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# Installation of Ionospheric Radio Sounding System Dynasonde 21 at Tomsk State University, Russia

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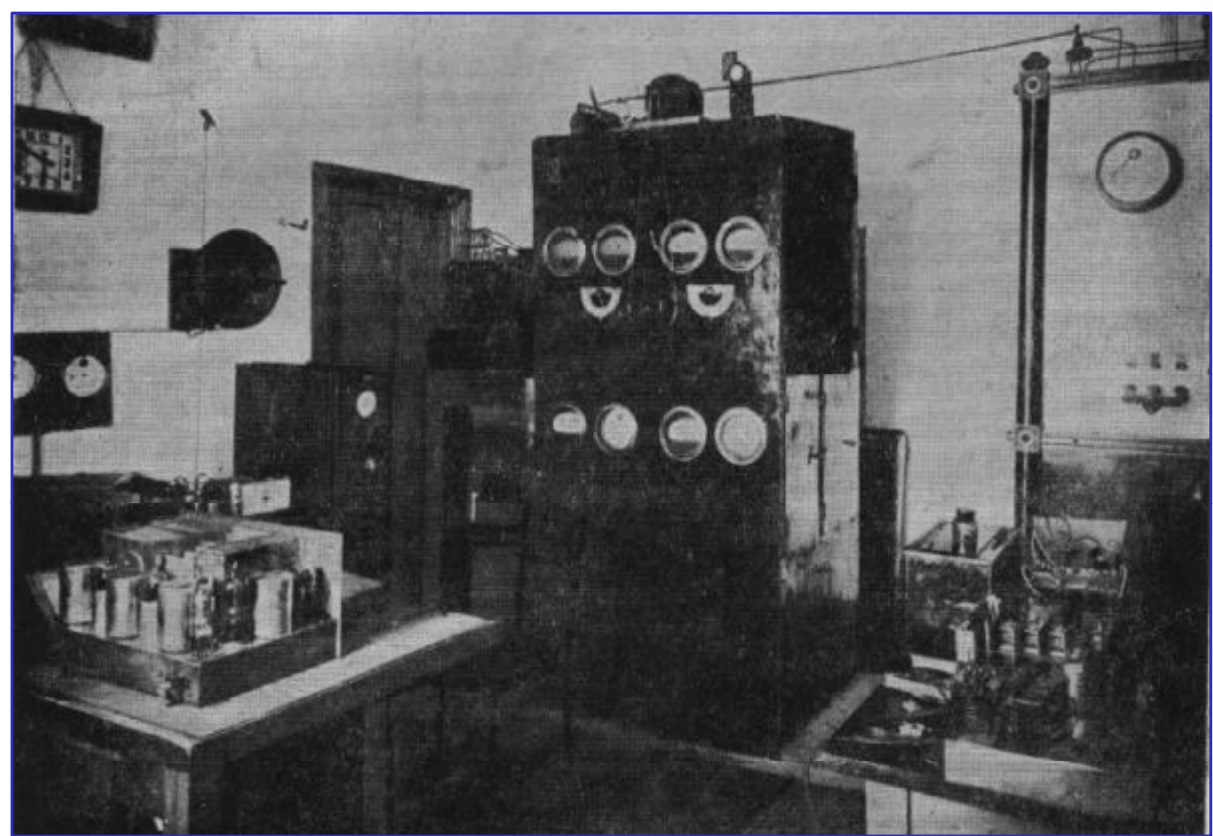
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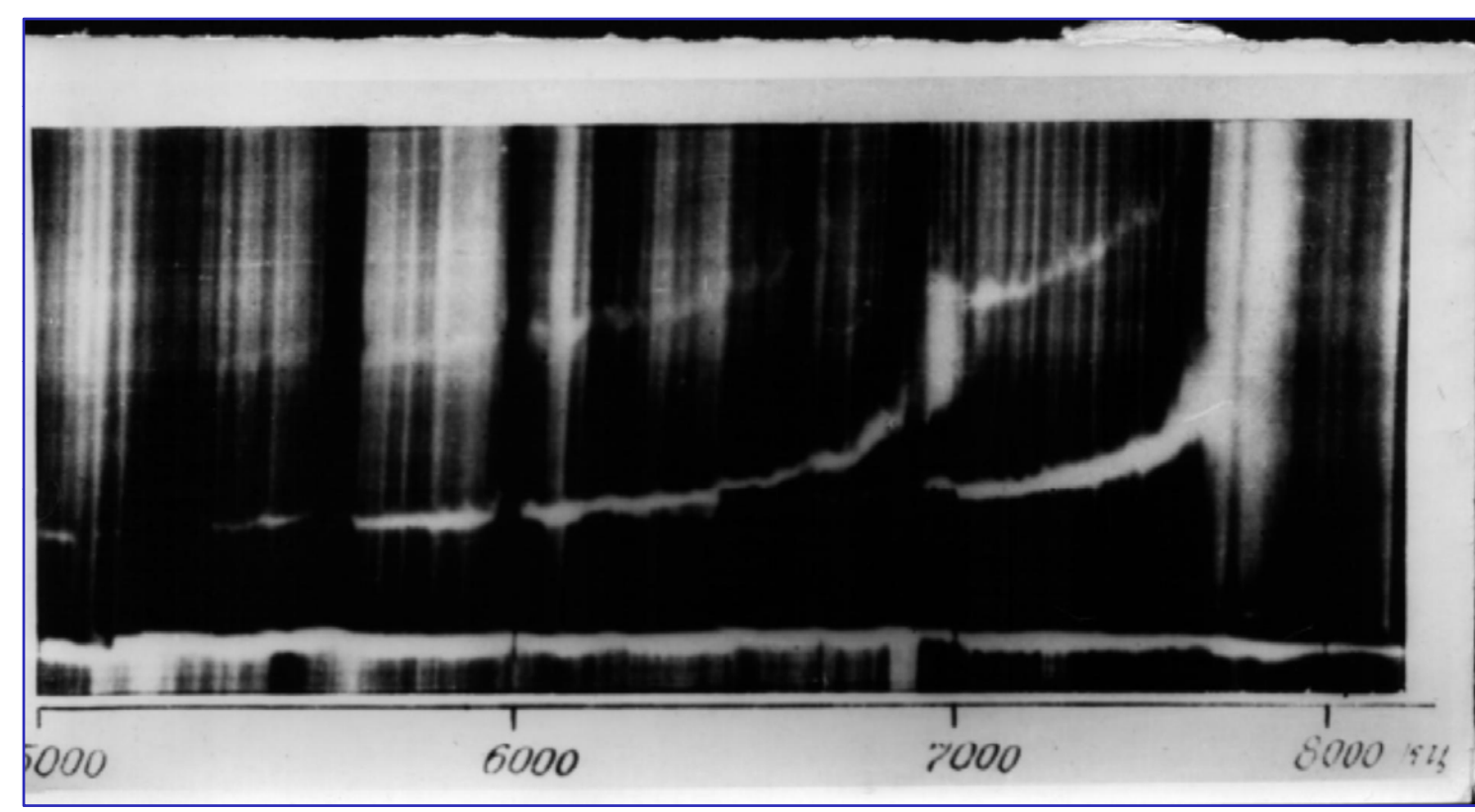
## Introduction

