Introduction by G3ZPF
When I began my SWL career in the mid 60's the prefix list included UPOL, which was stated as being a 'Russian floating arctic station'. At the time I was curious, but never enough to investigate, and eventually I forgot all about it.

When Yuri (RW3GA) joined RAOTA recently it seemed a good idea to ask him to provide some insights into the hobby from a viewpoint on the other side of the iron curtain. He sent me a lot of information and pictures about Ernst Krenkel, which reminded me about UPOL. I learned about its history, and the man behind it. In a time when all USSR amateurs had to communicate via "PO BOX 88 Moscow", Ernst Krenkel was allowed to have his private address on his QSL cards, and also allocated a non-standard callsign RAEM. This guy had to be something special in the eyes of the USSR govt and here, courtesy of the information supplied by Yuri, is the story of a remarkable man and an extreme DXpeditioner.

In addition to Yuri, who set me off on this historical adventure, I would like to pay special thanks to SM5IQ, N4IA, and G4AYO, for their help with translation of Russian technical information about the equipment used by Krenkel on the ice, together with additional information and images from their personal collections.

Using the Google search engine will produce a mountain of information about Ernst Krenkel, but I do not believe that his radio equipment has ever been described (certainly not in English) anywhere previously.

David G3ZPF

ERNST KRENKEL **by Yuri, RW3GA**

Ernst Krenkel was born on December, 24th, 1903 in the city of Belostok (Russian empire, now territory of Poland) in family of the inspector of commercial school. In 1910 Krenkel's family moved to Moscow. Despite their limited means Ernst's parents were determined to provide him with a good education and in 1913 sent him to a private school. Sadly Ernst was not able to complete his schooling. During the hard times of WW1 and the civil war he had to work to help his family make ends meet.

He was briefly employed as a packer, a billposter, an electrical engineer's assistant, and for a while a repairer of kerosene stoves and carriages. But Krenkel was not content and in 1921 he became interested in the role of radiotelegraph operators. Broadcasting and radio communication was perceived as something mysterious back then, slightly magical. At 18 yrs old Ernst Krenkel had the good fortune to notice an advertisement for a free evening class, leading to a Radio operator's license.

As with anywhere else, during that hard time, classrooms were not heated. Cadets and teachers wore overcoats and caps to keep warm. To cadets " the strengthened ration " - a small piece of black bread with the spoon of jam (free of charge) was a real incentive to attend.

Krenkel seems to have been an excellent pupil and in the final examinations showed himself capable of the highest CW reception speed in his class. After graduation he was sent to work at a receiving station near Moscow, but after working there for some time he decided upon a career as a ships radio operator to satisfy his desire for world travel.

In the summer of 1924 Ernst Krenkel went to Leningrad with what little money he had saved, hoping to find employment as the radio operator on any ship undertaking a long voyage. At that time, only specially designated Soviet vessels went on long voyages, and in Leningrad there were already qualified naval radio operators without work.

Just when Krenkel had given up all hope of finding work he was told that the hydrographic management bureau was in urgent need of a radio operator prepared to go on any expedition, to any island in the Arctic

Ocean. There was little interest because the pay was poor and it was necessary to be away for the whole year, living in 'hellish' conditions.

Ernst rushed around for an interview, and was offered a post. With a small advance on his salary, and wearing his new naval uniform he set off by train to Arkhangelsk (Archangel).

On arrival he was assigned to the "Yugorski Shar" which was preparing to take the relief crew to the first Soviet polar observatory "Matochkin Shar", constructed the year before on the northern coast of the Matochkin Shar strait of the Novaya Zemlya archipelago.

In his book *"RAEM is my callsign"* Krenkel notes that…. *"My arrival was, in fact, awaited in Archangel, where the expeditionary ship "Yugorski Shar" was tied up at the jetty, ready to put to sea. She was an old but quite strongly built vessel, which had been bought in Britain before the revolution by the Solovetsky Monastery. For many years the monastery, one of the most beautiful spots on the White Sea, attracted pilgrims and the monks made a respectable business out of this, as one may gather easily enough from their purchase of the "Yugorski Shar", which was acquired for the specific purpose of transporting pilgrims."*

After returning to Moscow the following year he was enlisted in the Red Army and served in the radiotelegraphic battalion in Vladimir. At around this time the USSR government decided to allow 'private radio stations' on the short-waves. Ham radio was born in the USSR and Ernst Krenkel was delighted. Soon he was on-air using homebrew equipment, with the callsign EU2EQ (later U3AA).

But Krenkel had fond memories of his winter on Novaya Zemlya and he was determined to return to the arctic. Shortwave radio had never been fully tested in the arctic, and few believed that fragile equipment could be reliably operated in such extremes. Ernst faced an uphill struggle to convince anyone to sponsor an expedition.

Somehow Krenkel managed to convince officials at the Moscow branch of the Nizhegorodskoj Radiolaboratory (Nizhny Novgorod Radio Laboratory) to provide radio equipment for his expedition by giving the impression that the russian Navy was keen to test it in the arctic. Then he went around to see the Navy officials in Leningrad. He explained to them that the Nizhegorodskaya Radiolaboratory had given him radio equipment to test in the arctic and he was ready to fill any vacancy in their polar expedition team.

His ruse worked, and he got the job despite the fact that no-one seriously believed he would be able to contact the mainland from the soviet polar station on Novaya Zemlya. Nowadays we would find it hard to believe that you would *not* be able to contact the Russian mainland from the Novaya Zemlya archipelago, but this 'over-wintering' expedition was in 1927/28 and things were very different back then. For one thing, climate-controlled accommodation was unheard of. Wide variations in room temperature, with the risk of 'dew-point' condensation within high voltage circuitry was an ever-present problem. Within a few hours of his arrival Krenkel made contact with Baku, and then many other locations, to the utter amazement (and delight) of the Russian authorities.

Crucially, for our interests, he was able to persuade the authorities that he could use the radio in his leisure time for amateur radio. The callsign was PGO, allocated to the Polyarnaya Geograficheskaya Observatoriya (Polar Geophysical Observatory).

Krenkel returned to Moscow, working as a ships radio operator, but he was always looking for an opportunity to return to the far north. He joined an expedition to spend winter 1929/30 on Franz Josef's Land as a wireless operator, using the callsign RPX. Early in 1930 he surpassed all previous achievements by making contact with Admiral Byrd's Antarctic expedition. This was on a wavelength of 42m. He was using 250w output, while Admiral Byrd's party had 700w. The radio operator of Byrd's expedition was Howard Mason, the callsign WFA.

The Russian authorities were keen to use airships in the arctic, so in 1931 Krenkel joined the crew of the "Graf Zeppelin". This flight was arranged in preparation for 1932, which had been designated "International Polar Year"

The flight lasted 104 hours and covered over 8000 miles. Starting from the Zeppelin Hangar in Friedrichshafen, to Leningrad, Arkhangelsk (Archangel), and then to Franz Josef's Land. Returning via Severnaya Zemlya and Cape Chelyuskin.

