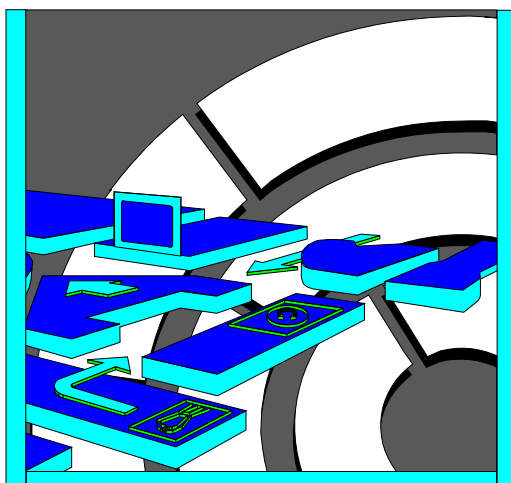


IBM 7526 Data Collection Terminal Installation, Operation, and Problem Determination

SC28-9627-01





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Second Edition (January 1993)

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Safety Information

CAUTION:

This product is equipped with a 3-wire power cord and plug for the user's safety. Use this cordset in conjunction with a properly grounded electrical outlet to avoid electric shock. For details of the specific power cordset supplied in your country, see Appendix B, "Power Cords" on page B-1.

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Safety Information

Sikkerhetsinformasjon

Turvaohjeet

Sikkerhedsforskrifter

Sicherheitsinformationen

Informazioni di sicurezza

Säkerhetsföreskrifter

Información de Seguridad

Indicações de segurança

Consignes de sécurité

Veiligheidsvoorschriften

CAUTION

Do not dispose in fire or incinerator.

ADVARSEL

Må ikke udsættes for varme eller åben ild.

WAARSCHUWING

Ne pas jeter au feu or incinerer. Niet in het vuur of een verbrandingsoven werpen.

ATTENTION !

Ne pas jeter au feu ni incinérer.

VAROITUS

Älä hävitä polttamalla äläkä vie jätteidenpolttouuniin.

ACHTUNG

Batterie als Sondermüll entsorgen und keinesfalls verbrennen.

ATTENZIONE

Non eliminare la batteria mediante incenerimento.

ADVARSEL

Får ej brännas.

CUIDADO

Não queime nem incinere quando deitar fora.

Varning:

Må ikke brennes eller kastes i et destruksjonsverk.

PRECAUCION

No exponer al fuego ni incinerar. **CAUTION**

This product is equipped with a 3-wire power cord and plug for the user's safety. Use this cord in conjunction with a properly grounded electrical outlet to avoid electric shock.

See Appendix B, "Power Cords" for details of the specific power cord set supplied in your country.

ADVARSEL

Dette produkt er af sikkerhedsmæssige årsager forsynet med en 3-polet netledning og stik. Dette skal tilsluttes en forskriftsmæssigt jordforbundet stikkontakt for at undgå elektrisk stød.

Se Appendix B, "Power Cords," hvori der er yderligere oplysninger om den type netledning m.m., som anvendes i Danmark.

WAARSCHUWING

Dit produkt is uit veiligheidsoverwegingen voorzien van een drie-aderig netsnoer met randaardestekker. Gebruik dit snoer in combinatie met een stopcontact met randaarde.

In Appendix B, "Power Cords" vindt u informatie over het netsnoer dat in Nederland wordt geleverd.

ATTENTION!

Pour votre sécurité, cet appareil est équipé d'un cordon d'alimentation et d'une prise de raccordement à trois fils. Afin d'éviter tout risque de choc électrique, cette prise doit être connectée à une prise d'alimentation correctement câblée et mise à la terre.

Reportez-vous à l'annexe Appendix B, "Power Cords" pour identifier avec précision le cordon livré dans votre pays et connaître ses spécifications.

VAROITUS

Laitteen virheetön ja turvallinen toiminta vaatii, että se kytketään vain maadoitettuun pistorasiaan tätä tarkoitusta varten toimitetulla verkkojohdolla.

Katso englanninkielisen julkaisun kohtaa Appendix B, "Power Cords," jossa on lisätietoja maassasi toimitettavan verkkojohdon kokoonpanosta. Tämän kohdan sisältämä varoitus on myös käännettynä jäljempänä.

ACHTUNG

Netzkabel und Netzstecker dieses Gerätes entsprechen den einschlägigen Sicherheitsbestimmungen. Dieses Gerät darf nur an eine Schutzkontaktsteckdose mit ordnungsgemäßer Schutzleiterverbindung angeschlossen werden.

Weitere Informationen über die in Deutschland erhältlichen Netzkabel sind dem Appendix B, "Power Cords" zu entnehmen. **ATTENZIONE**

Il prodotto è fornito di cavo di alimentazione trifilare e di una spina con spinotto di terra. Per evitare pericolose scosse elettriche utilizzare tale cavo con una presa di corrente munita di alveolo correttamente collegato alla terra di sicurezza.

ADVARSEL

Av sikkerhetsmessige grunner er dette apparatet utstyrt med en trelederkabel og plugg. Kabelen må brukes med en korrekt jordet stikkontakt for å unngå elektrisk støt.

Du finner spesielle detaljer om nettkablene i landet ditt i Appendix B, "Power Cords."

CUIDADO

Para segurança do utilizador, este produto está equipado com um cabo de corrente eléctrica e uma ficha com 3 fios. Utilize este cabo em conjunto com uma tomada com boa ligação de terra para evitar choques eléctricos.

Consulte o Appendix B, "Power Cords" para obter detalhes sobre o conjunto específico de cabos de corrente eléctrica fornecido no seu país.

VARNING

Risk för personskada

Den här produkten är av säkerhetsskäl utrustad med en jordad nätkabel. Anslut endast till ett korrekt kopplat jordat eluttag.

PRECAUCION

Este producto está equipado con un cable de alimentación de tres hilos y un enchufe para seguridad del usuario. Utilice este cable conjuntamente con una toma de alimentación eléctrica correctamente conectada a tierra para evitar descargas eléctricas.

Vea Appendix B, "Power Cords" para detalles sobre el conjunto específico de cables de alimentación suministrado en su país.

CAUTION

The lithium battery presents a fire, explosion, or severe burn risk. Do not recharge it, remove its polarized connector, disassemble it, heat it above 100 C (212 F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. When replacing the battery, use only Part No. 04G5389. Use of another battery could result in ignition or explosion of the battery. Replacement batteries can be ordered from IBM or IBM Authorized Dealers.

ADVARSEL

Litiumbatteriet kan forårsage brand, eksplosion eller alvorlige brandsår. Det må ikke genoplades, åbnes, udsættes for mere end 100 grader C, brændes eller komme i berøring med vand. Desuden må man ikke fjerne forbindelsesstikket fra det. Litiumbatteriet destrueres som foreskrevet af myndighederne. Ved udskiftning af litiumbatteriet anvendes partnummer 04G5389. Brug af andre former for batterier kan medføre, at batteriet brænder eller eksploderer. Nye batterier bestilles gennem IBM eller IBM-forhandleren.

WAARSCHUWING

De lithiumbatterij kan brand- en explosiegevaarlijk zijn. De batterij mag niet worden opgeladen, gedemonteerd, verbrand of boven 100°C worden verhit. Laat de inhoud niet in aanraking komen met water en verwijder de gepolariseerde aansluiting niet. Bescherm het milieu; lever oude batterijen in bij inzamelpunten. Gebruik ter vervanging uitsluitend batterijen met bestelnummer 04G5389. Gebruik van andere batterijen kan leiden tot ontbranding of explosie. Nieuwe batterijen kunnen worden besteld bij IBM of geautoriseerde IBM-dealers.

ATTENTION !

Prenez garde aux risques d'incendie, d'explosion et de brûlures graves liés à l'utilisation d'une pile au lithium. Ne rechargez pas la pile, n'en retirez pas le connecteur et ne la démontez pas. Ne la chauffez pas au-delà de 100°C (212°F) et n'en exposez pas le contenu à l'eau. Détruisez-la conformément à la réglementation en vigueur. Si vous la remplacez, commandez une pile de rechange sous la référence 04G5389 : toute autre pile risquerait de prendre feu ou d'exploser. Les piles de rechange peuvent être obtenues auprès d'IBM ou d'un distributeur agréé IBM.

VAROITUS

Litiumparisto voi syttyä tuleen, räjähtää tai aiheuttaa vakavia palovammoja. Ölä koskaan lataa paristoa uudelleen, irrota pariston polarisoitua liitintä, pura paristoa, kuumenna paristoa yli 100°C lämpötilaan, polta paristoa tai päästä vettä pariston sisään. Hävitä paristo paikallisten määräysten mukaisesti. Vaihda pariston tilalle ainoastaan tuote 04G5389. Muun pariston käyttö voi johtaa sen syttymiseen tai räjähtämiseen. Vaihtoparistoja voi tilata IBM:stä tai valtuutetulta IBM-jälleenmyyjältä.

ACHTUNG

Lithiumbatterien sind feuergefährlich, explosiv und können schwere Verätzungen verursachen. Bei Außerbetriebsetzen (Verschrotten) des Gerätes örtliche Entsorgungsrichtlinien für Sondermüll beachten. Die Batterie darf nicht mit Wasser in Berührung gebracht, über 100 Grad erhitzt, wieder aufgeladen, repariert oder zerlegt werden. Eine verbrauchte Batterie nur durch eine Batterie mit der Teilenummer 04G5389 ersetzen. Andere Batterien können sich entzünden oder explodieren. Ersatzbatterien können von IBM oder einem IBM Vertragshändler bezogen werden.

ATTENZIONE

La batteria al litio può incendiarsi, esplodere o procurare serie bruciature. Evitare di ricaricarla, toglierle il connettore polarizzato, smontarla, riscaldarla ad una temperatura superiore ai 100 gradi centigradi, incendiarla o gettarla in acqua. Per eliminarla seguire le procedure di sicurezza aziendali e quanto stabilito dal DPR 915 del 10-9-82 e successive disposizioni. Sostituire solo con la parte IBM N. 04G5389. L'uso di una diversa batteria potrebbe provocare incendi o esplosioni. Ordinare le batterie all'IBM o ai rivenditori autorizzati.

ADVARSEL

På grunn av brann- og eksplosjonsfare må ikke litiumsbatterier lades opp, taes fra hverandre, brennes eller utsettes for sterk varme over 100°C. Ikke fjern de polariserte tilkoblingene eller utsett batteriene for vann. Brukte batterier bør kastes så raskt som mulig og i henhold til gjeldende forskrifter. Bruk bare batterier med delnummer 04G5389 når du bytter batteri. Bruk av feil batteri kan føre til at batteriet antennes eller eksploderer. Nye batterier kan bestilles fra autoriserte IBM PC-forhandlere.

CUIDADO

A pilha de lítio representa um risco de incêndio, explosão ou de graves queimaduras. Não a recarregue, remova o conector polarizado, desmonte, aqueça acima de 100°C (212°F), queime ou molhe o conteúdo da célula. Destrua a pilha de acordo com os regulamentos locais. Quando substituir a pilha, utilize apenas a peça com o número de referência 04G5389. A utilização de qualquer outra pilha poderá ocasionar auto-ignição ou explosão da pilha. Podem ser encomendadas pilhas sobresselentes à IBM ou aos seus Concessionários Autorizados.

VARNING:

Litiumbatterier kan explodera eller börja brinna. Ladda inte upp det, ta inte bort dess polariserade anslutningar, upphetta det inte över 100°C, ta inte isär det och utsätt inte batteriets cellinnehåll för vatten. Om du ska byta batteriet ska du byta till ett batteri med beställningsnummer 04G5389. Om du använder något annat batteri kan det antändas eller explodera. Beställ batterier från IBM eller från en av IBM auktoriserad återförsäljare.

PRECAUCION

La batería de litio representa un peligro de incendio, explosión o de graves quemaduras. No la recargue, quite su conector polarizado, desmonte, caliente a más de 100°C (212°F), la incinere o someta su contenido al agua.

Deshágase de la batería según los reglamentos u ordenanzas locales. Utilice como recambio sólo el número de pieza No. 04G5389. La utilización de otra batería podría provocar su deflagración o explosión. Las baterías de recambio pueden pedirse a IBM o a Concesionarios Autorizados IBM.

About This Book

Purpose and Audience

This manual gives you instructions for installing and setting up (configuring) the 7526. It also gives you non-program specific operator information, including a description of all controls, displays, and connectors on the 7526. In addition, this manual gives easy-to-follow Problem Determination Procedures (PDPs), which will allow you to trouble-shoot any hardware malfunction to the level of user-replaceable components.

This manual is intended for use by trained installation personnel, as well as by operators and operator supervisors. While some of the installation procedures in this manual should not be attempted by persons who have not had suitable training, every attempt was made to make the information and procedures clear enough for the novice to understand and follow.

How To Use This Manual

The information and procedures in this manual are arranged to help you locate and understand them. This manual is divided into five chapters and four appendixes:

- Chapter 1 contains complete procedures for the installation technician to use when:
 - Preparing the terminal for installation
 - Installing optional features within the terminal
 - Mounting accessories on the terminal
 - Mounting the terminal.
- Chapter 2 contains non-program specific descriptions of the functions of all controls, displays, indicators, and connectors on the 7526 terminal and the power module.
- Chapter 3 contains the procedure for entering parameters into the terminal's memory. These parameters determine specific aspects of the terminal's operation.
- Chapter 4 contains non-program specific descriptions of the operation of the 7526 terminal, the power module, and supported accessories (slot readers and wands).
- Chapter 5 contains Problem Determination Procedures (PDPs), which will allow you to trouble-shoot any hardware malfunction to the level of user-replaceable components.
- Appendix A contains the procedure for erasing the current security password. This information is intended for use when access to the keylock mode is necessary, but the current security password is not available.
- Appendix B contains part numbers and information about the power supply cordsets that are available.
- Appendix C contains a mounting hole template and related mounting information for the optional communications line attachment box.

Related Publications

- *IBM 7526 Data Collection Terminal
Hardware Information and Site Preparation*
- *IBM 7526 Data Collection Terminal
Maintenance Information*
- *IBM 7526 Data Collection Terminal
Programming Technical Reference*

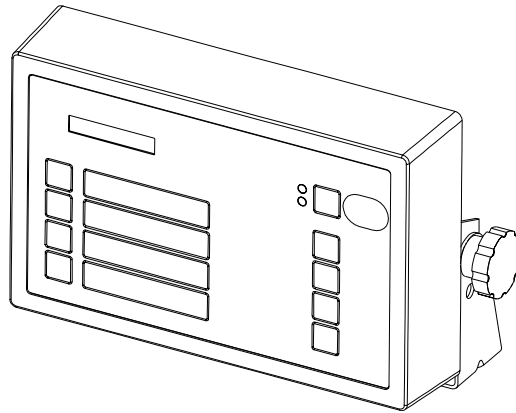
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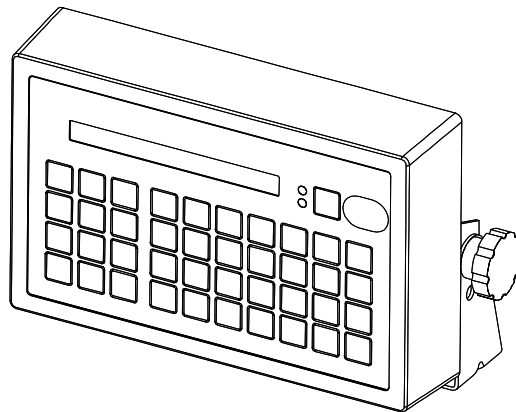
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IBM 7526 Data Collection Terminal Model 100



IBM 7526 Data Collection Terminal Model 200

Chapter 1. Installation Procedures

This chapter contains the installation procedures for the IBM 7526 Data Collection Terminal. It includes:

- General notes about prior site preparation and cable protection
- Installing the memory retention battery¹
- Installing optional features within the terminal
- Mounting accessories on the terminal
- Installing the terminal.

Procedures are given for installing the 7526 terminal using the standard mounting bracket and for using an optional mounting enclosure (not available from IBM).

All procedures are arranged in the order in which they should be performed if you are installing a new system. Thus, if you are installing all new hardware, you should begin on this page and follow the procedures as they are presented. Skip any procedures that do not apply to your particular installation.

You may also use individual sections of these instructions to install new features on an already-installed terminal.

