

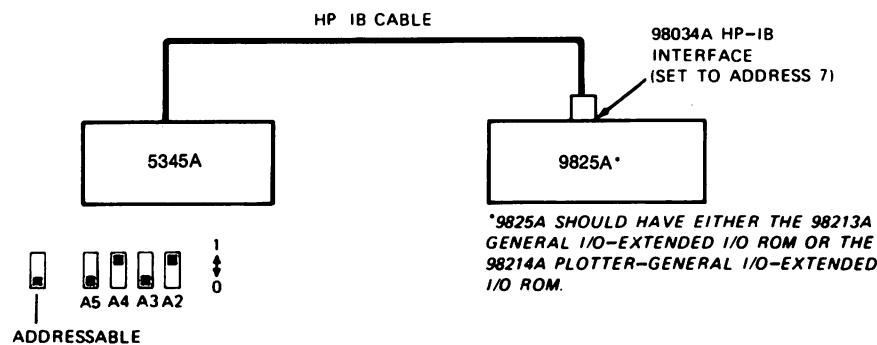
Supersedes:

5345A-9

HP MODEL 5345A ELECTRONIC COUNTER HP-IB VERIFICATION PROGRAM FOR 5345A OPT 011

The 9825A program listed in the table exercises the 5345A through its various operating modes via the HP-IB interface (opt. 011). If the 5345A successfully completes all phases of the verification program, then there is a very high probability that the opt 011 interface is working properly.

To perform the verification, set up the 5345A as shown and set its rear panel address switches to address 10 (if this address cannot be used due to other devices in the system, change the "dev" statement in line 8 of the program to the appropriate address).



The program listed in the table may be keyed into the 9825A or may be loaded from the HP-IB Verification Cassette, HP P/N 59300-10001, Rev. J or later, which also contains the HP-IB Verification programs for many Santa Clara Division instruments. To load the cassette program into the 9825A, insert the cassette into the 9825A and type `ldp0` . Enter "5345" and push when the instrument model number is requested. Enter "11" and push when the option number is requested. The 9825A will then load into memory the 5345A option 011 program. Power must be applied to the 5345A at some time before the last statement is entered.





Once the last entry is made, the counter performs its first set of tests. The program will stop at the conclusion of each test. At this time, the operator verifies that the action programmed by the 9825A has occurred. To advance to the next test, simply press . If it is desired to repeat a test, set the variable L to 1 via the keyboard (type `1→L`). Then enter the number of the test to be repeated by typing `cont "#"` . For example, to repeat test number 5, type `1→L` `cont "5"` . Test 5 will repeat each time is pushed. To advance to the next test (to step 6 in the example), return L to 0 when the program stops (type `0→L` and push .

DD/vi/WN







02/5-80
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Printed in U.S.A.

Step	Test	Description
1	GATE TIME	<p>The first test sets the 5345A to remote (RMT light on) and measures the frequency of the internal 100 MHz check signal. The program varies the gate times from 1 SEC to MIN and checks for a decreasing number of displayed digits. If an incorrect number of digits is displayed and output to the calculator, "ERROR" is printed by the calculator printer. The calculator displays the current gate time as the test progress. The test is finished when "MIN" is displayed in the calculator display. Push  to advance to step 2.</p>
2	FUNCTION SWITCH	<p>The counter is put in check and the function switch is remotely programmed in the following order: PLUG-IN, FREQ A, PERIOD A, RATIO B/A, TIME INT A to B, START, STOP. The operator should visually confirm that the counter's display matches the readout called for on the calculator's display. Push  after each condition.</p>
3	FREQ. MULTIPLIER SUFFIX	<p>This test checks the display multiplier suffix selection for frequency mode. This function, which cannot be selected by the front panel switches, allows the user to force the counter to display in a format (i.e., MHz, kHz, Hz, etc.) selected by the user instead of what the counter would normally display. The test programs the counter to display the 100 MHz check signal in terms of mHz, Hz, kHz, MHz, and GHz. The calculator display shows what the counter should display at each point. This test is completely automatic in that the calculator checks for the appropriate number of digits in the displayed answer. The operator should visually confirm operation of the suffix lights in the counter annunciator display. Push  to advance to test 4.</p>
4	DECIMAL POINT	<p>The display position may be remotely programmed. When operated in the AUTO mode, the display is positioned with the least significant digit in the right most display position. In this test, the .1 GHz check signal is measured and the display position is varied. The program automatically checks for the correct display. Push  to advance to test 5.</p>

