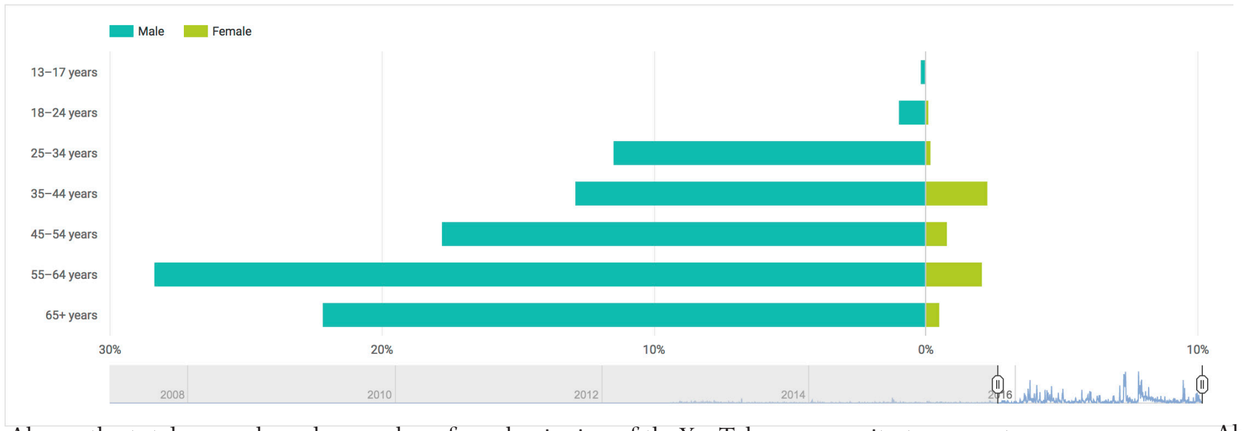
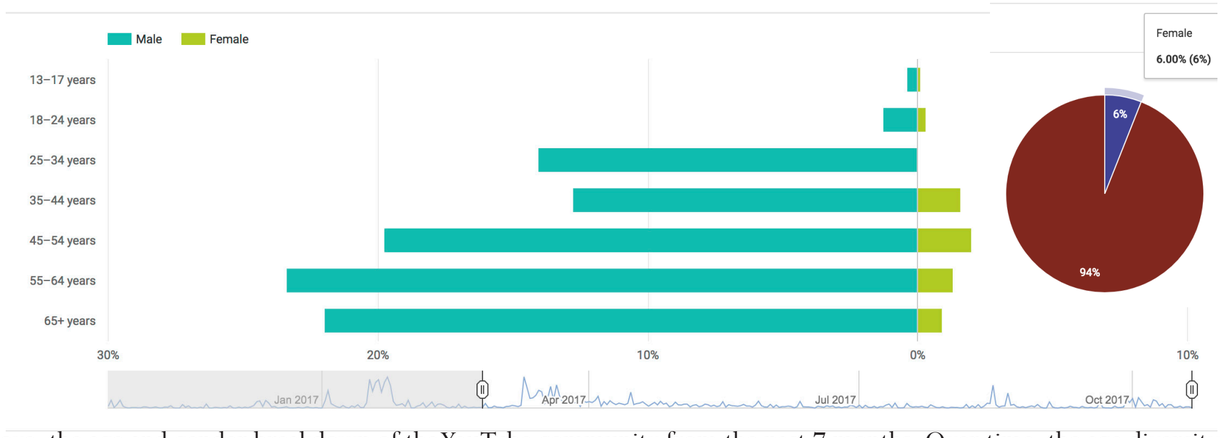
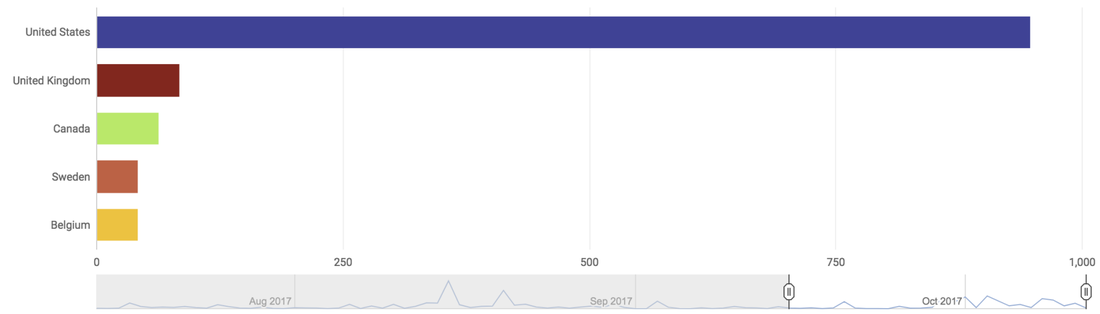
Who, Where, Platform, Minutes? Demographics of Phase 4 Ground YouTube Community



