

## **Student's Guide to Using Better-ICR**

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*We have a groups.io reflector to facilitate sharing of news and information, challenges and accomplishments, questions and answers, across the community of students and advisors using Better-ICR. All changes and upgrades to Better-ICR will be announced through that reflector. You can subscribe by sending an email to [Better-ICR-Community+subscribe@groups.io](mailto:Better-ICR-Community+subscribe@groups.io) .*

Better-ICR is a web app that measures your accuracy and response time in decoding individual characters in CW. It keeps track of your past response times and uses that history to influence which character to send next: the characters that you've tended to copy inaccurately or slowly are sent more frequently than the characters you've typically copied quickly and accurately. So you get more practice where you need it most. And as your trouble spots change, Better-ICR adjusts accordingly.

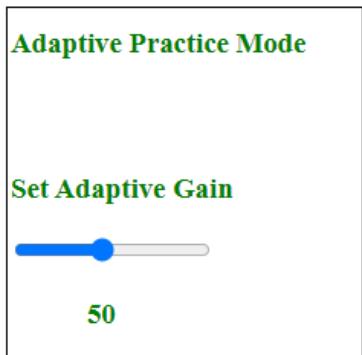
For background information on Better-ICR, see the article I published in the March 2024 issue of Solid Copy (the CWops newsletter): [https://cwops.org/wp-content/uploads/2024/03/Solid-Copy\\_2024\\_March\\_FINAL.pdf](https://cwops.org/wp-content/uploads/2024/03/Solid-Copy_2024_March_FINAL.pdf). The article begins on page 16. Please note that some aspects of the user interface have changed since that article, but the basic operating principles are unchanged.

Even though Better-ICR is designed to follow a step-by-step process, with instructions given at each step, some students who have tried it find it a bit confusing in real time. I suggest you watch this video demonstration of the app before you try running it yourself: <https://youtu.be/JfScW6XJZj0>.

To start Better-ICR use this url: <https://better-icr.herokuapp.com/>

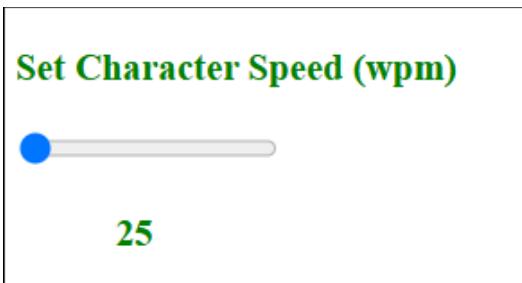
Continue with the rest of the audio setup as shown in the demo.

Below the Calibration test you'll see "Adaptive Practice Mode" in green characters. Just below that you'll see the Adaptive Gain slider:



If you're new to Better-ICR, leave this slider alone. After you've been using Better-ICR for a while you may choose to use the Adaptive Practice Mode slider to adjust the mix of characters. If you feel Better-ICR is giving you too little practice with your most difficult characters, increase the Adaptive Gain. If you feel it's giving you too little practice with your familiar characters, decrease the Adaptive Gain. After adjusting, save and reload your history, to recalculate the frequency factors.

Below the Adaptive Gain slider you'll find the "Set Character Speed" slider:



The character speed is set by default to 25 wpm. However, some students find that they are still counting dits and dahs at that speed. The character speed slider allows you to run Better-ICR with effective character speeds up to 40 wpm. You should probably start out at 25, then increase the speed if you need to.

### Custom Characters

Just below the Set Character Speed control, you'll see the "Custom Characters" button. If you are not a Beginner Level student, you can just skip past this button, using the Standard character set for your ICR practice. If you are a Beginner, see below, under Custom Characters for Beginners for information on selecting characters and character sets for your practice.

### Practice

To start practicing with Better-ICR, simply click "Start." Better-ICR will play you a random character in cw. You should then speak the character aloud as quickly as you can, then take your time to find and click the corresponding key on your keyboard.

