Pileup Runner

v.1.4

User's Manual

http://www.dxatlas.com/PileupRunner

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QUICK START

1. Start the program.

2. If you have more than one audio device in your system, click on **Settings / System** in the menu and select the device to use in the **Output Audio Device** drop-down list. Click on OK. It is recommended that you use your headphones instead of the speakers, this makes copying CW much easier. My own machine has two soundcards, one feeds the speakers for Windows sounds, music, etc., the other one feeds the headphones and is used by all of my Ham applications.

3. Press **F9** to start the audio. While the audio is running, click on **Settings / Radio** in the menu, and adjust **Audio Gain** and **CW Pitch**. Now press **F1** to start transmission, and adjust the **Sidetone Gain** and **Keyer Speed** settings. Click on **Run / Stop Pileup** in the menu to stop the audio. You can keep the **Radio Settings** dialog open if you want, and change the settings on the fly while working the pileup.

4. You are ready to work the pileup. Click on **Run / Start Pileup**, click on OK to accept the default parameters of the pileup, and the DX'ers will start calling you right away. Copy and type in a callsign and press the **";"** key on the keyboard to send the call and **"599"**. Once the DX'er answers, press **"."** to send **"TU UP"** and write the QSO to the log.

PILEUP SETTINGS

The **Pileup Settings** dialog that opens when you start a pileup allows you to set the parameters of the pileup.

DX-pedition Callsign:
   Enter any callsign you want there.

Operator's Callsign:
   Be sure to enter your own home callsign in this field.

Number of Callers:
   Enter a value between 1 and 1000. You can either select one of the pre-defined values from the drop-down list, or type a custom value in. One of the advantages of a simulated pileup is that all of its characteristics, such as the number of calling stations and signal strength of each station, are always known. Using this software, you will quickly learn how to determine the actual number of callers in the pileup just by looking at the waterfall display.

Average SNR, dB:

This is a parameter that you can change to simulate different propagation conditions. The values between 3 dB and 30 dB are accepted. 30 dB sounds like 10m in 1978, while 3 dB sounds more like 160m in 2012. The SNR is computed the same way as in CW Skimmer.

Difficult Continent:

Select either AS, EU, or NA as difficult continent (SA, AF and OC always count as difficult). The signals from the difficult continents are weaker than from the easy ones, but a QSO with such continent adds 3 points to your score, while a normal QSO gives you only 1 point.

Session Length:

Enter the length of your session, in minutes. The pileup will stop automatically after the time entered in this field. Of course, you can click on **Pileup / Stop** to terminate the session at any time and get your score.

Record I/Q WAV file:

If this check-box is ticked, the program records your session in the I/Q format that can be played back in CW Skimmer and many other SDR programs. 48 kHz of spectrum are recorded.

Practice/Competition:

Only the Practice mode is currently implemented.

NAVIGATION

Pileup Runner has the same waterfall display as CW Skimmer, and its navigation commands are a subset of the Skimmer commands. Use the **PageUp** and **PageDown** keys to scroll the display one page up or down. Click on the waterfall display or on the frequency scale to tune the receiver to the frequency under the mouse cursor. The button with arrows near the frequency display, when clicked with the left and right mouse buttons, performs the **PageUp** and **PageDown** commands respectively.

The green rectangle on the frequency scale represents the passband of your receiver with the light green triangle marking the center frequency. Drag the passband rectangle with the mouse vertically, or use the **Up** and **Down** arrow keys to change the bandwidth of your filter.

The red triangle marks your transmit frequency, the pileup starts 1 kHz above it.

Unlike CW Skimmer, Pileup Runner has a second, slow waterfall display. The mouse clicks on that display work the same way as on the main display. You can change the width of the slow display, or hide it completely, by dragging the splitter between the display and frequency scale.

Drag the frequency scale vertically with your mouse to see the signals above and below the current screen.

Drag the waterfall display to the right with your mouse to see the signals that have already scrolled away. This puts the pileup in the pause state, as if you clicked on **Run / Pause Pileup** in the menu. Click on **Pause Pileup** to resume the session.

