R A D I O N I C S

READYKEY® K6000/K6000-MS

Installation Manual

Notice

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This equipment generates and uses radio frequency energy. If not installed and used in accordance with the manufacturers's instructions, it may cause interference to radio and television reception. It has been tested and found to comply with the limits of restricted radiation devices which are used as field disturbance sensors pursuant to Subpart F of part 15 of FCC rules, which are designed to provide reasonable protection against radio communication interference. The operator of a field disturbance sensor, who is advised that his sensor is causing interference to an authorized radio service shall promptly stop operating the sensor, and operation shall not be resumed until the condition causing the harmful interference has been eliminated. The user, at his own expense, will be required to take whatever measures may be required to correct the interference.

If necessary, the installer should consult an experienced radio/television technician for additional suggestions, or send for the *"Interference Handbook"* prepared by the Federal Communications Commission. This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402, stock number 004-000-00450-7.

FCC Registration Number: IDHM32Y6K2000

Listing

UL 294—Access Control System Units

Table of Contents

Introduction

This Installation Manual provides all of the necessary information for the hardware installation and wiring connections of the K6000 and K6000-MS Central Network Controllers.

Line driver, modem and data switch connections to K2000-N door controllers are also included. Other installation details for the K2000-N door controllers (e.g., door locks, readers, alarm inputs) are contained in the *K2000-N Installation Manual* 74-05874-000.

Software installation for the K6000 and K6000-MS is included. All K6000 and K6000-MS programming features are covered in the *K6000/K6000-MS User's Guide* 74-05682-000.

K6000 Central Network Controller (CNC) System
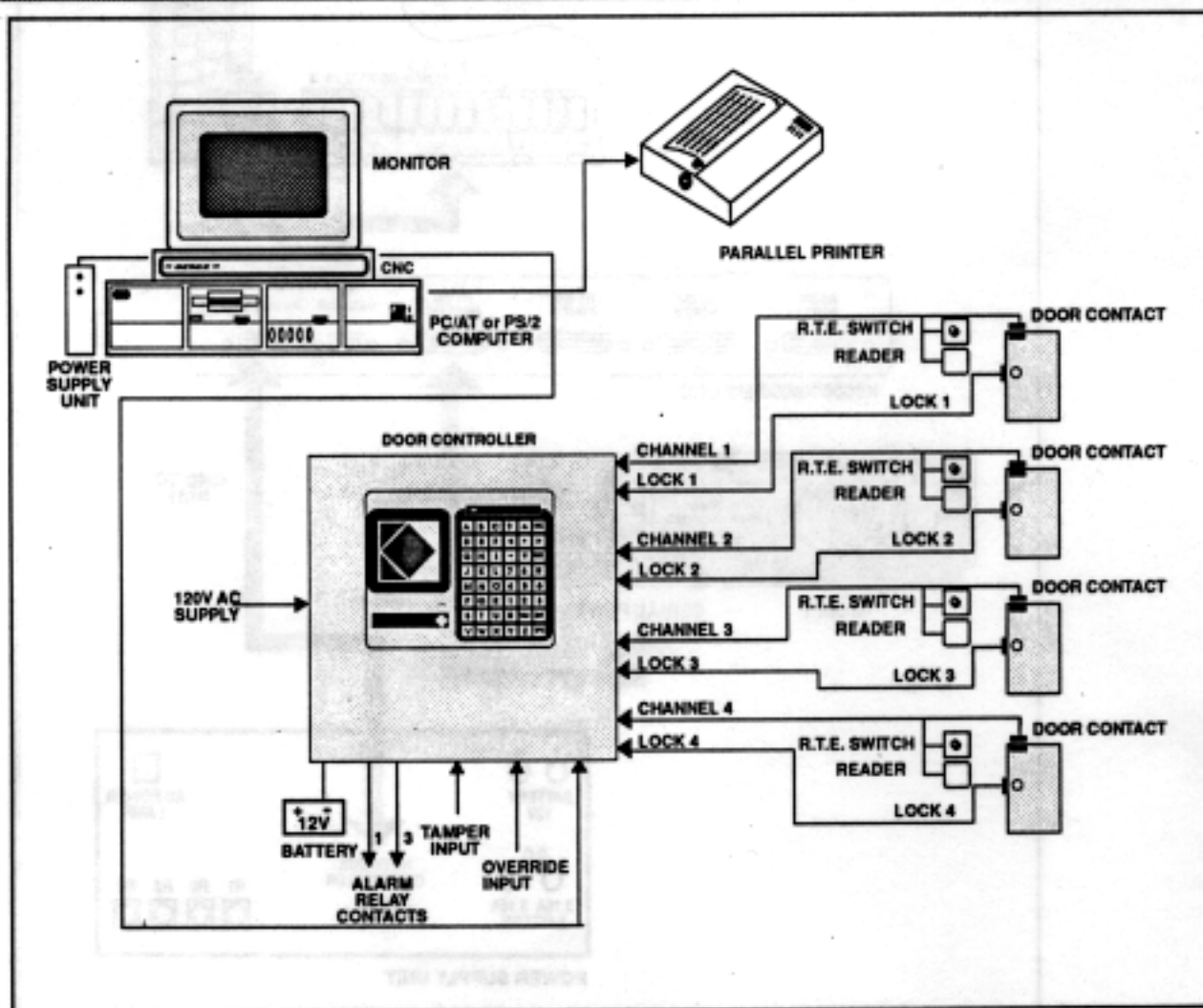
Figure 1: K6000 System

System Connections

Connections of equipment at the central point will involve the following connections between the Central Network Controller (CNC), PC and Power Supply Unit (PSU).

PC to CNC   Cable - PC/AT   25 pin to 9 pin
                     Cable - PS/2   25 pin to 25 pin
CNC to PSU   Cable - PSU   9 pin to 9 pin

All of the cables above are supplied with the K6000 CNC and PSU units. (The cabling diagram is shown below.) Note that all central equipment will require installation and cabling prior to software installation and programming.
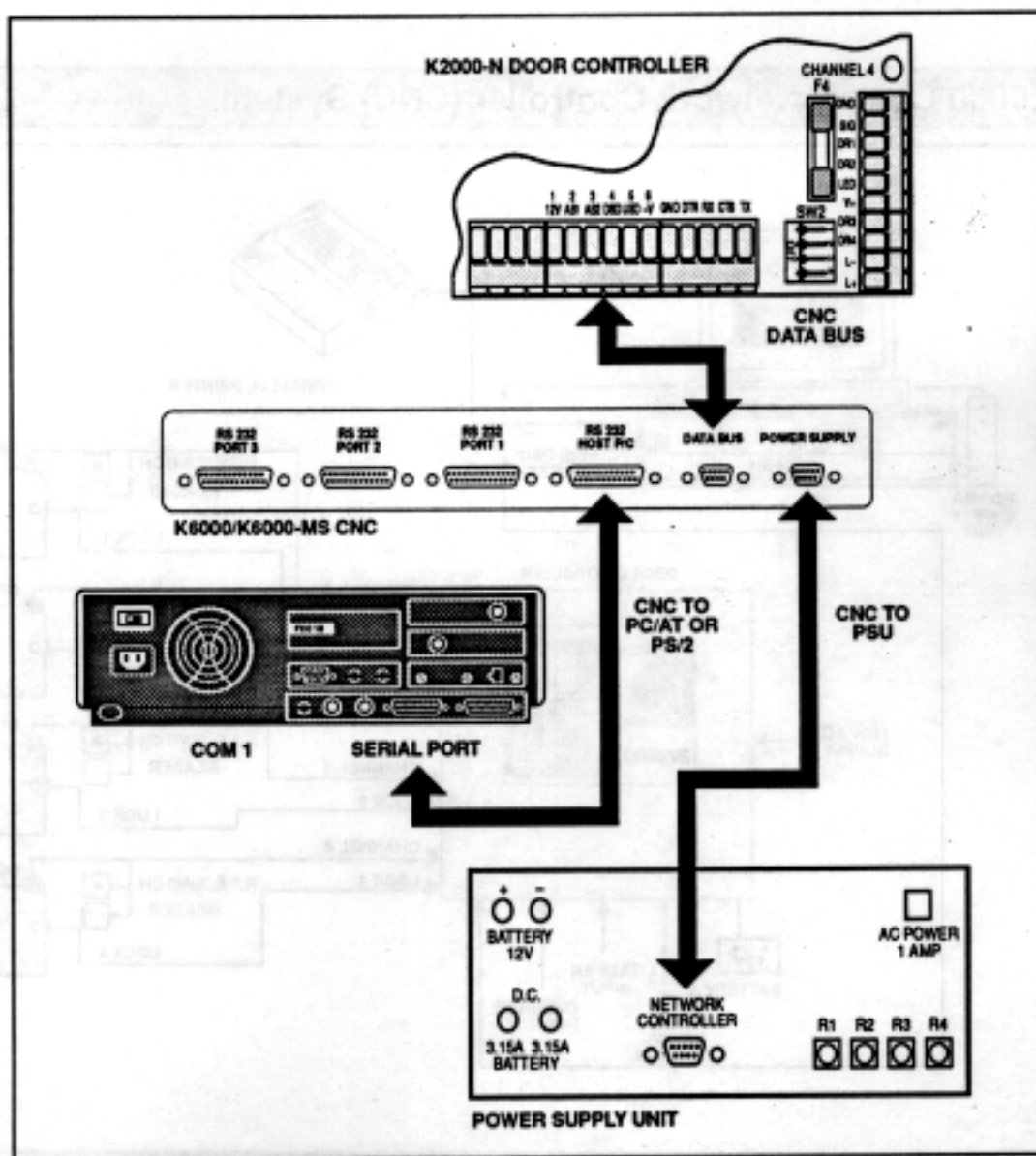
Figure 2: K6000 CNC Connection Details

Power Supply Unit (PSU) to CNC (provided)