Tomsk State University has the longest uninterrupted history of ionospheric radio sounding research in the former Soviet Union and Russia (since 1934). Tomsk Ionospheric Station was the first in that country and only the fifth in the world. The first ionogram was obtained there in May 1936, and by that time there were operating ionosondes only in Washington DC (USA), Slough (UK), Huancayo (Peru), and Waterloo (Australia). Recently a major upgrade of Tomsk ionospheric station has been undertaken. The new, fully digital 8-channel HF Radar manufactured by Scion Associates Inc. has been installed and equipped with data processing software Dynasonde 21. This is the third full-scale installation of the new Dynasonde-capable system in the world (after Wallops and Jicamarca), and the first in a University environment. We report details of installation of the system.

## Tomsk Ionospheric Station is one of the Oldest in the World



Ionospheric sounder #1 in Russia (#5 in the world). Tomsk, June 1936. The incentive for building this ionosonde was the total solar eclipse 19 June 1936. Operation of this ionosonde has continued until 1957.



The first official ionogram obtained at the Tomsk Ionospheric Station. 18 June 1936.

## 72 Years of Evolution of Ionospheric Sounders at Tomsk State University



First Russian (Soviet) serial ionosonde AIS-56. It was installed in Tomsk in 1957 and has operated continuously for almost 40 years (1957-1996).



