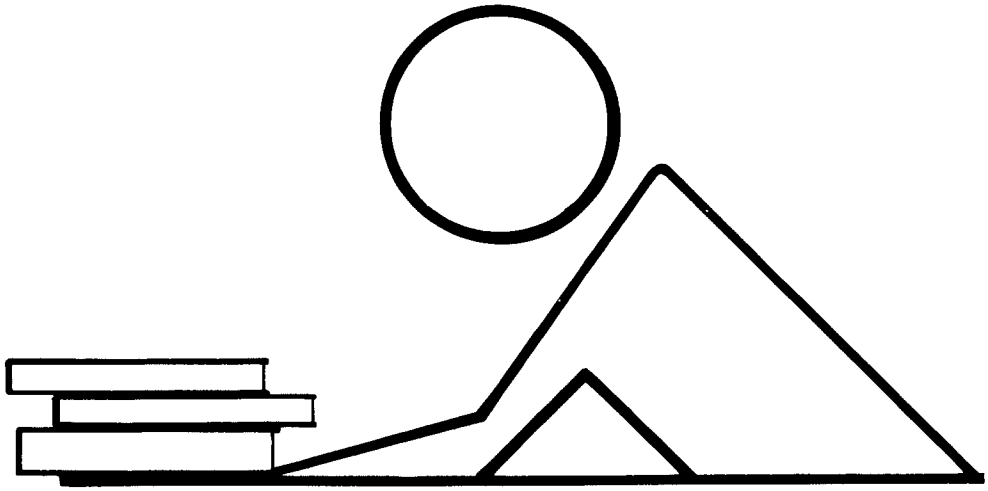
Simplex®

2001 Control Units Standard Packaging Concepts



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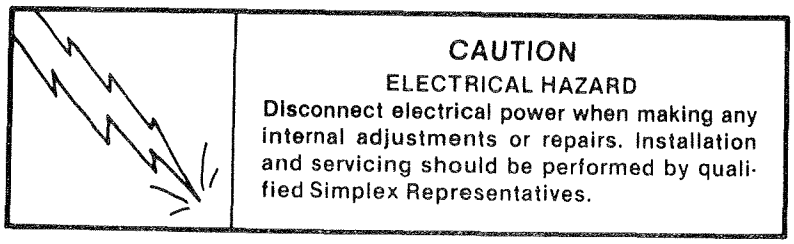


IDENTIFICATION

2001 Series

The numerical term "2001" does not refer to a system, but to a packaging concept. It refers to a method of arranging wiring, terminals, motherboards, and other such items that are hard-wired in a cabinet.

System Identification

Specific 2001 systems are designed by using various combinations of pluggable modules (daughter boards) along with the appropriate peripheral equipment.

Identification of particular system functions requires the addition of four other digits to the 2001 designation:

- 2001-8001 = Fire Alarm
- 2001-8002 = Security
- 2001-8003 = Telephone
- 2001-8004 = Voice
- 2001-8005 = Fire Alarm and Voice
- 2001-8006 = Fire Alarm, Telephone, and Voice
- 2001-8007 = Fire Alarm and Security
- 2001-8008 = Fire Alarm, Security and Voice
- 2001-8009 = Fire Alarm, Security, Telephone and voice
- 2001-8010 = Fire Alarm and Telephone

Publications

This manual will describe the packaging concepts of the 2001 Series equipment. Specific system functions (Fire Alarm, Security, etc.) and the individual daughter board circuits will be described in separate publications.

CONTROL CABINETS

Description

All control cabinets are equipped with an inner retainer panel which securely holds all modules in place. The retainer panel also allows convenient access to all switches and fuses while preventing access to circuits, exposed terminals and wiring. Sometimes this is referred to as "dead-front" construction. The panel also provides a decorative trimmed opening around each module grouping of eight.

All cabinets are equipped with a standard hinged outer door assembly which fastens over the inner retainer panel. The door comes furnished with a clear glass insert which allows all switches, fuses and lamps to be viewed easily yet are secured from tampering. The lock for this door, instead of being located on the front, is mounted out of sight on the edge of the door frame. The door is equipped with either a left or right hinge depending upon the cabinet position. A single cabinet installation normally has its hinge on the left and lock on the right as the viewer faces the cabinet. When two cabinets are joined side-by-side, as they do in some installations, there is one left-hand and one right-hand cabinet.

