IRON TRACKER

UI/UX Specification v1.0

Mobile-First Material Design 3 Interface

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1. Design System Foundation

1.1 Material Design 3 Implementation

Iron Tracker adopts Material Design 3 (Material You) principles implemented via MUI v6 with custom MD3 theming. Google's official @material/web library was evaluated but rejected: it is in maintenance mode, covers only ~20 components, and lacks bottom navigation, bottom sheet, snackbar, date picker, and data tables — all critical for this app.

MUI provides 50+ production-grade components. MD3 visual fidelity is achieved by mapping Material Color Utilities (@material/material-color-utilities) outputs to MUI's palette system, producing dynamic color schemes from a user-selected seed color.

1.2 Color System

Seed Color: #2E75B6 (confident, gym-appropriate blue). Users can customize this in settings, and the entire app theme regenerates dynamically.

Dark Mode (Default): Surface: #121212. On-Surface: #E6E1E5. Primary: #A8C7FA. Primary Container: #004A77. Secondary Container: #2B3133. Error: #F2B8B5. The dark theme is the default because gym environments are typically dim and users check phones between sets with dilated pupils.

Light Mode: Surface: #FFFBFE. On-Surface: #1C1B1F. Primary: #1B5E8C. The light mode is available for outdoor or well-lit environments.

Semantic Colors: PR Gold: #FFD700 for personal record celebrations. Warning Amber: #F9A825 for deload alerts. Success Green: #66BB6A for completed sets. Rest Timer Blue: #42A5F5 for the floating timer pill.

1.3 Typography

Font Family: Inter (variable weight, optimized for screens, broadly supported). Fallback: system-ui, -apple-system, Arial, sans-serif.

Role	Weight	Size	Line Height	Usage
Display Large	700	36px	44px	Home screen greeting, PR celebration
Headline Medium	600	28px	36px	Section headers, exercise names
Title Large	600	22px	28px	Card titles, chart labels

Role	Weight	Size	Line Height	Usage
Title Medium	500	16px	24px	Variant chip labels, list items
Body Large	400	16px	24px	Primary body text, input fields
Body Medium	400	14px	20px	Secondary text, notes, timestamps
Label Large	500	14px	20px	Buttons, tab labels
Label Small	500	11px	16px	Badges, overlines, chip counts

1.4 Spacing and Touch Targets

Base Unit: 4px. All spacing derives from this: 4, 8, 12, 16, 24, 32, 48.

Touch Targets: Minimum 48x48dp per WCAG/MD3. Primary action buttons (Log Set, Confirm): 56x56dp for sweaty-finger reliability.

Content Padding: 16px horizontal padding on all screens. 24px vertical spacing between major sections.

Card Elevation: MD3 Level 1 (1dp shadow) for set cards. Level 2 (3dp) for the active exercise card. Level 0 (filled container) for historical items.

1.5 Iconography

Icon set: Material Symbols (Outlined, weight 300, grade 0, optical size 24). The outlined style matches MD3 Expressive guidelines. Common icons: fitness_center (exercises), settings (variants), timer (rest), emoji_events (PRs), insights (analytics), photo_camera (AI machine ID).

1.6 Motion and Animation

Shared Axis: Forward/backward navigation uses horizontal shared-axis transitions (300ms, standard easing).

Container Transform: Exercise card expanding to full-screen log view uses container transform (450ms).

Emphasis: PR celebration uses a spring animation with overshoot: confetti particles with physics simulation (2s duration), gold banner slide-in with bounce (400ms).

Rest Timer: Linear progress with color shift from blue to amber at 30s remaining.

Micro-interactions: Set confirmation: checkmark scale-in (200ms). Stepper tap: subtle scale pulse on the number (100ms). Chip selection: fill transition (150ms).

2. Information Architecture

2.1 Navigation Structure

The app uses a bottom navigation bar with four primary destinations, following MD3 NavigationBar patterns. The bottom nav is persistent on all screens except full-screen modals (numpad, AI camera).

