned password.
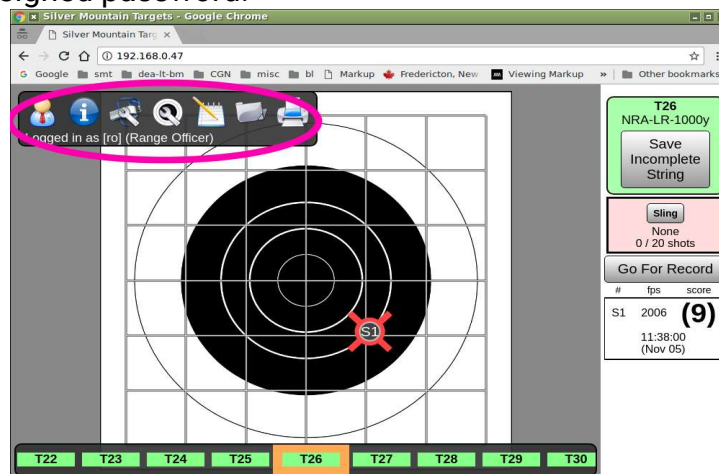
You may create additional Range Officer ids, using whatever scheme best suits your operations. Some examples that we have seen:
- One rifle club uses 3-digit Competitor Numbers for their shooters in competition. Some of these competitors also take on Range Officer duties from time to time. This club has created a special Range Officer userid (of 1000 plus the ordinary competitor id) to be used by these people when they are working as Range Officers
  - For example, if Fred Smith's regular competitor ID is "572", he will log in as userid "1572" when he needs to perform Range Officer functions
- Another club assigns a block of generic numbers for Range officers, which any club member may use when they need to perform RO duties
  - Userid "7701" is "Range Officer #1", userid "7702" is "Range Officer #2", etc.

STARTING A SHOOTING DAY

4.1   Setting Up Hardware

Set up all target line hardware and power up.

On the firing line, the best location for the S25 Server is in the middle of the group of shooters on the firing line
- the panel antenna should be pointed downrange
- The S25 on its tripod should be located as forward as practical on the firing line

Power up the S25 Server:
- Press and hold the "Power" button on the underside for five seconds, then release
- Both green status LEDs will light
- S25 Server will be ready in about 30s
- Verify the presence of WIFI networks "**SilverMountainTargets**" etc.

In installations where both an **S25 Server** and an **R10 Repeater** are to be used, the recommended placements are:
- The S25 Server should be placed amongst the right side of the group of shooters, or if preferred it may be placed on the right flank
  - S25 Server panel antenna should point **downrange** to targets
- The R10 Repeater should be placed amongst the left side of the group of shooters, or on the left flank
R10 Repeater panel antenna should point **crossrange**, to the S25 Server.

ENDING A SHOOTING DAY

5.1   Tearing Down Hardware

Power down the S25 Server (and R10 Repeater) as follows:
- Press and hold the power button for 7 seconds, then release
- You will observe the right-hand LED turn out 5-10s later
- You will observer the left-hand LED turn out ~5s after that

The S25 Server (and R10 Repeater) may now be removed from the range. AC power should be applied to charge:
- Four hours is needed to fully charge a completely empty S25/R10
- An S25/R10 may be safely left on AC power indefinitely, without risk of overcharge or battery damage
- An S25/R10 may be operated with AC power applied

AC power may be safely applied or removed at any time an S25/R10 is running

WIFI SYSTEM

6.1   WIFI – S25 Server

The S25 Server forms the core of the on-range wireless network system. It provides an open WIFI network (no password, SSID **SilverMountainTargets**) to which viewing devices can connect. The S25 Server communicates with the downrange shot sensing devices via the WIFI network, either directly (for example a G2 with a panel antenna) or indirectly (PnP devices connect to the pits relay radio system which in turn has an above-grade "uplink" radio which connects to the S25).

The S25 Server has a fixed IP address of **192.168.0.47** and runs a **server process** on port 80 using the http protocol, which produces the standard SMT T**argetViewer** web page interface:
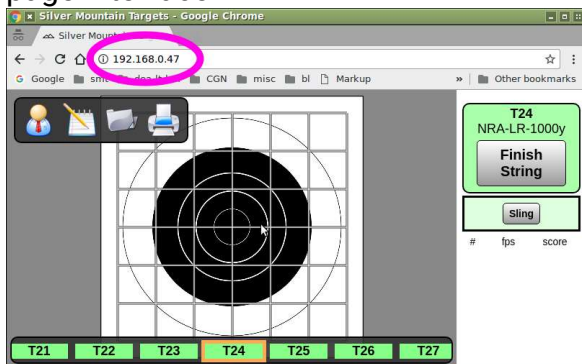
This webpage has a live javascript program running in the background that is in constant communication with the S25 Server.

