

Muisti ennen vanhaan

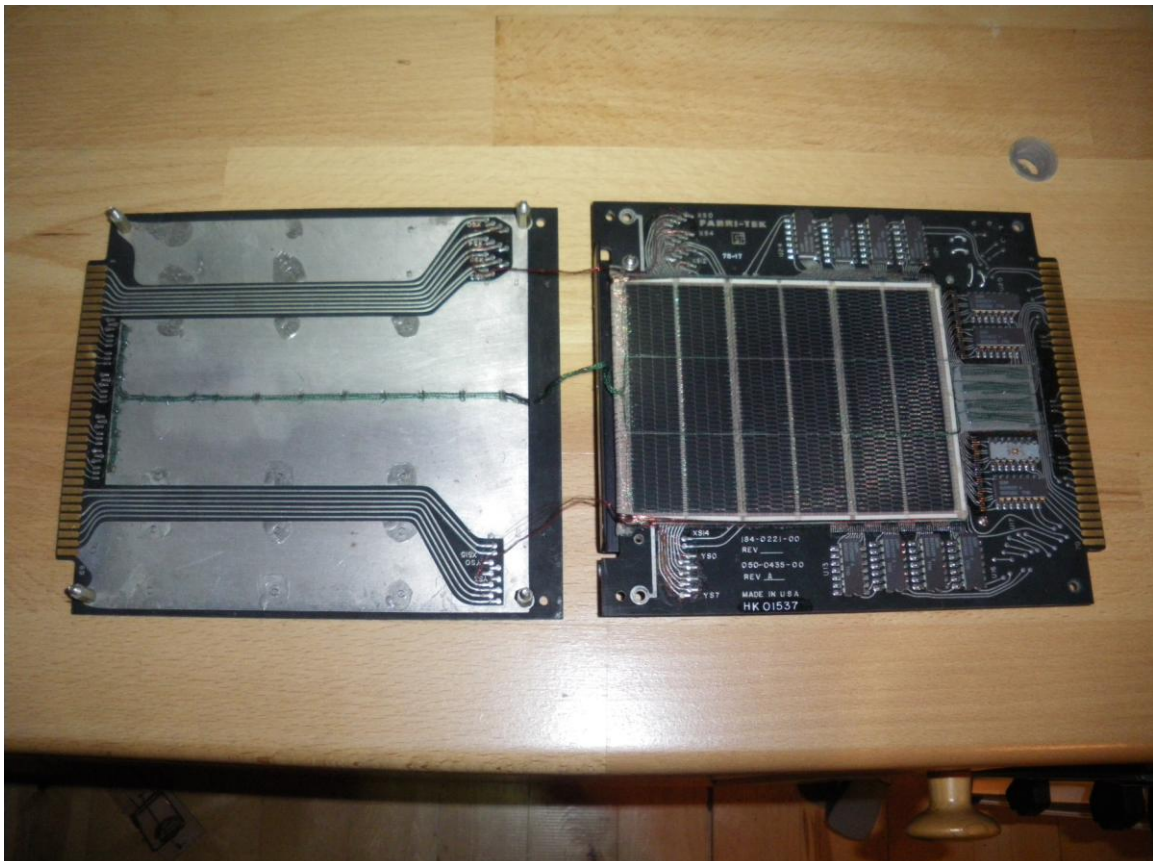
En olisi voinut kirjoittaa niin paljon resursseista ja energioista, jos en olisi ollut vahvassa yhteydessä minun parhaamaan tekniikkaan.

Lukekaa vanhoja Tiedelehtiä ja tulette huomaamaan, että lupaukset ratkaista maailmaan ympäristö-, sosiaaliset ja muut ongelmat teknisillä ratkaisuilla on ikivihreä tarina. Pidämme tarina totena koska unohdamme viimeistään yhden sukupolven ajan sisällä, että lupaukset keskimäärin eivät toteudu ja tekniikan aiheuttamia ongelmia on tullut rutkasti lisää.

Siksi pidän tieteen popularisoinnista. Silloin voi vielä olla hyötyä työstä, jonka eteen on leikeltä koe-eläimiä, räjäytelty kaupunkoja ja syytetty tekniikkaan kriittisesti suhtautuvia ajattelijoita takapajuisiksi nälviäisiksi.

