

SHARPSHOOTER GOLD

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Start here and find help

■ Drop a file in or choose it

Every import - a BHA sheet, a plan, surveys, an EDR file, an AC report, a backup - opens a small window first: drag the file from File Explorer onto it, or press Choose file for the usual Windows window. It says which file types the import takes, and a file it does not take is refused with the reason.

■ Open SharpShooter Gold

Extract the complete app ZIP before opening the executable. Keep its app, runtime and Support folder together. A subscription copy is downloaded from sharpshootergold.com; a dated demo package comes from your software supplier.

■ Updates from the internet

SharpShooter looks on sharpshootergold.com for an update a minute after it opens and every 12 hours, and asks first. Install update adds the new program files beside the old ones; your jobs, settings and everything it has learned stay as they are. Restart now opens the new version. Later waits a day, Skip this version waits for the next. File > Check for updates looks now and turns the automatic check on or off. Only updates signed by SharpShooter are taken.

■ Accept the agreement

The customer licence agreement is shown the first time the program opens on a computer, and again when it changes. Read it, tick the box and choose I agree and continue. Save a copy keeps the text; acceptance is recorded on this computer only. Slide recommendations are advisory: whether, where, how far and at what toolface to slide is the directional driller's decision (section 4.3).

■ Find an answer

Open the three-dot menu at the top-left of the black and gold sidebar and select Help. Type a question in What do you need help with? and choose Find help. Select a matching result to display that PDF page. Previous page and Next page let you continue reading. View setup PDF opens the complete guide. Online help & support opens the website, and Ask the assistant answers from these guides when the computer has internet.

■ Choose a sheet

The left sidebar opens Survey sheet, 3D view, Plan view, Vertical section, Downlinks (rotary steerable jobs), BHA, Learning, Pressure, Geosteering, Proposal, Offset wells, Reports and Job settings. The Engineering menu at the top opens Well control, Hydraulics, Torque and drag, BHA tendency, Cementing, AC plots and the magnetic model (section 14). The menu scrolls when the window is short. Pin the sidebar open or let it hide when more workspace is needed.

■ Windows beside the program

Rig activity, the rig data feed, Real Time AC, the 3D chart and the phone and office windows sit beside the program: click the slide sheet and it comes to the front. Move them aside or onto another screen and keep working; they close with SharpShooter. Real Time AC stays on top only when Keep on top is ticked.

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Start here and find help (continued)

■ Save your work

Save keeps the active database. Save As makes a separately named database. Back up database includes every job and its stored documents. Jobs are local to the computer unless you copy or share a database.

■ The phone app

Phone slide sheet.md beside the program explains pairing an Android phone to this computer and what the driller sees. The app, SharpShooter Gold for Android, is on Google Play; the computer shows a code to scan. The connection stays on while SharpShooter is open, follows the job you open (the phone signs itself back in), and comes back by itself the next time SharpShooter opens if it was on. Stop phone connection turns it off until you start it again.

■ Satellite ground on the phone

The phone's chart shows the same satellite picture of the pad the computer does, under the well in Plan view and 3D, with a Satellite on/off button beside the view buttons. The computer sends only where the pad is; the phone fetches the picture straight from Mapbox and keeps it for 30 days - as long as Mapbox allows - so it draws with no signal in between and is fetched again after that. It needs the pad latitude and longitude on the well plan - without them the chart says so instead of doing nothing. Not shown in Vertical section, where a square of ground is only a line. Phone app 1.4.2 and up.

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Database menu, backup and recovery

■ Create or open a database

File > Create new database starts an empty one. Open database opens an existing file. The active database name is shown in the window title.

■ Use a different database

Opening another database leaves the previous one untouched on disk. Jobs do not move between databases; copy the file, or export and import the data you need.

■ Make backups

Back up database writes a single file containing every job, its surveys, slides, plans and stored documents. Keep a backup before updating the program, changing computers or a large import.

■ Automatic backups

The program keeps recent automatic copies beside the database. Restore automatic backup opens a chosen copy as a separate file, so the current database is never overwritten by a restore.

■ Keep your reference data

Report setups, IPM libraries and company forms belong to the database or the program folder. A database backup does not include the program folder; keep the downloaded ZIP or reinstall from the website.

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New job and well-plan PDF import

■ Start a new job

File > New job asks for the well name and number. Import Excel and the plan PDF import both create the job's reference data. Enter job details before the first survey so reports and elevations are right from the start.

■ Review the import

The import shows what it read: stations, targets, VS direction, formation tops and the header details. Check the coordinate origin, the elevation datum and the units before accepting.

■ Choose the revision

Import each supported plan PDF as its own named plan, such as P1 or P2. The primary plan is chosen in Proposal and can be switched later without losing the others.

■ Add anti-collision data

Offset wells accepts supported anti-collision PDFs, and manual coordinate or angle entry. Import the offsets before relying on any separation figure.

■ Import a well database from other software

File > Open database (or New job > from a database) reads a well database (.mdb) from other directional software or a COMPASS EDM export into a new job. The well being drilled is offered first - the one the file marks Active - with its plan; tick the offsets to bring along. Depths come in to the centimetre, and the offsets show on the charts and in anti-collision straight away. The targets the file keeps for the well and its plans come in too, and from a COMPASS EDM export the plan's formation tops. A well with nothing in the file's casing list uses the standard 311 mm (12 1/4 in) hole, with no question asked; AC setup > Use for every well without one puts one diameter on every well that has none. A magnetic field saved in gauss or microtesla is read as nanotesla, and the import says which wells it corrected.

■ Update the job from a newer file

The office sent a revised plan or new offsets? File > Update this job from a well database file reads the newer COMPASS EDM XML export or well database (.mdb) into the job on screen. The plans in the file replace the ones of the same name and its primary plan becomes the active one; the offsets that came from a well database are replaced with their AC setup. Everything drilled stays exactly as it is - surveys, slides, BHAs, the tally and the activity - and so do the job's north, KB and magnetic settings, offsets you added by hand and hole sizes you typed. A file in another north reference, or one that puts the well somewhere else, is refused and nothing changes.

■ Keep the original

The uploaded PDF is saved inside the job database. Show PDF opens it again. An older import may ask you to locate the original document once.

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Job settings, north reference and elevations

■ Set job details

Job settings holds the well, operator, rig and personnel names, the units, the calculation method and the vertical section direction. These appear on reports and on the phone app.

■ Metric or imperial

METRIC | IMPERIAL on the Job settings page (Job configuration) switches the whole job in one click: depths m or ft, DLS per 30 m or per 100 ft, loads daN or klb, torque kN.m or kft.lb, pressure kPa or psi, flow L/min or gal/min, mud kg/m³ or ppg. Everything is kept in metric underneath, so switching only changes what is shown and typed - nothing is converted and nothing drifts. Pipe and hole sizes are a separate choice in Edit job settings: inches (the default) or millimetres. The rig feed keeps its own units, so switching never changes how the rig is read.

■ Use corrected bearings

Survey azimuths, toolfaces and imported bearings are used as entered. Declination and convergence are optional reference information; the program does not apply another automatic rotation. Check the coordinate origin and elevation datum during import.

■ Ground MSL, KB and Total KB

Ground MSL is the ground elevation. KB is the height above ground. Total KB equals Ground MSL plus KB. Imported well-plan KB is a default until you enter the correct value. The KB height also sets where ground level is drawn on the charts.

■ Pad latitude and longitude

Job settings > Facility satellite view opens the pad in Google Maps. Enter the pad latitude and longitude, or read the labelled Facility/Site coordinates from the plan PDF. Save location keeps them with the job, and the charts use them for the ground picture. Grid coordinates need the correct datum/zone conversion first.

■ Read subsea TVD

Subsea TVD equals Total KB minus TVD. It is negative below mean sea level. An unknown Total KB leaves the subsea value blank. Elevations are used by survey reports and formation display.

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Survey sheet: tie-in, depths and course lengths

■ Enter the initial survey

Enter Bit Depth, INC, AZI and the initial tie-in TVD. Enter N/S and E/W when needed. The BHA bit-to-sensor distance determines survey depth; check that setting before adding later rows.

■ Add the next survey

C.L. adds a positive course length after the preceding bit depth. Bit Depth accepts an absolute depth. Enter both INC and AZI to complete the measured survey; until then the row remains a tally entry.

■ Carry a depth change down, or just this one

Type a new Bit Depth, Survey Depth or C.L. on a row that has rows below it and the sheet asks first. Carry down: every survey, tally depth and slide below moves the same amount, so every course keeps its length. Just this one: only this station moves - its C.L. and the next station's C.L. change, and every depth below stays. A change that passes the next row can only carry down (or Cancel). There is no arbitrary maximum course length. Undo takes it back. A slide that started at a retyped depth moves with it, keeping its length but never running past the end of its course - a slide is never longer than the C.L.

■ Correct an entry

Click a cell and type, then press Enter or Tab. A red cell means the value was not saved. Read the bottom status message or hover over the red cell for the reason. Undo restores an accepted edit.

■ Take a row back out of the calculation

Clearing INC and AZI leaves the depth in place and removes that row from the calculations. The rows below keep their depths and course lengths, and the latest-survey forecast moves back to the last row that still has angles. Type the angles in again to bring it back.

■ Cleared rows back to fresh

A cleared cell shows empty, never 0, and nothing in it is used. A future depth whose depth is cleared (with no INC or AZ) and a slide with its From, To and Length all cleared have nothing left in them: the sheet takes those rows off the next time the job opens, and the status line says how many. Ask Pneuma "fix the cell issues" to do it straight away - she says what she would take off and does it after you say yes.

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Survey editing, columns and annotations

■ Copy, paste and insert

Right-click the Survey sheet for Copy, Paste, Insert row, Clear INC / AZ and Delete selected row. Ctrl+C and Ctrl+V are also available. Insert row makes a blank above the selection; existing absolute depths remain until an approved depth edit changes them.

■ Clear angles without losing depths

Select the rows and choose Clear INC / AZ - keep the depths. Both angles are cleared together, so a row is never left holding half a survey, and the measured depths are untouched. Delete with whole rows selected does the same. Delete selected row is the separate action that removes the row and its survey depth.

■ Choose columns and their colours

Double-click an optional column heading to hide it. Columns opens the Survey columns window: tick a column to show it, and pick a text colour in the box beside it (the Ahead column is green as standard). Standard colours puts every colour back. Colours are kept on this computer for every job. Bit depth, survey depth, INC, AZI, slide length and toolface always stay visible.

■ Use annotations

Annotations stores comments at survey or interpolated depths. Report setup separately controls annotations and saved interpolations. Free-form survey comments have their own report column.

■ Notes stay on one line

Every row of the sheet stays one line tall, however long its note. The Notes column widens by itself to the longest note (up to about 1,000 pixels at 100 %); a longer one ends in ... and shows in full when the mouse rests on it or the cell is opened to type. A width dragged by hand is kept until a longer note comes in.

■ The top of the sheet

Two cards. Set-up: SECTION and ASSEMBLY with the bit-to-sensor length, then STEER (Vertical | Build & Turn | Lateral) and PACE (Soft | Aggressive) as one-click switches with the target beside them, then START, NEXT COURSE and MOTOR, and on its own quiet line what the motor figure was learned from. The call: see Slide calls below.

