SYSTEM 1 USER'S MANUAL

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PREFACE

This document is a complete reference manual for the Corby System 1 Access Control unit, hardware, and software which are manufactured, designed, and distributed by Corby Industries, Inc., USA. It is assumed that the user of this manual is expert in the installation of high security devices and has professional knowledge in electronics and security related installations.

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Your Comments Are Invited.

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CHAPTER 1 GENERAL DESCRIPTION

1.1 **Corby's System 1** is an economical keypad, card or Data Chip access system which controls a single door. It may be used to restrict access to a computer room, supply room, or any other sensitive area. The System 1 accepts a code from a keypad or any one of five card reader technologies.

1.2 **Features:**

- Controls 1 Door
- Uses Keypads or Card Readers
- Supports 250 Users and 50 Events
- Wiegand or Proximity Cards
- Magnetic Stripe Cards
- Data Chips
- 16 Character Liquid Crystal Display
- 3 Programmable Time Schedules, 21 Zones
- Forced Entry and Door Ajar Capability
- Optional 80 Column Printer
- EEPROM Non-Volatile Memory
- Supports Request To Exit
- Optional Battery Back-up
- Optional 350 User Version

1.3 **System 1 features simple installation** with localized wiring and easy keypad/card programming. Any door strike, burglar alarm control panel, or other electronic device can be controlled with the built-in heavy duty relay that is fully programmable to be momentary (up to 250 seconds) or latching (on/off).

1.4 **There are six input technologies** to choose from. If you choose a Corby keypad, you have the option to use any of the six 4000 series keypads that Corby has to offer. If your application requires a card reader, you will have a choice of card reader technologies including: Wiegand, Proximity, Data Chip, Magnetic Stripe or Bar Code.

CHAPTER 2 QUICKSTART

Quickstart is for those who are too busy to read manuals!

2.1 Quick Installation:

Bench test the System. It can be pre-programmed before you take it to the job site because all data is stored in non-volatile EEPROM. Neat !

Locate a secure spot inside the protected area and mount the System 1 cabinet using the supplied hardware. Remove the cover plate but not the circuit board for mounting. The best viewing angle for the LCD is when the unit is mounted slightly below eye level.

Run the wire. You'll need one cable for the reader or keypad and door ajar switch, and a separate two conductor for the door lock. Don't forget a pair for the AC power transformer, and one for the door lock power supply.

Mount the card reader or keypad. Keypads should be mounted at eye level. All Wiegand and Data Chip readers are waterproof and may be installed outside. Magnetic Stripe and Proximity card readers are available in indoor and outdoor versions.

Mount the door lock and FOLLOW THE DIRECTIONS that come with it! Magnetic holding locks are easy to install once you understand the principles by which they work. Make sure to install a diode across the coil for noise and spike suppression, but only on DC powered door locks.

Install the Request To Exit button and door ajar/time cancel switch. Don't run the Request To Exit wires out to the keypad or card reader. Drop them off inside the protected area.

Make your connections to the System 1 and reinstall the cover plate. Power it up and look for smoke, if none proceed.

Program it, if you haven't already. Enter 11111 which is the starting serial number. (We suggest you change it). Set the time and date, etc. Put in one or two codes to start and test the system. Don't fool around with time schedules until the basics work.

CHAPTER 3 WHAT YOU GET

3.1 **When you receive your System 1**, please take a moment and do an inventory of the shipping box. We take great care when packaging and double check everything, but it's a good idea to check for the following items.

System 1 - The system comes with a metal cabinet, main circuit board, programming guide, cover plate, programming keypad, LCD display, LED display and battery leads.

Power Transformer - 16.5VAC, 15VA used to power the System 1 only. It cannot be used to power anything else.

Cabinet Keys - There are two supplied and are taped to the inside of the cabinet.

Mounting template - This sheet is used to locate the screw positions for mounting the cabinet. Match the template to the cabinet, and mark the proper holes.

Wire harness - A four position wire harness is supplied for the optional printer connections. This plug, with six inch wires, plugs onto header H2 and accesses the RS-232 signals needed for printing or Video Display Terminal (VDT) operation.

Instruction Manual - This is a six inch by nine inch booklet that contains comprehensive information for the installation and use of the System 1.

Screw Package - This plastic bag contains four screws and nylon plugs to mount the cabinet. 1N4001 diodes are also included for use on DC door locks to prevent high voltage kick-back. Since this standard screw pack is also used in other Corby products, there are 1N4148 diodes included. They should not be used.

CHAPTER 4 ADDITIONAL EQUIPMENT

4.1 **Keypads -** Choose one of seven Corby keypads.

Indoor keypads:

4010 - flush mount keypad.
4014 - surface mount hidden view keypad.
4063 - flush mount heavy duty keypad for high usage.

Outdoor keypads:

4012 - flush mount keypad with aluminum housing.
4062 - heavy duty keypad mounted in a lock box attached to a
4066 - flush mount heavy duty cast metal keypad for high usage.
4064 - surface mount heavy duty keypad mounted in a

4.2 **Card Readers -** Choose one of three available card reader technologies.

Wiegand card readers:

4042 - beige surface mount swipe reader.
4044 - black surface mount swipe reader.
4046 - black insertion reader.

***** all Wiegand readers can be mounted outdoors.

Proximity readers:

4178 - outdoor, door frame mount 3-4" read range.
4179 - indoor, flush mount 4-5" read range.
4182 - indoor, surface mount 5-8" read range.
4183 - outdoor, surface mount 5-8" read range.
4184 - outdoor, surface mount, bidirectional 12" read range.
4186 - outdoor, up to 30" read range.
4188 - outdoor, 20" read range.

