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Office Memorandum • UNITED STATES GOVERNMENT

TO : Contract RD-27, Task Order No.2

DATE: 12 February 1953

FROM :

[Redacted]

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SUBJECT: Conference with [Redacted] on the Transistor Research Program

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1. A visit was made to the plant of the contractor [Redacted] on 11 February 1953, for the purpose of monitoring the progress of the subject contract and further to discuss the possibilities of enlarging the transistor program. The following persons were present:

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[Redacted]

2. Prior to this visit, the contractor was requested to be prepared to discuss the merit of expediting the existing work program and/or initiating a new Task Order for the design of equipment. At the subject conference, the contractor was queried as to the feasibility of such action and also as to his willingness and capabilities of undertaking such an expanded program.

3. Firstly, it was stated that the existing program which this Agency has contracted for was essentially a long range program and is being treated as such by the contractor. The circuit investigations which are being undertaken are concerned with experimental transistors which exhibit characteristics which are not likely to be attainable in production transistors until the first of 1955. Consequently, a speed-up of this present program was not thought to possess too much merit. In addition, the additional manpower necessary for such a speed-up is not presently available.

4. Information was sought on the target production dates by the [Redacted]. The present plans call for the initial production of point-contact transistors by the first of 1954. The electrical characteristics of these transistors are by no means known at this time but tentative data sheets have been drawn up and they indicate that these transistors may be useful up to frequencies of approximately 10 megacycles. The initial production of junction transistors is scheduled for the middle of 1954. However, it is anticipated that these types will be useful for audio frequency work only with a small possibility that the frequency characteristics will be such as to allow their use in 500 kc I.F. Amplifier designs.

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5. Based upon the above information, it was stated that if a product design of a transmitter-receiver were to be initiated at this time, that it would be based entirely upon the use of point-contact transistors. And further, it was stated that this design would constantly be altered as the tentative data sheets for the production transistors were altered and completed. Even so, this is somewhat the same procedure that is used for circuits designed for developmental vacuum tubes. This procedure allows the design to be completed shortly after the production tubes are available.

6. The advantages of a transmitter-receiver design using these point-contact transistors was then discussed. It was pointed out that this Agency was not particularly interested in transistorized equipment for the sake of transistors alone but that some real advantages in size and weight must be realized to make such a program feasible. A transmitter with one watt of R.F. power output and a minimum requirement receiver, both with a frequency range of 2 to 8 megacycles was taken as the basis for the discussion. It was assumed that this equipment would be battery powered. If an equipment design for such a transistorized transmitter receiver were initiated at this time, [] engineers stated that no attempt would be made to provide a transistor output stage for the transmitter. However, all other tube functions would be accomplished by transistors. [] engineers would not commit themselves at this time on how much power savings would be realized by such a design. They did state, however, that no appreciable reduction in size and weight could be expected.

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7. The contractor was requested to prepare a paper design of a completely transistorized receiver, indicating expected performance characteristics and power drain, based upon the use of the point-contact transistors. It was agreed that this would be done and that it would be forwarded separately to this Agency. This paper design is necessary for a more exact evaluation of the action to be taken with regard to this program.

8. A preliminary estimate of the power savings to be expected, based upon an extension of the information obtained from the contractor can be made at this time. The total power savings for both the transmitter and receiver will be between 10 to 15 per cent. The reason this is such a low figure is because the transmitter output stage alone requires 60 to 65 per cent of the total equipment input power. A new evaluation of these figures will be made at the time the contractor forwards more complete design information. It would appear, however, that a more substantial power savings would be required to make such a project feasible, especially in view of the fact that size and weight reduction will not be appreciable.

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9. Work on the present Task Order involved a matrix analysis of transistor circuits, mixer circuits, phase inverters, and I.F. amplifiers. The work for the next two month period will continue with these same investigations as well as initial work on transistors in variable frequency oscillators aimed at providing a receiver H.F.O.



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