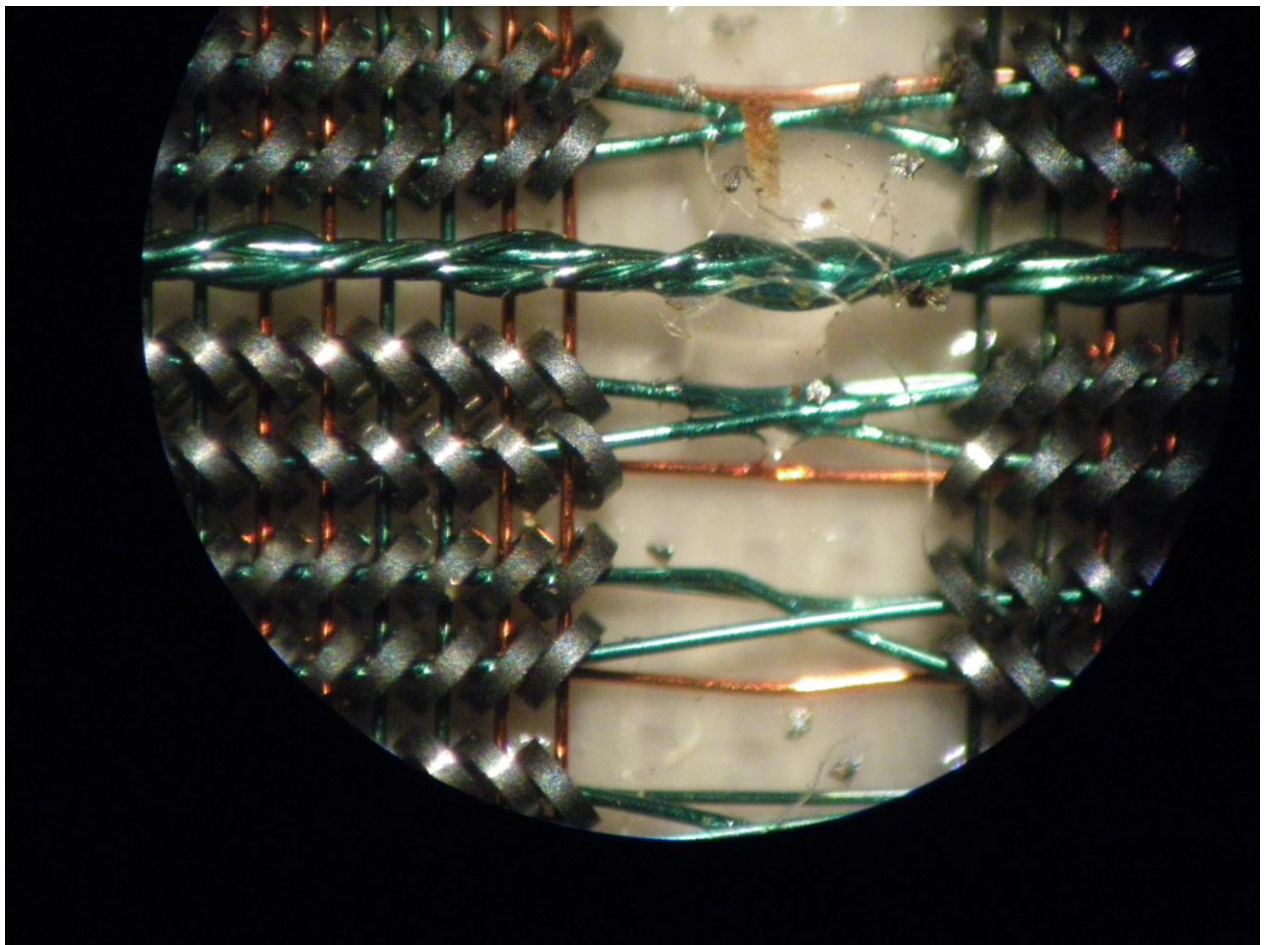
Näyttämällä museokuvia teknologian edistymisestä voimme ihmetellä, miten kauas olemme vieraantuneet maailmasta, jonka osa-alueet vielä olivat hallittavissa yhden ihmisen ajatuksin ja käsin. Se muu, joka ei ollut hallittavissa oli sitten jumalan tai luonnon määräämä kohtalo, jolle ei ollut mahdollisuutta valita.