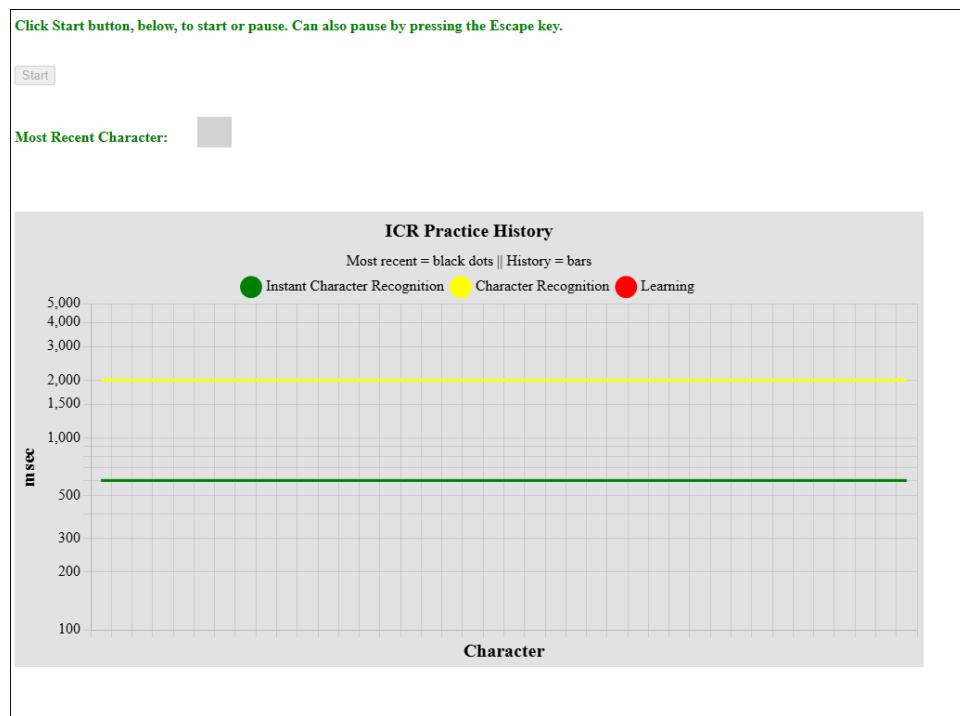
This idea of speaking first can be a stumbling block to a student new to Better-ICR because most of the cw practice apps you may have used require you to quickly type in your response to whatever code you've just heard. So when Better-ICR plays you some cw, you may reflexively type in the character. If that happens Better-ICR will let you know, discard that result, and continue sending you characters. With Better-ICR, your first response to hearing code needs to be to speak the character out loud. Do that as soon as you recognize the character. Next, you should carefully identify the keyboard key for the character you just identified (Better-ICR doesn't care how long you take, within limits), then type that character. To re-iterate: **hear => speak => type**, in that order.

If you are having trouble with this sequence of actions you might try looking away from the keyboard until after you've spoken the character. Or you might need to hold your hands away from the keyboard until after speaking the character. With a little bit of practice the hear/speak/type sequence becomes more natural. Another potential cause is speaking too softly. Try speaking louder; or, if you have a gain control for your mic, try turning it up.

