ELECTRONIC LOGGING

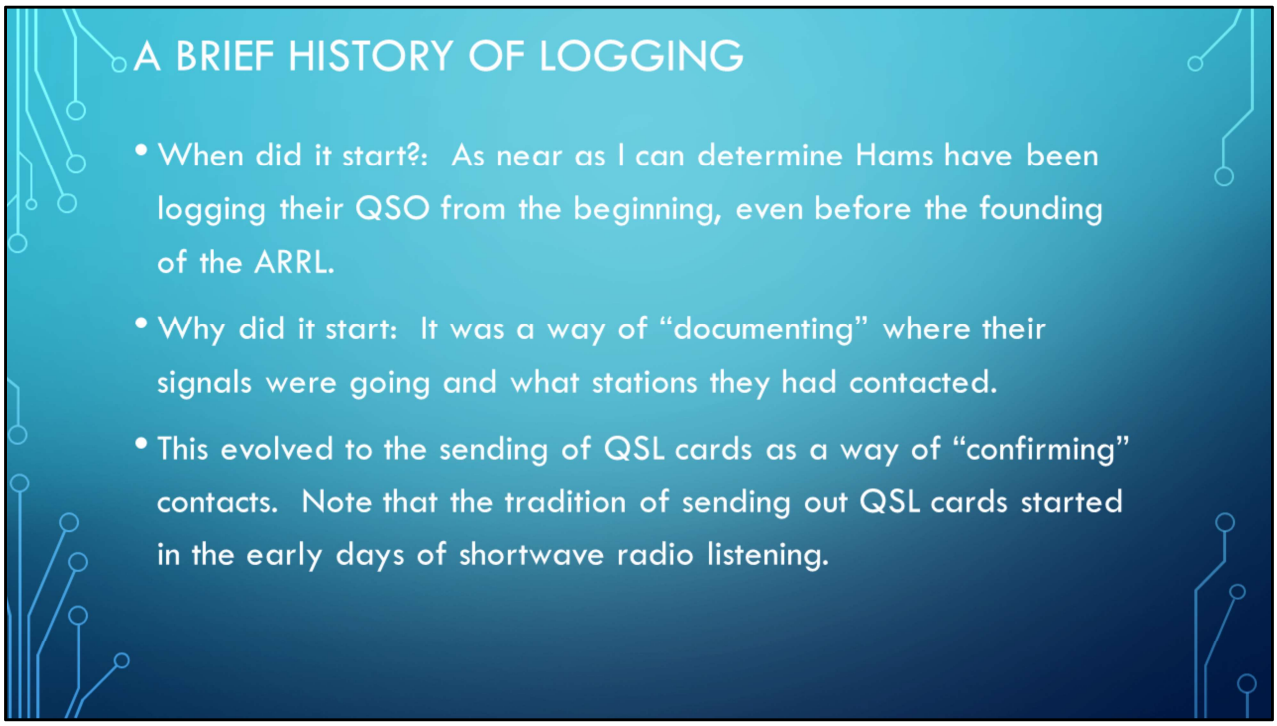
PRESENTED BY EUGENE MORGAN (WB7RLX)

TO THE OGDEN AMATEUR RADIO CLUB ON MARCH 18, 2023

V1.2

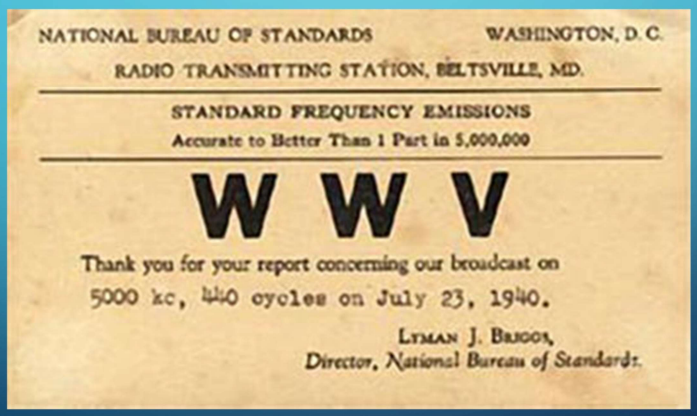
AGENDA

- Logging- A Brief History
- Why do we Log QSO's Today?
- Electronic Logging
- LoTW
- QRZ
- Questions



The very first radio signal that was purposely sent occurred in summer of 1865 by a Dr. (a dentist) Mahlon Loomis sent a signal up a wire suspended by a kit to a similar arrangement 18 miles away. (See: "200 Meters & Down" by Clinton DeSoto, page 11) Through the late 1800's folks like Marconi and Tesla were experimenting with radio and in the first years of the 1900's one can safely say amateur radio was born. For reference, the ARRL was founded by Hiram Percy Maxim in 1914.

EXAMPLE OF A QSL CARD FROM 1940



NATIONAL BUREAU OF STANDARDS WASHINGTON, D. C.

RADIO TRANSMITTING STATION, BELTSVILLE, MD.

STANDARD FREQUENCY EMISSIONS

Accurate to Better Than 1 Part in 5,000,000

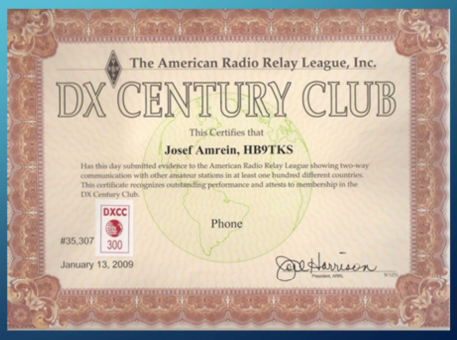
W W V

Thank you for your report concerning our broadcast on
5000 kc, 440 cycles on July 23, 1940.

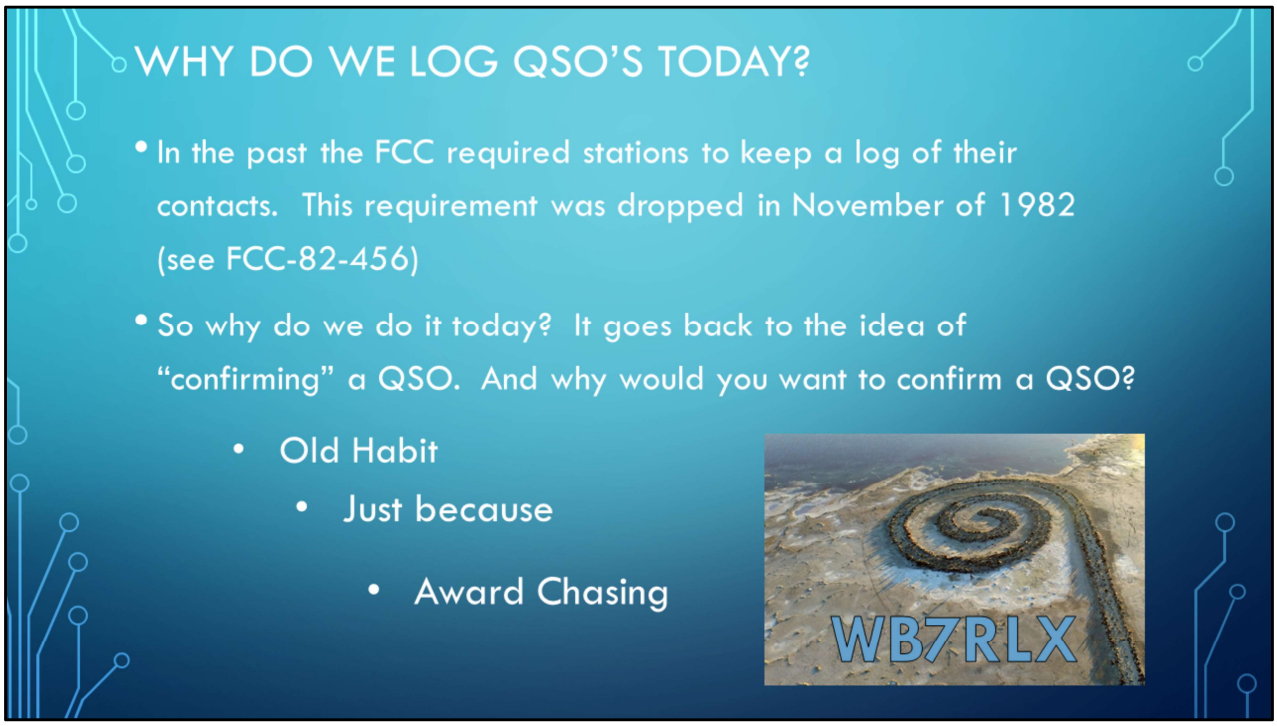
LYMAN J. BRIGGS,
Director, National Bureau of Standards.

THE EVOLUTION OF THE QSL CARD

- After the ARRL was formed the ARRL thought it would be a good idea to create awards for certain achievements such as WAS and DXCC. So in 1935 the DXCC program began.
- However to earn these awards the QSO had to be confirmed and that confirmation was in the form of a paper QSL card.



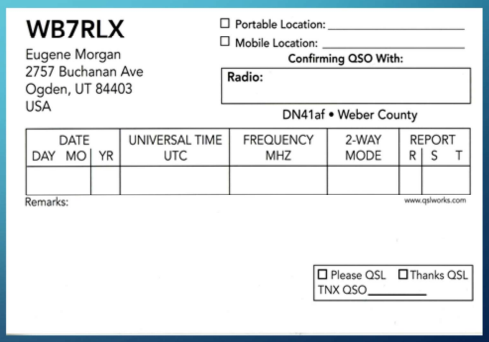
See: QST, October 1935 by Clinton DeSoto



For what ever reason the FCC dropped the logging requirement in 1982. So the question today is "Why do we log QSO's today?" Is it just that old habits die hard? For the fun of it? I'm sure that if we did a survey among hams that still log QSO's I'm sure we would find that some do it out of habit and some just because they what to keep track of who they have worked. But I believe the biggest reason is for chasing awards. But understand for awards it more than just logging, there also has to be "confirmation" In short both participants have to log the QSO and then send confirmation. And the properties of that conversation must agree. Let's look at this a bit closer in the next slide.

WHAT IS CONFIRMATION?

- Confirming A QSO requires the Following Information from both stations:
  - ✓ **Call Signs** - both QSO reports must name the same two call signs
  - ✓ **Date/Time (UTC)** - both QSO reports must have the same timestamp, +- 30 minutes
  - ✓ **Band** - both QSO reports report the same band in use
  - ✓ **Mode** - both QSO reports report the same mode in use



It's important that both stations log the date and time in UTC time. A question comes up about what time to log, the start time or the end time. I recommend that you should use the start time as a default time. Remember the margin of error can be as much as 30 minutes.

A JUST IN CASE YOU WERE WONDERING

- Yes people still send out paper QSL Cards! Although it's not as prevalent as it once was.

Needless to say the computer and Ham radio goes together like Champaign and strawberries, a match made in heaven. The computer has a hundred uses in ham radio from sending and receiving RTTY to designing antennas and circuits. And one if the more popular uses was logging.

SAMPLE LOGGING PROGRAM FROM 1981

A "Type-In" in GWBASIC, a version of Microsoft BASIC for the IBM PC. You would often see these "Type-In" programs in ham radio magazines like QST, 73 Magazine, and CQ Magazine. They were very popular with the readers.

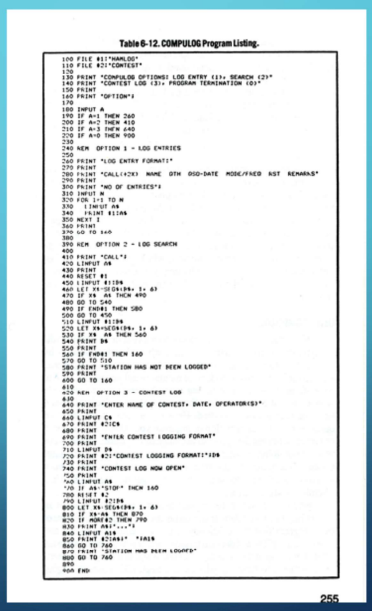


Table 6-12. COMPULOG Program Listing.