CNC			PSU	
Pin	Function	Wire Color	Pin	Function
1	12 V	Red	1	12V
2	USP	Blue	2	USP
3	DSR	Green	3	DSR
4	CTS	Yellow	4	CTS
5	RTS	White	5	RTS
6	DCD	Violet	6	DCD
7	Chassis	Shield	7	Chassis
8	DTR	Brown	8	DTR
9	Ground	Black	9	Ground
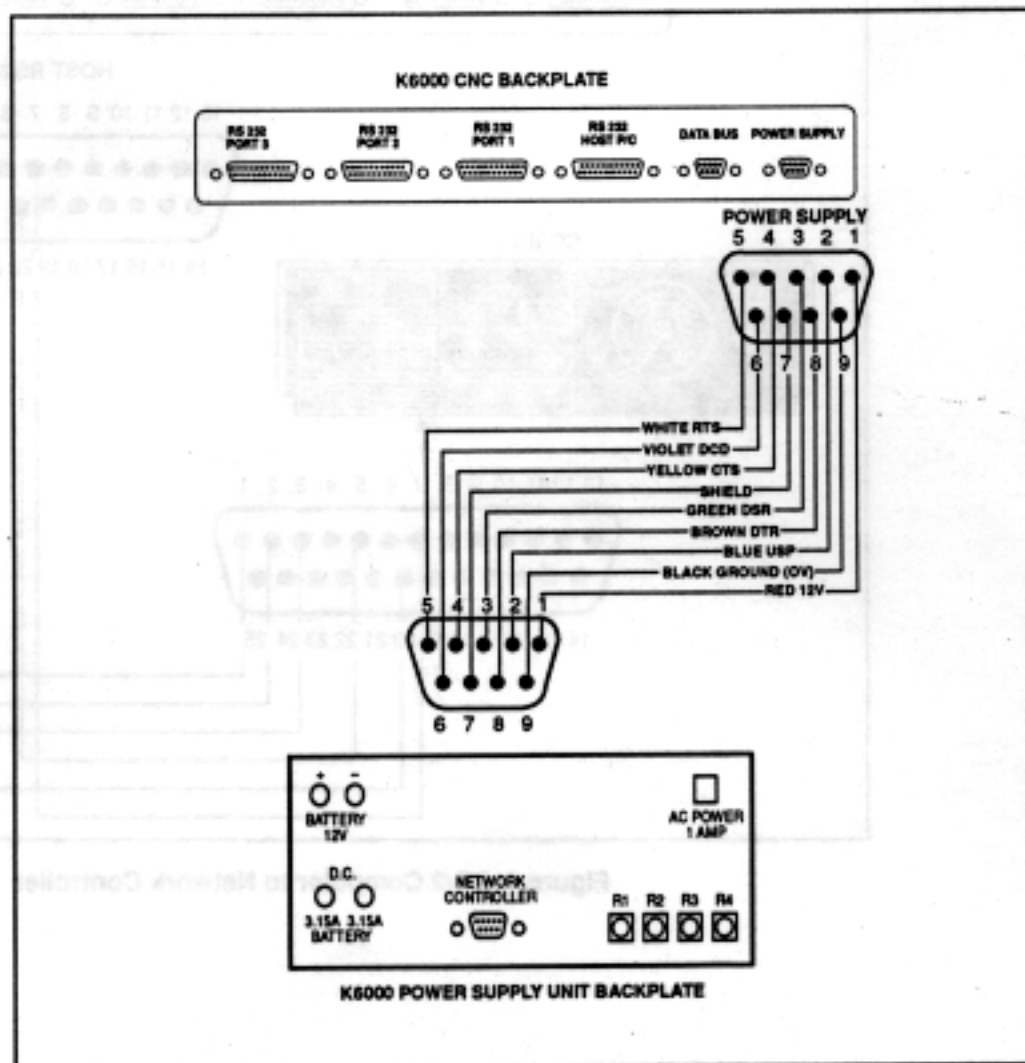
Figure 3: Power Supply Wiring

PS/2 Computer to CNC (provided)

CNC		DB 25	PS/2	
Pin	Function	Wire Color	Pin	Function
1	Chassis	Shield	1	Chassis
2	RX	Red	2	TX
3	TX	Blue	3	RX
5	CTS	Yellow	20	DTR
7	Ground	Black	7	Ground
20	DTR	Brown	5	CTS
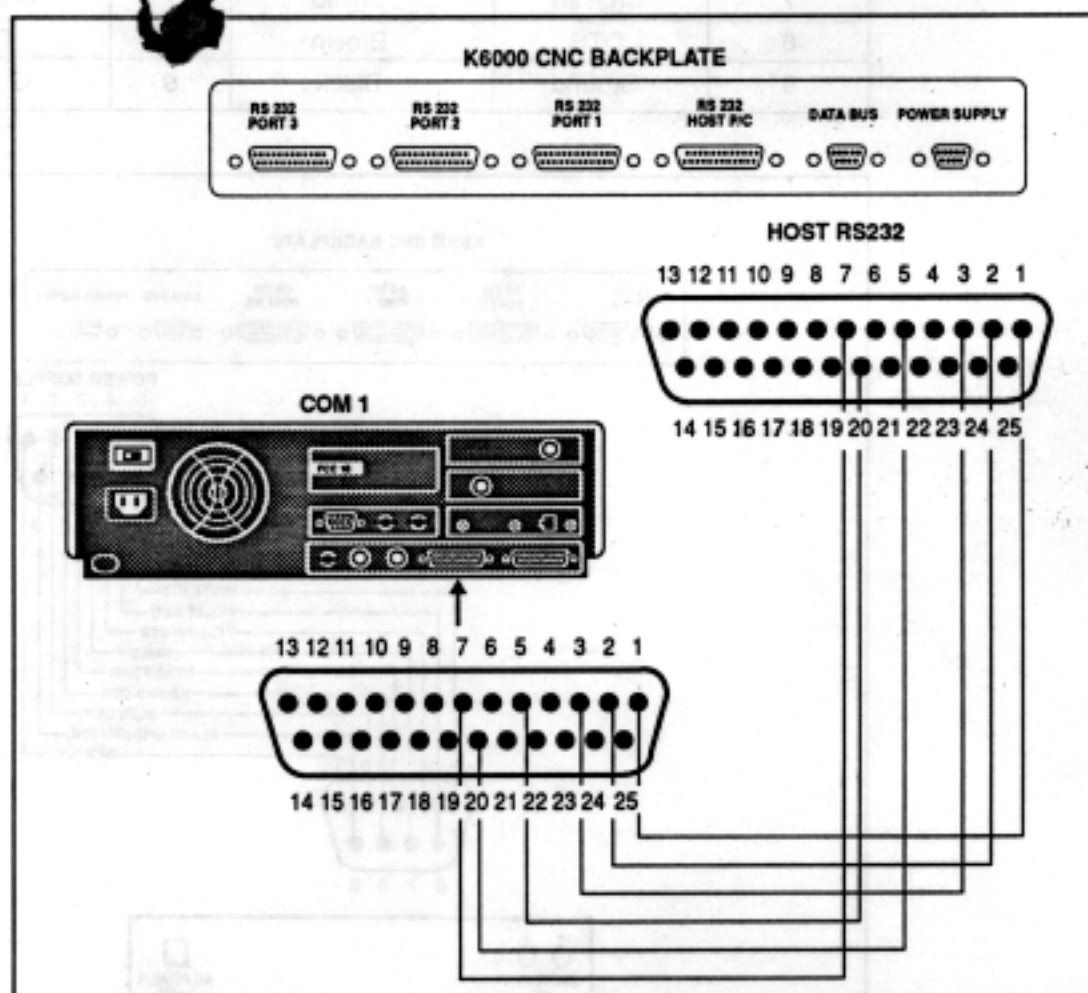
Figure 4: PS/2 Computer to Network Controller

CNC		DB 9	PC/AT	
Pin	Function	Wire Color	Pin	Function
1	Chassis	Shield	1	No Connection
2	RX	Red	3	TX
3	TX	Blue	2	RX
5	CTS	Yellow	4	DTR
7	Ground	Black	5	Ground
20	DTR	Brown	8	CTS
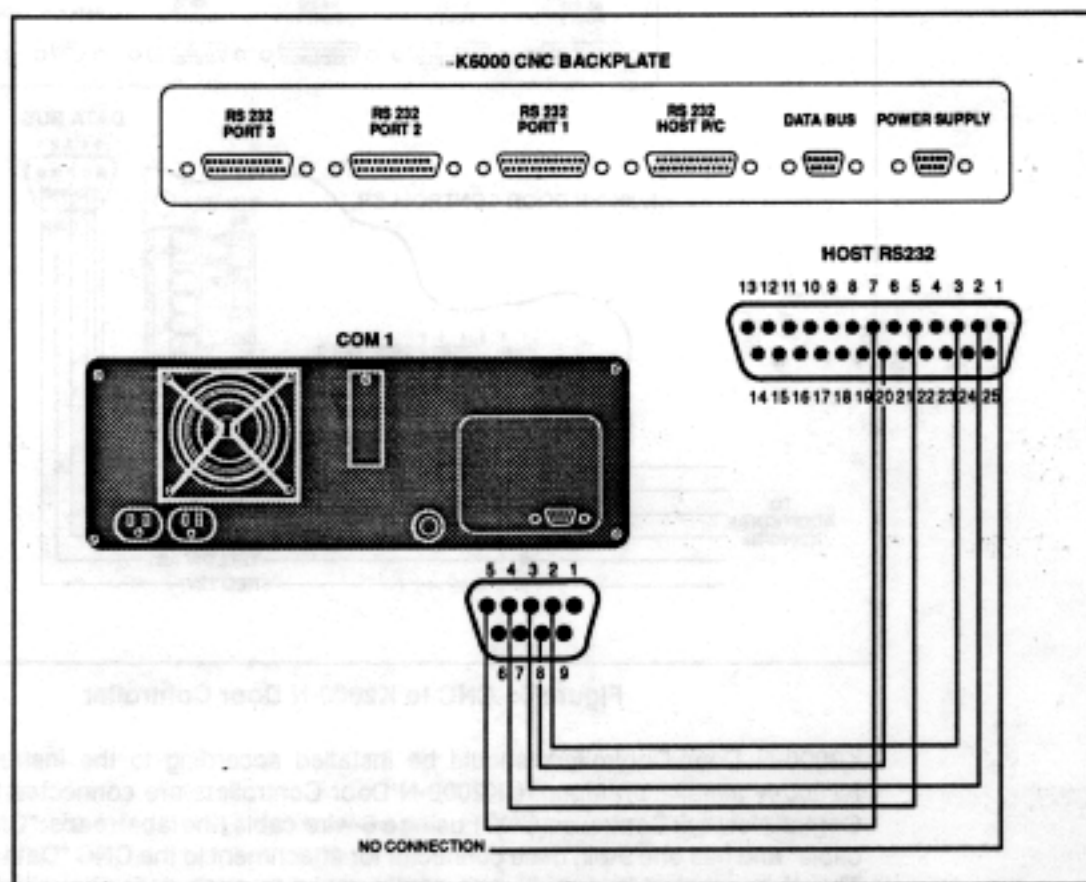
Figure 5: PC/AT to CNC Connection

