

Systems

**IBM 3270 Information
Display System
Problem Determination Guide**

IBM

Preface

This manual provides device operators and supervisors with problem-determination procedures related to the IBM 3270 Information Display System. The system comprises the following units:

- IBM 3271 Control Unit, Models 1 and 2
- IBM 3272 Control Unit, Models 1 and 2
- IBM 3275 Display Station, Models 1 and 2
- IBM 3277 Display Station, Models 1 and 2
- IBM 3284 Printer, Models 1, 2, and 3
- IBM 3286 Printer, Models 1 and 2

The manual is divided into chapters that relate to the various configurations of the above-mentioned units. An introductory chapter and a chapter that describes online testing are also included. Personnel using this manual should be familiar with the *Operator's Guide for IBM 3270 Information Display System*, GA27-2742. In-depth system information can be found in *IBM 3270 Information Display System Component Description*, GA27-2749.

First Edition (May, 1972)

Changes are periodically made to the information herein; before using this publication in connection with the operation of IBM systems, refer to the latest System/360 and System/370 SRL Newsletter, Order No. GN20-0360, for the editions that are applicable and current.

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LEGEND

(Flow Diagram Symbology)



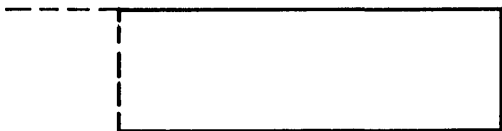
Terminal

Indicates beginning of a problem—
determination procedure.



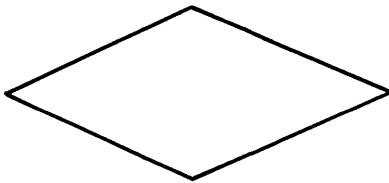
Statement

Indicates an action to be performed.



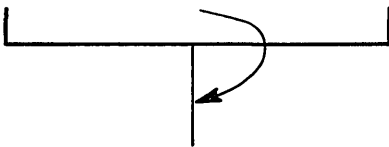
Annotation

Gives descriptive comment or
explanatory note.



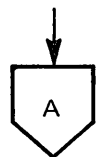
Decision

Indicates a point in a flow diagram where
a branch to alternate paths is possible.

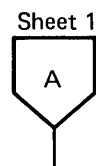


Re—entry

Indicates a return entry point from text
procedures.



Sheet 2



Sheet 1

Off—Page Connectors

Indicate connection between sheets of a flow
diagram. Connections use same letter in symbol.

Exit

Entry

1.1 PURPOSE

The purpose of this manual is to provide systematic problem-determination procedures that are fast, accurate, and easy to follow. These procedures are not intended to isolate all system failures; however, total system availability can be significantly increased through their use.

Adherence to these procedures, if the assumptions stated in paragraph 1.2 are satisfied, should increase productivity and reduce maintenance costs as follows:

1. The number of trouble calls initiated because of incorrect operational procedures will be reduced.
2. The ability to successfully isolate equipment failures to a particular unit or group of units will be improved. This will:
 - a. Reduce the probability of requesting service from the wrong maintenance organization.
 - b. Reduce the probability of requesting service for the wrong unit. This increases the probability that service personnel will be properly equipped and dispatched to the proper location.

1.2 ASSUMPTIONS

The procedures described in this manual will be effective if the following assumptions regarding application programs and device operators are correct. The assumptions are:

1. Programs are not the source of the problem. The problem-determination procedures in this manual are designed to isolate equipment failures in a program environment that is error-free.
2. Device operators have read and are familiar with the information contained in the *Operator's Guide for IBM 3270 Information Display Systems*, GA27-2742.
3. Device operators are familiar with the capabilities, limitations, and requirements of the application program as related to the performance of the device operator job function. The operators must be familiar with:
 - a. The various inputs required by the application program, and the correct method of generating the inputs.
 - b. The correct responses expected from the application program for each of the various inputs. This includes knowledge of field structure, image appearance, and the proper methods of using the various images provided by the application program.

1.3 DEFINITIONS OF SPECIAL TERMINOLOGY

1.3.1 Configurations

1. I/O Configuration – The general term, I/O configuration, refers to any grouping of input/output equipment (without regard to the make, type, model, or function of the equipment) that attaches to a communication line (remote I/O configuration) or attaches to a system channel (local I/O configuration).
2. 3270 Remote-Standalone Configuration – A 3270 Remote-Standalone Configuration is an I/O configuration that consists of a 3275 Model 1 or 2 Display Station with or without a 3284 Model 3 Printer attached.
3. 3270 Remote-Cluster Configuration – A 3270 Remote-Cluster Configuration is an I/O configuration that consists of:
 - a. A 3271 Model 1 Control Unit with any valid combination of the following devices attached:
 - (1) 3277 Model 1 Display Station
 - (2) 3284 Model 1 and 3286 Model 1 Printers, or
 - b. A 3271 Model 2 Control Unit with any valid combination of the following devices attached:
 - (1) 3277 Model 1 and 3277 Model 2 Display Stations
 - (2) 3284 Model 1, 3284 Model 2, 3286 Model 1, and 3286 Model 2 Printers.
4. 3270 Local-Cluster Configuration – A 3270 Local-Cluster Configuration is an I/O configuration that consists of:
 - a. A 3272 Model 1 Control Unit with any valid combination of the following devices attached:
 - (1) 3277 Model 1 Display Station
 - (2) 3284 Model 1 and 3286 Model 1 Printers, or
 - b. A 3272 Model 2 Control Unit with any valid combination of the following devices attached:
 - (1) 3277 Model 1 and 3277 Model 2 Display Stations
 - (2) 3284 Model 1, 3284 Model 2, 3286 Model 1, and 3286 Model 2 Printers.

1.3.2 Configuration Data Charts

Efficient use of the problem-determination procedures requires a centralized source of data that describes a given

3270 I/O configuration and utilization of the communication line or system channel to which it is attached. Forms upon which the required data is to be recorded are called configuration data charts.

1.3.3 Failure Symptoms

A failure symptom indicates that a problem exists. Any malfunction (i.e., an exhibition of abnormal functional characteristics) is a failure symptom. Failure symptoms are classified as conclusive or inconclusive while the problem-determination procedures specified in this manual are executed.

1. **Conclusive Failure Symptoms** – Conclusive failure symptoms are those that provide sufficient information to permit failure isolation (with a high degree of confidence) to one or more units within an I/O configuration.
2. **Inconclusive Failure Symptoms** – Inconclusive failure symptoms are those that, alone, do not provide sufficient information to permit failure isolation.

1.3.4 Personnel Designations

1. **Device Operator** – The device operator is the person who regularly operates a device or is any individual who is delegated the responsibility of performing problem-determination procedures related to a 3270 device.
2. **Supervisor** – The supervisor is the person in charge of a 3270 I/O configuration or is any individual who is delegated the responsibility of performing problem-determination procedures related to a 3270 I/O configuration.

1.3.5 Problem-Determination Flow Diagrams

To facilitate fast and accurate execution of certain problem-determination procedures, they are presented in a flow diagram format when appropriate. These diagrams are called problem-determination flow diagrams.

1.4 RECOMMENDED PRACTICES

This manual is organized in a manner intended to make its use self-explanatory (refer to the Contents). However, certain recommended practices, implied but not specifically stated elsewhere in this manual, should be observed in order to derive maximum benefit from the use of this manual.

1. **Use the Correct Number of Manuals** – The number of manuals required for satisfactory problem determination is a function of the type of 3270 con-

figuration, as follows:

- a. **3270 Remote-Standalone Configuration**: one copy is required for the device operator/supervisor.
 - b. **3270 Remote-Cluster Configuration**: one copy is required for the supervisor, and one copy is required for each of the device operators.
 - c. **3270 Local-Cluster Configuration**: one copy is required for the supervisor, and one copy is required for each of the device operators.
2. **Complete the Configuration Data Chart** – One completed configuration data chart is required for each 3270 configuration. This chart is to be used by the device operator/supervisor in the case of a standalone configuration, and by the supervisor in the case of a cluster configuration. The required data should be recorded on the appropriate configuration data chart as soon as the 3270 configuration is installed and operational. If this is not done, the required data may not be available in a convenient place when it is needed.
 3. **Become Familiar With the Contents of Applicable Chapters** – Personnel who participate in problem-determination activities should be familiar with the material presented in the applicable chapters of this manual. The chapters that require attention are a function of the type of 3270 configuration and the individual's job function, as follows:
 - a. **3270 Remote-Standalone Configuration**: the device operator/supervisor should become familiar with the contents of Chapters 1, 2, and 7.
 - b. **3270 Remote-Cluster Configuration**:
 - (1) The supervisor should become familiar with the contents of Chapters 1, 3, 5, 6, and 7.
 - (2) 3277 Model 1 and 3277 Model 2 Display Station operators should become familiar with the contents of Chapters 1, 5, and 7.
 - (3) 3284 Model 1, 3284 Model 2, 3286 Model 1, and 3286 Model 2 Printer operators should become familiar with the contents of Chapters 1, 6, and 7.
 - c. **3270 Local-Cluster Configuration**:
 - (1) The supervisor should become familiar with the contents of Chapters 1, 4, 5, 6, and 7.
 - (2) 3277 Model 1 and 3277 Model 2 Display Station operators should become familiar with the contents of Chapters 1, 5, and 7.
 - (3) 3284 Model 1, 3284 Model 2, 3286 Model 1, and 3286 Model 2 Printer operators should become familiar with the contents of Chapters 1, 6, and 7.

To perform the problem-determination procedures described in this chapter, the configuration data chart (Figure 2-1) should contain the current information regarding the status of the 3270 Remote-Standalone Configuration.

2.1 PROBLEM-DETERMINATION PROCEDURES

When it appears that a failure symptom is exhibited, proceed as follows:

1. Ensure that correct operating procedures have been used and that the responses expected are valid functions of a correctly operating configuration. Descriptions of correct operating procedures and expected responses can be verified from the following sources:
 - a. *Operator's Guide for IBM 3270 Information Display Systems*
 - b. User's guide for the application program being used.
 - c. Supervisor.
2. After verifying that a failure symptom has been detected (step 1, above), follow the problem-determination procedures shown in Figure 2-2.

Note: Always start at the beginning of the problem-determination flow diagram, regardless of which device (display station and/or printer) exhibits the failure symptom. The procedures and information contained in paragraphs 2.2, 2.3, and 2.4 should not be utilized independently of the problem-determination flow diagram.

2.2 FAILURE SYMPTOM CLASSIFICATION PROCEDURES FOR 3275-1 AND 3275-2 DISPLAY STATIONS

It is impractical, if not impossible, to list every failure symptom that could be exhibited by the display station. Thus, the method of failure-symptom classification used is a process of elimination. A listing of the most likely and most recognizable conclusive failure symptoms is provided in paragraph 2.3. If the display station exhibits one of these failure symptoms, it is classified as conclusive. However, the failure symptom is classified as inconclusive if it is not contained in the conclusive failure symptom list.

To classify an observed failure symptom, proceed as follows:

1. Develop a mental picture of the failure symptom.

2. Scan the conclusive failure symptom listing (paragraph 2.3) to find a listed failure symptom description that is similar to the observed failure symptom.

Note: The observed failure symptom may contain more conditions than are described in the listed failure symptom. However, it is still possible to classify the observed symptom as conclusive if it satisfies *all* conditions exactly as described in the listed symptom.

3. Classify the failure symptom. If the observed failure symptom exactly satisfies all the conditions stated in any one of the listed failure symptom descriptions, it should be classified as conclusive. However, if the observed failure symptom does not satisfy all of these conditions, it should be classified as inconclusive.

Two examples are presented below to illustrate the failure symptom classification procedure.

Example #1

Observed Failure Symptom — When a selection is attempted via the selector pen, the detect bars appear and the INPUT INHIBITED indicator comes on, but the designator character does not change.

Listed Failure Symptom — The conclusive failure symptom listing (paragraph 2.3) shows that item 2c of paragraph 2.3.3 is satisfied by the observed failure symptom.

Resultant Failure Symptom Classification — The observed failure symptom is classified as conclusive because it satisfies each condition stated by the listed failure symptom description. The state of the INPUT INHIBITED indicator, which is included in the observed failure symptom, is ignored because it is not a specific condition of the listed failure symptom description.

Example #2

Observed Failure Symptom — When a selection is attempted via the selector pen, the detect bars do not appear and the designator character does not change.

Listed Failure Symptom — The conclusive failure symptom listing does not contain a failure symptom description that is completely satisfied by the observed failure symptom.

Resultant Failure Symptom Classification – The observed failure symptom is classified as inconclusive.

2.3 CONCLUSIVE FAILURE SYMPTOM LISTING FOR 3275 MODEL 1 AND 3275 MODEL 2 DISPLAY STATIONS

2.3.1 Display Malfunctions

1. Empty Screen – The display screen is blank. No visible cursor or characters are displayed. Adjustment of the brightness control does not rectify the condition.
2. Single Horizontal Line on Screen – The display image consists of a single horizontal line at the top of the display area. The length of the line is equal to the full width of the screen or is equal to approximately two-thirds the width of the screen.
3. Many Horizontal Lines on Screen – The lines are as long as the display area is wide. They may appear in groups or be evenly spaced over a portion or all of the display area. They may appear in lieu of a normal image or be superimposed on a normal image.
4. Screen Full of Squares – A square is displayed in every character position of the display area (i.e., 480 squares for a 3275 Model 1 and 1,920 squares for a 3275 Model 2). The cursor, however, is displayed normally.
5. Brightness Control Is Inoperative
6. Image Is Not Focused
7. Image Size Is Incorrect – The overall dimensions (vertical and/or horizontal) of the display area are incorrect (too large or too small). The overall dimensions of displayed images are therefore incorrect.
8. Image Position Is Incorrect – The display area is not properly positioned on the display screen. The display area is off-center (shifted left or right and/or shifted up or down) or tilted. Displayed images are therefore off-center or tilted.
9. Inter-Row Spacing Is Incorrect – The vertical spacing between adjacent horizontal rows of character positions, within the display area, is incorrect or uneven.
10. Character Size Is Incorrect
11. Characters Are Distorted – Image contains one or more characters that are not formed correctly.
12. Characters are displayed normally, but the cursor is not displayed. Both the STATUS and INPUT INHIBITED indicators remain off.
13. Cursor Position Is Incorrect – The cursor is not positioned the correct vertical distance below a character. It may be drawn through the character area.
14. Cursor Size Is Incorrect – The cursor is too long or too short.
15. Multiple cursors are displayed, and both the STATUS and the INPUT INHIBITED indicators remain off.
16. Only Indicators Malfunction – One or more of the eight indicators (SYSTEM READY, SYNC SEARCH,

SELECTED, SYSTEM AVAILABLE, INSERT MODE, INPUT INHIBITED, TRANSMIT, and STATUS) malfunction. Except for the malfunctioning indicators, no other failure symptoms are exhibited.

2.3.2 Keyboard Malfunctions

1. Mechanical – One or more keys (or the spacebar) are broken, loose, missing, or bind when operated.
2. CLEAR Key Fails – Pressing the CLEAR key does not erase all characters on the screen, and/or does not position the cursor to character position 0 (top left), and/or does not cause the INPUT INHIBITED indicator to come on.

Note: Some application programs respond to the interrupt generated by the CLEAR key by writing a pattern to the display station. If this is true for the application program that is being used, CLEAR key operation is normal, even if the correct results exist only momentarily.