Tab	Icon	Label	Primary Content
1	fitness_center	Log	Exercise list for quick-logging, active session view
2	history	History	Session timeline, exercise-level history
3	insights	Stats	Charts, PRs, muscle heatmap, training calendar
4	person	Profile	Settings, account, data export, AI coach (future)

2.2 Screen Inventory

Screen	Route	Parent Tab	Description
Exercise List	/log	Log	Searchable list of exercises, grouped by recent/muscle/alphabetical
Set Logger	/log/:exerciseId	Log	Per-exercise logging with variant chips, set history, input fields
Variant Manager	/log/:exerciseId/variants	Log	CRUD for equipment variants (bottom sheet on mobile)
AI Machine ID	/log/identify	Log	Camera/upload flow for machine identification
Session Timeline	/history	History	Chronological list of sessions with summary cards
Session Detail	/history/:sessionId	History	All sets in a session, grouped by exercise
Exercise History	/history/exercise/:exerciseId	History	Full history of one exercise across all

Screen	Route	Parent Tab	Description
			sessions
Dashboard	/stats	Stats	Overview cards: weekly volume, recent PRs, frequency
Exercise Charts	/stats/ exercise/:exerciseId	Stats	1RM trend, volume trend, PR table for one exercise
Muscle Map	/stats/muscles	Stats	Body heatmap and muscle group volume breakdown
PR Board	/stats/prs	Stats	All-time PRs across all exercises
Settings	/profile	Profile	Units, rest timer defaults, theme, account
Onboarding	/onboarding	—	Welcome, profile setup, first exercise tutorial

2.3 Navigation Flows

Happy Path (Repeat User): Open app → Log tab (default) → Tap Chest Press (recent exercises at top) → Variant auto-selected (Hammer Strength, MRU) → See pre-filled 100kg x 8 from last session → Tap Log Set → Set confirmed, rest timer starts → Repeat. Total time for first set: ~5 seconds.

New Machine Flow: Open app → Log tab → Tap camera icon (AI Identify) → Photograph machine → AI returns exercise + details → Confirm/edit variant fields → Save variant → Redirected to Set Logger with new variant selected.

Progress Check Flow: Stats tab → Tap exercise from dashboard card → See 1RM trend chart → Toggle between variant-specific and all-variant view → Tap PR table to see records across rep ranges.

3. Screen-by-Screen Specifications

3.1 Exercise List (Log Tab Home)

3.1.1 Layout

TopAppBar: Prominent, with the title "Log" (left-aligned) and a camera icon button (right, for AI machine ID). Below the app bar: a SearchBar component (MD3 style, rounded, with a search icon and "Search exercises" placeholder).

Content: Three sections, each with a section header chip row for filtering. Section 1: "Recent" — last 5-8 exercises logged, displayed as horizontal scrolling cards (MD3 ElevatedCard, 120px wide). Section 2: "By Muscle Group" — collapsible groups (Chest, Back, Shoulders, Arms, Legs, Core) with exercise list items inside each. Section 3: "All Exercises" — alphabetical full list with a sticky alphabet scrubber on the right edge.

3.1.2 Exercise List Item

Each exercise list item is an MD3 ListItem with: leading icon (muscle group icon), title (exercise name, Title Medium), subtitle (last logged date + last weight/reps, Body Medium, muted color), trailing element (chevron_right icon). Tapping navigates to the Set Logger screen for that exercise.

3.1.3 Interaction States

Empty State: First-time user sees an illustrated empty state with the message "Your exercises will appear here as you start logging." and a prominent "Log Your First Set" button that navigates to a curated list of common starter exercises.

Search Active: Search bar expands to full width. Results filter in real-time with debounced input (200ms). Matching text is highlighted in the results. If no match, show "No exercises found. Create custom?" with a button.

