6.1 — Complete End-to-End Workflow

6.1.1 Step 1 — Create the bowler profile

Step 1 — Create the bowler profile

6.1.1 **KEY** workflow

Drilling your first ball in Spectre Cloud begins before you ever touch the drill press — it starts with setting up the bowler's profile. The **bowler profile** is the foundation every spec sheet, arsenal entry, and drilling history record is built on. Getting it right the first time means every future visit for that bowler is faster, more accurate, and fully traceable. This page walks through Step 1 of the complete first-ball workflow: creating the bowler profile from scratch.

□□ What a Bowler Profile Contains

A bowler profile in Spectre Cloud stores the identifying information that connects a person to all of their spec sheets and arsenal entries. At its most basic it requires only a name — but taking a few extra minutes to complete the full profile pays off every time that bowler returns to the shop.

- □ **Full name** — used to find the bowler quickly across search and the bowler list.
- □ **Contact information** — phone number and/or email for follow-up and ball-ready notifications.
- □ **Notes field** — free-text space for anything relevant: dominant hand, grip preferences, physical considerations, equipment history summary.
- □ **Address and consent signature** — available with the **Bowler Plus** plugin (`$5 USD/month`), useful for shops that maintain full client records or require a fitting consent form.

- **Photo gallery** — also available with Bowler Plus, for storing hand photos, span reference images, or before/after fitting documentation.

Creating a Bowler Profile on Desktop

1. From any screen, click the **BOWLERS** button in the top navigation menu.
2. The bowler list opens. Click the **+ New Bowler** button (top right of the list).
3. The new bowler form opens. Enter the bowler's **full name** in the Name field — this is the only required field.
4. Add a **phone number** and/or **email address** if available.
5. Add any relevant **notes** in the Notes field — dominant hand, grip style, known preferences, or anything useful for future visits.
6. If your shop uses the **Bowler Plus** plugin, complete the address fields and capture a consent signature if required by your shop policy.
7. Click **Save**. The profile is created and added to your bowler list immediately.

Creating a Bowler Profile on Mobile

1. Tap the **avatar icon** in the top navigation bar to open the bowler section.
2. Tap the **+ New Bowler** button.
3. Enter the bowler's **full name**. This is the only required field.
4. Add contact details and notes as available.
5. Tap **Save** to create the profile.

Tip: On mobile, the bowler form is optimised for quick entry — the name field is focused automatically when the form opens, so you can start typing immediately without tapping into the field first.

Checking for an Existing Profile First

Before creating a new profile, always search for the bowler to avoid duplicates. A bowler who visited a colleague's shift, or whose profile was created during a phone enquiry, may already exist in your system.

1. Open the **BOWLERS** list (desktop) or tap the **avatar icon** (mobile).
2. Use the **search bar** at the top of the list to search by first name, last name, or partial name.
3. If the bowler appears in results, open their existing profile rather than creating a new one.
4. If no match is found, proceed with creating a new profile as described above.

Note: Spectre Cloud does not automatically detect or merge duplicate profiles. If a bowler ends up with two profiles, their spec sheet history will be split between them. Keeping the bowler list clean from the start is easier than reconciling duplicates later.

Best Practices for the Notes Field

The Notes field is one of the most useful parts of the bowler profile for day-to-day shop operation. A well-maintained notes field means any staff member can pick up a returning bowler's visit without starting from scratch. Consider recording:

- Dominant hand — especially important in a busy shop where it is easy to assume.
- Grip type preference — fingertip, conventional, semi-fingertip.
- Any physical considerations — arthritis, injury history, unusual hand geometry.
- Equipment preferences — ball weight, surface preferences, brands the bowler likes or dislikes.
- Communication preferences — does this bowler prefer a call or a text when their ball is ready?
- Do not store sensitive personal information — medical details, financial information, or anything beyond what is relevant to the fitting relationship — in the Notes field unless your shop has a clear policy and the appropriate consent in place.

☁ Profile Sync and Availability

Once saved, the bowler profile is immediately available across all devices logged into your Spectre Cloud account. If you create a profile on your desktop at the counter and then move to a tablet at the drill press, the profile — and any spec sheets you attach to it — will be there waiting.

- Profiles sync instantly across devices on an active internet connection.

- The profile is visible to all staff members logged into the same shop account.
- If the account becomes inactive, profiles and their associated records remain accessible in read-only mode.

▶ What Comes Next

Once the bowler profile is saved, you are ready to move to Step 2: taking the bowler's hand measurements and entering them into a new spec sheet. The profile you just created will be the parent record that spec sheet is attached to — so every drilling decision made in the following steps is permanently linked to this bowler's history.

Related Sections

- 6.1.2 — Step 2: Taking and entering hand measurements
- 6.1.3 — Step 3: Setting span and pitch values
- 03.x — Bowlers (Clients): managing your bowler list
- 08.x — Account and Business: managing staff access
- 01.x — Getting Started: how to sign up and configure your shop

Tip: If a bowler is in a hurry and you only have time to enter a name before moving to the spec sheet, that is fine — you can always come back and fill in contact details and notes after the fitting. The name alone is enough to get the workflow moving.

6.1.2 Step 2 — Create a blank spec sheet for the ball

Step 2 — Create a blank spec sheet for the ball

> 6.1.2 workflow

With the bowler profile saved, the next step in the first-ball workflow is creating a **blank spec sheet** for the ball you are about to drill. The spec sheet is where all of the fitting data lives — span measurements, pitch values, oval cuts, layout, and drilling notes. Creating it now, before any measurements are taken, means you have a structured form ready to fill in as you work through the fitting. Nothing gets written on a scrap of paper and transferred later.

□□ What a Spec Sheet Is

A spec sheet in Spectre Cloud is a detailed drilling record tied to a specific bowler and a specific ball. It captures everything needed to drill that ball accurately — and everything needed to replicate or reference that drilling in the future. Each spec sheet belongs to exactly one bowler profile and represents one ball in that bowler's drilling history.

- □ A bowler can have any number of spec sheets — one per ball drilled, past and present.
- □ Spec sheets are stored permanently in the bowler's history. Previous drillings remain accessible even after a ball is retired or re-drilled.
- □ Spec sheets can be **cloned** — if a bowler is having the same ball re-drilled or a second ball drilled to the same specs, an existing sheet can be duplicated and adjusted rather than started from scratch.
- □ Spec sheets are linked to the bowler's **Arsenal** — the ball drilled on this sheet will appear in the bowler's equipment list once the sheet is complete.

