

# Radio Jamming in the Soviet Union, Poland and others East European Countries

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A specially emitted radio interference is classified into radio communication jamming and radio broadcasting jamming. The first occasions of jamming of military radio telegraph were recorded back in the beginning of the 20th century. Germany and Russia were the first to engage in jamming back then. The jamming signal most frequently consisted of co-channel characters. It was until the early thirties, when the first cases of jamming of radio broadcasting were recorded. In the late 20's Berlin started to jam the programs of Radio Komintern. In 1931 the USSR jammed the Romanian radio, in 1934 Austria jammed the German radio. The Lithuanian language broadcasts of the Vatican radio were jammed by the USSR in 1940.

Massive jamming of foreign radio broadcasts was initiated by the USSR in February of 1948. It was targeted at VOA and BBC Russian language broadcasts. Eventually jamming developed into a true monster, the greatest jamming network in the world. The Soviet jamming network was administrated by the 2<sup>nd</sup> department of the all-union ministry of communications, headed by Natalia Krestyaninova for more than 25 years.

The Soviet Union and its East European allies used six types of the jamming audio signals:

1. To block out the "most anti-Soviet" stations, a wide spectrum electronically generated noise signal was used. RFE/RL, Voice of Israel, and Radio Tirana would experience this type of jamming.
2. On August 3, 1964, one more source of interference was invented - Radio Mayak program, transmitted in FM mode and heard distorted on domestic receivers - to jam some "grey propaganda" stations such as VOA, BBC, Deutsche Welle, and R. Beijing.
3. In 1976, Soviets started to use the speech resembling signal.



Radio monitoring operator at her workplace in "control and correction post" of Kaunas city local radio jamming station in Lithuania.



Communications receivers "Krot-M" (USSR), used for tracking of the jamming targets in the 50's and 60's.

Its advantage was that it conformed to the timbre of the human voice. This jamming sound, which used to be played back from open reel tapes, was composed of two voices of male and female Russian announcers.



In 1971-1980 the Polish language programs of RFE were jammed from the USSR with a nonstop music, sent from Warsaw.

4. A unique case was the Polish service of RFE/RL: from 1971 until 1980 only light instrumental music was employed to jam it, both in clear AM and distorted FM modes.
5. East Germany aired its domestic radio programs via medium wave transmitters tuned in to several hundred Herz outside of the RIAS frequencies.
6. Czechoslovakia used the swinging carrier, also known as wobler, AM transmitters to jam RFE/RL.

The report of the RFE Engineering Department (dated January 29, 1982) calls for at least 4 transmitters per jammed program for each beam necessary. 250 kW and 500 kW transmitters have been proposed to replace the old 100 kW units in the RFE and RL relay stations. In Israel, there was an attempt to build a high-power radio station (16 x 500 kW) for transmission of the VOA, RFE and RL programs to the Soviet Union. This effort was halted due to the local protests. In Portugal, six 500 kW transmitters were installed. Fourteen of the 16 RFE/RL's language services were jammed, and twelve of the 21 languages of VOA. Deutsche Welle (DW) was jammed in five of its 11 East European and USSR languages. BBC was jammed in two of its 12 Eastern languages. The effectiveness of jamming ranged from minor annoyance to total blockage.

W. Edwards, "Longwave duel": "The trading pawn in the hands of the U. S. had been the megawatt long wave transmitter located in Munich. The record shows that when the Soviets stopped jamming the VOA Russian programs in June of 1963, the VOA megawatt transmitter in Munich shut down very soon thereafter. In August 1968, when the Soviets resumed jamming of the VOA. [...] the megawatt in Munich returned to the air. Again, in September of 1973 Soviet jamming against the VOA stopped and a month later the megawatt transmitter on 173 kHz went off the air. This off again-on again relation was rooted in the 1948 European Broadcasting Conference at Copenhagen where medium wave and long wave frequencies were



Tape-decks "Tembr" for playback of the "speech-like" audio signal, used for jamming in the USSR in 1976-1988.



Device for playback of the "speech-like" jamming audio signal

assigned to the participating countries within Europe. Under the plan, 173 kHz was assigned to the USSR. [...] The presence of the VOA megawatt transmitter in Munich appearing on the same frequency caused an acerbic reaction - the Soviets took the position that their 500 kW signal on 173 kHz from Moscow was being jammed".