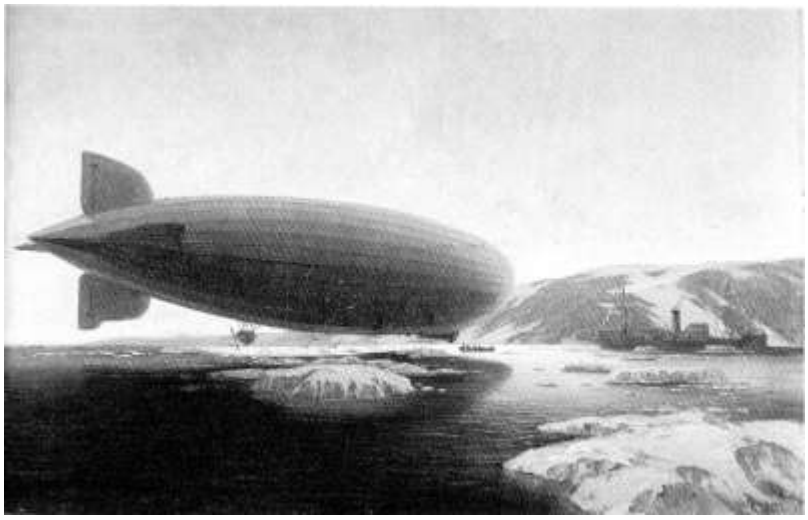


Fig-1

Graf Zeppelin at Franz Josef's Land

1933 was probably the year that really brought Krenkel's name to the attention of the general public. The north-east passage was important to Russia. All along the Siberian coast there were trappers, weather stations, and others who needed regular supplies. The previous year (1932) Krenkel had been wireless operator on board the icebreaker "Alexander Sibiryakov" which had demonstrated the viability of sea passage from Archangel to Vladivostok without having to over-winter trapped in ice, in ships with specially reinforced hulls.

The icebreaker "Chelyuskin" (7,500 tons displacement) had been fitted with a 2,500- horsepower engine, a special frame, and reinforcements, plus extra steel plates on the bow and forward bulkhead. By the time the ship reached Cape Chelyuskin (after which it was named), Captain Vladimir Voronin realized that his vessel was not performing to expectations and that conditions were worsening rapidly as the summer drew to a close. By mid-September, the "Chelyuskin" was picking its way through narrow strips of water, twisting and turning to avoid the big floes, heading ever eastward. Then, just 200 miles from the Bering Strait, the ship became trapped in the ice. Even its powerful engine was unable to free it.

The ice began to drift steadily to the southeast, and on November 3, the ice pack, with the "Chelyuskin" in it, moved into the Bering Strait. By radio, the captain heard that 12 miles ahead was open water. In a matter of hours, the "Chelyuskin" would be in the Pacific Ocean free to steam south. Success was finally within their grasp.

But alas it was never to be. Without warning the ice was gripped by powerful northerly current. After weeks of drifting to the northwest, they realized the ship was now in the main polar ice-pack and would never be free, so the captain started to make plans to abandon ship.

Once again nature would force their hand. On February 13, 1934, a mountain of ice gashed a 40- foot-long hole in the side of the ship, flooding the engine and boiler rooms. The Chelyuskin's bow began to go down rapidly and the order was give to abandon ship.

Krenkel stayed in his cabin to send a distress call. Only after he was sure it had been received did he dismantle all the radio equipment and carry it out onto the ice. As they watched, the stern of the ship gradually rose higher, until she stood almost vertically, before sliding down through the ice. Within just a few minutes she was gone.

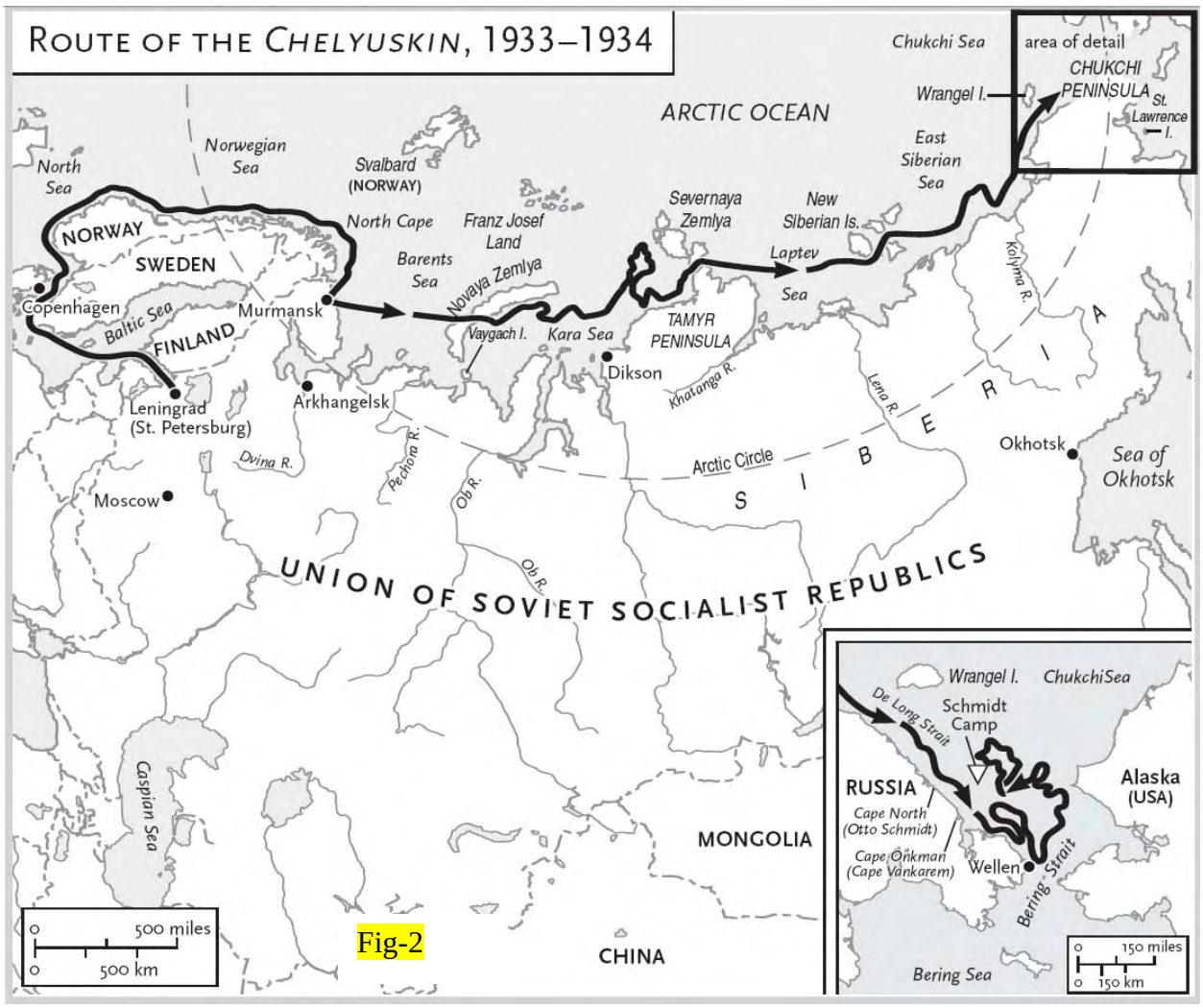


Fig-2


Fig-3

Out on the ice after the sinking of the Chelyuskin.

