5280

IBM

IBM 5280
Distributed Data
System

Cable Assembly Manual

IBM

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Distributed Data
System

Cable Assembly Manual

The purpose of this publication is to provide information about ordering twinaxial and multiconductor cables, assembling your own bulk cables, and testing the cables before installation.

RELATED PUBLICATIONS

● _IBM 5280 Planning and Site Preparation Manual_ GA21-9351.

● _IBM 5280 General Information Manual_ GA21-9350.

CONTENTS

For twinaxial cables (used to connect IBM 5225 and 5256 printers to
programmable units), you are responsible for determining the proper
lengths, ordering or assembling the cables, and installing and
maintaining the cables. This chapter explains which cables you should
order, how to assemble them, and the completion tests to use before
installing the cables. In presenting this information, it is assumed
that the person(s) doing the cable assembly and cable installation have
the skill required to do this type of work.

It is important that you order your cables early, so that cable labeling
and testing can be completed before the system arrives.

CABLE PREPARATION

This section explains how to order the twinaxial cables.

When ordering cables, be sure that the cables are long enough to reach
from machine to machine. Allow enough cable to move the machines for
servicing. A minimum of 1 meter (3 feet) at both ends is recommended
beyond the required length to connect the units. The distance from the
machine to the floor or ceiling (path of cable) must also be considered.
You may order cables either preassembled or in bulk (unassembled),
either from IBM or from other companies.

The following table provides ordering information for twinaxial cables.

Part Name	Twinaxial Cable Indoor or Outdoor
Cable Assembly (cable in specified length with connectors at both ends)	IBM part 7362267
Adapter (cable to cable)	IBM part 7362230 Amphenol part 82-5588 or equivalent
Bulk Cable (cable in specified length without connectors)	IBM part 7362211
Connector Kit (two male connectors)	IBM part 7362268
Connector (single)	IBM part 7362229 Amphenol part 82-5589 or equivalent

When ordering cables from other than IBM:

1. See the following table for the bulk cable specifications (IBM part 7362211 or equivalent.)

2. Specify the total length of each cable required.

3. Specify Amphenol part 82-5589 or equivalent for the cable connectors.

4. If an adapter is required, specify Amphenol part 82-5588 or equivalent.

See Cable Assembly later in this chapter for assembly instructions for cable connectors on bulk cables.

- Jacket
- Shield
- Core Insulation (polyethylene)
- Conductor Insulation
- Conductors (2)
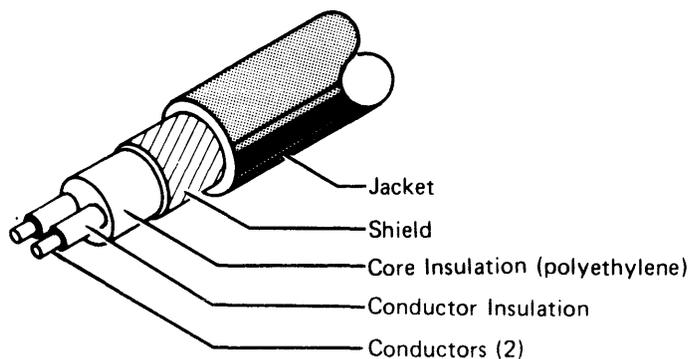
The following table provides bulk cable specifications for twinaxial cable

Conductor	AWG wire size	20
	Stranding	7 X 28
	Material	Copper
	Coating	Tin (1 conductor only)
	Conductors	2
	Resistance	11 ohms maximum per 30.5 meters (100 feet)
Insulation	Material	Polyethylene
	Outside dia.	6.1 millimeter (0.24 inch) nominal
Shield	Material	Tinned copper
	Type	Braid, 34 AWG, 7 ends/24 carrier, 9.7 ± 10% picks/inch
	Coverage	95% minimum
	Resistance	3 ohms maximum per 30.5 meters (100 feet)
Jacket	Material	Vinyl
	Color	Black
	Average single wall thickness	0.76 millimeter (0.029 inch)
	Cable O.D.	8.25 millimeter (0.325 inch) nominal
Rating	Dialectric strength	4500 Vdc for 3 seconds at 28°C (82°F)
Capacitance		53.1 pF/meter max (16.2 pF/foot max)
Impedance		111 ± 5% ohms at 0.5 Mhz 107 ± 5% ohms at 1.0 Mhz 105 ± 5% ohms at 2.0 Mhz and above
Attenuation at 100 Mhz		4.5 dB/30.5 meters (100 feet) maximum at 25°C (77° F) 4.7 dB/30.5 meters (100 feet) maximum at 80°C (176°F)
Velocity of propogation		66% ± 5%
Operating environment		-40° to 80°C (-40° to 176°F) 10% to 90% relative humidity

Cable Adapters

Do not splice cables; instead use connectors (IBM part 7362229, Amphenol part 82-5589, or an equivalent) and an adapter (IBM part 7362230, Amphenol part 82-5588, or an equivalent) as shown below.

The adapter and the attached cable connectors should be covered with shrink tubing or electrical tape to prevent accidental grounding of the connection. The following diagram illustrates the cable adapter for joining twinaxial cables.

Connector (IBM part 7362229,
Amphenol part 82-5589, or equivalent)
Connector Kit (IBM part 7362268)
includes two connectors

Adapter (IBM part 7362230,
Amphenol part 82-5588, or equivalent)

Bulk Twinaxial Cable (IBM part 7362211)[1]

