

Set Screws Used in Some Mobile Antennas

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"Set screws" are sometimes referred to as "grub" screws or "blind screws". They are often used to secure pulleys or knobs to a shaft where it is not desirable to have anything projecting outward, as would be the case if a headed screw or bolt were used. The length of the set screw is usually chosen so that when tightened the entire body of the set screw is flush or slightly recessed. I think of them simply as headless machine screws or headless bolts.

Materials

They are available in many metal types, similar to normal machine screws or bolts. However, stainless steel or brass seem to be popular.

Drive & Tools

Since a set screw is "headless" any means for adjustment must be within the body. Most common seems to be a hexagon or slotted drive recessed into the end of the set screw opposite to the "point". They are usually installed using an Allen head hex key or a blade screwdriver for the slotted types.

Sizes

They are available in many sizes and lengths, both Imperial and Metric, similar to normal machine screws or bolts. Set screws are manufactured and classed in fractional sizes (example: 1/8" diameter) for Imperial types and in millimetres (example: 5mm diameter) for metric.

Thread Pitch or TPI

Imperial threads are specified in threads per inch (TPI) whereas metric threads are specified by the "pitch" or the distance from one thread to the next.

Points

The end of the set screw which contacts the shaft is called the "point". The most common "point" type is the "cup-point", which has a thin edge that digs in to the contact surface for a secure hold on a wide range of surfaces. Many other types of points are also made such as flat, extended tip, swivel tip, cone, ball-bearing and so on. Figure 1 on the top right shows a typical example.

A Few Applications

Other than the obvious use to hold radio knobs in place, set screws are often used where one antenna element – such as a stainless steel whip or rod – needs to be adjusted for length and then locked securely in place by a set screw. There are many variations of such antennas – far too numerous to list here. However, worthy of mention is the Comet UVB series which also relies on set screws for set up.

Figure 2 at the bottom right shows two examples of set screw use in what are referred to as "Hamstiks".

The "Hamstik" shown in Figure 2 uses metric size M5 set screws which have a 2.5 millimetre hex drive.

The bottom one uses metric size M4 set screws which have a 2.0 millimetre hex drive.

Both types have cup points and both are approximately 4 millimetres long.

The Shark "mini" hamstiks are made in the United States and use imperial size 10-32" x 3/16" setscrews.



Figure 1:
Hex drive
set screws
with "cup" point



Figure 2: Mobile Radio "Hamstiks" using two set screws each.

A Few Tips

In many similar applications you may not absolutely need a set screw. If you have lost or need to replace a damaged set screw, you may find that an ordinary headed machine screw with the right thread will work just fine, even if the head sticks out a bit.

If the set screw you need happens to be M4, you should see if you have any stray transceiver mounting hardware around. The screw size for securing many mounting brackets to the radio chassis are very often M4 and are usually black.

If you have had trouble with the set screw stripping threads, try a screw with a longer body, for example like 1/4" or 5/16" or more long. The longer body has more useful threads to engage and makes it harder to strip.

Some Amateurs complain that the hex drive end of a set screw gets worn to the point where the hex key just slips and can no longer be tightened or even removed. This usually happens because the hex drive key used was too small and not the correct fit.

There is no easy way to remove a set screw that has had the hex drive end damaged to the point where the key no longer works. I have had some success with brute force "jamming" a tool, like the tip of one side of a needle nose plier, into the set screw damaged hex drive end.

Failing that, you may have to resort to drilling the centre of the set screw out and using an appropriate-sized reverse threaded screw extractor bit.

Hamstik / Ham Stick / Hamstick or...

A play on words for sure, but the playing field out there for what I am calling a "Hamstik" type antenna has changed a great deal in the last 15 years. Brands have disappeared and product names have changed. I don't want to tread on any copyrighted names.

Just to be clear, my meaning when using the name "Hamstik" is to describe any monoband mobile HF whip antenna, where a loading coil is helical wound on a fibreglass tube about three to five feet tall with an adjustable three to four foot stainless steel whip on top for fine-tuning.

Various manufacturers over the years have made these popular antennas. Company names like Lakefield, ProCom, Shark, MFJ and perhaps more. The survivors today seem to be Shark and MFJ. I welcome any comments from readers who may have a more current view of who makes what or anything else.