

# PCS500

## Troubleshooting

If there are any fails or problems when you run the PCS500\_TST.EXE at the first time on a new oscilloscope unit please make the following checks:

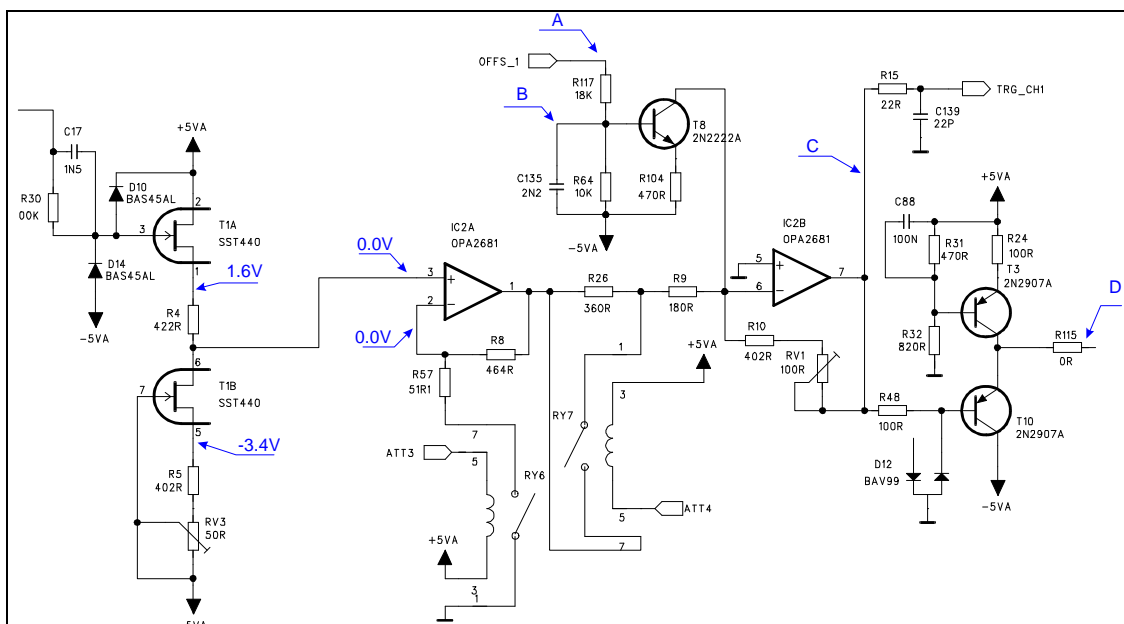
Test	Problem	Check
1	No power	The voltage at pin 6 of optocoupler IC30 should go down at the startup for a moment. See images 1 and 2. Check IC4, IC21, IC30 and the associated components.
2, 3	No trace on the screen	Check all the supply voltages of the digital and analog section. Check the voltages of the input amplifier section. See image A. Check the waveforms at the optocouplers. See images 2 ... 8. When measuring the waveforms use "Single" mode and keep triggering ON.
4	Calibration error	Open CALIBRATION.LOG file and check the failed test. Below there are more detailed comments (Table1).
5	Can't be adjusted	Check the input section components (C14, C15, C80)
6	Can't be adjusted	Check the input section components (C14, C15, C80)
7	Can't be adjusted	Check the input section components (C20, C21, C81)
8	Can't be adjusted	Check the input section components (C20, C21, C81)
9	Can't be adjusted	Check the resistors of the input attenuator and the amplifier section.
10	Can't be adjusted	Check the resistors of the input attenuator and the amplifier section.
11	Calibration error	Open CALIBRATION.LOG file and check the failed test. Below there are more detailed comments (Table1).
12	Can't be adjusted	Check the resistors of the input attenuator and the amplifier section.
13	Can't be adjusted	Check the voltages at IC24 (See image B). Check transistor T5 and associated components.
14	Test failed	Check the divider circuits IC9, IC10, IC11 and associated components.
15	Test failed	Check the trigger section components.
16	Power can't be switched off	The voltage at pin 6 of optocoupler IC30 should look like the waveform of image 2. Check IC4, IC21, IC30 and the associated components.