Shrink
Sleeve

23 mm (0.91 inch)
Connector Body Diameter

Cable Assembly (IBM part 7362267), includes connectors.
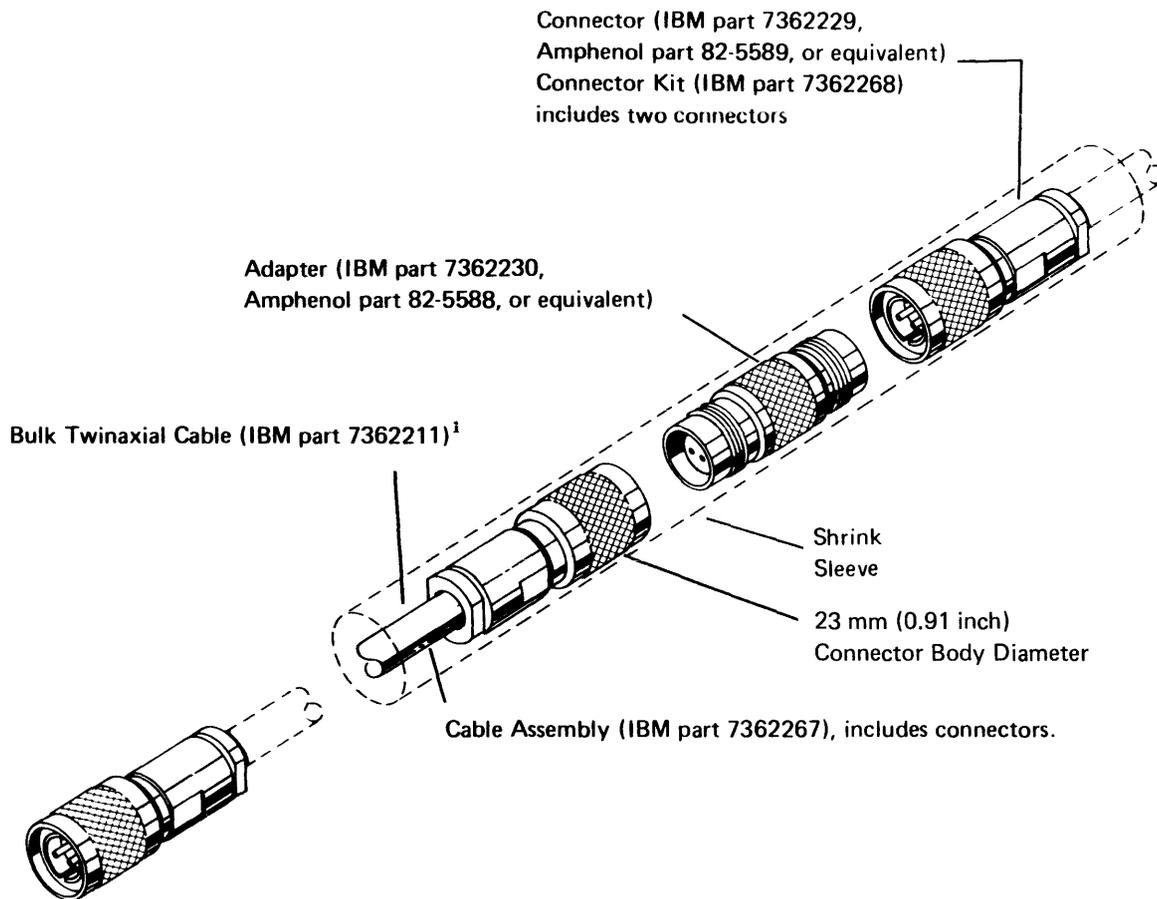
Cable Assembly

If you purchase bulk cables, assemble them as follows. Refer to the illustrations following these instructions for dimensions and for assistance in doing these procedures. If you use connectors provided by a company other than IBM, use the instructions provided by the manufacturer.

1. Be certain that the connector kit has all of the required parts. Check the cross-sectional diagram for location of the cable layers.

Twinaxial Cable

Jacket
Wire Shield
Cable Core Insulation
Conductor Insulation
Conductor

Clamp Nut
Clamp Gasket
Braid Clamp
Sleeve
Male Contacts
Insulator
Plug Body

(IBM part 7362229)
Twinaxial Connector
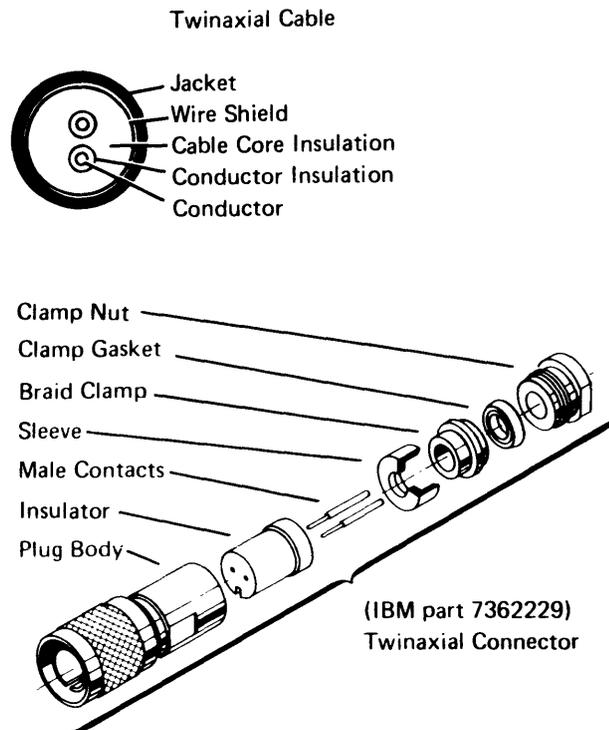
2. Cut the end of the cable sharp and square. Then slide a clamp nut and clamp gasket over the cable jacket and trim the jacket to the dimension given. Push the wire shield back to expose the inner insulation core, and cut the core and conductors to the dimension shown (16 millimeters (0.63 inch)). Slide the wire shield back over the core, and taper it to a point for ease of braid clamp assembly in step 3.
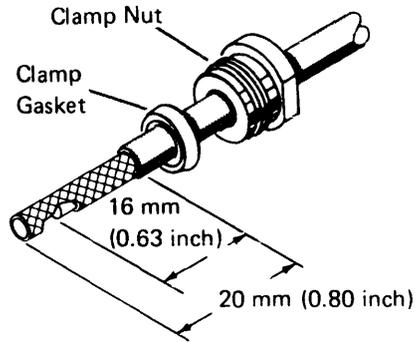
3. Slide a braid clamp over the braid so that its inner shoulder butts against the cable jacket. Then, fold the shield back over the braid clamp and trim below the shoulder.
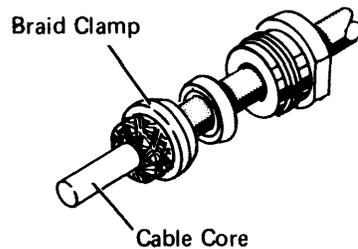
Note: Placement of braid wires over the braid clamp must be uniform to provide good rf (radio frequency) connection of the shield, and to prevent breaking the shield strands.

4. Cut the cable core and the conductor insulation to the dimensions shown. <u>Do not nick the conductors or the insulation.</u> If the braid is frayed, retrim the braid as in step 2.

4.3 mm (0.17 inch)

9.5 mm (0.38 inch)
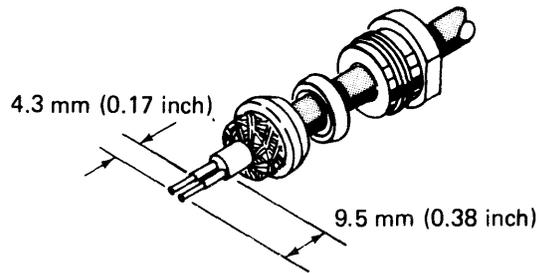
5. Slide the sleeve over the cable core and press the sleeve against the braid wires.