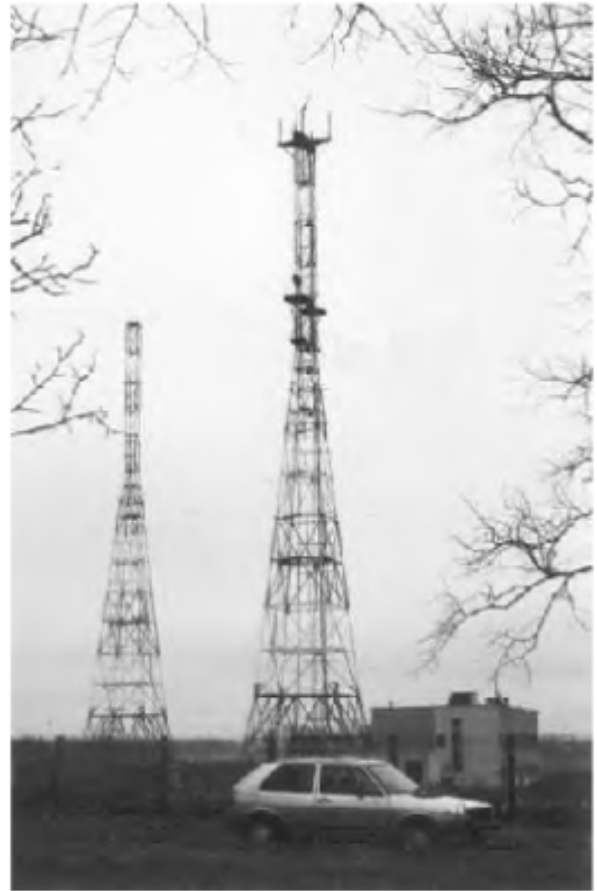


500 kW MW transmitter "Vikhr" was a reserve unit for jamming at Sitkūnai radio station in Lithuania.

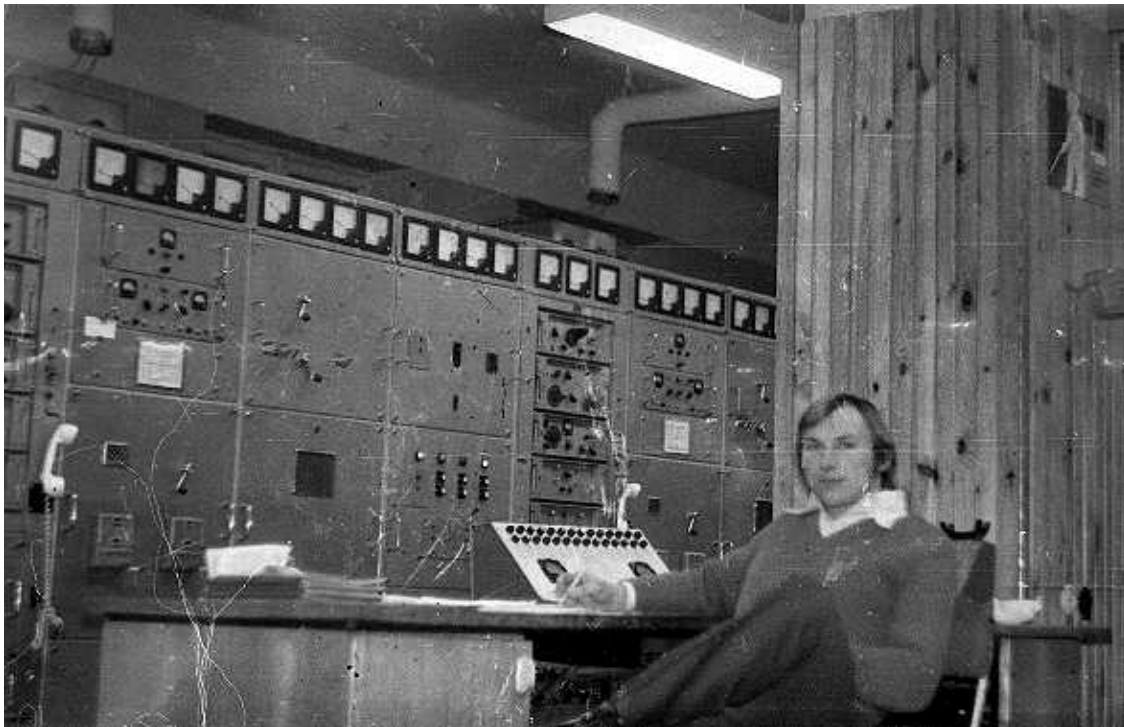
**Jamming in the USSR:** The local jamming transmitters ranged in power from 1 to 20 kW with 10 to 20 units per station. The typical antennas were multi-wire broadband dipoles, suspended vertically or at 45 degrees angle. The effective range of ground wave jamming usually was about 30 km. In 1986, the local jamming stations were located in 81 big city of the Soviet Union. Dwarf jammers were numbered with "60" and "600" series ("Object Nr. 600", etc.), while giants were assigned "800" series.