SENDING MESSAGES

The messages can be sent either by clicking on the buttons under the callsign input box, or by pressing the F keys. The following messages are supported:

F1 = **"QRZ DE <my_call> UP"**
F2 = **"599"**
F3 = **"TU UP"**
F4 = **<my_call>**
F5 = **<his_call>**
F6 = **"NIL"**
F7 = **"AGN"**

The mapping between the F keys and the messages can be changed in the **Settings dialog**.

The following macro shortcuts are easier to use than the F keys, especially for those who type with ten fingers:

"\"   =   **"QRZ DE <my_call> UP"**
";"   =   **"<his_call> + 599"**
"."   **<Insert>**   =   **"TU UP"** + <Write to log>

You can assign different keys to the **";"** and **"."** macros in the Settings dialog, either by entering the key codes in the **Macros / Key Code** input boxes, or by clicking on the buttons with ellipses and then pressing the desired keys. Do not assign the **"A"**..**"Z"**, **"0"**..**"9"** and **"/"** keys to the macros, you will need those keys to enter the callsigns.

The DX callsign is automatically included in the **"TU UP"** message every N-th QSO, turning it into **"TU <my_call> UP"**. The value of N may be set between 1 and 10 in the **Settings Dialog**.

To abort transmission, press the **Escape** button.
To clear the callsign input box, press **Ctrl-W**, **Alt-W** or **F11**.
To write the QSO to the log, press **Enter**, or click on the **Save** button.

If the callsign in the callsign input box has changed after it was sent last time, then the **"."** macro key automatically re-sends the callsign before finishing the QSO.

HINT: To answer a call quickly, you can type in the callsign prefix and press the **";"** key. While the program is sending the prefix, type in the rest of the callsign.

The ESM (Enter Sends Message) mode allows the operator to perform different tasks at different stages of the QSO by pressing the same key (**Enter**). This mode can be turned on and off   in the Settings dialog using the ESM check-box. At the initial stage, when the callsign input box is empty, the **Enter** key sends the QRZ message. Once the callsign is entered, the same key sends **"<his_call> + 599"**. After you copy the "exchange" and press the **Space** key, **Enter** sends **"TU UP"** and writes the QSO to the log. The message buttons corresponding to the current function of the **Enter** key have red labels.

LOGGING

The log panel shows the last 5 QSO, including the time, callsign, frequency, continent, SNR and a QSO status symbol. The following status symbols are used:

+	Valid QSO, 1 point
*	Valid QSO, 3 points
-	Incorrect callsign (0 points). The correct one is shown in the braces.
space	The QSO is not in the correspondent's log: either he is still copying your message, or he is waiting for your final TU, or the call you have entered is completely wrong and there is no such station in the pileup.

The full session log is saved in the ADIF format at the end of the session, so you can use your favourite log analysis tools to generate statistics, or perhaps do some research.

The results of every session are added to the History file, a plain text file that can be opened using the **File / History** command.

COMPETITION MODE

Select the **Competition** radio button in the **Pileup Settings** dialog to switch from the Practice mode to the Competition mode. The score that you achieve in this mode may be submitted the High Scores table on the Pileup Runner web site. The following pileup parameters are fixed in the competition mode:

Number of callers	100
Average SNR	15 dB
Session Length	15 min.

The color of the log panel changes from blue to red in the competition mode.

To submit your competition results to the online table, open the History file, copy the line with your score to the Clipboard, then paste it in the input box on the web page. Be sure to copy the whole line, including the signature at the end. Note that any changes to the line invalidate the signature.

Only the lines with Competition in the Mode field may be submitted to the online table, the lines with Practice are only for your own information.

DATA FOLDERS

Since Windows no longer allows the programs to write to their own folder, Pileup Runner stores its data in a special data folder designated by operating system. The location of this folder is different on every machine. Use the menu commands under **File** to open the folders containing the I/Q WAV recordings and ADIF logs, and to access the History file.