■ Hide controls

Hide controls folds the set-up card, the table toolbar, the reference line and the hints away; the call and the survey-against-plan strip stay in view. Show controls restores them. Table zoom and Fit columns help fit the working sheet to the window.

■ Make the top smaller

A grip sits under the top section. Drag it up and everything in the section - the set-up card and the call - is drawn smaller, down to half size, with the same layout; drag it down for bigger. Double-click it for full size. The table below takes the room, and the size is remembered on this computer.

■ Scroll to the bottom of the table

The mouse wheel never stops: working in the table the rows scroll first and the page takes over at the end, and the other way round, until the last surveys and the blank rows under them are on the screen with the black header at the top. Hide controls gives the table more room.

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BHA sections and multi-laterals

■ Insert a BHA before the planned one

Entered the next BHA ahead of time, but another one has to run first (a trip before the planned assembly goes in)? On the BHA page pick the newest BHA in SECTION and press Insert BHA. Give the section, bit to sensor and hole size, and choose the assembly - or Import BHA sheet in the same window. The BHA you insert takes the planned one's name and place (BHA 3), with anything already recorded on it, and the planned one moves up to the next number (BHA 4) with its own assembly, bit to sensor and hole size, ready for when it is picked up.

■ Check the BHA

Set the active BHA and its bit-to-sensor length before entering new depths. Historical surveys keep their saved sensor assignment.

■ Start a separate lateral

Multi-lateral, beside Delete BHA, asks for a tie-in depth within completed surveys. It interpolates the tie-in and starts the new BHA/Section there.

■ Keep laterals separate

Laterals retain separate surveys and slides even when MDs overlap. Use the BHA/Section selector to work in the intended branch. Verify the selected branch before importing or editing data.

■ Hole size

Hole size sits beside Bit to sensor in BHA setup. The anti-collision uses the saved hole size at each comparison depth for the as-drilled well.

■ Export the slide sheet

Export Slide Sheet includes the active lateral's BHA sections. A database backup is the complete backup of all jobs and lateral data.

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Slide calls, motor output and the lens call

Record drilling

Enter slide start and end, or slide length, and toolface on the Survey sheet. After the next survey the sheet shows what the slide did (Seen), the motor output it delivered and the build and turn per metre. The To plan column, before N/S, is each survey's distance to the plan chosen beside DISTANCE TO PLAN, at the survey's own depth.

Play with the slide ahead

Type the next slide in ahead of the latest survey - from, to and T/F - and the INC, AZI and TVD at bit cells show what the bit will read at the end of it, so you can change the numbers and see what you are going to get before you slide. Under the toolface crossover (near vertical) a plain number in T/F is a magnetic toolface, 213 meaning 213Mag, the way the recommendation reads it; above the crossover a plain number is a gravity toolface. HS, LS, 30L and 213Mag are read as written. When the estimate cannot be worked out, the steering origin line says why.

How the call is made

Every slide is planned from the bit on the pipe tally bit depths, so a slide never straddles a connection. The aim is never more than Max off plan (a steering setting, standard 2 degrees) off the plan INC or AZ; more than that off steps the call up to Aggressive, twice it to Hard. The rotate that follows uses the assembly's measured tendency. Near vertical, a slide on magnetic toolface is taken on toward its azimuth and the hole past the last survey keeps the direction it was going.

Read the call

The call is one card. The two dark tiles are the slide length and the toolface - click either to enter that slide on the newest survey (Undo takes it back). The line under them gives the whole slide, from which bit depth, where to rotate to and the angle after it, with the aim below. The reason is a banner: grey is a note, amber means the call was stepped up, red means the forecast leaves the window or a lens was found. Review goal & forecast shows the slides after this one.

Soft, Aggressive, Hard

The call steps up from Soft to Aggressive to Hard when the forecast would leave the window or the last slide did not deliver. A slide set down that was seen building gives a hard slide down, not Rotate ahead. A slide set mostly for a turn (120R, say) whose small down part built is not a reason to slide hard: the call says to check that survey and the toolface held instead.

From the survey to the bit

The hole between the last survey and the bit is carried at the measured trend when that course was rotated. When the survey has just seen a slide, the rotated hole after it is carried at the rotating tendency of the last rotated courses (straight ahead when none is measured yet) - never at the slide's own bend. The line under the sheet says which was used.

One slide on the sheet

The sheet shows the next slide only: length, toolface, where it starts and the attitude after it. Review goal & forecast (the button shows how many slides are planned) lists the slides after it, the aim, and a check of any slide length.

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Slide calls, motor output and the lens call (continued)

■ Hard lens

Three or more slides in a row up or down that made no difference means the bit is deflecting off a hard lens. The call backs the well 1 m off the face, then comes back at 2 degrees to the formation angle and holds it until the bit is through. The sheet shows the lens call in red with the slides that made no difference.

■ Motor output

The MOTOR dropdown offers the assembly's learned output (Learned - this BHA, with its basis line), the current value and a typed value. The learned figure comes from what this assembly delivered on this well and, through the Office Server, on the fleet's wells with the same assembly.

■ The formation's rotary trend

With Learned - this BHA chosen, the LEARNED line also says what the formation at the bit does on its own while rotating: the build and walk of the courses rotated the whole way and their usual swing, lowest to highest (for example builds 0.40 per 30 m, swinging -0.30 to 1.10, walks right 0.20, over 6 rotated courses). It then says whether the latest rotated course sat inside that swing - a build that comes back the next survey is the formation doing what it usually does, not news. The call itself does not change; the line is there so a swing is read as a swing.

■ Multi-dogleg to the target

With Multi-dogleg chosen as the projection method, each of the two doglegs shows DLS REQUIRED, METERS TO SLIDE, TOOLFACE AT START and the depth it starts at. METERS TO SLIDE, in the blue tile, is the recommended slide for the next course in that dogleg, worked out with the MOTOR output chosen on the sheet - or Rotate when there is nothing to slide. Click the blue tile to put that slide on the slide sheet at the dogleg's toolface (it asks first, and Undo takes it off).

■ LAND AT MD with the standard projection

LAND AT MD, the teal To target line on the 3D view and the phone's landing MD use the same landing as TOTAL DLS REQUIRED: one curve at that dogleg from the START to the target's TVD, INC and AZ. A well ahead of (above) the plan lands long - further along than the target point - and one behind lands short. Multi-dogleg and the other methods show their own arrival.

■ Recheck after a survey

New measurements change the forecast. Projection and survey-to-bit paths are forecasts, not measured survey rows. A red unsaved cell must be resolved before relying on the displayed calculation.

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Rotary steerable jobs: the switch and the call

■ Switch the job

BENT MOTOR | RSS at the bottom of the sidebar is saved with the job. A bent motor job is exactly as before. On a rotary steerable job the workspace turns blue, the slide columns and motor inputs leave the survey sheet, the slide cards become the downlink call, the Downlinks and Pressure pages appear, and the phone follows.

■ The downlink call

The call gives the toolface and the steering setting to send in the tool's own unit (steering ratio, deflection, force, duty cycle or build rate), the dogleg to expect and the aim - never more than 2 degrees off the plan INC or AZ. Inside the hold window it calls the tool's own hold mode (inclination hold, HIA, vertical) instead. The call stops there: you pick the command and the code from the tool hand's sheet (it is on the Downlinks page). Log downlink opens the log dialog with the toolface and setting from the call.

■ HIA on the call card

The tool's hold mode is always on the card: HIA (or inclination hold), and whether it is the call now and what it would hold - or why not yet (steer back on the line first; only between 10 and 170 degrees). Log HIA logs it with the hold inclination and azimuth filled in. The HIA adjustments - inclination target up or down, azimuth target right or left - are on the Downlinks page under Hold modes (HIA).

■ Keep, Adjust, Neutral

When the new call is within 6 degrees of toolface and 10% of range of the downlink already logged, the call is Keep. When only one of them changes, the call is Adjust (same toolface, new setting - or the same setting, toolface moved). When under 0.3 degrees per 30 m is needed, the call is Neutral.

■ Not steering - back off

When the surveys since a downlink show under half the dogleg the setting should give, the call works down the usual order: check the readback, hydraulics, RPM toward 100 without stick-slip, ROP and weight on bit, one step more setting, the anti-jam procedure, then bit or BHA. An unconfirmed downlink means check the readback first.

■ Cautions and the projection

The call lists the wait when the last downlink is inside the tool's lockout time, an unconfirmed readback and the channel rule (steady flow above the turn-on rate, no connection or survey during the sequence). The chart projection is one curve at the expected dogleg, then hold, flagged when it would leave the window.

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Downlinks page: tool versions, sources and the log

■ Pick the tool

MAKER, then SYSTEM - VERSION, then SIZE: 54 entries built from the makers' published material - PowerDrive X5 to Max, Geo-Pilot, iCruise, AutoTrak, Revolution, Magnus, VectorZIEL and the rest - or a generic tool. Enter the hole size, how the tool is downlinked (flow, RPM, bypass, EM), a setting ceiling and the tool software version from the tool hand's timing sheet, then Save tool. The page shows the rated dogleg at that hole size and the hold modes.

■ Where each command comes from

Every command carries its source: public patent, the maker's published sheet, or a standard command type with nothing filled in - the code and time for those come from the tool hand's sheet for the job. Where a maker has not published a rating the entry says so and the figure is a starting point only; the call moves to the learned rate after the first judged downlinks.

■ The job's own codes

The tool hand's downlink sheet always wins. Upload downlink sheet reads it - Excel (.xlsx), CSV, text or PDF - and shows every line with its page (for example Page 3: HIA Mode), code, toolface, setting and time, and the command it was matched to. Replace this job's copy clears the codes, times and notes the job had and uses the sheet; it is listed under This job's downlink sheet, where you look up the code for the call's toolface and setting. Check a few lines against the paper. Edit selected still changes one command; Clear this job's codes clears the codes and the sheet. The sheet, its codes and the timing stay with this job - they are not shared.

■ Log every downlink

Log downlink as it is sent; Mark confirmed when the readback shows it took; Delete selected removes a mistake. The log is how the tool's real dogleg per unit of setting is learned and how a downlink that is not steering is caught.

■ Timing and the back-off list

The downlink timing (flow steps, RPM steps, how long a downlink takes, the wait after one) sits above the commands: what the maker publishes, and this job's own figures from the tool hand's sheet (This job's timing...) - the job's figures win and the call's wait warning uses them. The back-off list at the bottom marks the step the call is on.

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BHA library and what the assembly learned

■ BHA sheets: kept, opened and printed

Import from PDF keeps the service company's sheet with the assembly: Open / print BHA sheet on the BHA page opens it in the PDF viewer to print (an assembly typed in prints a sheet drawn from the BHA page). The import reads the bit to bend however the sheet writes it (1 or 1.28), sizes the motor by its largest outside diameter - the kick pad (Pad OD) when the sheet gives one - and keeps the motor, bit and component serial numbers for the record. The learning never uses a serial number: the same motor comes back from the shop set up another way.

■ Keep assemblies across wells

The BHA page is a library of assemblies kept across wells. Import from PDF reads a service company's BHA sheet: motor make, model, bend, bit to bend, stator and rotor, bit make, type, size, TFA and jets, hole size, and the component list with I.D., O.D. and length. Edit by hand, copy an assembly or delete one. Motor size and the sizes in the list follow the job's units: mm on a metres job, inches on a feet job.