Step	Test	Description
5	PERIOD MULTIPLIER	This test checks the display multiplier suffix selection for period/time interval mode. The counter is programmed to display the period of the 100 MHz check signal in terms of Ksec, sec, msec, μ sec, and nsec. The calculator display shows what the counter should display at each point. This test is completely automatic in that the calculator checks for the appropriate number of digits in the displayed answer. The operator should visually confirm operation of the suffix lights in the counter annunciator display. Push <input type="button" value="CONTINUE"/> to advance to test 6.
6	INT/EXT GATE	This checks the operation of internal/external gate selection (a rear panel switch does the selection in the manual mode). For EXT GATE, the counter should display 0000000000 since no external gate signal is present. Push <input type="button" value="CONTINUE"/> for INT GATE; the counter should display the 100.00000 MHz check signal. Push <input type="button" value="CONTINUE"/> to advance to test 7.
7	SAMPLE RATE	This test first programs the counter for a minimum display time and then returns it to the normal sample rate. These functions are not selectable from the panel switches. In MIN. DISPLAY TIME, the counter effectively bypasses the sample rate control portion of the measurement cycle, allowing measurements to be taken every 1 to 5 msec. In this mode the counter display will be blank or consist of 1 digit. The gate light on the counter annunciator display should be on. Push <input type="button" value="CONTINUE"/> to select the normal sample rate mode which returns the counter to making measurements with 50 msec between samples. After verifying proper operation for each condition, push <input type="button" value="CONTINUE"/> to advance to test 8.
8	HOLD	This test checks another aspect of the sample rate control. When the counter is programmed to "HOLD", the counter displays all zeros and all gating is stopped. When the <input type="button" value="CONTINUE"/> key is pressed, the counter is instructed to make one measurement. The "GATE" light on the counter annunciator display should momentarily light, indicating that the gate was opened. Press <input type="button" value="CONTINUE"/> three times to make three measurements. The counter is then taken out of HOLD and the "GATE" light will flicker, indicating continual measurements and updating of the display. The calculator will display "NOT HOLD" for this condition. Push <input type="button" value="CONTINUE"/> to proceed to Test 9.

Step	Test	Description
9.	ACCUMULATE	<p>This test checks the operation of the ACCUMULATE A+B and ACCUMULATE A-B modes of operation (rear panel switch). The counter is placed in START and counts the check signal. Since the counter is in START and CHECK, the 100 MHz check signal is counted by both the event scaler (register) and time scaler (register). The display shows the sum of these two registers A+B.</p> <p>Push  and the counter is placed in STOP and A-B. The counter displays the difference of these two registers (should be 0). Push  after visual verification of proper operation.</p>
10	OUTPUT	<p>This test checks the operation of the output modes "WAIT until addressed" and "ONLY IF addressed". In the "WAIT until addressed" output mode, the counter waits in the output phase of the measurement cycle until a command to output is received. Consequently, the display cycle is not entered and the counter display will be blank. Push  to select the "ONLY IF addressed" mode. In this mode, the output phase of the measurement cycle is bypassed until an output command is received. Hence, the display cycle is entered after each measurement and the counter display continues (START, A+B mode). Pushing  causes the counter to output the current reading to the calculator which displays the reading. The two displays should agree. Push  and the calculator causes the counter to make and output 10 readings, each one momentarily displayed on the calculator. The last reading is held in both displays. Push  and END OF TEST will be displayed.</p>

To repeat the program, push RUN.

SAMPLE 9825A PRINTOUT

P/N 59360-10001
 HP SAOL Division
 HP-IB Test Tape
 Revision F

Contents:

- +593601A
- +593602M
- +593604A
- +593606A
- +593607H
- +593608A
- +593609A
- +593610A
- +593612A
- +593640H
- +593641H
- +593642H
- +593651H Oct 011
- +593652H Oct 012
- +593653H
- +593654H Oct H42
- +593655H Oct 035
- +593659A

5345A HP-IB Test

1-GATE TIME TEST
 Each GATE TIME
 code is
 automatically
 sent to 5345A.
 Check Mode set.
 Output verified.