3.2 Set Logger

3.2.1 Layout

TopAppBar: Small, with back arrow (left), exercise name (center, Headline Medium), and overflow menu (right, containing: Exercise History, Edit Variants, Exercise Info). Below the app bar:

Zone A — Variant Chips (conditional): Horizontal scrollable row of MD3 FilterChip components. Each chip shows the variant name (truncated to 20 chars). The most-recently-used variant is pre-selected (filled state). The last chip is "+ Add" which opens the variant creation bottom sheet. This entire zone is hidden when the exercise has 0 or 1 variants.

Zone B — Input Area: The primary interaction zone, occupying the center of the screen. Contains: Weight field (large, 48px font, center-aligned) with a "kg" or "lb" label and ±2.5 / ±5 stepper buttons on left and right. Reps field (large, 48px font, center-aligned) with ±1 stepper buttons. Both fields are tappable, opening the numpad bottom sheet on tap.

Zone C — Action Row: A prominent "Log Set" FAB (Extended FAB, MD3 style, full-width minus padding, 56dp height). Below it, a row of optional metadata toggles: RPE/RIR chip, Set Type chip (working/warmup/dropset/AMRAP), Notes chip. These are collapsed by default and expand inline when tapped.

Zone D — Session Sets: Below the action row, a scrollable list of sets logged in the current session for this exercise. Each set row shows: set number (circled), weight x reps, optional RPE badge, optional PR badge (gold star). Swipe left to delete. Tap to edit. The most recent set is at the top.

3.2.2 Pre-fill Logic

On screen load: query the user's most recent set for this exercise + variant combination. Pre-fill weight and reps. If no prior sets exist, weight = 0 (prompting input), reps = 10 (common default). The pre-fill source is displayed as ghost text: "Last: 3 days ago" below the input fields.

3.2.3 Numpad Bottom Sheet

Triggered by tapping the weight or reps field. Half-screen bottom sheet with: a display area showing the current value being edited, a numeric keypad (0-9, decimal point for weight, backspace), quick-select buttons along the top showing common values based on history (e.g., the user's last 4 unique weights for this exercise). A "Done" button closes the sheet and applies the value. The sheet uses MD3 BottomSheet with drag handle.

3.2.4 Rest Timer (Floating Pill)

Immediately after tapping "Log Set," a floating pill appears below the TopAppBar. The pill contains: a linear progress indicator (full width of pill, thin), the remaining time in MM:SS format (Title Medium, center), and +30s / -30s buttons on left and right. The pill persists across screen navigation and appears on all tabs. At 30 seconds remaining, the pill transitions from blue to amber. At 0 seconds, a haptic pulse fires and the pill shows "Rest Complete" for 3 seconds before auto-dismissing. Tapping the pill at any time navigates back to the Set Logger.

3.2.5 PR Celebration

When a logged set triggers PR detection, an overlay animation plays: a gold banner slides down from the top with the text "New PR!" (Display Large) and the record details (e.g., "Chest Press: New Est. 1RM — 125 kg"). Confetti particles emit from the center of the screen using a spring physics simulation. The banner auto-dismisses after 4 seconds. The set row in Zone D receives a permanent gold star badge.

3.3 Equipment Variant Bottom Sheet

3.3.1 Trigger

Opened from: the "+ Add" chip in the variant row, the overflow menu → "Edit Variants," or the AI machine identification result flow.

3.3.2 Layout

Full-height bottom sheet (draggable, with peek at 60% height). Content: Form fields for variant creation/editing. Name (text input, required, placeholder: "e.g., Hammer Strength Plate-Loaded"). Equipment Type (dropdown/select: machine_selectorized, machine_plate, cable, barbell, dumbbell, bodyweight, smith_machine, other). Manufacturer (text input, optional, with autocomplete from previously entered manufacturers). Weight Increment (number input, optional, with common presets: 2.5, 5, 10). Weight Unit (toggle: kg/lb, defaults to user preference). Seat Settings (dynamic key-value pairs: "Add Setting" button adds a row with label + value fields). Notes (multiline text, optional). Photo (camera/gallery picker, optional).

Action buttons: Save (primary, bottom-right), Cancel (text button, bottom-left). When editing an existing variant: Delete button (text, destructive red, with confirmation dialog).