Calibration results			
Test	Typical result		Acceptance range
CH1 offset at 15V/div	119	OK	100...156
CH2 offset at 15V/div	125	OK	100...156
CH1 correction at 5V/div	2	OK	-50...50
CH2 correction at 5V/div	3	OK	-50...50
CH1 correction at 15mV/div	2	OK	-50...50
CH2 correction at 15mV/div	3	OK	-50...50
CH1 correction at 5mV/div	6	OK	-50...50
CH2 correction at 5mV/div	8	OK	-50...50
CH1 correction at 20us/div	1	OK	-50...50
CH2 correction at 20us/div	1	OK	-50...50
CH1 correction at 10us/div	-1	OK	-50...50
CH2 correction at 10us/div	-2	OK	-50...50
CH1 correction at 5us/div	-5	OK	-50...50
CH2 correction at 5us/div	-7	OK	-50...50
CH1 Trigger low	98	OK	50...200
CH1 Trigger middle	124	OK	(CH1 Trigger low)+15...200
CH1 Trigger high	150	OK	(CH1 Trigger middle)+15...200
CH2 Trigger low	102	OK	50...200
CH2 Trigger middle	126	OK	(CH2 Trigger low)+15...200
CH2 Trigger high	152	OK	(CH2 Trigger middle)+15...200
EXT Trigger middle	84	OK	50...200

**Table 1.**

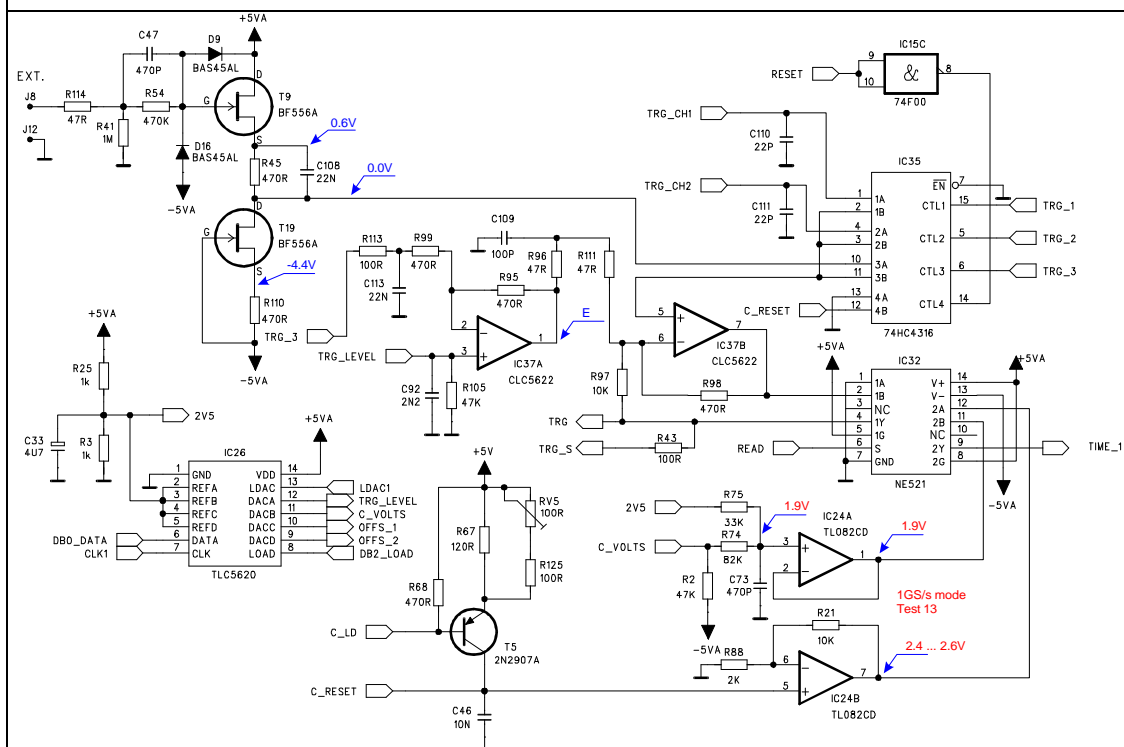
## Voltages of the analog input section and the trigger section.