3. Certain Cursor Control Keys Fail – i.e., Up (↑), Down (↓), Left (←), Right (→), or Backspace (↵). The cursor does not move properly or the INPUT INHIBITED indicator comes on for one or more of these keys.
4. Typamatic Failures – Typamatic keys function correctly when pressed and released, but one or more do not repeat their function when held fully depressed.
5. Character Key Failures – All keys related to the alphabet, to numerics, to symbols, and to punctuation marks are considered character keys for this discussion.

When attempting to type into an unprotected data field or an unformatted image, one or more of the following malfunctions occur:

- a. The wrong character enters for one or more character keys, or
- b. No character enters for all character keys, and the INPUT INHIBITED indicator comes on, or
- c. The correct character enters, but the INPUT INHIBITED indicator comes on for one or more character keys, or
- d. The cursor disappears or does not move properly when a character enters, or
- e. No character enters for all character keys, but the cursor advances when each character key is pressed, and the INPUT INHIBITED indicator does not come on.

Note: If it appears that one of these failure symptoms is exhibited, obtain an unformatted image via the CLEAR key (if the application program permits), and verify the symptom by retrying the operation.

6. Program Access Key Failures – The INPUT INHIBITED indicator does not come on for one or more of the

following keys: ENTER, PA1, PA2, PA3, TEST REQ, or PF1 through PF12.

Note: Refer to item 2, paragraph 2.3.2, for CLEAR key failure symptom.

2.3.3 Selector Pen Malfunctions

1. Mechanical – Selector pen operations cannot be executed error-free, and inspection of the selector pen reveals that:
 - a. Obvious physical damage exists, or
 - b. The selector pen tip movement, relative to the selector pen barrel, is not smooth when the selector pen switch is being activated.
2. Detect Bar or Designator Character Failures:
 - a. Detect bars appear through all selectable fields, even when selector pen is not being used, or
 - b. Detect bars appear and remain through all selectable fields when a selection is attempted, or
 - c. Detect bars appear, but the designator character does not change when a selection is attempted.

2.3.4 Audible Alarm Malfunctions

The audible alarm does not sound when a character is entered from the keyboard into the next-to-last character position of the display area (position 478 for a 3275 Model 1 and position 1918 for a 3275 Model 2).

2.4 FAILURE SYMPTOM CLASSIFICATION PROCEDURES FOR THE 3284 MODEL 3 PRINTER

To classify a 3284 Model 3 Printer failure symptom, proceed as follows:

1. Select the one statement from the three listed below that best describes the observed failure symptom, and follow the instructions associated with the selected statement:
 - a. The printer is totally inoperative; i.e., printout operations do not even start. (Skip to step 2.)
 - b. The printer appears to operate correctly except for the quality of the print density; i.e., the characters are not dark enough. (Skip to step 3.)
 - c. The printer operates, but its operation is abnormal. The abnormal operation is not limited to the quality of the print density. (Skip to step 4.)
2. When the printer is totally inoperative, make a visual inspection to verify that all of the following conditions are satisfied:
 - a. The PRINT PAT/ON LN switch is in the ON LN position.
 - b. An adequate supply of forms (paper) is properly loaded.
 - c. The printer top cover is closed.

- d. The printer power control switch is in the ON position.
- e. The printer power cable is connected to an appropriate power source.
- f. Power source circuit breakers are on.

If any of the above conditions (a through f) are not satisfied, the problem is found and can be corrected by satisfying the required conditions. If all conditions are satisfied and the printer is still inoperative, skip to step 4.

3. When the printer appears to operate correctly, except for the quality of the print density, the problem is probably caused by improper adjustment of the Copy-Control Lever or by a worn ribbon.

If the problem cannot be resolved by adjustment of the Copy-Control Lever or by replacing the ribbon, proceed to step 4.

4. Print the All H test pattern as follows:

Note: The three test switches used in this procedure are accessible when the printer top cover is open.

- a. Place the PRINT PAT/ON LN switch in the PRINT PAT position.
 - b. Place the MODE 1/MODE 2 switch in the MODE 2 position.
 - c. Momentarily operate the START PRINT switch.
 - d. Proceed to step 5.
5. Select the one statement from the three listed below that best describes the results obtained when step 4 was executed, and follow the instructions associated with the selected statement:
 - a. No printout resulted. (Skip to step 8.)
 - b. A correct All H test pattern printout (Figure 2-3) resulted. (Skip to step 6.)
 - c. An incorrect printout resulted. (Skip to step 8.)
 6. Print Alphameric test pattern as follows:
 - a. Place the PRINT PAT/ON LN switch in the PRINT PAT position.
 - b. Place the MODE 1/MODE 2 switch in the MODE 1 position.
 - c. Momentarily operate the START PRINT switch.
 - d. Proceed to step 7.
 7. Select the one statement from the three listed below that best describes the results obtained when step 6 was executed, and follow the instructions associated with the selected statement:
 - a. No printout resulted. (Skip to step 8.)
 - b. A correct Alphameric test pattern printout (Figure 2-4) resulted. (Skip to step 9.)
 - c. An incorrect printout resulted. (Proceed to step 8.)

8. Classify the failure symptom as conclusive. (Skip to step 10.)
9. Classify the failure symptom as inconclusive. (Proceed to step 10.)
10. Place the PRINT PAT/ON LN switch in the ON LN position, close the printer top cover, attach printouts generated by the operational program and/or steps 4 and 6 to the Operator Trouble Report form, and return to the appropriate point in the problem-determination flow diagram (Figure 2-2).

Device Data								
Display Station						Printer		
Type Number	Model Number		Type of Interface		Selection Address in Hexadecimal Form		3284 Model 3 Printer Attached	
3275	1	2	ASCII	EBCDIC	Control Unit	Device	Yes	No
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>

Figure 2-1. 3270 Remote-Standalone Configuration Data Chart (Sheet 1 of 2)

Communication Line Utilization Data				
Note: Enter the appropriate data for each I/O configuration on the communication line. Include non-3270 I/O configurations (if any).				
Communication Line Identification _____				
Relative Position of I/O Configuration on Communication Line	I/O Configuration Type	I/O Configuration Location	Problem Determination Representative	
			Name	Telephone
—	Computer Site			
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
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32				

Figure 2-1. 3270 Remote-Standalone Configuration Data Chart (Sheet 2 of 2)

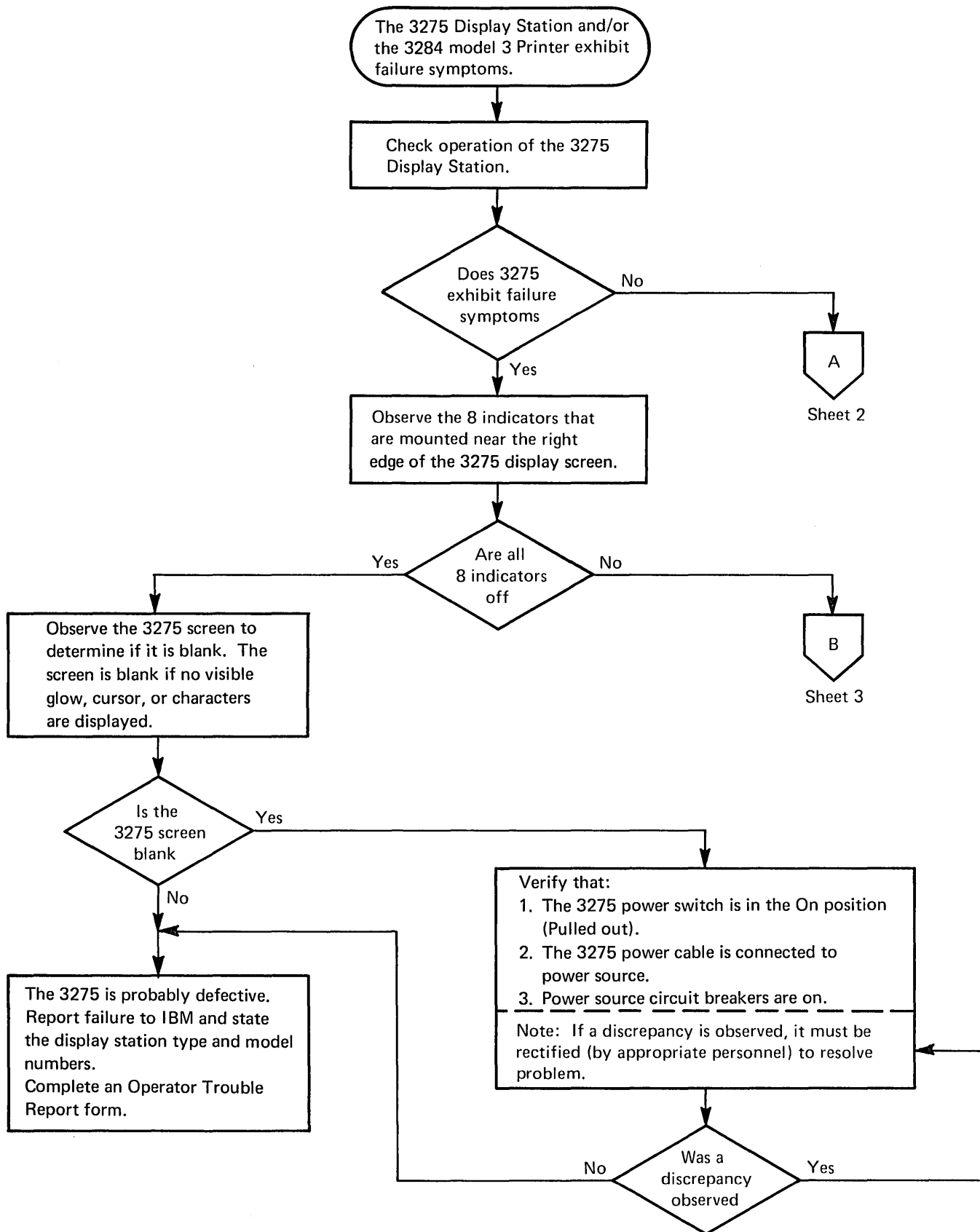


Figure 2-2. 3270 Remote-Standalone Configuration Problem-Determination Flow Diagram (Sheet 1 of 5)

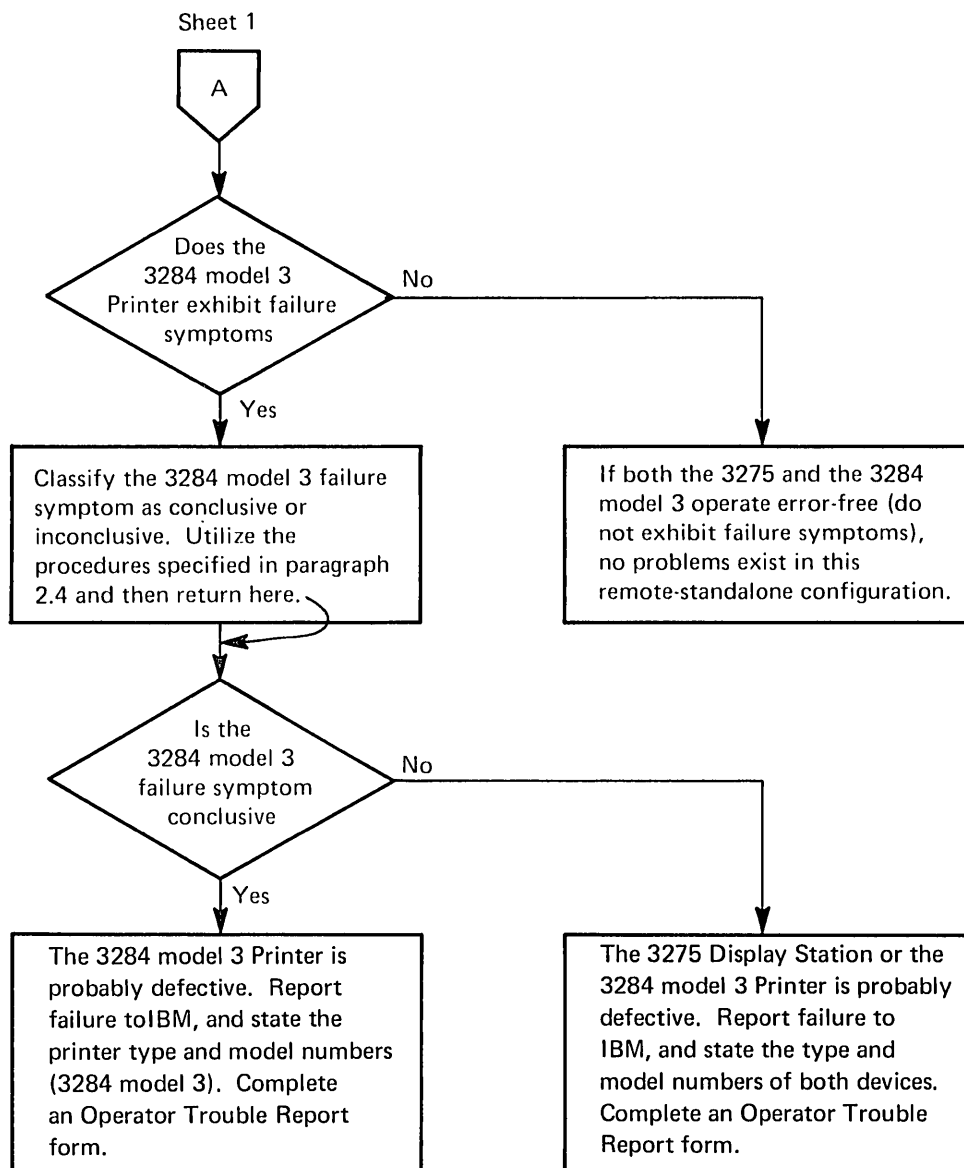


Figure 2-2. 3270 Remote-Standalone Configuration Problem-Determination Flow Diagram (Sheet 2 of 5)