Pictures courtesy of SM5IQ


Fig-4

It was 13th February 1934, and the 104 men & women from the “Chelyuskin” had to camp on the ice.

Rescue would have been impossible to organise without radio communication. The only aircraft available were based 230km away and could only take a few people each time. Rescue was co-ordinated via a radio station at Uelen, operated by Ludmila Shrader.

Flights were entirely dependent on favourable weather, something in short supply at those latitudes, and the last six men (Krenkel was one of them) would not be rescued until 13th April, after 7 weeks on the ice.

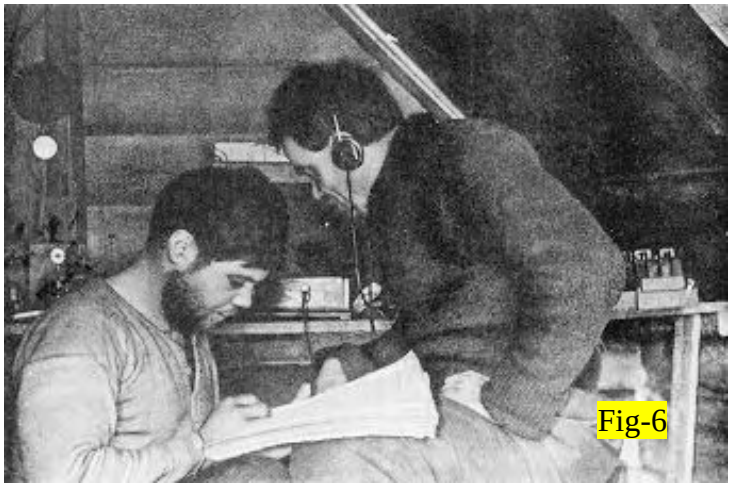


Fig-6

Ivanov and Krenkel (right) inside the radio tent


Fig-7

Ludmila Shrader. Operator at Uelen.

Throughout this time Krenkel had to maintain the radio equipment carefully. During the night, the ‘indoor’ temperature was well below zero, so dew formed inside the gear when the paraffin heater was lit

in the morning. Every time they wanted to use the radio Krenkel had to dismantle it, polish all the contacts, and let the components dry out near the paraffin heater.

The pilots of the rescue planes were the very first people to be made a “Hero of the Soviet Union” (an award that Krenkel would later be awarded himself) but for his part in the rescue Krenkel was awarded something that (as a radio ham) he would probably have been more pleased about. The Soviet government gave him the callsign of the Chelyuskin for use with his home amateur station. That callsign was RAEM.

In his book “RAEM is my callsign” Krenkel describes the final moments of his operating….*"I received instructions from Vankarem to close down the station and radioed back that I was removing the transmitter and would no longer hear them.*

Then I transmitted a general call in international code announcing that the camp's station was ceasing operations. Three times I repeated slowly: "RAEM! RAEM! RAEM! This was the Chelyuskin's callsign and it had been used as the callsign of Schmidt's camp.

I did not know then that it would soon become my own callsign, presented to me as a radio "ham" for fulfilling my professional duty in Schmidt's camp. I made the last note in the log: "Transmitter removed at 2.08 Moscow time, April 13, 1934".

Schmidt's camp fell silent.

Vladimir Voronin cut the name Chelyuskin from a ring buoy and picked out the signal flag representing the letter "C". I severed the leads of the transmitter and receiver. For a moment I felt a lump in my throat: it was not so simple to break with a single movement the link with the mainland that had been our lifeline."…

Most people would have opted for a quiet life after surviving such an ordeal, but Krenkel’s love for the polar region was undiminished. By august the following year he was on board the ice-breaker “Alexander Sibirjakow” en route to Severnaya Zemlya. There, at Cape Olovyanny he was to be the chief of a 4-man team at a wintering camp. But once that previously deserted camp had been restored Krenkel decided that it was foolish for four young men to do nothing but read the thermometer and weather data 4 times a day and relay it to Moscow.

Дом на Домашнем, куда весной 1936 года перебрались Кренкель с Мехрен-гиным.

The weather station at Domashny


Fig-9

The Domashny team. Krenkel 3rd from left

He requested permission for himself and one other man to travel 100km further north to Kamenev Island to restore an abandoned weather camp. His wish was granted, but he and his companion suffered terribly from scurvy during their stay. Despite this they survived, and were taken back to the mainland in May 1936 by the ice-breaker “Alexander Sibiryakov”, which brought Krenkel the news that he had been selected as 2nd in command for an expedition to the North Pole, led by Ivan Papanin, in March the following year.

Their mission was to set up a weather monitoring station near the North Pole.

On the outward journey the 5 large aeroplanes carried 35 researchers and 10 tons of equipment. They left Moscow and arrived at Rudolf Island easily enough, but then had to wait two months for the weather to become suitable to make the final leg of the journey to an ice floe near the North Pole.

Ten hours after leaving Rudolf Island a radio message was heard there. “This is UPOL. I hear you loud and clear”. By then they had erected a ‘residential tent’ made of eider down in a silk cover (weighing 17kg), a radio tent, a tent for the hydrological laboratory, and the radio masts. All on an ice floe near the north pole.

Fig-10

The radio tent at UPOL

Fig-11

«Дрейф» развернут на снежном столе. С момента высадки на полюс прошло всего 4 дня, но по всему чувствуется, что радист Кренкель уже привык к радиостанции, сроднился с нею.

Krenkel operating UPOL

Fig-12

Another view of Krenkel operating UPOL. Picture courtesy of G4AYO

Two weeks later most of the people made the return flight, leaving just 4 men (Krenkel included) to spend the winter on an ice floe measuring about 1.5km long and 1km wide, taking weather readings.

They knew that the ice floe would drift and 274 days and 2600km later they found themselves near the north coast of Greenland.

Fig-13

The decision to leave the ice floe was taken when it broke into 3 pieces during an extreme storm.

The picture shows Krenkel waiting to leave UPOL.

It was sent to me by N4IA.

