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# 53/63/64 INSTRUMENT SYSTEM

# GETTING STARTED

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# 53/63/64 INSTRUMENT SYSTEM

## GETTING STARTED


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# INTRODUCTION

The Getting Started Manual contains a separate section for each of the various 53/63/64 Series configured systems. The purpose of this manual is to provide the first-time user of a TSD system with an orderly procedure for bringing up the system. The procedures provided will enable the user to quickly assemble the various parts of the system and begin sending commands to the instrument function cards installed in the system.

Following the Getting Started section are manual sections for each of the parts of a 53/63/64 Series System. These manual sections contain detailed specifications and operating instructions for each component of a 53/63/64 Series System.

Service manuals on each component of a 53/63/64 Series System are also supplied in a separate set of binders.

The 53B System contains ten instrument slots and the 63B instrument contains five instrument slots. The 64B provides six instrument slots by eliminating the chaining slot. As a result, instrument systems that require a chaining slot (BTZ,ACX, MCX, and MPX) can not be used in 64B cage.

The BTZ is only available in the 53B configuration, which accommodates mounting the embedded PC-compatible in the rear of the cage. A brief description of the start-up procedure is outlined here, but it is recommended that you follow the detailed procedures listed in the Operating Manuals of these Instrument Systems.

Note that the ACX, MPX, and HAX are in limited demand. Consult TSD at 1-913-764-2542 for information on these or any of the other systems.

## 53B-BTZ

The left-most slot of the 53B Card Cage is the floppy disk slot, which has the red decal. The 53B-154 Comm/Chain Card has green ejectors and goes in the second slot from the left, which has a green decal. The 53A-171 Control Card has black ejectors and goes in the third slot from the let, which has a black decal.

Consult the 53B-BTZ Operating Manual for information on switch and jumper settings. Since the 53B-BTX computer and hard drive are shipped already installed, they are already configured.

1) Be sure power is off in the chassis.

2) Insert the Comm/Chain Card into the card guides and slide it in about half way.

3) Attach the ribbon cable to the connector on the lower front part of the card. Use a cable tie to fasten the ribbon cable to the tie base.

NOTE: The ribbon cable should be attached with the red wire toward the bottom the card.

4) Insert the card the rest of the way into the Comm/Chain slot.

5) Insert the 53A-171 Control Card into the control slot.

6) The 53B-BTZ requires that the video monitor be connected to the VIDEO connector on the butch plate of the 53B-BTZ. If the unit has an Option 31 LCD Display, follow the installation procedure listed below.

7) As shipped, an AT-compatible keyboard is required for an errorless power-up sequence. If the module is to be used without the keyboard, it must still be powered up the first time with a keyboard. Plug the keyboard cable into the butch plate connector labeled "KBRD". With a change in setup, the 53B-BTZ may subsequently be used without a keyboard.

If the System Controller is to be used without the keyboard, in a production test environment for example, use the Setup program described below to prevent the Ampro SSB386 from hanging up during boot-up when it detects that the keyboard is missing. The ERROR HALT field of the Setup menu may be scrolled to select NO HALT ON KEYBOARD. The Setup screen has instructions on how to change items. For CMOS memory screens, refer to the 53B-BTX manual for specific instructions.

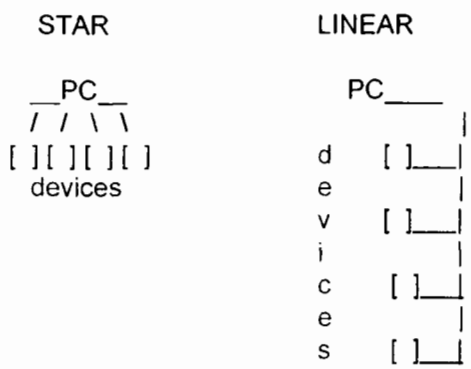
## Installing GPIB Cables on the Butch Plate

The 53B-BTZ uses connecting nuts with metric threads, in accordance with the IEEE 488-1978 standard. Any cables attached to the unit must have metric threads. Cables manufactured with English threaded screws typically have bright screws, and cables manufactured with metric threads typically have dark screws.