3.4 Session Timeline (History Tab)

3.4.1 Layout

TopAppBar: "History" title. Content: A vertically scrolling list of session cards, ordered by date (newest first). Each session card (MD3 FilledCard) contains: date header (e.g., "Monday, Feb 24"), session duration and total sets count, a compact summary of exercises performed (exercise name + set count + top set), and a total volume number. Tapping a card navigates to Session Detail.

3.4.2 Grouping Logic

Sets are grouped into sessions using a 90-minute inactivity threshold. Sessions spanning midnight are kept together. Each session can be optionally named by the user (long-press on the date header reveals an inline edit field).

3.5 Stats Dashboard

3.5.1 Layout

TopAppBar: "Stats" title with a date range filter chip (This Week, This Month, 3 Months, All Time). Content: A vertically scrolling dashboard of cards.

Card 1 — Weekly Snapshot: This-week-vs-last-week comparison. Shows total sets, total volume (weight x reps), and training days. Each metric has a delta indicator (green up arrow or red down arrow with percentage).

Card 2 — Recent PRs: Horizontal scrolling cards showing the last 3-5 PRs with exercise name, record type, value, and date.

Card 3 — Training Frequency Calendar: A GitHub-style heatmap showing the last 12 weeks. Each cell is a day, colored by volume intensity (light to dark). Tapping a day shows a tooltip with session summary.

Card 4 — Muscle Distribution: A donut chart showing volume distribution across muscle groups for the selected period. Below the chart: a horizontal body silhouette heatmap where each muscle group is colored by training volume (red = high, blue = low, gray = untrained).

Card 5 — Top Exercises: A ranked list of the user's most-performed exercises by volume, with mini sparkline charts showing recent trends.

3.6 Exercise Charts

3.6.1 Layout

TopAppBar: Exercise name. Content: Tab row with three tabs — Strength, Volume, History.

Strength Tab: Estimated 1RM trend line chart (Recharts LineChart). X-axis: date. Y-axis: estimated 1RM. Data points are colored by variant (if multiple). A segmented button at the top toggles between "All Variants" and individual variant names. Below the chart: a PR table showing records across rep ranges (1RM, 3RM, 5RM, 8RM, 10RM) with dates.

Volume Tab: Weekly volume stacked bar chart. Each bar segment represents a variant (color-coded). X-axis: ISO weeks. Y-axis: total volume (weight x reps).

History Tab: A flat list of all logged sets for this exercise, newest first, with: date, variant name (chip badge), weight x reps, RPE (if recorded), PR badge (if applicable). Filterable by variant and date range.

3.7 Onboarding

3.7.1 Flow

Screen 1 — Welcome: App logo, tagline ("Track every machine. Master every set."), Continue button.

Screen 2 — Profile Setup: Experience level (Beginner / Intermediate / Advanced radio chips), primary goal (Strength / Hypertrophy / General Fitness radio chips), preferred weight unit (kg / lb toggle), training frequency (2-7 days/week stepper).

Screen 3 — First Machine (Optional): Prompt to photograph a machine or skip. If photo taken, AI identification runs, variant is created.

Screen 4 — Tutorial: Animated walkthrough showing: how to select an exercise, how to log a set (highlighting the 1-tap flow), how to switch variants, how to read the rest timer. Uses coach marks (spotlight overlays) on a simulated screen.

Screen 5 — Ready: "You're all set. Let's lift." with a Start Logging CTA.

4. Component Library Reference

The following table maps Iron Tracker's custom components to their MUI/MD3 equivalents and describes specific customization.

