

DON'T PANIC!

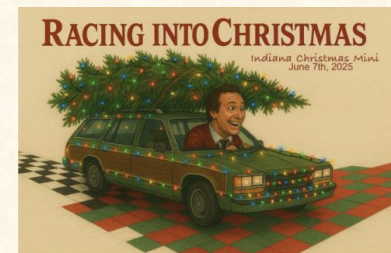
Troubleshooting your Christmas Display. Problems are inevitable, however all problems are solvable.

Presenter: John Storms

June 7th, 2025



Indiana Christmas Mini 2025



RACING INTO CHRISTMAS

Indiana Christmas Mini
June 7th, 2025



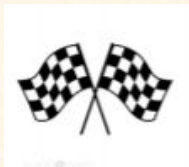
Time Slot	High School Room	Large Classroom 700
8:30a - 8:45	Introductions - Larry Calvert	
8:45 - 9:15	Great Light Fight Experience - Joe Monfre	
9:25 - 10:25	Sequencing by Showstopper Sequences - Michael Stoffregen	Intro to the Light-O-Rama Sequencer (1 hour) - Matt Brown
10:25 - 10:45	Break	
10:45 - 11:30	Coro Props Future - Gilbert Engineering	Pulse Mesh App - Aaron Sudduth
11:40 - 12:30	Controller builds and China Pixels - David Peace	<i>Sequencing Pixels: Motion Rows and Coro Props (50 minutes) - Matt Brown, Greg Jones, Mark Molter</i>
12:30 - 1:15pm	Lunch: People Networking / Table Sharing	
1:15 - 2:10	Trouble Shooting your show - John Storms	
2:20 - 2:50	FPP Show Scheduler - Tony Keith - The Christmas Light Guy	xSchedule Show Scheduler - Joel Dearing
3:00 - 3:45	Moving Heads - Edwin Schuster	<i>Advanced Light-O-Rama Motion Effects (45 min) - Matt Brown</i>
3:45 - 4:00	Break	
4:00 - 4:50	Sequencing- Pixel Pro Displays - Clyde Lindsey	<i>Q&A and New Features (50 Minutes) - Matt Brown</i>
5:00 - 6:00	Panel Discussion: Jason Gilbert, Clyde Lindsey, Michael Stoffregen, David Peace, Matt Brown, John Storms, Mini Team	

7000 Stones Crossing Road
Greenwood, Indiana 46143

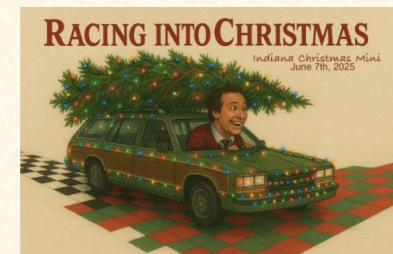


Hi I'm John Storms

- Married 33 years, father of 2 daughters, both Texas A&M (JPL & AA)
- Live in Leander, TX (North of Austin) raised in PA.
- Moved last year :(
- Recently retired from NVIDIA



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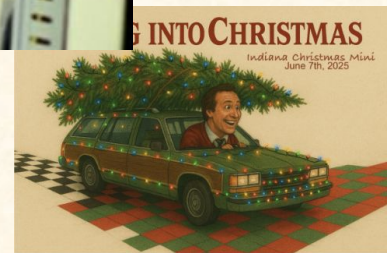
Amateur vs. Professional



WARNING: I'm not really an Electrician, I just pretend during Christmas. My advice may burn down your house.



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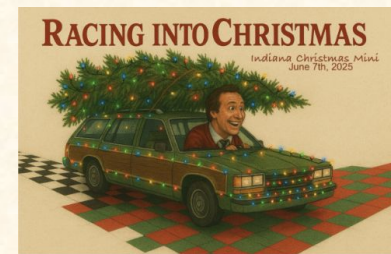


Current Projects

- Catching up on some Travel
- Learning to weld
- Building a studio
- Infrastructure and permanent lighting
 - Trim lighting
 - RGB landscape lighting
 - CONDUIT! Power and network everywhere



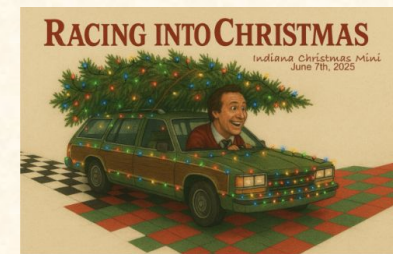
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Lights!



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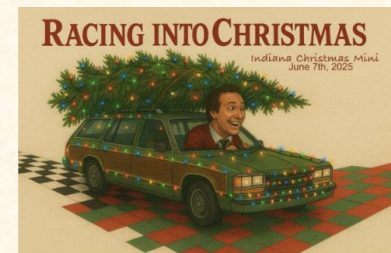


TROUBLE SHOOTING YOUR DISPLAY

ALL PROBLEMS ARE SOLVABLE



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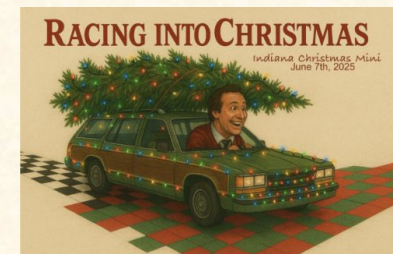
Let me tell you about Lee



- It's the big ta-dah night!
- Whole neighborhood is in front of your house. Plus your parents, family, friends, co-workers, even your boss is there.
- You've been muttering excitedly about Christmas lights the whole year so everyone wants to see what its about.
- Drum roll please...



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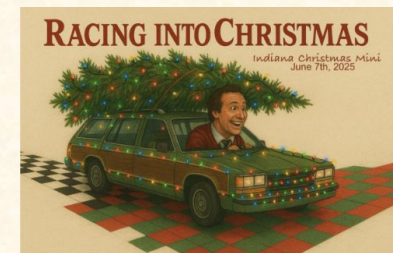


Lighting Community

- The Zoom Room (xlights.org)
- Facebook Groups
- Local friends (who may have spare parts)



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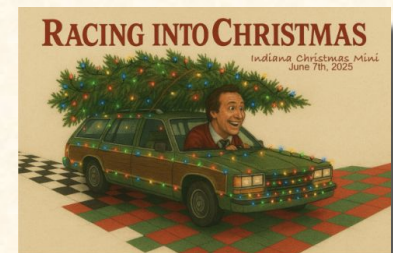
Moral of the Story

“Enhance your calm”