After the cable is installed, check to see that all devices on the GPIB have different addresses. Address assignments are usually made by setting a small group of switches near the device's GPIB connector. The device address of the IEEE-488 interface port is set under program control to any valid address (0 through 30, typically 0) by calling the INITIALIZE routine.

The IEEE-488 interface port is guaranteed to drive fifteen devices with a total cable length of 20 meters, or two meters times the number of devices, whichever is less. Longer cables will usually work but are not recommended.

A STAR cabling topology minimizes worst-case transmission path lengths but concentrates the system capacitance at a single node. A LINEAR cabling topology produces longer path lengths but distributes the capacitive load. Combinations of star and linear cabling configurations are also acceptable.




## Final Installation and Configuration

Turn on the card cage power and the video monitor power.

If the display is correct (legible), but an error message is displayed, check the system configuration by running the built-in Setup program. The CRT will display instructions for invoking Setup. When the 53B-BTZ boots up, it will be in the MS-DOS command mode. This is indicated by the requirements.

Consult the 53B-BTZ Operating Manual for information on installing Option 31-LCD Display, to various drivers, and/or an expansion card.

Consult individual function card Operating Manuals for a complete description of the commands used to program each card and the functions of the various LED indicators on each card.

## 53/63/64-IBX

The following represents an orderly procedure for bringing up your 53/63/64-IBX System:

1. Install the various function cards into the blue card cage slots of the 53/63/64-IBX Card Cage. As an addressing convention, it is recommended that the address Select switch on each card be set to the slot number in which the card is installed. Consult individual function card Operating Manuals for correct orientation of cards in the mainframe and for the settings of the various other switches on each card.

2. Install the 53A-171 Control Card in the black card cage slot after setting its Address Select switch. See the 53A-171 Operating Manual for instructions setting the Address Select switch. Be sure that the STEP/NORMAL switch is in the Normal position.

3. Next install the 53A-128 Communications Card in the green card slot. Before installing the Communications Card, use the four-position Rocker switch on the card to set the IEEE-488 bus TALK/LISTEN address of your IBM System. See the 53A-128 Manual for details on setting the Address Select Switch. If you plan to use the serial polling capability of your IBX System, set the Serial Polling response Switch as described in the 53A-128 Operating manual.

4. Use the TSD-supplied 53A-713, 53A-716, or 53A-717 Cable to connect the Front Edge Connector of the 53A-128 Communications Card to your IEEE-488 bus controller. Route the cable to the rear of the card cage cable tray.

5. Use the 53A-780 Hooded Connectors or pre-wired TSD data cables to route signals in and out of the various function cards installed in your system.

NOTE: If cables are being installed in a 63 Series System, consult the Cable Installation section of the card cage Operating Manual for instructions on removing the card cage top cover.

6. If one or more chained card cages (53/63/64-CCX's) are to be used with your IBX system (63B or 63B only), consult the 53/63/64-CCX section of this manual for instructions on interconnecting the card cages.

7. The System is now ready for operation. If the 53A-171 Card is set to Address 0 and the System contained a 53A-355 Relay switching Card with Address 3, sending @03C5 from your system controller to the IBX System would cause Relay 5 on the 53A-355 Card to close.

8. When the characters @03C5 are sent to the IBX System, the LEDs on the 53A-128, 53A-171, and 53A-355 Cards will go to the following states:

53A-128 Communications Card
LISTEN LED - lit, the 53A-128 Card is addressed to LISTEN.
POWER LED - flashes each time data is sent or received.

53A-171 Control Card
POWER LED - extinguished, the Control Card is addressed.

53A-355 Relay Switching Card
POWER LED - extinguished, the Relay Card is addressed.
RELAY LED 5 - lit, Relay 5 is closed.

9. Consult individual function card Operating Manuals for a complete description of the commands used to program each card and the functions of the various LED indicators on each card.

10. After power is applied to the System, the 53A-128 Communications Card will generate a service request (SRQ). The service request is caused by the power-up interrupt generated by the 53A-171 Control Card. The power-up interrupt is generated so that a user's system controller can easily determine if the IBX System has had an AC power failure since the last time the system controller communicated with it. The method used to clear the IBX power-up SRQ will depend on the setting of the SRQ Clear switch on the 53A-128 Communications Card. See the manual sections entitled SRQ Clear Switch and Service Request Line in the 53A-128 Operating Manual for specific Software programming details.