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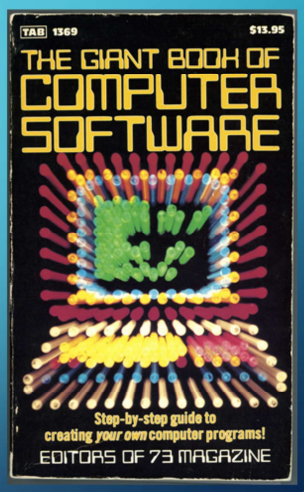
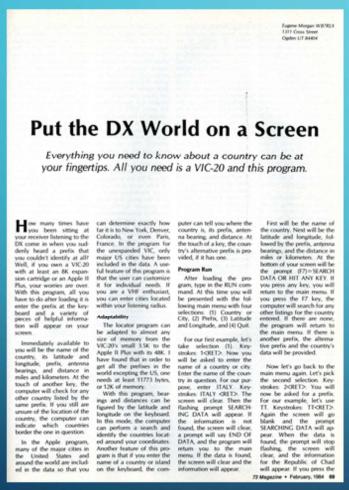


This program if from the book called "The Giant Book of Computer Software" published by 73 Magazine and was first published in 1981. This book is from my personal collection.

AND ALONG CAME THE COMPUTER (1977)

Even I published two programs in 73 Magazine in 1984



Put the DX World on a Screen

Everything you need to know about a country can be at your fingertips. All you need is a VIC-20 and this program.

How many times have you been sitting at your receiver listening to the DX come in when you suddenly heard a prefix that you couldn't identify at all? Well, if you own a VIC-20 with at least an 8K expansion cartridge or an Apple II Plus, your worries are over. With this program, all you have to do after loading it is enter the prefix at the keyboard and a variety of pieces of helpful information will appear on your screen.

Immediately available to you will be the name of the country, its latitude and longitude, prefix, antenna bearings, and distance in miles and kilometers. At the touch of another key, the computer will check for any other country listed by the same prefix. If you still are unsure of the location of the country, the computer can indicate which countries border the one in question.

In the Apple program, many of the major cities in the United States and around the world are included in the data so that you can determine exactly how far it is to New York, Denver, Colorado, or even Paris, France. In the program for the unexpanded VIC, only major US cities have been included in the data. A useful feature of this program is that the user can customize it for individual needs. If you are a VHF enthusiast, you can enter cities located within your listening radius.

Adaptability

The locator program can be adapted to almost any kind of country from the VIC-20's mouth (OK, to the size of Texas). You will have found that in order to get all the prefixes in the world excepting the US, one needs at least 31773 bytes, or 32K of memory.

With this program, bearings and distances can be figured by the latitude and longitude on the keyboard. In this mode, the computer can perform a search and identify the countries located around your coordinates. Another feature of this program is that if you enter the name of a country or island on the keyboard, the computer can tell you where the country is, its prefix, antenna bearing, and distance. At the touch of a key, the country's alternative prefix is provided, if it has one.

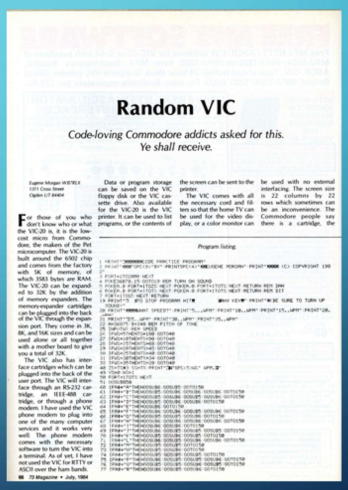
Program Run

After loading the program, type in the RUN command. At this time you will be presented with the following main menu with four selections: (1) Country or City, (2) Prefix, (3) Latitude and Longitude, and (4) Quit.

For our first example, let's take selection (1). Keystroke 1<CRET>. Now you are asked for a country or city name. Enter the name of the country in question. For our purpose, enter ITALY. Keystrokes ITALY<CRET>. The screen will clear. Then the flashing prompt SEARCHING DATA will appear. If the information is not found, the screen will clear, a prompt will say END OF DATA, and the program will return you to the main menu. If the data is found, the screen will clear and the information will appear.

First will be the name of the country. Next will be the latitude and longitude, followed by the prefix, antenna bearings, and the distance in miles or kilometers. At the bottom of your screen will be the prompt (F7)=SEARCH DATA OR HIT ANY KEY. If you press any key, you will return to the main menu. If you press the F7 key, the computer will search for any other listings for the country entered. If there are none, the program will return to the main menu. If there is another prefix, the alternative prefix and the country's data will be provided.

Now let's go back to the main menu again. Let's pick the second selection. Keystrokes 2<RET>. You will now be asked for a prefix. For our example, let's use IT. Keystrokes IT<CRET>. Again the screen will go blank and the prompt SEARCHING DATA will appear. When the data is found, the prompt will stop flashing, the screen will clear, and the information for the Republic of Chad will appear. If you press the



Random VIC

Code-loving Commodore addicts asked for this. Ye shall receive.

For those of you who don't know who or what the VIC-20 is, it is the low-cost micro from Commodore, the makers of the Pet microcomputer. The VIC-20 is built around the 6502 chip and comes from the factory with 5K of memory, of which 3583 bytes are RAM. The VIC-20 can be expanded to 32K by the addition of memory expanders. The memory-expander cartridges can be plugged into the back of the VIC through the expansion port. They come as 3K, 8K, and 16K sizes and can be used alone or all together with a mother board to give you a total of 32K.

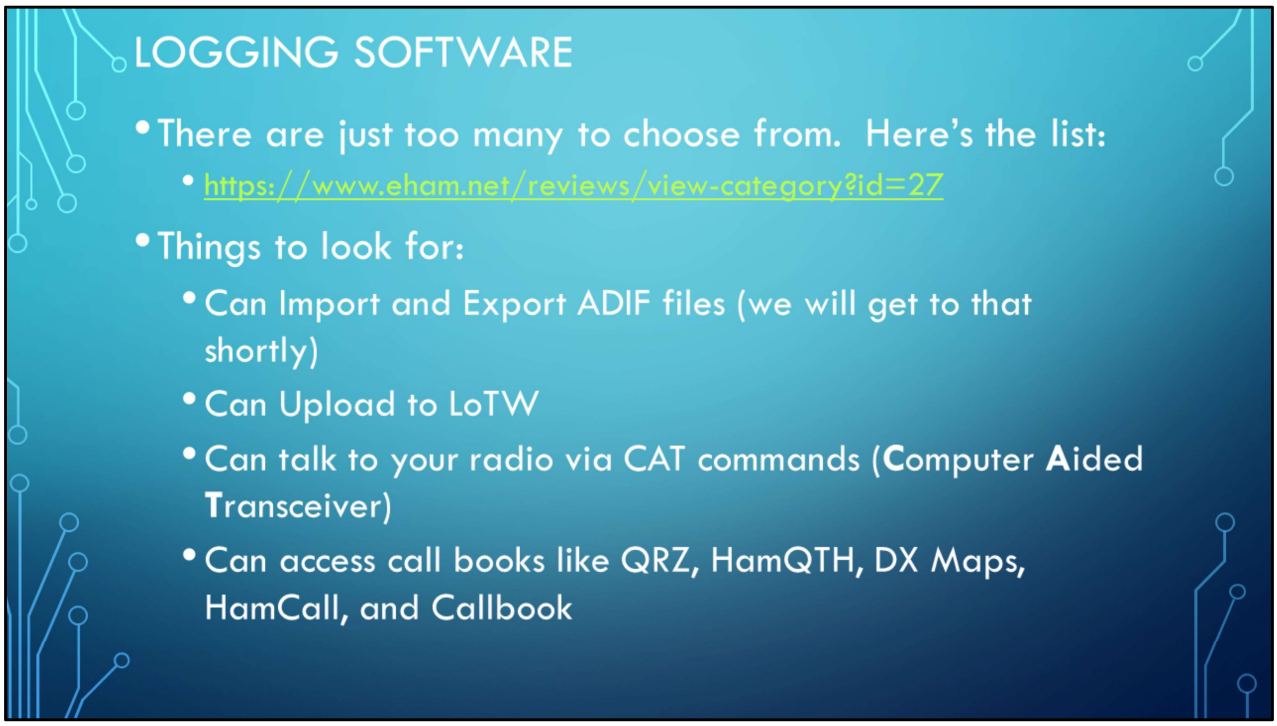
The VIC also has interface cartridges which can be plugged into the back of the VIC. The VIC will interface through an RS-232 cartridge, an IEEE-488 cartridge, or through a phone modem. I have used the VIC phone modem to plug into one of the many computer services and it works very well. The phone modem comes with the necessary software to turn the VIC into a terminal. As of yet, I have not used the VIC for RTTY or ASCII over the ham bands.

Data or program storage can be saved on the VIC floppy disk or the VIC cassette drive. Also available for the VIC-20 is the VIC printer. It can be used to list programs, or the contents of the screen can be sent to the printer.

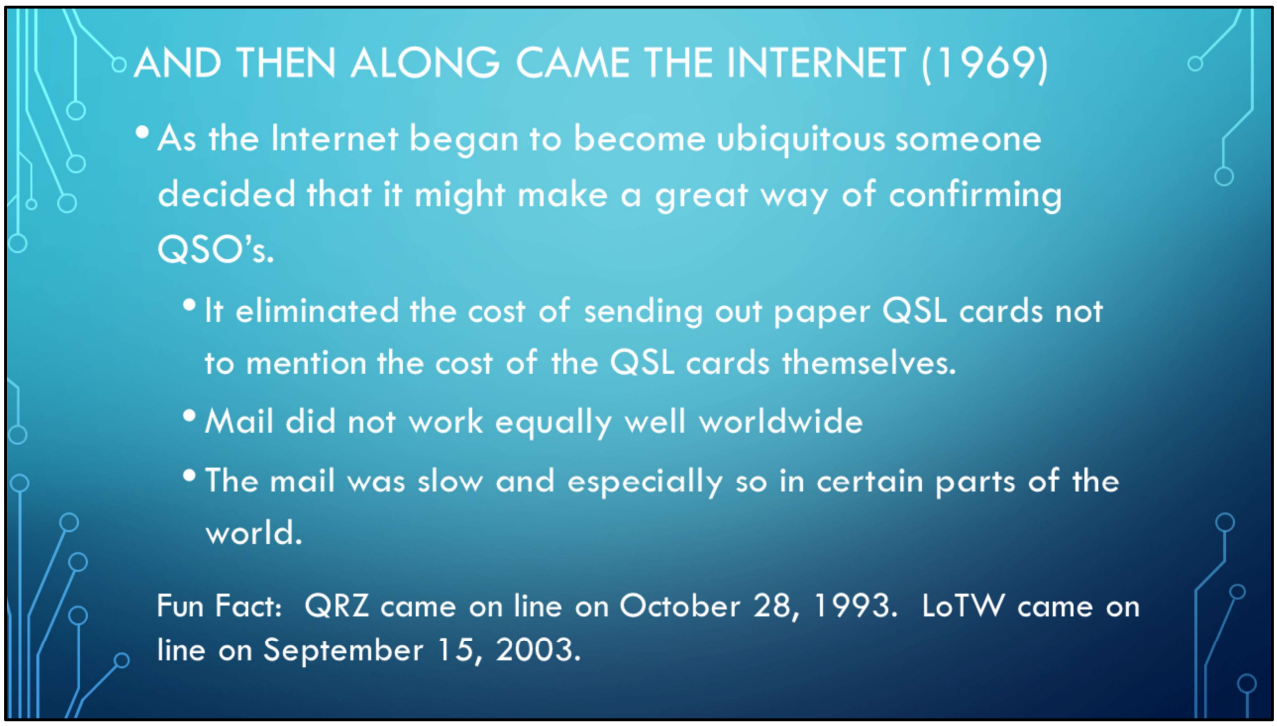
The VIC comes with all the necessary cord and fittings so that the home TV can be used for the video display, or a color monitor can be used with no external interfacing. The screen size is 22 columns by 22 rows which sometimes can be an inconvenience. The Commodore people say there is a cartridge, the

Program listing

These are two program I wrote for the Commodore computer. "Put the DX World on the Screen" was a program that would allow you to type in a prefix and the computer would tell you what country it was and give the bearing, distance and MUF (Maximum Usable Frequency) to the country in question. The MUF portion of the program was taken from a program called mini-muf which I converted to Commodore BASIC. The Random VIC program was one of the very first program I wrote. It was for learning CW. The VIC 20 had a whopping 3.5K of free RAM. The Vic 20 was my very first computer…. Now let's turn our attention to logging software in particular.