All the voltage values below are allusive approximations only.



Y-position	Voltage A	Voltage B	Voltage C	Voltage D
Up	0.0V	-3.3V	1.1V	1.7V
Middle	2.3V	-2.6V	1.8V	2.5V
Down	4.8V	-1.7V	2.6V	3.3V

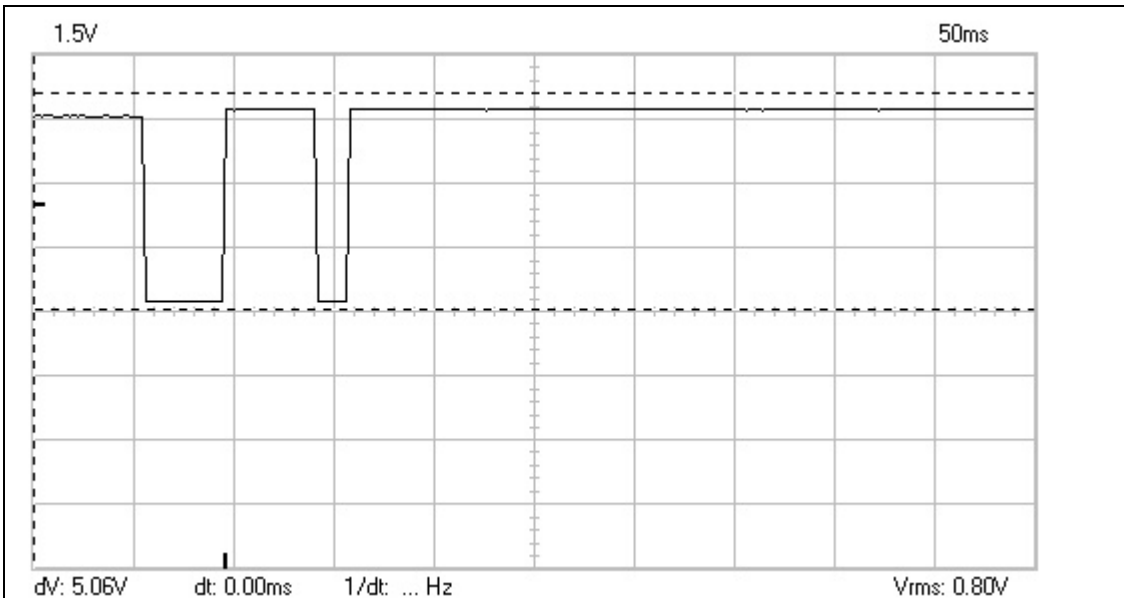
**Image A.** Voltages of the input section.



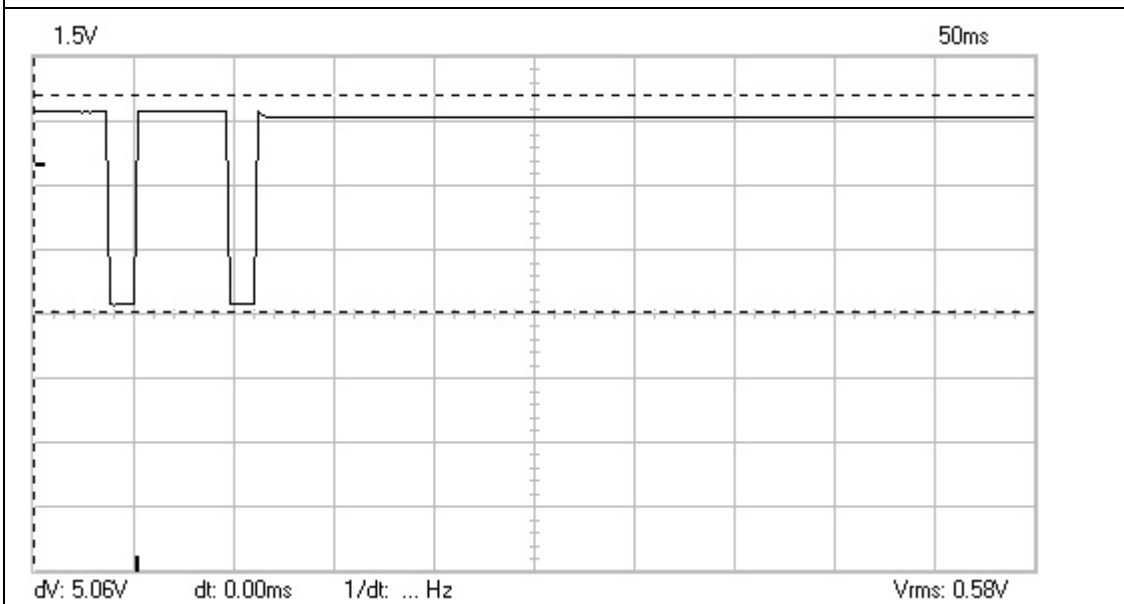
**Image B.** Voltages of the trigger section.

