Introduction: In CQ/X there are a number of different ways to use a GPS and a number of different levels of route information detail that can be utilized if the user decides to supply the information. The purpose of this document is to provide a brief description of these options including the planning tasks required and the advantages and disadvantages of each. The options divide along the following lines:

GPS Options:
- Do not use a GPS
- Use a GPS

Level of Route Information Detail Provided by User:
- No information on the planned route
- Planned route as a sequence of counties
- Planned route as a sequence of county line (C/L) crossings*
- Planned route as a sequence of C/L crossings and defined way points*

Note that the information in the starred items is only useful if a GPS is in use. For the most part the options will be discussed in the order of increasing amount of planning work required to implement the option.

Option 0: No Route Information, No GPS
In this option it is the responsibility of the user to tell CQ/X in which county the operation is taking place and to change the county as the trip progresses. To do this the user types a #-sign into the QSO Entry window and selects the county from the resulting dialog. Once the county is selected all county-dependent messages are automatically changed as is the logged county and any duping parameters. These messages, the logged county, and the duping parameters remain in effect until the user makes a new county selection. As far as CQ/X is concerned no work is required of the user prior to the start of the contest.

Option 1: Planned Route Included as a Sequence of Counties, No GPS
In this option it is again the responsibility of the user to tell CQ/X in which county the operation is taking place and to change the county as the trip progresses, but the selection beforehand of the planned sequence of counties serves to make the county changeover somewhat more efficient. The pre-contest selection of the county sequence is performed using menu item **QP Tools | Plan Route as a Simple Sequence** which activates a dialog wherein a county is selected, and the next county is selected from a combo box that shows all the counties adjacent to the previously selected county, etc. This process is repeated as necessary until all of the counties on the planned route have been specified including counties each time they are to be encountered on the planned route. During operation the user changes the county by performing the key strokes Alt+Q (to get to the QP Tools menu) and then using the cursor (up/down arrow) keys to reach the Manually Change County menu and Enter (twice) to activate the Next County menu item. At this point all county-dependent messages are automatically changed as is the logged county and the duping parameters. Similar key strokes can be used to move backward through the sequence. If for some reason a county outside of the planned sequence needs to be chosen the user can do so using the #-sign approach described in Option 0. These messages, the logged county, and the duping parameters remain in effect until the user makes a new county selection. In this option the only pre-contest work required of the user is the specification of the

county sequence using the **QP Tools | Plan Route as a Simple Sequence** dialog. Once chosen, the sequence will be retained across a program restart specification so the sequence only has to be developed once.

Option 2: GPS, No Route Information
This is similar to Option 0 except that the responsibility for informing CQ/X in which county the operation is taking place and to change the county as the trip progresses is delegated to the GPS processing logic within CQ/X. This logic reads the latitude and longitude from the GPS and determines in which county the vehicle is currently located. When a new county is detected all county-dependent messages are automatically changed by the CQ/X logic as is the logged county and any duping parameters. The ability to override the automatic county detection using the #-sign approach described in Option 1 is still present should it be necessary to do so. It it is necessary to override automatic detection, it is the responsibility of the user to re-enable automatic detection. Beyond procuring a GPS and interfacing it to CQ/X this option requires no pre-contest work on the part of the user.

Option 3: GPS, Planned Route as a Sequence of C/L Crossings
In this option the automatic detection of the current county, as in Option 2, remains in effect. The additional route information supplied by the user, describing where county lines are to be crossed and the order in which these crossings are planned to occur, allows CQ/X to keep the user informed of the name of the next county, the driving distance to the next county, and an estimate of the time required to reach it based on current speed. In order to supply the required route information the user designs the route using Google Maps. Details concerning how to do this are provided in

 http://www.no5w.com/Documents/DevelopingCrossingFileUsingGoogleMap.pdf

CQ/X can then be used prior to (or at) start up to determine the latitude and longitude of each crossing and the sequence in which the crossings will occur. This process uses Google Maps to obtain a file containing the sequence of latitudes and longitudes that describe the route. In order to obtain this file from Google Maps it is, of course, necessary to have internet connectivity but once the file is obtained there is no longer this requirement, unless of course it is desired to modify the route. The additional information concerning distance and time to next county can be useful in determining whether it might be necessary to stop or slow down in order to work down the pileup or perhaps speed up because the pile up has dissipated. Also when working a station and noting that the next county is only a few minutes away it can be useful to inform the station of that fact so that he will be waiting when you cross into the new county. This option also allows CQ/X to provide the user with information about how long he has been in the current county and the amount of time remaining before the next county, which might be useful in deciding whether to change bands and/or modes.

Option 4: GPS, Planned Route as a Sequence of C/L Crossings, Defined Way points
This option requires the most work on the part of the user but at the same time provides the most information during operation. In this option the automatic detection of the current county, as in the previous options, remains in effect as does the presentation of distance and estimated time to next county. The additional information supplied by the user is a file of latitude and longitude values describing the location of certain important way points along the route. The way points can be anything that the user considers important but probably the most useful is to

define the points where there are turns or changes in the highway. Once the data for the latitude and longitude along with a descriptor for the way point are defined in either a text file or a GPX file the information can be imported into CQ/X using the menu item GPS | Define Way points and the resulting dialog. If the user has a version of Streets & Trips these way points can be identified as stops on the route and the name of the stop changed to a unique label for the way point (e.g. LT-US19-FL40E meaning left turn from US19 to FL40E). Once all the way points have been defined in Streets & Trips the data can be exported from S&T and imported into CQ/X. In operation the user can activate the Multi-way point tracker in CQ/X in order to have CQ/X present distance to upcoming turns and highway changes. With a proper description attached to each turn the operator can easily inform the driver of how far it is to the next turn and what the turn involves. The Multi-way point tracker automatically determines distance to each way point and can be configured to present the next closest N way points or the next closest way points that are within a user-specified driving distance of the current location. This can be of considerable assistance in keeping on the desired route. Defining the way points in S&T is a simple matter once the route is finalized. Simply go into the Directions panel in S&T, and then click on a highway change which will place a small mark on the S&T map. Place a pushpin at the mark and give it a descriptor that indicates the action to be taken (e.g. LT-US19-FL40E). Repeat this for each highway change. Once you are done use the S&T menu item Data | Export to GPX File. Then use the CQ/X menu item GPS | Define Way points to import those way points into CQ/X. Finally review the way points for any extraneous values and remove them.

If a version of S&T is not available the user can use the county overlays available on www.no5w.com to perform essentially the same type of operation as described above except that it will involve creating a text file of the descriptors of the important way points and then using the county overlays to pick off the lat/lon of each way point and copying the lat/lon at each way point into the text file.

In summary there are five options for using a GPS and route information in CQ/X. In terms of the amount of pre-contest work required Option 0 is the simplest followed by Option 2, then Option 1. Option 3 requires familiarity with the use of Google Maps. Option 4 requires either placing a pushpin at each of the way points in S&T and then exporting to a GPX file and importing the way points into CQ/X or using the county overlays on the CQ/X website to prepare a text file of way points for import into CQ/X. None of these options requires manual entry of latitude and longitude data.