

MINUTES OF THE HOUSE COMMITTEE ON COMMUNICATIONS, COMPUTERS AND TECHNOLOGY

The meeting was called to order by Representative Mike Meacham at
Chairperson

3:30 ~~xxx~~ p.m. on March 1, 1984 in room 522-S of the Capitol.

All members were present except:

Representative Chronister (excused)
Representative Rolfs (excused)

Committee staff present:

Sherry Brown, Fiscal Staff, Research Department
Chris Stanfield, Fiscal Staff, Research Department
James A. Wilson, III, Senior Assistant Revisor
Betty Ellison, Secretary to the Committee

Conferees appearing before the committee:

Mr. Bill Abbott - Boeing Military Airplane Company
Mr. Ellis Ingle - Boeing Military Airplane Company
Mr. Jim Green - Data Processing Management Association
Ms. Doris McDiffett - Data Processing Management Association

The meeting was called to order by Chairman Meacham. Mr. Jim Wilson of the Revisor's Office reviewed House Bill 3082, "AN ACT relating to crimes and punishments; concerning computer crime and computer theft; classifying certain acts as misdemeanors and felonies."

Mr. Bill Abbott of the Boeing Military Airplane Company introduced Mr. Ellis Ingle, Computing Security Manager of that company. Mr. Ingle distributed copies of an outline of his comments. This outline explained the position of the Boeing Company regarding House Bill 3082. (Attachment 1) He noted that no software has yet been developed that would give 100 percent protection against abuse. He asked for support of the bill for the benefit of Boeing and other companies as well.

In reply to a question from Representative Friedeman, Mr. Ingle explained that the loss of computer tape represented not just the cost of the tape; the information on the tape and the time and effort required to make the tape were much more valuable. He felt that laws were needed as a deterrent to computer crime.

Representative Ramirez wondered if the punishment was severe enough to be an effective deterrent. Mr. Wilson said that a Class A misdemeanor is punishable by imprisonment of up to one year and/or a fine not exceeding \$2500. A Class D felony sentence was an undetermined period--minimum, not less than two years but not more than three years; maximum, not less than five years nor more than ten years; fine not exceeding \$5,000. Mr. Ingle said he thought the penalties were stiff enough because the people who would do this are well educated and would consider what the penalty would be.

Replying to a question of Representative Sallee, Mr. Ingle said that federal laws tie in with the Department of Defense work that is done at Boeing; all of that is locked in a room and is pretty well secured.

Mr. Jim Green, President of the Kaw Valley Chapter, Data Processing Management Association (DPMA) testified in favor of House Bill 3082. (Attachment 2) He also commented that in his position as Administrative Officer of the Kansas Bureau of Investigation, he was aware of this problem. He said that the KBI had not been involved in the investigation of any computer crime cases as yet, but had used the computer in a number of financial fraud cases.

CONTINUATION SHEET

MINUTES OF THE HOUSE COMMITTEE ON COMMUNICATIONS, COMPUTERS AND TECHNOLOGY,

room 522-S, Statehouse, at 3:30 ~~am~~/p.m. on March 1, 1984

Representative Friedeman asked about the definition of the penalty that leads to a misdemeanor or to a felony as being less or more than \$100 loss. He wondered if it would be difficult to establish loss. Mr. Green replied that it could be a problem; for example, a \$10 tape might represent 100,000 hours of effort which had gone into its creation. He said that anyone who was caught doing this would at least qualify for the misdemeanor, but it might be difficult to convince a court that it was a felony.

Ms. Doris McDuffett, of Data Processing Management Association, testified regarding establishment of a dollar value. She said that they do not keep track of the number of hours they put into a project, so it would be difficult to determine the value of a tape. She noted that according to an article in Computer World, one state differentiated between misdemeanor and felony by criminal intent. Ms. McDuffett said that many companies, such as insurance companies, do a lot of electronic fund transfers to specific accounts, to individual accounts, and disburse money electronically. She wondered if the definition of "financial instrument" would cover that.

After some Committee discussion regarding the definition of the word "property", Representative Friedeman moved and Representative Aylward seconded a conceptual motion to amend the bill to include the word "property" in Section 1, paragraphs (g) and (h) and Section 4. Because time was limited, Chairman Meacham suggested that a vote be taken on Representative Friedeman's amendment and further amendments could be made informally after the bill was moved out of Committee. A vote on the amendment was taken and the motion carried.

Representative Friedeman made a conceptual motion that a better way be found of describing \$100 loss. After some discussion, Representative Friedeman withdrew this motion.

Representative Friedeman moved and Representative Dean seconded that House Bill 3082 as amended be recommended favorably. The motion carried.

The Chairman announced that the Committee would meet informally to discuss any other amendments that might come up before the bill was taken to the floor.

Representative Dean commented on a speech he had heard made by the president of a high technology company which is associated with MIT in Boston, Massachusetts. Copies of the speech were distributed to members of the Committee. (Attachment 3)

The meeting was adjourned at 4:30 p.m.

COMMENTS TO THE COMMUNICATIONS, COMPUTERS AND TECHNOLOGY
COMMITTEE BY ELLIS INGLE, COMPUTING SECURITY MANAGER OF
BOEING MILITARY AIRPLANE COMPANY, WICHITA.