The S25 Server process employs "heartbeat" status messages to constantly verify the correct functioning of the shot measurement devices, the WIFI network, and the connectivity of the client devices (T**argetViewers**)

SYSTEM HEARTBEATS

7.1 Sensing Units

If a communication with a sensing unit fails (detected as a heartbeat failing to arrive within the expected time), the TargetFrame associated with it will change its status to "red". Here, target #27 has gone "red":
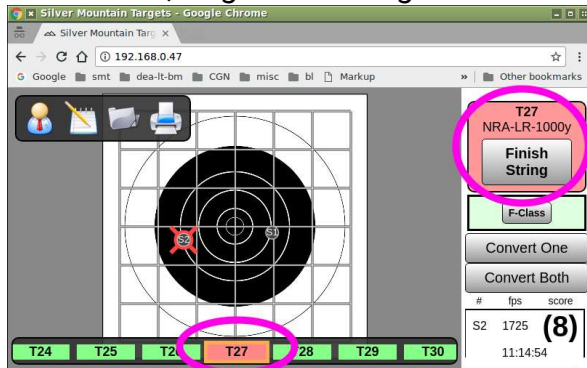
As long as a TargetFrame's status is "red", this indicates that no communications are happening between the S25 Server and the sensing unit. During this time, any shot(s) recorded by the sensing unit will NOT be shown to the shooter, however the sensing unit WILL be measuring and recording the shots measurements as the shots arrive. Once communication is restored the S25 will collect and process all shots fired during the loss of communication

It is extremely rare for a TargetFrame to go "red" in a properly functioning system; any such cases should be investigated and understood.

If communication to all the sensing devices in the pits is lost, then all targets will go to a "red" status.
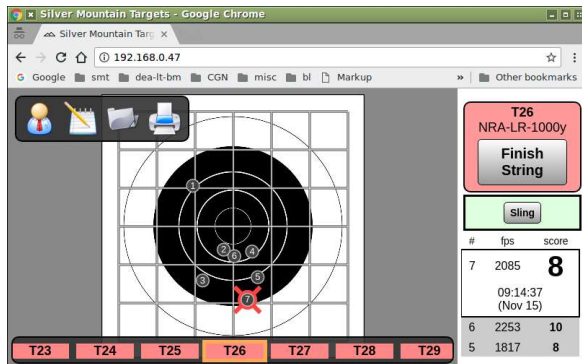
7.2   TargetViewer Devices

The S25 Server also sends "heartbeat" messages to all TargetViewer devices, every 1.5 seconds.

7.2.1   Spinning Wheel

If a TargetViewer has not received a heartbeat in time (usually set to 0.5 seconds), a "spinning wheel" symbol will display, to indicate that WIFI communication between the S25 Server and the TargetViewer device has momentarily been lost:
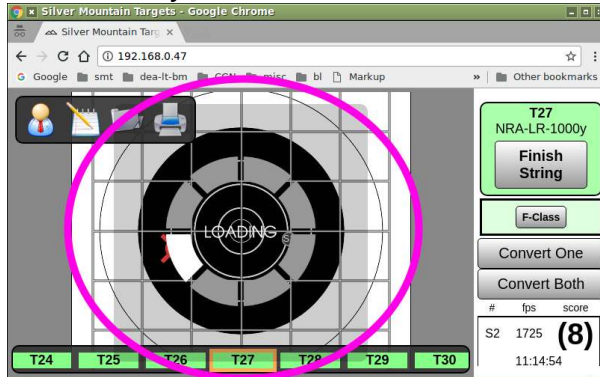
As soon as heartbeats start arriving again, the display will return to normal. This will almost always happen without user intervention.

Occasional very short appearance of a "spinning wheel" on any one client device is not a cause for alarm, and is often a sign of a heavily-loaded client device or poor client WIFI signal connection.

A "spinning wheel" appearing on all client devices on the range at the same time indicates a system-wide problem with timely WIFI communication between the S25 Server and all client devices.

Whenever a "spinning wheel" or a "red-X" is displayed, that client device is temporarily out of communication with the S25 Server and will not report any shots received. However, any shots fired *WILL* be detected and recorded, and will be displayed on the TargetViewer once communication has been reestablished.

