\ THE HAM'S KNIFE
Amateur Radio Multitool

User Manual & Onboarding Guide

Field: Niche But Brilliant · Knife 24 of 50 · \ Offline.Ltd

9	∞	✓	~250
Tools	Offline Forever	ADIF Export	Prefix Database

This manual covers every tool in The Ham's Knife — a single-file, offline amateur radio toolkit with nine integrated blades: Q-code reference, NATO phonetic alphabet, Morse code trainer, HF/VHF/UHF band chart, RST signal report calculator, antenna length calculator, field logbook with ADIF export, callsign oracle with great-circle bearings, and a programmable CW/voice memory keyer. No installation. No cloud. No account. Just open the HTML file in any modern browser and start operating.

Version 2.0 · For use with The_Hams_Knife.html

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1. Getting Started

The Ham's Knife is a single HTML file that runs entirely in your browser. No server, no cloud, no account. Everything is computed locally and your data stays on your machine.

System Requirements

BROWSER	VERSION	NOTES
Chrome / Edge	90+	Recommended. Full Web Audio and SpeechSynthesis support.
Firefox	88+	Full support. SpeechSynthesis may vary by OS.
Safari	14+	Fully supported on macOS and iOS.
Opera / Brave	Recent	Chromium-based, works identically to Chrome.
Internet Explorer	—	Not supported. Use Edge instead.

Opening the File

Double-click the HTML file on any computer, or open it from your browser's File menu. On mobile, download the file and open it in your device's browser. The knife works entirely offline — no internet connection is needed after the initial download.

The Welcome Screen

On first open, a welcome modal explains the basics: your work is saved automatically in localStorage, and you can export a JSON state file from the Files tab to back up or transfer your data. Click **Got it — open the knife** to dismiss it.

📡 **PRO TIP**

Email the HTML file to yourself as an attachment. Your radio tools will be waiting on any device, offline, forever. To preserve data across devices, also export and attach your state JSON file from the Files tab.

2. Interface Overview

The knife uses a consistent dark interface inspired by radio equipment. Every element is designed for readability in low-light field conditions.

The Header

The top bar shows the product name with the red backslash (\) brand mark, the field category ('Niche But Brilliant'), and the knife number (24 of 50) with the Offline.Ltd attribution.

The Tab Bar

Nine tool tabs plus two system tabs. The active tab is highlighted with a red underline. Tool tabs: Q-Codes, Phonetic, Morse Trainer, Band Chart, RST Report, Antenna Calc, Log, Oracle, Keyer. System tabs: ■ Files (with unsaved-changes dot) and ? Help. The tab bar scrolls horizontally on narrow screens.

Tooltips

Small circled ■ icons appear next to fields that benefit from explanation. Hover (desktop) or tap (mobile) to reveal the tooltip. Tap anywhere else to dismiss.

The Disclaimer Bar

The footer reads: 'No cloud. No nonsense. Just tools. All computation is local.' with a link to offline.ltd and the version number (ham-v2.0).

3. Saving & File Management

The knife automatically saves your inputs to the browser's localStorage every time you make a change. This means your data persists between sessions in the same browser on the same device — no manual saving required.

Exporting Your State

1. Open the ■ Files tab. 2. Click **Export state**. 3. A JSON file downloads containing all tool states, log entries, keyer memories, and settings. 4. Keep this file alongside your HTML knife file.

Importing State

1. Open the ■ Files tab. 2. Click **Import state**. 3. Select a previously exported JSON file. 4. All tools restore to the saved state.

> ⚠ **CAUTION**
> Importing a state file overwrites all current data in every tool, including your logbook entries. Export first if you want to keep your current data.

Per-Tool Export

Each tool also has individual Export/Import buttons in the Files tab, letting you back up or transfer a single tool's state without affecting the others.

Clearing All Data

The Danger Zone at the bottom of the Files tab has a **Clear all saved data** button. This permanently deletes all localStorage data for this knife. A confirmation dialog prevents accidental deletion.

> 📡 **PRO TIP**
> Name your exported state files by context: 'ham_fieldday_2026.json', 'ham_pota_k1234.json', 'ham_contest_cqww.json'. This makes it easy to swap between operating contexts by importing the appropriate file.