■ Link the assembly to the section

Pick the section and the assembly it ran (SECTION and ASSEMBLY) on the survey sheet. From then on what the section drills is filed against the assembly's set-up: the motor's size, power section (lobes and stages) and bend, the bit, and the flex monels, slick monels and stabilisers. No serial numbers are kept - the same motor comes back from the shop set up differently - so the same set-up is recognised on the next well, whatever the motor is called. The assembly's bit to sensor becomes the section's survey sheet offset; surveys already on the section keep their depths and it asks first when there are any.

■ What it learned

The BHA page shows the learned output: for example 6.1 degrees per 30 m from 14 intervals, this BHA, this formation, building, with the slide grade and the parameters it was slid on (weight on bit, differential, flow). The slide sheet's MOTOR dropdown carries the same figure.

■ The fleet

What a well learned rides with its surveys to the Office Server, and the fleet's answer for the assemblies this job runs comes back with the AC setup. The packet carries measurements only - no names, licences or job settings.

■ Learning online - kept within your company

From the late-September 2026 update, each copy also keeps its learning online, in its own space on the SharpShooter server, and reads it back live for its learned rates beside this database's own. Only anonymous results go: the set-up fingerprint, formation, inclination band, rates, slide grade, drilling parameters and a rough area about 50 km square - never well, operator, rig or people names, licence or well numbers, locations, depths or dates. A copy reads back only its own results - or, when its company turns on the company data agreement on the client portal (Your data), its company's copies' results. Nothing is ever shared with another company. These results are never listed anywhere; the line under MOTOR says when some are in the answer, for example incl. 12 saved online.

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Learning page: everything the motors have taught it

■ What is on it

The Learning tab (under BHA) shows your own learning - never the results kept online. LEARNED ON picks This job or All my jobs (every job in this database); an Office copy shows the company's own. The slide sheet's MOTOR line and the BHA page show the learned figure the call uses. Every completed survey files one interval: the part that was slid measures the motor, the part that was rotated measures what the well does on its own. The tiles at the top give the motor output, the rotating build and walk, where the toolface lands against the one set, the slide grade, and the footage and wells behind the figures.

■ Two tables

By assembly, formation and inclination pools every interval filed under that assembly in that formation at that inclination band - the same roll-up the slide sheet's MOTOR - Learned and the BHA page ask for, nearest match first. Every interval lists the rows one by one, newest first: well, assembly, MD, inclination and azimuth in and out, metres slid and rotated, the motor output, the rotating tendency, the toolface set and landed, and what it was slid on.

■ Filter and export

Filter by assembly (the ones on this job are starred), by formation, and by area - within 25 km of this pad, when the job has a pad position under Job settings. Export CSV writes the rows shown to a file for a spreadsheet.

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Torque & drag: dragging now and reaching TD

■ What it works from

The assembly from the BHA page, the trajectory from the survey sheet (As drilled) or the plan (Planned well), and the typed mud weight, drill pipe, heavy weight, collars, casing shoe, hole size, the two friction factors and the rig's hook rating and top-drive limit. Import mud report (PDF) reads the mud weight, hole, string and shoe off the day's report and shows what would change first.

■ Read the table

Pick up, slack off, rotate off bottom and drilling: hookload and torque at the bit and every step up the hole, and where slacking off or drilling buckles the pipe so weight stops reaching the bit.

■ Am I dragging?

As drilled compares what the rig reads (from the rig feed, or the readings you type at a depth) with the model and works out the friction factor the hole is actually running at. Use what the hole is running at replaces the typed open-hole factor with the real one. While turning, torque is the telling reading; on a trip, hookload.

■ Readings at every connection, off the feed

With the rig feed reading, the four numbers a crew reads off the driller's display at a connection - pick up, slack off, rotating weight and off-bottom torque - are found by themselves while the string is off bottom: the steady pull up with the rotary stopped, the steady lowering (not the drop when the string is set in the slips), and turning with the blocks still. When the string is back on bottom the reading is kept at the hole depth the connection was made at and checked exactly like a typed one; the From column says Rig feed or Typed. A tick on the page turns it off for the well. Type readings as before when there is no feed.

■ Will the string get to TD?

Planned well runs the whole plan and says where the string reaches total depth, or where it stops going in on its own weight, and where it passes the hook's or the top drive's rating.

SHARPSHOOTER GOLD

Engineering menu: well control, BHA tendency and cementing

■ Where it is

The Engineering menu at the top of the window holds the engineering pages and windows in one place: Well control, Hydraulics (the Pressure page), Torque and drag, BHA tendency, Cementing, AC plots and Magnetic model. Each works from the job's own numbers - the surveys, the plan, the BHA and the Torque and drag settings - and shows the arithmetic so it can be checked.

■ Well control

The kill sheet from the job: type the shut-in drill pipe and casing pressures, the pit gain and the slow pump rate pressure, and it gives the formation pressure, the kill mud (and rounded up), the initial and final circulating pressures, the strokes to the bit and the step-down table. With the fracture gradient at the shoe it gives MAASP and the kick tolerance; the trip speed gives the swab and surge at the bit and the shoe. Work it out keeps the numbers with the job; Copy the kill sheet puts it on the clipboard. The well control decisions stay with the rig's own procedure.

■ Buckling limits and critical speeds

The Torque and drag page ends with a Buckling limits and critical speeds card: the compressive load at which the drill pipe, heavy weight and collars start to snake (sinusoidal) and then coil (helical) at the steepest inclination the string sees, the BHA's whirl speed between its stabilisers, and the string's bounce and twist speeds. Stay about 15 percent clear of each speed; a roller-cone bit kicks three times a turn, so its speed to avoid is a third of the bounce speed.

■ BHA tendency

Engineering > BHA tendency works out the build the motor should give sliding at high side before the first slide, from the bend, the bit to bend and the two places the assembly touches the hole wall - filled in from the active BHA and the BHA library, and editable. It is an estimate: once slides are drilled, the learned motor output on the survey sheet takes over.

■ Cementing

Engineering > Cementing works a casing cement job from the survey: the lead and tail slurry volumes (open hole with the excess, cased annulus and the shoe track), the displacement to the float collar and the strokes, the pressure to land the plug, and the centraliser spacing for a standoff (67 percent is the usual design minimum). The cement design and the pressures to pump to are the cement company's - this is the arithmetic to check them against.

■ AC plots and the magnetic model

AC plots shows the ladder plot (centre to centre against depth), the separation factor plot and the travelling cylinder for the shown offset wells. Magnetic model opens Job settings, where From the model fills the declination, dip and total field from the World Magnetic Model built into the program, for the well's location and date.

SHARPSHOOTER GOLD

Units for the job and the rig feed warnings

■ Each unit for the job

Job settings shows the job in METRIC, METRIC-CAN or IMPERIAL. Each unit... beside them picks units one by one for this job: pressure in kPa, bar, MPa or psi; mud weight in kg/m³, SG, ppg, lb/ft³, kPa/m or psi/ft; weight in daN, kN, tonnes or klb; torque in kN.m, daN.m, N.m or ft.lb; flow in L/min, m³/min, gal/min or bbl/min. It is display only - the data is not changed - and the Pressure, Well control, Cementing and Torque and drag pages and the rig feed window follow it.

■ Rig feed warnings

With the rig feed reading, SharpShooter warns of a suspected washout (the standpipe drifting down at the same flow), a suspected pack-off (standpipe and torque climbing together while rotating), hanging up (weight set down while sliding with no new hole) and a drilling break (the hole made much faster than before). Each says what was seen and points to the rig's own procedure; Pneuma says it, or a beep and the status line.

■ Setting the limits

Thresholds > Feed alarms turns each warning on or off and sets its limits for this job, in the job's units: how far the standpipe has to fall or rise, how much the torque has to climb, how much weight set down and over how long, and how much faster the hole has to come. Back to the defaults puts them back. A feed that is already running uses the new limits at once.

SHARPSHOOTER GOLD

Pressure: the pressure drop and where the pump pressure goes

■ The pressure drop box

On a rotary steerable job the Pressure page opens with one box: flow, mud weight, the bit nozzles one per box in 32nds (or the jets or TFA on the line under them), a flow restrictor bore in 32nds, the share of the flow that skips the bit, and the pad drop the tool hand wants, low to high. Calculate. The big total - bit plus restrictor - is green in range, yellow low and red high (grey until it can calculate), with the flow, nozzles or restrictor that would put it in the middle of the range. Every box says its unit beside it. The full standpipe breakdown is folded away under the box.

■ The steering tool's faces

Under the range, on a rotary steerable job: the gap between the ball and its sleeve on each of the tool's three faces, upper and lower, plus the ball diameter - all in millimetres, the way they are measured with a feeler gauge on the floor. Leave a face empty when it was not measured. The page then shows how much mud slips past the faces instead of going down to the bit, whether the tool is as new, part worn or worn out, and what the pads are pushing with as a share of the same job on a fresh tool. A gap is a narrow ring the mud crawls through, so the flow goes with the cube of the gap: twice the gap passes eight times the mud. That is why a tool that still reads the right standpipe pressure can steer badly.

■ What else to enter

In the breakdown: plastic viscosity, yield point, the surface equipment case, the casing I.D., and the drops of the motor (no-load at a flow, plus the working differential), the MWD and the rotary steerable tool at a reference flow off their sheets. Mud weight, hole size, casing shoe, pipe, heavy weight and collars are shared with Torque & drag; the jets come from the BHA page. Save and calculate.

■ Where the pressure goes

The table lists surface equipment, each length of string in casing and open hole with its inside and annulus loss, velocity and laminar or turbulent flow, the tools, the bit and the total - the predicted standpipe pressure. Type what the rig reads and the page says whether it is within 10%, under (washout, lost nozzle, lighter mud) or over (plugged nozzle, packing off, motor stalling, heavier mud).

■ At the bit and in the annulus

Hydraulic horsepower, HSI, nozzle velocity, impact force and the share of pump pressure at the bit, with the jets that would put 55% there. The slowest annulus against the hole-cleaning floor, a turbulent open-hole warning and the ECD at the bit.

■ Pad differential on a steering tool

The drop across the bit (plus any flow restrictor) is what the tool's pads work on. The range typed in the pressure drop box is the band; the page says whether the jets and flow land in it, and the TFA or the flow that would - or a flow restrictor when the jets cannot change. PowerDrive tools use the maker's published density x flow squared rule for the tool size. When the face gaps are typed in, what slips past them is taken off before the bit, so a worn tool shows the softer pad differential it actually has.

SHARPSHOOTER GOLD

Pneuma, the SharpShooter built-in AI

■ Ask Pneuma

Pneuma is the SharpShooter built-in AI, with two voices - Kinsley (quick and warm) and Kane (calm and steady); pick either at the top of its window. Open it with the Pneuma star on the survey sheet (where the Drilling assistant button was), the three-dot menu's Pneuma - AI assistant, or Ask Pneuma in the Help window. Ask anything: this well, a calculation, WITS, the rig computers, SharpShooter Gold, everyday questions and the weather ("weather in Grande Prairie"). It works directional drilling numbers with exact formulas and asks for any number it is missing. Explained answers gives the formula with your numbers; off, you get the number first. Under each answer: Show the working, Helpful, Not right. Pneuma is an AI and can make mistakes - check the numbers; the directional driller decides.