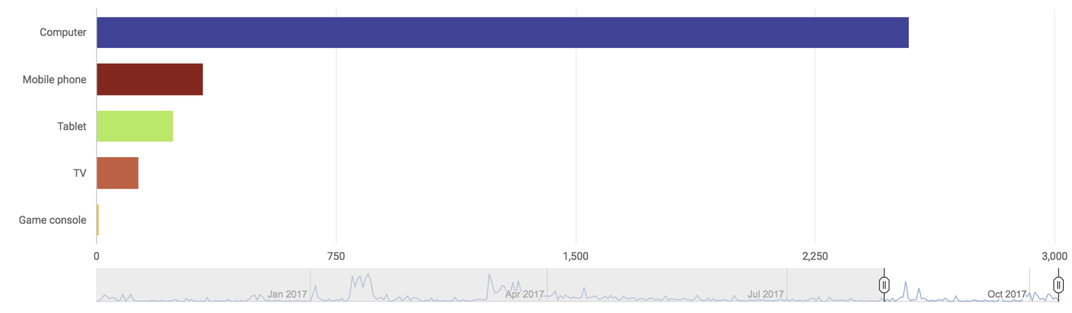
Above, the total age and gender numbers from beginning of the YouTube community to present. Demographics for the first two months was very skewed towards 55 and older and male, but the age and gender diversity changed at the three month mark.

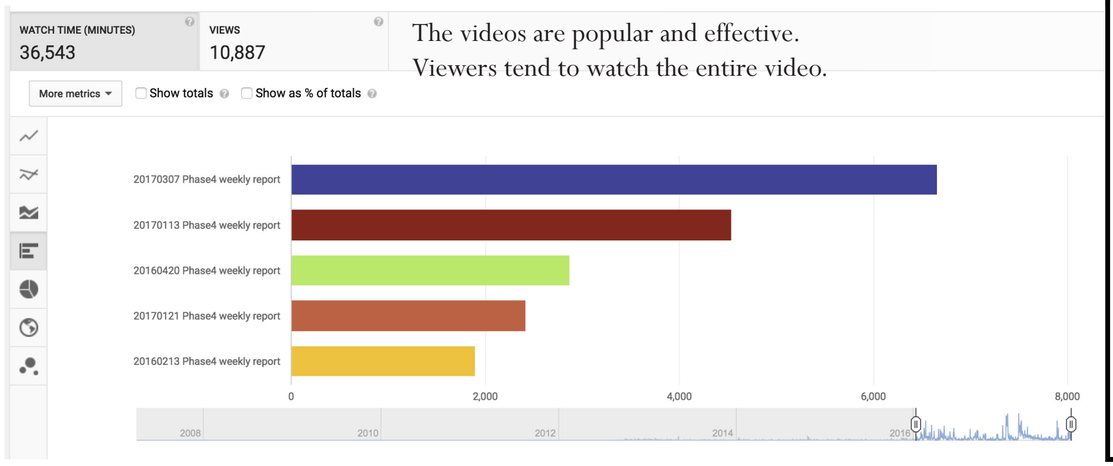


Above, the age and gender breakdown of the YouTube community from the past 7 months. Over time, the age diversity has continued to improve. Gender diversity remains stable at 6% of total, which is a number that was established within a few months of the project commencing a YouTube presence. In comparison, the percentage of women employed in electrical engineering in the US as of 2016 according to the US Bureau of Labor and Statistics is 9.6%. This is a low percentage compared to many other industrialized countries.