Do not lose your cool

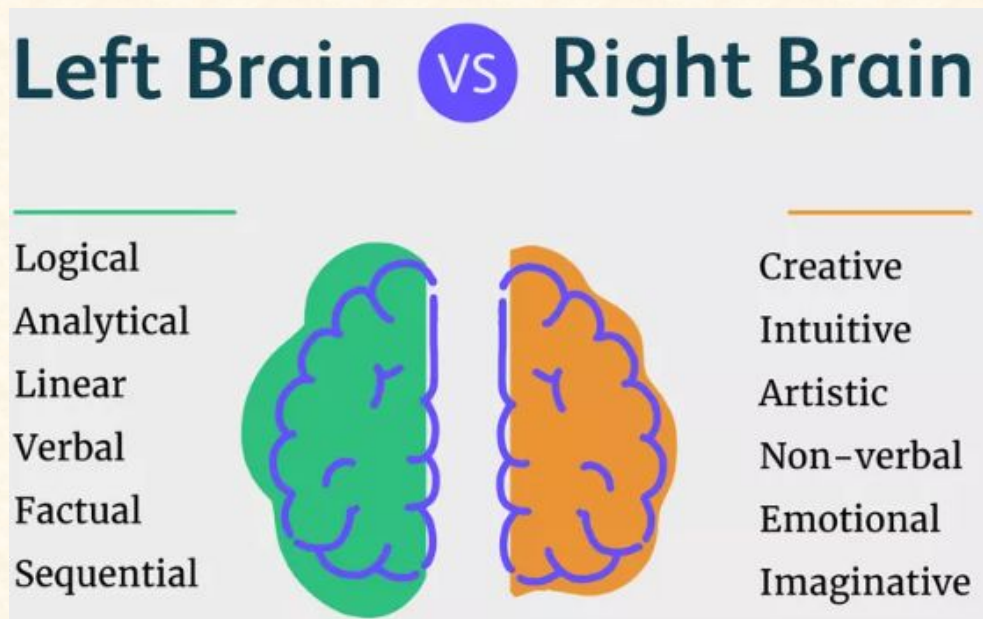


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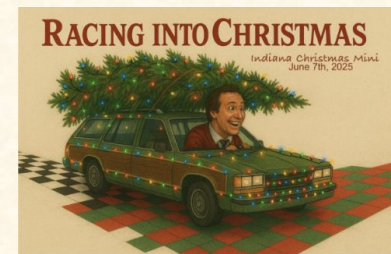


Trouble-shooting Light Problems

- Displays can be super complex
- Art + Technology + Weather + HOA = Problems
- Left and Right sides of brain



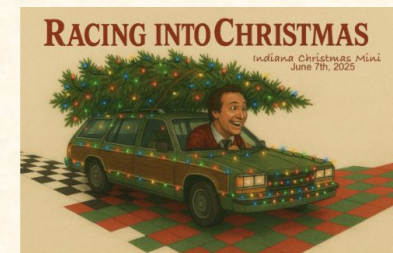
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Algebra



- Factoring out variables that are not the problem
- Problem isolation and characterization
- “A problem well defined is a problem half solved.” – Charles Kettering



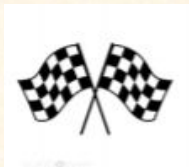
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Problem Solving Patterns

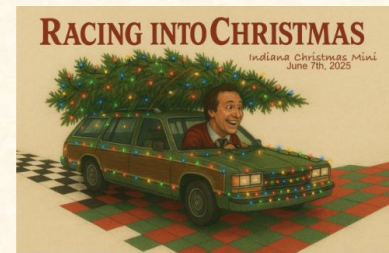


Spiral

- Wander around in circles until you bump into the answer

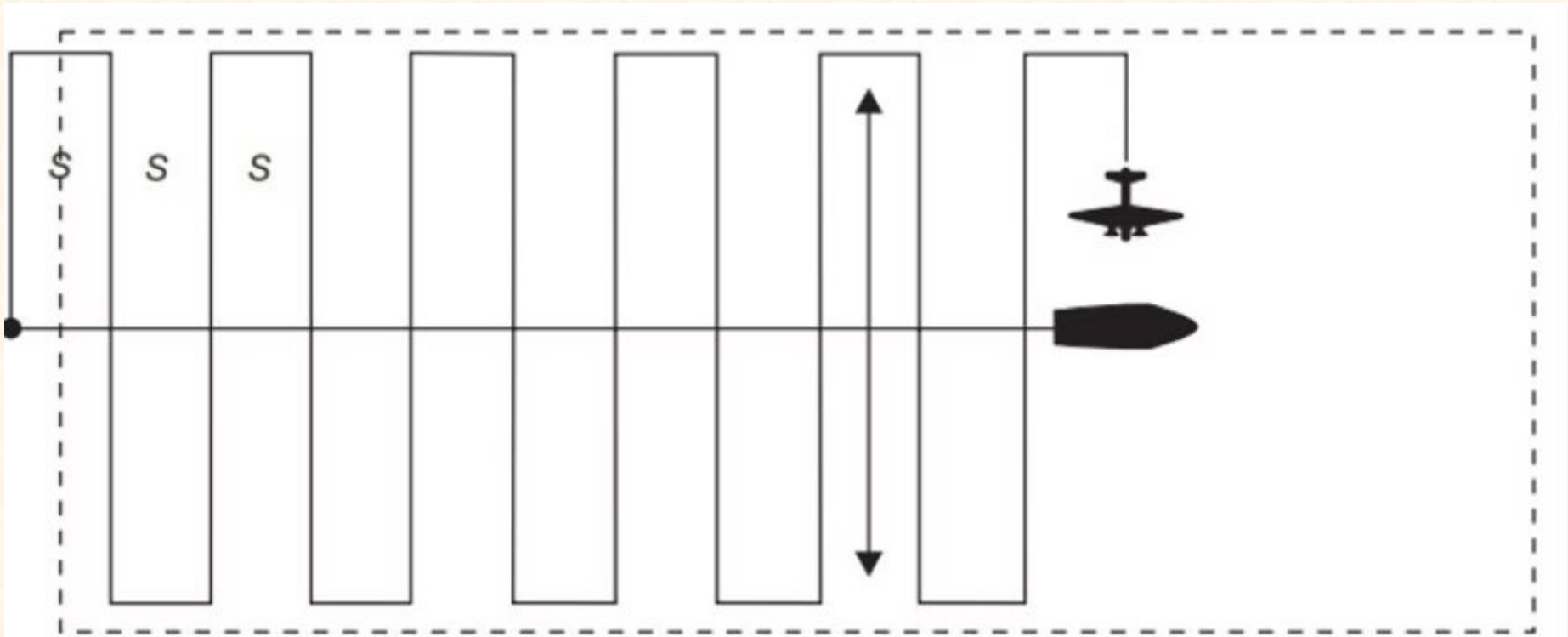


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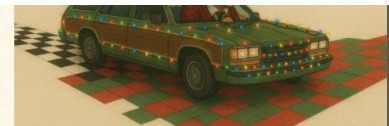