   Using minimum heat, solder the male contacts to the conductors. CLEAN OFF ANY EXCESS SOLDER.

Sleeve
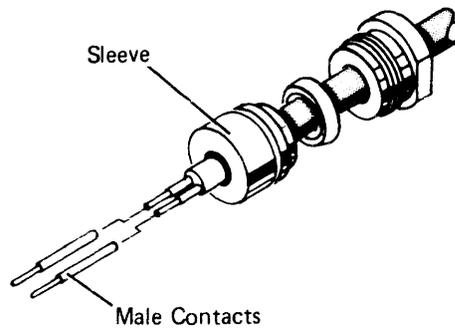
Male Contacts

6. Bend the conductors and the contacts out at right angles to the cable axis; then bend the conductors back to parallel (approximately 6.4 millimeters (0.25 inch) between conductors).

6.4 mm (0.25 inch)
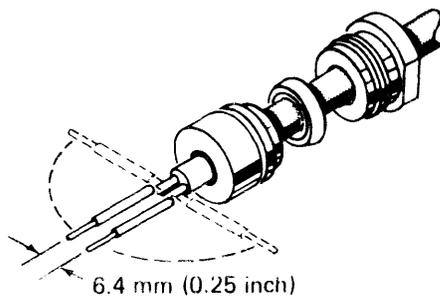
7. Slide the insulator over the contacts and the cable so that the insulator butts against the sleeve. Press all parts together. The contact on the copper lead of the cable goes into the insulator hole that has a dot next to it.
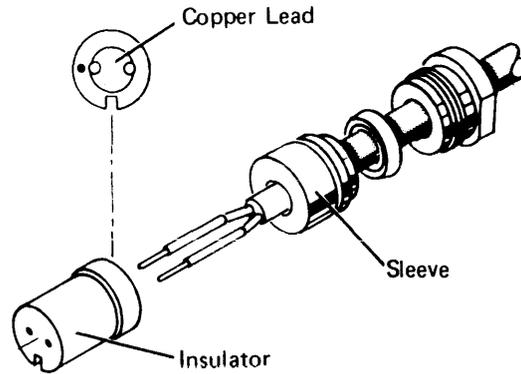
8. Insert the assembly into the connector body, aligning the polarizing slot in the insulator with the polarizing pin inside the plug body. Tighten the clamp nut with 5.7 to 6.8 newton meters (50 to 60 inch pounds) torque. (The cable and plug body should not be allowed to twist as the clamp nut is tightened.)
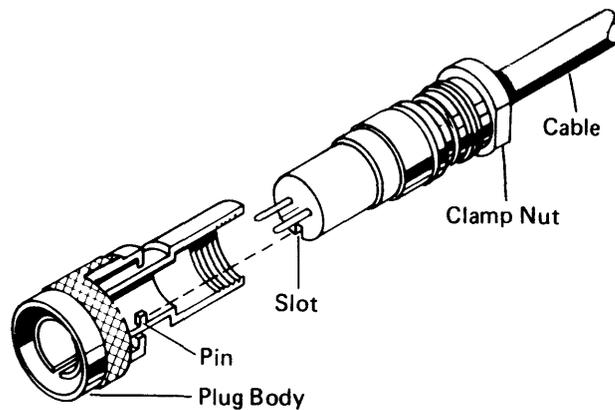
9. Check for shorts between the conductors and between each conductor and the connector body.

Completion Tests of Cabling

Installation of cabling should include completion tests to ensure that there are no faults, no high-resistance connections, and no circuit imbalances. The tests for faults should ensure there are no:

1. Open circuits in individual conductors or shields.

2. Short circuits between conductors.

3. Grounds on individual conductors, either between a conductor and a shield or between a conductor and a grounded object.

4. Reversed polarities.

Line Continuity and Polarity Tests

The following guidelines should be used for testing line continuity and polarity. The tests should be made for individual cable segments; however, they can be used for a complete cable run if cable segments are connected with a cable adapter or if they are attached directly from one machine to another.

Notes:

1. The power must be off to all units being checked.

2. Measurements are not valid with station protectors connected to the line. (Station protectors are discussed in the IBM 5280 Planning and Site Preparation Manual).

Line Continuity

The only tools required for line continuity checks are an ohmmeter and jumpers to connect between the connector pins (signal lines) and the connector body (cable shield). When the following checks are made, the resistance values measured should fall within the indicated ranges, for the maximum 1525-meter (5000-foot) line.

With both ends of the cable open and the cable not plugged into a machine, measure (at either end):

● Conductor-to-conductor---greater than 1 000 000 ohms

● Each conductor-to-shield---greater than 1 000 000 ohms

A reading less than 1 000 000 ohms means there is a short.

With both lines tied to the shield at the far end, measure (at the nearest end):

● Conductor-to-conductor---less than 110 ohms

● Each conductor-to-shield---less than 70 ohms

A reading greater than 110 or 70 ohms, respectively, means there is an open circuit.

Values for shorter lengths are proportional because this is a linear function. For example, a cable with half the maximum length would have half the resistance.

Line Polarity

After testing the line continuity and making any necessary correction, check the polarity as follows.

With conductor A (see diagram) tied to the shield at the far end, measure (at the nearest end): conductor A to shield---less than 70 ohms. (If over 70 ohms, the lines are crossed.)

The polarity of the line must be maintained for each cable segment (between each unit) and for the entire cable run to ensure proper machine operation.

Cable Plug

Conductor A

Slot

For multiconductor cables (used to connect IBM 5280 units), you are responsible for determining the proper lengths, ordering or assembling the cables, and installing and maintaining the cables. This chapter explains which cables you should order, how to assemble them, and the completion tests to use before installing the cables. In presenting this information, it is assumed that the person(s) doing the cable assembly and cable installation has the skill required to do this type of work.

It is important that you order your cables early, so that cable labeling and testing can be completed before the system arrives.

CABLE PREPARATION

This section explains how to order the multiconductor cables.

When ordering cables, be sure that the cables are long enough to reach from machine to machine. Allow enough cable to move the machines for servicing. A minimum of 0.6 meters (2 feet) at both ends is recommended beyond the required length to connect the units. The distance from the machine to the floor or ceiling (path of cable) must also be considered. You may order cables either preassembled or in bulk (unassembled), either from IBM or from other companies.

To make installation easier, it is recommended that you purchase preassembled cables. Proceed with the following sections in this chapter for cable specifications, assembly procedures, and testing.

The following table provides ordering information for multiconductor cables.

