Envoy Mini Tutorial

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Envoy *is a free utility for Wargame Design Studio's (WDS) series of historical wargames that simulates command and control with order delay. Often, decisive battles turned not on weapons and men, but on time and information: who knew what, and when? Were the correct orders issued—and received in time to make a difference? Using* Envoy*, you can explore these questions by composing orders for subordinates, then passing them down the chain of command with realistic (and customizable) delay. You will be notified on the turn when the order is delivered.*

As a solo or PBEM player, you can use this tool as a prompt for moving your units along constraints defined by the orders. You can also use it to umpire Kriegspiel-style wargames for multiple players, using the underlying WDS game to adjudicate combat.

While WDS games are remarkable in their unparalleled attention to historical detail, one of their current limitations is that they do not simulate the flow of information and authority on the battlefield. As soon as an enemy unit appears, it is immediately visible to every friendly unit, all of which may take immediate action to counter it without regard to orders or hierarchy—a utopian state of affairs for the wargamer, but in reality not yet attained in the 21st century, let alone the 18th. For those of us who use WDS games as a starting point for deeper historical understanding, some accounting for this "fog of war" is required.

While the most dedicated grognards already address this limitation by tracking the flow of orders and information with outside spreadsheets, *Envoy*—a free tool introduced earlier this year—is designed to eliminate nearly all manual accounting by integrating itself into the underlying WDS game, performing all calculations invisibly, and notifying the player directly when messages arrive. Note that some degree of discipline and 'house rules' are still required, as *Envoy* does not prevent you from moving any units; you (and your PBEM opponent, if applicable) must agree on some basic ground rules about how units will react to messages, and stick to them.

This mini-tutorial will show you how to get and install *Envoy,* how to navigate the Envoy interface to create orders and messages and will present a short demonstration of the use of *Envoy* in the Battle of Bussaco, from the WDS game <u>Bonaparte's Peninsular War</u>.

Before we continue, please note the following limitations:

* *Envoy* is only compatible with the WDS Musket & Pike, Napoleonic, and Civil War Battles series. The Panzer & Modern Campaigns series are **not** currently supported. The Early American Wars series is **not** currently supported, but will likely work automatically after those games receive their post-4.02 update from WDS.

* PBEM games are supported, but only if they are unencrypted. (In the WDS game, **Settings** -> **PBEM Encryption** should be unchecked.)

<u>**Acquiring Envoy**</u>

The download link for the *Envoy* application can be found on the following WDS forum page:
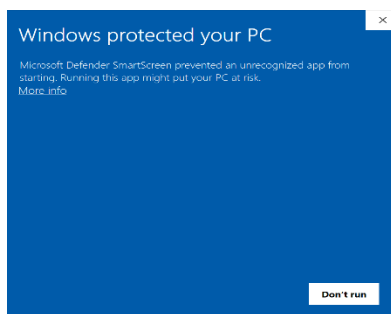
The link above will give you access to the download for the zipped application and associated files, a link to the game manual and a link to the source code for Envoy. Unzipping the Envoy download file will yield a folder with the following contents:

- 📁 presets
- ✴ Envoy.exe
- 📕 Envoy_Manual_v10.pdf
- 📄 Newtonsoft.Json.dll
- 📄 Newtonsoft.Json.xml
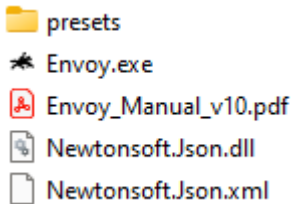
IMPORTANT NOTE: Since *Envoy* is a relatively new application with a small user base, Microsoft Defender SmartScreen and/or your third-party antivirus software may present a warning or attempt to isolate the application. Be assured that, as long as you download *Envoy* directly from links provided by the author, it is entirely safe for use on your machine.

If you see the following screen...

Windows protected your PC

Microsoft Defender SmartScreen prevented an unrecognized app from starting. Running this app might put your PC at risk.
More info

Don't run

... you can typically bypass it by clicking "More Info..." and then the "Run Anyway" button. If you don't see the "More Info..." option, this article will show you how to fix it.

If you also use third-party antivirus software, such as Avast or Norton, you may encounter additional obstacles. Please consult the documentation for your software in order to 'white-list' *Envoy* for use.

Using Envoy for a WDS Game

To use *Envoy*, first launch your WDS game and start a new solo game against the AI, a PBEM game against another player or a "hot seat" game. As soon as the map loads and you are presented with your first turn, immediately save the WDS game. At that point, the use of Envoy can begin.

Open the *Envoy* application and select **File** -> **New...** to start the setup process. *Envoy* will prompt you to select the WDS saved game file (.btl, .bte, .btc or .btt) you just created. Afterwards, you should see the following **Settings Panel**:
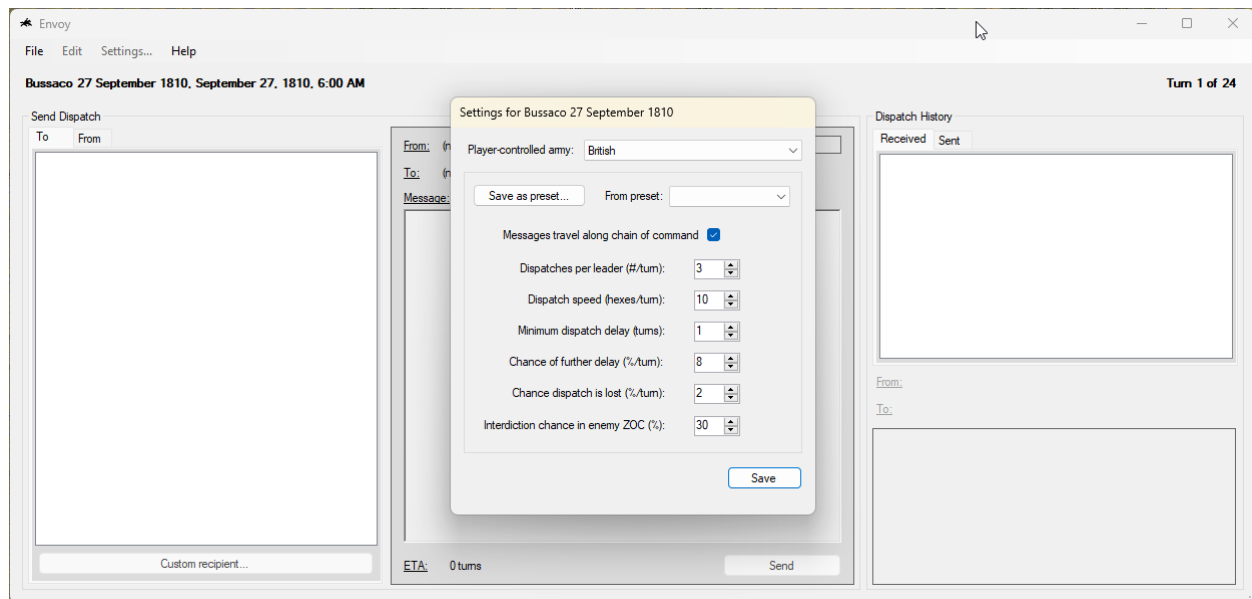
There are a number of parameters that control how *Envoy* controls orders and messages:

MESSAGES TRAVEL ALONG CHAIN OF COMMAND
When enabled, this setting ensures that messages pass through the entire hierarchy of superior leaders between a sender and receiver, instead of going directly to the destination; therefore, delivery times will tend to be longer. It is recommended that this setting be enabled in most situations, as it best abstracts the cumbersome nature of pre-modern command and control structures. It also better protects dispatches from interdiction, as it generally forces them to move along your interior lines.

DISPATCHES PER LEADER
This determines the number of dispatches a leader can send in a single turn.

DISPATCH SPEED
This determines the speed, in hexes per turn, that dispatches move on the map.

MINIMUM DISPATCH DELAY
This determines the minimum delay for any dispatch before delivery, regardless of distance. This abstracts processing time and other friction when passing through the leader's HQ.

CHANCE OF FURTHER DELAY
For every turn that a dispatch is in transit, you can set a percentage chance that it may be delayed an additional turn due to chance, tardiness, or injury.

CHANCE DISPATCH IS LOST
For every turn that a dispatch is in transit, you can set a percentage chance of Murphy's Law taking effect: the rider is killed by a stray round, the horse breaks its leg, etc. If this occurs, the message will be lost, and never delivered. If you use this setting, it is recommended to keep the

chance low, and to develop protocols that ensure resilience of your communications network (e.g. a requirement that leaders send an acknowledgement of message receipt).

INTERDICTION CHANCE IN ENEMY ZOC
If a dispatch passes through the enemy zone-of-control (either through or adjacent to a hex controlled by enemy infantry, cavalry, or artillery) on its way to its destination, you can set a chance that it will be lost due to interdiction.

If you forget what a particular setting signifies, you can read the tool-tip that appears when you hover the mouse over it:
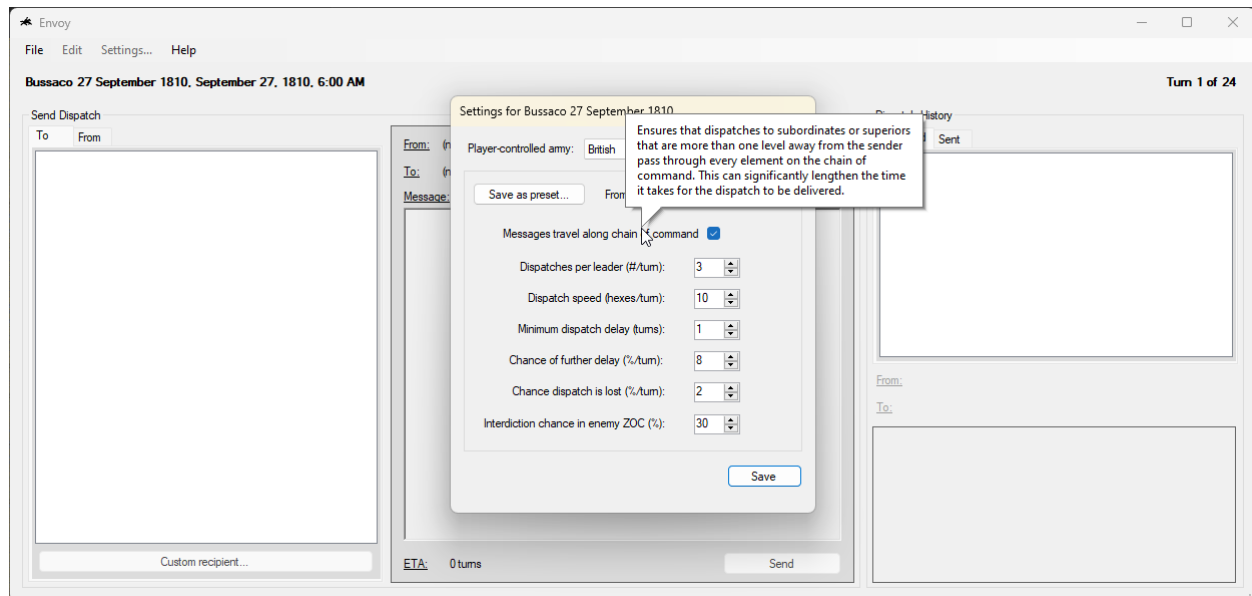
A good starting point for your first game will be to use one of the predefined settings. For the Bussaco game, we will select the *Napoleonic* option from the **From preset** pull down on the Settings interface. Once you've become more familiar with *Envoy*, feel free to customize these settings to your liking, or create new presets and share them with other players.

