

GOVERNMENT
DEPOSITION
EXHIBIT
1034

INTEGRATED CIRCUIT CARD PROGRAM REVIEW

P-0231

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IC CARD PROGRAM REVIEW

- INTRODUCTION ————— JOHN C. ELLIOTT
- ENGINEERING TEST RESULTS — BLAIR SHICK
ARTHUR D. LITTLE, INC.
- DESIGN OVERVIEW ————— GEORGE WARFEL, JR.
TRW FINANCIAL SYSTEMS
- WORLDWIDE STATUS —
IC CARD DEVELOPMENT ————— JOHN C. ELLIOTT
PILOT PROGRAM REVIEW
MARKET RESEARCH
- FUTURE APPLICATIONS ————— RICHARD L. DUNHAM
MICRO CARD TECHNOLOGIES, INC.

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IC CARD PROGRAM REVIEW

- STATUS OF INTAMIC AND ISO STANDARDS EFFORTS — LAWRENCE A. LADOUCEUR
MASTERCARD INTERNATIONAL
- CREDIT/FRAUD LOSS REDUCTION PLAN — DAROLD D. HOOPS
MASTERCARD INTERNATIONAL
- IC CARD ECONOMIC MODEL — DAVID POE/PETER DUNN
EDGAR, DUNN & CONOVER INC.
- PROPOSED ACTION PLAN — JOHN C. ELLIOTT
- PROPOSED FUNDING METHODOLOGY — PETER DUNN
EDGAR, DUNN & CONOVER INC.

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IC CARD PERFORMANCE STANDARDS TESTING AND EVALUATION

**BLAIR SHICK
ARTHUR D. LITTLE, INC.**

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PERFORMANCE STANDARDS OBJECTIVES

- EXISTING ANSI/ISO STANDARDS
- ISO WORKING DRAFTS
- ANALOGOUS PUBLIC AND PRIVATE STANDARDS
- EXPERIMENTAL TESTING
- FIELD RECALL EXAMINATION

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PERFORMANCE STANDARDS AREAS

- MECHANICAL STRESSES
- ELECTRICAL/ELECTRONIC STRESSES
- OTHER ENVIRONMENTAL, E.G. CHEMICAL

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MECHANICAL STRESSES

- FLEXING/BENDING
- TORSION
- ABRASION
- DROPPING, PHYSICAL IMPACT
- CONCENTRATED LOAD
- IMPRINTING
- EMBOSSSED CHARACTER HEIGHT RETENTION

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ELECTRICAL STRESSES

- REPEATED USE
- X-RAY EXPOSURE
- STATIC ELECTRICITY
- ELECTRO-MAGNETIC INTERFERENCES

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ENVIRONMENTAL STRESSES

- ULTRA VIOLET LIGHT
- TEMPERATURE
- HUMIDITY
- PLASTICIZERS
- COMMON CHEMICAL
SOLUTIONS (9)

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TEST RESULTS

- CARDS MANUFACTURED TODAY COULD SURVIVE THE EXISTING ENVIRONMENT
- IMPROVEMENTS RECOMMENDED IN THE FOLLOWING AREAS:
 - PLASTIC QUALITY
 - CHIP BONDING
 - STATIC ELECTRICITY RESISTANCE
 - CHIP CONTACT PLACEMENT

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PHYSICAL SECURITY REVIEW

- KNOWLEDGE OF CHIP ARCHITECTURE AND TERMINAL INTERACTION
- ACCESS TO STATE-OF-THE-ART INSTRUMENTATION/EQUIPMENT
- POTENTIAL FOR LARGE SCALE COUNTERFEIT/INVASION
 - GENERIC CHIPS
 - VIRGIN CARDS
 - PERSONALIZED CARDS AND FIELD TERMINALS

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PHYSICAL SECURITY REVIEW RESULTS/RECOMMENDATIONS

- **ENCAPSULATION OF CHIP
TO IMPROVE RESISTANCE
TO ACCESS AND PROBING**
- **IMPLEMENTATION OF MOST
RELIABLE, UP-TO-DATE CHIP
TECHNOLOGY**

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VISA MCAS FEATURES

- AUTHORIZATION SERVICE BASED ON MAGNETIC TECHNOLOGY
- VALIDATES MAGNETIC STRIPE AND PROVIDES OFF-LINE AUTHORIZATIONS
- PROTECTED ENCODING IN TRACK 1 OF MAGNETIC STRIPE:
 - CODE TO VALIDATE STRIPE DATA
 - CARD HOLDER PARAMETERS
 - PARTIAL PIN (OPTIONAL)
 - WATERMARK (OPTIONAL)

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MCAS ADVANTAGES

- LOGICAL MIGRATION STEP TOWARD INTELLIGENT SYSTEMS
- BUILDS ON EXISTING MAGNETIC TECHNOLOGY
- REDUCES AUTHORIZATION COSTS AND TIME
- SOME FRAUD PROTECTION

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MCAS DISADVANTAGES

- DOES NOT PROVIDE ISSUER CONTROL OVER INTERPRETATION OF PARAMETERS
- LACK OF DYNAMIC DECISION-MAKING FOR RISK PARAMETERS
- LACKS NECESSARY INTELLIGENCE FOR OFF-LINE CONTROL
- VULNERABILITY TO STRIPE COUNTERFEIT

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MCAS EXAMINATION CONCLUSIONS

- MCAS APPROACH IS HIGHLY VULNERABLE TO FRAUD
 - LOW LOST/STOLEN PROTECTION WITHOUT PINS
 - REMARKABLY EASY TO COPY ENTIRE DATA SET ON STRIPE
- THE ADDITION OF WATERMARK OFFERS A SUBSTANTIAL INCREASE IN FRAUD RESISTANCE
 - BUT, STILL A CONTINUING VULNERABILITY TO COUNTERFEIT
- THE APPROACH IS NOT AN ADEQUATE TRANSITION COMPLEMENT FOR INTEGRATED CIRCUIT CARDS

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THE MASTERCARD IC CARD SYSTEM

**GEORGE WARFEL, JR.
TRW FINANCIAL SYSTEMS**

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DESIGN OVERVIEW

- MEET BUSINESS CASE GOALS OF REDUCING
 - COMMUNICATION COSTS
 - FRAUD
 - CREDIT LOSSES
- EVOLUTIONARY — EXISTING SYSTEM COMPATIBLE
- OFF-THE-SHELF TECHNOLOGY; STABILIZED COSTS
- PERCEIVED BENEFIT TO CARDHOLDERS

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THE CARD

- EXACTLY LIKE TODAY'S CARDS IN:
 - SIZE
 - SHAPE
 - MAG STRIPE
 - EMBOSSING
 - SIGNATURE
 - HOLOGRAM
- CHIP SECURELY EMBEDDED
- MASS PRODUCIBLE AT LOW COST
- LONGER LIFE THAN CURRENT
MAG STRIPE CARDS
- EXTREMELY DURABLE

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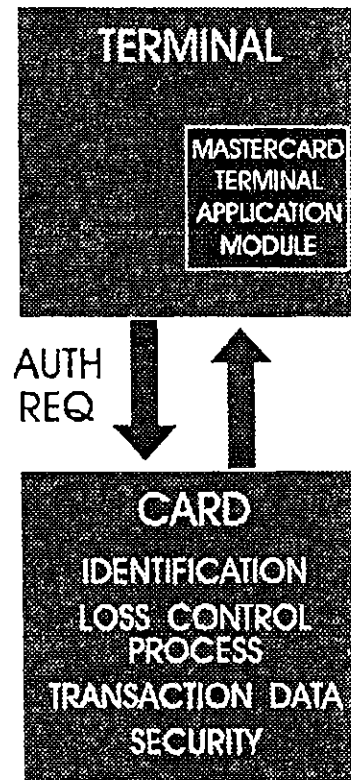
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THE TERMINALS

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- SEVERAL TYPES:
 - ON-LINE
 - DIAL-UP
 - OFF-LINE ONLY
 - PORTABLE
 - HAND-HELD
- SMALL FOOTPRINT, STURDY
- ONE TERMINAL FOR SEVERAL CARDS
 - CARD-SYSTEM-SPECIFIC MODULES
- PROCESS MAGNETIC/EMBOSSSED
NONCHIP CARDS
- MASS PRODUCIBLE; REASONABLE COST

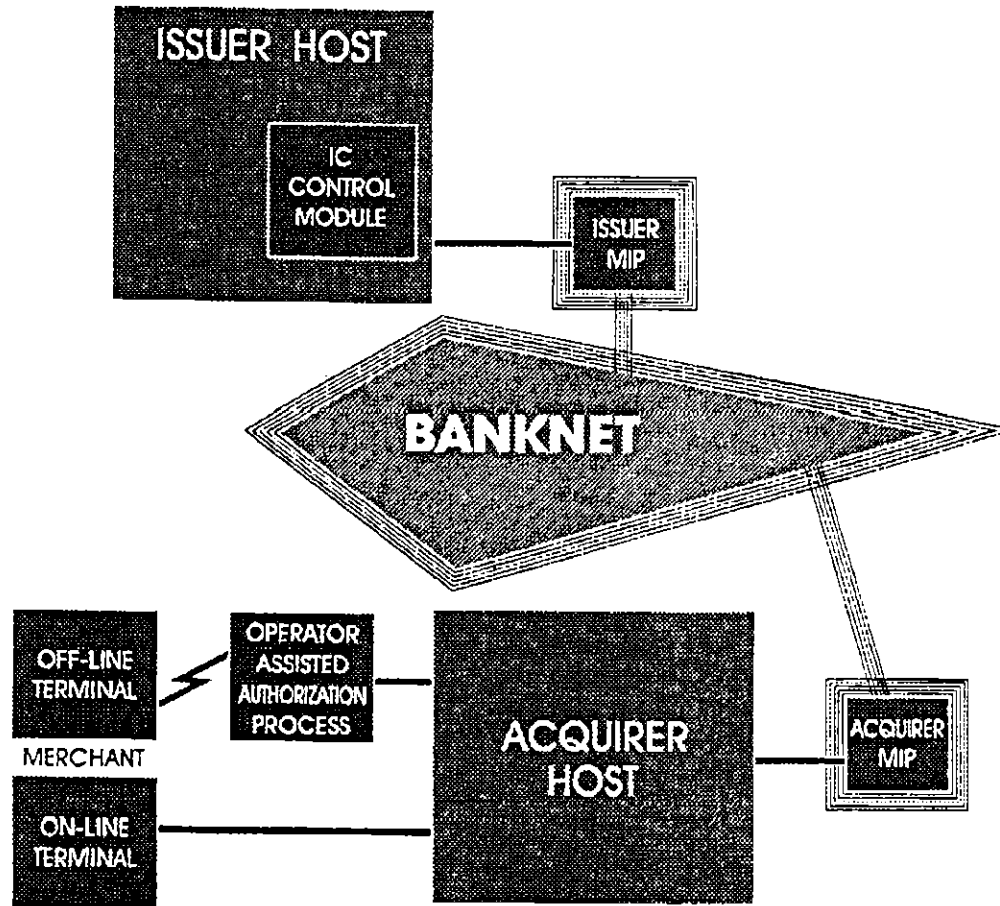
INTEGRATED CIRCUIT CARD TRANSACTION FLOW OVERVIEW OFF-LINE



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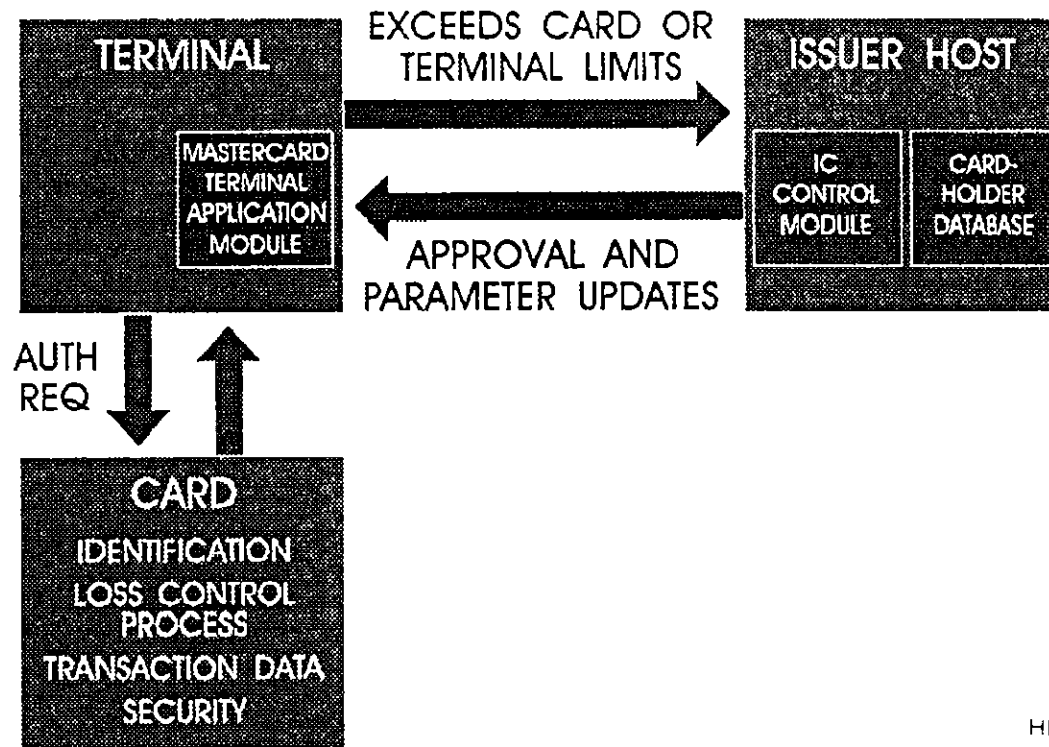
IC CARD AUTHORIZATION