Balashikha local radio jamming station (15x20 kW) near Moscow.



Panevėžys local radio jamming station (10x5 kW) in Lithuania



Transmitter technician and equipment at the "Object Nr. 600" in Vilnius, Lithuania. Late 70's

Some of the broadcasters liked to be deceptive: Radio Beijing used to change its frequencies slightly during the broadcast (frequency agility method), leaving the hoarse choir of Soviet jammers aside. There were several occasions recorded when R. Beijing played its Russian programs backwards, and these particular frequencies were not jammed. Moscow monitors would tape programs, play them backwards to make transcripts, and submit the scripts to the KGB and Communist party bosses.



**2.5/5 kW SW communications radio transmitters "Viaz-M2" (USSR), used at the local radio jamming stations in the late 70's and 80's.**

The jamming monitoring sites ("Control and Correction Posts") used to be installed several kilometers away from the transmitting facilities. The operators - mostly women - scanned the HF broadcasting bands. It was their decision to start jamming, depending on the actual audibility of the target station. Monitors issued orders by a dedicated phone line to the transmitter personnel to tune a particular transmitter to a particular frequency. All frequencies, times, station names, program languages and audibility evaluations were entered in logbooks. The transmitters sometimes were switched on remotely from the receiving site.



**Radio monitoring station of the local radio jamming station ("Object Nr. 600") was located in this house of Vilnius, Lithuania**



**Standard multi-wire broadband "VGDSH" type dipole, used for ground wave jamming in the USSR**

Vytautas Liatukas, a supervisor of Kaunas city jammer in Lithuania, complained in a company paper back in 1975 about their station "being in continuous shortage of filaments for radio tubes, transmitter measuring devices, cabling, as well as about the poor condition of the roof of the building and antennas." Some transmitters were said to be in operation for as much as 20 years with no major overhaul.



**Transmitter building of the "Object Nr. 603" in Kaunas, Lithuania.**

According to an old Soviet standard, masts of the jammers were painted in yellow and black until 1975, to prevent enemy aircraft from identifying them in the natural background. From about 1975 onward, all the radio and TV towers, including jammers, were painted in white and red. They have been illuminated at night with red non-blinking lights.



**Tower of the local radio jamming station in Tallinn, Estonia.**



**2.5/5 kW SW communications radio transmitters "Viaz-M2" at the local radio jammer near Panevėžys in Lithuania.**

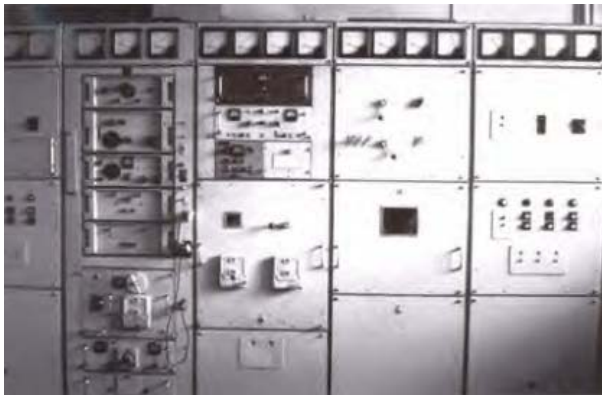
Every jammer used the same identification code, or call sign, for all its transmitters, made up of two letters. The call letters of the jammer were transmitted twice per minute for identification of each station.

Jonas Čepas, a veteran of the State Radio Frequency Service of Lithuania, gave the following exclusive account: "We witnessed many problems affecting TV and radio broadcasting caused by the shortwave transmitters used to jam foreign radio stations. Various combinations of the signals interfered with television and radio programs broadcast on long, medium, and short waves, with radio communication and other radioelectronic equipment. The signals emitted by powerful transmitters made their way even to the electric circuits of tape recorders and record players. Being aware of the many heavy-duty transmitters operating near their residential areas, people were worried about health hazards related to effect of the electromagnetic field. Measurement data proved that the worries were substantiated".