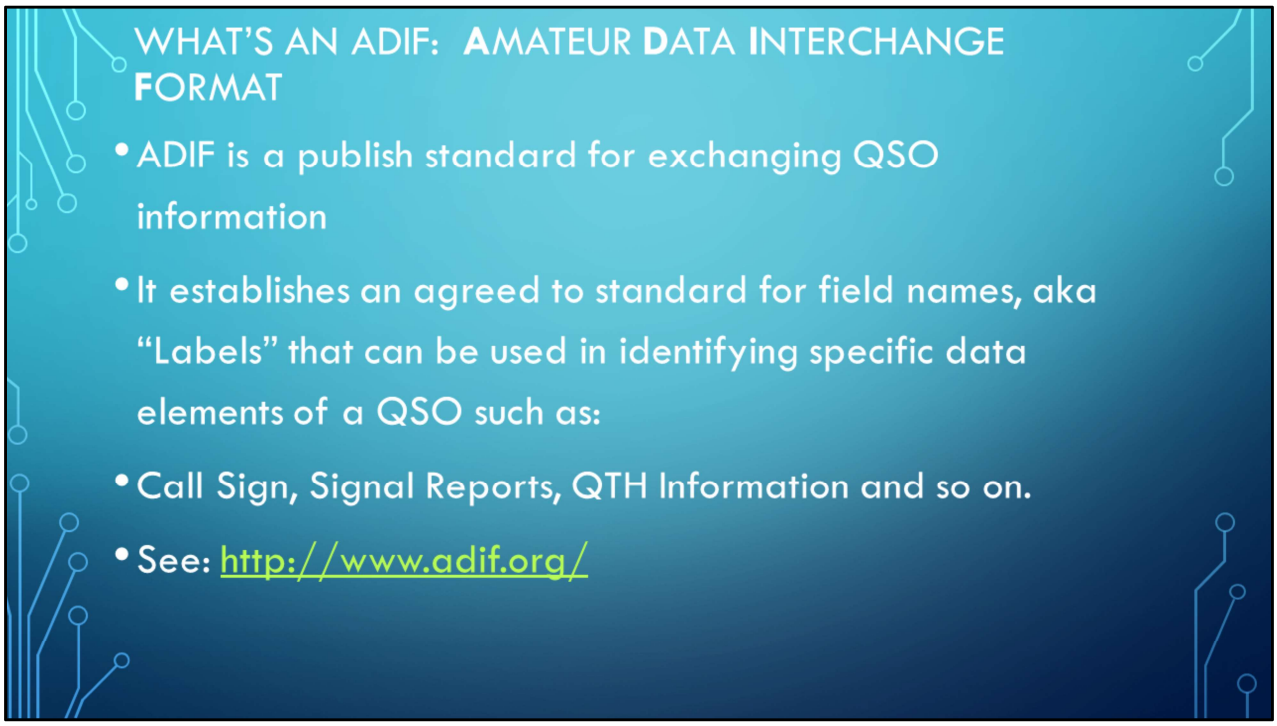
There are just too many logging programs to call out here. The provided link will give you an idea of what's available today. Logging programs can be broken down into two basic categories: one for contesting and one for everyday use and yes some can be adapted or extended to do both. From my perspective the most popular are: Ham Radio Deluxe, LogBook4OM, N1MM, N3FJP, and QRZ. Note that QRZ is an online log book while the others are installed on your local hard drive. I did not include LoTW in this list. LoTW a cloud based database and not a logging program per sa given that it doesn't have a user interface suitable for direct data entry of QSO information. LoTW depends on other systems such as those mentioned above for direct data input.



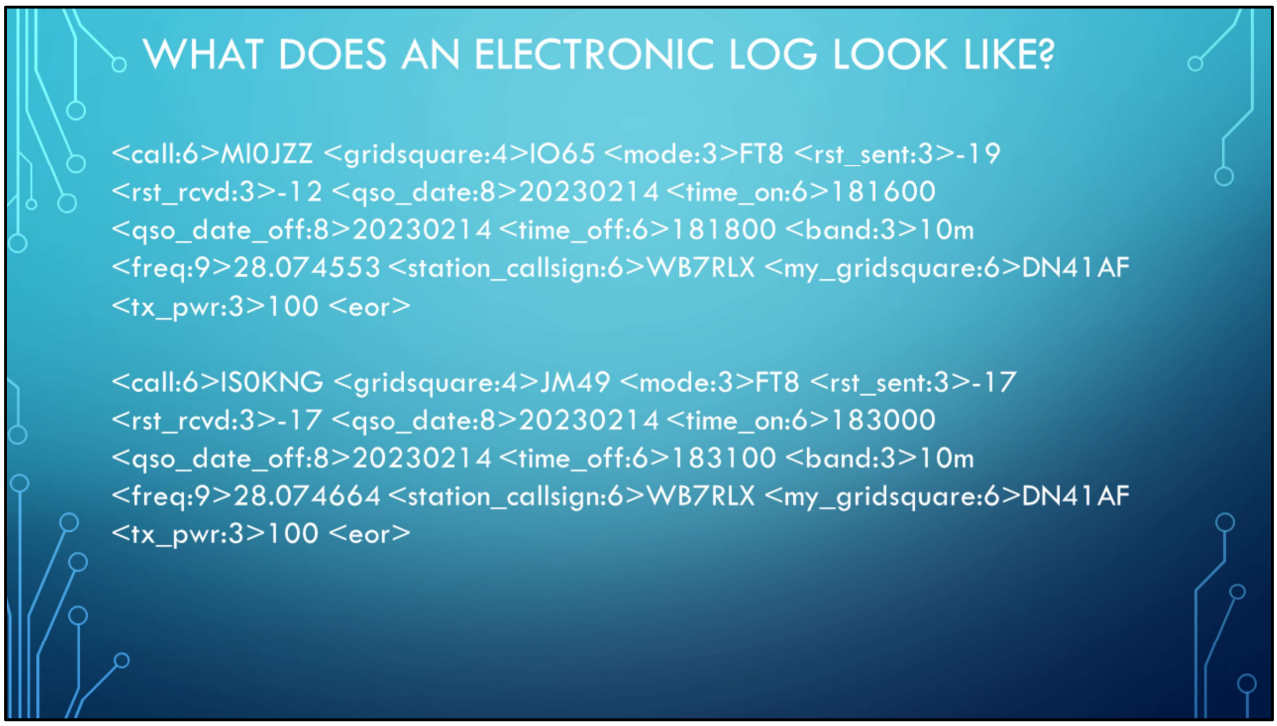
During the same period the World Wide Web was born, on **October 28, 1993**, QRZ went online with http://www.qrz.com It was one of the very first web based callsign lookup services. QRZ holds the distinction of being one of the first 5,000 websites in existence (there are many millions today).
See:
https://www.qrz.com/page/about.html#:~:text=During%20this%20same%20period%20the%20World%20Wide%20Web,websites%20in%20existence%20%28there%20are%20many%20millions%20today%29.

See: OCT 2003 - *QST* (PG. 46)
Introducing.Logbook of The World
Author: Mills, Wayne, N7NG
Article: QST Archive [PDF]

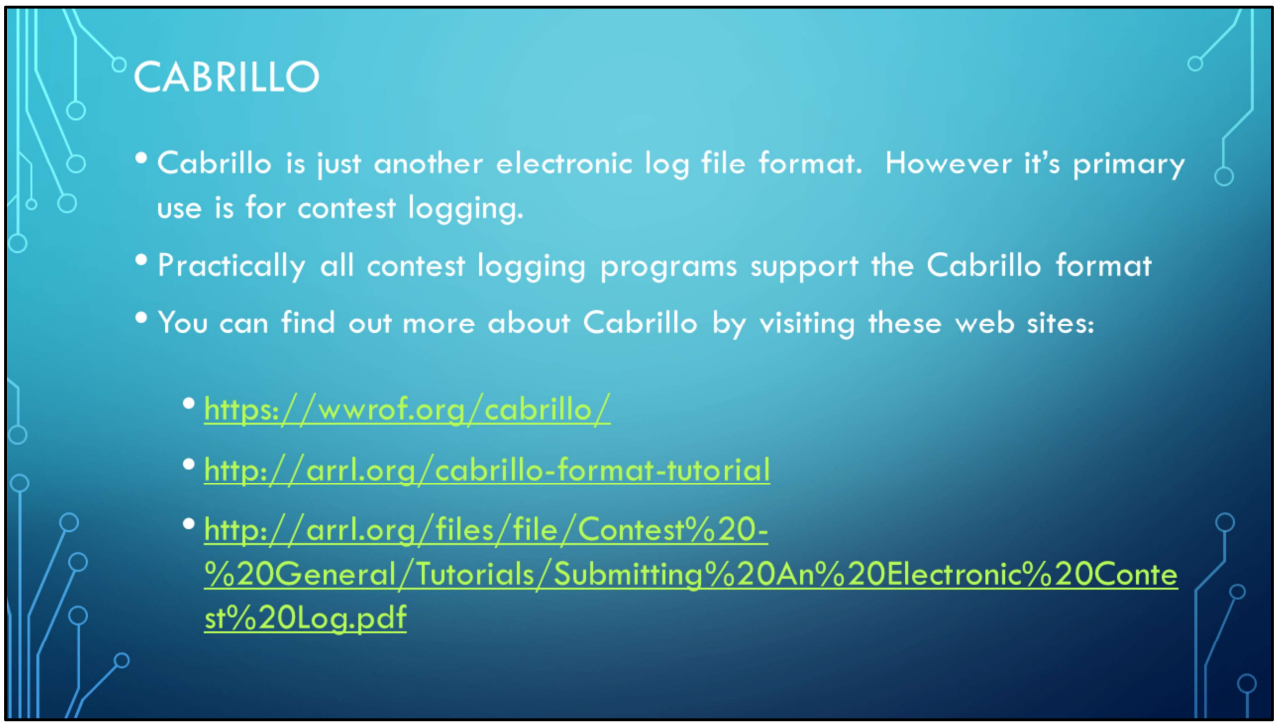
See: A Brief History of the Internet - Internet Society



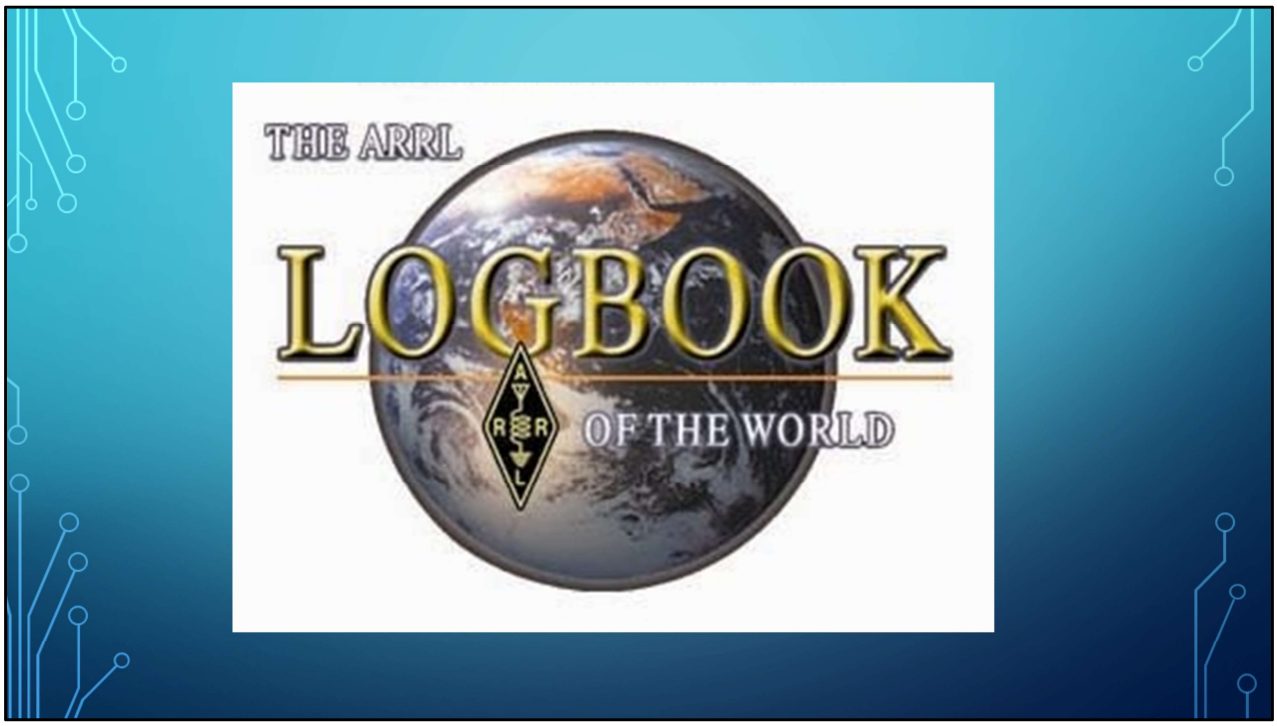
The key purpose of the ADIF format is to provide a means of transferring logbook data from one system to another such as when uploading your logbook to QRZ or LoTW. Writing parsers for ADIF files is fairly simple. The ADIF format is dynamic and is constantly being amended to include additional labels. The current ADIF standard is version 3.1.4 (as of March 2023)



