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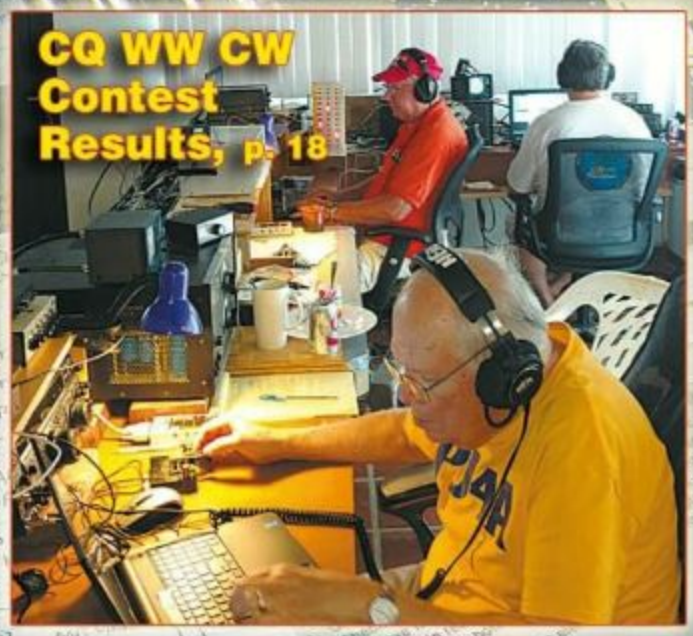

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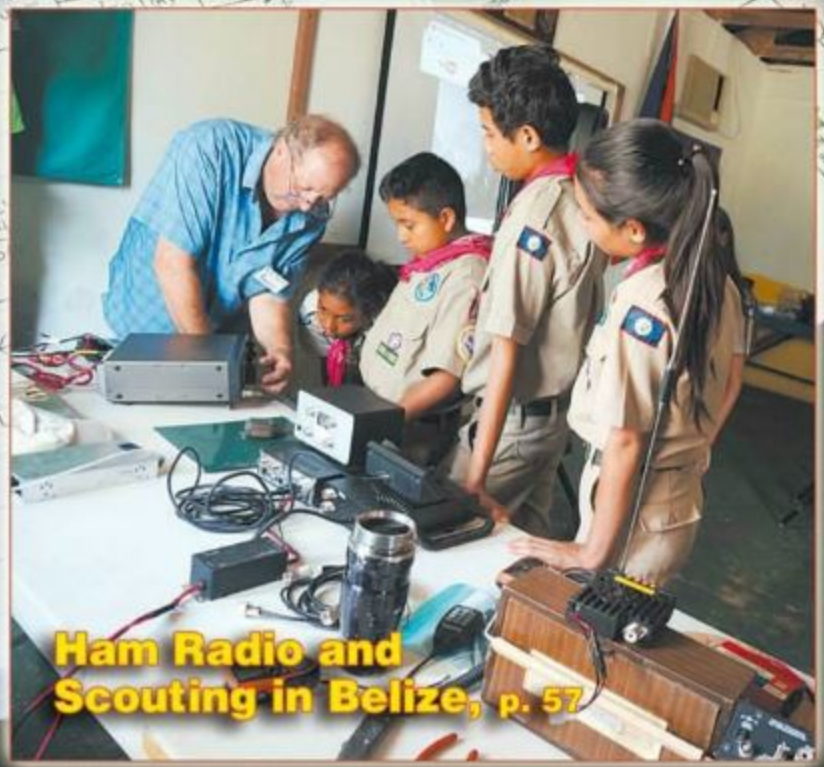

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On the Cover: Some of "Ham Notebook" editor KH6WZ's ham notebooks. Insets: (upper) PJ4A on the air during the 2016 CQ WW CW contest; (lower) Scouts in Belize learn about ham radio.