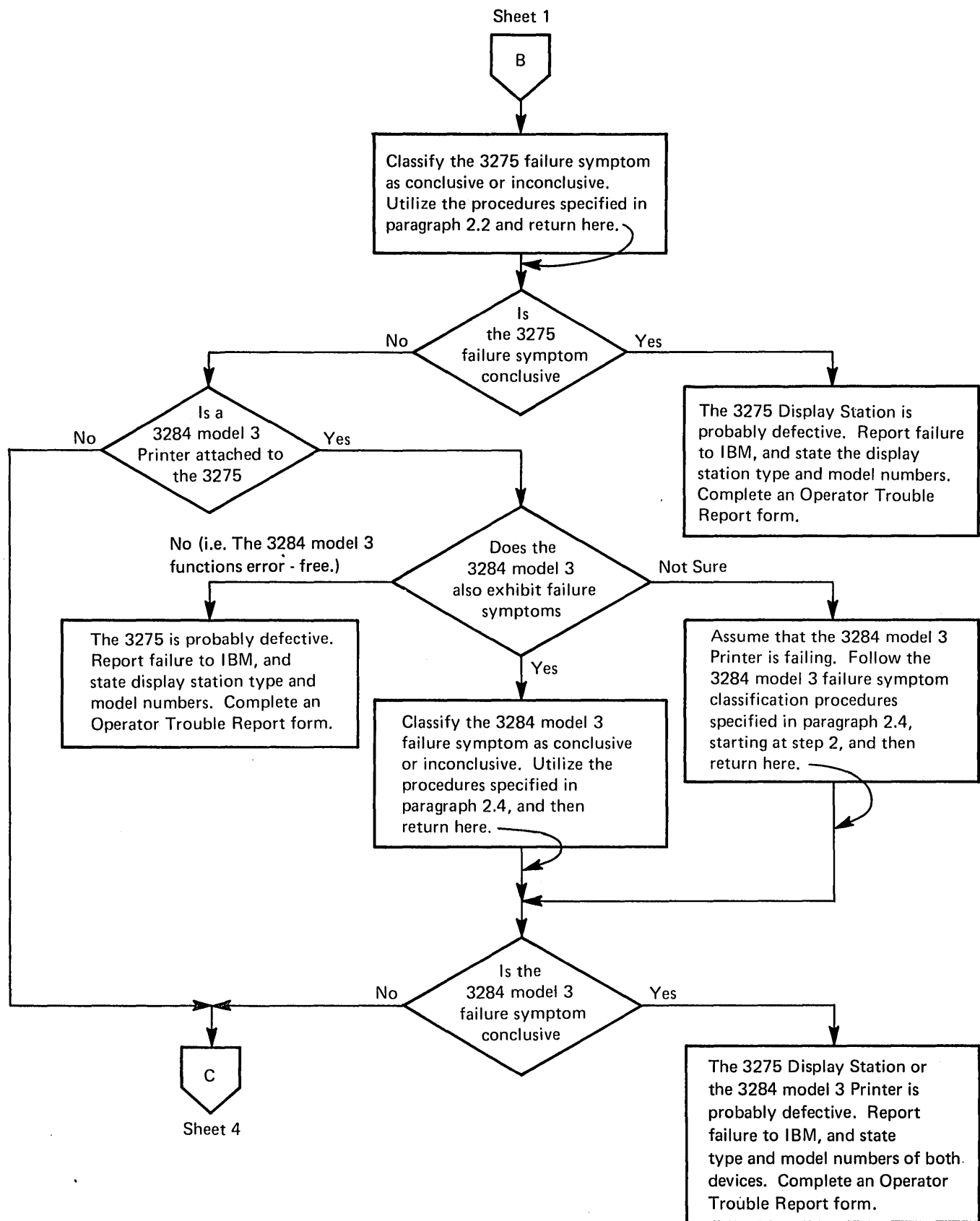


Figure 2-2. 3270 Remote-Standalone Configuration Problem-Determination Flow Diagram (Sheet 3 of 5)

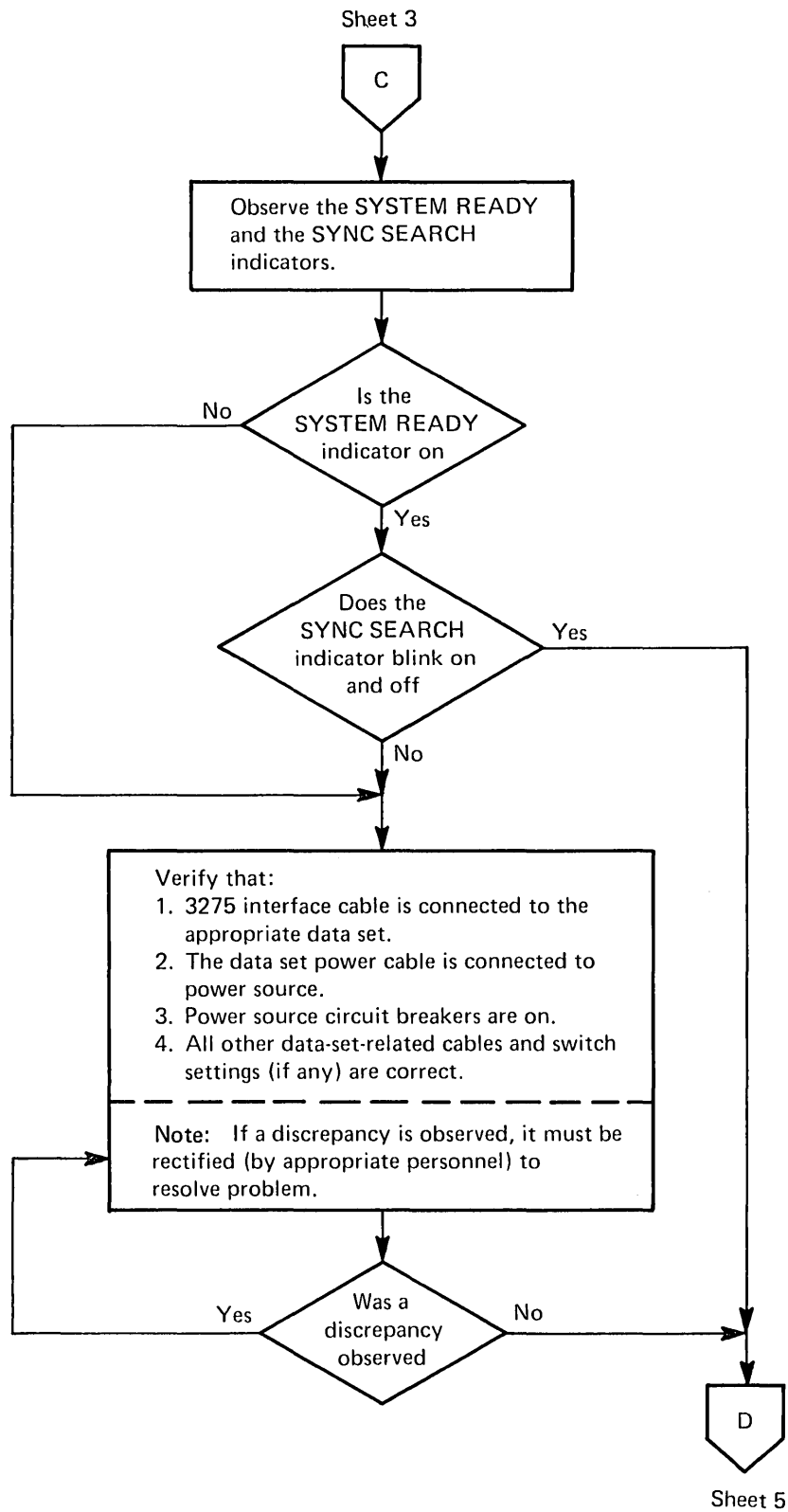


Figure 2-2. 3270 Remote-Standalone Configuration Problem-Determination Flow Diagram (Sheet 4 of 5)

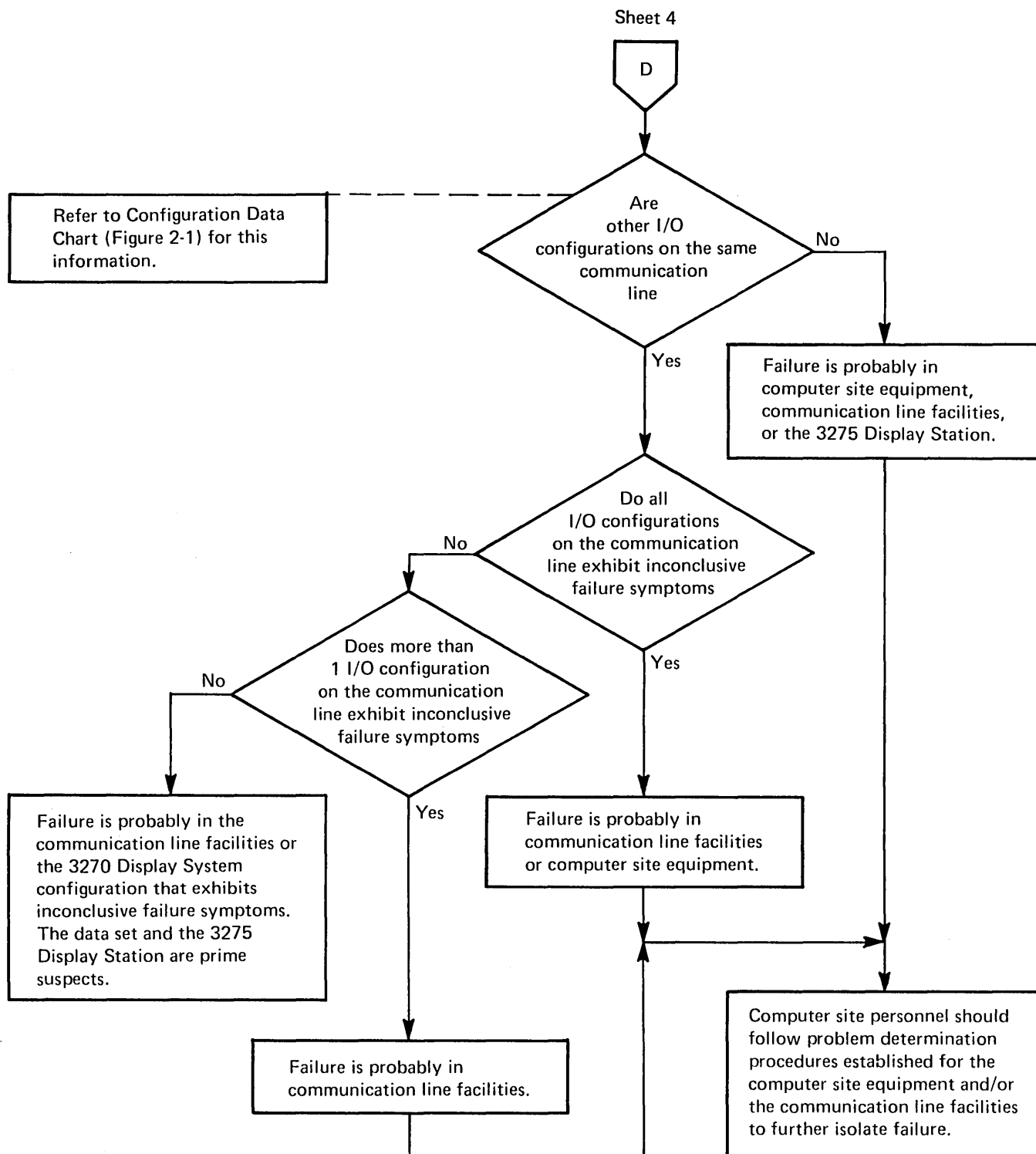


Figure 2-2. 3270 Remote-Standalone Configuration Problem-Determination Flow Diagram (Sheet 5 of 5)

Chapter 3. 3270 Remote-Cluster Configuration

To perform the problem-determination procedures described in this chapter, the configuration data chart (Figure 3-1) should contain the current information regarding the status of the 3270 Remote-Cluster Configuration.

3.1 CONFIGURATION-RELATED PROCEDURES

The supervisor should follow the procedures described in Figure 3-2.

3.2 DEVICE-RELATED PROCEDURES

Device operators should follow the procedures specified in Chapter 5 or 6, depending upon the type of device on which the problem is experienced. Chapter 5 should be used if the device is a 3277 Model 1 or 3277 Model 2 Display Station. Chapter 6 should be used if the device is a 3284 Model 1, 3284 Model 2, 3286 Model 1, or 3286 Model 2 Printer.

Control Unit Data												
Type Number	Model Number		Type of Interface		Physical Location	Selection Address in Hexadecimal Form						
3271	1	2	ASCII	EBCDIC								
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								

Device Data										Failure Symptom Classification Check-Off List (Check the type of failure symptom exhibited by device.)		
Device Number	Device Description (Check one.)		Device Type Number (Check one.)			Device Model Number (Check one.)		Device Location	Device Selection Address in Hexadecimal Form	No Failure Symptom	Conclusive Failure Symptom	Inconclusive Failure Symptom
	Display Station	Printer	3277	3284	3286	1	2					
0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 3-1. 3270 Remote-Cluster Configuration Data Chart (Sheet 1 of 2)

Communication Line Utilization Data				
Note: Enter the appropriate data for each I/O configuration on the communication line. Include non-3270 I/O configurations (if any).				
Communication Line Identification _____				
Relative Position of I/O Configuration on Communication Line	I/O Configuration Type	I/O Configuration Location	Problem Determination Representative	
			Name	Telephone
—	Computer Site			
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
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21				
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26				
27				
28				
29				
30				
31				
32				

Figure 3-1. 3270 Remote-Cluster Configuration Data Chart (Sheet 2 of 2)

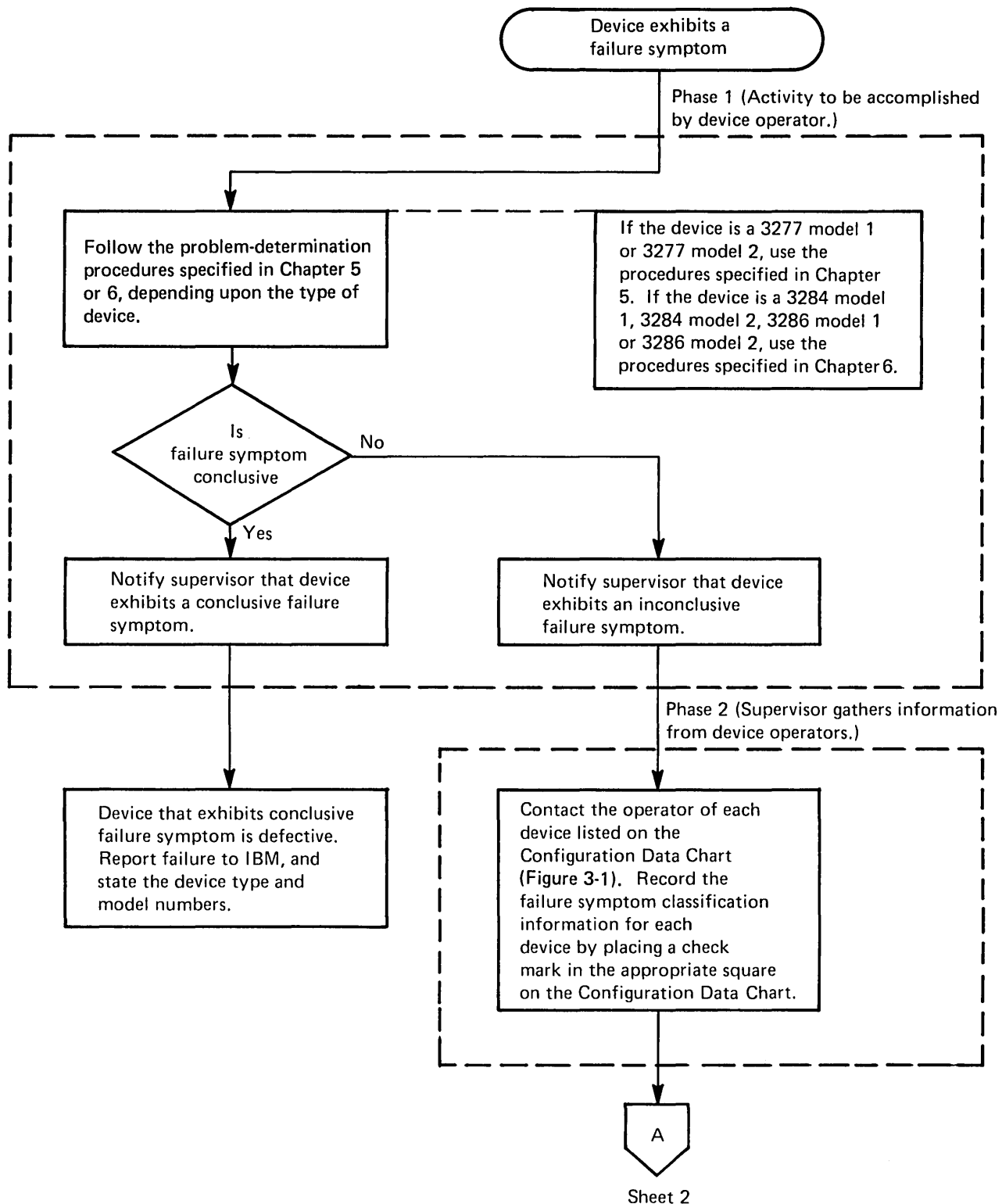


Figure 3-2. 3270 Remote-Cluster Configuration Problem-Determination Flow Diagram (Sheet 1 of 5)