In support of HB 3082

3-1-84

- o REPRESENT BOEING MILITARY AIRPLANE COMPANY, WHICH INCLUDES BOEING COMPUTING SERVICES COMPANY.
- o AT OUR BMAC FACILITY IN WICHITA WE HAVE:
 - 7 COMPUTER CENTERS
 - 1,000 + TERMINALS
 - 150,000 + DATA FILES
 - 2 DISHES THAT BEAM DATA VIA SATELLITE
 - ARE PART OF THE LARGEST PRIVATELY OWNED TELECOMMUNICATIONS NETWORK IN THE WORLD.
- o AT BMAC WE PROCESS VARIOUS CLASSIFICATIONS OF DATA WHICH ARE ASSETS OF THE COMPANY:
 - MILITARY CLASSIFIED
 - UNCLASSIFIED MILITARY
 - BOEING LIMITED/PROPRIETARY
 - COMMERCIAL SENSITIVE
- o WE ARE ASKING THAT COMPUTER SCIENCE AND LAW BE DESIGNED TO DEAL WITH CHANGING TECHNOLOGIES AND SOCIETIES.
- o REASONS BOEING IS SPONSORING HOUSE BILL 3082:
 - PROPER LEGISLATION TO GET OFFENDERS OFF THE STREETS.
 - ALLOW A COMPANY TO RECOUP SOME OF ITS LOSSES.
 - BMAC COMPUTING POWER HAS INCREASED OVER 1300% OVER THE LAST 5 YEARS.
 - STORAGE CAPACITY HAS INCREASED OVER 1900% TO APPROX. 450 BILLION WORDS.
 - CURRENT STATUTES LACK SPECIFIC DEFINITIONS IN THE COMPUTING AREA.
 - ADDITIONALLY CURRENT STATUTES LACK PENALTIES OR RECOURSE CONSISTANT WITH THE VALUE OF THE DATA.
 - MORE AND MORE VITAL COMPANY AND GOVERNMENT PROPRIETARY DATA RESIDES IN THE COMPUTER NETWORK.

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- ASSISTANCE IN HELPING US PROTECT OUR COMPUTER SYSTEMS AGAINST:
 - PHYSICAL ABUSE
 - DATA CORRUPTION
 - FRAUD

- OUR INTENT IS TO PREVENT THE INVASION OF OUR RIGHTS AND WHEN VIOLATED, PROVIDE EVIDENCE TO SHOW THAT OUR OBLIGATIONS IN PROTECTING THE RESOURCES HAVE BEEN CARRIED OUT.

MARCH 28, 1983 "COMPUTER WORLD"
18 STATES WITH COMPUTER CRIME LAWS

- | | |
|------------------------|------------------------------|
| 1. ARIZONA.H.B.2212 | 10. MISSOURI.S.B.559 |
| 2. CALIFORNIA.H.B.66 | 11. MONTANA.H.B.621 |
| 3. COLORADO.H.B.1110 | 12. NORTH CAROLINA.H.B.S.397 |
| 4. DELAWARE.H.B.730 | 13. NEW MEXICO.H.B.S.8 |
| 5. FLORIDA.H.B.1305 | 14. OHIO.H.B.437 |
| 6. GEORGIA.S.B.198 | 15. RHODE ISLAND.H.B.5775 |
| 7. ILLINOIS.H.B.H.1027 | 16. UTAH.H.B.183 |
| 8. MICHIGAN.H.B.4112 | 17. VIRGINIA.H.B.439 |
| 9. MINNESOTA.S.B.381 | 18. WISCONSIN.H.B.744 |

DATA PROCESSING MANAGEMENT ASSOCIATION

Testimony of

James R. Green, Kaw Valley Chapter President
Data Processing Management Association (DPMA)

before

The House Committee on Communication, Computers and Technology

March 1, 1984

The Kaw Valley Chapter is one of 280 chapters of the Data Processing Management Association. DPMA was founded in 1951, and with over 45,000 members in the U.S. and Canada is the largest professional association in the field of information management. It is governed by standards of conduct and an enforceable code of ethics.

At its last meeting, the chapter board of directors voted unanimously to endorse the explicit defining of computer crime and penalties for computer crime in the state statutes. This is especially important as the U.S. Congress does not seem in any hurry to address these matters at the federal level.

While neither the board nor the general membership (83 members in the greater Topeka area) had time to review HB3082 to any great extent, it appears to do a very good job of addressing the very real and present problem of computer crime.

Though none of us are attorneys, HB3082 appears to correct the two major problems with current statutes: 1) many products of the computer age can be misappropriated by persons not the owner or producer without depriving the original owner of their use; and 2) many products of the computer age may not be covered at all because of their intangible nature.

I personally cannot think of a proper and ethical use of a computer that would be made illegal by this bill, and yet it is broad enough to address all the weaknesses of current statutes outlined in the newspaper article in last weeks Topeka Capitol Journal (attached). It also seems to cover "hacking", that is, unauthorized use of computers, whether or not it is done with the intent to harm or for personal gain. I am not that knowledgeable about electronic fund transactions, but the inclusion of credit and debit cards in the definition of "property" should be a great help in that area.

The chapter proposes no specific changes in the wording of HB3082, but would be available at any time to discuss changes proposed in the future.

Attachment 2 3/1/84

House Communications, Computers and Technology
THE ASSOCIATION REPRESENTING THE INFORMATION PROCESSING AND COMPUTER COMMUNITY



Topeka Capital-Journal, Monday, February 20, 1984 5

Crime laws criticized

WASHINGTON (AP) — A Justice Department report said Sunday that existing criminal laws weren't sufficient to deal with crimes committed against automated banking machines and in other electronic financial transactions.