## 53/63/64-CCX

The following represents an orderly procedure for bringing up your 53/63/64-CCX System:

1. Install the various function cards into the blue card cage slots of the 53/63/64-CCX card cage. As an addressing convention, it is recommended that the Address Select switch on each card be set to the slot number in which the card is installed. Consult individual function card Operating Manuals for correct orientation of cards in the mainframe and for the settings of the various other switches on each card.

2. Install the 53A-171 Control Card in the black card cage slot after setting its Address Select switch. Each 53A-171 Control Card must have a unique address from all other 53A-171 Control Cards in a system. As an addressing convention, it is recommended that the control card in the first mainframe (IBX, MPX, RSX, PIX, ACX, or HAX) have its control card's Address Select switch set to an address of 0, the first CCX mainframe have its control card's address set to 1, the second CCX to 2, etc. See the 53A-171 Operating Manual for instructions on setting the Address Select switch. Be sure that the STEP/NORMAL switch is in the normal position.

3. Next install the 53A-123 Communications Card in the green card slot.

4. To chain the CCX mainframe to either an IBX, RSX, PCX, PIX, or HAX System, insert the 53A-145 Chaining Card in the red card cage slot (53B or 63B only) of the IBX, RSX, PCX, PIX, or HAX System. In n MPX System, the 53A-142 Memory/Chaining Card supplied with the MPX provides the chaining interface to the first CCX System. In an ACX System, the 53A-144 Disk Interface Chaining Card or the 53A-145 Chaining Card provide the chaining interface to the first CCX System.

5. Depending on the chaining card installed, use either the 53A-743 Chaining Cable (53A-145/142 Chaining cards) or 53A-758 Chaining Cable (53A-144 Chaining Card) as the connection between the chaining card in the ACX, MPX, IBX, RSX, PCX, PIX, or HAX Mainframe and the 53A-123 Communications Card in the first CCX Mainframe.

6. If additional CCX Mainframes are to be chained from the first CCX Mainframe, insert the supplied 53A-145 Chaining Card in the red slot of the first CCX Mainframe, and use the 53A-743 Chaining Cable as the connection between the 53A-145 Chaining Card in the first CCX Mainframe and the 53A-123 Communications Card in the second CCX Mainframe. Up to a total of nine CCX Mainframes can be chained together in this fashion.

7. The CCX Mainframe(s)are now ready for operation.

## 53/63/64-PCX

The following represents an orderly procedure for bringing up your 53/63/64-PIX System:

1. Install the various function cards into the blue card cage slots of the 53/63/64-PCX card cage. As an addressing convention, it is recommended that the Address Select switch on each card be set to the slot number in which the card is installed. Consult individual function card Operating Manuals for correct orientation of cards in the mainframe and for the settings of the various other switches on each card.

2. Install the 53A-171 Control Card in the black card cage slot after setting its Address Select switch. See the 53A-171 Operating Manual for instructions on setting the Address Select switch. Be sure that the STEP/NORMAL switch is in the original position.

3. Next install the 53A-128 Communications Card in the green card slot. Before installing the Communications Card, use the four-position Rocker switch on the card to set the IEEE-488 bus TALK/LISTEN address of your PCX System. In order to use the standard 53A-183 PC Software supplied with the PCX System, the address of the 53A-128 Communications Card must be set to decimal 24 (the factory-shipped address). See the 53A-128 Manual for details on setting the TALK/LISTEN Address switch. If you plan to use the serial polling capability of your PCX System, set the Serial Polling Response switch and the SRQ Clear Switch as described in the 53A-128 Operating Manual.

4. The 53A-903 I/O Card must be installed in the rear of your IBM PC or IBM PC-compatible computer. See the Installation section of the 53A-903 Operating Manual for detailed instructions on how to install the 53A-903 card.

5. Use the TSD-supplied 53A-713, 53A-7I6, or 53A-717 cable to connect the front edge connector of the 53A-128 Communications card to the 53A-903 I/O Card installed in your PC. Route the cable out the rear of the card cage using the card cage cable tray.

