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OBSERVATORY

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**TORRENT
PARTS LIST
LOCAL CONTROL BOARD (LCB)**

**Dwg No.: TRNT-EL-04-4002 Rev: B
Next Assembly: TRNT-EL-04-0002**

LTR	DESCRIPTION	ECR	DATE	BY	APPRVD
OD	intital release		24-Mar-09	dms	mhunten, pmoore
-1	add C239 to item 23				
-2	Item 45 to right angle connector		28-May-09	dms	
-3	Add items see ECO for details	TRNT-003	29-Jul-09	DMS	
A	see ECO for details	TRNT-012	15-Oct-10	dms	PMOORE
A1	Item 60, change qty to 1 remove designators, R68, R69, R108, R109 - Designators are in note 5 as not installed		11-May-11	dms	pmoore
A2	Addition of D2, D3 item # 91, 94 additions to part markings tab, Item 46- add available part equivalent. Correction to note 5 change designator R66 to R68	TRNT-017	19-May-11	dms	pmoore
B	removed item 94, white wire, added JP1 to Note 5,	TRNT-024	8/9/2011	dms	pmoore

1. Components shall only be crossed to equivalent or improved performance parts.
2. All components are listed in the Materials tab
3. This board is rohs compliant, all rework shall be done on a rohs work station
4. If modifications are performed on this board, the cleaning process should be confined to the modified areas. Do not subject the board to any all-over cleaning processes.
5. The following components are not installed: R68, R69, R108, R109, JP1

ITEM	QTY	Value	RefDes	Part Number	MFR	Description
1	1			TRNT-EL-04-1002	NOAO	PCB, blank TORRENT Local Control Board (LCB)
2	1		U25	24AA128I/SN	Microchip	IC, SOIC8N EEPROM 128K CMOS serial
3	1		J3	87832-1420 (wo/cap)	Molex	Con, 14 pos 2mm ctr shrouded smt w/pegs
4	1		U30	ADR510ARTZ-REEL7	Analog Devices	IC, V Ref 1.0V precision low noise SOT23-3
5	5		U5, U8, U17, U29, U74	SN74ALVC244PWR	TI	IC, TSSOP20 Octal buffer/line driver w/3 st out
6	9	0.01uF	C1, C2, C4, C7, C248, C249, C250, C251, C254	GRM155R71H103KA88D	Murata Electronics	Cap, Cerc 0402 0.01uF 50V 10% X7R
7	20	0.1uF	C6, C8, C12, C16, C23, C33, C67, C69, C70, C136, C146, C150, C159, C194, C195, C206, C228, C234, C244, C247	GRM155R71C104KA88D	Murata Electronics	Cap, Cerc 0402 0.1uF 16V 10% X7R
8	1	1000pF	C34	ECJ-1VC1H102J	Panasonic	Cap, Cerc 0603 1000pF 50V 5% NPO
9						
10	1	120pF	C135	C0603C121J5GACTU	Kemet	Cap, Cerc 0603 120pF 50V 5% NPO
11	87	0.22uF	C24, C25, C26, C27, C28, C29, C31, C32, C35, C36, C38, C39, C40, C41, C43, C44, C45, C46, C47, C48, C49, C50, C57, C58, C59, C60, C84, C85, C86, C87, C88, C89, C91, C92, C93, C94, C96, C97, C99, C100, C101, C102, C104, C105, C118, C119, C121, C122, C123, C124, C126, C127, C129, C130, C131, C133, C134, C137, C138, C141, C142, C189, C196, C210, C212, C213, C214, C215, C216, C217, C220, C221, C222, C223, C224, C226, C227, C229, C230, C232, C233, C235, C236, C237, C238, C241, C242	0603ZC224KAT2A	AVX	Cap, cerc 0603 0.22uF 10V 10% X7R
12	1	68pF	C211	ECJ-1VC1H680J	Panasonic	Cap, Cerc 0603 68pf 50V 5% NPO
13	3	1uF	C68, C71, C179	GRM21BR71H105KA12L	Murata Electronics	Cap, Cerc 0805 1uF 50V 10% X7R
14	3	10uF	C98, C140, C219	GRM21BR71A106KE51L	Murata Electronics	Cap, Cerc 0805 10uF 10V 10% X7R
15	6	2.2uF	C42, C53, C246, C256, C259, C261	EEF-CD1C2R2R	Panasonic	Cap, AElect low ESR 7343-17 2.2uF 16V 20%
16						
17	20	47uF	C14, C19, C52, C55, C77, C78, C80, C110, C112, C115, C144, C148, C158, C160, C190, C193, C203, C204, C208, C218	EEF-CD0J470R	Panasonic	Cap, AElect SP 7343-18 47uF 6.3V 20%
18	3	56uF	C95, C132, C225	EEF-SL0J560R	Panasonic	Cap, AElect low ESR 7343-17 56uF 6.3V 20%
19	2	100uF	C18, C245	EEF-HD0J101R	Panasonic	Cap, 7343x28 100uF 6.3V Spec polymer 15 ohm 20%
20	5	330uF	C56, C82, C128, C153, C207	EEF-UE0D331R	Panasonic	Cap, AElect SP 7343-43 330uF 2V 20%
21	2	1uF	C64, C72	F931E105MAA	Nichicon	Cap, Tant 3216-18 1uF 25V 20% F93 SERIES size A