7.2.2   Red "X"

If heartbeats have been lost for a long time (usually set to 10 seconds), the spinning-wheel will be replaced with a "red-X":
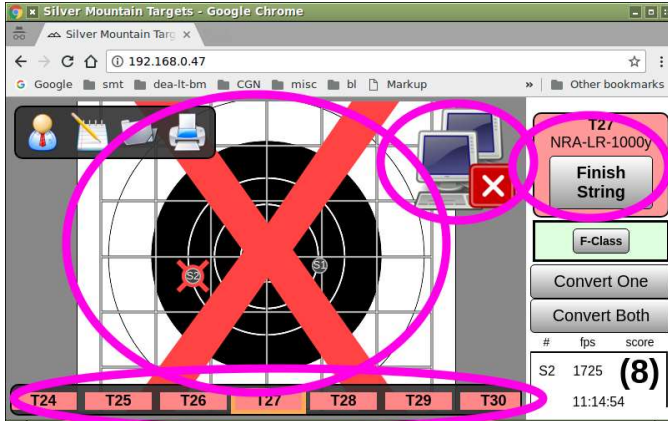
The TargetViewer will attempt to recover automatically however in some cases user intervention might be required (verify that TargetViewer WIFI is properly connected, reload page, etc.)

If this occurs on a particular device, it suggests something is wrong with the configuration or usage of that device.

If a "red-X" occurs on many devices simultaneously, it is symptomatic of a system-wide lapse of WIFI connectivity between the S25 server and the client devices

SIMPLE MODE – NO ASSIGNED USERS

8.1   Running a Match or Event

If you do not need to formally track the shooters or scorekeepers involvement with each string, you may choose to operate your match, practice or training session in "Simple Mode":
- a per-target scorekeeper may be used, or may omitted
- The shooter or scorekeeper or RO user may "manage" their string
  - Convert or "unconvert" sighters
  - Strike-out a shot
  - Save a string

Before calling a relay of shooters to the line you may wish to:
- Confirm the correct selections of TargetFace, course of fire etc.
- Confirm all targets clear with no shots (for example crossfires or extra shots received after a shooter finished)

Before commencing fire, **on each target** you or the Block Officers or the scorekeepers may wish to:
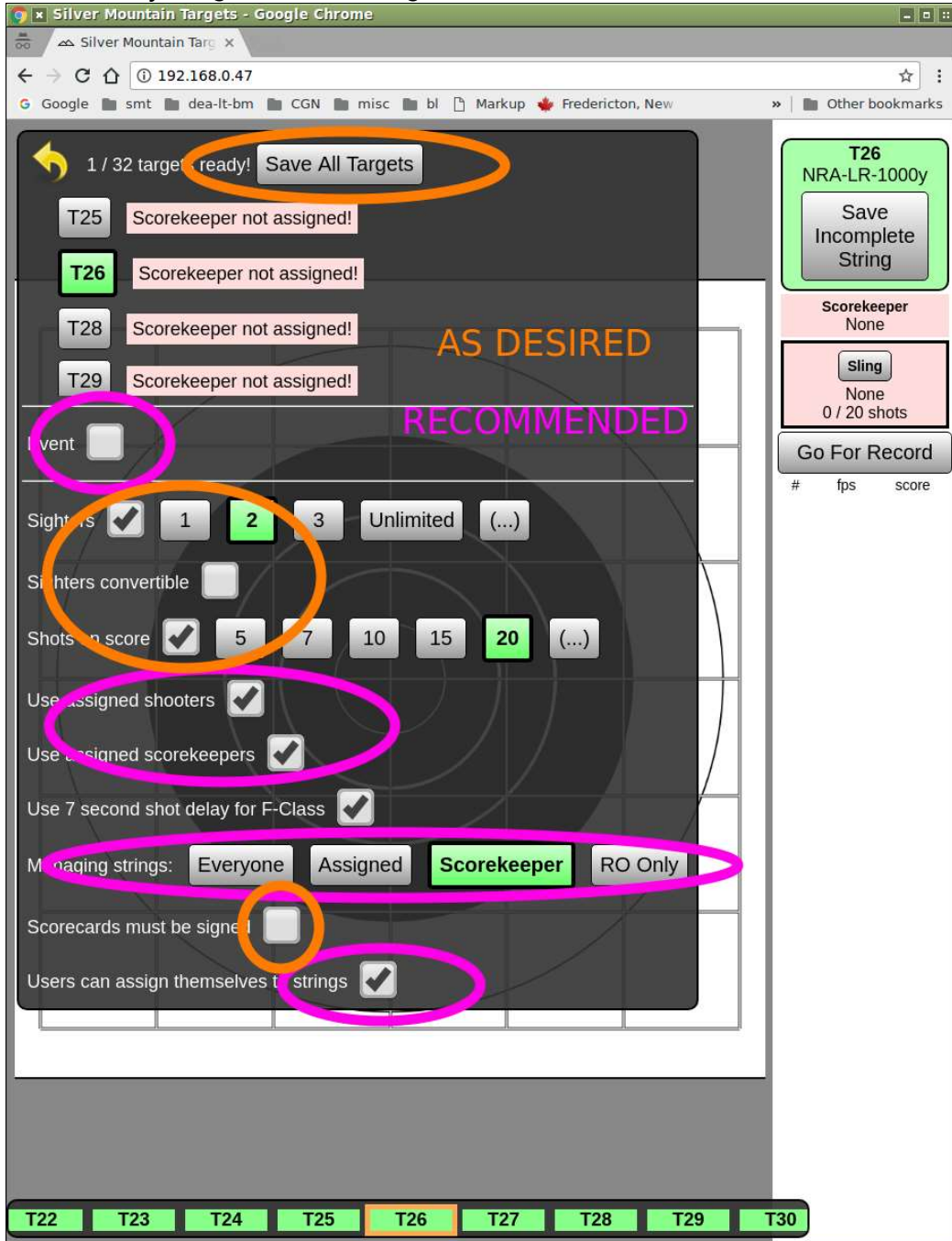- confirm that shooters and scorekeeper's display devices have selected the correct TargetFrame / lane

