

Revitalization of radiotelescopes from Psary and Komorowo

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In 2010 four radiotelescopes were dismantled in Psary with hope that they will be again fully valuable instruments for radioastronomy and/or for communication with space devices. Dishes of antennas have diameters: 9, 13, 13 and 16 meters. Two of four antennas are already built in Rzepiennik Biskupi (RT-9) and in Częstochowa (RT-13). The installation of the other RT-13 was started in Cieszęcin. Furthermore, in 2014 5.4-meter radio frequency terminal (RFT) was dismantled in Komorowo and installed in Rzepiennik Biskupi. We are searching for specialists to cooperate with us to make use of these instruments as soon as possible.

1 Introduction

In 2010 the modern Polish satellite ground station in Psary, equipped with seven big radiotelescopes (RT-x, where x is a dish diameter in meters) (Fig. 1), was fully destroyed. Three antennas, including the biggest one in Poland (RT-32.5), were cut into pieces. Four instruments, without any electronics or documentation, were dismantled with hope of their revitalization in new sites and in a new utility context (Wszolek 2011, Wszolek 2013). In Table 1 the dismantled antennas and their new sites are specified.



Fig. 1: Icons of seven antennas in their primary site in Psary (*Archives of the author*).

In 2014 RFT-5.4 was dismantled in Komorowo and installed in Rzepiennik Biskupi. All antennas from Psary and Komorowo are in a process of revitalization. Due to destruction of considered antennas, which took place before their disassembly, and due to planned new modes of their use, many specialized devices need to be recreated *de novo*. Therefore, Astronomia Nova Association (AN) is looking for specialists (mainly radioastronomers and engineers in modern electronics and informatics), who are able and interested to put new life in all these instruments. In chapters below we present some details concerning RTs mentioned above.

Antenna	Site	Geographic coordinates	Owners
RT-16	Kraków (?)	$\varphi = 50^{\circ}04'$ $\lambda = 19^{\circ}58'$ E	Jagiellonian University Astronomical Observatory
RT-13A	Częstochowa	$\varphi = 50^{\circ}49'$ $\lambda = 19^{\circ}07'$ E	Marek Pelian, AN
RT-13B	Cieszęcín	$\varphi = 51^{\circ}17'$ $\lambda = 18^{\circ}10'$ E	Kazimierz Błaszczak, AN
RT-9	Rzepiennik Biskupi	$\varphi = 49^{\circ}47'$ $\lambda = 21^{\circ}05'$ E	Bogdan Wszolek, AN

Table 1: Four antennas from Psary waiting for their revitalization in new sites. AN stands for Astronomia Nova Association (www.astronomianova.org).

2 RT-9 and RFT-5.4 in Rzepiennik Biskupi

Nine-meter parabolic RT, made by *Scientific Atlanta* (U.S.A.) in 1999, after its use in Psary (nearby Kielce) for communication with geostationary satellites was built in author's private astronomical observatory in 2012. Today its steering is almost ready to work in remote and local modes. The very first light, Milky Way 21 cm hydrogen line, was caught in 2014. Antenna may be positioned in full range of altitude and in restricted range, to 120 degrees, of azimuth. Its speed of movement is small, but sufficient to follow the sky. Instrument is potentially able to send and receive signals. It is also thought to measure wave polarization. The whole surfaces of primary and secondary mirrors may be warmed up to avoid ice from a cold weather.



Fig. 2: RFT-5.4 and RT-9 (in background) in Rzepiennik Biskupi. (*Archives of the author*).

5.4 meter remote sensing ground station (radio frequency terminal RFT), made for U.S. Army by *ViaSat* (Georgia U.S.A.) – former *Scientific Atlanta*, was in its original use from 2004 to 2010 in Komorowo (nearby Ostrów Mazowiecka). Together with satellite *ICONOS II* it served to image surface of Europe with very high resolution and was very important from military point of view. Satellite ground station in Komorowo was destroyed and RFT, in its strongly devastated state, was bought in 2014 by the author to install it and revitalize in his observatory in Rzepiennik Biskupi. All points at sky may be accessible by antenna with maximal speed (each axis) of 5

degrees per second. System is thought to detect signals in range 8.025 to 8.5 GHz. It may also broadcast signals at about 2 GHz.

Both antennas mounted in Rzepiennik Biskupi are thought to work in future as receivers of radio photons emitted by astronomical sources as well as devices for cosmic telecommunication. They will also be used for different didactic purposes.

3 RT-13A in Częstochowa

13-meter antenna, made in Japan, after its use in Psary came to Częstochowa and was built here in 2012 - 2013 by Marek Pelian (the local businessman) with substantial help of the author and patronage of AN. RT-13A returns to live parallel to new built Disco *RAY*. Incomes of Disco will support scientific use of the instrument. From the other side, cosmic signals received by RT, after transforming them in a proper way into sonic waves, will be mixed with other sounds to give "cosmic music".

RT-13 may change its position rather slowly, like RT-9. It can point the sky in full range of altitude and restricted, to about 120 degrees, range of azimuth. First photons were received by this instrument in 2014. Remote steering is not finished yet. Instrument is potentially able to send and receive signals in radio frequencies. It is thought, like RT-9 and RFT-5.4, to work in two scientific modes: radioastronomy and cosmic telecommunication.

4 RT-13B and RT-16

These RTs are still waiting for their building. RT-13B is a twin instrument to RT-13A. It is planned to be built in autumn 2014. The new site for it is Cieszęcín, close to Wiersuszów. RT-16, owned by Jagiellonian University, is planned to be built again in 2015 - 2016. The new site of it was questioned recently and it is possible that RT-16 will be build outside Kraków.

5 Conclusion

Five modern and professional big dish RTs, putative receivers and emitters, are going to be revitalized. Dozens specialists of different abilities may find new interesting field of their activity. We welcome readers of this contribution, as well as their friends, to contact us, to ask questions and to join us in fascinating adventure of revitalizing instruments, and then to make use of them!

References

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