ITEM	QTY	Value	RefDes	Part Number	MFR	Description
22	3	10uF	C13, C15, C185	T491A106K010AT	Kemet	Cap, Tant 3216 10uF 10V 10% T491 SERIES size A L-ESR 4 ohm
23	3	47uF	C22, C239, C257	T491B476M010AT	Kemet	Cap, Tant 3528-21 47uF 10V 20% T491 SERIES
24	4		U75, U76, U77, U80	DS25BR110TSD/NOPB	National Semi	IC, LLP8 3.125 Gbps LVDS receiver Buffer with rec equalization
25	3		U78, U79, U81	DS25BR120TSD/NOPB	National Semi	IC, LLP8 3.125 Gbps LVDS driver Buffer with rec equalization
26	4		XA1J1, XA1J2, XA2J1, XA2J2	ERF8-050-05.0-S-DV	Samtec	Con, 100 position .8mm ctr edge rate socket vertical
27	1		J12	TMM-102-06-L-D	Samtec	Con, 4 pin 2mm pitch male pcb mnt header
28	1		J4	TSW-105-23-L-D 68602-110HLF	Samtec FCI/Berg	Header, 2x5 .1 center unshrouded
29	1		J7	FH12-60S-0.5SV(55)	Hirose	Con, FPC 60 pos vertical 1mm pitch
30	1	100uH	L2	MLF2012C101K	TDK	Inductor, 0805 100uH 10% 2mA multilayer shielded
31	7	Z=220	L1, L3, L4, L5, L6, L7, L9	BLM15HB221SN1D	Murata	Inductor, smt 0402 filter chip 220 ohm 250mA
32	1	10uH	L8	LOH2MCN100K02L	Murata	Inductor, chip coil 10uH 0806 10%
33	2	4.7uF	C258, C260	ECJ-2FF1C475Z	Panasonic	Cap, Cerc 0805 4.7uF 16V +80% / -20% F
34	1		U28	LMK03000ISQ/NOPB	National Semi	IC, LLP49 precision clock conditioner with integrated VCO
35	2	RED 0805	LED1, LED2	SML-LXT0805IW-TR	Lumex	LED, Thin 635nm Red Diff 0805 SMD
36	2		J5, J6	LS2-115-02-S-D-K	Samtec	Con, 2mm SMT 30 pin
37	1		P1	LS2-130-01-S-D-RA2	Samtec	Con, 2mm right angle through hole shroud up
38	1		U50	LT3080EMS8E#PBF	Linear Technology	IC, Regulator, MS8E adj 1.1A single resistor lo dropout
39	1		U54	LTC2801CDE#PBF	Linear Technologies	IC, 1.8V to 5.5V RS-232 Single transceiver
40	2		U20, U37	LTM4608EV#PBF	Linear Technology	IC, DC/DC uModule w/tracking 8A Freq sync,
41	1		U70	SN74LV123APWR	TI	IC, TSSOP16 Dual retrig monostable multivibrator
42	1		U60	MAX4172EUA+	Maxim	IC, current sense amp precision, high side
43	5		U9, U56, U83, U84, U86	MAX8516EUB+	Maxim	IC, Reg 1.425V - 3.6V, 1A 0.2V dropout LDO 10 pin
44	2		U26, U57	MCP9803-M/MS	Microchip	IC, MSOP8 2 wire accurate temp sensor
45	1		J11	IPL1-102-02-L-S-K	Samtec	Con, SMT 2 pos-header friction lock
46	1		U31	MT47H128M16HG-3A MT47H128M16RT-25E:C	Micron	IC, BGA84 DDR2 SDRAM 2Gbit, 16M x16 bit x 8 banks
47	5		Q1, Q2, Q3, Q4, Q5	NDS331N	Fairchild Semi	Transistor, SOT-23-3 MOSFET N Ch
48	4		U14, U23, U24, U67	NLSV2T244MUTAG	On Semiconductor	IC, 2 bit dual supply non inverting level translator
49	44		U6, U7, U10, U11, U12, U13, U15, U16, U18, U19, U21, U22, U32, U33, U34, U35, U36, U38, U39, U40, U41, U42, U44, U45, U46, U47, U48, U49, U51, U52, U53, U58, U59, U61, U62, U63, U64, U65, U66, U68, U69, U71, U72, U73	NLSX3014MUTAG	On Semiconductor	IC, 4 bit 100 Mb/s configurable dual supply level translator