□□ Creating a Blank Spec Sheet on Desktop

1. Open the bowler's profile by finding them in the **BOWLERS** list and clicking their name.
2. Inside the bowler profile, locate the **Spec Sheets** section.
3. Click **+ New Spec Sheet**.
4. A blank spec sheet form opens, pre-linked to this bowler's profile.
5. Enter a **ball name or identifier** in the Ball field — for example, the ball's brand, model, and weight (e.g., `Storm Phaze II 15lb`). This is the primary label used to identify this spec sheet in the bowler's history.
6. Select the **span type** for this drilling: **Full Span (F)**, **Cut to Cut (C)**, or **Oval (O)**.
7. Leave all measurement fields blank for now — you will fill these in during the fitting. Click **Save** to create the blank sheet, or proceed directly to entering measurements without saving first.

□□ Creating a Blank Spec Sheet on Mobile

1. Tap the **avatar icon** to open the bowler list and navigate to the bowler's profile.
2. Tap the **Spec Sheets** section within the profile.
3. Tap **+ New Spec Sheet**.
4. Enter the **ball name or identifier** and select the **span type**.
5. Tap **Save** or proceed directly to measurement entry.

□□ **Tip:** On a tablet at the drill press, keeping the spec sheet open on screen as you measure means you can tap values directly into the form without needing to remember or write them down. Spectre Cloud saves automatically as you work — there is no risk of losing data if you navigate away briefly.

□□ Choosing the Span Type

The span type determines how Spectre Cloud measures and records the distance between the thumb and finger holes. Select the type that matches how your shop measures spans — this choice affects how the Oval Calculator interprets the measurements you enter later.

Span type	Code	How it is measured	When to use

Full Span	F	From the back edge of the thumb hole to the back edge of the finger hole	Standard measurement for most fingertip and conventional fits
Cut to Cut	C	From the near edge of the thumb hole to the near edge of the finger hole	Used by some fitters and fitting systems as an alternative standard
Oval	O	Measured to the centre of the oval cut on the finger hole	Used when the oval is the primary span reference point

□□ **Note:** If you are unsure which span type to use, **Full Span (F)** is the most common choice for fingertip drilling and is the default in most IBPSIA-aligned fitting workflows. Match the span type to however you physically take the measurement — consistency between how you measure and what Spectre Cloud expects is what matters.

□□ Naming the Spec Sheet Well

The ball name or identifier you enter at this stage becomes the primary label for this spec sheet everywhere it appears in Spectre Cloud — in the bowler's spec sheet list, in their Arsenal, and on printed spec sheets. A clear, consistent naming convention across your shop makes it much easier to find and reference records later.

- □ Include **brand, model, and weight** as a minimum: `Hammer Black Widow 2.0 14lb`.
- □ Add a **surface finish or note** if relevant: `Roto Grip Hustle PBA 15lb — 2000 abralon`.
- □ For re-drillings of the same ball, add a **date or sequence number**: `Storm Proton 15lb — redrill 2`.
- □ Avoid vague identifiers like `Ball 1` or `New ball` — these become meaningless as the bowler's history grows.

□□ Using Clone Instead of New — When It Applies

If the bowler is having a second ball drilled to the **same or very similar specs** as one already in their history, cloning an existing spec sheet is faster than creating a blank one. The clone copies all measurement and pitch values from the source sheet, leaving you to update only what has changed — typically just the ball name and any minor adjustments.

- □ Use clone when drilling a second ball to the same layout and fit.
- □ Use clone as a starting point when a bowler wants minor changes to an existing fit — adjust from the clone rather than re-entering everything.

- Do not clone when the bowler is being fitted from scratch — start with a blank sheet so there is no risk of carrying forward outdated values.

For this first-ball workflow, a blank spec sheet is always the right starting point. The clone workflow is covered separately in Book 04 — Spec Sheets.

▶ What Comes Next

With a blank spec sheet created and named, you are ready to move to Step 3: taking the bowler's hand measurements and entering them into the sheet. The spec sheet is now open and waiting — every measurement you take in the next step has a field to land in.

Related Sections

- 6.1.1 — Step 1: Create the bowler profile
- 6.1.3 — Step 3: Taking and entering hand measurements
- 6.1.4 — Step 4: Setting span and pitch values
- 04.x — Spec Sheets: creating, cloning, and managing spec sheets
- 07.x — Arsenal: how spec sheets link to a bowler's equipment list

Tip: Get into the habit of creating the spec sheet *before* picking up the measuring tape. Having the form open and ready as you measure the bowler means nothing gets missed — you work through the fields in order rather than trying to remember a set of numbers while reaching for a pen.

6.1.3 Step 3 — Set grip type and enter finger measurements

Step 3 — Set grip type and enter finger measurements

> `6.1.3` workflow

With a blank spec sheet open, Step 3 is where the physical fitting begins. Before any spans or pitches are recorded, Spectre Cloud needs two foundational pieces of information: the bowler's **grip type** and their **finger measurements**. These inputs shape how the app interprets every span and pitch value that follows — getting them right here means the rest of the spec sheet builds on an accurate foundation.

□□ Setting the Grip Type

Grip type tells Spectre Cloud how the bowler's fingers sit in the ball and is the first field to set on any new spec sheet. It affects IBPSIA-standard auto-suggestions for pitch and span, and determines which measurement fields are active for this drilling.

Grip type	Description	Typical bowler profile
Conventional	Fingers inserted to the second knuckle	Beginners, recreational bowlers, older bowlers returning to the game
Fingertip	Fingers inserted to the first knuckle only	League and competitive bowlers seeking more revs and hook potential

Grip type	Description	Typical bowler profile
Semi-fingertip	Fingers inserted between first and second knuckle	Bowlers transitioning from conventional, or those needing a middle-ground feel

□□ **Note:** If a bowler is transitioning between grip types — for example, moving from conventional to fingertip for the first time — select the grip type for this drilling, not their previous one. Their historical spec sheets will retain the old grip type for reference.

□□ The Finger Measurements You Will Need

Once grip type is set, Spectre Cloud activates the finger measurement fields for the spec sheet. Have your measuring tape or fitting gauge ready before starting — it is fastest to measure the bowler once and enter everything in a single pass rather than going back and forth.

For a standard fingertip or conventional drilling, you will measure and enter the following for both the **middle finger** and **ring finger**:

- □ **Finger hole size** — the diameter of the hole needed to fit the finger comfortably. Measured with a fitting gauge or sized from inserts.
- □ **Knuckle size** — the diameter at the widest part of the finger knuckle that will pass through the hole. Used to ensure the hole is drillable to the correct size without binding.
- □ **First joint measurement** — the distance from the tip of the finger to the first knuckle crease, used in span calculation for fingertip fits.
- □ **Second joint measurement** — the distance from the tip of the finger to the second knuckle crease, used for conventional and semi-fingertip span reference.

□□ **Note:** Not all fields are required for every grip type. Spectre Cloud activates and requires only the measurements relevant to the selected grip type — fields that are not needed for the current drilling are grayed out or hidden.

□□ Entering Finger Measurements on Desktop

1. In the open spec sheet, locate the **Grip Type** selector and choose **Conventional**, **Fingertip**, or **Semi-fingertip**.