Waveform images. All waveforms are captured using PCS500 in Single shot mode.

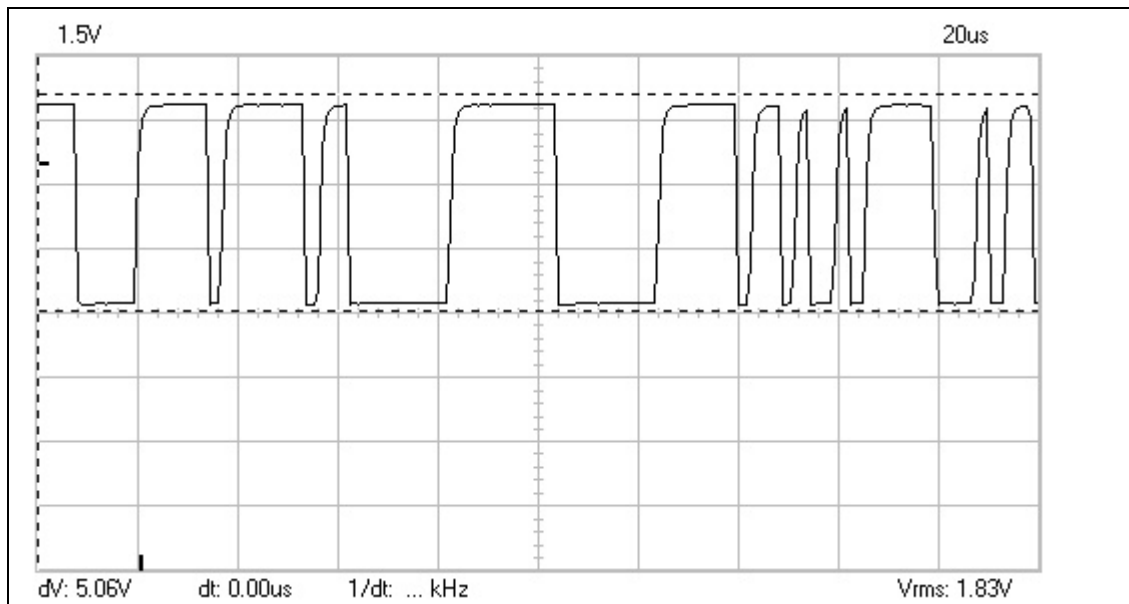
**Note: Look only the pulse amplitude and the pulse lengths. The pulse sequence (waveform) may be different.**