- If a "dual-mode" sling & F-Class TargetFace is in use, confirm that correct "Sling" or "F-Class" TargetFace has been chosen

When a shooter has finished firing, the RO or scorekeeper or shooter may press the

Save Final Scores ![Save Final Scores] button. You may enter a shooter name, series name, etc., which will be visible when the strings are later reviewed

8.2 Software Configuration

In the Range Officer's "MATCH CONTROL ("WHISTLE") tab, make these selections:

In the Range Officer's TARGET-CONTROL tab:

LOG-IN MODE – ASSIGNED SHOOTERS AND SCOREKEEPERS

9.1   Running a Match or Event

If you need to formally track the shooters or scorekeepers involvement with each string, you may configure your software to use "Login Mode":
- A "Users database" must be created and maintained
  - Range Officer users are not able to do this
  - Only the ADMIN user may add/delete/edit users
- An "electronic scorecard" is created for each string
- A shooter must login, for his shots to be counted
- A scorekeeper must login in order to "manage" the string.
  - Convert or "unconvert" sighters
  - Strike-out a shot
  - Save a string
- If dual-mode TargetFaces are in use, the correct TargetFace (Sling or F-Class) is automatically selected, based on the shooter's attributes

Before calling a relay of shooters to the line you may wish to:
- Confirm the correct selections of TargetFace, course of fire etc.
- Confirm all targets clear with no shots (for example crossfires or extra shots received after a shooter finished)

Before commencing fire, **on each target** you or the Block Officers or the scorekeepers may wish to:
- confirm that shooters and scorekeeper's display devices have selected the correct TargetFrame / lane
- If a "dual-mode" sling & F-Class TargetFace is in use, confirm that correct "Sling" or "F-Class" TargetFace has been chosen

When a shooter has finished firing, the RO or scorekeeper or shooter may press the

Save Final Scores [Save Final Scores] button. You may enter a shooter name, series name, etc., which will be visible when the strings are later reviewed

9.2   Software Configuration

In the Range Officer's MATCH CONTROL ("WHISTLE") tab, make these settings indicated by magenta; set orange items as desired:

In the Range Officer's TARGET-CONTROL 🔍 tab:

MANAGING STRINGS

10.1 Managing Strings of Fire

The "Manage String" privilege is required for the following operations:

- Saving a finished string
- Saving an incomplete string (not enough shots)
- Saving a string with too many shots
- Converting sighters
- Striking out shots

This privilege is controlled from the RO's Match Control menu ✎ may be granted to:

| Mode	Save/Convert/Strike Available to...
Everyone	Anyone. May be logged in, or may be guests (not logged in).
Assigned	Scorekeepers, shooters. Also RO users and ADMIN users
Scorekeeper	Scorekeeper. Also RO users and ADMIN users
RO Only	Only RO users and ADMIN users
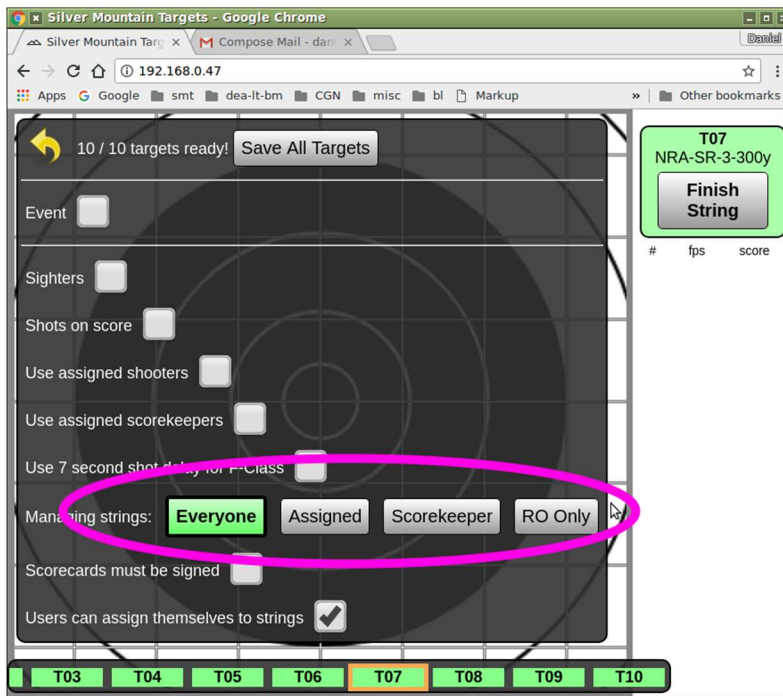
10.2 Struck Out Shots

