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Seize the Means of Radio Spectrum Allocation!: A Non-Standardized Analysis

Following Susan Leigh Star's monumental 1990 work "Power, technology and the phenomenology of conventions: On Being Allergic to Onions," I am concerned with the concept of convention/standardization. Albeit a natural phenomena, standardization is notable for its ability to pull many disparate objects under a single convention and (more importantly) also for its ability to push Others away, often unethically or to the neglect of them. Star's writing focuses on new strategies and methodologies to analyze standards and technologies. For too long, we have centered analysis of technological networks on the institutions of power that control the network. As an example of the extent to which Star re-centers our approach to analysis, she points out that even Bruno Latour does not go far enough. He says, "As a technologist, I could claim that, provided you put aside maintenance and the few sectors of population that are discriminated against, the groom does its job well, closing the door behind you constantly, firmly and slowly." To which Star retorts, "There is no analytic reason to put aside maintenance and the few sectors of population that are discriminated against, in fact, every reason not to" (Star 1990). She goes on to provide these reasons to her readers, focusing on two areas: (1) standardization adjoined to invisible work and (2) identity adjoined to marginality.

In this response I will apply Starr's concepts and analytical methods to a specific case study of radio frequency spectrum allocation standardization in the United States.

Usually spectrum allocation starts from the **standpoint** of the FCC, because they are the executive body that actually allocates and manages the radio frequency spectrum for the United States. Radio frequencies radiate through space in the form of electromagnetic waves, and humans have learned to control this invisible force by means of radio technology. The radio

spectrum is the invisible yet powerful resource that is used for all types of wireless communication. Radio devices for data transmission, broadcasting, navigation, and other types of wireless communication tune in to an allotted frequency range to listen for the data they need. The only problem is there are only so many frequency ranges to go around. This is where the FCC comes in. You can imagine the entire radio spectrum as a pie: the FCC slices the pie into pieces (called frequency bands) and serves them to licensed operators. But centering on this standpoint gives the FCC a lot of undeserved authority over a resource as abundant as the air we breathe. Think about it: a central body decides who transmits radio signals and what type of data they transmit. Specifically, the standard in the United States is a Command and Control approach. Fans of the military will recognize the origins of this approach as inherently militaristic. Commanders control their soldiers from a cold distance with absolute unquestioned authority. The exact same approach was taken to spectrum management. So even though Star (or I) refuses the executive standpoint, her essay seeks to remind us that "it could have been otherwise" (Star 1990). So let us utilize standpoint analysis to understand radio frequency standardization and allocation through the lens of other bodies.

Let us look from the standpoint of spectrum allocation's **marginal identities**, or the **marked** identities that oscillate between included and excluded in the radio network. These people are labeled "amateur radio operators," a diminutive term that connotes non-professional use. They are not commercial broadcasters, they are not the US Navy, they are the invisible radio enthusiasts who do not have permission to freely use the spectrum they have learned to control. Despite the name they were given, amateur radio operators do not possess any less skill than their commercial counterparts – to use the radio frequency is to use the radio frequency. Star accounts for this in her analysis, writing "the concept of the stranger, or strangeness to our own

culture, as a window into understanding culture, is fundamental to many branches of anthropology and to ethnomethodology and its fruitful investigations into the taken-for-granted" (Star 1990). Instead of assessing how the FCC would want to manage the radio spectrum, which sacrifices autonomy, respect, and efficiency for a network they have absolute control over, look at what amateur radio operators desire from the electromagnetic spectrum. They want to be able to communicate with radio operators without being explicitly approved by the FCC while not causing interference to other frequencies at the same time.

In fact, while being led along these premises due to Star's analytical framework, look at a competing, albeit marginal, approach to spectrum allocation: shared spectrum allocation. Shared spectrum is a decentralized and distributed allocation protocol basically releasing a natural resource (the electromagnetic spectrum) from the control of a centralized government body. The main developers of this approach are amateur radio operators (unsurprisingly) and large-scale powerful bodies like the U.S. Military (surprisingly). The military is interested in this technology to prop up efficient, secure radio networks anywhere in the world.

This relates to another concept Star refers to: the "**transition regime hypothesis**." She explains that "that large scale techno-logical change means a change in economic regime, which carries its own - often invisible to standard analyses - costs" (Star 1990). In this case study, shared access networks being developed by the U.S. military might accidentally change the economy of spectrum allocation to empower amateur radio operators. It is a case where in the military's struggle to constantly improve itself to stay ahead of adversaries, the only trajectory of improvement involves releasing the command and control protocol in favor of more efficient, equitable, and horizontal protocols that empower those who were previously controlled.

This is a point that standard analysis methods might miss. But, by taking in the perspectives of marginal identities and refusing to let the executive bodies determine the conditions of our technology, Star gives us a way to parse a politically important, standardized network: the radio frequency spectrum.