Door Controllers to CNC (provided)

CNC			Door Controller	
Pin	Function	Wire Color	Pin	Function
1	12V	Red	1	12V
2	AB1	Yellow	2	AB1
3	AB2	White	3	AB2
4	DSD	Green	4	DSD
5	USD	Blue	5	USD
6	GND (-V)	Black	6	GND (-V)
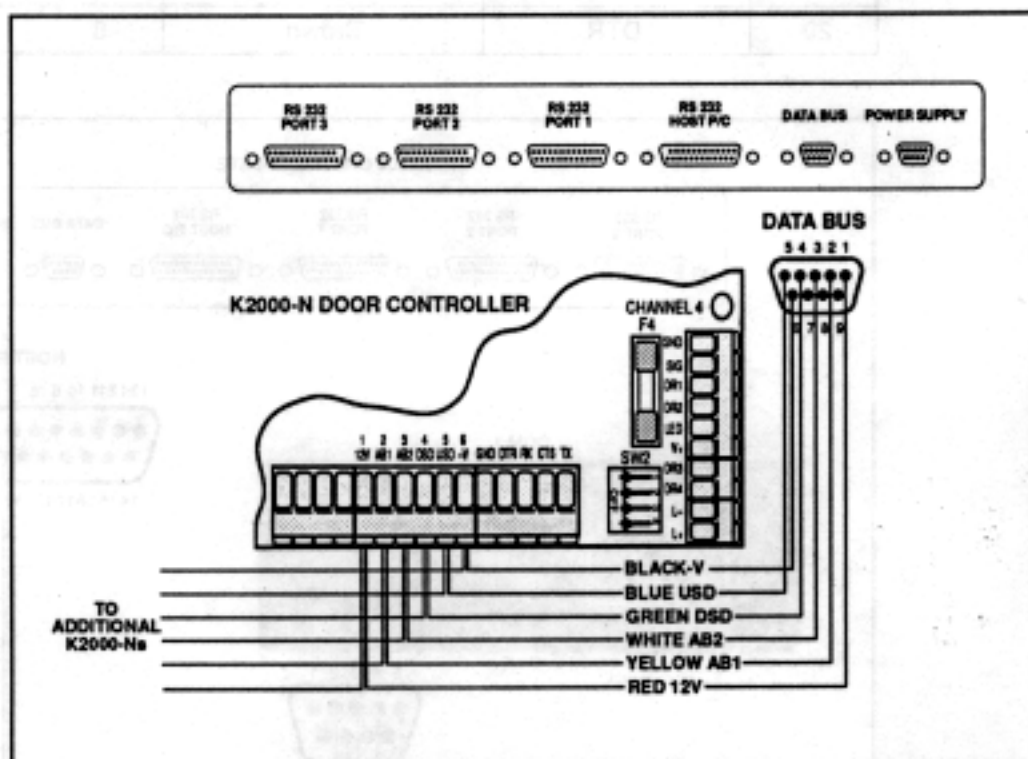
Figure 6: CNC to K2000-N Door Controller

K2000-N Door Controllers should be installed according to the instructions in the *K2000-N Installation Manual.* K2000-N Door Controllers are connected to the K6000 Central Network Controller (CNC) using a 6-wire cable (the label reads: "CNC to network cable" and has one 9-pin male connector for attachment to the CNC "Data Bus" output). This is connected in a multi-drop configuration to each door controller's 6-wire bus connector. Up to 32 door controllers may be linked to the CNC via the 6-wire bus. If two CNCs are used, the maximum number of door controllers is doubled to 64 using two separate 6-wire bus cables. All connections are in parallel as shown in Figure 6.

The 6-wire bus connects the CNC and READYKEY K2000-N. Use 6-wire 22 AWG stranded wire when connecting controllers to the 6-wire bus. From the CNC, a total of four 6-wire bus cables may be connected with a maximum distance of 3,000 feet each. The maximum total is 12,000 feet using four 3,000-foot branches.

The following procedure should be followed during installation of all door controllers in the networked system.

- Use a multimeter on the 100KΩ range to check the resistance to earth ground of each separate conductor in every wiring run prior to connecting it into the door controller. Check also for any residual voltage to the same point using the 250/300VAC and DC ranges. This checking is for possible shorts to other systems or services.

- All wiring runs should also be checked for continuity by looping back and measuring the loop resistance, using the 1K Ohm range on the test meter. An example of loop back testing of multi-wire cables is shown in Figure 7.
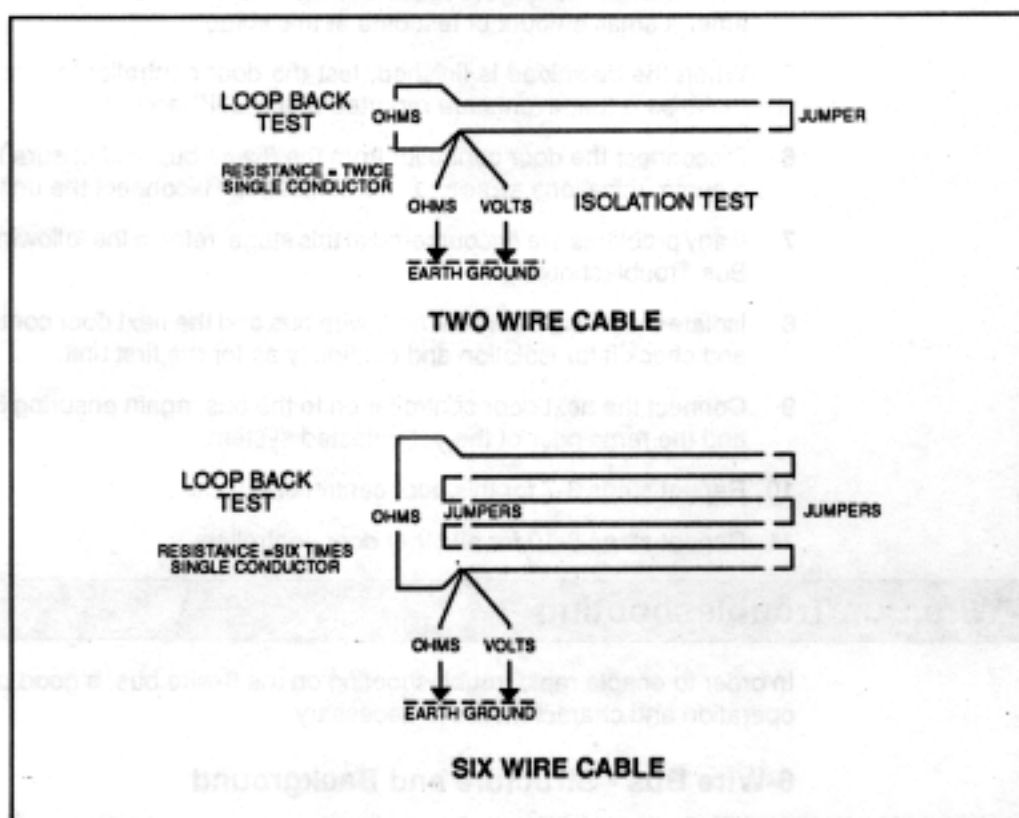
Figure 7: Loop Back Testing of Multi-wire Cable

- When all wiring runs have been checked for isolation and continuity, each cable can be connected to the controller in turn, except for the network connection to the 6-wire bus or RS232 port.

- The door controller should be powered up at this stage and voltage checks performed to ensure the reader and lock supplies are present. Resistance checks can also be performed to ensure all door contacts and RTE buttons are operational at this stage.

- When you are sure that the wiring on the door controller is correct, set the door controller address (refer to the K2000-N installation manual). Refer to the next section for details about installing the 6-wire bus network.

6-Wire Bus Installation Procedure

To install the 6-wire bus follow this procedure. The wiring network must be checked in sequence in order to efficiently isolate any possible problems.

1   Physically isolate the wiring between the CNC and the first door controller in the system and check its integrity using the isolation and loop back tests as described in the door controller wiring procedure (previous section).

2   Connect the bus between the CNC and the door controller, ensuring it is isolated from all other door controllers and network wiring.

3   Put the door controller on line (using the poll table command in the CNC software) and check if it replies correctly by monitoring the error display on the PC or CNC.

4   If all is well at this stage, begin a download to site. In order to speed the process, only enter a small amount of test data at this stage .

5   When the download is finished, test the door controller for correct operation and make sure that events are reported at the CNC and PC.

6   Disconnect the door controller from the 6-wire bus and ensure that the PC reports a communications ERROR 1 from that unit. Reconnect the unit to the 6-wire bus.