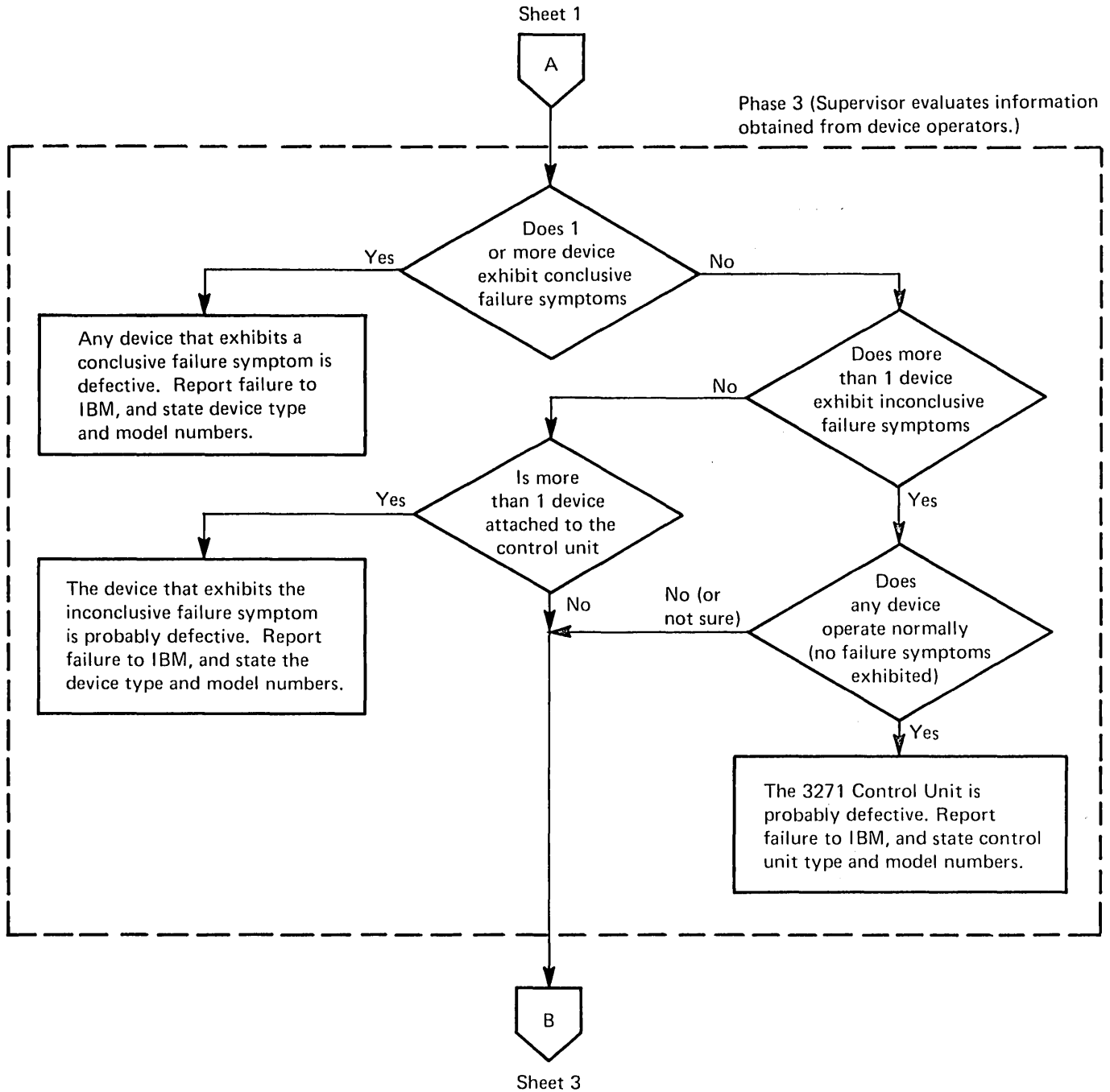


Figure 3-2. 3270 Remote-Cluster Configuration Problem-Determination Flow Diagram (Sheet 2 of 5)

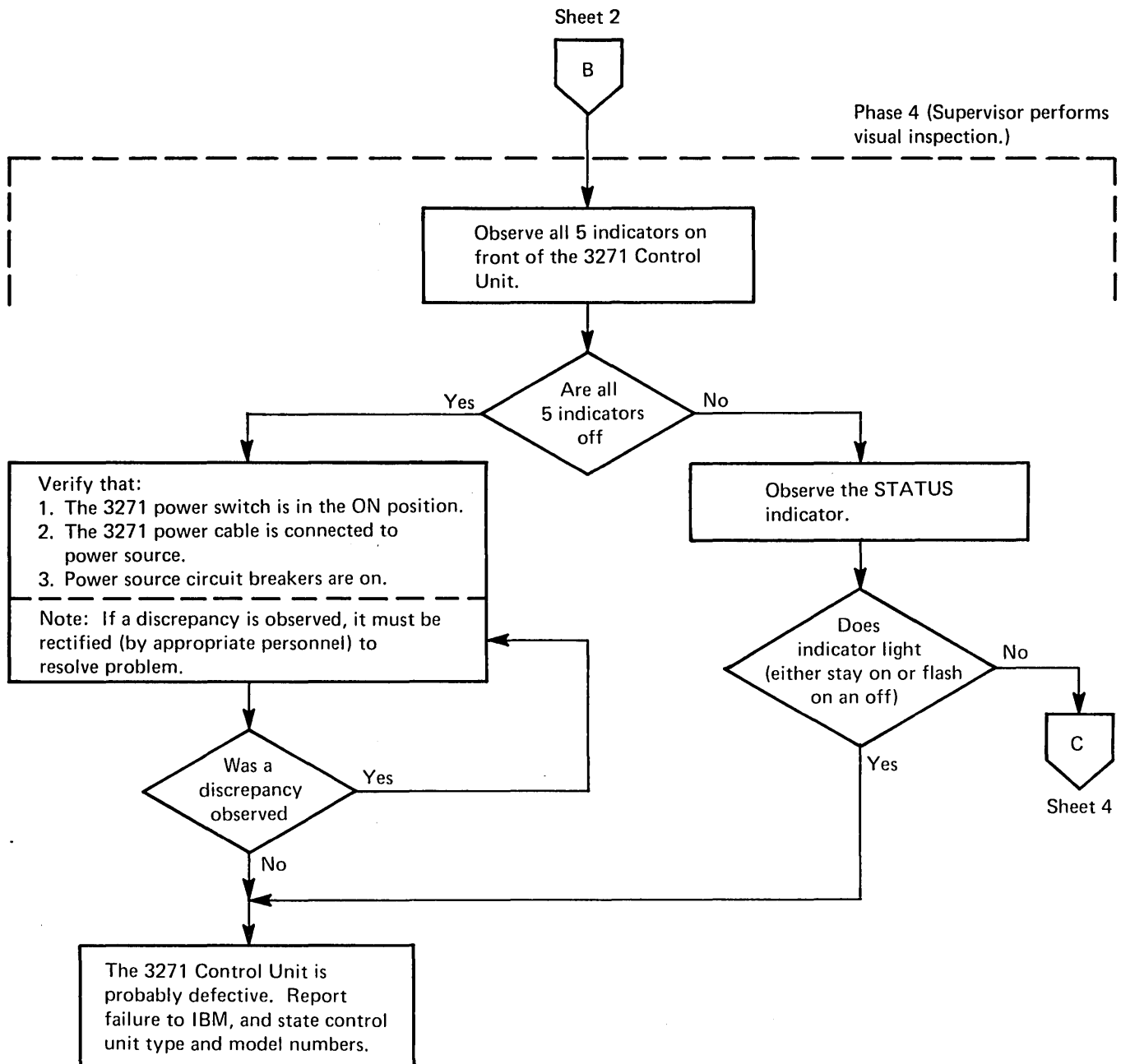


Figure 3-2. 3270 Remote-Cluster Configuration Problem-Determination Flow Diagram (Sheet 3 of 5)

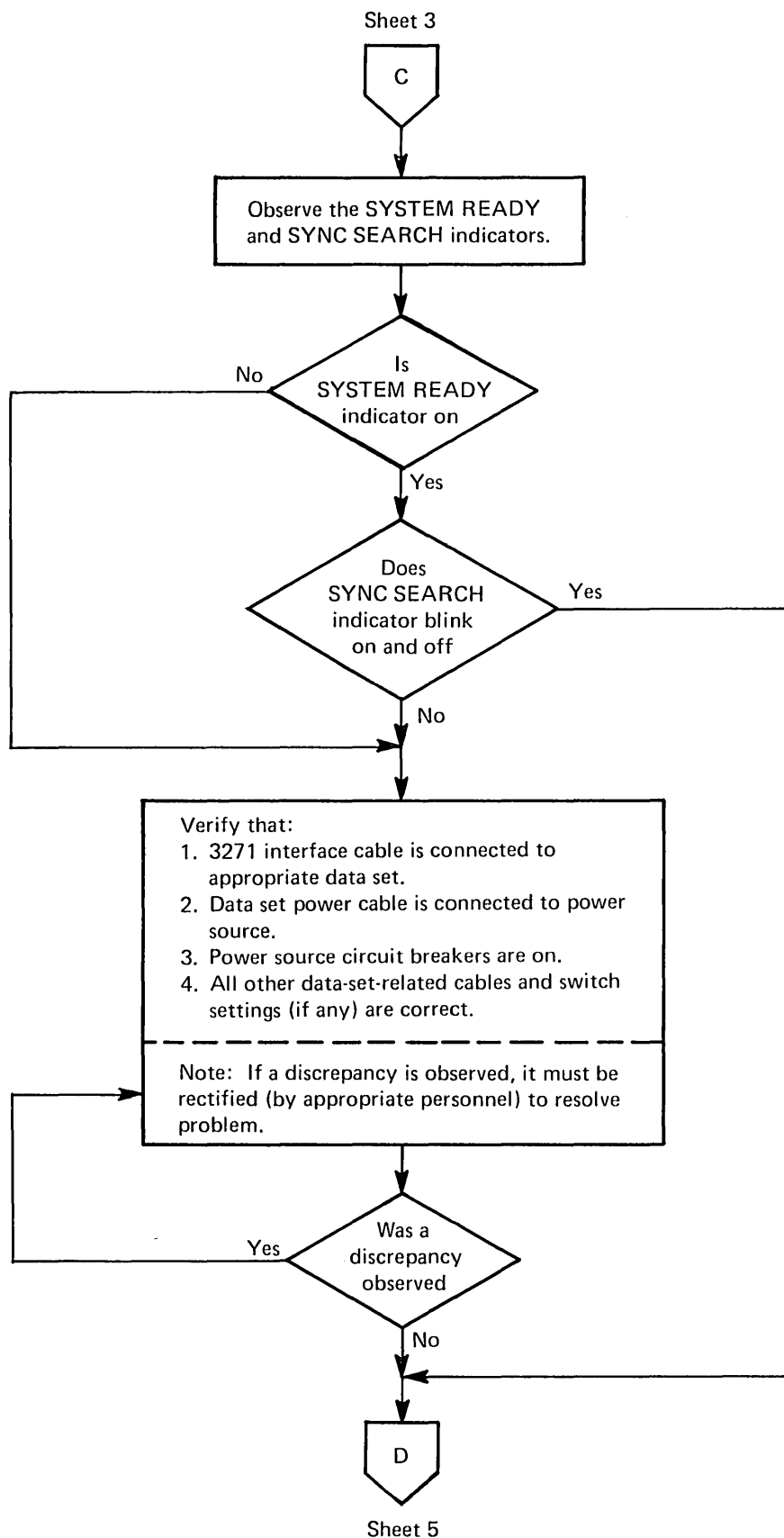


Figure 3-2. 3270 Remote-Cluster Configuration Problem-Determination Flow Diagram (Sheet 4 of 5)

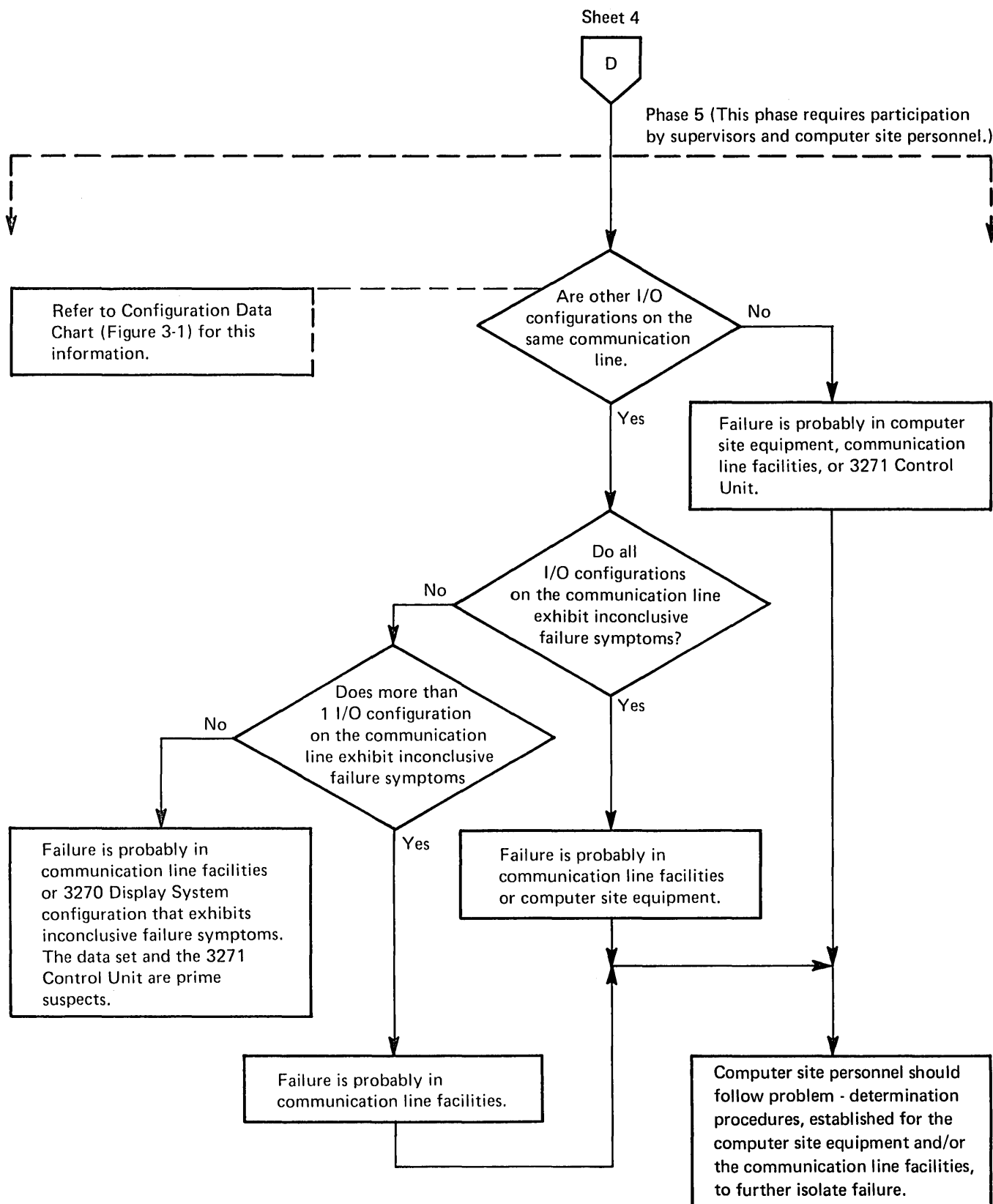


Figure 3-2. 3270 Remote-Cluster Configuration Problem-Determination Flow Diagram (Sheet 5 of 5)

To perform the problem-determination procedures described in this chapter, the configuration data chart (Figure 4-1) should contain the current information regarding the status of the 3270 Local-Cluster Configuration.

