

5071A-03A

S E R V I C E N O T E

SUPERSEDES: 5071A-03

HP 5071A Primary Frequency Standard

Information on clearing serial port (RS-232C) hangups

Serial Numbers: 0000A00000 / 9999A99999

I. INTRODUCTION

The RS-232C port on the HP 5071A rear panel is very useful for controlling the instrument and gathering data. However, communication via the RS-232C is not always a "connect-and-go" process. Until recently, there were many different vendors producing differing handshaking protocols, data rates, and wiring connections.

Because of the myriad of possible combinations, there are many ways to incorrectly set up and connect the RS-232C and potentially lock-up the system. This condition usually appears as non-sensible characters being received, or no communication at all.

II. MAKING PROPER CONNECTION AND SETTING COMMUNICATION PARAMETERS

This Service Note is intended to give you a summary of how some RS-232C lock-ups occur and how best to clear them.

For a description of how to make a proper connection to the HP 5071A Serial Port, refer to the Operating and Programming Manual, Chapter 4 "Remote Operation and Programming."

Continued

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ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:

INFORMATION ONLY

AUTHOR: DC	ENTITY: 0200	ADDITIONAL INFORMATION: Changes on Page 3, marked with " "
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III. PROBLEM: THE HP 5071A KEYPAD DOES NOT OPERATE.

Description:

The HP 5071a front panel can appear to be "frozen" (no keypresses accepted) if it is communicating with another serial device via the RS-232C and receives a data holdoff from that device. There are two types of holdoffs: One is the XON/XOFF (software) protocol, and the other is the DSR (Data Set Ready) line (hardware). Either of these can be used by printers or terminals. The HP 5071A is capable of understanding both.

XON/XOFF:

When a connected terminal or printer uses the XON/XOFF protocol the HP 5071A will hold off further data transmission when an XOFF (Control-S) is received. This usually happens when a terminal/printer buffer is full Service Note 5071A-003 or if a printer is out of paper. The HP 5071A will then wait until it receives an XON signal (Control-Q) before resuming the transmission. The HP 5071A will wait indefinitely for an XOFF to clear.

Example:

One example of this is when the HP 5071A is printing the Status Log and the connected printer runs out of paper. If the printer uses the XON/XOFF protocol, it will send an XOFF (Control-S) that will stop the flow of data from the HP 5071A. The front panel is now "busy" waiting for an XON (Control-Q) to resume printing.

Solution:

If the front panel is locked in a print operation to the Serial Port, the solution is to correct the cause of the problem (e.g. Add more paper to the printer).

If the printer is no longer connected but a terminal is available, ensure that the terminal's Baud Rate, Parity, Data Bits, and Stop Bits are consistent with the HP 5071A, then send a Control-Q from the terminal keyboard. This should result in the remaining data from the HP 5071A being sent to the terminal and thereby clear the problem.

DSR:

The DSR signal acts exactly like the XON/XOFF protocol, but instead of being implemented in software it is done in hardware. The DSR line (pin 6) is one of the three signals used by the HP 5071A in RS-232C communications (the other lines are Data Transmit and Data Receive). When DSR is false (negative voltage), data transmission from the HP 5071A will stop until the DSR is true again (positive voltage). If this line is not connected to any signal, then DSR is pulled positive inside the HP 5071A.

Symptom:

One example of how DSR can stop front panel operation is if the wrong cable is used, forcing a negative signal on the DSR (pin 6). If under these conditions, an INFO PRINT command is issued from the front panel, the HP 5071A will be "busy" until the DSR returns to a positive voltage.

Solution:

One way to find out if there is a DSR problem is to remove the Serial Port cable. The DSR will be pulled back to a positive voltage and the front panel should re-activate. As long as there are no other reasons for halting the data (e.g. XOFF) the HP 5071A will send data to the RS-232C port even when there is no device attached.

IV. PROBLEM: HP5071A DOES NOT RESPOND WHEN ENTER OR RETURN IS SENT FROM A TERMINAL OR COMPUTER

Another situation occurs when connecting the HP 5071A to a terminal or computer either directly or via modem. There are situations where connecting the HP 5071A to another device at the wrong baud rate can produce framing errors that might prevent further characters from being received. This condition will persist even if the external device is disconnected or reset to another baud rate at a later time.

Note that this problem does not have any effect on the front panel of the HP 5071A; it will still respond to keypresses.

Symptom:

A common scenario occurs when an HP 5071A is attached to a modem and that modem establishes communication at a different baud rate than that of the HP 5071A. Even after the problem is realized and the modem is re-set to the correct baud rate, the HP 5071A may not respond. The terminal or computer receives no "scpi> " or "E-xxx>" prompt when Enter or Return is pressed.

Solution:

Firmware Revisions W.3219 and above have a special routine built in that will automatically clear framing errors each time the HP 5071A baud rate is changed from the front panel. This was implemented to assist in this problems.

IMPORTANT NOTE

If the HP 5071A is in REMOTE mode (the padlock symbol appears in the upper right corner of the LCD display) the following procedures will not help, as the keyboard is locked. The only solution in this case is to remove all power from the HP 5071A to clear the problem. Once the HP 5071A is again operational, ensure that the correct baud rate is set.

Troubleshooting:

1. Ensure that all cabling is correct. Refer to Chapter 4 "Remote Operation and Programming" in the Hp 5071A Operating and Programming Manual.
2. Ensure that the HP 5071A, modem, and/or terminal are set to the same baud rate, parity, data bits, and stop bits. The factory default for the HP 5071A is 2400 baud, No parity, 8 data bits, 1 Stop Bit.

3. Ensure that your firmware revision is W.3219 or greater by doing the following from the HP 5071A front panel:
 - a. Enter the "UTIL" menu.
 - b. Select "VERS".
 - c. The Firmware Revision should show. If you see "W.3219" or higher, proceed to step 4 below. If it is a revision lower than W.3219, contact your local HP Sales or Service Facility for information on how to obtain a free upgrade kit for the firmware (HP Part Number 05071-67001).
4. If the firmware is W.3219 or higher, do the following to clear the problem:
 - a. On the HP 5071A, select the "CONFIG" menu.
 - b. Select "SERIAL".
 - c. Cursor to the baud rate field and change the baud rate up or down one value, and then back to your correct baud rate. This should clear any remaining framing errors.
 - d. Again attempt to get a prompt by pressing Enter or Return from your terminal or computer.
5. To check the connections, print the Status Log from the HP 5071A front panel by entering the "LOG" menu and selecting "PRINT" (Refer to the HP 5071A Operating and Programming manual for assistance on this. If communication is working properly, you should see information printed to the screen of the terminal or computer. If you cannot get the HP 5071A keyboard to respond, refer to Section III in this Service Note for assistance.
6. If problems still persist, you may need to use a bus analyzer to be sure the wiring is correct and the terminal, computer, and/or modem are functioning.
7. Contact your local HP Sales or Service Facility for further assistance or to make arrangements for repair of your instrument if the problem still persists.