Dyykkasin noin 30 vuotta sitten paikallisesta romukasasta jäänteiden tietokone-elektroniikan historiasta. Minun kannatti säilyttää sitä ladossa kymmeniä vuosia, koska voin vihdoinkin jakaa kuvan siitä teidän kanssa.



Ennen vanhaan sähköistä tietoa ei pystytty tallentamaan pysyvästi digitaalisilla piireillä. Kun sähkö katkesi, muisti haihtui. Siksi käytettiin 50 vuotta sitten tiedon pysyvämpään tallentamiseen samaa tapaa kuin kasettinauhureissa, joissa sähkövirtaa magnetisoi kelan kautta esimerkiksi rautaa sisältävän ääninauhan pintaa.

Vanha tietokonemuisti koostuu magnetisoituvista metallirenkaista, joita läpikulkeva virta laittaa joko bittitilaan 1 tai 0. Pienet ferriittirenkaat eivät näy paljain silmin, vaan otin kuvan mikroskoopilla noin 400x suurennuksella. Eli renkaan ulkoinen halkaisija on arviolta alle 0.5 millia.



Tämähän on hienomekaniikan ihme työ punoa tällaisia muistimattoja koneellisesti!

Alla on kuva koko piirilevystä jonka tummat suorakaiteen muotoiset alueet sisältävät niin uskomattoman määrän kuin 128 000 renkaita (joka on samaa kuin 128 kilobittiä) - ainakin muistaakseni, koska laskin niitä joskus 25 vuotta sitten). Muistimäärä on nykymittapuun mukaan naurettava ja ylittyy nykypuhelimilla kertoimella miljoona.

Kuvan otin edesmenneen isäni valokuvauslaboratoriossa nyt ennen kuin mahdolliset sukuriidat perintöjaosta estävät pääsyn huoneeseen. Heippa, hauskat härvelit, joiden läpi katselin lapsena maailmaa kunnes näin asioita selkeämmin.

Pienellä kaiholla,

Lasse Nordlund, 4.2025



FABRI-TEK
INCORPORATED



The Company

Organized in 1957 under the leadership of M. F. (Mike) Mickelson, Fabri-Tek has risen rapidly to the position of leadership in magnetic memory technology. The company now supplies core memories to the nation's leading computer manufacturers, and also supplies several foreign manufacturers.

Fabri-Tek employs over 2,500 people in plants located in Wisconsin, Minnesota and Pennsylvania. Products produced in these plants range from ferromagnetic memory cores to complete memory systems. The company also builds magnetic-film systems, special instruments, and computer education devices.

Not only has the company kept pace with the rapidly expanding data processing industry, but it has led in the areas of speed and performance. Fabri-Tek has produced the first commercially available magnetic-film system, manufactures a truly reliable one-microsecond memory system, has designed and built a practical mass core memory, and has presented the country's educators with a unique computer education system.