It is important that crossfires be dealt with consistently and fairly. Without the benefit of a target disappearing from view, shooters often crossfire more frequently on e-targets than manual.

On the target that receives the crossfire, it should be noticed by an alert scorekeeper, who should "strike out" the shot and allow his shooter to proceed without delay or interruption.

For the target that fired the crossfire the situation might not immediately be clear; all that the shooter and scorekeeper know is that they have fired a shot and no shot has been reported by the system. They must "find" the missing shot and best practice is to involve a Range Officer in this determination. To assist the Range Officer's situational awareness, whenever a shot is struck out a temporary popup message is displayed for sixty seconds on all "range officer" tablets on the range:
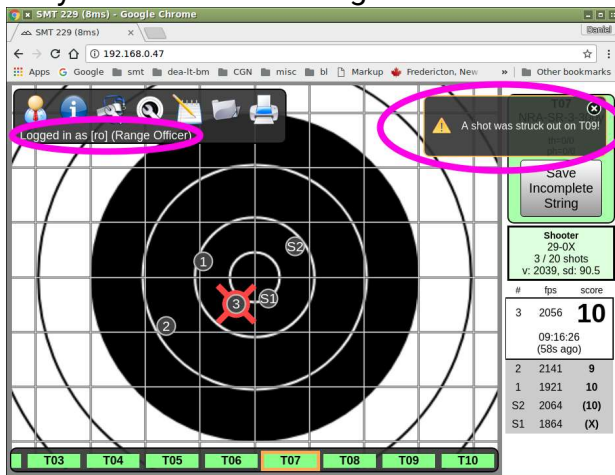

Additionally, a list struck out shots is always available from the info button ⓘ, showing the TargetFrame and the time elapsed since the shot was struck out:
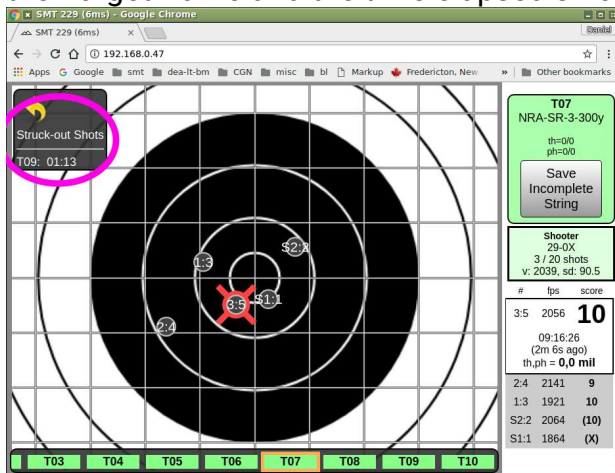
10.3 "*" Shots

When the system detects an anomaly in the shot calculations, such as an extreme angle, lack of a reading from one of the sensors, abnormal velocity, etc., it will flag that shot with an asterisk in the ShotsList column. This assists the range officer in addressing a challenge to the shot by highlighting that shot from all others.
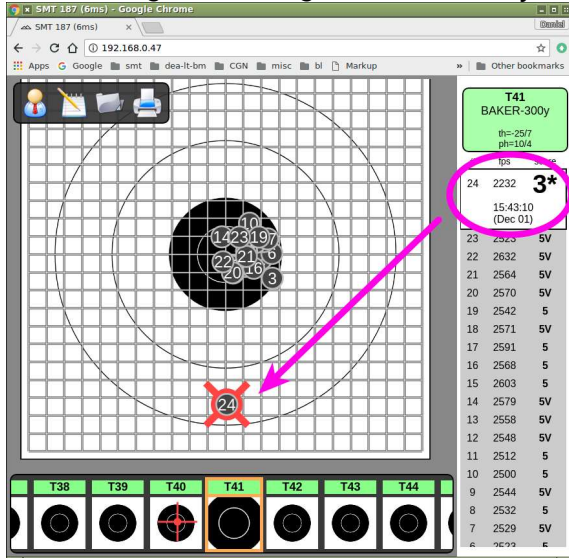
10.4 Dual Mode TargetFaces

Some TargetFace definition files are identified as "DUAL-MODE" on the Silver Mountain Targets web site, and include TWO sets of scoring rings, to support F-Class and iron sight ("sling") shooting.

