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Design Data for m-Derived Type Filters

PART VI

By the Engineering Department, Aerovox Corporation

THE CIRCUIT Components Chart accompanying this article lists all inductance and capacitance values for shunt-derived band-pass filters for twenty-three common mid-frequencies from 100 cycles to 10 megacycles and twelve bandwidths from 0.05 to 0.9. These values for circuit components may be taken directly from the chart and require no further computation. All L values are in henries; all C values in microfarads. A similar table of circuit component values for series-derived band-pass filters appeared in Part IV of this series (*Aerovox Research Worker,* February 1943).

The component values have been calculated for a characteristic impedance of 500 ohms. However, values for mid-frequencies and characteristic impedances other than those given in the chart may be obtained by interpolation, all component values being inversely proportional to the mid-frequencies. The inductance values are directly proportional and the capacitance values inversely proportional to the characteristic impedance. In determining the new values, locate first (on the chart accompanying this article) the L and C values corresponding to 500 ohms impedance. The values corresponding to a desired new impedance of R ohms will then be equal to the 500-ohm inductance multiplied by R/500, and the 500-ohm capacitance divided by R/500.

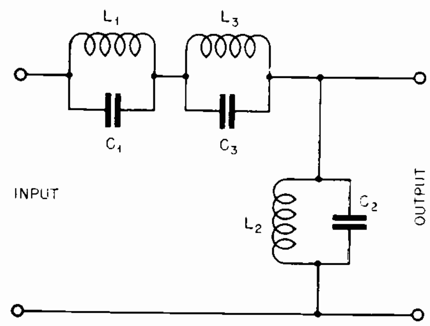

FIG. 10

The Circuit Components Chart accompanying this article may be used in conjunction with the band-pass frequency data chart which appeared in Part III, January 1943, of this series, to determine the three L and C values for shunt-derived sections. For example: employing both charts, it is found that a section with 1000-cycle mid-frequency and 0.05 bandwidth has upper and lower cut-off frequencies of 1025 and 975 cycles, respectively, and upper and lower infinite attenuation frequencies of 1076 and 926 cycles respectively. The components required for this section are: L_1 30.2 millihenries, L_2 20.9 m.h., L_3 35 m.h., C_1 0.723 mfd., C_2 12.06 mfd., and C_3 0.836 mfd.

A section with the same mid-frequency (1000 cycles) but with a considerably wider pass band might have a bandwidth of 0.5. Here the upper and lower cut-off frequencies (see Chart I, Part III) are 1281 and 781 cycles respectively, and the upper and lower infinite attenuation frequencies 1345 and 742 cycles respectively. The components required (see chart in this article) are L_1 22 m.h., L_2 36.8 m.h., L_3 39.8 m.h., C_1 0.636 mfd., C_2 0.686 mfd., and C_3 1.149 mfd.

Circuit diagram of the shunt-derived band-pass filter section is given in Figure 10.

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BUILT BETTER CONDENSERS AND RESISTORS

CHART 4 — Shunt-Derived Band-Pass Filters (R=500 Ohms)