4. Q-Code Reference

Tab: ■ Q-Code Reference · Keyboard: Ctrl+1

A searchable database of the most commonly used Q-codes in amateur radio. Filter by category or search by code, keyword, or meaning.

Inputs

FIELD	DESCRIPTION
Search	Free-text filter by code, meaning, or keyword
Category filter	Buttons: All, Operating, Signal, Frequency, Station

Outputs

OUTPUT	DESCRIPTION
Table	Filtered list showing Code, Question, Answer/Statement, and Category

Use Cases

Look up unfamiliar Q-codes during a QSO. Filter by category to study for a licence exam. Use the search to quickly find the code for a concept like 'frequency' or 'location'.

Common Difficulties

PROBLEM	CAUSE & SOLUTION
No results	Your search text doesn't match any code, question, answer, or category. Try a broader keyword.
Too many results	Clear the search field and use category filter buttons instead.

📋 **PRO TIP**

Q-codes were developed for CW but are widely used in voice communication too. 'QTH' meaning 'my location is...' has become universal ham slang.

5. NATO / ITU Phonetic Alphabet

Tab: ■ NATO / ITU Phonetic Alphabet · Keyboard: Ctrl+2

Converts any text input (callsign, name, or message) into the NATO/ITU phonetic alphabet. Displays the full alphabet grid with corresponding Morse code for each letter and digit.

Inputs

FIELD	DESCRIPTION
Spell out a callsign or message	Free text — typically a callsign like W1AW

Outputs

OUTPUT	DESCRIPTION
Phonetic output	Each character mapped to its NATO word and Morse code
Full alphabet grid	26 letters with NATO word and Morse pattern
Numbers grid	Digits 0-9 with NATO word and Morse pattern

Use Cases

Spell your callsign clearly during pile-ups or in noisy conditions. Practice phonetic spelling before going on air. Confirm callsigns from DX stations.

Common Difficulties

PROBLEM	CAUSE & SOLUTION
Character shows 'not in alphabet'	The input contains a character not in the NATO/ITU set (e.g. punctuation). Only letters A-Z and digits 0-9 have NATO phonetics.

PRO TIP

During contests or DX pile-ups, clear phonetics make the difference between being heard and being lost in the noise. Practice your own callsign until it's second nature.

6. Morse Code Trainer

Tab: ■ Morse Code Trainer · Keyboard: Ctrl+3

A practice tool for learning and improving Morse code recognition. Three modes: identify a visually displayed character, identify by audio, or encode text to Morse. Includes a full text-to-Morse and Morse-to-text converter.

Inputs

FIELD	DESCRIPTION
Mode	Identify (visual), Identify (audio), or Encode to Morse
Character set	Letters only, Numbers only, Letters + Numbers, or All including punctuation
WPM	Words per minute (5-40), using PARIS standard timing
Tone frequency	Audio tone in Hz (200-1200)

Outputs

OUTPUT	DESCRIPTION
Character display	The character to identify or encode
Morse code display	Dots and dashes for the current character
Score	Running correct, wrong, and streak counters
History	Last 30 answers colour-coded green/red
Text/Morse converter	Bidirectional text-to-Morse conversion

Use Cases

Build Morse proficiency for CW operation. Start with visual identification, progress to audio. Use the converter to decode received Morse or prepare messages for keying.

Common Difficulties

PROBLEM	CAUSE & SOLUTION
No sound plays	Check that your device volume is up. The browser may require a user interaction before playing audio — click any button first.
Audio sounds wrong	Adjust the tone frequency. 600 Hz is standard CW practice tone. Lower values sound deeper, higher values more piercing.

📡 **PRO TIP**

Start at 15 WPM with Farnsworth timing rather than learning slowly. Your brain needs to hear the rhythm patterns, not count individual dots and dashes.

7. HF/VHF/UHF Band Chart

Tab: ■ HF/VHF/UHF Band Chart · Keyboard: Ctrl+4

A filterable reference of amateur radio frequency bands from 160 metres through 23 centimetres. Shows frequency ranges, common modes, propagation characteristics, and typical usage notes for each band.