General Installation Notes

Site Preparation Prior to Installation

The 7526 terminal may be mounted to any flat surface with the use of its mounting bracket, which is included as a standard feature. If desired, the terminal may be secured within any one of a variety of suitable enclosures (not available from IBM).

If possible, you should plan and prepare the mounting location in advance, using the instructions provided in the *7526 Hardware Information and Site Preparation* manual to pre-drill any required mounting holes. (For your convenience, site preparation information for the 7526 terminal is presented in the procedures given in this chapter.) When making your plans, be sure to allow enough room around the terminal for all sensors (bar code and magnetic wands and slot readers) that are to be attached or mounted nearby, and for easy operation of all functions.

Protection of Cables

Upon completion of installation, all cables that are connected to the terminal must be secured by the two screws on their connectors. Also, the cables must not be exposed to rough edges or sharp bends that might cause cable damage. If the terminal and/or power supply module are mounted in an electrical enclosure (not available from IBM), all cables that enter the enclosure must be protected by rubber grommets. If a slot reader is installed, you should capture the slot reader cable

¹ All 7526s are shipped from IBM with the memory retention battery installed and ready for use. This procedure is included in this chapter in case the battery has been removed or in case you need to replace the battery.

between the terminal and the mounting area to protect the cable and for a neater appearance.

Processor Board Component Locations

Use the following figure to locate all processor board components and connectors that are mentioned in these instructions.

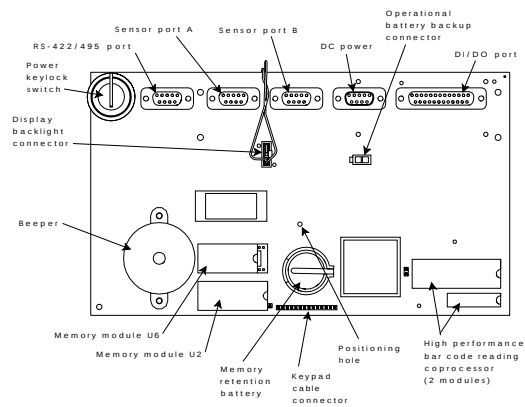


Figure 1-1. Processor board components

Installing the Memory Retention Battery

(All 7526s are shipped from IBM with the memory retention battery installed and ready for use. Thus, if you are installing a new 7526, you should skip this procedure.)

Use this procedure only if you are installing a 7526 that might have had its memory retention battery removed, or if you are replacing the memory retention battery.

CAUTION:

The lithium battery presents a fire, explosion, or severe burn risk. Do not recharge it, disassemble it, heat it above 100°C (212°F), incinerate it, or expose its cell contents to water. Dispose of the battery as required by local ordinances or regulations. When replacing the battery, use only Part No. 04G5389. Use of another battery could result in ignition or explosion of the battery. Replacement batteries can be ordered from IBM or IBM Authorized Dealers.

Refer to Figure 1-1 on page 1-2 for the location of the memory retention battery, and use the following procedure.

Warning:

Whenever handling the electronic components of the 7526, use precautions to prevent component damage due to electrostatic discharge. Before handling electronic components, touch a grounded metal surface to discharge any static buildup.

1. Turn the 7526 terminal over, so that the keyboard faces down. (Use the packing material as a cushion to prevent machine damage.)
2. Remove the four screws from the cabinet's bottom cover — one screw near each corner.
3. The cabinet may now be opened. Lift the bottom cover (metal backplate) off the top cover, and lay it aside.

Note: If an optional Operational Battery Backup Feature is already installed, disconnect the battery cable at the processor board by squeezing its retaining tab slightly and lifting it up. (The connector and cable end are keyed to assure correct replacement.)

4. Visually confirm that the memory retention battery is installed in its holder. If no battery is installed, install one by sliding it into its holder under the retaining tab, with its larger diameter (+ pole) toward the retaining tab. Be sure to use only the correct battery, Part No. 04G5389.
5. If you are going to install any optional internal features, such as:
 - Operational Battery Backup Feature
 - Keypad labels
 - Expansion memory
 - High Performance Bar Code Reading Coprocessor

leave the terminal apart for now and go to the next procedure. (You will be instructed later to reassemble the terminal.)

If you are not going to install any internal features, go directly to "Reassembling the Terminal" on page 1-13.

Installing Optional Features within the Terminal

This section describes the installation of all available internal optional features for the 7526 terminal. This includes:

- Operational Battery Backup Feature
- Keypad labels
- Expansion memory modules
- High Performance Bar Code Reading Coprocessor.

If none of these features is to be installed, go to “Reassembling the Terminal” on page 1-13.

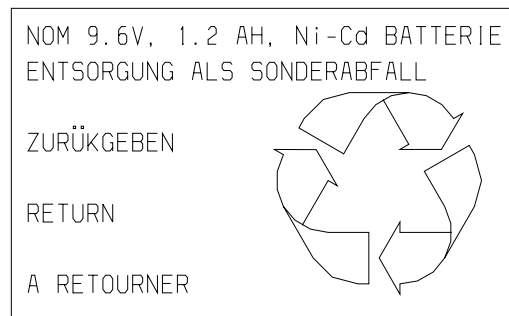
Installing an Optional Operational Battery Backup Feature

(If you are not installing an optional Operational Battery Backup Feature, you should skip this procedure.)

The optional Operational Battery Backup Feature is a rechargeable nickel-cadmium (nicad) battery that is plugged into a socket on the processor board. This battery is attached to the inside of the metal backplate by a hook-and-loop strip. If this feature is to be installed, you must open the terminal to install it. Use the following procedure. (Refer to Figure 1-1 on page 1-2 for locations.)

CAUTION:

Do not dispose in fire or incinerator.



Warning:

Whenever handling the electronic components of the 7526, use precautions to prevent component damage due to electrostatic discharge. Before handling electronic components, touch a grounded metal surface to discharge any static buildup.

Note: If the terminal is already open from the previous procedure, begin at Step 4.

1. Turn the 7526 terminal over, so that the keyboard faces down. (Use the packing material as a cushion to prevent machine damage.)
2. Remove the four screws from the cabinet's bottom cover — one screw near each corner.
3. The cabinet may now be opened. Lift the bottom cover (metal backplate) off the top cover.
4. The battery comes with both sides of a hook-and-loop strip fastener. Peel off the throw-away liner of the hook-and-loop strip.

5. Attach the battery to the recess on the inside of the backplate with the cable coming out on the side of the connector holes, as shown in the following figure. (Do not connect the battery cable at this time; you will be instructed to do so later.)

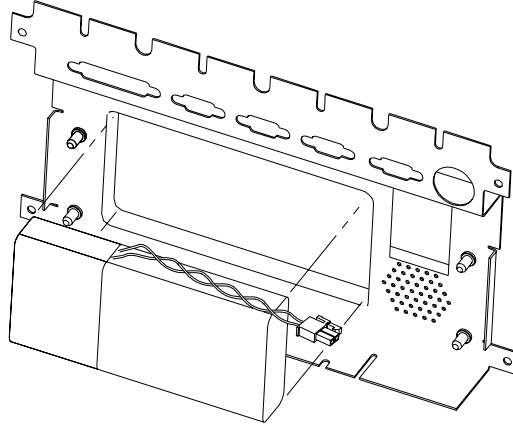


Figure 1-2. Installing the Operational Battery Backup Feature

6. If you are going to install any other internal feature (keypad label, expansion memory or the High Performance Bar Code Reading Coprocessor), leave the terminal apart for now and go to the next procedure. (You will be instructed later to reassemble the terminal.)

If you are not going to install any other internal feature, go directly to "Reassembling the Terminal" on page 1-13.

Important:

The battery requires 24 hours to fully recharge. It will recharge as long as the 7526 is plugged into its ac power source, even if the keyswitch is in the off position.

Installing Optional Keypad Labels

(If no optional keypad labels are to be installed, you should skip this procedure.)

If any optional optional keypad labels are to be installed, you must open the terminal to install them. Use the following procedure.

Warning:

Whenever handling the electronic components of the 7526, use precautions to prevent component damage due to electrostatic discharge. Before handling electronic components, touch a grounded metal surface to discharge any static buildup.

Note: If the terminal is already open from a previous procedure, begin at Step 4.

1. Turn the 7526 terminal over, so that the keyboard faces down. (Use the packing material as a cushion to prevent machine damage.)
2. Remove the four screws from the cabinet's bottom cover — one screw near each corner.
3. The cabinet may now be opened. Lift the bottom cover (metal backplate) off the top cover, and lay it aside.

Note: If an optional Operational Battery Backup Feature is already installed, disconnect the battery cable at the processor board by squeezing its retaining tab slightly and lifting it up. (The connector and cable end are keyed to assure correct replacement.)

4. Grasping the keypad ribbon cable **by its connector**, disconnect the cable from the processor board. (Do not pull on the ribbon cable itself.)
5. Grasping the processor board by one or more connectors, lift it out of the cabinet, while pivoting it up so as to clear the two plastic retaining tabs.
6. Lay the processor board just removed on a flat surface, with the display side down. (For maximum protection to the processor board components, lay the board on a thick book or some other flat object with the signal LEDs and display off the edge of the object.)
7. With the graphics of the keypad label insert facing toward you, fold the top area *backward* and crease the label material 15mm down from the top. (This dimension assumes that the labels are designed in accordance with the dimensions given in the appendix of the *7526 Hardware Information and Site Preparation* manual.) The national language keypad insert features offered by IBM are marked with a dashed line at the location where the fold should be made.
8. Insert the keypad label insert into the appropriate slotted holes in the inside of the cabinet top. Angle the tip of the insert toward the bottom of the terminal as it is being inserted.

There are ten slots on the 7526 Model 200 (one for each column of keys), and three slots on the 7526 Model 100 (one for each column of keys, and one large area for function key labeling). A large slotted hole in the case is used to insert the function key label on a Model 100, or several of the individual key labels on the Model 200. Markings on the molded case indicate the locations of the insert pockets based on the model. Use them to aim the insert into the pocket.

The national language keypad label features offered by IBM are marked at the top of each piece with a letter (A–J) followed by a number (100 or 200). The letter refers to the column in which the label is to be inserted, and the number indicates the 7526 model for which the label is intended. From the *rear* of the terminal, the key labeling columns are identified from *right* to *left* as columns A and B on the Model 100, and A through J on the Model 200. Match the label letter and number to the slots as they are inserted.

9. Slide the labels down into place so that they correctly align behind the key buttons. If the label binds as it is being inserted, back it out slightly and straighten it, and then resume pushing it down into the pocket.
10. If you are going to install any other internal feature (expansion memory or the High Performance Bar Code Reading Coprocessor), leave the terminal apart for now and go to the next procedure. (You will be instructed later to reassemble the terminal.)

If you are not going to install any other internal feature, go directly to “Reassembling the Terminal” on page 1-13.

Installing Optional Expansion Memory

(If no optional expansion memory is to be installed, you should skip this procedure.)

Both models of the 7526 have two memory module sockets on the processor board.

- **The 7526 Model 100** comes with one 32K-byte memory module in the first socket (U6). One 128K-byte memory module may be plugged into the second socket (U2), for a total of 160K-bytes. In addition, the 32K-byte memory module in the first socket may be replaced with a second 128K-byte module, for a total of 256K-bytes.
- **The 7526 Model 200** comes with one 128K-byte memory module in the first socket (U6). A second 128K-byte memory module may be plugged into the second socket (U2), for a total of 256K-bytes.

If optional memory is to be installed, you must open the terminal to install it. Refer to Figure 1-1 on page 1-2 for the location of the memory modules, and use the following procedure.

Warning:

Whenever handling the electronic components of the 7526, use precautions to prevent component damage due to electrostatic discharge. Before handling electronic components, touch a grounded metal surface to discharge any static buildup.

Note: If the terminal is already open from a previous procedure, begin at Step 4, or at Step 7 if the processor board is already removed.

1. Turn the 7526 terminal over, so that the keyboard faces down. (Use the packing material as a cushion to prevent machine damage.)
2. Remove the four screws from the cabinet's bottom cover — one screw near each corner.
3. The cabinet may now be opened. Lift the bottom cover (metal backplate) off the top cover, and lay it aside.

Note: If an optional Operational Battery Backup Feature is already installed, disconnect the battery cable at the processor board by squeezing its retaining tab slightly and lifting it up. (The connector and cable end are keyed to assure correct replacement.)

4. Grasping the keypad ribbon cable **by its connector**, disconnect the cable from the processor board. (Do not pull on the ribbon cable itself.)
5. Grasping the processor board by one or more connectors, lift it out of the cabinet, while pivoting it up so as to clear the two plastic retaining tabs.
6. Lay the processor board just removed on a flat surface, with the display side down. (For maximum protection to the processor board components, lay the board on a thick book or some other flat object with the signal LEDs and display off the edge of the object.)
7. Referring to Figure 1-1 on page 1-2, locate the module socket(s) to be filled by the new memory module(s).

8. If a 32Kb memory module is to be removed, use a module removal/installation tool if available. Otherwise, use a small flat-bladed screwdriver to pry up the module.

Note: Be sure to place the screwdriver between the module and its socket (not under the socket). Pry up first at one end, and then at the other end.

WARNING

In the following steps, avoid needlessly touching the module pins, due to the possibility of damage from electrostatic discharge. Also, because the module pins are easily bent, perform these steps with extreme care. If the module pins are formed too far outward or inward for easy installation, press the entire row of pins against a flat surface to bend them uniformly so that they can be inserted more easily.

9. Carefully insert the module to be installed in its socket with its notch pointing away from the beeper.
10. Press the module down, seating it into the socket. (Be sure to support the other side of the processor board firmly to prevent damaging it.)
11. Inspect the new module closely to ensure that none of its pins were bent during installation.
12. After completion and reassembly of the terminal, power on the terminal to verify that the correct memory size is shown at the end of power-on self test (POST). If the correct memory size is not shown at the end of POST,
 - a. Verify that all memory modules are installed with their notched end pointed in the same direction as other modules on the board (away from the beeper).
 - b. Verify that all pins have fully seated into the sockets
 - c. Verify that 128Kb modules (32 pins) fill the entire socket, and that 32Kb modules (28 pins) are bottom-justified (with four vacant pin sockets at the notched end).

Correct any errors in installation and re-run the POST. If no errors are found and the problem is not remedied, then call for service and report this symptom.

13. If you are going to install another internal feature (the High Performance Bar Code Reading Coprocessor), leave the terminal apart for now and go to the next procedure. (You will be instructed later to reassemble the terminal.)

If you are not going to install any other internal feature, go directly to "Reassembling the Terminal" on page 1-13.

Installing an Optional High Performance Bar Code Reading Coprocessor

(If you are not installing an optional High Performance Bar Code Reading Coprocessor you should skip this procedure.)

The optional High Performance Bar Code Reading Coprocessor feature is comprised of two different-sized modules that are plugged into sockets on the processor board.

Important:

If the High Performance Bar Code Reading Coprocessor feature is installed, only bar code devices may be used on sensor port A. A magnetic slot reader or wand cannot be used on sensor port A.

If this feature is to be installed, you must open the terminal to install it. Refer to Figure 1-1 on page 1-2 for the location of the High Performance Bar Code Reading Coprocessor modules, and use the following procedure.

Warning:

Whenever handling the electronic components of the 7526, use precautions to prevent component damage due to electrostatic discharge. Before handling electronic components, touch a grounded metal surface to discharge any static buildup.

Note: If the terminal is already open from a previous procedure, begin at Step 4, or at Step 7 if the processor board is already removed.

1. Turn the 7526 terminal over, so that the keyboard faces down. (Use the packing material as a cushion to prevent machine damage.)
2. Remove the four screws from the cabinet's bottom cover — one screw near each corner.
3. The cabinet may now be opened. Lift the bottom cover (metal backplate) off the top cover, and lay it aside.

Note: If an optional Operational Battery Backup Feature is already installed, disconnect the battery cable at the processor board by squeezing its retaining tab slightly and lifting it up. (The connector and cable end are keyed to assure correct replacement.)

4. Grasping the keypad ribbon cable **by its connector**, disconnect the cable from the processor board. (Do not pull on the ribbon cable itself.)
5. Grasping the processor board by one or more connectors, lift it out of the cabinet, while pivoting it up so as to clear the two plastic retaining tabs.
6. Lay the processor board just removed on a flat surface, with the display side down. (For maximum protection to the processor board components, lay the board on a thick book or some other flat object with the signal LEDs and display off the edge of the object.)
7. Referring to Figure 1-1 on page 1-2, locate the two empty sockets to be filled by the High Performance Bar Code Reading Coprocessor modules.

