



## Academy of Model Aeronautics

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The Chartered Club program has protection for club frequency operations providing the below impound standard is being followed by the club.

### The AMA Radio Impound Standard

An important aspect of maintaining proper frequency control at a radio-control event is the operation of a radio impound. An impound by definition is a place to hold, store, or take possession of items. This is exactly what we want to do with a radio impound. We want to hold transmitters that are not in use. This helps us ensure that transmitters not checked out and assigned to the frequency-control system will not inadvertently be turned on and potentially cause an accident. An impound is also very useful for the day-to-day operation of a club's flying site. A typical impound for day-to-day operation would not be staffed.

There are a couple of important elements to a radio impound; these are:

- A. Secure area
- B. Frequency monitoring
- C. Frequency control
- D. Location

Let's take a look at each of these elements separately:

**A. Secure area:** The best impounds are housed in some sort of structure or trailer. This allows you to keep expensive transmitters in a fashion that greatly reduces the chance they will be damaged by weather, unauthorized people, and most other outside elements. One big advantage to utilizing a metal-skinned trailer is that if a transmitter is accidentally left turned on in the impound, the metal skin of the trailer will often attenuate the transmitter's signal to the point that it may not cause an interference problem; this is far from a sure thing, however. The secure area should be configured in such a way that only the people staffing the impound can gain access to transmitters, they (the transmitters) are protected from weather (including sun), the shelves or tables holding the transmitters should be stable so that an inadvertent bump would not cause a transmitter to fall, and so that the impound staff has quick and ready access to all transmitters in the impound. It is also a good idea to have a place to impound transmitter modules. Impounding the modules only can save a significant amount of space in the impound.

**B. Frequency monitoring:** Whenever possible, it is imperative to have frequency-monitoring equipment in the impound. There are several scanner-type units available to us to do this. If utilizing a scanner, it is important that the unit be able to operate in the FMN (FM Narrow) mode, and of course be able to scan the 72 MHz band. FMN puts the unit in a mode that best replicates what our radio-control receivers are capable of. If the scanner is not capable of FMN operation, it will be looking at too large a "slice of the pie." In other words, it will give an indication that you had interference on a particular channel when in fact you do not. This is similar to the difference between old wide-band RC receivers and our current narrow-band receivers. We will talk about the actual implementation of a frequency monitor later in this document.

**C. Frequency control:** Frequency control is perhaps the most critical part of impound operation. A system must be utilized that assures only one transmitter on a particular frequency can be issued at a time. One of the simplest methods is a pin system. A clothespin or similar device has the channel number affixed to it. A board with a corresponding channel number on it is kept in the impound with the pin clipped to it. With the advent of 2.4 GHz systems, it is recommended that the clipboard have pins available for the 2.4 systems also so all active radios have a pin, eliminating confusion. When someone desires to use a channel he/she checks the board and removes the pin with his/her channel number on it. If

the pin is not there, it is already in use. Another method is a board in which you would insert your membership card. Slots are affixed to the board with each channel number on it. An advantage to this method is that no pins can be lost and you always know who is on what channel.

**D. Location:** The impound should be centrally located to the flightline whenever possible. You want it to be quickly accessible to the pilots utilizing it. It is also important that it not be in an area that anyone who should not be in the impound can easily get into. At a large event it is also important to have enough space so that you can do a separate check-in, check-out area.

**Impound operation:** An impound is a fairly simple thing to operate; however, it is vital to do it properly. All transmitters or modules should be placed in the impound as soon as they can be upon participants' arrival at the flying site. For an event, it is recommended that no flying take place until all transmitters or modules are secured in the impound. It is recommended that you number each transmitter and module so that it is placed in the impound in the same spot each time. There are two schools of thought on this. One is to simply group by frequency and then a unique number. So, if your transmitter is on channel 55 and it was the 10th one to be checked in, it would be numbered 55-10. The other is to use numbers that correspond to pilot numbers. As each pilot is registered or transmitter checked in, he/she and the transmitter are assigned a number. If a pilot has more than one transmitter and/or module, they are given a letter designation. If you are pilot 201 and you have three transmitters/modules, they would be numbered 201-a, 201-b, and 201-c. Both systems have their advantages. In the first example, the main advantage is that you have all transmitters on a like frequency grouped together. That way if there is a problem and you need to check all transmitters on channel 55, you can go right to that location. This method does make a busy impound harder to run because it takes a bit more time to find a particular radio. In the second example, your shelves can be numbered in advance and it is very easy to find each transmitter. I'd recommend that modules be numbered in the same way, but kept in a separate location from the transmitters. This also makes it easier in a busy impound since you can go straight to the particular transmitter or module instead of the particular channel area, then to the transmitter.

It is recommended that whenever possible, separate transmitter in and out areas be maintained.

Let's follow a transmitter first as it is checked into the impound, checked out, and then returned to give you a good feel for the overall operation of the impound. We will assume the use of pilot numbers for the transmitter numbers. The pilot would bring the transmitter(s) or module(s) to the check-in area of the impound. The impound staff affixes a sticky label or tag with a string on it to the transmitter or module. This label/tag should have the pilot's number on it and transmitter letter if there is more than one. The impound staff should always ask the pilot to show that the transmitter is turned off. The transmitter or module is then placed in the appropriate place in the impound. When a pilot desires to check out his/her transmitter or module, he simply goes to the impound and asks if the channel is available. If it is he/she tells the impound staff his pilot number. The staff retrieves the transmitter, affixes the proper frequency pin to it, and issues the transmitter to the pilot. At times it may be necessary to limit the amount of time the pilot has his transmitter. The impound staff should advise the pilot of this as well. If a scanner is available, it is a good idea to scan each particular frequency prior to issuing a transmitter. When the pilot is done with his/her transmitter, it is returned to the impound. The very first thing the impound staff should do is ask the pilot to show that the transmitter is turned off. The frequency pin is returned to the board and the transmitter is simply returned to the proper place in the impound.

These are the basics of impound management. Depending on the event or club, the operation can be scaled up or down as appropriate. However, remember that the purpose of an impound is to provide a safe flying environment. This means it is critical to operate it properly and for everyone to properly utilize it at all times. To not do so is simply asking for trouble.

Please contact the Technical Director Greg Hahn at (765) 287-1256, extension 230 or via e-mail at [gregh@modelaircraft.org](mailto:gregh@modelaircraft.org), should you ever have any questions concerning the operation of impound or frequency control in general.