

3725
Communication Controller

Stand-Alone Link Tests

System/370, 30xx, and
4300 Processors

IBM

3725
Communication Controller

Stand-Alone Link Tests

System/370, 30xx, and
4300 Processors

Publication Number
GA33-0028-0

File Number
S/370/30xx/4300-09

First Edition (January 1984)

References in this publication to IBM products, programs, or services does not imply that IBM intends to make these available in all countries in which IBM operates. Any reference to an IBM program product in this publication is not intended to state or imply that only IBM's program product may be used. Any functionally equivalent program may be used instead.

The information contained in this manual is subject to change from time to time. Any such changes will be reported in subsequent revisions or Technical Newsletters.

Publications are not stocked at the addresses given below. Requests for IBM publications should be made to your IBM representative or to the IBM branch office serving your locality.

A form for readers' comments is provided at the back of this publication. If the form has been removed, comments may be addressed to either of the following:

- International Business Machines Corporation, Department 812LG,
1133 Westchester Avenue, White Plains, New York 10604, USA
- IBM France, Centre d'Etudes et Recherches, Department 0798,
06610 La Gaude, France

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Preface

This manual is for users of the 3725 Communication Controller and describes the 3725 Stand-Alone Link Test Programs. It is divided into three chapters.

- Chapter 1. Introduction
Gives an overview of the 3725 Stand-Alone Link Test Program capabilities.
- Chapter 2. Link Test Function Procedure
Describes how to perform the 3725 stand-alone link test function.
- Chapter 3. Link Test Messages
Describes each stand-alone link test message and gives appropriate action.

Related Publications:

- *3725 Communication Controller Operating Guide, GA33-0014*, which describes:
 - 3727 operator console keyboard and layout.
 - 3725 control panel.
 - How to select and perform 3725 functions.
 - How to perform the 3725 problem determination.
- *3725 Operator Console Reference and Problem Analysis Guide, GA33-0015*, which describes completely the 3727 Operator Console.

Contents

Chapter 1. Introduction	1-1
Definitions	1-1
Program Environment	1-2
SDLC 'Test' Frame	1-3
Chapter 2. Link Test Function Procedure	2-1
Before Starting	2-1
Requester	2-2
Loading the Stand-Alone Link Test Program	2-2
Initialization Screen	2-4
Options Screen	2-5
Investigation Mode Screen	2-7
Requester Error Screen Example	2-8
Statistical Counters Screen	2-9
Personal Pattern Screen	2-10
Responder	2-11
Loading the Stand-Alone Link Test Program	2-11
Initialization Screen	2-13
Statistical Counters Screen	2-14
Responder Error Screen Example	2-15
Chapter 3. Link Test Messages	3-1
CCU Stopped by Output X'70' - Function Canceled	3-1
Command Reject Received Due to Buffer Overrun	3-1
Command Reject Received Due to Invalid Command	3-1
Enable Command Failed - Link Test Function Canceled	3-2
Hardware Error on Receive	3-2
Hardware Error on Transmit	3-3
Invalid Address Field Received	3-3
Invalid Control Field Received	3-3
Invalid Data Received	3-4
Invalid Data Received - Too Much Data Received	3-5
Invalid Input	3-5
Link Disabled - Link Test Function Canceled	3-6
Link not Defined in IPL Port Table	3-6
Link Test Program not Loaded - Function Canceled	3-6
More Than 128 Bytes Received	3-6
No Answer from Link Test Program - Function Canceled	3-7
Scanner Error on Receive	3-7
Scanner Error on Transmit	3-8
Scanner not Operational - Link Test Function Canceled	3-8
Set Mode Command Failed - Link Test Function Canceled	3-9
Timeout on Receive	3-9
Timeout on Transmit	3-9
Too Much Data Received	3-10
Transmission Error on Receive	3-10
Transmission Error on Transmit	3-11
Undefined PF Key	3-11
Index	X-1



Chapter 1. Introduction

Definitions

In the text that follows, these definitions apply:

Channel-Attached Controller: A controller directly attached to a host via a channel.

Link-Attached Controller: A controller attached to a host via a communication link.

Note: A controller may be channel-attached for a Host 'A', and link-attached for a Host 'B'.

Requesting Controller, or Requester: The controller that is selected by the operator as the controller that initiates the link test operations. It sends the data over the link, and expects to receive responses from the responding controller.

Responding Controller, or Responder: The controller that is selected by the operator as the responder. It receives the test frames from the requesting controller and reflects them back.

Note: The definitions of requester and responder are completely independent of whether the controllers are channel- or link-attached.

Program Environment

The Stand-Alone Link Test (called simply "link test" in the rest of this manual) tests an Intermediate Network Node (INN) link between two IBM Communication Controllers. The INN link is an SDLC leased or manually switched line. In addition, the link to be tested must be defined as an IPL port in the IPL Port table of the requester (and also in the responding controller, if the Link Test program is to be used as the responder).

The Link Test consists of two programs:

- Requester Link Test program, for use in the requester.
- Responder Link Test program, for use in the responder.

The programs are resident in the MOSS, and can be run even when the control program cannot be loaded. This is particularly useful for link-connected controllers in cases where the control program cannot be loaded over the normal IPL link(s).