■ Privacy notice

Before your first question Pneuma shows its privacy notice: read it, tick I have read the Pneuma privacy notice and I agree to it, and press I agree (Not now closes it and Pneuma does not answer). You are asked again only when the notice changes; the Privacy button in Pneuma's window shows it any time. Pneuma answers on SharpShooter Gold's own server with its own AI model - no outside AI company gets your questions. What it learns from your questions stays in your own account, or inside your company with the company data agreement on the client portal (Your data), where you can also delete your Pneuma history.

■ This well and voice typing

Use this well sends the open well's numbers with the question - the surveys, slides, plan comparison, forecast, the program's call and the closest offsets - never the job name, client, rig or location. With it ticked Pneuma takes what the question leaves out from SharpShooter: ask "what's my motor yield" and she gives the sheet's motor output for the last course first, with the plain sum from its dogleg and metres slid under it; "how long do I slide" gives the call. "What's the call", "how far off plan am I", "where's the bit" and "last survey" are answered from the sheet. Attach... adds a photo, PDF, CSV or text file to the question: she reads its words and numbers (and sees the photo when her own computer is answering); the file is used for that chat only and not kept. She tells the time where you are. Talk starts Windows voice typing (Windows + H): speak and it types into the question box.

■ Her voice

Kinsley and Kane read each answer aloud in their own voices - Voice at the top of the window (on as standard) switches it off and on, and Read aloud under an answer plays it again. The voice is made on SharpShooter Gold's own server and played by the program itself, in pieces: the first words come in a few seconds and the rest follows while it plays, and the line at the bottom of her window says why if the sound cannot play. Answers she works out on this computer are read aloud too - only the words of the answer go to the server to make the sound, and nothing is kept there.

■ Pneuma works the survey sheet

In the program, Pneuma reads and works the open well on this computer: "show me the last 10 surveys", "show the slides", "fix the slides" (a slide that runs past survey points is cut into one row per course), "change the survey at 1650.25 AZ to 142.5", "delete the slide at 1590", targets, BHAs and the imports, "fix the cell issues", "add the next C.L. 13.67" (the next pipe length as a new row after the last one), "what should I slide" and "watch my WITS feed" (she learns this rig's sliding RPM, pumps-on level and longest connection and sets the activity thresholds; the feed stays on this computer). Every change is said first and made only after you say yes, checked on the sheet afterwards, and one Undo takes it back.

SHARPSHOOTER GOLD

Pneuma, the SharpShooter built-in AI (continued)

■ Pneuma checks the job set-up

Ask Pneuma "set the job up" or "what's missing in the job": she reads the open job and lists what is still needed to steer (the north reference, the well plan, the BHA with its bit-to-sensor, the tie-in survey), what is worth adding (client, rig and job number, location, magnetic dip and field, KB and ground elevations, targets, formation tops, offset wells, casing, the rig feed) and what is done, with where to put each right. Say "import the plan", "import BHA", "import targets" or "add a target" and she opens it. The check changes nothing.

■ Check this computer

For WITS trouble press Check this computer: the window shows exactly what Pneuma would see - this copy's version, Windows, the serial ports and the rig data feed's state (port, speed, records, how long since the last value) - and sends it only when you say Send it with my question. Pneuma then goes through the set-up one step at a time; the check is for that one question and is not kept.

■ The website app, voice and the connection

Open the app has Pneuma on sharpshootergold.com, where she talks in the same voices and writes her answers as they come, and Install app puts it on the computer or phone as its own app, SharpShooter Gold AI. Pneuma needs the internet; the connection is encrypted (HTTPS) and the copy proves which copy it is with its licence. It comes with SharpShooter Gold AI (the demo) and is an add-on for the licensed programs; on the website it is free for two years, no account or daily limit.

SHARPSHOOTER GOLD

Rig data feed: WITS, mapping and slide grades

■ Setting up the WITS connection

The cables: the rig's EDR WITS port to a USB serial adapter on computer 1 (the rig computer), through a null-modem cable or adapter - a straight cable gives nothing - and for a second computer a null-modem cable (9-pin, female both ends) from a second port on computer 1's adapter to computer 2's own adapter. 1. Ask the rig's data hand to switch WITS Level 0 out on for that port: 9600, 8 data bits, no parity, 1 stop bit. 2. Device Manager > Ports (COM & LPT) shows the adapter's COM port. 3. On computer 1 open the job, Rig Data > Rig data feed (WITS), Serial cable from the rig, port Automatic, Pason keep-alive ticked, Start reading - green means reading; check the Measurements tab. 4. On the Second computer tab tick Out of serial port and leave it on Automatic. 5. On computer 2 open the same job (Cross shift over the cable copies it), Serial cable from the rig, Automatic, keep-alive ticked, Start reading. 6. Both green, Value now moving on both. Computer 2 gets the feed only while computer 1 is reading. The WITS guide has it step by step with what to check when nothing arrives.

■ Connect the rig

Rig Data > Rig data feed (WITS) opens the WITS serial window (the rig computer's serial or TCP feed) or a WITSML server. Closing the window keeps the feed running until SharpShooter closes. The Guides folder's Rig data feed (WITS) file has the cable and Pason details. On a serial cable, readings show the moment they arrive and Stop reading stops at once. A Pason EDR sends only while it hears a keep-alive: SharpShooter sends Pason's own packet (0111 = -9999, no value) every 10 seconds unless you untick it. Nothing arriving? Most rig serial outputs need a null-modem cable or adapter, and the rig's WITS output must be on for that port; bytes but no records means the wrong speed - leave the port on Automatic and it tries every port and speed, locks on to the one sending WITS and searches again by itself if the cable is unplugged. A job that was reading starts again by itself when it opens.

■ Map the channels

The default mapping follows the published WITS record list (hole and bit depth, block, ROP, hook load, weight on bit, torque, RPM, standpipe, flow, differential, gamma, INC, AZ, gravity and magnetic toolface). Work out the mapping from the feed finds the channels from how each one behaves when the rig's codes differ; Find the rig computer looks for it on the rig network. Pason's own defaults are included: hook load 0115, weight on bit 0117, torque 0119, flow 0219 (total pump output) and azimuth 0715.

■ The rig's units

A WITS feed sends numbers without units, and rigs differ: Canadian rigs usually send metric (daN or kdaN, kN.m, kPa, L/min or m³/min), US rigs imperial (klb, psi, gal/min, kft.lb or ft.lb). The Rig units column shows how each channel is read. Metric rig and Imperial rig set the whole list in one click; Units for the selected row changes one; Check the units against the feed compares the live values with the well - the depth on the wire against the well's depth (metres or feet), the hook load against the string's weight, and pressure, flow and torque while the rig pumps and rotates - and changes only the rows that cannot be right, saying why. The rig units are saved with the mapping and are separate from the job's display, so a metric job can read a US rig.

■ What is recorded

While drilling, the feed is banked against bit depth in one-metre cells, split into sliding and rotating: weight on bit, RPM, flow, differential, ROP, torque, standpipe pressure and toolface. Tripping and a stalled feed are left out.

Rig data feed: WITS, mapping and slide grades (continued)

■ Slides entered from the feed

With rotary RPM mapped, the feed enters your slides on the slide sheet as they happen: where the string slid, how many metres, and the average toolface it saw (45R, 30L, or 123Mag in vertical hole), with the note From the rig feed. A slide is a run of one-metre cells where the string was not turning while the bit drilled ahead - at least a metre and at least a minute, so connections and surveys on bottom are not slides. Rocking the pipe - a few wraps each way with the rotary on - still reads as a slide, marked pipe rocked. A slide is told from a rotate by four signs added up: the rotary stopped, the rotary turning backwards, surface torque down from the rotating torque this well drills with, and an MWD toolface that holds still. No single sign decides, so map torque and a toolface as well as RPM and the feed still calls it right on a rig whose RPM alone would fool it; the feed window shows what each sign says. If the recorder keeps its own slide length and average toolface - Pason's effective slide or slide seen - map those too: they are the rig's own numbers, they outweigh everything worked out here, and an EDR file that carries them is read the same way. The four rocking thresholds (reversals, the window, the longest wrap, the stopped RPM) are on the Rig data feed window and are remembered on this computer; the standard is 3 reversals in 120 s, wraps up to 60 s, stopped under 5 RPM. The row grows while you are still sliding, and the depths are the feed's bit depth, so check them against the tally. Each course gets its own row: the sheet's survey points and tally depths cut a slide, each part starting at its row's own bit depth with its own toolface. The rig's depth and the sheet's bit depth are measured apart and often differ by a metre or so: a slide the feed saw start up to 2 m before a survey - with most of it after - goes on that survey's row, starting at the survey's bit depth with its whole length and never past the next survey, and its note keeps the depth where the feed saw it start.

■ Squat on feed slides

To slide, the driller sets more weight down than when rotating - drag holds the pipe - and the extra weight squeezes the string shorter, so the depth at surface keeps going while the bit has not moved. With the weight on bit mapped, the feed compares the weight while sliding with the weight rotating on bottom just before, works out that squeeze (the extra weight x the string length / the steel's stiffness x the drill pipe's steel area) and takes it off the slide's effective length; the note says how much. Drag takes part of the extra weight before it gets far down the string, so a correction scales it - 50 % to start. Ask Pneuma "what's the squat", "set squat correction to 60%" or "drill pipe is 4.5 inch". Slides typed by hand are never changed.

■ Slide, a short rotate, slide again

Slide, rotate for 3.5 m or less, then slide again with the toolface no more than 90 degrees from before, and the sheet has one slide, not two: the metres slid in both parts at the toolface of the two together, from where the slide started, with the note 2 slides joined and the metres rotated between. The rotate is not counted as slid. The first part goes on the sheet when the rotate starts and grows to take in the second once it is over. Two rows the feed wrote before for one such slide are folded into one; a row you typed or changed is left as it is, and Undo puts the two back.

■ Edit them like any other

Retype a From, To or T/F and the row is yours: the feed never touches it again. Delete it or Undo it and it stays off. A slide you typed by hand always wins over what the feed saw at the same depth. Slides drilled before the feed started watching the well are not added on their own: Rig feed slides on the sheet's button row lists everything the feed saw between two depths, with slid and rotated metres, and enters the ones that are not on the sheet. With the feed off, the sheet works exactly as before. The tick box Auto-enter slides, on the survey sheet's rig feed bar beside Add to sheet, turns this off for the job: the feed still records every slide, and Rig feed slides enters them when you choose.

Rig data feed: WITS, mapping and slide grades (continued)

■ Import an EDR file

No live feed on that well, or the feed dropped? Rig Data > Import EDR file reads the rig recorder's export - a Pason time export (YYYY/MM/DD, HH:MM:SS, Hole Depth, Bit Depth, Hook Load ...), RigCLOUD, WellData / RigSense, a WITSML log saved as CSV, a LAS time log, or the same as Excel. It shows the columns it found and their units - from the file, or worked out from the numbers (check those) - then plays the file through the same rules as the live feed: the rig log, the Activity window and the slides on the sheet. Times the feed already recorded are skipped, so nothing is counted twice; hand-typed slides always win.