These permit F-Class or iron sight scoring rings to be manually selected, using the "Sling" or "F-Class" button. This is the same string, scored on the left using the F-Class rings and on the right using the iron sight rings:
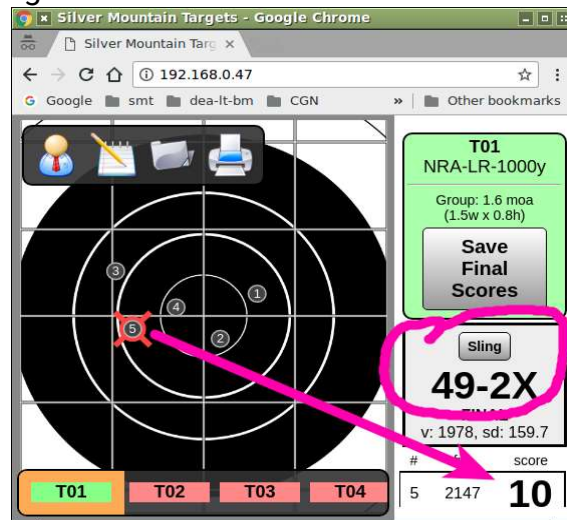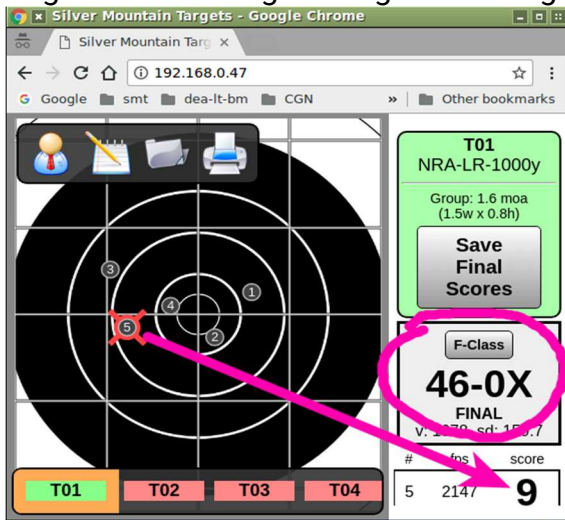
If the "assigned shooter" mode is in use then the correct scoring rings will be automatically selected when a shooter is assigned to a target.