Part Name	Multiconductor Cable Data Station or Diskette Drive
Cable Assembly (notes 3 and 4) (cable in specified length with connectors at both ends)	IBM part 7364212 (data station) IBM part 7364208 (diskette drive)
Bulk Cable (cable in specified length without connectors) (Note 1)	IBM part 7364108 (data station) (Belden part YR16167 or equivalent) IBM part 7364109 (diskette drive) (Belden part YR16168 or equivalent)
Connector Kit (Note 2)	IBM part 4177800

When ordering cables from other than IBM:

1. See the following table for the bulk cable specifications.

2. Specify the total length of each cable required (Note 1).

3. Specify Amphenol part 202208-1 or equivalent for the cable connectors (Note 2).

4. Specify Amphenol part 66507-3 or equivalent for the cable terminals (Note 2).

5. Order connector covers and screws, IBM parts 4177465/1618295/1621846 (Note 2).

6. Order cable retainer, IBM part 5642716 (Note 2)

Notes:

1. Specify the total length of each cable when ordering. For example, total length = distance from work station to controller + additional clearance for servicing (0.6 meters or 2 feet) at each end of the cable.

2. Each connector kit (IBM part 4177800) contains 2 covers and screws (IBM parts 4177465/1618295/1621846), 2 connectors (IBM part 1655338), 55 conductor terminals (IBM part 1655359), 4 conductor terminals (IBM part 1655339),2 cable retainers (IBM part 5642716), 1 green label, 1 yellow label, shrink tubing and a drain wire attaching wire.

3. The maximum cable length is 61 meters (200 feet).

4. The first data station connected to port 0 of the IBM 5288 Programmable Control Unit must be within easy viewing distance of the programmable control unit. It is recommended that the first data station be within 6 meters (20 feet) of the programmable control unit.

Multiconductor Cable Specifications

Cable		Data Station	Diskette Drive
Conductor	AWG wire size	26	26
	Stranding	7 X 34	7 x 34
	Material	Copper	Copper
	Coating	Tin	Tin
	Conductors	20	25
Insulation	Material	Polypropylene irradiated cellular	Polypropylene irradiated cellular
	Outside dia.	2.05 millimeter (0.081 in.) max.	2.05 millimeter (0.081 in.) max.
Shields (see note)	Material	Polyester-backed aluminum foil	Polyester backed aluminum foil
	Coverage	100%	100%
Jacket	Material	Noncontaminating PVC	Noncontaminating PVC
	Color	Black	Black
	Average single wall thickness	1.52 millimeter (0.06 in.)	1.52 millimeter (0.06 in.)
	Cable O.D. (nominal)	16 millimeter (0.63 in.)	17 millimeter (0.67 in.)
Drain wire (1 for Each conductor plus shield)	AWG wire size	28	28
	Stranding	7 x 36	7 x 36
	Material	Copper	Copper
	Coating	Tin	Tin
Rating, ambient temperature		60°C Maximum	60°C Maximum
Capacitance, maximum		70.5 pF/meter max (21.5 pF/foot max)	70.5 pF/meter max (21.5 pF/foot max)
Impedance	·	75 ± 7.5 ohms	75 ± 7.5 ohms
Attenuation (maximum)		3dB/30.5 meters (100 ft) at 10 Mhz 10 dB/30.5 meters (100 ft) at 100 Mhz	3 dB/30.5 meters (100 ft) at 10 Mhz 10 dB/30.5 meters (100 ft) at 100 Mhz

Note: The conductive (silver) surface for the conductor shield is to face in. The conductive surface for the cable shield is to face out.
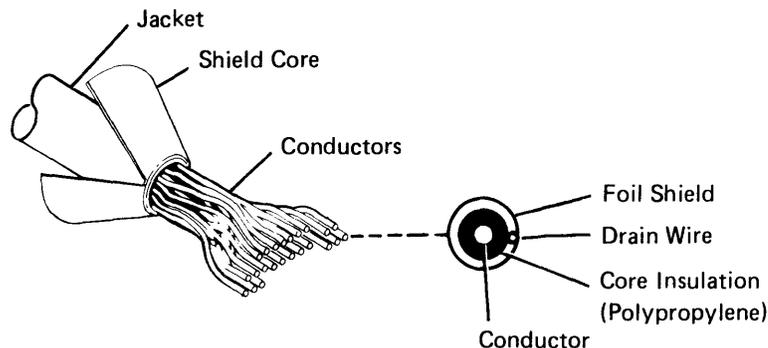
CABLE TO CONNECTOR ASSEMBLY

If you purchase bulk cables, assemble the connectors to the cables as
instructed by the following procedure. See the illustration following
each procedure for dimensions and guidance. If you use connectors
provided by a company other than IBM, use the instructions provided with
the connector.

1.   Verify that you have all the parts as shown in the following
     diagram.
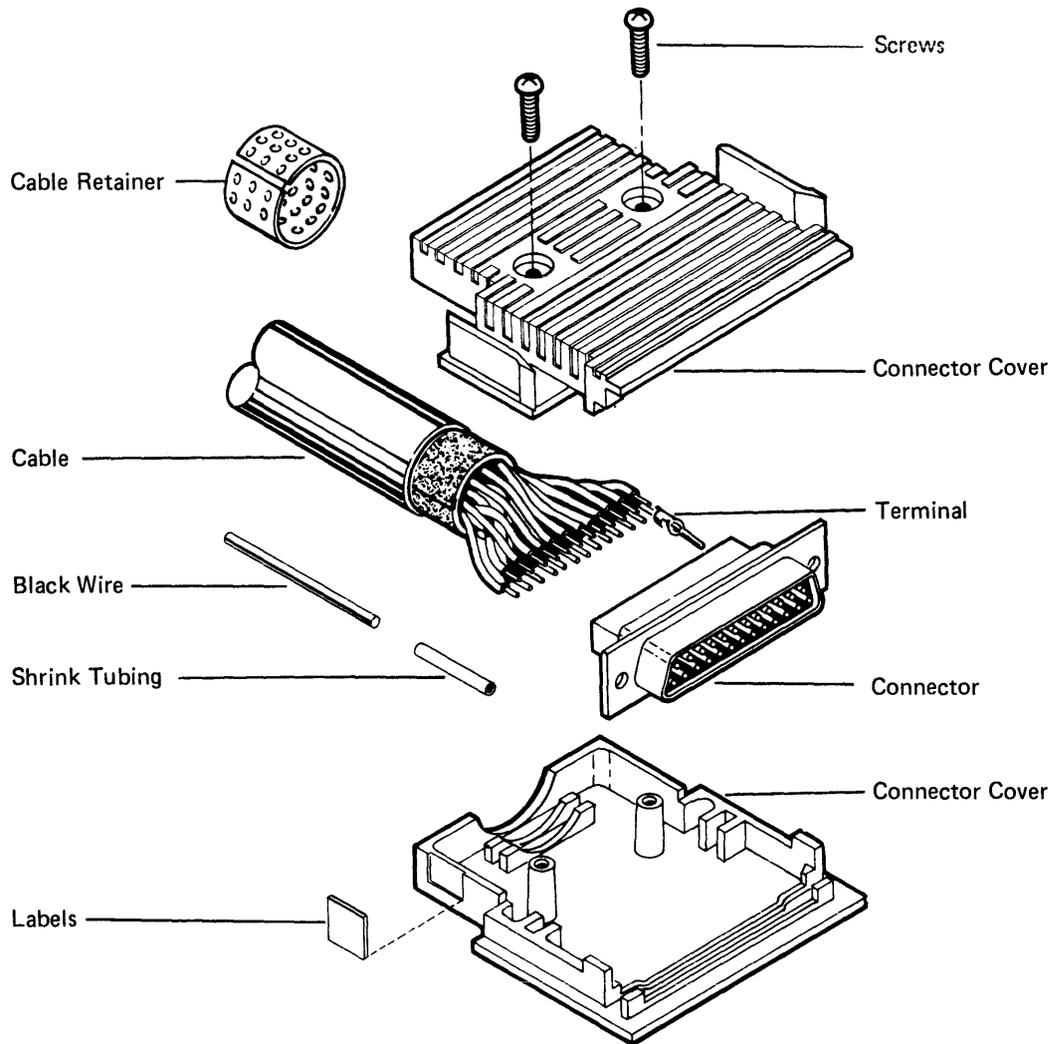
2. Measure 35 millimeters±2 millimeters (1.38 ± 0.08 inch) from the end of the cable.