Magnetic Stripe readers:

4073 - indoor, surface mount swipe reader.
4075 - outdoor, surface swipe reader.

Data Chip readers:
4302 - single gang plate, with one green LED
4303 - single gang plate, with one green and red LED
4304 - narrow plate, with one green LED
4305 - narrow plate, with one green and red LED
4306 - read head only
***** all Data Chip readers require a 4301 Data chip adapter

Bar Code readers:
4150 - outdoor, surface mount, swipe reader.

4.3 **Corby Cards -** Choose one of the available card types for your reader technology.

Wiegand cards:
4047 - photo ID card, plain white
4048 - photo ID card, Corby graphics
4049 - standard card, Corby graphics

Proximity cards:
4190 - credit card size card
4192 - key chain tag

Magnetic Stripe card:
4074 - standard card, Corby graphics

Data Chips:
4320 - coin assembled on a keyring with Corby logo
4321 - coin only (use with tape dots model #4323)

Bar Code cards:
4151 - credit card size, Corby graphics

4.4 **Reader Mounting Kit -** For use with model 4042, or 4044 Wiegand Card Readers (Corby model 4060).

4.5 **Wire -** Use an eight conductor stranded, 22 gauge shielded multiconductor wire, non twisted pair (Corby model 4023), for wiring the keypad or card reader. An 18 gauge or higher two conductor wire is recommended for the magnetic lock/door strike.

4.6 **Magnetic Lock/Door Strike -** Corby carries a 12VDC 1/4 amp. magnetic holding lock with 1500 lbs. of holding force. model # 4252 is used for a door that swings out from the secure area. Corby also carries a 12VDC door strikes. model # 4253 is a door strike for metal doors with a standard ANSI opening. Your magnetic lock/door strike will require the use of an external power supply.

4.7 **Power Supply** to match your door holding device - Corby stocks a 12VDC, 1 Amp continuous power supply. The power supply includes a 6 amp/hr battery and transformer. (Corby model 4094).

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CHAPTER 5 OPTIONAL EQUIPMENT

5.1 Standby Battery & Power Supply Methods

There are three methods of supplying power to the System 1. The method you choose depends on the AC power loss requirements for your system, and the type of power supply available for the electric door lock being used.

5.1.1 **AC only -** This method is the simplest. The supplied 16.5VAC, 15VA transformer is used to power the System 1, and a separate transformer is used to power the door lock. When AC power is lost, the system will be inoperative. With this method however, programmed data will be retained because it is stored in the non-volatile EEPROM memory.

5.1.2 **AC with Standby Battery -** This method uses the supplied 16.5 VAC, 15VA transformer and the optional 12 volt 1.2 amp/hr. battery to power the System 1. A separate power supply is used for the door lock if one is being used. When the System 1 is used to control something other than a door lock, (alarms, electrical equipment, etc.) this method allows only the System 1 to operate normally if AC power is lost.

5.1.3 **DC only -** This method is the most popular. A 12 VDC power supply with its own standby battery is used in place of the 16.5, 15VA transformer to power both the System 1 and the door lock. With this convenient method everything is powered from the same source and both the System 1 and the door lock will operate normally when AC power is lost.

5.2 **Printer / terminal -** System 1 has a built in, 1200 baud full duplex serial port that may be used for an optional printer or a terminal. The printer can provide a hard copy of events. The terminal can be used for remote programming.

5.3 **Door Ajar, Time Cancel, and Forced Entry -** System 1 will support the use of a door ajar contact. This switch which mounts to the door, must be a closed circuit when the door is closed, and open when the door opens. If any of these features are not used, a jumper wire must be placed across terminals 5 and 15.

5.4 **Request To Exit Button -** System 1 supports the use of a Request To Exit Button (Corby model 4035 or 4135), which must have normally open contacts.

CHAPTER 6 TECHNICAL DATA

6.1 **Earth Ground is very important** To protect the System 1 from voltage transients, static, and lightning discharges. The ground connection should be made to a dedicated metal stake or cold water pipe as close as possible to terminal 1 of the unit. If you install a separate ground rod, it must be bonded (tied to) to the building/electrical ground. Bonding insures that all the grounds are the same potential which eliminates ground loop problems.

6.1.1 **Keypad Ground -** All system keypads have an earth ground screw terminal for attaching the foil shield of the multiconductor wire. Also attach the foil shield to the keypad plate. The foil shield of the keypad should be connected to terminal 1, which is earth ground.

6.1.2 **Reader Ground -** All readers require a foil shield connection to terminal 1 on the System 1 circuit board. There is no physical connection between the shield and the Wiegand, Data Chip, Bar Code or Magnetic Stripe reader. The Proximity reader requires a physical connection of the shield to the reader itself (see wiring diagram for Proximity readers).

6.1.3 **Printer Ground -** The foil shield of the printer must be earth grounded. Attach the shield from the printer cable only to terminal 1 of the System 1. DO NOT connect the earth ground to the printer.

6.2 **Proper Wire** specifications for all keypads/card readers is a four, five, seven, or eight conductor, 18 or 22 gauge, stranded multiconductor with an overall foil shield. It cannot be a twisted pair cable. Please note that multiconductor cable does have some overall twist which is acceptable.

6.2.1 **Keypad Wiring -** The keypad requires a five conductor cable with a foil shield, if the LED connections are not used. A minimum of seven conductors are necessary to utilize the LED's. An eight conductor cable is required if the Request To Exit (RTE) or door ajar options are going to be used. A nine conductor cable is required if both options are going to be used. Maximum cable length from the System 1 to the keypad is 1000 ft.