7   If any problems are encountered at this stage, refer to the following section on 6-wire Bus Troubleshooting.

8   Isolate the wiring between the 6-wire bus and the next door controller in the system and check it for isolation and continuity as for the first unit.

9   Connect the next door controller on to the bus, again ensuring isolation between it and the remainder of the yet untested system.

10 Repeat steps 3-7 for this door controller.

11 Repeat steps 8-10 for all other door controllers.

6-Wire Bus Troubleshooting
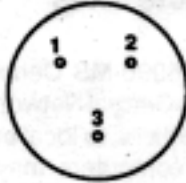
In order to enable rapid troubleshooting on the 6-wire bus, a good understanding of its operation and characteristics is necessary.

6-Wire Bus - Structure and Background

The 6-wire bus system allows several devices to be controlled from a central point using one 6-wire bus. The basic idea is to use two of the lines to distribute power and the remaining four lines to carry serial communications data to and from each device or door controller.

Of the four signal lines, two are dedicated to sending address information from the CNC to the door controllers, these being referred to as address bus 1 (AB1), and address bus 2 (AB2). The remaining two lines carry both replies to the address and data from the door controllers. The two data lines are termed upstream data (USD), and downstream data (DSD). USD carries data from the door controllers to the CNC and DSD carries data from the CNC to the door controllers. USD is also used by the door controller to confirm to the CNC that it has received its address and is functioning properly.

Central Relays

PSU Relays	
Pin	**Function**
1	N/C
2	N/O
3	COM

Relay Connector

The four relays in the PSU provide central alarm annunciation (only while the PC is operating the K6000 software).

Relay 1 (RL1)   Door Left Open (reset when door is closed).
Relay 2 (RL2)   Anti-Tamper/Unauthorized Access (reset by accepting alarm at the CNC).
Relay 3 (RL3)   Alarm Activated by a K2015 Alarm Module (reset by accepting the alarm at the CNC).
Relay 4 (RL4)   Not used.

Power Supply Unit (PSU)

The power supply unit provides regulated +12 volts to the CNC. Connect the power supply to a suitable AC power outlet (120 VAC, 60 HZ) using the power cord (supplied). For UL listed systems, a Panamax GNG 0200 surge protector (Radionics Part Number K2006) shall be used between A/C main input and the K6000/K6000-MS. The receptacle must be UL listed and comply, as well as be installed, by a licensed electrician per NFPA/NEC-70 (National Electrical Code). The voltage and current rating, as well as the installation, must comply with NFPA/NEC-70 and be installed by a certified electrician. Both the red and green LEDs on the power supply should light. The green LED indicates that either a fully charged battery is connected to the PSU (or no battery at all). The red LED indicates that 120 VAC is present.

The Power Supply for the K6000 (all models) needs to be installed in the same room.

The Power Supply Unit has three fuses.

FUSE	FUNCTION	TYPE/RATING
F1	12 V Supply to CNC	5 x 20 mm, 3A, Quick-Blow
F2	Battery Supply	5 x 20 mm, 3A, Quick-Blow
Main*	120 VAC Power	5 x 20 mm, 2A, Slow-Blow

* The Main fuse is located in the power cord housing. Use a screwdriver to open the fuse drawer.

Standby Power Supply

To meet UL 294 requirements, the use of a standby power supply (battery) is optional. If a battery is used, it must be of sufficient capacity to supply the system for 4 hours while the system is operated once every 5 minutes. The power consumption of the CNC is 150mA at 110VAC. It draws 920mA from the 12VDC battery, when the AC supply is off. The battery charge current is 207mA. Use two D126 batteries with a D122 Dual Battery Harness in a D8103 enclosure to meet the UL 294 requirement. The enclosure must be installed in the same room as the power supply unit.

For UL 294 applications the two D126 batteries must be rated 12V, 7AH.

Remote Sites

The K6000-MS Central Network Controller provides the same basic features as the K6000 Central Network Controller, with the addition of capabilities to control three RS232 connections to local or remote (modem) sites. Up to 127 additional sites may be added. Also, computers may be added (using additional serial connections directly to the computer which is connected to the K6000-MS). Up to 32 doors per site may be installed.
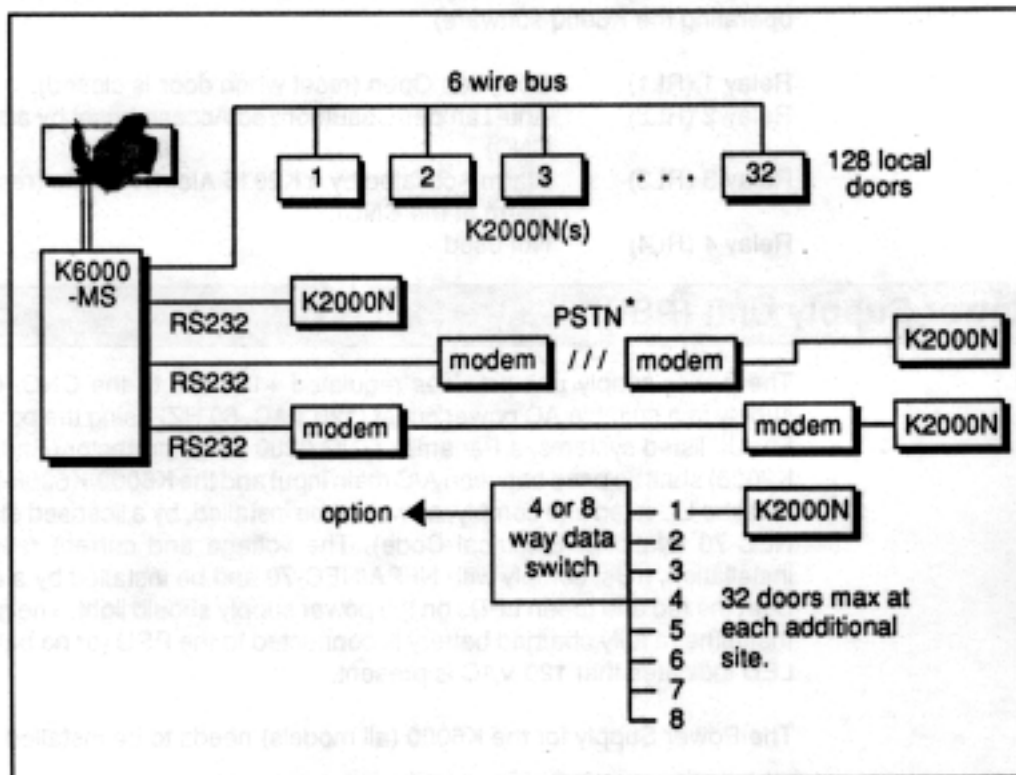
*PSTN = Public Switched Telephone Network

Figure 8: Multi-Site Connections

As shown above, up to 128 local doors (using 32 local door controllers) may be connected via the 6-wire bus on the CNC. The three RS232 connections on the K6000-MS may be used with a direct serial link, line drivers, a data switch or modems.

| Communication Type	Number of Door Controllers	Maximum Distance	CNC Port	Door Controller Port	Expansion
6-wire bus	32	3,000 ft. (4 branches allowed from CNC)	Data Bus	6-wire bus connector +12V, AB1, AB2, DSD, USD, -V	Add 2nd CNC to central PC
Serial Link	1	30 ft.	RS232	Serial	Add Line Drivers and/or Data Switch
Line Drivers	1	2000 ft.	RS232	Serial	Add Data Switch
Data Switch	8 max.	200 ft.	RS232	Serial	Add Line Drivers
Modem	1	Nationwide	RS232	Serial	Add Data Switch

Serial Communications

For direct connection of the serial link from the CNC to the door controller (30 feet maximum) use the following diagram. The maximum speed is 9600 baud.
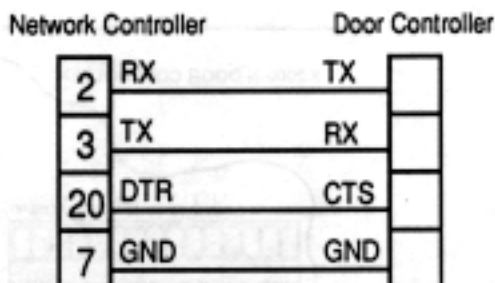
Modem Transmission Speeds

The rate of transmission for CCITT designations and compatible Bell designations are:

CCITT V.21   300 baud   (Bell 102)
CCITT V.22   1200 baud   (Bell 202)
CCITT V.24   2400 baud   (Bell 212) (maximum modem speed)

Line Driver (not provided)

Line Drivers can be used to extend the distance over which RS232 serial data can be transmitted. Line Drivers will allow you to transmit data up to 2,000 feet. Line Drivers work in pairs, one at either end of the communicating device.