Problem Solving Patterns

Search Pattern

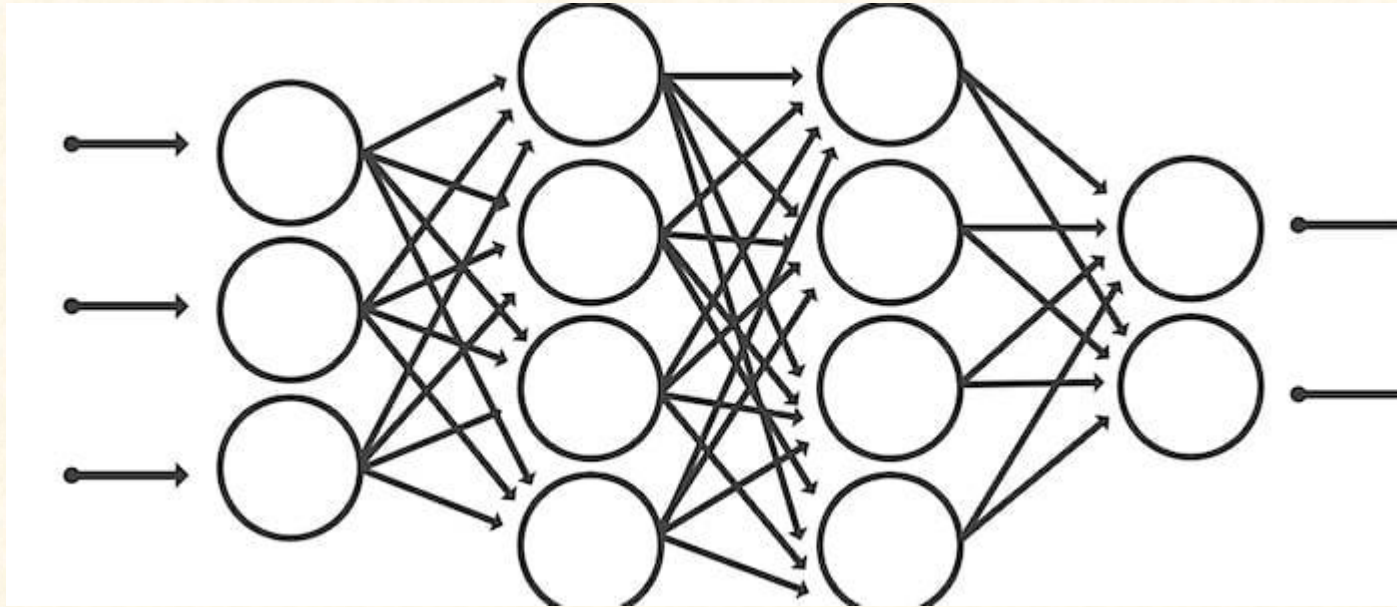


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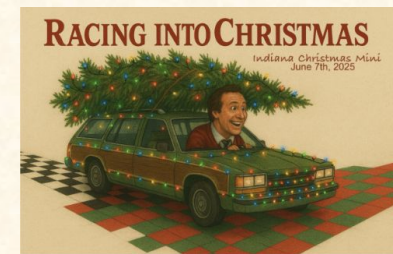


Problem Solving Patterns

“Use Brain”



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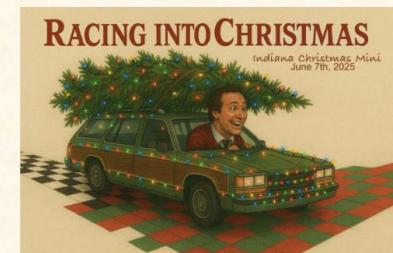


Phase Containment Effectiveness

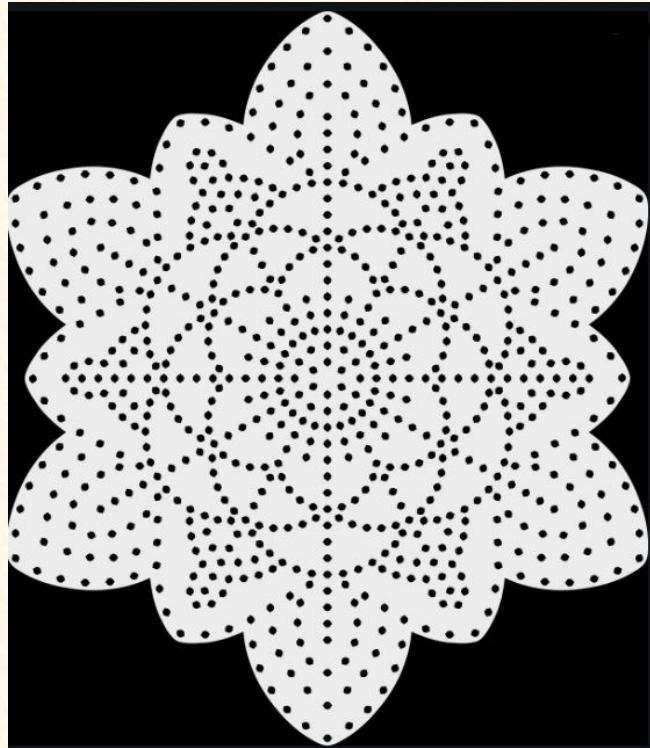
- Most cost effective to trap a problem closest to its injection point
- Planning
- Prevention
 - Dielectric grease
 - Testing



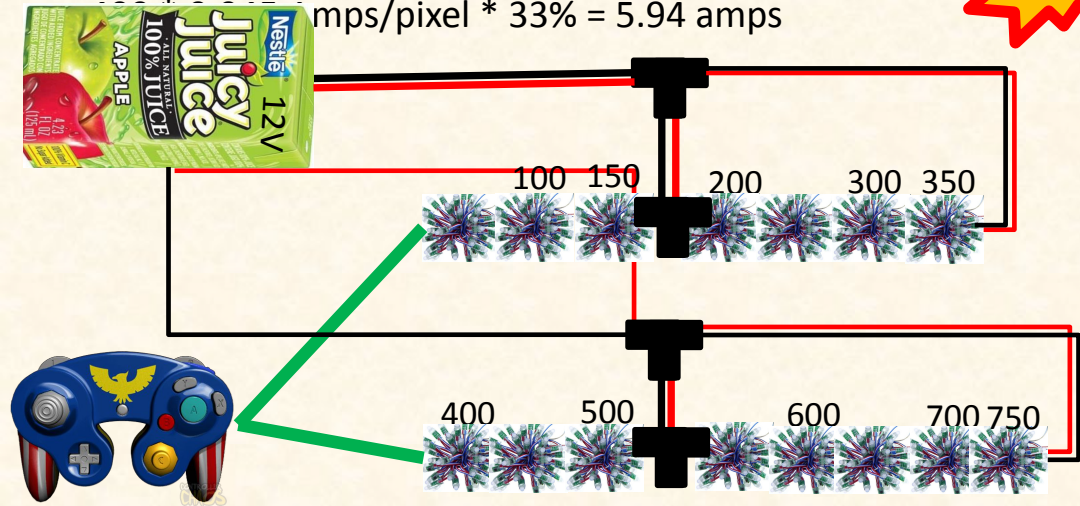
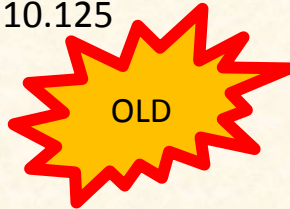
Indiana Christmas Mini 2025



