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SOVIET ELECTRONIC COUNTERMEASURES DURING INVASION OF CZECHOSLOVAKIA

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SOVIET ELECTRONIC COUNTERMEASURES DURING INVASION OF CZECHOSLOVAKIA

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SOVIET ELECTRONIC COUNTERMEASURES DURING INVASION OF CZECHOSLOVAKIA

Summary

Preliminary data indicate that the USSR's use of electronic countermeasures during the invasion of Czechoslovakia was carefully planned and well executed.

Details

The Soviet Union commenced extensive electronic jamming and chaff seeding against the radars of the Czechoslovak Air Defense System at 0035Z on 21 August. Electronic countermeasure activity was concentrated southeast and east of Prague to screen and protect Soviet air movements. The last ECM activity noted during the intrusion was at about 1600Z on 21 August. Jamming apparently was not targeted in the radio frequency range of NATO radars; the locations of chaff seeding suggests that it was not intended to screen Soviet air operations from Western observers.

Both electronic jamming and chaff seeding are believed to have been conducted mainly by Long Range Aviation (LRA) TU-16/ BADGERs and connotes a peripheral support role for LRA aircraft in some contingencies.

The chaff drops were similar in some respects to those seen in Soviet air defense exercises over Eastern Europe. The altitudes and speeds of dispensing aircraft as well as chaff trail widths of 6 to 15 nautical miles were similar to those seen in exercises. Chaff fall rates, however, varied from 400 to 700 feet per minute, which is somewhat faster than the average rate previously observed. The chaff reportedly was very dense and was characterized by instant blooming on observing radar scopes.

Electronic jamming was most intensive in the S-band frequency range utilized by Czechoslovak EW/GCI, height finder, fire control, and missile control radars. Jamming bandwidths of 10 to 380 MHz

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were reported. From available information, it cannot be determined if the very wide bandwidth jamming signals were transmitted by single jammers or from multiple jammers installed in specially configured ECM aircraft. It is probable that jamming bandwidths exceeding 100 MHz emanated from multiple jammers. Of special interest is the report of a short duration 3850 MHz jamming signal. [redacted] Moreover, there was a short incidence of possible jamming of the FAN SONG B missile guidance signal [redacted] In addition, VHF jamming was intercepted at 144-147 MHz. [redacted]

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The ECM phase of the Soviet invasion appeared to have been carefully planned and well executed, but, since there was no military opposition to test its effectiveness, a final judgment cannot be made. The overall ECM employed appeared to have provided the Soviets with an effective cover to deny the Czechoslovaks information on air operations. Most of the ECM flights are believed to have taken place southeast and east of Prague, but the air defense centers located in both zones of the country's air defense district were probably denied adequate data to follow or to counter air activity.

Chaff Drops

At 0038Z, a single aircraft in the vicinity of Hradec Kralove (5013N-01550E) was initially detected dispensing chaff at an altitude of 41,000 feet at an approximate speed of 420 knots. Chaff dropping by multiple aircraft continued until 0253Z by which time 24 chaff trails had been dispensed. The major portion of the chaff formed a large figure eight pattern extending north and northeast to approximately 5025N-01523E and 5005N 01649E with a cross-over point at 5000N-01529E. The lower half extended southwest to approximately 4937N-01425E and 4926N-01535E. Chaff trails were sown continually over the same area. The air surveillance sector filter center at Opatovice (5013N-01550E) and its subordinate EW/GCI radar stations were completely blanketed. At one point during the drops the ECM aircraft appeared approximately 10 nautical miles ahead of the chaff trail; later the aircraft was observed one nautical mile ahead of the chaff; then for periods of time the aircraft merged with the chaff. The drift was south-southeast at 25 knots. The aircraft appeared to make additional drops as soon

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as the chaff appeared to be fading; they seemed thus able to compensate immediately for the loss of an effective screen.

At 0212Z, chaff was dropped to screen an aircraft deployment from southwest Poland in the Legnica (5112N-01612E) area. Three flights of aircraft in a long trail formation were effectively screened by chaff at 18,000 feet.