4.1 CONFIGURATION-RELATED PROCEDURES

The supervisor should follow the procedures described in Figure 4-2.

4.2 DEVICE-RELATED PROCEDURES

Device operators should follow the procedures specified in Chapter 5 or 6, depending upon the type of device on which the problem is experienced. Chapter 5 should be used if the device is a 3277 Model 1 or 3277 Model 2 Display Station. Chapter 6 should be used if the device is a 3284 Model 1, 3284 Model 2, 3286 Model 1, or 3286 Model 2 Printer.

Control Unit Data												
Type Number	Model Number		Power Control Option		Physical Location							
3272	1	2	Local	Remote								
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>								

Device Data												
Device Number	Device Description (Check one.)		Device Type Number (Check one.)			Device Model Number (Check one.)		Device Location	Control Unit/Device Address in Hexadecimal Form	Failure Symptom Classification Check-Off List (Check the type of failure symptom exhibited by device.)		
	Display Station	Printer	3277	3284	3286	1	2			No Failure Symptom	Conclusive Failure Symptom	Inconclusive Failure Symptom
0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
14	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
15	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
16	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
17	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
18	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
19	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
20	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
21	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
22	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
23	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
24	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
25	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
26	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
27	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
28	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
29	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
31	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 4-1. 3270 Local-Cluster Configuration Data Chart (Sheet 1 of 2)

Channel Utilization Data			
Note: Enter the appropriate data for each I/O configuration on the channel. Include non-3270 I/O configurations (if any).			
Channel Address _____			
I/O Configuration Description	I/O Configuration Location	Problem Determination Representative	
		Name	Telephone

Figure 4-1. 3270 Local-Cluster Configuration Data Chart (Sheet 2 of 2)

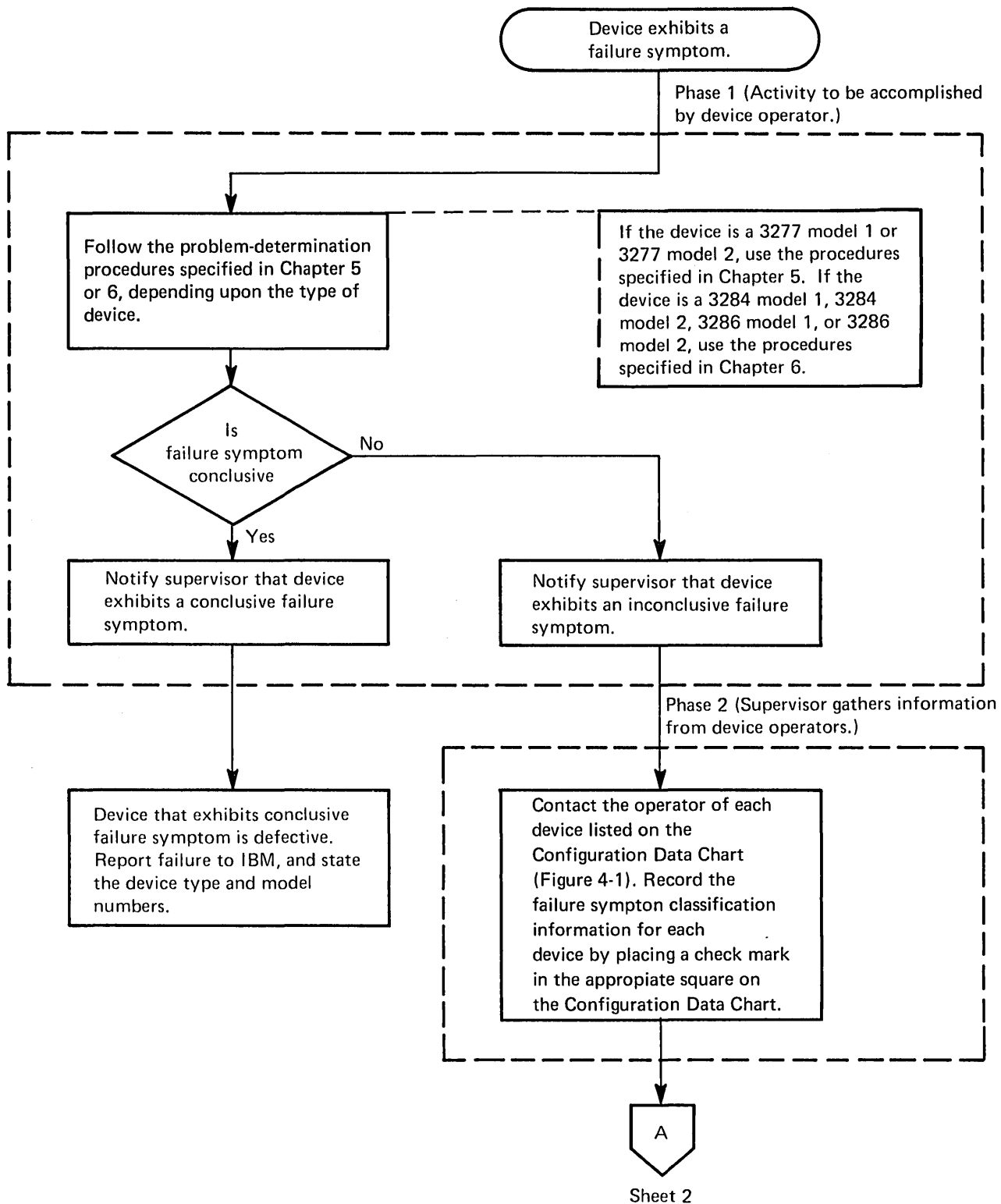


Figure 4-2. 3270 Local-Cluster Configuration Problem-Determination Flow Diagram (Sheet 1 of 4)

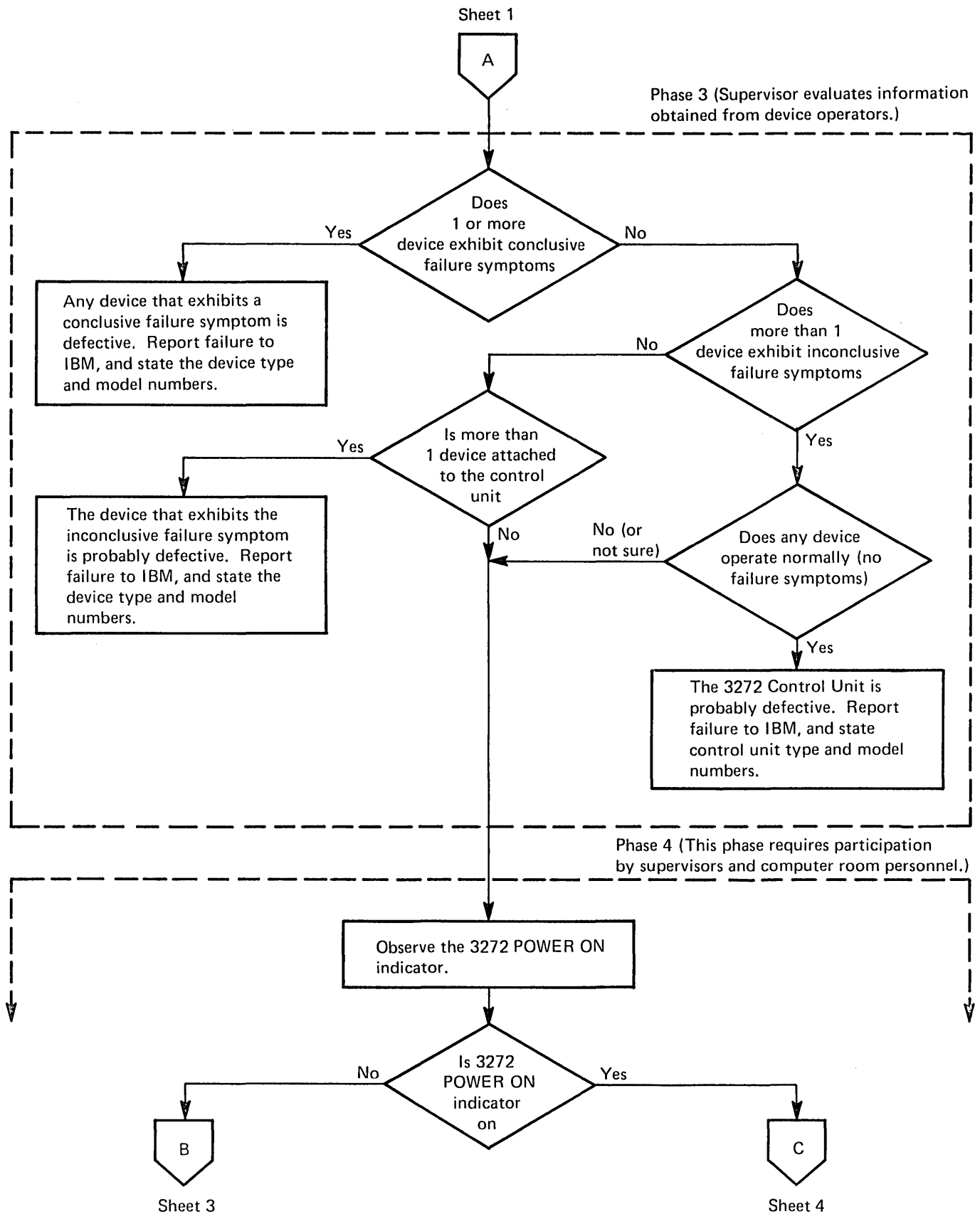


Figure 4-2. 3270 Local-Cluster Configuration Problem-Determination Flow Diagram (Sheet 2 of 4)

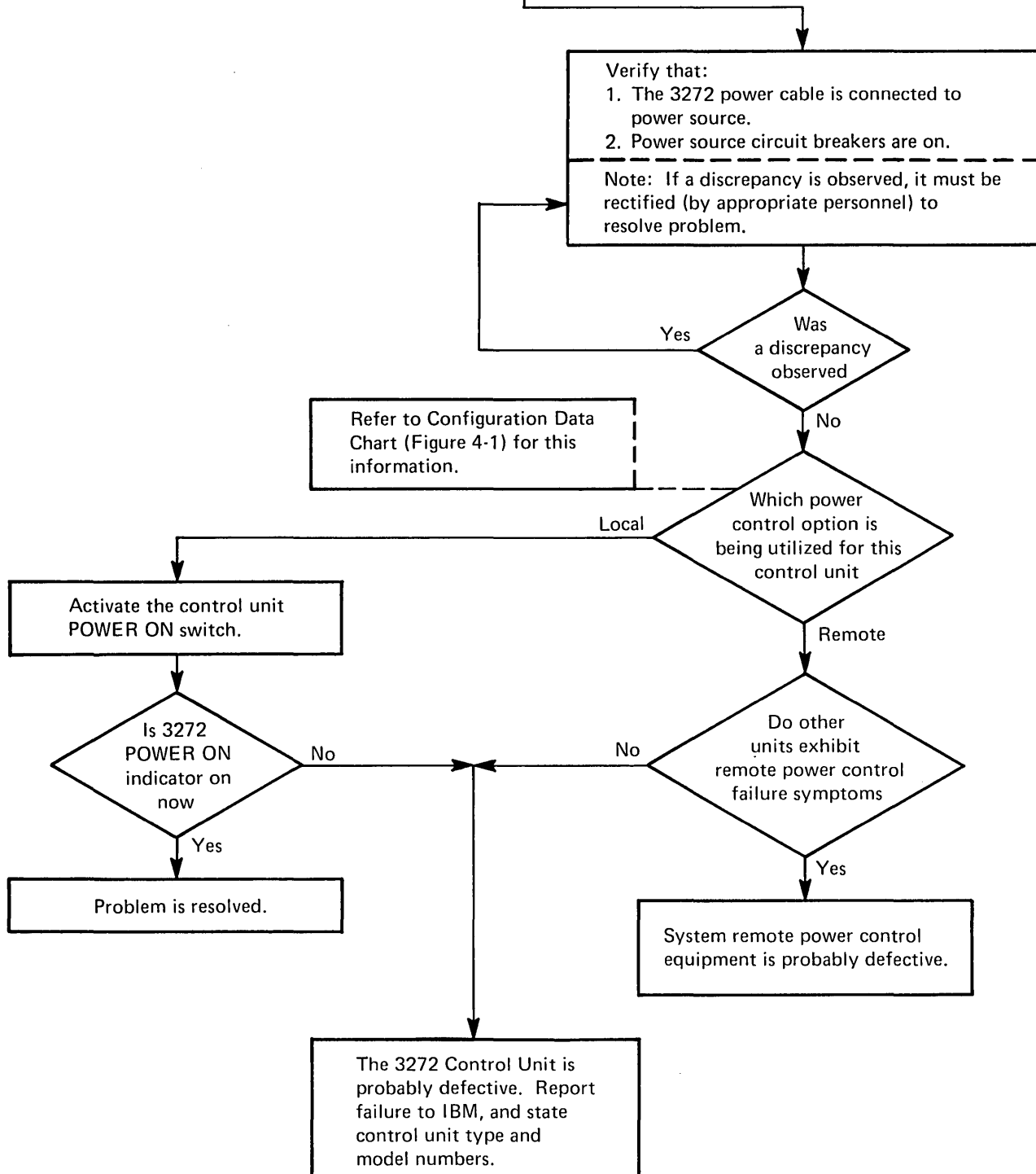


Figure 4-2. 3270 Local-Cluster Configuration Problem-Determination Flow Diagram (Sheet 3 of 4)