Figure 1 shows a six-unit cabinet. Other cabinet sizes that you might find at an installation are the two-unit and four-unit cabinets.

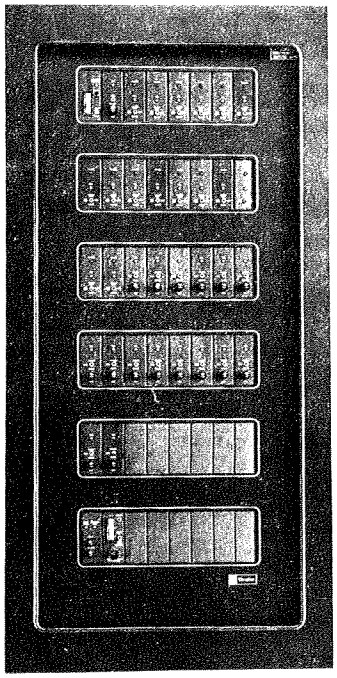


FIGURE 1

PC BOARDS

Daughter Boards

The 2001 consists mostly of pluggable, daughter board modules. These modules are the units which, together, determine the characteristics of any given control panel.

Refer to Fig. 2 insert.

When viewed from the front, the daughter board modules appear as black rectangles approximately 4.5 in. × 1.6 in. (11.4 cm × 4.0 cm) in size. These are plastic panels which contain all the lamps, switches, meters and fuses necessary to be viewed or operated during the normal functioning of the control.

Fastened to the back of each panel (and perpendicular to it) is a printed circuit board. These two pieces together form the complete module. These pluggable modules are held securely in sockets and guides. When there are not enough daughter boards to completely fill an area, blank panels are used.

Note: There are other modules, such as transformers and terminal units, which are not pluggable.

Motherboards

Refer to Fig. 2.

In order to provide a mechanically stable mounting base and a means of interconnecting the pluggable modules, a motherboard is provided with four 30-pin (15 on each side of a daughter board) sockets for holding the daughter boards. Each motherboard is a 4 in. × 8 in. (10.16 cm × 20.32 cm) printed circuit board acting as a bus. This provides a means of transmitting signals and power to and from the various daughter board modules plugged into it.

Motherboards are located behind a daughter board mounting rack and secured to a back plate. Depending upon requirements, one motherboard is mounted behind a half-rack capable of accepting four daughter cards. Two motherboards are mounted behind a rack capable of accepting eight daughter boards.