■ Surveys posted on the feed

Pason sends the last posted survey on the feed (0708 depth, 0713 INC, 0715 AZ). When a new one settles for a few seconds, the slide sheet shows it with Add to sheet and Dismiss, and so does the phone. Add only puts on a new, deeper survey - on the pending tally row at that depth, or the blank row. It never changes a survey or a depth already on the sheet. A rig that sends a live depth on 0708 is recognised and nothing is offered. Tick Auto-accept surveys on the survey sheet's rig feed bar, beside Add to sheet, and a new survey goes on as soon as it lands, when it sits sensibly after the last one: no more than 100 m on, no dogleg over 15 degrees per 30 m, not below the bit, and not graded bad by the survey checks when those readings are mapped. Anything else waits in the bar with the reason. The survey sheet has to be open for it to go on, and Undo takes one off. Every posted survey that is not on the sheet waits in line, shallowest first: with Auto-accept on each goes on one stand past the one before, up to the newest. With it off, the bar turns red when two or more are waiting and says how many, from which to which; Add all puts them on in order, Add newest only leaves the older ones off (the sheet then has one long course, so use Add all unless you typed them in), and Dismiss clears the line. The at-bit forecast runs only through slides within 100 m of the last survey's bit: slides further on belong to surveys not on the sheet yet, and the sheet says how many were left out. A survey that does not line up with the sheet - a survey missed, or one too short - or that bends more than 45 is held for you: a window over any page says why, with OK - add it and Not now, and the bar turns red. When the feed's reading differs from a survey already on the sheet, Use the feed's beside Dismiss takes the feed's INC and AZ (never the depth); Undo takes it back.

■ Import corrected (MSA) surveys

Rig Data > Import corrected surveys (MSA) reads the file the MSA provider sends - CSV, text, Excel or LAS. It picks the corrected INC and AZ columns (not the raw ones, not the amount of correction), the depth unit and the north reference, and lines every station up with the sheet. A survey at the same depth takes the corrected angles; its MD, note and BHA stay. A deeper station goes on as a new survey on the active BHA. The tie-in, a depth between surveys, a change of more than 1 degree INC or 3 degrees AZ, and a file in a different north reference are shown and never applied without you. When every azimuth moves by the same amount the window says so - that is a north reference difference, not an MSA correction. Tick what goes on and press Apply; Undo on the survey sheet takes it back, and each change is written down with the file and the old angles.

■ Slide grades

Each slide is graded from the live toolface - locked in, good, wandering or window washed - as a percentage. A wandering slide is recorded as a weaker slide, not a weaker motor, and the motor output is corrected for how much of the toolface was held. Without a feed the grade comes from the surveys instead.

SHARPSHOOTER GOLD

Rig data feed: WITS, mapping and slide grades (continued)

■ Activity: the same thing in a row is one line

Two or more lines of the same activity in a row - two Rotating lines split by a few seconds of something else - show as one line from the first start to the last end, with the drilling parameters beside it averaged over the whole of it. A connection is called Survey & connection. The window's top line gives Bit hours (the bit on bottom rotating, sliding, drilling or drilling cement) and Circulation hours (the pumps on, whatever else was going on) for the days shown; the BHA page gives both for the run of the BHA picked in SECTION.

■ Activity: the rig stats filled in for you

Activity > Rig activity (top menu) shows what the rig did, minute by minute, worked out from the feed: rotating or sliding on bottom making hole; a connection within 40 m of bottom (circulating when the pumps run on past 20 minutes); a trip out or in more than 40 m off bottom with the pumps off, stops in the slips included; circulating or reaming there with the pumps on; and lost feed. The bottom is the rig's own hole depth. Each line has its start and end time, depths, metres and the BHA in the hole, and the totals for today, yesterday, the last 24 hours, the week or the whole job - hours and share of each, connections with the average and longest, metres and ROP. Copy it as text or save it as a file. It goes to the office with the surveys, and on its own every hour while signed in. Hide totals on the legend line folds the totals table away so the list takes the whole window; Show totals brings it back, and the choice is remembered.

■ Type activity by hand

Feed down, or read it wrong? Add activity in the Rig activity window: pick the company code, the start and end time, the bit depths and a note. A typed line takes the place of the feed for its time, so nothing is counted twice. Edit on a feed line lays a typed line over it; Delete on a typed line brings the feed's own reading back. Typed lines are in italics and go to the office like the rest. The phone app's Activity tab does the same from the rig floor.

■ BHA laid down and picked up

With the rig feed on, SharpShooter writes both by itself - nobody has to be at the computer. Tripping out on a well drilled past 100 m (330 ft): once the bit is out of the hole, 6L Lay down BHA goes on from when the bit came under 100 m; when the bit starts back in, 6P Pick up BHA goes on until it is back past 100 m. Then it asks what went in: the new BHA, Running casing (12 Run casing and cement until the next BHA goes in, BHA column blank), Other (your own code) or Not a BHA change. Later leaves the lines as written. Without a feed, use BHA laid down... and BHA picked up... on the Activity window.

■ Casing, cement and BOP

After Running casing the feed carries on by itself: the casing within 20 m of the hole depth with the pumps on is 5 Condition mud and circulate; the rig's pumps off with returns still in the flow line is 12 Cementing; the flow line quiet after that is 14 Nipple up BOP, until the next BHA goes in. Map Flow out (flow line) on the Rig data feed window for the cement steps.

SHARPSHOOTER GOLD

Rig data feed: WITS, mapping and slide grades (continued)

■ Reaming and the thresholds

Running in more than 40 m off bottom with the pumps on and the string turning is Reaming (code 3); turning on the spot is circulating. Back from a trip in, nothing is a connection until drilling resumes: the pumps on with the rotary stopped (filling pipe, washing down) stays Tripping in, and turning with the pumps on while going down to bottom is Reaming / wash to bottom. After casing and before new hole, turning with the pumps on and going down is 2C Drilling cement - its metres are not drilled metres. Drilling and sliding are told from the bit and the blocks, never the pumps: the bit picked up 0.3 m, or the string in the slips (blocks moving, bit depth still), is a connection - backing out and spinning in never reads as a slide - and drilling starts again only with new hole. The pumps (under Auto from 30% of the rate this rig pumps at) decide circulating, trips, reaming and cement only. New hole is the hole getting deeper - a drilling line needs 0.2 m of it, so drilling slower than about 0.4 m/h reads as pauses - and when the feed starts, a bit sitting still reads as off bottom until it drills. The rig's own slide seen figure counts as a slide sign; switch it off on the Rig data feed window's Settings tab if you would rather not. Thresholds... on the Activity window shows every number the activity is worked out with: Auto uses SharpShooter's own, untick Auto to change them (kept on this computer).

■ Insert a row

Right-click a line on the Activity window and pick Insert row after this one: the new activity starts where that line ended, and a typed line after it starts when the new one ends.

■ Safety meeting and block height

On the way out under 100 m, the first time the blocks stand still for 5 minutes, 26 Safety meeting or drill goes on until they move again, and the lay-down starts after it. When the string gets light and the rig's bit depth stops tracking, SharpShooter follows the depth from the block travel instead - blocks up is the string coming out, blocks down (after the BHA is out and the blocks have stood still 10 minutes) is the string going in - until the rig's bit depth moves again. Map block height on the Rig data feed window.

SHARPSHOOTER GOLD

Proposal and primary plans

■ Plans are built in Office

Well Planning - building sections, printing and copying a plan to Proposal - is in SharpShooter Gold Office. The Field copy steers to the plan it imports from a PDF or receives from Office, and keeps every named plan under Proposal.

■ Targets from the plan

A plan PDF brings its targets from the Design Targets table with their full names, the heel included. When the targets are only in the plan's annotations, tick Load plan annotations as targets on the import: each annotation becomes a target at its own MD, TVD and position, named by its comment. Targets... on Formations & targets offers the same.

■ Import multiple plans

Import each supported plan PDF as its own named plan, such as P1 or P2. Proposal contains the Primary plan dropdown and Show PDF for the selected plan.

■ Switch the primary plan

Selecting another plan restores that plan's stations, targets, VS direction, available formations and imported reference information. The displayed plan details update with the selection.

■ Edit the defaults

Imported job and plan defaults remain editable. INC and AZ are displayed to two decimals in Proposal while the stored calculation values retain precision.

■ Interpolate the selected plan

Interpolate on the Proposal button row accepts a measured depth and shows INC, AZ, TVD, subsea TVD, N/S, E/W and VS on the selected primary plan. It leaves the plan unchanged and does not extrapolate past its depth range.

■ Keep the PDF

The original uploaded plan PDF is saved in the job database. Show PDF opens it. For older imports, the app may ask you to locate the original document once.

■ Create a geosteering copy

Open Geosteering and use Geosteering target. Enter the start and target MD/TVD. When a copy already exists, choose whether to add to it or start again from the original.

■ Review the result

The Geosteering sheet contains the controls and station table. Interpolate looks up an MD on this geosteering path and uses the new tie-in at a steering reset. The charts are on their dedicated sheets. Undo last geosteering change restores the previous copy.

■ Edit formations

Job settings > Edit formations and tops lets you review names and top depths. Available imported tops are associated with the selected plan.

■ Show formations

Proposed formation beside Subsea TVD uses the survey depth and available plan tops. In 3D, Show formations displays differently coloured translucent horizontal tops aligned through the KB/subsea reference.

SHARPSHOOTER GOLD

2D charts and visible wells

■ Choose a chart

Vertical section shows the well in its vertical-section direction; Plan view shows the horizontal view. Use the mouse to zoom and move around the plot. The chart tools fold into the slim Chart tools strip above the chart. Point at it and they drop down over the chart: ZOOM (in, out, Fit), GO TO (Survey, Projection), DRAG (Pan, Measure, Clear), SCREEN (Full screen), the Wells & paths table and the chart background. Go back to the chart and they fold away; click the strip to keep them open.

■ Keys and mouse on the plots

Click the plot, then W or S (or + and -) zoom in or out about the middle and A or D move it left or right - the same keys as the 3D view. The wheel zooms at the pointer, 4% a notch. Drag, Shift-drag or right-drag moves the plot (with Measure on, drag from the well measures and right-drag still moves). The controls card in the top-left corner shows these; Hide on it folds it to a small Show controls tab that brings it back.

■ Satellite view on the plan

Satellite view on the Plan view lays the pad's satellite picture under the wells. It needs the pad latitude and longitude in Job settings. The picture comes straight from Mapbox and is kept with the job for 30 days - as long as Mapbox allows - so a rig with poor internet only needs it once a month.

■ Choose offset wells

The Offset wells selector is shared by the charts and Survey sheet. Search for wells, select individual entries, Show listed, Hide all or Show nearest 5.

■ Understand nearest five

The nearest-five selection ranks centre distance along the available original-plan and as-drilled paths. It is not a ranking of separation factor. Re-select after major path or offset changes.

■ Read names

On 2D plots, well-name labels appear when you hover near a visible path. Move away to hide the name. Path lines become thicker as you zoom closer.