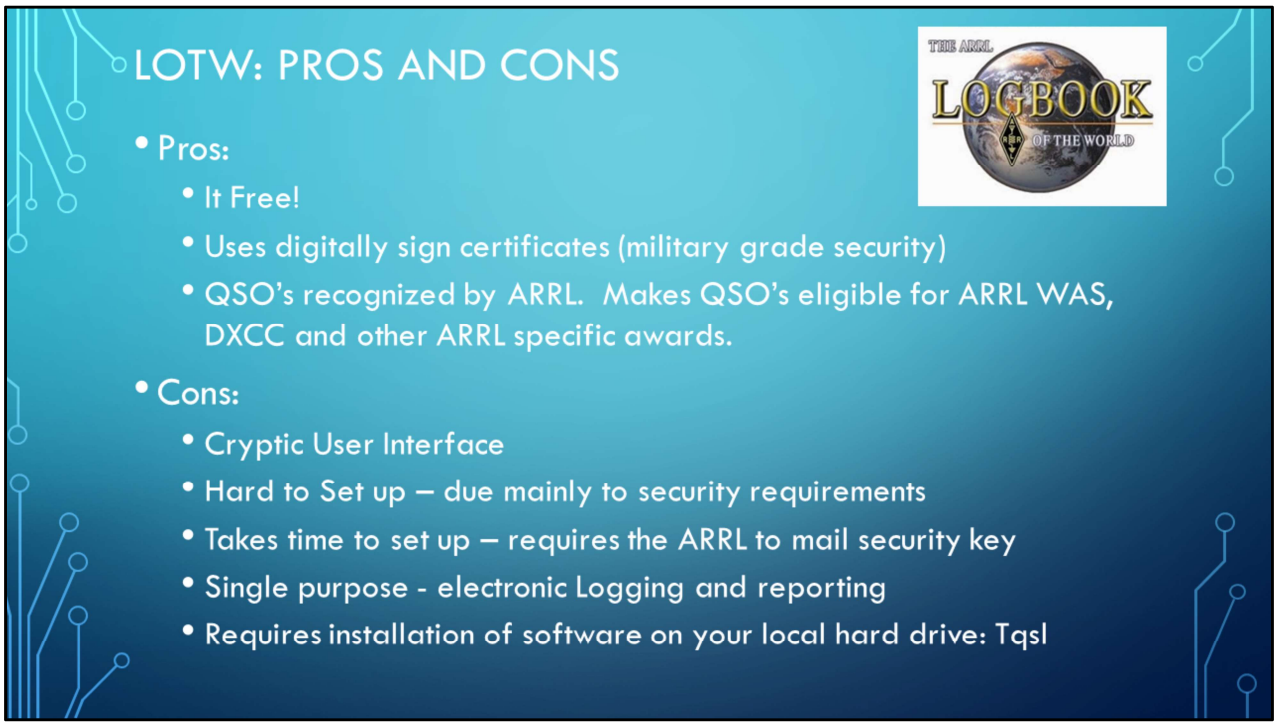
This is an example from my own log book as seen via Windows Notepad. Although there are several hundred records in this file this shows and excerpt of just two separate QSO's. Note that each QSO entry is terminated with an <eor> label which indicates the end of a given record. The advantage to this format is each record can be of a different length and the fields do not need to be stored in any specific order. The only requirement is each record must use the standard labels and that the length of each field be indicated. <label:length>data <label:length>data Example 1: <call:6>WB7RLX Example 2: <call:4>W7SU



Given that the Cabrillo was specific to contesting I chose to not include it in the formal presentation. But for those who are interested in contesting I wanted to include a slide that would explain what it is and where more information can be found.

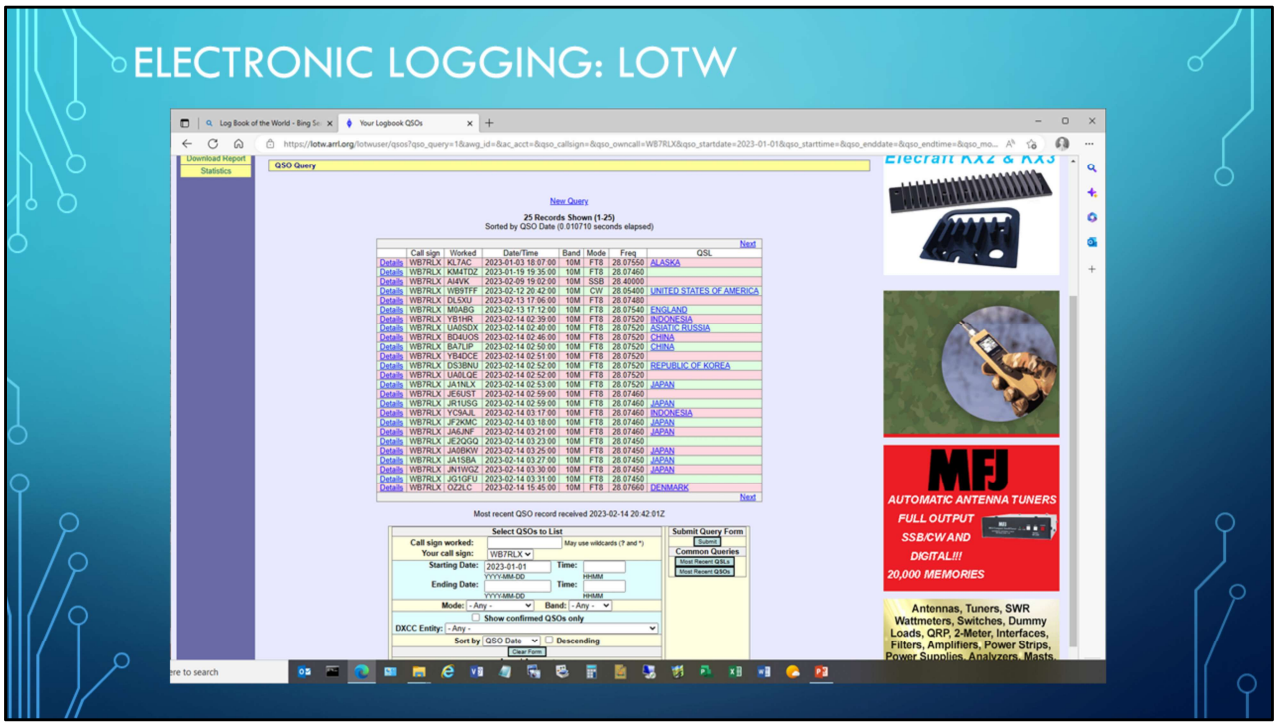


Now let’s dive into Log Book of the World aka: LoTW

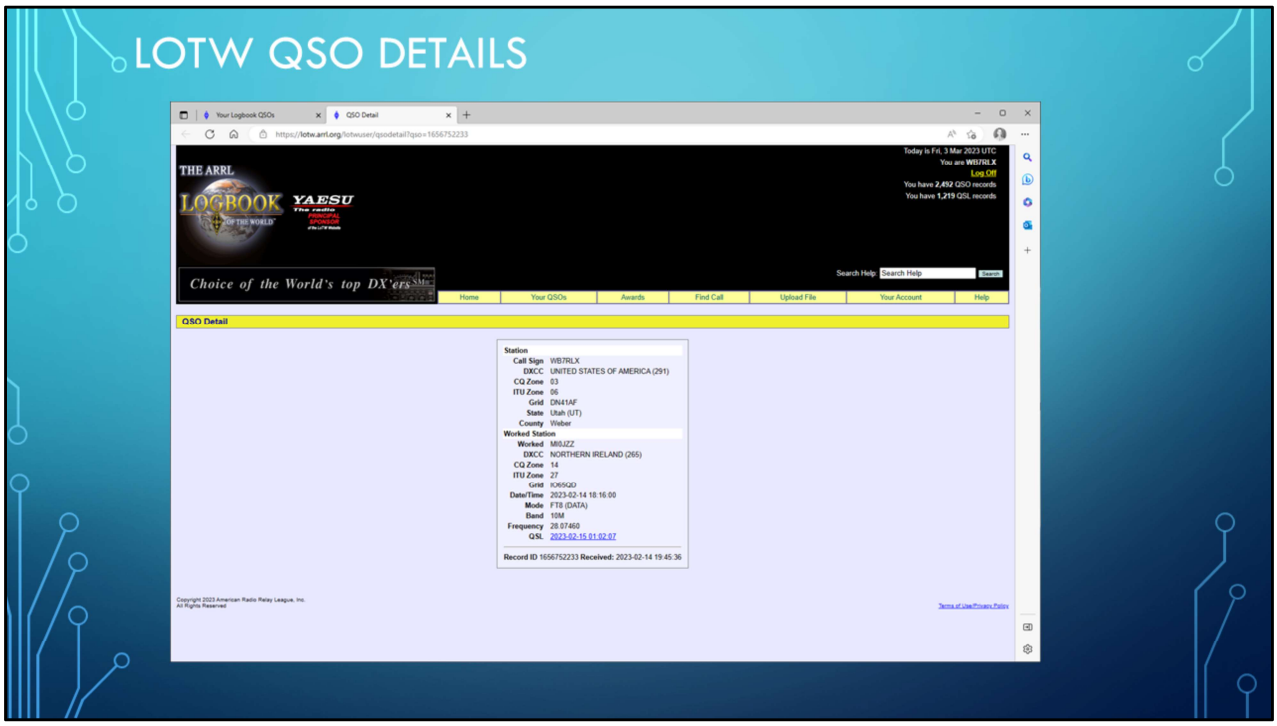


The biggest pro is that QSO's confirmed by LoTW are recognized by the ARRL. It's second biggest pro is it uses military grade public key/private key security system. In short that means that no one else can upload to your logbook. This also happens to be one of it's biggest cons. Setting up this public/private key security is complicated and takes time and requires you to configure your logging program to use the LoTW security certificate for signing logs before being uploaded to LoTW.