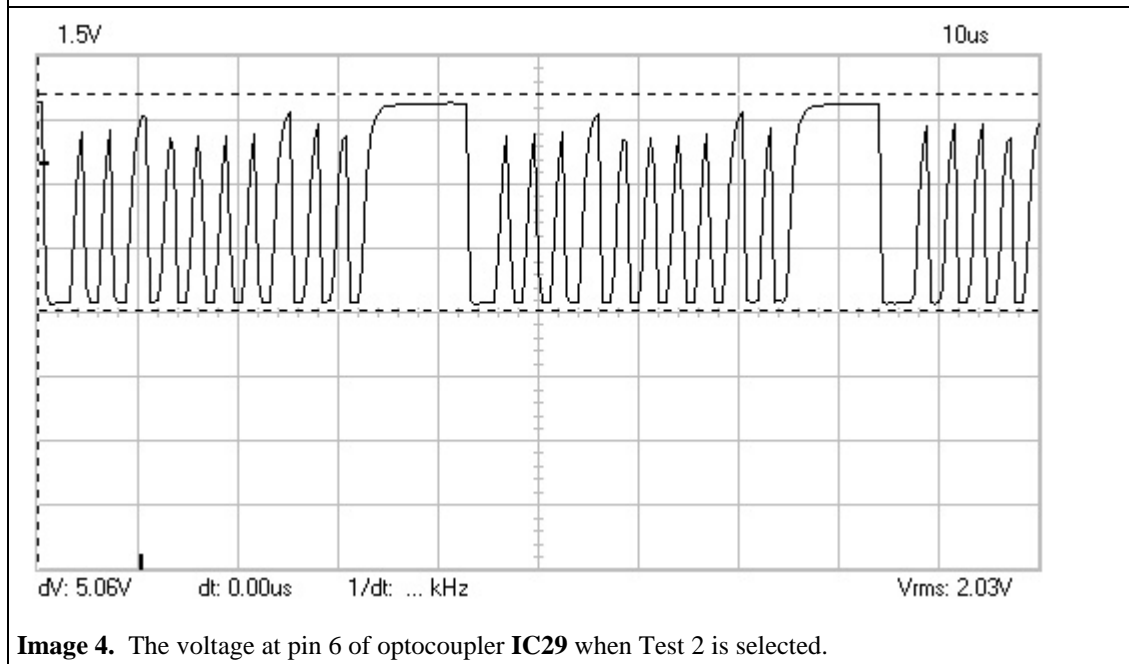
**Image 1.** The voltage at pin 6 of optocoupler **IC30** when Power ON Test (1) is selected.



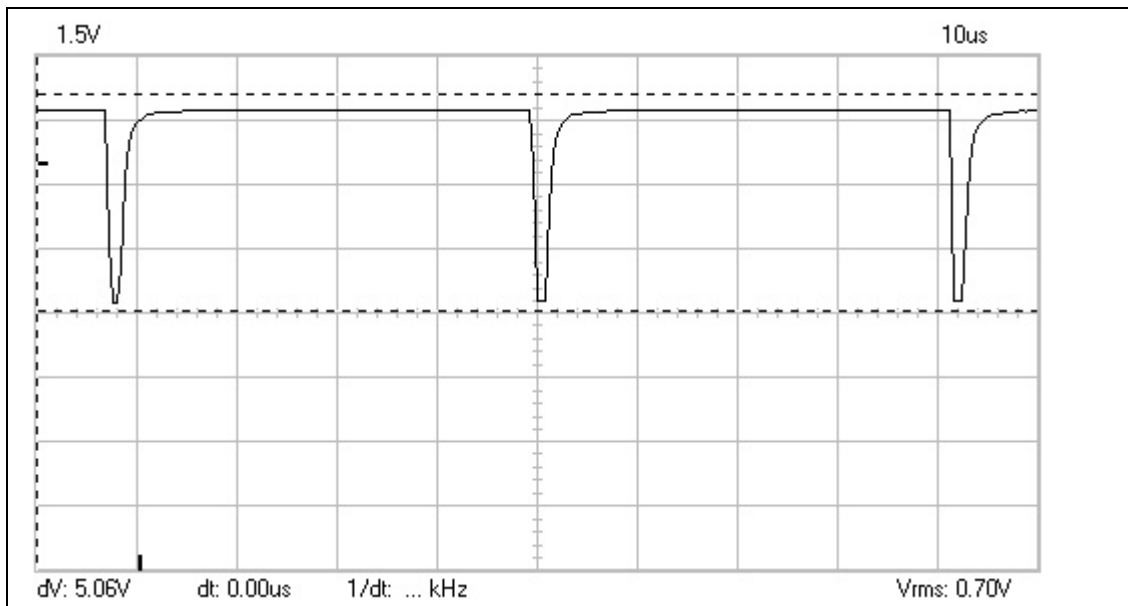
**Image 2.** The voltage at pin 6 of optocoupler **IC30** when Power OFF Test (16) is selected.