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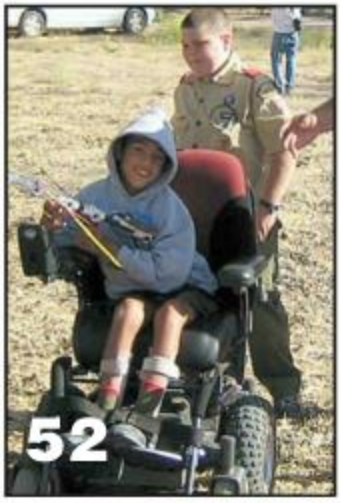
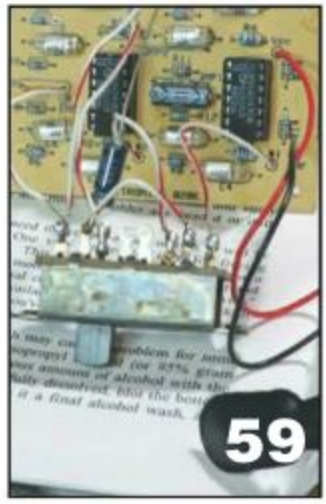




On the Cover: The wide world of amateur radio…PJ4A in Bonaire during the CW weekend of the 2016 CQ World Wide DX Contest (upper inset); Scouts in Belize get an introduction to ham radio (lower inset); both over a backdrop of a sampling of "Ham Notebook" editor KH6WZ's ham notebooks. (Main cover photo by Wayne Yoshida, KH6WZ; Inset photos courtesy of PJ4A and the Belize Amateur Radio Club)

FEATURES

COLUMNS

DEPARTMENTS

Remote operation of Internet-connected amateur stations is one of the fastest-growing areas of ham radio today. But the authors caution that it's important to know, understand, and observe both national and international regulations relating to who may operate a remote station.

Remote Radios and the Law

What You Need to Know as a Remote Station Owner and Operator

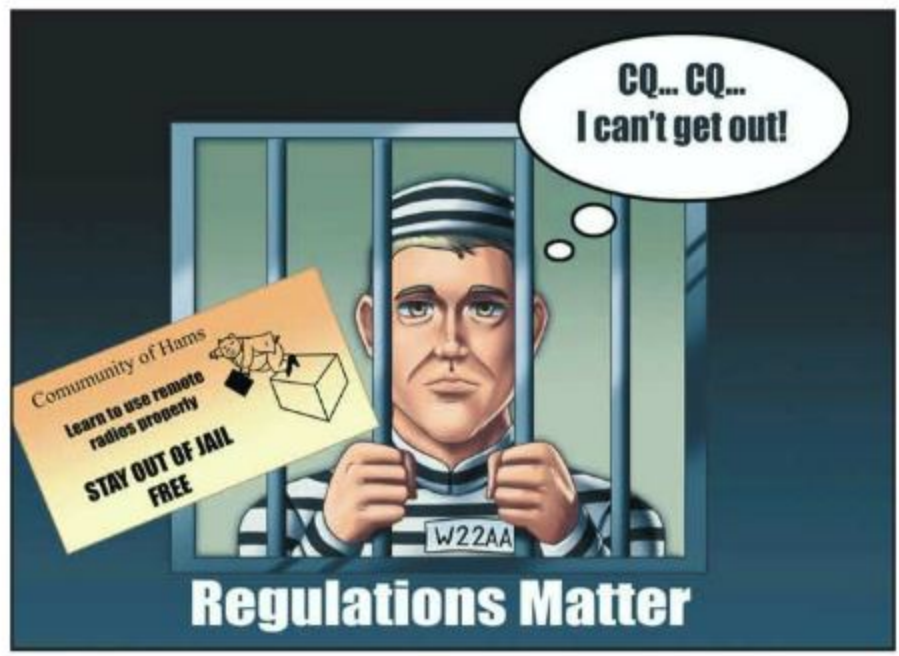
BY JIM MILLNER*, WB2REM AND GENE HINKLE#, K5PA

What if a DXpedition to North Korea (P5) was just announced and it was the last country you needed for DXCC Honor Roll but, unfortunately, you already had a business trip scheduled?

What if you can't get enough of amateur radio at home and want to operate on an excursion to the supermarket, a walk around the neighborhood, or even in an airplane?

It is easy today to connect via the internet to remote radios located all over the world. In some cases, you can transmit and receive on the ham bands.

Remotely-accessed ham radios pose an interesting dilemma for their operators since regulations always seem to lag the evolving technology. Computer and communication technologies have been rapidly changing and the laws that regulate them are always playing catch-up.