Thirteen long distance jamming radio centers with over 100 high power (50-500 kW) short wave transmitters were used for blocking out large territories by transmitting interference into specific region. The operational distances of such sky wave jammers were 500-3,000 km. The vertical curtain array and rhombic antennas were used for long range jamming. Additionally, the USSR jammed from its territory the Polish, Czech, Slovak and Bulgarian language programs of RFE/RL, VOA, BBC and DW. Several secret cross-border jamming agreements were signed between Moscow, Prague, Sofia and East Berlin. Romania and Hungary participated in the cross-border jamming network until 1963-64. There were 10 to 12 sky wave jamming centers in East Europe with over 90 transmitters.



**Standard 88.5 m tower of the Soviet local radio jamming stations**



**2.5/5 kW SW communications radio transmitters "KV-5" (USSR), used for the local jamming in the 50's and 60's.**



**Vertical curtain array SW antennas, used for the long-distance sky wave jamming**

Those who used to span the dial could often find "holes" in the jamming wall. Twilight immunity was one of several technical methods used for many years by the Western broadcasters to reduce jamming. The twilight immunity makes use of broadcasting to the target area on certain frequency on which the skywave jammer, placed a few thousand kilometres to the East, cannot be effective for a given area because of its lower maximum usable frequency at that time.

Roar of jammers smothered RFE/RL, VOA, BBC, DW, Voice of Israel, R. Beijing, R. Tirana, R. Korea and R. Free Russia. Before 1963, broadcasts from Vatican, Rome, Belgrade and Paris were jammed as well. Several times, when the political climate became warmer, the USSR would stop jamming government stations from London, Washington and Cologne:

- Six months in 1956, between Khrushchev's visit to Britain and the Hungarian crisis
- In September of 1959, during Khrushchev's visit to the U. S.
- In early 1960 until the "U2" incident
- June 19, 1963 - August, 1968 (Soviet invasion of Czechoslovakia)
- September, 1973 - August 20, 1980 (Martial law declared in Poland)

For over 30 years Washington and Moscow held an ongoing debate about radio jamming and I list below a comparison of their main arguments:

U.S.: "The participating States make it their aim to facilitate the free and wider dissemination of information of all kinds" (Helsinki Agreement, 1975); "Any frequency assignment shall have the right to international protection from harmful interference." (Article 9, ITU Geneva Regulation); "Everyone has the right to seek, receive, and impart information through any media and regardless of frontiers" (Article 19, Universal Declaration of Human Rights); "All stations whatever their purpose must be established and operated in such a manner as not to result in harmful interference to radio services or communications of other members" (Article 28, Montreaux convention).

USSR: "The sovereignty of the USSR in the field of radio broadcasting secures for the USSR the possibility and rights to sever a radio aggression directed against her in ether." (International Legal Regulation of Radio Communication and Broadcasting, S. Krylov, 1950); "The participating States will respect each other's sovereign equality and individuality as well as the rights inherent in and encompassed by its sovereignty... they will respect each other's right to define and conduct as it wishes its relations with other States in accordance with international law..." (Helsinki Agreement, 1975).



MW jamming modulator "Zenit-M" at Sitkūnai radio center in Lithuania



Communications receivers "R-399A" (USSR), used in the 80's for tracking of the jamming targets.

Officially the Soviets failed to mention the fact that they jammed foreign radio stations for a long time. Later they admitted it and declared they had rights to "defend the national sovereignty of countries in the fields of information and culture". The United Nations adopted a resolution in 1972 that declared jamming to be a violation of human rights. At several summits - e.g. Reykjavik, 1986 - the Soviets proposed to cease jamming of VOA (not RFE/RL) in exchange of the rights to acquire or to rent AM and FM transmitters in or near the U.S.

On the evening of November 29, 1988 the Soviet Union ceased to jam all foreign radio stations. The jamming session that lasted for 40 years was over. In December of 1988, Czechoslovakia and Bulgaria stopped the jamming of RFE/RL's broadcasts. In the end of 1988, not less than 1600 transmitters were switched off in about 120 jamming radio centers of the USSR, Czechoslovakia and Bulgaria.

When the Soviet Union collapsed, some jammers were converted into broadcasting stations or were put in month balls; others were dismantled. One such low power jammer, installed shortly after the WWII in the Jewish cemetery of the Lithuanian Baltic seaport Klaipeda, was also dismantled, and the chapel was returned to believers. In another city the closed jammer building was converted into a café. Some former Soviet jammers were modified into a commercial radio stations, as Radio 7 in Moscow.