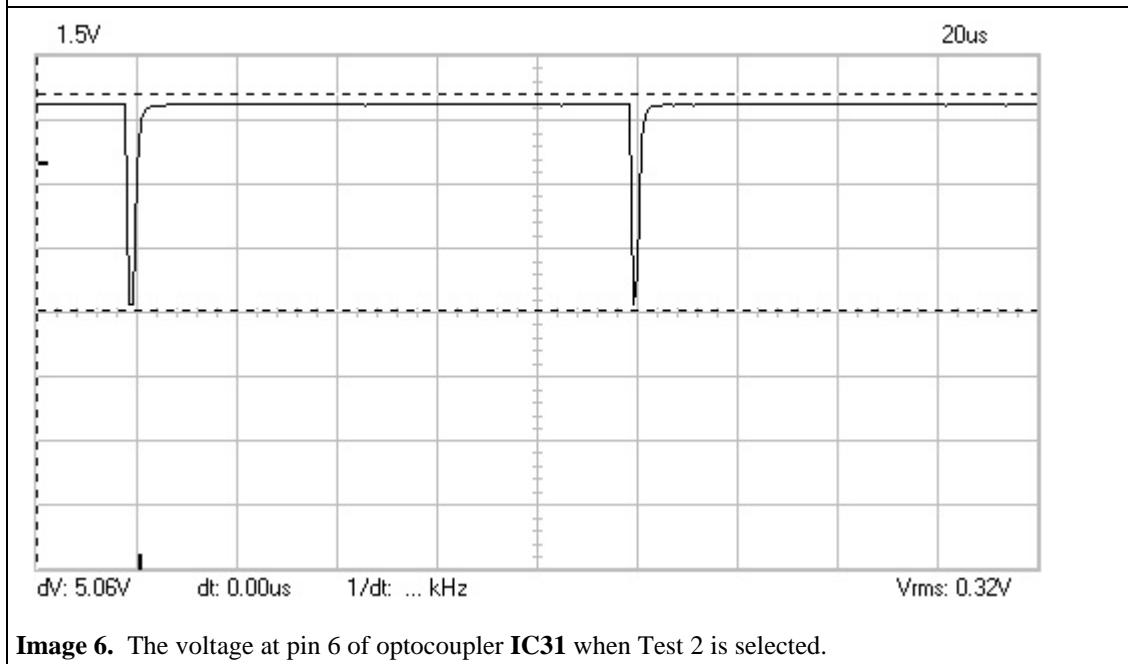
**Image 3.** The voltage at pin 6 of optocoupler **IC20** when Test 2 is selected.