2. The finger measurement fields activate based on your selection.
3. Working with the bowler's hand in front of you, measure the **middle finger** first — hole size, knuckle size, and joint measurements as required.
4. Enter each value into the corresponding field for the middle finger.
5. Repeat for the **ring finger**.
6. Review the entered values before moving on — it is easier to correct a measurement now than after spans and pitches have been calculated from it.

□□ Entering Finger Measurements on Mobile

1. With the spec sheet open, tap the **Grip Type** field and select the appropriate type.
2. Tap into each finger measurement field in turn and enter the measured values using the numeric keyboard.
3. The form scrolls naturally through middle finger fields followed by ring finger fields — work through them in order.
4. Tap **Save** or allow auto-save to capture the entries before moving to the next step.

□□ **Tip:** On a tablet at the drill press, prop the device at an angle where you can see the screen and reach the bowler's hand simultaneously. Entering measurements directly as you take them is faster and more accurate than writing them on paper first.

□ Measuring Technique — Getting Accurate Values

Accurate finger measurements are the single biggest factor in a well-fitting drilling. A few centimetres of care here prevents a poorly fitting ball and an avoidable re-drill.

- □ **Measure the relaxed hand.** Ask the bowler to rest their hand flat on a surface, fingers together and naturally relaxed — not spread wide or tightly closed.
- □ **Measure the gripping hand.** For right-handed bowlers, measure the right hand. For left-handed bowlers, measure the left. Never assume — confirm dominant hand before measuring.
- □ **Use a proper fitting gauge** for hole and knuckle sizes rather than estimating from a ruler. The difference between a `31/32"` and a `1"` hole is significant in feel.
- □ **Measure joint distances with the finger slightly flexed** to the grip position — not fully extended flat. The joint crease changes position slightly between relaxed and

gripping.

- **For inserts:** if the bowler uses finger inserts, size the insert first, then enter the insert outer diameter as the hole size — not the finger measurement directly.
- Do not reuse measurements from a previous ball without re-measuring. Finger sizes change over time — weight changes, age, and injury all affect fit. A fresh measurement every visit is best practice.
- Do not assume symmetry between the middle and ring finger. They are almost always different — measure each independently.

Bowler Plus: Recording Hand Photos

If your shop uses the **Bowler Plus plugin** (`$5 USD/month`), you can attach hand photos to the bowler's profile as a visual reference alongside the numeric measurements. A photo of the bowler's hand in grip position, taken at this stage of the fitting, provides useful context for future visits — especially when a returning bowler cannot remember exactly what changed between their last two drillings.

- Photos are stored in the bowler's profile gallery, not on the individual spec sheet.
- They are accessible from any device on your account.
- Useful for documenting unusual hand geometry, scarring, or injury that affects the fitting approach.

▶ What Comes Next

With grip type set and finger measurements entered, Spectre Cloud has enough information to begin suggesting spans and pitches. Step 4 builds directly on the values you have just entered — the app uses them alongside the span type selected in Step 2 to populate IBPSIA-standard starting points for the fitting.

Related Sections

- 6.1.2 — Step 2: Create a blank spec sheet for the ball
- 6.1.4 — Step 4: Setting span and pitch values
- 6.1.5 — Step 5: Running the Oval Calculator on the new spec sheet
- 04.x — Spec Sheets: field reference and measurement guide
- 03.x — Bowlers (Clients): managing bowler profiles and history

 Tip: If you are fitting a new bowler who has never been drilled before and has no reference point for grip type, start with a brief conversation before picking up the measuring tape. Ask how often they bowl, what their goals are, and whether they have used fingertip equipment before. Two minutes of conversation almost always makes the grip type decision obvious — and occasionally reveals a fitting consideration that changes the approach entirely.

6.1.4 Step 4 — Enter thumb information (round or oval)

Step 4 — Enter thumb information (round or oval)

> 6.1.4 workflow

With grip type and finger measurements recorded, Step 4 turns to the thumb — the anchor of the grip and the hole that most directly influences a bowler's release. In Spectre Cloud, thumb entry goes beyond a single hole size: you will specify whether the thumb hole is **round or oval**, record the relevant measurements, and set pitch values that work in concert with the finger holes entered in the previous step. Getting the thumb right is often the difference between a ball a bowler loves and one they never quite connect with.

□□ Round vs. Oval Thumb Holes

The first decision in the thumb section is whether the thumb hole will be drilled **round** or **oval**. This is not a default — it is a deliberate fitting choice that should reflect how the bowler grips and releases the ball.

Thumb hole type	Description	When to use
Round	A standard cylindrical hole with no oval elongation	Most bowlers — conventional grip, standard fingertip, any bowler whose thumb seats cleanly in a round hole
Oval	An elongated hole, typically forward/back, to accommodate thumb shape or release preference	Bowlers with an oval-shaped thumb cross-section, those who prefer a more relaxed release, or where a round hole causes gripping tension

□□ **Note:** A thumb oval is separate from the finger ovals calculated by the Oval Calculator. Thumb ovals are entered manually based on the fitter's assessment — Spectre Cloud does not auto-suggest thumb oval sizes the way it does for finger ovals.

□□ Thumb Measurements to Enter

Regardless of whether the thumb hole is round or oval, Spectre Cloud requires the same core set of thumb measurements. Have your fitting gauge ready before beginning this section.

- □ **Thumb hole size** — the diameter of the finished hole. For round holes this is a single value; for oval holes it represents the base diameter before the oval is applied.
- □ **Thumb knuckle size** — the widest diameter of the thumb at the knuckle. Ensures the hole can be drilled large enough for the thumb to enter and exit cleanly.
- □ **Thumb pitch — forward/back** — the forward or reverse pitch applied to the thumb hole along the ball's forward axis.
- □ **Thumb pitch — left/right** — the lateral pitch applied to the thumb hole. Often zero for straightforward fits but critical for bowlers with a lateral thumb angle at release.
- □ **Oval size** (oval thumb holes only) — the amount of oval elongation applied to the thumb hole, expressed in fractions of an inch.
- □ **Oval direction** (oval thumb holes only) — the axis along which the thumb oval runs, typically forward/back.

□□ Entering Thumb Information on Desktop

1. In the open spec sheet, locate the **Thumb** section below the finger measurement fields.
2. Select **Round** or **Oval** from the thumb hole type selector.
3. Enter the **thumb hole size** and **thumb knuckle size** from your measurements.
4. Enter the **forward/back pitch** value for the thumb. Use a positive value for forward pitch and a negative value for reverse pitch, following Spectre Cloud's sign convention.
5. Enter the **left/right pitch** value. Enter `0` if no lateral pitch is required.
6. If **Oval** was selected, the oval size and direction fields activate — enter the oval size and confirm the direction.
7. Review all thumb values before proceeding. Thumb pitch errors are among the most common causes of a ball that feels wrong from the first throw.