ITEM	QTY	Value	RefDes	Part Number	MFR	Description
50	1	106.25MHz	Y1	EG-2102CA 106.2500M-PGPNL3	Epson	Osc, SMT106.25MHz low jitter SAW 3.3V
51	10	182	R29, R30, R33, R34, R35, R36, R66, R145, R147, R148	ERJ-2RKF1820X	Panasonic	Resistor, 0402 1/10W 1% 182
52	15	100	R31, R32, R37, R50, R51, R52, R53, R54, R82, R83, R84, R88, R89, R146, R149	RC0402FR-07100RL	Yageo	Res, 0402 1/16W 1% 100 ohm
53	6	1.21K	R97, R98, R99, R101, R103, R104	ERJ-2RKF1211X	Yageo	Resistor, 0402 1% 1/10W 1.21K
54	6	169K	R39, R41, R42, R44, R45, R47	ERJ-2RKF1693X	Panasonic	Res, 0402 1% 1/10W 169K
55	1	26.1K	R144	ERJ-3EKF2612V	Panasonic	Resistor, 0603 1/10W 1% 26.1K
56	1	2.21K	R24	ERJ-2RKF2211X	Panasonic	Res, 0402 1/10W 1% 2.21K
57	19	4.99K	R1, R7, R18, R21, R26, R38, R40, R43, R46, R48, R49, R64, R67, R91, R106, R111, R112, R113, R116	ERJ-2RKF4991X CRCW04024K99FKED	Panasonic Dale/ Vishay	Res, 0402 1/16W 1% 4.99K
58	4	49.9K	R19, R20, R63, R65	RC0402FR-0749K9L	Yageo	Res, 0402 49.9K ohm 1/16W 1%
59	5	8.06K	R2, R6, R110, R114, R115	ERJ-2RKF8061X	Panasonic	Res, 0402 8.06K ohm 1/16W 1%
60	1	0	R120	RC0603JR-070RL	Yageo	Resistor, 0603 0 ohm 1/16W 5%
61						
62	8	10	R55, R56, R57, R58, R59, R60, R61, R62	ERJ-3EKF10R0V	Panasonic	Resistor, 0603 1/16W 1% 10
63	1	49.9	R90	ERJ-3EKF49R9V	Panasonic	Resistor, 0603 49.9 1/10W 1%
64	2	1.0K	R74, R75	ERJ-3EKF1001V	Panasonic	Resistor, 0603 1.0K 1/10W 1%
65	28	10.0K	R3, R4, R5, R8, R9, R10, R11, R12, R13, R14, R16, R27, R28, R70, R72, R85, R86, R87, R92, R95, R96, R100, R107, R121, R122, R123, R125, R143	RC0603FR-0710K1L ERJ-3EKF1002V	Yageo Panasonic	Resistor, 0603 1/10W 1% 10.0K
66	1	14.0K	R93	RC0603FR-0714K1L	Yageo	Resistor, 0603 14.0K 1/10W 1%
67	1	14.7K	R94	RC0603FR-0714K7L	Yageo Panasonic	Resistor, 0603 14.7K 1/10W 1%
68	4	150	R22, R102, R117, R118	ERJ-3EKF1500V	Panasonic	Resistor, 0603 150 1/10W 1%
69	2	1.5K	R17, R23	RC0603FR-071K5L	Yageo	Resistor, 0603 1.5K 1/10W 1%
70	3	40.2K	R15, R124, R126	RC0603FR-0740K2L ERJ-3EKF4022V	Yageo Panasonic	Resistor, 0603 40.2K 1/10W 1%
71	7	4.7K	R73, R76, R77, R78, R79, R80, R81	RC0603FR-074K7L	Yageo	Resistor, 0603 4.7K 1/10W 1%
72	1	4.87K	R71	RC0603FR-074K87L	Yageo	Resistor, 0603 4.87K 1/10W 1%
73	1	.015	R25	ERJ-6BWF015V WSL0805R0150FEA18	Panasonic Dale/ Vishay	Resistor, 0805 0.015 ohms 1/4W 1%
74	3	47	RN1, RN2, RN3	741X163470JP EXB2HV470JV	CTS Corp Panasonic	Resistor, network isolated 8 resistors 47 ohm convex
75	1		U55	SCAN90CP02VY/NOPB	National Semi	IC, LQFP 32 1.5Gbps 2x2 LVDS Switch w/pre emphasis and IEEE 1149.6
76	1		J10	74441-0001 74441-5001	Molex Molex obs #	Con, SFP RCP 20 pos .8mm RA smd
77	1		(J10)	74754-0101	Molex	EMI Cage for J10 SFP connector
78	1		SW1	KSC321JLFS	C & K components	Switch, momentary tact smt switch sealed
79	2	RJ47	J8, J9	TM11R-5M2-88-LP	Hirose	Con, CAT5e right angle pcb jack w/optical pipe

