

GA33-3055-2

File No. S370-14, S370-15

**IBM 3250 Graphics Display System  
Data Communications Facility  
(RPQs SU0090, SU0091,  
7J0005, and 7J0014)**

**Systems**

**Custom Feature Description**

**IBM**

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### **Third Edition, December 1983**

This major revision obsoletes GA33-3055-1. The revision incorporates changes brought about by the introduction of the IBM 3255 Display Control Unit Model 2. Changes or additions are indicated by a vertical line to the left of the change.

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## Preface

This publication describes the data communication facility provided for the IBM 3250 Graphics Display System by Request for Price Quotation (RPQ) SU0090, SU0091, 7J0005, and 7J0014. Information contained herein supplements the information in related publications for the 3250 Graphics Display System.

For further information about the 3250 system, refer to the following publications:

- *An Introduction to the IBM 3250 Graphics Display System*, GA33-3035, which provides an overview of the 3250 system and its applications.
- *IBM 3250 Graphics Display System: Component Description*, GA33-3037, which provides a detailed technical description of the 3250 system together with its hardware and software features.
- *IBM 3250 Graphics Display System: Installation Manual - Physical Planning*, GA33-3036, which describes the planning required prior to the installation of a 3250 system.

**Note:** Throughout this publication, reference to the 3255 Display Control Unit applies both to the 3255 Model 1 and to the 3255 Model 2.

Commercial part numbers quoted in this publication are those that satisfy IBM specifications at the time of publication. Because changes occur and IBM sources of supply change, it is the customer's responsibility to ensure that any products purchased from a source other than IBM comply with the latest IBM specifications. Only a few vendors are listed. This does not imply that only these vendors' products meet IBM specifications; other vendors may have equal or superior products.



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## Chapter 1. Custom Features SU0090, SU0091, 7J0005, and 7J0014

This publication describes the custom features that, together, comprise the Data Communications Facility for the IBM 3250 Graphics Display System.

The following requests for price quotations (RPQs) modify the IBM 3258 Channel Control Unit and the IBM 3255 Display Control Unit to allow communication via a wide-band communication link:

- **RPQs SU0090 (plant install) or 7J0018 (field install)** modify the 3258. The four coaxial interfaces (that is, the serial link ports) are replaced by a single CCITT <sup>1</sup> Recommendation V.35 interface.
- **RPQs SU0091 (plant install) or 7J0017 (field install)** modify the 3255. The coaxial interface is replaced by a CCITT Recommendation V.35 interface.
- **RPQ 7J0014** modifies the 3255 to allow it to be connected between the data circuit terminating equipment (DCE) and another 3255 that has a V.35 interface. This RPQ removes the coaxial interface from the 3255 and installs two CCITT Recommendation V.35 interfaces.

RPQ 7J0005 is a prerequisite to both RPQ SU0090 (or 7J0018) and RPQ SU0091 (or 7J0017). RPQ 7J0005 provides an interface cable, 6 meters (20 feet) external length, that connects the V.35 interface to a DCE such as the IBM 5979 Modem Model L21A or Model L21B.

**Note:** The 5979 modem is not suitable for use in a multipoint data communication configuration.

This cable is terminated in a Winchester Electronic connector (Part XAC34PD3300), or equivalent (see ISO <sup>2</sup> Standard 2593-1973). Conversion kits may be available if the selected DCE does not accept this connector.

### Data Communications Facility

In the IBM 3250 Graphics Display System, communication between the IBM 3258 Channel Control Unit and the IBM 3255 Display Control Unit is via a customer-supplied coaxial cable. This cable is normally limited in length to not more than 1524 meters (5000 feet). However, the use of low-loss cable permits a maximum distance of 5000 meters (16 500 feet).

Three data communication configurations are possible:

- **Point-to-Point:** This configuration has a 3258 connected to data circuit terminating equipment (DCE) (that is, a modem), at the host processor end of the communication link. This modem is connected to a 3255 via a link cable and a second modem.

