Battery Balancer - Relay Board

comp#	description	part#	page#	qty	holes	total holes	area	total area	lead spacing	labor	total labor	part$	total part $
D1-8	diode, 50v 1amp	Taitron 1N4004 (35991)	j.26	8	2	16	0.075	0.600	0.500	0.250	2	0.040	0.32
F1-9	fuse, 30amp ATO	Littelfuse 257 (3619-FU)	p.57	9	0	0	0.313	2.813	offboard	0.250	2.25	0.150	1.35
F1-9a,b	fuseholder clips, ATO, 30amp	Zierick 1022	z	18	2	36	0.070	1.262	0.200	0.250	4.5	0.180	3.24
	or 20amp	Keystone (534-3522)	m.189										
J1-13	#10-32 x 1/2" brass screw	Sartell Hardware		13	1	13	0.110	1.435	drawing	0.100	1.3	0.075	0.98
J1-13n	#10-32 brass nut (2 per screw)	Sartell Hardware		26						0.250	6.5	0.050	1.30
K1-8	relay, DPST, 30a contacts, 12vdc coil	P&B T92S7D12-12 (PB481-ND)	d.760	8	12	96	3.672	29.376	drawing	1.000	8.000	8.070	64.56
		or Am.Zettler AZ2850-2A-12DE	cds										
P1	DB9, male, vertical PC mount	Jameco DB9PPCB (111691)	j.84	1	11	11	0.599	0.599	drawing	1.000	1	0.490	0.49
P1j	jackscrew for J29, #4-40, 0.515"male, 0.	Jameco (108986)	j.84	2	0	0	0.000	0.000		1.000	2	0.490	0.98
P1n	nut for J29, #4-40	Jameco (40942)	j.97	6	0	0	0.000	0.000		1.000	6	0.018	0.11
P1w	lockwasher for J29, #4	Jameco (40977)	j.97	6	0	0	0.000	0.000		1.000	6	0.025	0.15
	misc. holes (mounting)				6	6	0.049	0.294					
PCB:	0.062" FR4, 2-sided, with silkscreen			1									79.10
	Total number of components			97									
	Total number of holes					178							
	Total component area							36.38	sq.in.				
	Actual board size			12	" by	3.5	" =	42.00	sq.in.				
	Total material cost												**$152.57**
Labor:	total preform and hand assemble	(	$0.25	for easy parts,			$1.00	for hard parts)			29.50		
	solder, touch-up, and visual inspect										10.00		
	test										10.00		
	Total labor cost												**$49.50**
Total Material and Labor cost													**$202.07**
Estimated cost of materials and labor to build Battery Balancer Relay boards.											by:	Lee A. Hart	
Part costs are prices from respective supplier's catalogs.											date:	Aug 15, 2002	
In Page# column; d# is Digikey catalog #T013, m# is Mouser catalog #611, p# is Marlin P. Jones catalog 02-07,											file:	BRELAY.XLS	
	j# is Jameco catalog #223, cds is CDS/Nedco, z is Zierick Mfg.												