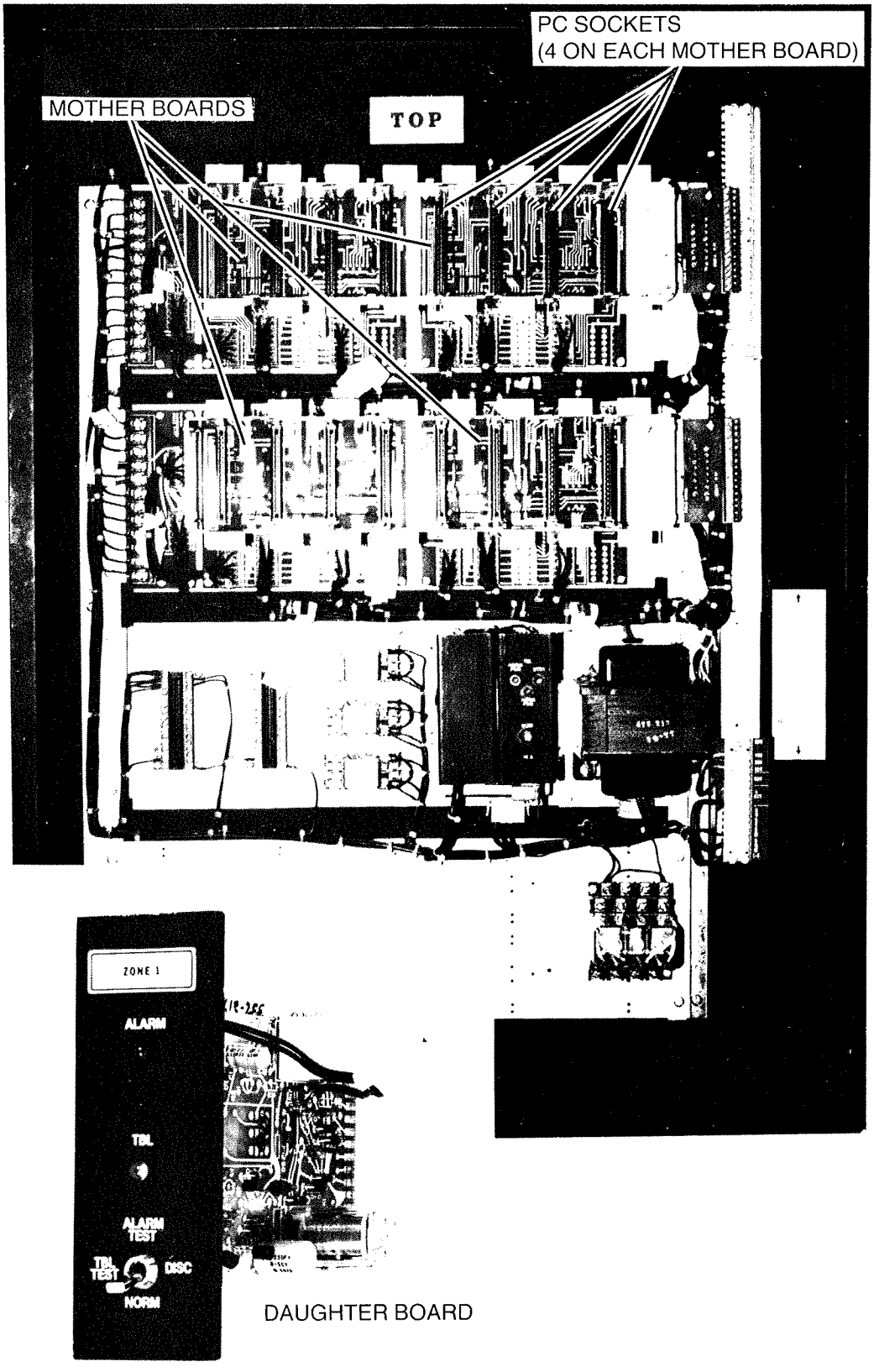

PC SOCKETS
(4 ON EACH MOTHER BOARD)
MOTHER BOARDS
TOP
ZONE 1
ALARM
TBL
ALARM TEST
TBL TEST
DISC
NORM
DAUGHTER BOARD

FIGURE 2

Introduction

There are two types of wiring connections in a 2001 system:

- Fixed or bussed wiring
- Custom wiring

All wiring from the motherboards is made through **plugs (sockets)** and **wiring harnesses** to other **plugs (sockets)** and **terminal strips.**

Sockets on the motherboard are designated A,B,C,D,F1,F2,F3 and F4.