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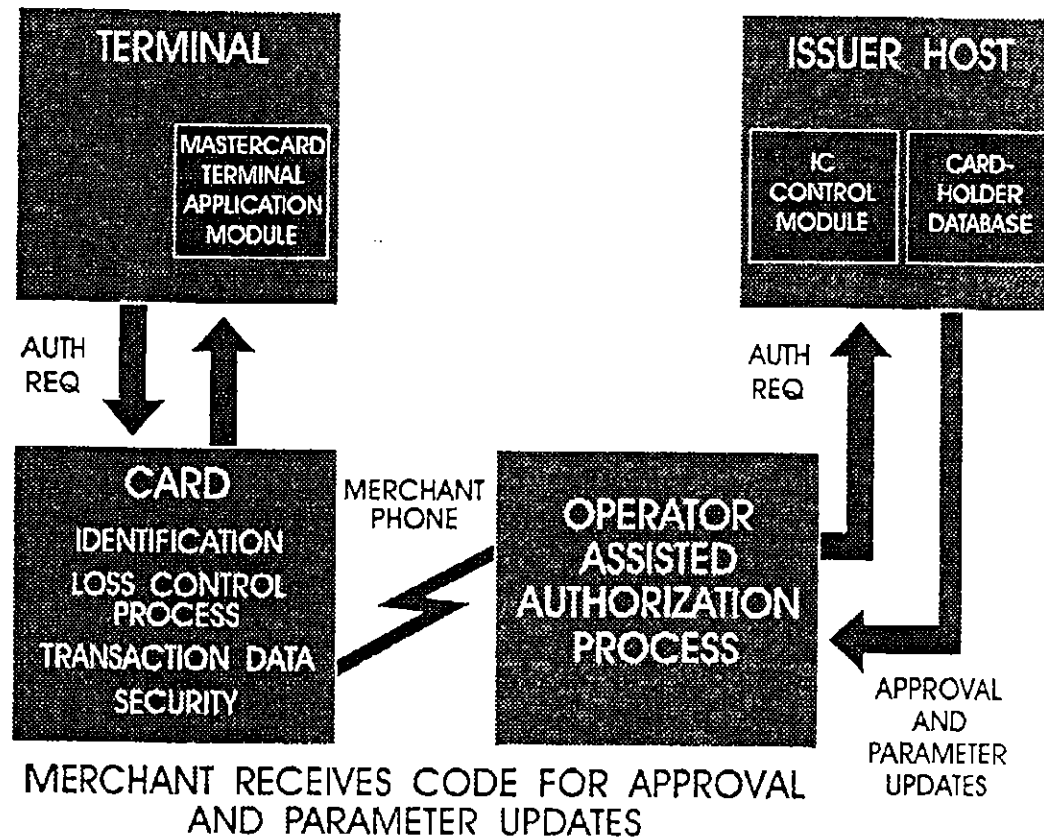
INTEGRATED CIRCUIT CARD TRANSACTION FLOW OVERVIEW ON-LINE



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INTEGRATED CIRCUIT CARD TRANSACTION FLOW OVERVIEW OPERATOR ASSISTED ON-LINE



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RISK MANAGEMENT

- DUAL CONTROL
 - FRAUDULENT CARD CAUGHT BY TERMINAL
 - FRAUDULENT TERMINAL CAUGHT BY CARD
- PERSONAL IDENTIFICATION
 - PIN – SUPERB SAFETY RECORD AND CUSTOMER ACCEPTANCE
 - BIOMETRIC ID – STORE AND COMPARE FINGERPRINT, SIGNATURE, ETC.
 - BIOGRAPHIC WORD

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RISK MANAGEMENT

- PARAMETER-DRIVEN CONTROLS
 - ISSUER FLOOR CASH/T&E/RETAIL
 - CUMULATIVE TOTAL AMOUNT OF CONSECUTIVE OFF-LINE CHARGES
 - CUMULATIVE TOTAL NUMBER OF CONSECUTIVE OFF-LINE CHARGES
 - NUMBER OF MONTHS SINCE LAST USE
 - CARD ACCEPTOR FLOOR LIMIT
 - AVERAGE BALANCE

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RISK MANAGEMENT

- LIFE CYCLE FULLY MASTERCARD CONTROLLED
 - CERTIFICATION OF VENDORS
 - REGULAR AUDITS
 - UNIQUE ID FOR EACH CHIP AND EACH TRANSACTION

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INDUSTRY REVIEW PROCESS

- FORMATION OF INTEGRATED CIRCUIT CARD INDUSTRY STEERING COMMITTEE (ICCISC)
- INVITED PARTICIPANT ORGANIZATIONS:
 - MASTERCARD
 - VISA
 - AMERICAN EXPRESS
 - INTAMIC (EUROPE)
 - BELL COMMUNICATIONS
 - FISC (JAPAN)
 - IBM
- PLUS CONSULTANTS:
 - ARTHUR D. LITTLE, INC.
 - TRW FINANCIAL SYSTEMS
- SELF-CHAIRING WITH ROTATING HOSTS
- INFORMATION SHARING FOR COMMON GOOD

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ICCISC CURRENT MEMBERSHIP

- ROGER PEIRCE, EXECUTIVE VICE PRESIDENT
EINAR ASBO, MANAGER, TECHNICAL APPLICATIONS } VISA
INTERNATIONAL

- PHILIP RIESE, SENIOR REGIONAL VICE PRESIDENT
ROBERT FLAST, VICE PRESIDENT } AMERICAN
EXPRESS

- JOHN C. ELLIOTT, EXECUTIVE VICE PRESIDENT
LAWRENCE A. LADOUCEUR, VICE PRESIDENT
JAMES O'CONNELL, CONSULTANT } MASTERCARD
INTERNATIONAL

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ICCISC CURRENT MEMBERSHIP

- JOHN TUNSTALL, _____ INTERNATIONAL ASSOCIATION FOR
GENERAL SECRETARY MICROCIRCUIT CARDS
(INTAMIC), FRANCE
- STEVEN WEINSTEIN, _____ BELL CORE
DIVISION MANAGER
- HIDEO MASUDA, DIRECTOR, _____ FINANCIAL INDUSTRY INFORMATION
ELECTRONIC RESEARCH DEPARTMENT SYSTEMS CENTER (FISC), JAPAN
- JEROME SVIGALS, MANAGER, _____ IBM
GROWTH PLANNING ISO TC68/SC6/WG5 COMMITTEE
- BLAIR SHICK, CONSULTANT _____ ARTHUR D. LITTLE, INC.
- GEORGE WARFEL, JR., CLIENT _____ TRW FINANCIAL SYSTEMS
EXECUTIVE CONSULTING AND
SYSTEMS ENGINEERING DIVISION

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ICCISC

- HAS MET SEVEN TIMES
- HUNDREDS OF HOURS OF REVIEW, DISCUSSION, AND DEBATE
- INVOLVEMENT BY STAFF OF:
 - VISA
 - AMERICAN EXPRESS
 - FISC
 - TRW FINANCIAL SYSTEMS
 - ARTHUR D. LITTLE, INC.
 - MASTERCARD INTERNATIONAL
- PRESENTATIONS BY EACH MEMBER
- FULL ACCESS TO ALL DOCUMENTATION
- TOURS OF TEST LABS

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ICCISC HAS RAISED AND RESOLVED OVER 50 TECHNICAL, BUSINESS AND SYSTEM ISSUES INCLUDING THE FOLLOWING MAJOR ISSUES:

- **CHIP PLACEMENT**
RESOLUTION: "MIDDLE POSITION"; ISO/DP 7816/2.3 STANDARD; CONTACTS ON BACK; ONLY 6 CONTACTS FOR STRENGTH
- **E-PROM VS. EE-PROM**
RESOLUTION: E-PROM TODAY; EE-PROM IN FUTURE WHEN TECHNOLOGY/COST FACTORS INDICATE
- **PIN SELECTION**
RESOLUTION: ISSUER SELECTS INITIAL PIN; CARDHOLDER MAY CHANGE PIN UP TO THREE TIMES
- **MULTIPLE ISSUERS ON ONE CARD**
RESOLUTION: ISSUING BANK OWNS THE MEMORY AND MAY "SUBLET" TO APPROVED OTHER USES
- **SINGLE TERMINAL ABLE TO PROCESS DIFFERENT CARDS**
RESOLUTION: APPLICATION MODULES ALLOW A SINGLE TERMINAL TO PROCESS SECURELY MULTIPLE CARDS, EACH BY ITS OWN RULES

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APPLICATION SECURITY REVIEW

- PURPOSE
 - TEST THE SECURITY OF THE DESIGN
- METHOD
 - SIMULATE THE ACTUAL PROCESS
- RESULT
 - SOME WEAKNESSES WERE FOUND AND REDESIGN UNDERTAKEN TO CORRECT
 - FINAL DESIGN IS SECURE

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REVIEW METHODOLOGY

- PARTICIPANTS HAD NO PRIOR EXPOSURE TO PROJECT
- SKILL LEVELS FROM "ADVANCED HACKER" TO FORMER MAJOR BANK DP HEAD TO COMPUTING SPECIALIST WITH WORK IN ENCRYPTION AND ARTIFICIAL INTELLIGENCE
- SEPARATE GROUPS WITH COMPARTMENTALIZED KNOWLEDGE
 - MERCHANTS
 - BANKERS
 - MANUFACTURERS
 - CARDHOLDERS
- REWARD FOR SUCCESSFUL BREACH IDEAS

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REVIEW METHODOLOGY

- COLLUSIVE ATTEMPT
 - PLAYERS SHARED DOCUMENTATION AND IDEAS
 - ATTENDED BY IC CARD SYSTEM DESIGN ENGINEER AND MCI
- TYPES OF BREACH ATTEMPTS RANGED WIDELY
 - BRIBE/THREATEN BANK OFFICIAL
 - OBTAIN PINS BY READING PIN PAD
 - SIMULATE VIA PC
 - BRUTE FORCE ATTACK WITH CRAY II
- REDESIGN EFFORT
 - POTENTIAL WEAKNESSES WERE NOT JUST PLUGGED, BUT WERE DESIGNED OUT

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**WORLDWIDE STATUS —
IC CARD DEVELOPMENT
PILOT PROGRAM REVIEW
MARKET RESEARCH RESULTS**

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IC CARD WORLDWIDE STATUS

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	POS	TELEPHONE	SECURITY	HEALTH
FRANCE				
JAPAN				
USA				
NORWAY				
CANADA				
GERMANY				