Easy Connections Leverage Today's Technology

Remote radio operation is definitely fun and exciting, which explains its rapid growth. The explosion of internet-connected devices has led to a revolution in how amateur radios are being accessed today. The technology we have embraced, like our cell phones, computers, and tablets, has fueled the ability to easily connect to our radio systems from outside our ham shacks. Ironically, it was once predicted these same developments would lead to the downfall of ham radio. Radio manufacturers have also been keeping pace with this technology by designing better remote-capable transceivers. Where built-in remote capabilities have been the exception in the past, the tide now seems to be changing.

One of the cool HF mobile applications is working other hams without any amateur radio gear (including the radio, amplifier, or antenna) in the car with you. How is this possible? It is achieved by using the power of an internet-connected device, such as an Android cell phone or tablet computer, to run an application linking the device to a home station. As long as you have an internet connection during your journey, contacts can be made worldwide. Imagine using a remote radio that has performance just like a home station while driving down the highway, riding a bicycle, or hiking in the woods. This would make working DX stations or participating in a net easy and fun.

Today's connected hardware and software provide a capability to allow immediate connectivity to remote radios worldwide. This is accomplished with a computer connected to the internet, client software, and radio/antenna. Once a software client is running, it is not too difficult to set up a local transceiver that can be used in the shack or remotely by anyone with internet access. Fortunately, the software keeps the remote system secure and accessible by only those granted permission. The question arises, however, concerning who is actually in control of the radio, who should be granted access, and whether it is within the regulatory structure of the nations concerned.

Figure 1 shows an example of internet and radio connectivity across the globe connecting North and South America, Africa, and Australia. The example shows that the remote station is in Africa with a hiker in Brazil connecting via his smartphone running a

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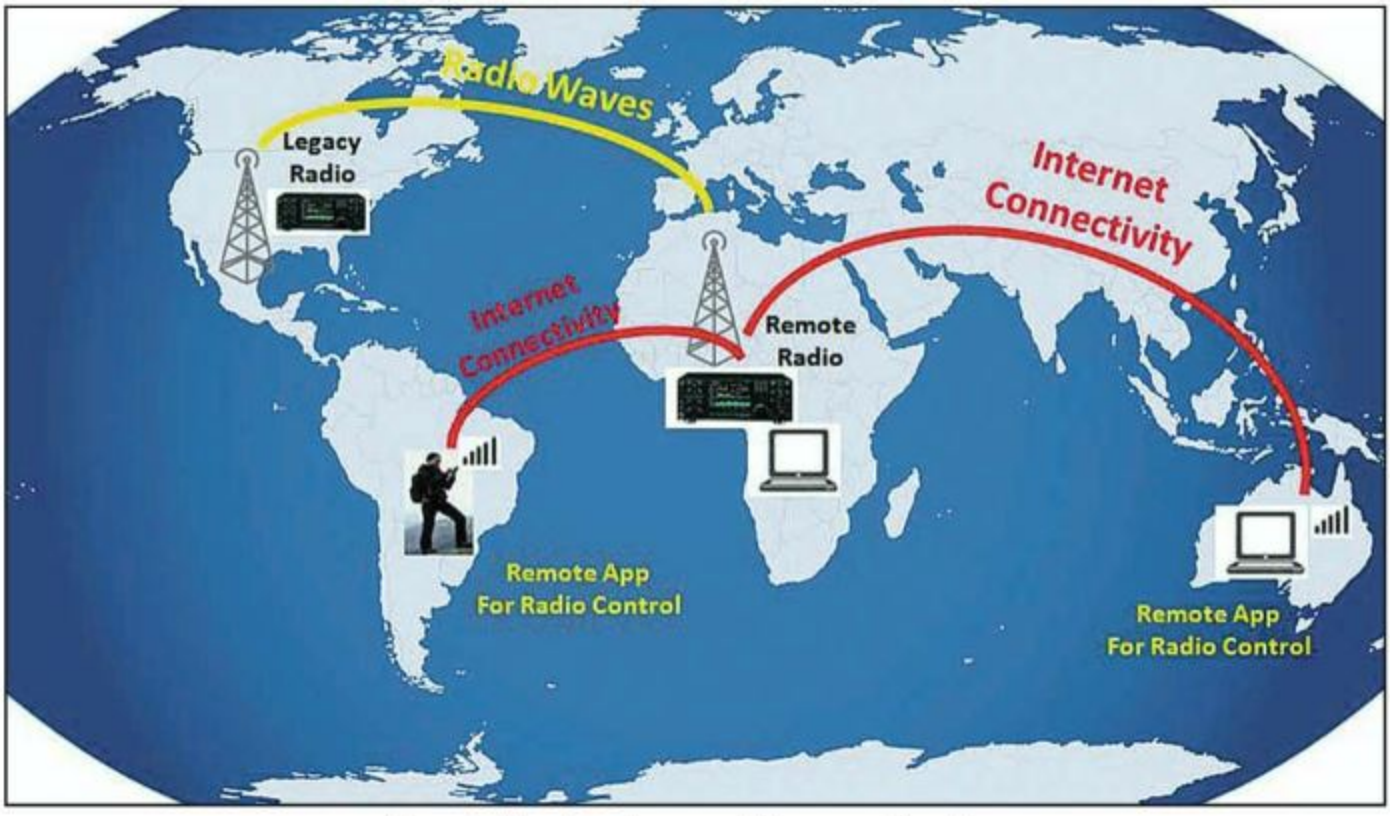