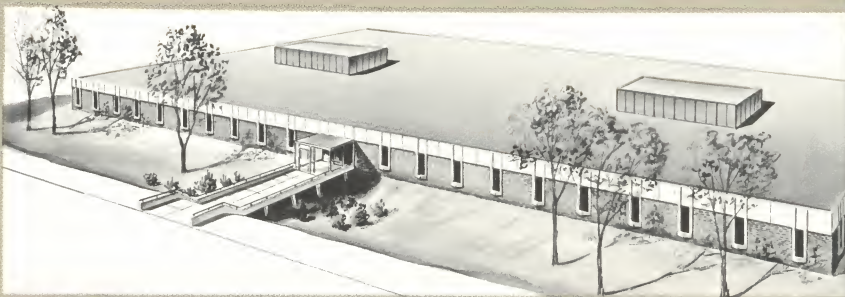


M. F. MICKELSON,
President





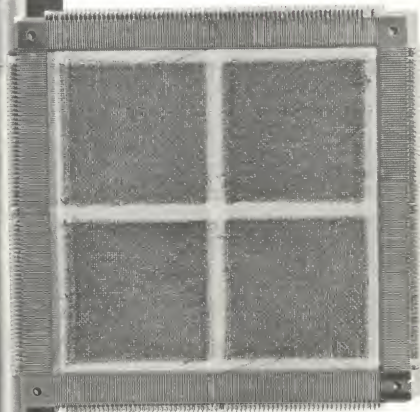
- 1 Amery, Wisconsin plant has 75,000 feet of engineering and manufacturing space.
- 2 St. Cloud, Minnesota plant has 10,000 square feet of manufacturing space.
- 3 Madison, Wisconsin plant has 6,000 square feet and houses the Instruments Division.
- 4 Eau Claire, Wisconsin plant has 25,200 square feet of engineering and manufacturing space.
- 5 Ft. Washington, Pennsylvania plant has 6,200 square feet and is producing ferromagnetic memory cores.
- 6 Edina, Minnesota plant, shown here as an artist's sketch, will have 100,000 square feet and will house corporate offices as well as the research and advanced product development center.





Products

Magnetic core memory **PLANES**..



Fabri-Tek manufactures the "heart" of the computer — its core memory. For those companies which fabricate their own memory systems, Fabri-Tek provides memory planes and stacks of every description.

Core memory planes are manufactured with either printed circuit frames or extended-pin contacts. Planes are available in the standard bit increments of 4,096 to 16,384 cores per frame, or in special capacities. Every core size and type is avail-

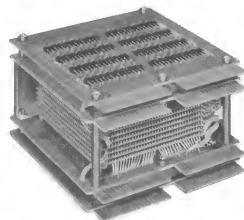
.. and STACKS

able to suit specific design requirements. Fabri-Tek also supplies magnetic-film planes and stacks.

Core memory stacks to match any physical, environmental, or circuit requirement are Fabri-Tek's specialty. Fabri-Tek's temperature-controlled stacks have been solving environmental problems with maximum economy for a number of years. Over 300 core memory stacks are shipped per week, representing 20,000,000 bits of information storage capacity.



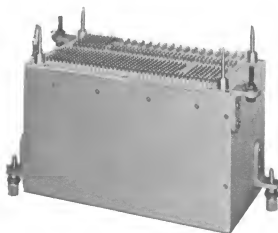
Customer: Control
Data Corporation
128 x 64 x 12 capacity,
temperature
controlled stack for
Polaris program



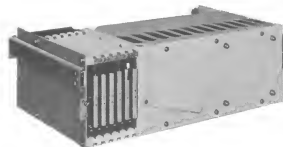
Customer: Honeywell
64 x 64 x 9 stack for
H-200 computer



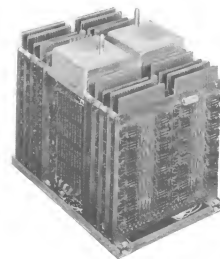
Customer: General
Electric Company
2048 x 74 stack for
635 computer



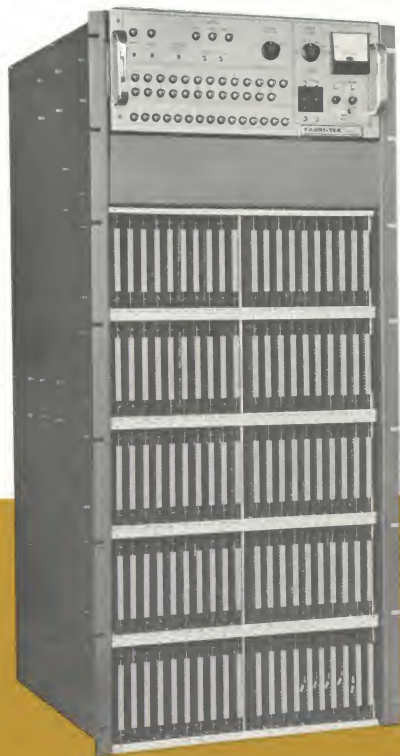
Customer: Bunker-
Ramo Corporation
16,384 x 16 stack for
BR 133 computer