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<sup>1</sup> The International Telegraph and Telephone Consultative Committee

<sup>2</sup> International Organization for Standardization

- **Multipoint:** This configuration has a 3258 connected to a single modem at the host processor end of the communication link. However, in this type of configuration, the single modem at the 3258 end controls two or more 3255s, each with an individual modem, dropped from the communication link.
- **Modem Interface Extension (MIE):** This configuration is similar to a point-to-point configuration in that it requires a single modem at each end of the communication link, but allows two or more 3255s to be connected in series to the single modem at the 3255 end of the communication link.

Communication between the modified 3258 and 3255 can be at any line speed of 19 200 bits per second (bps) through 750 000 bps. The highest line speed may not be usable in an installation configured for MIE. Consult your IBM Representative for advice.

Line speed is determined by the DCE, and this must operate at a speed suitable to the communication link. For example, the data distribution system (DDS) network (United States only) requires a DCE operating at 56 000 bps.

#### Notes:

1. RPQs SU0090/7J0018, SU0091/7J0017, and 7J0014 are transparent to the user. Applications that run on a 3250 without these RPQs will run on a 3250 with these RPQs installed. However, the rate of data transfer between the 3258 and the 3255 is reduced, and this may affect response times.
2. The communication link line speed affects the rate of data transfer.

## Configuration

A simplified configuration of the 3250 system modified by RPQs SU0090/7J0018, SU0091/7J0017, and 7J0014 is shown in Figure 1. The 3258 modified by RPQ SU0090 is capable of controlling up to twelve 3251s via four 3255s, but communication between the 3258 and the 3255s must be via one DCE at the 3258. Performance requirements and the availability of a suitable communication link may restrict the maximum configuration. If you have any doubts about suitable configurations, consult your IBM Representative.



## ***Data Circuit Terminating Equipment***

The customer is responsible for arranging the installation and testing of the DCE and communication link (common carrier, Post Telephone and Telegraph [PTT], or private).

**Note:** The communication link may, for example, be either digital, analog, CATV, microwave, or optical. The restrictions are that (1) the link must be terminated by a suitable DCE, and (2) the total "round-trip" propagation delay must not be more than 100 milliseconds.

The DCE selected must:

1. Conform to the CCITT Recommendation V.35 interface
2. Provide self-test and interface wrap facilities
3. Have signal ground isolated from frame ground

Depending on the configuration of the data communication facility, it is necessary to implement one of the following modes of operation:

1. Point-to Point Operation: Both the 3258 and the 3255 must have permanent "request-to-send" enabled.
2. Multipoint Operation: The 3258 must have permanent "request-to-send" enabled, and the 3255s must have switched "request-to-send" enabled. Because the 3255s are operated in switched "request-to-send" mode, the DCE (modem) at the 3258 end of the communication link has to provide "continuous receive clock."
3. Modem Interface Extension (MIE): The 3258, and each 3255 on the MIE, must have permanent "request-to-send" enabled.

Examples of DCEs that meet these requirements are:

- Leased lines in countries other than the United States: IBM 5979 Modem Model L21A or L21B depending upon the common carrier

**Note:** The 5979 modem is not suitable for use in a multipoint data communication configuration.

- Data distribution system (DDS) network in the United States: Type 500A Data Service Unit (Bell Telephone Company).

**Note:** If the Type 500A DSU is selected, the switches and indicators for self-test and interface wrap should be on the front of the unit for access during problem determination.

- Non-DDS networks in the United States: Type 8856 Terminating Arrangement (Bell Telephone Company).

## ***Customer's Preinstallation Schedule***

Preinstallation planning for the 3250 system is detailed in *IBM 3250 Graphics Display System: Installation Manual - Physical Planning*, GA33-3036. Additional points to be considered when planning for a 3250 system with RPQs SU0090 and SU0091 are detailed below.

### **Six Months before Delivery**

Six months before the Data Communications Facility custom feature is delivered:

- Verify that the DCEs and communication facilities can be installed and operational by the planned installation date.
- Ensure that there are sufficient power outlets for the 3250 system and for the DCEs.

