testing		2013may17						
Board		Dan W	for LEDA-OVRO with universal VAC input power supply					
source 1PPS from			Timing Solutions 4032 via 4 ft of BNC-BNC coax to Lecroy WavePro 960 scope					
Vout min		0	V					
Vout max		3.4	V (very slow rise from 3.07 to 3.4V)					
Rise 20-80 %		0.9	ns					
Fall 20-80 %		1.49	ns					
measure outputs 1 at a time using a 2nd 4 ft BNC-BNC coax.								
scope trigger point		1.5	volts					
		rising edge						
output		latency	Rise 20-80%	fall 20-80%				
		nsec	nsec	nsec				
lower left (from rear) 1		14.04	1.42	1.2				
2		14.29	1.47	1.41				
3		14.11	1.44	1.25				
4		14.16	1.42	1.32				
5		14.15	1.41	1.31				
6		14.26	1.46	1.39				
7		14.15	1.43	1.39				
8		14.07	1.33	1.36				
9		14.03	1.4	1.55				
10		14.06	1.44	1.25				
11		14.14	1.45	1.3				
12		14.26	1.51	1.54				
13		14.17	1.44	1.32				
14		14.15	1.44	1.31				
15		14.27	1.46	1.29				
upper right (16)		14.18	1.34	1.27				
min		14.03	1.33	1.2				
max		14.29	1.51	1.55				
range		0.26	0.18	0.35				
average		14.16	1.43	1.34				

Each output can be used to drive multiple 50 ohm loads as provided by the Roach N boards									
Please see the Sync input discussion at									
https://casper.berkeley.edu/wiki/ROACH2#Usage_Manuals.2C_Guides.2C_Memos.2C_etc.									
https://casper.berkeley.edu/wiki/ROACH#Usage_Manuals.2C_Guides.2C_Memos.2C_etc.									
Unlike the typical COTS 1PPS repeater or the sync reception logic on the iADC v1.1 or quadADC the RoachN boards do not need a									
full TTL swing to catch the transition. Instead they use active comparators which are looking for much smaller swings between the									
logic high and logic low levels.									
test setup									
1 RAL 16 way output driving 4ft of 50 ohm coax to a BNC T socket/socket/socket with 2 4ft 50 ohm coax									
cables to 50 ohm scope inputs.									
Time in nsec	0	1.35	2.1	2.75	4.33	6.83	12.9		
rising edge								then very slow rise	
volts	0	0.6	1.2	1.5	1.75	1.75	2.1	To 2.2x volts	
Time in nsec	0	1.94	2.29	3.62	4.77	5.72	8.7		
falling edge									
volts	2.2	1.6	1.5	1	0	-0.3	0.2	slow fall down to 0.0	
These kinds of swings are much larger than required by the RoachN sync inputs circuitry. And has been used at least 1 observatory.									
These swings are NOT large enough to drive another RAL nor COTS 1PPS replicator.									
Even when use two BNC T splitters for a copy of 3 outputs the levels would be plenty large for 3 roachN loads but this hasn't									
been used in the field as far as is known.									
Time in nsec	0	2.34	3.8	5.2	11	17.5	29		
rising edge								then very slow rise	
volts	0	0.6	1.2	1.3	1.5	1.35	1.5	To 1.7 volts	
Time in nsec	0	1.7	3.34	5.44	7.54	9.49	21.2		
falling edge									
volts	1.7	1.5	1.1	0.5	-0.2	0.2	0		
WARNING: if using the BNC splitters then all output cables must be terminated into 50 ohms. Do NOT leave long unterminated									
transmission lines in the circuit. They may cause any manner of false triggers.									