SMART CARD GRID
EUROPE, MIDDLE EAST, AND AFRICA

<u>FIRM</u>	<u>TYPE</u>	<u>USE</u>	<u>NUMBER OF CARDS ISSUED</u>	<u>LEVEL OF PROGRAM</u>
CARTES BANCAIRES	8K-16K IC	POS/TELEPHONE	13M	PRODUCTION APPROVED
PTT VIDEOTEX	16K-30K IC	VIDEOTEX		PRODUCTION APPROVED
MINITEL	8K DISPOSABLE	PHONES		PRODUCTION APPROVED
ITALIAN GOVERNMENT	8K-16K IC	POS/I.D.		TESTING
LUXEMBURG GOVERNMENT	8K-16K IC	BANK/POS	3M	TESTING
DEUTSCHE BUNDEPOST	8K-16K IC	PHONES		PILOTING
PASTEUR INSTITUTE		HEALTH SERVICES	1K	TRIAL
PARIS UNIVERSITY		STUDENT ID/ RECORDS	30K	PILOTING
IDA				
TOB		MAS TRANSIT	3K	PILOTING
PARIS SAVINGS BANK		ID/ATM	1K	PILOTING
		BLOOD TRANSFUSION RECORD	12K	PILOTING
LA VILLETTE		ACCESS/PAYMENTS		PILOTING
CLEMATIC		ACCESS/PAYMENTS/ E-MAIL		PILOTING
BULL		ACCESS/PAYMENTS/ E-MAIL		PRODUCED
ROLEX		WATCH WARRANTY RECORD		
SOCIAL SERVICES DEPT. OF GIRONDE		RECORDS/ SECURITY	1K	PILOTING
DECITEL SERVICES		ELECTRONIC SIGNATURE		PILOTING
CIRCARD		SECURITY OF COMMUNICATIONS		PRODUCED
20 RETAILERS		POS		PILOTING
SENEGALESE GOVERNMENT		IMPORTER CREDENTIAL		HIGHLY CONFIDENTIAL SUBJECT TO PROTECTIVE ORDER

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SMART CARD GRID
NORTH AMERICA

<u>FIRM</u>	<u>TYPE</u>	<u>USE</u>	<u>NUMBER OF CARDS ISSUED</u>	<u>LEVEL OF PROGRAM</u>
ROYAL BANK OF CANADA	8K IC	EFT SECURITY		PRODUCED
		EMPLOYEE ID		PRODUCED
MASTERCARD INTERNATIONAL	8K IC	POS	40K	PILOTING
VISA	TERMINALESS IC	POS/PERSONAL DATA		R&D
VARIOUS	8K IC	SECURE ACCESS	10S OF K	PRODUCED
AMEX		POS	0	RESEARCH
BLUE CROSS/BLUE SHIELD OF MARYLAND	OPTICAL	HEALTH RECORDS/ BILLING		PILOTING
AFFILIATED HEALTH CAR	8K IC AND MAG STRIPE	HEALTH PAYMENT	675	PILOTING
AMERICAN MEDICAL CENTER		HEALTH PAYMENT	1K	TRIAL
PRIMARY PREVENTION PROGRAM CENTER		DIET AND EXERCISE		TESTING
DAVIS & HENDERSON, LTD.		RETAIL	5K	PILOTING
WRITER SECURITIES		STOCK ORDERS		PILOTING
AT&T	24K IC CONTACTLESS	PAY PHONES		PILOTING
	24K IC CONTACTLESS	ID CARD WITH COLOR PHOTO		TESTING
		COSMETICS RECORD		RESEARCH
		SAVINGS STAMP		RESEARCH
		AUTO WARRANTY		RESEARCH
		AUTO REGISTRATION/ LICENSE		RESEARCH
TEXAS MEDICAL CENTER	OPTICAL	MEDICAL RECORDS		PILOTING

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SMART CARD GRID
ASIA

<u>FIRM</u>	<u>TYPE</u>	<u>USE</u>	<u>NUMBER OF CARDS ISSUED</u>	<u>LEVEL OF PROGRAM</u>
JAPAN MINISTRY OF HEALTH		HEALTH RECORDS		RESEARCH
JAPAN MINISTRY OF TRANSPORT		TRANSPORTATION AND LODGING		RESEARCH
KUNAMOTO VIDEOTEX		COMMODITY TRADING		R&D
SEIBU SAISON	64K IC	HEALTH RECORDS	12K	
HOKURIKU BUREAU OF CONSTRUCTION		VEHICLE OPERATING LOG		R&D
HUDSON SOFTWARE		PC GAME SOFTWARE		
MATSUSHITA FREEZER		VENDING MACHINES		
MITSUI BANK		ACCESS TO MANAGEMENT DECISION ROOM		
SAPPORO FITNESS CENTER		MEMBER BODY INFORMATION		
OFFICE TECHNICA		PERSONNEL RECORDS		
KOREAN GOVERNMENT		1988 OLYMPIC VISITOR/ PARTICIPANT ID		
		NATIONAL ID		
TOKAI BANK		POS	1K	PILOTING
KYOWA BANK/ NIPPON COINCO CO.		VENDING MACHINES		PILOTING
TOYO BANK & TRUST		FINANCIAL ADVICE		
DAI ICHO KANGIO, BANK OF TOKYO, MITSUI BANK, FUJI BANK, KYOWA BANK, TOSHIBA, OKI ELECTRIC, FUJITSU AND MATSUSHITA ELECTRIC		POS		TESTING
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JAPAN MINISTRY OF POST AND TELEGRAPH		BANKING/ POSTAL SERVICE/ INSURANCE/ID		TESTING

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COLUMBIA, MARYLAND TEST

- MICRO CARD TECHNOLOGIES, INC.
(CP8 BULL)
- 6 BANKS
 - CITIBANK
 - EQUITABLE BANK
 - FIRST AMERICAN
 - MARYLAND NATIONAL BANK
 - BANK OF VIRGINIA
 - SAVINGS BANK OF BALTIMORE
- 16,000 CARDS
- 70 MERCHANTS

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WEST PALM BEACH, FLORIDA TEST

- CASIO MICROCARD CORP.
- 4 BANKS
 - CITIBANK
 - ATLANTIC NATIONAL BANK
 - FIRST NATIONAL BANKIN PALM BEACH
 - MALL BANK
- 22,500 CARDS
- 120 MERCHANTS

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1986 PILOT USAGE STATISTICS

■ IC CARD ACCOUNTS	23,000
■ IC CARD ACCOUNTS ACTIVE	20-40%
■ IC CARD ACCOUNTS USED AT IC MERCHANT LOCATIONS	10-30%
■ AVERAGE NUMBER OF TRANSACTIONS PER ACTIVE ACCOUNT	10-12
■ AVERAGE NUMBER OF IC TRANSACTIONS PER ACCOUNT AT IC MERCHANT LOCATIONS	1.5-3

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1986 PILOT USAGE STATISTICS

- NUMBER OF IC CARD TRANSACTIONS AT THE 190 MERCHANT LOCATIONS 4,000-10,000
- NUMBER OF SUCCESSFUL IC CARD TRANSACTIONS 2,300
- AVERAGE IC CARD SALE \$48-\$70

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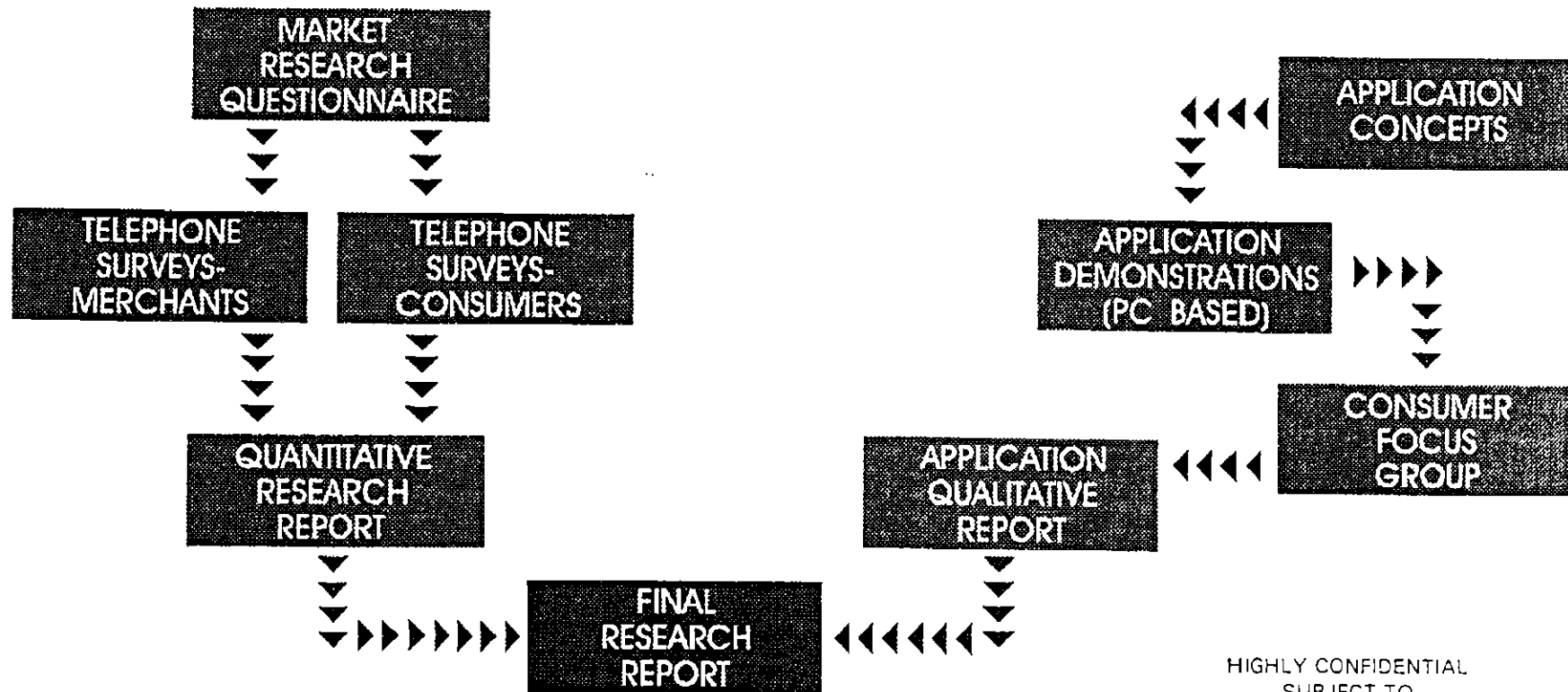
PILOT FIELD TEST RESULTS

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- CONSIDERABLE EDUCATION EFFORTS NECESSARY FOR BOTH CONSUMER AND MERCHANT
- POS ENVIRONMENT MUST BE SIMPLIFIED AND UNIVERSAL
- MULTIPLE PIN PADS PER LOCATION PROBABLY WILL BE REQUIRED
- PIN PAD AND TERMINAL LOCATION CANNOT BE ASSUMED CONTIGUOUS
- PROCESSING SPEED AT WHICH A CARD IS INITIALIZED MUST BE IMPROVED BY AT LEAST AN ORDER OF MAGNITUDE
- CARDHOLDER SELECTED PINS DEFINITELY BETTER OVER ISSUED PINS

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MASTERCARD IC CARD RESEARCH PROCESS



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SUMMARY OF FINDINGS

- IC CARD IMPROVES MASTERCARD IMAGERY
- CONSUMERS PERCEIVE SIGNIFICANT BENEFITS
- INTRODUCTION DID NOT NEGATIVELY AFFECT USAGE
- PIN WAS NOT A CONSTRAINT
- APPLICATIONS INCREASE CARD DESIRABILITY AND USAGE
- MERCHANTS WERE NEUTRAL

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IMAGE

- CARD IMAGERY AMONG SUCCESSFUL USERS APPEARS TO HAVE IMPROVED

% RATED MASTERCARD "EXCELLENT"

PRE-WAVE TOTAL 29

POST-WAVE

USERS 36

NON-USERS 28

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PERCEIVED BENEFITS - FRAUD

- THE MAJORITY OF SUCCESSFUL USERS FEEL A GREATER SENSE OF PROTECTION WITH THE IC CARD (67% MUCH/SOMEWHAT MORE PROTECTED) WHEN COMPARED TO THE REGULAR CARD
- AN EVEN GREATER PERCENTAGE OF USERS (75%) FEEL THAT THE ADDITION OF THE PIN PROVIDES MORE PROTECTION

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PERCEIVED BENEFITS - SPEED

- THE MAJORITY OF SUCCESSFUL USERS (57%) PERCEIVED THE SPEED OF TRANSACTION TO BE FASTER

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PIN

- A MAJORITY OF CONSUMERS ALREADY HAVE PINS (66%) WITH OTHER "BANK CARDS"
- MORE THAN HALF (52%) HAVE USED A CARD WITH A PIN
- ALMOST ALL (91%) OF PIN USERS FIND THE PROCESS EASY TO UTILIZE
- OVER 4 OUT OF 5 (83%) STRONGLY PREFER SELECTING THEIR OWN PIN