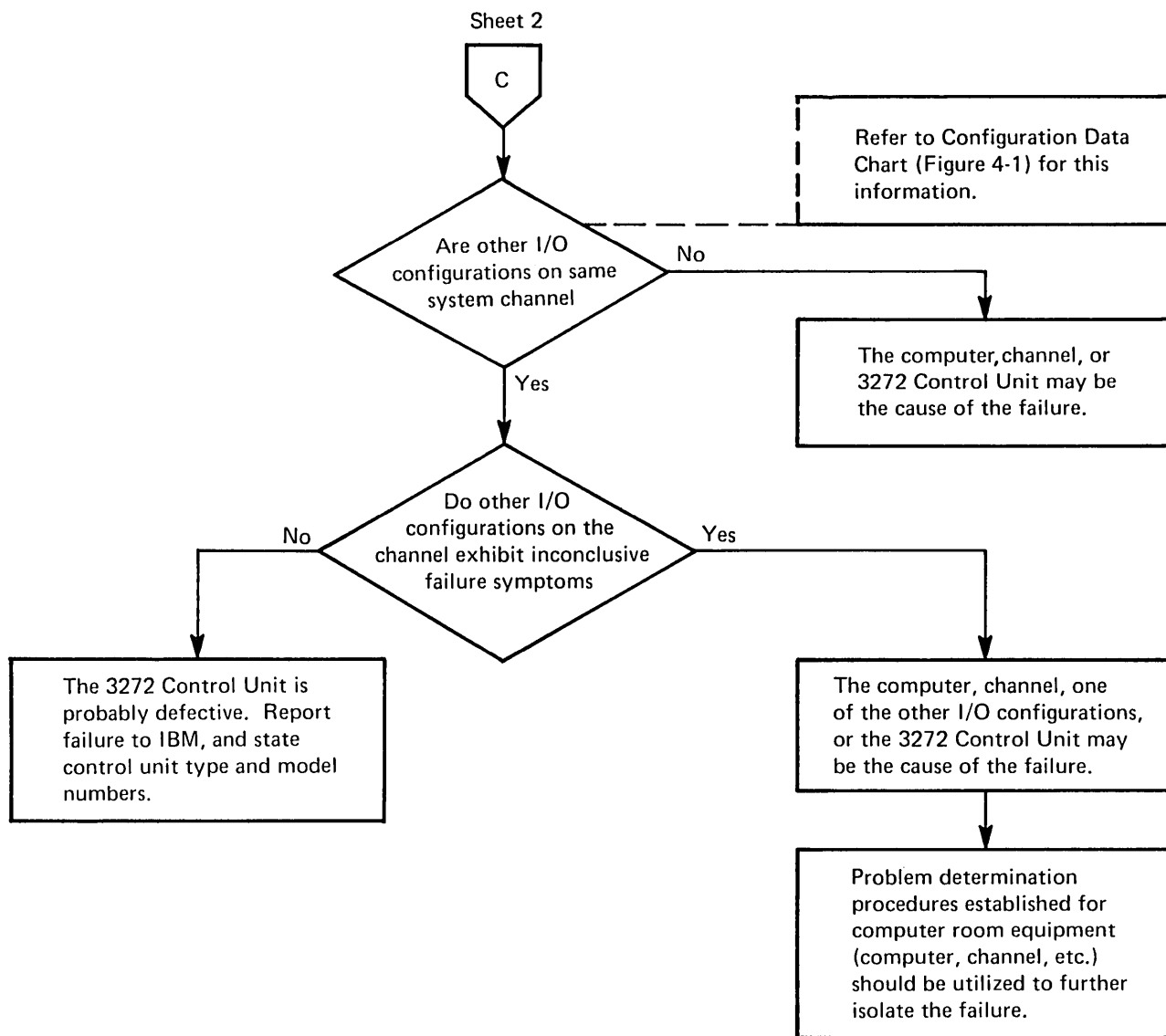


Figure 4-2. 3270 Local-Cluster Configuration Problem-Determination Flow Diagram (Sheet 4 of 4)

5.1 PROBLEM-DETERMINATION PROCEDURES

When it appears that a failure symptom is exhibited, proceed as follows:

1. Ensure that correct operating procedures have been used and that the responses expected are valid functions of a correctly operating configuration. Descriptions of correct operating procedures and expected responses can be verified from the following sources:
 - a. *Operator's Guide for IBM 3270 Information Display Systems*.
 - b. The user's guide for the application program being used.
 - c. Supervisor.
2. After verifying that a failure symptom has been detected (step 1, above), the failure symptom must be classified as being conclusive or inconclusive. Refer to paragraph 5.2 for a detailed description of failure symptom classification procedures.
3. Notify the supervisor that the display station exhibits a failure symptom, and indicate the failure symptom classification (conclusive or inconclusive).
4. Fill out the Operator Trouble Report form.

5.2 FAILURE SYMPTOM CLASSIFICATION PROCEDURES

It is impractical, if not impossible, to list every failure symptom that could be exhibited by the display station. Thus, the method of failure symptom classification used is a process of elimination. A listing of the most likely and most recognizable conclusive failure symptoms is provided in paragraph 5.3. If the display station exhibits one of these failure symptoms, it is classified as conclusive. The failure symptom is classified as inconclusive, however, if it is not contained in the conclusive failure symptom list.

To classify an observed failure symptom, proceed as follows:

1. Develop a mental picture of the failure symptom.
2. Scan the conclusive failure symptom listing (paragraph 5.3) to find a listed failure symptom description that is similar to the observed failure symptom.

Note: The observed failure symptom may contain more conditions than are described in the listed failure symptom. However, it is still possible to classify the observed symptom as conclusive if it satisfies *all* conditions exactly as described in the listed symptom.

3. Classify the failure symptom. If the observed failure symptom exactly satisfies all the conditions stated in any one of the listed failure symptom descriptions, it should be classified as conclusive. However, if the observed failure symptom does not satisfy all the conditions stated in any one of the listed failure symptoms, it should be classified as inconclusive.

The following examples illustrate the failure symptom classification procedure.

Example #1

Observed Failure Symptom – When a selection is attempted via the selector pen, the detect bars appear and the INPUT INHIBITED indicator comes on, but the designator character does not change.

Listed Failure Symptom – The conclusive failure symptom listing (paragraph 5.3) shows that item 2c of paragraph 5.3.3 is satisfied by the observed failure symptom.

Resultant Failure Symptom Classification – The observed failure symptom is classified as conclusive because it satisfies each condition stated by the listed failure symptom description. The state of the INPUT INHIBITED indicator, which is included in the observed failure symptom, is ignored because it is not a specific condition of the listed failure symptom description.

Example #2

Observed Failure Symptom – When a selection is attempted via the selector pen, the detect bars do not appear and the designator character does not change.

Listed Failure Symptom – The conclusive failure symptom listing does not contain a failure symptom description that is completely satisfied by the observed failure symptom.

Resultant Failure Symptom Classification – The observed failure symptom is classified as inconclusive.

5.3 CONCLUSIVE FAILURE SYMPTOM LISTING

5.3.1 Display Malfunctions

1. **Empty Screen** – The display screen is blank. No visible cursor, characters, or indicators are displayed. The

INSERT MODE indicator does not come on when the INS MODE key is pressed. Adjustment of the brightness control does not rectify the condition.

Note: This symptom may occur because the display station is not supplied with power. A visual inspection should be made to verify that all of the following conditions are satisfied:

- a. The display station power control switch is on (switch pulled out).
- b. The display station power cable is connected to an appropriate power source.
- c. The power source circuit breakers are on.

If any of the above conditions (a through c) are not satisfied, the problem is found, and it can be corrected by satisfying the required conditions. If all of the conditions are satisfied and the symptom persists, it is a conclusive failure symptom.

2. Single Horizontal Line on Screen – The display image consists of a single horizontal line at the top of the display area. The length of the line is equal to the full width of the screen or is equal to approximately two-thirds the width of the screen.
3. Many Horizontal Lines on Screen – The lines are as long as the display area is wide. They may appear in groups or be evenly spaced over a portion or all of the display area. They may appear in lieu of a normal image or be superimposed on a normal image.
4. Screen Full of Squares – A square is displayed in every character position of the display area (i.e., 480 squares for a 3277 Model 1 and 1,920 squares for a 3277 Model 2). The cursor, however, is displayed normally.
5. Brightness Control Is Inoperative
6. Image Is Not Focused
7. Image Size Is Incorrect – The overall dimensions (vertical and/or horizontal) of the display area are incorrect (too large or too small). The overall dimensions of displayed images are therefore incorrect.
8. Image Position Is Incorrect – The display area is not properly positioned on the display screen. The display area is off-center (shifted left or right and/or shifted up or down) or tilted. Displayed images are therefore off-center or tilted.
9. Inter-Row Spacing Is Incorrect – The vertical spacing between adjacent horizontal rows of character positions, within the display area, is incorrect or uneven.
10. Character Size Is Incorrect
11. Characters Are Distorted – Image contains one or more characters that are not formed correctly.
12. Characters are displayed normally, but the cursor is not displayed, and the INPUT INHIBITED indicator remains off.

13. Cursor Position Is Incorrect – The cursor is not positioned the correct vertical distance below a character. It may be drawn through the character area.
14. Cursor Size Is Incorrect – The cursor is too long or too short.
15. Multiple cursors are displayed, but the INPUT INHIBITED indicator remains off.
16. Only Indicators Malfunction – One or more of the three indicators (SYSTEM AVAILABLE, INSERT MODE, and INPUT INHIBITED) malfunction. Except for the malfunctioning indicators, no other failure symptoms are exhibited.

5.3.2 Keyboard Malfunctions

1. Mechanical – One or more keys (or the spacebar) are broken, loose, missing, or bind when operated.
2. CLEAR Key Fails – Pressing the CLEAR key does not erase all characters on the screen, and/or does not position the cursor to character position 0 (top left), and/or does not cause the INPUT INHIBITED indicator to come on.

Note: Some application programs respond to the interrupt generated by the CLEAR key by writing a pattern to the display station. If this is true for the application program that is being used, CLEAR key operation is normal, even if the correct results exist only momentarily.

3. Certain Cursor Control Keys Fail – i.e., Up (↑), Down (↓), Left (←), Right (→), or Backspace (←). The cursor does not move properly or the INPUT INHIBITED indicator comes on for one or more of these keys.
4. Typamatic Failures – Typamatic keys function correctly when pressed and released, but one or more do not repeat their function when held fully depressed.
5. Character Key Failures – All keys related to the alphabet, to numerics, to symbols, and to punctuation marks are considered character keys for this discussion.

When attempting to type into an unprotected data field or an unformatted image, one or more of the following malfunctions occur:

- a. The wrong character enters for one or more character keys, or
- b. No character enters for all character keys, and the INPUT INHIBITED indicator comes on, or
- c. The correct character enters, but the INPUT INHIBITED indicator comes on for one or more character keys, or
- d. The cursor disappears or does not move properly when a character enters, or
- e. No character enters for all character keys, but the cursor advances when each character key is pressed, and the INPUT INHIBITED indicator does not come on.

Note: If it appears that one of these failure symptoms is exhibited, obtain an unformatted image via the CLEAR key (if the application program permits), and verify the symptom by retrying the operation.

6. Program Access Key Failures – The INPUT INHIBITED indicator does not come on for one or more of the following keys: ENTER, PA1, PA2, PA3, TEST REQ, or PF1 through PF12.

Note: Refer to item 2, paragraph 5.3.2, for CLEAR key failure symptom.

5.3.3 Selector Pen Malfunctions

1. Mechanical – Selector pen operations cannot be executed error-free, and inspection of the selector pen reveals that:
 - a. Obvious physical damage exists, or

- b. The selector pen tip movement, relative to the selector pen barrel, is not smooth when the selector pen switch is activated.

2. Detect Bar or Designator Character Failures:

- a. Detect bars appear through all selectable fields, even when selector pen is not being used, or
 - b. Detect bars appear and remain through all selectable fields when a selection is attempted, or
 - c. Detect bars appear; but the designator character does not change when a selection is attempted.

5.3.4 Audible Alarm Malfunctions

The audible alarm does not sound when a character is entered from the keyboard into the next-to-last character position of the display area (position 478 for a model 1 or position 1918 for a model 2).

Chapter 6. 3284 Model 1, 3284 Model 2, 3286 Model 1, and 3286 Model 2 Printers

6.1 PROBLEM-DETERMINATION PROCEDURES

When a printer exhibits a failure symptom, proceed as follows:

1. Select the one statement from the three listed below that best describes the observed failure symptom, and follow the instructions associated with the selected statement:
 - a. The printer is totally inoperative; i.e., printout operations do not even start. (Skip to step 2.)
 - b. The printer appears to operate correctly except for the quality of the print density; i.e., the characters are not dark enough. (Skip to step 3.)
 - c. The printer operates, but its operation is abnormal. The abnormal operation is not limited to the quality of the print density. (Skip to step 4.)
2. When the printer is totally inoperative, make a visual inspection to verify that all of the following conditions are satisfied:
 - a. The PRINT PAT/ON LN/PRINT BFR switch is in the ON LN position.
 - b. An adequate supply of forms (paper) is properly loaded.
 - c. The printer top cover is closed.
 - d. The printer power control switch is in the ON position.
 - e. The printer power cable is connected to an appropriate power source.
 - f. Power source circuit breakers are on.

If any of the above conditions (a through f) are not satisfied, the problem is found and can be corrected by satisfying the required conditions. If all conditions are satisfied and the printer is still inoperative, skip to step 4.
3. When the printer appears to operate correctly except for the quality of the print density, the problem is probably caused by improper adjustment of the Copy-Control Lever or by a worn ribbon.

If the problem cannot be resolved by adjustment of the Copy-Control Lever or by replacing the ribbon, proceed to step 4.

4. Classify the failure symptom as conclusive or inconclusive. Refer to paragraph 6.2 for detailed failure symptom classification procedures.

6.2 FAILURE SYMPTOM CLASSIFICATION PROCEDURES

The classification of printer failure symptoms is simplified by the use of built-in pattern generation facilities. These facilities are controlled by three test switches that are accessible when the printer top cover is open.

To classify a printer failure symptom, proceed as follows:

1. Print the All H test pattern as follows:
 - a. Place the PRINT PAT/ON LN/PRINT BFR switch in the PRINT PAT position.
 - b. Place the MODE 1/MODE 2 switch in the MODE 2 position.
 - c. Momentarily operate the START PRINT switch.
 - d. Proceed to step 2.
2. Select the one statement from the three listed below that best describes the results obtained when step 1 was executed, and follow the instructions associated with the selected statement:

Note: Figures 6-1 and 6-2 illustrate the correct All H test patterns. Figure 6-1 applies if the printer is a 3284 Model 1 or a 3286 Model 1; Figure 6-2 applies if the printer is a 3284 Model 2 or a 3286 Model 2.

- a. No printout resulted. (Skip to step 5.)
 - b. A correct All H test pattern printout resulted. (Skip to step 3.)
 - c. An incorrect printout resulted. (Skip to step 5.)
3. Print the Alphameric test pattern as follows:
 - a. Place the PRINT PAT/ON LN/PRINT BFR switch in the PRINT PAT position.
 - b. Place the MODE 1/MODE 2 switch in the MODE 1 position.
 - c. Momentarily operate the START PRINT switch.
 - d. Proceed to step 4.
4. Select the one statement from the three listed below that best describes the results obtained when step 3 was executed, and follow the instructions associated with the selected statement:

Note: Figures 6-3 and 6-4 illustrate correct Alphameric test patterns. Figure 6-3 applies if the printer is a 3284 Model 1 or a 3286 Model 1; Figure 6-4 applies if the printer is a 3284 Model 2 or a 3286 Model 2.

- a. No printout resulted. (Skip to step 5.)
 - b. A correct Alphameric test pattern printout resulted.
(Skip to step 6.)
 - c. An incorrect printout resulted. (Proceed to step 5.)
- 5. Classify the failure symptom as conclusive, place the PRINT PAT/ON LN/PRINT BFR switch in the ON LN position, close the printer top cover, and skip to step 7.
 - 6. Classify the failure symptom as inconclusive, place the PRINT PAT/ON LN/PRINT BFR switch in the ON LN position, close the printer top cover, and proceed to step 7.
 - 7. Notify the supervisor that the printer is exhibiting a failure symptom, and indicate the failure symptom classification (conclusive or inconclusive).
 - 8. Complete the Operator Trouble Report form, and attach the printouts that were obtained from the operational program and/or those that were obtained via the use of the procedures in steps 1 and 3.



```

B D F H < K M O Q ! * S U W Y % 2 4 6 8 : @ B D F B D F
XXC XEFXXI<X<XXIJKXMXXPQXX$X);XX/SXUXXXYXX,X_>X0XX3X56XX9:X@XX" XXC XEFX XXC XEFX
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
B D F H < K M O Q ! * S U W Y % 2 4 6 8 : @ B D F B D F
XXC XEFXXI<X<XXIJKXMXXPQXX$X);XX/SXUXXXYXX,X_>X0XX3X56XX9:X@XX" XXC XEFX XXC XEFX
X
S U W Y % 2 4 6 8 : @
S U W Y % 2 4 6 8 : @

```

Notes:

1. A character may or may not appear in the position marked by the arrow. Disregard any character that may appear.
2. This figure illustrates the contents of the test pattern rather than the size and style of individual characters.
3. The USA EBCDIC character set is used in this illustration. Pattern will vary, depending on character generator feature installed.