The department's Bureau of Justice Statistics said there was growing concern that so-called electronic fund transfers "provide an electronic environment that is potentially fertile for criminal abuse."

The bureau said that only 22 states had laws addressing computer crime or electronic fund transfer, that virtually all those laws were enacted in the last five years, and that there was little information on how effective they were. There are also several federal laws in the area.

The bureau's report said electronic crimes had the same consequence as traditional theft but "the existing criminal law does not in many cases directly address the unique elements of electronic fund transfer crimes."

The report noted that theft statutes typically prohibited the taking of physical property but it was not clear whether an electronic command making a fund transfer constitutes "taking" under those laws. The report said it was also uncertain whether the contents of a computer memory constitute property. Finally, the bureau noted that fraud

statutes called for willful misrepresentation to a person, but it was unclear whether computers are legally considered persons.

The report said the use of automated teller machines had grown from 4,056

"The existing criminal law does not in many cases directly address the unique elements of electronic fund transfer crimes"

— Justice Department report

terminals in 1975 to 35,721 terminals in 1982, when they handled more than 2 billion transactions and \$240 billion.

Automated clearing houses handled 40 million transactions in 1976 and 300 million transactions in 1981.

Wire transfers grew from 23 million transactions involving more than \$42 trillion in 1975 to 700 million transactions involving \$137 trillion in 1981.

"The growth of electronic fund transfer use to date will, however, pale in comparison to its expected future growth, especially as banking laws are changed to accommodate the information age and as computer and communications technology becomes more

advanced," the report said. The bureau identified four basic types of crime directed at automatic teller machines:

- Unauthorized use of a stolen bank card. The bureau noted that many card holders make the mistake of keeping their personal identification numbers with their card.
- Fraud committed by a legitimate cardholder who because the machines do not use sophisticated verification procedures, like fingerprints or voice prints, can make withdrawals and later claim they were not responsible for the withdrawal.

- Insider manipulation ranging from the theft of cards by bank employees to computerized alterations of accounts.

- Physical attacks on the machines themselves to obtain the large amount of cash they contain or on cardholders immediately following a cash withdrawal.

In the case of wire transfer, the bureau said that the system was susceptible to errors made by authorized employees, to fraudulent computer instructions by unauthorized employees of financial institutions, and to illegal manipulation by outside criminals who use their own computer systems to skirt security arrangements and manipulate transactions.

PRESENTATION BY RAY STATA

IEEE 1984 CONFERENCE

ON

U. S. TECHNOLOGY POLICY

FEBRUARY 23, 1984

IN THIS PRESIDENTIAL ELECTION YEAR MANY ARE TURNING TO WASHINGTON FOR THE SOLUTIONS TO OUR ECONOMIC AND COMPETITIVE PROBLEMS. AND, INDEED, WASHINGTON HAS A VITAL ROLE TO PLAY IN ASSURING A STABLE INVESTMENT ENVIRONMENT AND A COMPETITIVE COST OF CAPITAL, IN PROVIDING INCENTIVES TO INVEST IN MODERN EQUIPMENT AND TECHNOLOGY, IN SUPPORTING BASIC RESEARCH IN OUR MAJOR UNIVERSITIES, AND IN MAINTAINING AN OPEN AND FAIR TRADE ENVIRONMENT.

BUT, IN MOST OTHER RESPECTS, THE DIVERSITY AND COMPLEXITY OF THE AMERICAN ECONOMY ARE SO ENORMOUS THAT IT WOULD BE FOLLY TO THINK THAT A TOPS DOWN, CENTRALIZED APPROACH TO INDUSTRIAL POLICY, IN WHATEVER FORM, CAN POSSIBLY WORK. EACH REGION OF THE COUNTRY HAS UNIQUE PROBLEMS, UNIQUE OPPORTUNITIES, AND UNIQUE RESOURCES AS EMBODIED IN THE KNOWLEDGE AND SKILLS OF ITS WORKFORCE, THE DISTINCTIVE COMPETENCIES OF ITS INDUSTRY, AND THE HERITAGE AND FOCUS OF ITS EDUCATIONAL INSTITUTIONS.

THERE IS A PRESSING NEED FOR COLLABORATION AND COOPERATION BETWEEN INDUSTRY, GOVERNMENT AND ACADEMIA, BUT THIS IS BEST WORKED OUT AT A REGIONAL LEVEL WHERE THE CHALLENGE IS BETTER DEFINED AND OF MORE MANAGEABLE PROPORTIONS. INDUSTRY DEPENDS ON ITS SURROUNDING INFRASTRUCTURE FOR SUPPORTING SERVICES. CHIEF AMONG THESE SERVICES IS THE EDUCATIONAL SYSTEM WHICH NOT ONLY EDUCATES AND TRAINS THE WORKFORCE BUT ALSO CREATES NEW KNOWLEDGE. AND, AS WE MOVE FURTHER INTO THE INFORMATION AGE, INDUSTRIES' DEPENDENCE ON EDUCATION AND RESEARCH WILL BECOME EVEN MORE ACUTE. BUT, IT'S AT THE STATE LEVEL THAT CRITICAL DECISIONS REGARDING EDUCATION AND OTHER SERVICES IMPORTANT TO INDUSTRY ARE MADE.

