NUREG-0274
Five in a Series of
Five Reports

CATALOG OF PHYSICAL PROTECTION EQUIPMENT

Book 2
Volume III. Entry Control Components

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for
U. S. Nuclear Regulatory Commission

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Book 2

Volume III. Entry Control Components

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Reports in the Series

1. Guidelines for the Development of a Methodology for Measuring Level of Effectiveness of Physical Protection Facilities at Fixed-Site Facilities
   NUREG-0270

2. Physical Protection Equipment Study: Final Report
   NUREG-0271

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4. Guide for the Evaluation of Physical Protection Equipment
   NUREG-0273

5. **Catalog of Physical Protection Equipment**
   NUREG-0274

ABSTRACT

A catalog of commercially available physical protection equipment has been prepared under MITRE contract AT(49-24)-03/6 for use by the U. S. Nuclear Regulatory Commission (NRC). Included is information on barrier structures and equipment, interior and exterior intrusion detection sensors, entry (access) control devices, surveillance and alarm assessment equipment, contraband detection sensors, automated response equipment, general purpose displays and general purpose communications, with one volume devoted to each of these eight areas. For each item of equipment the information included consists of performance, physical, cost and supply/logistics data. The entire catalog is contained in three notebooks for ease in its use by licensing and inspection staff at NRC.

PREFACE AND ACKNOWLEDGEMENTS

The Catalog of Physical Protection Equipment presents information on currently used or currently available physical protection equipment that could be employed to safeguard special nuclear materials. The primary source of information was the responses of manufacturers and vendors to requests for literature and data, unless otherwise noted, and as discussed in the Final Report (NUREG-0271, MTR 3458). All equipment listed in the Catalog has been screened in accordance with the following general criteria, and only items meeting one or more of these criteria have been included:

- Equipment is commercially available off-the-shelf;
- Equipment is currently in use at commercial nuclear facilities licensed or to be licensed by NRC;
- Equipment is applicable for use at nuclear facilities licensed or to be licensed by NRC;
- Equipment can operate in the environmental conditions present at nuclear facilities;
- Equipment is not designed solely or primarily for residential use.

The final report describes the methodology and rationale used to create the Catalog of Physical Protection Equipment. Individuals seeking background information concerning the Catalog are directed to that report.

The Catalog of Physical Protection Equipment was edited and reviewed by W. L. Parlee; W. Haberman had overall responsibility for its preparation. Inputs to the Catalog were prepared by the following individuals, and their contributions are gratefully acknowledged:

Volume I.

L. I. Egelson	Sections 1, 4, 5, 6, 7, 8, 9, 10
R. G. Hansen	Sections 2, 3

Volume II.

J. L. Conway	Section 1
R. D. Cotell	Section 2
Z. Kohorn	Sections 11, 14
R. N. Lawson	Sections 4, 5, 7, 9, 12
J. O. Runkle	Sections 6, 8, 10, 13, 15
G. O. Sauermann	Section 3

Volume III.

W. L. Parlee

Volume IV.

G. O. Sauermann

Volume V.

A. J. Graff

Volume VI.

R. N. Lawson

Volume VII.

C. E. Dolberg

Volume VIII.

D. Stone

D. G. Willard

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CODE COMBINATION LOCKS

There are three basic methods by which the identity of a individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

Code combination locks rely or something known by the individual, specifically a numerical or alphanumerical code. Typically, code combination locks are intended for unattended, self-contained use at a single entry point. A single, common code is provided to all authorized personnel. Codes are composed of three to six characters, usually numbers. Longer codes provide greater security since they require a substantially larger number of random attempts to guess the correct code than shorter codes; however, longer codes are more difficult to memorize.

Code combination locks fall into two categories: mechanical and electronic. Mechanical combination locks use internal gears and/or tumblers which are aligned when a correct code is entered. Mechanical combination locks are available with a built-in latch which is operable when the internal gears/tumblers are aligned, or with a switch which is opened or closed when a correct code is entered. The switches are used to energize or de-engergize electric latches or strikes. Code changes for mechanical combination locks usually require disassembly of the lock. Mechanical combination locks with built-in latches require no electrical power for operation. Those that use switches do not require power for their operation, but electrical power is required for energizing the electric latches and strikes. Electronic combination locks

use solid-state digital devices and circuitry to register the code and to compare it with a pre-set code. Entry of a correct code will cause a switch to open or close which energizes or de-energizes electric latches or strikes. Code changes are accomplished by plugging pins into a circuit board or by re-setting micro-switches. Typically, code change circuitry is included in a separate control unit which is connected by wires to a keyboard. Keyboards for both mechanical and electronic combination locks are either of the push-button type or three-position rocker switches.

Code combination locks should be designed in such a way that the code can be entered by the user in a concealed manner. Risk of compromise at the time that a code is entered is a chief limitation of code combination locks. A second major limitation is that the code may be compromised either accidently or through collusion. Codes should be changed frequently to reduce the possibility that an accidently discovered code might be used. There is no protection against collusion.

CODE COMBINATION LOCKS

Manufacturer	A.P.D. Security Systems 24700 Crestview Court Farmington, MI 48024 (313) 477-2703
Model	Selectronic 220
Reference Evaluation Guide Procedure No. III-1.A	NRC Identification No.

NARRATIVE DESCRIPTION

The Selectronic 220 is a 12-push-button keyboard-controlled combination lock for self-contained use at a single door. The code for each combination lock is determined by setting switches mounted on the printed circuit module to the selected combination. Any keyboard switch operated out of proper sequence resets the locking mechanism. If the correct code sequence is entered, an output will be generated for approximately 3 seconds to activate a door strike or movable gate arm. 500 three digit combinations are available (digits not repeated in sequence).

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Three digit code entered on keyboard.
Enrollment Capacity:	Common code.
Terminal/Reader Capacity:	Self-contained combination lock for use at single door.
Terminal/Reader Characteristics:	Code for each combination set by switches mounted on printed circuit module.
Central Display Characteristics:	No central display, printer optional.
Resistance to Spoofing and Tampering:	None, if code is known; otherwise, must guess code number. No resistance to tampering.
Temperature:	Weather resistant enclosure with SL/220/WR option. 0 to 125F (−18 to +52C); cold weather enclosure including heater and thermostat with SL/220/CWO option.
Humidity:	Information not available
Other Environmental Characteristics:	Information not available.
Interface:	5A, Form "C" relay contact.

PHYSICAL DATA

Size:	Combination lock with flush mount enclosure, 5.5x5.5in x adj. (14x14cm x adj.); combination lock with weather resistant enclosure, 7x6x12in (17.8x15x30.5cm).
Weight:	Information not available.
Power (Primary/Secondary):	Combination lock only, 24V ac – 10VA; with heater, 24V ac, 2A; no backup.
Emplacement:	Stand, post, or wall-mounted; SL/220/FM flush mount option for walls.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	SL/220, $300.; SL/220/FM, option, $40; SL/220/WR, option $50. SL/220/CWO option, $45.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Printer option available using A.P.D. Printer.

INSTALLATIONS

CODE COMBINATION LOCKS

Manufacturer CardKey Systems
20339 Nordhoff St.
Chatsworth, CA 91311
(213) 882-8111

Model Interrogator I

Reference Evaluation Guide Procedure No. III-1.A NRC Identification No.

NARRATIVE DESCRIPTION

The Interrogator I code combination locks are pushbutton-controlled combination locks for self-contained use at a single door. The keyboard is a 10-button touchtone type. Access is gained by keystroking a common memorized four digit code number. Code changes are accomplished by the use of thumbwheel switches in a collocated control unit. Up to 10,000 code combinations are available and numbers may be repeated in a sequence. Entry of a correct code activates a relay contact. Control unit may be located up to 500ft (153m) from lock.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Four digit code entered on pushbutton assembly.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained combination lock for use at a single door.
Terminal/Reader Characteristics: Keyboard is a 10-button touchtone type. Code changes are accomplished by setting thumbwheel switches in lock housing equipped with key lock and tamper switch. Relay output lasts for 0 to 10 seconds, depending on adjustment. Optional error annunciator.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: Incorrect entries cause an error timer to inhibit keyboard from 1 to 10 seconds, adjustable in control unit. A tamper switch is on control unit.
Temperature: 32 to 131F (0 to 55C); −30 to +131F (−35 to +55C) for readers with weather resistant housing.
Humidity: 0 to 95 percent (non-condensing).
Other Environmental Characteristics: Information not available.
Interface: Output relay capacity, 28V dc or 115V ac, 5A.

PHYSICAL DATA

Size: Reader, approximate depending on housing; 5.30x7.80x4.75in (13.5x19.8x12cm). Control Unit, 7.75x8.62x3.0in (19.7x21.9x7.6cm).
Weight: Information not available.
Power (Primary/Secondary): 7.25V ac, 0.7A; rechargeable battery and charger located in control unit.
Emplacement: Flush mount, surface mount and weather resistant surface mount housings, for keyboards; surface mount for control units; control unit can operate up to 500ft (153m) from keyboard unit.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Lock and Control Unit, $523. to $594., depending on housing; Error Annunciator, $385.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Error Annunciator provides an alarm (audible and/or visual) for one of the following:

a. Allows a preset number of errors (up to 10 tries) to be made during code entry before signalling an alarm; 10 position thumbwheel used to select number of tries.
b. Signals an alarm if door is held open longer than a preset time (10 to 30 seconds); time set by potentiometer.
c. Signals an alarm when a duress code number entered.

INSTALLATIONS

CODE COMBINATION LOCKS

Manufacturer CardKey Systems
20339 Nordhoff St.
Chatsworth, CA 91311
(213) 882-8111

Model Memori-Lock Series

Reference Evaluation Guide Procedure No. III-1.A NRC Identification No.

NARRATIVE DESCRIPTION

The ML Series code combination locks are pushbutton-controlled combination locks for self-contained use at a single door. One available pushbutton assembly consists of five 3-position switches (providing 10 numbers). The other assembly consists of fifteen pushbuttons (providing 15 numbers). Both assemblies require correct selection of four digits. The code numbers and their proper sequence are determined by wiring jacks in the logic housing.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Four digit code entered on pushbutton assembly.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained combination lock for use at a single door.
Terminal/Reader Characteristics: Code for each combination set by wiring appropriate jacks and sockets in logic housing. Logic and pushbutton assembly are two separate units connected by cable.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: None, if code is known; otherwise, must guess code number.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: Information not available.

PHYSICAL DATA

Size: Information not available.
Weight: Information not available.
Power (Primary/Secondary): 117V ac; will accept a rechargeable battery and integral recharger.
Emplacement: Wall surface mount.

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SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

CODE COMBINATION LOCKS

Manufacturer Coley Lock Corp.
4692 Knight Arnold Rd.
Memphis, TN 38118
(901) 794-9750

Model COL-E-LOC

Reference Evaluation Guide Procedure No. III-1.A NRC Identification No.

NARRATIVE DESCRIPTION

The COL-E-LOC is a pushbutton-controlled combination lock for self-contained use at a single door. The keyboard has 12 buttons, numbers 0 through 9 and two extra pushbuttons. Access is gained by keystroking a common, memorized 6 digit code number. Code changes are accomplished in the lock.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Six digit code entered on keyboard.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained combination lock for use at a single door.
Terminal/Reader Characteristics: Keyboard is 12 pushbutton; code changes are accomplished at the lock.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: None, if code is known; otherwise, must guess code number.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: None.

PHYSICAL DATA

Size: Information not available.
Weight: Information not available.
Power (Primary/Secondary): Information not available.
Emplacement: Information not available.
Emplacement: Pushbutton Panel: Weather-resistant surface mount, surface mount, flush mount; Control Unit: Weather resistant surface mount, surface mount.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Guaranteed for one year.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost:	Pushbutton Panel and Control Unit: $360. to $540., depending on options.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

CODE COMBINATION LOCKS

Manufacturer Continental Instruments Corp.
170 Lauman Lane
Hicksville, NY 11801
(516) 938-0800

Model Cypher Lock

Reference Evaluation Guide Procedure No. III-1.A NRC Identification No.

NARRATIVE DESCRIPTION

The Cypher Lock is a pushbutton-operated code combination lock for self-contained use at a single door. The pushbutton panel has five 3-position rocker switches to accommodate 10 numbers and a rest position for each switch. Access is gained by keystroking a common memorized 4 digit code number. The Cypher Lock consists of the pushbutton panel and a separately located control unit. Programming of the code combination is performed in the control unit by inserting plug wires into the code sockets. Entry of a correct code activates a relay contact. Optional features include allowing one, two or no errors in keystroking and use of a duress code number.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Four digit code entered on rocker switch assembly.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained combination lock for use at a single door.
Terminal/Reader Characteristics: The pushbutton assembly has a shielded panel containing five (5) rocker switches for 10 numbers and a rest position for each switch. The separately locked control unit is programmable by inserting plug wires into the code sockets; control unit is keylocked and can be equipped with an optional tamper switch.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: Incorrect entries cause an error timer to inhibit keyboard from 0 to 60 seconds; output relay can be energized from 1 to 15 seconds and after one, two or no errors in keystroking. All features adjustable in control unit. Control unit equipped with tamper switch.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Weather resistant housings available.
Interface: Output voltage, 6, 12 and 24V ac or V dc.

PHYSICAL DATA

Size: Pushbutton Panel: approximately 3¾x4¾x3½in (8.6x12x8.9cm), depending on housing; Control Unit: approximately 6x6¾x5⅛in (15.2x17.1x13.6cm), depending on options.
Weight: Information not available.
Power (Primary/Secondary): 115V ac; rechargeable battery and charger optional; can be located in control unit.
Emplacement: Wall surface mount.

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SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

CODE COMBINATION LOCKS

Manufacturer Preso-Matic Lock Co., Inc.
3048 Ind. 33rd St.
Fort Pierce, FL 33450
(305) 465-7400

Model PRESO-MATIC

Reference Evaluation Guide Procedure No. III-1.A NRC Identification No.

NARRATIVE DESCRIPTION

The Preso-matic Code Combination Lock is a mechanical, pushbutton-operated combination lock for self-contained use at a single door. The keyboard has 10 buttons, numbers 0 through 9. Access is gained by keystroking a common memorized 4 digit (or optional 7 digit) code number. Deadlock or deadlatch part of lock assembly, one individual and one master code combination available for each lock. Combination can be changed by replacing two "combination slides" (metal strips with appropriately positioned teeth).

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Four or seven digit code entered on keyboard.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained combination lock for use at a single door.
Terminal/Reader Characteristics: Deadlatch or deadlock part of assembly; latch bolt mechanically activated by entering four or seven digit code number on ten digit keyboard. Code changes are accomplished by changing two "combination slides" within lock.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: No resistance to tampering; latch bolts hardened steel, no tamper switches.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: None.

PHYSICAL DATA

Size: Lock, approximately 6x2½x3in (15.2x6.4x7.6cm), depending on decorative housing.
Weight: Information not available.
Power (Primary/Secondary): None required; all mechanical operation.
Emplacement: Flush-mounted on door.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Unconditional guarantee against manufacturer's defects.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Lock: ⅝in bolt projection, $25.35; 1in bolt projection, $29.25.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

INSTALLATIONS

CODE COMBINATION LOCKS

Manufacturer	Sargent and Greenleaf, Inc. One Security Drive Nicholasville, KY 40356 (606) 885-9411
Model	Code/Tronic 8418, 8419 8420, 8421

Reference Evaluation Guide Procedure No. III-1.A NRC Identification No.

NARRATIVE DESCRIPTION

The Code/Tronic Lock is a pushbutton-controlled code combination lock for self-contained use at a single door. The pushbutton panel has five 3-position rocker switches to accommodate 10 numbers and a rest position for each switch. Access is gained by keystroking a common memorized code number. Models 8420 and 8421 use a 6 digit code number. Models 8418 and 8419 use a 4 digit code number. The unit consists of a pushbutton panel and a separately located control unit. Programming of the code combination is performed by changing slide switches in the control unit. Entry of a correct code activates a relay contact. Models 8421 and 8419 provide an alarm output when improper entries are made.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Four (Models 8418 and 8419) or six (Model 8420 and 8421) codes entered on a rocker switch assembly.
Enrollment Capacity:	Common code.
Terminal/Reader Capacity:	Self-contained combination lock for use at a single door.
Terminal/Reader Characteristics:	The pushbutton assembly has a shielded panel containing 5 rocker switches for 10 numbers and a rest position for each switch. The separately located control unit is programmable by adjusting slide switches inside the unit. Also adjustable in the control unit are the number of errors allowed (1 to 9); the penalty time during which the keyboard is inhibited (2 to 26 seconds) and the length of time the lock is energized (2 to 26 seconds).
Central Display Characteristics:	None.
Resistance to Spoofing and Tampering:	Each digit of the code must be keystroked within 5 seconds; number of attempts is limited; the keyboard is inhibited after the programmed number of errors; control unit is keylocked and equipped with a tamper switch.
Temperature:	Information not available.
Humidity:	Information not available.
Other Environmental Characteristics:	Information not available.
Interface:	Alarm indicator output: 24V dc; Output for latch: 28V ac.

PHYSICAL DATA

Size:	Information not available.
Weight:	Information not available.
Power (Primary/Secondary):	Input to transformer, 117V ac, 50/60Hz; output from transformer 24V ac, 700mA RMS; rechargeable battery and charger available; standby time is 48 hours, charge time is 24 to 30 hours.
Emplacement:	Pushbutton assembly and control unit are surface-mounted.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Model 8418	$322.34
	Model 8419	389.09
	Model 8420	558.60
	Model 8421	603.09

Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

CODE COMBINATION LOCKS

Manufacturer	Simplex Security Systems, Inc. 10 Front St. Collinsville, CT 06022 (203) 698-8391
Model	Simplex 100 Series and 200 Series

Reference Evaluation Guide Procedure No. III-1.A NRC Identification No.

NARRATIVE DESCRIPTION

The Simplex Lock is a mechanical, pushbutton-operated code combination lock for self-contained use at a single door. The latch mechanism is a part of the pushbutton assembly. The pushbutton assembly consists of five pushbuttons located in a circular pattern. The button can be pushed individually or in unison with one or more of the other buttons as part of the lock combination. Code changing is performed by pressing a button inside the lock assembly, turning the know on button panel, entering the new code on the front panel button, and then turning the knob back to the original position. Up to 5 single or two-at-a-time numbers make up the code.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Code combination entered on keyboard.
Enrollment Capacity:	Common code.
Terminal/Reader Capacity:	Self-contained combination lock for use at a single door.
Terminal/Reader Characteristics:	A combined mechanical combination lock and latch mechanism. The pushbutton assembly consists of the pushbuttons located in a circular pattern. The code combination consists of 5 single numbers or two-at-a-time numbers pressed in sequence. The proper combination allows activation of the latch assembly.
Central Display Characteristics:	None.
Resistance to Spoofing and Tampering:	Combination change access can be padlocked; no tamper switches.
Temperature:	Information not available.
Humidity:	Information not available.
Other Environmental Characteristics:	Information not available.
Interface:	None.

PHYSICAL DATA

Size:	3½in (8.9cm) wide x 2½in (6.4cm) high, for use with 1⅜in (3.5cm) thick doors (100 Series), or 1¾ to 2⅛in (4.4 to 5.4cm) thick doors (200 Series).
Weight:	Information not available.
Power (Primary/Secondary):	None.
Emplacement:	Rim-mounted on door, pushbutton panel on one side and latch mechanism on the other.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Information not available.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Lock with 1in (2.5cm) dead bolt $54.20.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

INSTALLATIONS

CODE COMBINATION LOCKS

Manufacturer Unican
P.O. Box 307
Plattsburg, NY 12901
(514) 273-0451

Model 1000 Series

Reference Evaluation Guide Procedure No. III-1.A NRC Identification No.

NARRATIVE DESCRIPTION

The Series 1000 code combination lock is a mechanical, pushbutton-operated combination lock for self-contained use at a single door. The keyboard has 5 buttons, digits 1 through 5. Access is gained by keystroking a common, memorized code number. Deadlock is part of lock assembly. Combination is changed inside the lock assembly. Key override for master keying.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Code entered on keyboard.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained combination lock for use at a single door.
Terminal/Reader Characteristics: Deadlock part of assembly; latch bolt mechanically activated by entering code number on five digit keyboard. Code changes are accomplished by making changes internal to the lock assembly. Keylock override for master keying purposes.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: None.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: None.