ITEM	QTY	Value	RefDes	Part Number	MFR	Description
80	16		TP1, TP2, TP3, TP4, TP5, TP7, TP9, TP10, TP11, TP12, TP13, TP14, TP17, TP18, TP19, TP20	TP-108-02-1-T	Components Corp	Test point , smt trapazoid low profile
81	4		TP6, TP8, TP15, TP16	TP-105-01-02	Components Corp	Test point, red .1 center wire form loop
82	5		U1, U2, U3, U4, U85	TPD4S009DBVR	TI	IC, SOT23-6 4 CH ESD protection differential interface
83	86	0.1uF	C3, C5, C9, C10, C11, C17, C20, C21, C37, C51, C54, C61, C62, C63, C65, C66, C73, C74, C75, C76, C79, C81, C83, C90, C103, C106, C107, C108, C109, C111, C113, C114, C116, C117, C120, C139, C143, C145, C147, C149, C151, C152, C154, C155, C156, C157, C161, C162, C163, C164, C165, C166 C167, C168, C169, C170, C171, C172, C173, C174, C175, C176, C177, C178, C180, C181, C182, C183, C184, C186, C187, C188, C191, C192, C197, C198 C199, C200, C201, C202, C205, C209, C240, C243, C252, C253	CX0603MRX7R6BB104 100X14W104MV4T	Yageo Johanson	Cap, Cerc X2Y 0.1uF 10V 20% X7R 0603
84	1		U27	XC5VLX50T-1FFG1136C	Xilinx	IC, FPGA Virtex 5
85	1		U43	XCF32PVOG48C	Xilinx	IC, TSOP48 flash in system programmable configuration PROM
86	1		D1	ZHCS500TA	Zetex	Diode, SOT-23 high current silicon, schottky barrier diode 40V 500mA
87	1		U82	DS28CM00R-A00+	Maxim	IC, +5V Precision V ref / Temp Transducer
88	1		J13	22-23-2021	Molex	Con, 2 pos strt header friction lock
89	16	1.47K	R127, R128, R129, R130, R131, R132, R133, R134, R135, R136, R137, R138, R139, R140, R141, R142	ERJ-3EKF1471V	Panasonic	Resistor, 0603 1/10W 1% 1.47K
90	2		NA (NOAO TO APPLY)	88087	Seton	Sticker ROHS compliant
91	2		D2, D3	BAT54CTA	Diodes/zetex	Diode, SOT-23, array common cath
92	2	5600pF	C30, C255	ECJ-1VB1H562K	Panasonic	Cap, Cerc 0603 50V 10% X7R 5600pF
93	1	3.65K	R119	ERJ-3EKF3651V	Panasonic	Resistor, 0603 1% 1/10W 3.65K ohm
	551					