APPLICATION IDEAS PRESENTED

- ENHANCED CREDIT CARD (PIN, SECURITY, RECORDING)
- MEDICAL/HEALTH INSURANCE INFORMATION
- BANK INFORMATION (ACCOUNT #'S, CD DUE DATES, ETC.)
- TRAVEL INFORMATION (DISCOUNT #'S, FREQUENT FLYER, ETC.)
- TELEPHONE (SPEED DIALING, FREQUENT #'S)
- DEBIT CARD
- LOW COST CARD READER
- STOCK BROKER INFORMATION
- KEY DATE REMINDER

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IMPORTANCE

- THE IDEAS PERCEIVED AS MOST IMPORTANT WERE:
 - ENHANCED CREDIT CARD
 - MEDICAL/HEALTH INSURANCE INFORMATION
- THE IDEAS THAT APPEARED TO BE OF INTEREST TO CERTAIN SEGMENTS WERE:
 - TRAVEL INFORMATION
 - TELEPHONE
 - LOW COST CARD READER
- THE IDEAS OF LEAST IMPORTANCE WERE:
 - DEBIT CARD
 - BANK INFORMATION
 - STOCK BROKERAGE
 - KEY DATES

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IC CARD SYSTEM CONTROLS

- TERMINAL CONTROLS
- CARDHOLDER
AUTHENTICATION
- CARD CONTROLS
AND STORAGE

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IC CARD "CHIP" PARAMETERS

UNIQUE TO EACH ACCOUNT/CARD:

- TRANSACTION LIMITS
 - CASH
 - TRAVEL & ENTERTAINMENT
 - RETAIL
- ACCOUNT AVAILABLE CREDIT
- MAXIMUM NUMBER OFF-LINE TRANSACTIONS
- MAXIMUM NUMBER OF MONTHS SINCE LAST USE
- ACCOUNT RISK AND SERVICE LEVEL

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PROTECTIVE ORDER

J 000000

IC CARD CREDIT CONTROLS

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PROTECTIVE ORDER

- TRANSFERS THE FLOOR LIMIT CONTROL FROM THE MERCHANT TYPE TO THE INDIVIDUAL CARDHOLDER CHARACTERISTIC
- ALLOWS THE ACCOUNT TO CONTROL THE TRANSACTION
- ALLOWS BETTER CUSTOMERS MORE USAGE FLEXIBILITY
- ALLOWS GREATER CONTROL OVER THE USAGE OF THE HIGHER RISK CARDHOLDER
- OPENS UP ADDITIONAL MARKETING POTENTIAL TO UNBANKED CUSTOMERS

MASTERCARD IC CUSTOMER TYPE

LIMITS

CASH
SINGLE
TRANSACTION

T & E
SINGLE
TRANSACTION

RETAIL
SINGLE
TRANSACTION

CUMULATIVE
AMOUNT
(AVAILABLE CREDIT)*

CUMULATIVE
NUMBER OF
TRANSACTIONS

MAXIMUM
DORMANT
DAYS

	A	B	C	D	E
CASH SINGLE TRANSACTION					
T & E SINGLE TRANSACTION					
RETAIL SINGLE TRANSACTION					
CUMULATIVE AMOUNT (AVAILABLE CREDIT)*					
CUMULATIVE NUMBER OF TRANSACTIONS					
MAXIMUM DORMANT DAYS					

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* AVAILABLE CREDIT MAY NOT BE EQUIVALENT TO THE ACCOUNT OPEN TO BUY AMOUNT AT ISSUER'S OPTION

A-BEST CUSTOMER

- A CONVENIENCE USER
- HIGH NET WORTH
- BUSINESS TRAVELER
- UPSCALE DEMOGRAPHIC PROFILE
- PROFESSIONAL/MANAGERIAL JOB TYPE
- IMPECCABLE CREDIT RECORD
- OTHER BANKING RELATIONSHIPS
- HIGH MASTERCARD CREDIT LIMIT
- THREE YEAR PLUS ACCOUNT HISTORY
- HOME OWNER

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PROTECTIVE ORDER

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D-BELOW AVERAGE CUSTOMER

- REVOLVER OR NEW ACCOUNT
- LIMITED OR VERY ACTIVE
- AVERAGE OR BELOW AVERAGE INCOME
- NON MANAGERIAL/TECHNICAL JOB TYPE
- CREDIT RECORD SPOTTY BUT CONSISTENT
- AVERAGE CREDIT LIMIT
- NO VERIFIABLE NET WORTH
- PROMOTION

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J 230000

MASTERCARD IC CUSTOMER TYPE

LIMITS

CASH
SINGLE
TRANSACTION

T & E
SINGLE
TRANSACTION

RETAIL
SINGLE
TRANSACTION

CUMULATIVE
AMOUNT
(AVAILABLE CREDIT)*

CUMULATIVE
NUMBER OF
TRANSACTIONS

MAXIMUM
DORMANT
DAYS

	A	B	C	D	E
CASH SINGLE TRANSACTION	500			50	
T & E SINGLE TRANSACTION	1500			200	
RETAIL SINGLE TRANSACTION	1000			100	
CUMULATIVE AMOUNT (AVAILABLE CREDIT)*	5000			500	
CUMULATIVE NUMBER OF TRANSACTIONS	50			10	
MAXIMUM DORMANT DAYS	180			60	

* AVAILABLE CREDIT MAY NOT BE EQUIVALENT TO THE ACCOUNT OPEN TO BUY AMOUNT AT ISSUER'S OPTION

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J 2000001

CONCLUSIONS AND BENEFITS

	MAJOR BENEFIT	EFFECT
CREDIT LOSS	REDUCTION IN OVER LIMIT LOSSES	LOSSES REDUCED BY 10%
FRAUD LOSS	PIN CONTROL SIGNIFICANT	LOSSES REDUCED BY 80%
COUNTERFEIT LOSS	PIN CONTROL SIGNIFICANT	LOSSES REDUCED BY 95%
AUTHORIZATION COSTS	INCREASE IN OFF-LINE CARD AUTHORIZATION	ON-LINE AUTHORIZATION VOLUME REDUCED BY 70%

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J 1000052

DESIRABILITY AND USAGE

- TWO IDEAS WERE PERCEIVED AS LIKELY TO INCREASE INTEREST IN HAVING THE CARD AND INCREASING USAGE
 - ENHANCED CREDIT CARD
 - MEDICAL/HEALTH INSURANCE INFORMATION
- AMONG USERS, 42% SAID THAT THEY WOULD USE THE CARD MORE OFTEN IF ADDED FEATURES WERE AVAILABLE
- AMONG NON-USERS, 71% SAID THAT THEY'D USE THE CARD IF ADDED FEATURES WERE AVAILABLE IN SPITE OF MERCHANT UTILITY PROBLEMS

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J 00000000

MERCHANT RESPONSE

- MOST (68%) MERCHANTS FELT THAT THE IC CARD WAS A BETTER DETERRENT TO FRAUD THAN OTHER CARDS
- HOWEVER, ALMOST NINE OUT OF 10 (87%) MERCHANTS DO NOT FEEL THAT FRAUD IMPACTS THEIR BUSINESS
- MERCHANTS DID NOT PERCEIVE ANY DIFFERENCE IN AUTHORIZATION TIME AND ONLY A SMALL PERCENTAGE (8%) FEEL AUTHORIZATIONS ARE TOO SLOW
- OVERALL, MOST MERCHANTS (61%) FELT LITTLE RELUCTANCE OR EXCITEMENT

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J 2000004

FUTURE APPLICATIONS

**RICHARD L. DUNHAM
MICRO CARD TECHNOLOGIES, INC.**

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PROTECTIVE ORDER

J 2000035

BULL GROUP

- 1985 WORLD-WIDE
REVENUE — \$2.5 BILLION
- 1985 R&D INVESTMENT —
10% OF REVENUE
- BULL OFFICE OR
REPRESENTATION IN 75
COUNTRIES
- 26,000 EMPLOYEES
WORLD-WIDE

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PROTECTIVE ORDER

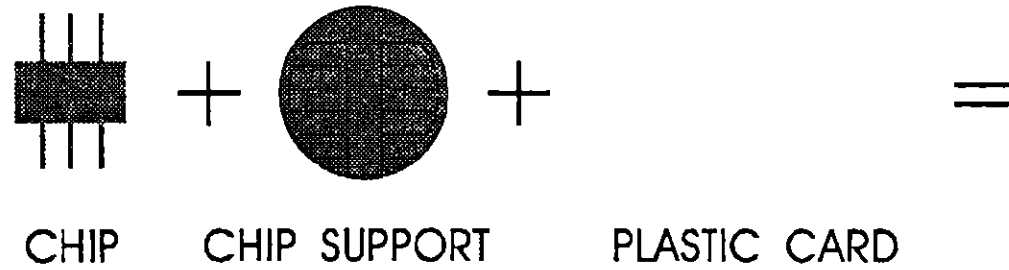
J 00000055

U.S. MANUFACTURING

- 21,000 SQUARE-FOOT STATE OF THE ART FACILITY IN DALLAS, TEXAS
- 2.4 MILLION CARDS SCHEDULED FOR PRODUCTION IN 1987
- 20 MILLION CARDS PER YEAR CAPACITY
- PLAN TO OPEN ADDITIONAL PLANTS THROUGHOUT NORTH AMERICA AS WE NEAR CAPACITY