Figure 6-3. 3284 Model 1 and 3286 Model 1 Alphanumeric Test Pattern



```

B D F H < K M O Q ! * S U W Y % 2 4 6 8 : @ B D F B D F
XXC XEFXXI<X<XXIJKXMXXPQXX$X);XX/SXUXXXYXX,X_>X0XX3X56XX9:X@XX" XXC XEFX XXC XEFX
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
B D F H < K M O Q ! * S U W Y % 2 4 6 8 : @ B D F B D F
XXC XEFXXI<X<XXIJKXMXXPQXX$X);XX/SXUXXXYXX,X_>X0XX3X56XX9:X@XX" XXC XEFX XXC XEFX
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
B D F H < K M O Q ! * S U W Y % 2 4 6 8 : @ B D F B D F
XXC XEFXXI<X<XXIJKXMXXPQXX$X);XX/SXUXXXYXX,X_>X0XX3X56XX9:X@XX" XXC XEFX XXC XEFX
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
B D F H < K M O Q ! * S U W Y % 2 4 6 8 : @ B D F B D F
XXC XEFXXI<X<XXIJKXMXXPQXX$X);XX/SXUXXXYXX,X_>X0XX3X56XX9:X@XX" XXC XEFX XXC XEFX
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
B D F H < K M O Q ! * S U W Y % 2 4 6 8 : @ B D F B D F
XXC XEFXXI<X<XXIJKXMXXPQXX$X);XX/SXUXXXYXX,X_>X0XX3X56XX9:X@XX" XXC XEFX XXC XEFX
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
ABCDEF GHI<.(+IJKLMNOPQR!$*);- /STUVWXYZ ,%_>?0123456789:#@'=" ABCDEF G ABCDEF G
X
S U W Y % 2 4 6 8 : @
S U W Y % 2 4 6 8 : @
S U W Y % 2 4 6 8 : @
S U W Y % 2 4 6 8 : @
S U W Y % 2 4 6 8 : @
S U W Y % 2 4 6 8 : @

```

Notes:

1. A character may or may not appear in the position marked by the arrow. Disregard any character that may appear.
2. This figure illustrates the contents of the test pattern rather than the size and style of individual characters.
3. The USA EBCDIC character set is used in this illustration. Pattern will vary, depending on character generator feature installed.

Figure 6-4. 3284 Model 2 and 3286 Model 2 Alphanumeric Test Pattern

BTAM (under OS or DOS) provides an online test facility, known as Request-For-Test (or RFT), that may be used to test 3270 devices (display stations and printers). These tests are requested from a display station by the device operator.

The requested tests (subject to the restrictions specified in paragraphs 7.3 and 7.4) may be sent to the display station from which they were requested or to another device (display station or printer).

Online tests are useful problem-determination tools because they provide considerable information concerning system operation. For example, the successful reception of an online test:

1. Verifies that the operating system and the BTAM application program are executing in the computer.
2. Verifies the continuity of the data-transmission path from the requesting device to the computer, and from the computer to the device being tested.
3. Verifies that the tested device is capable of executing the functions that are exercised by the given online test.

7.1 ONLINE TESTS RECOMMENDED AS PROBLEM-DETERMINATION TOOLS

The 3270 Basic EBCDIC Test Pattern (Figure 7-1) should be used for: all devices in a 3270 Remote-Standalone Configuration if the 3275 Display Station is equipped with an EBCDIC I/O interface, all devices in a 3270 Remote-Cluster Configuration if the 3271 Control Unit is equipped with an EBCDIC I/O interface, and all devices in a 3270 Local-Cluster Configuration.

The 3270 Basic ASCII* Test Pattern (Figure 7-2) should be used for: all devices in a 3270 Remote-Standalone Configuration if the 3275 Display Station is equipped with an ASCII I/O interface, and all devices in a 3270 Remote-Cluster Configuration if the 3271 Control Unit is equipped with an ASCII I/O interface.

7.2 TEST CAPABILITIES PROVIDED BY ONLINE TESTS

Twelve online tests are available for testing 3270 devices. The first six (XX=23 through 28) are EBCDIC test patterns that can be used for local and remote devices. The remaining six (XX=29 through 34) are ASCII test patterns that can be used only for remote devices. Some of the test

patterns are general-purpose; others are mainly intended for use with a specific device type or model.

The testing capabilities of the 12 test patterns are briefly described below:

XX=23 3270 Basic EBCDIC Test Pattern

This test pattern is issued via an Erase/Write command. It checks:

1. All alphameric characters on a display station or printer.
2. The ability of the write control character (WCC) to sound the audible alarm, start a printer, and specify the 40-character-per-line print format.
3. The ability to create various types of data fields by using certain combinations of: normal intensity, high intensity, nondisplay, selector-pen-detectable, numeric-only, protected, and unprotected data.

The Set Buffer Address (SBA) order, the Insert Cursor (IC) order, and the Start Field (SF) order are used.

XX=24 3270 Model 1 Align EBCDIC Test Pattern

This test pattern is issued via an Erase/Write command. It checks:

1. The position alignment for a 480-character display station.
2. The ability of the WCC to sound the audible alarm, start a printer, and specify the 40-character-per-line print format.
3. The ability to create protected and unprotected data fields. All data fields are normal intensity.

The Repeat to Address (RA) order, the SBA order, the IC order, and the SF order are used.

XX=25 3270 Model 2 Align EBCDIC Test Pattern

This test pattern is issued via an Erase/Write command. It checks:

1. The position alignment for a 1,920-character display station.
2. The ability of the WCC to sound the audible alarm, start a printer, and specify the 80-character-per-line print format.
3. The ability to create protected and unprotected data fields. All data fields are normal intensity.

The RA order, the SBA order, the IC order, and the SF order are used.

XX=26 3270 Orders EBCDIC Test Pattern

This test pattern is issued via an Erase/Write command. It checks:

*ASCII, American National Standard Code for Information Interchange, X3.4-1968.

1. The following 3270 orders in EBCDIC: SF, New Line (NL), SBA, IC, RA, Program Tab (PT), Erase Unprotected to Address (EUA), Duplicate (DUP), and Field Mark (FM).
2. The ability of the WCC to sound the audible alarm, start a printer, and specify the 64-character-per-line print format.
3. The ability to create normal intensity and high intensity data fields.

XX=27 3270 EBCDIC Universal Character Set Test Pattern

This test pattern is issued via an Erase/Write command. It checks:

1. The Universal Character Set in EBCDIC at a display station or printer.
2. The ability of the WCC to sound the audible alarm, start a printer, and specify the 132-character-per-line print format.
3. The NL order and the End of Message (EM) order for a printer.

The SF order and the IC order are also used.

XX=28 3270 NL/EM EBCDIC Test Pattern

This test pattern is issued via an Erase/Write command. It is mainly intended to check the EM order and multiple NL orders on a printer.

The SF order is also used. Nondisplay and normal intensity data fields are used.

XX=29–34 3270 ASCII Test Patterns

These six test patterns provide test capabilities that correspond with those provided by the six EBCDIC test patterns (XX=23–28). The transmission of these patterns, however, is in ASCII.

7.3 REQUESTING AN ONLINE TEST FROM A REMOTE 3270 DISPLAY STATION

To initiate an online test, the display station operator should proceed as follows:

1. Position the cursor at the top left (character position 0) of an *unformatted* screen. One way to accomplish this is to press the CLEAR key, and then press the RESET key.
2. Enter (via the keyboard) the text of the RFT message in the following format:

XXYYNMMDD

where: XX is a number specifying the desired test (23 through 28 for EBCDIC; 29 through 34 for ASCII).

YY is any number from 01 to 99 (01 is recommended for

problem determination), depending on the number of test pattern repetitions desired. However, when the test pattern is directed to a printer, a YY value other than 01 is meaningless; the pattern will be sent only once. When directed to a display station, the pattern will be sent YY times.

N is the number 4.

MMDD is a sequence of four alphanumeric characters specifying the selection addresses of the control unit (M) and the device (D) to which the test is to be sent. All alphabetic characters must be typed in uppercase. To obtain the correct control unit and device characters, refer to the tables presented in Figure 7-3. For example, to send an online test to control unit 20, device 7, in EBCDIC transmission, the operator should type 44GG.

3. Press the TEST REQ key. The INPUT INHIBITED indicator will come on.

If the INPUT INHIBITED indicator stays on, and no online test appears within 30 seconds on the 3270 device that was specified in the MMDD field of the RFT message, proceed as follows:

1. Ensure that each step of the above procedure was followed, and that the text of the RFT message was entered correctly. If a mistake was made, request the online test again.

Note: All alphabetic characters in the MMDD field must be entered in uppercase. Uppercase entry *cannot* be verified by observing the 3270 screen, because both lowercase and uppercase inputs are displayed as uppercase.

2. Check with the system operator to ensure that the operating system and the BTAM application program are still executing in the computer.
3. Check with the system programmer to ensure that the BTAM application program is set up for online test requests. The following requirements must be satisfied:
 - a. OS BTAM application programs must:
 - (1) Specify EROPT=T in the DCB macro instruction.
 - (2) Specify a buffer of at least 300 bytes in the READ macro instruction.

- b. DOS BTAM application programs must:
 - (1) Specify TERMTST=YES in the DTFBT macro instruction.
 - (2) Specify BSCTEST=YES in the BTMOD macro instruction.
 - (3) Specify a buffer of at least 300 bytes in the READ macro instruction.
- c. The RFT message must be read by a read initial operation or a read continue operation.
- d. The requesting device and the device to be tested must be on the same communication line.

7.4 REQUESTING AN ONLINE TEST FROM A LOCAL 3270 DISPLAY STATION

To initiate an online test, the display station operator should proceed as follows:

- 1. Position the cursor at the top left (character position 0) of an *unformatted* screen. One way to accomplish this is to press the CLEAR key, and then press the RESET key.
- 2. Enter (via the keyboard) the text of the RFT message in the following format:

XXYYNCUU

where: XX is a number specifying the desired test (23 through 28 for EBCDIC).

YY is any number from 01 to 99 (01 is recommended for problem determination). The test pattern will be sent YY times.

N is the number 3.

CUU is a three-digit hexadecimal number specifying the channel and unit address of the device to which the test is to be sent. Alphabetic characters in the hexadecimal number must be typed in uppercase.

- 3. Press the TEST REQ key. The INPUT INHIBITED indicator will come on.

If the INPUT INHIBITED indicator stays on and no online test appears within 15 seconds on the 3270 device that was specified in the CUU field of the RFT message, proceed as follows:

- 1. Ensure that each step of the above procedure was followed, and that the text of the RFT message was entered correctly. If a mistake was made, request the online test again.

Note: All alphabetic characters in the CUU field must be entered in uppercase. Uppercase entry *cannot* be verified by observing the 3270 screen, because both lowercase and uppercase inputs are displayed as uppercase.

- 2. Check with the system operator to ensure that the operating system and the BTAM application program are still executing in the computer.
- 3. Check with the system programmer to ensure that the BTAM application program is set up for online test requests. The following requirements must be satisfied:
 - a. OS BTAM application programs must:
 - (1) Specify EROPT=T in the DCB macro instruction.
 - (2) Specify a buffer of at least 300 bytes in the READ macro instruction.
 - b. DOS BTAM application programs must:
 - (1) Specify TERMTST=YES in the DTFBT macro instruction.
 - (2) Specify TST3277=YES in the BTMOD macro instruction.
 - (3) Specify a buffer of at least 300 bytes in the READ macro instruction.
 - c. The RFT message must be read by a read initial operation.
 - d. For OS BTAM — The requesting device and the device to be tested must be allocated to, and OPENed on, the same DCB macro, in the same OS BTAM application program.
 - e. For DOS BTAM — The requesting device and the device to be tested must be on the same 3272 Control Unit. The requesting device and the device to be tested must be allocated to, and OPENed on, the same DTFBT macro, in the same DOS BTAM application program.

Illustration A (See Note.)

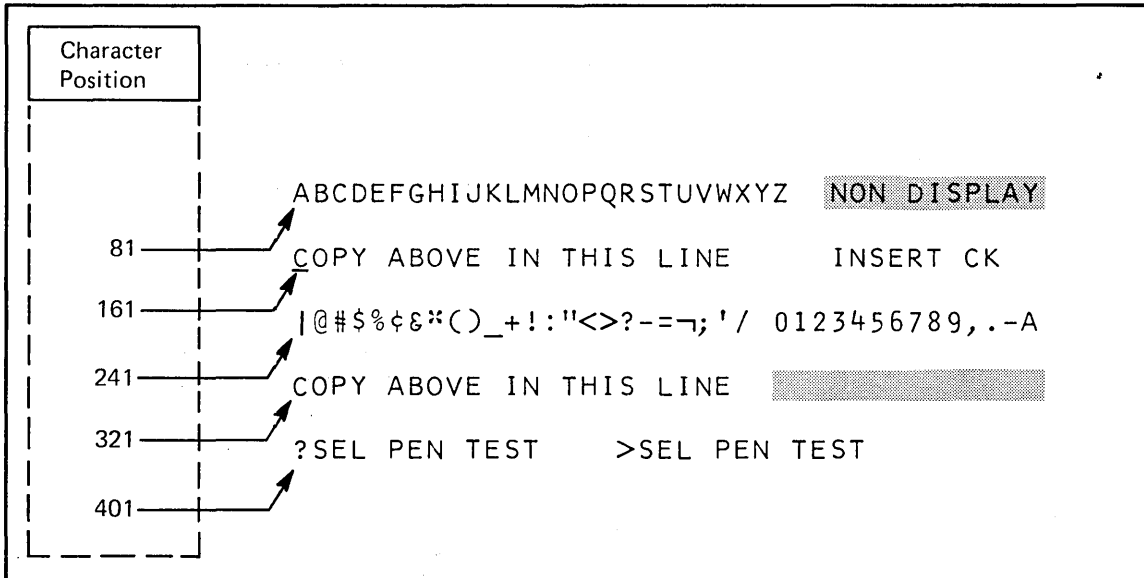
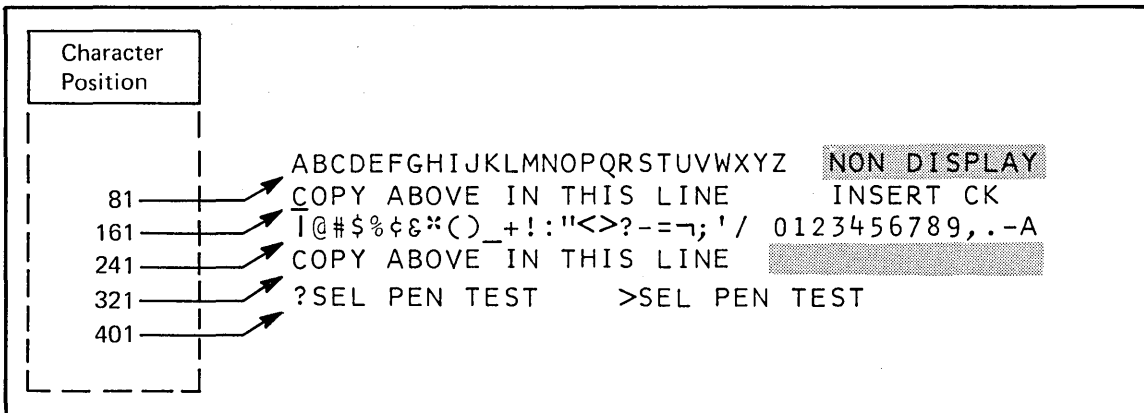


Illustration B (See Note.)