10.5 F-Class 7-Second Delay

An optional 7-second delay is available when DUAL-MODE TargetFaces are in use and the F-Class scoring rings are selected. The shot value and shot position will not be shown until a 7-second delay has elapsed. During this time a countdown timer is shown:
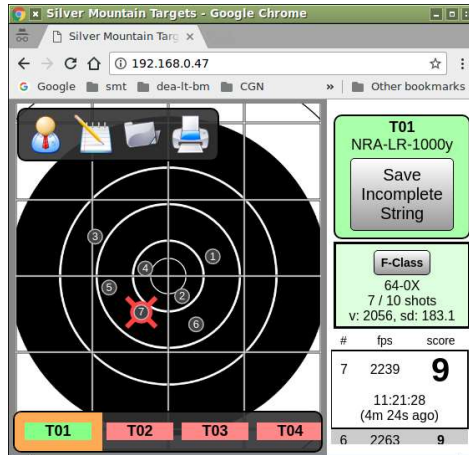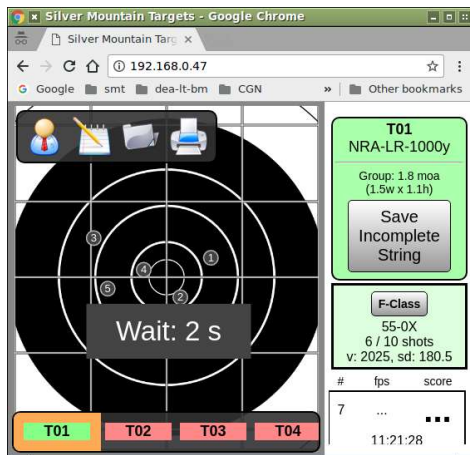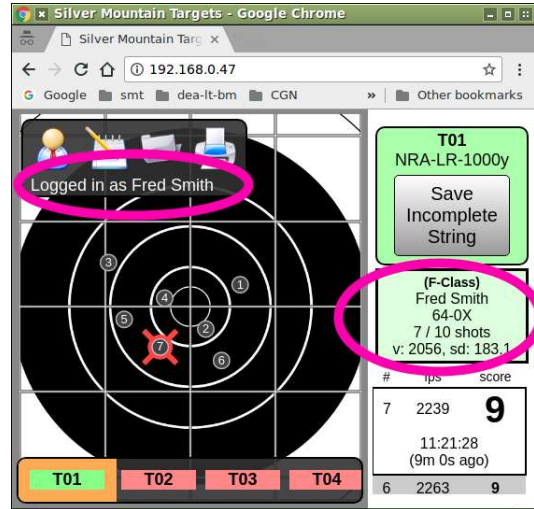
A Range Officer user can control this via the "WRENCH-WHISTLE" menu:
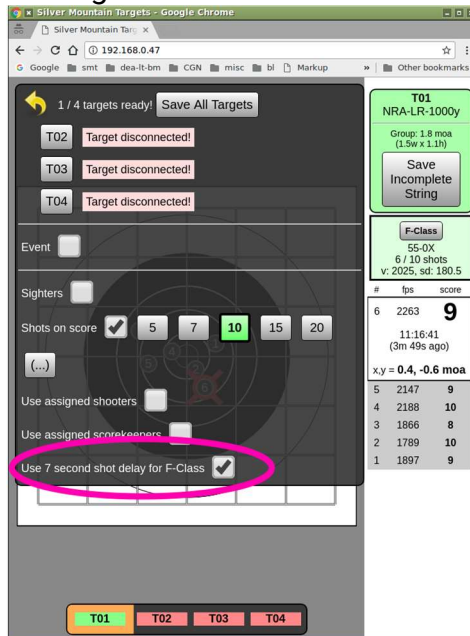
OTHER SPECIFIC RO FUNCTIONS BY MENU

11.1 User Icon

Logout
Allows Admin user to log out, returning to normal, non-admin menus

Change or set Password
Change or set the Admin password

Use F-class target
If selected, this enables a selection box for F-Class or Sling, for any target containing dual scoring rings

Bullet Diameter
Selection of default bullet diameter for scoring of shots close to rings

11.2 Notepad Icon

Plot mode provides the same functionality as a mechanical plotter with the added convenience of marking each shot for you.
This is a memory aid useful for visualizing your group and recording scope settings for each shot. It will not tell you what to set your scope to, calculate your group center, or predict the wind.
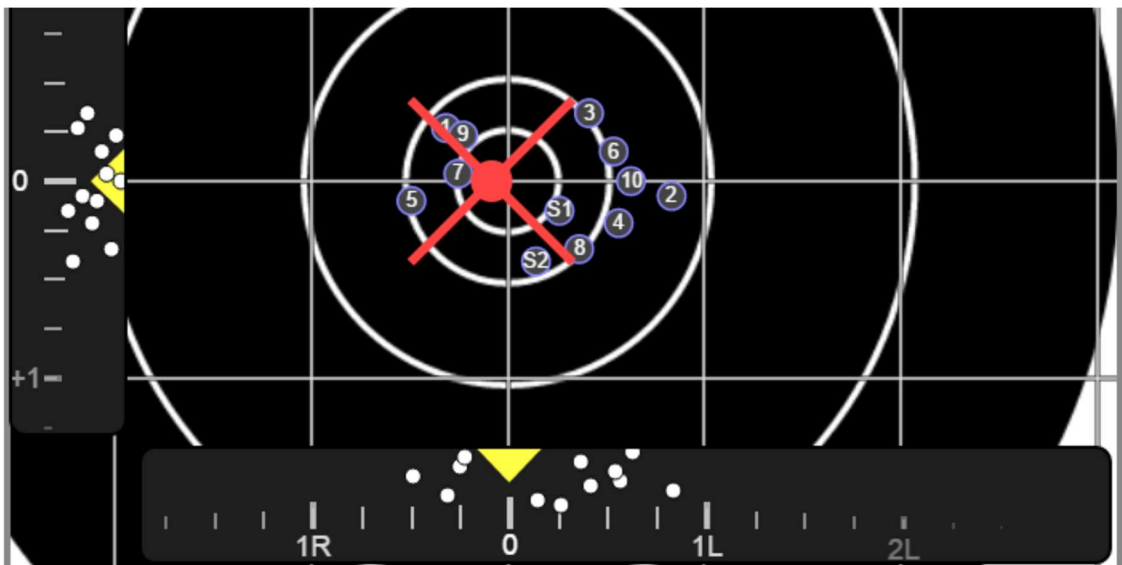
The size of your group is the dispersion of your shots had you not touched your scope settings for the entire string. This is very useful for understanding the precision of your aim, your rifle, and the wind effects.