6. Use 53A-780 Hooded Connectors or pre-wired TSD data cables to route signals in and out of the various function cards installed in your system.

NOTE: If cables are being installed in a 63 Series System, consult the Cable installation section of the card cage Operating Manual for instructions on removing the card cage top cover.

7. If one or more chained card cages (53/63/64-CCX's) are to be used with your PCX system (53B or 63B only), consult the 53/63/64-CCX section of this manual for instructions on interconnecting the card cages.

8. The System is now ready for operation. Again consult the Installation section of the 53A-903 I/O card Operation Manual for details on how to install and use the TSD-supplied 53A-183 SOFTWARE to control your PCX System.

If the 53A-171 Card is set to address 0 and the system contained a 53A-355 Relay Switching Card with address 3, sending @03C5 from your system controller to the PCX System would cause relay 5 on the 53A-355 Card to close.

When the characters @03C5 are sent to the PCX System, the LEDs on the 53A-128, 53A-171, and 53A-355 Cards will go to the following known states:

53A-128 Communications Card
LISTEN LED - lit, the 53A-128 Card is addressed to LISTEN.
POWER LED - flashes each time data is sent or received.

53A-171 Control Card
POWER LED - extinguished, the Control Card is addressed.

53A-355 Relay Switching Card
POWER LED - extinguished, the Relay Card is addressed.
RELAY LED 5 - lit, relay 5 is closed.

9. Consult individual function card Operating Manuals for a complete description of the commands used to program each card and the functions of the various LED indicators on each card.

10. After power is applied to the system, the 53A-128 Communications Card will generate a service request (SRQ). The service request is caused by the power-up interrupt generated by the 53A-171 Control Card. The power-up interrupt is generated so that a user's system controller can easily determine if the PCX System has had an AC power failure since the last time the system controller communicated with it. The method used to clear the PCX power-up SRQ will depend on the setting of the SRQ Clear switch on the 53A-128 Communications Card. See the manual sections entitled SRQ CLEAR Switch and Service Request Line in the 53A-128 Operating Manual for specific software programming details.

# 53/63/64-RSX

The following represents an orderly procedure for bringing up your 53/63/64-RSX System:

1. Install the various function cards into the blue card cage slots of the 53/63/64-IBX card cage. As an addressing convention, it is recommended that the Address Select switch on each card be set to the slot number in which the card is installed. Consult individual function card Operating Manuals for correct orientation of cards in the mainframe and for the settings of the various other switches on each card.

2. Install the 53A-171 Control Card in the black card cage slot after setting its Address Select switch. See the 53A-171 Operating Manual for instructions on setting the Address Select switch. Be sure that the STEP/NORMAL switch is in the normal position.

3. The 53A-121 Communications Card should be installed next in the green card slot. Before installing the Communications Card, the various switches controlling data baud rate, data format, etc. and the RIC and RIL characters must be set. See the 53A-121 Operating Manual for switch locations, functions, and settings.

   A. Set the Parity, Format, Baud Rate and Echo switches on the 53A-121 Communications Card to agree with the options selected on the RS-232 device being used to control the 53/63/64-RSX System.

   B. After reading the Switches For Command Characters (RIC & RIL) paragraphs in the Description section of the 53A-121 Operating Manual, set the RIC and RIL switches to ASCII appropriate for your application.

4. Use the 53A-738 Data cable to connect the required signal lines from the 53A-121 Communications Card to the RS-232 device that will control the 53/63/64-RSX System. Route the cable out the rear of the card cage using the card cage cable tray. At a minimum the following signal lines must be connected:

| 53A-121 Signal Name | 53A-121 Front Edge Connector Pin Number | Connect To Controlling Device Signal |
|---|---|---|
| RS-232 Input Data | 20 | RS-232 Output Data |
| RS-232 Output Data | 19 | RS-232 Input Data |
| Signal Ground | X | Signal Ground |
| RS-232 53/63/4 System Busy | 17 | Data Set Ready (input to controlling device) |
| RS-232 System Controller Busy | 21 | Clear To Send (output from Controlling device) |

The wire colors associated with the various signals available at the user end of the 53A-738 Data Cable are given in the Signal Connections section of the 53A-121 Operating Manual.