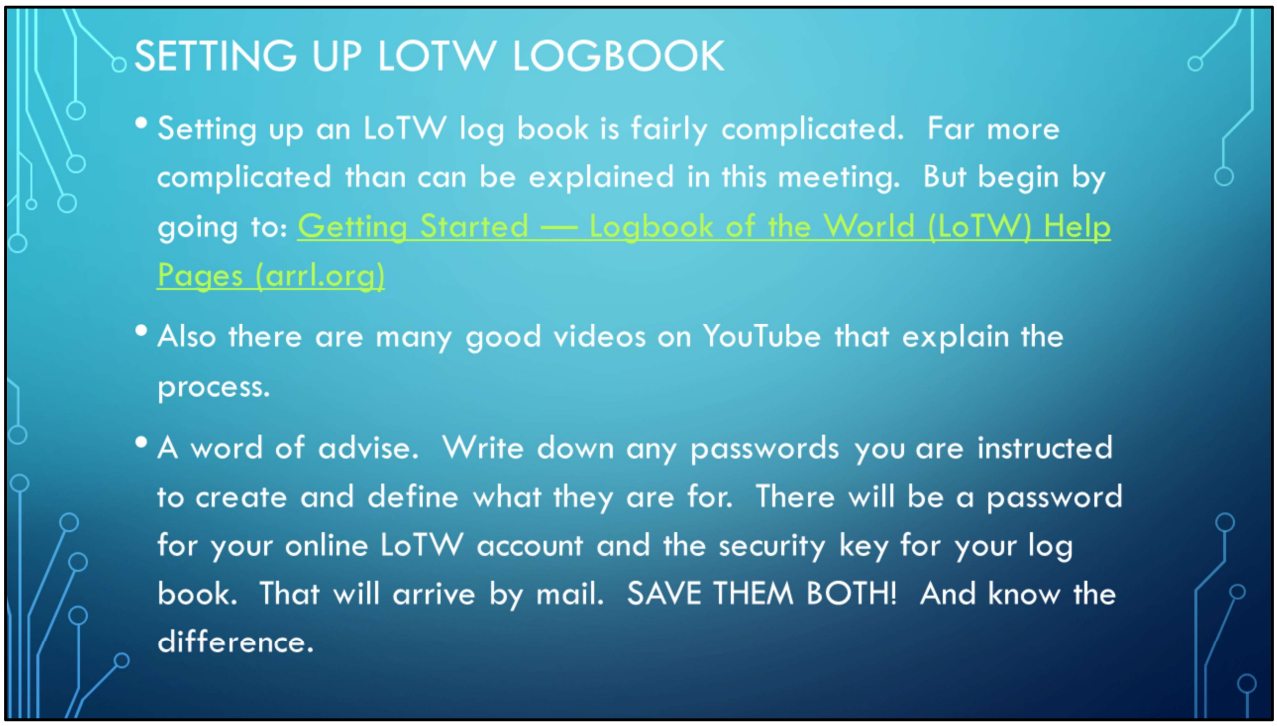
Also note that QRZ does recognize LoTW confirmations, but unfortunately the reverse is not true. I assume that's due to the fact the ARRL does not consider QRZ as "trustworthy." *(Editorial Note: There are many who consider the LoTW security overkill for a bunch of hams just exchanging QSO confirmations. It's not like life, property, or financial damage would occur if someone tried to cheat the system.)*



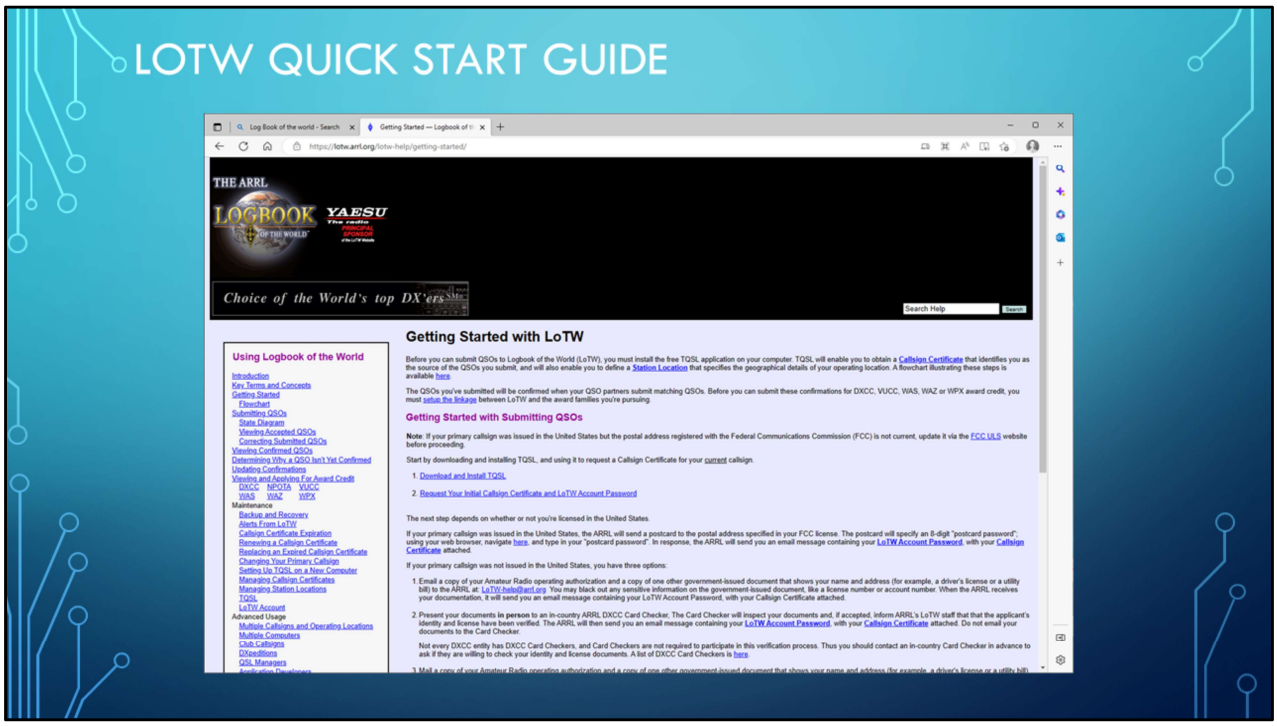
This is an example of the LoTW user interface. This was a query to pull up a list of my confirmed QSO's for all of 2023. I had to enter in the search criterial before executing the search. As you can see the UI is pretty basic especially when compared to actual logging programs like LogBook4OM or QRZ. In those program all I have to do is type in a call sign and it pulls up any information in the log book for that call and displays it. It addition these program can also give you things like bearing and distance. This goes back to what I said earlier, LoTW is little more than a cloud based central repository for QSO's that allow the ARRL to match up QSO's and certify the QSO was real.



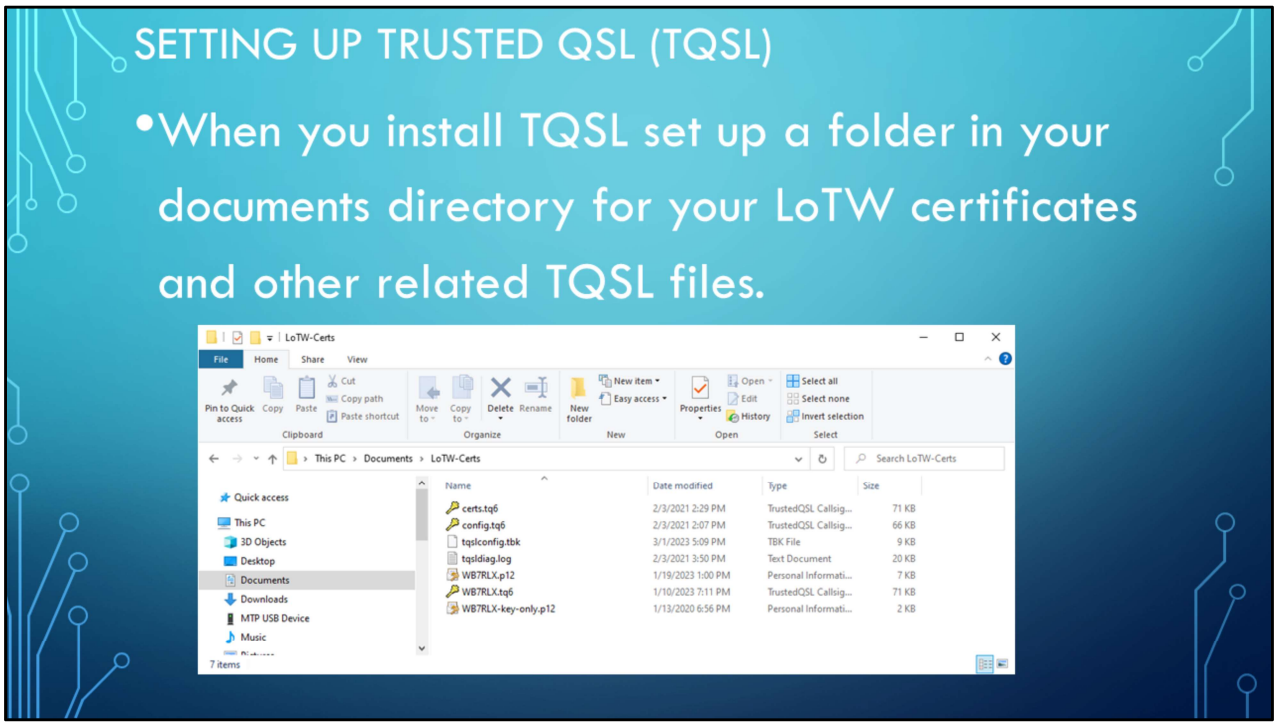
This is a simple screen shot of a particular QSO. This shows how minimal LoTW user interface is. I don't believe that LoTW was intended to be used as log book but rather just a QSO database with a minimal user interface.



The key point of this slide is save everything you get from the ARRL and understand the difference between your LoTW sign on password and your LoTW logbook password. Also, READ THE GETTING STARTED Guide It will save you a lot of frustration. It is very straight forward and provides step by step instructions. You might also consider asking a friend who has set up an LoTW account for some help.



READ THIS Before attempting to set up your LoTW account.



When you setup TQSL set up a folder on your local hard drive to store all of your LoTW specific files. These files will include your certificates, certificate backups, and tqsl configuration information. In my case I set this up in my "*Documents*" folder and named it LoTW-Certs. Because this is in my Windows profile directory it can be backed up by any of the many backup utilities for Windows including Windows File History Backup. You can also copy this folder to a thumb drive and put it in your safe. **Key points, know where this folder is on your hard drive and make a back up of it!.** Yes you can set it up on your OneDrive but I prefer to keep it local.

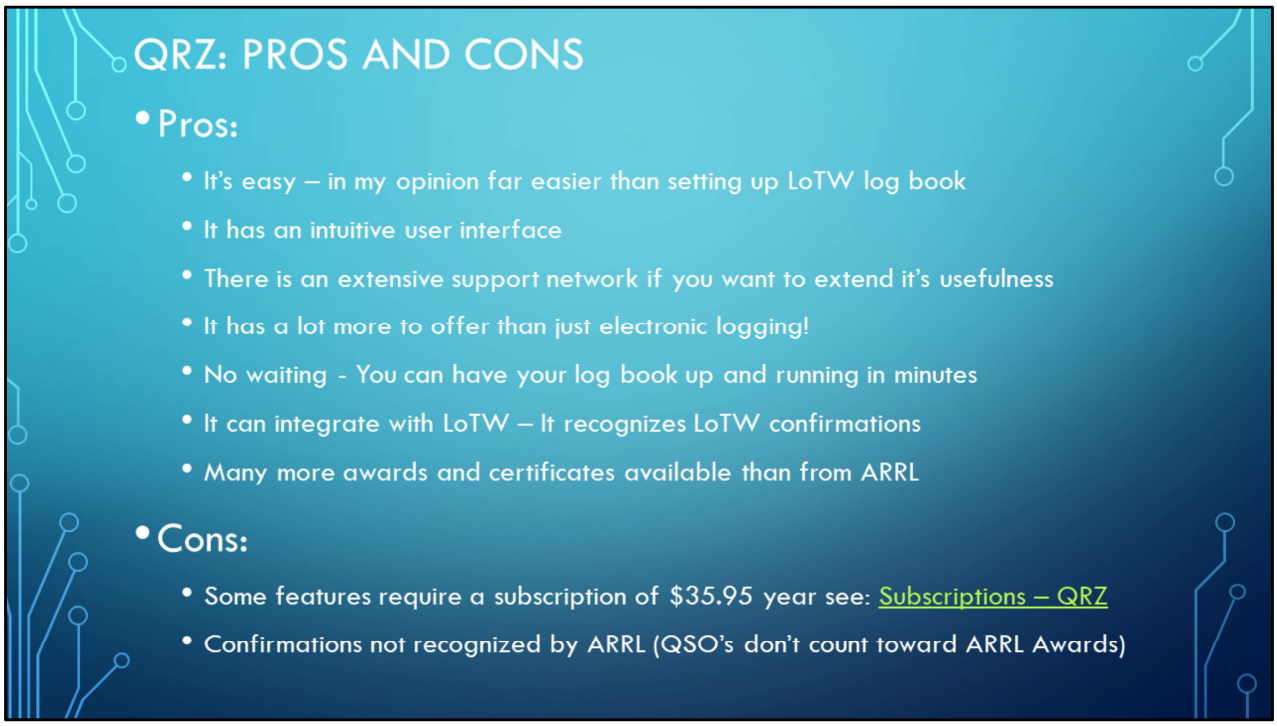
This is a common scenario after one upgrades from General to Advance or when one has requested a vanity call or when using a special event call sign. It needs to be understood that ARRL/LoTW considered these two separate entities and each call sign requires it's own unique certificate. For example WB7RLX would not be considered the same as WB7RLX/MM. I would need two different certificates, one for WB7RLX and one for WB7RLX/MM. Note /MM is the designation for Maritime Mobile.