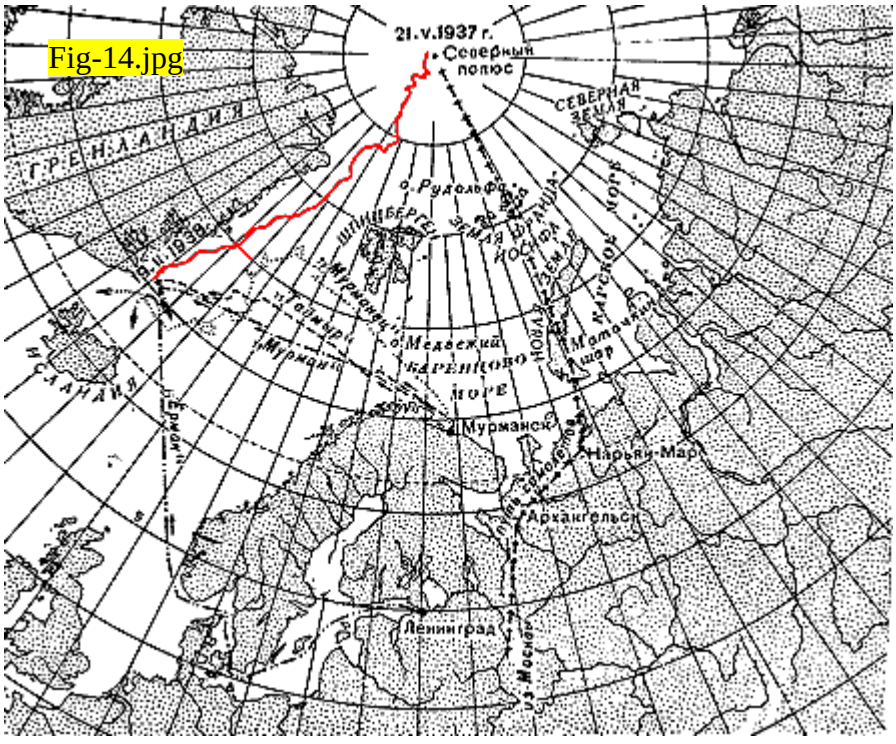


Fig-14.jpg

This picture shows the route of the drifting ice-floe (in red), together with the outward flight, and return journey home via sea.

Once again Ernst Krenkel had obtained permission to use the radio equipment on the amateur bands when he was not on duty. But there were restrictions. Wind power was used to charge the batteries so Krenkel was only permitted to use the radio on the amateur bands if the batteries were already fully charged, and there was enough wind to maintain them fully charged while he operated the equipment.

This inevitably limited the time he could spend on the amateur bands, but despite this he made a number of contacts.

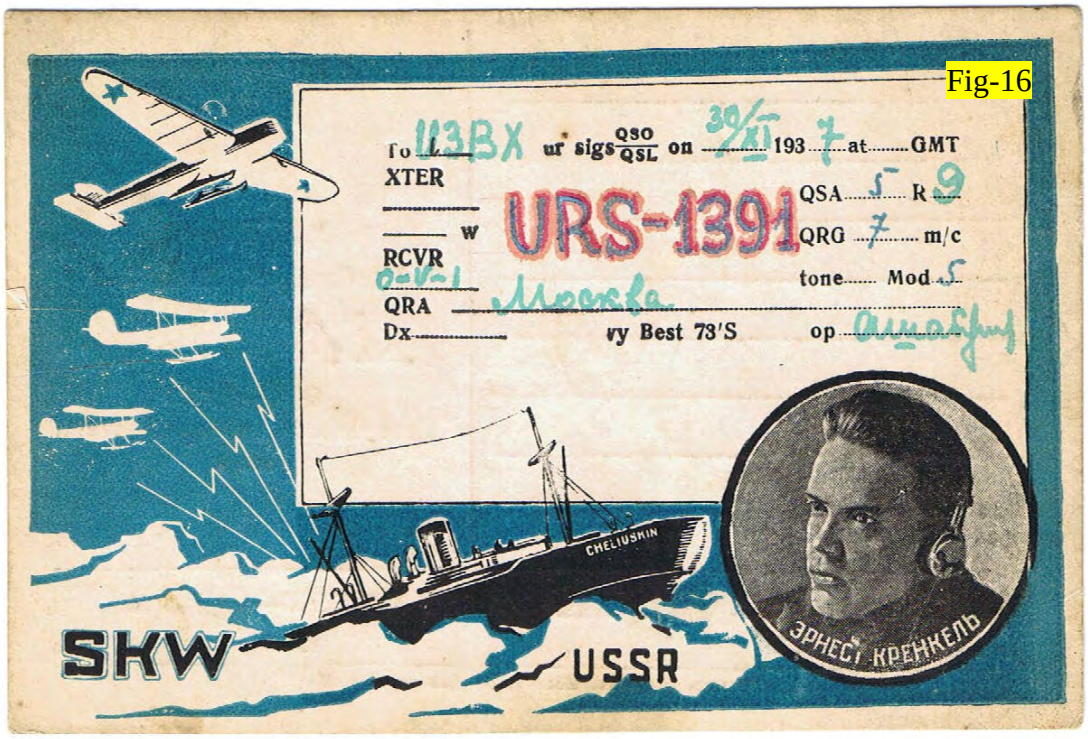
27th May to 31st July (from 89 degrees North to 88 degrees North)
LA1M, F8IS, W2CYS, PA0AS, GI5AJ, G6KP, G5RI, TF3C, U1AD, U1AP, W1EWD, OK1PK, ON4BW, D3FZI (Germany), U3CY, PA0FF, UK1CR, D3GKR (Germany), F8AI, PA0GN, K6SO (Hawaii), VK5WK, VK2DG

1st August to 31st October (from 88 degrees North to 84 degrees North)
SM5UW, W7LQS, VE5LD, G5MY, W8PMB, W1AEF, W9PNE, GM2JF, W2KAP