Customer: Dynatronics
2048 x 19 stack for
simulator system



Customer: Honeywell
128 x 128 x 9 stack
for H-2200 computer



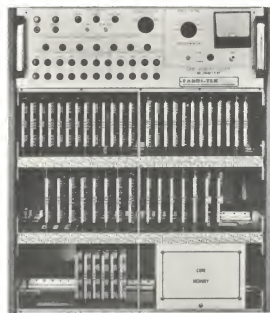
....and SYSTEMS

Fabri-Tek designs and manufactures complete memory systems ranging in speeds from 20 microseconds down to 300 nanoseconds, full-cycle time. Capacities are available up to 20-million bits or more. Any word selection scheme or operational mode can be ordered. All Fabri-Tek systems have the option of exclusive self-checking features. Each Fabri-Tek system design takes maximum advantage of the latest component advances in all-silicon semiconductors, integrated circuits, and fast rise-time transistors.

Series MA two-microsecond system. Meets most systems designer's needs for a field-proven versatile memory.

Series MF one-microsecond system. All-silicon semiconductors. Wide-operating margin reliability.





Series MB five-microsecond system. Used in many applications where slower speeds are called for.



Series MR ruggedized system. Meets rigid environmental requirements. All standard Fabri-Tek maintenance features.



Series MS all-silicon system. A two-microsecond system for uses requiring the wider operating ranges provided by silicon semiconductors.



Series MT mass core memory. The first practical mass core memory to offer over 20-million bit capacity with economy.

Series ML Memories. These versatile systems use integrated circuits and "big board" circuit design for maximum economy, while maintaining standard Fabri-Tek quality.

Series MC Memories. This is a compact, ruggedized system for airborne, van-mounted, or other special applications. A unique "sandwich" packaging permits the designer to choose any capacity he needs without extensive redesign costs.

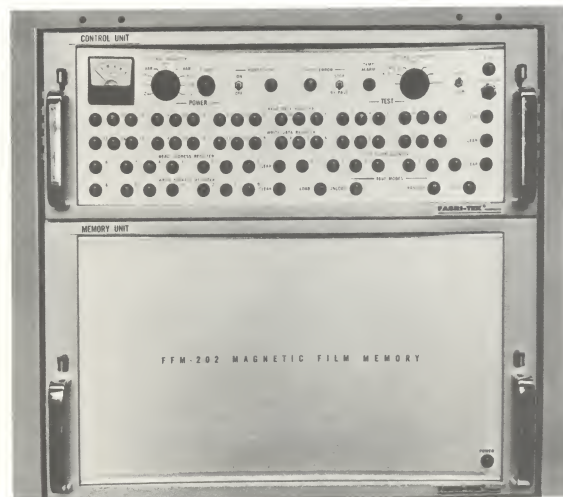


Series ML

Series MC

MAGNETIC-FILM Systems

Fabri-Tek's FFM-202 Magnetic-Film Memory system is the first 300-nanosecond film memory offered commercially. It is now available in modular form to systems designers who wish to take advantage of the field-proven Fabri-Tek designs in their own special applications. The magnetic-film memory stack alone, the stack with basic electronics, or the complete system are the three modular levels available. By choosing the appropriate module for his requirement, an engineer can tailor-make a high-speed memory system at optimum cost by avoiding much of the costly testing and circuit design associated with building a reliable film memory system.