IMPORTANT NOTE: Most of the time, *Envoy* correctly determines the side you intend to play, but will occasionally make the wrong choice. The Settings Panel can be used to alter the army being controlled by *Envoy* by selecting the pull-down tab labeled **Player-controlled army** (currently says British in example above).

After verifying the settings, click on the **Save** button on the lower right of the Settings interface. Envoy will then prompt you for the file name you will use to save the Envoy dispatches.

The next time Envoy is opened for a game, the player will select File -> Load to read the appropriate Envoy dispatch file for their current game. The ability to individually name Envoy files means that more than one Envoy game can be played from the current Saves directory.

The Envoy Interface

Upon starting up the *Envoy* application, you should see the following user interface, featuring three main sections which the player uses to create and manage the messages between the various leaders in their army:
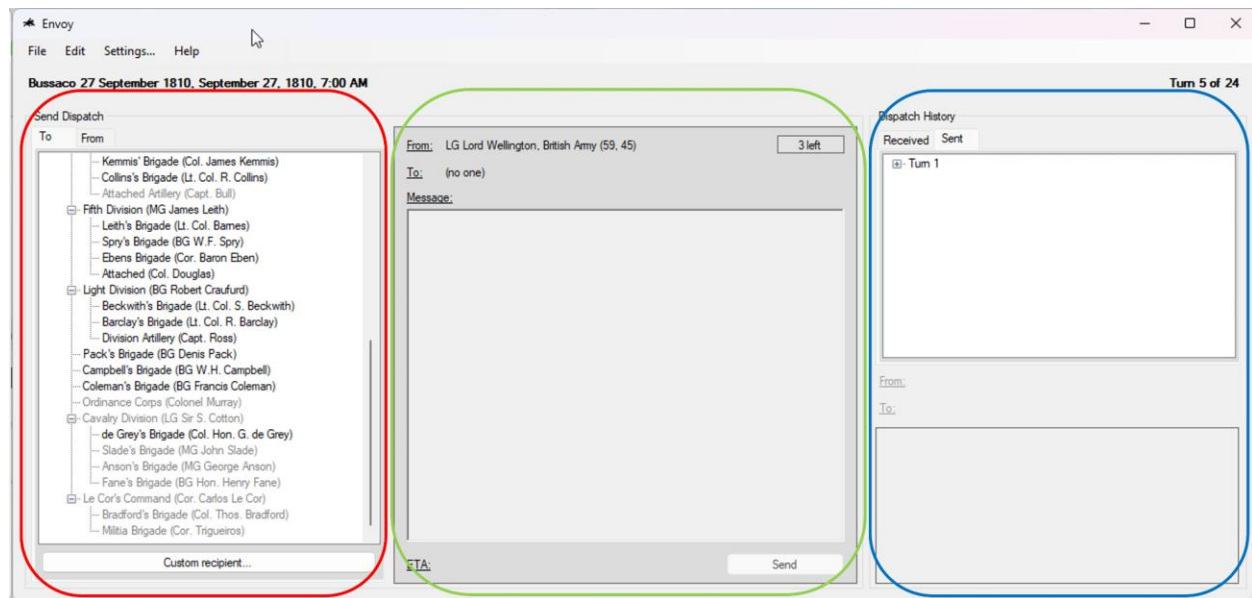

On the left (shown in red) is the section of the interface that contains the order of battle of your army's command structure. This is the same organization that you would see when selecting **Show Organization** (Alt-Q) in their WDS game. Note that *Envoy* distinguishes between leaders currently on the field of battle using black text, and leaders that have not yet entered the battle using gray text. (Messages can only be passed between Leaders that are present on the map.)

At the top of this section is a **To** and **From** tab; a leader selected on the **From** tab determines the message's sender, and a leader selected on the **To** tab determines the message's recipient. The player may also choose the **Custom Sender** or **Custom Recipient** button on the bottom, which is toggled depending on whether the **To** or **From** tab is selected. While the majority of messages will be passed between leaders, there may be times when the player would like to pass messages between units that don't have an active leader (e.g. a cavalry company or regiment scouting ahead of an army) and a leader in the army. The Custom Sender and Recipient buttons will allow the creation of these types of messages.

The center section (outlined in green) is used to create and send messages between leaders. Clicking on the **From** tab and selecting a leader from the OOB in the left section will fill in the **From** field in the message interface. (Note that by default your army leader has been pre-selected as a sender, until another sender is chosen.) Clicking on the **To** tab and selecting a leader from the OB will populate the To in the message panel in the center of the Envoy interface. The message section can then be selected and the message or order typed into the center panel, much like a text message or email. Note that right clicking in the Message section

of the center panel will bring up a context menu that can be used to create messages. The top right corner of the center panel shows how many remaining messages the selected leader may send during the current game turn. The bottom left corner of the center panel shows an estimate of how many turns the message will take to be delivered. Once the message is ready, the send button will cause the message to be sent.

To speed up the process of sending messages, *Envoy* provides an optional context menu, accessible by right-clicking in the center message window. In the example below, Wellington is ready to send a message to his Light Division commander Craufurd. Right clicking in the message window brings up the context message that shows **March to**, **Attack**, **Defend** & **Support**. The user can select from the menu which then will display additional possibilities.
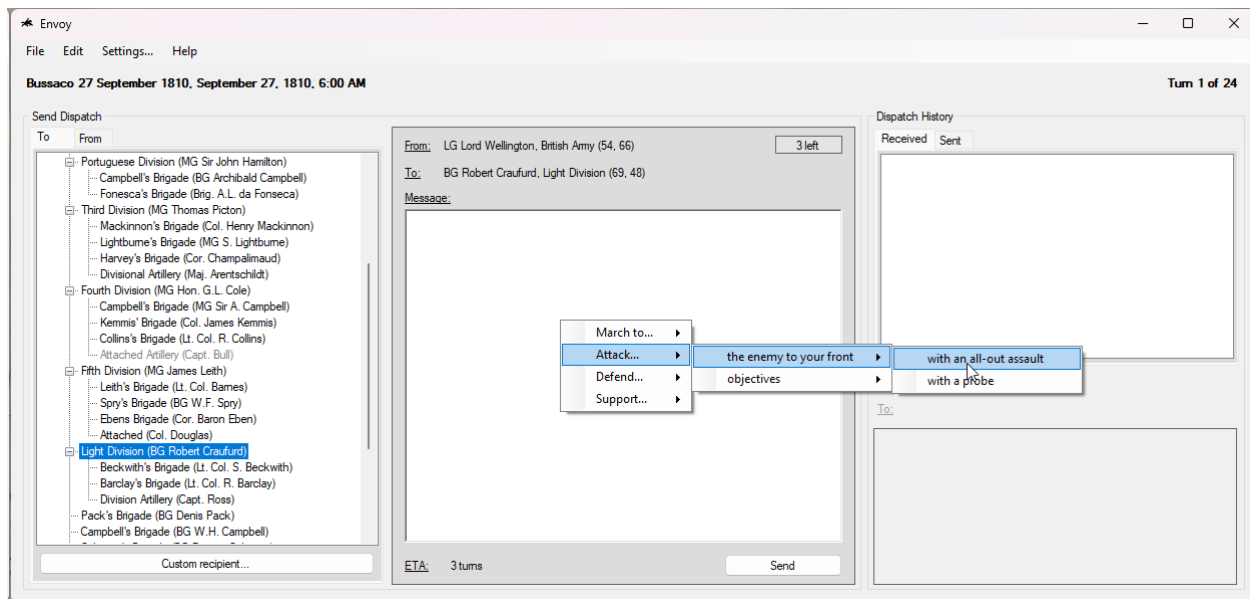
After the final selection is made in the context tree, Envoy creates the associated message in the message window. The context menu offers a quick way to create the type of terse messages that were typical of the orders of the time period; however the generated messages can be edited to add further information as desired.
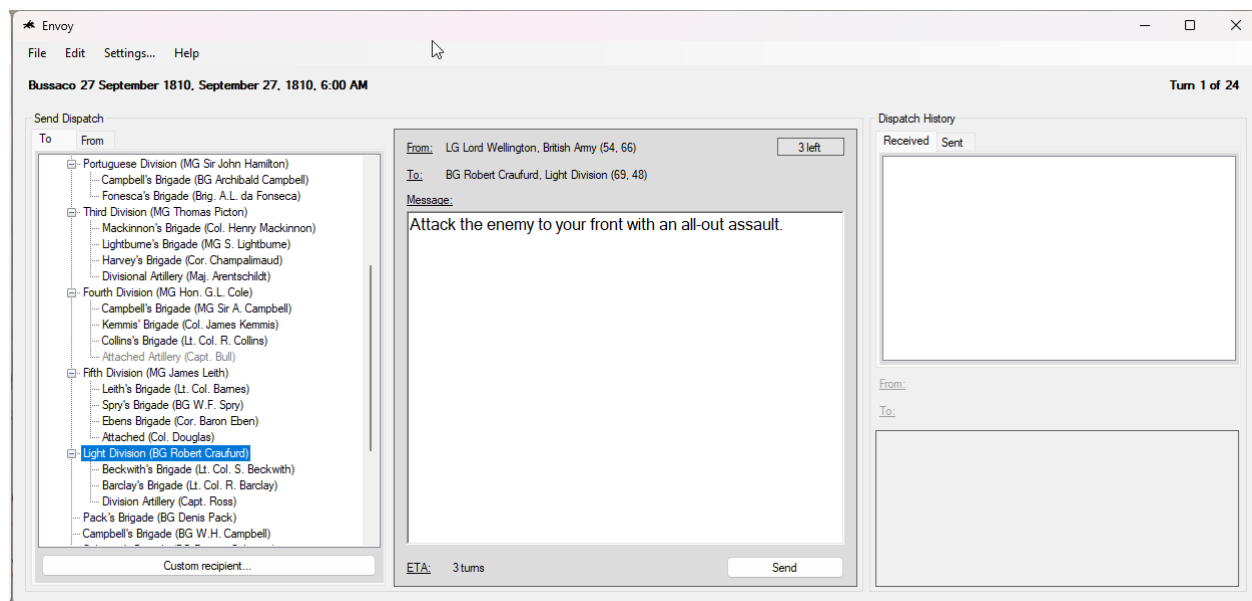
The right section (outlined in blue) is used to review the dispatch history of all messages **Sent** and **Received**. In each tab the messages are grouped and ordered by turn. Clicking on the turn number will show the individual messages sent that turn. Clicking on the individual message will show the specifics of the message sent in the lower right section.