Figure 1. Remote radio connectivity across the globe.

remote radio Android app. The Australian amateur is using a computer in his home to connect remotely to the same African remote radio while the U.S. amateur is using traditional radio connectivity via the ionosphere. This might seem like a far-fetched example but I have participated in early morning nets with this type of connectivity between Australia, U.S., the Netherlands, and a mobile radio operator on a U.S. highway.

We have given a lot of thought to the regulatory aspect of these type of connections. Do all amateurs participating have the proper authority to connect and control the remote transmitter? Do all amateurs hold the proper license? Good questions to consider when setting up and running a remote radio.

Regulations Matter

While doing research on remote radio operation, it was difficult to understand the regulatory basis for operating remote radios internationally.

There are many different combinations for citizens of different countries using each other's remote stations. For example, an operator using a remote radio could be a monitor on the radio channel (transmit not allowed), a participant as a third party where there is a control operator at the transmitter, or the control operator. In addition, the person operating from afar could be a licensed or unlicensed radio operator and a citizen or noncitizen of the country where the transmitter is located. It is easy to see how the regulations have not caught up with today's technology.

To further complicate things, each country has its own regulatory commissions that may or may not participate in the International Telecommunication Union (ITU). In the U.S., we have the Federal Communications Commission (FCC), but each country has its own regulatory body.

Figure 2 shows the world-wide organizations that are the enablers for the regulations that govern amateur radio. The members of the United Nations (UN) have established the International Telecommunication Union (ITU) to govern radio regulations. This is imperative because radio waves are not bound by borders and all countries need to adhere to a plan to manage the radio spectrum. Every few years, the ITU holds a World Radiocommunication Conference (WRC) that helps manage changes deemed necessary. Study Groups meet to work out these recommendations. There is also an organization called the International Radio Union (IARU) that binds together its member countries to represent the interests of amateur radio operators in these countries. The IARU has divided the world into three regions as shown in the figure. The IARU also provides input to the WRC with respect to proposed or requested changes in international radio regulations. Member nations have their own national governments that establish laws surrounding radio usage. Once the WRC has made its decisions, it is then up to each national regulatory agency to decide whether, when, and how to implement any changes. At this writing, for example, the FCC still has not enacted final rules to add changes made at WRC-12 into U.S. regulations.

It is rather obvious from the structure shown that, with all these different organizations, it takes a long time to keep the regulations up-to-date with rapidly changing technology. A new technology might take several years to emerge in the marketplace, whereas these organizations might take a decade or longer to bring regulations in line with how the technology is being used. This is where we are in 2017 with internet-connected radio and the current regulations governing them from various countries. It is no wonder that we amateurs try to force-fit current regulations to permit remote radio operation.

The Rules in the United States

In the U.S., the legality of remote-control linking was first

addressed in WB2REM's January 1995 QST article, "The WB2 'REMote' Link"[1]. At that time, the FCC had established that linking had to be controlled through a separate control frequency on 222.15 MHz or above, or with a dedicated telephone line. Since then, remote links have been primarily controlled through the internet. The internet essentially provides a connection between the operator of the link and the radio being controlled. It is as if the operator is using a long microphone extension cable. This has made it easier to follow FCC rules and has exponentially increased the number of remote links available.

Usually the station licensee (amateur radio operator to whom the station is licensed) and control operator (person operating the station) are the same person. However, in the case of remote control linking, the control operator may be using a station in some other part of the country or the world.