6.2.2 **Card Reader Wiring -** The card reader requires a five conductor shielded cable. A minimum of seven conductors are necessary to use the RTE button or door ajar contact. An eight conductor cable is required if both options are going to be used. **Magnetic Stripe card readers are very dependant on voltage for proper operation. For this reason it is recommended that 18 gauge wire be used for these readers.** Maximum cable length from the System 1 to the card reader is 500 ft.

6.2.3 **Data Chip Wiring -** The Data Chip reader requires a Data Chip adapter (model 4301). The adapter should be mounted in or next to the System 1 cabinet. Use the seven position wire harness provided with the adapter to connect it to the System 1. The 12VDC power input can also be connected to the System 1.

The Data Chip reader requires four conductor shielded cable. Six conductor cable should be used if RTE or Door ajar contacts are required. Maximum cable length from the System 1 to the reader is 500 ft.

6.2.4 **Printer Wiring -** The optional printer requires a two conductor, 22 or 24 gauge stranded wire, with an overall shield. Maximum cable length from the System 1 to the printer is 500 ft.

6.2.5 **VDT Wiring -** The optional Video Display Terminal (VDT) requires a three conductor, 22 or 24 gauge stranded wire, with an overall shield. Maximum cable length from the system to the VDT is 500 ft.

CHAPTER 7 INSTALLATION

7.1 **Mount the System 1 Control Cabinet** in a dry secure area. It contains all the electronic circuits which control the keypad/card reader and IT IS NOT WATERPROOF. It requires AC or DC power, an earth ground, and must be located within 1000 feet of a keypad, or within 500 feet of a card reader. Corby supplies a mounting template with the System 1. Use it to mount the cabinet. The printed circuit board does not have to be removed. The front panel must be removed to mount the cabinet, and should stay removed until all the terminal wire connections are made.

7.2 **Changing Your Serial Number** should be made while the front panel is removed. In order to change your serial number, which is explained in the programming section, Jumper J1 must be removed. Jumper J1 is located to the left of the main relay on the circuit.

7.3 **Mount the Keypad or Card Reader** on any flat surface. If the keypad/card reader is an outdoor version and will be mounted in a humid location, protect the wire terminals from corrosion by applying a light coat of grease or other protective caulk to the terminals.

7.4 **Wiring for the Keypad and Card Reader** requires an eight conductor, 18 or 22 gauge multiconductor shielded cable. DO NOT attach the shield to any terminals on the card reader! The shield attaches to a screw terminal on the keypads for an earth ground. Pick the wiring diagram which corresponds to the input device you have chosen.

7.5 **Keypad Connections** from the wiring harness to the System 1 terminal strip: Red to 5, Yellow to 7, Green to 8, White to 9, Black to 10. The LED connections include: Red to 4, Yellow to 6. **If you are using a keypad you must switch jumper J2 to 12V.**

7.6 Wiring for the Card Readers

7.6.1 **Wiegand Reader Connections** to the System 1 terminal strip: (+)5VDC to 4, Data-1 to 11, Data-0 to 12, LED to 6, GND to 5. Jumper J2 should remain at 5V for a Wiegand reader. Maximum wire distance is 500 ft.

7.6.2 **Proximity Reader Connections** to the System 1 terminal strip: Power (Red) to 4, Data-1 (White) to 11, Data-0 (Green) to 12, LED (Brown) to 6, Ground (Black) to 5. **If using a Proximity reader you must switch jumper J2 to 12V. The Proximity reader will not function on 5V.** J2 is located left of the LED display on the PCB, and just below the heat sink. Maximum wire distance is 500 ft.

7.6.3 **Magnetic Stripe Reader Connections** to the System 1 terminal strip: Red to 4, Brown to 6, White to 13, Green to 11, Black to 5. Jumper J2 should remain at 5V for a Magnetic Stripe reader. The maximum distance a magnetic stripe reader can be located from the System 1 is 500 ft. Magnetic Stripe readers are very sensitive to voltage for proper operation. Minimum operating voltage for Magnetic Stripe readers is 4.75 volts DC measured at the reader.

7.6.4 **Bar Code Connections** to the System 1 terminal strip: Red to 4, Brown to 6, Purple to 13, Green to 11, Black and Yellow to 5. Connect the shield form the reader to the shield in the cable. The Blue and Orange wire form the reader are not connected. Jumper J2 should remain at 5V for a Bar Code reader. The reader can be located a maximum of 500 ft. from the System 1.

7.6.5 **Data Chip Adapter Connections** use the seven position wire harness supplied with the adapter to connect to the System 1 terminal strip: Red and Blue to 5, Black to 10, Brown to 19, Yellow to 7, Green to 8, White to 9. The +12VDC terminal on the adapter connects to terminal 4. **Jumper J1 must be set to the 12V position**. Connect a jumper wire across terminals 4 and 20 of the System 1 for LED operation.

7.6.6 **Data Chip Reader Connections** to the adapter terminal strip: reader Black wire and LED Yellow wire to the (-) terminal, reader Grey wire to the DATA terminal, and LED Red wire to LED terminal.

7.7 **Transformer Connections** are accomplished with an 18 gauge wire to the System 1 terminal strip 2 and 3.

7.8 **Door Ajar, Time Cancel, and Forced Entry Connections** are made to the System 1 terminal strip 5 and 15. This switch which mounts to the door must be a closed circuit when the door is closed, and open when the door opens. If any of these features are not used, a jumper wire must be placed across terminals 5 and 15.

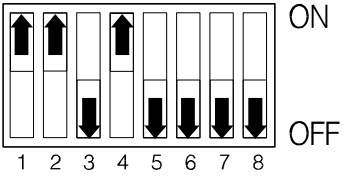
7.9 **Request To Exit Button Connections** are to the System 1 terminal strip 5 and 14. This button must be normally open.