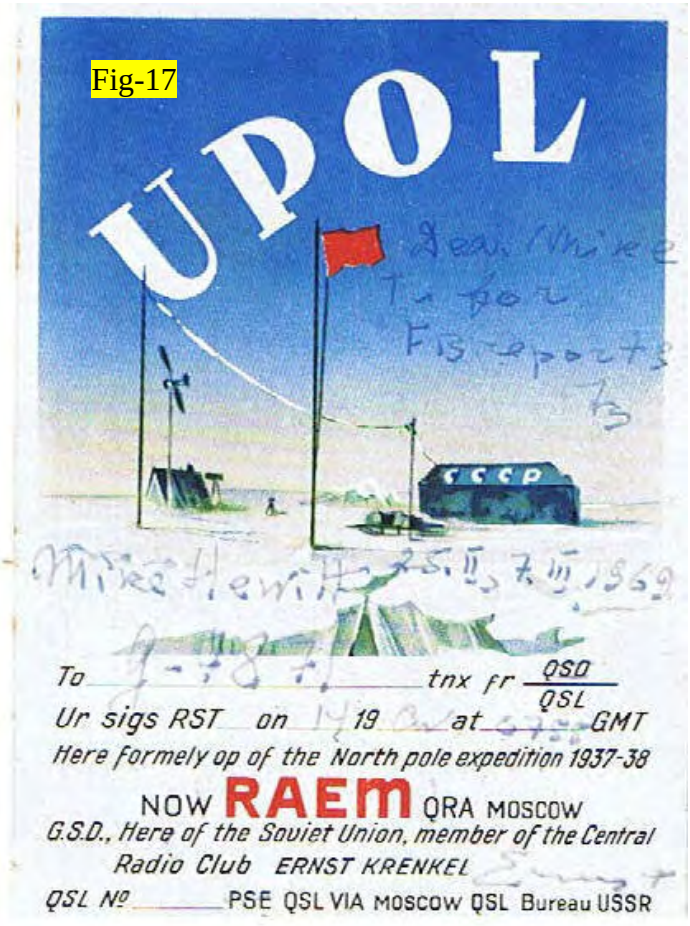
1st November to 4th December (from 84 degrees North to 82 degrees North)
W2SB, W2FSN, W8EME, K7RT, G5JX, F8GQ, W9THH, W9ALV, W9VDQ, W8CMH, W8HRD, W8NOT, W9AJA, W9PLX, W8BGX, W8LSK, W8DFH, U1CO, ZL4BR, U9ML, W1HUD, GM2JF, W2BHW, W2GTZ, PA0DA, SM5WM, SM5QU, U1AD, U1BC

Fig-15

This QSL shows contact between G5MY and UPOL. Picture courtesy of G4AYO



G4AYO provided this picture of this Krenkel-themed SWL card sent to U3BX



QSL received by Mike (G4AYO) from Ernst Krenkel in 1969, when Mike was still ISWL G7871

Although the UPOL callsign is more prominent, the QSL is actually from **RAEM** operating from his home QTH.

Fig-18

This picture is of the UPOL award to commemorate the 70th anniversary of UPOL – which G4AYO received in 2007

Mike actually provided "RADIO" magazine with the QSL image for the award.

Fig-19

Last year Mike (G4AYO) had many CW QSOs with Mike Fokin, RW1AI, who was QRV from North Pole-35 (R35NP). The QSL is shown here.

This was another 'drifting' ice station, of which Krenkel would have been proud.

Despite advances in technology, some things never change. R35NP had to be abandoned in a hurry when ice conditions changed suddenly, just as with UPOL many years before.

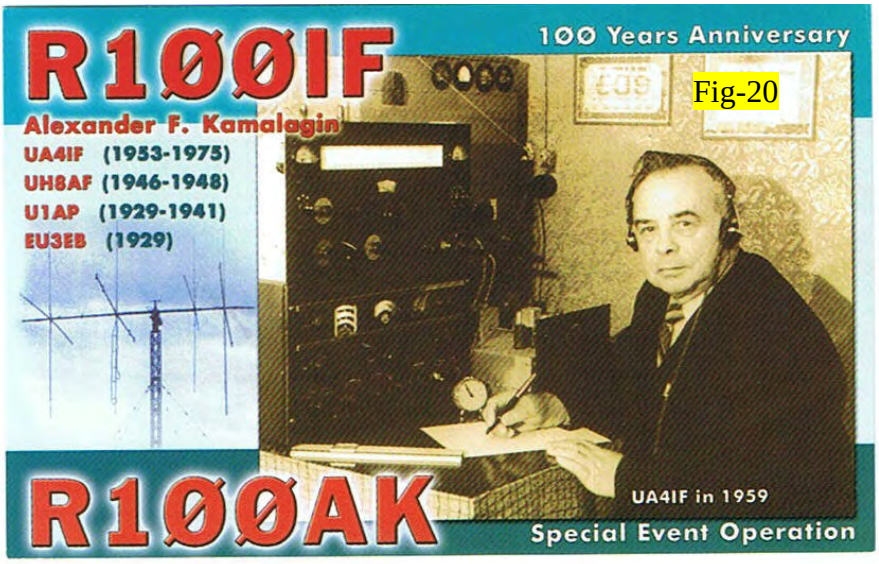


Fig-20

One callsign listed in the log of UPOL is that of A F Kamalagin, U1AP (later to be UH8AF and UA4IF).

Alexander became famous as a contester, DXer and radio expert.

In August 2007, R100AK and R100IF were QRV to commemorate the 100th anniversary of Alexander's birth

I worked both stations

73 **Mike (G4AYO)**

Fig-21

This image is of Ernst Krenkel operating as RAEM from his home QTH near Moscow in 1958. The original is in monochrome, but when Mike (G4AYO) sent it to the Krenkel Museum he received this colourised version in return from Eugene (UA3AJT) who was the founder of the museum.

Krenkel's AR-88-F is now on display in the RKK Museum

This BC-610-e, was owned by Krenkel and is now an exhibit in the RAEM memorial museum

Transmitter covers 1.5 – 18MHz. Up to 3 channels, determined by plug-in tuning units and final amplifier coils.

Modes A1 (400w) and A3 (300w).

Requires BC-614 speech amplifier for AM.

Nett weight 390lbs (without BC-614). Developed from Hallicrafters HT-4 amateur power amplifier. Manufactured from 1939

Fig-24

Even after the remarkable 'voyage' on the drifting ice in 1937, Krenkel still maintained his love of the arctic. Here is another QSL card, sent to UA1AB for a QSO in 1947 with RAEM/MM, while Krenkel was aboard the "George Sedov"

Fig-25

Ernst Krenkel's grave. Picture via SM5IQ

Every year, on December 24th (Ernst's birthday) people close to him, friends and pupils gather at his tomb on Novodevichiem a cemetery in Moscow.

There were many polar expeditions that RAEM participated in, or organized, but Krenkel's last voyage to the Antarctic Circle, took place in 1968. He headed a voyage of the scientific-research vessel "Professor Zubov", which was bound for the shores of Antarctica to relieve its staff of winterers, and also to carry out oceanographic research.

Despite so many winters in the arctic in primitive camps Krenkel not only survived, but succeeded in keeping his signals on the air. He then survived persecution in the Stalin epoch, in some ways more arduous still, but after Stalin's death in 1953, his reputation, his amateur radio license, and his honour were restored.

He was the first chairman of the central radio club (CRK) the USSR; and Chairman of the Federation of radiosports of the USSR (1959 - 1971). He put great effort into the popularization and development of amateur radio in the USSR, and he did all this despite the uneasy conditions behind the iron curtain.

He died on Dec 8th 1971, and his tombstone bears the letters of that unique callsign RAEM. Now the Central Radio Club of the Russian Federation bears his name.

In addition to the numerous museum exhibits and published articles honouring Ernst Krenkel, a bay on the coast of Komsomolets Island, and one of the islands in the Severnaya Zemlya archipelago are named after him. Together with a polar hydrometeorological observatory on Heys island (Franz Josef's Land), a street in Moscow, a Communications Electro-Technical College in St. Petersburg, and a weather research vessel of the Hydrometeorological Service.