NETWORK CONTROLLER
25-PIN FEMALE D-CONNECTOR

LINE DRIVER
25-PIN MALE D-CONNECTOR

WIRING DIAGRAM

NETWORK CONTROLLER   LINE DRIVER

2	RX	TX	3
3	TX	RX	2
20	DTR	CTS	5
7	GND	GND	7
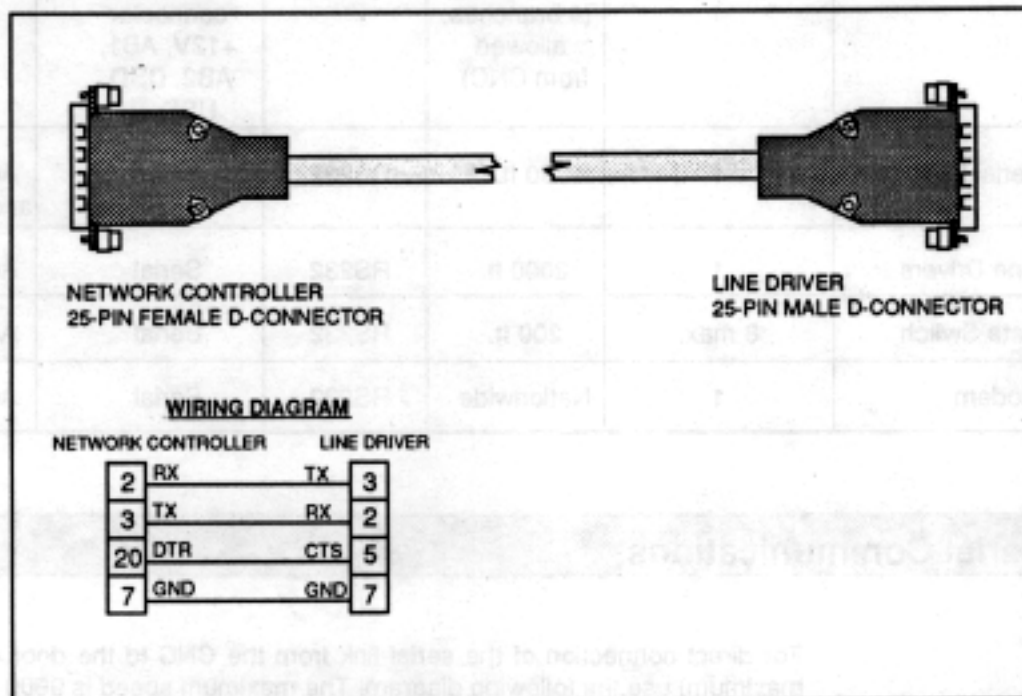
Figure 9: CNC to Line Driver

K2000-N DOOR CONTROLLER

CHANNEL 4
F4

LINE DRIVER
25-PIN FEMALE
D-CONNECTOR

WIRING DIAGRAM

LINE DRIVER   K2000-N

2	TX	RX	
3	RX	TX	
5	CTS	DTR	
7	GND	GND	
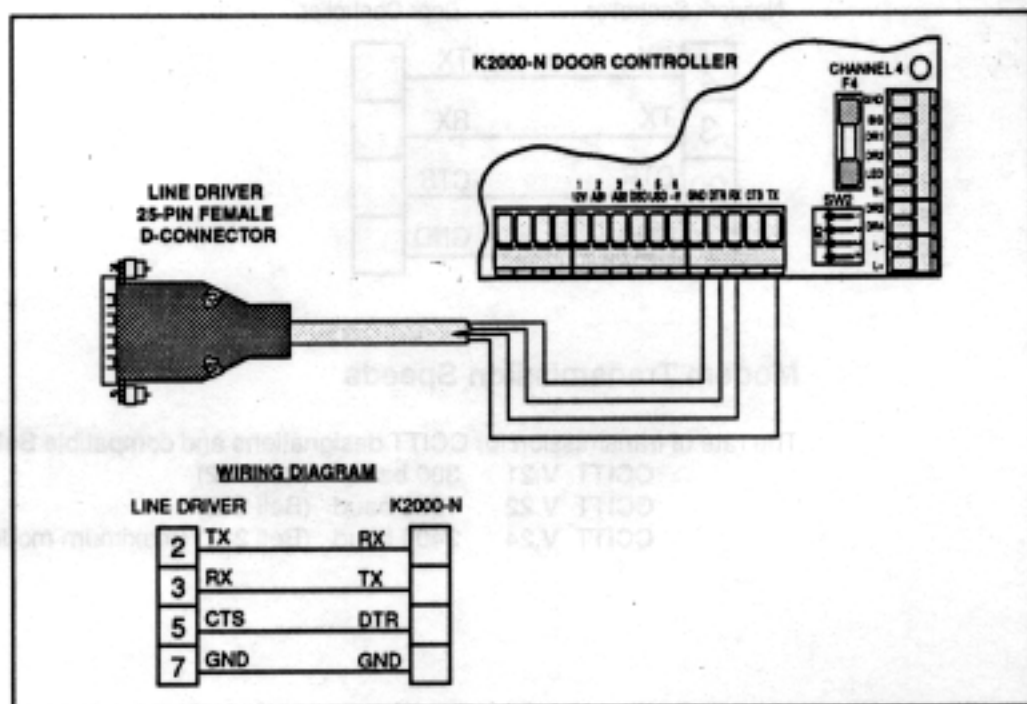
Figure 10: Line Driver to K2000-N

```
                    CNC PORT 1
                    [RS232]
                        ↕
                    [MODEM]
                        ↕
                        ↓
                    [MODEM]
                        ↕
                 [DATA SWITCH]
              ┌──────┬──────┬──────┐
          [2000N] [2000N] [2000N] [2000N]
                   UP TO 8
```

Figure 11: CNC Connected to a Door Controller Using a Data Switch

Using a Data Switch

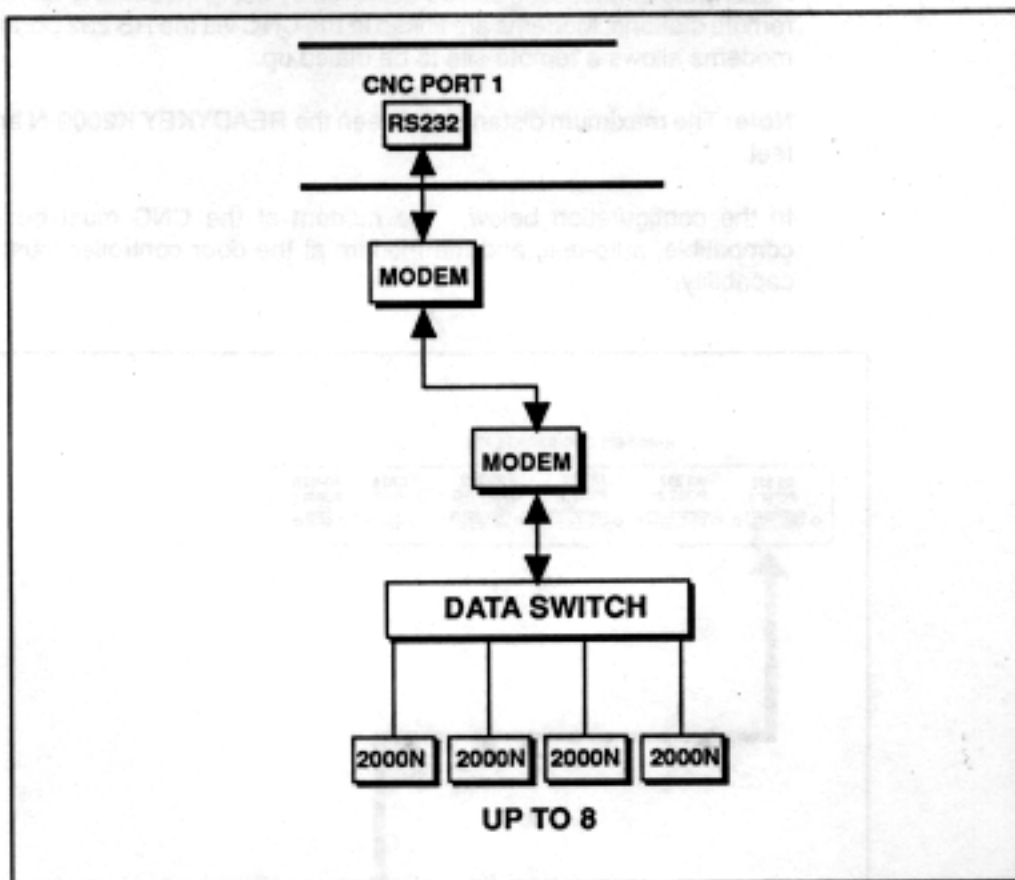For sites with up to 8 door controllers connected back to the K6000-MS CNC via a data switch and modem, the following wiring will be required for the modem to data switch connections.

The data switch connects to the modem link as shown below.

Data Switch		Modem (RS232 Port)	
Pin #	Signal	Signal	Pin #
2	TX	TX	2
3	RX	RX	3
7	-V	-V	7

The maximum distance between the Data Switch and the Modem is 30 feet.

Nationwide connections can be achieved by using modems to link the central station to remote stations. Modems are linked to the CNC via the RS 232 ports on the CNC. Using modems allows a remote site to be dialed up.

Note: The maximum distance between the READYKEY K2000-N and the modem is 30 feet.