Most viwers are from the USA, followed by the UK, Canada, Sweden, and Belgium. Membership in Phase 4 Ground is not limited to US persons.





The videos are popular and effective. Viewers tend to watch the entire video.

In general, amateur radio organizations lack diversity. Age, race, and gender are highly skewed. Some organizations and clubs do a better job than others. Since we are at an all-time high for amateur radio licensing in the United States, there has never been a better time to directly address this continuing problem.

Is it a problem? Yes, it is.

Businesses that make efforts to increase diversity increase their financial returns. They have happier and more productive employees.

"Diverse thought, experience, outlooks and cultures make for stronger solutions, more rapid innovation, more engaged employees and customers, and better all around performance."

-McKinsey & Company's 2014 report, "Why Diversity Matters"

The above report is a landmark study in this field. There are many others.

Of course, AMSAT and Phase 4 Ground and other projects are not businesses. But they are organizations of people, budgets, and goals. Some of these goals are very ambitious. These goals won't happen without rapid innovation, strong solutions, and engaged membership. It isn't difficult to believe that what helps businesses become measurably stronger and more successful in achieving their goals would also help volunteer organizations, especially technically-focused ones, become measurably stronger and more successful in theirs.

The effects of a lack of diversity in amateur radio in an increasingly diverse world can perhaps be seen in the recent IARU presentation of their annual report. As Don Beattie G3BJ summarized it in the presentation where IARU member societies futures were discussed, "The longer term financial outlook for Region 1 is poor". The situation is poor due to demographics.

ARRL is equally concerned about the organizational health of amateur radio in the US and has begun to take some action. Comments from the ARRL president in the most recent annual report revealed the dawning realization that traditional ham activities don't have universal appeal to young people that have grown up in a very different communications context.

Phase 4 Ground has seen some success in terms of including people of a wide variety of ages, both on the team and within our YouTube viewer community. This isn't an accident. Based on feedback received from internal surveys, participation from people of diverse age groups is partly due to the deliberately chosen content (wideband digital microwave) and partly because we are **accessible**, **open process**, and **open source**.

Accessibility requires additional work, documentation, and technical support. One of our goals is to make it clear that you do not have to be an expert to join and participate. We invite people to feel willing to become more expert in whatever aspect they want to contribute towards, whether it's application layer, graphic arts, protocol design, software design, or RF hardware.

Open process means that the intermediate designs are published. This takes effort to do and can be uncomfortable. Even people that are very dedicated to Open Source, where their finalized work is published, may not want to reveal how messy the process is or was. We believe that the open process mindset enables us to "fail faster", decreases engineering risk through early critique, attracts new members, and increases confidence in presenting and collaborating. If you are used to people looking at your work all along the way, then when they look at the finished design, it isn't a new experience and it isn't a big suprise.

Open source means that the source code or source schematics are openly published. We are an open source project. We use some closed source tools and some intermediate steps may rely on closed source code or equipment in order to make progress or to verify our open source designs. The goal is to produce an open source design.

Phase 4 Ground is a good place to learn a wide variety of skills and come up to speed in digital communications. The dual appeal of the subject matter and a commitment to being accessible, friendly, and supportive has made a big difference in the diversity of both viewers and team membership.

Despite having good age diversity and non-negligible gender diversity in our YouTube community, we have not made as much progress in including people of color and women as active team members. There is a statistically significantly higher number of women watching the YouTube videos than participate on the team. While the YouTube viewer statistics have drawbacks, they provide a very useful gauge of who is interested in broadband digital microwave projects for space and terrestrial applications. In order for volunteer-based projects like Phase 4 Ground to succeed, a diverse team that welcomes a broad spectrum of talent creates a higher probability of sucess.