Envoy / WDS Integration

After you've finished sending all of your dispatches for a turn, switch back over to the WDS game you are playing and play out your turn. As soon as you reach the Movement Phase of your next turn, save the battle file again from the WDS program (**File** -> **Save**). If you are still running *Envoy* in the background, it will automatically update, and notify you about any dispatches that have arrived on that turn. Otherwise, if Envoy is not already running, start it again, and select the Envoy game dispatch file you created earlier (**File** -> **Load**).

After reading through delivered dispatches and sending new ones, switch back to the WDS game and play out the next turn. Repeat this process through the entire game.

Note that there is no "Save" button in *Envoy*, as it automatically saves your current progress in the dispatch file you created at the start. If you want to pause play and resume later, you can simply quit *Envoy* at any time.

Envoy Demonstration Game: The Battle of Bussaco

Here's a demonstration of how you might use Envoy to play out a scenario—using the Battle of Bussaco, from Bonaparte's Peninsular War. In the battle, the French forces led by Marshal Messena attacked an Anglo-Portuguese force led by Lord Wellington. For the purposes of illustration, we will use *Envoy* to manually control the British (Anglo-Portuguese) side, while the French follow a predetermined AI-driven course of action.

The initial size and placement of both armies is shown in the image below:
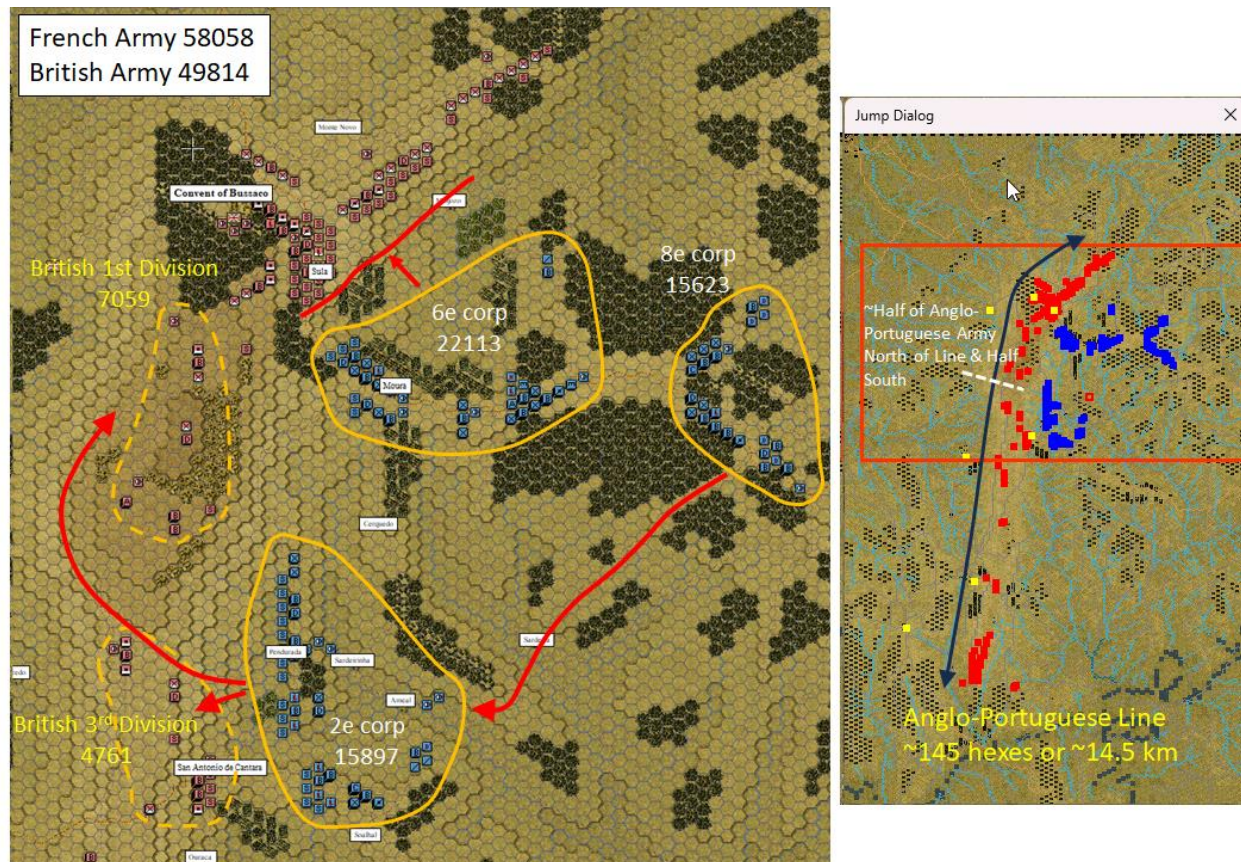
The French army is slightly larger than the British army and is organized into three corps. The British army is strung out in a defensive position that is roughly 14.5 km in length and is organized into 8 divisions with 3 supporting brigades. The battle starts at dawn with a visibility of 2 hexes, meaning that enemy forces are not initially visible to either side. Early morning mists that day resulted in low visibility during the first few hours of the battle.

In this simulation, we make the assumption that the French had some idea about the placement of the British forces and decided to take advantage of their intelligence. Unbeknownst to the British, the French follow the following plan: French 2e corp will attack the British 3rd Division and subsequently use a division to fence off British forces that retreat to the south. The remainder of the 2e corp will turn north, behind the British 1st Division and attack it from the rear, pushing towards the Convent of Bussaco. The French 8e corp will march along trails and follow the 2e corp into the breach in the British lines, turn north and attack the British forces defending the Convent of Bussaco from the south flank. The French 6e corp will move into an attacking position opposite the British forces defending the Convent and by their presence, pin the British forces in place. The 6e corp will attack the British forces to their front when they observe the 2e and 8e corps attacking the British forces defending the convent on their southern flank.

The initial British orders for all units is to hold positions and support units on their flanks until further orders are received. From now on, we will use *Envoy* on the British side to execute our defense and react to enemy actions.

On the British turn 1, there are no French forces visible. Let's assume for "Envoy practice" sake that the British Portuguese Division, located on the southern or right flank of the British defensive line, arrived in their position during the night. Let's have Wellington send the division an order.

The *Envoy* interface picture below shows the 4 steps we will use to send a message. There are four steps needed to send an Envoy message (see notations 1 - 4 in the picture below):
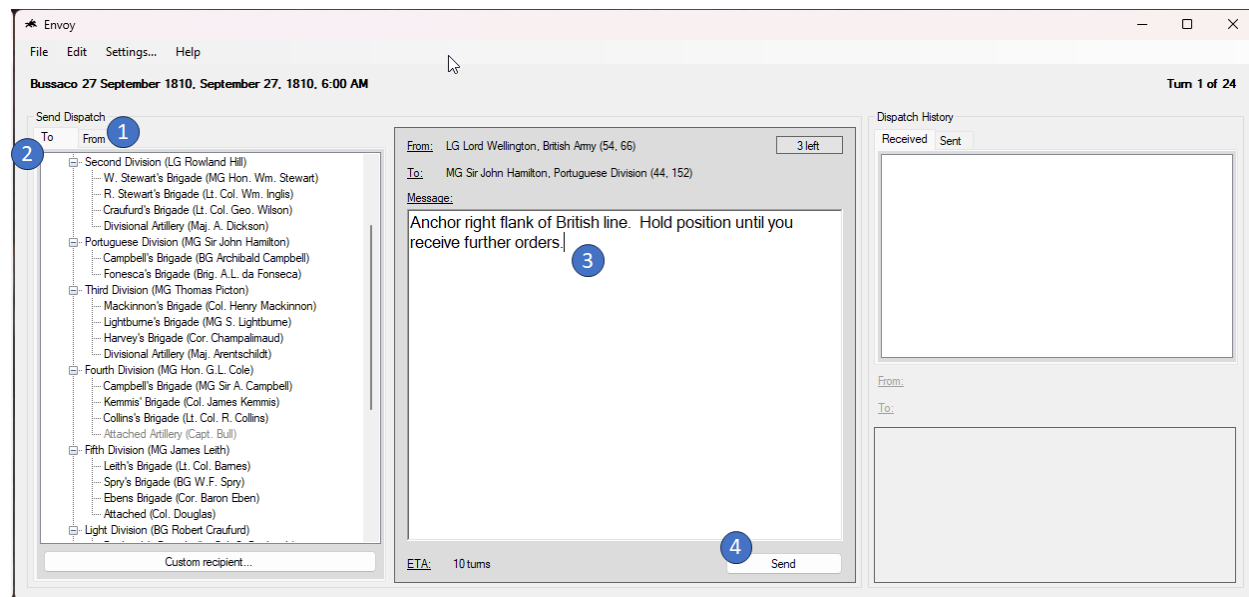
First, select the **From** tab on the upper part of the Envoy left window. Scroll through the British Order of Battle (OB) until the British Army Leader, Wellington is found. Click on Wellington. Wellington will highlight in the left window and the **From** section in the center message window will show the selection of Wellington as the source of the message. Next, we set the destination of the message by selecting the **To** tab in the left Envoy window, scrolling the OB until the Portuguese Division Leader is found, and clicking on that leader. We observe that the center message window now shows the message will be **To** MG Sir John Hamilton. We now click on the Message section and type the following order from Wellington: "Anchor right flank of the British line. Hold position until you receive further orders." The bottom left of the center window shows the message ETA is 10 turns, since the Portuguese Division is very far from Wellington at the moment. Click **Send**.

On turn 4, a couple of French skirmish units become visible to a couple of British units. At this point, from the British point of view, there is minimal French activity and nothing worth reporting as of yet. On turn 5, all that changes.