In the configuration below, the modem at the CNC must be AT Command Set compatible, auto-dial, and the modem at the door controller must have auto answer capability.
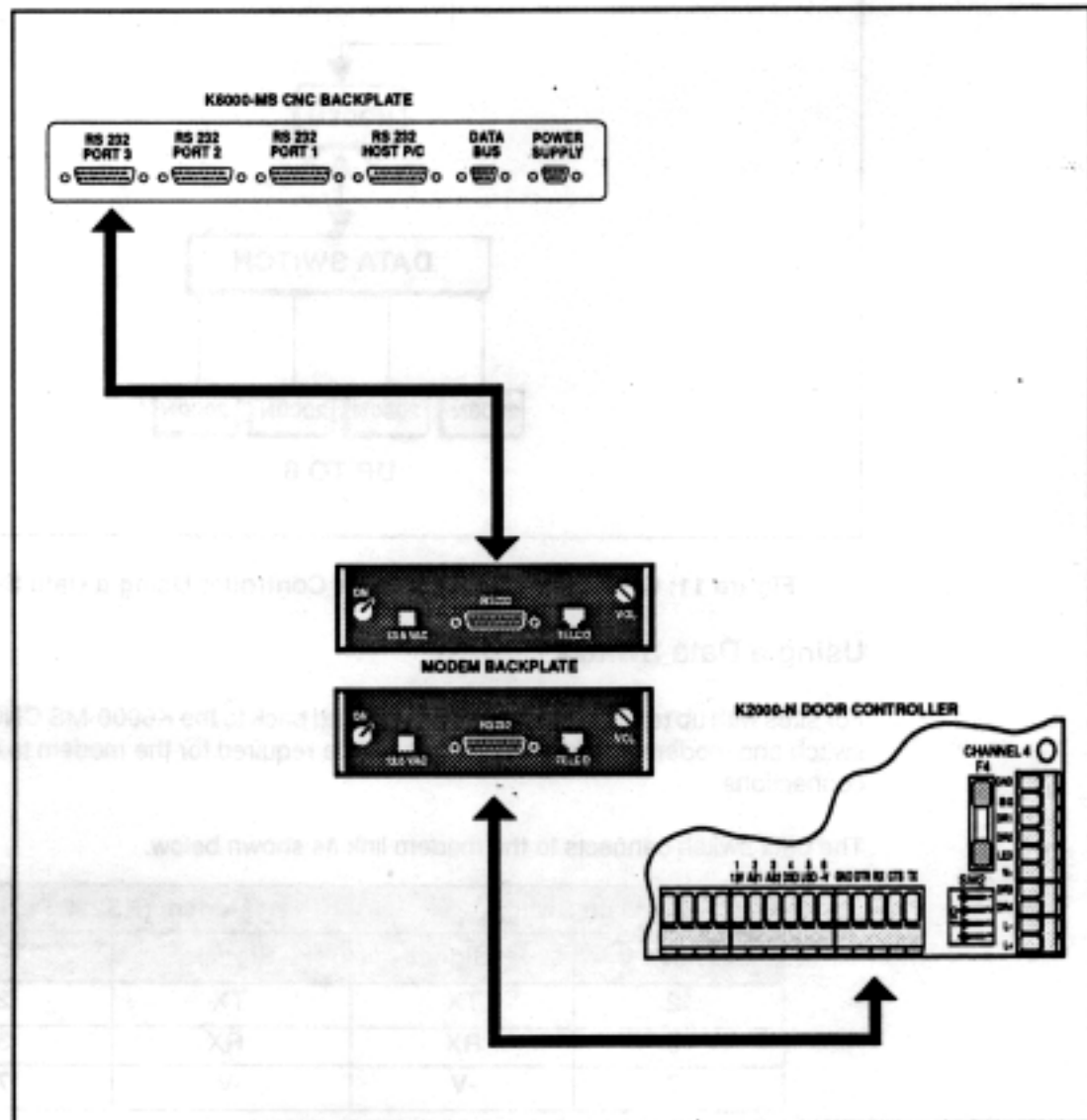

Figure 12: CNC Connected to a Door Controller Using a Modem

CNC (RS232 Port) to Modem (not provided)

CNC			Modem	
Pin	Function	Wire Color	Pin	Function
1	Chassis	Shield	1	Chassis
2	RX	Red	3	TX
3	TX	Blue	2	RX
4	RTS	White	4	RTS
5	CTS	Yellow	5	CTS
6	DSR	Green	6	DSR
7	Ground	Black	7	Ground
8	DCD	Violet	8	DCD
20	DTR	Brown	20	DTR

K6000-MS CNC BACKPLATE

RS 232 PORT 3 RS 232 PORT 2 RS 232 PORT 1 RS 232 HOST P/C DATA BUS POWER SUPPLY

RS232 PORT

13 12 11 10 9 8 7 6 5 4 3 2 1

14 15 16 17 18 19 20 21 22 23 24 25

RX
TX
SHIELD
BLUE RX
RED TX
WHITE RTS
YELLOW CTS
GREEN DSR
BROWN DTR
BLACK GROUND
VIOLET DCD

13 12 11 10 9 8 7 6 5 4 3 2 1

14 15 16 17 18 19 20 21 22 23 24 25

ON
RS232
VOL
13.5 VAC   TELCO

MODEM BACKPLATE
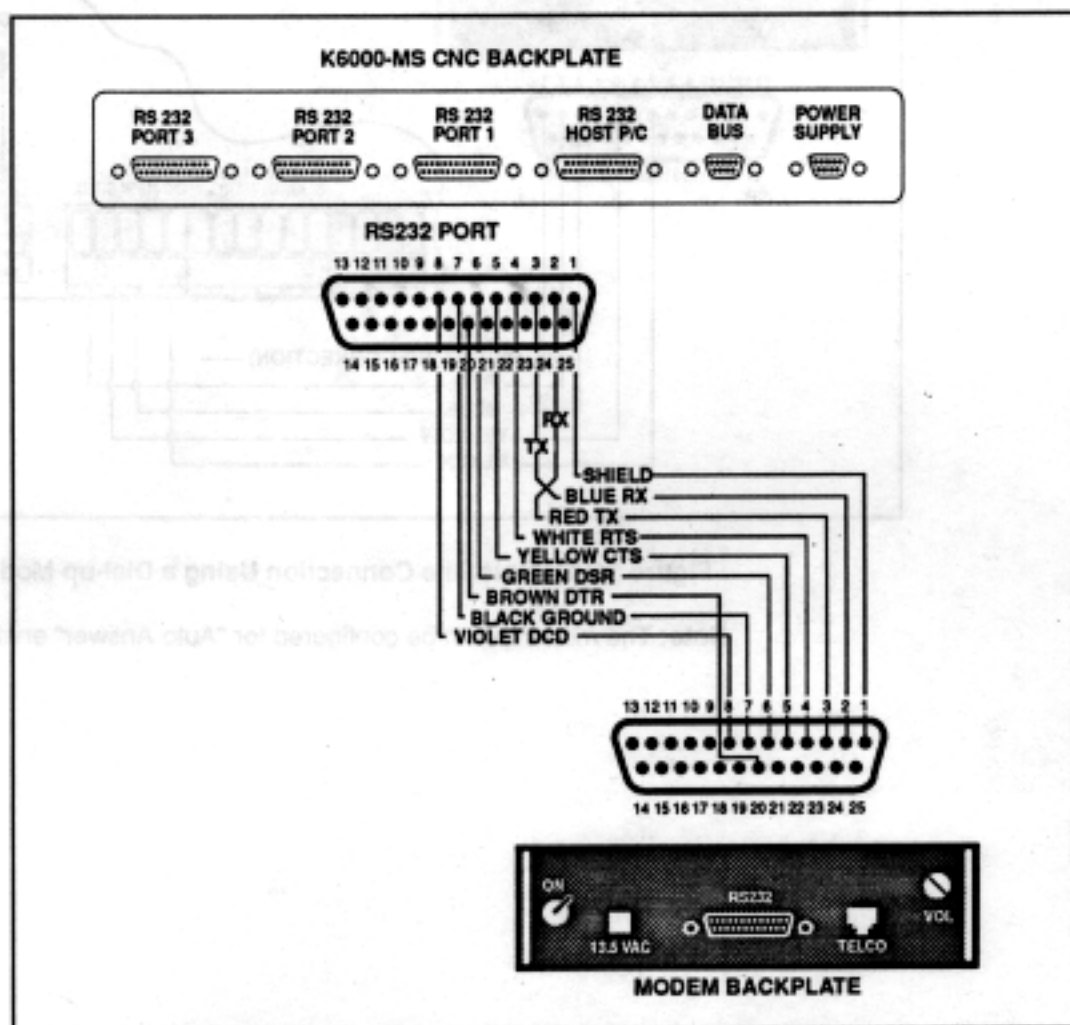
Figure 13: CNC RS232 to Modem

Modem to Door Controller (not provided)

Door Controller		Wire Color	Modem	
Pin	Function		Pin	Function
N/C	Chassis	Shield	1	Chassis
TX	TX	Red	2	RX
RX	RX	Blue	3	TX
CTS	CTS	Yellow	5	CTS
GND	GND	Black	7	Ground
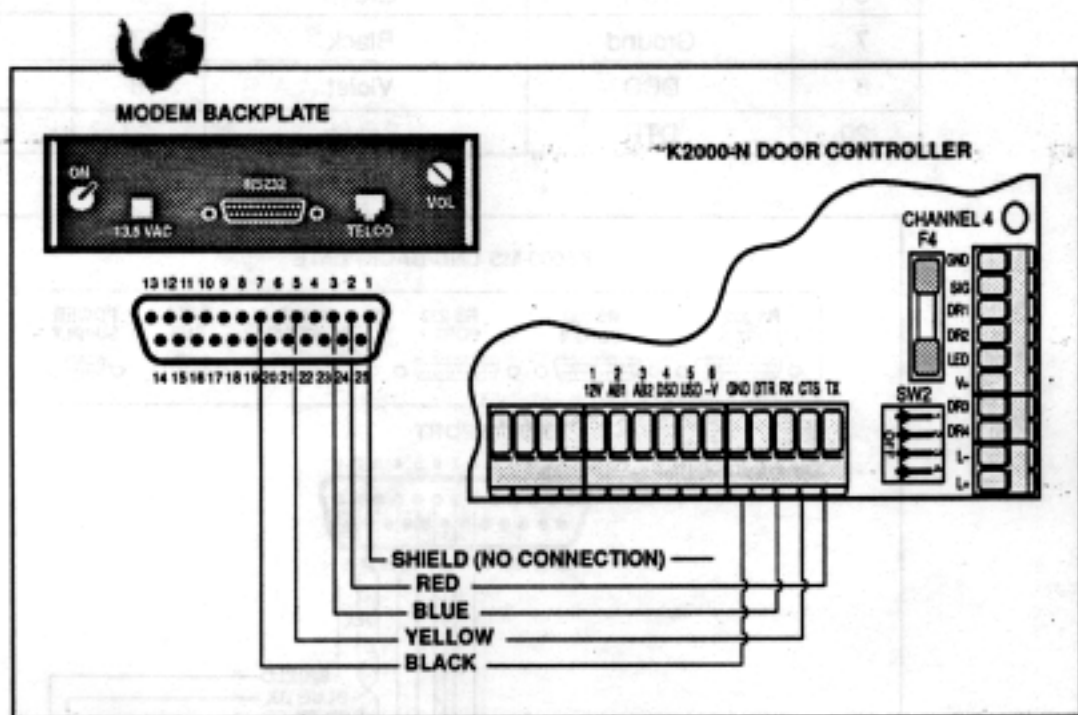
Figure 14: Remote Site Connection Using a Dial-up Modem

Note: The modem must be configured for "Auto Answer" enabled.