8. Note the position of the other modules' notches; that is, pointing away from the beeper. The High Performance Bar Code Reading Coprocessor modules must be installed in the same position.

WARNING

In the following steps, avoid needlessly touching the module pins, due to the possibility of damage from electrostatic discharge. Also, because the module pins are easily bent, perform these steps with extreme care. If the module pins are formed too far outward or inward for easy installation, press the entire row of pins against a flat surface to bend them uniformly so that they can be inserted more easily.

9. One at a time, carefully insert the modules to be installed in their respective sockets with their notches pointing away from the beeper.
10. Press the modules down, seating them into their sockets. (Be sure to support the other side of the processor board firmly to prevent damaging it.)
11. Inspect the new modules closely to ensure that none of their pins were bent during installation.
12. After completion and reassembly of the terminal, power on the terminal to verify that the message "COPROC" is shown at the end of POST. If that message is not shown at the end of POST,
 - a. Verify notched end of both coprocessor modules are pointed in same direction as other modules on the board (away from the beeper).
 - b. Verify that all pins have fully seated into the sockets
 - c. Verify that the modules fill their entire socketCorrect any errors in installation and re-run the power-on self test. If no installation errors are found, then call for service and report this symptom.
13. Leave the terminal apart for now, and go to the next procedure. (You will be instructed later to reassemble the terminal.)

Reassembling the Terminal

1. Lay the terminal cabinet face down on a flat surface.

Note: If the processor board has not been removed from the cabinet, you should skip to Step 4.

2. Grasping the processor board by its connectors, place it under the two retaining tabs in the cabinet, and pivot it down into place.
3. Reconnect the keypad ribbon cable to the processor board.
4. (The cabinet top has two locating pins for positioning the processor board. The main locating pin's hole is near the center of the processor board, close to the memory retention battery. The other pin's hole is near the keylock switch.)

Move the processor board around until it is properly positioned by the main locating pin, and then align the board parallel to the sides of the cabinet until the second locating pin is seated.

5. If an optional Operational Battery Backup Feature is installed in the metal backplate, connect the battery cable to the processor board. (Refer to Figure 1-1 on page 1-2 for the location of the connector.) The connector and cable end are keyed to assure correct replacement.
6. Carefully position the backplate onto the cabinet so that its flange is inserted between the cabinet inner wall and the keypad ribbon cable.

Warning:

Do not crease or otherwise damage the keypad ribbon cable.

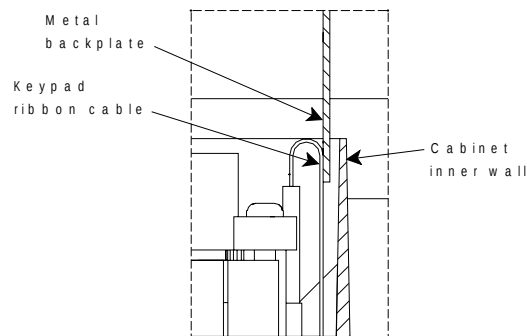


Figure 1-3. Installing the metal backplate

7. Reinstall the four screws that secure the backplate to the cabinet. (There is one screw near each corner of the metal backplate.)

Mounting Sensor Features (Slot Readers and Wands)

Up to two sensor features, such as slot readers and wands, may be connected to the 7526. The sensor features may both be either bar code readers or magnetic readers, or they can be one of each type of reader.

Important:

If the High Performance Bar Code Reading Coprocessor feature is installed, only bar code devices may be used on sensor port A. A magnetic slot reader or wand cannot be used on sensor port A.

Sensor features can be mounted to the underside of the terminal, or they can be mounted on any nearby flat surface. When they are to be mounted to the underside of the terminal, it is usually necessary to mount them onto the terminal before the terminal itself is mounted. The following procedures give instructions for installing these devices.

Note: All cables that are connected to the terminal must be secured by the two screws on their connectors. Also, the cables must not be exposed to rough edges or sharp bends that might cause cable damage. If the terminal and/or power supply module are mounted in an electrical enclosure (not available from IBM), all cables that enter the enclosure must be protected by rubber grommets.

The following figure shows a typical 7526 configuration, with a slot reader on one side and a wand on the other side.

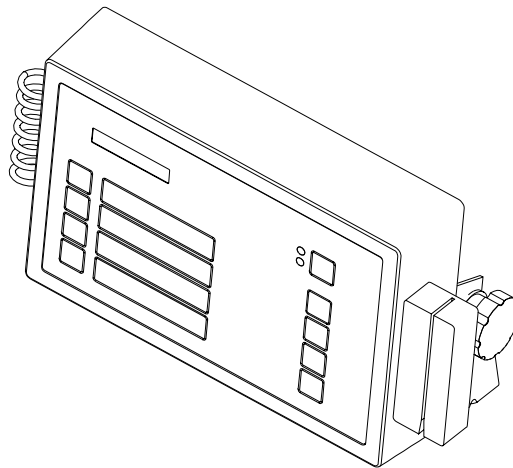


Figure 1-4. Typical 7526 configuration

Bar Code Wand

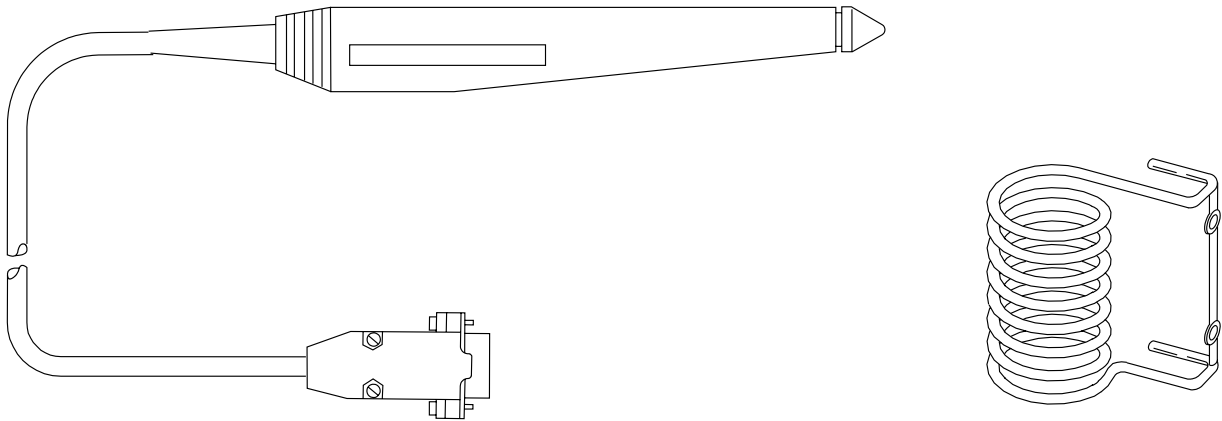


Figure 1-5. Bar code wand and mounting

1. Insert the two prongs of the bar code reader wand holder into the pair of holes on either side of the terminal. Use the side that provides the best position for wand operation.
2. Secure the wand holder to the terminal with the two screws provided.
3. When installation of the terminal is completed, connect the wand cable to the terminal at sensor port A or B, and place the wand in the holder.

Magnetic Wand

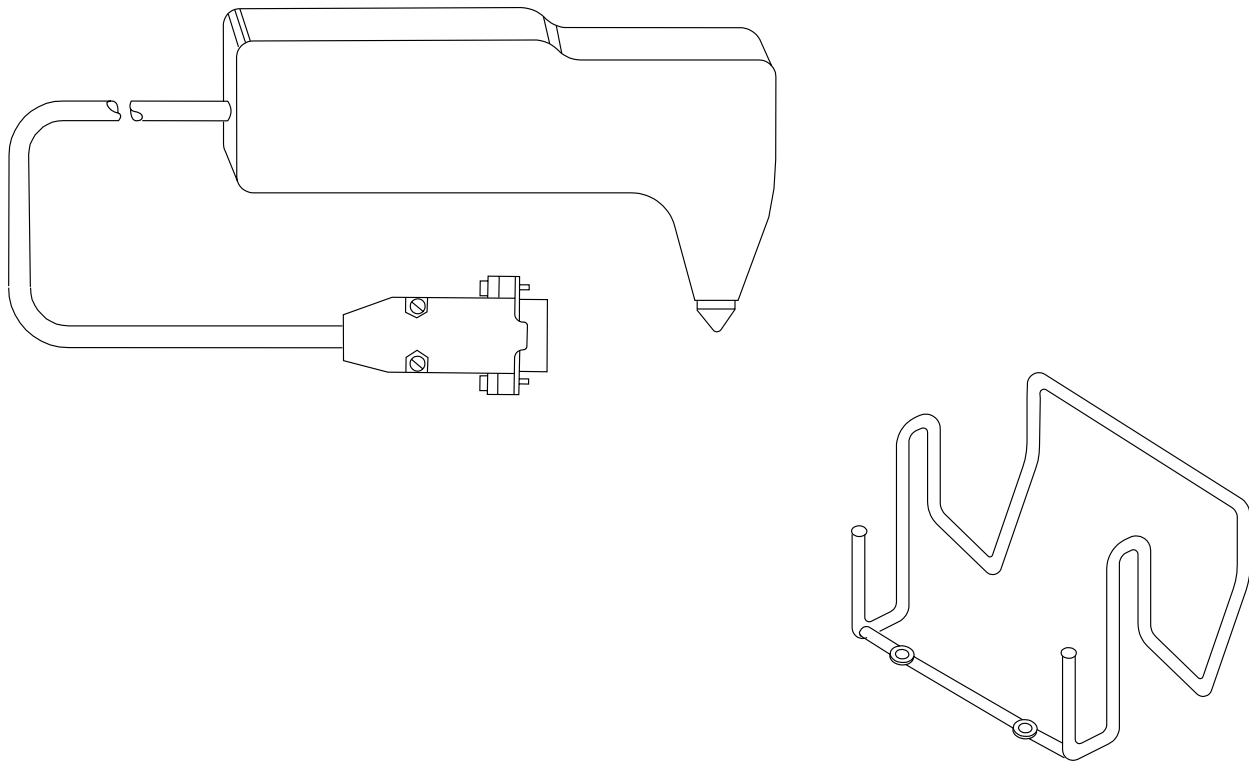


Figure 1-6. Magnetic wand and mounting

1. Insert the two prongs of the magnetic reader wand holder into the pair of holes on either side of the terminal. Use the side that provides the best position for wand operation.
2. Secure the wand holder to the terminal with the two screws provided.
3. When installation of the terminal is completed, connect the wand cable to the terminal at sensor port A or B, and place the wand in the holder.

Magnetic Document Slot Reader

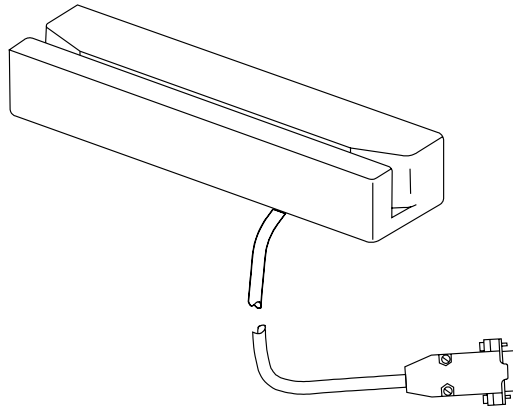


Figure 1-7. Magnetic document slot reader

Note: The magnetic document slot reader, because of its length, cannot be mounted directly onto the 7526. It can, however, be mounted nearby so that it may be connected to the 7526. In this case, you must determine the best mounting position for your particular situation.

For consistency and ease of operation, slot readers are usually mounted so that the read head is on the right side of the slot (as shown in Figure 1-7), whether the slot reader is mounted on the left side or the right side of the terminal.

1. Attach the slot reader to its mounting place using four screws provided in the installation kit.
2. When installation of the terminal is completed, connect the slot reader cable to the terminal at sensor port A or B.

Bar Code Slot Reader

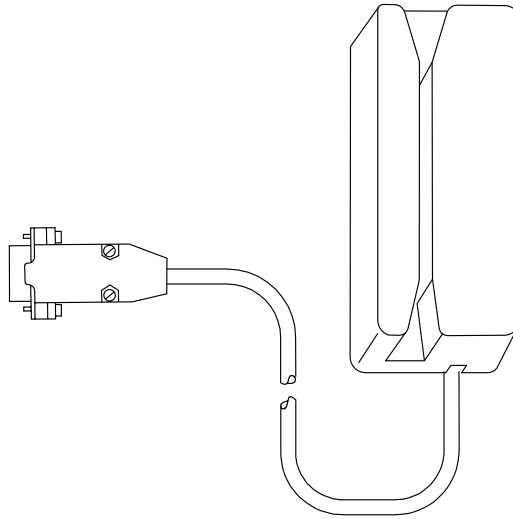


Figure 1-8. Bar code slot reader

Note: The bar code slot reader and the magnetic badge slot reader use the same mounting kit, but the magnetic badge slot reader uses an adapter plate that is not used by the bar code slot reader.

For consistency and ease of operation, slot readers are usually mounted so that the read head is on the right side of the slot (as shown in Figure 1-8), whether the slot reader is mounted on the left side or the right side of the terminal.

1. Hold the bar code slot reader and its bracket next to the side of the terminal on which they are to be mounted.
2. Note the relationship of the slot reader to its bracket, as well as where the cable should be routed.
3. Route the signal cable through the grooves on the underside of the slot reader so that the cable exits the slot reader on the appropriate side and orientation.
4. Attach the slot reader to its mounting bracket assembly, using two screws provided in the installation kit. Do not completely tighten the screws yet.

Note: Coil any excess cable inside the slot reader mounting bracket cavity.

5. Insert the two prongs of the mounting bracket assembly into the pair of holes on either side of the terminal. Use the side that provides the best position for slot reader operation.
6. Secure the mounting bracket assembly to the terminal with the two screws provided.
7. Align the slot reader against the terminal and tighten the mounting screws.
8. When installation of the terminal is completed, connect the slot reader cable to the terminal at sensor port A or B.

Magnetic Badge Slot Reader

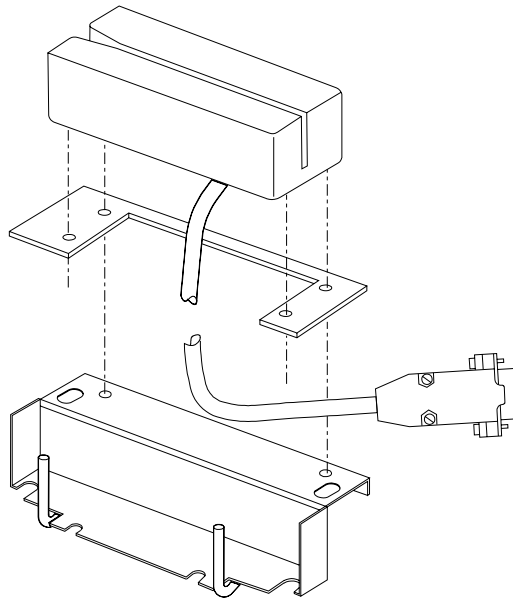


Figure 1-9. Magnetic badge slot reader and mounting

Note: The bar code slot reader and the magnetic badge slot reader use the same mounting kit, but the magnetic badge slot reader uses an adapter plate that is not used by the bar code slot reader.

For consistency and ease of operation, slot readers are usually mounted so that the read head is on the right side of the slot, whether the slot reader is mounted on the left side or the right side of the terminal.

1. Hold the magnetic badge slot reader, its bracket, and adapter plate next to the side of the terminal on which they are to be mounted. The opening in the adapter plate must face toward the terminal. (The arrows on the slot reader point down.)
2. Note the relationship of the slot reader to its adapter plate and bracket, as well as where the cable should be routed.
3. Route the signal cable through the opening in the adapter plate.
4. Attach the adapter plate to the slot reader as noted above, using two screws provided in the installation kit.
5. Attach the slot reader and its adapter plate to its mounting bracket assembly, using two screws provided in the installation kit. Do not completely tighten the screws yet.

Note: Coil any excess cable inside the slot reader mounting bracket cavity.

6. Insert the two prongs of the mounting bracket assembly into the pair of holes on either side of the terminal. Use the side that provides the best position for slot reader operation.
7. Secure the mounting bracket assembly to the terminal with the two screws provided.