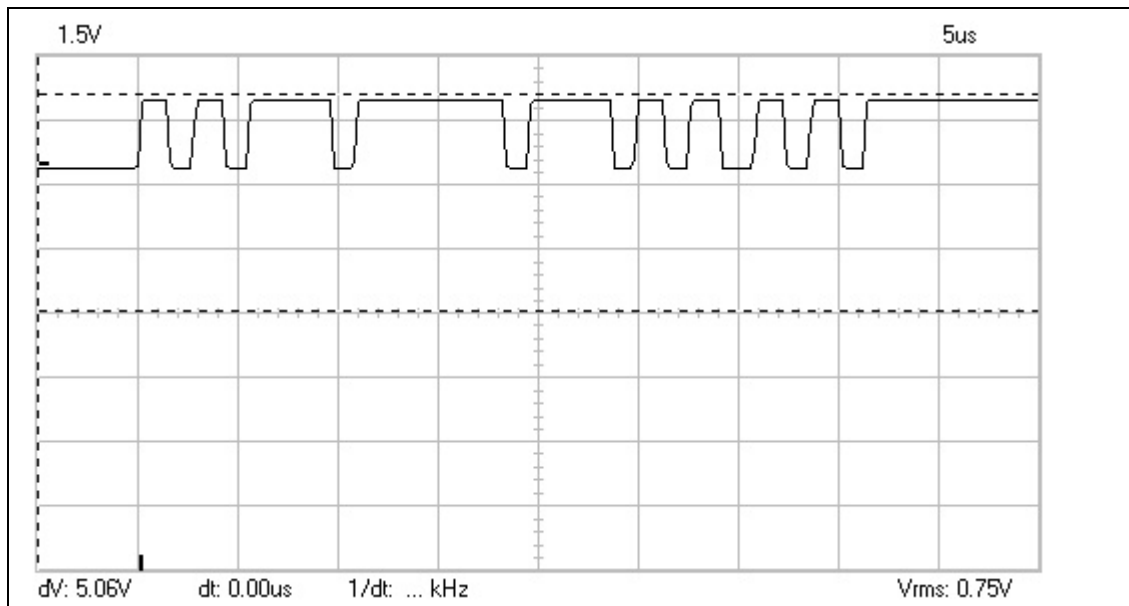
**Image 4.** The voltage at pin 6 of optocoupler **IC29** when Test 2 is selected.



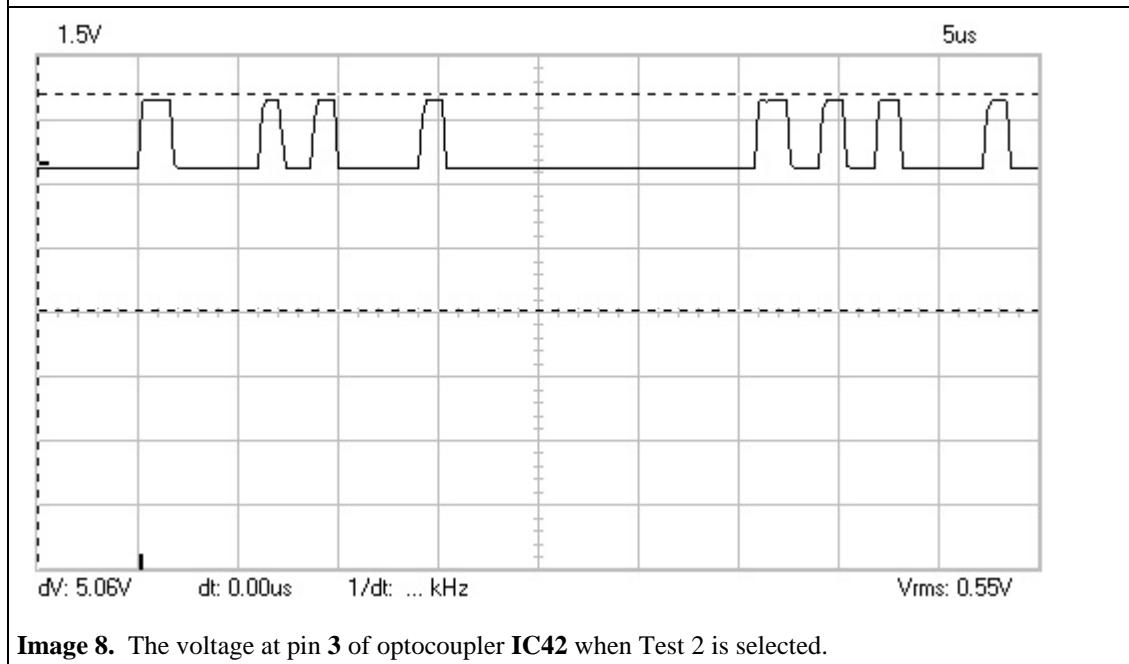
**Image 5.** The voltage at pin 6 of optocoupler **IC30** when Test 2 is selected.