PHYSICAL DATA

Size: Lock, approximately $7\frac{3}{8}$x3x$3\frac{13}{17}$in (18.7x6x9.7cm).
Weight: Information not available.
Power (Primary/Secondary): None required.
Emplacement: Flush-mounted on door.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Information not available.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

CODE COMBINATION LOCKS

Manufacturer Unican
P.O. Box 307
Plattsburg, NY 12901
(51[illegible] 273-0451

Model 2000 Series

Reference Evaluation Guide Procedure No. III-1.A NRC Identification No.

NARRATIVE DESCRIPTION

The Series 2000 code combination lock is a mechanical, pushbutton-controlled combination lock for use at a single door. The keyboard has 5 buttons, numbers 1 through 5. Access is gained by keystroking a common, memorized code number. Keystroking correct number causes activation of an output switch. The switch has a variable time delay (0 to 30 seconds) to allow the electric door release to remain energized for a preset interval. Code changes accomplished by making changes internal to the lock assembly.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Code number entered on keyboard.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained combination lock for use at a single door.
Terminal/Reader Characteristics: Keyboard is a 5 pushbutton type. Code combination changes accomplished by making changes internal to the lock assembly, accessible through keylocked front opening. Relay output has variable time delay; it can remain energized from 0 to 30 seconds.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: None.
Temperature: −15 to +120F (−26 to +49C).
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: Output relay rated at 250V ac or dc, 5A.

PHYSICAL DATA

Size: 3⅛ wide x 8⅝in high (7.9x21.9cm).
Weight: Information not available.
Power (Primary/Secondary): None required.
Emplacement: Information not available.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

MAGNETIC CARD LOCKS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

Magnetic card locks rely on something possessed by the individual, specifically a card magnetically coded with a common code. For some cards this data is encoded on a strip of magnetic tape, which can be either attached to the outside surface of the card or embedded within the card. The data is read by a magnetic pickup or reader head as the card is inserted into or withdrawn from the reader. Another type of magnetic-coded card contains data in an array of ferromagnetic spots that are polarized so that they can be read as the presence or absence of data bits. The cards may be readily re-encoded by reversing the polarity of any of the magnetic spots. A common billfold-size card or pass badge is 2 1/8 by 3 3/8 inches. Cards are constructed of three or more separately bonded layers or laminations. The outer layers are usually clear; the innermost layer or layers contain the data for access control and identification. The material used to bond the different layers together is a clear vinyl or polyester film coated with an adhesive. In addition to the information needed for access control, a seal, logo, photo or special design, included to make tampering more difficult, may be printed on the laminating film, placed on the inner layer before it is laminated, or heat impregnated or embossed onto the finished card. To color-code a card, the laminating plastic or the background of photos may be colored, or colored photographic mounting paper may be inserted with one of the laminations. Magnetic card readers may contain replaceable code reader cartridges into which the cards are inserted. In

order to change the code for the lock, the cartridge is replaced. The card readers include a relay or switch which is opened or closed when a properly coded card is used. The switch energizes or de-energizes an electric latch or strike.

In general, all magnetically coded cards can be duplicated. Some cards are more resistant than others, but none are counterfeit proof. Another limitation is that lost or stolen cards can be used for access, and cards can be transferred among individuals acting in collusion. Periodic code changes can reduce the possibility that a forged, lost or stolen card will allow an intruder to gain access. However, in some cases a lock code change also means a card change, which can be difficult to implement for a large number of card holders. Some locks allow the use of time zones either through the use of an external timer which slightly changes the code circuitry of the card reader or by actually changing the code reader cartridge. This allows a common code for each time zone. Time zones permit individuals to gain access only during specified time periods and to be rejected at all other times. The use of time zones can make it slightly more difficult for the individual who has a forged, stolen or lost card to gain access since the valid entry time must be guessed. A technique available with some magnetic card locks to limit the effectiveness of collusion is an "anti-pass back" feature. Card locks featuring anti-pass back usually employ both an enter card reader and exit card reader. The enter card reader modifies the code on the card so that it can be used only with an exit card reader, and vice versa. Thus, an individual who has gained access cannot "pass back" a card to an accomplice.

MAGNETIC CARD LOCKS

Manufacturer	A.P.D. Security Systems 24700 Crestview Court Farmington, MI 48024 (313) 477-2703
Model	ARL-1000
Reference Evaluation Guide Procedure No. III-2.A	NRC Identification No.

NARRATIVE DESCRIPTION

The ARL-1000 is a magnetic card access reader for self-contained use at a single door. The code for each reader is determined by 15 code switches which are mounted on the card lock. When a properly encoded magnetic card is inserted in the reader, a card-in switch is activated and the magnetic code is read. If the code switch corresponds to the Magnicard and the card has the correct entrance/exit code, an output will be generated to activate a door strike or movable gate arm. An operational feature of the card-lock is anti-passback. A common side number is utilized.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Encoded magnetic card read, and code matched against pre-selected number.
Enrollment Capacity:	Common code.
Terminal/Reader Capacity:	Self-contained reader for use at a single door.
Terminal/Header Characteristics:	The code for each reader is determined by 15 miniature code switches; control switch provided to inhibit the anti-passback mode; two period operation/time zone capability with ARL/TZ option.
Central Display Characteristics:	No central display; printer optional.
Resistance to Spoofing and Tampering:	Anti-passback; no resistance to tampering.
Temperature:	Weather-resistant enclosure with ARL/1000/WR option; 0 to +125F (−15 to 52C).
Humidity:	Information not available.
Other Environmental Characteristics:	Cold weather enclosure including heater and thermostat with ARL/CWO option.
Interface:	5A Form "C" relay contacts which pulse for approximately 500 milliseconds; transistor open collector output with sufficient drive to activate an external relay or surveillance lamp.

PHYSICAL DATA

Size:	Card lock only: 4.75x2.5x5in (12x6.4x12.5cm); Card locks with weather-resistant enclosure: 7.0x6.0x12.0in (17.5x15x30cm); Card locks with surface-mount enclosure: 5.5x5.5x6.0in (14x14x15cm).
Weight:	Information not available.
Power (Primary/Secondary):	Card lock only, 24V ac, 10VA; with heater, addition 24V ac, 2A; no backup power.
Emplacement:	Stand, post or wall-mount.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	90 day warranty on parts and labor.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	ARL-1000, $375.; ARL/1000/WR option, $50.; ARL/CWO option, $50.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Printer option available using APD Printer.

Magnetic card (Magnicard) is embedded with a rubber-banded barium ferrite composite material which generates a strong magnetic field with a high-resistance to de-magnetization. Cards are factory encoded. Card size 2.125x3.375x0.035in or 0.060in (5.4x8.6x0.09 or 0.15cm). Cards may be slotted, stamped, printed and can have I.D. photos mounted.

INSTALLATIONS

MAGNETIC CARD LOCKS

Manufacturer Card Key Systems
20339 Nordhoff St.
Chatsworth, CA 91311

Model MDL Series (G1,G2,G3)

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The MDL card lock is a non-powered, magnetic card access reader for self-contained use at a single door. The card lock includes card reader, door knobs and latch bolt. The code for each reader is determined by a "program board" which is inserted in the card lock through a locked cover plate. When a properly encoded magnetic card is inserted in the reader, magnetic pins are repelled, allowing the knob to be turned releasing the latch bolt.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded magnetic card read, and matched against "program board".
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: Terminal Includes card reader, inside and outside knobs and latch bolt mechanism; G1 option has a rigid outside knob, unlocked by insertion of proper card; G2 option has a lever near the inside knob to deactivate card reader; G3 option has a key hole on the outside knob and a pushbutton on the inside knob to allow either key or card use; time zones selected by inserting different program boards.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: No resistance to spoofing; latch bolt deadlocked; otherwise no resistance to tampering.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Indoor use only.
Interface: None.

PHYSICAL DATA

Size: For doors 1¾in (4.4cm) thick: 3¼x8in (8.2x20cm).
Weight: Information not available.
Power (Primary/Secondary): None.
Emplacement: Door-mounted.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Card cost: $1.20 to $1.90, depending on options. Program boards, $5.50.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Magnetic cards are sealed in laminated polyvinyl chloride; card size 2.125x3.375x0.040in (5.4x8.6x0.1cm) and can have I.D. photos mounted; cards may be slotted, stamped printed.

INSTALLATIONS

MAGNETIC CARD LOCKS

Manufacturer Card Key Systems
20339 Nordhoff St.
Chatsworth, CA 91311
(213) 882-8111

Model PSL Series

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The PSL Series card lock consists of a magnetic card access reader for self-contained use at a single door. The code for each lock is determined by inserting a code matrix card into the rear of the lock.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded magnetic card is matched against a code matrix card.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: The code for each lock is determined by a replaceable code matrix card which is inserted in the lock. "Dual-Code" option allows two levels of security which are slected by means of a switch on the lock. An external timer may be used to activate the switch. Other time zones may be set by changing the code matrix card.
Central Display Characteristics: None
Resistance to Spoofing and Tampering: None.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: Single-pole, double-throw switch rated at 125V ac, 5A or 28V ac, 5A.

PHYSICAL DATA

Size: Approximately, depending on housing: 4.5x5.3x4.75in (11.5x13.5x12cm).
Weight: Information not available.
Power (Primary/Secondary): None
Emplacement: Flush-mount housing for walls; glass door mount housing; weatherproof mounts for walls, posts and chain link fences.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Information not available.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost:	Card cost: $1.20 to $1.90, depending on options; code matrix card, $5.50; card lock assemblies, $194.00 to $515.00, depending on housing and options.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Magnetic Cards are sealed in laminated polyvinyl chloride. Card Size is 2.125x3.375x0.040in (5.4x8.6x0.1cm). Cards may be slotted, stamped or printed and can have I.D. photos mounted.

INSTALLATIONS

MAGNETIC CARD LOCKS

Manufacturer Card Key Systems
20339 Nordhoff St.
Chatsworth, CA 91311
(213) 882-8111

Model IN-X-IT

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The IN-X-IT card lock consists of two magnetic card access readers for self-contained use at a single door. One card reader is used for entry and the other is used for exit. A magnetic card coded for entry will only operate when used with an entry access reader. With its insertion into an entry access reader, the entry code is cancelled and the card is encoded to activate only an exit card lock. Each magnetic card contains two types of codes: the entry/exit code and the programmable lock code. The programmable lock code is determined by a "program board" which is inserted in each card access reader through a locked cover plate. When a properly encoded magnetic card is inserted in the reader, magnetic pins are repelled allowing activation of a relay or switch.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded magnetic card read, and matched against a program board.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained readers for use at a single door.
Terminal/Reader Characteristics: The code for each reader is determined by a program matrix board inserted in the card access reader through a key-locked front cover plate.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: Use of entry/exit readers reduces anti-passback problems; otherwise, none; no resistance to tampering.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Weather-resistant enclosures.
Interface: Relay output control.

PHYSICAL DATA

Size: Information not available.
Weight: Information not available.
Power (Primary/Secondary): 24V ac; no backup power.
Emplacement: Flush-mount housing for walls; weather-resistant housing for post mounting.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Information not available.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Card cost: $1.20 to $1.90, depending on options; program board, $5.50; card locks, $484.00.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

Magnetic cards are sealed in laminated polyvinyl chloride. Card Size is 2.125x3.375x.040in (5.4x8.6x0.1cm). Cards may be slotted, stamped or printed, and can have I.D. photos mounted.

INSTALLATIONS

MAGNETIC CARD LOCKS

Manufacturer Detex Corporation
4147 N. Ravenswood Ave.
Chicago, IL 60613
(312) 348-3377

Model DENTCO

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The DENTCO card lock consists of a magnetic card reader for self-contained use at a single door. The code for each lock is determined by inserting a cartridge in the lock through a keylocked front opening.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded magnetic card is matched against a code cartridge.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: The code for each lock is determined by a replaceable code cartridge in the lock. Access is through a keylocked front opening.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: None.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: Output relay capacity: 24V ac, 5A.

PHYSICAL DATA

Size: Reader: Approximately, 4x5x3in (10x12.5x7.6cm), depending on housing.
Weight: Information not available.
Power (Primary/Secondary): None required.
Emplacement: Surface mount or flush mount.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Information not available.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Cards are laminated polyvinyl chloride, may be printed and can have I.D. photos mounted.

INSTALLATIONS

MAGNETIC CARD LOCKS

Manufacturer Kee Company
P.O. Box 1063
Canoga Park, CA 19304
(213) 341-7788

Model WDF, AG, WP, CL

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The Kee card lock consists of a magnetic card access reader for self-contained use at a single door. The code for each lock is determined by inserting a cartridge in the lock.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded magnetic card is matched against a code cartridge.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: The code for each lock is determined by a replaceable code cartridge. Three time zones available by using switch.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: None.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: Information not available.

PHYSICAL DATA

Size: Reader: Approximately 4x4x5in (10x10x12.5cm), depending on housing.
Weight: Information not available.
Power (Primary/Secondary): WDF: 16V ac; AG: 16 to 24V ac or dc; WP and CL: 8 to 12V ac or 3 to 6V dc; rechargeable battery and power supply available.
Emplacement: Wall or door flush-mount; glass door mount; weather-resistant post mount, weather-resistant chain link fence mount.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: One year guarantee on electric components and housings; readers guaranteed for lifetime of system.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

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COST DATA

Unit Acquisition Cost: Information not available.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

Kee Cards: Impregnated paper in clear plastic jacket or laminated in vinyl plastic; plastic cards may be embossed, printed, equipped with apparel clip and can have I.D. photos mounted.

INSTALLATIONS

MAGNETIC CARD LOCKS

Manufacturer Rusco Electronic Systems
P.O. Box 5005
Glendale, CA 91201
(800) 423-2557

Model R-10

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The R-10 card lock consists of a magnetic card access reader for self-contained use at a single door. The code for each lock is determined by inserting a code circuit board in the lock.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded magnetic card is matched against a code matrix card.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: The code for each lock is determined by a replaceable code circuit board which is inserted in the lock.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: None.
Temperature: 32 to 125F (0 to 52C); 10 to 125F (−10 to +52C) for readers with weather-resistant housings.
Humidity: 0 to 90 percent, non-condensing.
Other Environmental Characteristics: Information not available.
Interface: Output relay capacity, 115V ac or 28V dc, 5A.

PHYSICAL DATA

Size: Reader: Approximately 4x3x5in (10x7.6x12.5cm), depending on housing.
Weight: Information not available.
Power (Primary/Secondary): None required; backup power for use with electric latches/strikes available.
Emplacement: Weather-resistant post mount; flush mount; surface mount; front access flush mount; chain link fence mount.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Information not available.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Information not available.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

Magnetic cards are sealed in laminated polyvinyl chloride. Card size is 2.125x3.375in (5.4x8.6cm). Cards may be printed embossed or slotted, and can have I.D. photos mounted.

INSTALLATIONS

MAGNETIC CARD LOCKS

Manufacturer Rusco Electronic Systems
P.O. Box 5005
Glendale, CA 91201
(800) 423-2557

Model R-15 and R-15/R

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The R-15 card lock consists of a magnetic card access reader for self-contained use at a single door. The code for each lock is determined by inserting a code circuit board in the lock. Two time zones are available which may be set manually by activating a switch in the lock or may be controlled by the use of an external timer. The R-15/R Card Lock contains an anti-passback feature. When a properly coded card is inserted in an entry reader, entrance is permitted and the card is automatically recoded to allow operation only with an exit reader. The R-15/R contains an override switch to inhibit the anti-passback feature. Two R-15/R readers are required, one for entry and one for exit.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded magnetic card is matched against a code matrix card.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: The code for each lock is determined by a replaceable code circuit board which is inserted in the lock. Reader is all solid state. Two time zones can be selected by setting a switch in the lock.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: R-15, none; R-15/R, has anti-passback feature. Neither is resistant to tampering.
Temperature: 10 to 125F (−10 to +52C).
Humidity: 0 to 90 percent, non-condensing.
Other Environmental Characteristics: Information not available.
Interface: Output solid state switch capacity: 115V ac maximum, 3A maximum for R-15; 12V ac, 3A maximum for R-15/R.

PHYSICAL DATA

Size: Reader: Approximately 4x3x5in (10x7.6x12.5cm), depending on housing.
Weight: Information not available.
Power (Primary/Secondary): 12V ac, 50/60Hz, 0.2A; optional backup power available.
Emplacement: Weather-resistant post mount; flush mount, surface mount, front access flush mount, chain link mount.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Information not available.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Information not available.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

Magnetic cards are sealed in laminated polyvinyl chloride. Card size is 2.125x3.375in (5.4x8.6cm). Cards may be printed, embossed, equipped with apparel clip, and can have I.D. photos mounted.

INSTALLATIONS

MAGNETIC CARD LOCKS

Manufacturer	Rusco Electronic Systems P.O. Box 5005 Glendale, CA 91201 (800) 423-2557
Model	RS-20

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The RS-20 card lock consists of a magnetic card access reader for self-contained use at a single door. The code for each lock is determined by inserting a coded circuit board in the lock. Encoding system for the RS-20 is more secure than for the RS-10 or RS-15 Series readers. Three time zones are available which may be set manually by activating a switch in the lock or may be controlled by the use of an external timer.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Encoded magnetic card is matched against a code matrix card.
Enrollment Capacity:	Common code.
Terminal/Reader Capacity:	Self-contained reader for use at a single door.
Terminal/Reader Characteristics:	The code for each lock is determined by a replaceable code circuit board which is inserted in the lock. Reader is all solid state. Three time zones can be selected by setting a switch in the lock.
Central Display Characteristics:	None.
Resistance to Spoofing and Tampering:	None.
Temperature:	10 to 125F (−10 to +52C).
Humidity:	0 to 90 percent, non-condensing.
Other Environmental Characteristics:	Information not available.
Interface:	Contact Closure: 115V ac or 28V dc maximum, 3A, maximum.

PHYSICAL DATA

Size:	Reader: Approximately 4x3x5in (10x7.6x12.5cm), depending on housing.
Weight:	Information not available.
Power (Primary/Secondary):	12V ac, 60Hz, 0.5A, maximum; optional backup power available.
Emplacement:	Weather-resistant post mount, flush mount, surface mount, front access flush mount, chain link fence mount.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Information not available.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Information not available.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

Magnetic cards are sealed in laminated polyvinyl chloride. Card size is 2.125x3.375in (5.4x8.6cm). Cards may be printed, embossed, equipped with apparel clip, and have I.D. photos mounted.

INSTALLATIONS

MAGNETIC CARD LOCKS

Manufacturer A.P.D. Security Systems
24700 Crestview Court
Farmington, MI 48024
(313) 477-2703

Model ASL-100

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The ASL-100 card lock is a non-powered, magnetic card access reader for self-contained use at a single door. The code for each reader is determined by a matrix card which is inserted in the rear of the lock. When a properly encoded magnetic matrix card is inserted in the reader, magnetic pins are repelled allowing the card to activate an output switch, thus releasing a door strike, gate or other barrier.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded magnetic card read, and code matched against number on matrix card.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: The code for each reader is determined by a matrix card inserted in the back of the lock; time zones may be selected by inserting different matrix cards.
Central Display Characteristics: No central displays; printer optional.
Resistance to Spoofing and Tampering: None.
Temperature: Weather-resistant enclosure with ASL/100/WR option, −40 to +140F (−40 to 60C).
Humidity: Information not available.
Other Environmental Characteristics: Cold weather enclosure including heater and thermostat with ASL/100/CWO option.
Interface: SPST switch, enclosure UL-listed; 115V ac at 15A.

PHYSICAL DATA

Size: Card lock only: 3.5x1.0x5in (9x2.5x12.5cm); Card lock with weather-resistant enclosure: 7x6x12in (17.8x15.2x30cm); Card lock with flush-mount enclosure: 5.5x5.5inx adjustable (14x14cm x adj.).
Weight: Information not available.
Power (Primary/Secondary): No power required for normal operation; with heater, 24V ac, 2A; no backup needed.
Emplacement: Flush-mount option; ASL/100/FM for walls; stand or post mount with other options.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	90 day warranty on parts and labor.
Government or Professional Standards:	Enclosure UL-listed.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	ASL-100, $215.; ASL/100/FM, $40.; ASL/100/WR, $50.; ASL/100/CWO, $50.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Printer option available using APD Printer.
Magnetic Card (Magnicard) is embedded with a rubber-bonded barium ferrite composite material which generates a strong magnetic field with a high-resistance to de-magnetization. Cards are factory-encoded. Card size 2.125x3.375x0.035 or 0.060in (5.4x8.6x0.09 or 0.15cm). Cards may be slotted, stamped, printed and can have I.D. photos mounted.