Data Field Definitions

Data	Type of Data Field
ABCDEFGHIJKLMNOPQRSTUVWXYZ	Protected, Normal Intensity
NON DISPLAY	Protected, Non-Display/Non-Print
COPY ABOVE IN THIS LINE	Unprotected, Normal Intensity
INSERT CK	Unprotected, Normal Intensity
@#\$\$%&*()_+!:"<>?-=-; ' /	Protected, High Intensity, Selector Pen Detectable
0123456789,.- A	Protected, Numeric, High Intensity, Selector Pen Detectable
COPY ABOVE IN THIS LINE	Unprotected, High Intensity, Selector Pen Detectable
	Unprotected, Numeric, High Intensity, Selector Pen Detectable
?SEL PEN TEST	Protected, Normal Intensity, Selector Pen Detectable
>SEL PEN TEST	Protected, High Intensity, Selector Pen Detectable

Figure 7-1. 3270 Basic EBCDIC Test Pattern (XX=23) (Sheet 1 of 2)

Device – Dependent Variations (See Note.)

Device	Test Pattern Description
3275-1 W/O 3284-3	Illustration A applies.
3275-1 with 3284-3	Illustration A applies, except for the location of the cursor. The cursor jumps to character position 0, and then moves through succeeding character positions as the 3284-3 prints. The cursor comes to rest at character position 0 on the 3275-1 screen at the end of the 3284-3 print operation.
3275-2 W/O 3284-3	Illustration B applies.
3275-2 with 3284-3	Illustration B applies, except for the location of the cursor. The cursor jumps to character position 0, and then moves through succeeding character positions as the 3284-3 prints. The cursor comes to rest at character position 0 on the 3275-2 screen at the end of the 3284-3 print operation.
3277-1	Illustration A applies.
3277-2	Illustration B applies.
3284-1 3284-2	Illustration B applies, except for the cursor. The cursor is not printed. Ignore the character position reference numbers that are provided in the illustration. The 40-characters-per-line print format is specified.
3284-3	Illustration A applies, except for the cursor. The cursor is not printed. Ignore the character position reference numbers that are provided in the illustration. The 40-characters-per-line print format is specified.
3286-1 3286-2	Illustration B applies, except for the cursor. The cursor is not printed. Ignore the character position reference numbers that are provided in the illustration. The 40-characters-per-line print format is specified.

Note: Illustrations A and B result when the USA EBCDIC character generator feature is used. Use the following table to determine the change that occurs when other EBCDIC character generator features are used.

EBCDIC Hex	USA	UK	French	German
4A	¢	\$	¢	Ö
5A	!	!	!	Ü
5B	\$	£	\$	Ü
7B	#	#	#	Ä
7C	@	@	@	Ö
7F	"	"	"	Ä

Figure 7-1. 3270 Basic EBCDIC Test Pattern (XX=23) (Sheet 2 of 2)

Illustration A (See Note.)

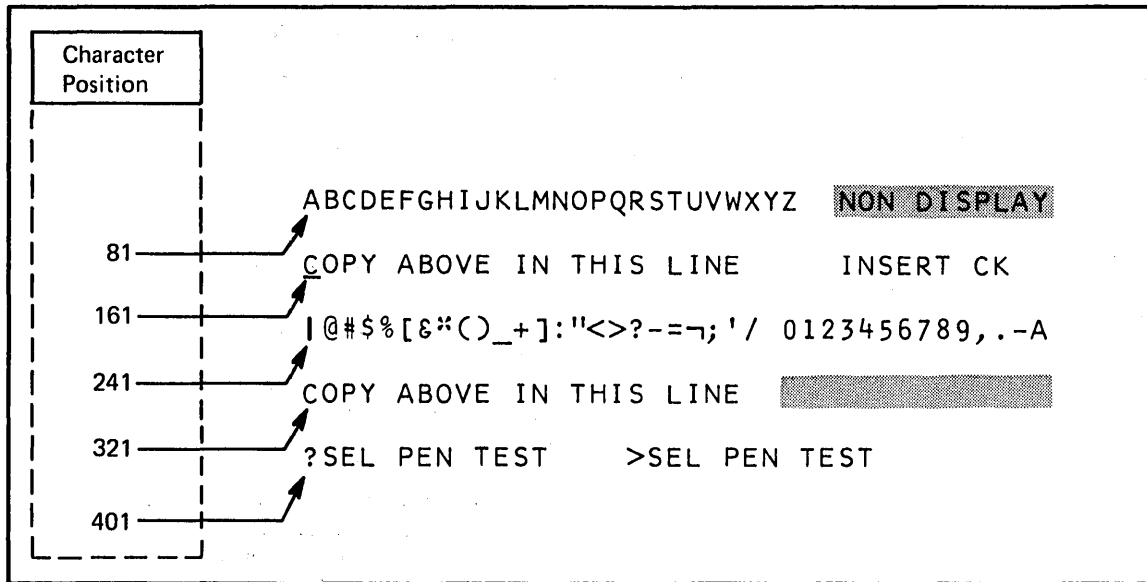
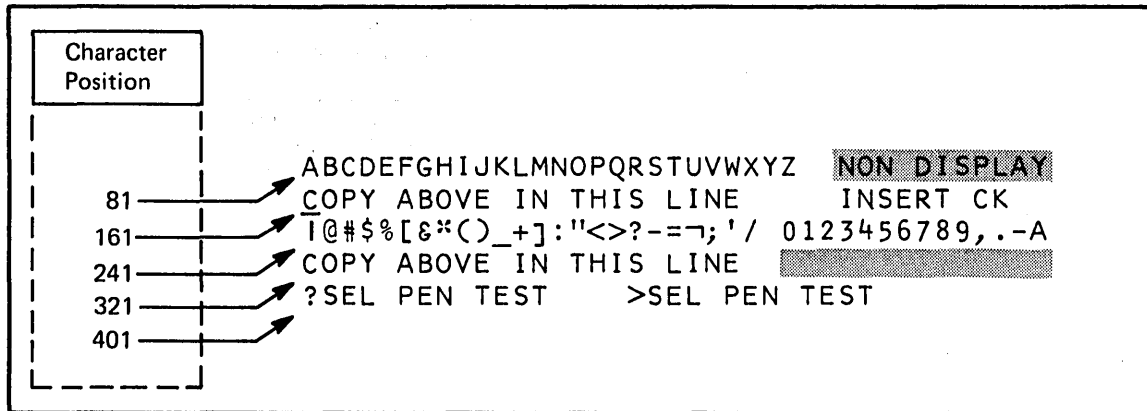


Illustration B (See Note.)



Data Field Definitions

Data	Type of Data Field
ABCDEFGH IJKLMNOPQRSTUVWXYZ	Protected, Normal Intensity
NON DISPLAY	Protected, Non-Display/Non-Print
COPY ABOVE IN THIS LINE	Unprotected, Normal Intensity
INSERT CK.	Unprotected, Normal Intensity
@#\$\$[%*(*)_+]:"<>?-=~;'/	Protected, High Intensity, Selector Pen Detectable
0123456789,.- A	Protected, Numeric, High Intensity, Selector Pen Detectable
COPY ABOVE IN THIS LINE	Unprotected, High Intensity, Selector Pen Detectable
	Unprotected, Numeric, High Intensity, Selector Pen Detectable
?SEL PEN TEST	Protected, Normal Intensity, Selector Pen Detectable
>SEL PEN TEST	Protected, High Intensity, Selector Pen Detectable

Figure 7-2. 3270 Basic ASCII Test Pattern (XX=29) (Sheet 1 of 2)

Device – Dependent Variations (See Note.)

Device	Test Pattern Discription
3275-1 W/O 3284-3	Illustration A applies.
3275-1 with 3284-3	Illustration A applies, except for the location of the cursor. The cursor jumps to character position 0, and then moves through succeeding character positions as the 3284-3 prints. The cursor comes to rest at character position 0 on the 3275-1 screen at the end of the 3284-3 print operation.
3275-2 W/O 3284-3	Illustration B applies.
3275-2 with 3284-3	Illustration B applies, except for the location of the cursor. The cursor jumps to character position 0, and then moves through succeeding character positions as the 3284-3 prints. The cursor comes to rest at character position 0 on the 3275-2 screen at the end of the 3284-3 print operation.
3277-1	Illustration A applies.
3277-2	Illustration B applies.
3284-1 3284-2	Illustration B applies, except for the cursor. The cursor is not printed. Ignore the character position reference numbers that are provided in the illustration. The 40-characters-per-line print format is specified.
3284-3	Illustration A applies, except for the cursor. The cursor is not printed. Ignore the character position reference numbers that are provided in the illustration. The 40-characters-per-line print format is specified.
3286-1 3286-2	Illustration B applies, except for the cursor. The cursor is not printed. Ignore the character position reference numbers that are provided in the illustration. The 40-characters-per-line print format is specified.

Note: Illustrations A and B result when the ASCII A character generator feature is used. Use the following table to determine the change that occurs when the ASCII B character generator is used.

ASCII Hex	ASCII A	ASCII B
21		!
5E	⌋	⌋

Figure 7-2. 3270 Basic ASCII Test Pattern (XX=29) (Sheet 2 of 2)

Control unit addresses for selection.

Control Unit	Address in Character Form	Address in Hexadecimal Form (EBCDIC)	Address in Hexadecimal Form (ASCII)
0	-	60	2D
1	/	61	2F
2	S	E2	53
3	T	E3	54
4	U	E4	55
5	V	E5	56
6	W	E6	57
7	X	E7	58
8	Y	E8	59
9	Z	E9	5A
10	(\)	6A	5C
11	.	6B	2C
12	%	6C	25
13		6D	5F
14	>	6E	3E
15	?	6F	3F
16	0	F0	30
17	1	F1	31
18	2	F2	32
19	3	F3	33
20	4	F4	34
21	5	F5	35
22	6	F6	36
23	7	F7	37
24	8	F8	38
25	9	F9	39
26	:	7A	3A
27	#	7B	23
28	@	7C	40
29	'	7D	27
30	=	7E	3D
31	"	7F	22

Device addresses for polling, selection, and identification.

Device	Address in Character Form	Address in Hexadecimal Form (EBCDIC)	Address in Hexadecimal Form (ASCII)
0	SP	40	20
1	A	C1	41
2	B	C2	42
3	C	C3	43
4	D	C4	44
5	E	C5	45
6	F	C6	46
7	G	C7	47
8	H	C8	48
9	I	C9	49
10	ç ([)	4A	5B
11	.	4B	2E
12	<	4C	3C
13	(4D	28
14	+	4E	2B
15		4F	21
16	&	50	26
17	J	D1	4A
18	K	D2	4B
19	L	D3	4C
20	M	D4	4D
21	N	D5	4E
22	O	D6	4F
23	P	D7	50
24	Q	D8	51
25	R	D9	52
26	! (I)	5A	5D
27	\$	5B	24
28	*	5C	2A
29)	5D	29
30	;	5E	3B
31	┘	5F	5E
General Poll	"	7F	22

Figure 7-3. Selection Address Conversion Tables

The index, presented below, lists the major topics presented in this manual. The index is intended to be used as a quick reference to those major topics. When it appears that a problem exists in a device or a configuration, use the chapter (2, 3, or 4) designated in the Contents for the I/O configuration in which the problem is experienced. Do not use this index to find specific corrective actions when an apparent problem exists.

All H Test Pattern:

- 3284 Model 1 and 3286 Model 1 6-3 (Fig. 6-1)
- 3284 Model 2 and 3286 Model 2 6-3 (Fig. 6-2)
- 3284 Model 3 2-11 (Fig. 2-3)

Alphanumeric Test Pattern:

- 3284 Model 1 and 3286 Model 1 6-4 (Fig. 6-3)
- 3284 Model 2 and 3286 Model 2 6-4 (Fig. 6-4)
- 3284 Model 3 2-11 (Fig. 2-4)

Assumptions 1-1

Basic ASCII Test Pattern 7-6 (Fig. 7-2)

Basic EBCDIC Test Pattern 7-1, 7-4 (Fig. 7-1)

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Configuration Data Chart:

- Defined 1-1
- Local-Cluster Configuration 4-2 (Fig. 4-1)
- Remote-Cluster Configuration 3-2 (Fig. 3-1)
- Remote-Standalone Configuration 2-4 (Fig. 2-1)

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Control Unit Addresses 7-8 (Fig. 7-3)

Conversion Tables, Selection Address 7-8 (Fig. 7-3)

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Device Operator (Defined) 1-2

Failure Symptom Classification:

- 3275 Models 1 and 2 2-1
- 3277 Models 1 and 2 5-1
- 3284 Model 3 2-3
- 3284 Models 1 and 2 6-1
- 3286 Models 1 and 2 6-1

Failure Symptoms (Defined) 1-2

Flow Diagrams (Problem Determination):

- Local-Cluster Configuration 4-4 (Fig. 4-2)
- Remote-Cluster Configuration 3-4 (Fig. 3-2)
- Remote-Standalone Configuration 2-6 (Fig. 2-2)

Inconclusive Failure Symptoms 1-2

I/O Configuration (Defined) 1-1

Local-Cluster Configuration:

- Configuration Data Chart 4-2 (Fig. 4-1)
- Defined 1-1
- Problem-Determination Flow Diagram 4-4 (Fig. 4-2)

Online Testing (RFT) 7-1

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- Capabilities 7-1
- Recommended as Problem-Determination Tools 7-1
- Requesting from a Local Display Station 7-3
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- Remote-Cluster Configuration 3-1
- Remote-Standalone Configuration 2-1
- Purpose (of manual) 1-1

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Remote-Cluster Configuration:

- Configuration Data Chart 3-2 (Fig. 3-1)
- Defined 1-1
- Problem-Determination Flow Diagram 3-4 (Fig. 3-2)

Remote-Standalone Configuration:

- Configuration Data Chart 2-4 (Fig. 2-1)
- Defined 1-1
- Problem-Determination Flow Diagram 2-6 (Fig. 2-2)

Request for Test (RFT) 7-1

Requesting Online Tests:

- From Local Display Station 7-3
- From Remote Display Station 7-2

Selection Address Conversion Tables 7-8 (Fig. 7-3)

Supervisor 1-2

Test Patterns:

All H:

- 3284 Model 1 and 3286 Model 1 6-3 (Fig. 6-1)
- 3284 Model 2 and 3286 Model 2 6-3 (Fig. 6-2)
- 3284 Model 3 2-11 (Fig. 2-3)

Alphanumeric:

- 3284 Model 1 and 3286 Model 1 6-4 (Fig. 6-3)
- 3284 Model 2 and 3286 Model 2 6-4 (Fig. 6-4)
- 3284 Model 3 2-11 (Fig. 2-4)

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Basic EBCDIC 7-1, 7-4 (Fig. 7-1)

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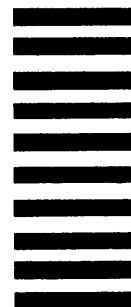
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