**Jamming in Poland.** RFE/RL archive document dated August 17, 1956: "During the period of unrest [...] it has been decided to end the jamming of Western broadcasts in Poland"; "newspapers reported the local jamming station is being dismantled." The date acknowledged by the Polish government is November 24, 1956. After a short period of confusion, jammers in Czechoslovakia and Russia carried on against the RFE Polish broadcasts. However, the cessation of local jamming within Poland itself greatly increased the intelligibility and reliability of reception of RFE programs".

Stanley Leinwoll, a former RFE/RL manager, wrote in his article "Jamming - Past, Present, and Future" ("World Radio-TV Handbook", 1980): "Coincident with a series of riots in the city of Poznan [...] jamming of RFE Polish language programs was ended. The official date was November 24, 1956. There had been mounting outcries from the press about the jamming of foreign broadcasts, and it has been reported that at the onset of the Poznan rioting the local jamming station was destroyed".

Ralph Walter, Perry Esten, "Jamming against RFE programs" (July 6, 1965): "In the summer of 1964 the USSR switched to a new type of jamming against RFE Polish programs. Instead of noise modulation formerly used, the new interference consisted of very distorted program material from the "Mayak" program, which is a 24-hour service from Moscow for listeners in the USSR and abroad. It is believed that this new type jamming was adopted to minimize complaints from the free world about jamming operations".

David Walcutt, a retired RFE/RL engineer, wrote to me in 1997: "I have a lot of material on jamming. These are files that were moved to Washington after the Munich office of RFE/RL closed.



**Racal "RA-1772" (UK) communications receivers, used for tracking of the jamming targets in the 70's and 80's at the receiving station near Warsaw.**



**Building of the former monitoring station of the cross-border radio jamming operations in Poland, 40 km East of Warsaw.**

But when the Engineering Department closed, I rescued these materials from the trash because of their historic nature. It is certain that Polish jammers were located in Russia.

There are triangulation studies which prove it". Triangulation data was collected by Deutsche Bundespost and ITU.





**Popovka SW broadcasting center near Leningrad (St. Petersburg) in Russia, used in 1971-1988 for cross-border jamming of the RFE/RL Polish language programs.**

RFE/RL archive document dated July 14, 1971: "From 11 to 27 of December, 1970, RFE Polish channels were jammed by music programs without announcements, whereby Poland used several of its short-wave channels. This was caused by the unrest in Gdansk and other Polish cities. On 18 March 1971 jamming activity was resumed. After two days modulation became distorted. Added was an increased jamming activity from the USSR: partly Mayak jamming (distorted) and partly pop music (distorted).

RFE/RL archive document dated January 27, 1982: "Soon after the commencement of martial law in Poland, heavy jamming from transmitters located inside the Soviet Union was affecting all of our [RFE] Polish frequencies. At the same time we noticed a dramatic decrease in jamming on the Czechoslovakian service. This indicates that the jamming transmitters covering our Czechoslovakian programs were shifted to cover Poland". Research of the Institute for Telecommunications Services: "In many instances, a specific marker could be associated with a particular broadcast language. For example, the jammer with the marker "1G", located near Leningrad, primarily jammed Polish language broadcasts.



**100 kW SW "Tesla" transmitters near Warsaw were shortly tested for jamming of the RFE Polish programs in December of 1970.**

An interesting feature of most of the Polish language jammers was that they were not located within the borders of Poland. For example, jammers that were associated with Polish language broadcasts were found in Leningrad ("1G"), Tashkent ("4F"), and Kiev ("1D").



**Antenna field of the SW radio station near Lidzbark Warminski in Poland, used for cross-border sky wave jamming, beamed to the Soviet Union, Czechoslovakia and Bulgaria.**