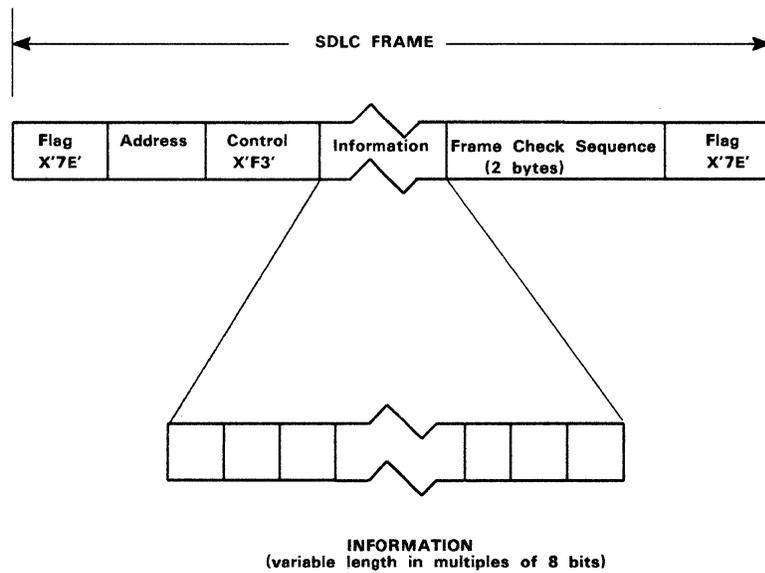
It is not essential for the Link Test program to be running in the responder, as the responding station can be any product capable of replying correctly to the SDLC 'Test' frame. This is the case with the IBM Communication Controllers when running the IBM-supplied Network Control Program (NCP).

Notes:

1. If the Link Test program is running in both controllers, an operator must be present at both locations; if only the requester is running the link test, the operation of the responder may be unattended.
2. The Link Test program should preferably be run in the link-attached controller only, as this mode causes the least disturbance to the network. However, using the Link Test Responder program as the responder may be necessary if it is required to collect statistics at the responder.

SDLC 'Test' Frame

The format of the SDLC 'Test' frame is shown below. Refer to *IBM Synchronous Data Link Control, General Information* manual, GA27-3093 for further information on SDLC.



Notes:

1. The address field contains the address of the responder to which the test frame is sent.
2. The information field can be either of the default patterns, or the personal pattern. The personal pattern may be null.
3. The frame reflected back by the responder should be identical to the frame sent by the responder.



Chapter 2. Link Test Function Procedure

Before Starting

To perform a link test, load the Link Test program (requester) into the requester. In addition, load the responding station with the Link Test Responder program if you want to use it as the responder.

Note: For error messages, refer to Chapter 3.

WARNING

The link to be tested must be defined as an IPL Port in the IPL Port table of the requester. It must also be defined as an IPL port in the responder, if the Link Test program is to be used as the responder. When the requester is a link-attached 3725, as is usually the case, the link will probably already be defined as an IPL port.

The IPL Port table(s) must be updated before loading takes place (refer to the *IBM 3725 Communication Controller Operating Guide*, GA33-0014). If you change the IPL Port table(s), you must reload the corresponding link test(s). Do not forget to restore the original contents of the IPL Port table(s) when you have finished using the Link Tests.

Notes:

When defining the IPL ports, pay particular attention to the following points:

- Verify the parameters of the link (full- or half-duplex, switched or non-switched, and direct attachment/external clock). If the link test is to be used in the wrap mode at the modem (local or remote) level, the IPL port **must** be defined as full-duplex.
- If the responder is the Link Test program, verify that the IPL ports are defined identically at both ends of the link.

Requester

WARNING

Loading the Link Test program destroys the control program.

Loading the Stand-Alone Link Test Program

1. Disable all channel ports and power up the 3725 if not already done.
2. Perform a MOSS IML from the control panel. When MOSS IML is complete, the primary menu is displayed (refer to Chapter 4 of the *Operating Guide*).
3. Define the intermediate network node (INN) link as an IPL Port in the IPL Port table.
4. Enter 'T' followed by SEND to select IPL CCU/TSS. The following screen is displayed:

Machine Status Area

I: IPL CCU/TSS	G: GCF/IPL PORTS	SP: CCU STOP	Q: DATE/TIME
L: LINE FNCTN	C: CNTRL PGM PROC	ST: CCU START	T: TERMINATE
E: ERROR LOG	M: MAINTENANCE	RS: CCU RESET	

. 1 ONE SCANNER IML	
. 2 3725 IPL	
. 3 LINK TEST REQ	
. 4 LINK TEST RESP	

====>

5. Select function 3 (for requester) in the IPL CCU/TSS menu. The screen displays:

```

Machine Status Area

I: IPL CCU/TSS   G: GCF/IPL PORTS           SP: CCU STOP   Q: DATE/TIME
L: LINE FNCTN   C: CNTRL PGM PROC         ST: CCU START  T: TERMINATE
E: ERROR LOG    M: MAINTENANCE            RS: CCU RESET

. 1 WRAP TEST
. 2 LINE INTF DPLY
. 3 LINK TEST

STAND-ALONE LINK TEST PROGRAM IPL

LOADING IN PROGRESS AT REQUESTER

AFTER 'LINK TEST PROGRAMS LOADED' MSG, ENTER T IN THE
SELN AREA, THEN SELECT LINE FNCTN 3 TO START THE TEST

#END>_

```

The machine status area shows successively (as loading progresses):

```

IPL PHASE 1
IPL PHASE 1 PHASE 2
IPL PHASE 1 PHASE 2 PHASE 3
IPL PHASE 1 PHASE 2 PHASE 3 LINK TEST PROGRAM LOADED.

```

6. Enter 'T' in the selection area to terminate IPL.
7. Enter 'L' to select the line functions.
8. Enter '3' to select the Link Test program for the requester.
9. The initialization menu is displayed.

Initialization Screen

Machine Status Area

I: IPL CCU/TSS	G: GCF/IPL PORTS	SP: CCU STOP	Q: DATE/TIME
L: LINE FNCTN	C: CNTRL PGM PROC	ST: CCU START	T: TERMINATE
E: ERROR LOG	M: MAINTENANCE	RS: CCU RESET	

. 1 WRAP TEST	REQUESTER	INITIALIZATION	
. 2 LINE INTF DPLY			
. 3 LINK TEST			

	: LINK ADDRESS (0 TO 255)	==>	A
	: RESPONDER ADDRESS (00 TO FE)	==>	B

==>_

1. Enter the link address **A** (the screen shows 0-23 for the Model 2). The link address is the address of the 3725 port to which the link cable is connected.
2. Enter the responder address **B**. The responder address is the address that is placed by the requester in the SDLC test frame. This address does not change when the responder reflects the test frame to the requester.
3. Press SEND. When the initialization is successful, the options screen replaces the initialization screen.