The image below shows the British point of view at the start of British turn 5:
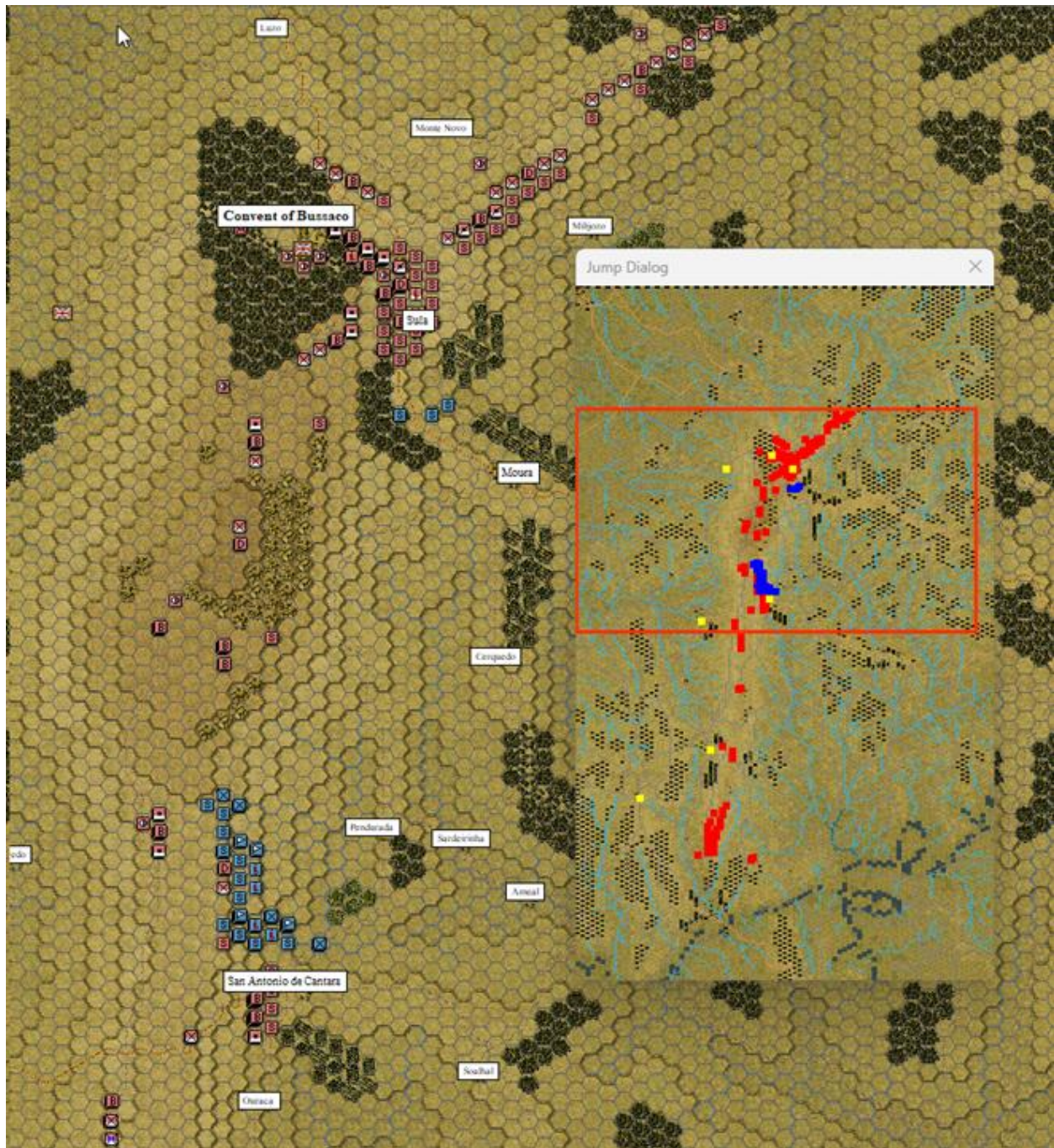
Here is where the use of *Envoy* will greatly change the way the game will play. Without *Envoy*, the British player on turn 5 would observe the French 2e corp making contact with the British 3rd Division, and could move any and all of their units to respond to this French incursion. However, with *Envoy*, we must instead consider what information is available at the unit level and respond accordingly.

The pictures below show the situation from two different parts of the British 3rd Division:

In the image on the left, the 3rd Division leader can see half of the French 2e corp attacking the northern part of the British 3rd Division. The Division leader has no view, and therefore no knowledge, of what, if anything, is going on with the southern half of the 3rd Division. The right image shows the view from MacKinnon's Brigade commander. The visibility from some of the skirmish units near MacKinnon can see some of the French skirmish units to the north, but none of the French regiments. Similarly, MacKinnon has a view of only a single French skirmish unit. At this point, from MacKinnon Brigade's point of view, something might be happening to the north, but none of it is visible. What to do?

The Third Division leader, MG Thomas Picton, decides on a course of action and sends two messages using *Envoy*. The first message will be to the Army Leader—Wellington needs to know what is going on. The image below shows the message being sent:
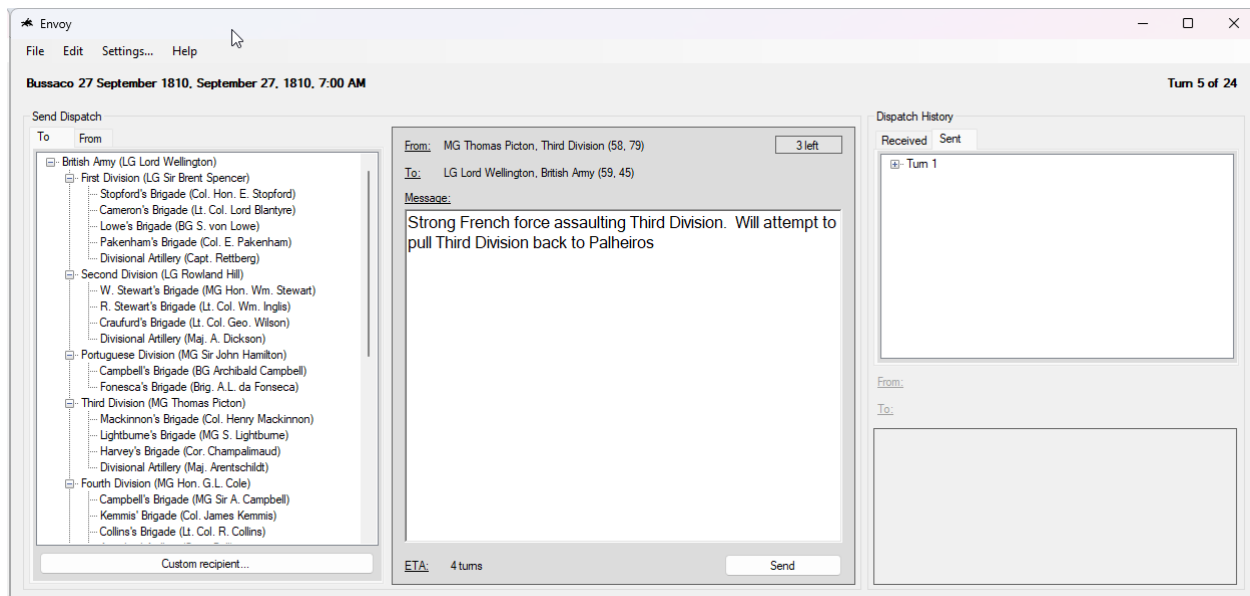
The next message is from the Third Division leader to his subordinate Brigade Leader, MacKinnon. MacKinnon's Brigade is guarding San Antonio de Cantara, an objective hex. His

order will be to try and hold the objective, but gives MacKinnon knowledge of where to fall back to should his brigade get pushed back:
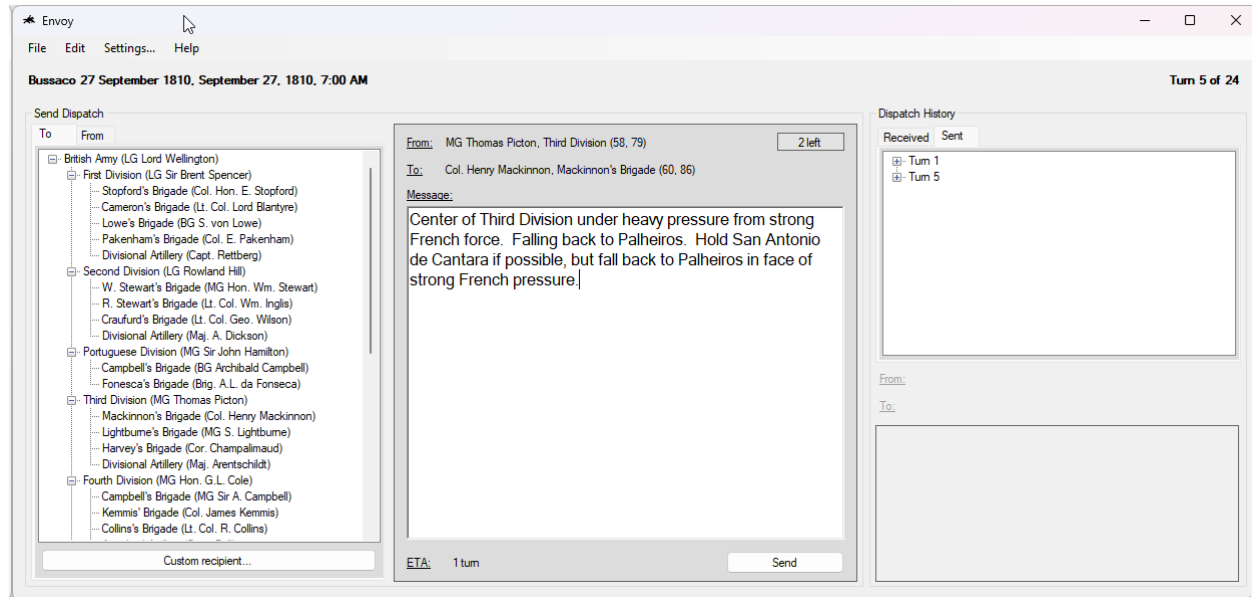

Given the short distance between Picton and Mackinnon, it will take roughly 1 turn for this message to be delivered, assuming it is not delayed or intercepted. (Note that in the previous picture, Picton was able to send 3 messages that turn, but after sending the previous message, Picton can only send 2 more. Also notice that the Dispatch History, in the upper right of the interface, now shows the Turn 5 message that was just sent from Picton to Wellington.)

At the end of turn 5, only the Third Division of the British army knows about the strong French force. While they have sent messages raising the alarm, the rest of the British army has no knowledge about the French army and no reason to react until those messages are delivered, or until they observe French forces on their own.