Inputs

FIELD	DESCRIPTION
Band group filter	All Bands, HF, VHF, or UHF
Search	Free-text filter by band name, frequency, or mode

Outputs

OUTPUT	DESCRIPTION
Band cards	Cards showing band name, frequency range, group badge, modes, and operating notes

Use Cases

Quickly check frequency allocations before transmitting. Study band characteristics for licence exams. Find the right band for your operating conditions (time of day, solar cycle, distance).

Common Difficulties

PROBLEM	CAUSE & SOLUTION
Band appears empty	Some bands (like 60m) have channelised or restricted allocations in certain countries. Check your national band plan for specifics.
Can't find a frequency	Try searching by mode (e.g. 'FT8') or band name (e.g. '20m') rather than exact frequency.

📻 **PRO TIP**

Band conditions change with the solar cycle, time of day, and season. 20m is the 'bread and butter' DX band, while 40m and 80m come alive at night.

8. RST Signal Report Calculator

Tab: ■ RST Signal Report Calculator · Keyboard: Ctrl+5

Builds an RST (Readability, Strength, Tone) signal report from individual component selections. Shows the combined report code and a plain-English description. Supports both Phone/SSB (RS only) and CW/Digital (RST) modes.

Inputs

FIELD	DESCRIPTION
Report mode	Phone/SSB (2-digit RS) or CW/Digital (3-digit RST)
R — Readability	1 (Unreadable) to 5 (Perfectly readable)
S — Strength	1 (Faint) to 9 (Extremely strong)
T — Tone	1 (Rough AC) to 9 (Perfect tone) — CW/Digital only

Outputs

OUTPUT	DESCRIPTION
RST display	Large digit cards for each component
Combined report	The full RST or RS code (e.g. 599, 59)
Description	Plain-English meaning of each component
Quick reference table	Common reports with meanings and when to use them

Use Cases

Generate accurate signal reports during QSOs. Understand what a received RST report means. Learn the RST scale for licence exams.

Common Difficulties

PROBLEM	CAUSE & SOLUTION
Only see 2 digits	You're in Phone/SSB mode, which uses RS (no Tone). Switch to CW/Digital for the full 3-digit RST.
Report seems wrong	RST reports are subjective estimates. The calculator helps you formalise what you're hearing into the standard scale.

PRO TIP

In contests, '599' is almost always exchanged regardless of actual signal quality — it's a formality. For ragchewing and DX reports, give honest assessments to help the other station.

9. Antenna Length Calculator

Tab: ■ Antenna Length Calculator · Keyboard: Ctrl+6

Calculates the physical length of common wire antenna types for any frequency. Supports half-wave dipoles, quarter-wave verticals, full-wave loops, five-eighths wave verticals, and J-Poles. Accounts for wire diameter via velocity factor.

Inputs

FIELD	DESCRIPTION
Antenna type	Half-wave dipole, Quarter-wave vertical, Full-wave loop, 5/8 wave vertical, J-Pole
Frequency	Target frequency in MHz or kHz
Freq. unit	MHz or kHz
Wire diameter	10, 12, 14, 16, or 18 AWG
Display unit	Feet/inches or Metres

Outputs

OUTPUT	DESCRIPTION
Wire visual	Proportional wire length illustration
Length display	Calculated antenna length with unit
Stats grid	Total length (ft and m), wavelength, velocity factor
Reference table	Dipole and quarter-wave lengths for common HF/VHF bands

Use Cases

Calculate wire lengths before cutting for field antennas. Compare antenna types for your operating frequency. Quick reference for common band lengths during portable operations.

Common Difficulties

PROBLEM	CAUSE & SOLUTION
Length seems wrong	Check the frequency unit (MHz vs kHz). 14.2 MHz and 14200 kHz give the same result.
Wire too short after cutting	The formula gives a starting point. Real-world factors like height, feedline, and nearby objects shift resonance. Always cut a few inches long and trim with an analyser.

📐 **PRO TIP**

Always cut your wire a few inches long and trim to resonance with an analyser. The formula gives you a starting point — real-world factors like height, feedline, and nearby objects will shift your resonance.

10. Field Logbook

Tab: ■ Field Logbook · Keyboard: Ctrl+7

A complete contact logger that auto-fills data from the other tools. Log callsigns, bands, modes, RST, and notes. Tracks stats including countries worked, band/mode breakdown, and activity tags (POTA, SOTA, Field Day, Contest, DX). Exports to ADIF and CSV.