DXERS' CALLSIGNS

The list of DXers' callsigns has been produced by Michael G7VJR from his ClubLog data (MNI TNX!). These are real callsigns of the real DX'ers who worked a certain minimum number of DX-peditions in the last few years. Be prepared to hear many familiar calls in the pileup! You can even work yourself if you are lucky enough.

DSP CHAIN

When the program generates the audio for you and plots the waterfall display, it does not cheat, and does not cut corners. After the I/Q stream containing all signals is generated, it is processed by the code identical to that in CW Skimmer, as if it were received from a radio. The processing includes filtering, AGC, FFT, key click canceling, etc. This ensures that the quality of the audio and waterfall graphics are the same in a simulation and on the air.

PILEUP BEHAVIOUR

The pileup simulator tries to model many features of the real pileups. I the simulation, the DX'ers copy your signals most of the time, but sometimes they cannot copy their own call, or accept an incorrectly sent call, or miss your transmission completely. You will notice that they use all kinds of variations on the **"599 TU"** theme, from plain **"599"** to something like **"BK DE XX0XXX TU 599 599 GL 73 DE XX0XXX TU E E"**. Be patient and do not send your final TU until your correspondent finishes sending his message, or you may end up being not in his log.

The DX'ers do their best to work you, but their skill levels are different. Some of them just keep calling blindly on the same frequency in a hope that you will eventually tune across their signals, some at least monitor their own TX frequency and QSY when necessary to ensure that their signal is more or less in the clear, but there are also experienced DX'ers who try to figure out your listening frequency, and they often succeed in this. As soon as your correspondent sends **"599"** to you, some of the experienced DX'ers know where you are listening, and tune to, or near, that frequency. Do not listen on the same frequency for too long, unless you want to see half of the pileup squeezed in the passband of your receiver.

TIPS AND TRICKS

Since Pileup Runner has the same waterfall display as [CW Skimmer](#), you can use all tricks that you would use if you were running a pileup with the Skimmer. Here are a few for you to try.

The QSO with the difficult continents are more valuable than with the easy ones, which is also true for a real DX operation. Since you get 3 points for a difficult continent, you can spend up to 3 times more time on such QSO and still have a better score. Find a 3-point station on the waterfall visually while your correspondent is sending **"599"** to you, then click-to-tune to that station while you are sending **"TU UP"**. Look for the weak signals on the waterfall as these are often 3-point stations.

Learn to read Morse Code visually off the waterfall display. With some practice, you will be able to visually copy all signals that you can copy aurally, including the high-speed and very weak stations. This skill has multiple uses, from finding the 3-point stations to verifying the calls you copy by the ear, to making a QSO with a station that is not even in your passband. Indeed, you can copy the callsign visually and answer her call, then copy her **"599"**, again visually, and save the QSO to the log, all without hearing the station. If you use this technique to work a station a few kHz away from where you are listening, those who are chasing your QSX frequency will move there (well, at least some of them), allowing you to work a few more stations in the clear.

Do not neglect the **PageUp** command. The pileups are often much thinner near the top than at the bottom, be sure to page through the whole pileup and always work in the areas with a low concentration of the callers.

As has already been said, staying on the same listening frequency for more than a few QSO is a sure way to cause problems to both your callers and yourself. Even if you did not have time to find a good new frequency in advance, just tune 2-3 kHz up or down, this requires only a single mouse click on the waterfall. The slow waterfall available in Pileup Runner may give you a rough idea of where in the pileup the density of the stations is low.

VERSION HISTORY

2012-10-10   1.4

- Increased space between the callsigns when the calling station sends its call twice
- The **"."** macro key, if pressed twice, does not add a duplicate QSO to the log
- If   the operator changes the listening frequency by more than 300 Hz, the callsign input box is automatically cleared

2012-10-05   1.3

- Competition mode added
- Macro (**";"** and **"."**) keys re-assignable by user
- Arrow up and down keys control filter bandwidth
- Improved artificial intelligence behind the calling stations
- Auto-send DX callsign every N-th QSO

2012-09-28   1.2 Beta

- Improved performance on slow computers

2012-09-26   1.1 Beta

- F key mapping
- ESM mode

2012-09-24   1.0 Beta

- Initial release