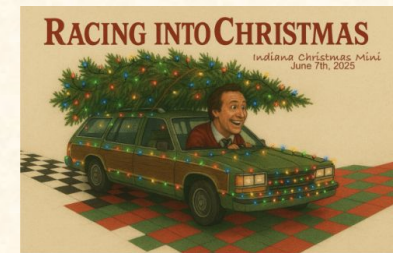
EFL Showstopper 46" Flake



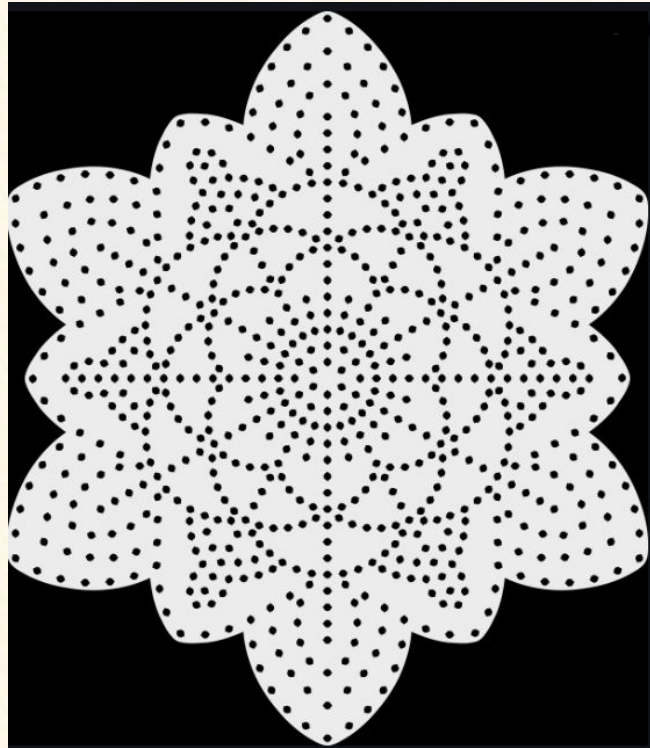
- $750 \text{ pixels} * 0.045 \text{ Amps/pixel} = 33.75 \text{ amps} * 30\% = 10.125 \text{ amps}$
- $350 * 0.045 \text{ Amps/pixel} * 33\% = 5.19 \text{ amps}$
- $\text{Amps/pixel} * 33\% = 5.94 \text{ amps}$



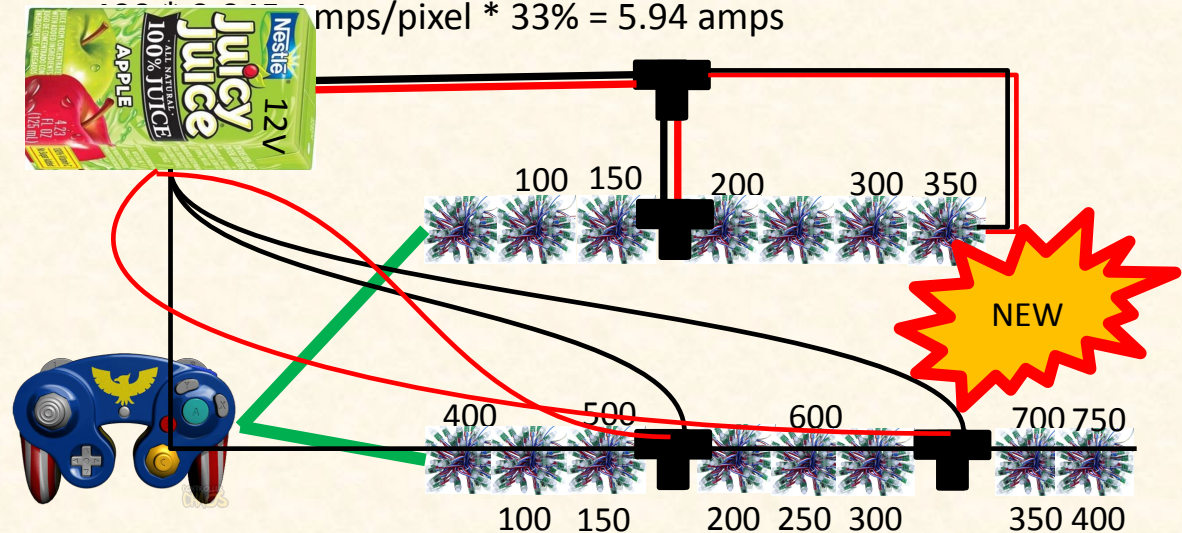
Indiana Christmas Mini 2025



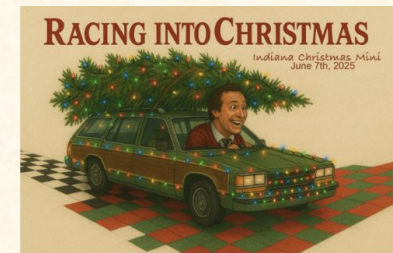
EFL Showstopper 46" Flake



- $750 \text{ pixels} * 0.045 \text{ Amps/pixel} = 33.75 \text{ amps} * 30\% = 10.125 \text{ amps}$
- $350 * 0.045 \text{ Amps/pixel} * 33\% = 5.19 \text{ amps}$
- $400 \text{ pixels} * 0.045 \text{ Amps/pixel} * 33\% = 5.94 \text{ amps}$



Indiana Christmas Mini 2025

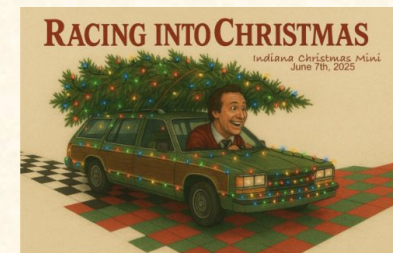


Failure Modes

- Can't connect – intermittent
- Lights don't go on at all
- Only some lights come on
- Wrong lights come on
- Lights are wrong color
- Lights are all white
- No Music – volume too low
- Lights are to the music, but messed up
- Whole part of the show is off
- Lights don't turn off
- Smoke/Fire
- Wrong Music



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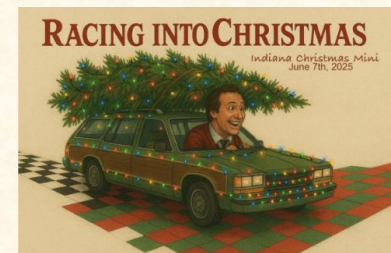


Pixel Common Solutions

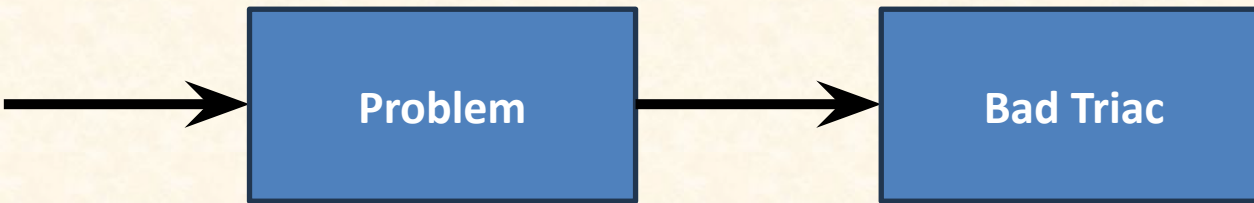
- Bad or dying pixel
- Low voltage (Power injection/balancing)
- Data Problem (famp)
- Controller Configuration
- xLights model