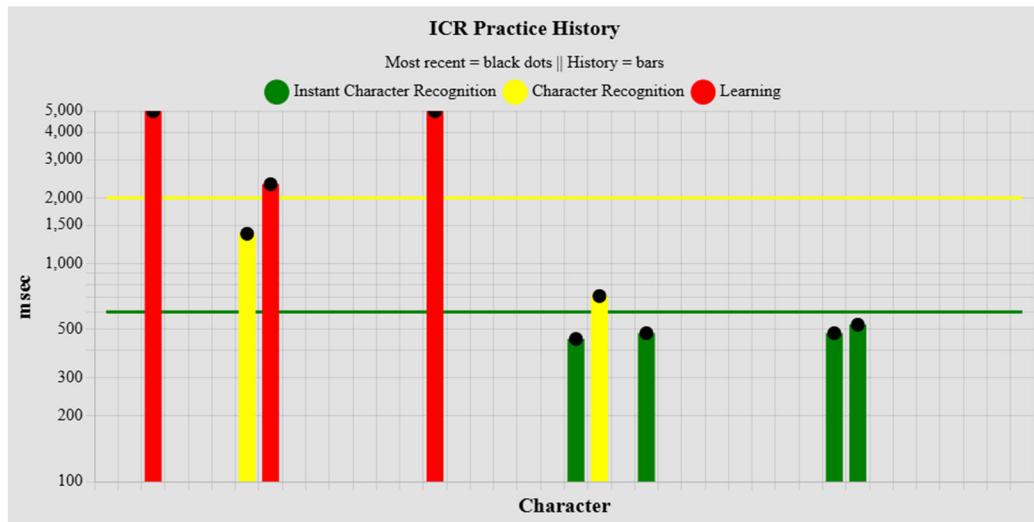
Better-ICR will continue sending characters randomly (but influenced by your history) until you hit the "Pause" button (what was previously the "Start" button – it toggles back and forth). Alternatively, you can pause by hitting the Escape key – some people find it easier to do that than to mouse around to the Pause button. In either case you click "Start" to resume.

### Progress Graph

Your Progress Graph appears below the Start button and the Most Recent Character box (more about that below). While you're practicing with Better-ICR, your Progress Graph is updated in real-time to reflect your practice history. The Progress Graph starts out blank:



Here is a Progress Graph after the first few characters have been sent:



Each bar corresponds to a different character. The character names are not displayed on the graph, but if you hover your cursor over a bar a tool tip will come up telling you the character name and your results for that character.

Each black dot represents your most recent response time (in msec) for that character.

The red, yellow, and green bars represent your accumulated response time history (in msec) for each of those characters. The first time through for each character the height of the history bar equals the height of the corresponding black dot. When you've practiced long enough to have responded to a character more than once, the bar and the dot will diverge. Each bar height is calculated as a Weighted Moving Average (wma) of all previous results for that character. The wma calculation gives more weight (i.e., influence) to your recent results and less to your older results.

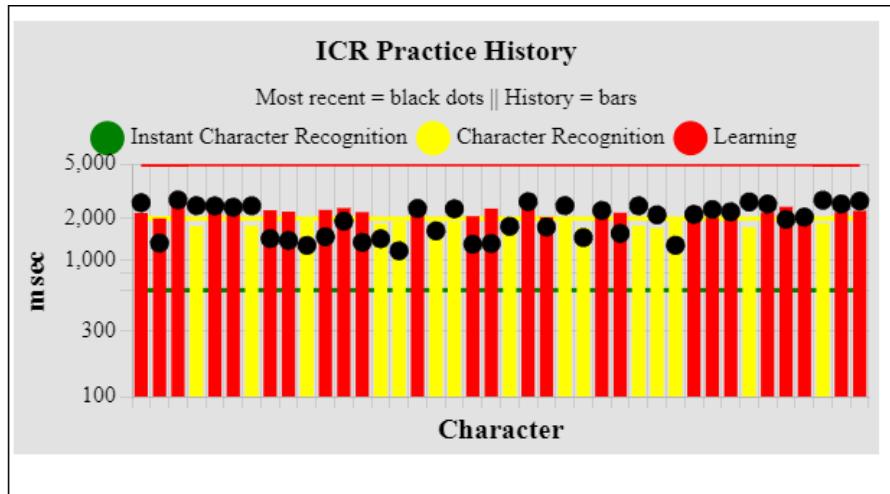
In case you are wondering how an incorrectly copied character fits into the calculation, Better-ICR treats it the same as a character copied correctly, but with a 5000 msec response time. Inaccuracy has a significant impact on your response time, as it should: you need solid accuracy to achieve ICR. The two highest history bars in the graph above represent incorrect answers – the bars are both 5000 msec high.