Component	MUI Base	Customization
VariantChipRow	Chip (FilterChip variant)	Horizontal scroll, auto-select MRU, + Add chip at end
SetInputField	TextField	48px font size, center-aligned, stepper buttons as InputAdornment
NumpadSheet	SwipeableDrawer (anchor=bottom)	Custom keypad grid, quick-select row from history
RestTimerPill	Paper (floating)	Fixed position below TopAppBar, linear progress, color transition
SetRow	ListItem	Swipe gestures (react-swipeable), PR badge, set number circle
PRCelebration	Modal overlay	Custom animation: banner + confetti (react-confetti)
SessionCard	Card (FilledCard)	Compact summary with exercise list, volume total
ExerciseListItem	ListItem	Leading muscle icon, trailing chevron, subtitle with last log
MuscleHeatmap	Custom SVG	Body silhouette with color-mapped muscle group paths
FrequencyCalendar	Custom (Nivo Calendar)	GitHub-style heatmap, 12-week view, tooltip on tap
ChartToggle	SegmentedButton	All Variants / per-variant toggle for chart data filtering

5. Responsive Behavior

5.1 Breakpoints

Breakpoint	Width	Layout Adaptation
Mobile (primary)	320-599px	Single column, bottom navigation, full-width cards, bottom sheets for modals
Tablet	600-904px	Two-column layout on Stats tab (chart + PR table side by side), NavigationRail replaces bottom

Breakpoint	Width	Layout Adaptation
		nav
Desktop	905px+	Three-column layout: fixed left nav rail, content center, exercise detail right panel. Charts expand to full width.

5.2 Mobile-First Principles

All layouts are designed mobile-first and progressively enhanced for larger screens. The Set Logger screen is optimized for one-handed use: the Log Set button sits in the thumb zone (bottom third of screen). Weight and reps fields are large enough for imprecise taps (56dp minimum). The variant chip row scrolls horizontally to avoid vertical space consumption.

Bottom sheets are the primary modal pattern on mobile (variant manager, numpad, exercise info). On tablet and desktop, these become side sheets or inline expanded panels. The floating rest timer pill is positioned consistently across all screen sizes.

6. Accessibility Specification

Color Contrast: All text meets WCAG 2.1 AA contrast ratios (4.5:1 for normal text, 3:1 for large text) in both dark and light themes.

Touch Targets: Minimum 48x48dp, with 56dp for primary actions. Adjacent targets have at least 8dp spacing.

Screen Reader: All interactive elements have descriptive aria-label attributes. Set rows announce: "Set 3, 100 kilograms for 8 reps, working set." Chart data is available as an accessible data table beneath each chart (visually hidden, screen-reader accessible).

Reduced Motion: Users with prefers-reduced-motion receive instant transitions instead of animations. PR confetti is replaced with a static badge.

Keyboard Navigation: Full keyboard support for desktop use. Tab order follows visual layout. Escape closes bottom sheets and modals. Enter confirms the active action (Log Set, Save Variant).

Focus Indicators: Visible focus rings on all interactive elements (2px outline, offset 2px, using the primary color).

7. Error States and Empty States

7.1 Error States

Scenario	Treatment
Network offline during set log	Set logs immediately (optimistic). Subtle chip in TopAppBar shows "Offline — sets will sync when connected." No blocking UI.
Sync failure after reconnect	Snackbar: "Some sets failed to sync. Retrying..." with a manual Retry action button.
AI machine ID fails	Bottom sheet shows: "Couldn't identify this machine. Try a clearer photo or create the variant manually." with Retry and Manual Create buttons.
AI rate limit reached	Snackbar: "AI features paused for today. Resets at midnight." Disabled camera icon with tooltip.
Supabase auth token expired	Silent refresh attempt. If refresh fails: redirect to login with "Session expired. Please sign in again."

7.2 Empty States

Screen	Empty State
Exercise List (new user)	Illustration of a dumbbell. "Your exercises will appear here as you start logging." Button: "Log Your First Set."
Set Logger (no history)	Ghost text in input fields: "Enter weight." No session sets section. Encouraging text: "First set on this machine! Let's go."
Session Timeline (no sessions)	Illustration of a calendar. "No workouts yet. Your training history will build here."
Stats Dashboard (no data)	Illustration of a chart. "Log a few workouts to start seeing your trends." Each card shows a placeholder skeleton.
PR Board (no PRs)	"Your personal records will appear here as you train. Keep pushing!"