INSTALLATIONS

MAGNETIC CARD LOCKS

Manufacturer A.P.D. Security Systems
24700 Crestview Court
Farmington, MI 8024
(313) 477-2703

Model BSL-1000

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The BSL-1000 card lock is a magnetic card access reader for self-contained use at a single door. The code for each reader is determined by 15 code switches which are mounted on the card lock; when a properly encoded magnetic card is inserted in the reader, a card-in switch is activated and the magnetic code is read. If the code switch corresponds to the Magnicard, an output will be generated for approximately 3 seconds to activate a door strike or movable safe arm. No anti-passback options are available. Utilizes a common code number.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded magnetic card read, and code matched against pre-selected number.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: The code for each reader is determined by 15 miniature code switches; two-period time zone operation capability with BSL-TZ option.
Central Display Characteristics: No central display; printer optional.
Resistance to Spoofing and Tampering: None.
Temperature: Weather-resistant enclosure with BSL/1000/WR option; 0 to +125F (−15 to +52C).
Humidity: Information not available.
Other Environmental Characteristics: Cold weather enclosure including heater and thermostat with BSL/1000/CWO.
Interface: Up to 48V ac, 2A, solid state Darlington transistor output.

PHYSICAL DATA

Size: Card lock with flush-mount enclosure: 5.5x5.5in x adj. (14x14cm x adj.) Card lock for surface mounting: 3.5x5.5x6in (14x14x15cm); Card lock with weather-resistant enclosure: 7x6x12in (17.5x15x30cm).
Weight: Information not available.
Power (Primary/Secondary): Card lock only: 24V ac, 10VA; with heater, additional 24V ac, 2A.
Emplacement: Stand, post or wall-mounted; BSL/1000/FM flush-mount option.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	90 day warranty on parts and labor.
Government or Professional Standards:	Information not available.
Lead Time.	Information not available.

COST DATA

Unit Acquisition Cost:	BSL/1000, $255; BSL/1000/FM option, $40; BSL/1000/WR option, $50 BSL/1000/CWO, $50; BSL/1000/7Z, $100.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Printer option available using A.P.D. Printer.

Magnetic card (Magnicard) is embedded with a rubber-bonded barium ferrite composite material which generates a strong magnetic field with a high-resistance to de-magnetization. Cards are factory-encoded. Card size 2.125x3.375x0.035in or .60in (5.4x8.6x0.09 or 0.15cm). Cards may be slotted, stamped and printed and can have I.D. photos mounted.

INSTALLATIONS

MAGNETIC CARD LOCKS

Manufacturer	Card Key Systems 20339 Nordhoff St. Chatsworth, CA 91311 (213) 882-8111	Secura Key 6319 Desoto Ave. Woodland Hills, CA 91364 (213) 883-6221	Card Lock Co., Inc. P.O. Box 550 163 W. Third St. Prattville, AL 36067 (205) 365-9787
Model	CSL and SSL Series	SK-01 and SK-03	CSL

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The CSL and SSL Series card lock consists of a magnetic card access reader for self-contained use at a single door. The code for each door is determined by a lock cartridge which also operates as the card reader. Insertion of a card with the proper coding causes magnetically activated internal tumbler elements to close a single-pole, single-throw switch, thus operating the electric strike or other controlled element. Changing of the code requires changing the lock cartridge. A common code is used with all cards. The SSL Series has more magnetic tumblers and a heavier duty controlled switch.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded magnetic code is matched against lock cartridge.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: The code for each reader is determined by a lock cartridge which is an integral component of the card lock.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: None.
Temperature: Secura Key: up to 180F (82C); information not available for other manufacturers.
Humidity: Secura Key: up to 95 percent; information not available for other manufacturers.
Other Environmental Characteristics: Weatherproof mount available for Card Key.
Interface: Normally open or normally closed switch logic; 250V ac or 28V dc, 5A switching capacity.

PHYSICAL DATA

Size: Card lock unit only: 3.75x3.125x1.625in (8.57x7.94x4.13cm).
Weight: Card lock unit only: 10oz (0.28kg).
Power (Primary/Secondary): No power required for normal operation.
Emplacement: Flush-mount housing for walls; glass door mount housing; weatherproof mounts for walls, posts and chain link fences.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Card Key Cost: $1.20 to $1.90, depending on options; Secura Key Cost: Card Lock only, SK-01/SK-03, $65, programmable option, $80, cartridges, $4.50 to $5.00, card cost, $.50 to $1.15, depending on options; Card Lock Co., Inc., no information available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Magentic Cards are sealed in laminated polyvinyl chloride. Card size is 2.125x3.375x.040in (5.4x8.6x0.1cm). Cards may be slotted, stamped, printed and can have I.D. photos mounted.

INSTALLATIONS

CAPACITIVE CARD LOCKS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

Capacitive card locks rely on something possessed by the individual, specifically a card capacitively coded with a common code. The cards have embedded in them a piece of metal foil, sections of which are removed when the card is coded. The presence or absence of the foil changes the capacitance of different areas of the card. The capacitance changes are determined by the reader in the terminal.

A common billfold-size card or pass badge is 2 1/8 by 3 3/8 inches. Cards are constructed of three or more separately bonded layers or laminations. The outer layers are usually clear. The innermost layer or layers contain the data for access control and identification. The material used to bond the different layers together is a clear vinyl or polyester film coated with an adhesive. In addition to the information needed for access control, a seal, logo, photo or special design, included to make tampering more difficult, may be printed on the laminating film, placed on the inner layer before it is laminated, or heat impregnated or embossed onto the finished card. To color code a card, the laminating plastic or the background of photos may be colored or colored photographic mounting paper may be inserted with one of the laminations. Capacitive card readers may contain replaceable code reader cartridges into which the cards are inserted. In

order to change the code for the lock, the cartridge is replaced. The card readers include a relay or switch which is opened or closed to energize or de-energize an electric latch or strike when a properly coded card is used.

In general, all capactively coded cards can be duplicated. Some cards are more resistant than others, but none are counterfeit proof. Another limitation is that lost or stolen cards can be used for access, and cards can be transferred among individuals acting in collusion. Periodic code changes can reduce the possibility that a forged, lost or stolen card will allow an intruder to gain access. However, in most cases, a lock code change also means a card change, which can be difficult to implement for a large number of card holders. Some locks allow the use of time zones either through the use of an external timer, which changes slightly the code circuitry of the card reader, or by actually changing the code reader cartridge. This allows a common code for each time zone. Time zones permit individuals to gain access only during specified time periods and to be rejected at all other times. The use of time zones can make it slightly more difficult for the individual who has a forged, stolen or lost card to gain access since the valid entry time must be guessed.

CAPACITIVE CARD LOCKS

Manufacturer	Sentracon Corp. 80 Wilson Way Westwood, MA 02090 (617) 449-0800
Model	110 Series

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The 110 Series card lock consists of a capacitive coded card reader for self-contained use at a single door. The code for each lock is determined by inserting a code circuit board in the lock. Access to the code change board is through the front panel which is keylocked and which can have an optional tamper switch. Inserting proper card provides output voltage to operate a locking device.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Encoded capacitive card is matched against a stored code on a code circuit board.
Enrollment Capacity:	Information not available.
Terminal/Reader Capacity:	Self-contained reader for use at a single door.
Terminal/Reader Characteristics:	The code for each lock is determined by a replaceable code circuit board which is inserted in the lock through the front panel. The front panel is keylocked and can be equipped with an optional tamper switch.
Central Display Characteristics:	None.
Resistance to Spoofing and Tampering:	No resistance to spoofing; optional tamper switch on front panel access.
Temperature:	32 to 120F (0 to 50C).
Humidity:	Information not available.
Other Environmental Characteristics:	Weather resistant housing available.
Interface:	Output power half-wave rectified, 45V peak.

PHYSICAL DATA

Size:	Interior Housing: 8½x6½x5in (21.5x16.5x12.5cm); Exterior Housing: 12⅛x6½x13⅝in (31x15.5x35cm).
Weight:	Information not available.
Power (Primary/Secondary):	115V ac, 60Hz; transformer supplied, 36V ac.
Emplacement:	Semi-flush, surface or pedestal-mounted.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: One year guarantee.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Cards: $2.00; Card lock: $240. to $370., depending on housing.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

Cards are constructed of heat-fused resilient plastic, and contain embedded metal strips which act like capacitors. Cards may be printed, equipped with apparel clips and can have I.D. photos mounted.

INSTALLATIONS

CAPACITIVE CARD LOCKS

Manufacturer	Avant, Inc. Lewis St. Lincoln, MA 01773 (617) 259-9260	Sentracon Corp. 80 Wilson Way Westwood, MA 02090 (617) 449-0800
Model	Access Control System	810

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The Avant and Sentracon card locks consist of a capacitive coded card reader for self-contained use at a single door. The code for each lock is determined by setting four switches in the lock; up to 14 different codes are available. Access to the code change switches is through the front panel which is keylocked and which can have an optional tamper switch. Inserting a proper card provides output voltages to operate a locking device. Inserting a wrong card provides an alarm.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded capacitive card is matched against a stored code.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: The code for each lock is determined by setting four switches in the lock; up to 14 different codes are available. Access to the code change switches is through the front panel which is keylocked and which can have an optional tamper switch.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: No resistance to spoofing; optional tamper switch on front panel access.
Temperature: 32 to 120F (0 to 50C).
Humidity: Information not available.
Other Environmental Characteristics: Weather-resistant housing available.
Interface: Output power: 24V ac or dc.

PHYSICAL DATA

Size: 13⅜x6⅛x6¾in (35x15.5x17cm) approximately, depending on housing.
Weight: Information not available.
Power (Primary Secondary): 115V ac, 60Hz; transformer supplied, 24V ac. Optional rechargeable battery and charger.
Emplacement: Semi-flush, surface and pedestal mount.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: One year guarantee.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Cards: $2.00; Card lock: $395. to $510.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

Cards are constructed of heat-fused resilient plastic and contain embedded metal strips which are like capacitors. Cards may be printed, equipped with apparel clips and can have I.D. photos mounted.

INSTALLATIONS

EMBOSSED CARD LOCKS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

Embossed card locks rely on something possessed by the individual, specifically an embossed card coded with a common code. These cards are widely used, especially as credit cards and as pass badges. They usually contain such information as name, address, identification number, and validation or expiration data in raised letters, and they also have a space for a signature. These cards are of low security as they offer almost no protection against misuse. A common billfold-size card or pass badge is 2 1/8 by 3 3/8 inches. In addition to the information needed for access control, a seal, logo, photo or special design also may be included to make tampering more difficult. To color code a card, the plastic or the background of photos may be colored. The card readers include a relay or switch which is opened or closed to energize or de-energize an electric latch or strike when a properly coded card is used.

In general, all embossed coded cards can be duplicated. Another limitation is that lost or stolen cards can be used for access, and cards can be transferred among individuals acting in collusion. Periodic code changes can reduce the possibility that a forged, lost or stolen card will allow an intruder to gain access. However, in most cases, a lock code change also means a card change, which can be difficult to implement for a large number of card

holders. Some locks allow the use of time zones by changing the code reader cartridge. This allows a common code for each time zone. Time zones permit individuals to gain access only during specified time periods and to be rejected at all other times. The use of time zones can make it slightly more difficult for the individual who has a forged, stolen or lost card to gain access since the valid entry time must be guessed.

EMBOSSED CARD LOCKS

Manufacturer Robot Industries, Inc.
7041 Orchard St.
Dearborn, MI 48216
(313) 846-2623

Model KK-Series

Reference Evaluation Guide Procedure No. III-2.A NRC Identification No.

NARRATIVE DESCRIPTION

The Robot card lock consists of an embossed card reader for self-contained use at a single door.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Embossed code matched against position sensors in reader.
Enrollment Capacity: Common code
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: The common code for each lock is changed in the lock assembly through access of a keylocked door.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: None.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Weather-resistant housing available.
Interface: Information not available.

PHYSICAL DATA

Size: Information not available.
Weight: Information not available.
Power (Primary/Secondary): 110V ac.
Emplacement: Flush mount, weather-resistant post mount.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Information not available.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Information not available.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

Embossed cards are white, laminated plastic card stock, size 2⅛x3⅜x0.024in (5.4x8.6x0.06cm).

INSTALLATIONS

RADIO FREQUENCY CARD LOCKS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

RF interrogation/response card locks rely on something possessed by the individual, specifically a card containing tuned circuits coded with a common code. When the card is brought within 6 in (15 cm) of a transmitter-receiver sensor which sweeps through a specified frequency range, the frequencies radiated by each of the tuned circuits in the card are sensed by the receiver portion of the sensor. The sensor is a flat disc with a radius of 5 in (12.5 cm) and is mounted on a surface or wall. Because RF energy is used in the card validation process, the card does not have to be inserted into a card reader. A common billfold-size card or pass badge is 2 1/8 by 3 3/8 inches. Cards are constructed of three or more separately bonded layers or laminations. The outer layers are usually clear. The innermost layer or layers contain the data for access control and identification. The material used to bond the different layers together is a clear vinyl or polyester film coated with an adhesive. In addition to the information needed for access control, a seal, logo, photo or special design, included to make tampering more difficult, may be printed on the laminating film, placed on the inner layer before it is laminated, or heat impregnated or embossed onto the finished card. To color code a card, the laminating plastic or the background of photos may be colored, or colored photographic mounting paper may be inserted with one of the laminations. RF interrogation/response card

control units contain replaceable oscillator crystals. In order to change the code for the lock, a crystal is replaced. The card-reading units include a relay or switch which is opened or closed to energize or de-energize an electric latch or strike when a properly coded card is used.

In general, all RF interrogation/response coded cards can be duplicated. Some cards are more resistant than others, but none are counterfeit proof. Another limitation is that the card may be lost or stolen and used by an intruder for access. Periodic code changes can reduce the possiblity that a forged, lost or stolen card will allow an intruder to gain access. However, usually a lock code change also means a card change, which can be difficult to implement for a large number of card holders.

RADIO FREQUENCY CARD LOCKS

Manufacturer	Schlage Electronics 1135 Kern Ave. Sunnyvale, CA 94086 (408) 736-8430
Model	114
Reference Evaluation Guide Procedure No. III-2.A	NRC Identification No.

NARRATIVE DESCRIPTION

The Schlage card lock consists of cards containing tuned circuits, a transmitter/receiver and a control unit. The transmitter/receiver transmits a signal that sweeps over the range of 4 to 32MHz. The receiver senses when the transmitted frequencies and the frequencies of the tuned circuits in the cards match. When a match occurs, entry is allowed. The code for each lock is a 6 digit code and is determined by the tuned circuits and by replaceable tuned circuit modules in the control unit. The card must be within 7 inches (17.8cm) of the transmitter/receiver for proper operation. Three levels of access are allowed by changing the modules in the control unit.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	The transmitter/receiver transmits a signal that sweeps over the range of 4 to 32MHz. The receiver senses when the transmitted frequencies and the frequencies of the tuned circuits in the card match. When a match occurs, entry is allowed.
Enrollment Capacity:	Common code.
Terminal/Reader Capacity:	Self-contained reader for use at a single door.
Terminal/Reader Characteristics:	The transmitter/receiver is a flat, plastic disk with a built-in loop antenna. The card must be held within 7 inches (17.8cm) of the transmitter/receiver for proper operation. The control unit contains electronic circuitry, power supplies, programmed code modules, lock control and alarm relays.
Central Display Characteristics:	None.
Resistance to Spoofing and Tampering:	No resistance to spoofing; transmitter/receiver may be located within wall side that is not accessible; the control unit has a tamper switch on the keylocked cover plate.
Temperature:	0 to 140F (−18 to +60C).
Humidity:	0 to 95 percent.
Other Environmental Characteristics:	Radio Frequency, 4 to 32 MHz; radiated power less than the FCC minimum; does not require FCC license.
Interface:	Lock control relay.

736 327

PHYSICAL DATA

Size:	Transmitter/Receiver: 8.4in (21cm) diameter, ⅛in (0.32cm) thickness; fiberglass unit, 9x12x1in (22.5x30x2.5cm); control unit: 10x6x2in (25x15x10cm).
Weight:	Information not available.
Power (Primary/Secondary):	Standard equipment includes transformer for 120V ac to 12V ac, 5W; optional equipment is a standby power unit which replaces the transformer, and consists of a rechargeable battery and charger; battery good for 8 hours or 100 lock activations.
Emplacement:	Transmitter/Receiver: Plastic disk may be surface mounted or located within wall or door; fiberglass unit is weather-resistant for surface-mounting; control unit is surface-mounted.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Card is a polyvinyl chloride laminated card with embedded tuned circuits; size is IBM standard 2.328x3.25x0.046in; cards may be printed, equipped with apparel clip and can have I.D. photos mounted.

INSTALLATIONS

CODED CIRCUITRY CARD LOCKS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristics of the individual.

Coded circuitry card locks rely on something possessed by the individual, specifically a card with a common code. The code on the card is determined by a printed circuit laminated within each card. Connectors on one end of the card provide electrical contacts for the card reader. The code for each lock is determined by a replaceable printed circuit card in the associated control unit. A common billfold-size card or pass badge is 2 1/8 by 3 3/8 inches. Cards are constructed of three or more separately bonded layers or laminations. The outer layers are usually clear. The innermost layer or layers contain the data for access control and identification. The material used to bond the different layers together is a clear vinyl or polyester film coated with an adhesive. In addition to the information needed for access control, a seal, logo, photo or special design, included to make tampering more difficult, may be printed on the laminating film, placed on the inner layer before it is laminated, or heat impregnated or embossed onto the finished card. To color code a card, the laminating plastic or the background of photos may be colored, or colored photographic mounting paper may be inserted with one of the laminations. The card readers include a relay or switch which is opened or closed to energize or de-energize an electric latch or strike when a properly coded card is used.

In general, all coded circuitry cards can be duplicated. Some cards are more resistant than others, but none are counterfeit proof. Another limitation is that lost or stolen cards can be used for access.

Periodic code changes can reduce the possibility that a forged, lost or stolen card will allow an intruder to gain access. However, usually a lock code change also means a card change, which can be difficult to implement for a large number of card holders.

CODED CIRCUITRY CARD LOCKS

Manufacturer	Eaton Corp. Lock & Hardware Div. P.O. Box 25288 Charlotte, NC 28212	General Binding Corp. 1101 Skokie Blvd. Northbrook, IL 60062 (312) 272-3700
Model	Identi-Lock 1001 & 2001	1001 and 2001
Reference Evaluation Guide Procedure No. III-2.A		NRC Identification No.

NARRATIVE DESCRIPTION

The Identi-Lock consists of a printed circuit card reader and a control unit for self-contained use at a single door. The code on each card is determined by a printed circuit laminated in each card. Connectors on one end of the card provide electrical contacts for the card reader. The code for each lock is determined by a replaceable printed circuit card in the control unit. The Model 1001 had 4 access levels and Model 2001 has 10 access levels. Access levels are programmed in the control unit. If an incorrect card is inserted in the reader, an alarm output is provided.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Binary coded printed circuit board in card has electrical readings made on connector; the readings are compared with the programmed code.
Enrollment Capacity:	Information not available.
Terminal/Reader Capacity:	Self-contained reader for use at a single terminal.
Terminal/Reader Characteristics:	Terminal consists of a card reader and a control unit. The reader consists of an electrical connector into which the card is inserted. The control unit contains a programmed printed circuit board. Up to 4 access levels may be used with Model 1001 and up to 10 access levels with Model 2001.
Central Display Characteristics:	None.
Resistance to Spoofing and Tampering:	None.
Temperature:	Information not available.
Humidity:	Information not available.
Other Environment Characteristics:	Information not available.
Interface:	Output for latch is 6V ac, 1A, maximum; output for alarm is 10V dc, 200mA.

PHYSICAL DATA

Size:	Reader: 2¾x4½x2in (7x11.5x5cm); Model 1001, Control Unit: 5x3x1in (12.5x7.6x2.5cm); Model 2001, Control Unit: 6x8x2½in (15x20x6.2cm).
Weight:	Information not available.
Power (Primary/Secondary):	6V dc, 1A, 6W; includes a compact transformer which plugs into a wall outlet.
Emplacement:	Reader: Flush mount; Control Unit: Surface mount.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available.
Parts and Repairs: Information not available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Information not available.
Government or Professional Standards: Information not available.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Cards, approximate, depending on design: $1.00; Model 1001, $260.00; Model 2001, $430.00; cost for General Binding not available.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

Cards are printed circuit strips laminated in polyvinyl chloride, ends of strips are exposed at end of card for insertion into electrical connector. Cards are available in four configurations besides credit card. Credit card size is standard 2.125x3.375in. Cards may be printed and can have I.D. photos mounted.