Options Screen

Machine Status Area

I: IPL CCU/TSS	G: GCF/IPL PORTS	SP: CCU STOP	Q: DATE/TIME
L: LINE FNCTN	C: CNTRL PGM PROC	ST: CCU START	T: TERMINATE
E: ERROR LOG	M: MAINTENANCE	RS: CCU RESET	

. 1 WRAP TEST	REQUESTER	TEST OPTIONS	
. 2 LINE INTF DPLY			
. 3 LINK TEST			

· ENTER PATTERN OPTION (0,1,2)	==>	A
0 = CREATE PERSONAL PATTERN		
1 = USE DEFAULT PATTERN NUMBER 1		
2 = USE DEFAULT PATTERN NUMBER 2		
· ENTER COUNT OF TEST (1 TO 99) OR P	==>	B
P = PERMANENT		
· SELECT TEST MODE (I OR S)	==>	C
I = INVESTIGATION MODE (STOP ON ERROR)		
S = STATISTICAL MODE		

===>

1. Select the pattern option **A**. You have three possibilities:
 - Enter '0' to create your own pattern (see 'personal pattern' screen).
 - Enter '1' to select the 128 bytes from X'00' through X'7F'.
 - Enter '2' to select the 128 bytes from X'80' through X'FF'.

The IBM NCP and the Link Test Responder programs can both buffer a full 128 bytes. Other responders may be limited to less than 128 bytes; for example, the Controller Load/Dump Program (CLDP) is limited to 32 bytes. In this case, there will be an INVALID DATA RECEIVED message if the test message sent by the requester was longer than the limit.

2. Select the count option **B**. You have two possibilities:
 - Enter a count from 1 to 99 as requested by the prompt message. Counting takes place from 1 to the count that you have entered.
 - Enter 'P' to select the permanent count. Counting takes place from 1 to 65535, and then wraps back to 0.
3. Select the mode option **C**. You have two possibilities:
 - Enter 'I' to select the investigation mode. The test stops on the first error detected, and information relative to the error is displayed. The test can be restarted, and will then stop on the next error, if any.
 - Enter 'S' to select the statistical counters mode. Error counts are kept in statistical counters; an error does not stop the test (unless the error disables the line).

4. Press **SEND** to validate the selection. One of the following screens will be displayed, depending on the options that you entered:

- Investigation mode screen.
- Statistical mode screen.
- Personal pattern screen.

Note: Whatever the mode you selected, the test stops when the specified count of tests (if any) is exhausted; the link test function is terminated. You can also stop the test at any time by pressing the **ATTN** key. You may then decide to continue the test or to terminate the link test function by entering 'T' in the **SELN** area.

Investigation Mode Screen

This screen is displayed when you selected the investigation mode from the options screen. The test stops on the first error detected, and the error data is displayed (see Requester Error Screen Example below).

Machine Status Area

I: IPL CCU/TSS	G: GCF/IPL PORTS	SP: CCU STOP	Q: DATE/TIME
L: LINE FNCTN	C: CNTRL PGM PROC	ST: CCU START	T: TERMINATE
E: ERROR LOG	M: MAINTENANCE	RS: CCU RESET	

. 1 WRAP TEST . 2 LINE INTF DPLY . 3 LINK TEST	REQUESTER INVESTIGATION MODE PERMANENT TEST CURRENT COUNT: PRESS ATTN TO STOP THE TEST
--	--

===>_

The screen above shows the 'permanent test' option selected in the first line. If you selected the count option, the first line appears as follows:

REQUESTER INVESTIGATION MODE TEST COUNT = xx

The link test function terminates when the specified count (if any) is reached. The message 'COUNT OF TESTS EXHAUSTED - LINK TEST FUNCTION COMPLETED' is then displayed in the message area.

The CURRENT COUNT is incremented from 1 to the user-specified count or, for a permanent test, from 1 to 65535, wrapping back to 0.

1. Press ATTN to stop the test.
2. Press PF1 to continue the test, or end the link test function by entering 'T' in the SELN AREA.

Requester Error Screen Example

Machine Status Area

I: IPL	CCU/TSS	G: GCF/IPL	PORTS	SP: CCU STOP	Q: DATE/TIME
L: LINE	FUNCTN	C: CNTRL	PGM PROC	ST: CCU START	T: TERMINATE
E: ERROR LOG	M: MAINTENANCE			RS: CCU RESET	

. 1 WRAP TEST	REQUESTER	INVESTIGATION MODE	PERMANENT TEST
. 2 LINE INTF DPLY	CURRENT COUNT:		
. 3 LINK TEST			

HARDWARE ERROR ON TRANSMIT

SCF: LCS: SES:

PF1: CONTINUE

====>

Press PF1 to continue the test, or end the link test function by entering 'T' in the SELN AREA.

Statistical Counters Screen

The counters are refreshed twice per second. When the value of a counter changes, this count is highlighted for two seconds. The screen has the following format:

```

                                     Machine Status Area

I:IPL CCU/TSS   G:GCF/IPL PORTS           SP:CCU STOP   Q:DATE/TIME
L:LINE FNCTN   C:CNTRL PGM PROC          ST:CCU START  T:TERMINATE
E:ERROR LOG    M:MAINTENANCE             RS:CCU RESET

. 1 WRAP TEST'   REQUESTER      STATISTICAL COUNTERS'   TEST COUNT = NN'
. 2 LINE INTF DPLY'
. 3 LINK TEST'

TEST FRAMES SENTO OK'           00
TEST FRAMES RECEIVED OK'       00
INVALID ADDRESS FIELD RECEIVED' 00
INVALID CONTROL FIELD RECEIVED' 00
INVALID/TOO MICH DATA RECEIVED' 00
COMMAND REJECT RECEIVED'       00

HARDWARE ERROR'   ON TRANSMIT'   ON RECEIVE'
SCANNER ERROR'   ON TRANSMIT'   ON RECEIVE'
TRANSMISSION ERROR' ON TRANSMIT' ON RECEIVE'
TIMEOUT'         ON TRANSMIT'   ON RECEIVE'

PRESS ATTN TO STOP THE TEST'

===>_

```

For the permanent test, the counters can count up to 65355, wrapping back to 0.