The question arises as to who is responsible for the operation of the link. The FCC indicates that both the control operator and station licensee share responsibility. If a remote control operator is granted permission to use a link, adherence to the operating privileges of his/her license is required. (This means that a General Class operator controlling the station of an Extra Class licensee is still bound by the limitations of the General Class license.) In addition, specific reciprocal operating privileges between countries must be followed.

An interesting aspect of remote operating is allowing amateurs from foreign countries to operate the remote station. The regulatory basis for this is in its early phase and therefore amateurs are searching for the legal basis to operate this way. A common reference is made to the European Conference of Postal and Telecommunications Administrations (CEPT) reciprocal licensing agreement[2]. This is referred to as a "multilateral agreement" since many nations are parties to it.

According to the IARU, the CEPT agreements are intended to allow foreign operators who physically visit a country to operate there temporarily. Clarification was made by the IARU that this does not pertain to remote operations[3,4]. This has also been clarified in the errata notes for the book, Remote Operating for Amateur Radio[5,6]. However, in the U.S., specific FCC regulations allow such operation as long as there are valid bilateral agreements in place[7]. This means specific agreements between the United States and one other country, such as Canada.

In a similar manner, other bilateral reciprocal operating privilege countries would have to have their rules followed explicitly. In the case of U.S. operations, if an FCC license has not been granted or a country does not have a reciprocal agreement, the station licensee could allow another person to operate remotely only if the station licensee/control operator is present in the shack or at a remote location controlling the station. This would be similar to having a non-ham sitting in the shack and allowing them to speak through a microphone held by the control operator.

There is a possible downfall to amateurs operating links remotely from countries where bilateral operating privileges have not been obtained or there are no agreements at all. They will be forbidden by FCC regulations from talking to countries with which the U.S. does not have third-party agreements. One exception to this rule is if the remote control operator possesses a valid license from the country (e.g., U.S.) in which the link is located. In this case, he can operate the U.S. located remote link from anywhere in the world but must only use his FCC assigned callsign. Stations outside of the