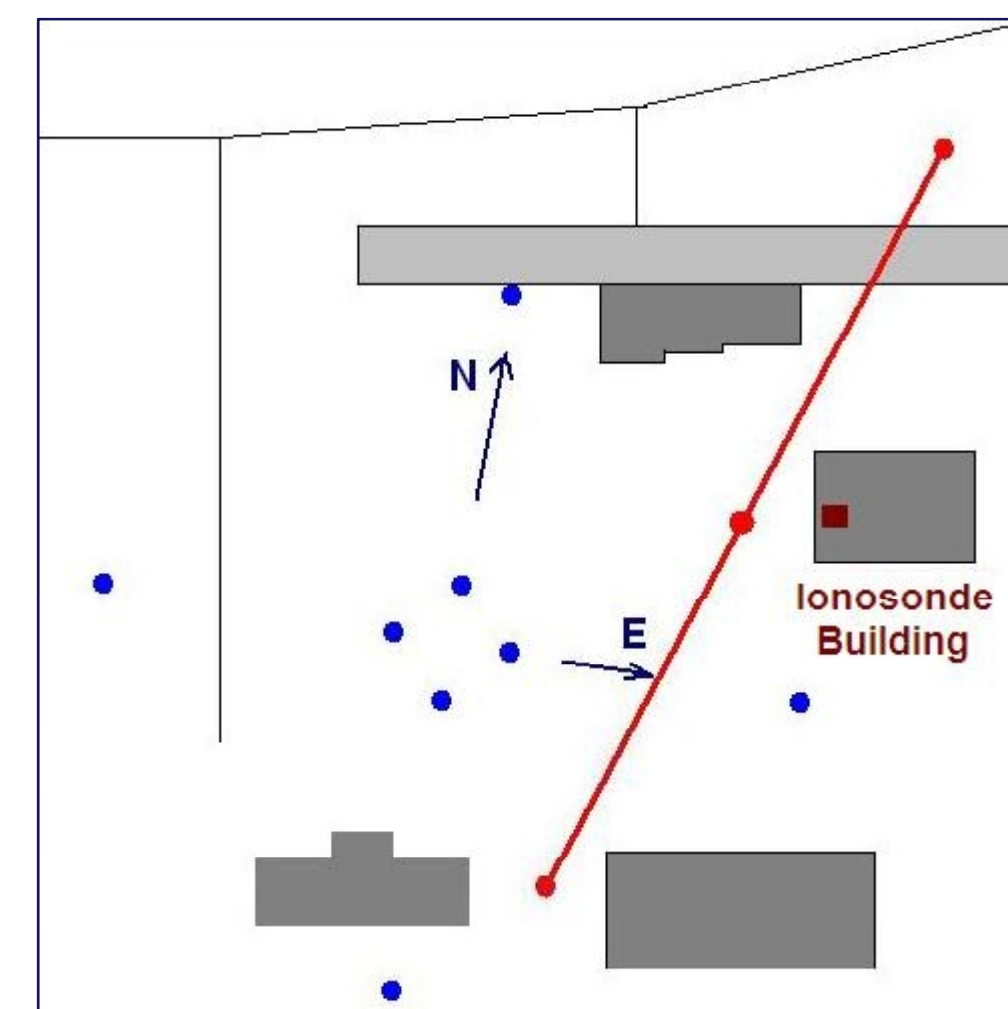
Digital ionosonde Parus (designed and built at IZMIRAN), operating in Tomsk since 1996.



Geographical coordinates:  
E 84.5831 deg  
N 56.2691 deg

## Latest Upgrade: Installation of the Modern Fully Digital Ionospheric Sounding System with Autonomous Data Processing

Advanced software and hardware complex, intended for radio sounding of the Earth ionosphere in Tomsk, consists of the High Frequency Radar System designed and built by Scion Associates Inc. (right-hand rack in the photo) running the Dynasonde 21 Software Suite developed by Dynasonde Solutions Ltd. Shown side-by-side with the old digital sounder (Parus, left-hand rack).



The map on the left shows mutual layout of the Tomsk Ionospheric Station Building, the rhombic transmitting antenna (red line) and the array of 8 electric-dipole receiving antennas (blue dots) that conforms (at 80% scale) with the design of the new Dynasonde receiving antenna field at NASA's Wallops Flight Facility.



In the photographs on the left: Effort on the clearing of the future antenna field and the team of Tomsk Ionospheric Station participating in the system installation.



Photographs showing details of the antenna layout: Left, the transmitting antenna; middle, the four inner receiving dipoles; right, close-up of one of the receiving dipoles.