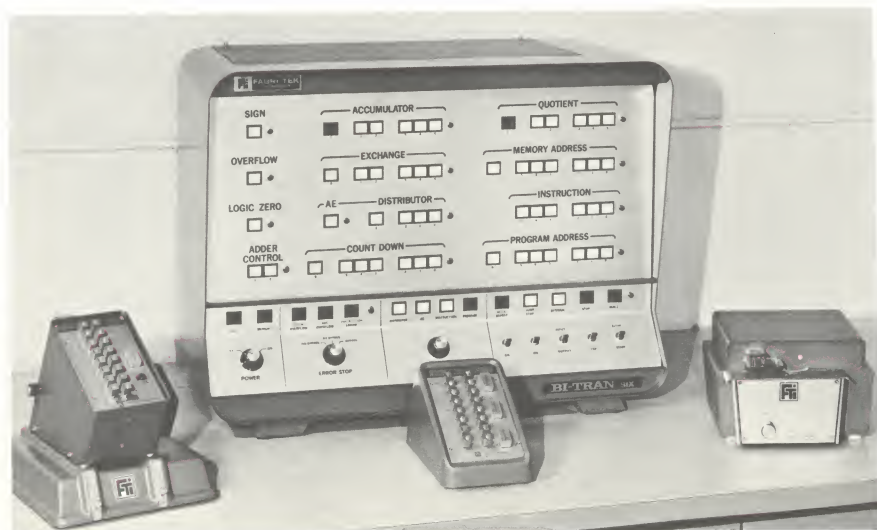


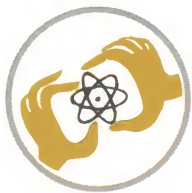
BI-TRAN SIX Computer Education System

Fabri-Tek has recently introduced to the educational market the BI-TRAN SIX Computer Education System. The central unit of this system is a modern, inexpensive, general-purpose computer which is designed exclusively for teaching purposes.

The BI-TRAN SIX system is used to teach the

fundamentals of computer science at any grade level from secondary schools through college, and can be used in vocational and military schools as well. Complete course material for every grade level is available. Peripheral equipment, also designed specifically to teach, makes the BI-TRAN SIX system a complete instructional laboratory.





Production

The manufacture of core memories is a careful combination of "hand made" skills and the latest automation techniques. Highly specialized tooling ranging from hundreds of jigs and fixtures through completely automated testing and manufacturing equipment has one single purpose — zero defects.



Left: Each of the millions of cores are meticulously wired, by hand.

Below: Memory cores are sintered in automatically-controlled kilns. Sintered cores are each measured and electrically interrogated by a completely automatic handler.





Left: Automatic flow-soldering machine solders more than 100,000 connections an hour.

Below: Memory plane for the Fabri-Tek 20-million bit mass core memory is carefully assembled by hand soldering. Every process, whether it be completely by hand or completely automated, has one ultimate objective — product integrity.

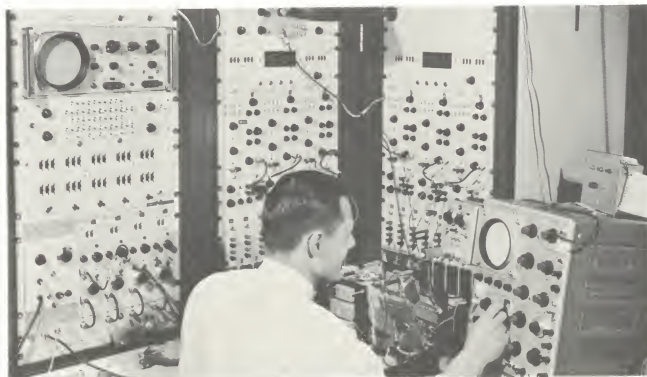


Quality Assurance

Quality assurance for an entire memory system begins with cores. Every part up to and including the memory system itself is tested 100%. Planes, stacks and systems receive 100% testing three times before being shipped.

Below: Automated stack tester completely checks out a unit by simulating every extreme electrical condition to which it could be subjected in an actual system.

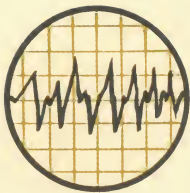
Right: Semi-automatic core tester checks the quality of the 20-million cores strung at Fabri-Tek every week. A single core can have as many as three individual check-outs before it is wired into a stack.