Moving the sliders will move your group around and show you where your shots would have landed had you fired with this setting for all shots. This may help you visually determine which setting is optimal for the next shot.

The white dots on the sliders mimic the functionality of graphing. Each dot represents where a shot landed relative to your scope setting on the elevation and windage axes separately. Equivalently, this shows you what scope setting would have landed this shot in the center.

To use plot mode:

- Using the sliders, set the scope elevation and windage to match what you have on your scope BEFORE firing each shot.
- As you adjust your scope, adjust the plot immediately to help keep them synchronized.

If you fire a shot with different settings than recorded, select the shot in the ShotsList column and adjust it with the pop-up.

11.3 Folder Icon

This menu selection will allow the user to select a saved string and recall it onto the TargetFace.

11.4 Printer Icon

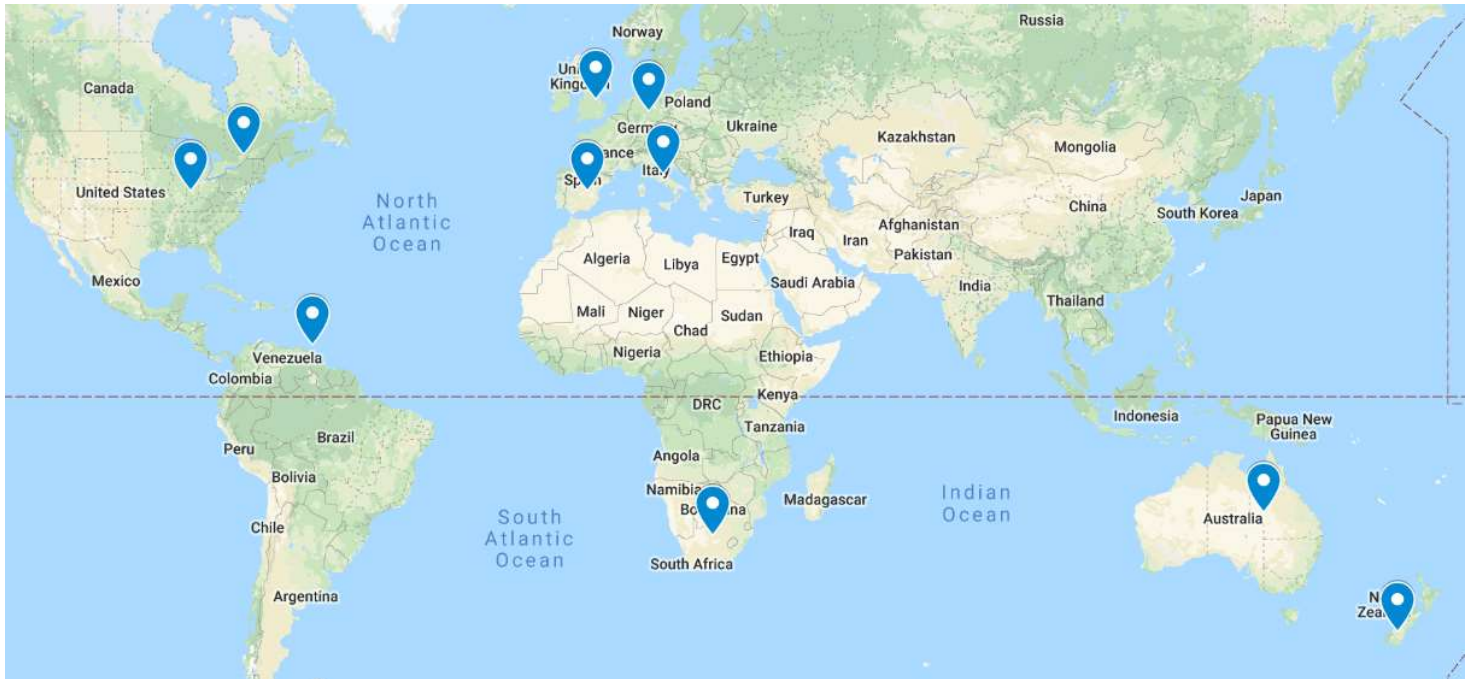Allows printing of the displayed target

TROUBLESHOOTING

12.1 WIFI

In rare instances, WIFI connection will be lost to a display device. If this occurs, a large red X will be displayed across the entire target face. Typically, this is a temporary situation, and waiting a few seconds will correct it. However, it can be caused by distance from the shooter to the Line Server, or obstructions between the two. In this case, make sure the shooter's display device has a clear line of sight to the Line Server.

SILVER MOUNTAIN TARGETS

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