**Jamming in Czechoslovakia.** "RFE/RL Research": "Before the invasion of Czechoslovakia this language service was jammed by stations both inside and outside the country. The latter are in the USSR. On May 8, 1968 Czechoslovakia had stopped all jamming except for some transmissions of RFE. Immediately after the [Soviet] invasion and for several days thereafter there seemed to be some confusion among the jamming networks and some of the lower frequencies we used for Czechoslovak were free of jamming. What jamming there was on the higher frequencies then seemed to be by jammers in the USSR, and for a while the medium and lower short-wave frequencies were quite clear of jamming. This situation changed about the beginning of September 1968 when [...] the former jammers located in Czechoslovakia made a slow comeback: the old call sign "Z3" was first heard again on 25 November, 1968 and "G7" reappeared on 7 January 1969. A new stronger jammer started on [medium wave] 719 kc on 25 March 1969. In summary, all Czechoslovak frequencies are now heavily jammed from the USSR and Hungary, and from within Czechoslovakia. Jamming against the RFE Czechoslovak service has varied over the years, but can in general be characterised as heavy noise jamming". There were 18 local town jammers in Czechoslovakia. Three sky wave jamming radio stations transmitted interference to the USSR and Bulgaria.

**Jamming in Bulgaria:** In 1951-1988 there was a network of local jamming stations, covering all the major cities, as well as several sky wave jamming radio centers, beamed at the USSR, Poland and Czechoslovakia.

**Jamming in Hungary:** The local and sky wave radio jamming centers were active between 1951 and 1964. By the end of February 1964, no incoming cross-border jamming was heard, except one low-power station in the Ukraine.

RFE research document "A history of jamming", dated 17 October 1965: "The classic jamming pattern still found in the case of RFE Czech/Slovak and Bulgarian Services (and used against all RFE languages prior to November 1956) is that of extensive coverage of a country with low - or medium - intensity interference from long-range jammers located in the Soviet Union or in other satellites, plus reinforcement in highly populated areas by large numbers of local jammers. Generally a number of transmitters at different locations are active against each frequency to be jammed. Operations are coordinated by a central authority which includes a monitoring facility for identifying jamming targets and probably for assessing effectiveness."

In the early seventies USIA announced its plan to use communications satellites to start television broadcasting directly into the USSR and Eastern Europe. According to Viktor Sheimov, a KGB communications expert who fled to the West, the Central Committee of the Communist Party instructed the *Institute of Space Research* to design a satellite television jamming system. The scientists had concluded that jamming of satellite television with existing surface jammers would probably be ineffective due to the narrow beam receiving antennas.

On 27 March 1990 at 1:30 a.m. local time the American TV Marti started broadcasting into Cuba from the U.S. air balloon Fat Albert (part of the U.S. border surveillance system) floating over Cudjoe Key, South of Florida. Cubans had installed many small jamming transmitters beforehand that effectively "erased" the first TV Marti programs. However, the jamming was inadequate in the country side. To extend the jamming range, Castro's engineers and pilots equipped several Russian made Mi-17 helicopters with jamming equipment. The Cubans got so excited that they even started jamming Radio Marti's services from VOA transmitters in Greenville, NC, and Bethany, OH. Radio Marti previous to this had not been jammed by Cubans for 5 years.

It has been recently reported in 1997 that "Med TV, the world's only Kurdish language satellite TV, suffered deliberate technical interference on 1st July, the launch date for its new test transmission on Eutelsat" (Med TV/World Media, BBC). Before this there was a Turkish protest aimed at Syria over Med TV's terrestrial relays. According to World Media, the jamming was not an accident because "it completely swamped Med TV with a noisy dark screen and silenced the TV sound." The management of Eutelsat began to investigate this affair but technically it is very difficult to determine the jammer's location. Med TV director Hikmet Tabak's view is that the Turkish Government has "both the political motive and the financial and technical capacity" to jam the Kurdish television station. BBC monitoring specialists confirm the existence of intentional jamming. Med TV's representatives assert that interference in Turkey is carried out from the Sinop uplink station "by means of military equipment". It is difficult to counter this type of jamming because the satellite's transponder automatically relays the jamming signal sent to it.



**Sky-wave jammer near Kashi in Xinjian province, western China (39N20/75E46): one of 13 rotatable Thales ALLISS antennas with 500 kW Thales TSW2500 transmitters**

In the fall of 1997 Anatoly Batiushkin, one of the former managers of the Soviet jamming system, gave this answer to my inquiry: "All employees who have had at one time a direct relationship with (jamming) work are now retired pensioners, and my efforts to ask them to review your book (*Jamming*) were not successful. All jamming sites have been either converted to other purposes or have had their equipment written off. All related legal, technical and operational documentation no longer exists."

By the end of 2003, the most active jamming countries are China, Cuba, Iran and Vietnam. The jamming emissions were also traced in North Korea, South Korea, Morocco, Saudi Arabia and Myanmar. Besides, Cuba and Iran are involved in satellite television jamming.

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