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LOR troubleshooting



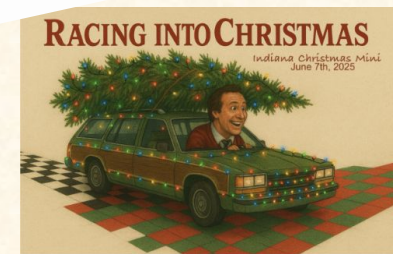
LOR is pretty solid
Either a bad triac (infamous) or
Strain on an RJ45 connector or
Blown fuse
Terminators



just
kidding

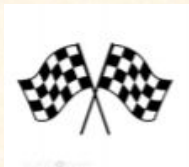


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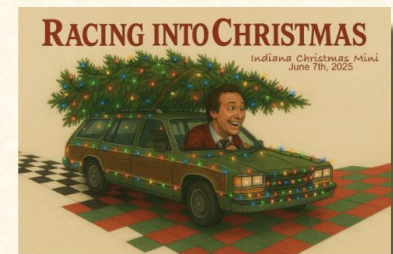


Troubleshooting Pixels

- Not coming on
- Flickering
- Wrong Color
- Stuck on
- On Fire/Smoking
- Noise
- Wrong port
- Power supply on 220



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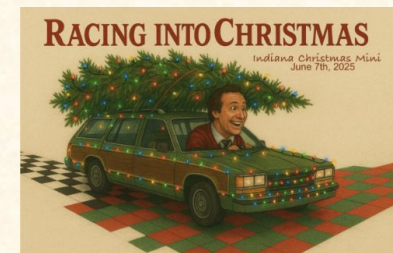


Characterize & Isolate

- Enhance your Calm
- Observe – What it is, what it is not
- Scientific Method
- Increasing Frequency?
 - HW Issue
 - Maybe cold solder
 - Corrosion



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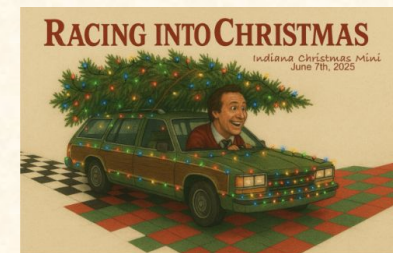


Diagnostics

- Ethernet testing
- Multimeter
 - Measure Voltage
 - Measure continuity
- Ftest – like a tricorder for pixels



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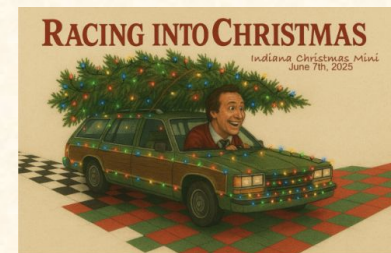


Installation Tips

- Keep “parts” low down
- Key high-up props, build in redundancy
- Test in advance
- Have spares (have friends)



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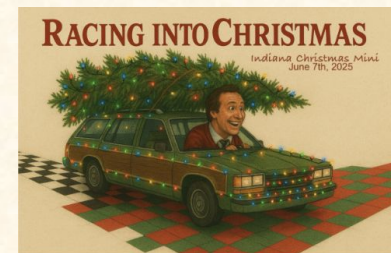


Testing

- Testing layout/models
- Test Ethernet
- Testing pixels
- Continuity on V+ and V-
- Measure voltage at start and end



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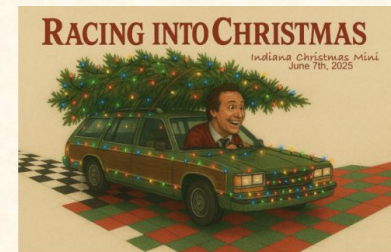


Scenarios

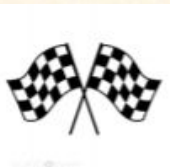
- Flicker to the music on tree trunks
- Transmitter interface on Mom's display
- Last Lights on Long/High String went out
- Lightning Strike
- Cactus lost pixels repeatedly



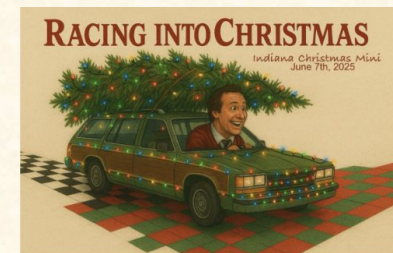
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Matrix Flickering



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LEFT TRUNK

32x19

Had to do custom xlights model

32/8 = 4

- L-FS1:1-4,61-68,125-132,189-196,253-260,315-322,377-384,437-444,501-508,565-572
- L-FS2:5-8, 57-72,121-136,185-200,249-264,311-326,373-388,433-448,497-512,561-576
- L-FS3:
- L-FS4:
- L-FS5:
- L-FS6:
- L-FS7:
- L-FS8:

600	537	536	473	472						288	225	224	161	160	97	96	33	32		
599	538	535	474	471				350	349	287	226	223	162	159	98	95	34	31		
598	539	534	475	470	411	410	351	348	289	286	227	222	163	158	99	94	35	30		
597	540	533	476	469	412	409	352	347	290	285	228	221	164	157	100	93	36	29		
596	541	532	477	468	413	408	353	346	291	284	229	220	165	156	101	92	37	28		
595	542	531	478	467	414	407	354	345	292	283	230	219	166	155	102	91	38	27		
594	543	530	479	466	415	406	355	344	293	282	231	218	167	154	103	90	39	26		
593	544	529	480	465	416	405	356	343	294	281	232	217	168	153	104	89	40	25		
592	545	528	481	464	417	404	357	342	295	280	233	216	169	152	105	88	41	24		
591	546	527	482	463	418	403	358	341	296	279	234	215	170	151	106	87	42	23		
590	547	526	483	462	419	402	359	340	297	278	235	214	171	150	107	86	43	22		
589	548	525	484	461	420	401	360	339	298	277	236	213	172	149	108	85	44	21		
588	549	524	485	460	421	400	361	338	299	276	237	212	173	148	109	84	45	20		
587	550	523	486	459	422	399	362	337	300	275	238	211	174	147	110	83	46	19		
586	551	522	487	458	423	398	363	336	301	274	239	210	175	146	111	82	47	18		
585	552	521	488	457	424	397	364	335	302	273	240	209	176	145	112	81	48	17		
584	553	520	489	456	425	396	365	334	303	272	241	208	177	144	113	80	49	16		
583	554	519	490	455	426	395	366	333	304	271	242	207	178	143	114	79	50	15		
582	555	518	491	454	427	394	367	332	305	270	243	206	179	142	115	78	51	14		
581	556	517	492	453	428	393	368	331	306	269	244	205	180	141	116	77	52	13		
580	557	516	493	452	429	392	369	330	307	268	245	204	181	140	117	76	53	12		
579	558	515	494	451	430	391	370	329	308	267	246	203	182	139	118	75	54	11		
578	559	514	495	450	431	390	371	328	309	266	247	202	183	138	119	74	55	10		
577	560	513	496	449	432	389	372	327	310	265	248	201	184	137	120	73	56	9		
576	561	512	497	448	433	388	373	326	311	264	249	200	185	136	121	72	57	8		
575	562	511	498	447	434	387	374	325	312	263	250	199	186	135	122	71	58	7		
574	563	510	499	446	435	386	375	324	313	262	251	198	187	134	123	70	59	6		
573	564	509	500	445	436	385	376	323	314	261	252	197	188	133	124	69	60	5		
572	565	508	501	444	437	384	377	322	315	260	253	196	189	132	125	68	61	4		
571	566	507	502	443	438	383	378	321	316	259	254	195	190	131	126	67	62	3		
570	567	506	503	442	439	382	379	320	317	258	255	194	191	130	127	66	63	2		
569	568	505	504	441	440	381	380	319	318	257	256	193	192	129	128	65	64	1		