1. Press ATTN to stop the test.
2. Press PF1 to continue the test, or end the link test function by entering 'T' in the SELN AREA.

Personal Pattern Screen

This screen allows you to create a personal pattern of up to 128 bytes.

```

                                     Machine Status Area

I:IPL CCU/TSS      G:GCF/IPL PORTS      SP:CCU STOP      Q:DATE/TIME
L:LINE FNCTN      C:CNTRL PGM PROC      ST:CCU START     T:TERMINATE
E:ERROR LOG       M:MAINTENANCE         RS:CCU RESET

.1 WRAP TEST'
.2 LINE INTF DPLY'
.3 LINK TEST'

                                     PERSONAL PATTERN
- ENTER PAIRS OF HEX CHARACTERS SEPARATED BY ONE BLANK'
==> 00 01 02 04 08 10 20 40 80 A8 AC AE CC CF DD EE <==
==> EF FF 24 48 88 BF                                     <==
==>                                                         <==
==>                                                         <==
==>                                                         <==
==>                                                         <==
==>                                                         <==
==>                                                         <==

- ENTER C WHEN PATTERN IS COMPLETE ==>
PF3:QUIT

====>_

```

1. Enter the pattern as pairs of hexadecimal characters separated by a single blank as shown on the screen above.
It is possible to send an empty (null) data pattern; to do this, simply enter 'C', then press SEND. This may be useful if you wish to send an empty message consisting only of a header and a trailer.
2. Enter 'C' followed by SEND to check the data for valid hexadecimal characters.
3. The investigation mode screen or the statistical counters screen is displayed, depending on the option specified in the OPTIONS screen.

Notes:

1. You can return to the OPTIONS screen at any time by pressing PF3.
2. The IBM NCP and the Link Test Responder programs can both buffer a full 128 bytes. Other responders may be limited to less than 128 bytes; for example, the Controller Load/Dump Program (CLDP) is limited to 32 bytes. In this case, there will be an INVALID DATA RECEIVED message if the test message sent by the requester was longer than the limit.

Responder

WARNING

Loading the Link Test program destroys the control program.

Loading the Stand-Alone Link Test Program

1. Disable all channel ports and power up the 3725 if not already done.
2. Perform a MOSS IML from the control panel. When MOSS IML is complete, the primary menu is displayed (refer to Chapter 4 of the *Operating Guide*).
3. Define the intermediate network node (INN) link as an IPL Port in the IPL Port table.
4. Enter 'I' followed by SEND to select IPL CCU/TSS. The following screen is displayed:

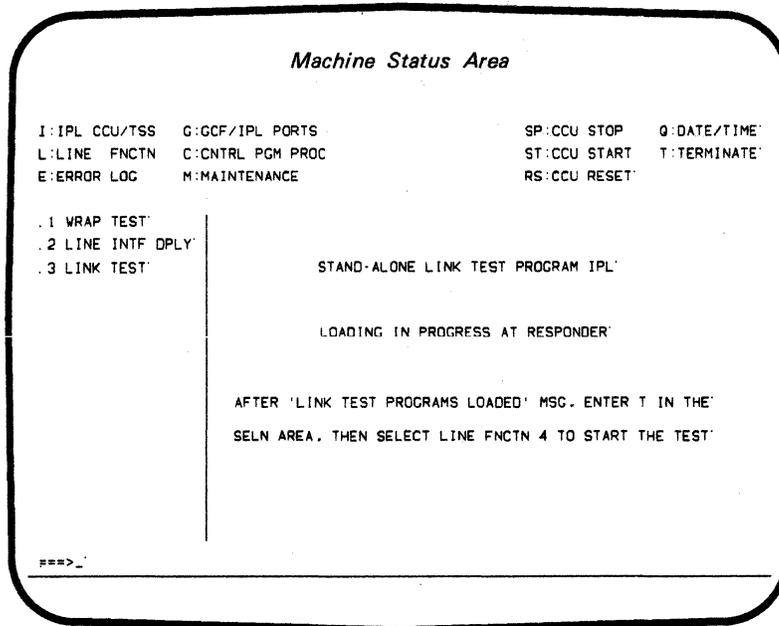
Machine Status Area

I: IPL CCU/TSS	G: GCF/IPL PORTS	SP: CCU STOP	Q: DATE/TIME
L: LINE FNCTN	C: CNTRL PGM PROC	ST: CCU START	T: TERMINATE
E: ERROR LOG	M: MAINTENANCE	RS: CCU RESET	

. 1 ONE SCANNER IML
. 2 3725 IPL
. 3 LINK TEST REQ
. 4 LINK TEST RESP

====>

5. Select function 4 (for responder) in the IPL CCU/TSS menu. The screen displays:



The machine status area shows successively (as loading progresses):

IPL PHASE 1
IPL PHASE 1 PHASE 2
IPL PHASE 1 PHASE 2 PHASE 3
IPL PHASE 1 PHASE 2 PHASE 3 LINK TEST PROGRAM
LOADED.

6. Enter 'T' in the selection area to terminate IPL.
7. Enter 'L' to select the line functions.
8. Enter '4' to select the Link Test program for the responder.
9. The initialization menu is displayed.