SHARPSHOOTER GOLD

3D view: turning, moving and follow view

■ Top of well, small steps, the bit at the hole depth

Go to > Top of well (beside Latest survey) turns the chart about the first survey. Up and Down move along the well a metre a press (a foot on a feet job), five with Shift. With START on At bit - continuous INC on the survey sheet, the survey-to-bit stretch runs through the continuous INC reading and the at-bit station on to the hole depth the rig has drilled to, and the red bit is drawn there. The distance box in the follow view is in larger bold type. Every chart starts dark; Chart tools > Background > Light keeps a chart light.

■ Turn, move and zoom

The chart turns about the survey - the one selected on the survey sheet, or the latest - and that survey stays put on screen. Drag sideways to go round it and up or down to tilt, half a degree for every pixel, up to looking straight down; the chart moves exactly with the mouse and stops the moment you let go. The vertical always stays vertical. Shift-drag or right-drag moves the picture. The wheel, + and -, or W and S move the camera toward the survey in small even steps - 4% a notch of the wheel, 1.5% a press of W or S (hold it to keep going), 12% a click of the zoom buttons - and A and D move the picture left and right. Zoomed in (past twice the whole-well view) the background is black; zoomed out the pad picture and the formations show. Right-click for Look down, north up; Centre on the survey; Go to the top or the bottom of the well; and Fit everything in view. The View bar offers Top, North, East, South, West, Side on (square to the well, like a vertical section), Along well and Fit. Other keys: Ctrl + arrows turn 5 degrees, Home resets, F fits. A double-click glides the well point under the pointer to the middle of the view.

■ The controls card

The top-left corner of the chart shows the controls: the keys drawn as keys (W S, A D, Shift, the arrows, 1 2, Home, F) and the mouse actions as tabs (Drag, Right-drag, Wheel, Right-click, Double-click), each with what it does. Click the chart first so the keys go to it. The card is see-through and the chart's labels keep off it. Hide on the card, or untick Show controls under Chart tools (Appearance), hides it. Hidden, a small Show controls tab stays in the corner - click it to bring the card back (on the 3D view, Show controls is on the right-click menu too). The choice is kept on this computer - once for the 3D view, once for the plan view and vertical section.

■ Perspective

The 3D view is drawn in perspective with a narrow lens, like a camera far off: with the whole pad in view it reads almost flat, and as you move in close, the wells near the camera - yours and every offset - draw bigger and the far ones smaller, with a thinnest line so a far well never disappears. The satellite picture of the pad lies in the same perspective.

■ The chart tools

The chart tools fold into the slim Chart tools strip above the chart so the chart gets the room. Point at the strip and they drop down over the chart, grouped by what they do: GO TO (Latest survey, Focus projection, Projection end), VIEW (View from, Bird's-eye, Straighten, Reset view), DRAG (Rotate or Pan with the left button), SCREEN (Full screen), SHOW (plans, surveys, projections and offsets), FOLLOW, and the appearance settings - background, line width, colours, gridlines, formations, targets, solid wells, floor, earth block, satellite view and rig. Go back to the chart and they fold away; click the strip to keep them open. The wells draw as lit pipe inside a block of layered rock; the landing MD is plotted to the target.

SHARPSHOOTER GOLD

3D view: turning, moving and follow view (continued)

■ Follow downhole

The FOLLOW row contains Follow as drilled, the followed-well selector and comparison controls. View from offers East, West, North, South, Vertical profile and Downhole. The Up arrow moves up the selected path and Down moves down it, in 5-unit steps (Shift 25); Left/Right or 1/2 change the followed well; Latest survey returns to the latest station.

■ Compass and appearance

The compass stays within the visible chart area and uses the saved north reference. Appearance holds Background, Lines, Chart colours, well labels, ellipse, gridlines, formations, targets, Solid wells, Floor & shadows, Earth block, Satellite view and Rig & wellheads. Chart colours also lets you choose colours for individual offsets.

■ Drill pipe and the survey-to-bit stretch

Drill pipe & BHA (Appearance, on as standard) draws the well as steel drill pipe and the survey-to-bit stretch as a pipe in the Survey to bit colour (Chart colours), with the red bit marker at the forecast bit depth. Widths are enlarged for visibility, as every line on the chart is, until you zoom in to true size - the BHA library's pipe size when it is entered. The grey pipe stops at the last survey and the coloured pipe runs from there to the bit. Nothing about the depths or the calls changes. Untick it for the plain blue and amber lines.

■ Casing at true size

Casing > Casing strings (the Casing menu at the top) lists the strings run: name, outside diameter, top and shoe depth, and the inside diameter when it is known; several strings and liners are fine. Show > Casing on the 3D chart then draws each as a see-through steel shell at its true outside diameter along the surveyed path, with a ring at the shoe and its name and size beside it. Zoomed out, a string thinner than the drawn pipe shows as a faint sleeve round the pipe until you zoom in. A shoe below the last survey is drawn to the last survey and labelled. The casing goes with the job to the office and the cross-shift computer, and it changes nothing else: not the AC hole sizes, the pressure page or the torque-and-drag shoe.

■ Separate monitor

Full screen opens a separate chart window. Its top controls hide until the pointer approaches the top edge. The main window stays on Survey sheet.

SHARPSHOOTER GOLD

3D simulator: drill it yourself

■ The Simulator view

The 3D view's Simulator (the game-style picture, on as standard) draws the wells on the graphics card and is flown like a game - drag, the wheel, W A S D - with the mud motor and BHA at the bit and the bit turning. The window opens maximised; Hide tools gives the picture the whole screen and F11 is full screen. The panel on the right is in sections that fold, and the offset wells are in one drop-down with Show all and Hide all.

■ See Pneuma's plan

In DRILL IT YOURSELF / SLIDE / ROTATE WHAT-IF, See Pneuma's plan shows her stand-by-stand plan to TD - how many slides, the metres slid and rotated and the share slid - puts her next stands in the step boxes and plays her whole plan from the bit, the BHA sliding and rotating as she would. Hold Shift to go faster; Clear stops.

■ Drill it yourself

Drill it yourself drives the bit from the survey sheet's bit: A and D turn the toolface (Shift for 15 degrees), H and L go to high side and low side, Space switches between sliding and rotating, and holding W (or Up) drills. The top of the picture shows SLIDING at the toolface or ROTATING, a toolface dial, the metres slid and rotated for the stand and in all, the bit's MD, inclination and azimuth, and where it is against the plan. Enter starts a new stand, R starts again from the bit and Esc stops. Slides make the sheet's motor output and rotations the rotating trend; nothing on the sheet is changed.

■ The score

Each run is scored out of 100: up to 60 for ending close to the plan, up to 25 for rotating rather than sliding and up to 15 for a smooth hole (no 30 m worse than the section's dogleg limit). The same score is worked out for Pneuma's own plan over the same depth; Esc shows both and who won.

SHARPSHOOTER GOLD

Satellite ground, the rig and wellheads

■ Turn the ground picture on

Satellite view in the 3D chart's APPEARANCE row lays the pad's satellite picture flat under the wells. The same tick applies on the Plan view and is saved with the job.

■ Where ground level sits

The picture is drawn at ground level, which is the KB height below the wellhead. A 6.4 m KB puts the ground at 6.4 m TVD and the rig floor above it, the same as on the lease. Enter Ground MSL and KB in Job settings first.

■ What it needs

The pad latitude and longitude must be saved with the job. The picture comes straight from Mapbox, so the computer needs internet the first time and then once every 30 days; in between it is kept beside the job database (Mapbox allows 30 days). If the tick cannot produce a picture it says why.

■ The rig and the wellheads

Rig & wellheads stands the derrick over the well being drilled and puts a wellhead on the top of every offset, in that well's own colour. The rig is drawn to scale. With the whole well in view a real mast is only a few pixels, so it shows as a small tower mark and grows into the rig itself as you zoom in.

■ When it is not drawn

The ground picture and the rig are left off in Follow mode, which looks through a perspective camera. Turn Follow off, or use Bird's-eye view, to see them again.

Offset coordinates and AC imports

■ Import or enter offsets

Offset wells accepts supported anti-collision PDFs and manual coordinate or angle data. Review the reference well, origin and elevation datum before applying an import.

■ Match the north reference

An offset must use the same north reference as the job, or Show / hide on charts refuses it. Re-import the offset with the matching reference, or correct the job's Survey AZI reference in Job settings.

■ Edit coordinates

Edit numbers directly in Offset coordinates, using Enter or Tab to save. Coordinate changes update the plotted path. Original report SF, CC and ellipse-gap values remain historical reference data.

■ Read source coverage

A report may contain only closest-approach samples. Its plotted path may therefore cover only part of an offset. Offset MD coverage describes the available coordinates, not a guarantee of a full survey.

■ View the original

Show imported AC report opens the saved source PDF. An older import may ask you to locate and verify that PDF once.

SHARPSHOOTER GOLD

Real Time AC, concern depths and ellipse distance

■ Use selected wells only

Real Time AC follows the selected completed survey and includes only the offset wells selected to show. Choosing Show nearest 5 therefore limits it to those selected offsets. Changing visibility updates the summary.

■ Read a concern at its depth

Imported AC summary lists critical CC, between-ellipse and SF points. Separate concern depths have separate rows. Reference MD, offset MD, SF, CC and ellipse gap all come from the same source row.

■ Distinguish current and imported values

Calculated SF and ellipse gap use configured uncertainty for the current surveyed geometry and selected method. Imported SF and gap remain historical report values at their displayed source depths.

■ Missing values

Missing calculated values stay blank with the cause shown in Job settings > AC setup / missing inputs. Report values and covariance are never extended beyond their coverage. The 3D comparison labels current calculations and historical results separately.

■ Highlights

Imported rows use yellow for SF below 2 or CC below 10 m, and red for SF below 1 or CC below 5 m. Real Time AC Warning settings controls its separate warning thresholds.

■ The light, and the approaching limits

The Real Time AC button on the survey sheet and the phone's A/C light show the worst of the shown offsets at the survey: red past the job's warning limits (or an SF under 1), green when every offset worked out and none is flagged. Warning settings also take approaching limits - a second SF and a second centre-to-centre, above the warning ones (the standard is SF 2 and one and a half times the warning distance). Inside either of them the light goes yellow before the warning turns it red, and the offset's row says which limit it is approaching. Leave one blank to turn it off.

Ellipse outlines and survey tool assignments

■ Turn on the outline

Show ellipse draws oriented ellipsoids from full covariance at the selected display sigma. Other paths can show separately labelled original reported-radius envelopes. Turning it on switches off well-name labels.

■ As-drilled outline

As drilled uses its own configured uncertainty. It never borrows a plan radius. Open Job settings > AC setup / missing inputs to supply approved IPM runs, full history and starting covariance, or a full one-sigma covariance export.

■ Tool program

Job settings > AC setup & IPM checks shows assigned tools and depth intervals. Assign tools from AC PDF uses the reference tool program; otherwise a primary-plan program can supply the assignment.

■ Automatic checks

Job settings checks assigned tool names against available local IPMs and lists missing or ambiguous models. The chart reads missing evaluation/display sigma separately from labelled AC report settings. Existing saved values remain editable; missing or conflicting settings require review.

■ Limits of these values

Confirm per-well field inputs, sigma, margin and projection in AC setup. In Office connection > Company IPMs, download approved revisions. New jobs check after sign-in. Existing jobs keep pinned models; known withdrawals require review. Unsupported gyro/floating models and missing prior history need provider covariance.