LET'S LOOK AT MASSACHUSETTS AS AN EXAMPLE OF A STATE THAT HAS MADE A SUCCESSFUL TRANSITION FROM AN OLD TURN-OF-THE-CENTURY INDUSTRY, DEPENDENT ON TEXTILES AND SHOES, TO A HIGH TECHNOLOGY INDUSTRY FOCUSED ON COMPUTERS AND ELECTRONICS. THIS TRANSITION, WHICH OCCURRED OVER A THREE DECADE PERIOD BEGINNING IN THE 1950'S, WAS FOR THE MOST PART UNPLANNED AND UNFORESEEN. IT OCCURRED LARGELY AS A RESULT OF A HIGH CONCENTRATION OF TECHNICAL HIGHER

EDUCATION RESOURCES. THOSE TECHNICAL RESOURCES ATTRACTED LARGE INVESTMENTS OF GOVERNMENT SPONSORED R&D FOR THE COLD WAR OF THE 50'S AND FOR THE SPACE RACE OF THE 60'S, WHICH IN TURN FURTHER STRENGTHENED THE LEADERSHIP OF THE REGION'S TECHNICAL UNIVERSITIES AND, IN PARTICULAR, MIT.

TO ILLUSTRATE, IN 1960, MASSACHUSETTS, WITH ONLY 2.6% OF THE NATION'S POPULATION, PRODUCED 5.6% OF THE COUNTRY'S B.S. GRADUATES IN ELECTRICAL ENGINEERING, 10.7% OF THE M.S. GRADUATES, AND 11.6% OF THE PH.D.'S.

BY 1983, MASSACHUSETTS HAD CAPTURED 10% OF COMPUTER RELATED EMPLOYMENT, 9% OF ELECTRONIC COMPONENT EMPLOYMENT, AND 9% OF THE MEASUREMENT AND CONTROL EQUIPMENT EMPLOYMENT. MASSACHUSETTS TODAY RANKS FIRST AMONG THE TEN LARGEST INDUSTRIAL STATES IN THE PERCENTAGE OF MANUFACTURING IN HIGH TECH - ABOUT 35%. INTERESTINGLY, NEW HAMPSHIRE, MASSACHUSETTS, VERMONT AND CONNECTICUT RANK FIRST THROUGH FOURTH RESPECTIVELY IN THE PERCENTAGE OF TOTAL EMPLOYMENT IN HIGH TECH. THIS ILLUSTRATES THE SPREADING EFFECT AS EMPLOYMENT GRADUALLY PERMEATES THE REGIONS CONTIGUOUS TO CENTERS OF TECHNICAL HIGHER EDUCATION.

THE CLOSE CONNECTION BETWEEN INDUSTRY AND THE UNIVERSITIES IN THE REGION IS DRAMATIZED BY AN MIT SURVEY WHICH SHOWS THAT 80% OF ENGINEERS IN MASSACHUSETTS COMPANIES RECEIVED THEIR LAST EDUCATION IN MASSACHUSETTS SCHOOLS, AND 94% IN NEW ENGLAND SCHOOLS. THE CLOSE PROXIMITY OF INDUSTRY TO TECHNICAL UNIVERSITIES WILL BECOME EVEN MORE IMPORTANT IN THE FUTURE AS THE RAPID PACE OF TECHNOLOGICAL CHANGE REQUIRES CONTINUOUS LIFE-LONG EDUCATION.

ONE CANNOT OVER-EMPHASIZE THE IMPORTANCE OF MIT IN THE DEVELOPMENT OF THE MASSACHUSETTS HIGH TECHNOLOGY INDUSTRY. AN MIT SLOAN SCHOOL STUDY OF 216 HIGH TECH COMPANIES IN THE BOSTON AREA SHOWED THAT 156 OF THEM WERE BORN IN MIT DEPARTMENTS AND LABORATORIES, INCLUDING THE MOST FAMOUS - DIGITAL EQUIPMENT CORPORATION. MIT IS A MAGNET THAT DRAWS TOP TALENT FROM AROUND THE WORLD. WHILE ONLY 9% OF MIT'S UNDERGRADUATE ENROLLMENT IS FROM MASSACHUSETTS, 36% OF THE GRADUATES REMAIN IN THE REGION AFTER GRADUATION. TODAY, 10,000 MIT GRADUATES LIVE IN MASSACHUSETTS. MANY OF THEM HEAD CORPORATIONS, BUT EQUALLY IMPORTANT, MANY ARE PROFESSORS AND ADMINISTRATORS

IN OTHER TECHNICAL UNIVERSITIES. MIT, THUS, IS OFTEN REFERRED TO AS A TEACHER OF TEACHERS. TODAY, MIT DRAWS MORE THAN \$100 MILLION ANNUALLY IN RESEARCH CONTRACTS, MOSTLY FROM THE FEDERAL GOVERNMENT, AND AS A RESULT CONTINUES TO GENERATE A LARGE NUMBER OF NEW IDEAS AND RESEARCH ORIENTED GRADUATE STUDENTS.

A LOOK AT OTHER ELECTRONICS INDUSTRY CENTERS LIKE CALIFORNIA, TEXAS, AND NEW YORK REVEALS A PATTERN SIMILAR TO MASSACHUSETTS. THESE STATES, TOO, ARE TOP RANKING PRODUCERS OF ELECTRICAL ENGINEERS AND ARE WELL ENDOWED WITH MAJOR RESEARCH UNIVERSITIES.