Initialization Screen

Machine Status Area

I: IPL CCU/TSS	G: GCF/IPL PORTS	SP: CCU STOP	Q: DATE/TIME
L: LINE FNCTN	C: CNTRL PGM PROC	ST: CCU START	T: TERMINATE
E: ERROR LOG	M: MAINTENANCE	RS: CCU RESET	

. 1 WRAP TEST	RESPONDER	INITIALIZATION
. 2 LINE INTF DPLY		
. 3 LINK TEST		

- LINK ADDRESS (0 TO 255) ==> **A**

====>_

1. Enter the link address **A** (the screen shows 0-23 for the Model 2). The link address is the address of the 3725 port to which the link cable is connected.
2. Press SEND. When the initialization is successful, the initialization screen changes to:

Machine Status Area

I: IPL CCU/TSS	G: GCF/IPL PORTS	SP: CCU STOP	Q: DATE/TIME
L: LINE FNCTN	C: CNTRL PGM PROC	ST: CCU START	T: TERMINATE
E: ERROR LOG	M: MAINTENANCE	RS: CCU RESET	

. 1 WRAP TEST	RESPONDER	INITIALIZATION
. 2 LINE INTF DPLY		
. 3 LINK TEST		

- LINK ADDRESS (0 TO 255) ==>

INITIALIZATION COMPLETED

- PRESS SEND TO START THE TEST

====>_

3. Press SEND.
4. The initialization screen is replaced by the statistical counters screen.

Statistical Counters Screen

The counters are refreshed twice per second. When the value of a counter changes, this count is highlighted for two seconds. The screen has the following format:

```

                                     Machine Status Area

I:IPL CCU/TSS      O:GCF/IPL PORTS      SP:CCU STOP      Q:DATE/TIME
L:LINE FNCTN      C:CNTRL PGM PROC      ST:CCU START     T:TERMINATE
E:ERROR LOG       M:MAINTENANCE         RS:CCU RESET

.1 WRAP TEST      RESPONDER:      STATISTICAL COUNTERS
.2 LINE INTF DPLY
.3 LINK TEST

TEST FRAMES RECEIVED OK
TEST FRAMES SENT OK
INVALID ADDRESS FIELD RECEIVED
INVALID CONTROL FIELD RECEIVED
MORE THAN 128 BYTES RECEIVED

HARDWARE ERROR   ON TRANSMIT:   ON RECEIVE:
SCANNER ERROR    ON TRANSMIT:   ON RECEIVE:
TRANSMISSION ERROR ON TRANSMIT:   ON RECEIVE:
TIMEOUT          ON TRANSMIT:

PRESS ATTN TO STOP COUNTER REFRESH

====>
```

When you press ATTN, the screen is frozen, but the test (and counter incrementation) continues.

1. If no error was detected:

PF1: CONTINUE

Press PF1 to restart counter refreshing.

2. If at least one error was detected:

PF1: CONTINUE PF2: DISPLAY LAST ERROR

Press PF1 to restart counter refreshing, or press PF2 to display the last error that was detected (see following under the heading "Responder Error Screen Example").

Responder Error Screen Example

Machine Status Area

I: IPL CCU/TSS	G: GCF/IPL PORTS	SP: CCU STOP	Q: DATE/TIME
L: LINE FNCTN	C: CNTRL PGM PROC	ST: CCU START	T: TERMINATE
E: ERROR LOG	M: MAINTENANCE	RS: CCU RESET	

. 1 WRAP TEST	RESPONDER	LAST DETECTED ERROR
. 2 LINE INTF DPLY		
. 3 LINK TEST		

HARDWARE ERROR ON TRANSMIT

SCF: LCS: SES:

PF1: CONTINUE

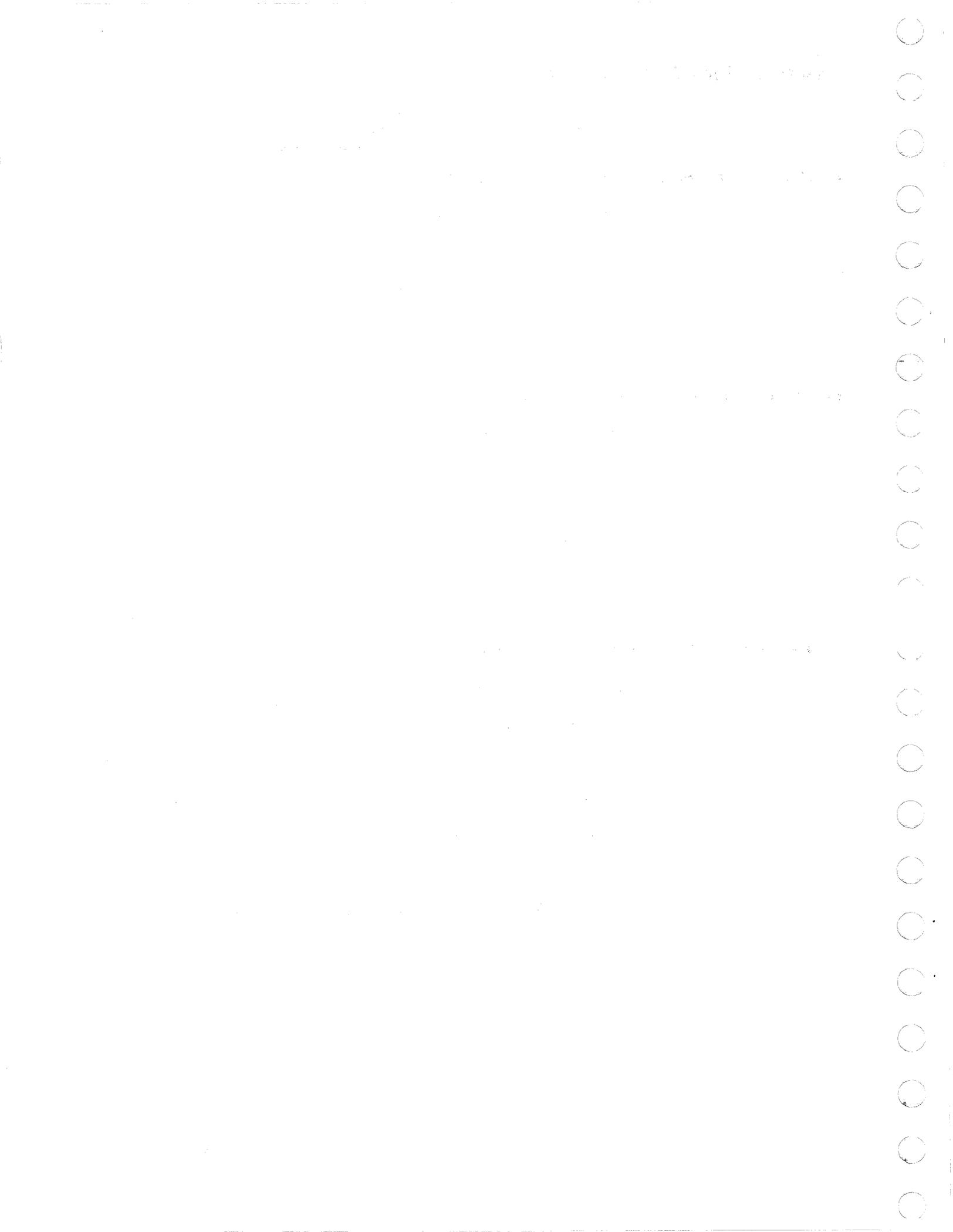
====>_

Press PF1 to redisplay the statistical counters screen, and to restart counter refreshing.

Note: If an error disables the line, the function is terminated and the message area displays:

LINK DISABLED - LINK TEST FUNCTION CANCELED

You must now select option 4 of the line function menu to restart the test (reloading of the Link Test program is not necessary).



Chapter 3. Link Test Messages

Messages not in the following list may be looked up in the *3725 Operating Guide*. Except where stated, messages apply to both requester and responder.

CCU Stopped by Output X'70' - Function Canceled

Cause: An error occurred that prevents the CCU from functioning correctly.

Action:

1. Re-IPL the Link Test program.
2. Restart the test.
3. If the error persists, contact the service representative.

Command Reject Received Due to Buffer Overrun

This message only applies to the requester.

Cause: An overrun condition occurred at the responder.

Action:

1. Re-IPL the Link Test program.
2. Restart the test.
3. If the error persists, contact the service representative.

Command Reject Received Due to Invalid Command

This message only applies to the requester. This message is followed by two hexadecimal digits representing the invalid command code that was received by the responder and returned to the requester.

Cause: An invalid command (not X'F3' = TEST) was received by the responder.

Action:

1. Re-IPL the Link Test program.
2. Restart the test.
3. If the error persists, contact the service representative.

Enable Command Failed - Link Test Function Canceled

Cause: The line cannot be enabled.

Action:

- Check that the IPL Port table has been correctly defined.
- Check that the modem cable is correctly connected.
- Check that the modem is powered up and operational.
- If the link is a Direct Attachment, check that the responder is powered on and initialized.
- If the error persists after the above operations, contact the service representative.

Note: The SCF, LCS, and SES are also displayed for this type of error.

Hardware Error on Receive

Cause: A cable or modem error occurred on receive.

Action:

1. Verify the modem and modem cable.
2. Restart the test.
3. If the error persists, contact the service representative.

Notes:

1. The SCF, LCS, and SES are also displayed for this type of error.
2. Some errors of this type may disable the link. In this case, the PF1 key is not made available and the following message is displayed in the message area:

LINK DISABLED - LINK TEST FUNCTION CANCELED.

Hardware Error on Transmit

Cause: A cable or modem error occurred on transmit.

Action:

1. Verify the modem and modem cable.
2. Restart the test.
3. If the error persists, contact the service representative.

Notes:

1. The SCF, LCS, and SES are also displayed for this type of error.
2. Some errors of this type may disable the link. In this case, the PF1 key is not made available and the following message is displayed in the message area:

LINK DISABLED - LINK TEST FUNCTION CANCELED.

Invalid Address Field Received

This message is followed by two hexadecimal digits representing the address field that was received.

Cause: An invalid address field was received in the test frame.

Action:

1. Check that the responder address specified when you initialized the requester is correct.
2. Restart the test.
3. If the error persists, contact the service representative.

Invalid Control Field Received

This message is followed by two hexadecimal digits representing the control field that was received.

Cause: An invalid control field was received in the test frame.

Action:

1. Re-IPL the Link Test Program.
2. Restart the test.
3. If the error persists, contact the service representative.

Invalid Data Received

This message only applies to the requester.

Cause: The received data does not match the transmitted data, which is therefore displayed on a separate screen as follows:

```

                                     Machine Status Area

I:IPL CCU/TSS      G:GCF/IPL PORTS      SP:CCU STOP      Q:DATE/TIME
L:LINE FNCTN      C:CNTRL PGM PROC      ST:CCU START     T:TERMINATE
E:ERROR LOG       M:MAINTENANCE         RS:CCU RESET

.1 WRAP TEST      INVALID DATA RECEIVED
.2 LINE INTF DPLY SENT      : 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
.3 LINK TEST      RECEIVED : 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F

SENT      : 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F
RECEIVED : 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F

SENT      : 20 21 22 23 24 25 26 27 28 29 2A 2B 2C 2D 2E 2F
RECEIVED : 20 21 22 23 24 25 26 2F 28 29 2A 2B 2C 2D 2E 2F

SENT      : 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F
RECEIVED : 30 31 32 33 34 35 36 37 38 39 3A 3B 3C 3D 3E 3F

PF1:CONTINUE      PF5:FORWARD

====_
```

Action:

1. Examine the data to determine the character(s) in error. The cursor is positioned in front of the first character that does not match.

Note: Up to 64 bytes can be shown on a screen, so two screens may be needed to display all the data. In this case, you can see which screen is displayed by looking at the bottom right hand corner of the screen:

- If "PF5:FORWARD" is displayed, you are looking at the first screen (first 64 bytes).
 - If "PF4:BACKWARD" is displayed, you are looking at the second screen (second 64 bytes).
2. Use PF5 or PF4 to switch between screens as required.
 3. Press PF1 to continue the test.