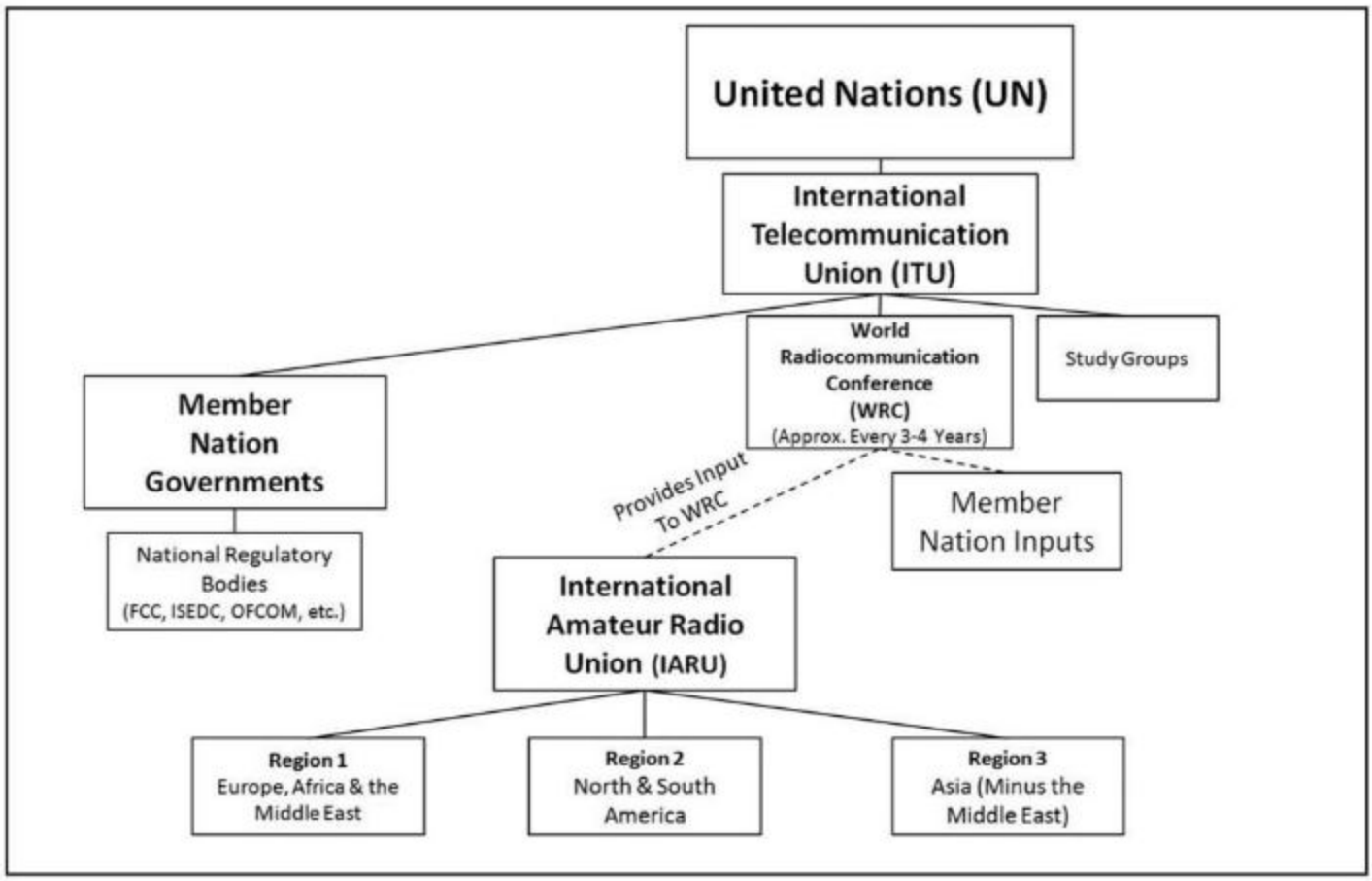

Figure 2. Simplified diagram of the ITU, member nations, and IARU organizations.

U.S. wishing to set up remote control links should investigate specific requirements pertinent to their country's rules and regulations before setting up a link.

Summary

Remote radio linking and operation is here to stay. It has become very popular as observed during QSOs on the HF bands. However, it is important to understand what the regulations are within your country if you are considering setting up or using a remote radio. Ask yourself who the operators will be, where and how they are licensed, whether they will have full control, and whether their countries allow direct control based on their licenses or if they need to be a third party with you acting as the control operator. Eventually, we expect the regulations will directly address remote linking and operation since it is so prevalent today. Until then, learn as much as you can about your license structure that permits this type of operation.

In the U.S., the FCC establishes the rules under Part 97-Amateur Radio Service[7] that must be followed related to remote operation. The rules require that the control link be secure and have the capability for the remote transmitter to be shut down in the case of erroneous operation. The FCC-licensed control operator is the operator using the remote and must be licensed to operate the transmitter independently within the limitations of his or her license privileges (§s 97.103, 97.105 & 97.109).

The FCC licensed control operator may be a non-US citizen as long as he/she is licensed by the FCC (§97.107). Also, the location of the control operator can be anywhere in the world as long as control is maintained. Foreign-licensed amateur radio operators may use a remote link if there are reciprocal agreements between the U.S. and their country (§97.115). Otherwise, foreign users are essentially third parties and the local FCC-licensed operator is the control operator. The control operator is responsible for who is using the link. All third-party agreements must be followed to stay within international laws.

In countries other than the U.S., the local regulatory agency (such as ISEDC, OFCOM, etc.) must be consulted to determine if they have reciprocal agreements with the country where the remote transmitter is located, who can control a remote transmitter and any aspects of a third party participating in transmissions. National radio organizations within each country can also be consulted to determine references to the appropriate regulations governing remote radio operations.

Notes:

1. Millner, James, WB2REM, "The WB2 'REMote' Link," QST, Jan 1995, pp 29-34.
2. <http://www.arrl.org/cept>
3. <http://bit.ly/2nGpNl3>
4. Remote Operation under CEPT T/R 61-01, IARU Region 1, 2011 Regional Conference, August 12-19.
5. Ford, Steve, WB2IMY, Remote Operating for Amateur Radio, First Edition, ARRL, Newington, CT, 2010. (Please see first edition errata shown below)
6. http://www.arrl.org/product-notes for Remote Operating for Amateur Radio (errata info)
7. FCC Rules, Part 97 - Amateur Radio Service, <http://bit.ly/1g2RUxS>