During turn 6 the French 2e corp continues its attack against the British 3rd Division, and it is apparent that the British 3rd Division is beginning to crumble. With the visibility still at 4 hexes, and with messages still in transit, the British 3rd Division fights alone.
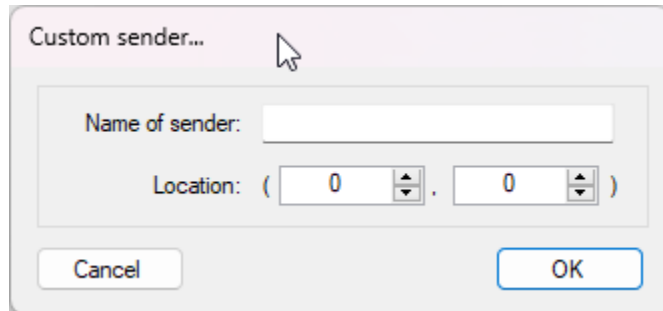
On the northern side of the British line, three French skirmish units and a French infantry regiment have just become visible to the British skirmish line south of the town of Sula:
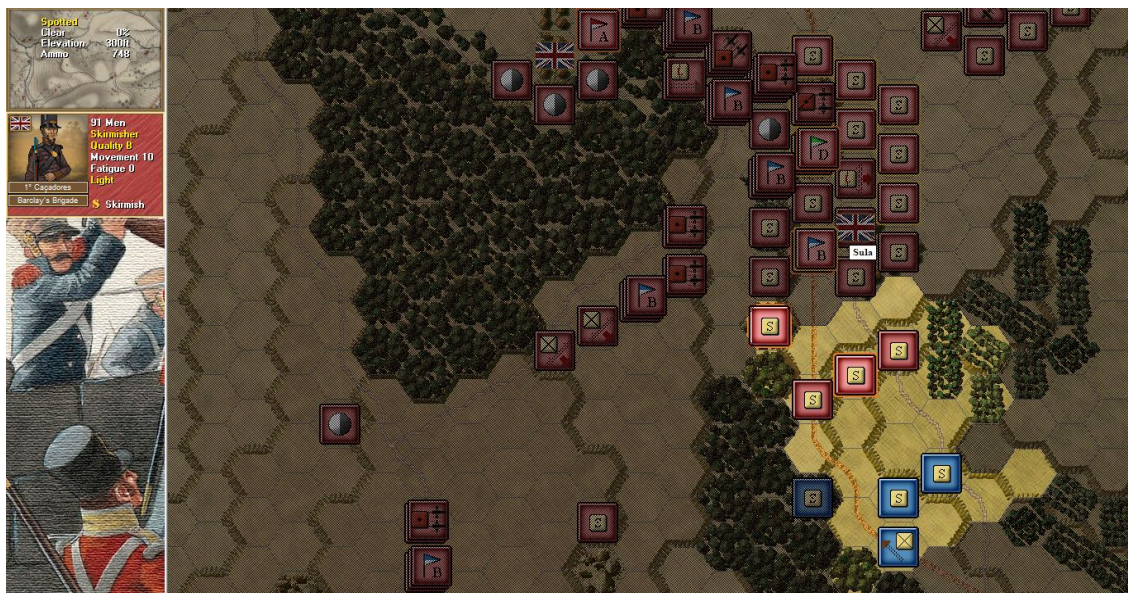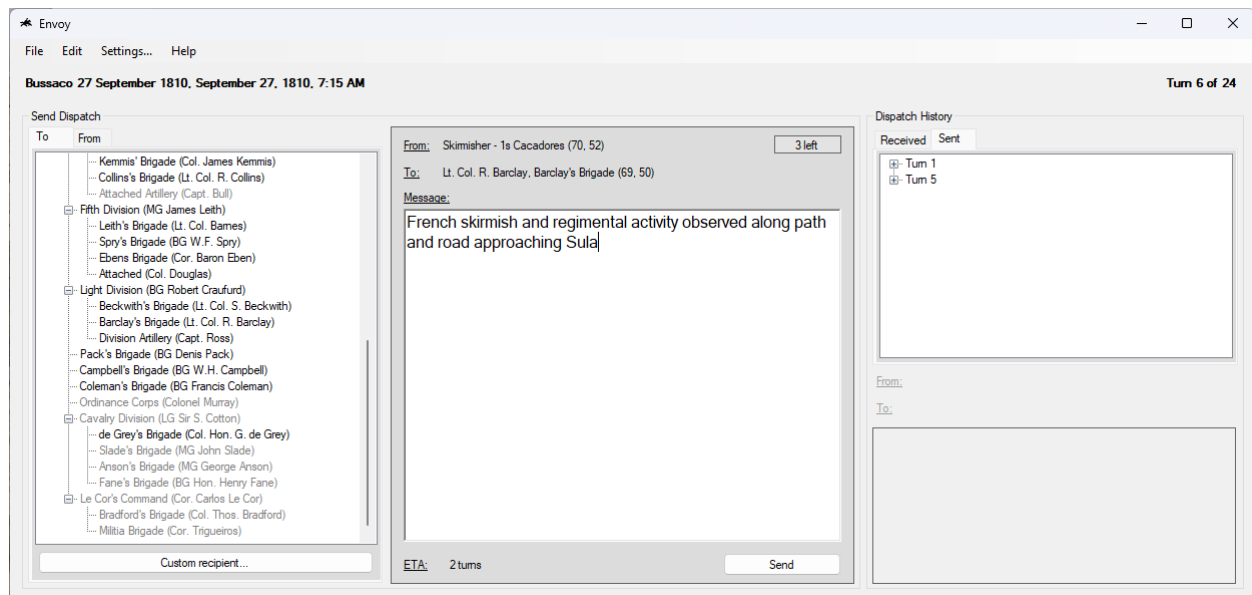
Let's use this opportunity to illustrate another feature of *Envoy*. The central British skirmish unit needs to report their battlefield observations up their chain of command. We'll use the **Custom Sender** button on the bottom left of the Envoy interface to allow this non-leader skirmish unit to send a message. On the Send Dispatch panel of the Envoy interface (left side), select the **From** tab and then press the **Custom sender** button.

This action brings up the Custom sender interface. Provide a name for the unit sending the message, provide the hex location, and click OK:

Select **To** in the Send Dispatch section of the Envoy interface, then select the skirmish units parent leader from the OB (Lt. Col. R. Barclay). We now dash off a quick missive reporting the sighting and hit **Send**. Information about the sighting is on its way up the chain of command.

On the British turn 8, the situation facing the Third Division is bleak. The French 2e corp continues to pressure the Third Division. A couple of units from the British Fifth Division, just to the south of the Third Division, now can see few Third Division units retreating south, but with the early morning mist still present (visibility is now 6 hexes), the fate of the Third Division isn't yet known by the British Fifth Division nor the rest of the British army.
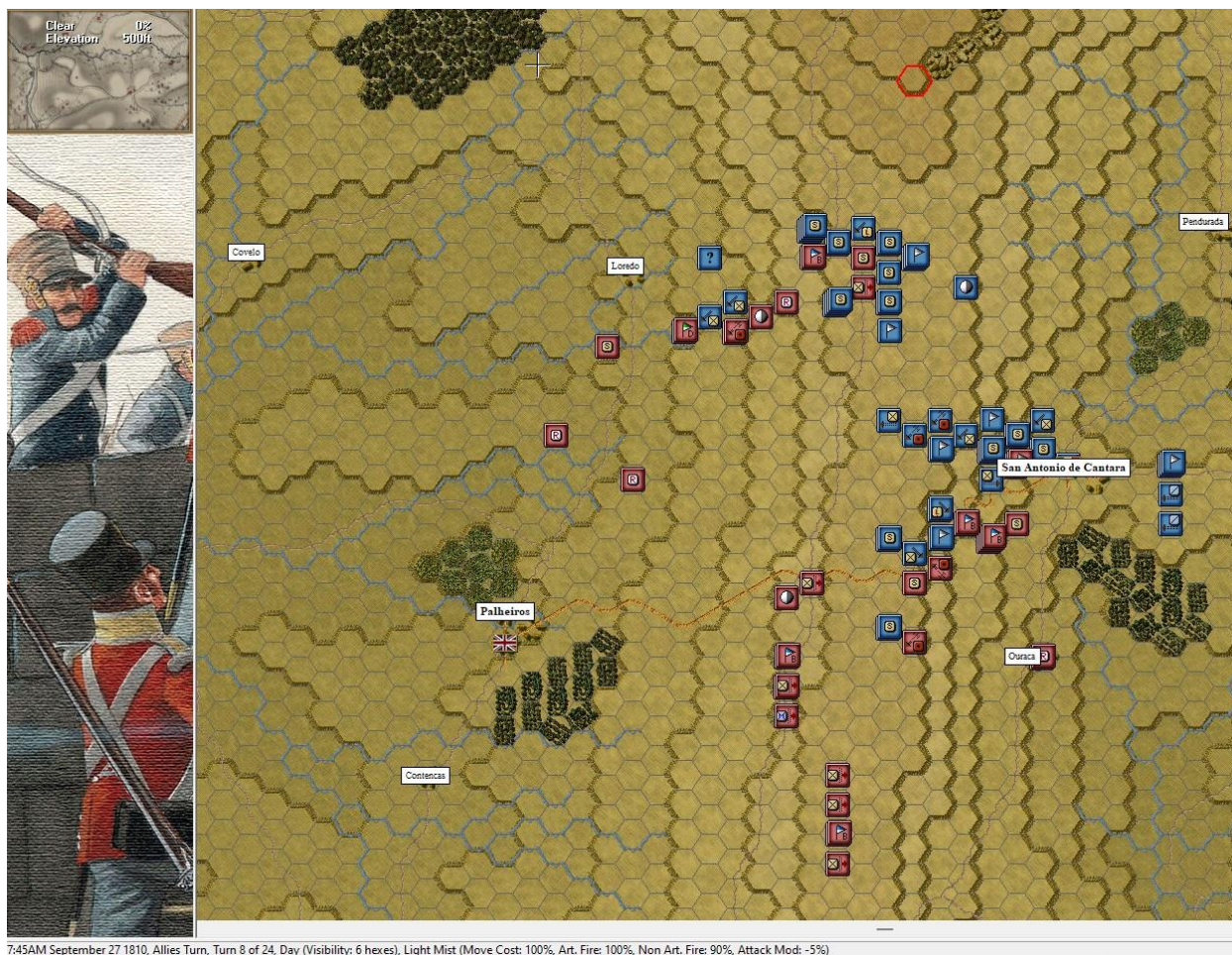
At the start of turn 8, a delivered message finally appears. This message is the message the skirmisher unit sent on turn 6:
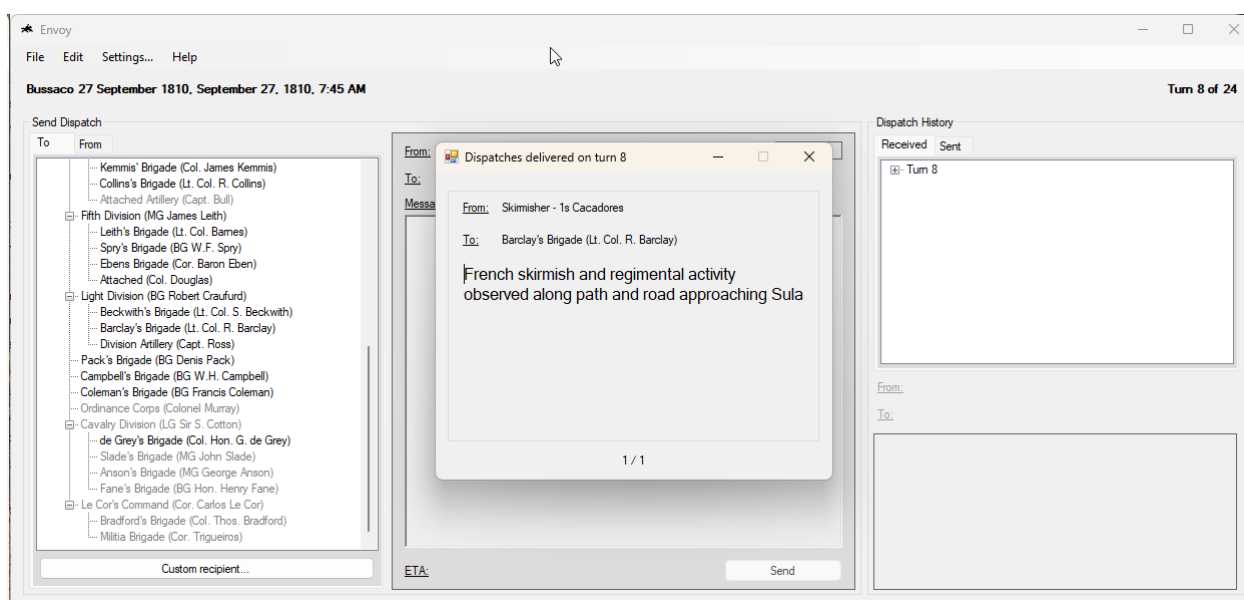
Brigade leader Barclay will then use *Envoy* to dutifully pass the message received up to his Division leader, Craufurd.