8. Align the slot reader against the terminal and tighten the mounting screws.
9. When installation of the terminal is completed, connect the slot reader cable to the terminal at sensor port A or B.

Installing the Terminal

The instructions in this section can be used to mount a 7526 terminal by either of two methods:

1. The terminal may be mounted to any flat surface with the use of its mounting bracket, a standard feature with every 7526 terminal. This mounting bracket provides for easy manual adjustment of the tilt angle of the terminal, and it may also be installed to allow rotation of the terminal about another axis.
2. The terminal may be attached to the faceplate of a user-supplied enclosure, for purposes of security, environmental sealing, or both. A variety of enclosures are suitable for this type of installation.

If possible, you should plan and prepare the mounting location in advance, pre-drilling any required mounting holes. (For your convenience, site preparation information for the 7526 terminal is presented in the procedures given in this chapter.) When making your plans, be sure to allow enough room around the terminal for all sensors (bar code and magnetic wands and slot readers) that are to be attached or mounted nearby, and for easy operation of all functions.

Depending on the clearance of the mounted terminal, it might be advisable to first mount any slot reader or wand holder that is to be installed. Refer to the instructions earlier in this chapter.

Connecting Cables

These instructions apply when connecting cables in the following procedures:

1. Cables must not be exposed to rough edges or sharp bends that might cause cable damage. Where any cable enters a housing, it must be protected by a rubber grommet or other protective device.
2. All cables that are connected to the terminal must be secured by the two screws in their connectors.
3. When possible, avoid connecting (or disconnecting) cables while power is switched on.

Installing the Terminal with the Standard Mounting Bracket

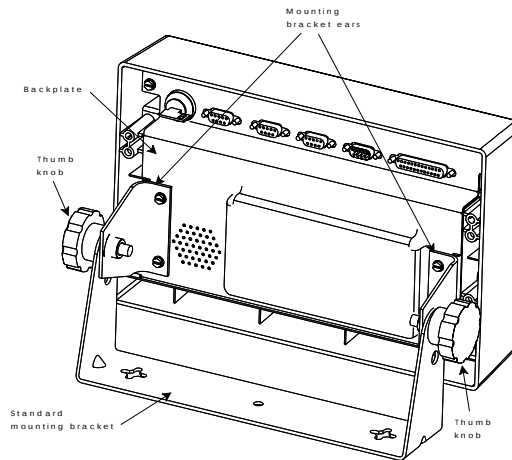


Figure 1-10. 7526 terminal and standard mounting bracket

The standard mounting bracket, which is supplied with all 7526s, allows the terminal to be easily mounted on any flat surface and quickly removed if service becomes necessary. This standard mounting feature may be used equally well for a bench (table) mount or a wall mount.

The standard mounting bracket offers easy manual tilt adjustment, using two large thumb knobs to lock the tilt adjustment. In addition, this bracket may be installed to allow rotation of the terminal about another axis. This flexibility allows optimum terminal position to be attained.

All 7526s are shipped from IBM with the memory retention battery installed and ready for use. If the terminal that you are installing is not new from IBM, you might want to confirm that the battery is in place before beginning the installation procedure. (Refer to "Installing the Memory Retention Battery" on page 1-3.) Also you must mount any slot reader or wand holder that is to be installed. Refer to the instructions earlier in this chapter.

Clearance Dimensions

The following figure shows the clearances required for the terminal and mounting bracket. Use these dimensions to help determine the exact mounting location of your terminal. Be sure to allow sufficient clearance for ease of operation of wand and slot readers, and for variations in terminal adjustment on the mounting bracket.

Note in the side view of the following figure that the terminal may be pivoted on the mounting bracket, and that the bracket has two sets of holes for the thumb screws. These features allow optimal positioning of the terminal.

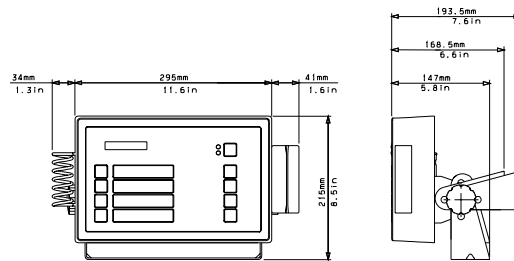


Figure 1-11. Terminal and mounting bracket clearances

Installation Procedure

If the terminal's intended mounting area has not yet been prepared, start with Step

1. If the terminal's intended mounting area has already been prepared, start with Step 5 on page 1-23.

1. Select the type of fasteners to be used, based on the type of material to which the terminal is to be mounted:

- **Solid or hollow wall (masonry, drywall, wood):**

Use plastic wall anchors and sheet metal screws, expanding wall anchors and machine screws, toggle bolts, or equivalent fasteners.

- **Solid wood:**

Use wood screws.

- **Sheet metal:**

Use sheet metal screws.

- **Sheet metal, dry wall, or other material where rear access is possible:**

Use machine screws and nuts.

2. Determine the mounting holes required and the size of fasteners, according to the following figure and information:

Important:

The following figure is drawn to approximate scale; but it is not actual size. Before drilling mounting holes, you should make measurements based on the figure, or you can use the actual mounting bracket as a template.

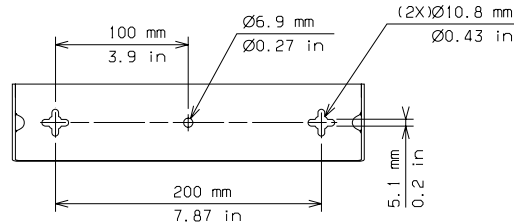


Figure 1-12. Mounting hole template for standard mounting bracket

- For a fixed mounting to a vertical or horizontal surface, use fasteners at both omni-directional keyhole slots (the two outer holes).

Fasteners used in these mounting holes may have a maximum shaft diameter of 5.1 mm (0.201 inch), while the fastener head diameter must be at least 7mm (0.275 inch). In order for the bracket to be installed/removed with the fastener in place, the fastener head diameter must also be less than 10.6 mm (0.412 inch).

Suitable fastener sizes include M4, M5, 10-32 or 10-24 machine screws or #10 sheet metal or wood screws.

- For mounting to a horizontal surface to allow swiveling of the terminal about the vertical axis, use a fastener in the center only.

Fasteners used in this mounting hole may have a maximum shaft diameter of 6.9 mm (0.272 inch), while the fastener head diameter must be at least 8.9 mm (0.350 inch). The use of a large flat washer under the head of this fastener is recommended.

Suitable fastener sizes include M6 or 1/4-20 machine screws or #12, #14, or 1/4 inch sheet metal or wood screws.

3. Determine the exact location for mounting the terminal.

Be sure to allow enough access area around the terminal for all sensors (wand and slot readers) that are to be used.

To make vertical wall or post installations convenient for use by all personnel, install the **center** of the mounting bracket at a height approximately level with the height of the shortest worker.

4. Drill all required holes.

You may use the dimensions given in Figure 1-12 to mark the hole locations to be drilled, or you may use the mounting bracket base for a template.

5. For ease of installation, remove the U-shaped bracket from the terminal. This is easily done by unscrewing the two thumb screw knobs.
6. Install the U-shaped bracket to the mounting surface, using the mounting holes provided.

7. Connect to the terminal all cables from the DI/DO (digital input/digital output) devices, the sensor(s) (wands and slot readers), the communications network, and the power supply module. Be sure to secure each connector with its two screws.

Note: Later production terminals are printer-capable, as explained in “Parallel Input/Output Port” on page 2-9. If your terminal is printer capable and you are to connect a printer, connect the printer cable to the DI/DO port.

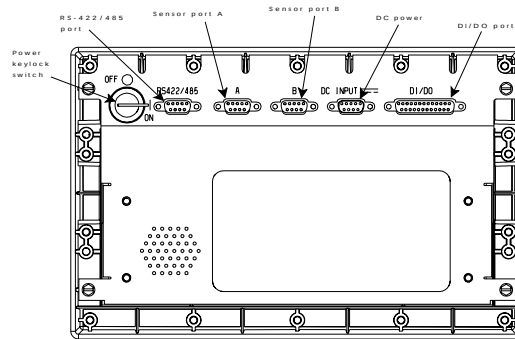


Figure 1-13. Cable connector panel

8. Holding the terminal in place inside the U-shaped bracket, install the two thumb screw knobs, leaving them slightly loose. (It is usually better to use the upper set of holes for a bench-mounted terminal, and the lower set of holes for a wall-mounted terminal.)
9. Position the terminal for optimal ease of use, and tighten the two thumb screw knobs.
10. Connect the ac cordset to the power supply module.

Installing the Terminal on an Electrical Enclosure

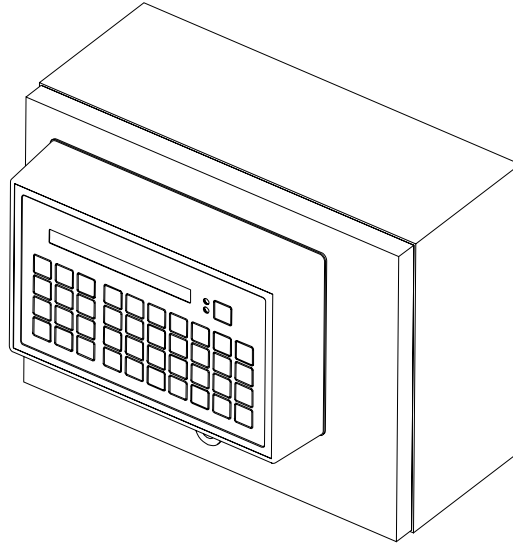


Figure 1-14. 7526 Terminal installed on an electrical enclosure

The 7526 terminal may be mounted onto a variety of electrical enclosures. This method of installation provides security for the cables and the keylock switch, as well as protection against environmental contaminants.²

This method calls for the terminal to be mounted through a precisely cut hole in the enclosure, so that only the terminal's upper cabinet, containing the keypad and screen, protrudes from the enclosure. The terminal is held securely by screws from inside the cabinet, and a gasket is used to prevent the entrance of environmental contaminants.

Note: This same installation method may be used to mount the terminal through a hole in a wall or bench top.

You should prepare the mounting location using the instructions provided in the *7526 Hardware Information and Site Preparation* manual). Be sure to allow enough room around the terminal for all sensors that are to be attached and for easy operation of all functions.

Slot readers and wand reader holders must not be mounted to the underside of the terminal for this type of installation. Instead, they should be mounted directly to the electrical enclosure or to another convenient base. For cable protection information, refer to "Protection of Cables" on page 1-1.

Note: All 7526s are shipped from IBM with the memory retention battery installed and ready for use. If the terminal that you are installing is not new from IBM, you might want to confirm that the battery is in place before beginning the installation procedure described below. (Refer to "Installing the Memory Retention Battery" on page 1-3.)

² When mounted in an electrical enclosure, the 7526 will maintain an environmental protection rating of NEMA-4, NEMA-4X, and IP 66.

Installation Procedure

If the terminal's intended mounting area (e.g., enclosure, wall, or table-top) has not yet been prepared, start with Step 1. If the terminal's intended mounting area has already been prepared, start with Step 3.

1. Use the overall dimensions of the sealing gasket, as shown in Figure 1-15, to procure an enclosure. The enclosure must feature a flat mounting area of at least this size, with at least 100mm (4 inches) of clearance behind that area for clearance of the terminal's connectors and cables.

Also verify that the enclosure has no details, such as hinges, braces, or latches, which may interfere with use of the 14 screw holes shown in the figure.

You may also want to allow free space on the mounting area around the terminal to install a slot reader device, as described in "Mounting Bar Code/Magnetic Sensors on an Enclosure" on page 1-28. This reader could be installed on the enclosure either running vertically to the left or right of the 7526, or running horizontally under or above the terminal. Silicone or latex caulking material can be used to seal the reader in place.

If the 7526 will be powered by one of the IBM power supply features, then it is recommended that a standard ac power outlet be installed inside the enclosure. The IBM power supply module can then be placed in the bottom of the enclosure and simply plugged into this outlet.

2. Prepare the intended mounting surface by cutting all holes called for in the following mounting hole diagram. There are fourteen screw holes in addition to the large rectangular hole through which the terminal fits.

Important:

The following figure is drawn to approximate scale; but it is not actual size.

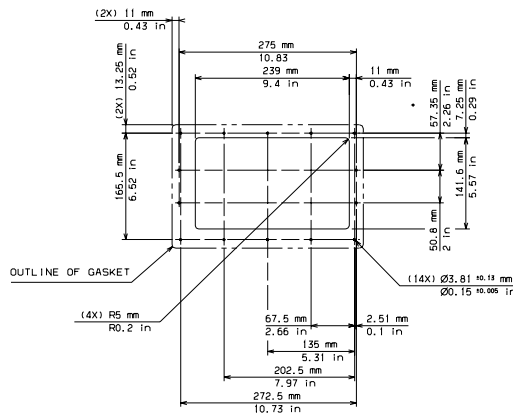


Figure 1-15. Mounting hole template for enclosure installation

3. Remove the entire standard mounting bracket from the terminal. This is done by removing the four screws (two each) that secure the mounting bracket ears to the terminal's metal backplate.
4. Screw the ten stand-offs provided in the box mounting feature into the recessed mounting holes on the terminal's underside.

5. If an environmental sealing gasket is to be installed, place it on the enclosure in its correct position. (For ease of installation, it may be held in place temporarily by several pieces of tape.)
6. Insert the terminal's bottom through the hole in the enclosure (from the outside) until it seats correctly.

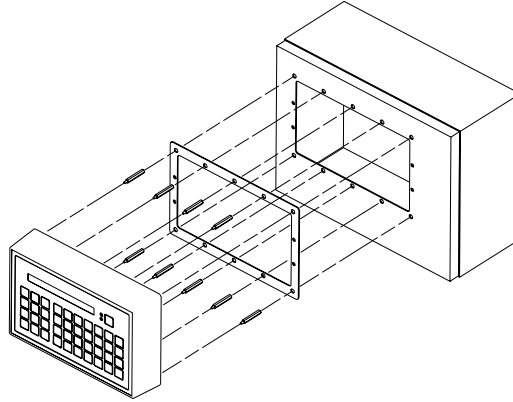


Figure 1-16. Enclosure installation exploded view

7. Open the enclosure and use the fourteen screws provided with the box mounting feature to secure the terminal to the enclosure. (Before tightening the screws, make sure that the gasket is flat and in place.)
8. Connect to the terminal all cables from the DI/DO (digital input/digital output) devices, the sensor(s) (wands and slot readers), the communications network, and the power supply module. Be sure to secure each connector with its two screws.

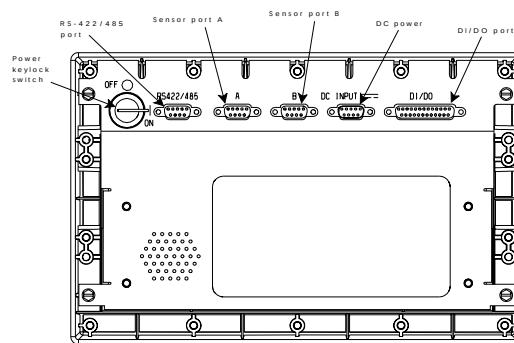


Figure 1-17. Cable connector panel

9. Connect the ac cordset to the power supply module.
10. Close the electrical enclosure (and lock it).

Mounting Bar Code/Magnetic Sensors on an Enclosure

When the 7526 is face-mounted on an enclosure, the optional sensor mounting brackets may not be used. Sensors may be mounted to an enclosure along with the terminal, or otherwise cabled out of the enclosure, in the following ways:

Slot Readers

1. Cut a rectangular hole sized for clearance of the connectors on the slot reader cables in the face or side of the enclosure.

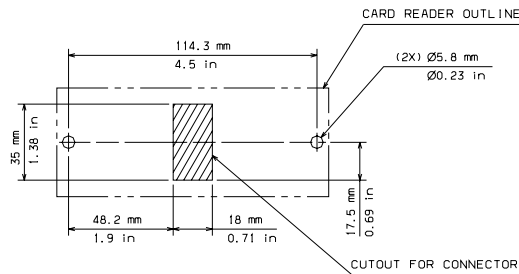


Figure 1-18. Bar code/magnetic badge slot reader mounting template

2. Drill mounting holes that match the type of slot reader to be used, such that the installed reader will cover the rectangular connector hole.
3. Pass the cable into the enclosure through its hole.
4. Screw the slot reader into place from the inside of the enclosure. The bar code slot readers are environmentally sealed units, so they could be sealed in place with latex or silicone caulking before being fastened down.

