Notes on antenna

My commitment to antenna started with the “pirate” HAM radio. Seeking the better receiving and transmitting ability, I was obedient to the regular formula of making antenna.

In order for a transmitter to work effectively, you need to exactly adjust the transmitting frequency and the airwaves length. The 7 MHz band needed 10 meter wire at least because the wavelength of 7 MHz is 40 meters and the one quarter is 10 meters.

The model was finally decided as a Dipole that the shape was T-like. So the total length of the units was 20 meters. Later I tried other models such as Vertical Dipole, Yagi and etc, but at any rate the long length and the technical rigidness disenabled my free and dream-inspiring formative creation of antenna.

It was the late 70s that I was able to test various types of antenna when I became involved in the free radio. As the mainstream band was VHF, the airwaves length was less than 4 meters. The sensibility of FM radio receiver became dramatically improved and people became less interested in the antenna. Even if wrong antenna was able to catch radio programs. Although to transmit was still not so easy and you had to keep the mathematics formula of antenna, the receiving situation was utterly different from the period that 40 meter band was main stream and the parts and devices were operated by vacuum tubes. And at last even transmitters became tolerant on the antenna. Wireless remote-controller and toy-type micro transmitters worked with cheap antenna. So Users became unconcerned about the antenna.

This kind of sloppiness/freedom was found in the newborn Mini-FM movement in the 80s in Japan. The high tide of the visually “artistic” antenna was there. Various shapes of antenna appeared at the every station. It was, however, not because of an artistic renaissance in radio but because of the lack of knowledge of what the radio antenna is. People were naive on the mechanism of transmission. So they were able to be venturous in transmitting even mismatched shape and size of the antenna that should be otherwise strict in accordance with the used wavelength.

Before long, the antenna consciousness was split on their interest in what their aim of transmission was. Community-radio-oriented people began to mind the technical performance of their transmitter. They consulted to the technicians or Ham radio practicians to improve their technical system. Eventually they used the ready-made antenna such as Dipole, Yagi, Helical and so on. They had a modernist-symmetrical beautility, but had no postmodern or transmodern aesthetic.

In the late 80s, a lot of people who used to be passionate in Mini-FM lost their interest in Mini-FM because they noticed that to cover a certain area was not so easy. But I myself learned the possibility of the radio-transmission with no strict matching that the professional engineers would be never tolerant.

If such sloppy Mini-FM examples had not existed , I could not have learned such a possibility as “radio without the audience,” an interference using irregular antenna for the transmitter, a transformation of my body especially my fingers to a kind of antenna, and to use unusual—non-metal materials like conductive plastic boards and even sea water as an antenna.

Already, there are many antenna projects using huge and microscopic antenna. We know huge parabola antennas for extraterritorial signals of outer planets, L-shaped antenna abridged as LIGO, L-I-G-O with 4 kilometers on each side for gravitational wave, military communications, and practical experiments for the future mobile.

As the antenna for the very high radio spectrum such as THF is less than 1.00 mm for 300 GHz, it becomes difficult to make the antenna by hands without a robotic procedure of a factory production. Apart from this technical difficulty, the real difficulty of the conventional antenna projects for art would be the fact that the aim of such ambitious antennas is the same: device to receive or transmit “meaningful” or content-oriented signals.

In the 90s, VLF became fashionable in the radioart and sound-art communities. This is different way to use airwaves from the conventional use of VLF, which is for radio broadcasting, and submarine's military communication towing a long underwater cable of antenna. However, VLF artists were relatively less interested in transmission rather than reception of the signals.

Once I tried to put a 20-40 meters of ordinary thin wire into the water of Sumida river, the width was about 100 meters in Tokyo. The receiving/transmitting frequency was changeable from 160 Khz to 250 Khz. Of course there was no audio input. The output power was only 0.2 watts or so. But it was able to cover some part of the river. The function was just like a narrowcasting guide system of museum.

However I am interested in using airwave technique differently. The main direction is to more feature “meaningless” or “contentless” signals. So this project was also to make some interference with the other same transmitter at the opposite side of the river. The audience walked along the river and listened to the interference. But they were not a passive audience but the participator because the interfering sounds were created not only by the transmitting artists but also by those who carried a receiver and changed the dial of the LF. This experiment can work by the other bands such as HF and even VHF.

Finally, I would like to mention about a bit “philosophical” topics. Antenna is not only for electromagnetic device but also tentacle for insects and animals. Every sensing system of human beings could be recaptured as antenna. And it could be said that our body from extremities to innards, and even every cell has various and numerous antennas. The question is why every substance shuts itself independently namely “individuating” and then remotely relates each other over some kind of antenna. Recent studies on octopus who has numerous tentacles=antennas combined with suckers which are much flexible than human hands are very inspiring even in terms of antenna contemplation.

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