Inputs

FIELD	DESCRIPTION
My Callsign	Your station callsign — set once, used everywhere
My Grid Square	6-character Maidenhead locator (e.g. JO21pu) for bearing calculations
Default Mode	SSB, CW, FT8, FM, AM, RTTY, PSK31, JS8, Other
Their Callsign	The station you're logging — triggers inline Oracle lookup
Band	160m through 70cm
Frequency	Operating frequency in MHz
Mode	Operating mode for this contact
RST Sent / Rcvd	Signal reports exchanged
Notes	Free text — name, QTH, park reference, etc.
Activity	General QSO, POTA, SOTA, Field Day, Contest, DX

Outputs

OUTPUT	DESCRIPTION
Stats grid	QSO count, countries, bands, modes, and per-activity tallies
Log entries list	Chronological contact list with call, time, band, mode, RST, country, notes
ADIF export	Standard .adi file for upload to LoTW, eQSL, QRZ
CSV export	Spreadsheet-friendly comma-separated log

Use Cases

Log contacts during field operations, POTA activations, Field Day, or everyday ragchewing. Use auto-fill to pull RST, band, and frequency from the other tools. Export ADIF for electronic QSL confirmation.

Common Difficulties

PROBLEM	CAUSE & SOLUTION
Oracle info not showing	Callsign must be at least 2 characters. Check that the prefix matches a known DXCC entity in the embedded database.
Auto-fill gives wrong band	Auto-fill reads the Antenna Calculator's current frequency. Set the antenna calc to your operating frequency before using auto-fill.
ADIF rejected by LoTW	Ensure your callsign is set in 'My Station'. LoTW requires a station callsign and valid date/time. Check that the mode field matches LoTW's accepted mode list.

📝 **PRO TIP**

Use the activity tags to keep POTA/SOTA activations separate. The ADIF export includes all fields — upload directly to LoTW or eQSL after your activation.

11. Callsign Oracle

Tab: ■ Callsign Oracle · Keyboard: Ctrl+8

Type any amateur callsign and instantly see the country, CQ zone, ITU zone, continent, NATO phonetic spelling, great-circle bearing and distance from your grid square, plus a mini map showing the short-path direction. Contains a ~250-entry embedded prefix database covering virtually all DXCC entities.

Inputs

FIELD	DESCRIPTION
Callsign	Any amateur callsign (e.g. JA1NUT, VK2ABC, W1AW)

Outputs

OUTPUT	DESCRIPTION
Country	DXCC entity name
Detail line	Continent, CQ zone, ITU zone
Phonetic spelling	NATO phonetic expansion of the callsign
Bearing cards	Short-path and long-path bearings (degrees), distance in km and miles
Great-circle map	Mini equirectangular projection showing your position and the DX station with a connecting line

Use Cases

Look up a callsign heard on the air to identify the country and beam heading. Prepare for a pile-up by knowing where to point your antenna. Study DX prefixes and zone assignments.

Common Difficulties

PROBLEM	CAUSE & SOLUTION
No result showing	The callsign must start with a recognised amateur prefix. Some special-event or temporary callsigns may not match the embedded database.
Bearing says 'Set your grid square'	Go to the Log tab and enter your Maidenhead grid square in 'My Station'. The Oracle needs your position to calculate bearings.
Distance seems wrong	The database uses approximate centre coordinates for each country. Actual distance to a specific station may vary.

PRO TIP

Set your grid square to get accurate beam headings. During a pile-up, the Oracle tells you exactly where to point your antenna before you even finish copying the call.

12. Memory Keyer

Tab: ■ Memory Keyer · Keyboard: Ctrl+9

Eight programmable memory slots that play back as perfect CW Morse (at any WPM) or synthesised voice using NATO phonetics. Store CQ calls, exchanges, contest macros, and 73 messages — with placeholders that auto-fill from your station data.