Note: Only the bar code slot reader features are rated for outdoor or hose-down environments. The magnetic readers should not be subjected to any liquid contaminants.

Wands: An entry hole for the wand's cable can be accomplished in one of several ways:

- Cut a clearance hole for the connector and pass the connector into the enclosure. This hole may need to be rimmed with a grommet or other material to prevent cutting the cabling with any sharp edges. For cable protection information, refer to "Protection of Cables" on page 1-1.
- Cut a clearance hole for the cable diameter only, located at the parting line of the enclosure's door or other large opening. Close the door after positioning the cable in this hole. A sealing, split-ring grommet may be used in the hole.
- Build a cable with connectors that match the sensor ports on one end, and the wand connector on the other end. Use fasteners on the wand-end which allow that connector to be box-mounted on the enclosure wall. Then, simply attach the wand to this box-mounted extension cable.

Note: This is similar to using the *Bar Code/Magnetic Sensor Extension Cable*, which is available from IBM. That cable could be adapted to this purpose.

The bar code wands offered as features are not rated for immersion, but sustain immersion of the wand tip in water and moderate amounts of rain on the entire wand (not on the connector area).

Holders for the wands must be provided, if desired, by the customer. Hewlett-Packard part number HBCS-2998 may be obtained for this purpose.

Chapter 2. Controls, Display Screens, Indicators, and Input/Output Connectors

This chapter contains non-program specific descriptions of the functions of all controls, displays, indicators, and input/output connectors on the 7526 terminal. The function of most keys is dependent on the application program.

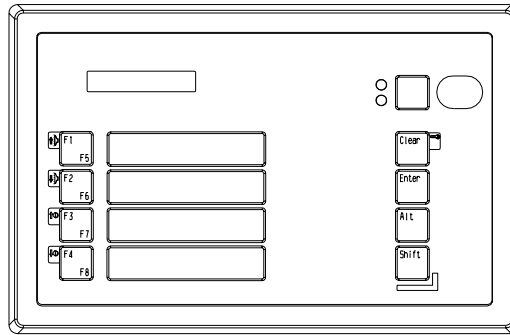


Figure 2-1. Keyboard and screen, Model 100

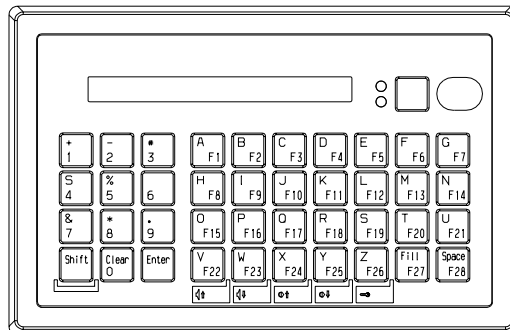


Figure 2-2. Keyboard and screen, Model 200

Power On/Off (I/O) Keylock Switch

The Power On/Off (I/O) keylock switch is located on the back of the terminal, in line with the cable connectors. This switch turns dc power to the terminal on or off.

Note: The optional operational battery backup battery recharges whether the power keylock switch is on or off, as long as the terminal is receiving dc power from the power supply module.

Keys

Program Function (F) Keys

The 7526 Model 100 has four program function keys (**F1–F4**). An alternate set of functions (**F5–F8**) can also be assigned by the program. That set of functions is accessed by using the **Alt** key.

The 7526 Model 200 has twenty-eight program function keys (**F1–F28**). These keys share their respective key buttons with the alphabetic keys, and they are active as function keys only during “idle” mode. (It is not possible to assign an alternate set of functions on the Model 200.)

The system programmer can assign data collection transaction programs to each function key. By pressing the function key when the terminal is in “idle” mode, the operator may start the desired program.

Alphabetic Keys

The 7526 Model 100 has no alphabetic keys. The 7526 Model 200 has twenty-eight alphabetic keys (**A–Z**, **Fill**, and **Space**).

When in “data entry” mode, the alphabetic keys are used to input alphabetic information, a single space, or to “fill” with spaces (when in alphabetic mode) or zeroes (when in numeric mode). Under default alphabetic data entry use, these keys cause only uppercase characters to appear on the display. However, lowercase characters or any displayable characters can be assigned by the application program. (See “Shift Key” for more information.)

Numeric Keys

The 7526 Model 100 has no numeric keys. The 7526 Model 200 has ten numeric keys (**0–9**).

Under default numeric data entry use, the numeric keys are used to input numeric information. When pressed following the **Shift** key, these keys are used to input the default special characters shown on the key buttons (see Figure 2-2 on page 2-1). The application program may assign any displayable character to these shifted keys. (See “Shift Key” for more information.)

Shift Key

The **Shift** key is used in conjunction with other keys to alter the function of those keys. When the **Shift** key is pressed, both LEDs begin to flash, indicating that the terminal is in Shift mode.

If the terminal is displaying a keypad entry field, the displayable character of the next key pressed (after the **Shift** key) is altered. For example, the numeric keys are shifted to produce the special characters shown in Figure 2-2 on page 2-1, unless altered by the application program. Likewise, the alphabetic keys are shifted to whatever displayable character is specified by the application program. Thus, these keys are dependent upon the application program to determine their shifted, or secondary, function.

Some keys always require previously pressing the **Shift** key — for example, the contrast adjustment keys, the beeper volume adjustment keys, and the keylock key (which puts the terminal into keylock mode for terminal setup).

You must put the terminal into Shift mode to perform the following:

- Adjust the display contrast by pressing either of the contrast adjustment keys (see “Contrast Adjustment Keys” on page 2-4).
- Adjust the beeper volume by pressing either of the beeper volume adjustment keys (see “Beeper Volume Adjustment Keys” on page 2-4).
- Enter the terminal setup procedure by pressing the keylock key (see Chapter 3, “Setup (Configuration)” on page 3-1).
- Input a shifted character (either default or program-defined) into a numeric or alphanumeric field.

When in Shift mode, pressing any key other than the contrast adjustment keys, the beeper volume adjustment keys, or the keylock key causes the terminal to exit Shift mode. (If a function key is pressed, that function would be performed before exiting Shift mode; if a character key is pressed, that character would be displayed before exiting Shift mode.) The terminal will also exit Shift mode if the **Shift** key is pressed again or if no key is pressed within about five seconds.

Alt Key

The **Alternate** key, which is on the Model 100 only, is used to access the alternate set of functions (**F5–F8**) on the four program function keys. When the **Alternate** key is pressed, the green LED begins flashing. The terminal will exit Alt mode if the **Alt** key is pressed again or if no key is pressed within about five seconds.

Clear Key

The function of the **Clear** key is determined by the application program. This key is usually used to clear the data that has been keyed into the current input field. If the input field is already clear, the **Clear** key will cancel the transaction program. This key is also used in Statistics mode of the keylock mode to reset a counter to zero.

Enter Key

The function of the **Enter** key is determined by the application program. This key is generally used to enter the data that has been keyed in (and which usually appears on the display screen). This key is also used in the keylock mode during terminal setup.

Keylock Key

The keylock key is designated by a key symbol. This key is pressed in conjunction with the **Shift** key to enter keylock mode. Keylock mode is only for terminal setup or for maintenance operations.

Note: Keylock mode cannot be entered when the terminal is in a keypad input field of a transaction program, or when in Diagnostic mode.

Contrast Adjustment Keys

The two contrast adjustment keys are designated by a circular dark-light symbol and an up or down arrow. These keys are used in conjunction with the **Shift** key to set the contrast on the display to the desired level. Each time that one of the two keys is pressed (following the **Shift** key), the contrast level is either increased or decreased.

Note: Contrast adjustments cannot be made when the terminal is in a keypad input field of a transaction program, or when in Diagnostic mode.

Beeper Volume Adjustment Keys

The two beeper volume adjustment keys are designated by a speaker symbol and an up or down arrow. These keys are used in conjunction with the **Shift** key to set the beeper volume to the desired level. Each time that one of the two keys is pressed (following the **Shift** key), the beeper volume level is either increased or decreased. A long beep indicates that the maximum volume level has been reached.

Note: Beeper adjustments cannot be made when the terminal is in a keypad input field of a transaction program, or when in Diagnostic mode.

Display Screens

Based on the display parameters selected, the displays use a subset of IBM code plate 850 or 857. The displays for both models use a backlight for better visibility under low lighting conditions.

Model 100 Display Screen

The display screen on the Model 100 can display one line of information with sixteen characters.

Model 200 Display Screen

The display screen on the Model 200 can display two lines of information with forty characters per line.

Indicators

Terminal Indicator Lights (LEDs)

There are two indicator lights (LEDs) on the terminal's front — one yellow and the other green. These lights flash once after the terminal is switched on to indicate that POST has completed. They also flash repeatedly to indicate that the terminal is in the adjustment mode for display contrast and beeper volume.

In addition, these indicators can be programmed by the application program to either flash or remain lighted upon the occurrence of specific events, such as the valid entry of data from a wand or slot reader.

Beeper

The terminal's internal beeper sounds after the terminal is switched on to indicate that POST has completed. This audible signal can be also programmed by the application program to beep upon the occurrence of specific events, such as the valid entry of data from a wand or slot reader.

Magnetic Wand Indicators

The optional magnetic wand feature contains three indicator lights: green, yellow, and red. The meanings of these indicator lights is dependent upon the application program.

Input/Output Connectors

The connectors for all external input/output cables are located on the cable connector panel, as shown below.

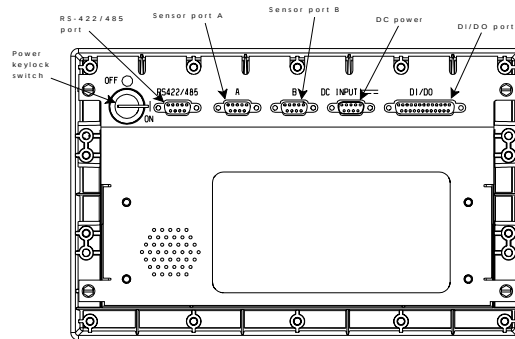


Figure 2-3. Cable connector panel

The physical interface for each of the 7526's input/output connections is described in the remainder of this chapter. Refer to the *7526 Hardware Information and Site Preparation* manual for additional information.

DC Power Input

The dc power input connector on the 7526 is a 9-pin male D-shell connector. Its pin designations are:

Pin	Function
1	DC Voltage
3	DC Ground

Its mating connector has the following specifications:

Receptacle	9-position D-subminiature receptacle for sockets (AMP 205203-3 or equivalent)
Sockets	Gold-plate over nickel sockets, quantity = 2 (AMP 66504-9 or equivalent)

IBM offers two power supply features which are specifically designed for connecting to this dc input connector:

- Feature Number 5305 for 100–125 Vac input
- Feature Number 5308 for 200–240 Vac input

Alternatively, dc power may be fed to the 7526 via the RS-422-A/RS-485 host port. This allows bulk dc power to be supplied from a central source inside the same overall cable jacket as the RS-422-A/RS-485 host communications lines. Cable with three twisted pairs may be used — two twisted pairs for communications and one twisted pair for power. Care must be taken in specifying current limiters and cable conductor size for this customer-supplied power supply and cabling to prevent damage to the cabling in the event of a short circuit in the system. Also, any power supply connected to the 7526 must output only Safety Extra-Low Voltage (SELV) and must be certified by an appropriate agency for the country of installation.

Refer to “DC Power Requirements” on page 2-12 for dc input power specifications.

RS-422-A/RS-485 Host Port

The RS-422/RS-485 port provides for multi-drop, half-duplex communications to the data collection controller (host computer). Up to 32 terminals may be connected to the communications network. Refer to the *7526 Hardware Information and Site Preparation* manual for details of the design and installation of the communications network.

The physical port follows the connector style and pin designations of the IBM 7527, with the addition of bulk dc input pins to facilitate wiring of communications and bulk dc distribution in the same cable.

Pin	Function
1	Receive +
2	Receive –
3	Transmit +
4	Transmit –
6	Not used
7	Bulk dc input
8	Not used
9	Bulk dc ground
Connector	Ground
Shell	

Its mating connector has the following specifications:

Plug	9-position D-subminiature plug for pins (AMP 205204-4 or equivalent)
Pins	Gold-plate over nickel pins, quantity = 4–6 (AMP 66506-9 or equivalent)

Parallel Input/Output Port

The 7526 contains a parallel input/output port which can be used to interface to attached discrete input or output devices or to a standard IBM-compatible parallel printer device:

- All production of the 7526 has the digital input/output capability.
- Later production 7526 terminals also contain the capability to use the parallel connector for driving a printer. Terminals that were produced with the printer capability and terminals that have been upgraded with a new processor board may be identified by observing the microcode identification and copyright information that is displayed when the terminal is powered on. Terminals that are capable of operating a printer have microcode level 2.0 or higher **and** they display the characters "PRT" at the end of the copyright message (immediately following the copyright date). This is shown on the second line of the display for the Model 200 and at the end of the scrolling message on the Model 100.

A printer-capable terminal can also be identified by removing the rear cover and observing the processor board. The printer-capable version of the processor board contains *surface mount* electronics.

Digital Input/Output Port

The 7526 DCT digital input/digital output (DI/DO) port provides eight discrete input/output points and drives digital input/output optical isolator modules or other low voltage, low current devices. Using the optical isolating hardware with the proper I/O modules, the 7526 can sense inputs and control outputs ranging from 3 volts DC to 240 volts AC. All I/O modules must be specified for 5 Vdc logic operation. The power to the modules should, preferably, be supplied by the 7526.

Note: If the power is not supplied by the 7526, a ground connection must be made to the 7526. Such power configuration may cause the modules to activate if the 7526 loses power while the external supply remains powered.

The eight DI/DO points may be configurable as inputs or outputs in groups of four. In 4/4 mode, points 0–3 are configured as DI (and 4–7 become DO).

The DI/DO interface is capable of driving an industry-standard eight-position optical isolator board and modules (for example, Opto22 and Potter-Brumfield) including 5 Vdc power to the modules. All optical modules must be specified for 5 Vdc operation on the 7526 side.

A 25-position connector-compatible IBM DI/DO cable accessory is available to connect the 7526 to these devices. This cable accessory is orderable as:

- Part Number 33F5180 in the U.S.A.
- Feature Number 6634 outside the U.S.A.

The DI points also may be manipulated with simple switches connected between the respective connector socket and one of the ground points in the connector. The DO points normally are pulled high internally to the 7526. They can source and sink up to 25 milliamps.

When automatic operation of operator indicators are enabled (the default) DO point 6 indicates nominal, good, or accepted event, while DO point 7 indicates an error, bad, or rejected event. The beeper and front panel indicators, described

previously, are also activated in conjunction with the DO points during this automatic operation.

The 7526 supplies 5 Vdc to the optical isolator rack on pin 20 of the 25-position connector. To use this power on the optical isolator rack, it may be necessary to install a fuse or jumper on the rack. For details, refer to the manufacturer's schematic of the rack being used.

Total 5 Vdc power supplied by this port and the two sensor ports combined should be less than 500 milliamps continuous load.

Note: 7526 processor boards which support parallel printers have a separate 5V regulator which supplies pin 20 with power. This regulator is not activated until the 7526 has been downloaded with the files which tell it whether it should operate the parallel port as a DI/DO port or as a printer port. If a printer is plugged into the port, or if the DI/DO interface has connected pin 20 to ground, this regulator will sense the short circuit and will shut itself down. It will stay shutdown until the 7526 is powered off and then on.

The pin designations are:

Pin	Function
2	DI/DO bit 0
3	DI/DO bit 1
4	DI/DO bit 2
5	DI/DO bit 3
6	DI/DO bit 4
7	DI/DO bit 5
8	DI/DO bit 6
9	DI/DO bit 7
20	5 Vdc power to optical module(s) 5 Vdc power to optical module(s)

Note: This is turned on by the terminal only after the configuration files are loaded which determine if the parallel port is to be for DI/DO or printer connection.

18-19	Ground
21-25	Ground
Others	Standard printer port usage

Its mating connector has the following specifications:

Plug	25-position D-subminiature plug for pins (AMP 207464-2 or equivalent)
Pins	Gold-plate over nickel pins (AMP 66506-9 or equivalent)

Parallel Printer Port

The 7526's parallel port may be configured to drive a parallel-interface printer, such as an IBM Proprinter, Graphics printer, 5533 printer, QuickWriter, or other IBM-compatible printer. The 25-position connector on the 7526 has the same interface as IBM personal computers, so a standard printer cable may be used.