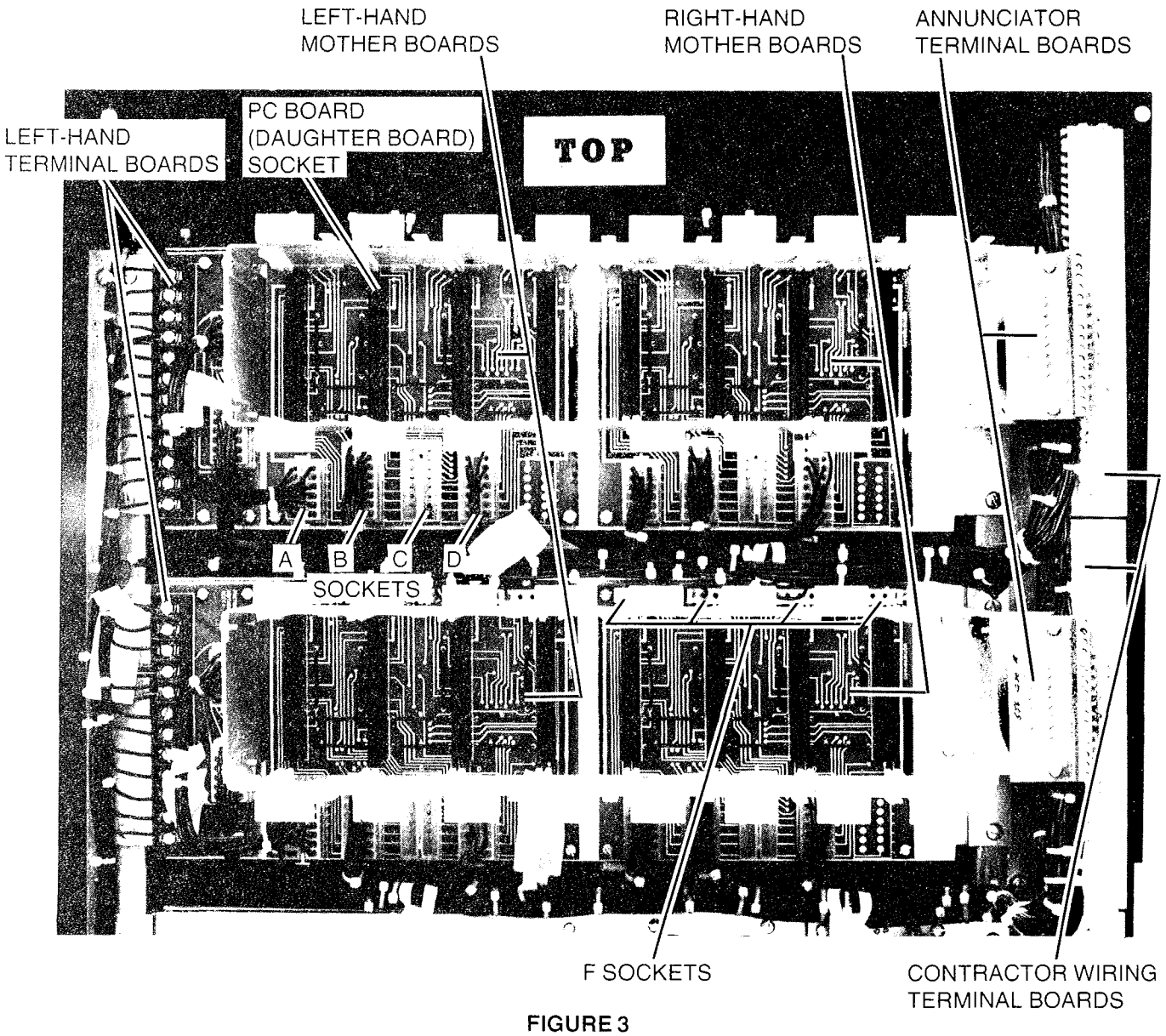


FIGURE 3

- Figure 4 shows the schematic wiring between **PC socket pins and other socket pins.**

  Example: At PC socket 1, pin 1 is connected to C16 (pin 16 of the C socket)

- Figure 5 shows the **socket locations** on the motherboard.

- Figure 6 shows the **pin designations for each socket** as viewed from the front of the motherboard.