BUT DESPITE THE SUCCESS OF THE HIGH TECH INDUSTRY IN MASSACHUSETTS, IN THE MID-70'S THE UNDERLYING DRIVING FORCE OF THE ECONOMY WAS NOT WELL UNDERSTOOD. AS A RESULT, BUSINESS, EDUCATION AND GOVERNMENT WERE GOING OFF IN DIFFERENT DIRECTIONS LEAVING THE HIGH TECH INDUSTRY IN JEOPARDY.

IN MASSACHUSETTS, PERSONAL TAXES HAD RISEN TO 20% ABOVE THE NATIONAL AVERAGE - MAKING IT INCREASINGLY DIFFICULT TO ATTRACT AND RETAIN SCARCE ENGINEERS AND

TECHNICAL MANAGERS. FUNDING OF PUBLIC HIGHER EDUCATION WAS NEAR THE LOWEST OF THE FIFTY STATES ON A PER CAPITA BASIS AND AS A PERCENTAGE OF STATE REVENUES. THE OUTPUT OF STATE COLLEGES AND UNIVERSITIES WAS BADLY MISMATCHED TO THE JOB MARKET. STATE SERVICES WERE UNRESPONSIVE TO INDUSTRY NEEDS. AS A RESULT, MASSACHUSETTS' HIGH TECH COMPANIES WERE SERIOUSLY LOOKING TO GREENER PASTURES FOR EXPANSION.

IN 1977, A CONCERNED GROUP OF HIGH TECH EXECUTIVES FORMED THE MASSACHUSETTS HIGH TECH COUNCIL TO COLLECTIVELY SEARCH FOR SOLUTIONS TO THESE AND OTHER PROBLEMS. THE HIGH TECH COUNCIL PLAYED A MAJOR ROLE IN DEFINING FUTURE GROWTH OPPORTUNITIES FOR THE STATE AND IN IDENTIFYING THE CONDITIONS AND RESOURCES REQUIRED TO EXPLOIT THESE OPPORTUNITIES. IT ANALYZED THE SUPPLY AND DEMAND PROFILE OF THE TECHNICAL WORKFORCE AND QUANTIFIED A LARGE AND GROWING GAP IN CERTAIN JOB CATEGORIES. IT DEFINED THE CURRICULAR REQUIREMENTS FOR ELECTRONIC AND COMPUTER TECHNICIANS. IT TOOK THE LEAD IN BUILDING CLOSER RELATIONSHIPS WITH LOCAL UNIVERSITIES AND IN PROVIDING RESOURCES TO HELP THEM SOLVE THEIR PROBLEMS. IT JOINED WITH A GRASS ROOTS CITIZENS GROUP TO LOWER THE TAX BURDEN, NOT ON CORPORATIONS, BUT ON INDIVIDUALS.

ONCE THE PROBLEMS FACING THE HIGH TECH INDUSTRY WERE KNOWN AND UNDERSTOOD, NOT ONLY BY GOVERNMENT AND EDUCATIONAL LEADERS, BUT BY THE PUBLIC AT LARGE, CORRECTIVE ACTIONS CAME WITH AMAZING SPEED. BY 1983, ONLY SIX YEARS LATER, THE TAX BURDEN ON INDIVIDUALS HAD DROPPED BELOW THE NATIONAL AVERAGE. SPENDING BUDGETS FOR HIGHER EDUCATION FOCUSED ON JOB NEEDS WERE GROWING AGAIN DESPITE A PERIOD OF EXTREME FISCAL AUSTERITY. THE OUTPUT OF ELECTRICAL ENGINEERING GRADUATES HAD INCREASED BY 60%. INDUSTRY SUPPORT FOR HIGHER EDUCATION WAS AT RECORD LEVELS. INDUSTRY AND UNIVERSITIES WERE COLLABORATING ON A BROAD RANGE OF INITIATIVES THAT WOULD BE IMPORTANT TO THE LONG TERM FUTURE OF THE STATE. JUST TO NAME A FEW: A MASS HIGH TECHNOLOGY PARK WAS INITIATED WITH \$20 MILLION FUNDING BY STATE GOVERNMENT; A PROGRAM WAS SET IN MOTION TO ESTABLISH A MICROWAVE LINK BETWEEN INDUSTRY AND UNIVERSITIES TO FACILITATE COMMUNICATIONS; CAREER TRANSITIONS PROGRAMS WERE STARTED TO RETRAIN DISPLACED WORKERS, ESPECIALLY "RIFED" TEACHERS, FOR EMPLOYMENT IN HIGH TECH INDUSTRIES.

IN SHORT, THE BUSINESS CLIMATE IN MASSACHUSETTS IS RIDING A NEW HIGH AS UNEMPLOYMENT DROPPED FROM THE

HIGHEST IN THE NATION DURING THE '75 RECESSION TO THE LOWEST AMONG INDUSTRIAL STATES DURING THE RECENT RECESSION.

THE BENEFITS OF SUCCESS OF THE MASSACHUSETTS HIGH TECH INDUSTRY GO WELL BEYOND EMPLOYMENT IN THE INDUSTRY ITSELF. A REPORT BY THE BOSTON FEDERAL RESERVE BANK SUGGESTS THAT THE EXPANSION OF THE HIGH TECH INDUSTRY HAD A MULTIPLIER EFFECT ON LOCAL BUSINESS SERVICES SUCH AS ADVERTISING, PUBLIC RELATIONS, DATA PROCESSING, MANAGEMENT CONSULTING, FINANCIAL AND LEGAL SERVICES. THE ANALYSIS SHOWED ALMOST A ONE-TO-ONE RATIO BETWEEN JOBS CREATED IN OFFICE AND COMPUTING MACHINE SECTORS AND THOSE IN COMPUTER SERVICES.