The horizontal yellow line on the Progress Graph corresponds to a response time of 2000 msec. We believe that if you can recognize and vocalize a character within 2000 msec, you have achieved "Character Recognition," which is a reasonable goal for students at the Beginner Level. As you can see on the graph, above, the characters for which the historical response time was greater than 2000 msec (above the yellow) line, the bar is colored red. For characters with historical response time below 2000 msec, the bar is colored yellow.

The horizontal green line corresponds to a response time of 600 msec, which represents Instant Character Recognition. For students at the Fundamental and Intermediate Levels, your goal is to get all of your characters near or under this line. For characters with historical response time below 600 msec, the bar is colored green. Your ultimate goal is to turn all the bars green.

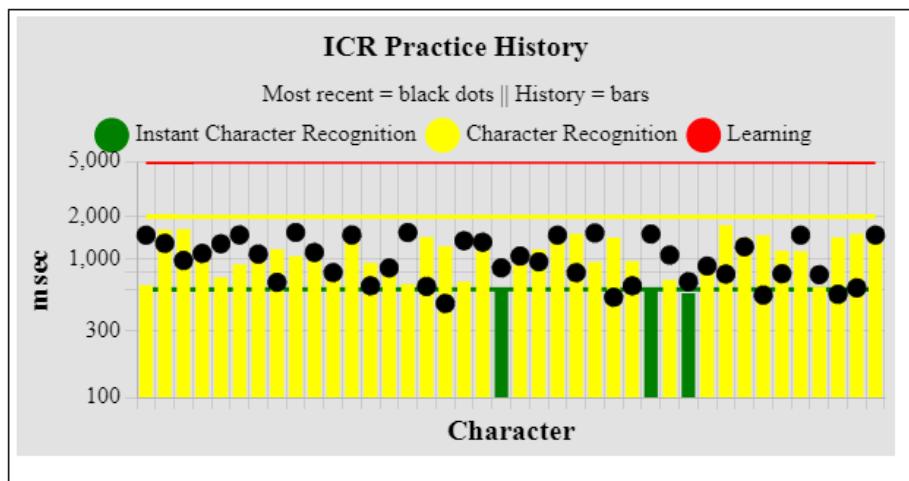
Here are some examples of Progress Graphs for typical students.

A student approaching CR (Character Recognition):



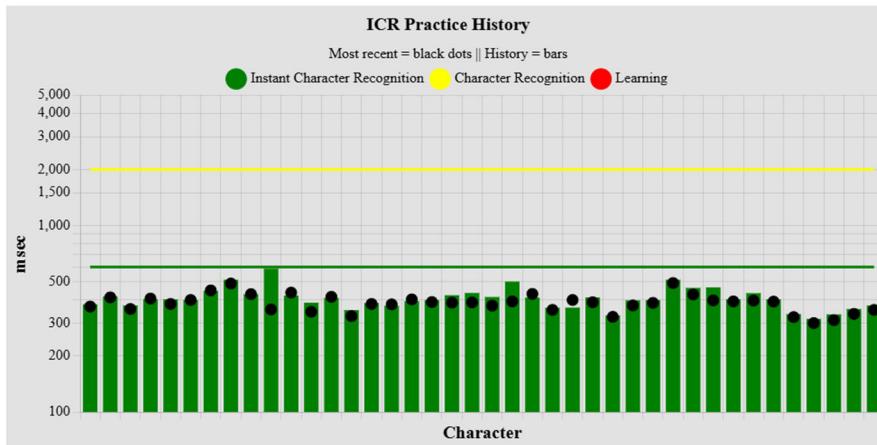
The yellow bars are for the characters where the student has achieved CR (history below 2000 msec) and red bars are for the characters where the student needs more practice to achieve CR (history above 2000 msec).

A student who has achieved CR and is just beginning to achieve ICR:



Most of the bars are yellow, signifying CR, with three of them green, signifying ICR.

Finally, a student who has achieved ICR:



All green bars!

Try not to be distracted by the changing graphics while practicing!