7.10 **Magnetic Lock/Door Strike Connections** are to the System 1 terminal strip 17 and 18. Connections must also be made to your power supply. Refer to appropriate wiring diagram for exact connections (Appendix).

7.11 **Printer Connections** are from the four position wire harness included with the system. The harness is plugged into the circuit board (H2) which is located to the left of the first terminal strip (16-23). The Green wire (TD) is connected to pin 3 on a 25 pin D subminiature male connector. The Yellow (RD)is not used. The Orange wire (CTS) is not used. The White wire (GND) is connected to pin 7 on the connector. Plug the 25 pin connector into the right side of the printer.

7.12 **Printer Baud Rate and Dip Switch Settings** for the Citizen GSX-190 with the RS-232 card (Corby model 4007). The System 1 outputs serial data through H2 at 1200 Baud with 8 data bits, 1 stop bit, and no parity. To set the switches for the printer, turn OFF the printers AC power and remove the dip switch cover plate. There are three sets of switches inside this panel. The two located beside each other (labeled SW1 and SW2) allow you to control the parallel port. These switches do not need to be set. The switch labeled SW1 on the serial port is the only switch which needs to be set.

Refer to the Citizen GSX-190 manual for additional information.



7.13 **VDT Connections** are from the four position wire harness included with the system. The harness is plugged into the circuit board (H2) which is located to the left of the first terminal strip (16-23). The Green wire (TD) is connected to pin 3 on a 25 pin D subminiature male connector. The Yellow wire (RD) is connected to pin 2 on the 25 pin D subminiature male connector. The Orange wire (CTS) is not used. The White wire (GND) is connected to pin 7 on the connector. Plug the 25 pin connector into the connecter on the terminal label main or modem port.

7.14 **Modem Connections** are from the four position wire harness included with the system. The harness is plugged into the circuit board (H2) which is located to the left of the first terminal strip (16-23). The Green wire (TD) is connected to pin 2 on a 25 pin D subminiature male connector. The Yellow wire (RD) is connected to pin 3 on the 25 pin D subminiature male connector. The Orange wire (CTS) is not used. The White wire (GND) is connected to pin 7 on the connector.

7.15 **PC Connections** are from the four position wire harness included with the system. The harness is plugged into the circuit board (H2) which is located to the left of the first terminal strip (16-23). The Green wire (TD) is connected to pin 3 on a 25 pin D subminiature male connector. The Yellow wire (RD) is connected to pin 2 on the 25 pin D subminiature male connector. The Orange wire (CTS) is not used. The White wire (GND) is connected to pin 7 on the connector.

If the PC has a 9 pin connecter, connect the Green wire (TD) to pin 2 on a 9 pin connector. The Yellow wire (RD) is connected to pin 3 on the 9 pin connector. The Orange wire (CTS) is not used. The White wire (GND) is connected to pin 5 on the connector.

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CHAPTER 8 SYSTEM OPERATION

8.1 **Programming Functions** are done using the keypad, LCD, LED bar, and menus. Each is discussed in detail in Chapter 9.

8.2 **User Functions -** Users can gain access through a keypad, Wiegand, Proximity, Data Chip, Magnetic Stripe or Bar Code reader. Three possible results can occur when a user enters a code or uses a card or Data Chip. Each one is outlined below and assumes a user number of 001:

1) When the valid code for user number 001 is entered the main relay will activate. The valid user number, time, and date will be displayed on the LCD: **V001 hh:mm mm/dd**.

2) When a valid code is entered outside the programmed time schedule, the main relay will not activate. The following will be displayed on the LCD: **S001 hh:mm mm/dd**.

3) When an invalid code is entered, the main relay will not activate. The following will be displayed on the LCD: **INV hh:mm mm/dd**.

8.3 **Door Functions**

8.3.1 **Time Cancel -** When the door is closed before the allotted time, any programmed door activation time remaining will be canceled. This prevents unauthorized "follow thrus".

8.3.2 **Door Ajar -** After a valid entry or exit, if the door is held open 30 seconds beyond the programmed activation time, the auxiliary relay closes and a door ajar message will appear on the LCD:
DRAJ hh:mm mm/dd. The auxiliary relay stays closed until the door closes, which causes a door closed message to appear on the LCD: **DRCL hh:mm mm/dd**.

8.3.3 **Forced Entry -** If the door is opened without a valid code or by using a RTE button, the auxiliary relay will activate and remain activated until the door is closed. A **FREN hh:mm mm/dd** message will appear on the LCD.

8.3.4 **Request To Exit -** When the RTE button is pushed, the main relay will close for the programmed relay time and a Request To Exit message will appear on the LCD: **RTE hh:mm mm/dd**.

8.4 **Status of AC Power -** If AC power is lost and the system has a standby battery connected, the following message will be displayed on the LCD: **ACOF hh:mm mm/dd**. When AC power is restored **ACON hh:mm mm/dd** will be displayed on the LCD.

8.5 **Reset -** System 1 has a "watchdog" circuit that resets the processor automatically on power up and when electrical noise interrupts the microprocessor.

8.6 **User Numbers -** System 1 makes use of two sets of numbers to organize its data. One is the user number, the other is the code/card number. When a code/card number is programmed into the system it is automatically assigned by the System 1 to the lowest user number. When a code/card number is deleted from the system its user number becomes available to be used again.

User numbers are displayed when a code/card number is programmed into the System 1 and when a valid code/card number is used at the keypad or card reader.