From 0537Z to 0757Z, a minimum of nine chaff trails were dispensed. One 45 nautical miles long trail of chaff extended over the Bechyne (4918N 01429E) area to the southwest. North of Pardubice (5002N 01547E) in the Czechoslovakia-Polish border area extending into Poland, four aircraft dispensed one chaff trail, two aircraft dispensed five, and one aircraft dispensed two. Aircraft altitudes varied from 25,000 to 48,000 feet. At 0727Z, chaff dropped by one aircraft was used to screen 30 aircraft flying in trail on a northeast heading out of Czechoslovakia.

At 1039Z one aircraft outbound from Czechoslovakia on a northeast heading laid a 35 nautical miles chaff trail which faded at 1053Z. At 1050Z, 12 aircraft broke out of the chaff heading northeast. Other aircraft were observed flying the same route after the chaff had faded.

Beginning at 1410Z, additional chaff activity was indicated by a chaff trail in the Czechoslovakia border area north of Prague. This trail appeared to be screening three aircraft which broke out on a northwest heading toward East Germany. Another trail was started east of Prague over Kolin (5002N 01512E) on initial east-southeast heading. The ECM aircraft assumed a northeast heading and continued dropping chaff until 1540Z. At this point, the trail was 148 nautical miles long. At 1549Z, eight to twelve aircraft were detected with an initial point coincident to the start of the drop; the chaff had begun to fade, and the aircraft were not screened.

At an unspecified time, a "radar cloud" about 50 nautical miles in diameter reportedly drifted from Czechoslovakia into Austria. Austrian teams sent to find samples were unsuccessful. Since it is generally difficult to find chaff -- especially the micro-wire type -- their failure is not surprising.

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Electronic Jamming

From 0035Z to 0702Z, extensive airborne electronic jamming was detected over Czechoslovakia. Jamming consisted mainly of S-band A310Z noise modulated signals at 2590 to 3140 MHz. Bandwidths of 80,100, 110, 120, 210 and 380 MHz were reported for the S-band A310Z jamming. The A310Z signals displayed unusual "clicks" which occurred at 1.1 to 1.5 second intervals. The significance of the "clicks" is not known, but they may be related to timing or "look-through" devices. VHF A343Z jamming at 144-147 MHz occurred from 0047Z to 0429Z; the bandwidths were not reported. The major portion of the Czechoslovak Early Warning/Ground Controlled Intercept, Fire Control, Missile Control and height finder radars operating in the S-band appear to have been saturated by the jamming.

DIA-25x1 [redacted]

One intercept of A310Z jamming was made at 3850 MHz with a 60 MHz bandwidth for a five minute period. The last noted instance of jamming in this frequency range occurred in April when Soviet LRA BADGERs performed an extensive air defense exercise penetration over the Eastern European Communist area. Conclusive evidence is not available, but a possible target for this jamming could be the SA-2 missile fusing system.

DIA-25x1 [redacted]

ELINT detected an unusual signal which may be associated with the jamming of land-based guided missile systems. The signal had not been noted before in Eastern Europe. A noise-modulated CW signal was intercepted over the Prague area at 834 MHz with a bandwidth of 15 MHz at 0638Z and continued to 0647Z and again from 0657Z to 0702Z. Possibly associated with this jamming was an A310Z signal from the same general direction at 2935 MHz from 0659Z to 0701Z.

DIA-25x1 [redacted] In addition, a single aircraft

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flying at 29,000 feet dispensed a 55 nautical miles long chaff trail from 0639Z to 0700Z. The chaff trail started some six nautical miles southeast of Prague and ended about 10 nautical miles northeast of Pardubice and faded at 0800Z.

DIA-25x1 [redacted]

During periods of S-band jamming, height finders and Early Warning/Ground Controlled Intercept radars were intercepted on

DIA-25x1 frequencies being jammed. [redacted] During the period 0135Z to 0325Z, A310Z jamming signals were noted on radio frequencies of 2692, 2630, 2780, 2810 and 3020 MHz at bandwidths of from 10 to 14 MHz. (SECRET NO FOREIGN DISSEM/EXCEPT CAN/UK)

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