5. Use the 53A-780 Hooded Connectors or pre-wired TSD data cables to route signals in and out of the various function cards installed your system.

NOTE If cables are being installed in a 63 Series System, consult the Cable Installation section of the card cage Operating Manual for instructions on removing the card cage top cover.

6. If one or more chained card cages (53/63/64-CC)'s) are to be used with your RSX System (53B or 63B only), consult the 53/63/64-CCX section of this manual for instructions on interconnecting the card cages.

7. The System is now ready for operation. If the 53A-171 Card is set to address 0 and the System contained a 53A-355 Relay Switching Card with address 3, sending @03C5 from your system controller to the RSX System would cause relay 5 on the 53A-355 Card to close.

   When the characters @03C5 are sent to the RSX System, the LEDs on the 53A-121, 53A-171, and 53A-355 Cards will go to the following known states:

53A-121 Communications Card
   INPUT/OUTPUT LED - out, the 53A-121 card is receiving output from the system controller.
   CONTROLLER BUSY - Out
   SYSTEM BUSY - Flashes when data is sent to the 53A-121.
   POWER LED - Flashes each time data is sent or received.

53A-171 Control Card
   POWER LED - extinguished, the Control Card is addressed.

53A-355 Relay Switching card
   POWER LED - extinguished, the Relay card is addressed.
   RELAY LED 5 - lit, relay 5 is closed.

8. Consult individual function card Operating Manuals for a completed description of the commands used to program each card and the functions of the various LED indicators on each card.

## 53/63/64-PIX

The following represents an orderly procedure for bringing up your 3/63/64-PIX System:

1. Install the various function cards into the blue card cage slots of the 3/63/64-PIX card cage. As an addressing convention, it is recommended that the Address Select switch on each card be set to the slot number in which the card is installed. Consult individual function card Operating Manuals for correct orientation of cards in the mainframe and for the settings of the various other switches on each card.

2. Install the 53A-171 Control Card in the black card cage slot after setting its Address Select switch. See the 53A-171 Operating Manual for instructions on setting the Address Select switch. Be sure that the STEP/NORMAL switch is in the normal position.

3. The 53A-129 Communications Card should be installed next in the green card slot.

4. Use the 53A-742 Data Cable to connect the required signal lines from the 53A-l29 Communications Card to the TTL I/O port on your system controller. Route the cable out the rear of the card cage using the card cage cable tray.

Consult the 53A-129 Communications Card Operating Manual for information on the required interface signals between the 53A-129 Communications Card and your controller's TTL I/O port.

5. Use 53A-780 Hooded Connectors or pre-wired TSD data cables to route signals in and out of the various function cards installed your system.

NOTE: If cables are being installed in a 63 Series System, consult the Cable Installation section of the card cage Operating Manual for instructions on removing the card cage top cover.

6. If one or more chained card cages (53/63/64-CCX's) are to be used with your PIX System (53B or 63B only), consult the 53/63/64-CCX section of this manual for instructions on interconnecting the card cages.

7. The system is now ready for operation. If the 53A-171 Card is set to address 0 and the system contained a 53A-355 Relay Switching Card with address 3, sending @03C5 from your system controller to the PIX System would cause relay 5 on the 53A-355 Card to close.

When the characters @03C5 are sent to the RSX System, the LEDs on the 53A-129, 53A-171, and 53A-355 Cards will go to the following known states:

53A-129 Communications Card
INPUT/OUTPUT LED - out, the 53A-129 Card is receiving output

53A-123 Communications Card
I/O LED - out, the 53A-123 Card is receiving data from the HP 1000.
POWER LED - flashes each time data is sent or received.

53A-171 Control Card
POWER LED - extinguished, the Control Card is addressed.

53A-355 Relay Switching Card
POWER LED - extinguished, the Relay Card is addressed.
RELAY LED 5 - lit, relay 5 is closed.

8. Consult individual function card Operating Manuals for a complete description of the commands used to program each card and the functions of the various LED indicators on each card.

