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GUIDED MISSILE INTELLIGENCE COMMITTEE

REPORT OF THE

SPECIAL ENGINEERING ANALYSIS GROUP

27 November 1957

Washington, D. C.

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GUIDED MISSILE INTELLIGENCE COMMITTEEREPORT OF THESPECIAL ENGINEERING ANALYSIS GROUPI. INTRODUCTION

This report summarizes the studies and resulting conclusions of the Engineering Analysis Group which was formed to analyze the TALENT data on the Kapustin Yar and Tyura Tam-Klyuchi missile test ranges. This group was requested to establish, as completely as possible from photographic data, the types, sizes, performance, and development status of Russian missile and rocket projects. A thorough and complete briefing on the photographic information was received and preliminary examination of the data carried out. It was concluded by this group that only through the use of other available intelligence information could a reasonable analysis of the TALENT material be made. Therefore, COMINT, ELINT, RADINT, and other intelligence data was provided for reference. Particularly in examining photography showing the Tyura Tam test range instrumentation and orientation these other data were invaluable. Due to the limits of photographic coverage, erroneous conclusions were being drawn which were corrected only by use of the COMINT information. Thus, all source information was requested to eliminate obvious misconceptions and prevent wasted effort.

Since the composition of the analysis group encompassed all primary fields associated with missile development, specialty teams were formed. The format of this report essentially follows this team breakdown. The use of small teams provided not only the necessary specialist concentration but also gave continuity to the analysis of facilities common to the various areas.

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In the body of this report, the ranges, locations, zones, dimensions, and nomenclature are taken from the briefing charts prepared for OPERATION JAM SESSION. Therefore, reference should be made to the plates of the zones mentioned in reading this report.

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II. GENERAL CONCLUSIONS

1. The Soviet test ranges and rangehead facilities at Kapustin Yar and Tyura Tam represent a capability and potential that is generally equivalent, and in some respects superior, to that of the US. The land area of the rangeheads is well in excess of that devoted to all US ranges combined. At the present time, however, the US ICBM launch facilities appear to outnumber those found in the TALENT material.

2. The entire facility complex indicates that the Soviet missile program is directed almost exclusively to the development of mobile systems. Even their largest missiles appear to have been developed for rail mobility. Of significance also is that the mobility is apparently incorporated from the beginning of the research and development program. Thus, the operational ground support equipment appears to be developed simultaneously with the missile.

3. The Soviet programs have evidently been well planned, both in the weapon system and outer space vehicle fields. Existing facilities at Kapustin Yar, Tyura Tam, and Klyuchi have the capacity for supporting the known Soviet missile programs with considerable expansion in rate of activity achievable, if required. In addition, Tyura Tam-Klyuchi is capable of sustaining both highly energetic propulsion systems and large complex space vehicles.

4. These test ranges have at least as many instrumentation sites as any of the US ranges, thus indicating that the Soviets attempt to obtain a large amount of information from each firing.

5. The extensive and diversified research and development programs being conducted on the Soviet missile test ranges indicates that large and capable research, engineering, and manufacturing organizations exist in support of these programs.

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6. The study reported herein is not considered to have exhausted the useful data from PROJECT JAM SESSION. The quantity of data alone precluded this. However, the level of this current effort is believed sufficient to provide considerable knowledge on the Soviet missile development programs.

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III. DETAILED CONCLUSIONS

A. SURFACE-TO-SURFACE BALLISTIC MISSILES

1. Kapustin Yar

a. The lack of identifiable main communications and administration facilities indicates that complete photographic coverage has not, as yet, been obtained.

b. The overall average rate of fire per pad together with the apparent reliability of firing indicates an efficiently designed and operated range, as well as high reliability of missile components.

c. The development of operational ground equipment appears to progress simultaneously with development of the rest of the missile system.

d. There is TALENT evidence of the development of at least some second generation missile weapons.

e. The areas associated with ballistic missiles appear to have been developed for mobile systems capable of reasonable accuracy.

f. The long-base "V" and "L" configurations seen in front of the launch stands are probable range instrumentation tracking systems. (Occasional ELINT intercepts of S-Band beacons could be identified with these units.)

g. Single station radio-inertial guidance techniques (e.g., Corporal RIG) are strongly indicated by TALENT for missiles fired from Zones¹ 7, 9-North, and 9-South. These guidance systems are probably road mobile.

h. The guidance system used at Zone 8 cannot be determined from TALENT coverage. It is possible that an all-inertial system is used with the short-range missiles which are associated with this launching complex.