Part Number	Package Markings	MFR	Description	COMMENTS
EEF-HDOJ101R	100	Panasonic	Cap, 7343x28 100uF 6.3V Spec polymer 15 ohm 20%	
EEF-CD1C2R2R	225	Panasonic	Cap, AElect low ESR 7343-17 2.2uF 16V 20%	
EEF-CD1C4R7R	475	Panasonic	Cap, AElect low ESR 7343-17 4.7uF 16V 20%	
EEF-SLOJ560R	566	Panasonic	Cap, AElect low ESR 7343-17 56uF 6.3V 20%	
EEF-UEOD331R	337	Panasonic	Cap, AElect SP 7343-43 330uF 2V 20%	
1N4148W-7-F	T4	Diodes, Inc.	Diode, SOD-123 fast switching	
ZHCS500TA	ZS5	Diodes/Zetex	Diode, SOT-23 high current silicon, schottky barrier diode 40V 500mA	
BAT54CTA	KL3 L43	Diodes/zetex Fairchild	Diode, SOT-23, array common cath	
ADR510ARTZ-REEL7	RAA#	Analog Devices	IC, V Ref 1.0V precision low noise SOT23-3	
LT3080EMS8E#PBF	LTCBM	Linear Technology	IC, Regulator, adj 1.1A single resistor lo dropout	
LTM4608EV#PBF	LTM4608V	Linear Technology	IC, DC/DC uModule w/tracking 8A Freq sync,	
LTC2801CDE#PBF	2801	Linear Technoolgies	IC, 1.8V to 5.5V RS-232 Single transceiver	
DS28CM00R-A00+		Maxim	IC, +5V Precision V ref / Temp Transducer	
MAX4172EUA+	4172 EUA	Maxim	IC, current sense amp precision, high side	
MAX8516EUB+	AAAH	Maxim	IC, Reg 1.425V - 3.6V, 1A 0.2V dropout LDO 10 pin	
24AA128I/SN		Microchip	IC, SOIC8N EEPROM 128K CMOS serial	
MCP9803-M/MS	9803M	Microchip	IC, MSOP8 2 wire accurate temp sensor	
MT47H128M16HG-3A MT47H128M16RT-25E:C	D9JJB D9MVD	Micron	IC, BGA84 DDR2 SDRAM 2Gbit, 16M x16 bit x 8 banks	
DS25BR110TSD/NOPB	2R110	National Semi	IC, LLP8 3.125 Gbps LVDS receiver Buffer with rec equalization	
DS25BR120TSD/NOPB	2R120	National Semi	IC, LLP8 3.125 Gbps LVDS driver Buffer with rec equalization	
LMK030001SQ/NOPB	K030001	National Semi	IC, LLP49 precision clock conditioner with integrated VCO	
SCAN90CP02VY/NOPB	SCAN90 CP02VY	National Semi	IC, LQFP 32 1.5Gbps 2x2 LVDS Switch w/pre emphasis and IEEE 1149.6	
NLSV2T244MUTAG	UP?	On Semiconductor	IC, 2 bit dual supply non inverting level translator	? = date code
NLSX3014MUTAG	UT?	On Semiconductor	IC, 4 bit 100 Mb/s configurable dual supply level translator	? = date code
SN74ALVC244PWR	VA244	TI	IC, TSSOP20 Octal buffer/line driver w/3 st out	
SN74LV123APWR	LV123A	TI	IC, TSSOP16 Dual retrig monostable multivibrator	
TPD4S009DBVR	NFJK	TI	IC, SOT23-6 4 CH ESD protection differential interface	
XC5VLX50T-1FFG1136C		Xilinx	IC, FPGA Virtex 5	
XCF32PVOG48C	XCF32PVOG48	Xilinx	IC, TSOP48 flash in system programmable configuration PROM	
EG-2102CA 106.2500M-PGPNL3	EEG-2102 106.250P	Epson	Osc, SMT106.25MHz low jitter SAW 3.3V	
741X083470JP	470	CTS Corp	Resistor, network bussed 8 resistors 47 ohm concave	
NDS331N		Fairchild Semi	Transistor, SOT-23-3 MOSFET N Ch	