CAUTION: Do not cut the aluminum foil under the jacket in the next step.

3. Score the outer jacket of the cable with a shallow cut at this point and twist off the scored section.

Outer Jacket ————————   ———————— Foil

35 ± 2 mm
(1.38 ± 0.08 inch)
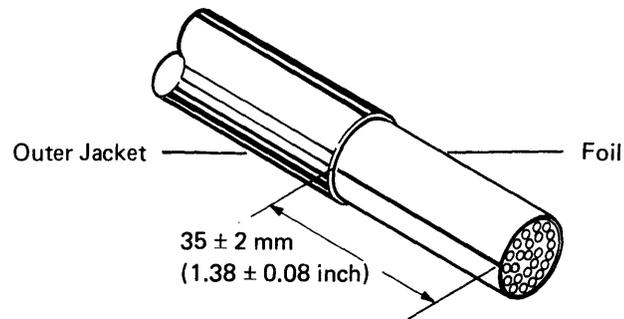
4. Slip a piece of heat shrink tubing (approximately 20 mm, 0.08 in.) over the cable.

5. Slit the outer jacket 15 ± 1 millimeter (0.6 ± 0.08 inch).

———— Shrink Tubing
(20 mm, 0.8 inch)

15 ± 1 mm
(0.60 ± 0.04 inch)
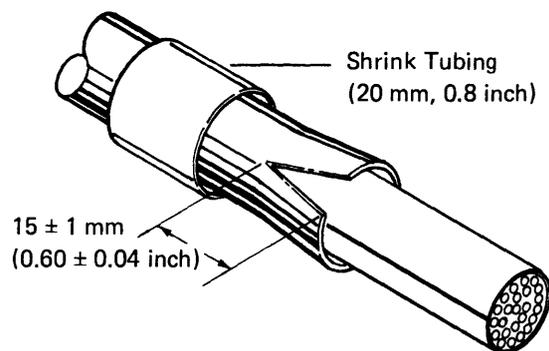
6. Fold back the outer jacket, aluminum foil, and outer drain wire that
    surrounds the conductors over the outer jacket.

7. Remove the plastic wrap (if present) at the fold.

Shrink Tubing ——————
Outer Jacket ——————
Outer Aluminum Foil ——————
—————— Outer Drain Wire
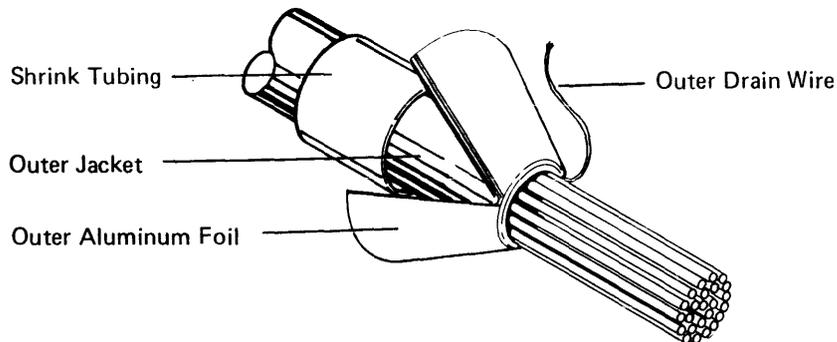
8. The exposed conductors are individually wrapped in aluminum foil and
    are color coded in two ways: the color of the aluminum foil wrapping
    and the color of the inner insulation around the conductor. The
    orange conductor wrapped in silver colored foil (in the 25 conductor
    cable) is a spare conductor; place a piece of electical tape over
    the end of this conductor.

Spare Conductor
(orange conductor wrapped
in silver foil, 25 conductor cable)

—————— Tape

9. Locate the colored conductors listed in the table for the cable you are assembling and cut those conductors 5 ± 1 millimeter (0.20 ± 0.04 inch) shorter than the other conductors. This will allow a better lay in the covers.

Cut 5 ± 1 mm
(0.20 ± 0.04 inch) shorter.

Data Station

Body Color	Foil Shield Color
Orange	Blue
Blue	Blue
Yellow	Blue
White	Blue
Black	Red
Brown	Red
Red	Red
Red	Green
Orange	Green
Blue	Green
Yellow	Green

Diskette Drive

Body Color	Foil Shield Color
Orange	Blue
Blue	Blue
Yellow	Blue
White	Blue
Black	Red
Brown	Red
Red	Red
Red	Green
Orange	Green
Blue	Green
Yellow	Green
White	Green
Black	Clear

10. Take a single conductor (except the 25 conductor cable spare conductor) and peel back the plastic wrap and aluminum foil approximately 25 millimeters (1.0 in). This will expose a bare silver wire (the conductor drain wire).

Plastic Wrap and Aluminum Foil

25 mm (1 inch)

Conductor Drain Wire

11. Bend the drain wire away from its conductor.

12. Remove approximately 3 millimeters (0.12 inch) of insulation from the conductor. Use a crimping tool (Amphenol part number 90302-1 or equivalent) and crimp a terminal (IBM part 1655359) onto the conductor.