Note that the message sent by the Third Division leader Picton on turn 5 to his brigade leader MacKinnon has not arrived. The ETA was 4 turns, but it also may be delayed, lost, or intercepted. In any case, since it hasn't arrived, MacKinnon doesn't know about the fall back position for the Third Division and is retreating south, away from French pressure.

On turn 9, Craufurd receives the dispatch from Barclay:
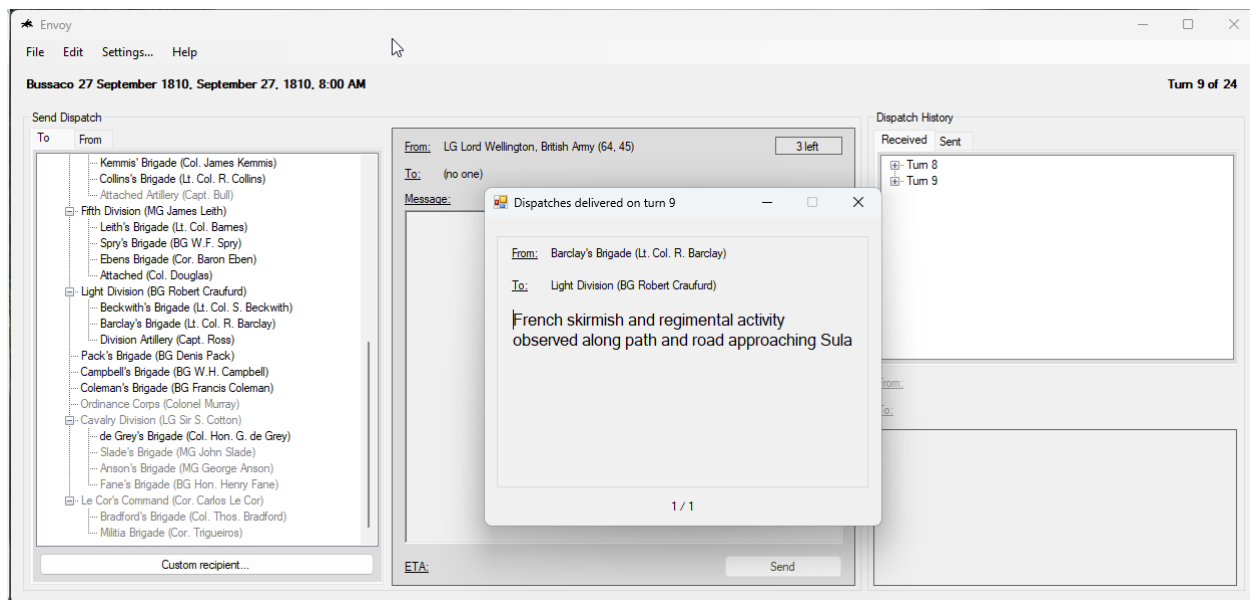
As division leader, Craufurd sends on three messages. The first message is to Wellington, letting the army leader know about the observation near Sula. Craufurd then sends two more messages to his other brigade commanders, letting them know about the situation and to stand ready for a French attack.

By turn 10, the rout of the British Third Division is nearly complete. While the British Fifth Division, just to the south of the Third Division still can't see what is happening on the field of battle due to the morning mists, retreating and routing units from the Third Division begin streaming past the northernmost elements of the Fifth Division. The Fifth Division, highlighted on the map, is strung out over 38 hexes (3.8 km).

Col Douglas, the brigade leader of the northernmost brigade of the Fifth Division, immediately sends a message to his Division Leader upon observing the dissolution of the Third:

Envoy

File   Edit   Settings...   Help

Send Dispatch

To   From

- Kemmis' Brigade (Col. James Kemmis)
- Collins's Brigade (Lt. Col. R. Collins)
- Attached Artillery (Capt. Bull)
- Fifth Division (MG James Leith)
  - Leith's Brigade (Lt. Col. Barnes)
  - Spry's Brigade (BG W.F. Spry)
  - Ebens Brigade (Cor. Baron Eben)
  - Attached (Col. Douglas)
- Light Division (BG Robert Craufurd)
  - Beckwith's Brigade (Lt. Col. S. Beckwith)
  - Barclay's Brigade (Lt. Col. R. Barclay)
  - Division Artillery (Capt. Ross)
- Pack's Brigade (BG Denis Pack)
- Campbell's Brigade (BG W.H. Campbell)
- Coleman's Brigade (BG Francis Coleman)
- Ordinance Corps (Colonel Murray)
- Cavalry Division (LG Sir S. Cotton)
  - de Grey's Brigade (Col. Hon. G. de Grey)
  - Slade's Brigade (MG John Slade)
  - Anson's Brigade (MG George Anson)
  - Fane's Brigade (BG Hon. Henry Fane)
- Le Cor's Command (Cor. Carlos Le Cor)
  - Bradford's Brigade (Col. Thos. Bradford)
  - Militia Brigade (Cor. Trigueiros)

Custom recipient...

From: Col. Douglas, Attached (51, 92)   [3 left]

To: MG James Leith, Fifth Division (50, 128)

Message:

Routing units from Third Division streaming through Fifth Division. Reordering brigade to protect against enemy units coming from Third Division direction. Recommend reorienting Division to protect from attack on Division flank.

ETA: 4 turns   Send

Dispatch History

Received | Sent

- Turn 1
- Turn 5
- Turn 6
  - Skirmisher - 1s Cacadores -> Barclay's Brigade (Lt. Col. R. Barclay)
- Turn 8
  - Barclay's Brigade (Lt. Col. R. Barclay) -> Light Division (BG Rober
- Turn 9
  - Light Division (BG Robert Craufurd) -> British Army (LG Lord Wellir
  - Light Division (BG Robert Craufurd) -> Beckwith's Brigade (Lt. Col
  - Light Division (BG Robert Craufurd) -> Division Artillery (Capt. Ros

From:

To:

On turn 11, 1 hour and 15 minutes after the presence of French skirmish and regimental units near Sula was first reported by the British skirmish unit, Wellington finally knows about the sighting:

Envoy

File   Edit   Settings...   Help

Send Dispatch

To   From

- Kemmis' Brigade (Col. James Kemmis)
- Collins's Brigade (Lt. Col. R. Collins)
- Attached Artillery (Capt. Bull)
- Fifth Division (MG James Leith)
  - Leith's Brigade (Lt. Col. Barnes)
  - Spry's Brigade (BG W.F. Spry)
  - Ebens Brigade (Cor. Baron Eben)
  - Attached (Col. Douglas)
- Light Division (BG Robert Craufurd)
  - Beckwith's Brigade (Lt. Col. S. Beckwith)
  - Barclay's Brigade (Lt. Col. R. Barclay)
  - Division Artillery (Capt. Ross)
- Pack's Brigade (BG Denis Pack)
- Campbell's Brigade (BG W.H. Campbell)
- Coleman's Brigade (BG Francis Coleman)
- Ordinance Corps (Colonel Murray)
- Cavalry Division (LG Sir S. Cotton)
  - de Grey's Brigade (Col. Hon. G. de Grey)
  - Slade's Brigade (MG John Slade)
  - Anson's Brigade (MG George Anson)
  - Fane's Brigade (BG Hon. Henry Fane)
- Le Cor's Command (Cor. Carlos Le Cor)
  - Bradford's Brigade (Col. Thos. Bradford)
  - Militia Brigade (Cor. Trigueiros)

Custom recipient...