8.7 **Time Schedules** - System 1 has three programmable time schedules which act as user selectable time clocks. Time schedules can be assigned to user codes/cards to limit access. They can also be assigned to the main relay for automatic activation and deactivation. In each time schedule there are seven time zones, one for each day of the week. Time zones consist of two time cells: a start and end time cell. Time schedules are programmed in option 3, using a military time format for hours and minutes (HH:MM), seconds are not used . The week days are shown as a three letter abbreviation, example: MON, WED, FRI. User codes/cards may have one time schedule assigned to them. The main relay may have one (1) schedule assigned to it.

8.7.1 **User Time Schedules** - Time restriction is a very useful management tool used to restrict user access at preset times of the day or week. A user code/card can have one of the three time schedules assigned to it. When a user enters a code/card the system checks if the code/card is valid, and also if the user is allowed access at the time of code entry. Start time for a user refers to the time of day when the user code/card becomes valid. End time for the user refers to the time of day when the user code/card becomes invalid. The user code/card is valid between the start and end time of the time zones assigned to it.

A user time zone with a start and end time equal to each other will allow 24 hour access for that day. A special case is a time zone with a start and end time of 00:00. In this case access will not be allowed to that user for that day. If a user is allowed 24 hour access seven days a week, a time schedule is NOT needed for access and should not be assigned.

Example of a 24 hour time zone: **MON 12:00 12:00**.
Example of a no access time zone: **MON 00:00 00:00**.

A time schedule granting access from 8:30AM to 5:30PM Monday through Friday is shown on the next page (use military time).

SUN	**00:00**	**00:00**
MON	**08:30**	**17:30**
TUE	**08:30**	**17:30**
WED	**08:30**	**17:30**
THU	**08:30**	**17:30**
FRI	**08:30**	**17:30**
SAT	**00:00**	**00:00**

8.7.2 **Relay Time Schedules** - Auto relay activation is a very powerful security management tool that can lock/unlock a door or gate, arm/disarm an alarm system, or control energy management systems without any user involvement. The System 1 can automatically activate the main relay each day. Each activation also has a corresponding deactivation. Start time for a relay schedule refers to the time of day when the relay automatically activates. End time for a relay schedule refers to the time of day when the relay automatically deactivates. Relay activation and deactivation refer to the relay contacts physically changing states. The relay will be in the active state between the start and end time for any time zone.

A relay time schedule with a start and end time equal to each other will keep the relay in the active state for a 24 hour period for that time zone. If Wednesday's time zone was 07:00 to 07:00, the relay will be in the active state from midnight on Tuesday to midnight on Wednesday (a 24 hour period). When the relay is activated from a time schedule, all inputs that affect the relay will be ignored during the on time for any time zone in that schedule.

Caution must be used when assigning a schedule to a relay. If a time schedule is assigned to the main relay in the middle of a valid time zone, the relay activates as soon as the system is returned on-line. If the program mode is entered at 2:00 P.M. and a schedule is set up for automatic relay activation from 09:00 to 17:00 (5:00 P.M.), the relay will activate as soon as the system is returned on-line.

A time schedule used to unlock the Lobby door at 9:00AM and relock the door at 5:00PM is shown below:

SUN 00:00 00:00
MON 09:00 17:00
TUE 09:00 17:00
WED 09:00 17:00
THU 09:00 17:00
FRI09:00 17:00
SAT 00:00 00:00

8.7.3 Schedules that Cross Midnight - If a time schedule is required to cross the midnight hour, the schedule will appear slightly different than a normal one. A good example is the 23:00 to 07:00 shift. This time schedule could apply to a group of users or to the main relay. This example is shown below:

SUN 23:00 00:00
MON 23:00 07:00
TUE 23:00 07:00
WED 23:00 07:00
THU 23:00 07:00
FRI00:00 07:00
SAT 00:00 00:00

8.8 Clearing the Keypad - The # button should be used before entering a code on a keypad. This will clear the keypad buffer erasing anything entered before the # was touched. The keypad does not have a timer that clears the buffer automatically.

8.9 **Keypad and Reader Operation** - Keypads can be used along with any of the reader technologies supported by the System 1. A keypad and a reader may be used together. One or the other will activate the System 1 relay. However, increased security can not be gained through combined operation.

If Magnetic stripe or Proximity readers are used the LED on the keypad must be switched through the "A" form contacts of the main relay, as shown in the wiring diagram for keypad connection method # 2. Switching the negative side of the LED with Terminal 6 would leave the LED on all the time.

8.10 **Programming Data Chip batch ID numbers** - Along with the five digit code number there is also a batch ID number in the Data Chips. This batch number must be programmed into the Data Chip adapter. To program the batch number into the adapter, install the jumper across the two pins of jumper J1 on the adapter, then touch one of the Data Chips to the reader or the test point on the adapter. The LED on the adapter and at the reader will flash to indicate the batch number was accepted. The jumper should then be removed from J1 and placed over only one of the two pins. This will put the adapter into normal mode.

8.11 **Remote Programming** - System 1 can be remotely programmed by using a terminal connected to the serial port (H2). The serial port parameters are 1200 baud, 8 data bits, no parity, and 1 stop bit. The terminal will show exactly what is on the LCD display. The "*" and "#" keys provide the same function as on the System 1 keypad. The "enter" key can be used in place of the "*" key and the "backspace" key can be used in place of the "#" key.

8.12 **Off-site Programming** - System 1 can be programmed off-site by using a pair of modems and a terminal. System 1 can transmit at 1200 baud only. The modems and the off-site terminal must be setup as shown in section 8.11 "Remote Programming".

CHAPTER 9 PROGRAMMING THE SYSTEM

9.1 General Guidelines:

9.1.1 **The ✱ Key** is similar to the enter key on a terminal keyboard and must be touched after each entry. Inputing information and touching ✱ will enter the data. Touching ✱ without Inputing information will exit you out of the option to the previous function.