### Most Recent Character

The Most Recent Character box just under the Start/Pause button provides immediate feedback on the character you just heard. As soon as you click a key on the keyboard, the character that was just sent appears in that box. If the character is displayed in Green, you decoded it correctly; if in Red, you decoded incorrectly. 500 msec later, when Better-ICR sends the next character, the box goes back to uniform grey.

If the Progress Graph gives you a picture of your past practice history, the Most Recent Character box informs you of your present resultt.

### Saving Your History

It doesn't make a lot of sense to start out with a blank progress graph every time you start Better-ICR. So the app lets you save your history between runs.



Click the Save button and it will open a file browser to let you choose where to put the history file. The default file name includes a date/time stamp in case you want to save multiple copies. You can rename it if desired, as long as you preserve the ".json" extension. To restore that

history at a future time, you click the Choose File button to select the appropriate history file, then click the Restore button to load that history into the app. The history graph will update to where you left off and away you go.

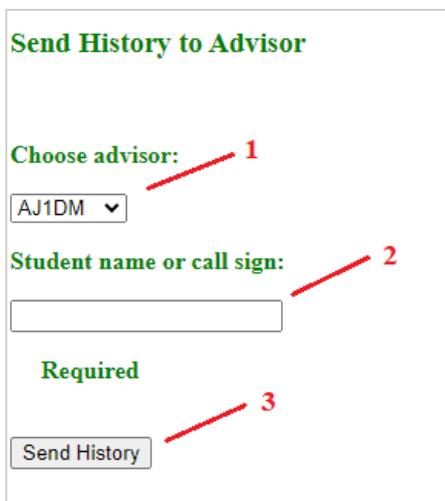
If you have history saved in a prior version of the app, it will still load properly. Go ahead and use it.

### Practice Timer

Some students get so thoroughly absorbed into Better-ICR that they forget to take breaks. Our brains are not wired for sustained concentration - we do better with frequent breaks. So Better-ICR includes a break timer. Whenever you've been practicing continuously for ten minutes the app will give you a friendly suggestion to take a break. You can very easily ignore the reminder if you want, Better-ICR will continue sending code characters, while leaving the friendly suggestion in place. If you want to clear the suggestion, simply pause the app and restart it. However, if you are smart (in my humble opinion) you will take these reminders to heart: take a quick walk or melt some solder or talk to a human being or do something else to give your brain a chance to integrate what you've just been learning. I'm convinced your cw progress will benefit from the break.

### Advisor History Report

Better-ICR has a convenient way for you to show your advisor how you are progressing. Just below the Save History button you will see the caption "Send History to Advisor:"



Send History to Advisor

Choose advisor: 1

AJ1DM

Student name or call sign: 2

Required

Send History 3

(1) Select your advisor from the dropdown, (2) enter your name or call sign in the text box, and (3) click the "Send History" button. Your advisor will receive an email with your current Better-ICR results.

You should see a pop-up telling you Better-ICR successfully sent the report. Give it a bit of time – it takes a while to send an email. If you don't see the pop-up after a reasonable amount of time, contact your Advisor. If he or she can't solve the problem they will contact me.

## Download your Student History Report

If you'd like to save a copy of the report you sent your advisor (above), click the Download button below "Download your Student History report."

### Save History File from this Run:

### Download your Student History Report:



### Send History to Advisor

This will allow you to save your report in MS Word format to any desired location on your computer. The report and the default filename includes a time stamp, for your reference. If you don't have MS Word available on your computer, the file is compatible with Open Office, Libre Office, and Google docs.

## Custom Character Sets for Beginners

If you are a Beginner Level student you will start out not knowing all (or maybe any!) of the characters. Since Better-ICR most frequently sends you the characters you are recognizing most poorly, that almost guarantees that you will have a miserable experience and learn slowly, if at all. Fortunately, Better-ICR allows you to select only those characters you are practicing at a given time.