BUT EVEN MORE IMPORTANT, WE CAN VIEW THE HIGH TECHNOLOGY INDUSTRY AS THE TOOLMAKERS OF THE 80'S AND 90'S. HIGH TECH PRODUCTS LIKE WORD PROCESSORS, ROBOTS, COMPUTER-AIDED DESIGN AND MANUFACTURING EQUIPMENT PUT THE LATEST TECHNOLOGY IN THE HANDS OF WORKERS IN ALL SEGMENTS OF THE ECONOMY - IN MATURE INDUSTRIES, SERVICE INDUSTRIES, HOSPITALS, UNIVERSITIES, GOVERNMENT OFFICES - WORKERS EVERYWHERE - TO INCREASE THEIR PRODUCTIVITY AND COMPETITIVENESS.

WHILE WORKERS IN OUR HOSPITALS AND INSURANCE COMPANIES DON'T COMPETE DIRECTLY FOR JOBS WITH THE JAPANESE, THEY DO VERY MUCH COMPETE INDIRECTLY. FOR EXAMPLE, IT'S ESTIMATED THAT THE COST OF MEDICAL INSURANCE TRANSLATES INTO ALMOST \$480 FOR EACH CAR MANUFACTURED IN DETROIT. HIGHER SERVICE COSTS IN EDUCATION, HOSPITALS, AND INSURANCE COMPANIES ESCALATE WAGE DEMANDS AND BENEFIT COSTS IN MANUFACTURING JOBS AND, THUS, THE COST OF EXPORTED PRODUCTS. FEWER CARS SOLD MEANS NOT ONLY FEWER MANUFACTURING JOBS BUT ALSO FEWER SERVICE JOBS AS WELL. CONSIDERING THAT 80% OF OUR WORKFORCE IS ENGAGED IN NON-MANUFACTURING INDUSTRIES, PERHAPS THE GREATEST IMPACT OF THE HIGH TECHNOLOGY INDUSTRY WILL BE TO BOOST PRODUCTIVITY IN OUR SERVICE INDUSTRIES.

AND THERE IS AMPLE EVIDENCE THAT HIGH TECHNOLOGY IS ALREADY HAVING A PERSUASIVE INFLUENCE ON THE PRODUCTIVITY OF OUR ECONOMY IN ALL SECTORS. IN 1982, ONE-HALF THE CAPITAL EQUIPMENT INVESTMENTS IN AMERICA WERE FOR COMPUTERS, COMMUNICATIONS, INSTRUMENTS AND OTHER ELECTRONIC EQUIPMENT. THAT'S UP FROM ONE-QUARTER JUST A DECADE AGO.

NOT EVERY REGION OF THE COUNTRY WILL, LIKE MASSACHUSETTS, FLOURISH AS MANUFACTURERS OF COMPUTERS, WORD PROCESSORS, INSTRUMENTS AND OTHER HIGH TECH TOOLS. BUT EVERY REGION CAN AND MUST BENEFIT FROM INCORPORATING THE NEW TECHNOLOGY EMBODIED IN THESE PRODUCTS TO BOOST ITS PRODUCTIVITY AND TO ALTER THE NATURE OF ITS PRODUCTS AND SERVICES. THE CHALLENGE WILL BE FOR EACH REGION TO DETERMINE HOW BEST TO MAKE THE TRANSITION. IN MOST CASES, THE ANSWER WILL NOT BE TO ABANDON EXISTING INDUSTRIES, BUT RATHER TO BUILD ON THEM AND OUT OF THEM. WE SEE THIS HAPPENING IN A UNIQUE WAY IN THE VARIOUS REGIONS.

DETROIT, PERHAPS, REPRESENTS THE MOST DRAMATIC CHALLENGE NOT ONLY BECAUSE THE AUTO INDUSTRY IS SO IMPORTANT TO THE NATIONS' ECONOMY, BUT ALSO BECAUSE IT IS A SYMBOL OF AMERICA'S MANHOOD AND PRESTIGE. IF WE WIN IN DETROIT, THIS WILL LEND COURAGE AND HOPE THAT WE CAN MAKE THE TRANSITION IN OTHER MATURE INDUSTRIES AS WELL. THE CHALLENGE IN DETROIT IS NOT JUST INNOVATION IN INCORPORATING NEW TECHNOLOGY TO AUTOMATE MANUFACTURING, BUT ALSO INNOVATION IN BUILDING NEW AND MORE PRODUCTIVE RELATIONS BETWEEN WORKERS AND MANAGEMENT. A MAJOR CHALLENGE WILL BE TO INFUSE NEW KNOWLEDGE AND SKILLS INTO

THE WORKFORCE TO APPLY, OPERATE AND MAINTAIN MACHINES
BASED ON COMPUTER AND ELECTRONICS TECHNOLOGY.