9.1.2 **The # Key** is similar to the delete key on a terminal keyboard and will clear whatever is displayed on the LCD.

9.1.3 **When a ? Appears** you have the option to choose a yes or no answer. The **"yes key"** is 1. The **"no key"** is 2. **To exit** touch 0.

9.2 Programming

To Begin Programming Touch ✱

A prompt on the LCD will ask for your Serial #, **Entr Ser #**. The system is shipped with 11111 as the default serial number. Enter **11111 ✱** to get into programming mode. When you enter the serial number, "✱"s will be displayed instead of the numbers you entered. You have the option to change this number further into the programming mode. While in program mode the system inputs and outputs will be inoperative.

The LCD will then prompt you to **Enter Option #**.

9.2.1 **Set the Time and Date** by touching **1** then ✱. When prompted to **Enter Time** use military time (hh:mm). Seconds are not used. Set the time, then touch ✱ to enter the information. Next, you may set the **Date** (mm/dd/yy). After setting the date touch ✱ to enter the information. You will then be prompted to **Enter Option #**.

9.2.2 **Set the Code Length** by touching **2** then **✱ (Set Length).** Choose two through five digits, if using keypads, then touch ✱. The default setting is five digits. Cards must have a code length of five. After selecting a code length a prompt will ask **Are you sure? CAUTION!** Answering "yes" (1) will clear memory erasing all previous codes. A "no" answer keeps the code length at its previous length and gives you the **Enter Option #** prompt.

9.2.3 **Program Time Schedules** for users or the port automatically by touching **3** then **✱ (Select Sched)**. Select the schedule number desired (1-3) followed by a ✱. The default setting upon power up is **SUN 00:00 00:00**. This is the first day for which you have to enter a time schedule. Enter the starting and ending time

desired (hh:mm hh:mm) followed by a ✱. The "START" time is the exact time of the day when a User Code becomes valid, or the Door/Port automatically opens. The "END" time is the time of day when the User Code becomes invalid, or the Door/Port automatically closes. If there is an existing time schedule which you do not wish to change, simply touch ✱ to go to the next day. You will be prompted **Again?** where you will have the option to enter another time schedule. Touching 1 "yes" will prompt you to **Select Sched**, by touching 2 "no" you will be prompted to **Enter Option #**. Follow the same steps for other days if desired.

9.2.4 **Enter Codes/Cards** into the system by touching **4** then ✱. The prompt will ask you to **Enter Code** (choice of 2-5 digits depending upon the code length selected in option 2). Example: If you choose 12345 for a code, enter this number and tocuh ✱. A time schedule may now be assigned to a user **(Enter Schedule).** Enter the schedule number (1-3) and touch to enter the information. If no schedule is desired, enter 0. This will allow a user 24hr. access seven days a week. After all data is entered you will be prompted **xxx Again?**, touching **1, ✱** will cause the routine to be repeated to add more users (xxx is the user number for the code you just entered). Touching **2, ✱** will cause an exit out of option 4 and ask you to **Enter Option #**.

9.2.5 **Delete-Display Codes/Cards** is a dual function option. This option can be used to delete codes/cards or to display the codes/cards one by one. Touch **5** then ✱. Enter the code number **Enter Code** and touch ✱. If, for example, your wish to delelte the first user who has a code 12345 enter **12345 ✱**. **D 12345 001 2 ?** The **D** stands for Delete. **12345** stands for the user code. **001** stands for the user number. **2** stands for the time schedule assigned to the user. Choose 1 for "yes" or 2 for "no". If you choose 1, **Are you sure?** will appear. A "yes" answer will delete this user. A "no" answer will advance to the next code. To exit, touch **0** at the **D 12345 001 2?** prompt. **Enter Option #** will then be displayed.

Touching (2) "no" repeatedly will allow you to step through and examine all your codes/cards. ✱ will exit this option.

9.2.6 **Set Port Parameters** by touching **6** then ✱. When you enter this option, **Keypad?** will be displayed. Touch (1) for "yes" if the input device is a keypad or Data Chip. If you touch (2) for "no", **Card Reader?** will be displayed. Again you may choose (1) "yes" or (2) "no".

Note: Data Chips use a keypad format. Select **Keypad** in option 6.

If a card reader is selected, **Bank Card?** is displayed. A "yes" response will allow most magnetic stripe cards as well as Corby cards to work in the system. A "no" response will allow only Mag Stripe cards with the exact Corby format to work. A yes or no response to the **Bank Card?** prompt applies only to Magnetic Stripe cards. All other cards are not affected by this selection.

When you have entered (1) "yes" to one of the above options, a choice between a momentary or latching relay output must be made. The prompt will say **Momentary?.** Choose (1) "yes" or (2) "no". If you choose (1) "yes", the momentary relay time must be entered **Relay Time** in a three digit format (001-250 seconds). If you choose (2) "no" the relay will be programmed to be latching.

Finally, you will be asked to enter a time schedule (1, 2, or 3) to assign the relay **(Auto Sched)**. Example: To assign the relay to schedule 1, enter **1**. If you do not wish to use a schedule simply enter 0. The door will remained locked 24hrs a day.

9.2.7 **Change Serial Number** by first removing the jumper J1 and then touching **7** followed by ✱. Enter the new 5 digit serial number at the **New Ser #** prompt. Re-enter the new serial number at the next **New Ser #** prompt to assure you entered the number correctly. If the two serial numbers entered do not match, the old serial number will remain valid and the prompt **New Ser #** will appear allowing another try. **(Jumper J1 must be removed for this option).** Jumper J1 is located to the left of the main relay on the circuit board.