INSTALLATIONS

CODE COMBINATION AND CARD LOCKS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

Code combination and card locks rely on both something known by the individual and something possessed by the individual, specifically a numerical or alphanumerical code and a coded card. Typically, code combination and card locks are intended for unattended, self-contained use at a single door. A unique, personal code composed of four to six characters, usually numbers, is provided to all authorized personnel. Longer codes are more secure since they require a substantially larger number of random attempts to guess the correct code than shorter codes; however, longer codes are more difficult to memorize. The code combination is compared within the lock to the code present on a coded card. If the code combination corresponds with the card code, entry (or exit) is permitted.

Code combination and card locks use digital, solid-state devices and circuitry to register the code and to compare it with the code read from the card. Keyboards are typically of the touch tone, push-button type with 10 or 12 buttons; cards are typically magnetically coded.

Some cards have the data encoded in a strip of magnetic tape, which can be either attached to the outside surface of the card or embedded within the card. The data is read by a magnetic pickup or reader head as the card is being inserted into or withdrawn from the reader. Another type of magnetically coded card contains an array of

ferromagnetic spots that are polarized so that they can be read as the presence or absence of data bits. The cards may be readily re-encoded by reversing the polarity of any of the magnetic spots. A common billfold-size card or pass badge is 2 1/8 by 3 3/8 inches. Cards are constructed of three or more separately bonded layers or laminations. The outer layers are usually clear; the innermost layer or layers contain the data for access control and identification. The material used to bond the different layers together is a clear vinyl or polyester film coated with an adhesive. In addition to the information needed for access control, a seal, logo, photo or special design, included to make tampering more difficult, may be printed on the laminating film, placed on the inner layer before it is laminated, or heat impregnated or embossed onto the finished card. To color code a card, the laminating plastic or the background of photos may be colored, or colored photographic mounting paper may be inserted with one of the laminations. The card readers include a relay or switch which is opened or closed to energize or de-energize an electric latch or strike when a match between a code combination and a coded card occurs.

In general, all magnetically coded cards can be duplicated. Some cards are more resistant than others, but none are counterfeit proof. Another limitation is that lost or stolen cards can be used by an intruder for access. However, since a unique, personal code combination must be used also, a possible intruder would need to gain possession of the card and knowledge of the code combination. (Some individuals have been known to write their code on the card.) Collusion is still possible since both the code and card may be transferred. Some locks allow the use of time zones either through the use of an external timer, which changes the code circuitry of the card reader, or by actually changing the code reader cartridge. Time zones permit individuals to gain access only during specified time periods and to be rejected at all other times. The use of

time zones can make it slightly more difficult for the individual who has a forged, stolen or lost card and a code combination to gain access, since the valid entry time must be guessed.

CODE COMBINATION AND CARD LOCK

Manufacturer A.P.D. Security Systems
24700 Crestview Court
Farmington, MI 48024
(313) 477-2703

Model Selectronic/Lock 1220

Reference Evaluation Guide Procedure No. III-3.A NRC Identification No.

NARRATIVE DESCRIPTION

The Selectronic/Lock 1220 is both a 12-position keyboard combination lock and a magnetic card access reader for self-contained use at a single door. The correct 3 digit code combination must be entered on the keyboard and a properly encoded magnetic card must be inserted in the card lock for access. The code for each combination lock is determined by setting switches on the combination lock printed circuit module and the code for the card lock is determined by setting 15 code switches mounted on the card lock printed circuit module. Operation may be selected for either card lock only, combination lock only or both card and combination lock. 500 three digit combinations are available (digits not repeated in sequence). Combination code is common and card code is common for all users. When correct combination code and encoded card are used, an output will be generated for approximately 3 seconds to activate a door strike or movable gate arm.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Three digit combination code and encoded magnetic card matched against pre-selected numbers.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained unit for use at a single door.
Terminal/Reader Characteristics: Both 3 digit combination code and encoded magnetic card reader combined into a single terminal; codes set by switches on the circuit boards mounted in the terminal; two period time zone operation capability for card lock only with SL/1220/T option.
Central Display Characteristics: No central display; printer option.
Resistance to Spoofing and Tampering: None, if code is known; otherwise must guess code number.
Temperature: Weather-resistant enclosure with SL/BSL/1220/WR option, 0 to +125F (−18 to +52C); cold weather enclosure including heater and thermostat with SL/BSL/1220/CWO option.
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: 5A, Form "C" relay contact.

PHYSICAL DATA

Size: Flush mount wall enclosure, 11x11in x adj. (28x28cm x adj.); Weather resistant enclosure, 7x6x12in (17.8x15.2x30.5cm).
Weight: Information not available.
Power (Primary/Secondary): 24V ac, 20VA; with heater, additional 24V ac, 2A.
Emplacement: Stand, post or wall mount; SL/BSL/1220/FM flush mount option.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	Information not available.
Maintainability:	Information not available.
Warranty Information:	90 days warranty on parts and labor.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	SL/BSL/1220, $550.; SL/BSL/1220/FM, $50.; SL/BSL/1220/WR, $50.; SL/BSL/1220/CWO, $50.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Printer option available with A.P.D. Printer.

Magnetic card (Magnicard) is embedded with a rubber-bonded barium ferrite composite material which generates a strong magnetic field with a high-resistance to de-magnetization. Cards are factory-encoded. Card size 2.125x3.375x0.035 or 0.060in (5.4x8.6x0.09 or 0.15cm); cards may be slotted, stamped, printed and can have I.D. photos mounted.

INSTALLATIONS

CODE COMBINATION AND CARD LOCK

Manufacturer Card Key Systems
20339 Nordhoff St.
Chatsworth, CA 91311
(213) 882-8111

Model Interrogator II

Reference Evaluation Guide Procedure No. III-3.A NRC Identification No.

NARRATIVE DESCRIPTION

The Interrogator II is both a pushbutton combination lock and a magnetic card access reader for self-contained use at a single door. Interrogator II uses a common memorized four digit numerical code and a common card code. Entry is conditional on use of both the correct card and correct keystroking of the code number. The four digit numerical code is determined by setting three thumbwheel switches in the control unit. Access to the control unit is through a keylock opening which is equipped with a tamper switch. The card lock is programmed by means of a matrix card inserted into the secured side of the card lock with a unique facility code. The lock has available up to 10,000 code combinations numbers of digits utilized in any sequence. Switches in the control unit allow selection of card only, code combination only or both. Incorrect entries cause the keyboard and reader to be inhibited from 1 to 10 seconds (determined by switch in control unit). Correct entry causes the activation of a relay output. Activation of the relay is from 1 to 10 seconds (determined by switch in control unit). The control unit can operate up to 500ft (153m) from the keyboard unit. May be used with SCD Series. In SCD System Series, a three digit numerical code number is used instead of the four digit number.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Four digit combination code and encoded magnetic card matched against a coded matrix card.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained unit for use at a single door.
Terminal/Reader Characteristics: Unit combines Interrogator I coded combination lock and a PSL Series card lock; control unit is located at a separate secure location.
Central Display Characteristics: None when used as self-contained unit; uses SCD Series controller/display when part of SCD System.
Resistance to Spoofing & Tampering: Incorrect entries cause an error timer to inhibit keyboard from 1 to 10 seconds; adjustable in control unit; tamper switch on control unit.
Temperature: 32 to 131F (0 to 55C) (−30 to +131F (−35 to 55C) for readers with weather-resistant housing).
Humidity: 0 to 95 percent, non-condensing.
Other Environmental Characteristics: Information not available.
Interface: Output relay capacity, 28V dc or 115V ac, 5A; card reader for use with SCD System Series; has edge connector for interface with central controller.

PHYSICAL DATA

Size:	Reader, 5.30x7.80x4.75in (13.5x19.8x12cm.); approximately, depending on housing; Control Unit, 7.75x8.62x3in (19.7x21.9x7.6cm).
Weight:	Information not available.
Power (Primary/Secondary):	7.25V ac, 0.7A; rechargeable battery and charger located in control unit.
Emplacement:	Flush mount, surface mount and weather resistant surface mount housing for terminals; surface mount for control units; control unit can operate up to 500ft (153m) from terminal.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Self-contained terminal and Control Unit: $633. to $704., depending on housing; Error Annunciator, $375.; Terminal and Control Unit for use with SCD System Series, $1,228. to $1,266. depending on housing.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Error Annunciator provides an alarm (audible and/or visual) for one of the following:

a. Allows a preset number of errors (up to 10 tries) to be made during code entry before signalling an alarm; 10-position thumbwheel used to select number of tries;
b. Signals an alarm if door is held open longer than a preset time (10 to 30 seconds); time set by potentiometer;
c. Signals an alarm when a duress code number is entered.

INSTALLATIONS

CODE COMBINATION AND CARD LOCK

Manufacturer	CardKey Systems 20339 Nordhoff St. Chatsworth, CA 91311 (213) 882-8111
Model	Interrogator III
Reference Evaluation Guide Procedure No. III-3.A	NRC Identification No.

NARRATIVE DESCRIPTION

The Interrogator III is both a pushbutton combination lock and a magnetic card access reader for self-contained use at a single door. The card code has two parts; one part of the card code is compared to a matrix card in the card lock; the second part of the code is read and held in a memory located within the control lock. The control unit processes this code through a portion of its circuitry to establish the unique four digit numerical code that must be correctly keystroked for entry to be allowed. Each card has a personalized individual four digit code necessary to obtain access. A ten-position rotary switch located within the control unit is used to permit changes in all personalized codes through a scramble circuit. Access to the control unit is through a keylock opening which is equipped with a tamper switch. Up to 10,000 personalized code numbers are available. Switches located in the control unit are used to determine either card only operation or card and numerical code operation. Incorrect entries cause the keyboard and card reader to be inhibited from 1 to 10 seconds (determined by switch in control unit). Correct entries cause the activation of a relay output. Activation of the relay is from 1 to 10 seconds (determined by switch in control unit). Activation of the relay is from 1 to 10 seconds (determined by switch in control unit). The control unit can operate up to 500ft (153m) from the keyboard/card reader unit. Interrogator III may be used with an SCD Series or Interrogator 880 controller to provide a centralized entry control system.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Four digit combination code matched against one part of code on magnetic card; second part of code on magnetic card matched against a coded matrix card.
Enrollment Capacity:	Up to 10,000 personalized numerical code numbers of four digits.
Terminal/Reader Capacity:	Self-contained for use at a single door; control unit is located at a separate, secure location.
Terminal/Reader Characteristics:	Unit combines a touchtone keyboard and a combination card reader/card lock.
Central Display Characteristics:	None when used as a self-contained unit; use SCD Series or Interrogator 880 controller/display when part of a system.
Resistance to Spoofing and Tampering:	Incorrect entries cause an error timer to inhibit keyboard from 1 to 10 seconds; adjustable in control unit; tamper switch on control unit.
Temperature:	32 to 131F (0 to 55C). −30 to +131F (−35 to +55C); for readers with weather-resistant housing.
Humidity:	0 to 95 percent, non-condensing.
Other Environmental Characteristics:	Information not available.
Interface:	Output relay capacity, 28V dc or 115V ac, 5A; terminal has interface for either SCD System Series or Interrogator 880.

PHYSICAL DATA

Size:	Reader: approximately 5.30x7.80x4.75in (13.5x19.8x12cm), depending on housing; Control Unit: 7.75x8.62x3in. (19.7x21.9x7.6cm).
Weight:	Information not available.
Power (Primary/Secondary):	7.25V ac, 0.7A; rechargeable battery and charger located in control unit.
Emplacement:	Flush mount, surface mount and weather-resistant surface mount housings for terminals; surface mount for control units; control unit can operate up to 500ft (153m) from terminal.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Self-contained terminal and control unit, $1,305. to $1,507., depending on housing; error annunciator, $375.; terminal and control unit for use with SCD System Series, $1,590. to $1,628.; for use with Interrogator 880, $1,969. to $2,002., depending on housing.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Error annunciator provides an alarm (audible and/or visual) for one of the following:

a. Allows a preset number of errors (up to 10 tries) to be made during code entry before signalling an alarm; 10-position thumbwheel used to select number of tries;
b. Signals an alarm if door is held open longer than a preset time (10 to 30 seconds); time set by potentiometer;
c. Signals an alarm when a duress code number is entered.

INSTALLATIONS

CODE COMBINATION AND CARD LOCK

Manufacturer	CardKey Systems 20339 Nordhoff St. Chatsworth, CA 91311 (213) 882-8111
Model	Memori-Lock Code and Card Lock

Reference Evaluation Guide Procedure No. III-3.A NRC Identification No.

NARRATIVE DESCRIPTION

The Memori-Lock Series is both a pushbutton combination lock and a magnetic card access reader for self-contained use at a single door. One available pushbutton assembly consists of five 3-position switches (providing 10 numbers). The other assembly consists of 15 pushbuttons (providing 15 numbers). Entry is permitted by insertion of the proper card into the card reader and pushing three pushbuttons in a predetermined sequence. Cards use a common code.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Three digit combination code and encoded magnetic card matched against a coded matrix card.
Enrollment Capacity:	Common code.
Terminal/Reader Capacity:	Self-contained unit for use at a single door.
Terminal/Reader Characteristics:	Unit combines PSL Series card lock and Memori-Lock Series code combination lock.
Central Display Characteristics:	None.
Resistance to Spoofing and Tampering:	None, when code is known and card is possessed.
Temperature:	Information not available.
Humidity:	Information not available.
Other Environmental Characteristics:	Information not available.
Interface:	Information not available.

PHYSICAL DATA

Size:	Information not available.
Weight:	Information not available.
Power (Primary/Secondary):	Information not available.
Emplacement:	Information not available.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

CODE COMBINATION AND CARD LOCK

Manufacturer Rusco Electronic Systems
P.O. Box 5005
Glendale, CA 91201
(800) 423-2557

Model R-10/ID SYSTEM

Reference Evaluation Guide Procedure No. III-3.A NRC Identification No.

NARRATIVE DESCRIPTION

The R-10/ID System is both a 12-button keyboard combination lock and a magnetic card access reader for self-contained use at a single door. The correct four digit code must be entered on the keyboard and a properly encoded magnetic card must be inserted in the card lock for access. The code for each combination is determined by setting 4 switches in the lock assembly, and the code for the card lock is determined by inserting a code circuit board in the lock. Access to the switches and circuit board is by keylock. Up to 10,000 combinations of 4 digits may be used for the code number. Readers can be operated by combination code only, card only or both. Selection is made by a switch in the reader.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Four digit combination code and encoded magnetic card matched against preselected numbers.
Enrollment Capacity: Common code.
Terminal/Reader Capacity: Self-contained unit for use at a single door.
Terminal/Reader Characteristics: Both four digit combination code and encoded magnetic card reader combined into a single terminal; number for combination code set by using four switches located in lock; replaceable circuit board determines card code; selection of combination code only, card only or both made by setting switch in lock.
Central Display Characteristics: None.
Resistance to Spoofing and Tampering: None when code is known and card possessed.
Temperature: 35 to 125F (2 to 52C).
Humidity: 0 to 90 percent, non-condensing.
Other Environmental Characteristics: Information not available.
Interface: Output relay capacity, 12/24V ac, 3/1.5A.

PHYSICAL DATA

Size: Reader/Keyboard: Approximately, 5x7x6in (12.7x17.8x15.2cm), depending on housing.
Weight: Information not available.
Power (Primary/Secondary): 115V ac, 60Hz, 1A; 230V ac, 50Hz, 0.5A; optional backup available.
Emplacement: Front access, flush mount.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Magnetic cards are sealed in laminated polyvinyl chloride; card size 2.125x3.375in (5.4x8.6cm) cards may be printed, embossed, slotted and can have I.D. photos mounted.

INSTALLATIONS

CODE COMBINATION AND CARD LOCK

Manufacturer	Rusco Electronic Systems P.O. Box 5005 Glendale, CA 91201 (800) 423-2557
Models	R-15/ID and RS-20/ID

Reference Evaluation Guide Procedure No. III-3.A NRC Identification No.

NARRATIVE DESCRIPTION

The RS-15/ID System is both a 12-button keyboard combination lock and a magnetic card access reader for self-contained use at a single door. The correct four digit code must be entered on the keyboard and a properly encoded magnetic card must be inserted in the card lock for access. The code for each combination is determined by setting four switches in the lock assembly and the code for the card lock is determined by inserting a code circuit board in the lock. Two time zones are available, which may be set manually by activating a switch in the lock or may be controlled by the use of an external timer. Access to the switches and circuit board is by keylock. Up to 10,000 combinations of four digits may be used for the code number. The RS-20/ID has similar features with the exceptions that a more sophisticated encoding scheme is used and that three time zones are available.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Four digit combination code and encoded magnetic card matched against preselected numbers.
Enrollment Capacity:	Common code.
Terminal/Reader Capacity:	Self-contained unit for use at a single door.
Terminal/Reader Characteristics:	Both four digit combination code and encoded magnetic card reader combined into a single terminal; number for combination code set by using four switches in locks; replaceable circuit board determines card code; two (RS-15/ID) or 3 (RS-20/ID) time zone operation capability by using switch in lock; selection of combination code only; card only or both made by setting switch in lock.
Central Display Characteristics:	None.
Resistance to Spoofing and Tampering:	None, when code is known and card possessed.
Temperature:	10F to 125F (−12 to +52C).
Humidity:	0 to 90 percent, non-condensing.
Other Environmental Characteristics:	Information not available.
Interface:	Output contact closure, 12/24V ac, 3/1.5A maximum.

PHYSICAL DATA

Size:	Reader/Keyboard: 6x9½x6½in (15.2x24x16.5cm).
Weight:	Information not available.
Power (Primary/Secondary):	115V ac, 60Hz, 1A, maximum; 230V ac, 50Hz, 0.5A, maximum; optional backup available.
Emplacement:	Front access, flush mount.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Magnetic (5.4x8.6cm) cards are sealed in laminated polyvinyl chloride; card size 2.125x3.375in cards may be printed, embossed, equipped with apparel clips, and can have I.D. photos mounted.

INSTALLATIONS

CODE COMBINATION AND CARD LOCK

Manufacturer	Rusco Electronic Systems P.O. Box 5005 Glendale, CA 91201 (800) 423-2557
Model	RS-20/IDEK

Reference Evaluation Guide Procedure No. III-3.A NRC Identification No.

NARRATIVE DESCRIPTION

The RS-20/IDEK is both a pushbutton combination lock and a magnetic card access reader for self-contained use at a single door. The card code has two parts; one part of the card code is compared to a code circuit board in the lock assembly, the second part of the code is read and held in memory in the lock assembly for comparison with the personalized four digit numerical code that must be correctly keystroked for entry to be allowed. Each card has a personalized individual four digit code necessary to obtain access. Access to the lock assembly is by keylock. A switch in the lock assembly is used to determine either card only operation, or card and numerical code operation. Three time zones are available, which may be set manually be activating a switch in the lock assembly. Up to 10,000 combinations of four digits may be used for the code number.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Four digit combination code matched against one part of code on magnetic card; second part of code on magnetic card matched against a coded matrix card.
Enrollment Capacity:	Up to 10,000 personalized numerical code numbers of four digits.
Terminal/Reader Capacity:	Self-contained for use at a single door.
Terminal/Reader Characteristics:	Unit combines a 12-pushbutton keyboard and a combination card reader/card lock.
Central Display Characteristics:	None when used as a self-contained unit.
Resistance to Spoofing and Tampering:	None when code is known and card possessed.
Temperature:	10 to 125F (−12 to +52C).
Humidity:	0 to 90 percent, non-condensing.
Other Environmental Characteristics:	Information not available.
Interface:	Output contact closure, 12/24V ac, 3/1.5A, maximum.

PHYSICAL DATA

Size:	Reader/Keyboard: 6x9½x6½in (15.2x24x16.5cm).
Weight:	Information not available.
Power (Primary/Secondary):	115V ac, 60Hz, 1A maximum; 230V ac, 50Hz, 0.5A, maximum; optional backup available.
Emplacement:	Front access, flush mount.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Magnetic cards are sealed in laminated polyvinyl chloride; card size 2.125x3.375in (5.4x8.6cm); cards may be printed, embossed, equipped with apparel clips, and can have I.D. photos mounted.