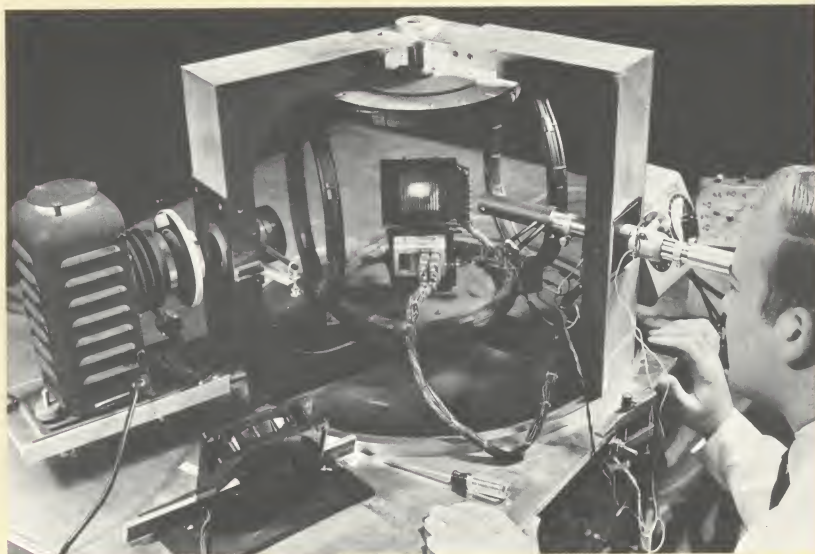
NASA Soldering School

Fabri-Tek requires every employee who solders to graduate from its NASA-approved soldering school. Only 50% of the students make the grade. The remainder are educated in other skills, but do not solder. Every unit produced at Fabri-Tek, whether for aerospace or commercial use, has the same high quality.





Research and Development

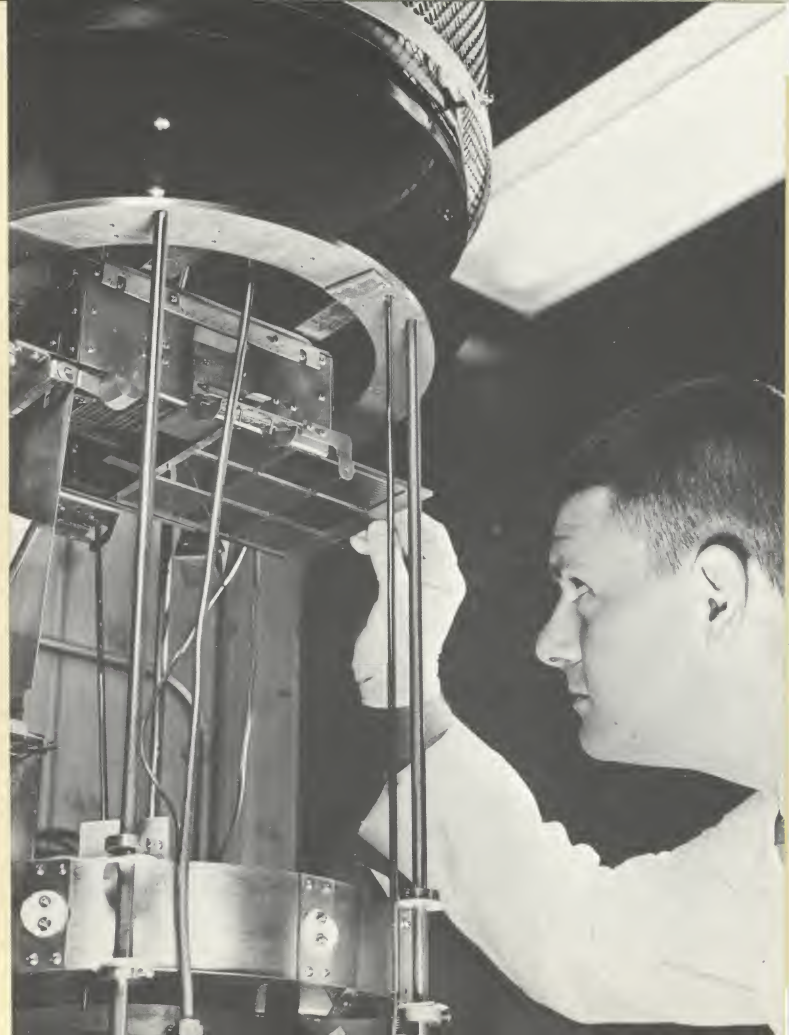


One of the keys to Fabri-Tek's remarkable growth is its strong commitment to research and development. One of the major areas of research has been, and continues to be, the deposition of films and their use in magnetic-film memories. Materials research is being heavily emphasized, as well as investigation of batch fabrication techniques.

Left: Magneto-optics and their effects are being studied here with a Kerr-effect optical device.

Far right: Batch fabrication of magnetic-film substrates to increase bit densities and to lower costs is under constant investigation.

Right: Other means of deposition, such as electron-beam bombardment "sputtering," are being researched to add to the present fund of knowledge available on memory films.