Ernest Krenkel's 100th anniversary was celebrated by a team of ham radio operators from 18th to 21st December 2003.

All the operators who participated were issued with special call-signs that resembled the personal call-sign of Ernest Krenkel. R1AEM, R3AEM, R4AEM, R6AEM, R9AEM, R0AEM, RAEM

The design of the R#AEM QSLs was of RAEM's own QSL card, with that of RAEM being different

Fig-26

Fig-27

Fig-28

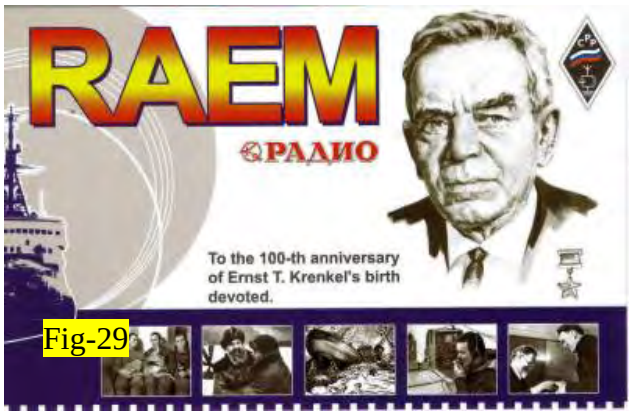


Fig-29

The various stations were located as follows….

1) **RAEM** - (RZ1AWB, ice-breaker "Krasin", Sankt-Petersburg),
2) **R1AEM** - (RK1ZWX, QTH Murmansk)
3) **R3AEM** - (RK3DZD, QTH Kolomna, nr Moscow)
4) **R4AEM** - (RK4WWY, QTH Votkinsk, nr Izhevsk)
5) **R6AEM** - (RK6AXS, QTH Krasnodar)
6) **R9AEM** - (RK9XWW, QTH Vorkuta)
7) **R0AEM** - (RK0BWW, QTH Norilsk)

For RAEM QSL manager = RV1AQ (193231, Sankt-Petersburg, P.O.Box. 80).

For all other R#AEM callsigns, the QSL manager is A.Pervacov (UA9XC), P.O.Box 73, Syktyvkar, 167023, Russia. QSL via the bureau, or via e-mail to ua9xc@parma.ru

There is an RAEM Diploma available for contacts with Russian stations in either the arctic or antarctic region. Full details in **appendix 3**

The 'Ernst Krenkel Memorial' - International Contest is held on the 4th full weekend of December each year, on the 80, 40, 20, 15 and 10 m. bands. The uniqueness of the contest is in the non-trivial number exchange that requires operators to show their true CW skills. Further details can be found in **appendix 5**

The memory of Ernst Krenkel will never die!

Yuri Manukovsky, RW3GA

PS : I wish say special thanks to David G3ZPF for his care, support, and help when I decided to write this article. Also my thanks go to Mike (G4AYO) and to Alf (SM5IQ) for helping G3ZPF with translation and images from their private collections.

For the writing of this article I used:

1. *E. Krenkel "RAEM is My Callsign";*
2. *B.Kremer "The radio operator and the polar explorer";*
3. *"Radio"Magazines (1946-2009)*

APPENDIX 1 : Equipment at UPOL.

Translation from Russian to Swedish: SM0RGH
Translation from Swedish to English: SM5IQ

The main equipment was named ”Drift” and was produced by the advanced radio laboratories in Leningrad.

Chief engineer - Vladimir Leonidovich Dobrozhansky (U1AB; earlier: 65RA, EU3AJ);
Developers - Feodor Abramovich Gaukhman (U1BP; earlier: RK-1, 93RB, EU2DF, EU3DE);
Engineers - Nikolay Nikolayevich Stromilov (U1CR), Andrey I.Kovalev, Nikolay Ivanovich Aukhtun;
Designers - Maria Zabelina, Tosya Sheremet and Alexey Razhev;
Technologists - Evgenie Leonidovich Ivanov (U1BH; earlier: 51RW, EU3BT) and Paul Tovpenets;
Mechanics - Anatoly Kiselyov, Alexey Kirsanov and Alexander Zakharov
Assembler - Victor Dzervanovsky.

Other radio amateurs who worked on the project :
Dmitry Petrovich Aralov (U1AH, earlier - EU3FD)
Boris Grigorevich Haritonovich (U1AK; earlier-EU3ED)

The main transmitter in the two Drift stations was a two stage telegraphy transmitter, the main oscillator being crystal controlled.

Power output	20 W
Bands	20-30, 40-60, 560-610 metres
Power source	Ni-Fe accumulators
Plate voltage	Via rotating converter PM-2 which, if necessary, could also be hand-cranked or treadled).
Power amplifier	
Power output	50-80 W depending on frequency band
Power source	Ni-Fe accumulators
Plate voltage	Via “enankaromformare” PM-1, (from the low voltage outlet the batteries could be charged) driven by an air-cooled petrol engine B-3. *“Enankaromformare” is a Swedish word that I cannot translate. It is a rotating converter, which in contrary to a motor-generator has only one rotor block for the input and output windings.*
Main receiver	1-v-1 19-20000 metres, battery powered
Aerial	L shaped wire antenna, horizontal part 55 m, sloping part (to tx) 15 m, height 8.5 m (two duraluminium masts)
Spare station	Name “Reserv”. One stage transmitter with fixed frequency, max 20 W, wavelength 600 m. with 0-v-1 receiver
Main power source	“The windmill” (designed by eng. S B Perli, Kharkov Dynamo power output 200 W at max voltage 15 V

Note: Russians are often mixing latin letters into their usual cyrillic alphabet. An example is 1-v-1.
We assume that the same is valid for PM-1 and PM-2. If the “P” had been cyrillic, it should have been translated as RM-1 and RM-2, and B-3 as V-3.

It is interesting to note, that in 1937, when all western “household” receivers had been using superheterodynes for five years, the Russians still relied upon receivers like 0-v-1 and 1-v-1.

APPENDIX 2 : An interview with Ernst Krenkel on the day before he departed to UPOL. Published in the Russian 'RADIO' magazine.

Translated from Russian by Mike (G4AYO)

We placed before the designers of the radio laboratory of the People's Commissariat for Internal Affairs the following basic requirements: a total autonomous (i.e. capable of existing independently) portable radio transmitter, durable, with back-up and maximum lightness. A radio station which I will have to operate at the North Pole, built by the Leningrad laboratory especially for our expedition.

V.L. Dobrozhansky, head of the research part of the laboratory who had been involved with the construction of the radio relay centre on Dikson Island, took upon himself leadership in the planning of the radio station. Taking on the work was radio technician N.N. Stromilov, a participant of Arctic sailings, who built two transmitters of 20 and 80 watts power which operated on short and long wave.