INSTALLATIONS

MAGNETIC CARD SYSTEMS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

Magnetic-card systems rely on something possessed by the individual, specifically a magnetically coded card. Some cards have this data encoded in a strip of magnetic tape, which can be either attached to the outside surface of the card or embedded within the card. The data is read by a magnetic pickup or reader head as the card is being inserted into or withdrawn from the reader. Another type of magnetic-coded card contains data in an array of ferromagnetic spots that are polarized so that they can be read as the presence or absence of data bits. The cards may be readily re-encoded by reversing the polarity of any of the magnetic spots. A common billfold-size card or pass badge is 2 1/8 by 3 3/8 inches. Cards are constructed of three or more separately bonded layers or laminations. The outer layers are usually clear; the innermost layer or layers contain the data for access control and identification. The material used to bond the different layers together is a clear vinyl or polyester film coated with an adhesive. In addition to the information needed for access control, a seal, logo, photo or special design, included to make tampering more difficult, may be printed on the laminating film, placed on the inner layer before it is laminated, or heat impregnated or embossed onto the finished card. To color code a card, the laminating plastic or the background of photos may be colored, or colored photographic mounting paper may be inserted with one of the laminations.

After the code on the card is read by the reader, it is transmitted to a central porcessor, usually over a dedicated wire cable or a telephone line. Some units employ line supervision (see Volume VIII - General Purpose Communications) between the reader and the central processor. The received card code is compared within the central processor to a previously assigned code. If the codes are equivalent, authorization is granted, and a signal is transmitted back to the reader location to actuate a relay which energizes or de-energizes an electric strike or latch. Because of the storage capability of the central processor, each individual who has entry authorization can be assigned a unique code. With the use of a central processor as a comparator for stored and entered credentials, features in addition to identity verification are possible. These features include automatic entry/exit recording and display, allowance for different levels of access, limits on the time periods in which entry is authorized for different doors, speed in adding or deleting individuals from the system, and employment of an anti-passback feature in which a card must have been used for an entry before it can be used for an exit and vice versa.

In general, all magnetically coded cards can be duplicated. Some cards are more resistant than others, but none are counterfeit proof. Another limitation is that lost or stolen cards can be used for access, and cards can be transferred among individuals acting in collusion. An advantage of a system with a central processor is that an individual's card code can be eliminated from the file quickly and consequently cannot be used thereafter at any card reader connected to the processor. However, the fact that a card is lost or stolen is often not recognized until after a considerable period of time during which the card could be used by an intruder.

MAGNETIC CARD SYSTEMS

Manufacturer	CardKey Systems 20339 Nordhoff St. Chatsworth, CA 91311 (213) 882-8111
Model	Interrogator 770 Series and Interrogator 880 Series

Reference Evaluation Guide Procedure No. III-4.A NRC Identification No.

NARRATIVE DESCRIPTION

The Interrogator 880 controller monitors up to 128 magnetic card reader/terminals in remote locations, and controls access at those locations. The card reader/terminal is a combined card lock and card reader. The cards contain a two-part magnetic code, one part to actuate the card lock at the terminal and one part which is read to determine the unique identification number assigned to the card. The data is then transmitted to the central controller, which evaluates the data, determines whether or not access should be granted, and returns the appropriate signal to the terminal location. Terminals may be located up to 1.5 miles (2.4km) from the controller. Programming of the controller allows setting up to 128 separate access levels, 8 time zones, up to 62,000 different card codes. All programming is performed by means of a "Touchtone" telephone keyboard and a 16-button key-pad. Key-operated switch on controller inhibits programming operations. An optional printer is available. Anti-passback is also available as an option. The Interrogator 770 controller has similar features but less capability. The controller monitors up to 16 card reader/terminals, and allows up to 32 access levels, 8 time zones, and up to 1500 separate card codes.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Two-part magnetic code on card; one part activates terminal for transmission of second part of code to controller for verification. First part of code is a unique facilities code, the second part is a personalized code.
Enrollment Capacity:	Interrogator 880, up to 62,000 cards in steps of 2,000 or 4,000 cards, Interrogator 770, up to 16 terminals and 1500 separate codes.
Terminal/Reader Capacity:	Interrogator 880, up to 128 terminals in steps of 16 terminals; Interrogator 770, up to 16.
Terminal/Reader Characteristics:	Terminal consists of a card reader and separately located terminal interface unit. The terminal interface unit is keylocked and is equipped with a tamper switch.
Central Display Characteristics:	The Interrogator 880 has Touchtone telephone keyboard, 16 button keypad, digital readout display, and an audible alarm. Interrogator 770 has a 16 button key pad, digital readout display, and an audible alarm. An optional stand-alone printer is available for the 880 and a built-in printer for the 770.
Resistance to Tampering and Spoofing:	Anti-passback prevents repeat use of a card for 5 minutes to 24 hours at selected terminals; time is programmable. Tamper switches on terminals.
Temperature:	Central Controller and associated equipment 32F to 131F (0 to 55C). Radar/Terminal 32 to 131F (0 to 55C) or −30to +131F (−34 to +55C) with weather resistant housing.
Humidity:	Information not available.

Other Environmental Characteristics:	Information not available.
Interface:	Reader/Terminal: Access output is 28V dc or 115V ac, 15A. Controller: 20mA current loop or RS232C interfaces available to connect controller to a remote terminal or computer.

PHYSICAL DATA

Size:	Reader/Terminal: 4.50x5.30x5.15in (11.4x13.5x13cm) approximate depending on configuration. Controller: 19x12x22in (48x30.5x55cm) approximate, depending on configuration.
Weight:	Information not available.
Power (Primary/Secondary):	Reader/Terminal 8V ac, 10VA or 16V ac, 10VA at 50/60Hz Controller 115V ac, 3A, 50/60Hz; 230V ac, 1.5A; 50/60Hz Rechargeable battery and charger available for use with Reader/Terminal.
Emplacement:	Reader/Terminal: flush mount, post mount, surface mount, glass door mount, chain link fence mount; some housings are available as weather resistant. Controller/Associated Equipment: Table top or rack mount. Readers may be located up to 1.5 miles (2.4km) from controller when twisted pair wire used; distance can be greater if modems are used.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Manuals are available. Training information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Reader/Terminals: $792 to $1249 depending on housing Controller: $12,650 and up depending on capability and options.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Controller operations include:

a. Displays entry requests and reasons for denying entry
b. Monitors for malfunctions; indicates if one occurs
c. 880 stores 64 most recent transactions; 770 stores 32 most recent transactions

Printer modes:

a. No printout
b. Print voided cards only
c. Print valid cards only
d. Print alarm combinations only
e. Print any combination of the above
f. Print all transactions

INSTALLATIONS

MAGNETIC CARD SYSTEMS

Manufacturer CardKey Systems
20339 Nordhoff St.
Chatsworth, CA 91311
(213) 882-8111

Model SCD Series

Reference Evaluation Guide Procedure No. III-4.A NRC Identification No.

NARRATIVE DESCRIPTION

The SCD Series is a centrally controlled magnetic card access system. The system is comprised of a central access controller, a card reader at each access point, an optional printer and an optional void card alarm control. When a valid magnetic card is inserted into any reader, the multiplexer within the central controller scans all reader stations at remote access points. When the active reader is located, a signal is transmitted to halt the multiplexer. The controller then requests and accepts the data from that reader. When the controller determines that the card is valid, it generates a signal that is transmitted to an access control unit such as a door strike. The access control unit remains actuated as long as the valid card is held in the reader, but the multiplexer is released within one-half second to cycle to the next reader waiting to be read. Memory has capability of either 999 three-digit card numbers or 9,999 four-digit card numbers. System has capability for 10 to 30 card readers. Void cards are denied access and an alarm switch is actuated. Alarm devices are optional. Printer-display is optional.

PERFORMANCE DATA

Random Reading Error: Information not available.

Processing Time: Polling time of ½ second per reader in addition to processing time. Processing time less than ½ second.

Identification Mechanism: Encoded magnetic card is matched against both a program matrix card in each reader and the code stored in the central controller. Each card contains two separate coded portions.

Enrollment Capacity: Either 999 three-digit numbers or 9,999 four-digit numbers.

Terminal/Reader Capacity: Either up to 10 readers or up to 30 readers depending on the selected option.

Terminal/Reader Characteristics: Each card reader is similar to the PSL series card lock. Level or zone coding is performed at the readers by changing the program matrix card. Each reader contains a PSL lock cartridge for matching against one portion of the coded card and a set of magnetic sensors to respond to the second portion of the card and to transmit the code to the central controller.

Central Display Characteristics: The central controller consists of a multiplexer, data converter, access controller and void-a-matic unit. All code numbers are valid until voided. Voiding is achieved by manually inserting a void pin in the socket corresponding to that card number in the void panel located under the lockable lid to the controller. Printer-display is optional. Test digit switches on controller to check void cards.

Resistance to Tampering and Spoofing: Immediate voiding of cards possible at central controller, anti-passback available with card readers using IN-X-IT option. No tamper switches for card readers or central controller.

Temperature: Information not available.

Humidity: Information not available.

Other Environmental Characteristics: Card readers have weatherproof housing, central controller is for indoor use.

Interface: Access control units can switch 28V dc 5A. Telephone interface Mode ICR-4 available to connect readers and access control units to central controller.

PHYSICAL DATA

Size:	Central controller is 12¼x20x17¼in (31x51x44cm) desk mount or 10½x19x20¼in (26.5x48x51.5cm) rack mount. Card readers (approximate depending on housing) 4.5x5.3x4.75in (11.5x13.5x12cm).
Weight:	Information not available.
Power (Primary/Secondary):	No back-up power. Central controller, 117V ac, 100W. Reader, no power required. Power required for access devices (door strikes) 28V dc 5A.
Emplacement:	Central controller, desk top or rack mount. Readers have flush mount, surface mount, weather proof pole mount housing.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Manuals are available. Information concerning training not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTA not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Coded card $1.45 to $1.90 depending on option; program matrix cards $5.50; central controller $2,866.00 to $9,444.00 depending on options; card readers $617 to $926 depending on options.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Magnetic cards are sealed in laminated polyvinylchloride. Card size is 2.125x3.375x0.065in max. (5.4x8.6x0.17cm) Cards may be slotted, stamped, printed and have I.D. photos mounted.

Printer/display is optional. If a printer is included in the central controller, simultaneous with actuation of the access control unit the printer records:

Time of day
Date
Reader station number
Card number
Valid or void status

Printout data is displayed visually on the front panel until the next print command.

Special card readers with Hi-X-IT option (requiring separate entry and exit card readers) are available for anti-passback control.

INSTALLATIONS

MAGNETIC CARD SYSTEMS

Manufacturer Rusco Electronic Systems
P.O. Box 5005
Glendale, CA 91201
(800) 423-2557

Model RS-30 and RS-40

Reference Evaluation Guide Procedure No. III-4.A NRC Identification No.

NARRATIVE DESCRIPTION

The RS-40 controller monitors up to 100 magnetic card reader/terminals in remote locations, and controls access at those locations. The card reader/terminal determines the code on the card and transmits the data to the controller, which evaluates the data, determines whether or not access should be granted, and returns the appropriate signal to the terminal location. Terminals may be hardwired up to 2 miles (3.2km) from the controller. Programming of the controller allows setting up to 95 separate access levels, 7 time zones, up to 20,000, 5-digit ID numbers for cards. All programming is performed by means of switches on the controller front panel. Optional printer is available. Use of two recoding, access reader/terminals (such R-15/R) permits anti-passback. The RS-30 has similar features but less capability. The controller monitors up to 8 remote terminals, 20 separate access levels, 3 time zones, and up to 1000, 4-digit ID numbers.

PERFORMANCE DATA

Random Reading Error: Information not available.

Processing Time: Information not available.

Identification Mechanism: Encoded magnetic card is read to determine personalized code number for transmission to central controller for comparison with number stored in memory.

Enrollment Capacity: RS-40 up to 20,000; RS-30 1000.

Terminal/Reader Capacity: RS-40 up to 100 card reader/terminals; RS-30 up to 8 card reader/terminals.

Terminal/Reader Characteristics: Terminals are similar to RS-20 series reader; code combination and card reader terminals can be used with the controllers.

Central Display Characteristics: The controllers contain switches on the front panel for programming the controller, a digital readout display, and a card reader for testing cards.

Resistance to Tampering and Spoofing: Optional anti-passback when used with two reading access readers. No resistance to tampering.

Temperature: 10 to 125F (−12 to +52). −25 to +125F (−32 to +52C) for readers equipped with weather resistant housing.

Humidity: 0 to 90 percent humidity, noncondensing.

Other Environmental Characteristics: Information not available.

Interface: Card Readers: output relay capacity 115V ac or 28V dc, 3A max. Card Reader/Code Keyboard: output relay capacity 12/24V ac, 3/1.5A max. Controller: 20mA current loop, isolated.

PHYSICAL DATA

Size: Card Readers: (approximate depending on housing) 3x6x6in (7.6x15x15cm) Card Readers/Code Combination Keyboard: 5¾x9⅝x6⅝in (14.6x24.4x16.8cm) RS-30 Controller: 7¾x16⅞x17¾in (19.7x42.9x45cm) RS-40 Controller: 13⅞x19¾x20½in (35.2x50.2x52cm).

Weight: Information not available.

Power (Primary/Secondary): Card Readers: 12V ac, 50/60Hz, 0.5A max. Card Reader/Code Keyboard: 115V ac, 60Hz, IA; 230V ac, 50Hz, 0.5A. Controller: 115V ac, 60Hz, 3A; 230V ac, 50Hz, 1.5A.

Emplacement: Card Readers: Front access, flush mount; surface mount; weather resistant post mount. Controller: Table top, RS-30 may be rack-mounted.

SUPPLY/LOGISTICS DATA

Documentation and Training: Information not available concerning training. Manuals are available.

Parts and Repairs: Information not available.

Reliability: MTBF not available.

Maintainability: MTTR not available.

Warranty Information: Information not available.

Government or Professional Standards: Information not available.

Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Information not available.

Unit Installation Cost: Information not available.

Training Cost: Information not available.

Maintenance Cost: Information not available.

Operation Cost: Information not available.

NOTES

Magnetic cards are sealed in laminated polyvinalchloride. Card size is 2.125x3.375in (5.4x8.6cm). Cards may be printed, embossed, equipped with apparel clip, and can have ID photos mounted.

Printer: The printer records:

- Date
- Time of day
- Reader number
- ID number
- Status level
- Invalid attempts printed in red; valid attempts printed in black

INSTALLATIONS

MAGNETIC CARD SYSTEMS

Manufacturer Rusco Electronic Systems
P.O. Box 5005
Glendale, CA 91201
(800) 423-2557

Model System 500

Reference Evaluation Guide Procedure No. III-4.A NRC Identification No.

NARRATIVE DESCRIPTION

The system 500 is composed of either a MAC 530 or MAC 540 controller, SAL 500 system activity logger, and system 500 readers. The controllers are micro-computer operated. The MAC 530 controller can be programmed to accept up to 8 terminals, up to 1000 different card codes, up to 32 status levels, and up to 32 time zone intervals. The MAC 540 controller can be programmed to accept up to 256 terminals, 20,000 different card codes, up to 256 status levels, and up to 127 time zone intervals. The card code is composed of two encoded sets of numbers, a system code and an individual identification number. The controller checks the system code before comparing the unique card code with the stored number. Each controller has a keyboard on the front panel for programming. Operation of the keyboard can be inhibited by the use of a keyswitch. Anti-passback is available. Line supervision of communications between reader and controller uses inquiry/response technique.

PERFORMANCE DATA

Random Reading Error: Information not available.

Processing Time: Information not available.

Identification Mechanism: Two part magnetic code on card; one part is system code, second part is personalized identification number. Code is read by terminal and transmitted to controller for comparison with stored number.

Enrollment Capacity: MAC 530: up to 1000 different card codes; MAC 540: up to 20,000 different card codes.

Terminal/Reader Capacity: MAC 530: up to 8 terminals; MAC 540: up to 256 terminals.

Terminal/Reader Characteristics: Card readers only or card reader/keyboard combination available; access to readers through key-locked front panel. Terminals are equipped with tamper switches. Communications have line supervision. When there is a loss in communications, readers allow entry based on system code.

Central Display Characteristics: Each controller has a keyboard for programming and digital readout display. Controller keyboards are equipped with key switches to inhibit operation. The system's activity logger provides a printout of all system activity on 3½in (8.9cm) wide paper.

Resistance to Tampering and Spoofing: Anti-passback. Readers equipped with key-locks and tamper switches; line supervision for communications between reader and controller; controllers equipped with keyboard inhibit key-switches.

Temperature: Terminals: 32 to 120F (0 to 49C). −25 to +120F (−32 to +49C) with weather resistant housing. Controllers and Logger: 32 to 120F (0 to 49C).

Humidity: 0 to 95 percent, non-condensing.

Other Environmental Characteristics: Information not available.

Interface: Card Reader: Output relay capacity, 115V ac or 28V dc, 3A max. Controller: 20mA current loop, optically isolated.

PHYSICAL DATA

Size:	Card readers: approximate depending on housing, 4x8x4in (10x20x10cm). Card reader/code keyboard: approximate depending on housing, 9½x9¾x5½in (24x24.8x14cm). MAC 530 controller: 10x15x23.20in (25.4x38x59cm). MAC 540 controller: 10x21.62x27.70in (25.4x55x70.4cm). SAL 500: 10x15x23.20in (25.4x38x59cm).
Weight:	Information not available.
Power (Primary/Secondary):	Terminal: 12 to 24V ac, 50/60Hz, 0.5A. MAC 530 controller: 115V ac, 50/60Hz, 2A; 230V ac, 50/60Hz, 2A. MAC 540 controller: 115V ac, 50/60Hz, 4A; 230V ac, 50/60Hz, 0.2A. SAL 500: 115V ac, 50/60Hz, 0.4A; 230V ac, 50/60Hz, 0.2A.
Emplacement:	Card Reader: All front access; flush mount, post mount, surface mount. Controller and Logger: Table-top. Readers may be located up to 2 miles (3.2km) from controller when hardwired; distance can be greater if modems used.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Manuals are available. Information concerning training not available.
Parts and Repair:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not avialable.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Magnetic cards are sealed in laminated polyvinyl chloride. Card size is 2.125x3.375in (5.4x8.6cm). Cards may be embossed, printed, equipped with apparel clip, and have ID photos mounted.