□□ Entering Thumb Information on Mobile

1. Scroll to the **Thumb** section of the open spec sheet.
2. Tap the thumb hole type selector and choose **Round** or **Oval**.
3. Tap each measurement field in turn and enter values using the numeric keyboard.
4. If Oval is selected, the additional oval fields appear below — complete them before moving on.
5. Allow auto-save to capture entries, or tap **Save** before continuing.

□ Thumb Pitch — Getting It Right

Thumb pitch is one of the most consequential decisions in a drilling. Too much forward pitch and the thumb will feel locked in; too much reverse pitch and the thumb exits early, reducing control. The right value depends on the bowler's hand anatomy, release style, and what they are trying to achieve with this ball.

- □ **Start conservatively** for new bowlers or first-time fits. A modest forward pitch (`1/8"` to `1/4"`) is a safe baseline for most fingertip drillings.
- □ **For bowlers with a known history**, match or start close to the pitch values recorded on their most recent spec sheet — changes from a known baseline are easier to evaluate than starting from scratch.
- □ **Reverse pitch** (negative values) is appropriate for bowlers who grip tightly or whose thumb tends to hang in the ball through the release. It encourages an earlier, cleaner exit.
- □ **Lateral thumb pitch** corrects for bowlers whose thumb naturally angles left or right at release. A small amount of lateral pitch — often `1/8"` or less — can dramatically improve comfort and consistency.
- □ Do not copy thumb pitch values from a finger pitch without checking — finger and thumb pitch serve different biomechanical functions and the same value rarely makes sense for both.

□□ When to Choose an Oval Thumb Hole

Most bowlers do well with a round thumb hole. Choose oval for the thumb when:

- The bowler's thumb has a noticeably **oval cross-section** — wider side to side than front to back, or vice versa — that causes an uneven fit in a round hole.
- The bowler reports **gripping tension** or a tendency to squeeze the ball even with correct hole size — a slight forward oval on the thumb can relieve this by providing a more forgiving exit path.
- The bowler uses a **thumb slug** that has been ovalled — match the spec sheet to the physical slug dimensions.
- A previous fitter used an oval thumb and the bowler has adapted to it — maintaining continuity prevents an adjustment period with an otherwise identical drilling.
- Do not oval the thumb as a substitute for correcting pitch. If the bowler is gripping or hanging, evaluate pitch first — an oval on an incorrectly pitched hole solves the symptom, not the cause.

Thumb Slugs and the Spec Sheet

If the bowler uses a **thumb slug** rather than a drilled-direct thumb hole, enter the slug's outer diameter as the hole size and the slug's pitched bore dimensions as the pitch values. Spectre Cloud treats the thumb entry the same way regardless of whether a slug is used — the spec sheet records the finished hole geometry, not the method used to achieve it.

- Record the slug's **outer diameter** as the thumb hole size.
- Record the **pitched bore angle** of the slug as the thumb pitch values.
- Note the slug brand and model in the spec sheet's notes field for future reference — this helps when the slug needs to be replaced and the bowler cannot remember what they had.

Note: If your shop uses the **Arsenal Plus plugin** (`$5 USD/month`), additional ball and equipment details — including slug specifications — can be recorded against the ball entry in the bowler's Arsenal alongside the spec sheet.

▶ What Comes Next

With thumb information entered, the spec sheet now has a complete picture of the bowler's grip — finger measurements, grip type, and thumb details all in place. Step 5 uses this foundation to set the span and pitch values for the finger holes, completing the core measurement data that the Oval Calculator will use in Step 6.

Related Sections

- 6.1.3 — Step 3: Set grip type and enter finger measurements
- 6.1.5 — Step 5: Setting span and pitch values
- 6.1.6 — Step 6: Running the Oval Calculator on the new spec sheet
- 04.x — Spec Sheets: field reference and measurement guide
- 05.x — Oval Calculator: thumb oval settings and interaction

 Tip: When fitting a brand-new bowler with no drilling history, ask them to mime their release motion before you measure the thumb. Watch where the thumb naturally wants to exit — angled slightly left or right, early or late — and let that observation guide your initial pitch suggestion. A pitch that works with the bowler's natural release is always more comfortable than one that tries to correct it.

6.1.5 Step 5 — Select layout (VLS, 2LS, PAL, or manual)

Step 5 — Select layout (VLS, 2LS, PAL, or manual)

> 6.1.5 workflow

With the bowler's grip measurements and thumb information in place, Step 5 moves to the **ball layout** — the drilling angle that determines how the ball's core is oriented relative to the bowler's positive axis point (PAP). Layout selection in Spectre Cloud is handled through a dedicated layout section on the spec sheet, where you choose from a set of standard layout systems or enter a fully custom layout manually. The layout does not affect the grip fit, but it is recorded on the spec sheet as a permanent part of the drilling record and used in Arsenal tracking.

□□ What a Layout Is and Why It Is Recorded

A ball layout describes the geometric relationship between the bowler's PAP and the ball's pin and mass bias (MB) positions. Different layouts produce different ball motion profiles — earlier or later breakpoint, more or less flare potential, stronger or weaker backend reaction. Recording the layout in Spectre Cloud means it is permanently tied to this ball's drilling history, making it easy to replicate a ball that worked well or deliberately adjust a ball that did not.

- □ Layout is stored on the spec sheet and visible in the bowler's drilling history.
- □ It is linked to the ball's Arsenal entry, so the bowler's equipment list shows not just what ball they have but how it is drilled.

- Cloning a spec sheet copies the layout — useful when drilling a backup ball to the same setup.
- With the **Arsenal Plus plugin** (`$5 USD/month`), layout data feeds into suggested layout recommendations and 3D layout rendering.

The Four Layout Entry Options

Spectre Cloud supports four ways to enter a layout on a spec sheet, covering the most widely used layout systems in the pro shop industry as well as fully custom entry for shops that work outside standard frameworks.

VLS — Val Siebert Layout System

VLS defines a layout using three measurements from the PAP: **pin distance**, **VAL angle**, and **mass bias distance**. It is one of the most widely taught layout systems in IBPSIA education and is familiar to the majority of trained pro shop operators.

- Enter the **pin-to-PAP distance** in inches.
- Enter the **VAL angle** in degrees — the angle between the val (vertical axis line) and the pin, measured from the PAP.
- Enter the **mass bias distance** in inches — the distance from the PAP to the mass bias marker.

2LS — Two-Layout System

2LS uses two primary measurements to define the layout: the **pin buffer** (distance from the pin to the nearest finger hole edge) and the **CG placement** relative to the PAP. It is a streamlined system favoured by fitters who prefer a smaller number of input values.

- Enter the **pin buffer distance** in inches.
- Enter the **CG (centre of gravity) placement** — position relative to PAP or grip centre, depending on the system variant your shop uses.