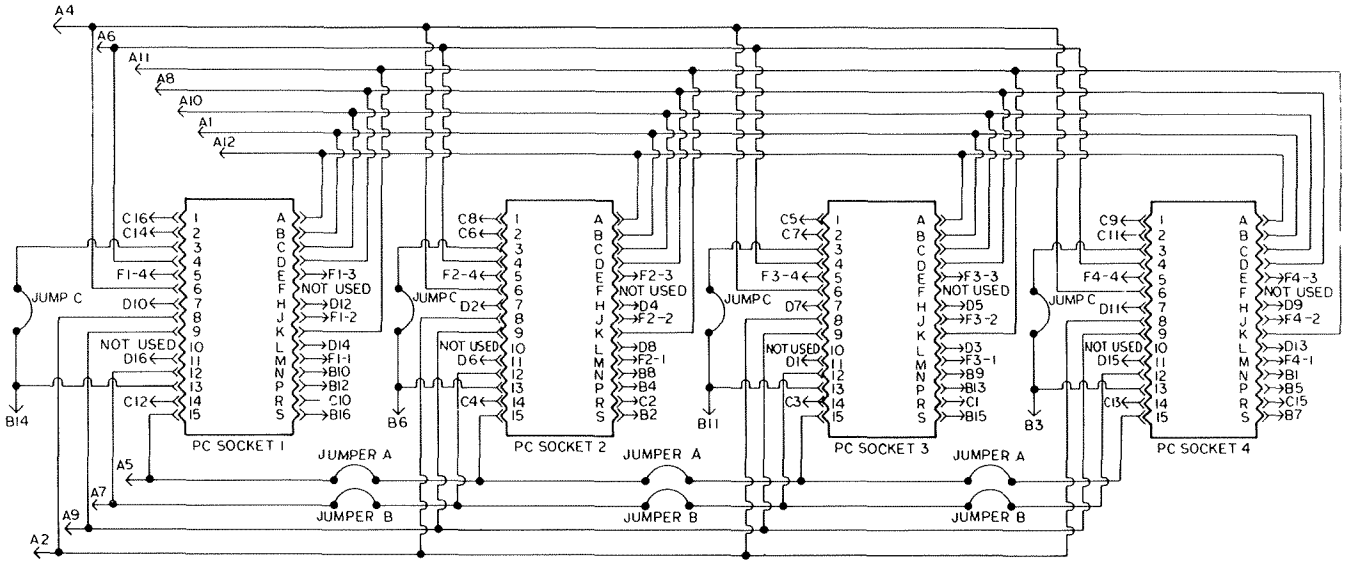


FIGURE 4

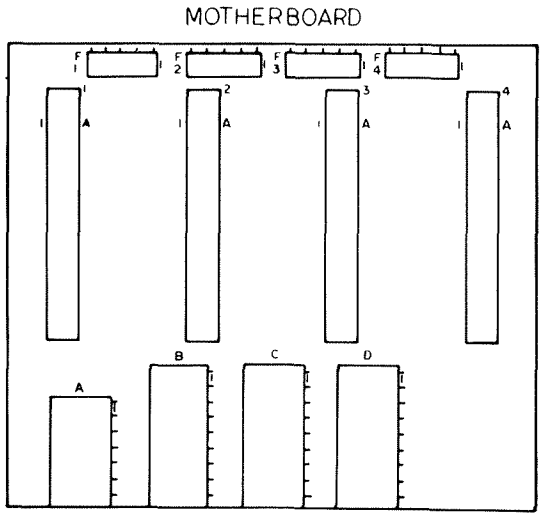


FIGURE 5

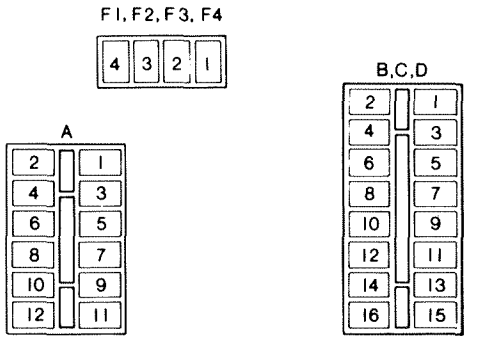


FIGURE 6

Bus Wiring (A Socket)

Eleven **etched busses** on each motherboard carry data that is common to all four daughter boards.

Figure 7 shows that these eleven busses are then connected to the **A socket** on the motherboard. The information is then further bussed by an eleven-wire **harness** to the terminal board located to the left of the motherboard.

Referring to Figure 4, notice designations A4, A6, A11, etc. These designations refer to pin numbers for the **A socket.** For example, A4 refers to pin 4 of the A socket.

Find the following pin designations on **PC socket 1** in Figure 4:

- 4
- 6
- 8
- 9
- 12
- 15
- A
- B
- C
- D
- K

Notice where the above **PC pins** connect:

- 4 to A6
- 6 to A4
- 8 to A2
- 9 to A9
- 12 to A7
- 15 to A5
- A to A12
- B to A1
- C to A10
- D to A8
- K to A11

Find the same **PC pins** (4 thru K) on **PC sockets** 2,3, and 4. Notice that they connect to the same place that **PC pins** on **PC socket** 1 are connected . . . to the same **A socket pins.**

Example: All daughter board PC pins 4 are connected by a motherboard etched bus to pin 6 of the A socket.

As an example of bussing, let's say that there is a signal at **PC pin** 6 of the daughter board at **PC socket** 1. This signal would be bussed by the motherboard not only to PC pin 6 of each of the other three daughter boards, but also to pin 4 of the **A socket.** From the **A socket,** the signal would be delivered by a bus wire to the **terminal board** located to the left of the motherboard.