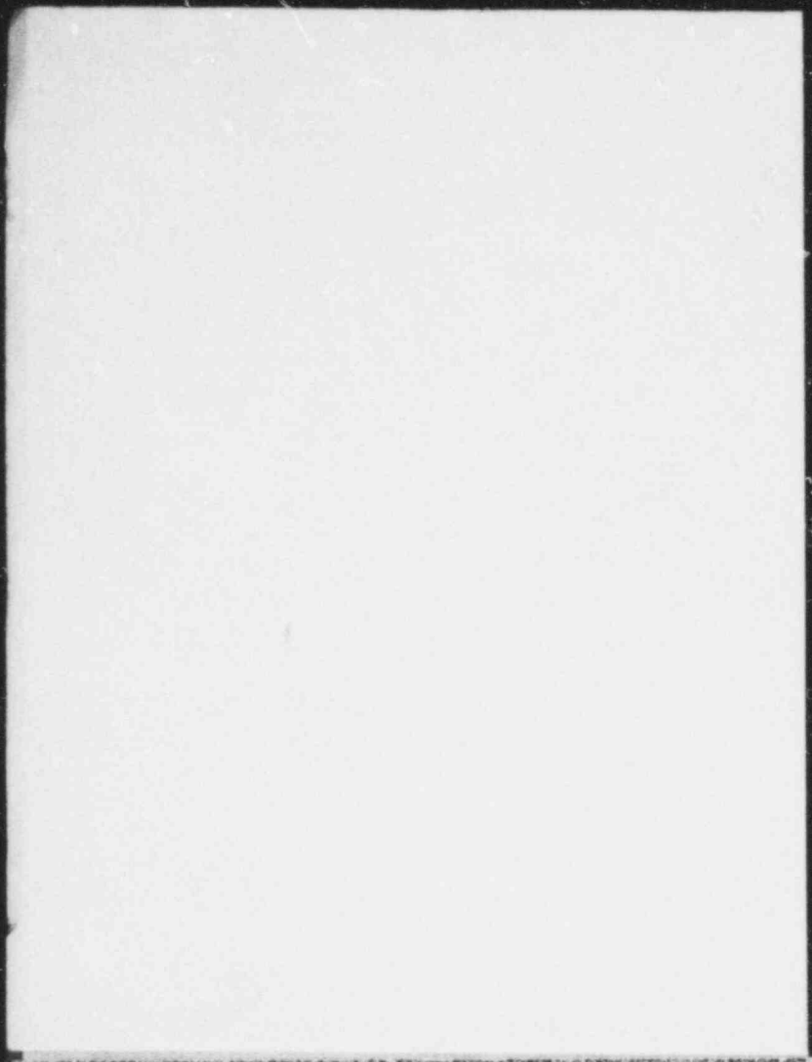
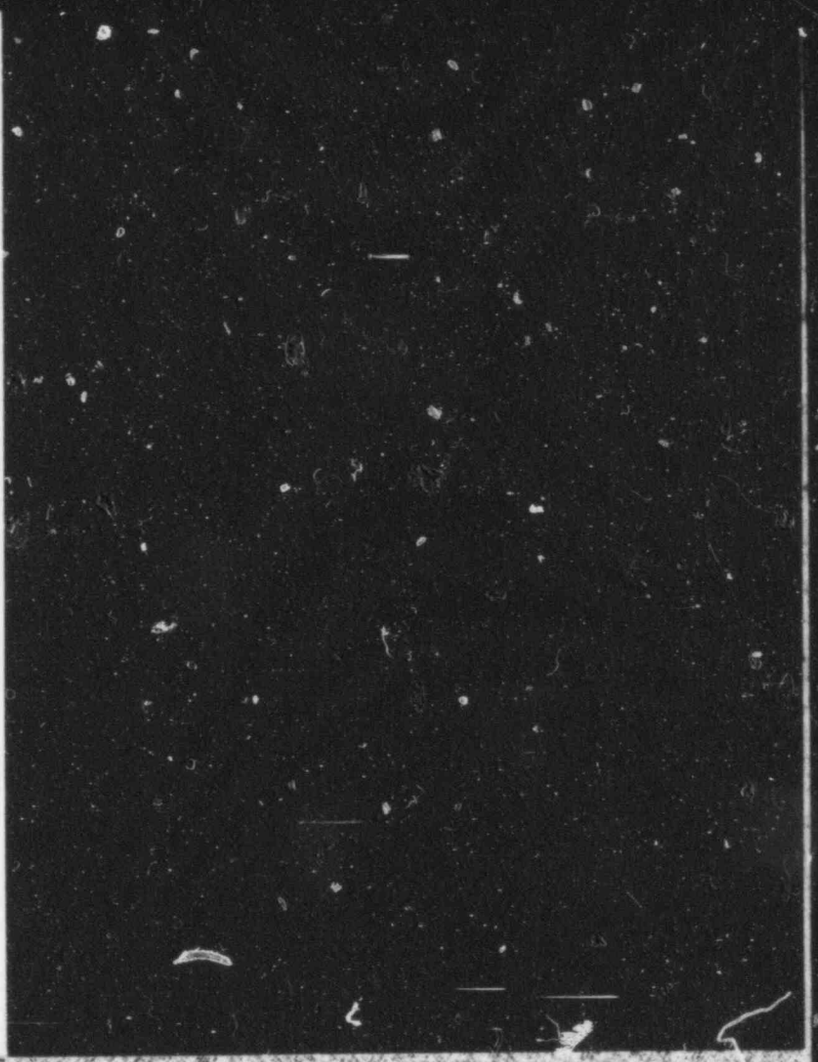
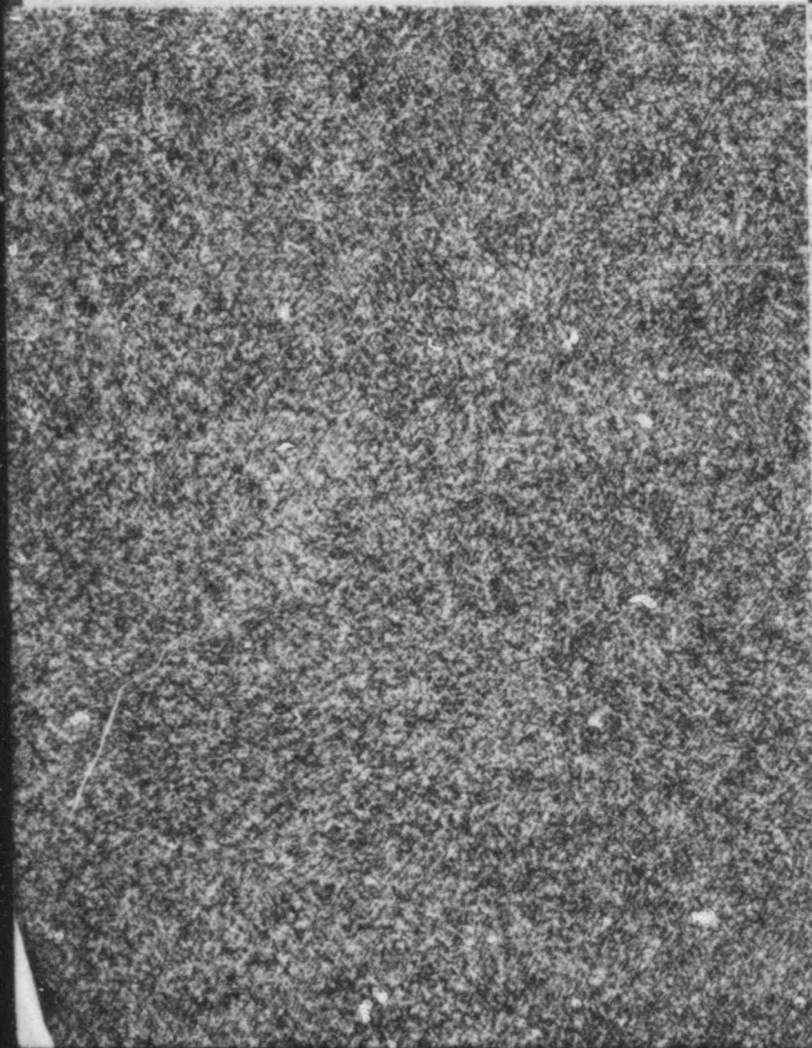
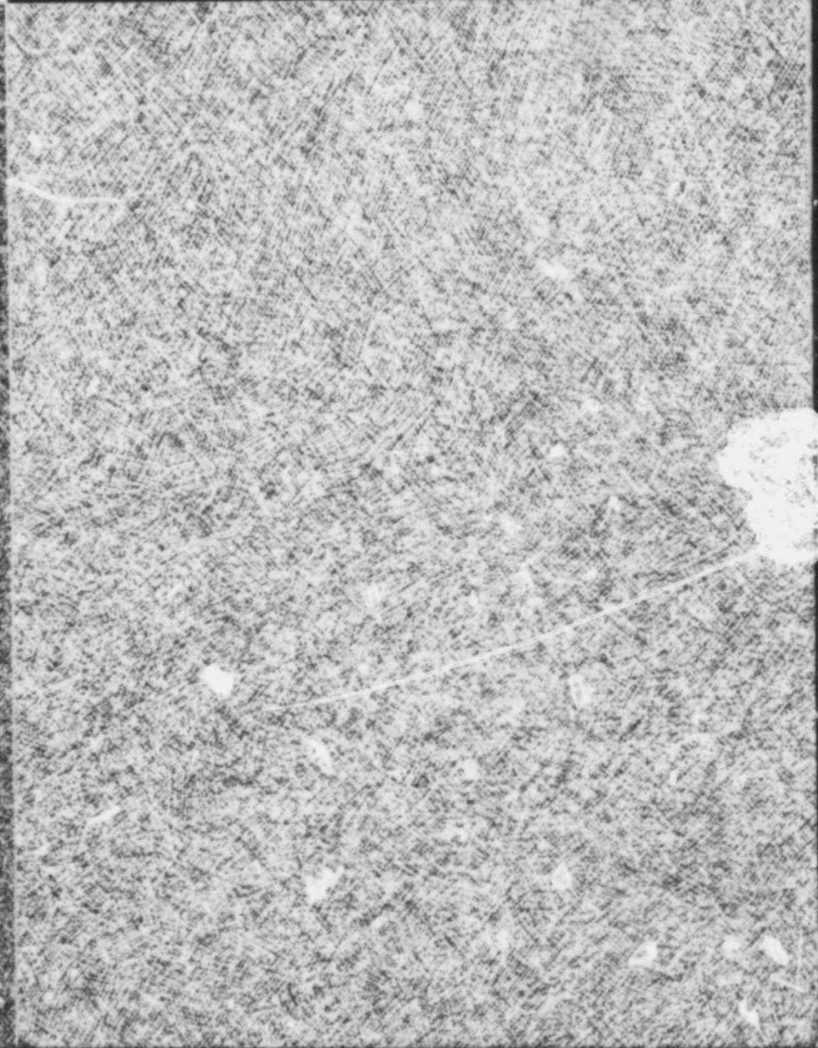
Line supervision on communications link between controllers and terminals: Controller interrogates each terminal, the terminal must respond with an acknowledge message, an alarm message or a data message. If the controller does not receive any reply, it will print an alarm message.

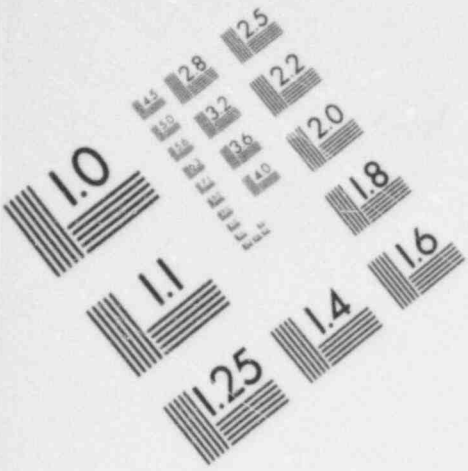
Printer: Simultaneous with activation of the access control device, the printer records:

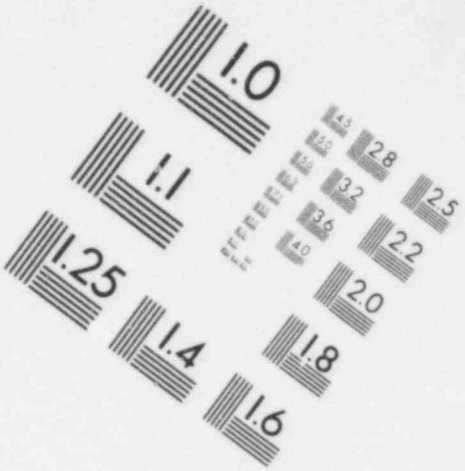
- Transaction code
- ID number
- Status level
- Reader number
- Time of day
- Date

INSTALLATIONS

736 360





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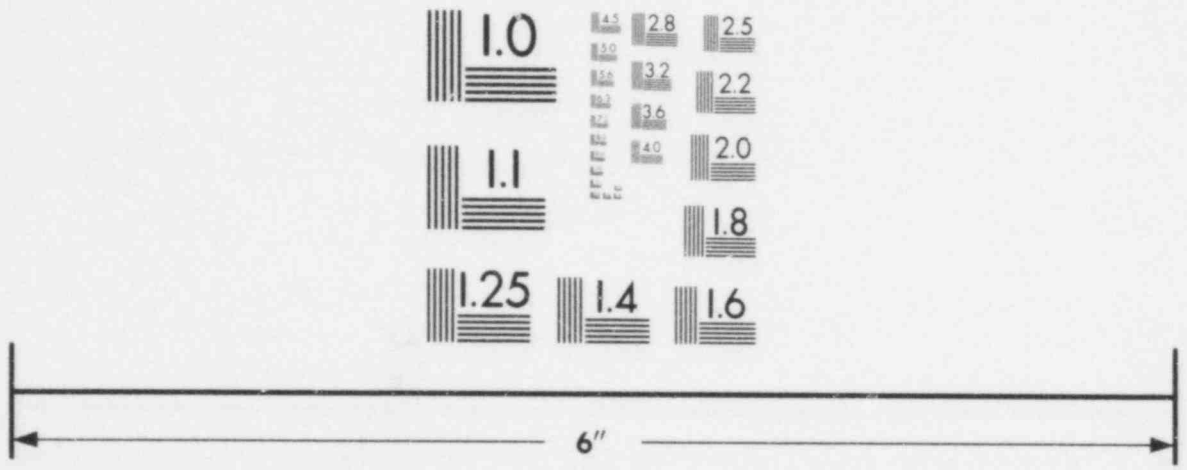

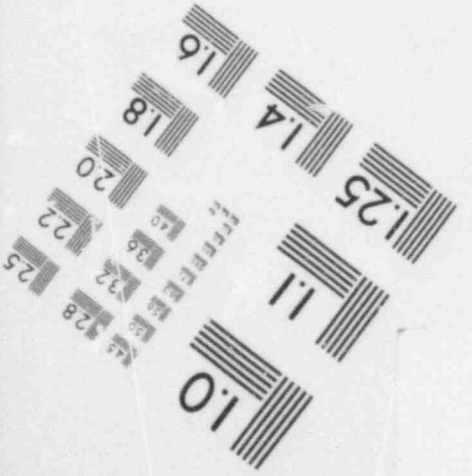

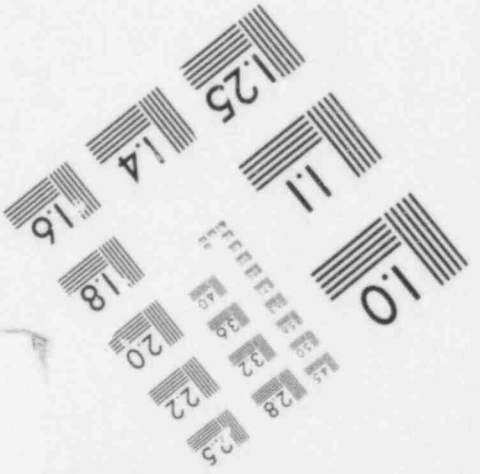

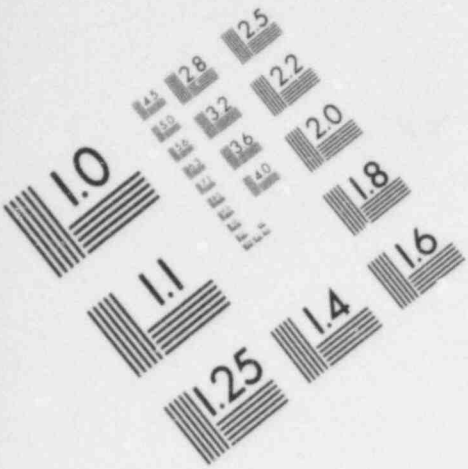

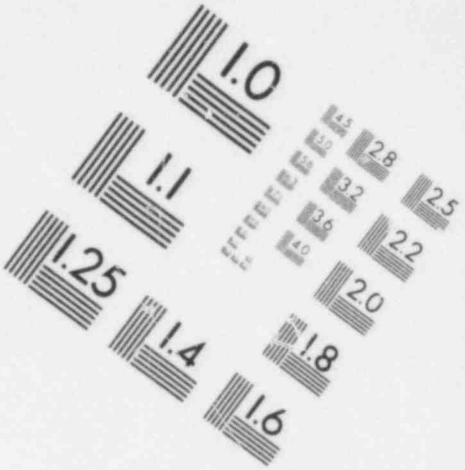

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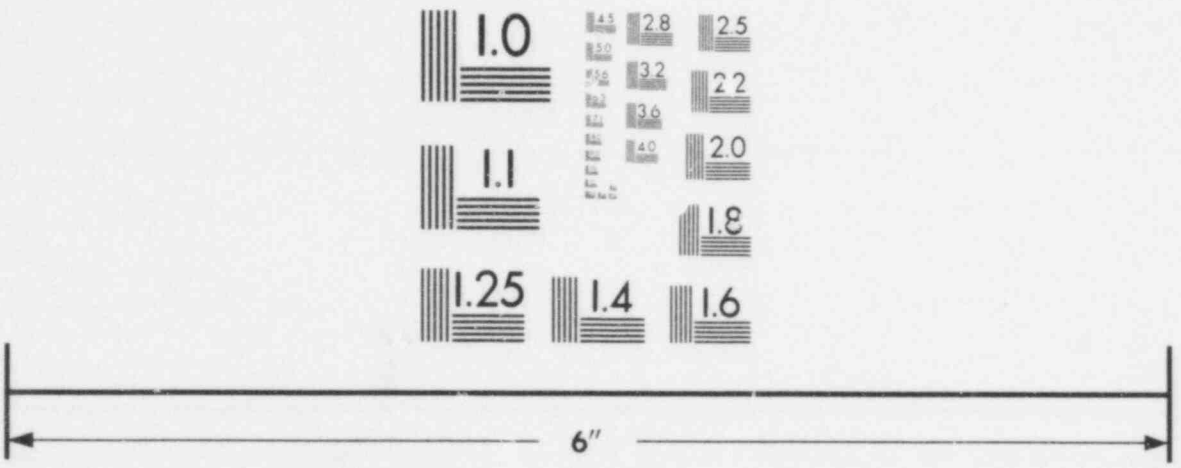

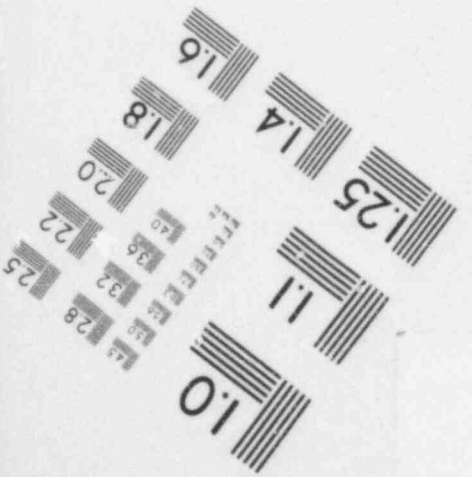

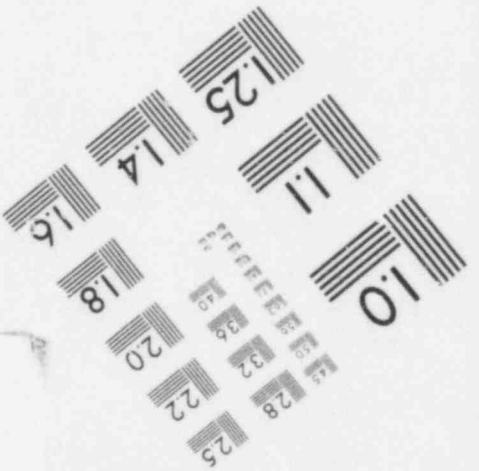

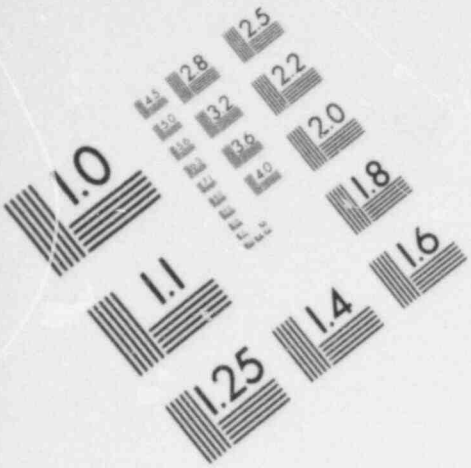

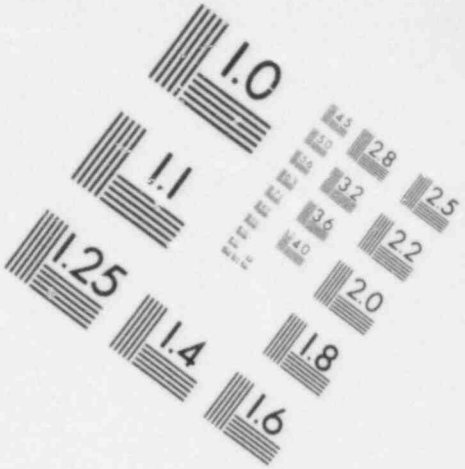

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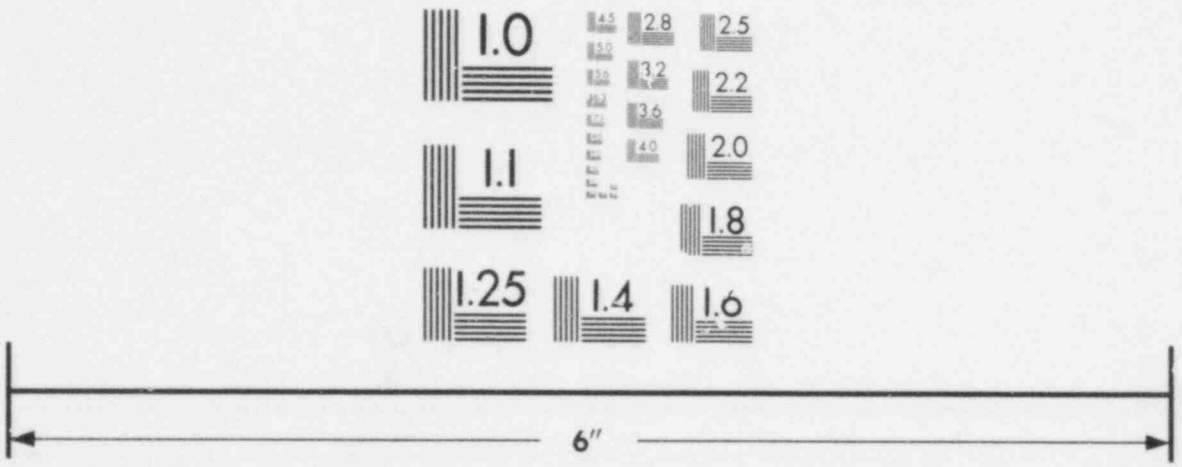

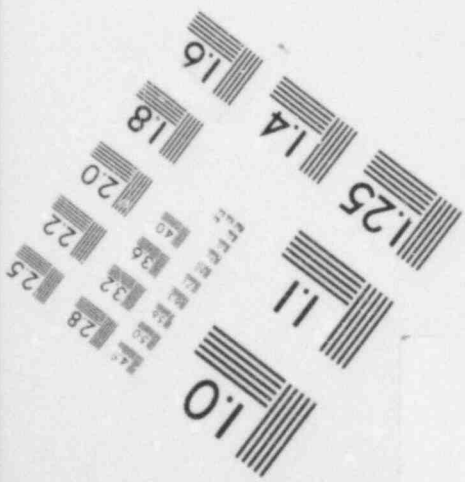

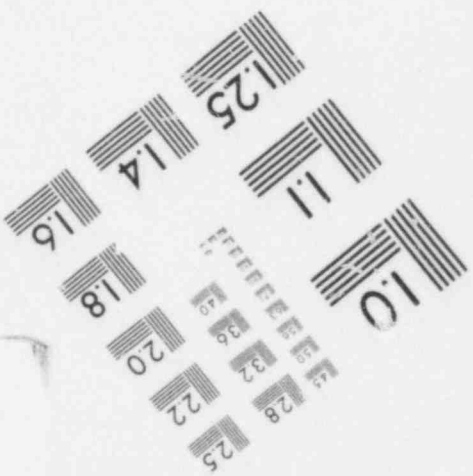

CAPACITIVE CARD SYSTEMS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the indidivual, or
- Some characteristic of the individual.