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Right Trunk

$$32/8 = 4$$

L-FS1:

L-FS2:

L-FS3:

L-FS4:

L-FS5:

L-FS6:

L-FS7:

L-FS8:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
1	1	2	3	4	5	6	7	8	9	0	1	2	3	4	5	6	7	8	9	0		
2		END																				
3	x	600	537	536	x	x	x	x	353	352	289	288	225	224	161	160	97	96	33	32		
4	x	599	538	535					354	351	290	287	226	223	162	159	98	95	34	31		
5	x	598	539	534	475	474	415	414	355	350	291	286	227	222	163	158	99	94	35	30		
6	x	597	540	533	476	473	416	413	356	349	292	285	228	221	164	157	100	93	36	29		
7	x	596	541	532	477	472	417	412	357	348	293	284	229	220	165	156	101	92	37	28		
8	x	595	542	531	478	471	418	411	358	347	294	283	230	219	166	155	102	91	38	27		
9	x	594	543	530	479	470	419	410	359	346	295	282	231	218	167	154	103	90	39	26		
10	x	593	544	529	480	469	420	409	360	345	296	281	232	217	168	153	104	89	40	25		
11	x	592	545	528	481	468	421	408	361	344	297	280	233	216	169	152	105	88	41	24		
12	x	591	546	527	482	467	422	407	362	343	298	279	234	215	170	151	106	87	42	23		
13	x	590	547	526	483	466	423	406	363	342	299	278	235	214	171	150	107	86	43	22		
14	x	589	548	525	484	465	424	405	364	341	300	277	236	213	172	149	108	85	44	21		
15	x	588	549	524	485	464	425	404	365	340	301	276	237	212	173	148	109	84	45	20		
16	x	587	550	523	486	463	426	403	366	339	302	275	238	211	174	147	110	83	46	19		
17	x	586	551	522	487	462	427	402	367	338	303	274	239	210	175	146	111	82	47	18		
18	x	585	552	521	488	461	428	401	368	337	304	273	240	209	176	145	112	81	48	17		
19	x	584	553	520	489	460	429	400	369	336	305	272	241	208	177	144	113	80	49	16		
20	x	583	554	519	490	459	430	399	370	335	306	271	242	207	178	143	114	79	50	15		
21	x	582	555	518	491	458	431	398	371	334	307	270	243	206	179	142	115	78	51	14		
22	x	581	556	517	492	457	432	397	372	333	308	269	244	205	180	141	116	77	52	13		
23	x	580	557	516	493	456	433	396	373	332	309	268	245	204	181	140	117	76	53	12		
24	x	579	558	515	494	455	434	395	374	331	310	267	246	203	182	139	118	75	54	11		
25	x	578	559	514	495	454	435	394	375	330	311	266	247	202	183	138	119	74	55	10		
26	x	577	560	513	496	453	436	393	376	329	312	265	248	201	184	137	120	73	56	9		
27	x	576	561	512	497	452	437	392	377	328	313	264	249	200	185	136	121	72	57	8		
28	x	575	562	511	498	451	438	391	378	327	314	263	250	199	186	135	122	71	58	7		
29	x	574	563	510	499	450	439	390	379	326	315	262	251	198	187	134	123	70	59	6		
30	x	573	564	509	500	449	440	389	380	325	316	261	252	197	188	133	124	69	60	5		
31	x	572	565	508	501	448	441	388	381	324	317	260	253	196	189	132	125	68	61	4		
32	x	571	566	507	502	447	442	387	382	323	318	259	254	195	190	131	126	67	62	3		
33	x	570	567	506	503	446	443	386	383	322	319	258	255	194	191	130	127	66	63	2		
34	x	569	568	505	504	445	444	385	384	321	320	257	256	193	192	129	128	65	64	1	START	
35																						
36		U	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U	D	U		