2-FUNCTION TEST
 Plus-in
 Frequency
 Period
 Ratio
 Time Interval
 Start
 Stop

3-FREQ MULT
 SUFFIX TEST
 Function=Freq.
 Each MULT SUFFIX
 is automatically
 sent to 5345A.
 Check mode set.
 Output verified
 and displayed
 on the 9825A.

4-DECIMAL POINT
 TEST (FREQ MODE)
 Each DISPLAY
 POSITION code
 is automatically
 sent to 5345A.
 Check mode set.
 9825A shows
 position of
 the dec point
 digit 12 on left
 digit 0 on right

5-PERIOD MULT
 SUFFIX TEST
 Function=Period.
 Each MULT SUFFIX
 is automatically
 sent to 5345A.
 Check mode set.
 Output verified
 and displayed
 on the 9825A.

6-INT-EXT GATE
 TEST
 External Gate
 Internal Gate

7-SAMPLE RATE
 TEST
 Sample rate
 control
 bypassed.
 Max Sample Rate

8-HOLD TEST
 HOLD sent to
 5345A. Send
 Sample Trigger
 Command each
 time CONTINUE
 is pressed.
 Sample count is
 delayed on 9525A.

9-ACCUMULATE
 TEST
 A/B code sent
 B/B code sent

10-OUTPUT TEST
 Hold till address
 011: 12 address
 *Takes 1 reading.
 *Stops. When
 *CONTINUE is
 *pressed, takes
 *10 more readings
 *and displays
 *them on 9825A.
 *Stops and
 *displays the
 *11th reading.

