

## Integrating Logbook of the World with Logging Applications

The ARRL's Logbook of the World (LoTW) is an online service that enables Radio Amateurs to confirm their two-way contacts, and submit these confirmations for credit toward various awards. Each QSO submitted to LoTW must specify the location from which it was made, and must be included in a log file that is digitally signed with a Callsign Certificate issued by the ARRL. LoTW provides web services that accept digitally-signed files, report the acceptance of submitted QSOs, and report the confirmation of submitted QSOs.

Developers interested in integrating their applications with LoTW are encouraged to join the LoTW Development Mailing List via [lotw-devel@reflector.arrl.org](mailto:lotw-devel@reflector.arrl.org)

### Submitting QSOs to LoTW

TrustedQSL is an open source C++ library that includes functions for managing Callsign Certificates and Station Locations, digitally signing ADIF and Cabrillo files, and uploading files via the internet to LoTW. TrustedQSL is [hosted on SourceForge](#); the documentation for this library is available [here](#).

TQSLCert and TQSL are open source C++ applications built using TrustedQSL. TQSLCert enables a user to manage Callsign Certificates. TQSL enables a user to manage Station Locations, detect QSOs that have already been uploaded to LoTW and haven't subsequently changed, digitally sign ADIF and Cabrillo files, and upload signed files to LoTW via the internet. TQSL's functionality is also accessible via a command line interface, which is documented [here](#).

If you'd like to participate in the development of TrustedQSL and its applications, join the Trusted QSL Development Group via [TrustedQSLDevel@yahoogroups.com](mailto:TrustedQSLDevel@yahoogroups.com)

A logging application that aspires to manage Callsign Certificates and Station Locations on behalf of its user would do so by invoking functions provided in TrustedQSL. A logging application that only intends to automate the uploading of logged QSOs to LoTW can do so by invoking TrustedQSL functions, or by invoking TQSL via its command line interface.

TrustedQSL provides facilities for detecting *duplicate* QSOs, which are defined as QSOs

- that have already been submitted to LoTW from the computer on which TrustedQSL is hosted, and
- whose Callsign, Band, Mode, Propagation Mode, and Satellite fields have not been subsequently modified, and
- were submitted with a Station Location whose fields have not been subsequently modified

When directed to digitally sign a log file, switch options in TQSL's command line interface enable the invoking logging application to specify whether the presence of one or more duplicate QSOs in that log file should abort the signing operation, only sign QSOs that aren't duplicates, or sign all QSOs including duplicates. To prevent the LoTW Server from having to process duplicate QSOs, developers of logging applications are encouraged to exploit the duplicate QSO detection and removal facilities provided in TrustedQSL and by TQSL's command line interface. Duplicate QSOs should only be re-submitted if the user concludes those QSOs never reached LoTW when originally submitted, or were subsequently lost. Note that any digitally-signed log file generated by TrustedQSL that contains one or more duplicate QSOs will be recognized by the LoTW Server as containing duplicate QSOs.

LoTW provides a web service at <https://p1k.arrl.org/lotwuser/upload> that will accept a digitally-signed log file using the [RFC1867](#) protocol. This service returns HTML containing two comments that describe the results of an upload operation:

```
<!-- .UPL. result -->
where result will be either accepted or rejected.
```

```
<!-- .UPLMESSAGE. text -->
where text is a possibly multiline text message that can be displayed to the user if desired.
```

## Querying LoTW for Acceptance and Confirmation of Submitted QSOs

LoTW provides a web service at <https://p1k.arrl.org/lotwuser/lotwreport adi> that accepts [RESTful](#) queries that report QSOs satisfying specified criteria:

- accepted by LoTW after a specified date
- confirmed by LoTW after a specified date
- with a specified callsign
- with an operator in a specified DXCC entity
- in a specified mode
- on a specified band
- at a specified date and time
- using a specified station callsign

The service returns records in ADIF format. Documentation of query parameters and ADIF fields is provided [here](#).

This web service enables a logging application to update logged QSOs to reflect their status in LoTW:

- submitted, but not accepted
- accepted, but not confirmed
- confirmed