Dispatches delivered on turn 11

From: Light Division (BG Robert Craufurd)

To: British Army (LG Lord Wellington)

French skirmish and regimental activity observed along path and road approaching Sula

1 / 1

ETA: Send

Dispatch History

Received | Sent
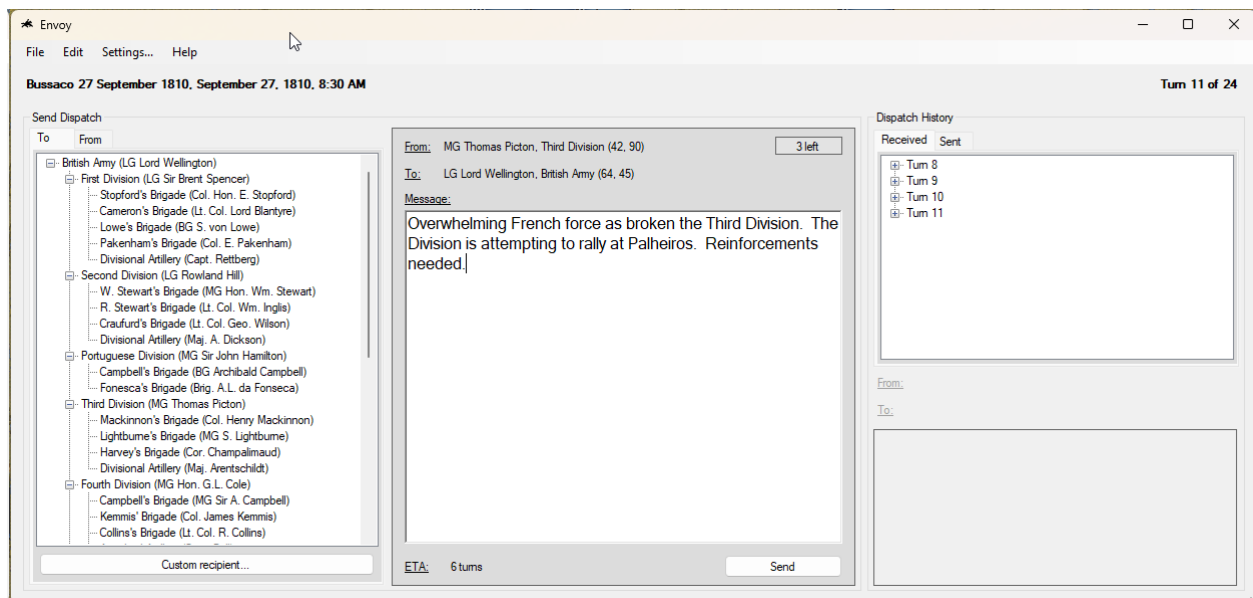
- Turn 8
- Turn 9
- Turn 10
- Turn 11

From:

To:

Wellington still does not know anything about the destruction of the British Third Division.

Meanwhile, Picton, the Third Division commander, has finally been able to stop running and is trying to reform his division near the fall back position of Palheiros.

Picton sends off another quick message to Wellington:

In the north, the Brigade commander of the skirmish unit that initially reported French activity south of Sula, rides towards the skirmish line to take a look. With the visibility clearing, Barclay observes a much larger French force and sends the following message:
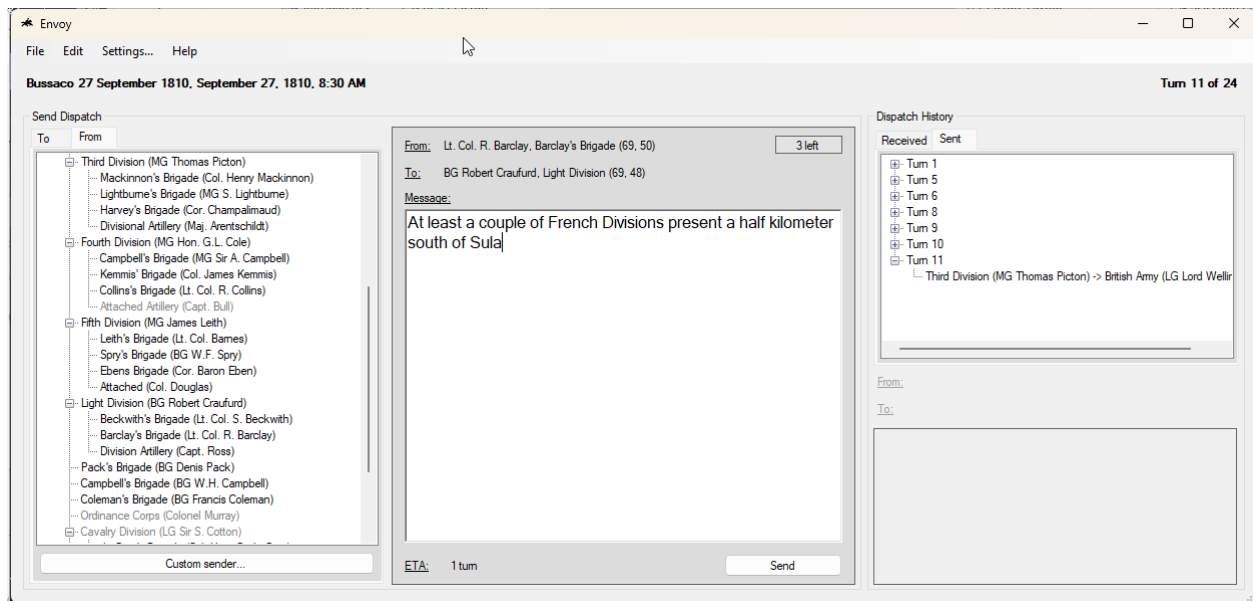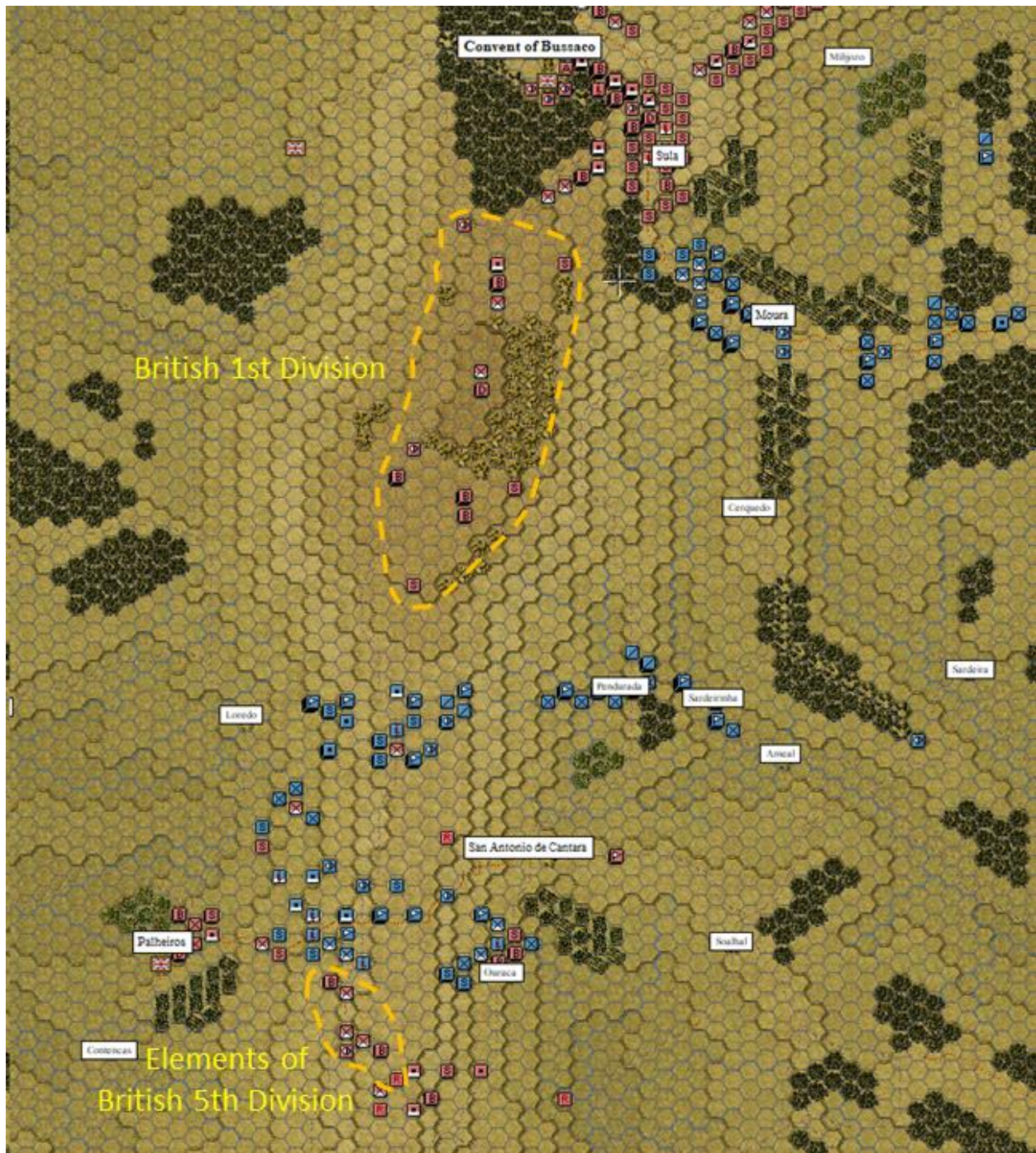
At last, on turn 13, the initial message from Wellington to the Portuguese Division leader, sent on turn 1, finally arrives. The long distance between Wellington and his Portuguese Division subordinate meant that delivery of the message took nearly three hours.
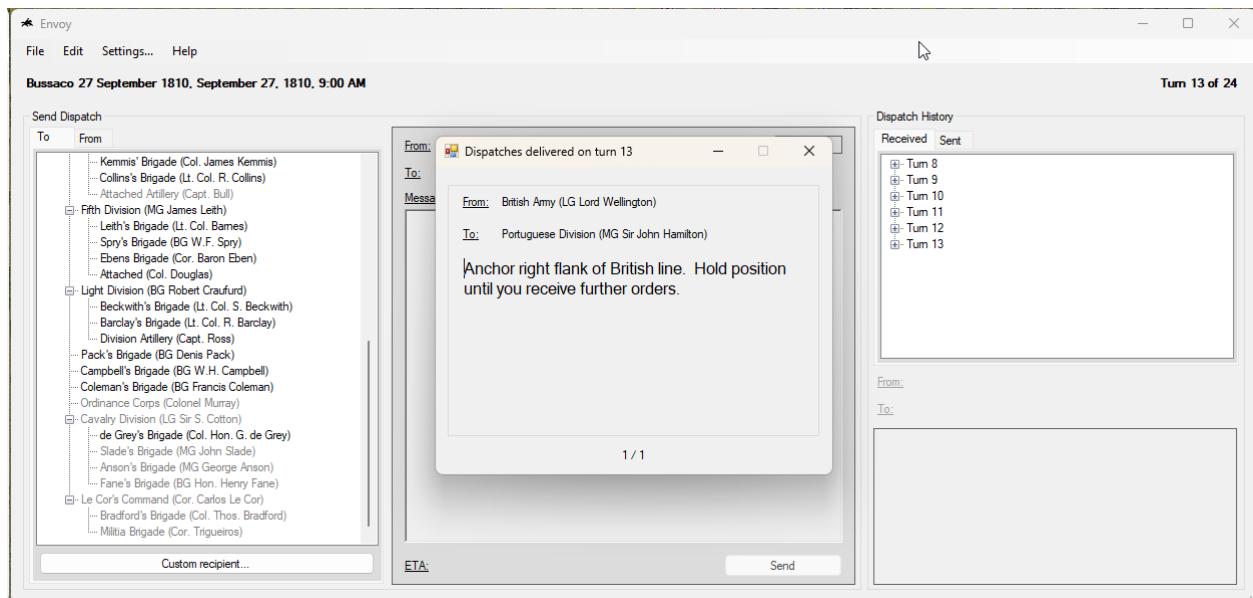

On the battlefield, the French continue to press their attack. At the start of the turn, the morning mist dissipates further (visibility up to 20 hexes) and the French disposition shows the 2e corp finishing off the British Third Division and setting up some defensive positions to prevent the British Fifth Division from pushing north. Notice the two skirmish units on the hill north of the French 2e corp. These skirmish units are attached to the British First Division and since they are visible to the French, the French will be visible to elements of the British First Division for the first time.