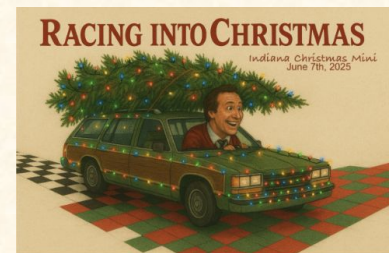
Indiana Christmas Mini 2025



LED AC Lights Flickering



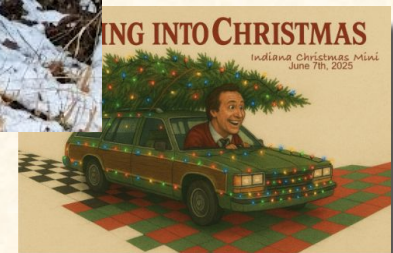
Indiana Christmas Mini 2025



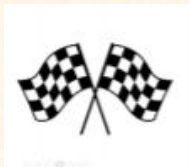
Scranton + 30 miles or so



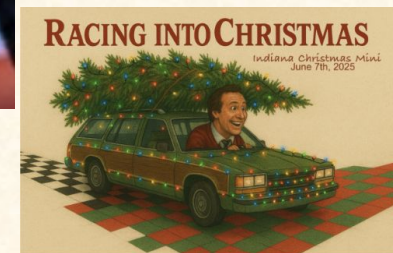
Indiana Christmas Mini 2025



Dad's Extension Cords



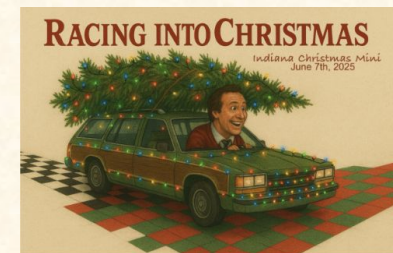
Indiana Christmas Mini 2025



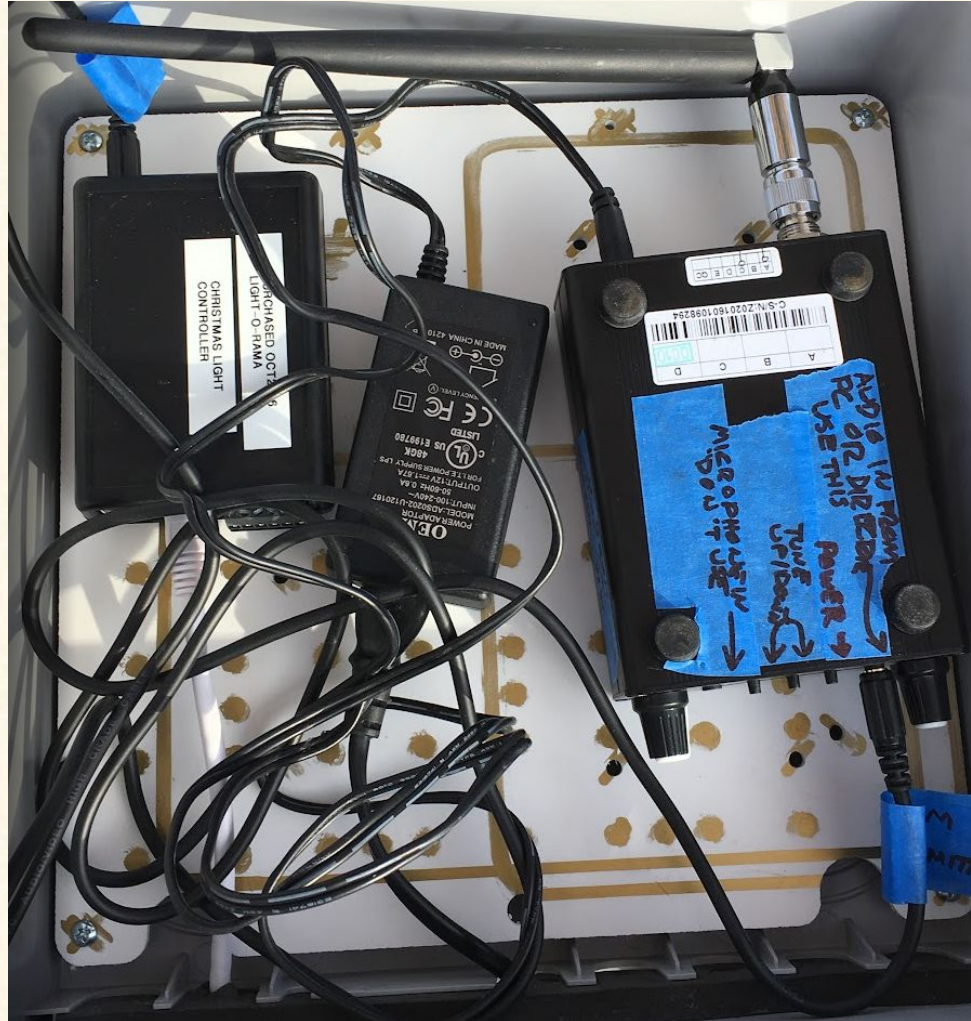
Not the most waterproof setup



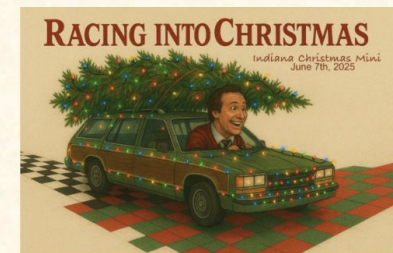
Indiana Christmas Mini 2025



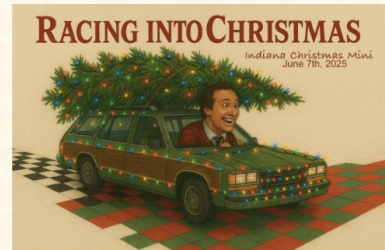
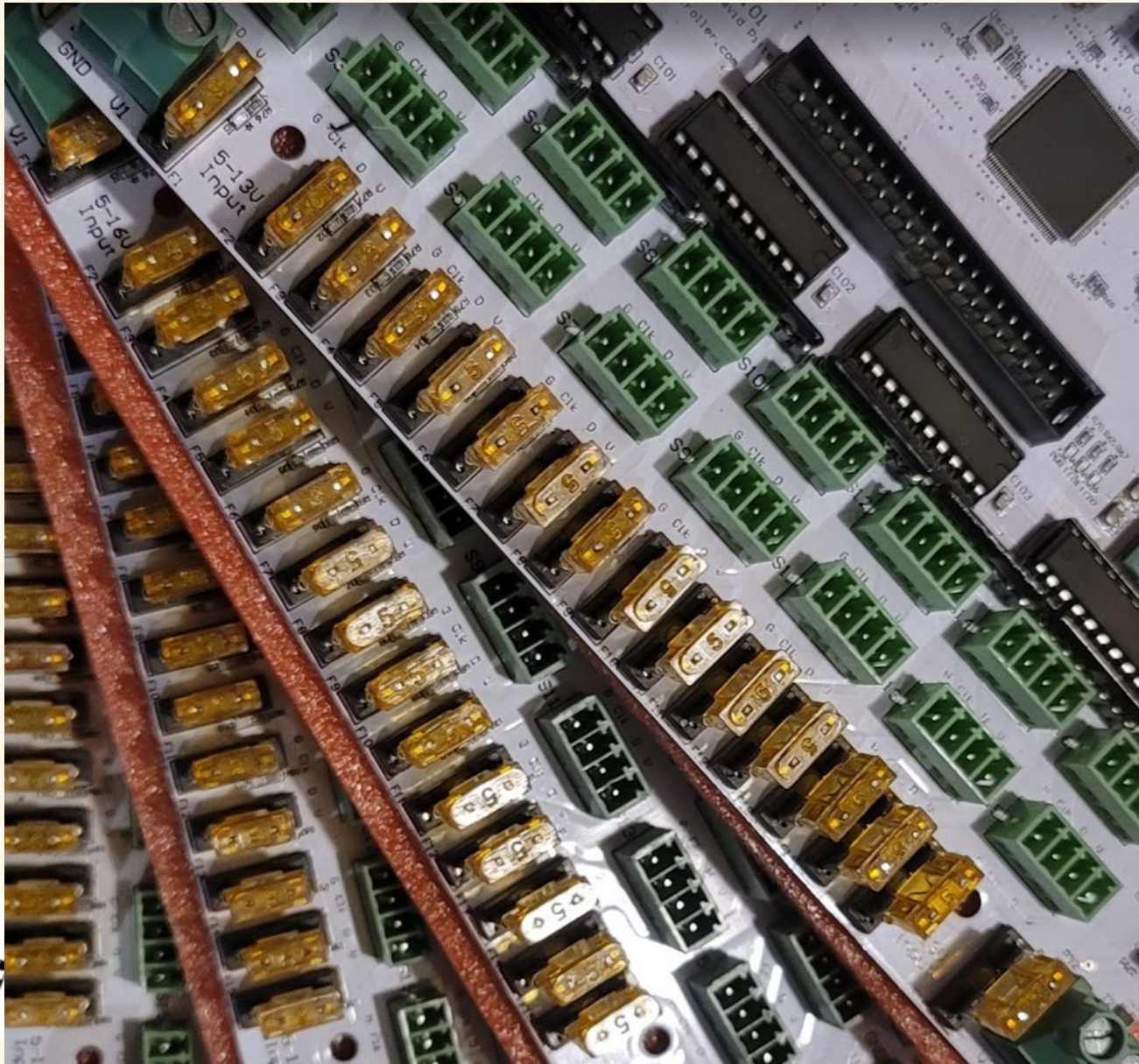
LOR with Mini-show director



Indiana Christmas Mini 2025

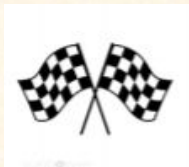


Lightning Strike

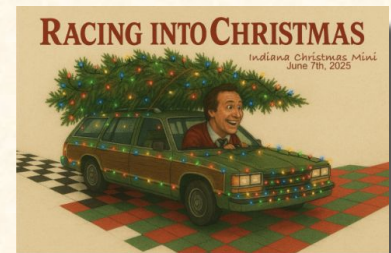


The following year...

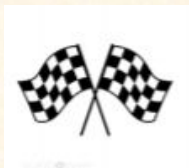
- Lost Ethernet ports on Falcon
- Lost String outputs
- Show starts up, runs for about 10 minutes, then whole controllers worth of lights go out.