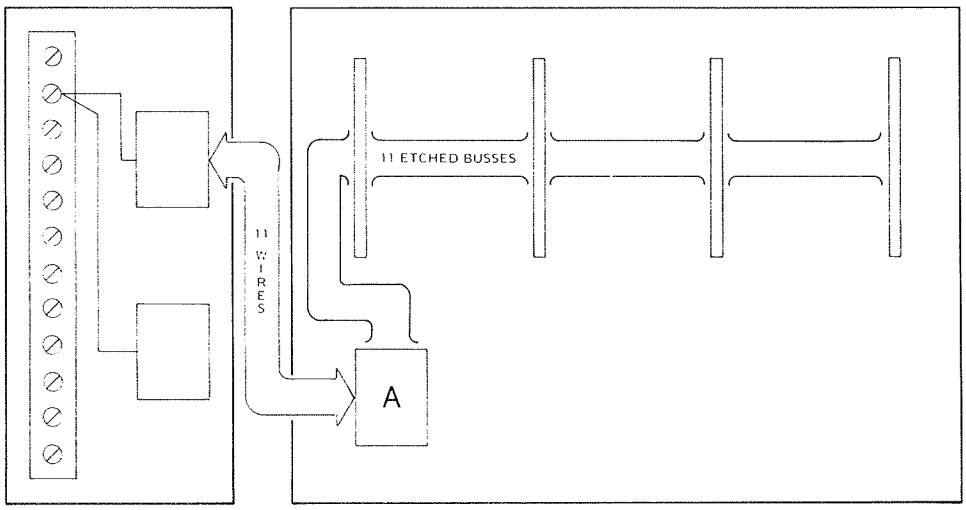


FIGURE 7

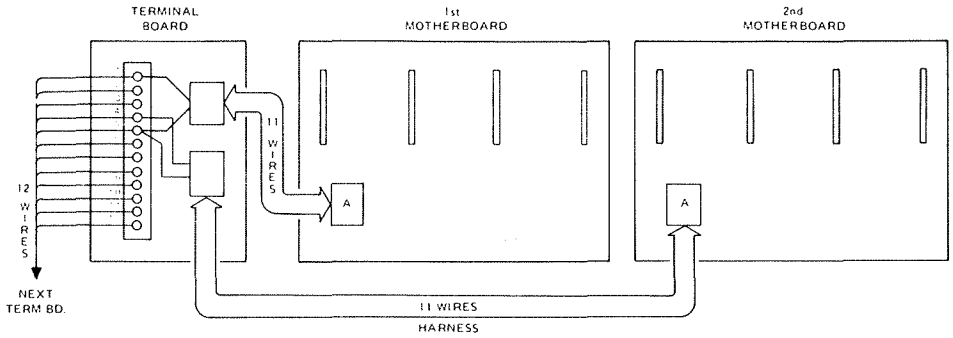


FIGURE 8

Refer to Figure 8.

Since a full rack unit (steel plate) can contain two motherboards, it is necessary that the bus lines on both motherboards be connected in parallel to keep the bus lines from each motherboard bussed throughout the system. This is done by connection to the **terminal strip.**

There is an exception, however, to this system bussing. The flexibility of this system allows for the possibility of motherboards having different voltages for signaling devices or other functions. This separation is accomplished by connecting the B bus on the first motherboard via its A socket to terminal 1 on the terminal strip, and connecting the B bus on the second motherboard via its A socket to terminal 4 on the terminal strip. All other motherboard busses are commonly connected.

The following chart shows the connection from the **PC boards** to the **terminal board** via the **A socket:**

PC Pin	A Socket Pin	Terminal No.
4	A6	6
6	A4	3
8	A2	2
9	A9	9
12	A7	7
15	A5	5
A	A12	12
B	A1	1 or 4
C	A10	10
D	A8	8
K	A11	11

Note: The system functions of the busses are identified in the system manuals. For example, the functions of these busses in the 2001-8001 are indicated in the chart on page 8 of the **2001 Circuit Analysis** publication.

The busses for the two motherboards on each rack are paralleled at their assigned terminal strip. Then, all terminal strips receiving these busses are paralleled together. In this way, all busses are kept common throughout the system. In other words, a signal at **PC pin** 6 of any daughter board module is bussed to **PC pin** 6 of every daughter board module in the system. Signals at other PC pins are bussed in the same manner.

Figure 8 shows that all twelve terminals on the terminal boards are connected to the next terminal strip. Remember, however, that the connections to terminals 1 and 4 (signal power) and terminal 5 (system common) are dependent on power requirements.

B Socket

Pins P, N, S and 13 of each daughter board are connected to the 16-pin **B socket.** (See Figures 3,4, and 9).

