WORKSHOP B: USER/SUPPLIER COMMUNICATION

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The consensus of all the participants was the folowing:

A. Early communication between the system designer and the hardware supplier will have significant improvement in cost and cycle time.

B. The use of off–the–shelf designs whch meet the environmental requirements must be implemented in the 1990's to be cost competitive.

C. Minimize bureaucracy that clouds the system requirements and significantly increases product cost. In order to achieve this objective, the following recommendations came out from the panel discussion:

1. Initiate additionel educational program through technical confrences or industry lecture series to improve the dialog between system designer, supplier, end user, and all of the support services (quality control, material processes, documentation).

2. Establish a cooperative spirit between industry, government, and universtities to meet the future challenge of components and subsystems for military, aerospace, and commercial end use.

3. Obtain data from existing clocks in satellites and timing systems used by the military in order to establish a history of long term performance.

4. Improvements in testing and testing methods in order to eliminate non–value–added tasks that have significant impact on cost and cycle time.

5. The use of off–the–shelf products for significant advantage both in cost and delivery, however, it is imperative thata clear understanding must be achieved between the user and the manufacturer to ensure that the environmental requirements are met.

6. Communication: The following areas have continuously created cost and delivery problems.

   a) static vs dynamic phase noise

   b) stabilization time vs long term aging

   c) behavior of oscillator and clocks during transient conditions of shock, temperature changes, and random vibration.

A great deal of mystery exists in industry between the system designer, the responible engineer on the project, and what suppliers can provide. The education process is necessary and the possibility of "white paper"" generation for distribution though the industry would be helpful.

7. Over Specifying Requirements: The general consensus of all the participants is:

   a) It does not improve the reliability of the product. As a matter of fact, over testing and alignment difficulty might detract from the relibility of the product.

   b) There are significant cost drivers. 165 dB floor is readily achievable on quartz os SAW oscillators. 169 dB floor is twice as difficult.

   c) The added margin for safety and testing errors by each layer of people touching the specification makes some clocks impossible or very expensive to build.

   d) The bureaucracy in specifying the product has to be analyzed and reduced considerably with the objective of achieving system requirements without burdening the product with non–value–added requirements which, in many cases, triple the product cost.

The conclusion of the workshop is there are major misunderstandings between system designers, government imposed requirements, and product manufacturers which require communication, education, and constant dialog for better quality products at lower costs and with shorter cycle times.