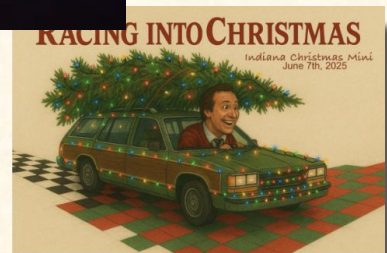
Indiana Christmas Mini 2025



Light Stuck On



Indiana Christmas Mini 2025



Pixel Icicle Lights 2023

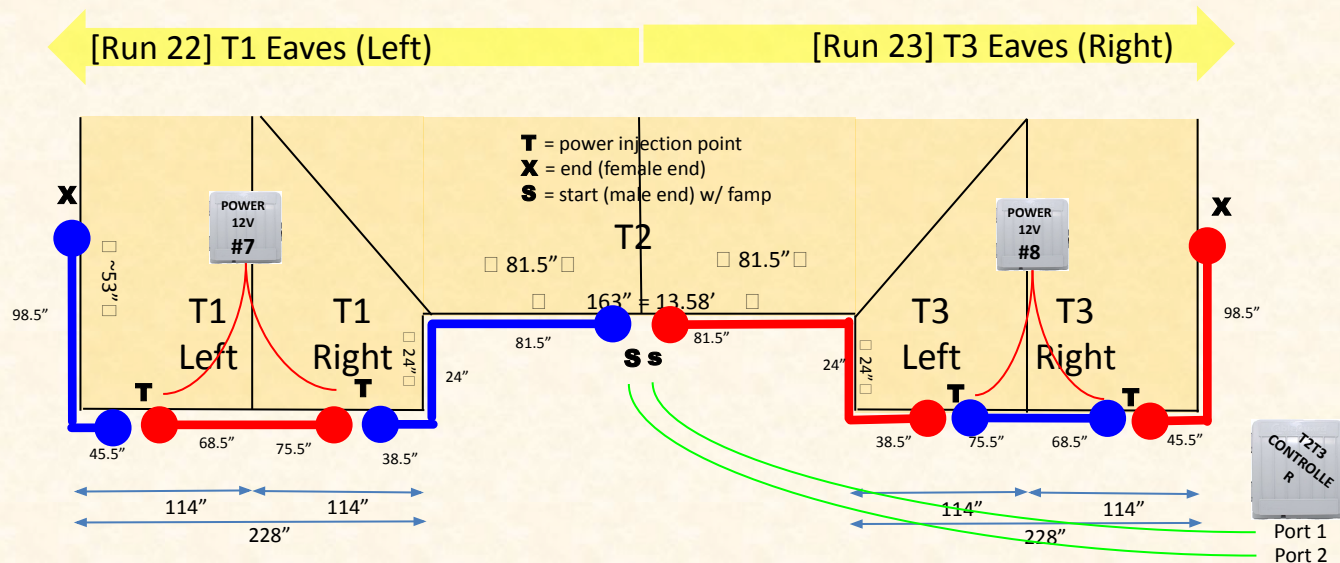
Foreach side:
 $81.5'' / 7.2''$ per drop = 11 drops
 12x5 pixels per drop = 55 pixels

$24'' / 7.2''$ per drop = 3 drops
 3 x 5 = 15 pixels

$114'' / 7.2''$ per drop = 16 drops
 16 drops x 5 per drop = 80 pixels

$114'' / 7.2''$ per drop = 16 drops
 16 drops x 5 per drop = 80 pixels

70 pixels for side of house.



Using Paul Zhang lights from 2020
 3 strands per side, 12' each = 36'
 $300/5 = 60$ covers per side

Every 7.2"



Use binder clips to secure wires to shingles every so often



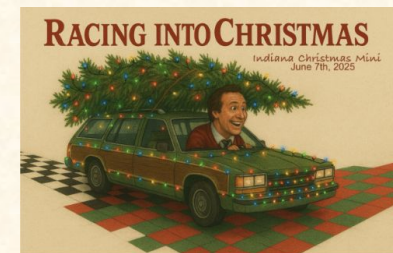
Indiana Christmas Mini 2025



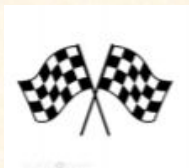
Its not a good time Cactus



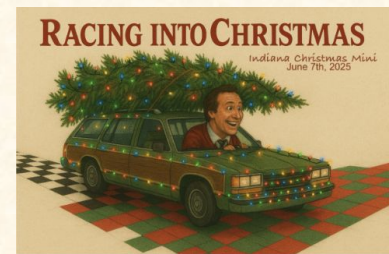
Indiana Christmas Mini 2025



Cactus



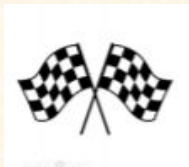
Indiana Christmas Mini 2025



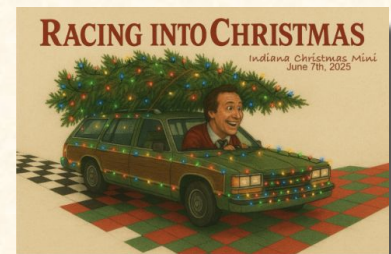
Pixel goes bad



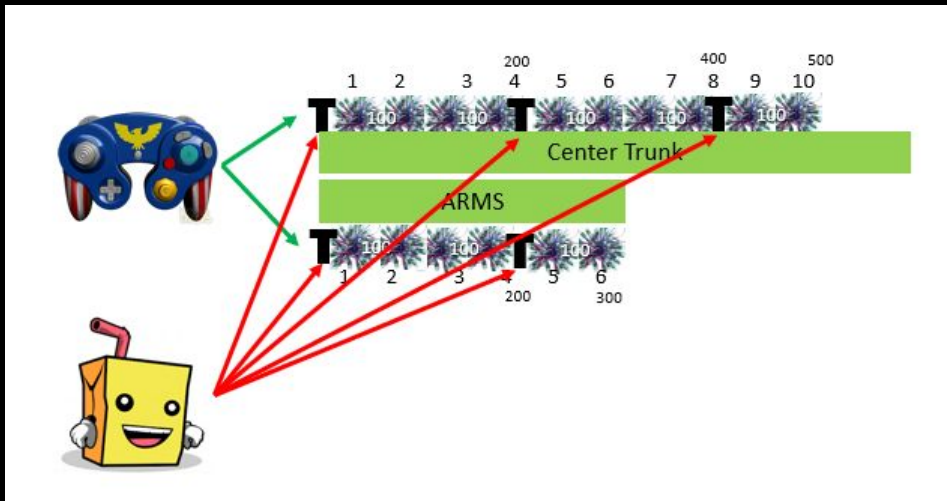
Pixel goes out taking whole arm of catus with it



Indiana Christmas Mini 2025



POWER PLANNING



483 trunk + 296 arm = 779 pixels
779 pixels / 50 pixels per string = 15.6 strings
15.6 strings * 3 amps per string = 46.8 amps
46.8 amps * 60% brightness = 28.08 amps

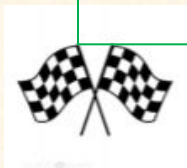
33 amp PSU – 28.08 amps
= 4.92 amps left over or a 15% buffer

2 Falcon ports will have data and V-
5 Power ports will have V+ and V-

Total nodes 776



Indiana Christmas Mini 2025



Indiana Christmas Mini 2025