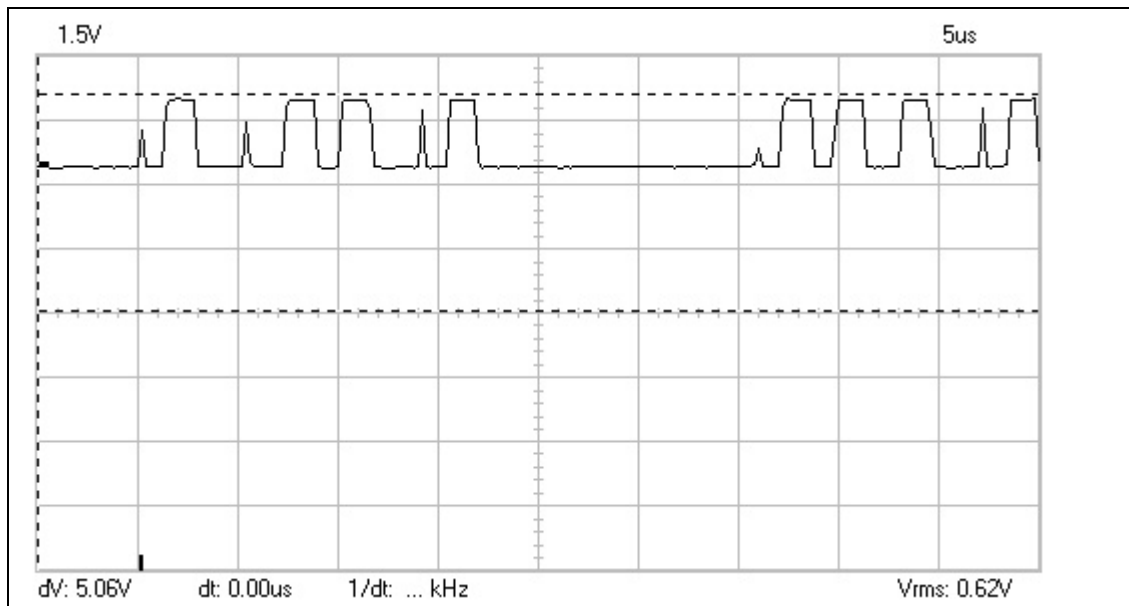
**Image 6.** The voltage at pin 6 of optocoupler **IC31** when Test 2 is selected.



**Image 7.** The voltage at pin 3 of optocoupler **IC41** when Test 2 is selected.



**Image 8.** The voltage at pin 3 of optocoupler **IC42** when Test 2 is selected.



**Image 9.** The voltage at pin 3 of optocoupler **IC43** when Test 2 is selected.




Table 1  
Typical calibration results in the CALIBRATION.LOG file.

Test	Typical result		Possible reason if there is "FAIL" instead of "OK"
CH1 offset at 15V/div :	119	OK	Faulty relay, faulty IC19
CH2 offset at 15V/div :	125	OK	Faulty relay, faulty IC21
CH1 correction at 5V/div :	2	OK	Wrong offset adjustment RV3 or faulty relay
CH2 correction at 5V/div :	3	OK	Wrong offset adjustment RV4 or faulty relay
CH1 correction at 15mV/div :	2	OK	Wrong offset adjustment RV3 or faulty relay
CH2 correction at 15mV/div :	3	OK	Wrong offset adjustment RV4 or faulty relay
CH1 correction at 5mV/div :	6	OK	Wrong offset adjustment RV3 or faulty relay
CH2 correction at 5mV/div :	8	OK	Wrong offset adjustment RV4 or faulty relay
CH1 correction at 20us/div :	1	OK	
CH2 correction at 20us/div :	1	OK	
CH1 correction at 10us/div :	-1	OK	
CH2 correction at 10us/div :	-2	OK	
CH1 correction at 5us/div :	-5	OK	
CH2 correction at 5us/div :	-7	OK	
CH1 Trigger low :	98	OK	Check the trigger section components
CH1 Trigger middle :	124	OK	Check the trigger section components
CH1 Trigger high :	150	OK	Check the trigger section components
CH2 Trigger low :	102	OK	Check the trigger section components
CH2 Trigger middle :	126	OK	Check the trigger section components
CH2 Trigger high :	152	OK	Check the trigger section components
EXT Trigger middle :	84	OK	Check the trigger section components