CAUTION: If J1 is removed and the serial number is changed, replacing J1 will change the serial number back to 11111. If the program mode is entered after replacing J1 the system will prompt **Are You Sure?**. Entering a (1) for "yes" will **Clear Memory**. Entering a (2) for "no" will exit program mode. This will allow you to replace J1 restoring the old serial number. The reason for clearing memory is so that anyone replacing J1 and entering the default serial number can not get into program mode without being detected.

9.2.8 **Clear Memory** by touching **8** then ✱. When prompted **Are you sure?**, enter (1) "yes" or (2) "no". **Caution!** This will erase all existing codes, operating parameters, and will insert the default settings. This routine takes approximately 2 seconds. Reprogramming may take hours!

9.2.9 **Print User Numbers, Codes, and Last 50 Events** by touching **9** then ✱. All Users with their codes and schedules will be printed out. You need the optional printer to see this data. After all the users are printed System 1 will prompt you **Print?**. If you have a printer enter (1) "yes" if not enter (2) "no". If you answered "yes", the last 50 events will be printed out. If you answered "no" the last 50 events will be displayed on the LCD one at a time. Touch the ✱ to advance to the next event. Touching 0 then ✱ will cause an exit out of the option.

9.3 **Exit Programming** by touching **0** then ✱ at the **Enter Option #** prompt. This will return the system back online. The system will display "ONLN" the time and the date.

APPENDIX A LCD MESSAGES

LCD Messages:

V xxx hh:mm mm/dd	Valid User
S xxx hh:mm mm/dd	Schedule Error
INV	Invalid Code
PRTY	Parity Error
ARON	Auto Relay On
AROF	Auto Relay Off
DRAJ	Door Ajar
DRCL	Door Closed
RTE	Request To Exit
FREN	Forced Entry
PROG	Program Mode
ONLN	On Line
ACON	AC Power On
ACOF	AC Power Off
RST	Reset

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APPENDIX B TERMINAL DESCRIPTION

Terminal Description:

Terminal 1 - Earth Ground The earth ground must be connected to a dedicated metal stake or cold water pipe using a 12 gauge or larger solid copper wire. **DO NOT** use electrical, gas or telephone grounds. Shields from the keypad or card reader cables must also connect to terminal 1.

Terminals 2 and 3 - AC or DC Input Power The System 1 accepts 12 to 24 volts AC or DC. If AC is used, a 16.5 volt 15 VA transformer is recommended. If DC is used, terminals 2 and 3 are not polarity sensitive. The System 1 requires a minimum of 250 milli amps.

Terminal 4 - (+) Voltage Output The System 1 has a selectable output voltage of 5 or 12 volts DC. This output is only to be used to power card readers or the LED on the remote keypad. The voltage is selected at the jumper labeled J2. This output **CANNOT** be used to power any other external device. The output on terminal 4 is fused at 1/2 amp.

Terminal 5 - (-) Common This is the System 1's common power supply negative for card readers and keypads. PLEASE NOTE: The keypad common line is a red wire **NOT** to be associated with (+) power connections.

Terminal 6 (-) LED Driver This is a negative output voltage for lighting a Light Emitting Diode (LED). When the main relay is activated the LED on the keypad or card reader will light to show
that a valid code/card was entered.

Terminals 7 through 10 - BCD Keypad/Data Chip Input Data Lines All keypads and Data Chips used with the System 1 output a Binary Coded Decimal (BCD) output. BCD has four data lines DATA 1, DATA 2, DATA 4, and DATA 8.

Terminal 11 - DATA 1 Wiegand and Proximity readers require two data lines, data 1 and data 0. Terminal 11 is the data 1 input. Mag Stripe readers do not use this terminal.

Terminal 12 - DATA 0 and Magnetic Stripe Clock This terminal serves as the data 0 connection for Wiegand and Proximity readers and as the clock input for Magnetic Stripe or Bar Code readers.

Terminal 13 - DATA for Magnetic Stripe This terminal is used only as the Magnetic Stripe or Bar Code data input.

Terminal 14 - Request To Exit Input Terminal 14 is the Request-To-Exit (RTE) input line. Whenever Terminal 14 is shorted to terminal 5 common (-), the main relay will activate as if a valid code/card was entered. RTE contacts must be open circuit. Please Note: RTE connections should be made away from the keypad or card reader for security reasons.

Terminal 15 - Door Ajar, Forced Entry and Time Cancel Input This input serves three functions at the same time and uses a closed circuit switch contact mounted to the door. This switch is a typical alarm type magnetic switch and must be closed when the door is closed for proper operation. Please Note: If any of these features are not used, place a jumper between Terminals 5 and 15.

Terminals 16 through 18 - Main Relay The contacts are rated at 5 AMPS 30 volts AC or DC. They can be used to switch power to a lock or gate, or arm / disarm an alarm system. Terminal 16 is Normally Open, 17 is Common, and 18 is Normally Closed.

Terminals 19 and 20 - Shunt Contacts The contacts are rated at 5 AMPS 30 volts AC or DC. They can be used to shunt a door contact. This set of contacts follows the main relay because they activate at the same time the main relay activates. Terminal 19 is Normally Open and 20 is Common.

Terminals 21 through 23 - Aux Relay The contacts are rated at 1 AMP 30 volts AC or DC. They activate whenever a door ajar or forced entry condition occurs. Terminal 21 is Normally Open, 22 is Common, and 23 is Normally Closed.

APPENDIX C GLOSSARY

AC
Alternating Current used to power devices.

ASP
Advantage Series Proximity. A technology employed in Corby's proximity cards. Does not require an internal battery to power the card thus drastically improving the life span of the card.

AWG
American Wire Gauge, usually denotes the size of wire used in a system.

BCD
Binary Coded Decimal.