Refer to "Parallel Input/Output Port" on page 2-9 for details of how to determine if your 7526 has parallel printer capability.

Sensor Input Ports

The 7526 has two sensor input ports for attachment of accessory input devices, such as bar code and magnetic wands, slot readers, and scanners. Each sensor input port is able to interface and provide power to any of the accessory input devices. The terminal can provide sufficient 5 Vdc power for most popular laser bar code scanners (for example, Symbol 8500 series and Photographic Sciences 4000/5000 series). Power supply outputs are current-limited per regulatory agency requirements to protect attached equipment in case of short circuits in such equipment.

The sensor ports, as a default, are configured with the same pin designations as the IBM 7527 terminal; thus readers used on the 7527 may also be used on the 7526.

Total 5 Vdc power supplied by these ports and the DI/DO port (pin 20) combined should be less than 500 milliamps continuous load.

The pin designations are given below:

- **Port B and Standard Port A (No Bar Code Reading Coprocessor)**

Pin	Function
1	5 Vdc power
2	Bar code signal
3	Supply ground
4	Magnetic card present
5	Magnetic data
6	Magnetic strobe
7	LED 1 control line
8	LED 2 control line
9	LED 3 control line

- **Port A with Bar Code Reading Coprocessor Installed (optional feature)**

Pin	Function
1	5 Vdc power
2	Bar code signal (input)
3	Supply ground
4	Laser start of scan (input)
5	Not Used
6	Laser trigger switch (input)
7	Laser decode LED/Ack (output)
8	Laser enable (output)
9	LED 3 control line

Its mating connector has the following specifications:

Plug	9-position D-subminiature plug for pins (AMP 205204-4 or equivalent)
Pins	Gold-plate over nickel pins (AMP 66506-9 or equivalent)

DC Power Requirements

Customers may choose to supply their own dc power to the terminal, for example, from a battery or a supply which powers a number of terminals. **Any power supply connected to the 7526 must output only Safety Extra-Low Voltage (SELV) and must be certified by an appropriate agency for the country of installation.** Requirements for this dc power are as follows:

Input voltage	Nominal input voltage 22 Vdc	High input voltage (Absolute Maximum) 35 Vdc ¹	Low input voltage (Absolute Minimum) 9 Vdc ²
Corresponding current at full load (10 Watts)	460 mA	285 mA	1110 mA
Corresponding current at typical load (4 Watts; configured with one bar code reader)	180 mA	105 mA	500 mA
Ripple (maximum)	Up to 20% of dc input, with peak excursions not to exceed High and Low dc limits.		

Notes:

1. When the optional nickel-cadmium Operational Battery Backup feature is used, the supply voltage should not exceed 28 Vdc for maximum battery life.
2. When the optional nickel-cadmium Operational Battery Backup feature is used, the battery will not charge at voltages below 16 Vdc.

Chapter 3. Setup (Configuration)

Setup mode is used to configure various operating parameters on the 7526, such as:

- terminal address
- communications speed
- national language support, etc.

Whenever a terminal is first placed in service or has been cold-reset, all desired configuration items must be re-established by using the setup mode.

The 7526's built-in diagnostics are also accessed from the setup mode. These diagnostics:

- Allow auditing of the terminal's performance and usage.
- Verify the function of various subsystems on the terminal.
- Offer support for testing the function of bar code/magnetic readers and their respective media.

Starting Setup Mode

If the 7526 comes up with the IBM copyright screen constantly displayed, this indicates one of the following:

- The terminal is being installed for the first time.
- The terminal has lost its memory retention battery backup.
- The terminal has been cold-reset.

In any of these cases, simply press the **Enter** key to start the setup mode.

If the terminal has already been configured using setup (and the setup parameters are still retained), use the Keylock key sequence to restart the setup mode. To do the Keylock key sequence, press the **Shift** key to select one of the blue-highlighted functions, and then press the **Keylock** key, which is marked with a key symbol on the blue highlight background.

If a password has been set to protect access to the keylock mode, the correct key sequence must be entered at the password prompt.

Successful entry to setup mode is indicated when the 7526 display presents "ADDR-." This is the first setup menu item.

The various configuration items available are listed in "Setup Configuration Items" on page 3-2.

Setup Mode Key Usage

When in the setup mode, use the following keys to proceed through the menus and make selections:

- Next selection keys:
Press any numeric key, any **F** key, or the **Alt** key to change a parameter to the next possible value. After the last value is shown, the display wraps around to the first option on the list.
- Accept selection key:
Press Enter when the parameter has the desired value or to accept the current or default value.
- Quick-configure key
After the address is set, you may quickly accept the default values for all other parameters by pressing the **Clear** key.

Setup Configuration Items

The following table lists all the setup mode configuration items available. For each item, it shows the display prompt, the default value, and the values possible.

Configuration Item	Prompt	User value	Default value	Available parameter values
Terminal Network Address	ADDR–		a	a–y, 0–6
Data Speed	BAUD RATE–		9600	9600, 19200, 38400, 1200, 2400, 4800
Data Character Length (bits)	DATA LENGTH–		8	8, 7 (If you are using Custom Function Routines or are using any ASCII character above 127 (7Fh) in a message file or verification file, you must use 8 data bits.)
Data Character Parity	PARITY–		EVEN	EVEN, ODD, NONE (Parity of NONE is assumed if DATA LENGTH is set to 8 bits.)
Idle Prompt Time Style	TIME–		12 HR	12 HR, 24 HR
Idle Prompt Time Separator	TIME SEPARATOR		: (colon)	: (colon), . (period), – (dash)
Idle Prompt Date Format	DATE–		MMDDYY	MMDDYY, DDMMYY, JJYY
Idle Prompt Date Separator	DATE SEPARATOR		/ (slash)	/ (slash), – (dash), . (period)
Decimal	DECIMAL		. (period)	. (period), , (comma)
Keylock Mode Password	PASSWORD:		(no password)	Press up to 6 keys in sequence. Valid keys are: Model 100: F1–F4, Alt Model 200: F1–F28 (A–Space), 0–9
Display Code Page	CODE PAGE–		850	850, 857

Configuration Item	Prompt	User value	Default value	Available parameter values
Execute Diagnostics	DIAGNOSTICS–		NO	NO, YES (Selecting YES will cause the terminal diagnostics menus to be presented at this time, as described in the next section.)
Perform Cold Start of Terminal	COLD START–		NO	NO, YES (Selecting YES will cause clearing of the terminal's memory and initialization of the Power-On Self Test).

After the last configuration item has been accepted, the terminal will present the "OUT OF SERVICE" screen until the host computer has begun the downloading sequence. If you want to change any parameters, or execute diagnostics, press the Shift-Keylock sequence, and the setup menus will appear again.

Note: As a convenience, you could use a copy of the preceding page to record the setup values that are to be entered for your particular 7526 terminal(s). Record your setup values in the blank "**User value**" column. (For security reasons, do not write your password.)

Chapter 4. Operation

This chapter contains non-program specific descriptions of the operation of the 7526 terminal, its power supply module, and supported accessories (slot readers and wands). It also contains procedures for accessing and using the keylock mode functions.

Switching Power On

Power to the IBM 7526 Data Collection Terminal is turned on with the keylock switch on back of the terminal. Move the switch to the ON (|) position. As soon as power is switched on, the terminal's built-in Power-On Self Test (POST) begins.

After POST completes successfully, the copyright screen display appears. If any application programs have been loaded into memory, another display may be programmed to appear. If the above does not occur, refer to Chapter 5, "Problem Determination Procedures (PDPs)" to resolve the problem.

If no application programs have been loaded into memory, that must be done. Application programs are loaded over the communications network under control of the system programmer.

Screen Contrast Adjustment

The screen contrast adjustment keys are designated by a circular dark-light symbol and an up or down arrow. First press the **Shift** key, and then press one of the contrast adjustment keys to set the contrast on the screen to the desired level. Each time that one of the two keys is pressed (following the **Shift** key), the contrast level is either increased or decreased.

Note: Contrast adjustments cannot be made when the terminal is in a keypad input field of a transaction program, or when in Diagnostic mode.

Beeper Volume Adjustment

The beeper volume adjustment keys are designated by a speaker symbol and an up or down arrow. First press the **Shift** key, and then press one of the beeper volume adjustment keys to set the volume of the beeper to the desired level. Each time that one of the two keys is pressed (following the **Shift** key), the volume level is either increased or decreased. A long beep indicates that the maximum volume level has been reached.

Note: Beeper adjustments cannot be made when the terminal is in a keypad input field of a transaction program, or when in Diagnostic mode.

Program Function (F) Keys

An application program must be loaded for the program function (F) keys to become active. If no application programs have been loaded into memory, that must be done. Application programs are loaded over the communications network under control of the system programmer.

When in “idle” mode (that is, not actually executing a transaction program), function keys are used to start the transaction programs that have been loaded into the terminal. When in “data entry” mode, these keys are interpreted as character inputs.

Note: A “custom function routine” may be used to alter the default function of the program function keys. (For information about custom function routines, refer to the *7526 Programming Technical Reference*.)

Data Entry Operations

An application program must be loaded before data entry operations can be performed. If no application programs have been loaded into memory, after power-up, the display will remain at:

- the copyright screen — if terminal setup has not been completed;
- the out-of-service screen — if terminal setup has been completed.

In this case, the program function (F) keys will not become active. Application programs are loaded over the communications network under control of the system programmer.

Entering Data Manually on the Terminal

- **Keyboard use is dependent upon application programs.**

Note: Manual data entry input fields must be configured and enabled by the application program.

- Use an F key to start a transaction.
 - The 7526 Model 100 has four program function keys (**F1–F4**). An alternate set of functions (**F5–F8**) can also be assigned by the program. That set of functions is accessed by using the **Alt** key.
 - The 7526 Model 200 has twenty-eight program function keys (**F1–F28**). These keys share their respective key buttons with the alphabetic keys, and they are active as function keys only during “idle” mode. (It is not possible to assign an alternate set of functions on the Model 200.)
- On a Model 200, use the alphabetic and numeric keys to manually key in data on the terminal. Refer to Chapter 2, “Controls, Display Screens, Indicators, and Input/Output Connectors” for an explanation of the use of the terminal's keys.

- Use the **Clear** key to clear the data that has been keyed into the current input field. If the input field is already clear, the **Clear** key will cancel the transaction program.
- Use the **Enter** key to accept the data that has been keyed or scanned.

Note: A “custom function routine” may be used to alter the default function of the data entry keys. (For information about custom function routines, refer to the *7526 Programming Technical Reference*.)

Entering Media Data with Wand or Slot Readers

- Use the appropriate wand or slot reader (bar code or magnetic) to enter media data.

Note: Sensor data entry input fields must be configured and enabled by the application program.

- Slot readers are usually mounted so that data is read on the right side of the reader. Thus, you must run the media through the slot with the data on the right side, unless otherwise directed.
- Run media through a slot reader only in the proper direction. (Some slot readers can accept media in either direction.)

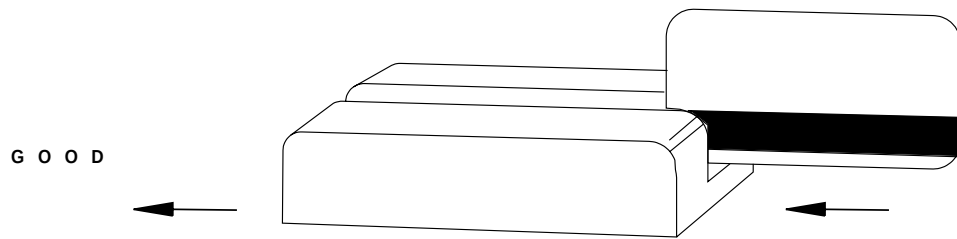
Magnetic Stripe Scanning Tips

To achieve high first-read rates when scanning magnetic stripes, the operator must use the proper technique. The technique includes:

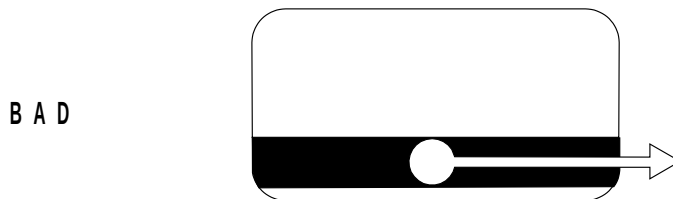
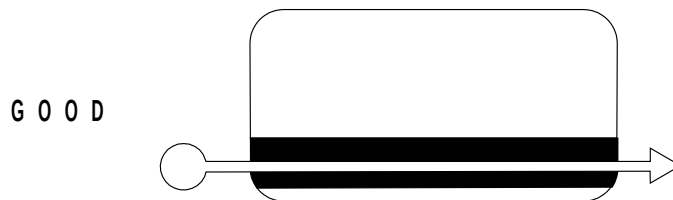
- Start the scan at the end of the stripe or badge and continue smoothly all the through it.
- When using a slot reader, slide the badge or document all the way through the reader, keeping it in steady contact with the bottom of the slot.
- When using a wand, keep the wand tip touching the surface of the magnetic stripe and within the stripe area.
- Scan at a constant speed all the way along the length of the stripe. The speed should be between 100 and 1000mm (4–40 inches) per second.

The following figure illustrates the proper scanning technique for using magnetic stripe slot readers and wands.

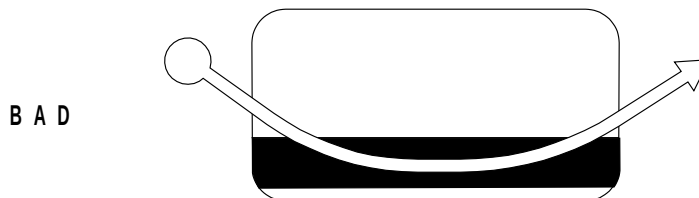
Magnetic Stripe Slot Reader



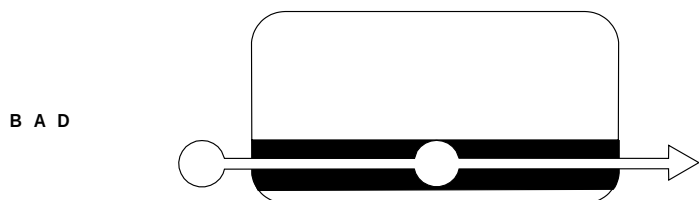
Magnetic Stripe Wand



Cause of Problem: Failure to start scan at beginning of magnetic stripe.



Cause of Problem: Failure to remain in magnetic stripe during entire scan.



Cause of Problem: Stopping scan or hesitating while in magnetic stripe.

Figure 4-1. Magnetic stripe scanning tips

Bar Code Scanning Tips

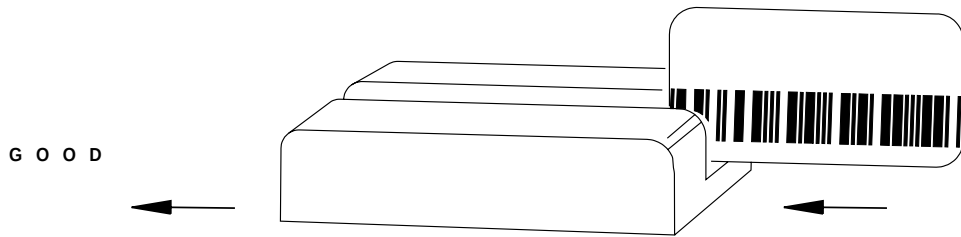
To achieve high first-read rates when scanning bar codes, the operator must use the proper technique. The technique includes:

- Start the scan in the quiet zone (the white area at either end of the bar code) or at the end of the badge, and continue smoothly all the through the bar code.
- Scan at a constant speed all the way across the bar code symbol and well into the quiet zone at the other end.
- Do not hold a wand in the quiet zone for very long. This can confuse the wand's white/dark level-sensing circuitry. As soon as the wand tip has touched down in the quiet zone, immediately start the scan.
- When using a slot reader, slide the badge or document all the way through the reader, keeping it in steady contact with the bottom of the slot.
- When using a wand, keep the wand tip touching the surface of the bar code and within the bar code area.
- Scan the bar code at the following speeds:
 - For wands: 100–1000mm (4–40 inches) per second
 - For slot readers: 200–1000mm (8–40 inches) per second

Note: Most bar code slot readers and wands can be used in either direction.