SHARPSHOOTER GOLD

MSA from the tool's raw readings

■ What it does

Rig Data > MSA from raw readings works out a multi-station correction on this computer: the tool's fixed magnetometer errors for one BHA run, found from the raw readings of all its surveys, then each survey's INC and AZ worked out again. Advisory - the provider's corrected survey stays the survey of record unless your company says so.

■ Import the raw readings

Import raw readings takes the MWD provider's raw export (CSV, text, Excel or LAS) with MD and Gx, Gy, Gz, Bx, By, Bz; a BHA column and the raw INC and AZ help. Units are worked out by size. Readings stay in the job and are never overwritten.

■ Check the reference

Total field, dip and gravity, and the declination and grid convergence the job's AZ needs - the same values the MWD provider used. Tick IFR when they came from an in-field referencing service.

■ Work it out

The tool's axes are proved against the provider's raw INC and AZ, then the axial bias and scale (and the cross-axial biases when the toolfaces are spread) are found. Moving or far-off surveys are left out with the reason.

■ Read the verdict

Good, Check before use, or Refused with the reason: under 10 surveys, nearly all in the east-west zone, two answers that fit, or readings a fixed tool error cannot explain. The table shows each survey's AZ before and after, the field and dip errors before and after, and the plots show them against depth.

■ Send to review

Send to review puts the corrected surveys through the MSA review window: tick, Apply, and Undo on the survey sheet takes it back. East-west surveys are shown but not ticked. Nothing runs on its own.

SHARPSHOOTER GOLD

Well data on the client portal

■ Off until your company turns it on

Your company's Office account turns Well data on the portal on at sharpshootergold.com/portal and confirms the company has the right to put the wells' data there and is responsible for who sees it. Until then nothing is sent.

■ What goes

While it is on, the open well goes up whenever it changes: its details, surveys, plan, targets, slides, rig activity, daily tickets and the KPI report. Only the company's Office accounts can see it. Raw survey readings and survey check grades never go.

■ In the program

Server > Client portal well data shows whether it is on and when the well was last sent, with Send now and Take this well off the portal. Turning it off on the portal deletes the wells there.

■ The link at the bottom

The chain-link button at the bottom right of the window shows it at a glance: green LIVE while this well is going to the client portal, orange SERVER while the website is down and your company's Office Server stands in for the tools and ticket prices, red NOT LIVE when nothing is going (off on the portal, no licence, the website not reached). Point at it for the reason; click it to open Server > Client portal well data.

■ When the website is down

If this computer is signed in to your company's Office Server (Office connection), the tools and ticket prices come from the server's copy of the portal and your changes wait there; the server passes them on when the website is back. The well itself goes up again as soon as the website answers.

■ Tools and prices on the portal

While it is on, the company's Office accounts can add, edit, move and ship tools and change each well's ticket prices on the portal, and see the surveys and slides (both download as CSV). SharpShooter picks the changes up by itself and sends the rig's measurements and statuses the same way. The newest change of a tool wins.

SHARPSHOOTER GOLD

Every WITS item and the EDR traces

■ Every item the rig sends

While the rig feed reads, every item the rig sends is kept with the job against the time - tank volumes, pump strokes, casing pressure, gas, the rig's own activity code - with nothing to map or type. A value is kept when it changes, one every 5 seconds at most and once a minute when it holds still. The list is under Every item the rig sends on Rig Data > Rig data feed; untick Keep every item the rig sends to stop it for a job.

■ Names

Each item is named from the standard WITS list (Tank volume (active), Pump stroke rate #1, Casing (choke) pressure ...), or by the measurement it is mapped to. Select one and Rename the selected item gives it your rig's name and unit; an empty name goes back to the standard one.

■ What was this stop?

When the bit has sat still with the rotary stopped for 30 minutes or more, a small window asks what it was - rig repair, cut drill line, test BOP or any of your company's codes - and puts it on the activity as a typed line over the feed's Rig service line. Leave keeps the feed's line. Untick Ask what a long stop was to stop it for a job.

■ Open the traces

Rig Data > EDR traces (or Show the traces on the Rig data feed window) draws the items against the time: tracks side by side, time running down with the newest at the bottom, each curve with its own scale, and the rig's activity beside the clock. Bit and hole depth share one scale.

■ Move, zoom and read

Hover for every curve's value at that moment. Zoom in and Zoom out (or + and -, or Ctrl + wheel) halve or double the time shown, 1 minute to 30 days; type your own in Show (45 min, 3 h, 2 days); drag down the traces over a stretch to fill the screen with it; Show all puts the whole record on one screen. The mouse wheel moves in time; Live follows the newest.

■ Pick the items to see

Traces... on the toolbar lists every item the rig has sent: tick the ones to see. A ticked item takes a track of its own while there is room (8 tracks), then goes beside others, up to four to a track; untick to take it off; Standard puts the usual set back. The choice is remembered on this computer.

■ Change the tracks

Click a track's heading to add a curve, take one off, set its scale or remove the track. Add a track makes a new one. Standard tracks puts back hook load and WOB, RPM and torque, pressures and flow, depths and ROP, pits and gas. The tracks are remembered on this computer.

SHARPSHOOTER GOLD

Every WITS item and the EDR traces (continued)

■ Export and pictures

Export (CSV) writes the curves shown, a row every 5 seconds to 1 minute. Save picture writes a PNG of the window. An imported EDR file (Rig Data > Import EDR file) fills the traces too. The values live in a file beside the database (name.db.traces), left out of the 15-minute automatic backups because of their size.

SHARPSHOOTER GOLD

Surveys and plans through the website

■ What goes

While your company has Well data on the portal on, the open well's surveys and slides go to the office through sharpshootergold.com by themselves when they change - no Office Server needed. The rig's WITS traces go the same way every 5 minutes for the office's EDR traces.

■ A new plan from the office

When the office sends a plan through the website, it comes into the plan library within a few minutes and a window asks whether to use it now. Later keeps the plan you have; choose the new one on the Plan page any time.

■ A well the office set up first

Server > Client portal well data > Well on the website lists the wells the office has put plans on. Pick the one this job is, and the surveys go to that well. Pick the first line to send the job as itself again.

■ Check it

The same window shows what went and when, with Check now. The last 5 versions of each well's surveys and plan and 90 days of traces are kept on the website, in your company's 2 GB.

■ When the website is down

A computer signed in to your company's Office Server sends and receives through it as before. While the website is carrying a well, the Office Server leaves that well's automatic sends alone, so the office does not get every revision twice.

■ What never goes

Raw survey readings, MSA rows and survey check grades never leave the computer; the website refuses them too. Demo copies do not send well data.

SHARPSHOOTER GOLD

Checking AC against another program's report

■ Why two programs can differ

The same wells can give different SF numbers when the two programs use different hole or casing sizes, a different surface margin or projection, or a different way of growing the error along the well. Line these up before comparing.

■ One SF formula

Every job works SF out the same way: $SF = \text{centre distance} / \text{MASD}$ and $ES = \text{centre distance} - \text{MASD}$. MASD, the minimum allowable separation, is both hole or casing radii + the surface margin (0.3 m) + $\sigma \times$ the combined error with the projection (0.5 m). SF 1.00 is the limit. AC setup keeps the σ , margin and projection; there is no method to pick.

■ Hole and casing sizes

Enter the hole or casing size for our well and each offset (for example 340 mm for 13-3/8 in casing). A well with no size uses the standard 311 mm (12 1/4 in) hole by itself - nothing is asked and no well waits for a size. Type 0 to allow for no hole.

■ Offset slots from a well database

Offsets imported from a well database are now placed with the grid convergence turned into the job's north. Run Update from well database once on an older job so its offsets move to the right place.

■ Report-compatible propagation

Tick it only to check numbers against another program's report: errors start at the ground row, the first survey carries half its course and cross-axial errors count from the next survey. Leave it off for normal work.

■ Gyro tools

Gyro models are now sized with the earth rate in the right unit and use the true-north azimuth. A gyro model marked Provisional loads, but check one well against the provider's numbers before using it for live AC.

SHARPSHOOTER GOLD

Daily tickets and the KPI report

■ Price list (office)

Tickets > Price list. The office enters each charge with a code, description, unit and rate. The list goes to the rig with the plan (Office connection > send the plan) and is locked there - the office changes it.

■ The day's ticket (rig)

Tickets > Daily ticket. Pick the day, add lines from the price list or type another charge, and set how many. Copy the day before starts a new day from yesterday's lines. Every change saves by itself.

■ Print

Print ticket PDF makes the day's ticket. A later price change never rewrites a ticket already written.

■ Cost summary

Tickets > Cost summary totals every ticket between two days: each day's total, each charge's total and the whole. Print summary PDF for the office or the client.

■ Tickets go to the office

The tickets ride up with the surveys. The office can add or change a day too; whichever copy of a day was changed last is the one kept.

■ KPI report

Operations > KPI report works itself out from the rig activity, the surveys and the tickets - nothing to type. Speed: metres drilled, metres per day, ROP rotating and sliding, connections and trip speeds. Downtime: waiting plus lines coded rig repair, fishing, waiting / NPT, rig not working or well control, as hours and a share of the time. Cost: daily costs, cost per day, cost per metre and the cost of the downtime. Print or copy it.

Tool inventory

■ Open it

Operations > Tool inventory. On the rig it shows this well's tools as the office sent them; pick All tools to see the company's list. The Kind drop-down shows one kind at a time - DD tools, MWD tools, Other tools, Drill bits, Tubulars, Mud motors - or all of them; a standard item's kind comes from its type, and the office picks the kind of its own types. Pick a tool to see its measurements, notes and history.

■ Office: add, move and ship

Add item picks a standard drilling item (mud motor, MWD tool, stabilizers, jars, NMDC, bit and more) or a type of the company's own, with serial, size, description, status and well. Move to well, Shipping (carrier, waybill, date), any status, Edit details and Delete are office work. Our own item types keeps the company's list.

■ Rig: measurements and status

Enter the tool's measurements (pick a name such as Bend setting, OD or Blade OD, or type one) and Save measurements; add notes; mark it On location, Ready to ship or Shipped back. Add other tool puts a tool of the rig's own on the well - a hand tool, a gauge, a rental - as an Other tool, On location; it goes to the office with the surveys and the office looks after it from there. Everything else is the office's.

■ How it travels

The well's tools come to the rig with the plan and go back with the surveys (Office connection). With well data on the client portal they also go through the portal, where Office accounts can change them. Every change keeps a history line with who and when; the newest change wins.

SHARPSHOOTER GOLD

Communication: morning reports, DD updates, tool orders and manifests

■ Open it

Operations > Communication, in the menu at the top. Four things to write, each filled in from what the program knows and finished by hand, and one list of everything sent and received.

■ Morning report and DD update

Filled in from the sheet and the rig feed: the bit depth, the last survey, the BHA in the hole, what the rig is doing now and the last 24 hours of rig activity. Type the plan for the next 24 hours and the remarks; change any line of the text before you send it. A DD update is the short form.

■ Order tools

Lines of tool (pick from the inventory's types or type one), quantity, size, needed by and a note, where to deliver, and remarks. Write the order makes the text.