## 53/63-ACX

To familiarize yourself with the ACX operation, it is recommended that the ACX first be operated in Unbuffered Mode using a CRT or other RS-232 keyboard/printer. The following represents an orderly procedure or Bringing up the system:

1. Install the various function cards into the blue card cage slots of the 53/63-ACX card cage. As an addressing convention, it is recommended that the Address Select switch on each card be set to the slot number in which the card is installed. Consult individual function card Operating Manuals for correct orientation of cards in the mainframe and for the settings of the various other switches on each card.

2. Install the 53A-171 Control Card in the black card cage slot after setting its Address Select switch. See the 53A-171 Operating Manual for instructions on setting the Address Select switch. Be sure that the STEP/NORMAL switch is in the normal position.

3. The 53A-130B Communications Card should be installed next in the green card slot. Before installing the Communications Card, the various switches controlling data baud rate, data format, etc. must be set. See the Hardware Description section in the ACX Operating Manual for switch locations and settings.

   A. Set the Communications Configuration switch on the 53A-130B Communications Card to agree with the options selected on your CRT. (See Table 2 in the ACX Operating Manual).

   B. Set the User-Interface Configuration switch for system address 0, ACX Self-test disabled, Expansion RAM Self-test disabled, Carrier Override disabled, BASIC Mode non-buffered and User IFC to SD0.

   C. Make sure that the RS-232C/RS-422 switch has all rockers closed in order to place the serial port in RS-232C mode.

D. Set the Option switch bank to Echo ON and Disk Interface to the position indicated in the ACX Manual.

E. Your terminal will be hooked up to Serial Device O.

4. Using either a 53A-761 Data Cable or a 53A-780 Hooded Connector, connect the following signal lines between the 53A-122 Communications Card and your terminal.

| Signal Name | 53A-130 Front Edge Connector Pin Number | Connect to Terminal |
|---|---|---|
| XMIT Data from ACX | Y | REC |
| REC Data into ACX | W | XMIT |
| Ground | 24 | Ground |

The wire colors associated with the various signals available at the user end of the 53A-761 Data Cable are given in the 53A-761 Operating Manual.

Your CRT may also require additional connections in the CRT connector, such as: Pin 4 to Pin 5 (CLEAR TO SEND tied to REQUEST TO SEND), and Pin 8 to Pin 20 (CARRIER DETECT tied to DATA TERMINAL READY).

5. Use 53A-780 Hooded Connectors or pre-wired TSD data cables to route signals in and out of the various function cards installed in your system.

NOTE: If cables are being installed in a 63 Series System, consult the Cable Installation section of the card cage Operating Manual for instructions on removing the card cage top cover.

6. If one or more chained card cages (53/63/64-CCX's) are to be used with your ACX System, use the 53A-743 Chaining Cable to connect either the 53A-145 Chaining Card or the 53A-145 Chaining Card or a 53A-758 Chaining Cable to connect the 53A-144 Disk Interface Chaining Card in your ACX card cage (53B or 63B only) to the 53A-123 Communications Card in your first chained card cage.

7. Place your terminal in the Full Duplex Mode of operation. (Failure to do so will result in double characters being printed on the terminal).

8. Power up the ACX System and any chained card cages. The ACX system will then give you a configuration message which describes the hardware environment of your system, the XYBASIC sign-on message and an available memory message followed by the XYBASIC prompt 'READY'. At this point the system is ready for operation and you may begin entering XYBASIC commands for a program.

NOTE: All character strings sent to the ACX from your terminal keyboard must be terminated by a carriage return or a line feed or both.

9. Now that you have the ACX up and running, consult the 53A-130B Operating Manual for information on XYBASIC programming of the ACX and individual function card manuals for the programming commands needed to operate specific function cards. The example BASIC program below shows how 53A-522 DMM Card would be programmed to DC volts, autorange; followed by taking a voltage reading from channel 4 of a 53A-332 Scanner Card. The example assumes that the Address switch on the 53A-171 Control Card has been set to 0 and that the addresses o the DMM and Scanner Cards are 1 and 2 respectively.

```
10 PRINT @BPI, "@024"      : REM CLOSE RELAY 4 ON 331 SCANNER CARD
10 PRINT @BPI, "@03F1A"    : REM SET 522 DMM FOR DC VOLTS, AUTORANGE
30 PRINT @BPI, "T"         :REM TRIGGER DMM MEASUREMENT
40 INPUT @BPI, RESULTS$    :REM FETCH RESULTS FROM 522 DMM CARD
50 PRINT RESULTS$          :REM PRINT THE RESULTS TO THE SCREEN
RUN
```