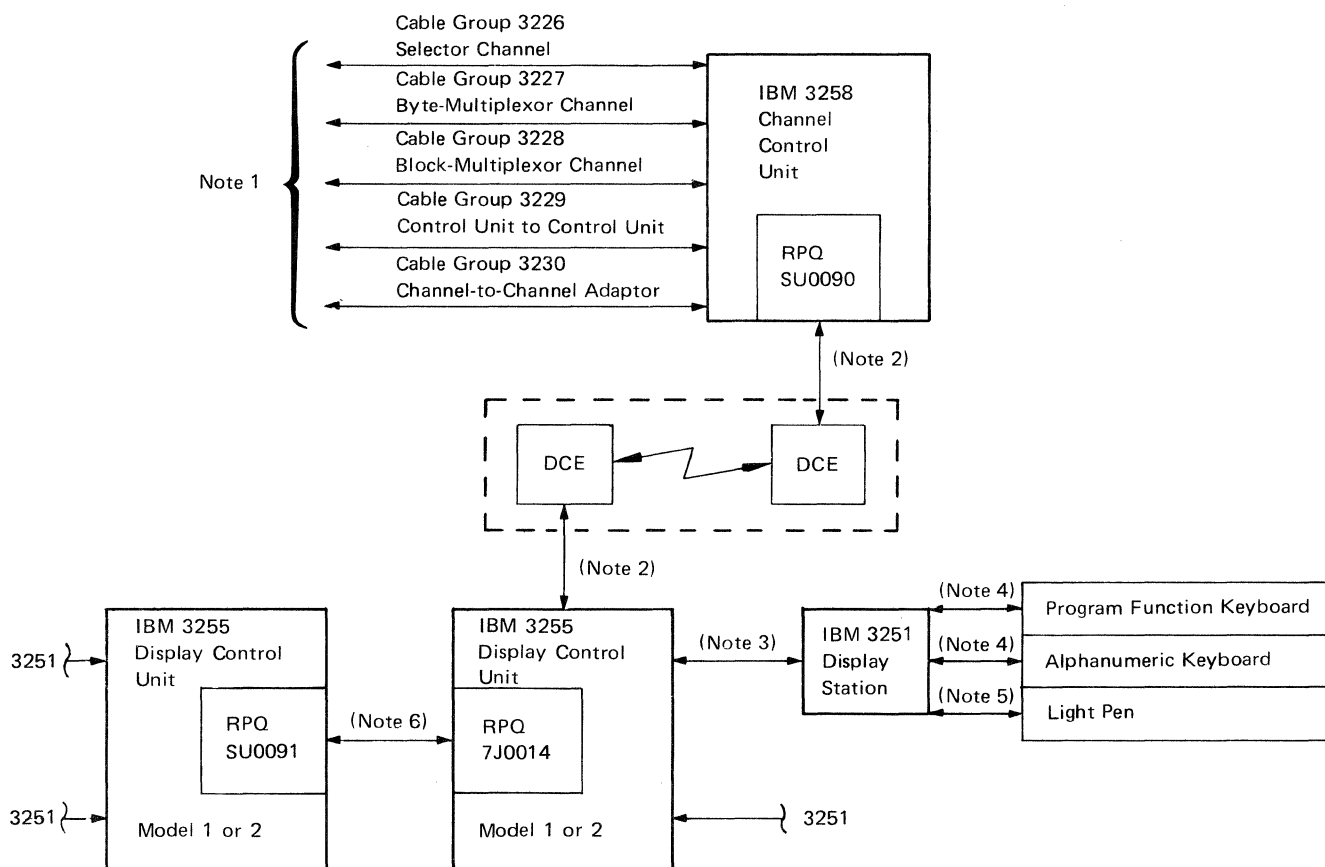
### **One Month to One Week before Delivery**

One month to one week before the Data Communications Facility custom feature is delivered:

- Provide space for the 3255s and the 3258:
  - The cable path between each unit and the associated DCE must be less than 6 meters (20 feet).
  - One 3251 must be placed adjacent to each 3255. If a second 3251 is to be attached to a 3255, it can be placed anywhere within the limits of the specified cable length.
- DCEs and communication facilities are installed, tested, and operational.