See:
https://lotw.arrl.org/lotw-help/multiple-callsigns-locations/#:~:text=Using%20LoTW%20With%20Multiple%20Callsigns%20and%20Operating%20Locations,than%20your%20present%20operati

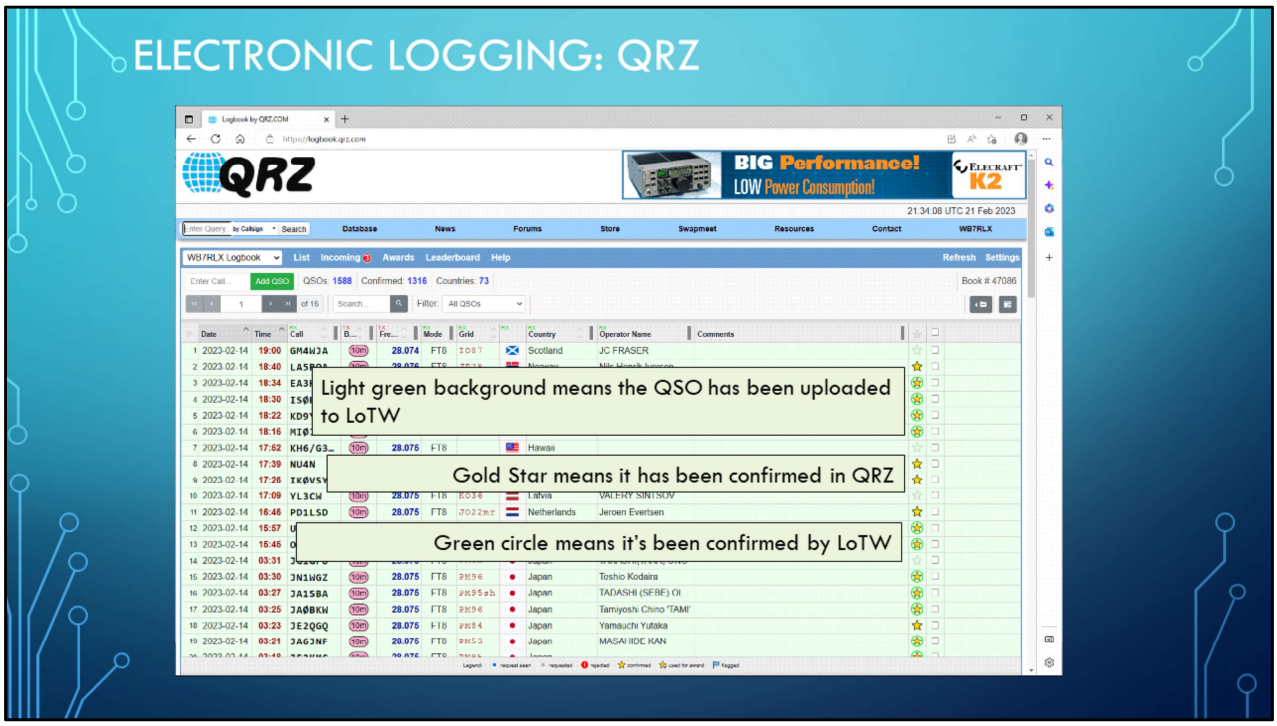
ng%20location.%20It%20assumes%20that

Now lets turn our attention to QRZ. Unlike LoTW QRZ is not only a cloud based QSO data store capable of matching up QSO's for the purpose of confirmation but can also be used as an actual log book complete with a fairly intuitive user interface. This is what distinguishes it from LoTW. Also note that data can be imported and exported into LoTW, however as has been mentioned LoTW does not recognize QRZ confirmations. What that means is that both stations have to have uploaded the QSO data to LoTW either via QRZ or directly into LoTW. Assume I upload my QSO with KB7LAK to LoTW either directly to LoTW via QRZ and KB7LAK only uploads his side of the QSO to QRZ and not LoTW it will not be recognized by LoTW.

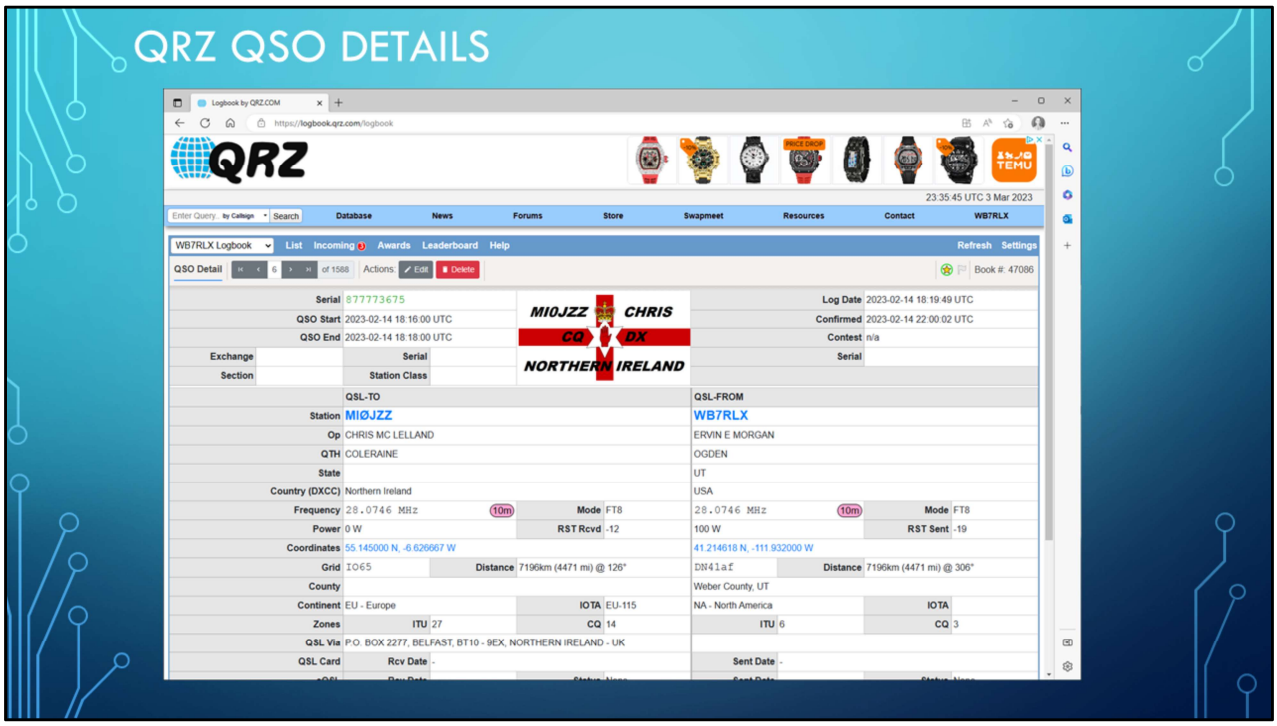
Fun Fact: What we have found is if you use both LoTW and QRZ your confirmed QSO rate will be around 80% but if you only use one or the other your confirmed QSO rate will be much lower.



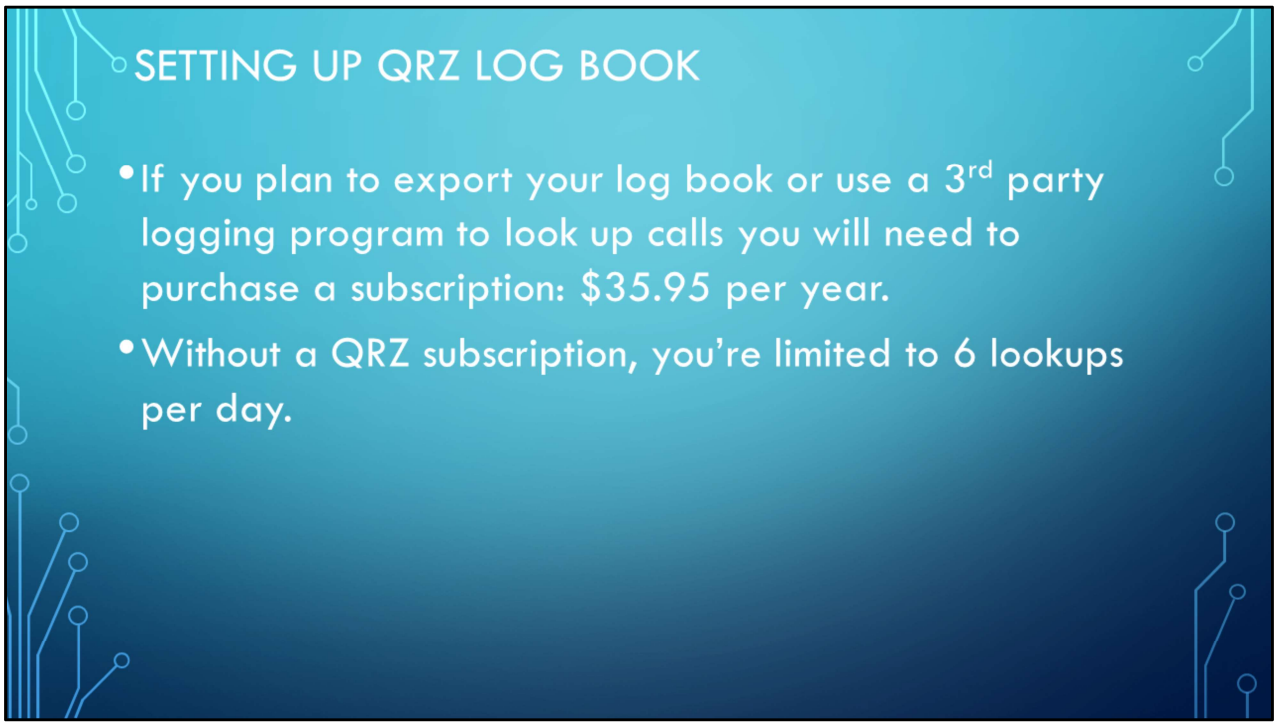
The biggest advantage to QRZ is that's it's very easy to set up. You can set up your first log book in only a few minutes using a fairly intuitive process. The biggest con is that the ARRL does not recognize QSO's confirmed only by QRZ. In short what that means is both sides of the QSO need to be uploaded into LoTW in order for the QSO to count toward any of the ARRL sanctioned awards. QRZ on the other hand does recognize LoTW confirmed QSO's. What that means if the QSO is confirmed by LoTW then QRZ recognizes it and the QSO can be counted toward any of the QRZ specific awards.