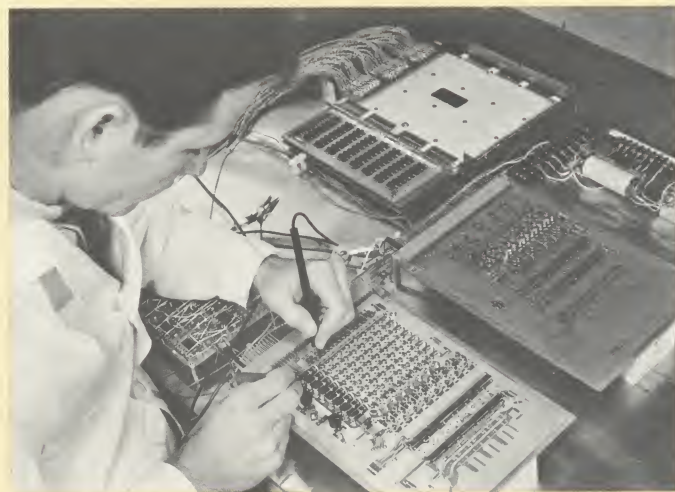
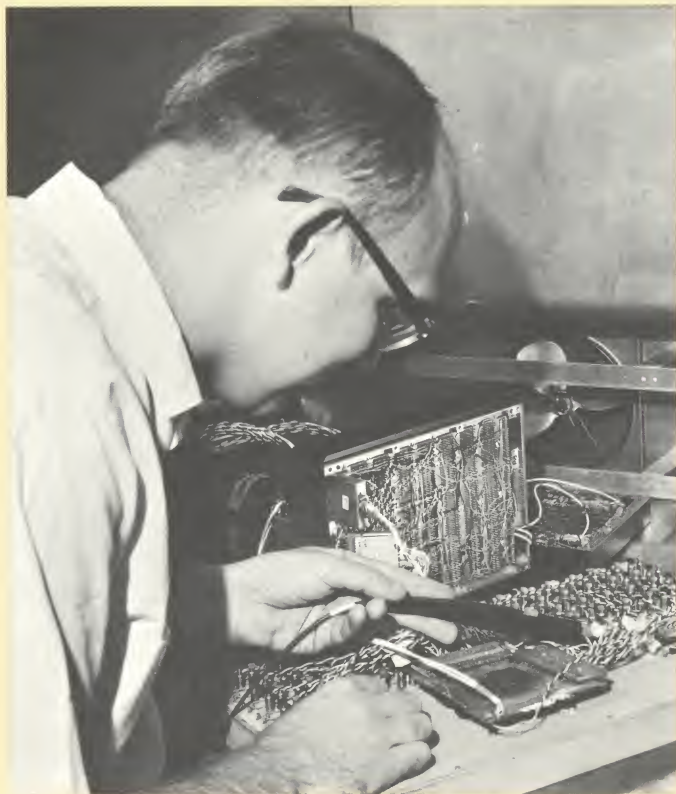


Advanced Product Development

The advanced Product Development group has one goal — to constantly improve speed, performance, and reliability of Fabri-Tek's magnetic memories.

Left: The Series MC compact memory undergoes complete environmental testing to assure its meeting the most rigid military specifications.

Below: A "big board" magnetic-film system is fabricated to prove the reliability and economy of this packaging technique.



New Products

Fabri-Tek's major product area has been information storage devices. The company has been careful to diversify in only those product areas where maximum use can be made of Fabri-Tek engineering and manufacturing know-how. Such is the case in these tape punches (below) being assembled for use with the BI-TRAN SIX Com-

puter Education System. Specifically designed as a teaching unit, these tape punches have excellent potential in other markets.

At the newly formed Instrumentation Division in Madison, Wisconsin, production is beginning on a unique signal analyzer for the research market. Again, Fabri-Tek's knowledge of memories and their application is put to work in a new way.





JAMES W. SCHALLERER
Vice President
Director of Planning
and Product Development



W. DEL CLINTON
Vice President
Director of Finance



DONALD D. HASELHORST
Vice President
Director of Manufacturing

Management

ROBERT E. RIFE
Director of Marketing



RICHARD J. PETSCHAUER
Director of Engineering



Summary of Growth