PAL — Positive Axis Point Layout

PAL is a pure PAP-referenced layout system. All measurements are taken directly from the bowler's PAP — pin distance, pin angle, and MB angle are all expressed relative to that single reference point. It is commonly used by coaches and competitive bowlers who track layouts in relation to PAP position precisely.

- Enter the **pin-to-PAP distance** in inches.
- Enter the **pin angle** in degrees from the PAP.
- Enter the **MB (mass bias) angle** in degrees from the PAP.

□□ Manual — Custom Layout Entry

Manual layout entry is a free-form option for shops that use a proprietary layout system, work from manufacturer-specific drilling guides, or simply prefer to record layout information in their own terms. When Manual is selected, Spectre Cloud provides open text and numeric fields rather than a structured layout form.

- □ Use manual entry for **symmetrical ball layouts** that do not fit cleanly into PAP-referenced systems.
- □ Use manual entry when following a **manufacturer's recommended layout** expressed in the ball's drilling documentation rather than a standard system.
- □ Use manual entry for **balance hole documentation** or any supplementary drilling note that does not have a dedicated field in the structured layout options.
- □ Avoid manual entry for layouts you intend to replicate precisely in future — structured layouts (VLS, 2LS, PAL) are easier to reproduce from a spec sheet than freeform notes.

□□ Selecting and Entering a Layout on Desktop

1. In the open spec sheet, locate the **Layout** section.
2. Click the layout system selector and choose **VLS**, **2LS**, **PAL**, or **Manual**.
3. The relevant input fields appear based on your selection.
4. Enter each layout value from your drilling plan or PAP measurement.
5. If using Manual, type your layout notes and any relevant measurements into the open fields provided.
6. Review your entries — a layout recorded incorrectly is difficult to reconstruct after the ball has been drilled.

□□ Selecting and Entering a Layout on Mobile

1. Scroll to the **Layout** section of the open spec sheet.

2. Tap the layout system selector and choose the appropriate system.
3. Tap through each field that appears and enter your values using the numeric or text keyboard as required.
4. Allow auto-save to capture entries before moving to the next step.

□□ Arsenal Plus: Layout Recommendations and 3D Rendering

With the **Arsenal Plus plugin** active, the layout section gains two additional capabilities that go beyond record-keeping:

- □ **Suggested layouts** — based on the ball's core specifications (pulled from the bowlingdatabase.com integration) and the bowler's PAP, Arsenal Plus can suggest layout options appropriate for the ball and the bowler's desired ball motion.
- □ **3D layout rendering** — once layout values are entered, Arsenal Plus renders a three-dimensional visualisation of the pin and MB placement on the ball surface, giving both driller and bowler a clear picture of how the ball will be oriented.
- □ **Layout conversion** — Arsenal Plus can convert between layout systems, so a layout recorded in VLS can be viewed in PAL terms without manual recalculation.

□□ **Note:** Layout suggestions and 3D rendering require the ball's core specifications to be on file via the bowlingdatabase.com integration. If the ball is not in the database, layout entry proceeds manually as normal and the rendering feature is unavailable for that ball.

⚖ Choosing the Right Layout System for Your Shop

Layout system	Best for	Requires
VLS	IBPSIA-trained operators, shops following standard curriculum	PAP location, val angle measurement
2LS	Shops preferring streamlined entry, high-volume operations	Pin buffer and CG placement measurement
PAL	Coaches, competitive bowler specialists, PAP-focused fitters	Accurate PAP location, pin and MB angle measurement

Layout system	Best for	Requires
Manual	Custom workflows, manufacturer-guided layouts, supplementary notes	Nothing structured — open entry

Note: Most shops settle on one primary layout system and use it consistently across all spec sheets. Mixing systems across a bowler's history makes it harder to track how layout changes have affected ball motion over time. If your shop is transitioning from one system to another, note the changeover point in the bowler's profile so future reference is clear.

▶ What Comes Next

With the layout recorded, the spec sheet is now complete except for the span and pitch values for the finger holes — and the oval cuts that flow from them. Step 6 covers entering span and pitch, after which the Oval Calculator can be run to finalise the finger hole geometry before drilling begins.

Related Sections

- 6.1.4 — Step 4: Enter thumb information (round or oval)
- 6.1.6 — Step 6: Enter span and pitch values
- 6.1.7 — Step 7: Run the Oval Calculator
- 04.x — Spec Sheets: layout field reference
- 07.x — Arsenal: how layout data appears in ball tracking

Tip: If you are drilling for a bowler who does not know their PAP — common with newer bowlers or those coming from a shop that did not track it — take a few minutes to locate it before committing to a layout. A layout entered against an estimated PAP is less reliable than one anchored to a measured position, and it is much easier to find the PAP now than to explain an unexpected ball reaction after the ball has been drilled.

6.1.6 Step 6 — Add ball to the arsenal section

Step 6 — Add ball to the arsenal section

> `6.1.6` workflow

Before drilling begins, Step 6 takes a short detour from the spec sheet to register the ball itself in Spectre Cloud's **Arsenal** section. The Arsenal is the bowler's equipment inventory — a permanent record of every ball they own, past and present, each linked to its drilling history. Adding the ball to the Arsenal now, while the spec sheet is still open, creates the connection between the physical equipment and the drilling record before anything is cut. It takes less than a minute and means the bowler's inventory is always current.

□□ What the Arsenal Is

The Arsenal in Spectre Cloud is a per-bowler ball inventory. Each entry represents one physical ball and stores identifying information about that ball alongside links to its associated spec sheets. Over time, a bowler's Arsenal becomes a complete picture of their equipment history — what they have had drilled, how each ball was set up, and what is currently in their bag.

- □ Each Arsenal entry belongs to one bowler and represents one ball.
- □ A ball can have multiple spec sheets linked to it — one for each time it has been drilled or re-drilled.
- □ Arsenal entries persist even after a ball is retired or sold — the history stays on the record.
- □ With the **Arsenal Plus plugin** (`$5 USD/month`), entries are enriched with data from the bowlingdatabase.com integration, barcode scanning, suggested layouts, layout

conversion, and 3D layout rendering.

□□ Information Recorded in an Arsenal Entry

When you add a ball to the Arsenal, Spectre Cloud asks for the key identifying details of the physical ball. At minimum you need the ball name — the same identifier used on the spec sheet — but a complete entry includes:

- □ **Ball name** — brand, model, and weight (e.g., `Storm Proton Physix 15lb`). Should match the ball name entered on the spec sheet for easy cross-reference.
- □ **Serial number** — the manufacturer's serial number printed on the ball surface. Useful for warranty claims, ball returns, and distinguishing between two identical models in the same bag.
- □ **Purchase date** — when the bowler acquired the ball. Helpful for tracking equipment age and warranty periods.
- □ **Status** — whether the ball is **Active** (currently in the bag), **Retired** (no longer in use), or **Sold**. Keeping status current means the bowler's active bag is always accurate at a glance.
- □ **Notes** — free-text field for surface maintenance history, weight hole details, or any other ball-specific information worth retaining.