Capacitive card systems rely on something possessed by the individual, specifically a capacitively coded card. The cards have embedded in them a piece of metal foil, sections of which are removed when the card is coded. The presence or absence of the foil changes the capacitance of different areas of the card. The capacitance changes are determined by the reader in the terminal. A common billfold-size card or pass badge is 2 1/8 by 3 3/8 inches. Cards are constructed of three or more separately bonded layers or laminations. The outer layers are usually clear; the innermost layer or layers contain the data for access control and identification. The material used to bond the different layers together is a clear vinyl or polyester film coated with an adhesive. In addition to the information needed for access control, a seal, logo, photo or special design, included to make tampering more difficult, may be printed on the laminating film, placed on the inner layer before it is laminated, or heat impregnated or embossed onto the finished card. To color code a card, the laminating plastic or the background of photos may be colored, or colored photographic mounting paper may be inserted with one of the laminations.

After the code on the card is determined by the reader, it is transmitted to a central processor usually over a dedicated wire cable or a telephone line. Some units employ line supervision (see Volume VIII - General Purpose Communications) between the reader and the

central processor. The received card code is compared within the central processor to a previously assigned code. If the codes are equivalent, authorization is granted, and a signal is transmitted back to the reader location to actuate a relay which energizes or de-energizes an electric strike or latch.

Because of the storage capability of the central processor, each individual who has entry authorization can be assigned a unique code. With the use of a central processor as a comparator for stored and entered credentials, features in addition to identity verification are possible. These features include automatic entry/exit recording and display, allowance for different levels of access, limits on the time periods in which entry is authorized for different doors, speed in adding or deleting individuals from the system, and employment of an anti-passback feature in which a card must have been used for an entry before it can be used for an exit and vice versa.

In general, all capacitively coded cards can be duplicated. Some cards are more resistant than others, but none are counterfeit proof. Another limitation is that lost or stolen cards can be used for access, and cards can be transferred among individuals acting in collusion. An advantage of a system with a central processor is that an individual's card code can be eliminated from the file quickly and consequently cannot be used thereafter at any card reader connected to the processor. However, the fact that a card is lost or stolen is often not recognized until after a considerable period of time during which the card could be used by an intruder.

CAPACITIVE CARD SYSTEMS

Manufacturer Sentracon Corp.
80 Wilson Way
Westwood, MA 02090
(617) 449-0800

Model System 600 and System 650

Reference Evaluation Guide Procedure No. III-4.A NRC Identification No.

NARRATIVE DESCRIPTION

The system 650 entry control system consists of series 170 card readers and a system 650 control console. The series 170 card readers scan the cards, which are coded using a capacitive technique, to determine the code number. The number is then transmitted to the console where it is checked for validation. If the card is valid a signal is transmitted from the console to the card reader to activate the lock device. The console will accommodate up to 7 card readers, 512 card codes, and 4 levels of access. The system 600 entry control system consists of series 870 card readers and a system 600 control console. The console will accommodate up to 32 card readers, 8 access levels and 1000 card codes.

PERFORMANCE DATA

Random Reading Error: Information not available.

Processing Time: Information not available.

Identification Mechanism: Cards coded using a capacitive technique are scanned by a card reader and then transmitted to a console for verification.

Enrollment Capacity: Up to 7 card readers and 512 card codes for system 650; up to 32 card readers and 1000 card codes for system 600.

Terminal/Reader Characteristics: The electronic equipment in the card reader is accessible through the key-locked front panel; an optional tamper switch is available. Power for the card reader is provided from the console.

Central Display Characteristics: The console consists of a printer and a keyboard on the front panel. The keyboard is used to authorize void or inquire about the status of cards, and to acknowledge the audible wrong card alarm. Behind a locked, tamper switch equipped plate on the front panel are a switch to set the levels of access and switches to inhibit the keyboard.

Resistance to Tampering and Spoofing: None for spoofing. Tamper switches on the card reader and console are optionally available.

Temperature: Card Readers: 32 to 120F (0 to 49C); weather resistant housings available. Console: 45 to 115F (7 to 47C).

Humidity: Information not available.

Other Environmental Characteristics: Information not available.

Interface: Power Output: 24V ac or dc.

PHYSICAL DATA

Size:	170 Card Reader: 9x7x5in (22.8x17.8x12.7cm), approximate depending on housing. 650 Console: 13½x6⅛x7in (34.3x15.9x17.8cm), approximate depending on mounting. 870 Card Reader: 13⅝x6⅛x7in (34.4x15.9x17.8cm), approximate depending on housing. 600 Console: 8x19x27in (20.3x48x68.6cm) approximate depending on mounting.
Weight:	Information not available.
Power (Primary/Secondary):	115V ac, 60Hz; transformer operating voltage for console 24V ac; console provides 12V dc for card reader and 24V ac/24V dc for lock device. In case of a power failure, the memory is retained for 24 hours.
Emplacement:	Card Readers: Semi-flush or surface mount. Console: 19in rack mounted or table top.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	1 year guarantee.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	650 Console: $3,995 to $4,770 depending on options and size. 170 Card reader: $695 to $835 depending on housings. Cards: $2.00. 600 Console: $9200 to 18,240 depending on options and size. 870 card readers: $750 to $770 depending on housings.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Cards: Constructed of heat fused resilient plastic, contain embedded metal strips which act like capacitors. Cards may be printed, equipped with apparel clips and have ID photos mounted.

Printer: For each attempt the card prints the following in black for a valid attempt and red for an invalid attempt.

Date
Time of day
Card reader number
Card code number

INSTALLATIONS

OPTICALLY CODED CARD SYSTEMS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

Optically coded card systems rely on something possessed by the individual, specifically an optically coded card. These cards, also described as a differential-optics card, are designed with a geometric array of dots offering different levels of optical density which allow penetration of varying degree by infrared light beams. The card itself is opaque to ordinary light yet each dot of the pattern may be any of 10 levels of optical density when scanned by the card reader. The number of combinations make it possible to encode up to 65,000 different access cards without repetition. A common billfold-size card or pass badge is 2 1/8 by 3 3/8 inches. Cards are constructed of three or more separately bonded layers or laminations. The outer layers are usually clear. The innermost layer or layers contain the data for access control and identification. The material used to bond the different layers together is a clear vinyl or polyester film coated with an adhesive. In addition to the information needed for access control, a seal, logo, photo or special design, included to make tampering more difficult, may be printed on the laminating film, placed on the inner layer before it is laminated, or heat impregnated or embossed onto the finished card. To color code a card, the laminating plastic or the background of photos may be colored, or colored photographic mounting paper may be inserted with one of the laminations.

After the code on the card is determined by the reader, it is transmitted to a central processor usually by a dedicated wire cable or telephone line. Some units have line supervision (see Volume VIII - General Purpose Communications) between the reader and the central processor. The received card code is compared within the central processor to a previously assigned code. If the codes are equivalent, authorization is granted, and a signal is transmitted back to the reader location to actuate a relay. Such an actuation will energize or de-energize an electric strike or latch. Because of the storage capability of the central processor, each individual who has entry authorization can be assigned a unique code. With the use of a central processor as a comparator for stored and entered credentials, features in addition to identity verification are possible. These features include automatic entry/exit recording and display, allowance for different levels of access, limits on the time periods in which entry is authorized for different doors, speed in adding or deleting individuals from the system, and employment of an anti-passback feature in which a card must have been used for an entry before it can be used for an exit and vice versa.

In general, all optically coded cards can be duplicated. Some cards are more resistant than others, but none are counterfeit proof. Another limitation is that lost or stolen cards can be used for access, and cards can be transferred among individuals acting in collusion. An advantage of a system with a central processor is that an individual's card code can be eliminated from the file quickly and consequently cannot be used thereafter at any card reader connected to the processor. However, the fact that a card is lost or stolen is often not recognized until after a considerable period of time, during which the card could be used by an intruder.

OPTICALLY CODED CARD SYSTEMS

Manufacturer A.P.D. Security Systems
24700 Crestview Court
Farmington, MI 48024
(313) 477-2703

Model System 710

Reference Evaluation Guide Procedure No. III-4.A NRC Identification No.

NARRATIVE DESCRIPTION

System 710 is a centrally controlled access control system using optically coded card readers. A central memory unit accepts any number of card readers and has memory for 8,000 code numbers. Voiding or validating cards from the memory is accomplished by entering on the hand held programmer (located at the central memory/controller) the code number and operation. With use of an optional external timer, several time zones are available. Anti-passback is available as an optional feature.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Information not available.
Identification Mechanism:	Encoded card using optical reading technique ("Differential Optics").
Enrollment Capacity:	Up to 8000 code numbers can be centrally stored.
Terminal/Reader Capacity:	Information not available.
Terminal/Reader Characteristics:	Optical code reader.
Central Display Characteristics:	No central display. Printer option records entry attempts; invalid attempts are printed in red.
Resistance to Tampering and Spoofing:	Anti-passback feature optional. No resistance to tampering.
Temperature:	Information not available.
Humidity:	Information not available.
Other Environmental Characteristics:	Information not available.
Interface:	Information not available.

PHYSICAL DATA

Size:	Information not available.
Weight:	Information not available.
Power (Primary/Secondary):	Information not available.
Emplacement:	Card readers are flush mounted on walls central controller and printer sit on table top.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

OPTICALLY CODED CARD SYSTEMS

Manufacturer A.P.D. Security Systems
24700 Crestview Court
Farmington, MI 48024
(313) 477-2703

Model Memory Card Lock 740

Reference Evaluation Guide Procedure No. III-4.A NRC Identification No.

NARRATIVE DESCRIPTION

The Memory Card Lock is an optical card access reader with internal memory for self-contained use at a single door. 1000 card memory is standard and 2000 card memory is optional. Voiding or validating cards from the Memory Card Lock is accomplished by opening the front panel door (key-lock is used to lock panel door), plugging in the hand-held programmer and entering the card number and desired operation on the keyboard. With the addition of an optional external timer, several time zones are available. If the encoded card corresponds to one of the programmed codes, an output will be generated to activate a door strike or movable gate arm. An optional unauthorized card alarm is available that will signal when a voided card has been inserted into the reader. Anti-passback is an optional feature.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Encoded card using optical reading technique ("Differential Optics").
Enrollment Capacity: 1000 code numbers, 2000 code numbers optional, at each terminal.
Terminal/Reader Capacity: Self-contained reader for use at a single door.
Terminal/Reader Characteristics: Validating or voiding code numbers is accomplished by opening the front panel door (key-lock used to lock panel door), plugging in the hand-held programmer and entering the desired card number and operation on the keyboard; period operation/time zone capability optional; unauthorized card alarm optional; anti-passback optional.
Central Display Characteristics: Information not available.
Resistance to Tampering and Spoofing: None with basic system. Anti-passback feature available.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: N.O. and N.C. contacts rated 5A; non-inductive output relay has adjustable time delay of 0 to 15 seconds.

PHYSICAL DATA

Size: Flush or surface mounting housing, 8x6x4in (20.3x15.2x10.1cm).
Weight: Information not available.
Power (Primary/Secondary): 24V ac or dc, 24W max.
Emplacement: Wall mounting, flush or surface mount.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	Information not available.
Maintainability:	Information not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

OPTICALLY CODED CARD SYSTEMS

Manufacturer	Johnson Controls, Inc. 507 E. Michigan St. Milwaukee, WI 53201 (414) 276-9200
Model	MG-7001, MG-7003, and JC/80

Reference Evaluation Guide Procedure No. III-4.A NRC Identification No.

NARRATIVE DESCRIPTION

The MG-7001, MG-7003, JC/80 card access units employ a patented level-optic technique for card verification. MG-7001 is used as a single unit for each portal. MG-7003 is a centrally controlled unit that allows an "unlimited" number of readers with a memory of 4000 cards. JC/80 is a centrally controlled unit that allows an "unlimited" number of readers with a memory of 65,000 cards and can be used with a keyboard option. The cards will accept photos and apparel clips. JC/80 is part of entire monitoring and control for building security, heating, fire-safety.

PERFORMANCE DATA

Random Reading Error:	Information not available.
Processing Time:	Maximum 1.5 seconds.
Identification Mechanism:	Level-optic technique senses the presence or lack of code material, and the degree of code material at each code position.
Enrollment Capacity:	MG-7001, 2000; MG-7003, 4000; JC/80, 65,000.
Number of Zones:	8 time zones; JC/80 allows 256 reader groupings.
Terminal/Reader Capacity:	Information not available.
Terminal/Reader Characteristics:	MG-7001 self-contained reader/terminal requires MG-9001 programmer to add or delete cards; JC/80 allows use of keyboard, exit button.
Central Display Characteristics:	MG-7003 has a central printer available, MG-7003-4; JC/80 uses general purpose display.
Resistance to Tampering and Spoofing:	Anti-passback, adjustable door strike operation, time zones, area zones on JC/80. No resistance to tampering.
Temperature:	Information not available.
Humidity:	Information not available.
Other Environmental Characteristics:	Information not available.
Interface:	MG-7001 and MG-7003 have outputs for unauthorized card alarms. JC/80 reports alarm to central display.

PHYSICAL DATA

Size:	Information not available.
Weight:	Information not available.
Power (Primary/Secondary):	MG-7001, V ac or dc, 60 hour standby; MG-7003, 24V ac or dc, 68 hours for system; JC/80, information not available.
Emplacement:	MG-7001 surface-mounted at portal; MG-7003 has readers surface or flush-mounted at portal, printer at central location; JC/80 readers are surface or flush-mounted at portal, central display is rack-mounted or table-top.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintai..	MTTR not available.
Warranty Inform..tion:	Information not available.
Governmen.. or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

737 012

CODED CIRCUITRY CARD SYSTEMS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

Coded circuitry card systems rely on something possessed by the individual, specifically a coded card. The code on the card is determined by a printed circuit laminated within each card. Connectors on one end of the card provide electrical contacts for the card reader. The code for each lock is determined by a replaceable printed circuit card in the associated control unit. A common billfold-size card or pass badge is 2 1/8 by 3 3/8 inches. Cards are constructed of three or more separately bonded layers or laminations. The outer layers are usually clear; the innermost layer or layers contain the data for access control and identification. The material used to bond the different layers together is a clear vinyl or polyester film coated with an adhesive. In addition to the information needed for access control, a seal, logo, photo or special design, included to make tampering more difficult, may be printed on the laminating film, placed on the inner layer before it is laminated, or heat impregnated or embossed onto the finished card. To color code a card, the laminating plastic or the background of photos may be colored, or colored photographic mounting paper may be inserted with one of the laminations.

After the code on the card is determined by the reader, it is transmitted to a central processor usually over a dedicated wire cable or a telephone line. The received card code is compared within the central processor to a previously assigned code. If the codes

are equivalent, authorization is granted and a signal is transmitted back to the reader location to actuate a relay which energizes or de-energizes an electric strike or latch. Because of the storage capability of the central processor, each individual who has entry authorization can be assigned a unique code. With the use of a central processor as a comparator for stored and entered credentials, features in addition to identity verification are possible. These features include automatic entry/exit recording and display, allowance for different levels of access, limits on the periods in which entry is authorized for different doors, speed in adding or deleting individuals from the system, and employment of an anti-passback feature in which a card must have been used for an entry before it can be used for an exit and vice versa.

In general, all coded circuitry cards can be duplicated. Another limitation is that lost or stolen cards can be used for access, and cards can be transferred among individuals acting in collusion. An advantage of a system with a central processor is that an individual's card code can be eliminated from the file quickly and consequently cannot be used at any card reader connected to the processor. However, the fact that a card is lost or stolen is often not recognized until after a considerable period of time during which the card could be used by an intruder.

CODED CIRCUITRY CARD SYSTEM

Manufacturer	Eaton Corp./Lock and Hardware Div. P.O. Box 25288 Charlotte, NC 28212	General Binding Corp. 1101 Skokie Blvd. Northbrook, IL 60062 (312) 272-3700
Model	IDENTI-LOGIC 6002 and 6003	
Reference Evaluation Guide Procedure No. III-4.A		NRC Identification No.

NARRATIVE DESCRIPTION

The Identi-Logic card system consists of a Model 6002 or 6003 hardwired central control printer and the Model 1001 or 2001 card reader and control unit. The Model 6002 has a capacity of 1000 cards and up to 100 cards can be voided. The Model 6003 has a capacity of 10,000 cards and up to 70 cards can be voided. Voiding cards is accomplished by patching wires into appropriate holes in the front panel of the unit. Each controller is able to accommodate one entrance. For more entrances (up to 40) a Model 6400 multiplexer is required. Additional voiding of up to 200 cards is available with Model 6303 expander. A visual and audible alarm are located on the front panel and are activated by the use of a voided card.

PERFORMANCE DATA

Random Reading Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Binary coded printed circuit board has electrical readings made on the connector; the headings are compared with the programmed code in the central controller.
Enrollment Capacity: Information not available.
Terminal/Reader Capacity: One entrance per controller, expandable to 40 entrances with Model 6400 multiplexer.
Terminal/Reader Characteristics: Readers are Identi-Logic Model 2001 or 1001.
Central Display Characteristics: Audio and visual alarm indicators, test button, printer controls and printer are located on the front panel. A patch panel for voiding cards is located on the front panel. Model 6002 has a capacity of 1000 cards and up to 100 can be voided. Model 6003 has a capacity of 10,000 cards and up to 70 cards can be voided. Additional voiding of up to 200 cards is available with the Model 6303 expander.
Resistance to Tampering and Spoofing: None.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: Information not available.

PHYSICAL DATA

Size: Model 6002 and 6003 central controller 19½x9½x15in (49.5x24x38cm).
Weight: Approximately 40lb (18kg).
Power (Primary/Secondary): 120V ac, 60Hz, 150W during print operation, 25W in standby.
Emplacement: Control unit and printer are for desk-top use. Card reader surface mounted.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Information not available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Model 6002 Central Control Printer $8,320 Model 6003 Central Control Printer $9,160 Model 6400 Multiplexer (5 doors) $3160; each additional 5 doors $860 Model 6303 Expander $3,380
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

FINGERPRINT VERIFICATION SYSTEMS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

Fingerprint verification equipment falls into the third category. Two basic approaches are pursued in automating the matching of fingerprints. One method consists of a direct optical comparison between the "search" print (the print entered by the individual) and the file print. In the other method, the search print is optically scanned and converted to an electrical signal, and a list of significant detailed features of the fingerprint ("minutiae") and their location is compiled in digital form. The minutiae, which consist of ridge endings and ridge bifurcations, may then be compared with a similar list on file in the processing unit.