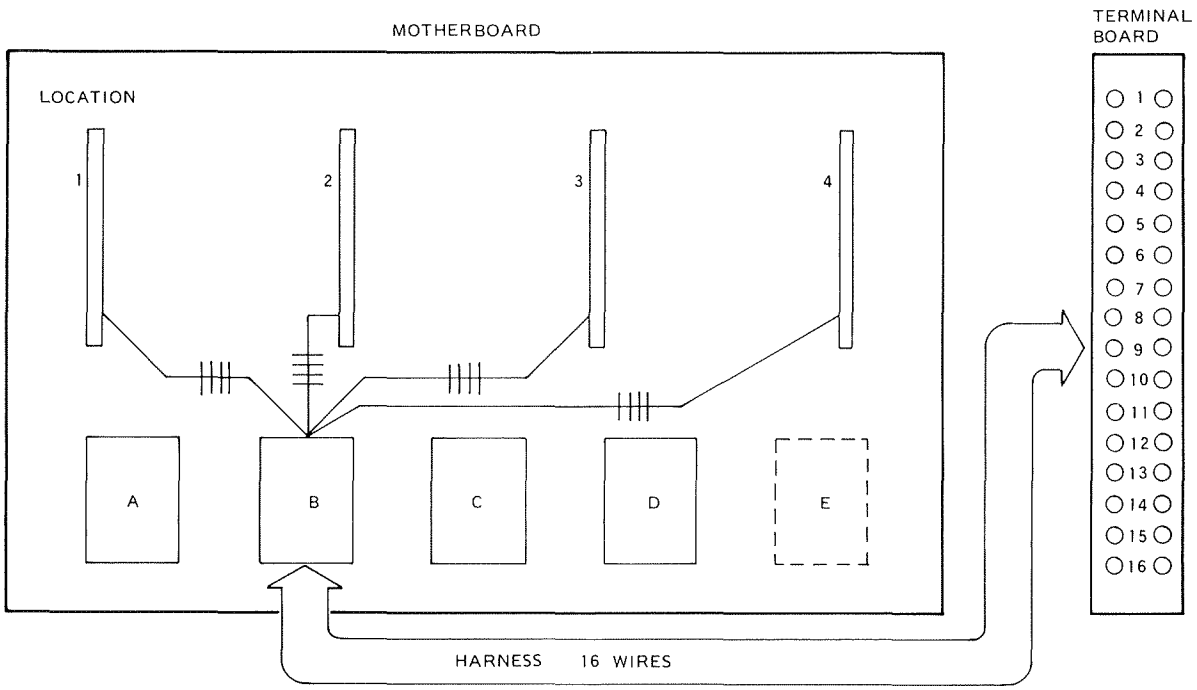


FIGURE 9

The **B socket** is then connected via a 16-wire **harness** to the **terminal board** on the right side of the motherboard. The left-hand motherboard is connected to the top right-hand terminal board. The right-hand motherboard is connected to the bottom right-hand terminal board.

These terminal boards are then connected to **contractor (building) wiring.** To find out where this contractor wiring goes, it is necessary to consult a system interconnect drawing and the corresponding M-drawing or M-8000 wiring diagram.

The following list shows the connections from the **PC boards** to the **terminal board** via the **B socket:**

PC Board Location	PC Pin	B Socket Pin	Terminal No.
1	P	B12	1
	N	B10	2
	S	B16	3
	13	B14	4
2	P	B 4	5
	N	B 8	6
	S	B 2	7
	13	B 6	8
3	P	B13	9
	N	B 9	10
	S	B15	11
	13	B11	12
4	P	B 5	13
	N	B 1	14
	S	B 7	15
	13	B 3	16

C Socket

Pins 1, 2, 14 and R of each daughter board are connected to the 16-pin **C socket.** (See Figs. 3, 4 and 5).

C socket wiring is used for auxiliary functions and may be connected to a **special auxiliary terminal block** or to other connection points within the control panel. When used, the auxiliary terminal block is often located between the right-hand motherboard and the contractor wiring terminal block.

To determine specific system wiring, consult the system interconnect drawing and wiring identification chart.

The following list shows the connections from the **PC boards** to the **terminal block** (when used) via the **C socket:**

PC Board Location	PC Pin	C Socket Pin	Terminal No.
1	1	C16	1
	2	C14	2
	14	C12	3
	R	C10	4
2	1	C 8	5
	2	C 6	6
	14	C 4	7
	R	C 2	8
3	1	C 5	9
	2	C 7	10
	14	C 3	11
	R	C 1	12
4	1	C 9	13
	2	C11	14
	14	C13	15
	R	C15	16

D Socket

Pins 11, H, L and 7 of each daughter board are connected to remote annunciator and printer wiring via the **D socket.** (See Figs. 3, 4 and 5).