END OF TEST

```

0: dsp "5345A Verification Test";prt "5345A HP-IB Test"
1: prt "-----";spc 2
2: "code":ert "select code?";S
3: if S=721;dsp "ERROR";wait 1000
4: if S=721;dsp "calculator address=computer dump";wait 2500;gto "code"
5: if S>730;dsp "out of address range+high";wait 1000;gto "code"
6: if S<700;dsp "out of address range+low";wait 1000;gto "code"
7: if Smod2=1;dsp "odd address+computer dump";wait 2000;gto "code"
8: dim C$(40);dev "ctr";S
9: "1":prt "1-GATE TIME TEST","Each GATE TIME","code is","automatically"
10: prt "sent to 5345A.,""Check Mode set.,""Output verified.";spc 2
11: prt "ctr","I2E8?I1"
12: 9→A;gsb "ECHK"
13: dsp "1 SEC GATE";beep;wait 3000
14: wrt "ctr","G?I1";8→A;gsb "ECHK"
15: dsp "100 MSEC GATE";beep;wait 2000
16: wrt "ctr","G>I1";7→A;gsb "ECHK"
17: dsp "10 MSEC GATE";beep;wait 1000
18: wrt "ctr","G=I1";6→A;gsb "ECHK"
19: dsp "1 MSEC GATE";beep;wait 1000
20: wrt "ctr","G<I1";5→A;gsb "ECHK"
21: dsp "100 USEC GATE";beep;wait 1000
22: wrt "ctr","G;I1";4→A;gsb "ECHK"
23: dsp "10 USEC GATE";beep;wait 1000
24: wrt "ctr","G:I1";3→A;gsb "ECHK"
25: dsp "1 USEC GATE";beep;wait 1000
26: wrt "ctr","G9I1";2→A;gsb "ECHK"
27: dsp "100 NSEC GATE";beep;wait 1000
28: wrt "ctr","G5I1";1→A;gsb "ECHK"
29: dsp "MIN GATE-Press CONTINUE";stp
30: if L=1;gto "1"
31: "2":prt "2-FUNCTION TEST";wrt "ctr","I2E8?G?F2I1"
32: prt "Plug-in"
33: dsp "Verify 5345A dsply: 00000000000";stp
34: wrt "ctr","F0I1";1e8→A;gsb "READ"
35: prt "Frequency"
36: dsp "Verify 5345A: 100.00000 MHz";stp
37: wrt "ctr","F1I1";1e-8→A;gsb "READ"
38: prt "Period"
39: dsp "Verify 5345A: 10.000000 nSEC";stp
40: wrt "ctr","F5I1";1→A;gsb "READ"
41: prt "Ratio"
42: dsp "Verify 5345A: 1.0000000";stp
43: wrt "ctr","F3I1";prt "Time Interval"
44: dsp "Verify 5345A: 10.000000 nSEC";stp
45: wrt "ctr","F4I1";prt "Start"

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46: dsp "Verify 5345A: Accumulating";stp
47: wrt "ctr","F6";prt "Stop";spc 2
48: dsp "Verify 5345A: Stopped acc'ltnng";stp
49: if L=1;gto "2"
50: "3":prt "3-FREQ MULT","SUFFIX TEST","Function=Freq."
51: prt "Each MULT SUFFIX","is automatically","sent to 5345A"
52: prt "Check mode set.,""Output verified","and displayed"
53: prt "on the 9825A.";spc 2
54: wrt "ctr","I2G?D;C3E?E8I1";11→A;gsb "PCHK"
55: dsp "00000000000.MHZ*";beep;wait 3000
56: wrt "ctr","C4I1";9→A;gsb "PCHK"
57: dsp "1000000000.HZ*";beep;wait 3000
58: wrt "ctr","C5";6→A;gsb "PCHK"
59: dsp "100000.KHZ*";beep;wait 3000
60: wrt "ctr","C6";3→A;gsb "PCHK"
61: dsp "100.MHZ";beep;wait 3000
62: wrt "ctr","G580C7";0→A;gsb "PCHK"
63: dsp ".1 GHZ--press CONTINUE";beep;stp
64: if L=1;gto "3"
65: "4":prt "4-DECIMAL POINT","TEST (FREQ MODE)"
66: prt "Each DISPLAY","POSITION code","is automatically"
67: prt "sent to 5345A","Check mode set.,""9825A shows"
68: prt "position of","the dec point","digit 10 on left"
69: prt "digit 0 on right";spc 2
70: wrt "ctr","I2G5E8?C7D1";10→A;fxd 0
71: gsb "ECHK"
72: beep;dsp "5345A digit # ",A;wait 1000
73: wrt "ctr","D2";9→A;gsb "ECHK"
74: beep;dsp "5345A digit # ",A;wait 1000
75: wrt "ctr","D3";8→A;gsb "ECHK"
76: beep;dsp "5345A digit # ",A;wait 1000
77: wrt "ctr","D<";7→A;gsb "ECHK"
78: beep;dsp "5345A digit # ",A;wait 1000
79: wrt "ctr","D=";6→A;gsb "ECHK"
80: beep;dsp "5345A digit # ",A;wait 1000;wrt "ctr","D>";5→A;gsb "ECHK"
81: beep;dsp "5345A digit # ",A;wait 1000;wrt "ctr","D?";4→A;gsb "ECHK"
82: beep;dsp "5345A digit # ",A;wait 1000;wrt "ctr","D8";3→A;gsb "ECHK"
83: beep;dsp "5345A digit # ",A;wait 1000;wrt "ctr","D9";2→A;gsb "ECHK"
84: beep;dsp "5345A digit # ",A;wait 1000;wrt "ctr","D:";1→A;gsb "ECHK"