8. Micro-Copy and Voice Guidelines

Tone: Encouraging, concise, never condescending. The voice is that of a knowledgeable training partner, not a drill sergeant and not a therapist. Direct and action-oriented.

Numbers: Always show units immediately adjacent to the number (100 kg, not 100 kilograms). Use space as thousand separator in volume totals (12 500 kg). Decimal weights show one decimal place (67.5 kg).

Time: Rest timer uses MM:SS format. Dates use relative when recent ("Today," "Yesterday," "3 days ago") and absolute when older ("Feb 24"). No year unless it's a different year.

PR Announcements: "New PR! Est. 1RM: 125 kg on Chest Press." Short, celebratory, specific.

Error Messages: State what happened and what to do. Never blame the user. "Couldn't identify this machine. Try a clearer photo or create the variant manually."

Loading: Use skeleton screens, not spinners. Never show "Loading..." text. The app should feel instant.

9. Key Interaction Specifications

9.1 Set Logging: 1-Tap Flow

Precondition: User is on the Set Logger screen, has logged at least one prior set of this exercise. Step 1: Screen loads with pre-filled weight and reps from last set. Variant is auto-selected (MRU). Step 2: User taps "Log Set" (single tap). Step 3: Set is immediately added to Zone D (optimistic). Haptic tick feedback fires. Rest timer auto-starts. Step 4: Background sync to Supabase. PR check runs asynchronously; if triggered, PR celebration plays.

9.2 Variant Switching: 2-Tap Flow

Precondition: Exercise has 2+ variants. User is on Set Logger. Step 1: User taps a different variant chip (tap 1). The chip transitions to filled state. Weight and reps re-populate from the last set on that variant. Step 2: User taps "Log Set" (tap 2). Total taps for a variant-switched repeat set: 2.

9.3 Weight Adjustment: 3-Tap Flow

Precondition: User wants to increase weight by 5 kg. Step 1: Tap the +5 stepper button once (tap 1). Weight display updates immediately. Step 2: (Optional) Adjust reps if needed via stepper. Step 3: Tap "Log Set" (tap 2-3). Total taps for a weight-adjusted set: 2-3.

9.4 AI Machine Identification Flow

Step 1: User taps the camera icon on the Exercise List screen. Step 2: Native camera/gallery picker opens. User captures or selects a photo. Step 3: Full-screen loading state with a subtle pulsing animation of the machine icon and the text "Identifying machine..." Step 4: Result appears as a pre-filled variant creation bottom sheet: exercise name (editable dropdown if AI suggests multiple), equipment type, manufacturer guess, muscles targeted (read-only display), form tips (read-only expandable section). Step 5: User confirms or edits fields, taps "Save." Variant is created and user is navigated to the Set Logger with the new variant selected.

10. Design Tokens Summary

The following tokens define the MUI theme override that approximates MD3 from the seed color. These are generated dynamically using @material/material-color-utilities and mapped to MUI's createTheme().

Token	Dark Value	Light Value	Usage
--md-sys-color-primary	#A8C7FA	#1B5E8C	Primary buttons, active states, links
--md-sys-color-on-primary	#003258	#FFFFFF	Text on primary surfaces
--md-sys-color-primary-container	#004A77	#D1E4FF	Variant chips (selected), FAB
--md-sys-color-surface	#121212	#FFFBFE	Page background
--md-sys-color-surface-container	#1E1E1E	#F3EDF7	Card backgrounds
--md-sys-color-on-surface	#E6E1E5	#1C1B1F	Primary text
--md-sys-color-on-surface-variant	#CAC4D0	#49454F	Secondary text, icons
--md-sys-color-outline	#938F99	#79747E	Borders, dividers
--md-sys-color-error	#F2B8B5	#B3261E	Error text, destructive actions
--it-color-pr-gold	#FFD700	#FFD700	PR celebrations, badges
--it-color-rest-timer	#42A5F5	#1E88E5	Rest timer pill, progress
--it-color-rest-warning	#F9A825	#F57F17	Rest timer < 30s remaining

End of UI/UX Specification.