## ***System Cabling***

Figure 2 shows, schematically, the cables needed for 3250 systems with RPQs SU0090, SU0091, and 7J0014.



Cable Group No.	Number of Cables	From	To	Maximum Length	Number
3226	2	3258	Selector Channel	61 m (200 ft)	1
3227	2	3258	Byte-Multiplexor Channel	61 m (200 ft)	1
3228	2	3258	Block-Multiplexor Channel	61 m (200 ft)	1
3229	2	3258	Control Unit	61 m (200 ft)	1
3230	2	3258	Channel-to-Channel Adapter	61 m (200 ft)	1

Figure 1-2. System Cabling - Schematic

#### Notes:

1. The maximum cable length of 61 m (200 feet) is available to attach the 3258 to the channel, unless modified by the cabling schematics of the individual processing units or control units with which the 3258 is associated. Refer to *IBM Input/Output Equipment Installation Manual - Physical Planning for System/360, System/370, and 4300 Processors*, GC22-7064.
2. The cables connecting to the DCEs are supplied when RPO 7J0005 is requested for both the 3258 and the 3255 Model 1 or 2. For a configuration with more than one 3255, the cable supplied with RPO 7J0005 connects the DCE to the 3255 that has RPO 7J0014.

3. This IBM-supplied cable is available in three lengths: 4.6 m (15 feet), 9.1 m (30 feet), and 15.2 m (50 feet). When specifying the cable length on the unit order, the first 3251 must be specified with a 4.6 m cable for positioning adjacent to the 3255. For planning purposes, the cable leaves from the left-hand side of the 3251 (looking from the front) and a minimum bend radius of 200 mm (8 in.) should be allowed for the cable path.
4. Keyboards are supplied with a cable length of 910 mm (3 feet).
5. The light pen is supplied with a cable length of 1524 mm (5 feet).
6. This cable is supplied with the 3255 that has RPQ 7J0014. The maximum length is 7.6 m (25 feet).



## Chapter 2. Bibliography

Further information concerning the IBM 3250 Graphics Display System is contained in the following publications:

*An Introduction to the IBM 3250 Graphics Display System*, GA33-3035: This publication provides introductory information about the system, its attachment to a host system, and the available programming support.

*IBM 3250 Graphics Display System Component Description*, GA33-3037: This publication provides reference information for users of the 3250 system. The information is primarily intended to assist the user who is writing application programs for execution in the 3250 system and includes (1) a description of the facilities available to the programmer; (2) a definition of the buffer orders used by the 3250 system; and (3) an example buffer program with a description of some programming techniques.

An associated publication is the *IBM Input/Output Equipment Installation Manual - Physical Planning for System 360, System 370, and 4300 Processors*, GC22-7064. This describes the cabling requirements for attaching an IBM 3250 Graphics Display System to the above mentioned processor units.

*IBM 3250 Graphics Display System: Installation Manual - Physical Planning*, GA33-3036: This publication describes the environment in which a 3250 system can be installed; details electrical power requirements; gives cable and connector details; warns of electro-magnetic interference and lightning-strike hazards and suggests remedies; details the physical dimensions, and the weights of the units of the system.

Associated with this publication are two physical planning templates as an aid in preparing ground plans. One template, GX22-7067, is to a scale of 1 : 48, and the other, GX22-7068, is to a scale of 1 : 50.

**Note:** The IBM 3250 Graphics Display System is compatible with the IBM 2250 Display Unit Model 3 apart from the differences described in *An Introduction to the IBM 3250 Graphics Display System*; GA33-3035. Any reference to the IBM 2250 Display Unit Model 3 in the above publications is pertinent also to the 3250 system.



IBM 3250 Graphics Display System  
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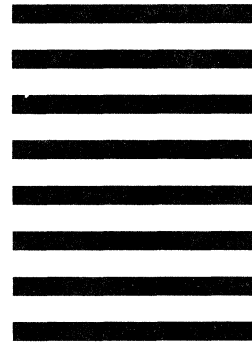
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