The following figure illustrates the proper scanning technique for using bar code slot readers and wands.

Bar Code Slot Reader



Bar Code Wand



Cause of Problem: Failure to start scan at beginning of bar code.



Cause of Problem: Failure to remain in bar code during entire scan.



Cause of Problem: Stopping scan or hesitating while in bar code.

Figure 4-2. Bar code scanning tips

Chapter 5. Problem Determination Procedures (PDPs)

The **Problem Determination Procedures (PDPs)** consist of a list of possible installation problems and recommended actions to take in order to resolve the failure.

Diagnostic Tools

The IBM 7526 Data Collection Terminal contains two built-in tools for determining hardware failures and diagnosing failing units.

- **Power-On Self Test (POST)**, which is run automatically each time the 7526 is turned on. The POST checks the following units and reports if it detects a failure:
 - Processor board
 - Memory, standard and expansion (if installed).
 - Keypad
 - High performance bar code reading coprocessor (if installed)
 - Display
- **Diagnostics**, which are usually run by the trained technician to diagnose all failures and isolate them to *field-replaceable* units. Some tests in the Diagnostics are also useful in determining the cause of installation problems.

Field-replaceable units are lowest-level, field-installable replacement parts which are available from IBM for servicing the terminal. They should be diagnosed and installed by a trained service technician. Replacement of such units could require the use of special knowledge or tools; it could also require opening up the terminal.

The *7526 Maintenance Information* manual contains **Maintenance Analysis Procedures (MAPS)** for use by these technicians. The MAPS are a set of step-by-step procedures that use written instructions and the built-in Power-On Self Test (POST) and Diagnostics to isolate failures to a specific *field-replaceable* unit (FRU), as defined above. Also in the manual are removal/replacement instructions and a parts catalog.

Additional problem determination procedures for diagnosing communications network problems are given in the *7526 Hardware Information and Site Preparation* manual.

Customer Responsibilities

Important:

It is the customer's responsibility to determine if a failure is caused by customer-supplied cabling or third-party bar code or magnetic readers that are attached to the 7526.

This determination must be made prior to calling IBM for service.

If the failure is with IBM-supplied equipment, providing the information (diagnosis) resulting from the Problem Determination Procedures to the IBM representative can help get the problem fixed more quickly and efficiently.

Problem Determination

If you encounter a problem with the installation or operation of the 7526 Data Collection Terminal, you should review the problem symptom list in the following table and then perform the resolution actions indicated. If your problem is not addressed, or the resolution actions are not successful, then call IBM Service, your IBM distributor, or other repair group as applicable.

Table 5-1 (Page 1 of 3). Problem Determination Symptoms/Actions

Failure Symptom	Do This ...
Display characters are difficult to read.	Refer to Chapter 4, "Operation" on page 4-1 and try adjusting the display contrast.
Terminal beeper is too faint to hear, or uncomfortably loud.	Refer to Chapter 4, "Operation" on page 4-1 and adjust the beeper volume level.
A bar code laser scanner fails to operate. Also see symptoms: "A bar code symbol fails to read" "Bar code coprocessor does not appear to be active" elsewhere in this table.	Wand-emulating laser scanners can be used on either sensor port; direct-output laser scanners will only work when the <i>High Performance Bar Code Reading Coprocessor</i> is installed and the laser scanner is connected to sensor port A. Refer to the <i>7526 Hardware Information and Site Preparation</i> manual for details of interfacing laser scanners to the 7526.
A bar code symbol fails to read. Also see symptoms: "A bar code laser scanner fails to operate" "Bar code coprocessor does not appear to be active" elsewhere in this table.	You can utilize the bar code reading test of the 7526's built-in diagnostics to help in evaluating the readability of your bar code symbols. Refer to "Starting Diagnostics" on page 5-5 for instructions on running the test. 1. Verify that the bar code symbology used is compatible with the configuration of the 7526. Only 3 of 9 code, Interleaved 2 of 5, UPC, or EAN may be read with the native decoding support – one of these codes will be selected by the system programmer when loading the terminal. Other codes may be read when using the High Performance Bar Code Reading Coprocessor. Refer to the <i>7526 Hardware Information and Site Preparation</i> manual for details. 2. Verify that the quality of the bar code meets the requirements of the 7526, and that the light wavelength and optical resolution are appropriate for bar code printing employed. Refer to the <i>7526 Hardware Information and Site Preparation</i> manual for details on bar code specifications. 3. If the failing reader is attached to sensor port A and a <i>High Performance Bar Code Reading Coprocessor</i> is installed, refer to the symptom "Bar code coprocessor does not appear to be active" later in this table.

Table 5-1 (Page 2 of 3). Problem Determination Symptoms/Actions

Failure Symptom	Do This ...
A magnetic stripe document fails to read.	You can utilize the magnetic reading test of the 7526's built-in diagnostics to help in evaluating the readability of your bar code symbols. Refer to Chapter 3, "Setup (Configuration)" on page 3-1 for instructions on running the test. 1. Verify that the magnetic stripe used is compatible with the 7526. Only ISO/ANSI/ABA track 2 encoded data may be read. Refer to the <i>7526 Hardware Information and Site Preparation</i> manual for details. 2. If the magnetic reader is connected to sensor port A, verify that there is no <i>High Performance Bar Code Reading Coprocessor</i> installed.
Terminal is completely inoperable: • No display backlight • No beeps • No characters on the display.	1. Verify that the power supply is connected to a functioning outlet, that the ac cordset is firmly plugged into the power supply, and that the dc output cord is fully inserted into the dc input connector on the 7526. 2. Verify that the power keyswitch is fully turned to the On position. 3. If a remote, bulk dc voltage supply is used, verify that it is functioning and that its output meets the 7526's specifications. 4. Disconnect all attached bar code and magnetic readers, RS-422/485 communications cabling, and digital input/output cabling. If the 7526 now works, reconnect one cable at a time until the offending cable is found. Analyze that cable for short circuits into or excessive power drain from the 7526's connector.
Terminal operates but program operation appears to hang up.	If you are operating the terminal with a programmed Custom Function Routine, remove the memory backup battery and leave the terminal off for at least 20 minutes. Retry operation without the CFR; if it works, analyze the CFR for programming errors (e.g., overwriting of stack areas, use of disallowed C functions, etc.)
Communications to the terminal does not work.	1. Verify that the baud rate, parity, and data length setting of the terminal match those of the host computer. 2. Verify that the terminal has a unique address on its communications line, and that the host supports this address. 3. Refer to the <i>7526 Hardware Information and Site Preparation</i> manual for additional debugging techniques for the communications line.

Table 5-1 (Page 3 of 3). Problem Determination Symptoms/Actions

Failure Symptom	Do This ...
Memory size is not as large as expected, or an error is reported (201, 216, etc.).	1. Verify that all memory modules are installed with their notched end pointed in the same direction as other modules on the board (away from the beeper). 2. Verify that all pins have fully seated into the sockets. 3. Verify that 128 KB modules (32-pins) fill the entire socket, and that 32 KB modules (28-pins) are bottom-justified (with four vacant pin sockets at the notched end). Correct any errors in installation and re-run the power-on self test.
Printer does not print	1. Verify that the terminal was configured in the system programming menus as using a printer, not Digital I/O. Try using the TEST PRINTER function in the built-in diagnostics. 2. Verify that the printer is online. 3. Verify that the printer cable is connected at each end, and that the cable is good. 4. Verify that the printer is on.
Digital I/O does not work	1. Verify that the terminal was configured in the system programming menus as using digital input/output, not as a printer port. 2. Verify that any external I/O modules are working, and that any required 5V power is present. 3. Verify that the DI/DO cable is connected at each end, and that the cable is good.
Bar code coprocessor does not appear to be active: • The beam of a direct-output laser scanner stays on constantly (see the note at the bottom of this table). • The bar code reader on port A is not working, and a coprocessor is installed. • The coprocessor is installed, and the word "COPROC" is not shown on the right side of the display at the end of power-on self test. Also see symptoms: • "A bar code laser scanner fails to operate" • "A bar code symbol fails to read" elsewhere in this table.	1. Verify that the notched end of both coprocessor modules is pointed in same direction as other modules on the board (away from the beeper). 2. Verify that all pins have fully seated into the sockets 3. Verify that the modules fill their entire socket Correct any errors in installation and re-run the power-on self test.
Note: You must determine what type of laser scanner is being used. Either ask the user, or count the number of wires in the scanner cable connector. • A "wand-emulating" scanner simulates the interface of a regular digital wand or slot reader. Thus, it requires only three wires in the connector (a single bar code signal line, power, and ground). • A "direct" laser scanner sends the raw, high-speed bar code signal to the 7526. Thus, it requires about seven wires in the connector (several signal lines to connect the trigger, etc.).	

Starting Diagnostics

The built-in diagnostics are started from one of the setup mode menu items. After starting the setup mode, press Enter repeatedly to accept the current or default parameter for each setup configuration item, as described in Chapter 3, “Setup (Configuration),” until the prompt “DIAGNOSTIC–NO” is shown. Use a *next selection* key to change the answer to “YES,” and then press Enter. “Built-in Diagnostic Tests” explains the purpose of each of the diagnostic tests and how to execute them.

Built-in Diagnostic Tests

After entering the setup menu choice “DIAGNOSTICS–YES,” the diagnostics tests available are presented on the display. Use the keys described below to navigate through the test menus.

- Next selection keys

Press any numeric key, any F key, or Alt to rotate to the next test or to the next option when answering a question or selecting a parameter.

- Accept selection key

Use the Enter key to select the current test or to accept the answer to a question or the value of a parameter.

- Exit test key

After a test is started, the Enter key is also used to terminate the test. When a test is terminated, the “EXIT DIAGNOSTICS” option is displayed. You may either press Enter to end the diagnostics, or you may press a *next selection* key to return to the beginning of the test menus.

The tests are presented in the following sequence:

1. DISPLAY COUNTERS

Various event counters maintained by the terminal are presented for diagnostic purposes. For example, you can evaluate the quality of your bar codes or operator scanning technique by looking at the number of bad reads on the bar code ports. Use the Clear key to set a counter back to 0. Counters include:

- HOST ACKS—number of times the host has acknowledged the terminal
- HOST NAKS—number of times the host has negatively acknowledged the terminal
- TERMINAL ACKS—number of times the terminal has acknowledged the host
- TERMINAL NAKS—number of times the terminal has negatively acknowledged the host
- COMM0 PARITY—counter of parity errors on COMM0 (the host port)
- COMM0 OVERRUNS—counter of overruns on COMM0 (the host port)
- COMM0 FRAMING—counter of framing on COMM0 (the host port)
- GOOD MAG0 READ—number of good magnetic reads on port A (0)
- BAD MAG0 READS—number of bad magnetic reads on port A (0)
- BAD MAG0 LENGTH—number of bad magnetic read lengths on port A (0)
- GOOD BAR0 READ—number of good bar code reads on port A (0)
- BAD BAR0 READS—number of bad bar code reads on port A (0)
- BAD BAR0 LENGTH—number of bad bar code read lengths on port A (0)
- GOOD BAR1 READ—number of good bar code reads on port B (1)

- BAD BAR1 READS—number of bad bar code reads on port B (1)
- BAD BAR1 LENGTH—number of bad bar code read lengths on port B (1)
- COLD STARTS—counter of times the terminal has been cold-reset
- COOL STARTS—counter of times the terminal has been cool-reset
- WARM STARTS—counter of times the terminal has been warm-reset
- PROCESSOR ERRS—number of processor errors encountered
- ROM ERRORS—number of read-only memory (ROM) errors encountered
- RAM ERRORS—number of random-access memory (RAM) errors encountered
- V25 TIMER ERRORS—number of V25 timer errors encountered
- CLEAR KEYS—number of times the CLEAR key has been used
- COMM1 PARITY—counter of parity errors on COMM1 (the internal coprocessor port)
- COMM1 OVERRUNS—counter of overruns on COMM1
- COMM1 FRAMING—counter of framing on COMM1
- GOOD MAG1 READ—number of good magnetic reads on port B (1)
- BAD MAG1 READS—number of bad magnetic reads on port B (1)
- BAD MAG1 LENGTH—number of bad magnetic read lengths on port B (1)

2. TEST DISPLAY

This test scrolls various character sequences across the display, allowing a check of the function of the display character generator and the display pixels.

3. TEST KEYBOARD

This test allows verification of the function of each key on the keypad. As each key in sequence is pressed, the corresponding character on the screen is erased. The Shift, Alt, Enter, etc. keys are represented by various non-alphabetic characters.

If the wrong key is pressed, its graphic symbol is briefly shown at the cursor position, and then the correct key to press is reshowed.

The proper key sequence for each model is described below. Once all the keys have been pressed, in order, the display will be blank. Pressing the Enter key one more time will cause the "EXIT DIAGNOSTICS" screen to appear.

- Model 100:

Start at the F1 key (upper left) and go *down* the column (F2–F4), then go *down* the right-hand column of keys (Clear–Shift). The indicator light labeling area adjacent to the LEDs is *not* a key.

- Model 200:

Start at the F1/A key (upper-left corner of the alpha key block), and go *across* the row to the F7/G key. Repeat this for the rows starting with F8/H, F15/O, and F22/V keys. Then start with the 1 key (upper-left corner of numeric area) and go *across* to the 3 key. Repeat this for the rows starting with 4, 7, and Shift.

4. TEST MAG READING

This test monitors sensor ports A and B for magnetic stripe reader input. If a valid magnetic read is received, the decoded data is presented for several seconds. If the read is in error, a bad read message will be shown. Press Enter at any time to exit the test.

5. TEST BAR READING

This test monitors sensor ports A and B for bar code reader input. If a valid bar code read is received, the decoded data is presented for several seconds. If the read is in error, a bad read message will be shown. Press Enter at any time to exit the test.

Before testing can begin, the bar code symbology for the 7526's native-mode decoding algorithm must be selected. This sets the style of bar code that will be accepted by both sensor ports A and B if the *High Performance Bar Code Reading Coprocessor* is not installed, or for only sensor port B if this option is installed. The choices are:

3/9 UPC EAN I2/5

where

- 3/9 is for 3 of 9 (also known as Code 39) symbology
- UPC is for Uniform Product Code symbology
- EAN is for European Article Numbering symbology
- I2/5 is for Interleaved 2 of 5 symbology

Use the *next selection* keys to move the reverse-video cursor to the desired choice, and then press Enter.

When the *High Performance Bar Code Reading Coprocessor* is installed, the diagnostics enables all of its supported bar code symbologies for the diagnostics testing. This affects only port A.

6. TEST COMM

This test can:

- Perform an internal wrap-back test of the host communication port.
- Act as a communications monitor (data scope) to show the network traffic to other terminals on the communications line.

Note: The communications monitor mode uses terminal memory to record the network communications, resulting in the loss of your downloaded programs and accumulated transactions. Be sure to poll all transactions from the terminal before using this test mode.

First, the baud rate, character length, and parity to be used must be selected. For the internal wrap test, simply select the default values by pressing Enter; for data scope mode, select the values which match the host communications parameter. Use the *next selection* keys to show or high-light (with the reverse-video cursor) the desired choice, and then press Enter.

Then select either DATASCOPE or WRAP modes:

- DATASCOPE mode:

When you select DATASCOPE communications monitor mode, the terminal sounds a long beep while it clears all available memory for the buffer. The terminal will then begin displaying communications sent from the host to the other data collection terminals. Besides being displayed, the terminal will also buffer this data in memory for later review.

Note: The DATASCOPE mode will only show communications from the host to the terminals. Do not attempt to show both host and terminal communications by rewiring the connectors.

To stop the flow of incoming data to the screen and allow review of captured communications, press the F1/A key (Access). While the monitor is being accessed, you can scroll back and forth through the previously captured data or clear the data using the following key sequences:

- Clear the capture buffer and restart the monitor: Press Shift then Clear.
- Scroll left (towards older data) by one screen-width: Press A.
- Scroll right (towards newer data) by one screen-width: Press Shift then F1/A.
- Page left (towards older data) by 256 characters: Press F2/B.
- Page right (towards newer data) by 256 characters: Press Shift then F2/B.
- Jump left (towards older data) by 1024 characters: Press F3/C.
- Jump right (towards newer data) by 1024 characters: Press Shift then F3/C.

Press Enter to restart the data monitor.