Baud Rate
Speed at which serial data is being transmitted.

Code
A sequence of digits which are sensed by the System 1 when the user enters a Corby*Card or touches numbered keypad buttons.

CORBY*CARD
A plastic card containing user ID information. CORBY*CARDs come in three different technologies Wiegand, Magnetic stripe, Proximity. This card is inserted into, swiped through, or presented to a Corby*Card reader.

CPU
Central Processing Unit.

Data Chip
A stainless steel, coin shaped canister containing an integrated circuit that transfers 48 bits of digital data when touched to a compatible reader. Used in place of keypad, Magnetic Stripe, Proximity or Wiegand card technologies for access control.

DC
Direct Current. Usually specified as having a positive and negative source.

Default
Pre-set values in the software which the System 1 will use if the user does not change them.

Disabled
Turned off. Not active.

Earth Ground
A direct electrical path to earth. Usually a cold water pipe, the steel beams of a building, or a steel rod driven at least six feet into the earth.

Enabled
Turned on. Active.

Enter
To type information on the System 1 in response to a prompt.

EEPROM
Electrically Erasable Programmable Read Only Memory. A memory chip used in System 1 that contains all user information. EEPROMs retain all information without the need for backup power.

Fail-Safe
If and when power to the portal (door) fails, the portal will be made permanently-open and allow entrance or exit without the need for access control codes or cards.

Fail-Secure
If and when power to the portal (door) fails, the portal will be made permanently closed and will not allow entry or exit.

Form A Relay
A type of relay which is single pole, single throw.

Form C Relay
A type of relay which has contacts including a common, a normally open (NO) leg and a normally closed (NC) leg.

LED
Light Emitting Diode. A semiconductor device that emits light.

Magnetic Stripe
Card technology that uses a magnetic stripe to hold its data. System 1 uses a track 2 ABA format.

PCB
Printed Circuit Board.

PIN
Personal Identification Number. A number which is unique to each user of the system, and is entered at a keypad in order to gain access.

Power Supply
Converts AC voltage to DC voltage.

Prompt
A cue. When programming the System 1 will "ask" you to enter various information. This "asking" is called a prompt.

RAM
Random Access Memory. Semiconductor memory that can be both written to and read from.

RS-232
Data transmission standard using +/- 12 volt transitions to transmit digital data.

RTE
Request to Exit. A circuit controlled by a push button installed within a secured area which, when touched, allows a user to exit the area.

SPDT
Single Pole Double Throw

SPST
Single Pole Single Throw

UL
Underwriters Laboratories. An organization that certifies the safety and functionality of electrical devices.

Watchdog
A circuit in the System 1 that prevents microprocessor latch-up. The watchdog circuit minimizes the likelihood that voltage transients will "crash" the system.

Wiegand Technology
Card technology that uses special patented wires imbedded inside the card to encode its data.

APPENDIX D TIME SCHEDULE SHEETS

This Time Schedule Worksheet is provided so that you have a permanent copy of the 3 available Time Schedules showing the day, starting time, and ending time for user code access or relay operation. **Use 24 hr. military time format only (5 pm = 17:00).**

SCHEDULE 1

Description: _____

[ ] User Schedule **[ ]** Relay Schedule

#	**DAY**	**START**	**END**	COMMENTS
1	SUNDAY	:	:	
2	MONDAY	:	:	
3	TUESDAY	:	:	
4	WEDNESDAY	:	:	
5	THURSDAY	:	:	
6	FRIDAY	:	:	
7	SATURDAY	:	:	

SCHEDULE 2

Description: _____

[ ] User Schedule **[ ]** Relay Schedule

#	**DAY**	**START**	**END**	COMMENTS
1	SUNDAY	:	:	
2	MONDAY	:	:	
3	TUESDAY	:	:	
4	WEDNESDAY	:	:	
5	THURSDAY	:	:	
6	FRIDAY	:	:	
7	SATURDAY	:	:	

SCHEDULE 3

Description: _____

[ ] User Schedule **[ ]** Relay Schedule

#	**DAY**	**START**	**END**	COMMENTS
1	SUNDAY	:	:	
2	MONDAY	:	:	
3	TUESDAY	:	:	
4	WEDNESDAY	:	:	
5	THURSDAY	:	:	
6	FRIDAY	:	:	
7	SATURDAY	:	:	

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APPENDIX E 350 USER VERSION MODEL 1001

Differences between the Model 1000 and Model 1001

The standard System 1, model 1000, supports up to 250 users. For special applications requiring up to 350 users, Corby offers the model 1001. The model 1001 differs from the model 1000 in only one other important way, it does not support time schedules for users or doors.

Because the model 1001 is a special unit, a different faceplate has not been produced. Because of this, the faceplate will reference option 3 "Program Time Schedules" even though this option is not supported by the model 1001. System 1 manual sections 8.7 and 9.2.3 are not applicable.

If you touch a 3 at the Enter Option # prompt it will ignore the 3 and display the Enter Option # prompt again.

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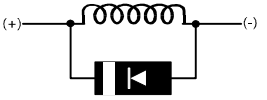

CAUTION!!!

If you use this system to operate a DC door strike, magnetic lock, relay, or any device that has a coil (inductive load) that is powered from a DC source; you MUST install a diode, in parallel, across the coil terminals. Use a 1N4001, 1N4002 or equivalent. Connect the stripe side of the diode to the coil terminal that becomes positive (+). Connect the other side of the diode to the other end of the coil. Proper installation of this diode will prevent the high voltage spike that occurs whenever a coil is de-engergized. If you do not use this diode, you will eventually damage the system and any other electronic device attached to it. Corby supplies the necessary diodes with this product, please use them.

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