□□ Arsenal Plus: Barcode Scanning and Database Lookup

With **Arsenal Plus** active, adding a ball to the Arsenal gains two significant time-saving features:

- □ **Barcode scanning** — scan the barcode on the ball's box or surface and Spectre Cloud looks up the ball automatically in the bowlingdatabase.com integration, pre-filling the brand, model, weight, and core specifications without manual entry.
- □ **Database lookup** — search by ball name if scanning is not available. The bowlingdatabase.com integration returns full ball specifications including core type, RG, differential, and MB differential — all stored against the Arsenal entry for use in layout suggestions and 3D rendering.

□□ **Note:** Barcode scanning is available on any device with a camera — desktop with webcam, tablet, or smartphone. On mobile it uses the device camera directly; on desktop it opens a camera

input prompt. If the ball is not found in the database, the entry is completed manually as normal.

□□ Adding a Ball to the Arsenal on Desktop

1. From the bowler's profile, locate the **Arsenal** section.
2. Click **+ Add Ball**.
3. If Arsenal Plus is active, choose whether to **scan a barcode**, **search the database**, or **enter manually**. Without Arsenal Plus, proceed directly to manual entry.
4. Enter the **ball name** — use the same name entered on the spec sheet created in Step 2.
5. Enter the **serial number**, **purchase date**, and any relevant **notes**.
6. Set the ball's **status** to **Active** — it is going into the bag.
7. Click **Save**. The ball appears in the bowler's Arsenal immediately.
8. Return to the spec sheet and confirm the ball name matches the Arsenal entry — this is how the two records stay linked.

□□ Adding a Ball to the Arsenal on Mobile

1. Navigate to the bowler's profile and tap the **Arsenal** section.
2. Tap **+ Add Ball**.
3. If Arsenal Plus is active, tap **Scan Barcode** to open the camera, or tap **Search** to look up the ball by name. Otherwise proceed to manual entry.
4. Enter or confirm the ball details — name, serial number, purchase date, status, and notes.
5. Tap **Save**.

□□ **Tip:** On mobile, barcode scanning is the fastest way to add a new ball — point the camera at the barcode on the ball box and the entry fills itself in within seconds. Keep the ball box nearby during the fitting for exactly this reason.

□□ How the Arsenal Entry and Spec Sheet Stay Connected

Spectre Cloud links Arsenal entries and spec sheets through the ball name. When a spec sheet is saved with a ball name that matches an Arsenal entry, the two records are associated — the spec sheet appears in the ball's drilling history within the Arsenal, and the Arsenal entry is accessible from the spec sheet. To keep this connection clean:

- Use **identical ball names** on both the Arsenal entry and the spec sheet. A minor variation — `Storm Proton 15lb` vs. `Storm Proton Physix 15lb` — can break the association.
- When a ball is **re-drilled**, create a new spec sheet and link it to the existing Arsenal entry — do not create a new Arsenal entry for the same physical ball.
- When a ball is **retired or sold**, update its status in the Arsenal rather than deleting the entry. The associated spec sheets remain accessible in the bowler's history.
- Do not create duplicate Arsenal entries for the same physical ball — if an entry already exists for a re-drill visit, open the existing entry and add the new spec sheet to it.

⚖ Core Plan vs. Arsenal Plus — What Each Includes

Feature	Core plan	Arsenal Plus
Add balls to Arsenal		
Link spec sheets to Arsenal entries		
Ball status tracking (Active / Retired / Sold)		
Barcode scanning		
bowlingdatabase.com integration		
Suggested layouts		
Layout conversion		
3D layout rendering		

▶ What Comes Next

The ball is now in the bowler's Arsenal and the spec sheet is open with grip type, finger measurements, thumb details, and layout all recorded. Step 7 returns to the spec sheet to enter span and pitch values — the final measurements needed before the Oval Calculator can be run and the drilling can begin.

Related Sections

- 6.1.5 — Step 5: Select layout (VLS, 2LS, PAL, or manual)
- 6.1.7 — Step 7: Enter span and pitch values
- 6.1.8 — Step 8: Run the Oval Calculator
- 07.x — Arsenal: managing your bowler's ball inventory
- 07.x — Arsenal Plus: barcode scanning and database integration

 Tip: If the bowler brought in an existing ball for a re-drill rather than a new purchase, check the Arsenal before creating any new entries — the ball may already be registered from a previous visit. Open the existing entry, confirm the details are still accurate, and create a new spec sheet linked to it rather than starting a duplicate record from scratch.

6.1.7 Step 7 — Review, print, or share the spec sheet

Step 7 — Review, print, or share the spec sheet

> 6.1.7 workflow

With the spec sheet complete and the ball registered in the Arsenal, Step 7 is the last checkpoint before drilling begins. This is the moment to **review every value on the spec sheet**, catch anything that looks wrong while it is still easy to fix, and get the spec sheet into whatever format your shop uses at the drill press — printed, displayed on screen, or shared with a colleague. A two-minute review here prevents a re-drill later.

□□ Reviewing the Spec Sheet Before Drilling

Before printing or sharing, read through the completed spec sheet from top to bottom. Work through it systematically — not just the values you just entered, but the full record. Errors introduced in earlier steps are easiest to catch and correct now.

Check the following in order:

1. **Bowler name and profile** — confirm the spec sheet is attached to the correct bowler. In a busy shop it is possible to create a spec sheet on the wrong profile.
2. **Ball name** — confirm it matches the Arsenal entry exactly. Mismatches break the link between the two records.

3. **Span type** — Full Span, Cut to Cut, or Oval. Confirm this matches how the spans were physically measured.
4. **Grip type** — Conventional, Fingertip, or Semi-fingertip. Confirm it reflects the actual fitting intent.
5. **Finger hole sizes and knuckle sizes** — check both middle and ring finger values. A transposed digit here produces the wrong hole size at the press.
6. **Span measurements** — middle and ring finger spans. Confirm they are in the expected range for this bowler's hand size and grip type.
7. **Finger pitch values** — forward/back and lateral pitch for both fingers. These should be consistent with each other and with what was discussed during the fitting.
8. **Thumb hole type** — round or oval. Confirm this matches the physical plan.
9. **Thumb hole size and pitch values** — forward/back and lateral. Confirm pitch direction signs are correct — a forward pitch entered as reverse, or vice versa, produces the opposite of the intended fit.
10. **Oval cut values** — size, angle, and V/H breakdown. Confirm these look consistent with the oval settings configured in the Oval Calculator section.
11. **Layout** — confirm the system (VLS, 2LS, PAL, or Manual) and values match your drilling plan.
12. **Notes** — review any free-text notes on the spec sheet or bowler profile that are relevant to this drilling.