While the monitor is displaying communications data on the LCD, the following character substitutions are made:

- STX is displayed as a right-facing arrow
- ETX is displayed as a left-facing arrow
- RS is displayed as a vertical bar
- ACK is displayed as a plus sign
- NAK is displayed as a minus sign
- All other characters from 00h to 1Fh and from 7F to FF are shown as asterisks (*).

To stop the data scope, press the Enter key (press it twice if the monitor is already halted for data access).

- WRAP mode:

After selecting the WRAP test mode, you will be reminded to disconnect the 7526 from the host communications network. This is required to avoid interference with communications traffic to other terminals on the line. After verifying that the host connection is broken, press the Enter key again.

If the wrap testing is successful, you will see the message

WRAP MESSAGE xxx

where xxx is an incrementing sequence number on the display. Otherwise, you will see a test failure message.

Press Enter at any time to end the test.

7. TEST CLOCK CHIP

This test verifies that the clock-calendar chip is working and that interrupts from that chip are getting to the processor. A date (YYMMDD) and a time (HHMMSS, in 24-hour format) are entered, and then the clock-calendar function of the 7526 begins counting from there, updating the display once per second. A default date and time are prefilled in the fields, and may be selected simply by pressing the Enter key.

On the Model 100, use the following key sequences to set a date and time:

- Press F1 to increment the digit indicated by the flashing cursor.
- Press F2 to decrement the digit indicated.
- Press F3 to move the flashing cursor to the next digit on the display.
- Press Shift then Clear to reset the date or time to the prefilled value.
- Press Enter to accept the date or time as shown.

On the Model 200, use the numeric keypad keys and the Enter key to set the date and time.

After the test has started, the message "WAITING FOR TICK" is displayed, followed by the incrementing time and date. If the "WAITING FOR TICK" message stays on the screen for more than 1 second, the processor board is defective.

8. TEST DIGITAL I/O

This test allows manipulation of the digital (discrete) input/output points on the 7526 to verify their function.

Note: When testing digital output points, the outputs will be toggled every 3 seconds. If this would be disruptive to the connected equipment, the equipment should be disconnected prior to execution of the test. Use the *next selection* keys to configure the I/O port for either 8 inputs, 8 outputs, 4 inputs/4 outputs, or 4 outputs/4 inputs. After selecting the configuration with the Enter key, the display will show the state of the inputs and/or outputs. The input states are updated once per second, while the output states are toggled every 3 seconds.

You may change the state of an input by shorting the input point to ground; output states may be monitored with a volt meter between the output point and ground (5 Vdc scale).

Connector pin-outs are:

At the 7526 connector:	At the DI/DO cable far end:
Points 0–7 are at positions 2–9, respectively.	Points 0–7 are at positions 17–24, respectively.
Ground is on 21–24.	Ground is on all positions of the opposite side of the connector.

9. TEST PRINTER

Note: This test is not shown unless the processor board is printer-capable. This test will attempt to print the 7526 version data. If the 7526 detects that the printer is either:

- offline
- out of paper
- not selected
- powered off
- any other error

it will show a “PRINTER ERROR” message.

10. TEST MEMORY

This memory test does an exhaustive exercise of the random access memory. Because the test erases the contents of the 7526's RAM, you should be certain that no valuable transaction data remains in the terminal. If uncertain, connect the terminal to an active host computer so any transactions may be polled out of the 7526's memory.

The diagnostics ask you to confirm whether or not you want to continue with the memory test. At the “PROCEED? NO YES” prompt, use the *next selection* key to choose an answer and then press Enter.

The “TEST IN PROGRESS” message will be shown for several seconds, followed by the message

```
U2=xxxK U6=xxxK
```

indicating that all memory tested was good, and showing how much memory was detected in each memory socket.

If the test found any defective memory, the message

```
201 SSSS:OOOO Ux
```

will be shown. Error code 201 indicates a memory error, SSSS:OOOO gives the segment and offset of the defective cell, and Ux gives the socket number (e.g., U2 or U6).

After the results message is displayed, press Enter to continue. Because the memory test has written over all RAM, the terminal will then do a cold reset. Reconfiguring of all setup parameters is then required.

Appendix A. Erasing the Current Password

If you do not know the current security password (or have forgotten it), but still need access to the keylock mode, you can erase the password with the following procedure.

1. Switch off power at the keylock switch, and remove the key.
2. Tag all cables connected to the terminal (to prevent confusing them when they are unplugged).
3. Unplug all cables connected to the terminal. (Remove the two screws that secure each cable to its connector, and unplug the cable.)
4. Remove the terminal from its mounting. Be sure to hold the terminal while removing it, to prevent it from falling. (If the terminal is mounted with a Standard Mounting Bracket, the bracket ears or the entire bracket assembly may be left attached to the terminal backplate.)
5. Open the terminal as follows:

Warning: Whenever handling the electronic components of the 7526, use precautions to prevent component damage due to electrostatic discharge. Before handling electronic components, touch a grounded metal surface to discharge any static buildup.

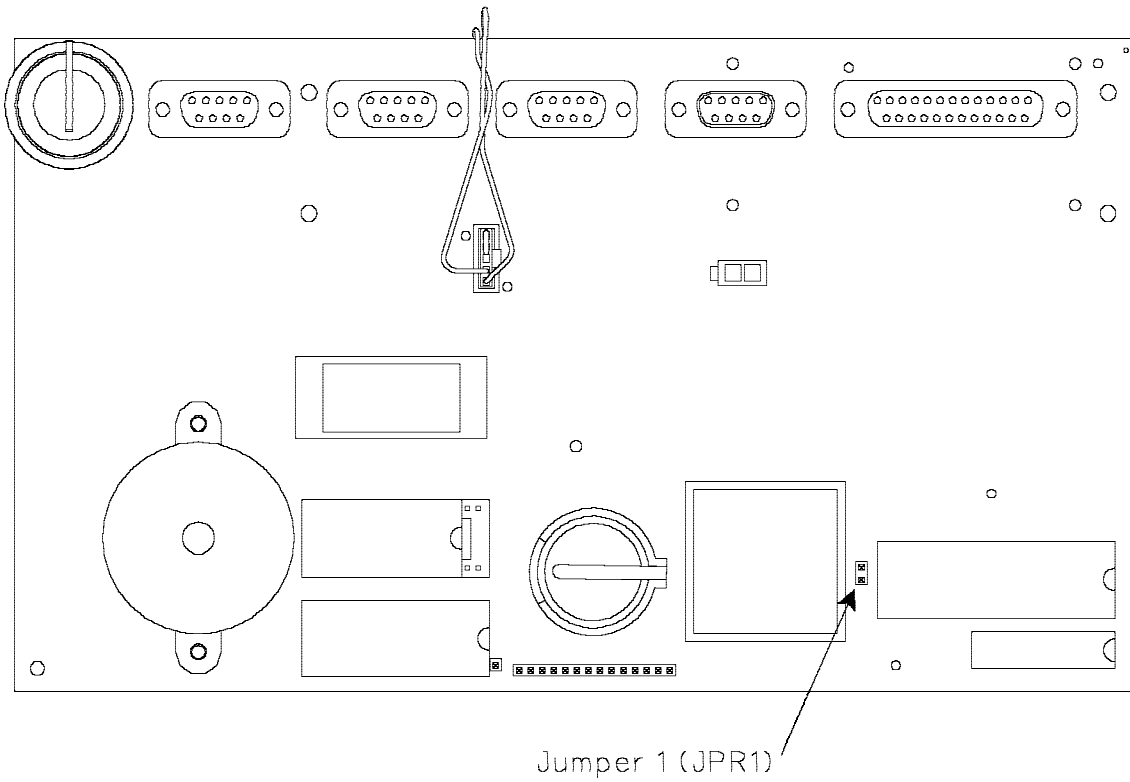
- a. Turn the 7526 terminal over, so that the keyboard faces down. (Use a soft material as a cushion to prevent machine damage.)
- b. Remove the four screws from the cabinet's bottom cover — one screw near each corner.
- c. The cabinet may now be opened. Lift the bottom cover (metal backplate) off the top cover, and lay it aside.

Note: If an optional Operational Battery Backup Feature is installed, disconnect the battery cable at the processor board by squeezing its retaining tab slightly and lifting it up. (The connector and cable end are keyed to assure correct replacement.)

6. Locate jumper 1 (JPR1) on the processor board. (Refer to Figure A-1 on page A-2 for the jumper location.)
7. Reconnect the cordset and power supply module.
8. Carefully short out between the two jumper pins with a small screwdriver, and while holding the pins shorted, power on the terminal until the two beeps are heard. This action erases the current password.
9. Reassemble the terminal using the procedure described in "Reassembling the Terminal."

To reset the password, use the setup procedure found in Chapter 3, "Setup (Configuration)" on page 3-1.

Early production board (not printer-capable)



Later production board (printer-capable)

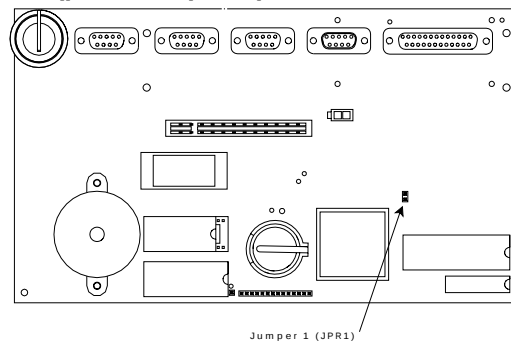


Figure A-1. Processor board jumper 1 (JPR1) location

Appendix B. Power Cords

IBM power cords used in the United States and Canada are listed by Underwriter's Laboratories (UL) and certified by the Canadian Standards Association (CSA). These power cords consist of:

- Electrical cables type SJT.
- Attachment plugs complying with National Electrical Manufacturers Association (NEMA) 5-15P.
- Appliance couplers complying with International Electrotechnical Commission (IEC) Standard 320, Sheet C13.

IBM power cords used in all other countries consist of:

- Electrical cables type HD21 ◀ HAR ▶.
- Attachment plugs approved by the appropriate testing organization for the specific countries where they are to be used.
- Appliance couplers complying with International Electrotechnical Commission (IEC) Standard 320, Sheet C13.

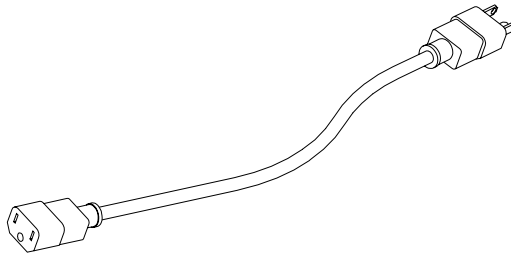


Figure B-1. Cordsets

The following list shows power cordset part numbers by country. IBM cordsets for a specific country are usually available only in that country.

Cordset part number	Country where used
6952320	Austria
6952320	Belgium
6360991	Canada
6952329	Denmark
6952320	Finland
6952320	France
6952320	Germany
6952320	Greece
6952383	Ireland
6952383	Israel
6952374	Italy
6952374	Ivory Coast
6952365	Liechtenstein
6952320	Netherlands
6952320	Norway
6952320	Portugal
6952356	Saudi Arabia
6952347	South Africa
6952320	Spain
6952320	Sweden
6952365	Switzerland
6952356	United Kingdom
6360991	United States

Appendix C. Communications Line Attachment Box Mounting Information

This appendix contains information for mounting the communications line attachment box which is available from IBM as an optional feature. A mounting hole template **drawn to approximate scale** and hole drilling information are given here.

Mounting Hole Template

The following figure shows the hole template mounting the optional communications line attachment box.

Important:

This template figure is drawn to approximate scale, but it is not actual size. Before drilling mounting holes, you should make measurements based on this figure; or you can use the actual communications line attachment box as a template.

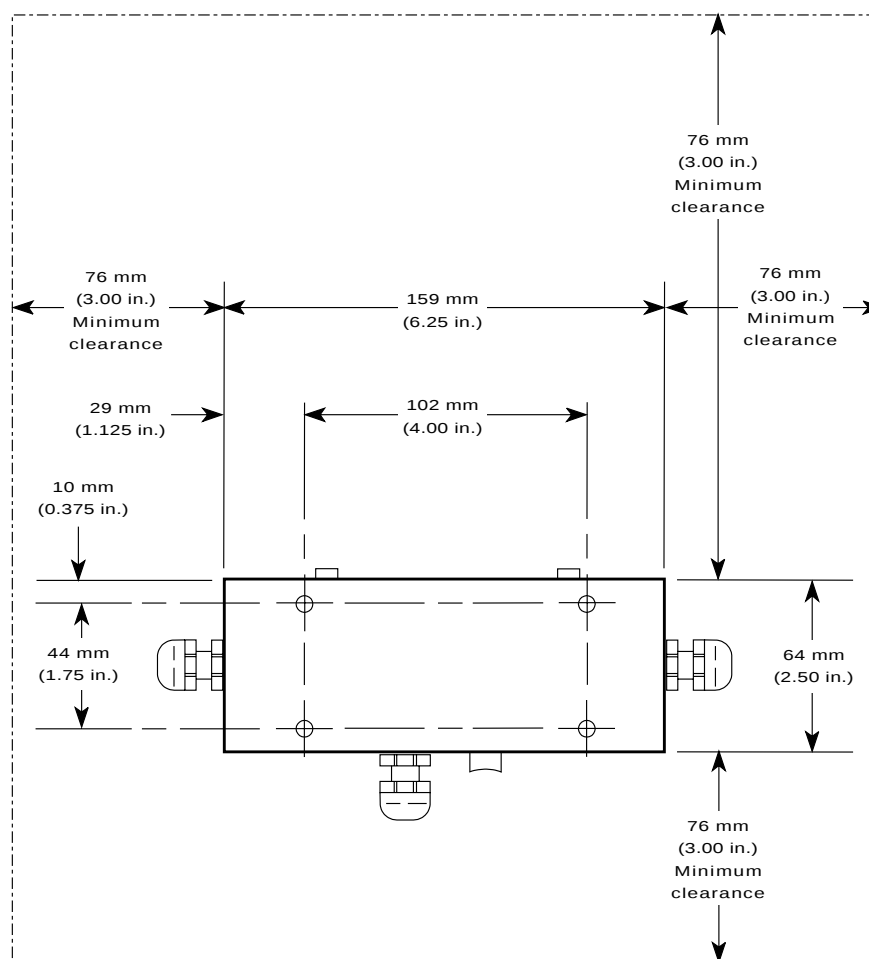


Figure C-1. Mounting hole template: Communications line attachment box

Mounting Hole Drilling Information

Use the drill size information given in the following chart for drilling all holes when mounting the communications line attachment box.

Notes:

1. Drill and use all four holes indicated in the mounting hole template.
2. Plastic anchors, sheet metal screws, and machine screws and nuts are provided in the mounting feature kit for the different methods of installation shown in the chart.
3. If the provided plastic anchors are used, drill all holes approximately 28.6 mm (1 $\frac{1}{8}$ ") deep. (This allows clearance for the plastic anchors.)

Type of base or wall	Drill size (mm)	Drill size (in.)
Solid or hollow — using #8 plastic anchors and #8 sheet metal screws provided in mounting feature kits. Drill anchor holes 28.6 mm (1 $\frac{1}{8}$ in.) deep.	4.8 mm	0.187 in. (#13)
Solid wood — using #8 sheet metal screws provided in mounting feature kits, but not plastic anchors.	3.6 mm	0.140 in. (#28)
Sheet metal — using #8 sheet metal screws provided in mounting feature kits, but not plastic anchors. Metal thickness: 0.030 in. (0.76 mm) 0.036 in. (0.91 mm) 0.048 in. (1.17 mm) 0.060 in. (1.52 mm) 0.075 in. (1.91 mm) 0.105 in. (2.67 mm)	2.9 mm 3.0 mm 3.3 mm 3.5 mm 3.6 mm 3.8 mm	0.116 in. (#32) 0.120 in. (#31) 0.128 in. (#30) 0.136 in. (#29) 0.140 in. (#28) 0.149 in. (#25)
Sheet metal — using 8-32 machine screws and nuts provided in mounting feature kits.	4.8 mm	0.187 in. (#13)

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Installation, Operation,
and Problem Determination
Publication No. SC28-9627-01**

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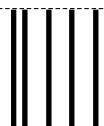
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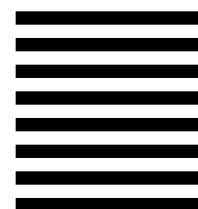
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