Notes:

1. If, in addition, too many bytes have been received, the error message is:

INVALID DATA RECEIVED - TOO MUCH DATA RECEIVED.

2. The IBM NCP and the Link Test Responder programs can both buffer a full 128 bytes. Other responders may be limited to less than 128 bytes; for example, the Controller Load/Dump Program (CLDP) is limited to 32 bytes. In this case, there will be an INVALID DATA RECEIVED message if the test message sent by the requester was longer than the limit.

Invalid Data Received - Too Much Data Received

See "Invalid Data Received", Notes 1 and 2 above.

Invalid Input

Cause: You did one of the following:

- You pressed SEND before entering the requested input.
- You entered one or more invalid characters.
- You entered an invalid value, for example, a link address outside the specified range.
- You made a formatting error.

Action:

- Correct the erroneous input.
- or
- Press one of the function keys indicated on the screen, if any.

Link Disabled - Link Test Function Canceled

Cause: An error occurred that disabled the link.

Action:

1. Determine the error condition from the display.
2. Restart the test in investigation mode and check the other error message.

Link not Defined in IPL Port Table

Cause: The link being tested is not defined in the IPL Port table.

Action:

1. Define the link as an IPL port (see the *3725 Operating Guide*).
2. Re-IPL the Link Test program.
3. Restart the test.

Link Test Program not Loaded - Function Canceled

Cause: You tried to select option 3 in the LINE FNCTN menu when the Link Test program was not loaded.

Action: Go to the IPL CCU/TSS menu and select option 3 or 4 to load the Link Test program (refer to "Loading the Link Test Program" in this manual).

More Than 128 Bytes Received

This message only applies to the responder.

Cause: The Link Test responder expects to receive up to 128 bytes of data, but more than 128 bytes were received. The extra data is ignored.

Action:

1. Press PF1 to return to the responder statistical counters screen.
2. If the error persists, contact the service representative.

No Answer from Link Test Program - Function Canceled

Cause: The Link Test program did not reply within 2 minutes.

Action:

1. Press Power ON to reset the 3725.
2. Re-IPL the Link Test program.
3. Restart the test.

If the error persists, contact the service representative.

Scanner Error on Receive

Cause: A scanner error occurred.

Action:

1. Press Power ON to reset the 3725.
2. Re-IPL the Link Test program.
3. Restart the test.

If the error persists, contact the service representative.

Notes:

1. The SCF, LCS, and SES are also displayed for this type of error.
2. Some errors of this type may disable the link. In this case, the PF1 key is not made available and the following message is displayed in the message area:

LINK DISABLED - LINK TEST FUNCTION CANCELED.

Scanner Error on Transmit

Cause: A scanner error occurred.

Action:

1. Press Power ON to reset the 3725.
2. Re-IPL the Link Test program.
3. Restart the test.

If the error persists, contact the service representative.

Notes:

1. The SCF, LCS, and SES are also displayed for this type of error.
2. Some errors of this type may disable the link. In this case, the PF1 key is not made available and the following message is displayed in the message area:

LINK DISABLED - LINK TEST FUNCTION CANCELED.

Scanner not Operational - Link Test Function Canceled

Cause: The scanner supporting the link to be tested is not operational.

Action:

1. IML the scanner (see the *Operating Guide*).
2. Restart the test.
3. If the error persists, contact the service representative.

Set Mode Command Failed - Link Test Function Canceled

Cause: The scanner did not respond to a Set Mode command.

Action:

1. Press Power ON to reset the 3725.
2. Re-IPL the Link Test program.
3. Restart the test.

If the error persists, contact the service representative.

Timeout on Receive

This message only applies to the requester.

Cause: A timeout occurred at the requester because no answer was received from the responder within the timeout period.

Action:

1. Check that the responder is correctly IPLed.
2. Check the modems, cables, and the line.
3. If the error persists, contact the service representative.

Timeout on Transmit

Cause: The scanner did not reply to a command sent from the Link Test program within the timeout period.

Action:

1. Re-IPL the Link Test program.
2. Restart the test.
3. If the error persists, contact the service representative.

Too Much Data Received

This message only applies to the requester.

Cause: More data than expected was received (extra data is ignored). However the received data **does** match the transmitted data.

Action:

- Press PF1 to continue the test.
- If the error persists, contact the service representative.

Transmission Error on Receive

Cause: The scanner indicated a transmission error occurred on receive.

Action:

1. Re-IPL the Link Test program.
2. Restart the test.
3. If the error persists, contact the service representative.

Notes:

1. The SCF, LCS, and SES are also displayed for this type of error.
2. Some errors of this type may disable the link. In this case, the PF1 key is not made available and the following message is displayed in the message area:

LINK DISABLED - LINK TEST FUNCTION CANCELED.

Transmission Error on Transmit

Cause: The scanner indicated a transmission error on transmit.

Action:

1. Re-IPL the Link Test program.
2. Restart the test.
3. If the error persists, contact the service representative.

Notes:

1. The SCF, LCS, and SES are also displayed for this type of error.
2. Some errors of this type may disable the link. In this case, the PF1 key is not made available and the following message is displayed in the message area:

LINK DISABLED - LINK TEST FUNCTION CANCELED.

Undefined PF Key

Cause: You pressed a PF key that was not defined on the screen.

Action: Press a PF key that is listed on the screen.