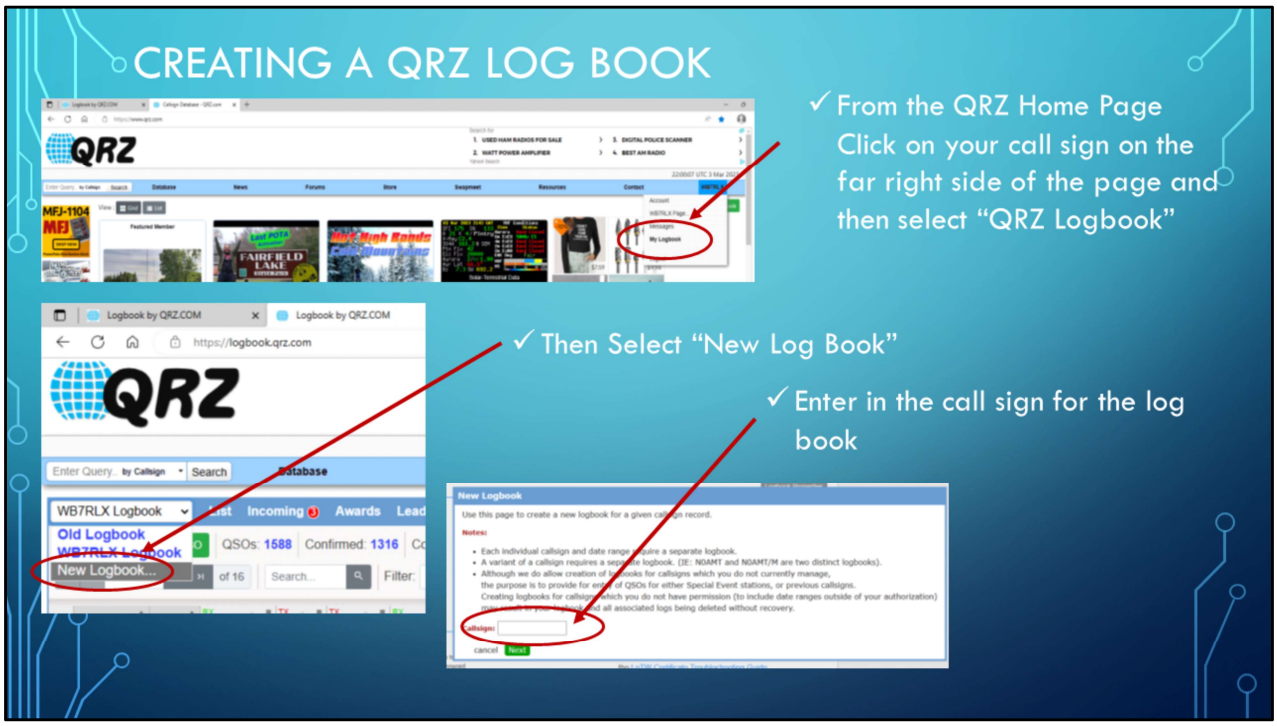
This is a screen print of my QRZ log book. Note the column with the gold stars and circles.



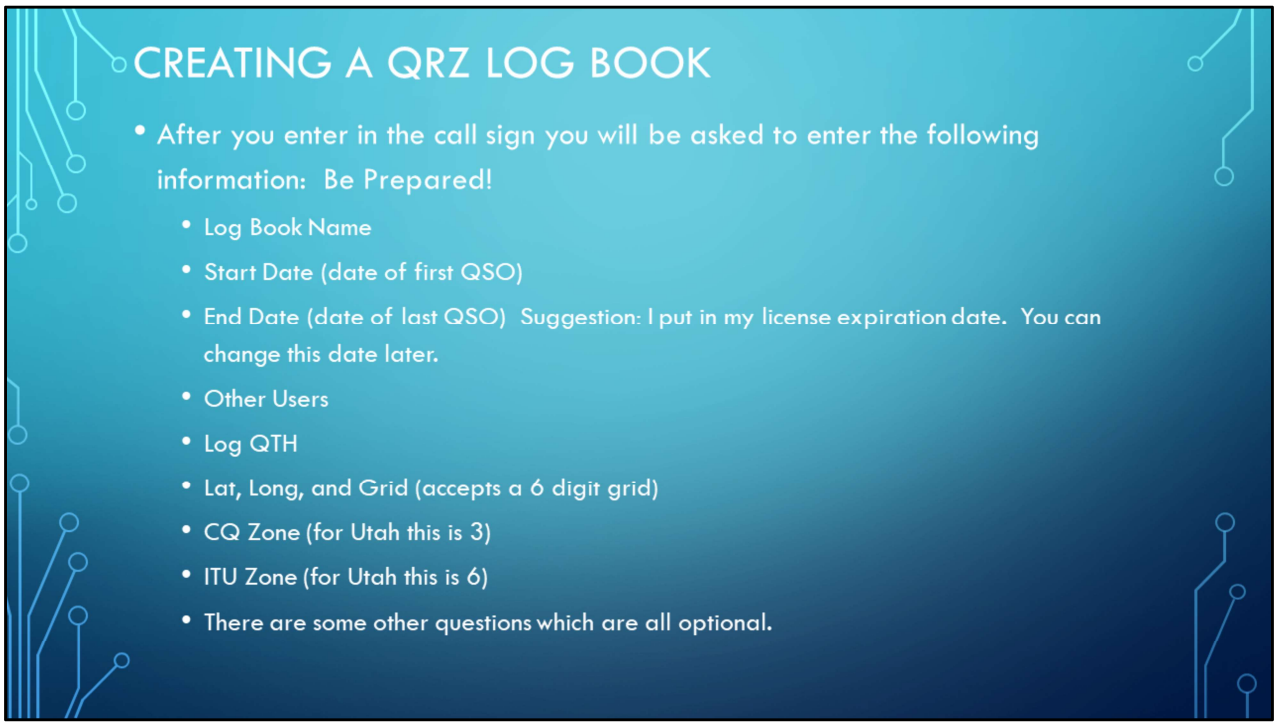
This is a screen dump of my QSO with MI0JZZ There's a lot of information here. Note that I can go to his QRZ profile page by simply clicking on his call sign. This is what I mean when I say QRZ offers a lot more functionality than LoTW and is one of the biggest reasons why I like QRZ. LoTW is a cloud based database with a fairly sophisticated QSO match algorithm. QRZ is that and much more.



However all that functionality is not free, at least not if you want to exploit QRZ full functionality.



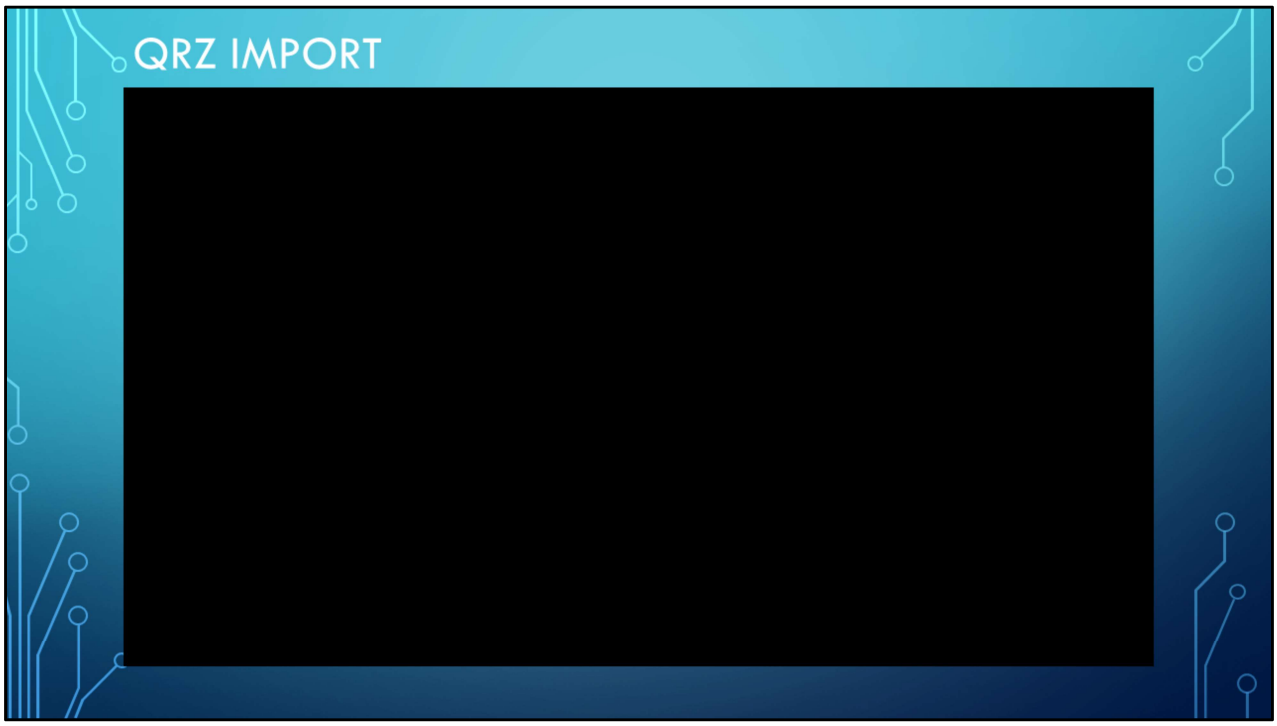
This slide shows you the step by step clicks for setting up you QRZ log page. However before you start the process there is certain information that you will need before you begin.



This is the minimum information you will need before proceeding to set up you QRZ log book. Let me talk specifically about the end date question. When I set up my QRZ log book I wanted to set up two logs. The first one was for my activities before I move into my current home. What I did was look up the date of my first and last QSO before I move to my current QTH. This became my Start date and end date for my first log book. I named that log book simply "Old" I then uploaded that log file which was in a ADIF format to QRZ. I never did bother to upload that log book to LoTW. Next I created my second log book and called it WB7RLX. For starting date I put the date of the first QSO I logged from this QTH. And for the end date I entered in the date my current license expires. Note that when I renewed my license I was able to very easily change the end date for my log book. It was very simple.

A suggestion regarding your lat/long for your Bio page. In the QRZ bio page if you leave the lat and long blank QRZ will default your lat and long to the center of your 4 digit grid. I would recommend that you get your actual lat and long and enter it in in your profile page and not let QRZ default it based on your 4 digit grid square.

A short comment on this slide. This is the process I used to get all of my old calls into QRZ. I used LogBook4OM and hand enter in the information from all of my old QSL cards. This process took me days spread over a period of about 3 months. Once I did that I exported the log file to an ADIF file and uploaded that file to QRZ. It was interesting to see that a small number of those QSO's from as far back as 1977 were confirmed even though they were dated back to June of 1977. There were even a few that were confirmed in LoTW.

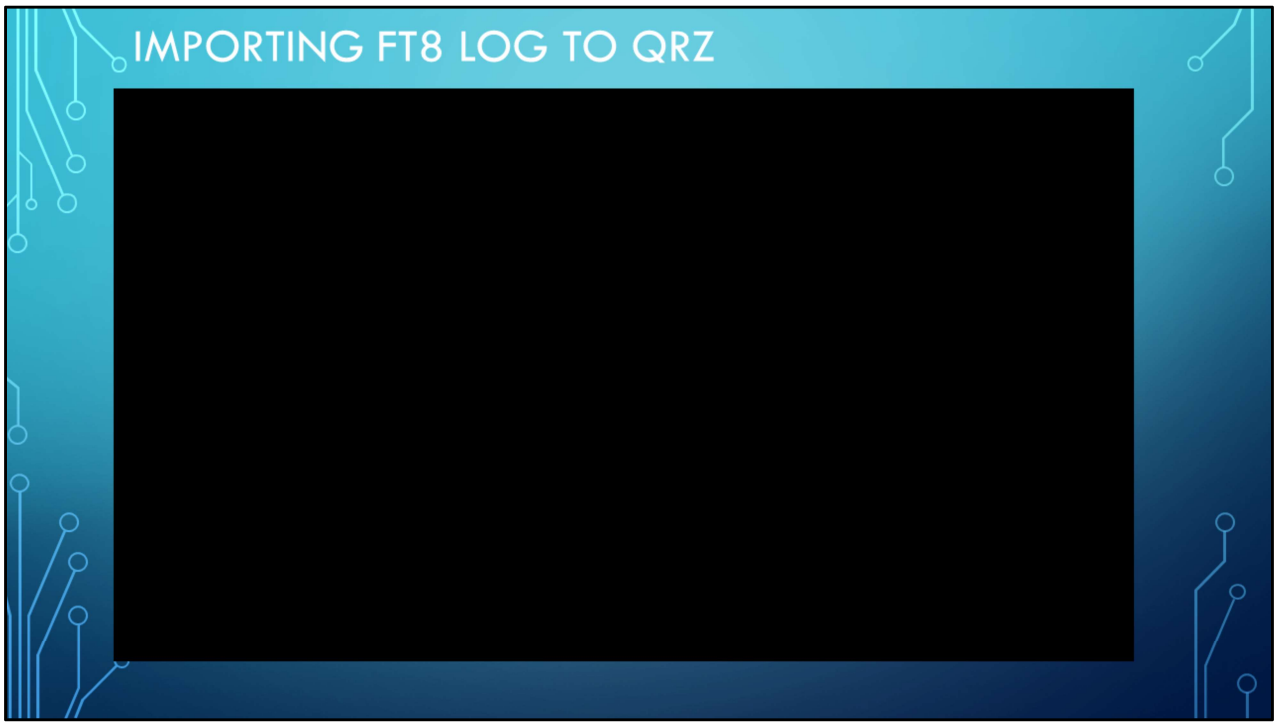


This video goes through the process of importing an ADIF file into QRZ. One of your questions will be, where did the ADIF file I uploaded to QRZ come from? In my case it was a file created by one of my programs. In this particular case it looks at my FT8 log and pulls out the new log entries and writes them to an ADIF file that I can then export into QRZ. In your case the export file could be one generated by a logging program or one of the programs you might be using, such as WSJT-X, CWTY, or MRP40. Understand that with most logging programs this process can be automatically done inside your logging program. I know Ham Radio Deluxe and LogBook4OM both have this capability. In a minute I'll demonstrate how to import your WSJT-X/FT8 log file into QRZ.