Conductor Drain Wire

Approximately
3 mm (0.12 inch)
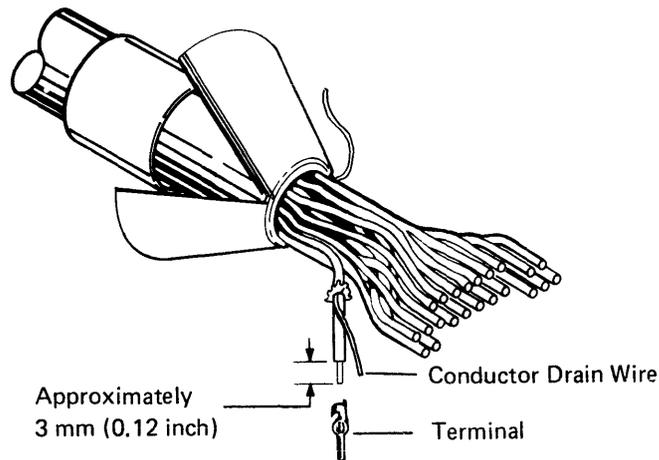
Terminal

Note: Do not solder the terminal or insert it into its assigned connector hole.

13. Repeat steps 10, 11, and 12 for each conductor, one conductor at a time. Be careful not to peel away too much aluminum foil--you will need to know its color in later steps.

14. After you have crimped terminals on all of the conductors, twist all of the bare drain wires together to form one wire.

15. Remove approximately 5 millimeters (0.20 inch) from each end of a separate piece of black wire 25 millimeters (1.0 inch) long.

16. Twist this wire around the drain wires twisted together in step 14.

Note: This wire is supplied in IBM connector kit 4177800.

Conductor Drain Wires

(Terminals not shown)

25 mm (1 inch)

5 ± 1 mm
(0.20 + 0.04 inch)

5 ± 1 mm
(0.20 + 0.04 inch)
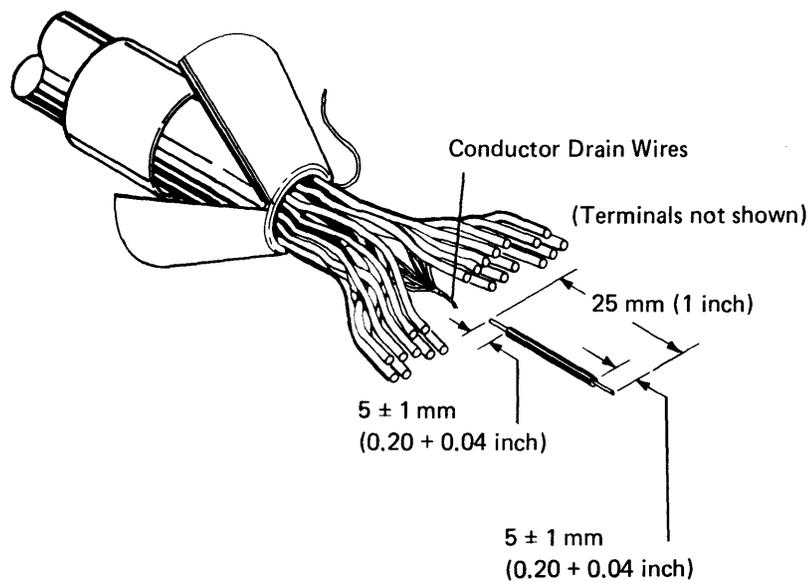
17. Use minimum heat and carefully solder the conductor drain wires and the black wire together. Ensure that the section of the black wire where the insulation has been removed remains exposed.

CAUTION: Clean off any excess solder. Ensure that the solder joint does not have any sharp edges and that the wrapping on the individual conductors is not damaged during the soldering process.

(Terminals not shown)
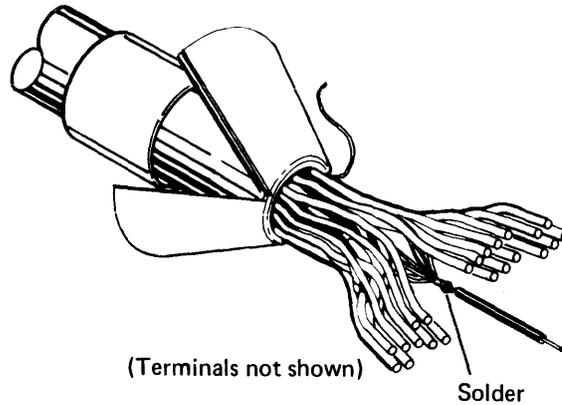
Solder

18. Apply and shrink a 15 ± 2 millimeter (0.6 ± 0.08 inch) piece of shrink tubing over the soldered joint.

19. Crimp the large terminal (IBM part 1655339) onto the exposed end of the black wire.

15 ± 2 mm
(0.60 ± 0.08 inch)

(Terminals not shown)

Shrink Tubing
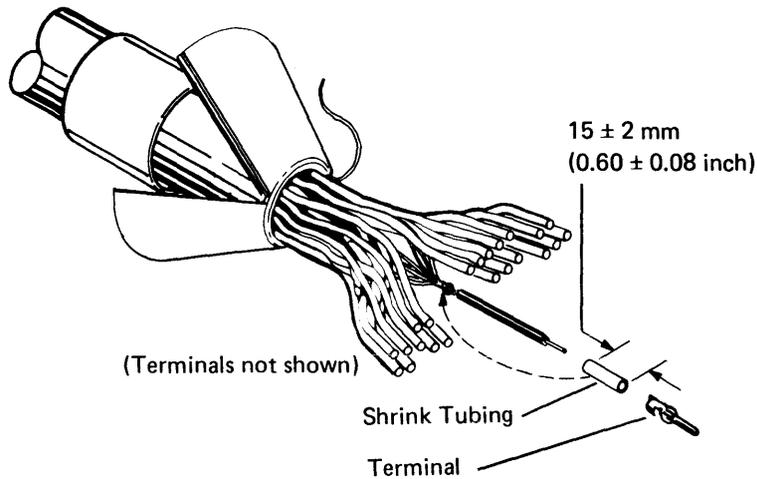
Terminal

20. Use the cable chart for the cable you are assembling as a guide and insert the terminals into the assigned connector holes. Leave the spare conductor (in the 25 conductor cable) free.