In a personal recognition device using the direct optical comparison method, the comparison process must be carried out locally within the recognition device since it is not practical to transmit the fingerprint image over a distance. One way of obtaining the two images to be compared is to have the person enter a card containing the file copy of his fingerprint and then have him place the corresponding finger on an optical window through which the "live" print can be viewed along side of the file print. This window is typically a prism arranged to exploit the principle of frustrated total internal reflection to obtain a high quality fingerprint image. Alternatively, the user might key in identifying information which would cause the file print to be retrieved from an internal file and positioned in the recognition device. He could then enter a card containing his

fingerprint to be compared with the file print. Within the device, the images of the search print and the file print are compared using an optical correlation technique, and an output signal is produced signifying the degree of match obtained. In one device, the image of the fingerprint is optically Fourier - transformed, and the resulting spatial frequency spectrum is compared to a holographically produced spectrum from the card. This approach permits a smaller reference image, enables individualization of the card by varying the optical parameters, conceals the reference image, and avoids the need for lateral translation of the image. However, it is still necessary to rotate one of the images slightly in order to compensate for misorientation. In direct comparision devices, two translations and one rotation must be employed by the comparison algorithm.

In the digital comparison method, the person keys in identifying information which causes the minutiae list for his fingerprint to be retrieved from a file at a central location. He then places the corresponding finger on an optical window, and an optical scanning process produces the search print. The search minutiae list, which requires only a moderate amount of data, is sent to the central location either by a dedicated wire cable or telephone line. Some units have line supervision (see Volume VIII - General Purpose Communications) between the terminal and the central processor. At the central processor a comparison is made between the search minutiae list and the file minutiae list, using special algorithms for this purpose. Because of alignment problems and the plasticity of the finger, it is generally not possible to get an exact match. Therefore, the comparison process generates a score which indicates the likelihood that the two prints are the same. The central system may have minutiae lists on file for more than one fingerprint for a given individual in order to allow for the possibility that the first, or primary, finger to be tried might not be able to be scanned properly for some reason (e.g., the finger may have been injured).

Performance of an automatic fingerprint verification system may be judged upon the level of Type 1 Errors (refusal to admit an authorized person -- a false rejection), or Type 2 Errors (admittance of an unauthorized person) and processing time (the time required for a single individual to be verified). It is important that all users of an automated identify verification system be given adequate instruction and training so that they will understand the system and how it operates before they begin using the system for access control. Experience indicates that some individuals will have an abnormally high number of false rejects. These may be due to manual activities (e.g., working in the garden on weekends) or to nervousness, physical disabilities (such as dry skin, poorly defined prints, scars or missing fingers), or simply an inability to cope with mechanical or automated systems. Such individuals may have to be excluded from the use of these identify verification systems. Another potential problem is that the variables that were used for identification are subject to change over a prolonged period of use due to aging and wearing away of prints. Consequently, these variables might not continue to match the data originally obtained during the initial training or enrollment period.

FINGERPRINT VERIFICATION

Manufacturer Calspan Technology
Products, Inc.
P.O. Box 235
Buffalo, NY 14221
(716) 632-7500

Model FINGERSCAN

Reference Evaluation Guide Procedure No. III-5.A NRC Identification No.

NARRATIVE DESCRIPTION

The FINGERSCAN System is an automatic fingerprint verification system used for access control. The system detects the minutiae in the fingerprint, that is, the tiny ridge endings and branches that distinguish one person from another. No inking or other process is required. The system includes a terminal located at each access site and a central station. The remote terminals can be connected to the central station by direct cable up to a mile in length, or through dedicated or dial telephone connections. The comparison algorithm updates the stored reference data each time the system is used by an individual.

PERFORMANCE DATA

Type 1 Error: DIA Test program (see Note 1): 6.1 percent; MITRE Test program 5.3 to 6.5 percent. (See Note 2).

Type 2 Error: DIA Test program (see Note 1): 6.3 percent; MITRE Test program 2.2 to 2.3 percent. (See Note 2).

Processing Time: DIA Test program (see Note 1): 14.3 seconds; MITRE Test program 12 to 13 seconds. (See Note 2).

Verification Mechanism: Verification initiated by keystroking identification number. Comparison of current fingerprint with stored fingerprint. System uses fingerprint minutiae for verification.

Enrollment Capacity: 500 or 4000 person configuration.

Terminal Capacity: 16 to 64 terminals.

Terminal Characteristics: 10 digit, 2 function keyboard; finger positioning and scanning equipment; indicator lamps to display status information and instructions.

Central Display Characteristics: Keyboard and alphanumeric display for operator control; log printer and magnetic tape unit are optional.

Resistance to Tampering and Spoofing: Tamper switch on remote terminal; central station is keylocked. A three-dimensional replica of an enrolled person's fingerprint using plastic or rubber type material has been tested (see Note 3). Valid ID must be entered; has programmable time zones and line supervision.

Temperature: 50 to 90F (10 to 30C).

Humidity: 10 to 90 percent.

Other Environmental Characteristics: Information not available.

Interface: Twisted pair from terminal to central station or telephone connection.

757 020

PHYSICAL DATA

Size:	Central station: 42x70x33in (105x168x84cm); remote terminal: 18x14x15in (45x35x38cm).
Weight:	Central station: 600lb (270kg); remote terminal: 40lb (18kg).
Power (Primary/Secondary):	115V ac ± 10%, 47 to 63Hz, single phase, 1400W; no backup power.
Emplacement:	Central station: floor mounted; remote terminal: desk or table top mounted.

SUPPLY/LOGISTICS DATA

Documentation and Training:	Manuals and training are available.
Parts and Repairs:	Information not available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	Information not available.
Lead Time:	Information not available.

COST DATA

Unit Acquisition Cost:	Approximately $30,000 (includes one remote terminal).
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

(1) *Information System Security,* Defense Intelligence Agency, 30 May 1975.
(2) Results of MITRE Test program in preparation for publication by the MITRE Corp.
(3) Results of this test have been published in *Automatic Fingerprint Verification System Countermeasure Tests,* WP-21097, MITRE Corp., 31 January 1977 (DoD Confidential).

INSTALLATIONS

737 021

HAND GEOMETRY VERIFICATION SYSTEMS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

Hand geometry verification equipment falls into the third category. The equipment measures the length of the fingers. The individual to be identified carries a card with identifying information plus the data representing the profile of his hand measurements. He inserts the card into the recognition device and then positions his hand upon the sensing area. His finger geometry is then measured and compared with the data read from the card. If a match is obtained, his identity is considered to be verified. Alternatively, the profile data may be stored centrally. In this case, the individual first supplies identifying information on the system and positions his hand upon the sensing area. The measurements are then made and transmitted to the central location for comparison with the profile data. The system can then respond appropriately, based upon whether or not a match is obtained.

Performance of an automatic hand geometry verification system may be judged upon the level of Type 1 Errors (refusal to admit an authorized person -- a false rejection), Type 2 Errors (admittance of an unauthorized person) and processing time (the time required for a single individual to be verified). It is important that all users of an automatic identity verification system be given adequate instruction and training so that they will understand the system and how it operates before they begin using it for access control. Experience indicates that individuals with an abnormally high number

of false rejects which are due to nervousness, physical disabilities (arthritis, missing fingers), or inability to cope with mechanical or automated systems may have to be excluded from the use of identity verification systems. Another potential problem is that the variables that were used for identification are subject to change. (Finger lengths can change with temperature and time of day.) Consequently, these variables might not continue to match the data originally provided for the initial enrollment period.

HAND GEOMETRY VERIFICATION SYSTEM

Manufacturer Identimat Corporation
10 East 53rd St.
New York, NY 10022
(212) 371-3300

Model Identimat

Reference Evaluation Guide Procedure No. III-5.A NRC Identification No.

NARRATIVE DESCRIPTION

The Identimat system measures the length of the index, middle, ring and little finger of the right hand and records this information on a coded card. An individual requiring access to a secure area inserts his coded card in the terminal unit which observes finger length by means of a set of photoelectric cells travelling beneath a set of six slots on which the hand is placed. The four fingertips are referenced to the crotches between the index and middle fingers and between the ring and little fingers, and must agree with the recorded measurements within a preset tolerance.

PERFORMANCE DATA

Type 1 Error: DIA Test program: 17.6 percent (see notes).
Type 2 Error: DIA Test program: 0.0 percent (see notes).
Processing Time: DIA Test program: 19.4 seconds (see notes).
Verification Mechanism: Comparison of current length of fingers with measurements magnetically stored on card.
Enrollment Capacity: Unlimited.
Terminal Capacity: Unlimited.
Terminal Characteristics: Hardwired terminal; card slot and card reading equipment. Push-button/indicator lamps for display of status information and instructions.
Central Display Characteristics: None.
Resistance to Tampering and Spoofing: Tamper switch on terminal; cardboard replica of an enrolled person's hand may be successful in achieving verification.
Temperature: 40 to 120F (5 to 50C).
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: Output relay contacts for lock operation.

PHYSICAL DATA

Size: Terminal: 19x13x19in (48x33x48cm).
Weight: Terminal: 32lb (14.5kg).
Power (Primary/Secondary): 115V ac ± 10%, 60Hz, single phase.
Emplacement: Desk or table top mount.

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SUPPLY/LOGISTICS DATA

Documentation and Training:	Manuals and training available.
Parts and Repairs:	Repair service available.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	Information not available.
Government or Professional Standards:	None.
Lead Time:	Off-the-shelf.

COST DATA

Unit Acquisition Cost:	Approximately $2900.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

Information System Security, Defense Intelligence Agency, 30 May 1975.

INSTALLATIONS

PHOTO BADGE AND CCTV VERIFICATION SYSTEMS

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

Split image photo badge/CCTV verification equipment relies on a characteristic of the individual, specifically his or her facial image. Facial images can be compared remotely for identification by using CCTV and photo badges. This remote identification system requires a guard to compare side by side the televised images of an individual's face and the photo badge photograph. As an example of system operation, the person seeking access at an unattended access control point inserts a photo badge into a terminal which causes the TV image of the photograph and of his face to appear simultaneously on either separate monitors or as a split image on a single monitor at the central control point. The person controlling access must make an identification by determining that there is a satisfactory match between the two images before granting access. Several entrances may be monitored by one individual using multiple terminals and multiple television monitors (see Volume IV - Video Surveillance Components). Transmission of the video signal from the remote terminal to the central control point is by means of either coaxial cable or microwave beam.

Primary disadvantages of this verification technique are that photo badges can be lost, stolen and forged relatively easily; facial disguises can be used; and even the most conscientious security guard's ability to compare images will vary during a shift of duty because of fatigue, boredom or distraction.

PHOTO BADGE AND CCTV VERIFICATION SYSTEM

Manufacturer Mardix Security Systems
900 Stierlin Rd.
Mountain View, CA 9.:043
(415) 961-3030

Model Videoguard 300

Reference Evaluation Guide Procedure No. III-5.A NRC Identification No.

NARRATIVE DESCRIPTION

Videoguard is a remotely monitored, simultaneous video display of an entrant's face and photo badge. The entrant's face appears on one half of the video monitor and the entrant's badge appears on the second half. A guard compares the face and badge and if the guard believes they match, allows entry. Typically, three cameras are used at each entry, one to observe the badge, one to observe the entrant's face and one to observe the entry area. The central console display can switch from face-badge view to entry area view.

PERFORMANCE DATA

Type 1 Error: Information not available.
Type 2 Error: Information not available.
Processing Time: Claim: "an experienced Video-guard operator can handle as many as 150 people through a single entrance in a 15 minute period".
Verification Mechanism: Remote, visual comparison of badge and face using CCTV.
Enrollment Capacity: Unlimited.
Terminal Capacity: One entry terminal allocated to each monitor; number of monitors is configuratio dependent only.
Terminal Characteristics: Terminal consists of a badge camera, face-view camera behind a one-way mirror, voice intercom and control circuitry. Terminals may be located at various distances depending on cable or microwave communications.
Central Display Characteristics: Central controller consists of monitor, 2 door-selection buttons, camera control (general or face-badge), intercom control.
Resistance to Tampering and Spoofing: None.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: For sheltered areas.
Interface: Requires video, audio and control links; options are dedicated conduit and cable; telephone lines for audio and control links and microwave for video.

PHYSICAL DATA

Size: Entry equipment varies depending on configuration. Central console is 10¼x11¾x13$^{5}/_{16}$in (26x30x34cm); rack mount is 19x10¼x11¾in (48x26x30cm).
Weight: Information not available.
Power (Primary/Secondary): 115V ac, no back up provided.
Emplacement: Entry equipment should be in an enclosed double door area. Central console is table-top or rack-mounted.

737 027

SUPPLY/LOGISTICS DATA

Documentation and Training:	Manuals and training are available.
Parts and Repairs:	Service available from local representatives.
Reliability:	MTBF not available.
Maintainability:	MTTR not available.
Warranty Information:	1 year warranty.
Government or Professional Standards:	None.
Lead Time:	30 to 60 days.

COST DATA

Unit Acquisition Cost:	Building entrance and console: $12,000.
Unit Installation Cost:	$4,500 approximate.
Training Cost:	Information not available.
Maintenance Cost:	$960 per year approximate.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

PHOTO BADGE AND CCTV VERIFICATION SYSTEM

Manufacturer MP Video, Inc.
P.O. Box 96
381 Eliot St.
Newton Upper Falls, MA 02164
(617) 965-5405

Model Identi-Cabinet

Reference Evaluation Guide Procedure No. III-5.A NRC Identification No.

NARRATIVE DESCRIPTION

The Identi-Cabinet is a remotely monitored, simultaneous video display of an entrant's face and photo badge. The entrant's face and upper torso appears on the left half of the video monitor and the entrant's badge is displayed in the lower, right quadrant. A guard compares the face and badge and if the guard believes they match, allows entry. Two cameras are used, one to observe the badge and one to observe the entrant's face. Intercom communication between entrant and guard is available.

PERFORMANCE DATA

Type 1 Error: Information not available.
Type 2 Error: Information not available.
Processing Time: Information not available.
Verification Mechanism: Remote, visual comparison of badge and face using CCTV.
Enrollment Capacity: Unlimited.
Terminal Capacity: One entry terminal allocated to each monitor; number of monitors is configuration dependent only.
Terminal Characteristics: Terminal consists of a badge camera, face-view camera behind a one-way mirror, voice intercom and control circuitry.
Central Display Characteristics: Central display consists of a single monitor; camera control (general or face or face/badge) optional.
Resistance to Tampering and Spoofing: None.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Sheltered area; weather proofing option available.
Interface: Requires video and audio links.

PHYSICAL DATA

Size: Terminal: 16x14x30in (40x35x78cm).
Weight: Terminal: 70lb (31.7kg).
Power (Primary/Secondary): 115V ac; 24V dc operation optional.
Emplacement: Wall mounted.

SUPPLY/LOGISTICS DATA

Documentation and Training: Manuals and training available.
Parts and Repairs: Parts commercially available.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: None.
Government or Professional Standards: None.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost: Identi-Cabinet (without monitors), $2500; dual 10in monitors in cabinet, $480.
Unit Installation Cost: Information not available.
Training Cost: Information not available.
Maintenance Cost: Information not available.
Operation Cost: Information not available.

NOTES

INSTALLATIONS

PHOTO BADGE AND CCTV VERIFICATION SYSTEM

Manufacturer Visual Methods, Inc.
Box 644
200 Birchwood Rd.
Westwood, NJ 07675
(201) 391-7383

Model Twinguard

Reference Evaluation Guide Procedure No. III-5.A NRC Identification No.

NARRATIVE DESCRIPTION

Twinguard is a remotely monitored, simultaneous video display of an entrant's face and photo badge. The entrant's face appears on one half of the video monitor and the entrant's badge appears on the second half. A guard compares the face, and badge and if the guard believes they match, allows entry. A split-image optical system in the unit focuses the entrant's face and badge simultaneously on one television camera. Intercom communication between entrant and guard is available.

PERFORMANCE DATA

Type 1 Error: Information not available.
Type 2 Error: Information not available.
Processing Time: Information not available.
Verification Mechanism: Remote visual comparison of badge and face using CCTV.
Enrollment Capacity: Unlimited.
Terminal Capacity: Multiple terminals allocated to each monitor. Exact number not available.
Terminal Characteristics: Terminal consists of a single camera and split-image optics behind a one-way mirror, voice intercom and control circuitry.
Control Display Characteristics: Central controller consists of a monitor, door selection buttons, intercom control.
Resistance to Tampering and Spoofing: No resistance to spoofing. Terminal is key-locked.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: For sheltered areas.
Interface: Requires video, audio and control links.

PHYSICAL DATA

Size: Terminal: 5x24¾x20½in (12.5x62x52cm).
Weight: 35lb (16kg).
Power (Primary/Secondary): 110V ac; low voltage installation optional.
Emplacement: Wall-mounted. Located 5ft (1.5m) from floor.

SUPPLY/LOGISTICS DATA

Documentation and Training: Manuals available. Information concerning training not available.
Parts and Repairs: Service available from local representatives.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: None.
Government or Professional Standards: None.
Lead Time: Information not available.

COST DATA

Unit Acquisition Cost:	Information not available.
Unit Installation Cost:	Information not available.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS

BADGE COMPARISON

There are three basic methods by which the identity of an individual may be established:

- Something known by the individual,
- Something possessed by the individual, or
- Some characteristic of the individual.

The technique of badge comparison relies on a characteristic of the individual, specifically his or her facial image. There are two different methods for implementing badge comparison. Under the first method, authorized individuals are issued photo identification badges. When an individual requests entry to an area, a security guard at the entrance compares the photo on the badge with the individual; if there is a satisfactory match, entry is permitted. Under the second method, authorized individuals are issued color-coded photo identification badges; duplicate badges with different color codes are held at each entry point for which access is authorized. When an individual requests entry to an area, the security guard matches the badge photo to both the individual and to the photo on the corresponding badge on file at the control point. If there is a satisfactory match, the regular badge is exchanged for the one at the entry control point, and entry is permitted. A similar exchange must take place as the individual leaves.

Primary disadvantages of single badge comparison are that the photo badge can be lost, stolen and forged relatively easily; facial disguises can be used; and even the most conscientious security guard's ability to compare badges will vary during a shift of duty because of fatigue, boredom, or distraction. The exchange badge

comparison should reduce the possibility that lost and stolen badges might be used, and will make the use of a forged badge impractical. However, the problems of facial disguise and security guard effectiveness still remain.

BADGE COMPARISON

Manufacturer	General Binding Corp. 1 Skokie Blvd. Northbrook, IL 60062	Rusco Electronic Systems P.O. Box 5005 Glendale, CA 91201 (800) 423-2557	Polaroid Corp. 549 Technology Sq. Cambridge, MA 02139 (617) 864-6000
Model	Photo ID System	Econophoto	Photo ID

Reference Evaluation Guide Procedure No. III-5.d.1-1 NRC Identification No.

NARRATIVE DESCRIPTION

These are photo ID cards to use by a guard in badge comparison with the individual. Components are an ID camera, die cutter (manual or power operated) and a laminator. Up to four photos can be placed on one sheet.

PERFORMANCE DATA

Type 1 Error: Information not available.
Type 2 Error: Information not available.
Processing Time: Information not available.
Identification Mechanism: Comparison of individual with ID photo on badge.
Enrollment Capacity: Unlimited.
Terminal/Reader Capacity: Not applicable.
Terminal/Reader Characteristics: Not applicable.
Central Display Characteristics: Not applicable.
Resistance to Tampering and Spoofing: None.
Temperature: Information not available.
Humidity: Information not available.
Other Environmental Characteristics: Information not available.
Interface: Not applicable.

PHYSICAL DATA

Size: Card size: 2.328x3.25in (5.9x8.3cm), thickness varies.
Weight: Not applicable.
Power (Primary/Secondary): Cameras, die cutters and laminators use 110V ac.
Emplacement: Camera is tripod mounted; die cutter and laminators are desk or table-top mounted.

SUPPLY/LOGISTICS DATA

Documentation and Training: Manuals and training are available.
Parts and Repairs: Service available from local representatives.
Reliability: MTBF not available.
Maintainability: MTTR not available.
Warranty Information: Information not available.
Government or Professional Standards: None.
Lead Time: 4 to 6 weeks.

COST DATA

Unit Acquisition Cost:	Card cost: cores $.40 ea.; laminating pouches $.09 to $.24 ea. depending on size, thickness and quantity. Camera: $775 Die cutter: manual $155, power $225 Laminator: $295
Unit Installation Cost:	None.
Training Cost:	Information not available.
Maintenance Cost:	Information not available.
Operation Cost:	Information not available.

NOTES

INSTALLATIONS