Figure 15 shows a K6000/K6000-MS system configuration with two network controllers and up to four remote PCs and printers.
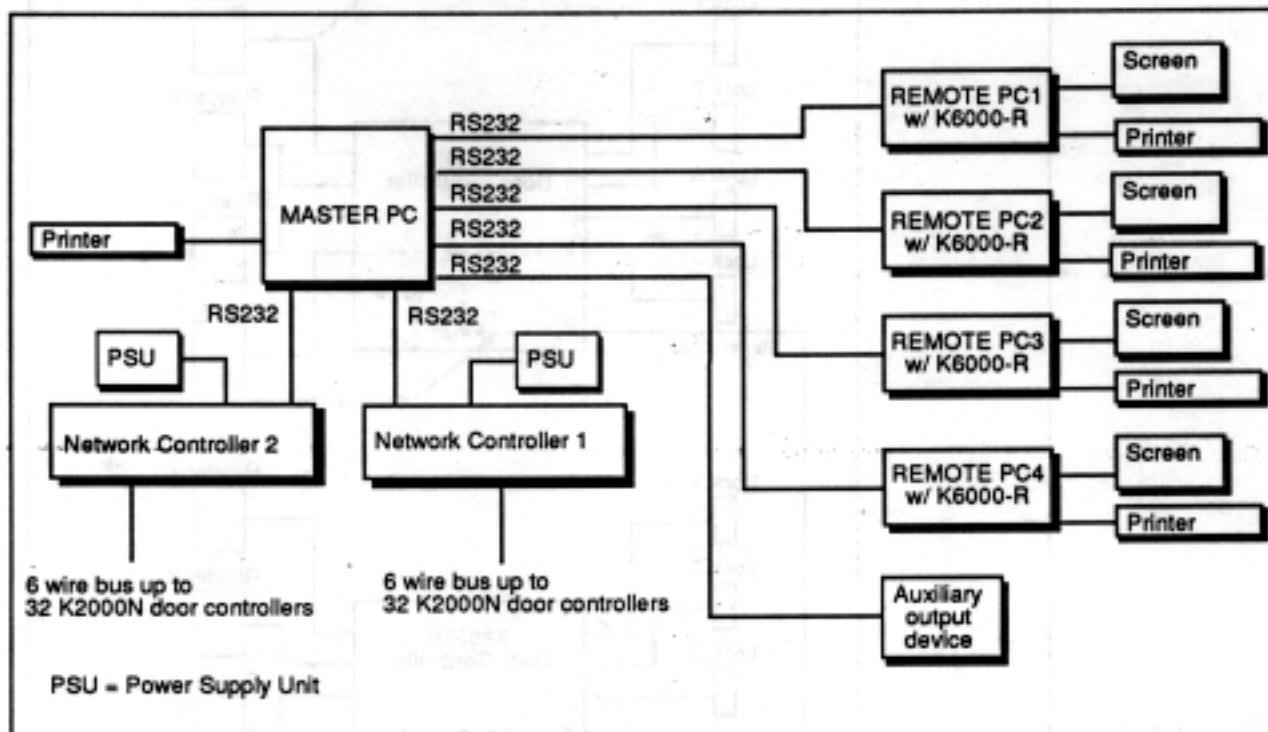

Figure 15: Remote PCs and Printers

For programming, refer to the READYKEY K6000 Central Network Controller and K6000-MS Multi-Site Central Network Controller User's Guide (74-05682-000-B) PC Configuration Menu, Configure Ports, page 66.

Note: CNC 1 should be on COM1; CNC 2 should be on COM2. Record the port addresses for each device attached because you will need this information in the K6000/MS software configuration utility.

Remote PCs are connected via dedicated high-speed RS232 links. The distance to the master PC is 30 feet (or 2,000 feet using line drivers).

Troubleshooting Guide

Importance of Wiring Integrity

In the K2000-N, the reader, lock and 6-wire bus all share the same common ground connection. In the networked system, where door controllers are connected together using the 6-wire cable, a ground on the wiring of one door controller affects the others. Single shorts of this type do not in themselves prove destructive; however, when a second short occurs somewhere else on the system, causing a fault current to flow, the system may become non-functional. Figure 16 shows a typical fault condition caused by two independent wiring shorts to building earth.
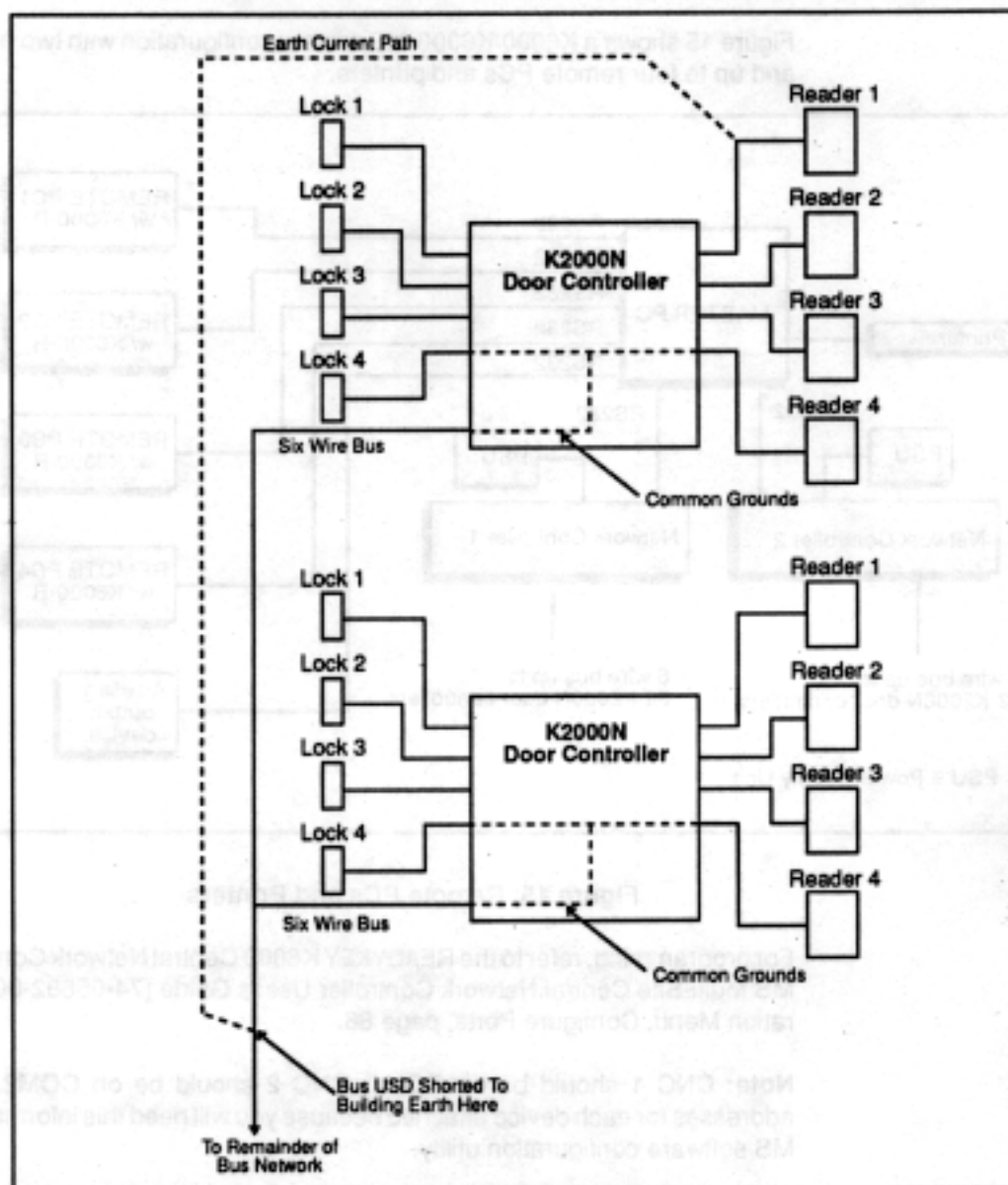
Figure 16: Building Earth

To prevent the system becoming non-functional, the installer should ensure that no short circuits of this type exist during the installation of each door controller before it is connected to the 6-wire cable network. The 6-wire cable wiring should be checked for integrity during installation and a structural installation procedure adopted.

The same comments apply to door controllers connected into the network via RS232 serial links, where similar problems may occur.

The procedures detailed in this document provide a structured approach to both installing and troubleshooting a networked system. These, along with standard electrical installation practice, will reduce installation problems, speed troubleshooting and improve overall system reliability.

Interpreting the Communications Status Display

Both the PC and the CNC provide a communication status display for the six wire bus. Three differing errors are reported as follows:

Error 1   This error indicates that the CNC is not receiving a reply from the door controller it is polling. This may be caused by the door controller losing power, the AB1 or USD bus lines being shorted to ground or disconnected, or the door controller bus interface being faulty. If all door controllers are giving error 1's, suspect a cabling fault, a damaged USD circuit in one or more door controllers, or CNC bus interface failure.

Error 2   This error indicates that the CNC has received a garbled message from a door controller. Possible causes are localized RF or power line interference where the error will clear, or incompatible door controller software where the error will be permanent.

Error 3   This error indicates that the CNC has received no data from the door controller following a command. Possible causes are damaged cabling on the DSD line or a damaged DSD circuit in the door controller.

Software Installation

Installation of the K6000/K6000-MS software is covered in this next section. The system operating software is made up of several programs and data files.