Start by clicking the "Custom Characters" button just below the Adaptive Gain control. This will make the custom characters selection interface visible:

**Custom Character Set Selection:**

Standard	ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789./?
Session 1	A E N T
Session 2	I O S
Session 3	D H L R
Session 4	C U
Session 5	M W 3 6 ?
Session 6	F Y ,
Session 7	G PQ 7 9 /
Session 8	B V +
Session 9	JK 0 8 =
Session 10	X Z . >
Special	ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789./?=>!
Include	ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789./?=>!
Exclude	ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789./?=>!
Custom	Custom Character Set Selection

**Prosigns:** For <BT> use "=" | For <AR> use "+" | For <SK> use ">"

Suppose you are just starting out so you want to practice only the characters for Session 1. Simply click on “Session 1.” “Session 1” shifts from light green to dark green to show that it has been selected and the characters in that row (A, E, N, and T) now appear in the “Custom” row. This is what you’ll see:

Custom Characters									
Custom Character Set Selection:									
Standard	ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789.,/?								
Session 1	A	E		N	T				
Session 2			I	O	S		1	4	
Session 3	D	H	L	R			2	5	
Session 4	C			U					
Session 5			M		W	3	6	?	
Session 6	F				Y		7	9	,
Session 7	G		PQ						/
Session 8	B		JK		V	0	8		+
Session 9					X	Z	.		>
Session 10									
Special	ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789.,/?=>!								
Include	ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789.,/?=>!								
Exclude	ABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789.,/?=>!								
Custom	A	E		N	T				

Prosigns: For <BT> use "=" | For <AR> use "+" | For <SK> use ">"

The characters in the “Custom” row (A, E, N, and T) are the only characters Better-ICR will send you. Your ICR Practice History graphic will include only four columns, one for each of the characters selected.

When you save your practice history at the end of your session, that file will include your custom character selections. So when you reload and restore that history file, it will restore your custom character selections as well.

When you are ready to move on to Session 2, you can select “Session 2,” adding I, O, S, 1, and 4 to the “Custom” row. “Session 1” remains selected, so “Custom” still lists A, E, N, and T. If you would prefer to practice just the characters in Session 2, click on “Session 1” to deselect those characters.

Some advisors adapt the curriculum in so far as the order they introduce characters. For example, some eliminate the prosigns BT, AR, and SK from your practice routine. You can mirror that recommendation in Better-ICR by deselecting those characters. That’s what the “Exclude” row is all about. If you click on “=”, “+”, and “>” (those are the keyboard shortcuts for BT, AR, and SK, respectively), those characters will never be added to the Custom row, no matter which Sessions are selected.

Similarly, if your advisor wants you to start on a character earlier than the Session syllabus suggests, you can click on that character in the “Include” row. Now, no matter what character sets are selected, that character will be included in the “Custom” row.

Here's an example of a hypothetical student who wants to practice Session 1 plus Session 2, but not the numbers "1" and "4", but adding the characters "M" and "W":

Custom Characters

**Custom Character Set Selection:**

Standard	ABCDEFGHIJKLMNPQRSTUVWXYZ0123456789.,/?
Session 1	A E N T
Session 2	I O S 1 4
Session 3	D H L R 2 5
Session 4	C U
Session 5	M W 3 6 ?
Session 6	F Y ,
Session 7	G PQ 7 9 /
Session 8	B V +
Session 9	JK 0 8 =
Session 10	X Z . >
Special	ABCDEFGHIJKLMNPQRSTUVWXYZ0123456789.,/?=>!
Include	ABCDEFGHIJKLMNPQRSTUVWXYZ0123456789.,/?=>!
Exclude	ABCDEFGHIJKLMNPQRSTUVWXYZ0123456789.,/?=>!
Custom	A E I MNO ST W

**Prosigns: For <BT> use "=" | For <AR> use "+" | For <SK> use ">"**

As an aid to your understanding, all clickable elements in the interface are green or red: dark if selected and light if unselected. All the words and characters in black are not clickable.

Play around with it for a while and it should make sense.

73 and I hope to catch you on the bands someday!

de John AJ1DM