AS IN MASSACHUSETTS, A TURN-AROUND IN MICHIGAN
WILL REQUIRE A COLLABORATIVE EFFORT BETWEEN INDUSTRY AND
UNIVERSITIES OF UNPRECEDENTED SCOPE TO EDUCATE A NEW
GENERATION OF WORKERS WHILE RE-EDUCATING AN OLDER
GENERATION. THE TECHNOLOGY TO APPLY COMPUTER-AIDED DESIGN
AND MANUFACTURING EQUIPMENT WILL HAVE TO BE WORKED OUT IN
DETROIT, AND LANSING, AND ANN ARBOR -- NOT IN BOSTON AND
IN PALO ALTO. THIS IS BEGINNING TO HAPPEN. AT THE END OF
HIS TERM OF OFFICE IN 1980, GOVERNOR MILLIKEN GOT HIS
LEGISLATURE TO CREATE AN INDUSTRIAL TECHNOLOGY INSTITUTE
FUNDED WITH 6 MILLION STATE DOLLARS. THE ITI'S WORK IS
FOCUSED ON ACCELERATING THE ADAPTATION OF AUTOMATED
MANUFACTURING TECHNOLOGY TO AUTO FIRM SUPPLIER COMPANIES
-- OF WHICH THERE ARE SEVERAL THOUSAND IN MICHIGAN ALONE.
LOCATED ADJACENT TO THE UNIVERSITY OF MICHIGAN IN ANN
ARBOR, THE ITI IS SUPPORTED BY AN ADDITIONAL \$40 MILLION
IN GRANTS AND FUTURE PLEDGES FROM THE KELLOGG FOUNDATION
AND ANOTHER \$9 MILLION FROM THE DOW FOUNDATION.

GMF - ROBOTICS, A SUBSIDIARY OF GENERAL MOTORS
CORPORATION, ALREADY PROMISES TO BE A LEADING, IF NOT THE

LEADING MANUFACTURER OF ROBOTS IN AMERICA - NOT JUST FOR USE IN DETROIT BUT FOR EXPORT THROUGHOUT THE WORLD. THERE IS NO REASON TO QUESTION THEIR ABILITY AND MOTIVATION TO ACHIEVE THIS GOAL AND TO TRANSFORM DETROIT INTO ANOTHER HIGH TECH TOOL MAKING CENTER IN AMERICA.

THE TRANSITION IN MICHIGAN CAN BEST BE ACCOMPLISHED THROUGH LOCAL COLLABORATION AND COOPERATION - BY AUTO MANUFACTURERS AND THEIR SUPPLIERS SPONSORING JOINT RESEARCH AND EDUCATIONAL PROGRAMS IN LOCAL UNIVERSITIES - BY AUTO MANUFACTURERS AND UNIONS NEGOTIATING A NEW VISION OF PRODUCTIVE RELATIONSHIPS - BY STATE GOVERNMENT SUPPORTING AND ENCOURAGING THE TRANSITIONAL PROCESSES, ESPECIALLY IN EDUCATION, THAT ARE REQUIRED TO SUCCEED IN AN INCREASINGLY KNOWLEDGE-INTENSIVE ERA.

WHEN WE LOOK AT MASSACHUSETTS, AS WELL AS MICHIGAN, MUCH HAS ALREADY BEEN ACCOMPLISHED, BUT MUCH MORE REMAINS TO BE DONE. ONE OF THE KEYS TO SUCCESS IS BETTER COMMUNICATIONS AMONG THE MAJOR PLAYERS. THIS WILL TAKE A SIGNIFICANT COMMITMENT OF TIME AND EFFORT FROM LEADERS OF INDUSTRY, GOVERNMENT, AND EDUCATION TO UNDERSTAND IN DETAIL EACH OTHERS PROBLEMS AND NEEDS AND MUTUAL INTERDEPENDENCES.

THIS TASK CANNOT BE ACHIEVED BY CORPORATIONS ACTING SINGULARLY OR BY CEO'S DELEGATING THE TASK TO PEOPLE OF LESSER ORGANIZATIONAL SCOPE AND AUTHORITY. IT TAKES A LEVEL OF INVOLVEMENT AND COOPERATION THAT IS UNCHARACTERISTIC OF AMERICAN INDUSTRY, STEEPED AS IT IS IN SELF-RELIANCE AND FEARFUL OF REPRISALS FOR COLLABORATING WITH COMPETITORS. IN LARGE MEASURE, THE SUCCESS OF THE MASSACHUSETTS HIGH TECHNOLOGY COUNCIL CAN BE ATTRIBUTED TO THE INVOLVEMENT OF CORPORATE CEO'S, COLLECTIVELY FASHIONING POLICIES AND GOALS THAT NOT ONLY ADDRESSED THEIR CORPORATE NEEDS BUT ALSO THE BROADER NEEDS OF THE COMMUNITIES AND CITIZENS OF THE STATE FROM WHICH THEY DRAW THEIR EMPLOYEES. THIS WAS NOT A BROAD COALITION OF INDUSTRIALISTS AND BANKERS, BUT A FOCUSED GROUP OF ELECTRONIC AND COMPUTER EXECUTIVES, IN MANY CASES ARCH COMPETITORS, WHO SHARED COMMON PROBLEMS AND CONCERNS. BY THOUGHTFUL ANALYSIS, THIS GROUP WAS ABLE TO FORGE A CONSENSUS ON THE REQUIREMENTS FOR ITS CONTINUED SUCCESS AND THEN COMMUNICATE THIS CONSENSUS SO THAT OTHERS COULD UNDERSTAND AND RESPOND APPROPRIATELY.