## 53/63-MPX

To familiarize yourself with the MPX operation, it is recommended that the MPX first be operated in Local Mode using a CRT or other RS-232 keyboard/printer. The following represents an orderly procedure for bringing the System up:

1. Install the various function cards into the blue card cage slots of the 53/63-MPX card cage. As an addressing convention, it is recommended that the Address Select switch on each card be set to the slot number in which the card is installed. Consult individual function card Operating Manuals for correct orientation of cards in the mainframe and for the settings of the various other switches on each card.

2 Install the 53A-171 Control Card in the black card cage slot after setting its Address Select switch. See the 53A-171 Operating Manual for instructions on setting the Address Select switch. Be sure that the STEP/NORMAL switch is in the normal position.

3. The 53A-122-Communications Card should be installed in the green card slot. Before installing the Communications Card, the various switches controlling data baud rate, data format, etc. must be set. See the Switch Layout section of the 53A-122 Operating Manual for a diagram of switch locations.

   A. Set the Communications Option switch on the 53A-122-communications Card to agree with the options selected on your terminal. (See 53A-181 Firmware Operating Manual, Table VI.)

   B. Set the Address Option switch on the 53A-I22 to address 0, Local Mode. (See 53A-181 Firmware Operating Manual, Table V.)

   C. Set the A and B Mode switches to Pos. 1 - Closed, 2 and 3 - Open. (See 53A-122 Communications Card Operating Manual, Mode switches.)

   D. Your terminal will be hooked up to I/O port 0; therefore, the A Baud Rate switch must be set to agree with the Baud Rate selected on your CRT. Use the X16 ratio when setting the Baud Rate. (See 53A-122 Communications Card Operating Manual, Baud Rate switches.)

4. Using either a 53A-750 Data Cable or a 53A-780 Hooded Connector, connect the following signal lines between the 53A-122 Communications Card and your terminal.

| Signal Name | 53A-122 Front Edge Connector Pin Number | Connect to Terminal |
|---|---|---|
| XMIT Data from MPX | 2 | REC |
| REC Data into MPX | 8 | XMIT |
| Ground | 6 | Ground |

To allow the 53A-122 Card to transmit data, you must jumper together the following three signals:

| Signal Name | 53A-122 Front Edge Connector Pin Number |
|---|---|
| Data Terminal Ready | 1 |
| Clear to Send | 11 |
| Data Carrier Detect | 13 |

A detailed description of all 53A-122 Communications Card Input and Output signals is given in the 53A-122 Operating Manual Section entitled Interfacing to the MPU Communications Card. The wire colors associated with the various signals available at the user end of the 53A-750 Data Cable are given in the 53A-750 Operating Manual.

Your terminal may also require additional connections, such as: Pin 4 to Pin 5 (CLEAR TO SEND tied to REQUEST TO SEND), and, Pin 8 to Pin 20 (CARRIER DETECT tied to DATA TERMINAL READY).

5. Use 53A-780 Hooded Connectors or pre-wired TSD data cables to route signals in and out of the various function cards installed in your system.

NOTE: If cables are being installed in a 63 Series System, consult the Cable Installation section of the card cage Operating Manual for instructions on removing the card cage top cover.

6. If one or more chained card cages (53/63/64-CC's) are to be used with your MPX System, use the 53A-743 Chaining Cable to connect the 53A-142 Chaining Card in your MPX card cage (53B or 63B only) and the 53A-123 Communications Card in your first chained card cage.

7. Place your terminal in the Half Duplex Mode of operation. (The 122 character echo feature was disabled in Step 3 when the Mode switch was set.)