■ Shipping manifest

The tools marked Ready to ship in the inventory are ticked; tick any other tool going too. Carrier, waybill, date and ship-to. The manifest lists each tool with its serial, size, measurements and notes; with the box ticked the tools are marked Shipped back as it is sent.

■ Sending

Send to office keeps the message with the well and it goes up with the next survey send (every minute while signed in through the Office Server or the website); Send now pushes it straight away. Email opens your own mail program with the text in it (the address is remembered). Copy and Save as text file for anything else. Sent & received lists every message with its status; the office sees them on its own Communication page, marks them handled, and the mark comes back to the rig with the plan.

SHARPSHOOTER GOLD

Rosebud page and the toolface from the rig

■ Open it

Rosebud on the left, under BHA. The rig feed's toolface on a rosebud drawn like the phone's: the last readings as green dots, the newest outermost and biggest, the newest toolface written in the middle (a magnetic one as 245 m), the slide call's toolface as a gold wedge, the survey INC and AZ in the top corners, the continuous INC and the rig's slide figure with the call in the bottom corners.

■ Beside it

The slide recommendation exactly as the survey sheet works it out (DLS, build or drop, turn, metres to slide, toolface, landing MD - change the target, start or motor on the sheet) and the live anti-collision picture: the AC light, the survey it follows and the nearest offsets with their SF and ellipse gap. Real Time AC opens the full window.

■ When the rig stops sending toolfaces

Some rigs send the toolface, inclination and azimuth items only while making hole - nothing from the moment the bit comes off bottom until it is drilling again. The last toolface stays on the rosebud and on the phone, faded, with how long ago it came in. Which toolface is used is the one the MWD is changing; when both the gravity and the magnetic items change, or neither, near vertical (under 5 degrees) it is the magnetic one and above that the gravity one. Ask the rig to send the survey record on time (every second) to have toolfaces off bottom too.

SHARPSHOOTER GOLD

Second computer on the rig feed: the port found by itself

■ Automatic

Rig data feed > Second computer > Out of serial port: leave the port on Automatic. Every serial port but the rig cable's is listened to for a computer waiting for a feed (SharpShooter's Pason keep-alive), and the feed goes out of the port it is heard on; a port sending real readings is a rig device and is never written to. The port found is tried first next time, and the rig-cable search never listens on it.

■ On the second computer

Choose Serial cable from the rig with the Pason keep-alive on and Start reading, at the speed set on the first computer (9600 is the usual). The status line on the first computer says where it is looking and when it is sending.

SHARPSHOOTER GOLD

Cross shift over the cable

■ What it is

The null-modem cable between the two computers - the one the feed is passed on over - also carries the job, both ways. Open Cross shift over the cable (the three-dot menu, or the button on the Rig data feed window's Second computer tab) on both computers, press Send this job on the one with the job and Get the job on the other.

■ What comes across

The whole job: surveys, slides, the plan and targets, BHAs, offsets, casing, rig activity, settings and notes - checked against a fingerprint at the far end, with any line lost or garbled on the cable sent again by itself. The well database reference data of an imported job stays behind (the other computer keeps its own). The rig feed keeps flowing while it copies: the job's lines go between the records.

■ Just the surveys and slides

When the other computer already has the well, Send the surveys and slides only takes seconds: the surveys (with their BHA and sensor offset), the slides, the BHAs and the INC/AZ ahead rows - a few kilobytes. On the other computer open the same well and press Get; what it does not have is added to it. Nothing there is changed: a survey that reads differently at the same depth, or a slide that overlaps one there with other depths, is kept as it is there and the window says so; a survey above that copy's tie-in stays out. Both computers need this build; an older one takes only the whole job.

■ Cable speed

Automatic - nothing to set. For a handover both computers go to 115200 baud by themselves, twelve times quicker than 9600, and back to the cable's own speed (9600 unless changed on the Second computer tab) when it is done; the rig computer settles it and the cross shift window says which speed it is on. If 115200 does not come through, both go back to 9600 by themselves and the handover carries on there (on that cable it then stays at 9600 until SharpShooter is opened again). The rig feed keeps going to the second computer while a job copies.

■ How long, and what to expect

At 115200 allow about a minute for every 400 KB of a whole job (at 9600, a minute for every 33 KB); the surveys and slides only take seconds. The window says the size and the time. The job arrives as a database of its own beside the current one (cross-shift-....db) and SharpShooter offers to open it. Nothing runs from what comes over. Both computers need the 27 September 2026 build or later: during a handover the rig computer gives the second computer a turn to answer every half second or so, and an older copy at either end cannot take turns. If the other computer does not answer, the window says so, the handover stops and the feed carries on - hand over by Wi-Fi or a USB stick instead. The second computer must be reading the feed by cable with the keep-alive on, and it never sends a byte until it has heard SharpShooter on the rig computer. Nothing ever goes out of the rig cable's own port.

SHARPSHOOTER GOLD

Survey sheet: getting about and what the lines say

■ The two little arrows

Bottom right of the page, two round arrows stay on the screen however far the page is scrolled: the bottom one brings the last survey and the blank entry rows under it into view, the top one the header and the steering call. Moving the selection with the arrow keys keeps the row on the screen going down as well as up.

■ The plan line

The Distance to plan line ends with which formation the bit is in (from the latest survey and the sensor-to-bit length, against the plan's formation tops). The status lines under the toolbar fold away behind the Hide / Show details pill; the choice is remembered.

■ The learned motor figure

With MOTOR on Learned - this BHA, the line under it says what the figure stands on: the step it came from (this BHA in this formation and inclination band, or wider), the metres slid, and how many slides with their lowest and highest output - a learned 10 next to slides of 18 and 21 usually means short early slides are in the average. Average - last 4 MDLS or Current MDLS use the latest courses only.

■ Connections joined

Two connections the feed wrote back to back - a connection, the bit set back on bottom for a few seconds without making hole, and another connection - show, count and go to the phone and the office as one line, with the pumps-off time added up. A typed line between them still cuts the line where it sits.

Sections and BHAs

■ On the survey sheet

SECTION picks the BHA: each section is a BHA run with its own bit to sensor, tie-in and sheet. The chips beside it say the bit to sensor and the assembly running. Multi-lateral is the one button there.

■ On the BHA page

New BHA adds a section for the next run, tied in at the latest survey; Edit BHA and Delete BHA are there too. Select the assembly the section ran in the list and press Run this on it - that is what the learning and the book value use.

SHARPSHOOTER GOLD

Reports: PDF, Excel, CSV and TXT

■ Open Reports

Use Reports in the left sidebar. Choose Survey report or AC report for shown offsets, then select all surveys/saved interpolations or the selected survey. Use PDF, EXCEL, CSV or TXT to save a file.

■ Choose report columns

Report columns controls the data table independently of the survey-sheet display. Survey options include MD, INC, AZI, TVD, Subsea TVD, N/S, E/W, VS, DLS, BR, TR and Comments.

■ Choose header information

Click Header information to open the settings window. Choose a section on the left, tick which details to show and edit the report values alongside them. Save header keeps the changes; Cancel leaves the saved settings unchanged. Use job / plan values resets optional overrides in the window.

■ The header image and logo

The SharpShooter Gold logo is the standard header image. In Header information, select Image & extras: Upload header image puts your own PNG or JPEG in its place, Remove image leaves the header without one, and Use SharpShooter Gold logo goes back to it; then Save header. The image is saved with the job and can appear in PDF and Excel. CSV and TXT contain text only.

■ Save a named setup

In Reports, Save as names the current columns, header choices and logo. Choose a saved report setup and Load to reuse it on any job in this database. Update saved replaces it after confirmation. The current well keeps its own identity and header values.

■ Check the result

Check the selected scope, units, reference and columns before sharing. Missing metadata remains blank. Excel stores survey numbers as numeric cells; SF is shown to three decimals where present.

Safety meeting and imported company forms

■ Open the meeting sheet

Job settings > Open safety meeting opens a separate form window. It stays blank until a company PDF is imported.

■ Use your own PDF

Choose the intended company form and fill its available fields. The imported document and saved entries belong to the job. Closing the window saves its edits.

■ Keep the record

Back up the database to retain the saved job documents. Keep the company's original PDF separately if you need a clean form for another job.

SHARPSHOOTER GOLD

Subscription, activation and demo expiry

■ Subscribe and download

Subscribe at sharpshootergold.com/buy. Payment is taken by Stripe, by card or Apple Pay, and the receipt comes from Stripe. The download link is emailed straight away. One subscription covers one computer; write to us about more than one computer or a whole crew.

■ Get my key

Install, open the program and use the Paid by card on the website? box on the activation screen. Enter the email address you paid with and press Get my key. The program fetches its key and activates itself. If the key is not ready yet it keeps trying in the background, so you can leave the window open.

■ Renewal is automatic

While the subscription is paid the program renews its own key in the background, within a few days of expiry. There is nothing to reinstall and nothing to re-enter. Cancel any time from the Stripe receipt email; the program keeps working to the end of the period already paid for.

■ Activation by key

Copies supplied directly require the computer-bound activation key. Give the displayed computer code to your software supplier and enter the matching key. Contact the supplier when moving to another computer.

■ Demo expiry

Demo copies use the signed expiry included with their ZIP. Check the displayed date. New demo installations start with a fictional sample well and its offset wells. Reinstalling does not extend the demo period.

■ Internet time checks

Subscription and demo copies verify signed internet time at startup and every six hours while open, including in the background. While a previously verified program stays open, its offline allowance lasts up to 48 hours from the last successful check. Licence and demo expiry still apply.

■ Keep your job data

Back up your local database before updating or moving computers. Saved demo jobs remain after expiry. Ask your supplier about activation, an extension or arranging access to export your data.

SHARPSHOOTER GOLD

AC setup from Office

■ Send the latest surveys

Open Office connection from the three-dot menu, sign in and link the correct shared job. Send the latest saved surveys. The revision includes the job's offsets and existing AC inputs.

■ Office reviews and publishes

Office prepares its tools, survey histories, starting uncertainty and separation settings in Job settings > AC setup / missing inputs > Advanced setup. In Office connection, choose Publish AC setup and review its contents and readiness.

■ Field pulls the matching setup

In Job settings > AC setup / missing inputs, click Pull AC setup from Office. Sign in through Office connection and click Pull AC setup from Office there. Review the publishing user, revision and remaining missing inputs before Apply AC setup.

■ Read the current results

Real Time AC shows the current survey and closest offset depths, centre distance, direction, calculated SF and distance between ellipses where available. Click Needs inputs for the specific reason a result is unavailable. Imported report values retain their original reference and depths.

■ When the surveys changed

Send the new surveys and have Office prepare a matching setup. Field rejects a different source well, geometry or reference. A saved IPM can calculate future surveys while its runs and inputs remain applicable; imported covariance is tied to the original path and coverage.

■ Use the plan's tool

If the actual well uses the same tool program as the reference plan, choose Use the plan's tool for As drilled and save with OK. The exact local IPM is pinned to this job. The actual uncertainty is calculated along the actual path; plan covariance is not copied.

■ An incomplete setup stays incomplete

Request the original survey/tool history or an applicable full covariance export from Office or the survey provider. Missing calculated values are not evidence of clearance.