

What do I need to know about replacing my old radio with an 8.33kHz replacement?

To replace your existing radio for a new 8.33 kHz radio there are several decisions you will need to make based on the type of aircraft you have, how many seats, along with which radio type you currently have and which microphone type is currently in use.

For instance, if you have a motor glider with one or two seats, chances are you also use a headset. This is a key differentiator as “most” headsets use an Electret microphone whereas most Pure gliders are likely to have been fitted with Dynamic boom microphones. This is important because if you connect a new 833 radio to an existing microphone and speaker, you need to know it will work correctly. Just to make things worse, it is often not possible to tell physically if your microphone is an Electret or Dynamic just by looking at it. You may need to look back at your documentation for the original fit of the glider to see what was fitted. The big problem is that if you connect a new radio which thinks it is talking to an Electret microphone but is in-fact connected to a Dynamic, it will damage the microphone!

There is also one other variant to consider and that is Self-Launching motor gliders which have both headsets and separate microphones and speakers. These configurations can have either a mix of Electret microphones in the headsets and dynamic boom mics if the radio has two separate mic channels in the case of a Becker radio or could be all Electret for other types.

Collecting data

The key bit is to work out what you have before you start. If for any reason you are not able to establish what the configuration of microphones are then it is best to assume you will need to replace the existing one and match a new microphone to your new radio.

Price is often a key driver for basing the purchase of a radio on but we would urge you to consider the following. In life, you tend to get what you pay for and buying radios is no exception. The quality and support tends to increase with price and in some cases functionality is also reflected in price. The other thing to consider is this is likely to be a long-term purchase with the radio expected to last as long if not longer than the old one so consider the purchase to be a long term investment in the glider.

If you are expecting the new radio to connect to the existing wiring harness and antenna cable, unfortunately it is rarely that simple. The exception to this is the Becker 4201 being replaced by a Becker 6201, this has the same connection and should be

a direct replacement. This is good news because with no wiring changes or microphone changes this is a pilot install option and sign off by an inspector is not required but always advised. (You will need to produce a work pack for the installation, update the aircraft log book and issue a new equipment list. The Form 1 that comes with the radio must be kept in your glider documents).

There are a number of radio manufacturers offering adapters between older models and new 833 radios. At first glance this looks like a really good, easy solution but only if the adapter is literally changing pin connections (like the Becker 3201 > 6201 adapter), if not, they are likely to be a compromise. The adapters for the Dittel KRT2 and the FUNKE 833 all contain complex circuit boards with very little detail on what or how they are making the adaptation. We have found these adapters do not always work in every installation and nonetheless it introduces another point of failure in your radio installation. We strongly recommend avoiding adapters where possible. If you have to use an adapter, please read the configuration information for both the radio and adapter before switching on for the first time.

Wiring options

All of the radio manufacturers offer both an open-ended wiring harness and a connection plug. To use a harness or plug, it involves finding the 4 pairs of wires (speaker, Mic, PTT and Power for a single seat pure glider) in the original wiring harness, then re-wiring the wires in accordance with the new radio's wiring diagram. However, there are a number of pitfalls to watch out for.

It is entirely possible that the existing wiring harness is sound but physically not long enough to stretch to the new radio socket after the old plug is cut off. The radio installation may also not be in the easiest location to solder 8 plus connections. The simple soldering job on a bench suddenly becomes 10 times harder in the bowels of the back of a panel. So, an open-ended wiring harness suddenly looks like good value!

The final choice is crimp or solder connector. Crimp connectors are a bit fiddly to start with but easier than a soldering iron in the back of a cramped panel. The down side is you need a special crimp tool (we have one that our customers can borrow from us as they are typically several hundred pounds to buy).

In very old installations, it is quite possible that the ground connection for the speaker and the microphone are combined or even just attached to the air frame. For most of the modern 833 radios, you need to bring each of these individual grounds back to the radio for an effective installation.

Antenna connection. In gliders and light aircraft, this is typically coax with a 50 Ohm bayonet style (BNC) connector which pushes and twists onto the back of the radio. If this is in good condition and is long enough, then there is unlikely to be any work to do. However, it is worth checking to make sure it is long enough as some of the new radios may be shorter than the old one. It is also worth checking the BNC connector is well secured on the end of the old coax cable. Replacing the connector with a new one during the installation of a replacement radio if there are any signs of wear is well worth doing. If installing a TRIG TY91/2 unit, then you will need to replace this BNC with a TNC connector provided with the radio. If the cable is not long enough, then it is possible to add a short extension cable but please be aware that any joints in the cable are likely to reduce the effectiveness of the antenna. Replacing the antenna is a whole new bag of worms and is likely to require extensive work as the antenna is often fitted in the fin of the glider when it was first assembled. Running a new one is not a job to be taken on lightly but not impossible.

Ease of use

The largest differences between the various models available are around how you select a channel. Most of them use either a combination of button presses and rotation of knobs. By far the simplest operation is the Trig TY91 radio. Very well built and very robust, the simple two step rotating main knob allows you to change frequency quickly and easily. All the others are not quite as easy and intuitive to operate. Most also now have the memory capacity to store at least 10 frequencies which should be enough for most pilots. For those who would like to store more, many will save up to 100 frequencies in their memory. It is definitely worth seeing some of the 8.33 models available – have a look at some of the privately owned gliders around your club to get an idea of the build quality and ease of use of the options on the market.