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J 2300067



MASTERCARD IC CARD

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CARTE BLEUE
CARD

200,000	1985
3,000,000	1986
4,000,000	1987
5,000,000	1988

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PROTECTIVE ORDER

J 2000069

TELECARTE
CARD

2,000,000	1986
2,000,000	1987
3,000,000	1988

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PROTECTIVE ORDER

J E000070

CURRENT USES OF PORTABLE FILES

HEALTH

UNIVERSITY

CHILDRENS MEDICAL
HISTORY

STUDENTS I.D. AND
EDUCATIONAL RECORD

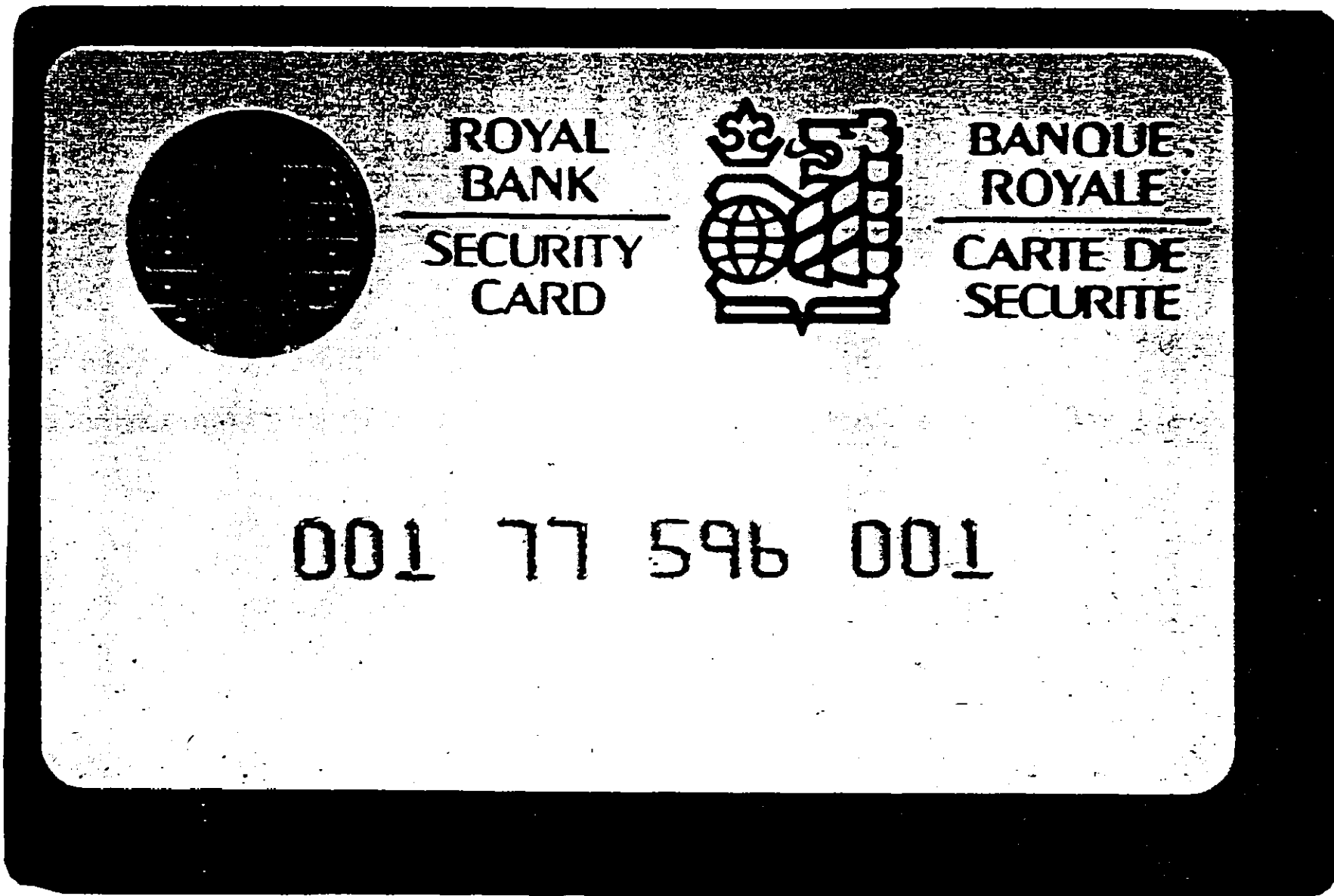
COMMERCIAL

WARRANTY CARD

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PROTECTIVE ORDER

J E000071

CORPORATE BANKING IMPLEMENTATION

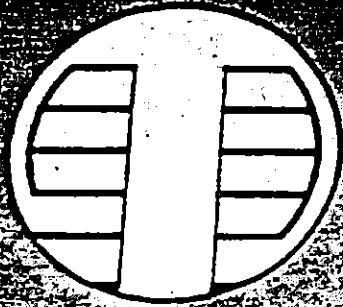


001 77 596 001

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PROTECTIVE ORDER

J 2000072

USDA CROP QUOTA/SALE IMPLEMENTATION



USDA-ASCO
PEANUT MARKETING CARD

21 478

84055

RICHARD L DUNEAN

ROUTE 1

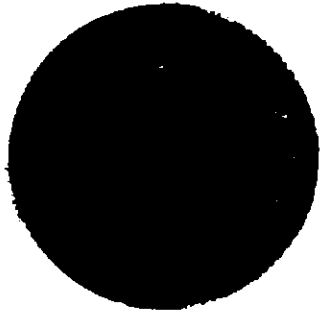
DALLAS

TX 75230

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PROTECTIVE ORDER

J 2000073

MEDICAL INSURANCE IMPLEMENTATION



**Blue Cross
Blue Shield**
of Michigan

336 52 2665

RALPH T. WAKERLY

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PROTECTIVE ORDER

J 8600074

CREDIT AND MEDICAL SERVICES INFORMATION

INSURANCE INFORMATION

MR. JOHN DOE

INS: TRAVELERS GROUP ID: GA 676386DM

POLICYHOLDER: ABC COMPANY GROUP: 151

MEDICAL CREDIT LINE: \$3000.00

HEALTH INFORMATION

BLOOD TYPE: AB+ ALLERGIES: PENICILLIN

SPEC. CONDITIONS: DIABETES

RELIGION: CATHOLIC

EMERGENCY CONTACT:

MRS. JOHN DOE 817-982-2221

FAMILY DOCTOR: DR. JOSEPH ROBINSON

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PROTECTIVE ORDER

J 2000075

- INFORMATION SYSTEM SECURITY
- EMPLOYEE AND DEPENDENT TRAVEL
- SYSTEM WIDE ACCESS CONTROL
- ELECTRONIC TIME CARD
- EMPLOYEE BADGE
- SECURE CONTAINER
- PORTABLE DATA BASE AND CUSTOMER PROFILE
- PRESTIGE CARD
- WORLD AIRLINES CREDIT CARD
- AIRPORT CLUB CARD
- CORPORATE TRAVEL CARD
- FREQUENT TRAVELER INQUIRY
- VIDEOTEXT ACCESS
- FREQUENT TRAVELER AWARDS
- HOTEL/RENTAL CAR PROMOTIONS
- ELECTRONIC TICKET BOARDING PASS
- PREPAID TOKEN FOR COMMUTER TYPE FLIGHTS

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PROTECTIVE ORDER

J 2600075

CORPORATE CARD

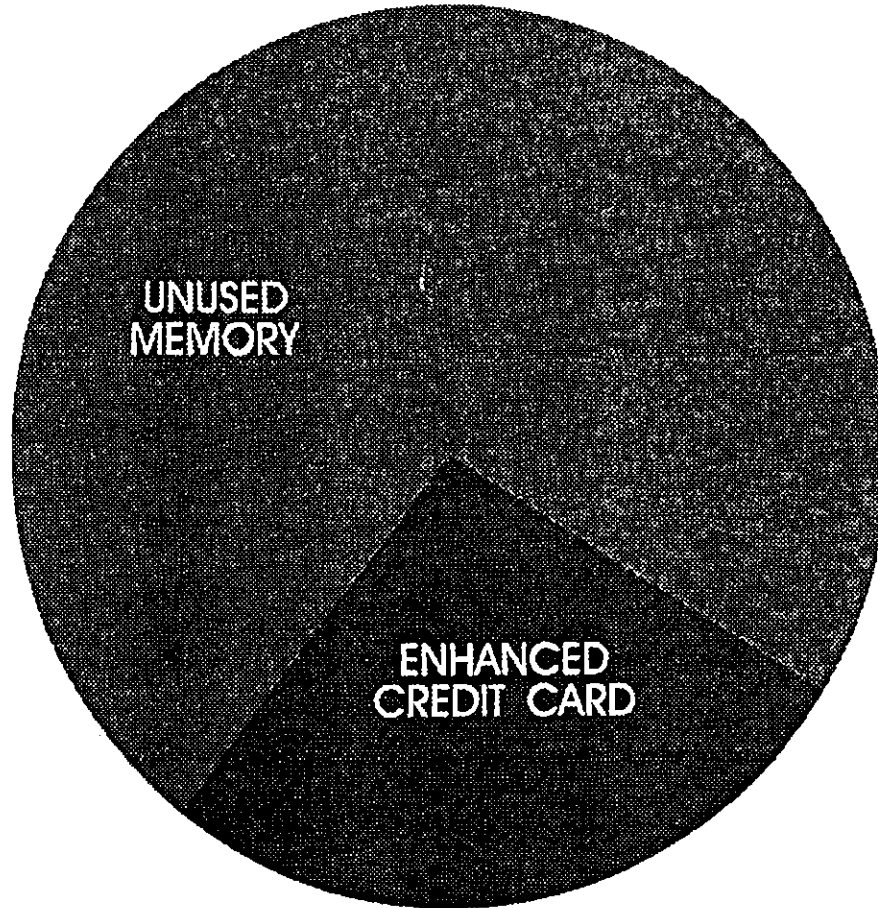
CREDIT CARD OFFERING MULTIPLE SERVICES

- CREDIT CARD WITH SELECTED PARAMETERS TO CONTROL EXPENDITURES
- MEDICAL INFORMATION
- TELEPHONE CALLING CARD
- FREQUENT TRAVELER INFORMATION
 - AIRLINE
 - HOTEL
 - CAR RENTAL

HIGHLY CONFIDENTIAL
SUBJECT TO
PROTECTIVE ORDER

J 2000077

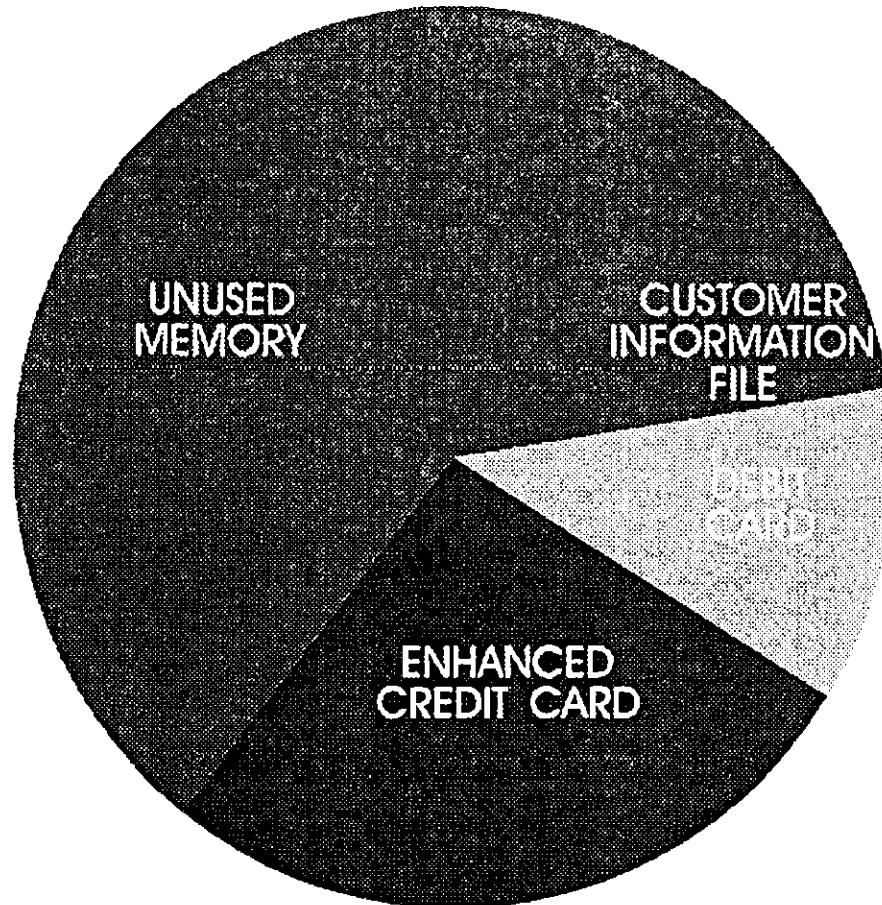
FINANCIAL CARD SERVICES



HIGHLY CONFIDENTIAL
SUBJECT TO
PROTECTIVE ORDER

J 2330078

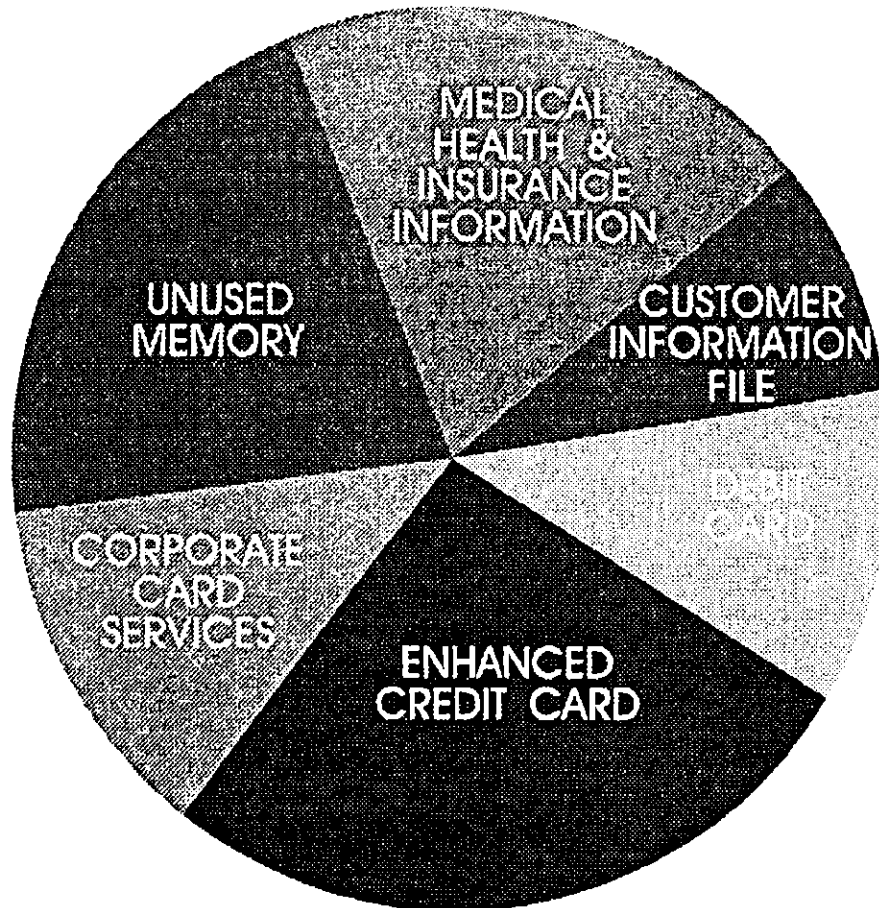
FINANCIAL CARD SERVICES



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J 0000079

SHARED CARD SERVICES



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J 000000

STATUS OF INTAMIC AND ISO STANDARDS EFFORTS

**LAWRENCE A. LADOUCEUR
MASTERCARD INTERNATIONAL**

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J 8000031

ISO CURRENT STANDARDS FOR PLASTIC CARDS

- ISO 7810 PHYSICAL CHARACTERISTICS
- ISO 7811 EMBOSSING RECORDING
TECHNIQUE
- ISO 7812 NUMBERING SYSTEM
- ISO 7813 MAGNETIC STRIPE
TRACK 1 AND 2
DATA CONTENT
- ISO 4909 MAGNETIC STRIPE
TRACK 3
DATA CONTENT

