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November 11, 1960

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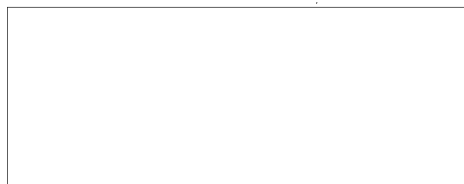


Dear

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Enclosed please find Technical Report Number 2 on the development of AP-3 and PS-10 power supplies.

Very truly yours,



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Vice President



Enclosure

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November 8, 1960

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Report of progress on development of AP-3 and PS-10 Power Supplies

In the last 2 1/2 weeks we have finally been able to make substantial progress on the development of these power supplies. Prior to this time we had been waiting for delivery of a prototype miniature power transformer from both suppliers (Malmac and United Transformer Co.) with whom we had placed orders. Both transformers arrived nearly simultaneously. The Malmac unit is the smaller of the two and we spent about one week working on a design based upon its use, since the package size if we used this transformer would be smaller. A careful investigation, however, showed that this transformer was not satisfactory and that the manufacturer had gone too far in miniaturization. It did not meet the necessary electrical requirements. The transformer from U.T.C. was then tried in our circuit and was found to perform satisfactorily. However, this transformer was designed using a "C" core and results in a certain amount of wasted space. We have now determined that a compromise between these two transformer types is possible and will result in our obtaining the required performance in this smaller possible transformer size, and we are having the compromise transformer built for us at the present time. Using this transformer, the package size for the miniature supply will be 7.5" X 4.6" X 2.5".

In this package size, no compromise with the original electrical performance specification is required. The 2 Ampere regulated output can be delivered continuously and the 5 Ampere unregulated output can be delivered on a continuously occurring 50% duty cycle. In the battery charging mode of operation, 4 Amperes can be delivered continuously. With the test battery we have here, this results in fully charging the battery in less than two hours. It should be pointed out that charging the battery at this rate can be dangerous if the operation is not monitored and charging discontinued when the battery is fully charged, because the final charging current is about 2 Amperes. There is no meter indication that the battery is charged. The condition of the battery will have to be monitored visually and the power supply disconnected when the battery is fully charged.

The electrical performance, as far as ripple, regulation and stability is concerned, is excellent and well within the original specifications. Delivery of the final version of the transformer is expected in ten days, and the final packaging of the supply will then take place.


Vice President

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