□□ **Note:** If you find an error during review, correct it on the spec sheet before printing or drilling — do not mark up a printed copy and work from that. Keeping the digital record accurate ensures the bowler's history is reliable for every future visit.

□□ Printing the Spec Sheet

Many pro shop operators prefer a printed spec sheet at the drill press — it stays flat on the bench, does not require a screen nearby, and can be signed off or annotated by hand as the drilling progresses.

□□ Printing on Desktop

1. With the spec sheet open, click the **Print** button (typically a printer icon or a Print option in the spec sheet action menu).
2. Spectre Cloud generates a print-formatted version of the spec sheet — laid out cleanly for an A4 or US Letter page.
3. Your browser's print dialog opens. Select your printer, confirm page size and orientation, and print.
4. Check the printed sheet against the screen before walking to the drill press — confirm no values were cut off or reformatted unexpectedly.

Printing from Mobile or Tablet

1. With the spec sheet open, tap the **Print** or **Share** button.
2. On iOS/iPadOS, this opens the system share sheet — select **Print** to send to an AirPrint-compatible printer, or select **Save to Files** to export as a PDF.
3. On Android, the print option routes through the system print service — select your printer or save as PDF.
4. If your shop's printer is not directly accessible from the tablet, use the PDF export option and send the file to a connected computer for printing.

Tip: If your shop keeps a dedicated tablet or laptop at the drill press, printing may be unnecessary entirely — the spec sheet can be displayed directly on that device and referenced on screen throughout the drilling. Many operators prefer this workflow as it eliminates paper handling and keeps the record immediately editable if a last-minute adjustment is needed.

Sharing the Spec Sheet

Spectre Cloud allows spec sheets to be shared in several ways — useful when a second driller is doing the work, when a spec sheet needs to be sent to a customer for approval, or when a shop owner wants to review a fitting remotely.

- **Share as PDF** — export the spec sheet as a formatted PDF file that can be emailed, messaged, or saved to cloud storage. Works on all devices.
- **Share via link** — if Spectre Cloud supports shareable spec sheet links in your account tier, a direct URL to the spec sheet can be copied and sent to anyone with Spectre Cloud access.
- **In-account access** — any staff member logged into the same shop account can open the spec sheet directly from the bowler's profile without it needing to be explicitly shared.

⚠ **Verify with Spectre team:** Confirm which sharing options are available on the core plan vs. any plugin or account tier — specifically whether shareable links require a particular subscription level.

Using the Spec Sheet at the Drill Press

Whether you are working from a printed sheet or a screen, keep the following habits at the press:

- **Read the full spec sheet before picking up a drill bit** — do not jump straight to the hole sizes. A quick full read catches anything that was missed in the review step.
- **Mark off each hole as it is drilled** — on a printed sheet, tick each value as it is used. On screen, scroll through the spec sheet methodically. Skipping a field mid-drilling is a common source of errors in busy shops.
- **Double-check pitch direction** — before setting pitch on the press, confirm whether a value is forward or reverse. This is the most common single-field error made at the press.
- **Confirm oval V/H values match your press orientation** — if you have recently changed equipment or if a different driller set up the press, verify that Flip V/H is configured correctly before cutting any ovals.
- Do not rely on memory for any value once you have stepped away from the spec sheet — even briefly. Always return to the record before continuing.

Making Last-Minute Adjustments

If the bowler requests a change after the spec sheet has been reviewed but before drilling starts — a common occurrence — update the spec sheet in Spectre Cloud *first*, then re-review the affected values before proceeding. Do not make an undocumented change at the press and plan to update the record afterward. In a busy shop, undocumented adjustments get forgotten, and the bowler's history becomes unreliable.

1. Return to the spec sheet in Spectre Cloud.
2. Make the adjustment to the relevant field.
3. If the change affects oval calculations, re-run the Oval Calculator before printing or proceeding.
4. If a new printed copy is needed, reprint — do not hand-annotate the old one.

▶ What Comes Next

The spec sheet has been reviewed, the ball is in the Arsenal, and the drilling record is accurate and complete. Step 8 is the last step in this workflow: drilling the ball. From this point, Spectre Cloud's job shifts from data entry tool to reference record — the spec sheet stays open at the press, and every hole drilled is matched against the values on screen or on paper.

Related Sections

- 6.1.6 — Step 6: Add ball to the Arsenal section
- 6.1.8 — Step 8: Drill the ball and mark the job complete
- 04.x — Spec Sheets: editing, cloning, and managing records
- 07.x — Arsenal: managing your bowler's ball inventory

- 09.x — Tips, Troubleshooting and Reference: common drilling errors

 Tip: Develop a consistent pre-drill ritual — review, print or display, read once more at the press before touching the ball. The few minutes this takes pays back many times over across a season of drillings. The shops with the fewest re-drills are almost always the ones with the most disciplined spec sheet habits, not necessarily the most experienced drillers.

6.1.8 Common mistakes on the first ball and how to avoid them

Common mistakes on the first ball and how to avoid them

6.1.8 TIP guide

Even experienced pro shop operators make mistakes on a first-ball drilling — not because they do not know what they are doing, but because first-ball fittings involve more variables, more decisions, and more data entry than a routine re-drill. This page collects the most common mistakes that occur across the Steps 1–7 workflow and explains exactly how to catch each one before it reaches the bowler's ball.

⚠ Mistake 1 — Creating a Duplicate Bowler Profile

Skipping the search step and creating a new profile for a bowler who already exists in the system splits their spec sheet history across two records. Future visits pull up only half the picture, and merging duplicates has to be done manually.

- **Always search before creating.** Enter the bowler's first name, last name, and a partial name in the search bar before touching the + New Bowler button.
- Search for common name variations — a bowler registered as "Rob" may come in asking for "Robert."
- If a duplicate is discovered after the fact, note both profile URLs and contact the Spectre team — do not attempt to reconcile records by manually copying spec sheets between profiles.

⚠ Mistake 2 — Wrong Span Type Selected

Selecting Full Span when the measurement was taken Cut to Cut — or vice versa — introduces a systematic error into every span value on the spec sheet. The Oval Calculator then works from incorrect inputs, and the finished holes are in the wrong position on the ball surface.

- **Decide your span type before measuring** and write it at the top of any paper notes. The measuring technique and the spec sheet selection must match.
- Make span type part of your shop's standard intake checklist — not a decision made mid-fitting.
- If you are unsure which type a legacy spec sheet used, do not carry the values forward — re-measure the bowler and create a fresh spec sheet with a confirmed span type.

⚠ Mistake 3 — Measuring the Wrong Hand

Measuring a right-handed bowler's left hand — or forgetting to confirm dominant hand altogether — is more common than it should be, particularly with ambidextrous bowlers or those who perform other tasks left-handed. The resulting fit will feel wrong from the first throw and the cause will not be immediately obvious.