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PROTECTIVE ORDER

J 1000002

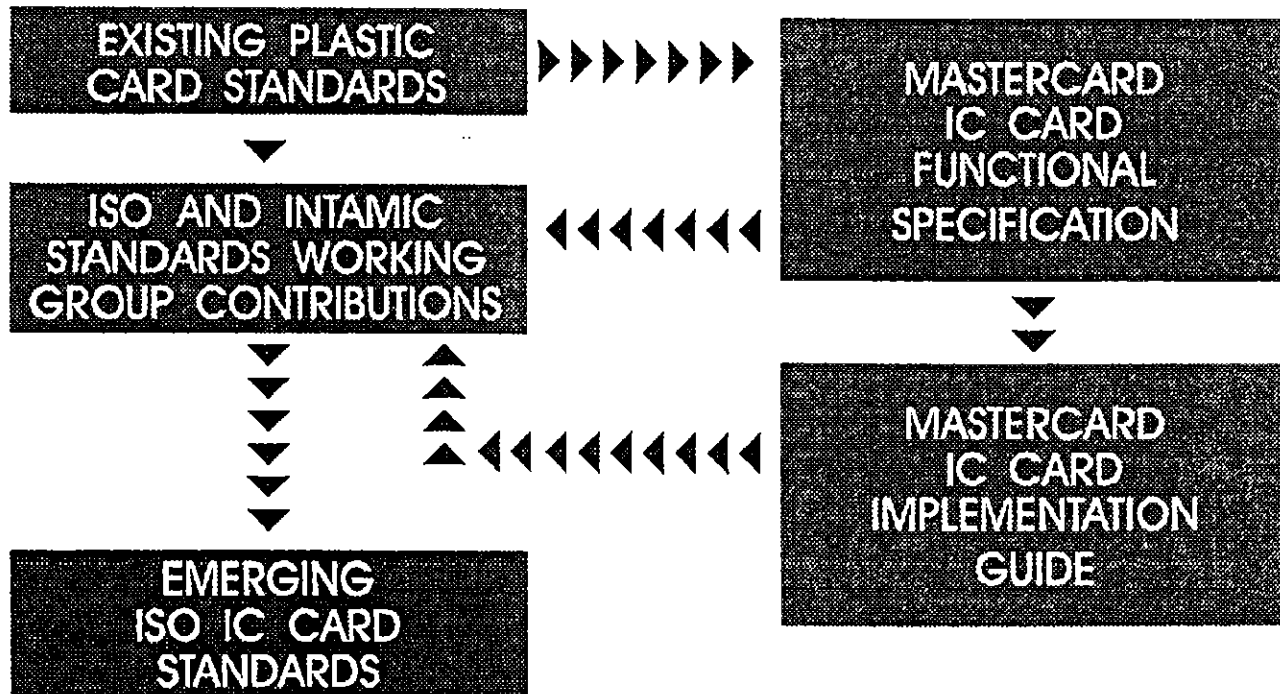
CURRENT ISO STANDARDS WORKING GROUPS FOR THE IC CARD

- ISO TC 97/17/4 PHYSICAL
CHARACTERISTICS
- ISO TC 68/6/5 MESSAGES BETWEEN
IC CARD AND
CARD ACCEPTOR
DEVICE
- ISO TC 68/6/7 SECURITY
ARCHITECTURE
FOR THE IC CARD

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J 2030303

CURRENT STANDARDS PROCESS



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PROTECTIVE ORDER
J 1000000

CREDIT/FRAUD LOSS REDUCTION PLAN

**DAROLD D. HOOPS
MASTERCARD INTERNATIONAL**

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J 200000

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CURRENT ENVIRONMENT

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J 1000000

CONSOLIDATED MASTERCARD/VISA LOSSES

1984	\$ 876.0 M
1985	\$ 1,710.0 M
1986 (1ST HALF)	\$ 1,319.0 M
1990 (PROJECTED)	\$ 2,950.0 M

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J 12 1987

CURRENT SYSTEM CONTROL EXPENSES

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J 000000

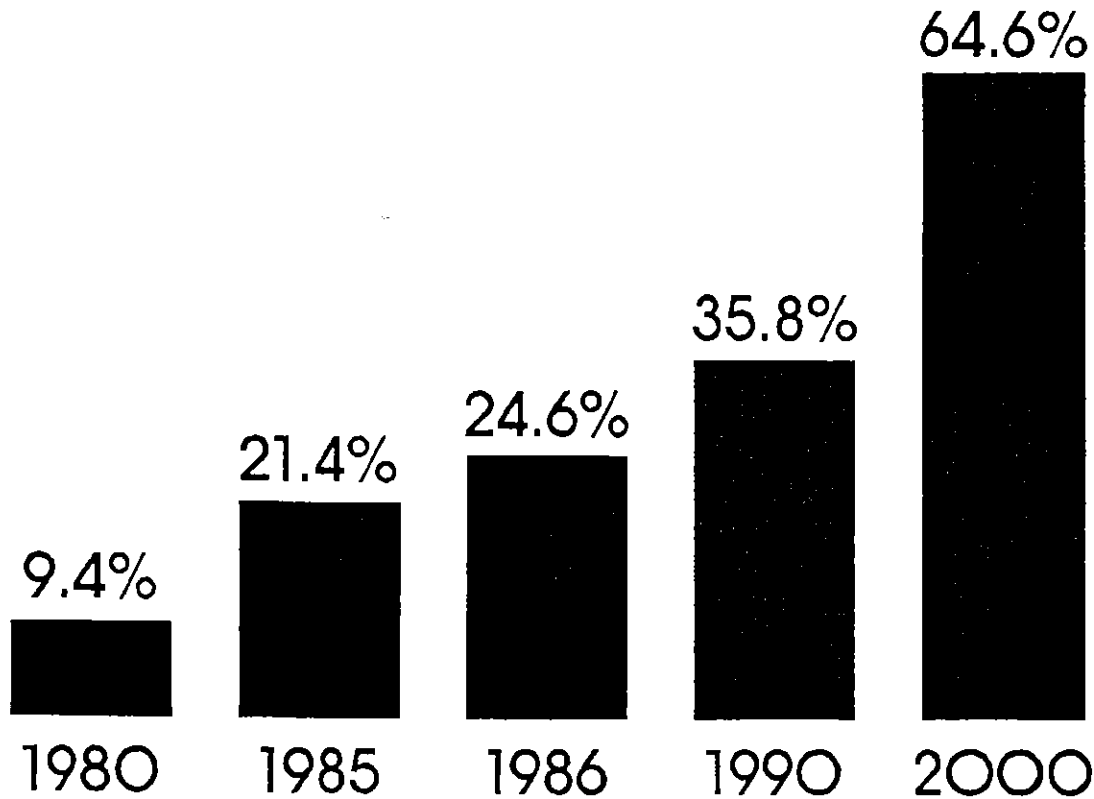
CONTROL EXPENSE AS A PERCENTAGE OF TOTAL OPERATING EXPENSE

■ CREDIT LOSSES	20.0%
■ FRAUD LOSSES	3.5%
■ AUTHORIZATION	6.0%
■ COLLECTIONS/OVERLIMIT AND FRAUD CONTROL	19.0%
<hr/>	
TOTAL PERCENTAGE OF OPERATING EXPENSE	48.5%

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J 1200000

PERCENTAGE OF TRANSACTIONS AUTHORIZED

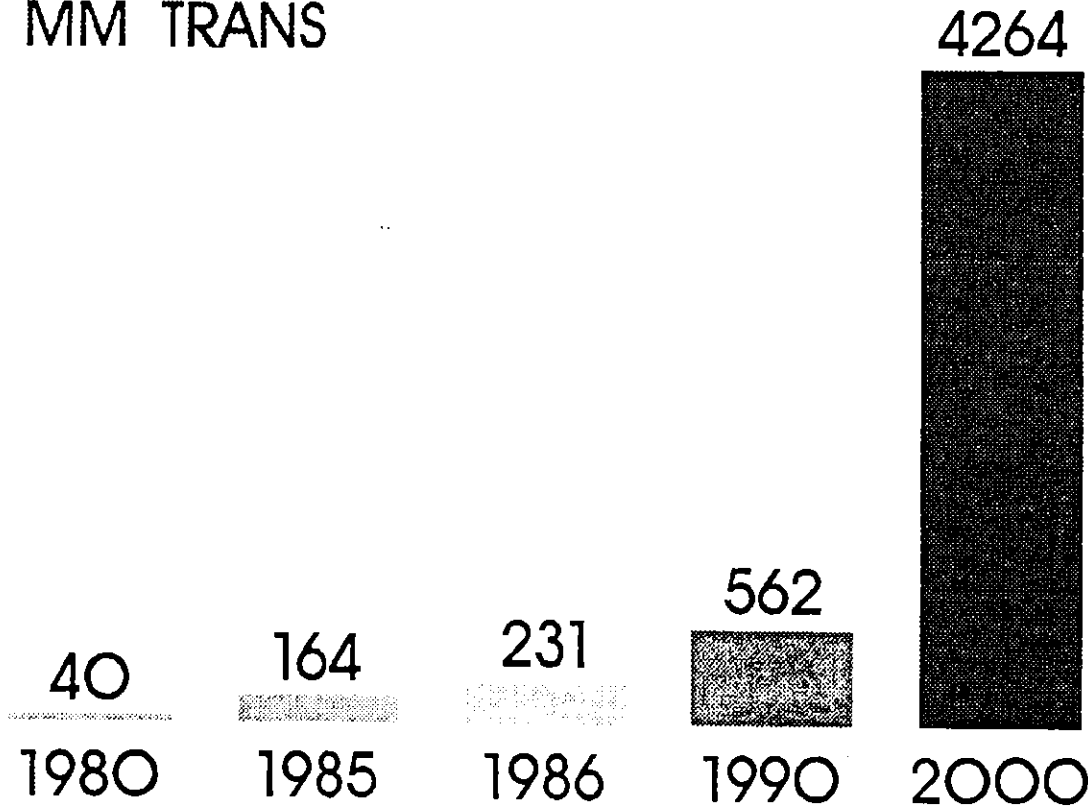


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J 200000

INAS ANNUAL VOLUME

MM TRANS



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JAN 15 1986

AUTHORIZATION CHARACTERISTICS

- 24.6% OF INTERCHANGE TRANSACTIONS AUTHORIZED -- 3RD QTR. 1986
- 91.5% OF INTERCHANGE AUTHORIZATION REQUESTS APPROVED
- 47% AUTHORIZATION REQUESTS BELOW FLOOR LIMITS
- 58% AUTHORIZATION REQUESTS BELOW \$100

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J 280000?