Inputs

FIELD	DESCRIPTION
Output	CW (Morse audio) or Voice (speech synthesis)
CW Speed	Words per minute (5-40) for Morse playback
Tone	CW tone frequency in Hz (200-1200)
Repeat count	Number of repetitions (0 = play once)
Repeat delay	Seconds between repetitions (1-30)
Memory slots F1-F8	Editable message text with macro support
Quick Send	Ad-hoc text to play immediately

Outputs

OUTPUT	DESCRIPTION
Slot playback	Click to play, right-click or long-press to edit
Stop button	Appears during playback to halt the keyer
Macro expansion	[MYCALL], [CALL], [RST], [NAME], [NR] replaced at playback time

Use Cases

Automate CQ calls during POTA activations or contests. Practice contest exchanges with correct timing. Use voice mode for SSB memory keying or phonetic practice.

Common Difficulties

PROBLEM	CAUSE & SOLUTION
No sound	Check device volume. For CW, the browser may need a user click to enable audio. For voice, ensure your browser supports SpeechSynthesis.
Voice sounds robotic	Speech synthesis quality varies by browser and OS. Chrome generally has the best voices. The keyer uses NATO phonetics to improve clarity.

PROBLEM	CAUSE & SOLUTION
Macros not expanding	Macros must be in square brackets and uppercase: [MYCALL], [CALL], [RST], [NAME], [NR]. Set your callsign in the Log tab for [MYCALL].

🎹 **PRO TIP**

Set up a CQ loop: 'CQ CQ CQ DE [MYCALL] [MYCALL] K' with repeat=5 and 3-second delay. Hit play and grab your coffee while the keyer calls for you.

13. Keyboard Shortcuts

All keyboard shortcuts use Ctrl (or Cmd on macOS) as the modifier key.

`Ctrl + 1`	Q-Code Reference
`Ctrl + 2`	Phonetic Alphabet
`Ctrl + 3`	Morse Trainer
`Ctrl + 4`	Band Chart
`Ctrl + 5`	RST Report
`Ctrl + 6`	Antenna Calculator
`Ctrl + 7`	Field Logbook
`Ctrl + 8`	Callsign Oracle
`Ctrl + 9`	Memory Keyer
`Ctrl + S`	Export full state
`Ctrl + H`	Open Help
`Ctrl + L`	Quick Log (jump to Logbook)
`Esc`	Close modal / dialog
`A–Z, 0–9`	Morse trainer: type answer directly (when Morse tab active)
`Space / P`	Morse trainer: replay audio (in audio mode)

14. Troubleshooting

Blank page or broken layout

JavaScript must be enabled. Disable any browser extensions that block scripts. Clear cache and reload if the file was updated.

Data lost between sessions

The knife stores data in localStorage, which is per-browser and per-device. Clearing browser data, using private/incognito mode, or opening the file from a different path can cause a fresh start. Always export your state regularly.

No audio in Morse Trainer or Keyer

Modern browsers require a user interaction (click or tap) before playing audio. Click any button on the page first. Check that your device volume is up and not muted.

Speech synthesis not working

The Memory Keyer's voice mode uses the browser's SpeechSynthesis API. Not all browsers support this — Chrome has the best support. On some systems, no voices are installed by default.

Bearings show 'Set your grid square'

The Callsign Oracle needs your Maidenhead grid square to calculate bearings. Go to the ■ Log tab and enter it in the 'My Grid Square' field under 'My Station'.

Tab bar too wide on mobile

The tab bar scrolls horizontally. Swipe left/right to see all tabs. The three new tabs (Log, Oracle, Keyer) are at the right end of the bar.

Import fails or shows 'Wrong knife'

State files are specific to each knife. The 'knife' field in the JSON must be 'ham'. You cannot import state from a different Offline.Ltd product.

Logbook ADIF rejected by logging service

Ensure your callsign is set in 'My Station'. Some services require specific field formats. Check that the mode field matches the service's accepted mode list (e.g. 'SSB' not 'Phone').

15. Accuracy & Limitations

The Ham's Knife is a reference and practice tool. Here is what to expect from each tool's accuracy.