The working out of two receivers to this transmitter was carried out by chief radio technician A.I. Kovalyov who used original working apparatus which with extraordinary portability allows coverage of a range of waves from 20 to 20,000 m.

The third set of radio equipment is a reserve backup receiving-transmitting radio station created under the direction of senior technician of the ORL comrade Gaukhman who set up the receiving-transmitting radio station on a fixed wave of 600 m.

The main radio station works on long and short wave. For work on short wave range the transmitter is constructed with a three-cascade circuit.

The power of the transmitter is 80 watts with the possibility of reducing to 20 watts. It works solely by wireless telegraphy and I consider such communications most advantageous over long distances. Valves UB-132, SK-164 and GD-50 are used in the transmitter.

The portable wireless transmitter is set into a common framework and gives the means to transmit in the following ranges:

20.5 - 32.5 m	550 - 1600 m
32 - 52.5 m	1800 - 3820 m
50 - 85 m	3200 - 8500 m
230 - 650 m	7500 - 19800 m

The radio is constructed according to 1-V-1 layout with a pentode in the output and with feed-back.

UB-152, CB-154 and SB-155 valves are fitted in it.

An additional station power 20 watts "analogous basic"(?)

We also took a reserve station of 20 watts working in the 550-610 m ranges.

During work on long waves the transmitter will feed from a RM-2 transformer.
During our work on short waves we will set working a petrol engine with RM-1 machine.

Besides this we will have 2 complete sets of alkaline accumulators. We will charge the accumulators from a special 200 watts output turbine. During calm weather charging can also be produced from the RM-1 machine coupled with a petrol engine.

Our reserve source of power supply are 3 dry anode batteries and one RUN-10 machine for feeding the anodes. We also have two spare RM-2 and one spare RM-1.

We will construct a one-radial antenna and will extend it on two masts. The height of each mast is 8.5 m and the total length of the antenna 70 m.

It is difficult to say what the communication conditions will be on the drifting ice. Obviously we will work with Rudolph Island on long wave and with coastal stations and Dikson Island on short.

APPENDIX 3 : THE RAEM DIPLOMA

The RAEM diploma was established in 1972 in memory of Ernst Krenkel. From January 1, 2006, the Union of Russia Radio awards two diplomas RAEM (different in appearance) with new requirements.

Contacts are allowed on any HF band, starting from 10 December 1971.

In order to receive a diploma RAEM, you require 68 points (for number of years of Krenkel's life) for QSO with russian amateurs located in northern and southern polar circle.

Repeat QSO with the same radio station is not counted. Scoring is as follows…..

QSO with
(1) memorial radio RAEM - 15 points
(2) radio stations located in Antarctica, radio stations, drifting in the Arctic – 10 points
(3) memorial stations R1AEM, R3AEM, R4AEM, R6AEM, R9AEM, R0AEM, (in 2003) - 10 points;
(4) radio stations located in the islands of the Arctic - 5 points;
(5) radio stations located in northern and southern polar circle - 2 points.

The basic RAEM diploma is awarded for all-mode contacts. Applications to be submitted with an extract from the log.

The Honorary RAEM diploma is for CW-only contacts. Applications to be accompanied by QSL-cards received for confirmation of QSOs.

The application should be submitted in alphabetical order of call signs.

SWL diplomas are issued on the same terms.

For amateurs outside the USSR, the cost is 10 IRCs.

RAEM award applications should be sent to…
Vladimir Fedenko, UA3AHA
RAEM award manager
PO Box 88, Moscow 119311
e-mail: ua3aha@mail.ru
ua3aha@rambler.ru

Fig-30

Fig-31

Images of the basic and CW-only versions of the RAEM Diploma

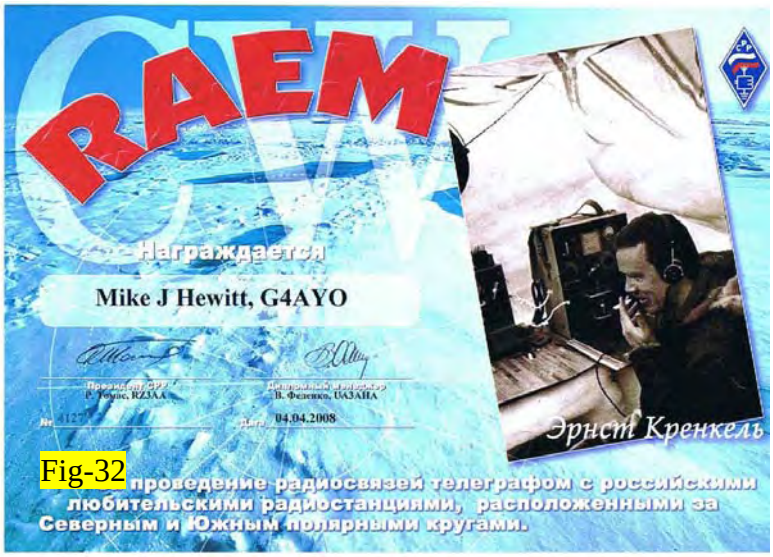


Fig-32

To begin with, the RAEM award was only available to Russian radio amateurs, but now it is open to all.

Mike (G4AYO) received his award in April 2008, and his certificate is shown here.

APPENDIX 4 : In his book “RAEM Is My Callsign”, Krenkel described his amateur radio QSOs from UPOL

Provided by Mike (G4AYO), from his 1978 English edition of the book.

Contacts with radio "hams" gave me immense pleasure. I wonder how many of the readers of these notes can understand the excitement and interest which accompanies this occupation? If you have never been a short-wave enthusiast, never ventured out into the airwaves with your own transmitter, you have missed a lot. The sharp-shooter of the airwaves can only be understood by the hunter. It was for this reason that Papanin (*UPOL team leader and ‘political officer’*) proved sympathetic to my passion: it reminded him of duck hunting, which he loved so much.

Our ice-floe was an ideal spot for the radio "ham", possessing neither trams nor lifts to create annoying interference. In brief, working conditions were perfect. It was no wonder that we could listen to the entire world with our little receiver: and listen we did, to every continent. Like an angler's tin of worms, the ether seethed with amateur operators round the clock.

UPOL, our callsign, was widely known and we had only to appear on the air in order to receive calls from every quarter. All I had to do was choose the most interesting station. An everyday contact with Europe had, of course, its own interest, but it was far more tempting to find a genuine "rarity" among operators: the only "ham" on Tierra del Fuego, for instance!

In August a competition for Soviet short-wave operators was announced in Moscow. The winner would be the first "ham" to make contact with the Pole. I must admit that I had already had something to do with promoting this competition, having left my own short-wave receiver at the offices of the magazine Radio Front before leaving for the Pole. This receiver would be presented to the first Russian operator to set up a two-way radio link with the Pole. Time passed and eventually the Leningrad short-wave operator Saltykov (U1AD) won the receiver, followed soon after by the first Muscovite - Vetchinkin (U3CY).