FRAUD LOSS CHARACTERISTICS

- 42% OF LOST AND STOLEN FRAUD OCCURS BEFORE CARD LOSS IS REPORTED TO THE ISSUER
- 18% OCCURS ON THE DAY OF REPORT
- 32% OCCURS AFTER THE DAY OF REPORT BUT BEFORE THE ACCOUNT CAN BE LISTED ON THE CARD WARNING BULLETIN
- 8% OCCURS AFTER THE CARD IS DROPPED FROM THE BULLETIN
- 75+% OF FRAUD TRANSACTIONS ARE BELOW THE FLOOR LIMIT

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CREDIT LOSS CHARACTERISTICS

- THE AVERAGE TRANSACTION TAKES 9 DAYS TO BE POSTED TO A CARDHOLDER ACCOUNT
- 10% OF THE CREDIT LOSSES ARE RELATED TRANSACTIONS OVER THE CREDIT LIMIT OF THE ACCOUNT
- 54% OF THE CHARGEOFFS OCCUR IN ACCOUNTS DURING THE FIRST 18 MONTHS
- 60% OF THE TRANSACTIONS IN ACCOUNTS CHARGED OFF WERE BELOW THE FLOOR LIMIT

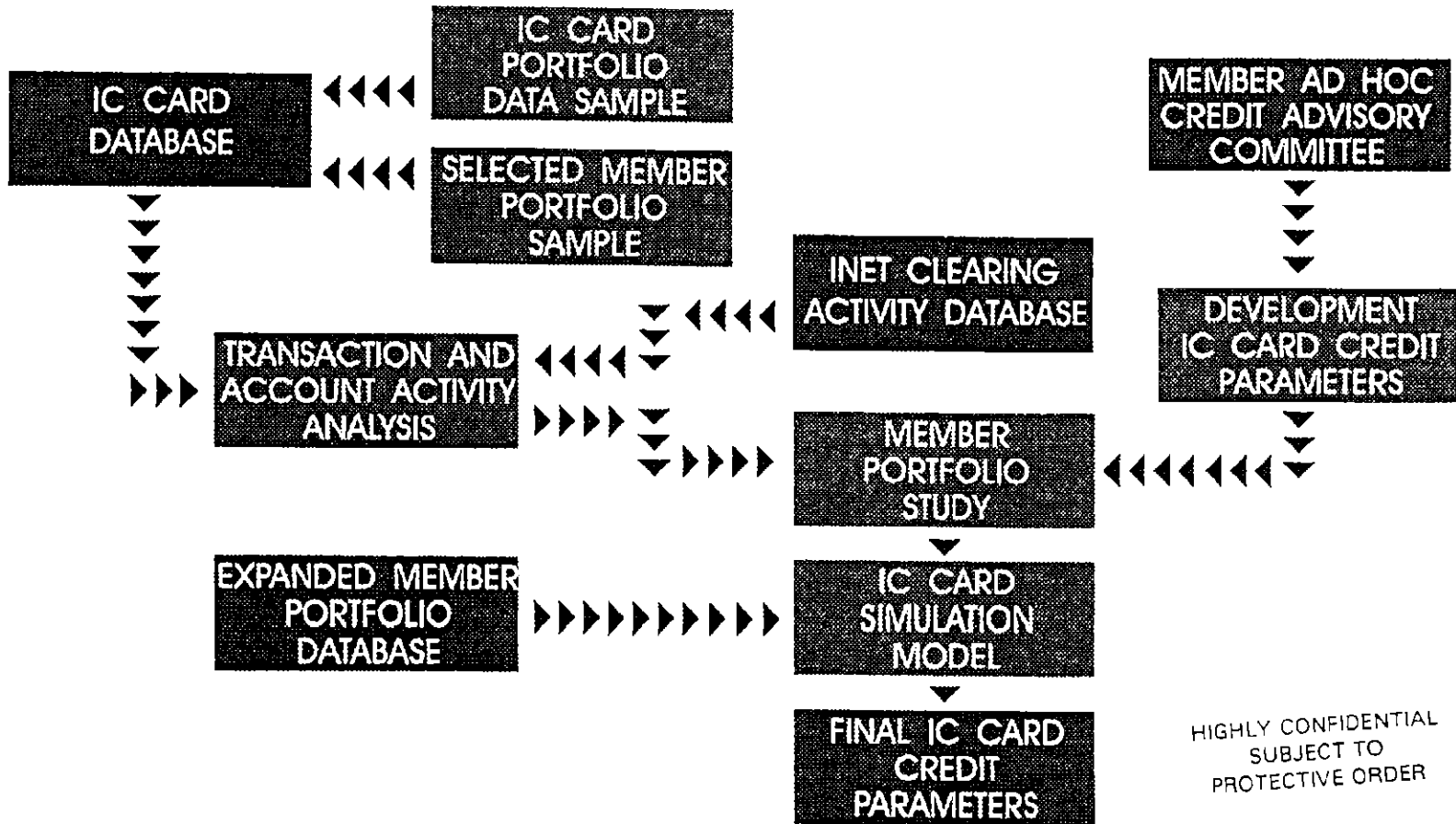
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J 0000054

CARD ISSUER PORTFOLIO CONTROL

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PROTECTIVE ORDER

J 000005

MASTERCARD IC CARD PORTFOLIO ANALYSIS PROCESS



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PROTECTIVE ORDER

J 000005

BANKCARD PORTFOLIO CHARACTERISTICS

	<u>REVOLVING ACCOUNTS</u>	<u>NON-REVOLVING ACCOUNTS</u>
ACTIVE ACCOUNTS	73%	27%
\$ LOANS OUTSTANDING	91%	9%
\$ POSTED SALES VOLUME	45%	55%
TICKETS/ACTIVE/MONTH	1.7	4.7

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J E000057

IC CARD ECONOMICS

**DAVID POE AND PETER DUNN
EDGAR, DUNN & CONOVER INC.**

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J 2000090

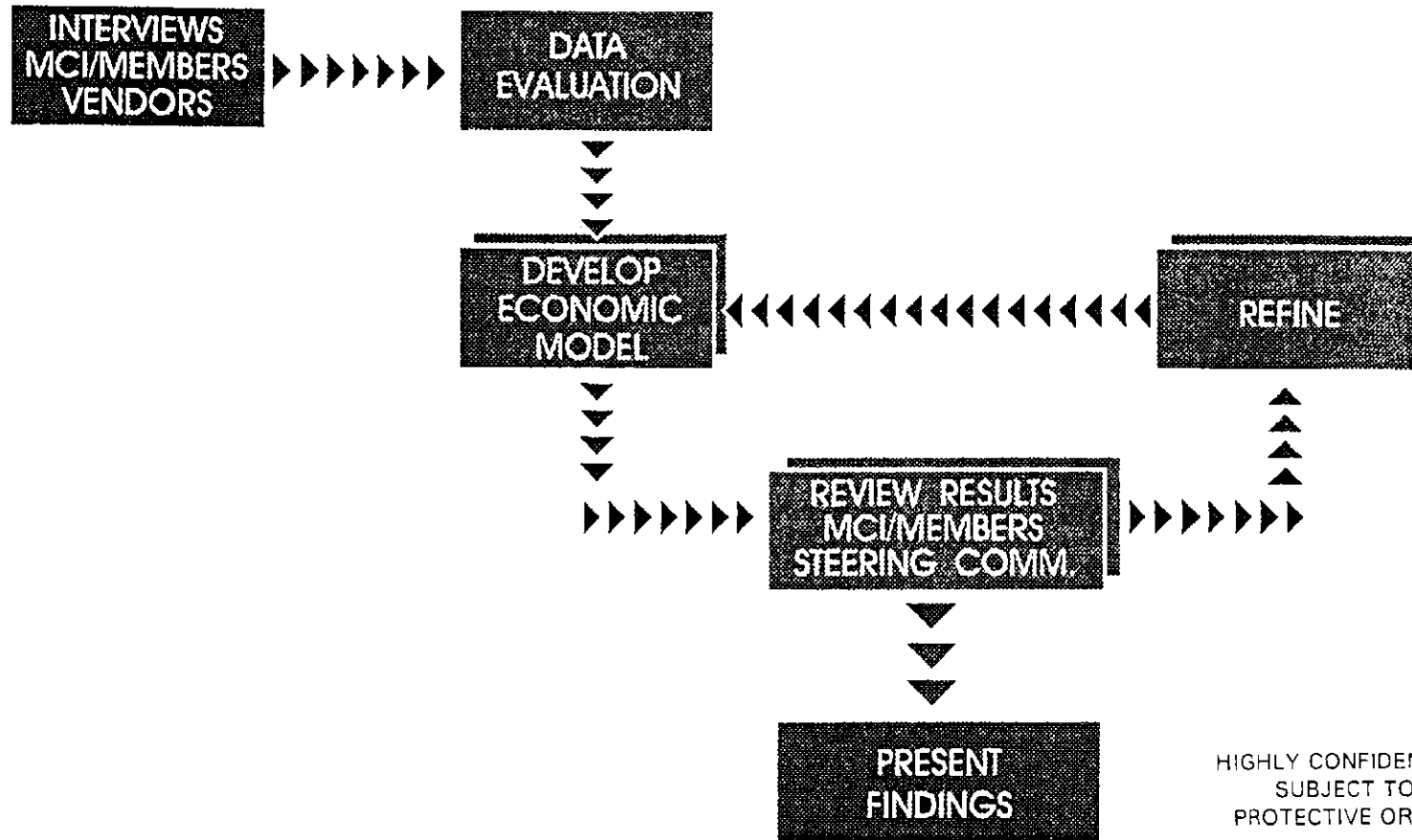
OBJECTIVE

- COMPARE COSTS AND BENEFITS OF IC CARD WITH MAGNETIC STRIPE CARD.

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J E000099

APPROACH TO IC CARD ECONOMIC ANALYSIS



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J 1200100

BASE CASE ASSUMPTIONS

- GENERAL
- MARKETING
- CREDIT AND FRAUD
LOSSES
- AUTHORIZATIONS
- CARDS
- TERMINALS
- SYSTEMS

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PROTECTIVE ORDER

3 2500101

GENERAL

- FIVE YEAR CONVERSION PERIOD FOR BOTH CARDS AND TERMINALS
- ANNUAL GROWTH IN CARDS AND TRANSACTIONS – 7% (1981–1985 EXPERIENCE)
- TEN YEAR ANALYSIS
- USE OF CONSERVATIVE ASSUMPTIONS FOR BASE CASE

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PROTECTIVE ORDER

J 1000102

MARKETING

- CONVERSION PERIOD MARKETING COST PER ACCOUNT — DECLINING
 - \$14 — YEAR ONE — \$10
 - \$ 8 — YEAR FIVE — \$ 5
- ANNUAL INCREMENTAL CUSTOMER SERVICE COST DURING CONVERSION — \$0.30 PER ACCOUNT

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J E000100

CREDIT AND FRAUD LOSSES

- CREDIT AND FRAUD LOSSES INCREASE WITH CARD GROWTH DURING CONVERSION PERIOD (COUNTERFEIT CONSTANT)
 - 1985 MASTERCARD WORLDWIDE CREDIT LOSSES WERE \$850 MILLION, PROJECTED TO BE \$1,400 MILLION IN 1993
 - 1985 MASTERCARD WORLDWIDE FRAUD LOSSES WERE \$100 MILLION, PROJECTED TO BE \$160 MILLION IN 1993 (INCLUDES COUNTERFEIT)
- WITH IC CARD, CREDIT LOSSES REDUCED 10% (OVERLIMITS)
- WITH IC CARD, FRAUD LOSSES REDUCED 80% (COUNTERFEIT 95%)
- BENEFITS ASSUMED TO BE RETAINED BY MEMBERS

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AUTHORIZATIONS

- PROJECTED ELECTRONIC AUTHORIZATION VOLUME — 60% OF TOTAL TRANSACTIONS AT END OF CONVERSION PERIOD
- WITH IC CARD, 70% REDUCTION IN ELECTRONIC AUTHORIZATIONS
- VOICE AUTHORIZATIONS CONSTANT AS PERCENT OF TOTAL TRANSACTIONS

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J E000105

AUTHORIZATIONS

	ELECTRONIC	
	<u>ACQUIRER</u>	<u>ISSUER</u>
COST ASSUMPTIONS		
■ PROCESSING COST (INCLUDING DATA LINES)	\$.04	\$.045
■ COMMUNICATIONS COSTS (INCREASING AT 7% PER YEAR)	.10	--
■ SWITCH AND SYSTEM (INAS/BASE) COST	.005	.025

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CARDS

- AVERAGE IC CARD LIFE — 2.6 YEARS
- IC CARD COST DECLINING FROM \$5.75 TO \$2.80 OVER CONVERSION PERIOD; DECLINES 7% ANNUALLY THEREAFTER