Physical size and shape

Your new radio is likely to fit in a 57mm round panel cutout but your old radio may be oblong or square and fitted in a frame. For the older style of radio you may need to remove the radio and frame and replace with an FGF-O1 adapter plate that has a 57mm hole in the middle. Please also note that the wiring harness and antenna cable fitted to the radio frame may not be long enough to reach the new radio – check first.

Choice of single block or remote head

Both Becker and Trig offer a remote head option to the main unit. This is ideal if you have limited space behind the panel and can mount the main unit in a position which is both out of the way but also easy to get to if needed. The slight down-side is the wiring harness needs to have an additional connection and is likely to be made to measure. We are happy to make up custom length wiring harnesses on request.

Second seat option.

For two seat gliders and motor gliders, a second seat repeater is optionally available from most manufacturers. The second seat remote head typically requires a separate wiring harness connected to the primary unit and allows the second seat to change channel and operate the radio independently of the primary display. It is unlikely that any existing second seat repeater will work with your new radio so you need to consider replacing this at the same time and making the appropriate wiring harness changes. Don't forget the wiring harness for a two seat glider and for motor gliders will be considerably more complicated with two PTT switches, two boom mics and in the case of Motor gliders, additional headset jacks.

Some simple two seat options do not have a second seat repeater but have a PTT switch and boom microphone which are connected in tandem to the primary radio unit. You should check that your new radio will work with this arrangement and also double check the microphone type. Mixing microphone types is possible but only with certain makes that support both Dynamic and Electret microphones. Becker and FUNKE will support both types simultaneously. The TQ KRT2 will support Electret or Dynamic but not both at the same time (the support for Dynamic mics on the KRT2 is not great). TRIGs will only support Electret microphones or dynamic microphones with an amplifier)

Configuration

All of the radios will require some kind of configuration particularly if you have two seats and or use a combination of headsets and boom microphones. The one exception we know about is the Becker AR6201 replacing a Becker AR4201 in a pure glider with a Dynamic microphone, the default setup will work out of the box. Please make sure you configure the radio correctly and the antenna is plugged in before you press the transmit button!

Information to gather:

1. The old radio type and model,
2. The microphone type and if used, the headset make and model,
3. Check the wiring harness length and accessibility,
4. Check the antenna cable length and BNC connector condition,
5. Work out your budget bearing in mind this might be a long-term investment for you,
6. Will you need the installation completed by a BGA inspector (required if any wiring is to be touched or remade),
7. Do you have an old style square or oblong radio requiring an adapter mounting plate.

Once you have all the above information or at least know what you know and what you don't know, we can help you make a decision on which radio to go for and how to get it fitted.

Simple and easy options.

If you have a Becker then we recommend to replace it with a Becker, it's the most expensive option but it will be the simplest and give you the highest quality replacement on the market. There may also be some trade in value for your old radio if you have the original Form 1. (for multi seat and head set equipped aircraft, you will need to spend a bit more time working with the installation configuration to make sure all the headsets and microphones are configured correctly.)

If you have an old Dittel FSG 40/50 or ATR/Filser 720 then it is most likely you have a dynamic microphone and may have a square or oblong radio head that will require an adapter plate. The wiring harness is likely to be old and may not be long enough to reach your new radio.

If your budget is tight then the TQ KRT2 is likely the best compromise. If you can, change the microphone for an Electret as it works a lot better. We don't recommend these radios for clubs as members can change the configuration and potentially damage Dynamic microphones if not replaced with electrets. They're also not as easy to use as some of the other models. We recommend using a harness or ST1 connector to wire in to your existing setup.

If your budget can stretch to it, replace the wiring harness, change to an electret microphone and if space and budget allows, choose the TRIG. It is worth the extra money for the quality, durability and ease of use, particularly in a club fleet.

If you have an older style ATR or FUNKE radio, then replace with either the TQ KRT2 or the ATR833 LCD radio and an appropriate adapter if your budget is tight. If you can stretch a bit, again replace the wiring harness and change to an Electret microphone, it will save you in the long run. If your budget will stretch a bit further, then go for the TRIG. It's worth the extra money for the quality, durability and ease of use, particularly in a club fleet.

Paperwork and getting it installed

Paperwork is probably the most important part of the radio change process. You will need to make sure that any radio change is overseen by an inspector, recorded in a work pack, have a copy of the new Form 1 in your glider documentation, issue a new equipment list for your glider, possibly calculate an adjustment to the glider's most

recent weighing record if there is a significant change in weight when replacing the radio, inform the radio section of the CAA that you have changed radio, keep a copy of your receipt. You will need the receipt to make your claim with the CAA for the 20% rebate – deadline for claim submissions with the CAA is 30/09/2018.

Please note that the radio is a primary instrument and requires inspector sign off for any work carried out on the radio change and wiring changes. There is one exception and that is where no wiring changes have been made such as the Becker 4201 to 6201. Using an adapter could be deemed as making a wiring change so we would recommend you do any adapter installs under the supervision of an inspector at least and preferably carried out by the inspector. Any installations requiring a change of wiring needs to have been completed and signed off by an inspector.

Navboys Ltd have now sold and fitted several hundred radios and have experience of fitting all types of 833 radios in many different types of gliders, motor gliders and tugs. We are also regular users of all the popular models of 833 radios and have first-hand experience of both good and bad installations, we have made most of the mistakes and practised getting it right on our own aircraft. We are very happy to share our experience with you and are happy to talk you through the process in more detail or we can provide you with a quote for carrying out your radio installation and any other instrument fit.

For more information drop us an email at sales@navboys.com or give us a call on 01264 981934 or visit our website: www.navboys.com.