

DEVELOPING AN "INFORMATION AGE" TECHNOLOGY

THE BEGINNING . . . Bob Anderson, inventor of the first simplified bistable, direct-view storage tube.

The art of inventing is a fusion of the imaginative and the practical.

The first step is in the realm of the practical, and typically consists of the identification of a specific and worthwhile need. This identification may come directly out of problems which are well recognized in existing devices, or may come out of the recognition of a previously unvoiced need.

The second step is in the realm of the imaginative, and consists of dreaming new dreams of better ways to reach the objective. At this stage, the untried uncertain conjecture is often the precursor of invention, for you cannot be truly new by building entirely on old and certain knowledge. There is no compromise with finished history—you either have something which differs from past knowledge, or you have no invention.

The third stage is again in the realm of the practical, and consists of experimental selection, verification and extension of the new concepts, and then the implementation through development, design, production and sales, which will involve many essential contributors besides the inventor.

All of these steps are equally important in the sense that, like the serial links of a chain, none can be omitted and still bridge the gap from "conception to contraption". However, the truly new idea is one of the more scarce commodities. The man who says "ideas are cheap" identifies himself as one who is not making his living and his career out of his ability to conceive new ideas. For the career inventor who takes the consequences of the ideas which fail, good ideas are crucial, scarce and most expensive—not cheap.

To the beginning inventor, I would offer these comments. Cultivate a deliberate sensitivity to problems, leading you to form a large and explicit backlog of unfilled needs. Then, think deeply about how you will select problems from this reservoir for your most intensive efforts. You will need to be working on many problems, and well chosen ones, since you will succeed so seldom. Do not scorn the imaginative, but be proud of your dreams, since they are at the source of creativity. Do not hesitate to use your own personal aids to the imaginative process, such as conjectural "bull sessions", graphic aids to visualization and information gathering activities. Do not be dismayed at those who persistently and critically ask why you need these procedures, for they are not equipped to understand your answer.

Be encouraged when an expert tells you that your concept is unworkable (if his reasons are vague), because he is really telling you that the novelty of your concept has taken him by surprise, and you are getting close to an answer.

Success often comes soon after such predictions of failure.



THE FUTURE . . . C. Norman Winningstad, Information Display Manager.



Today, the general population still has little contact with the computer. Although many paychecks and bills are computer prepared and processed, there is little direct contact between man and machine. Even engineers and scientists usually interface the computer through a stack of cards or a programmer.

Often, companies with computer installations are disillusioned because information needed for decisions is not readily accessible from the computer. How many times have you had to wade

through the pages of the weekly printout, vainly searching for what you want? If computer information was quickly and easily accessible, man could enter the "Information Age".

The remote computer terminal allows entry into the Information Age. Bring the information to the man! At Tektronix, we believe we have an excellent solution. Since one picture is worth 10,000 words, we are proposing graphic computer terminals rather than just alphanumeric terminals. We did not invent the idea of graphics, but Anderson's in-

vention led us to a practical, economic solution to graphics. We feel we are performing a "pump priming" operation.

There is little now in existence in operational information systems for several reasons. Software, compatible communications language and terminals all need to evolve further. Now that the key item of reasonable-cost terminals is here, the others will follow quickly. Software development is proceeding rapidly, especially among the time-sharing services. The ASCII code is close to a universal language.

The main point here is compatible business procedures. Let's not use business in the broad sense of purposeful human activity, but confine it to the communication of information. Accountants, for example, are used to scanning columns of figures, and develop the skill of reading trends from numbers. They would prefer to express the numbers graphically, but until recently, it was not economically feasible to obtain graphical results. Almost everyone today operates his business in alphanumeric simply because typewriters, teletypes and computer printers cannot do graphics and humans take too long to generate a graph. Wouldn't you like to have a PERT chart available to you, up-to-date on a daily basis for your individual projects? Or any Standard and Poor's stock performance chart updated daily?

Low-cost graphics, and the availability of mass data bases will fundamentally change the way we do business. From education to medicine, from engineering to housekeeping—nothing will ever be the same.

We are proud to be among the pump primers!