

S E R V I C E N O T E

SUPERSEDES: NONE

HP 44704A High Speed Voltmeter

Serial Numbers: 0000A00000/3234A01053

44704A Intermittent Extra Readings

To Be Performed By: HP-Qualified Personnel

Parts Required:

HP P/N	Description	Quantity
0160-4806	100V 39 pf cap	1

Situation:

On rare occasions, the output of the 44704A shifts readings. The problem is: "data dependent", "temperature sensitive" and "mode dependent".

To test for the problem:

Connect 10V to channel zero and 0V to channel one of a 44711 or 44713 FET switch. Then program to scan alternate channels.

The expected results should be : 10,0,10,0...etc.....10,0.

On rare occasions, results are : 10,0,10,0,..10,10,..0,10,0.

There is an extra 10V reading.

DATE: July 1997

ADMINISTRATIVE INFORMATION

SERVICE NOTE CLASSIFICATION:			
MODIFICATION RECOMMENDED			
ACTION CATEGORY:	<input type="checkbox"/> IMMEDIATELY <input checked="" type="checkbox"/> ON SPECIFIED FAILURE <input type="checkbox"/> AGREEABLE TIME	STANDARDS:	LABOR 1.0 Hours
LOCATION CATEGORY:	<input checked="" type="checkbox"/> CUSTOMER INSTALLABLE <input type="checkbox"/> ON-SITE <input type="checkbox"/> HP LOCATION	SERVICE INVENTORY:	<input type="checkbox"/> RETURN <input type="checkbox"/> SCRAP <input type="checkbox"/> SEE TEXT
AVAILABILITY:	PRODUCT'S SUPPORT LIFE	USED PARTS:	<input type="checkbox"/> RETURN <input type="checkbox"/> SCRAP <input type="checkbox"/> SEE TEXT
AUTHOR: WEW	ENTITY: 0960	HP RESPONSIBLE UNTIL: Product's support life	
		ADDITIONAL INFORMATION:	

1. The 44704 must be operating with SCANMODE ON
2. Failure is detected only with RESOL 16
3. Set sper/scdelay for most failures SPER 50 usec
4. (To observe the problem) SCDELAY 0,110E-6 3.

The most severe case we have been able to determine is when the voltage switches between 10V and 0V, or some high voltage and 0V. (0V is the key factor)

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20 ! This program demos a failure mode for the 44704A which was not
30 ! previously detected by the standard production test.
40 !
50 ! Units shipped with serial # below 3234A01053 will need A MOD.
60 ! The 44704-66502 board date code below 3704 must be modified by:
70 ! Connecting a 100V 39 pf capacitor between pins 1(trg) and 7(Gnd)
80 ! of connector J001. Hp part # 0160-4806.
90 !
100 ! The Problem:
110 ! The 44704 skips or inserts extra readings.
120 !
130 ! Test setup for this program: (Modify configuration as required)
140 ! 44704 in slot 8, 44711 in slot 7, 44727A in slot 1 of extdr 1
150 ! Connect 10V to chan 1100 & 0V to chan 1101 with Guard to low.
160 ! Run the attached program :
170 !     results should be:   10,0,10,0...etc.....10,0
180 !     results randomly are: 10,0,10,0,..10,10.....??
190 ! If a 44727 is not available, then provide 0 and 10V external.
200 !
210 ! The problem is data dependent, mode dependent & temp sensitive.
220 ! The unique parameters that demo the failure are the following.
230 !
240 ! 1. The 44704 must be operating with  SCANMODE ON
250 ! 2. Failure is detected only with  RESOL  16
260 ! 3. Set sper/scdelay for most failures SPER   50 usec
270 ! 4.                SCDELAY  0,110E-6
280 ! 3. The failure appears to be data dependent. The most severe
290 ! case I have been able to determine is when the FET switches
300 ! between 10V and 0V, or some high voltage and 0V.
301 !     (0V is the key factor)
310 ! ! No failures if 0V is not used!
320 !
330 ! The test program follows
340 !
350 RE-SAVE "skipsdat"

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360 REAL Rdgs(0:39)
370 ASSIGN @Dac TO 709
380 CLEAR @Dac
390 OUTPUT @Dac;"RESET"
400 WAIT 1
410 !
420 Fail=0
430 Lop=0
440 OUTPUT @Dac;"inbuf on"
450 OUTPUT @Dac;"outbuf on"
460 OUTPUT @Dac;"fastout on"
470 OUTPUT @Dac;"fastdisp on"
480 OUTPUT @Dac;"disp off"
490 !
500 OUTPUT @Dac;"packed buff_dat(79)"
510 OUTPUT @Dac;"rst 1800" ! Reset the 44704 extdr 1 slot 8
520 !
530 OUTPUT @Dac;"APPLY DCV 1100, 10.0" ! set a test voltage Dac card
540 OUTPUT @Dac;"APPLY DCV 1101, -0.0" ! set a test voltage Dac card
550 !
560 OUTPUT @Dac;"USE 1800" ! SCANMODE ON presets VM to pwron state:
570 OUTPUT @Dac;"SCANMODE ON"! RANGE..auto RDGSMODE dav ARMODE..after
580         ! SCTRIG..hold NRDGS.. 1 ASCAN...off
590         ! TRIG....int RDGS...sys STTRIG...int
600         ! SCSLOPE..LH STSLOPE..LH SLOPE....LH
610         ! SPER .10E-6 PRESCAN 1 POSTSCAN 0
620         ! TERM....ext Perc.. 0% INTRPT..disab
630         ! FUNC...dcv(depends on CONF)
640         ! SCDELAY 0ms,2ms (sctrig dly/scan pace)
650         !
660 OUTPUT @Dac;"func dcv 10.24" ! Alter preset values
670 OUTPUT @Dac;"RESOL 16" ! ! #####
680 OUTPUT @Dac;"term ribbon"!
690 OUTPUT @Dac;"rdgsmode complete"! The scan is int
700 OUTPUT @Dac;"SPER 50E-6" ! ! 50 usec seems to be dominant fail
710 OUTPUT @Dac;"SCDELAY 0,110E-6" ! scan pace must scan+scan delay
720 OUTPUT @Dac;"prescan 20"
730 OUTPUT @Dac;"clwrite 1700-1701"
740 OUTPUT @Dac;"sctrig int"
750 OUTPUT @Dac;"xrdgs 1800, into buff_dat"
760 !!!
770 OUTPUT @Dac;"vread buff_dat"
780 ENTER @Dac;Rdgs(*)
790 F=0
800 FOR I=0 TO 39 STEP 2
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810 IF Rdgs(I) THEN
820   F=1
830   PRINT I;Rdgs(I)
840 END IF
850 NEXT I
860 !
870 Lop=Lop+1
880 IF F=1 THEN
890   Fail=Fail+1
900   PRINT "loop count= ";Lop;"Failures= ";Fail
910 END IF
920 DISP Lop
930 BEEP 1000,.005
940 GOTO 740
950 STOP
960 END
    
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Solution / Action:

The problem has been isolated to noise on the trig input of the XILINX part on the 44704-66502 board. It can be resolved by Connecting a 100V 39 pf capacitor between pins 1(trg) and 7(Gnd) of connector J001. Use capacitor Hp part # 0160-4806.

1. Remove the side cover of the 44704A to expose the 44704-66502 PC board. (The side away from the ribbon cable.) There are four screws.
2. Remove the 44704-66502 board to get to the back side. There are 4 connectors and one screw.
3. Solder the 39 pf capacitor between pins 1 and 7 of the largest ribbon connector on the board.



4. Re-assemble and test with the above program.