This video goes through the process of exporting your QRZ log book to your local hard drive. Why would you want to do this you might wonder? If your setting up a new logging program you might want to import your cloud based log book to your client based log book. Or maybe for backup purposes. Or maybe you want to write a custom utility that uses your log book. It should be noted that you can also do this with LoTW, it's just a different process.

If your are applying for one of the clubs awards such as 10 on 10 or 10 meter WAS you will need to export your log file. Once you have exported it you will receive an email from QRZ with a link to where you can download your exported log from. Just forward that email to me and I can take care of it from there. Please note your do not need to filter your log. I have written software that will do that for me and pull out all your 10 meter confirmed QSO and process them accordingly.

For LoTW you will need to send me your actual log file. If your log file is over 25MB you will need to either zip it or filter it. Most email systems limit attachment size to 25 MB but some email providers may vary.



This video goes through the process of importing my FT8 log into QRZ. Note that I wrote a small utility that can pull out new QSO's and write them to a separate file that can be uploaded to QRZ or LoTW. I will be happy to make this available to via the clubs web site. It's small enough that I could also email it to you.

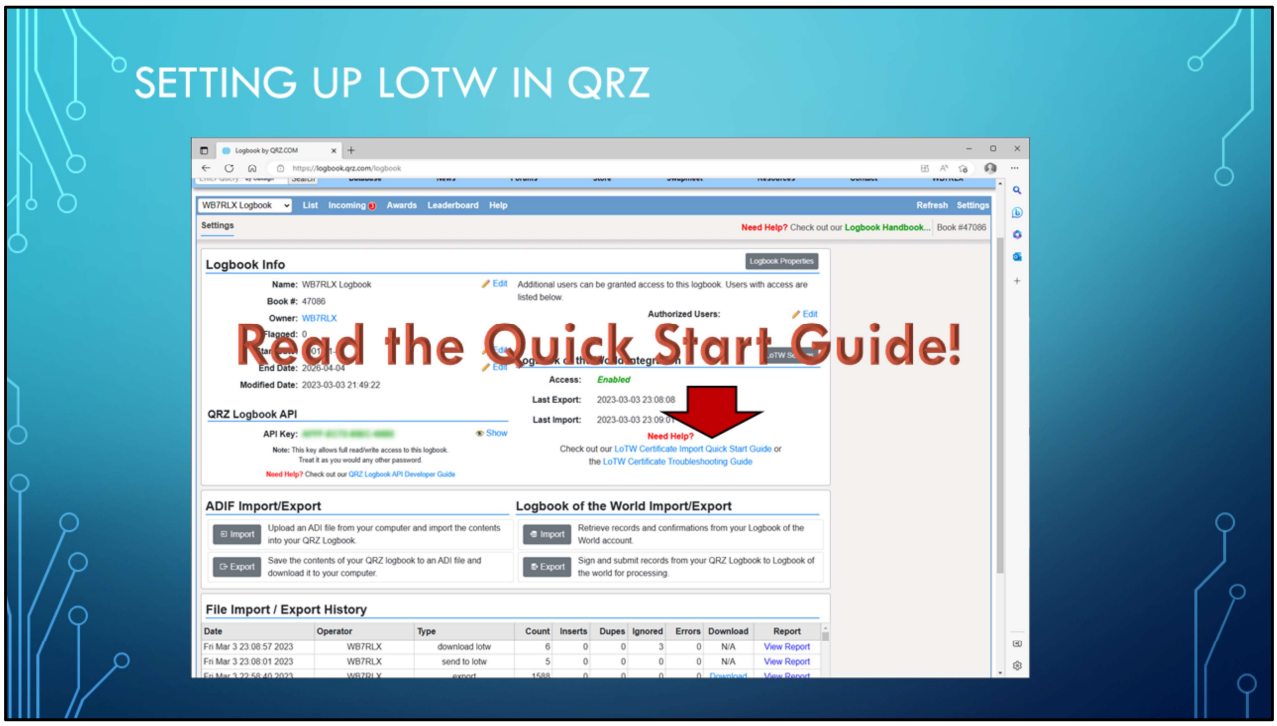
IMPORTING FT8 LOG TO QRZ

My FT8 Log is in:

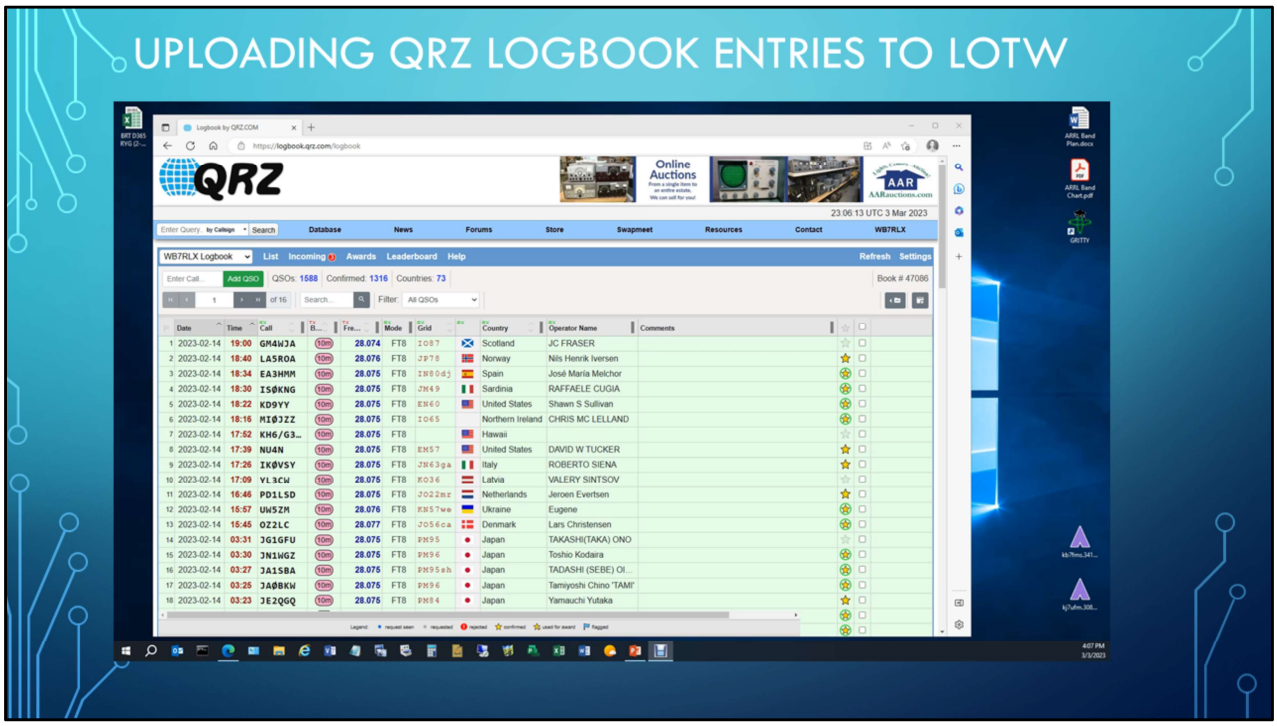
C:\users\eemorgan.000\AppData\Local\WSJT-X\wsjtx_log.adi

Yours will most likely be in the same place but instead of *eemorgan.000* it will be your login name:

C:\users*[your login name]*\AppData\Local\WSJT-X\wsjtx_log.adi

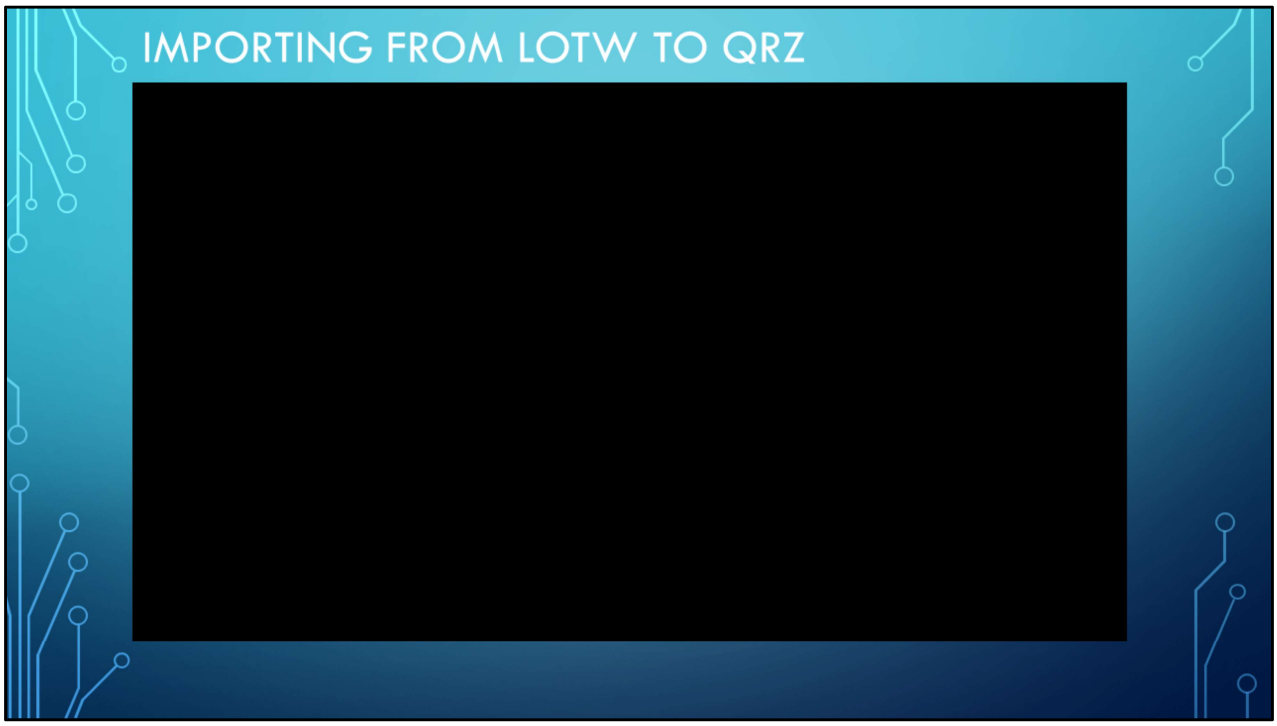


Setting up QRZ to be able to upload to LoTW is fairly straight forward. I strongly suggest you read the quick start guide. Once you have configure QRZ to upload to LoTW the process of uploading to LoTW is pretty simple. From your log book page select the QSO's you want uploaded, then click on "Action" and then click on "Send to LoTW". The next slide shows that process.



Step 1: Select the QSO's you want to upload to LoTW
Step 2: Click on "Action"
Step 3: Click on "Send to LoTW"

Your done. I usually do this after every operating session.



This video shows how to update your QRZ logbook from LoTW. I usually do this before every operating session. But to be honest you don't have to do it that often. But you should sync them up once it a while especially if your are actively chasing awards.

Step 1: From your look book click on setting
Step 2: Click on "Import"
Step 3: Enter in your LoTW account login password
Step 4: Make sure that "Import new and/or updated records" is enabled
Step 5: Click on "Import from LoTW
Step 6: Select "Close Window"

This brings us to the end of the presentation. It‘s your turn to ask questions.