NATURAL PARTNERS FOR INDUSTRY SEEKING NEW WAYS TO COMPETE IN A KNOWLEDGE-INTENSIVE AGE ARE UNIVERSITIES AND

INSTITUTIONS OF HIGHER EDUCATION. IN ADDITION TO INDUSTRY LEADERS PULLING TOGETHER AMONGST THEMSELVES TO WORK ON COMMON PROBLEMS, THERE IS ALSO A GREAT OPPORTUNITY FOR UNIVERSITIES TO EXERCISE LEADERSHIP IN ESTABLISHING CENTERS OF EXCELLENCE THAT WOULD PROMOTE COLLABORATION AND COOPERATION AMONG COMPANIES HAVING COMMON INTEREST IN NEW TECHNOLOGY AND ITS APPLICATION. IN MANY WAYS, THIS IS NOT UNLIKE THE AGRICULTURAL EXTENSION CENTERS OF LAND GRANT COLLEGES THAT WERE SO SUCCESSFUL IN AN EARLIER PERIOD EDUCATING FARMERS AND SPREADING NEW TECHNOLOGY. INDUSTRY GROUPS LINKED TO UNIVERSITY BASED CENTERS OF EXCELLENCE REPRESENT A POWERFUL MODEL TO GENERATE BOTTOMS-UP SOLUTIONS TO WELL DEFINED REGIONAL PROBLEMS. IN THIS MODEL, STATE GOVERNMENT CAN PLAY AN ACTIVE ROLE IN ENCOURAGING AND SUPPORTING A PROCESS OF RENEWAL AND CHANGE, WHILE THE FEDERAL GOVERNMENT CAN CONTRIBUTE BEST IN A PASSIVE ROLE BY PROVIDING RESEARCH GRANTS TO UNIVERSITIES AND TAX CREDITS AND INCENTIVES TO BUSINESS.

THE TRANSITION IN MASSACHUSETTS AND THE CONTINUING ADJUSTMENTS TO A KNOWLEDGE-INTENSIVE ERA ARE FOLLOWING UNCHARTERED PATHS. IT IS OCCURRING WITHOUT THE BENEFIT OF A NATIONAL PLAN OR AN INDUSTRIAL POLICY. AND,

I BELIEVE, THE TRANSITION IN MICHIGAN WILL OCCUR WITHOUT ONE AS WELL. IT HAS BEEN LOCAL PEOPLE TALKING TO EACH OTHER, SOLVING LOCAL PROBLEMS. UNDERSTANDING OUR OPPORTUNITIES AND WHAT TO DO ABOUT THEM IS A LOCAL -- NOT A FEDERAL -- RESPONSIBILITY. WE DON'T NEED HELP FROM WASHINGTON TO UNDERSTAND THAT THERE ARE PROBLEMS IN NEW BEDFORD AND FALL RIVER AND ROXBURY. IF LOCAL GOVERNMENT, INDUSTRY AND EDUCATIONAL LEADERS DON'T CARE ENOUGH ABOUT THESE PROBLEMS TO SOLVE THEM, IS IT REASONABLE TO ASSUME THAT SOMEONE OR SOME ORGANIZATION IN WASHINGTON WILL HAVE THE KNOWLEDGE AND MOTIVATION TO DO BETTER.

THE WAY WASHINGTON CAN HELP IS TO GET ITS HOUSE IN ORDER WITH SOUND FISCAL POLICIES, WITH INCENTIVES TO ENCOURAGE INNOVATION AND CHANGE. WASHINGTON, AS WELL AS STATE GOVERNMENT, CAN ALSO HELP WITH SUPPORT IN BUILDING CENTERS OF TECHNICAL EXCELLENCE IN OUR MAJOR RESEARCH UNIVERSITIES, PARTICULARLY THOSE THAT ARE BRINGING TOGETHER CORPORATE AND UNIVERSITY RESOURCES TO FOCUS ON INDUSTRIAL INNOVATION.

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RAY STATA
PRESIDENT
ANALOG DEVICES

IEEE 1984 U.S. Technology Policy Conference
Washington, D.C.
February 22-23, 1984

Session on: "Social Benefits of Innovation"

Remarks by: Ian M. Ross, President
AT&T Bell Laboratories

"A NEW CHARTER FOR TELECOMMUNICATIONS"

Summary

The telecommunications industry, driven by major advances in an array of new technologies, is on the threshold of entering a new era, nationally and internationally. In the U.S. a new charter has been given to telecommunications, largely influenced by the new competition expected to be stimulated by the AT&T divestiture. The competition, if allowed to flourish in a fair and equitable way, should stimulate increased innovation in this already creative field. As a result we should see telecommunications grow from a business principally concerned with providing reliable, universal telephone service to one that universalizes a variety of communication and information services, including all forms of data and video capabilities. The new charter for telecommunications involves many challenges for both the industry and society at large. Some of these are discussed in terms of the responsibilities they hold for the industry and for government. They include concerns for standards, national security, interface barriers and technological opportunities. Now is the time to recognize both the possible benefits and problems of the Information Age which telecommunications can create. We must do so and act accordingly to maximize the many opportunities that can accrue, economically and socially, through innovation, competition, and sound policy related to telecommunications.

REPORTS OF STANDING COMMITTEES

3-1-84

MR. SPEAKER:

Your Committee on Communication, Computers and Technology

Recommends that House Bill No. 3082

"AN ACT relating to crimes and punishments; concerning computer crime and computer theft; classifying certain acts as misdemeanors and felonies."

Be amended:

On page 2, in line 76, by striking "or" and inserting in lieu thereof a comma; also in line 76, after "data" by inserting "or property";

And the bill be passed as amended.

Chairperson