Spare Conductor

Connector

Diskette Drive

| Body Color	Foil Shield Color	Connector Pin Number
Black	Blue	1
Brown	Blue	2
Red	Blue	3
Orange	Blue	4
Blue	Blue	5
Yellow	Blue	6
White	Blue	7
Black	Red	8
Brown	Red	9
Red	Red	10
Orange	Red	11
Blue	Red	12
Yellow	Red	13
White	Red	14
Black	Green	15
Brown	Green	16
Red	Green	17
Orange	Green	18
Blue	Green	19
Yellow	Green	20
White	Green	21
Black	Clear	22
Brown	Clear	23
Red	Clear	24
Orange	Clear (spare)	Not Used
Soldered drain wires		25

Data Station

Body Color	Foil Shield Color	Connector Pin Number
Black	Blue	1
Brown	Blue	2
Red	Blue	3
Orange	Blue	4
Blue	Blue	5
Yellow	Blue	6
White	Blue	7
Black	Red	8
Brown	Red	9
Red	Red	10
Orange	Red	11
Blue	Red	12
Yellow	Red	13
White	Red	14
Black	Green	15
Brown	Green	16
Red	Green	17
Orange	Green	18
Blue	Green	19
Yellow	Green	20
Soldered drain wires		25

Multiconductor Cable 2 - 11

21. Pull the aluminum foil and outer cable jacket forward toward the connector.

22. Install the retainer (IBM part 5642716) over the cable outer jacket. Locate slot to side of cable as shown.


Cable Retainer
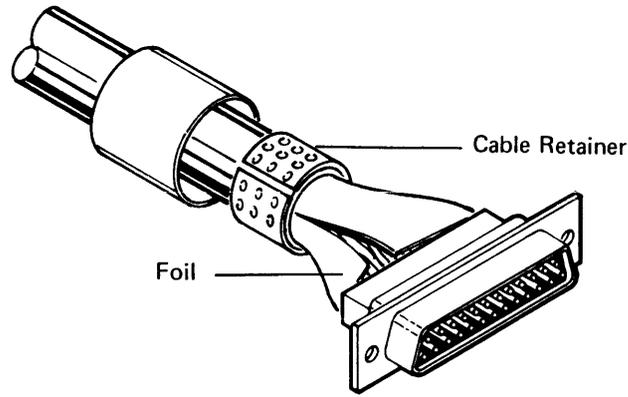
Foil

23. Fold the aluminum foil back over the retainer approximately 15 millimeter (0.6 inch) and refold forward. The silver side of the foil must be visible.

24. Wrap one layer of electrical tape where foil was removed.

Shrink Tubing

Drain Wire

Foil

Electrical Tape
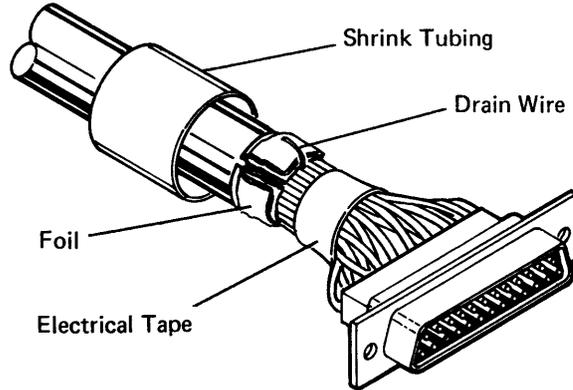
CAUTION: Ensure connector is correctly placed in cover as shown for a data station or a diskette drive cable.

25. Place connector into slots in bottom half of connector cover. and position wires between the bosses.

26. Fold the spare conductor into the cover. (Diskette Drive cable.)

27. Ensure that the retainer and end of outer jacket is inside the cover and that the conductive foil and drain wire are in contact with the cover clamping ribs.

28. Align top half of cover with the bottom half and press both halves together. Secure with the two screws.

29. Slide the heat shrink tubing over slit in outer jacket until it is against the cover.

30. Shrink the tubing.
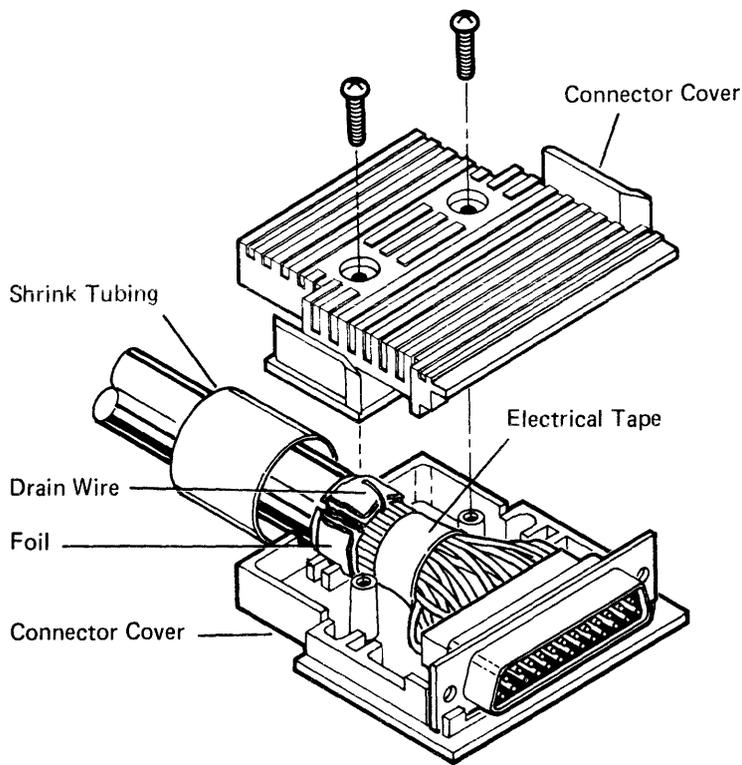
(Data Station Connector Shown)
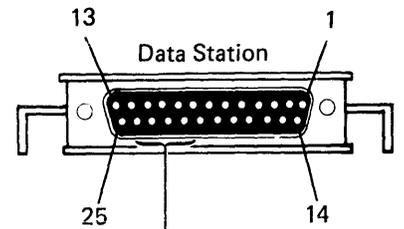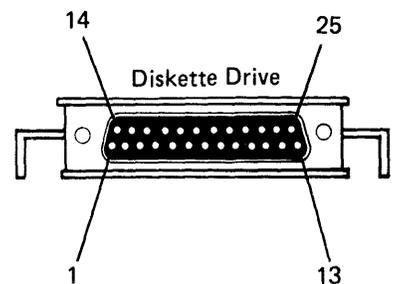
31. Attach the sticky label (provided with connector kit) in the postion
    shown. A yellow label should be attached to a diskette drive cable
    connector; a green label to the data station cable connector.
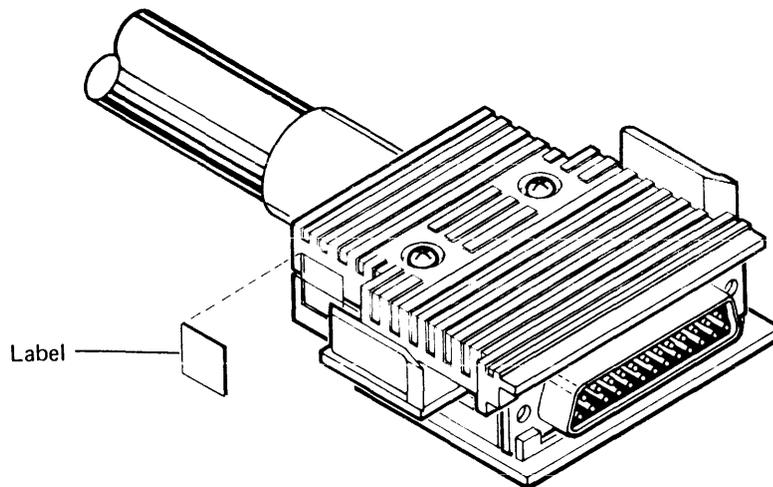
Label

