DEPARTMENT OF THE ARMY
OFFICE OF THE ASSISTANT CHIEF OF STAFF, INTELLIGENCE
WASHINGTON 25, D. C.

20 March 1958

ACSI-IT

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MEMORANDUM FOR: CHAIRMAN, GUIDED MISSILE INTELLIGENCE COMMITTEE

SUBJECT: Evaluation of REG-372, Proposal for MTI Indicator

1. Reference is made to REG Report EG-1877, subject: "Proposal for a Moving Target Indicator", and to memorandum from GMIC, dated 16 January 1958, subject: "Request for Advice from GMIC R&D consultant to Chief, REG. We concur in the following comments by Dr. Saunders and Mr. Pervy W. Griffin of DOFL in evaluation of the report, EG-1877.

    a. This is the first step in a design process that has gone a long way in America.

2. What is required is not just frequency coherence, but phase coherence.

3. The claim that blind speeds are eliminated is erroneous. This is a function of the information sampling rate. In our view, the Soviets are probably well aware of the requirement for an MTI system for the B-200 system and are probably devoting intensive effort to develop an MTI so as to provide the B-200 with a low altitude capability. However, we do not believe that when and if the Soviets become aware of Kummer's patented MTI, such a proposal will have any appreciable impact on the Soviet MTI development program.

4. The proposals of REG-372 resemble the way a modern U.S. pulse doppler radar works, provided the block designated as the "reference frequency generator" is maintained phase coherent or synchronized with the radar frequency.

It is doubltful that it applies to the B-200. The fundamental doppler frequency for a target flying at 1000 feet per second being detected by an S-band radar is:

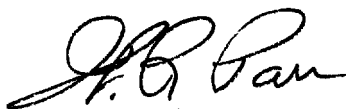Unable to determine regrading data

$$D = \frac{100V}{\lambda}$$

where

D is given in cycles per second
V is given in knots
is transmitted wavelength in centimeters

then: $\quad 1000 \ 1/\text{sec} = \frac{1000}{6080} \times 3600 = 592 \text{ knots}$

and: $\quad D = \frac{(100) \ (592)}{10} = 5920 \text{ cycles/sec}$

This frequency would be easily detected without multiplication if the radar PRF were high enough. It does not appear that the B-200 PRF is high enough for the doppler frequency to be detected.

5. On the basis of this evaluation, it is not too likely that the proposal of REG-372 would have been given any more consideration by the Soviets than any other MTI proposal.

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