Like the C socket, the harness from the D socket may go to an **annunciator terminal board, printer,** or various parts of the system internally, depending on system specs.

Always refer to the system interconnect drawing and wiring chart for information on where the wires terminate.

The following list shows the connections from the **PC boards** to the **annunciator terminal block** (when used) or **printer** via the **D socket:**

PC Board Location	PC Pin	D Socket Pin	Terminal No.
Left-Hand Motherboard			
1	11	D16	1
	H	D12	2
	L	D14	Printer
	7	D10	Printer
2	11	D 6	3
	H	D 4	4
	L	D 8	Printer
	7	D 2	Printer
3	11	D 1	5
	H	D 5	6
	L	D 3	Printer
	7	D 7	Printer
4	11	D15	7
	H	D 9	8
	L	D13	Printer
	7	D11	Printer
Right-Hand Motherboard			
1	11	D16	9
	H	D12	10
	L	D14	Printer
	7	D10	Printer
2	11	D 6	11
	H	D 4	12
	L	D 8	Printer
	7	D 2	Printer
3	11	D 1	13
	H	D 5	14
	L	D 3	Printer
	7	D 7	Printer
4	11	D15	15
	H	D 9	16
	L	D13	Printer
	7	D11	Printer

F Sockets

Pins M, J, E and 5 of each daughter board are connected to one of the **F sockets.** (See Figs. 3, 4 and 5).

The F sockets are used for **non-bussed** data not carried by the other sockets. The connections are often made between PC boards or between motherboards.

The wire identification chart with each system will need to be consulted for specific connections.

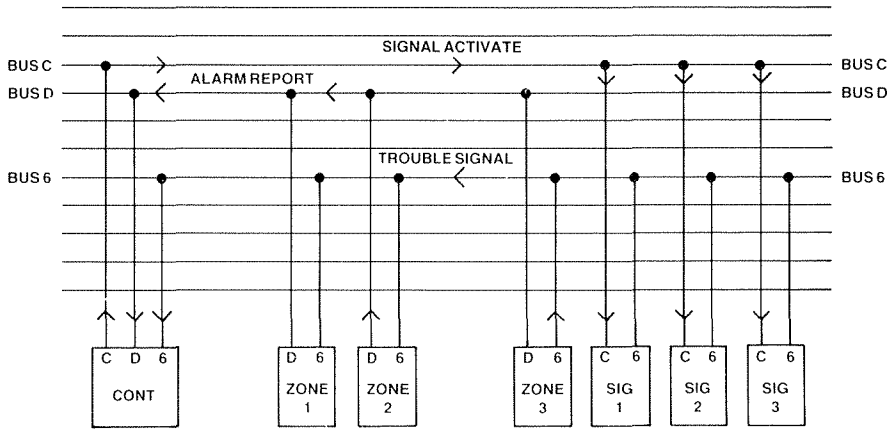
The following list shows the connections from the **PC boards** to the **F sockets:**

PC Board Location	PC Pin	F Socket	F Socket Pin
1	M	F1	1
	J	F1	2
	E	F1	3
	5	F1	4
2	M	F2	1
	J	F2	2
	E	F2	3
	5	F2	4
3	M	F3	1
	J	F3	2
	E	F3	3
	5	F3	4
4	M	F4	1
	J	F4	2
	E	F4	3
	5	F4	4

EXAMPLE OF SYSTEM BUSSING

Description

The diagram below shows seven daughter boards (requiring two motherboards) and the way they might be arranged in a fire alarm system.



Each daughter board would have eleven pins at which information would be bussed by eleven etched busses on each motherboard. Then, the motherboard busses are connected through their A plugs and the left-hand terminal block.

For illustrative purposes, the diagram simply shows the eleven busses for each group of modules as if they are connected together directly.

Remember however, that each motherboard may have different B bus voltages (as discussed on page 7).

Notice that a trouble occurring in the Zone 3 Module is reported out pin 6 of the module to pin 6 of the Control Module via bus 6.

Now notice what happens when an alarm is initiated in Zone 2, for instance. The alarm is reported out pin D of the Zone 2 Module to pin D of the Control Module via bus D. The Control Module processes this report and sends out an alarm command on pin C to pin C on each of the three Signal Modules via bus C.

You can see in this example how data is carried between modules by using system busses.

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