Completion Tests of Cabling

Installation of cabling should include completion tests to ensure that there are no faults, no high-resistance connections, and no circuit imbalances. The tests for faults should ensure there are no:

1. Open circuits in individual conductors or shields.

2. Short circuits between conductors.

3. Grounds on individual conductors, either between a conductor and a shield or between a conductor and a grounded object.

Line Continuity Tests

The following guidelines should be used for testing line continuity. The tests should be made for individual cable segments.

Line Continuity

The only tools required for line continuity checks are an ohmmeter and jumpers to connect between the connector pins (signal lines) and the connector body (cable shield). When the following checks are made, the resistance values measured should fall within the indicated ranges, for the maximum 61-meter (200-foot) line.

With both ends of the cable open and the cable not plugged into a machine, measure (at either end):

● Conductor-to-conductor--greater than 1 000 000 ohms

● Each conductor-to-shield--greater than 1 000 000 ohms

A reading less than 1 000 000 ohms means there is a short.

With each line tied to the shield at the far end, measure (at the nearest end):

● Each conductor-to-shield--less than 16 ohms (A reading greater than 16 ohms means there is an open circuit).

Note: Values for shorter lengths are proportional because this is a linear function. For example, a cable with half the maximum length would have half the resistance.

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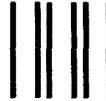
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Technical Newsletter

**IBM 5280
Distributed Data
System
Cable Assembly
Manual**

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This technical newsletter provides replacement pages for the subject manual. The replacement pages remain in effect for subsequent versions and modifications unless specifically altered. Pages to be removed and inserted are:

> 2-1, 2-2
> 2-7, 2-8

A change to the text is indicated by a vertical line to the left of the change.

Note: Please file this cover letter at the back of the manual to provide a record of changes.

For multiconductor cables (used to connect IBM 5280 units), you are
responsible for determining the proper lengths, ordering or assembling
the cables, and installing and maintaining the cables. This chapter
explains which cables you should order, how to assemble them, and the
completion tests to use before installing the cables. In presenting
this information, it is assumed that the person(s) doing the cable
assembly and cable installation has the skill required to do this type
of work.

It is important that you order your cables early, so that cable labeling
and testing can be completed before the system arrives.

CABLE PREPARATION

This section explains how to order the multiconductor cables.

When ordering cables, be sure that the cables are long enough to reach
from machine to machine. Allow enough cable to move the machines for
servicing. A minimum of 0.6 meters (2 feet) at both ends is recommended
beyond the required length to connect the units. The distance from the
machine to the floor or ceiling (path of cable) must also be considered.
You may order cables either preassembled or in bulk (unassembled),
either from IBM or from other companies.

To make installation easier, it is recommended that you purchase
preassembled cables. Proceed with the following sections in this
chapter for cable specifications, assembly procedures, and testing.

The following table provides ordering information for multiconductor cables.

| Part Name	Multiconductor Cable Data Station or Diskette Drive
Cable Assembly (notes 3 and 4) (cable in specified length with connectors at both ends)	IBM part 7364212 (data station) IBM part 7364208 (diskette drive)
Bulk Cable (cable in specified length without connectors) (Note 1)	IBM part 7364108 (data station) (Belden part YR16167 or equivalent) IBM part 7364109 (diskette drive) (Belden part YR16168 or equivalent)
Connector Kit (Note 2)	IBM part 4177800

When ordering cables from other than IBM:

1. See the following table for the bulk cable specifications.

2. Specify the total length of each cable required (Note 1).

| 3. Specify Amp part 202208-1 or equivalent for the cable connectors (Note 2).

| 4. Specify Amp part 66507-3 or equivalent for the cable terminals (Note 2).

5. Order connector covers and screws, IBM parts 4177465/1618295/1621846 (Note 2).

6. Order cable retainer, IBM part 5642716 (Note 2)

Notes:

1. Specify the total length of each cable when ordering. For example, total length = distance from work station to controller + additional clearance for servicing (0.6 meters or 2 feet) at each end of the cable.

2. Each connector kit (IBM part 4177800) contains 2 covers and screws (IBM parts 4177465/1618295/1621846), 2 connectors (IBM part 1655338), 55 conductor terminals (IBM part 1655359), 4 conductor terminals (IBM part 1655339),2 cable retainers (IBM part 5642716), 1 green label, 1 yellow label, shrink tubing and a drain wire attaching wire.

3. The maximum cable length is 61 meters (200 feet).

9. Locate the colored conductors listed in the table for the cable you are assembling and cut those conductors 5 ± 1 millimeter (0.20 ± 0.04 inch) shorter than the other conductors. This will allow a better lay in the covers.


Cut 5 ± 1 mm
(0.20 ± 0.04 inch) shorter.

Data Station

Body Color	Foil Shield Color
Orange	Blue
Blue	Blue
Yellow	Blue
White	Blue
Black	Red
Brown	Red
Red	Red
Red	Green
Orange	Green
Blue	Green
Yellow	Green

Diskette Drive

Body Color	Foil Shield Color
Orange	Blue
Blue	Blue
Yellow	Blue
White	Blue
Black	Red
Brown	Red
Red	Red
Red	Green
Orange	Green
Blue	Green
Yellow	Green
White	Green
Black	Clear

10. Take a single conductor (except the 25 conductor cable spare
    conductor) and peel back the plastic wrap and aluminum foil
    approximately 25 millimeters (1.0 in). This will expose a bare
    silver wire (the conductor drain wire).

Plastic Wrap and Aluminum Foil ——

25 mm (1 inch) ——

Conductor Drain Wire

11. Bend the drain wire away from its conductor.

12. Remove approximately 3 millimeters (0.12 inch) of insulation from
    the conductor. Use a crimping tool (Amp part number 90302-1 or
    equivalent) and crimp a terminal (IBM part 1655359) onto the
    conductor.

Approximately
3 mm (0.12 inch)

—— Conductor Drain Wire

—— Terminal

Note: Do not solder the terminal or insert it into its assigned
connector hole.