STANDARD FORM NO. 64

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Office Memorandum • UNITED STATES GOVERNMENT

TO : The Files

DATE: 13 February 1959

FROM : [redacted] 25X1

SUBJECT: Trip Report re Noise Modulated [redacted] 25X1

1. On 3 February 1959 a visit was made to [redacted] 25X1
[redacted] to monitor the progress of Contract 25X1
RD-128, Task Order 7, Study for Noise Modulated [redacted] Partici- 25X1
pating in discussions concerning this program were:

[redacted] 25X1

2. [redacted] reported that much of the study had been completed 25X1
and that he hoped to finish the final report on this program by 15 March. Many sections had been written, and the remaining portions, most of which deal with packaging considerations, will be written in conjunction with the design engineers at [redacted] After a 25X1
review by us, the report will be printed and published early in April.

3. [redacted] described in detail the modulation method that [redacted] 25X1
is recommending for the noise modulated [redacted] The contractor 25X1
is suggesting that a generated reference signal be used, provided by a feedback shift register. This reference signal will have a very short repeat time, in the order of 100 milliseconds. A 100 microsecond pulse will be the basic signal unit and a code of about 100 of them will be used for each 10 millisecond mark or space signal. The contractor ruled out the use of filter pairs since heavy equipment would be needed at the transmitter. He also excluded the use of a recorded reference because the mechanical stability of recorders is not adequate. A transmitted reference is not recommended since the need to provide two virtually parallel channels, one for information and the other for reference, is felt to be altogether too cumbersome.

4. A modified matched filter may be used at the base station, instead of [redacted] to provide protection against multi- 25X1
path energy losses. A simplified search procedure will be possible if peak energy alone is to be recovered. Preliminary calculations indicate that only a 5 to 10 db loss is suffered if peak signals alone are used. [redacted] said that the anticipated multipath problem might rule out the 25X1
use of this set on double loop circuits, and he recommended that low frequencies for daytime operation be avoided.

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5. [redacted] has made little progress on an advanced storage medium and is recommending a simple tape loop to store the 500 characters of our message. The output of this tape, however, instead of keying the transmitter directly, goes into a single-character shift register and is readout at a constant rate, so that inaccuracies due to tape wow and flutter are eliminated. If the tape fails to fill the shift register in time for transmission of a new character, a blank is transmitted while the tape catches up with the shift register. [redacted] was asked to discontinue its work on the coder, since it had gone as far as it could and was considering a subcontract to a computer firm. [redacted] was asked to devote his remaining effort to modulation and packaging considerations. 25X1 25X1 25X1

6. [redacted] outlined a new noise modulation technique to [redacted] and asked for their comments and reaction to it. It is a simple approach in which purely random noise is transmitted for "space" and modulated noise, from the same random source, is used as "mark". Modulation consists merely in maximizing the third moment of the random noise signal in order to permit a specially equipped base station to differentiate between mark and space signals. To an ordinary receiver, the signal sounds like continuous noise. [redacted] has completed preliminary analysis of such a system and asked if [redacted] would be interested in continuing the work. [redacted] said they could see no obvious shortcoming in the technique and agreed to look into it. [redacted] said that sufficient excess funds would be available within Task Order 7 to allow an active pursuit of this problem. 25X1 25X1 25X1 25X1

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