1. See Kapustin Yar Graphic Books 1 and 3.

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1. It is difficult to identify a guidance technique in the TALENT coverage of Zone 10. Poles on the launch stand may suggest collimation of inertial components; the similarity of Zone 10 and Tyura Tam in this respect is interesting.

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2. Tyura Tam-Klyuchi

- a. The existing facilities at Tyura Tam and Klyuchi have the capacity for supporting the ICBM/ESV programs presently noted.
- b. The instrumentation complex in the Klyuchi area makes it well suited for either land or water impacts of ICBM re-entry vehicles.
- c. The 60 mile baseline configuration composed of instrumentation stations 28, 30 and the launch stand (Plate 22, Tyura Tam-Klyuchi Book) is probably a range instrumentation tracking system.
- d. The "Azusa" cross configuration observed at Tyura Tam and Klyuchi are probably VHF interferometers (e.g., microlock) used for range instrumentation or satellite tracking.
- e. The two 110 foot towers observed on the Tyura Tam launch stand are possible collimation devices for aligning inertial guidance systems prior to takeoff. Similar towers are observed on the launch stand of Zone 10 at Kapustin Yar.
- f. No reliable estimate of ICBM guidance accuracy can be made from the present TALENT and COMINT coverage of Tyura Tam.

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B. SURFACE-TO-AIR MISSILES

1. A very extensive surface-to-air missile research and development test program is apparent in the Kapustin Yar area, from which the system deployed operationally around Moscow was developed.
2. There is a lack of evidence of the development of a different system. Specifically, there is no evidence of the development of a low altitude or area defense surface-to-air missile system.
3. Present surface-to-air missile flight tests probably do not extend beyond a range of about 25 nautical miles.
4. From the elaborate surface-to-air missile support and fabrication facilities at Kapustin Yar area, it is logical to expect continuing use of the facility for testing new surface-to-air missile systems.

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C. AIR-TO-SURFACE MISSILES

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2. At least one short-range air-to-surface weapon system is operational. This is probably a "first generation" system, not particularly sophisticated. Characteristics may include (approximations):

- a. Range - 45 nautical miles
- b. Launch altitude - medium, 15,000 feet
- c. Launch speed - low, 250 knots
- d. Flight path - 3° or less below horizontal

3. The TALENT material reveals that the Vladimirovka complex is a suitable base for a long-range air-to-surface missile activity, using the Air Force associated test range as a firing area. No evidence of such activity has been found as yet.

4. Close links between the airport complex at Vladimirovka, the support/launch facilities at Zones 10-12, and the Air Force associated range toward Lake Balkhash suggest facilities for an advanced program. The airport and range could support high altitude/speed manned vehicle research similar to the US X-1, X-2, and X-15 programs. Zones 10-12 could permit firing of a first stage and manned last stage glide rocket as a step toward manned space flight.

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D. VLADIMIROVKA-LAKE BALKHASH RXBY GOO68 TEST ACTIVITIES

1. The TALENT information is insufficient to confirm or deny the existence of a new test range.



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3. The operations and control of the new test range appears to be somewhat divorced from that of either Kapustin Yar missile test range or Tyura Tam missile test range.

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4. The new test range may be elaborate enough to accommodate any type of missile or manned vehicle testing restricted only by the confines of the test range. Race track courses could be flown for long-range airplanes or cruise missiles.

5. The new test range may or may not be directly connected with part or all of the new installations (TALENT information) being constructed in Zones 10, 11, 12, 13 and 14 near to and north of the Vladimirovka airstrip.

6. Of the many types of activities that may be utilizing this suspected new test range, it seems most logical to connect it with a manned satellite research test program. However, it should be noted that no specific evidence from TALENT or COMINT sources is available to support this conclusion.

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