8. Power up the MPX System and any chained card cages. Send the characters !0 followed by a carriage return from your terminal. The MPX will respond with 0*, indicating that it is now addressed and in the Executive Mode. The DS0 and DS1 LEDs will be lit on the 53A-122 Communications card (See 53A-181 Firmware Operating Manual, Table VII for a further description of the DS LEDs.) Each time a character is sent from the terminal to the MPX, the large Power LED on the 53A-122 Communications Card will blink indicating data is being received from the terminal.

NOTE: All character strings sent to the MPX from your terminal keyboard must be terminated by a carriage return.

9. To self-test the MPX System, send the word TEST to the MPX while it is still in the Executive Mode. The test results will be shown on your terminal per the TEST Command described in the 53A-181 Firmware Operating Manual.

10. To transfer the MPX to BASIC so that you can enter a BASIC program and run it send the command BASIC to the MPX. The MPX will respond with READY. To return to the Executive Mode from BASIC, send !0.

11. To connect your terminal directly to the TSD back plane in order to send commands to the system cards without running a BASIC program, use the DI0 command. For example, return to the Executive mode by sending !0, then send DI0#2.

If the 53A-171 Card is set to address 0 and the MPX contains a 53A-355 Card with address 3, sending @03C5 to the MPX would cause Relay 5 on the 53A-355 Card to close. To exit the DI0 Mode, again send !0. See the DI0 Command in 53A-181 Firmware Operating Manual for a further explanation of DI0.

12. Now that you have the MPX up and running, consult the 53A-181 Firmware Operating Manual or information on BASIC programming of the MPX and individual function card manuals for the programming commands needed to operate specific function cards.

## 53/63/64-HAX

The following represents an orderly procedure for bringing up your 53A/63A/64A-HAX System:

1. Install the various function cards into the blue card cage slots of the 53/63/64-HAX card cage. As an addressing convention, it is recommended that the Address Select switch on each card be set to the slot number in which the card is installed. Consult individual function card Operating Manuals for correct orientation of cards in the mainframe and for the settings of the various other switches on each card.

2. Install the 53A-171 Control Card in the black card cage slot after setting its Address Select switch. See the 53A-171 Operating Manual for instructions on setting the Address Select switch. Be sure that the STEP/NORMAL switch is in the Normal position.

3. Next install the 53A-123 Communications Card in the green card slot.

4. The 53A-902 I/O Card should next be installed in an I/O slot of the Hewlett Packard 1000(2IMX or 2100) computer. Before installing the card, set the Line Feed, Stop Character Enable and Stop Character Select switches per the instructions given in the 53A-902 Operating manual.

5. Use the TSD-supplied 53A-741 Cable to connect the front edge connector of the 53A-123 Communications Card to the front edge connector of the 53A-9O2 I/O Card. Route the cable out the rear of the card cage using the card cage cable tray.

6. Use 53A-780 Hooded Connectors or pre-wired TSD data cables to route signals in and out of the various function cards installed in your system.

NOTE: Cables are being installed in a 63 Series System, consult the Cable Installation section of the card cage Operating Manual for instructions on removing the card cage top cover.

7. Using HP 1000 Documentation, a system generation must be done in order to configure HP teletype driver into the HP 1000 Operating System or control of data transmission to and from the 53A-902 I/O Card. In an HP RTE operating system environment, driver DVROOO is normally used. If the standard HP teletype driver is to be modified, or a custom driver is to be written, see the section in the 53A-902 Operating Manual entitled Assembly Language Instructions.

8. The system is now ready for operation. If the 53A-171 card is set to address 0 and the system contained a 53A-355 Relay Switching Card with address 3, sending @03C5 from your system controller to the HAX System would cause relay 5 on the 53A-355 Card to close.

When the characters @03C5 are sent to the HAX System, the LEDs on the 53A-121, 53A-171, and 53A-355 Cards will go to the following known states:

53A-129 Communications Card
INPUT/OUTPUT LED - out, the 53A-129 Card is receiving output
POWER LED - flashed each time data is sent or received.

53A-171 Control Card
POWER LED - extinguished, the Control Card is addressed.

53A-355 Relay Switching Card

POWER LED - extinguished, the Relay Card is addressed.
RELAY LED 5 - lit, relay 5 is closed.

9. Consult individual function card Operating Manuals for a complete description of the commands used to program each card and the functions of the various LED indicators on each card.

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