85: beep;dsp "5345A digit # ",A;wait 1000;wrt "ctr","D:";0→A;gsb "ECHK"
86: beep;dsp "5345A digit # ",A,"--PRESS CONT";stp
87: wrt "ctr","D0"
88: if L=1;gto "4"
89: "5":prt "5-PERIOD MULT","SUFFIX TEST"
90: prt "Function=Period.,""Each MULT SUFFIX"."is automatically"
91: prt "sent to 5345A.,""Check mode set.,""Output verified"

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92: prt "and displayed", "on the 9825A.";spc 2
93: wrt "ctr", "I2F1G?D1C3E8?I1";10→A;gsb "ECHK"
94: dsp ".0000000000KSEC*";beep;wait 2000
95: wrt "ctr", "C4I1";7→A;gsb "LCHK"
96: dsp ".0000000100SEC";beep;wait 2000
97: wrt "ctr", "C5I1";4→A;gsb "LCHK"
98: dsp ".0000100000MSEC";beep;wait 2000
99: wrt "ctr", "C6I1";1→A;gsb "LCHK"
100: dsp ".0100000000USEC";beep;wait 2000
101: wrt "ctr", "C7D3I1";2→A;gsb "PCHK"
102: dsp "10.000000 NSEC--Press CONTINUE";beep;stp
103: if L=1;gto "5"
104: "6":spc 1;prt "6-INT/EXT GATE", "      TEST"
105: wrt "ctr", "I2E8?G?E;I1";0→A
106: prt "External Gate"
107: dsp "Verify 5345A: 0000000000";stp
108: wrt "ctr", "F3";1e8→A;gsb "READ"
109: prt "Internal Gate";spc 2
110: dsp "Vrify 5345A: 100.00000 MHz Gating";stp
111: if L=1;gto "6"
112: "7":prt "7-SAMPLE RATE ", "      TEST"
113: wrt "ctr", "I2G<E<?8";prt "Sample rate", " control", " bypassed."
114: dsp "Verify 5345A: Blank Gating & GATE";stp
115: wrt "ctr", "F4";prt "Max Sample Rate";spc 2
116: dsp "Vrify 5345A: 100.00 MHz Gating";stp
117: if L=1;gto "7"
118: "8":prt "8-HOLD TEST"
119: prt "HOLD sent to", "5345A. Send", "Sample Trigger", "Command each"
120: prt "time CONTINUE", "is pressed. ", "Sample count is", "displyd on 9825A"
121: soc 2
122: wrt "ctr", "I2E8?G?E;I1"
123: dsp "5345A: 00000000000 No GATE";stp
124: wrt "ctr", "J1";beep;dsp "SAMPLE 1--Press CONTINUE";stp
125: wrt "ctr", "J1";beep;dsp "SAMPLE 2--Press CONTINUE";stp
126: wrt "ctr", "J1";beep;dsp "SAMPLE 3--Press CONTINUE";stp
127: wrt "ctr", "E1";dsp "NOT HOLD--Verify 5345A: gating";stp
128: if L=1;gto "8"
129: "9":spc 1;prt "9-ACCUMULATE", "      TEST"
130: wrt "ctr", "I2F4E8?1=5?I1"
131: prt "A+B code sent"
132: dsp "Verify 5345A: Accumulating";stp
133: wrt "ctr", "F6E75";0→A;gsb "READ"
134: prt "A-B code sent";spc 2
135: dsp "Verify 5345A: 0000000000";stp
136: if L=1;gto "9"
137: "10":prt "10-OUTPUT TEST";wrt "ctr", "I2F4E?8:15G?I1"
138: prt "wait 'til addrsd"
139: dsp "Verify 5345A: Blank & GATE";stp
140: wrt "ctr", "E2I1";prt "Only if addrsd"

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141: dsp "Verify 5345A: accumulating.";stp
142: prt "*Takes 1 reading.", "*Stops. When", "*CONTINUE is", "*pressed, takes
143: prt "*10 more readings", "*and displays", "*them on 9825A.", "*Stops and"
144: prt "*displays the", "*11th reading.";spc 2
145: wrt "ctr", "E8F6";red "ctr",A;cmd 7, "_";fxd 0
146: dsp "Verify 5345A:",A;stp
147: wrt "ctr", "I2E8?F4I1";0>X
148: wait 1000;wrt "ctr", "F6";red "ctr",A;cmd 7, "_";dsp A;beep
149: wait 1000;if (X+1>X)>9;gto +2
150: wrt "ctr", "F4";gto -2
151: fxd 0;dsp "Verify 5345A:",A;stp
152: spc 2;prt "END OF TEST";dsp "END";spc 4;stp
153: "ECHK":wait 50;69>R;-2>C
154: gsb "CNT"
155: wrt "ctr", "I1"
156: ret
157: "PCHK":wait 50;46>R;-1>C
158: gsb "CNT"
159: wrt "ctr", "I1"
160: ret
161: "LCHK":wait 50;49>R;-2>C
162: gsb "CNT"
163: wrt "ctr", "I1"
164: ret
165: "CNT":rdb("ctr")>B
166: if B=R;gto +2
167: C+1>C;gto -2
168: if A#C;prt "ERROR C=",C,A
169: ret
170: "READ":wait 50;red "ctr",C;red "ctr",C
171: if A#C;prt "ERROR"
172: wrt "ctr", "I1"
173: ret
174: end
*6378
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