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J E000107

TERMINALS

- TERMINAL TYPES INCLUDE OFF-LINE, DIAL-UP, AND ON-LINE
- INCREMENTAL TERMINAL COSTS — \$40 TO \$60 PER TERMINAL

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J 2000108

SYSTEMS

- SYSTEM MODIFICATION COSTS — \$200,000 PER PROCESSOR
- ANNUAL MAINTENANCE COSTS ON MODIFICATIONS — 10%

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PROTECTIVE ORDER

J 8880109

RESULTS

- INCREMENTAL CASH FLOWS
- PAYBACK
- INTERNAL RATE OF RETURN
- FOUR VOLUME SCENARIOS

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PROTECTIVE ORDER

J 2000110

RESULTS

The following page from the model shows the individual components of cash flows for the Base Case MCI/VISA Worldwide volume scenario

Amounts shown in boxes are represented on the summary table on page 13

12:49 PM CASH FLOW BASIS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	YEAR 6	YEAR 7	YEAR 8	YEAR 9	YEAR 10	FIVE YEAR TOTAL	YEARS 6 - 10	TEN YEAR TOTAL
COSTS:													
Card Issuance	(890.6)	(812.6)	(8438.6)	(8568.9)	(8651.0)	(8361.4)	(8256.6)	(8351.5)	(8346.3)	(8340.8)	(81,861.7)	(81,756.6)	(83,618.2)
Terminals													
Issuer	(13.0)	114.4)	(77.9)	(97.2)	(146.9)	(86.6)	(94.2)	(94.7)	(102.2)	(102.2)	(349.4)	(479.8)	(829.2)
Acquirer	(33.7)	(40.7)	(155.1)	(261.9)	(369.7)	(175.5)	(176.6)	(177.3)	(178.0)	(178.7)	(861.1)	(886.2)	(1,747.2)
Systems													
Issuer	(12.6)	(12.6)	(12.6)	(2.9)	(2.9)	(2.9)	(2.9)	(2.9)	(2.9)	(2.9)	(43.5)	(14.5)	(58.0)
Acquirer	(12.6)	(12.6)	(12.6)	(2.9)	(2.9)	(2.9)	(2.9)	(2.9)	(2.9)	(2.9)	(43.5)	(14.5)	(58.0)
Marketing	(4.0)	(4.6)	(23.6)	(33.8)	(43.6)	(11.8)	(15.9)	(20.7)	0.0	0.0	(109.5)	(48.3)	(157.8)
Increased Merchant Reb activity	(1.2)	(2.5)	(7.4)	(14.9)	(24.8)	(24.9)	(25.1)	(25.2)	(25.3)	(25.4)	(50.7)	(125.7)	(176.4)
Reduced Merchant Discount Fees	0.0	0.0	(1.4)	(73.9)	(180.2)	(196.7)	(214.3)	(233.2)	(253.3)	(274.8)	(255.5)	(1,172.3)	(1,427.7)
Subtotal Costs													
Issuer	(120.2)	(144.1)	(552.6)	(702.8)	(844.4)	(462.7)	(469.6)	(469.8)	(451.3)	(445.8)	(2,364.1)	(2,299.2)	(4,663.3)
Acquirer	(47.5)	(55.7)	(176.4)	(353.5)	(577.6)	(400.1)	(418.9)	(438.5)	(459.4)	(481.7)	(11,210.7)	(2,198.7)	(13,409.4)
Total	(167.7)	(199.8)	(729.0)	(1,056.3)	(1,422.0)	(862.8)	(888.5)	(908.3)	(910.8)	(927.6)	(3,574.7)	(4,497.9)	(6,072.6)
DEFITS:													
Postage/Card/Enroll & Post Mail	(2.9)	2.5	(4.5)	23.2	61.5	144.4	154.5	165.3	176.8	189.2	79.7	830.1	909.9
Operations													
Issuer	13.9	31.4	106.1	233.0	426.0	484.9	518.9	555.2	594.1	635.7	810.4	2,788.8	3,599.1
Acquirer	7.4	19.3	68.8	161.8	314.6	394.9	420.4	447.7	476.9	508.1	572.0	2,247.9	2,819.9
Credit Losses	16.6	35.5	114.0	244.0	435.2	465.7	498.3	533.2	570.5	610.4	845.4	2,678.0	3,523.4
Fraud Losses (Incl. C/F)													
Issuer	4.2	8.6	26.5	54.4	93.0	95.5	98.2	100.9	103.8	106.9	186.7	505.3	698.0
Acquirer (C/F only)	0.7	1.4	4.3	8.5	14.3	14.3	14.3	14.3	14.3	14.3	29.2	71.3	100.5
Reduced Outgoing I/C (Acquirer)	0.0	0.0	2.7	147.8	360.5	393.4	428.7	466.3	506.6	549.5	510.9	2,344.6	2,855.5
Reduced Incoming I/C (Issuer)	0.0	0.0	(2.7)	(147.8)	(360.5)	(393.4)	(428.7)	(466.3)	(506.6)	(549.5)	(510.9)	(2,344.6)	(2,855.5)
Subtotal Benefits													
Issuer	31.8	78.0	239.4	406.8	655.2	797.0	841.1	884.2	938.7	992.6	1,411.2	4,457.7	5,868.9
Acquirer	8.1	20.8	75.8	318.2	689.3	802.6	863.4	928.3	997.7	1,071.9	1,112.1	4,663.7	5,775.9
Total	39.9	98.8	315.2	724.9	1,344.5	1,599.6	1,704.5	1,812.5	1,936.3	2,064.5	2,523.4	9,121.4	11,644.8
NET INVESTMENT:													
Issuer	(88.4)	(66.1)	(313.2)	(296.0)	(189.2)	334.4	371.5	418.5	487.3	546.8	(952.8)	2,158.4	1,205.6
Acquirer	(39.4)	(34.9)	(100.6)	(35.4)	111.7	402.5	444.5	489.8	538.2	590.1	(98.6)	2,465.1	2,366.5
Total	(127.8)	(101.0)	(413.8)	(331.4)	(77.5)	736.9	816.0	908.2	1,025.6	1,136.9	(1,051.4)	4,623.5	3,572.2

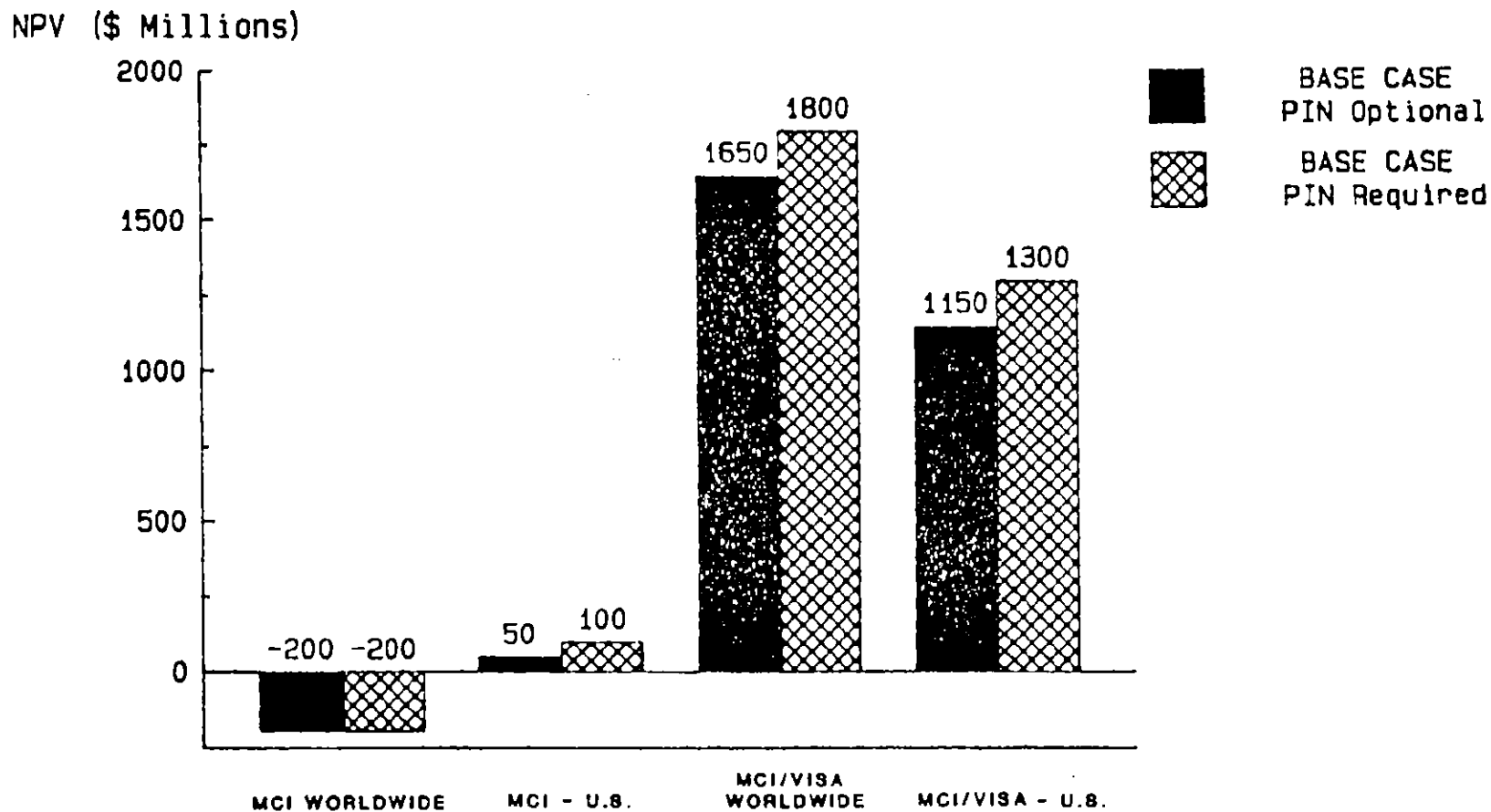
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PIN SCENARIO

CHANGES TO BASE CASE ASSUMPTIONS

- Assumes PIN use is required at point of sale
- Marketing costs increase to \$10 per account for those accounts converted in year one, declining to \$5 per account for those accounts converted in year five
- Fraud losses reduced by 80%
- Annual incremental customer service cost during conversion - \$.30 per account
- Operating costs reduced (increased) as follows:
 - . Customer Service 15%
 - . Card Security 50%
 - . Chargebacks and Adjustments 65%
 - . Merchant Accounting 50%
 - . Merchant Representatives (35%)

BASE CASE vs. PIN Scenario 10 YEAR NPV at 8% Discount Rate



CONCLUSION: For all volume scenarios, adjustment of the BASE CASE to include the costs and benefits associated with a PIN do not significantly impact the Net Present Value.

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CONCLUSIONS

- IC CARD IS A LONGER-TERM INVESTMENT;
CONVERSION PERIOD — ABOUT FIVE
YEARS — FOLLOWED BY PAYBACK PERIOD
- KEY TO ECONOMICS IS RETENTION OF
BENEFITS BY MEMBERS
- MASTERCARD RESULTS CAN BE ATTRACTIVE;
AND THE ECONOMICS IMPROVE
SIGNIFICANTLY WITH THE ADDITION OF
VISA VOLUMES

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PROPOSED ACTION PLAN

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NEXT STEPS

- PROCEED WITH JOINT
MASTERCARD/VISA EXECUTIVE
COMMITTEE MEETING
- RECOMMEND COORDINATED
IC CARD IMPLEMENTATION
TO VISA

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RECOMMENDED IC CARD PROGRAM

- MANDATORY TERMINAL PLACEMENT
- OPTIONAL IC CARD PARTICIPATION
- ASSOCIATIONS TO MANAGE
FUNDING FOR KEY COMPONENTS

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PROPOSED PROGRAM IMPLEMENTATION

- COMPLETE MEMBERSHIP/COMMITTEE FORMAL APPROVAL PROCESS
- COMPLETE IC CARD ISSUER SUPPORT PACKAGE
- CERTIFY TERMINAL VENDORS FOR EACH REGION
- BEGIN TERMINAL PRODUCTION
- CONDUCT 1987 CARD AND TERMINAL PRODUCTION PILOTS
- BEGIN FIVE-YEAR TERMINAL IMPLEMENTATION — FIRST QUARTER 1988

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