The French 8e corp continues their march and are within 1 km of heading up the hill towards the British First Division.

Looking at the British side, the units of the First Division are circled with a dashed line north of the French incursion. Elements of the French Fifth Division are circled with a dashed line south of the French incursion. The rest of the British units interspersed with the French 2e corp units are the remnants of the British Third Division.

Two British skirmisher units in the First Division can now see the French 2e corp and the French 8e corp. They dutifully make separate reports to their brigade leader:
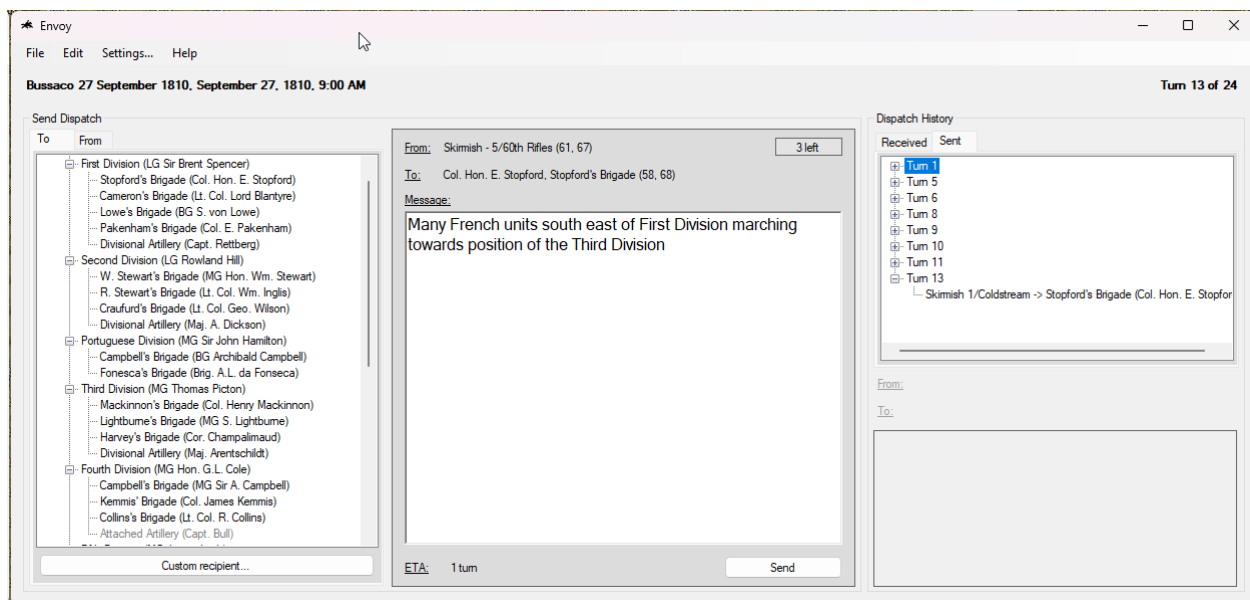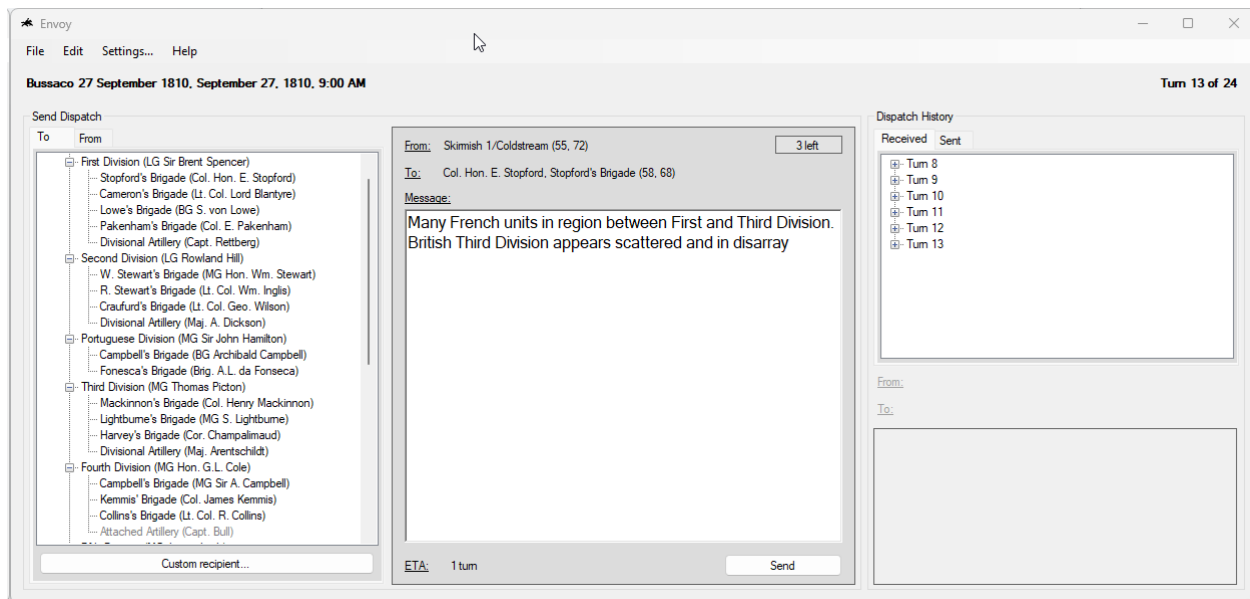
These two messages, from the 1st Division skirmishers to their brigade leader, will initiate a message to the First Division leader and then subsequently to Wellington. From this dispatch along the First Division chain of command, Wellington will learn about the rout of the Third Division and the strong French forces pouring through the British line. Several hours will have passed since the start of the French attack before the British can properly react to the French attack and the delay may end up being fatal.

Conclusion

As you have seen in this partial run-through of the battle of Bussaco, the use of delayed messages and orders drastically changes the way games are played and illustrates some of the challenges army commanders had in managing their forces on the field of battle. Armies that attack via unexpected avenues will force the enemy to react—and the sluggishness of that reaction, due to the delay in passing messages, can provide the attacker with a distinct advantage.

—Wallace Welder

A Final Note from Envoy's Author

Wallace has done an incredible job summarizing the use of *Envoy* above; I hope this serves as a jumping-off point, as I'm sure you can find novel uses for this tool in your own games. Please feel to reach out in the official forum thread to post descriptions of your Envoy games, as well as any comments or suggestions for improvements in future versions:

https://forum.wargameds.com/viewtopic.php?t=1096

Envoy is also an open-source application, and interested programmers are encouraged to make pull requests (although I recommend you start by raising an issue) on the GitHub page:

https://github.com/musurca/envoy/

—Nicholas Musurca

Addendum:

Modes of Controlling Armies in WDS Civil War, Napoleonic & Musket and Pike Games

Level 0: No FOW. Players play games knowing where all the enemy units are and can instantly move units to react to their opponents' moves. No Envoy.

Level 1: FOW on. Players are provided visibility to their opponents forces subject to game visibility rules. Initially, not much is known about the placement and size of the opposing forces, but the information grows as opposing sides clash. Players can still move their forces and react instantly to perceived enemy movement. No Envoy.

Level 2: FOW on. Players are provided visibility to their opponents forces subject to game visibility rules. Initially, not much is known about the placement and size of the opposing forces, but the information grows as opposing sides clash. The player's forces still know about everything that is visible, but each top-level force (e.g. Corp if Army/Corp/Div/Bde, Grand Division of Army/Grand Division/Division/Bde or Div if Army/Div/Bde) is required to follow an order (e.g. defend given location, advance to given objective and hold or attack right flank of enemy line). Orders are provided to each top-level force at the beginning of the game and this order can only be changed via an order passed from the Army commander via **Envoy**. Anything below the top-level force (e.g. Div/Bde of a Corp) is free to act with all knowledge about the enemy as long as the force remains in command range of their parent organization.

Level 3: FOW on. Same as Level 2, but need for an army organization to maintain orders and receive orders extends one level lower (e.g. Corp & Division of Army/Corp/Div/Bde) would be required to maintain and adhere to orders and would require an order passed via **Envoy** from their parent organization to change orders.

Level 4: FOW on. Same as Level 3 but treating visibility differently to account for how visibility differs between real life and how it is presented in the game. In the game, all units are visible subject to the FOW rules. In real life, units can only see what is directly visible to them. Two level 4 options are proposed to account for more limited "real life" visibility.

> **Level 4.1:** FOW on. Same as Level 3, but with visibility knowledge changes. While the player still will be able to see all enemy units via the visibility rules of the game, the visibility knowledge of each army element (e.g. Army/Corp/Div/Bde) is a function of the visibility of the lowest level units and messages passed up through the chain of command. In addition to maintaining orders for two levels of the organization like in Level 3 above, knowledge of visibility is also maintained by the player. The use of **Envoy** in the mini tutorial (Battle of Bussaco) is an example of this level of **Envoy** use. This level produces the most historically accurate behavior of an army but requires the player to keep track of the visibility knowledge of each element of army and use that knowledge as the basis for making decisions and sending subsequent orders.

> **Level 4.2:** FOW on. Same as Level 3, but with a reduction in the speed that messages travel between superiors and subordinates. This reduction in message speed abstractly accounts for the necessity to pass messages up the chain of command to inform superiors about spotting before superiors can subsequently send orders down the chain of command to respond to new

information about the location of the enemy, and the slowness of that two-way process. While less accurate than Level 4.1, it is easier to manage from a player's perspective since the visibility knowledge of the army order of battle doesn't need to be tracked by the player. This level abstracts all the various factors causing friction and delays of differing lines of sight without slowing play to determine exactly who-can-see-whom.