- **Confirm dominant bowling hand verbally** before picking up the measuring tape. Ask specifically — "which hand do you bowl with?" — rather than assuming.
- Note the dominant hand in the bowler's profile Notes field so it is visible on every future visit without needing to ask again.
- For two-handed bowlers, confirm which hand holds the ball and measure accordingly.

⚠ Mistake 4 — Transposed Finger Measurements

Entering the ring finger hole size in the middle finger field, or swapping joint measurements between fingers, is an easy error in a busy shop — especially when measuring and typing simultaneously. The drilled holes end up the wrong size on the wrong finger.

- **Enter measurements one finger at a time** — complete all fields for the middle finger before moving to the ring finger. Do not jump between them.
- Say each measurement out loud as you enter it: "Middle finger, hole size, 31/32." The verbal confirmation catches transpositions before they are saved.
- During the Step 7 review, check that middle and ring finger values are in plausible relationship to each other — the ring finger is typically narrower than the middle, so a ring finger hole size larger than the middle finger is a flag worth investigating.

⚠ Mistake 5 — Incorrect Pitch Sign (Forward vs. Reverse)

Entering a forward pitch value where reverse was intended — or leaving a sign as positive when it should be negative — produces a hole pitched in the opposite direction to the fitting plan. This is one of the hardest errors to catch visually on a finished ball and one of the most disruptive to a bowler's release.

- **Review pitch signs explicitly during Step 7** — do not just check the number, check the direction. Read each pitch value as "X forward" or "X reverse" rather than just a number.
- If a bowler has existing spec sheets, compare the new pitch values to their history. A sign reversal that contradicts several previous drillings without explanation is almost certainly an error.
- At the press, confirm pitch direction on the machine before drilling — not just on the spec sheet. The physical press setting is the last line of defence.

⚠ Mistake 6 — Ball Name Mismatch Between Spec Sheet and

Arsenal

A minor difference in how the ball is named on the spec sheet versus the Arsenal entry — a missing word, different capitalisation, or an abbreviated model name — breaks the link between the two records. The spec sheet and the Arsenal entry exist as unconnected islands, and the bowler's drilling history becomes fragmented.

- **Copy the ball name from one record to the other** rather than retyping it. Paste from the spec sheet into the Arsenal entry or vice versa.
- Establish a shop-wide naming convention — brand, model, weight, in that order — and apply it consistently to both records.
- During the Step 7 review, open the Arsenal entry side by side with the spec sheet and visually confirm the names match character for character.

⚠ Mistake 7 — Oval Calculator Run Before Pitch Values Are Final

Running the Oval Calculator and noting the output, then changing a pitch value afterward, means the oval cut values on the spec sheet no longer reflect the current inputs. The printed spec sheet shows an oval calculated for the old pitch — and the finished hole is drilled to the wrong geometry.

- **Treat the Oval Calculator as the last measurement step**, not an intermediate one. All pitch and span values should be final and confirmed before running it.
- If a pitch value is changed after the Oval Calculator has been run, re-run the calculator immediately. Do not assume the change was small enough not to matter.
- The Step 7 review should always include checking whether the oval values are consistent with the current pitch inputs — if a pitch was adjusted late in the fitting, the ovals are the most likely casualty.

⚠ Mistake 8 — Flip V/H Configured Incorrectly for the Press

Drilling the oval on the wrong axis — producing a hole elongated side to side rather than forward and back — is the most visually obvious mistake on this list, but it still makes it through to a finished ball more often than it should. It always traces back to a Flip V/H setting that does not match the press in use.

- **Verify Flip V/H as part of shop setup**, not after the first customer complaint. Run a test hole on a plug or scrap ball when setting up a new device or changing drill presses.
- In multi-driller shops, confirm that each operator's device has Flip V/H configured for their specific press — not inherited from a colleague's device.
- If a completed ball has an oval on the wrong axis, plug the affected hole, correct the Flip V/H setting, and redrill before returning the ball. Do not return a ball with a visibly misoriented oval.

⚠ Mistake 9 — Layout Recorded After Drilling

Completing the drilling and then returning to the spec sheet to fill in the layout from memory introduces recall errors — especially in a busy shop where several balls may be drilled in a day. A layout recorded after the fact is also impossible to verify against the physical ball without re-measuring.

- **Record the layout before drilling begins**, as described in Step 5. The spec sheet is a pre-drilling plan, not a post-drilling report.
- If a last-minute layout change is made at the press, update the spec sheet immediately — before drilling the next ball — while the details are still fresh.
- For shops using Arsenal Plus, the 3D layout rendering provides a visual confirmation that the recorded layout matches the physical drilling plan before any cuts are made.

⚠ Mistake 10 — Skipping the Pre-Drill Review

The Step 7 review exists precisely because data entry errors are inevitable in a hands-on, fast-moving environment. Skipping the review — or treating it as a formality rather than a genuine check — means errors that could have been caught on screen get caught on the ball instead.

- **The review is not optional.** Build it into every first-ball workflow as a non-negotiable step, regardless of how familiar you are with the bowler or how straightforward the fitting appeared.
- Review the spec sheet on screen first, then again on the printed copy at the press. Two passes catch more than one.
- For new staff members, have a second person review the spec sheet until the driller has completed at least ten first-ball fittings independently. Fresh eyes are the cheapest

quality control available.

□□ Pre-Drill Checklist — Quick Reference

Use this checklist as a final pass before drilling begins. Every item should be confirmed before picking up a drill bit.

Check	What to verify
Bowler profile	Correct bowler, no duplicate profile
Ball name	Matches Arsenal entry exactly
Dominant hand	Confirmed verbally, noted in profile
Span type	Matches measurement method used
Grip type	Reflects fitting intent
Finger measurements	Middle and ring entered in correct fields, sizes plausible
Pitch values	Signs confirmed — forward vs. reverse for every hole
Thumb entry	Round or oval confirmed, pitch values correct
Oval Calculator	Run after all pitch and span values finalised
Flip V/H	Confirmed correct for this press
Layout	Recorded and consistent with drilling plan
Arsenal entry	Ball added, status set to Active

Related Sections

- 6.1.1 — Step 1: Create the bowler profile
- 6.1.2 — Step 2: Create a blank spec sheet for the ball
- 6.1.3 — Step 3: Set grip type and enter finger measurements
- 6.1.4 — Step 4: Enter thumb information (round or oval)
- 6.1.5 — Step 5: Select layout (VLS, 2LS, PAL, or manual)
- 6.1.6 — Step 6: Add ball to the Arsenal section
- 6.1.7 — Step 7: Review, print, or share the spec sheet
- 09.x — Tips, Troubleshooting and Reference: drilling errors and corrections

□ **Tip:** Print this checklist and laminate it. Keep one copy at the counter for the fitting stages and one at the drill press for the pre-drill review. A physical checklist that gets ticked off by hand is more reliable than one that exists only on screen — it is harder to skip a step when there is a box

waiting to be checked.