Index

A

address
 link 2-4
 responder 2-4
address field 1-3
 invalid 3-3

B

buffer overrun 3-1
buffering at the responder 2-10

C

cannot load control program 1-2
CCU stopped by output X'70 3-1
channel-attached controller 1-1
collecting statistics at responder 1-2
command reject
 due to buffer overrun 3-1
 due to invalid command 3-1
control field, invalid 3-3
control program cannot be loaded 1-2
controller
 channel-attached 1-1
 link-attached 1-1
 requesting 1-1
 responding 1-1
count option 2-5
counter refreshing 2-9
creating a personal pattern 2-10

D

data pattern, null 2-10
definitions 1-1
direct attachment 3-2

E

enable command failed 3-2
error messages 3-1
error screen example
 requester 2-8
 responder 2-15
extra data 3-6

H

hardware error
 receive 3-2
 transmit 3-3

I

initialization
 requester 2-4
 responder 2-13
INN 1-2
intermediate network node 1-2
invalid command 3-1
invalid control field 3-3
invalid data 3-4
invalid input 3-5
investigation mode 2-7
IPL port table 2-1

L

limitation, model 2 2-4, 2-13
limitation, responder 2-10
link address 2-4, 2-13
link disabled 3-6
link not defined 3-6
link test program
 requester 1-2
 responder 1-2
link test program does not answer 3-7
link test program loading
 requester 2-2
 responder 2-11
link test program not loaded 3-6
link test, use in wrap mode 2-1
link-attached controller 1-1
loading the requester link test program 2-2
loading the responder link test program 2-11

M

messages 3-1
minimizing network disturbance 1-2
mode option 2-5
model 2 limitation 2-4, 2-13
more than 128 bytes received 3-6

N

network disturbance, minimizing 1-2
no answer from link test program 3-7
null data pattern 2-10

O

options 2-5

P

- pattern
 - null data 2-10
 - personal 2-10
- pattern option 2-5
- personal pattern, creating 2-10

R

- receive timeout 3-9
- requester 1-1
 - error screen example 2-8
 - initialization 2-4
 - loading the link test program 2-2
 - statiscal counters 2-9
- requester link test program 1-2
- requesting controller 1-1
- responder 1-1
 - error screen example 2-15
 - initialization 2-4
 - loading the link test program 2-11
 - statisal counters 2-14
- responder address 2-4
- responder buffering 2-10
- responder limitation 2-10
- responder link test program 1-2
- responding controller 1-1

S

- scanner error
 - receive 3-7
 - transmit 3-8
- scanner not operational 3-8
- SDLC test frame 1-3
- set mode command failed 3-9
- statistical counters
 - requester 2-9
 - responder 2-14

T

- test frame, SDLC 1-3
- timeout
 - receive 3-9
 - transmit 3-9
- too much data received 3-5, 3-10
- transmission error
 - receive 3-10
 - transmit 2-11
- transmit timeout 2-9

U

- undefined PF key 3-11
- using the link test in wrap mode 2-1

This manual is part of a library that serves as a reference source for systems analysts, programmers, and operators of IBM systems. You may use this form to communicate your comments about this publication, its organization, or subject matter, with the understanding that IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you. Your comments will be sent to the author's department for whatever review and action, if any, are deemed appropriate.

Note: *Copies of IBM publications are not stocked at the location to which this form is addressed. Please direct any requests for copies of publications, or for assistance in using your IBM system, to your IBM representative or to the IBM branch office serving your locality.*

Possible topics for comments are:

Clarity Accuracy Completeness Organization Coding Retrieval Legibility

If you wish a reply, give your name, company, mailing address, and date:

.....
.....
.....
.....

Note: Staples can cause problems with automated mail sorting equipment.
Please use pressure sensitive or other gummed tape to seal this form.

What is your occupation?

Number of latest Newsletter associated with this publication:

Thank you for your cooperation. No postage stamp necessary if mailed in the USA. (Elsewhere, an IBM office or representative will be happy to forward your comments or you may mail directly to the address in the Edition Notice on the back of the title page.)

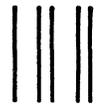
Reader's Comment Form

Cut or Fold Along Line

Fold and tape

Please Do Not Staple

Fold and tape



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 40 ARMONK, N.Y.

POSTAGE WILL BE PAID BY ADDRESSEE:

International Business Machines Corporation
Department 812LG
1133 Westchester Avenue
White Plains, New York 10604

Fold and tape

Please Do Not Staple

Fold and tape

IBM 3725 Communication Controller Stand-Alone Link Tests Printed in USA GA33-0028-0



This manual is part of a library that serves as a reference source for systems analysts, programmers, and operators of IBM systems. You may use this form to communicate your comments about this publication, its organization, or subject matter, with the understanding that IBM may use or distribute whatever information you supply in any way it believes appropriate without incurring any obligation to you. Your comments will be sent to the author's department for whatever review and action, if any, are deemed appropriate.

Note: Copies of IBM publications are not stocked at the location to which this form is addressed. Please direct any requests for copies of publications, or for assistance in using your IBM system, to your IBM representative or to the IBM branch office serving your locality.

Possible topics for comments are:

Clarity Accuracy Completeness Organization Coding Retrieval Legibility

If you wish a reply, give your name, company, mailing address, and date:

.....
.....
.....
.....

Note: Staples can cause problems with automated mail sorting equipment.
Please use pressure sensitive or other gummed tape to seal this form.

What is your occupation?

Number of latest Newsletter associated with this publication:

Thank you for your cooperation. No postage stamp necessary if mailed in the USA. (Elsewhere, an IBM office or representative will be happy to forward your comments or you may mail directly to the address in the Edition Notice on the back of the title page.)

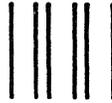
Reader's Comment Form

Cut or Fold Along Line

Fold and tape

Please Do Not Staple

Fold and tape



NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES



BUSINESS REPLY MAIL
FIRST CLASS PERMIT NO. 40 ARMONK, N.Y.

POSTAGE WILL BE PAID BY ADDRESSEE:

International Business Machines Corporation
Department 812LG
1133 Westchester Avenue
White Plains, New York 10604

Fold and tape

Please Do Not Staple

Fold and tape

IBM 3725 Communication Controller Stand-Alone Link Tests Printed in USA GA33-0028-0



Publication Number
GA33-0028-0

File Number
S/370/30xx/4300-09

Printed in
USA

IBM[®]