

The Files - Project 2655

26 March 1959

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Trip Report - Miniaturized Test Equipment

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1. On 16 March 1959 a visit was made to the [redacted] Philadelphia, Pennsylvania. This visit was made for the purpose of reviewing [redacted]'s preliminary proposal for the miniaturized signal generators which are required under this program. The following persons participated in the meeting:

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2. The meeting began with a review of the requirements for this equipment. Since miniaturized signal generators in the frequency range of 10 mc to 21 kmc are required, [redacted] used Hewlett-Packard equipment specifications as a point of departure. This approach was suggested by Messrs. [redacted] on [redacted]'s last visit to Washington. Hewlett-Packard covers this frequency range in eight separate units. [redacted] initially used the same approach. Generally speaking, [redacted] felt that most of the specifications cited by Hewlett-Packard for their equipment could be held to within an approximate degree by [redacted]. However, to accomplish our required size reduction, complete redesign of a great portion of the equipment is a must. To accomplish this, the [redacted] engineers have several methods under consideration.

3. For the 10 to 460 mc range, [redacted] felt that the unit could utilize solid state construction throughout. A transistorized oscillator and buffer amplifier could be used here. This, incidentally is the only unit where complete transistorization may be effected.

4. In the 450 to 1230 mc range, all solid state construction, with the exception of the oscillator and buffer sections, may be accomplished. In these two sections vacuum tubes such as the GE 7077 or Sylvania 5757 would have to be used. There is also a possibility that the power amplifier section may be eliminated.

5. The 800 to 2100 mc range may be completely transistorized except for the RF generation sections. There is a remote possibility that the RF may be generated by utilizing transistor and diode harmonic generation.

6. The next frequency range, 1800 to 4000 mc, could also effectively be completely transistorized with the exception of RF generation. This may be circumvented by using: (1) a klystron with an external tunable cavity, (2) vacuum tubes, (3) transistor and diode harmonic generation, or (4) a voltage tuned magnetron.

7. As for the upper frequency ranges of 3.8 to 7.6 mc, 7 mc to 11 kmc, 10 to 15.5 kmc, and 15 to 21 kmc, [redacted] indicated that they may all be transistorized with the exception of RF generation. Methods under consideration to accomplish the RF generation in these units involve: (1) klystron tubes, (2) backward wave oscillators or (3) traveling wave tube amplifiers.

8. All equipment units will meet the required packaging dimensions of 20" x 20" x 12" crated for shipment. Each unit will have provision for 110/220-volt AC and 6-hour DC battery operation. The equipment will be designed so that the batteries may be trickle charged when operating from the AC line.

9. Near the end of this meeting, Messrs. [redacted] indicated that, if possible, [redacted] should consider reducing the total number of deliverable units. This might be accomplished by covering a larger frequency range per unit than Hewlett-Packard does. The [redacted] engineers considered this approach and agreed that the total number of units could be reduced to approximately 6 units.

10. The last item to be discussed at this meeting was the preliminary budget estimate for the signal generator system. [redacted] currently plans to divide the program into two phases. Phase I would encompass a study and development period of approximately 7 months during which time a complete working breadboard of each signal generator would be fabricated. The cost for this phase is tentatively quoted at \$138,690. Phase II of this program would permit fabrication of one complete production prototype system. These units would all be complete working engineering units which could conceivably be sent to the field for equipment evaluation. The cost of this phase has been tentatively quoted as \$110,870. [redacted] was asked to indicate what he felt would be an accurate price for the production run. A total of 12 systems are required.

Considering the production prototype system as the first of the group, the balance of 11 systems would run in the neighborhood of \$20,000 each. This would be a total cost of \$220,000. As a result, the overall equipment development program would cost approximately \$469,560. Finally, [REDACTED] indicated that [REDACTED] would make a special effort to have a complete formal proposal submitted to the Agency by 1 April 1959.

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