The first foreigner to get in contact was a Norwegian (LA1M). Subsequently I established contacts with almost all the countries of Europe, with many Americans, with Alaska, Canada, New Zealand, South Australia and Hawaii. I spoke to an amateur operator in Hawaii (K6SO) several times. He became a fan of our expedition and was greatly concerned about us, asking questions that were naive but, in their own way, touching: …"Won't the snow melt?"…. "Aren't you afraid?".

Sometimes he even relayed newspaper reports to us, which had been published by Soviet newspapers and then reprinted by Western press. His accounts were evidence that news about "North Pole-1" circled the globe extremely rapidly.

Three contacts with Australians formed the long-distance record for my radio conversations. The power of my transmitter, after all, was only 20 watts.

What did I talk about to my radio correspondents? As a rule, each contact lasted two to three minutes. My correspondents usually expressed their delight at making contact with us (one doesn't talk to the North Pole every day), asked questions and offered their services in transmitting my telegrams to Moscow.

A Dutchman told me that his local newspaper published a weather report from "North Pole-1" every day; a Swede was delighted to have caught me after a three-month search. Amateur operators from only one country - Nazi Germany - were cold and devoid of enthusiasm. After a few dry, polite words they hastened to bring the conversation to a close.

Contacts with Americans were particularly frequent. When they appeared the airwaves immediately became crowded, the US transmitters, which ranged in power up to a kilowatt, literally jostling and jamming each other.

Once, when listening conditions were good, I spoke to eleven Americans in the course of two hours, passing from "ham" to "ham".

"Call my friend, please, he's listening to you!"

I called. Contact was established, and passed on the next American operator.

"Greetings from the fur trading post! This is the Hudson Bay Company!"

I decided that, all the same, the greetings were the initiative of the radio operator but, being a polite person, I replied and asked that my best wishes be conveyed to the Eskimos, who worked for the company.

So the nights passed. My only regret was that the onset of morning brought my activities to an end. I had

to get up and boil the kettle. The battery situation too, meant that I was certainly not able to allow myself diversions of this kind every evening.

APPENDIX 5 : RAEM CONTEST

1. Organizers The "Soyuz Radioljubitelej Rossii" (Union of Radioamateurs of Russia) is pleased to announce the RAEM Contest.

2. Contest Period : 0200 - 0959 UTC 28 December 2008, **8 hours**.
The E.T.Krenkel Memorial, "RAEM Contest is to be held on the 4-th full weekend of December on the following amateur bands: **80**, **40**, **20**, **15** and **10** m.
Mode: CW only.

3. Categories

MULTI-ONE	Multi operator - All Bands (2-3 operators) - Single transmitter
SINGLE-OP ALL HIGH	Single operator - All Bands - HP
SINGLE-OP ALL LOW	Single operator - All Bands - LP
SINGLE-OP 80M	Single operator - Single band 80 m
SINGLE-OP 40M	Single operator - Single band 40 m
SINGLE-OP 20M	Single operator - Single band 20 m
SINGLE-OP 15M	Single operator - Single band 15 m
SINGLE-OP 10M	Single operator - Single band 10 m
SWL	SWL

4. Exchange : Serial number of QSO, since 001 and participant's geographical coordinates, degree values only (!) with hemisphere indicator in German language: N-Nord (Northern), S-Sud(Southern), W-West (Western) and O-Ost (Eastern) Hemispheres. For instance, RW9HZZ and RX0LWC have "001 57N85O" and "001 44N133O" exchange numbers respectively. You may work the same station on different bands. 10 band changes per hour are allowed. Only one signal can be transmitted at any given time. Any cluster or human assistance is prohibited.

5. QSO Points : Each QSO worth 50 points + 1 point for every degree difference in geographical coordinates, both latitude and longitude. Every QSO with a Polar Circle station gives additional 100 points. Every QSO with RAEM memorial station gives additional 300 points.

The final score consists of:
QSO points
Coordinates difference points
QSO with Polar Circle stations points
QSO with RAEM station points
Participants, located in the Polar Circle, multiple their final score to 1.1.
example: 300 QSO x 50 +11000 coordinates difference points + 3200 additional points = 29200 points.

6. Short-wave listeners : SWL stations must copy both calls and one exchange numbers in case of one-way QSO reception, and both call and both exchange numbers in case of two-way QSO reception. One-way QSO reception worth 1 point, two-way - 3 points. Dupe reception of the same station on the same band worth 0 points. Final score is the sum of the QSO points by the bands.

7. Awards : 1st, 2nd and 3rd place plaquettes will be awarded in each category, listed in the "Categories" section if there were at least 5 participants. MULTI-ONE, SINGLE-OP ALL HIGH and SINGLE-OP ALL LOW categories continental winners and Polar Circle stations winner will be awarded as well.

8. Log submissions : Stations expecting to enter a "top ten" score in any category MUST use electronic submission. Submit your log as an attachment in a cabrillo format. Filename for your log should contain your call sign, for instance RX9RXX.CBR. Be sure to put your call and category name in the "subject" line of your log submission, for instance: RW4WR SINGLE-OP ALL HIGH. Title sheet should contain the following data….

contest name;
dates of the contest;
callsign, used in the contest;
category;
station location;
operator's call sign, full name;
address;
number of QSOs

The counting of points is unessential. Contacts in a log submission should be made in chronological order. Each QSO or SWL record must contain the following (* asterisk means not obligatory requrement in case of paper logs):
Frequency, kHz (14010, 3500, etc.), **paper log - MHz**;
Mode *;
Date; *
UTC;
Your call * (for SWLs - one of the received calls);
Sent exchange number;
Other station's call (for SWLs - another received call);
Received exchange number

The example of electronic or paper log:
START-OF-LOG: 2.0
CONTEST: RAEM
CALLSIGN: RX9RXX
CATEGORY: MULTI-ONE
CLAIMED QSO TOTAL: 1
CLUB:
OP1: Mikhail Kokov RX9RA
OP2: Victor Ivanov RY9RA
OP3: Sidor Sidorov RZ9RA
ADDRESS: P.O. BOX 00, Nonamecity
ADDRESS: 630032, Russia
ADDRESS: rx9ra@yandex.ru
SOAPBOX:
QSO: 21051 CW 2008-12-28 0700 RX9RXX 001 54N63O UA9OA 001 55N83O
END-OF-LOG:

9. DEADLINE : Log submissions should be sent to the organizers within 30 days. All entries must be postmarked NO LATER than January 27, 2009. Log submissions sent after that day or received after February 11, 2009 will be accepted as the check-logs. An extension of the log submission terms may be given by the referees if requested by letter or other means. In that case the last deadline would be given.

Submit your log to raem@srr.ru
Your mailed logs should be sent to Alexander Pashkov, P.O. BOX 177, Novosibirsk, 630032, RUSSIA