TOOL	TYPICAL ACCURACY	NOTES
Q-Code Reference	Definitive	Standard ITU Q-codes. Comprehensive for common amateur use.
Phonetic Alphabet	Definitive	Official NATO/ITU phonetic alphabet.
Morse Trainer	Exact	Standard Morse code table. Audio timing follows PARIS standard.
Band Chart	Accurate	Based on ITU Region allocations. Check your national band plan for local variations.
RST Report	Standard scale	RST is inherently subjective — the calculator formalises the scale.
Antenna Calculator	±2-5%	Theoretical lengths using standard formulas. Real-world factors (height, ground, feedline) will shift resonance. Always trim with an analyser.
Field Logbook	Exact	Records what you enter. ADIF export follows ADIF 3.1.4 specification.
Callsign Oracle	Good	~250-entry prefix database covers most DXCC entities. Uses approximate country centre coordinates. Bearings may differ from actual station location by several degrees.
Memory Keyer	Accurate	CW timing follows PARIS standard at selected WPM. Voice uses browser SpeechSynthesis — quality varies by platform.

⚠ **CAUTION**

The Ham's Knife is a reference and practice tool, not a certified measurement instrument. Do not rely solely on the antenna calculator for safety-critical installations. Do not use the bearing calculator for aviation or maritime navigation. Always verify critical measurements with appropriate professional instruments.

16. Glossary

Key amateur radio terms used across the tools in this knife.

ADIF	Amateur Data Interchange Format. A standard file format for exchanging amateur radio contact logs between logging programs and online services like LoTW and eQSL.
AWG	American Wire Gauge. A standard for wire diameter. Lower numbers = thicker wire. Common antenna wire is 14 AWG.
Beam heading	The compass direction to point a directional antenna for the strongest signal to a specific location, calculated along the great-circle path.
CQ	General call inviting any station to respond. 'CQ CQ CQ DE [callsign]' is the standard calling sequence.
CW	Continuous Wave. Morse code transmission using an unmodulated carrier that is keyed on and off. The oldest mode in amateur radio.
DXCC	DX Century Club. An ARRL award programme recognising contacts with 100+ countries (entities). Also refers to the list of ~340 entities worldwide.
Dipole	A half-wavelength wire antenna fed at the centre. The most fundamental and common wire antenna in amateur radio.
FT8	A digital mode designed for weak-signal communication. 15-second transmission cycles, very popular for DX contacts with modest stations.
Field Day	An annual amateur radio exercise and contest emphasising portable operation, emergency preparedness, and public outreach.
Great circle	The shortest path between two points on the Earth's surface. Radio signals follow great-circle paths, which differ from straight lines on flat maps.
Grid square	Maidenhead Locator System. A geocoding scheme that divides the world into grid squares identified by letter-number pairs (e.g. JO21pu).
ITU Zone	One of 90 zones dividing the world, defined by the International Telecommunication Union. Used in some contest exchanges.
LoTW	Logbook of the World. An ARRL-operated online system for electronic QSL confirmation. Requires a digital certificate for authentication.
Maidenhead	See Grid square. Named after the town in England where the system was devised in 1980.

NATO phonetic	The NATO/ITU phonetic alphabet: Alfa, Bravo, Charlie… Zulu. Used to spell callsigns and messages clearly over voice communications.
POTA	Parks on the Air. A programme where operators activate public parks and protected areas, logging contacts for awards.
Pile-up	When many stations call a DX or rare station simultaneously. Operating skill and clear phonetics are essential to break through.
Q-code	Three-letter codes beginning with Q, originally developed for CW. Each has a question form and an answer/statement form (e.g. QTH? = What is your location?).
QSL	Confirmation of a radio contact. Can be a physical card, electronic confirmation (eQSL), or Logbook of the World entry.
QSO	A two-way radio contact between amateur stations. The fundamental unit of amateur radio activity.
RST	Readability, Strength, Tone. The standard system for signal reports: R (1-5), S (1-9), T (1-9, CW only).
SOTA	Summits on the Air. A programme where operators activate mountain summits, logging contacts for awards.
SSB	Single Sideband. The most common voice mode on HF amateur radio. Uses either Upper Sideband (USB) or Lower Sideband (LSB).
Velocity factor	The ratio of signal speed in a conductor to the speed of light in vacuum. Affects the physical length of wire antennas (typically 0.95-0.98 for bare wire).
WPM	Words Per Minute. The standard measure of Morse code speed, calibrated to the word 'PARIS' (50 dit-units per word).

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