Available diskette formats are as follows:

IBM AT format	360Kb	5.25 inch
IBM PS/2 format	720Mb	3.5 inch

Installation Procedure

1. If the computer does not already have the K6000 installed and running, go to step 3.

2. Escape to DOS (Disk Operating System).

   i) Access the editor by presenting a valid key to the CNC reader and enter the correct password.

   ii) Select Option 9, `Disk Functions`, at the Main menu and then select Option 6, `Escape to DOS`.

   iii) Press the **Y** key to escape to DOS. The prompt `C:\P6000` will be displayed.

   iv) Go to step 4.

3. Log into Drive C by typing `C:` then press **ENTER**. You must now check that the CONFIG.SYS file on your computer already has the following command lines present:

   ```
   Files=40
   Buffers=25
   ```

To bring up the CONFIG.SYS display, type: TYPE CONFIG.SYS, then press ENTER. If the file is not present or does not contain the above two statements, refer to the instructions on generating or editing the CONFIG.SYS file in your IBM computer User's Guide.

4. Insert diskette number 1 into Drive A.

5. Type A: then press ENTER. The computer will respond with the prompt A:\.

6. Type INSTALL then press ENTER. The computer will now run the automatic system installation procedure.

7. If the software has two diskettes. You will be informed when to remove diskette 1 and insert diskette 2. On a first-time installation, the screen will display:

   ERROR - DATABASE FILES ARE EMPTY

   CREATE DATABASE?

8. Press ENTER. After the database files have been created, the screen will display: PRESENT KEY TO CONTROLLER

9. Present the intended Master Key to the first CNC.

10. Press ENTER to start the configuration utility.

11. When installation is complete, the K6000 system will automatically start a configuration program.

First Time Installations

1. CONFIG will display the following menu:

1	PC Configuration
2	Change Master Key
3	Initialize Global Files
4	Initialize Site Files
5	Add a New Site
6	Initialize a Door Controller
7	Initialize the Network Controller
8	Set Assembly Points
9	Define Site Areas

   Pressing ESC will save changes and exit you to DOS.

2. Press 1 to enter the PC Configuration menu.

3. Select a suitable printer type by pressing 1 until the printer type displayed is the one you have connected to the PC.

4. Configure the port by pressing 2 and entering the com port addresses and baud rates of additional devices, such as a second CNC and remote PCs.

   Note: Printing on the system is always via the parallel port of the PC.

5. **Press 3** to assign sites to CNCs.

6. Exit to the Configuration Utility menu by pressing **ESC**.

7. Next, install the system Master Key. This is done by pressing **2**, and holding a key next to the shaded area on the right of the CNC front panel. When the key has been read, the PC will prompt for a password (maximum of 8 characters). Enter the password then press **ENTER**. A NULL password may be defined simply by pressing **ENTER**.

8. If only one site was available in PC Configuration-Assign Sites to CNC, and more than one site is required, you can now add these using **5**.

   Warning! It is not possible to delete sites once they have been added, unless you reinstall the sytsem.

9. Exit to DOS using the **ESC** key. The system prompt should be displayed as:
   C:\P6000

10. Run the READYKEY K6000 system by typing K6000, then pressing **ENTER**. After a short time the transaction monitoring screen will be displayed. For K6000-R systems, type K6000R.

11. Present the Master Key and enter the password. The Main menu will appear. Press **8** and the System Configuration menu will appear. Press **2** and the Site Information file will appear, ready for editing. Using the User's Guide, fill in all fields for the required site information.

12. Before bringing any K2000-N Door Controllers on-line, simplify installation by:

    a. Disconnecting all K2000-N Door Controllers from the 6-wire bus.

    b. In the K6000, program all K2000-N Door Controller door records with 5-second lock times and no door open time (DOT). Set all other options to 0, except for the correct lock type and alarm module, if installed.

13. Connect door controller 1 to the 6-wire bus, and make sure that the polling address is shown on the front panel display. Short DR2 to GND on each reader channel and make sure REQUEST TO EXIT reports are generated at the PC.

14. Repeat the above step for all K2000-N Door Controllers.

15. Remote door controllers may now be brought on-line as required.

    Note: You can FORCE DIAL any dial-up door controller by selecting its site information file. This will allow each site to be checked. (See the *K6000/K6000-MS User's Guide*.)

16. Several keys may now be added into the system and all K2000-N Door Controllers checked for correct reader operation.

17. Any special lock mode options and door times can now be assigned and the channels checked for correct operation, both on local and remote door controllers.

18. Once all basic operational checks have been made to the system, personnel keys may be assigned and issued as required.

19. Further door controllers may be added to a system at any time and their databases brought up to date using the Download to Site function. (See the K6000/K6000-MS User's Guide).

    Note: Changes done while a download is in progress will not be sent until after the download.

CNC Alarm/Display Reporting

Local Alarm Reporting Facility

This facility allows alarms occurring on the system while the PC is off line to be reported at the network controller. These alarms will be annunciated on the network controller display and cleared by presenting any valid editor key to the network controller reader. This will cause the display to blank and the beeper to sound for one second. If there are any further alarms, these will be stacked up and displayed immediately after the current one is cleared.

If any alarms are being displayed or pending when the PC comes back on line, these will clear as soon as they are passed to the PC. All alarm events that are reported in this way on the CNC still require subsequent acknowledgement at the PC when it returns to an on-line condition.

Local Display Reporting

All local reporting is performed using the in-built 16-character display. Each message type is prioritized to allow more urgent events to be reported immediately when they occur. Alarms have the highest priority, with the exception of the clock sync event, and the familiar 'MONITORING' message having the lowest.

Priority 1

Message: Snnn Dnnn UNAUTHORIZED ACCESS ALARM
This message scrolls across the display from right to left while the beeper sounds. It identifies a door forced alarm from site Snnn, door Dnnn. As with all local alarms, the message is cleared by presenting a valid editor key to the network controller reader. This message goes to the CNC and does not appear if the PC is currently on line.

Priority 1 (cont'd.)

Message: Snnn Dnnn ANTI-TAMPER ALARM

This message scrolls across the display when an anti-tamper alarm from site Snnn, door Dnnn. A beeper also sounds to alert the operator. It is cleared as described above. This message goes to the CNC and does not appear if the PC is currently on line.

Message: Snnn D/Cnn FIRE ALARM

This is a scrolling message similar to the above message. It identifies a fire alarm from Snnn, door controller number D/Cnn. It is cleared as described above. This message goes to the CNC and does not appear if the PC is currently on line.

Message: Snnn Znnnn ALARM RECEIVED

This message has the same characteristics as the message described above. It identifies an alarm received from an alarm module which is zone Znnnn or site Snnn. It is cleared as described above. This message goes to the CNC and does not appear if the PC is currently on line.

Priority 2

Message: **BUFFER FULL**

This message appears when the network controller has room for only 1000 more transactions in its internal buffer. This would usually be due to the PC being off line for an extended period of time. This message will clear when the buffer has room for 1100 transactions. A beeper sounding will accompany the message to alert the operator.

This message can also appear upon installation with door controllers on-line. If so:

1. Disconnect the door controllers.
2. Power down the CNC, and then power it back up.
3. Load and run the PC software.
4. Connect the door controllers to the CNC.
5. Select INITIALIZE NETWORK CONTROLLER.

Priority 3

Message: Snnn D/Cnn ERRnn

These types of messages appear to identify various errors on the door controller network. Currently, only errors on the six-wire bus are reported. If more than one door controller error is present, they will be reported in rotation, each message being displayed for 3 seconds. The meaning of each error number is as follows:

ERR01: The door controller does not reply to a poll. Possible causes include:

- No power on door controller
- Wrong address set at door controller
- AB1 disconnected, intermittent or short-circuit
- USD disconnected, intermittent or short-circuit
- Door controller has a faulty six-wire bus interface

Priority 3 (cont'd.)

ERR02: A scrambled message has been received by the door controller or PC. Possible causes include:

- Two door controllers with the same address
- Severe noise on USD or DSD
- Incompatible door controller and CNC software issues
- Door controller has a faulty six-wire bus interface

ERR03: The door controller failed to reply to the CNC when sent a command. Possible causes include:

- Two door controllers with the same address
- DSD disconnected, intermittent or short-circuit
- Incompatible door controller and CNC software
- Door controller has a faulty six-wire bus interface

AC induction and RF interference may occur when a system is installed in or near the following:

- Radio station transmitter or other broadcast station
- Ham radio transmitter site
- Computer network system
- Heavy machinery and motors
- Welding shop
- High voltage electrical equipment or transformers
- PBX telephone
- Public service (police, fire dept., etc.) using radio communications
- When wires must be run close to electrical lines, florescent fixtures or telephone cabling.

Priority 4

Message: ****PC OFFLINE****

This message appears to indicate that the network controller has not been polled by the PC for 10 seconds. Possible causes include:

- PC performing an intensive off-line task, such as transaction analysis or producing a download file
- PC serial link to network controller disconnected
- PC powered down or faulty

Priority 5

Message: ****UPDATE nnn****

This message indicates the percentage of the update buffer currently in use for buffering database changes to door controllers.

Priority 6

Message: **MONITORING**
This message is displayed if no higher priority event occurs.

Message: **CLOCK SYNC**
This message appears for three seconds and the beeper pulses. It identifies two separate events.

The first is when the CNC and all door controller real time clocks are synchronized to the PC internal clock by the 'clock sync' user command. The second is at midnight every day when the CNC sets up to synchronize all clocks in the network either immediately or at the next dial-up time.

Priority 6

Message: `**MONITORING**`
This message is displayed if no higher priority event occurs.

Message: `**CLOCK SYNC**`
This message appears for three seconds and the beeper pulses. It identifies two separate events.

The first is when the CNC and all door controller real time clocks are synchronized to the PC internal clock by the 'clock sync' user command. The second is at midnight every day when the CNC sets up to synchronize all clocks in the network either immediately or at the next dial-up time.