Band Width		f_m=100	1000	1500	2000	2500	3000	3500	4000	4500	5000	5500	6000
0.05	L_1	0.3021	0.0302	0.0201	0.01510	0.01208	0.01007	0.00863	0.00755	0.00671	0.00604	0.00549	0.00504
	L_2	0.0209	0.00209	0.001392	0.001045	0.000836	0.000697	0.000597	0.000523	0.000464	0.000418	0.000380	0.000348
	L_3	0.3498	0.0350	0.0233	0.01749	0.01400	0.01166	0.00999	0.00875	0.00777	0.00700	0.00636	0.00584
	C_1	7.234	0.723	0.482	0.362	0.289	0.241	0.207	0.1809	0.1607	0.1447	0.1316	0.1206
	C_2	120.65	12.06	8.04	6.03	4.83	4.04	3.45	3.02	2.68	2.41	2.19	2.01
	C_3	8.358	0.836	0.557	0.418	0.334	0.279	0.239	0.209	0.1856	0.1672	0.1519	0.1392
0.1	L_1	0.2162	0.0216	0.01441	0.01081	0.00864	0.00720	0.00618	0.00540	0.00480	0.00432	0.00393	0.00360
	L_2	0.0473	0.00473	0.00315	0.00236	0.001892	0.001576	0.001351	0.001182	0.001051	0.000946	0.000860	0.000788
	L_3	0.2671	0.0267	0.01780	0.01336	0.01069	0.00891	0.00763	0.00668	0.00594	0.00534	0.00485	0.00445
	C_1	9.464	0.946	0.631	0.473	0.378	0.315	0.270	0.237	0.210	0.1892	0.1721	0.1578
	C_2	53.508	5.35	3.57	2.68	2.14	1.783	1.527	1.338	1.188	1.070	0.973	0.892
	C_3	11.691	1.169	0.779	0.585	0.468	0.390	0.334	0.292	0.260	0.234	0.213	0.1950
0.15	L_1	0.2247	0.0225	0.01498	0.01124	0.00899	0.00749	0.00642	0.00562	0.00499	0.00450	0.00408	0.00374
	L_2	0.0766	0.00766	0.00510	0.00383	0.00306	0.00255	0.00219	0.001915	0.001702	0.001532	0.001392	0.001276
	L_3	0.2798	0.0280	0.01865	0.01399	0.01119	0.00933	0.00800	0.00700	0.00622	0.00560	0.00509	0.00466
	C_1	9.053	0.905	0.604	0.453	0.362	0.302	0.259	0.226	0.201	0.1811	0.1646	0.1508
	C_2	33.072	3.31	2.20	1.654	1.323	1.102	0.945	0.827	0.735	0.661	0.601	0.551
	C_3	11.274	1.127	0.752	0.564	0.451	0.376	0.322	0.282	0.250	0.225	0.205	0.1879
0.2	L_1	0.1934	0.01934	0.01289	0.00967	0.00774	0.00645	0.00553	0.00484	0.00430	0.00387	0.00352	0.00322
	L_2	0.1105	0.01105	0.00737	0.00552	0.00442	0.00368	0.00316	0.00276	0.00245	0.00221	0.00201	0.001842
	L_3	0.2571	0.0257	0.01714	0.01286	0.01028	0.00857	0.00734	0.00643	0.00571	0.00514	0.00467	0.00428
	C_1	9.845	0.984	0.656	0.492	0.394	0.328	0.281	0.246	0.219	0.1968	0.1789	0.1640
	C_2	22.896	2.29	1.526	1.145	0.916	0.763	0.654	0.572	0.509	0.458	0.416	0.382
	C_3	13.086	1.309	0.872	0.654	0.523	0.436	0.374	0.327	0.291	0.262	0.238	0.218
0.25	L_1	0.2287	0.0229	0.01525	0.01144	0.00916	0.00763	0.00654	0.00572	0.00509	0.00458	0.00416	0.00382
	L_2	0.1401	0.01401	0.00934	0.00700	0.00560	0.00467	0.00400	0.00350	0.00312	0.00280	0.00255	0.00234
	L_3	0.3242	0.0324	0.0216	0.01621	0.01296	0.01080	0.00927	0.00811	0.00720	0.00648	0.00589	0.00540
	C_1	7.821	0.782	0.521	0.391	0.313	0.261	0.223	0.1955	0.1737	0.1564	0.1422	0.1303
	C_2	18.105	1.810	1.207	0.905	0.724	0.604	0.517	0.452	0.402	0.362	0.329	0.302
	C_3	11.084	1.108	0.739	0.554	0.443	0.370	0.317	0.277	0.246	0.222	0.202	0.1847
0.3	L_1	0.2326	0.0233	0.01551	0.01163	0.00930	0.00775	0.00664	0.00581	0.00517	0.00465	0.00423	0.00388
	L_2	0.1750	0.01750	0.01167	0.00875	0.00700	0.00583	0.00500	0.00438	0.00389	0.00350	0.00318	0.00292
	L_3	0.3473	0.0347	0.0232	0.01736	0.01390	0.01158	0.00993	0.00868	0.00772	0.00694	0.00632	0.00579
	C_1	7.293	0.729	0.486	0.365	0.292	0.243	0.208	0.1824	0.1621	0.1458	0.1326	0.1216
	C_2	14.416	1.442	0.961	0.721	0.576	0.481	0.412	0.360	0.320	0.288	0.262	0.240
	C_3	10.889	1.089	0.726	0.544	0.436	0.363	0.311	0.272	0.242	0.218	0.1980	0.1815
0.4	L_1	0.2213	0.0221	0.01475	0.01106	0.00885	0.00738	0.00632	0.00553	0.00492	0.00442	0.00402	0.00369
	L_2	0.2694	0.0269	0.01795	0.01347	0.01077	0.00898	0.00770	0.00674	0.00599	0.00539	0.00490	0.00449
	L_3	0.3629	0.0363	0.0242	0.01815	0.01452	0.01210	0.01037	0.00907	0.00806	0.00726	0.00660	0.00605
	C_1	6.981	0.698	0.465	0.349	0.279	0.233	0.1993	0.1745	0.1550	0.1396	0.1268	0.1163
	C_2	9.381	0.938	0.625	0.469	0.375	0.312	0.268	0.234	0.208	0.1875	0.1705	0.1562
	C_3	11.453	1.145	0.763	0.572	0.458	0.382	0.327	0.286	0.254	0.229	0.208	0.1908
0.5	L_1	0.2204	0.0220	0.01470	0.01102	0.00882	0.00735	0.00630	0.00551	0.00490	0.00441	0.00401	0.00367
	L_2	0.3685	0.0368	0.0245	0.01842	0.01475	0.01228	0.01053	0.00922	0.00819	0.00737	0.00670	0.00614
	L_3	0.3978	0.0398	0.0265	0.01989	0.01592	0.01326	0.01136	0.00995	0.00884	0.00796	0.00723	0.00663
	C_1	6.362	0.636	0.424	0.318	0.255	0.212	0.1817	0.1591	0.1414	0.1272	0.1157	0.1060
	C_2	6.858	0.686	0.457	0.343	0.274	0.228	0.1960	0.1715	0.1525	0.1372	0.1247	0.1143
	C_3	11.486	1.149	0.766	0.574	0.460	0.383	0.328	0.287	0.255	0.230	0.209	0.1915
0.6	L_1	0.2266	0.0227	0.01510	0.01133	0.00907	0.00756	0.00648	0.00567	0.00504	0.00453	0.00412	0.00378
	L_2	0.4596	0.0460	0.0306	0.0230	0.01837	0.01532	0.01312	0.01148	0.01021	0.00919	0.00836	0.00766
	L_3	0.4505	0.0450	0.0300	0.0225	0.01802	0.01502	0.01287	0.01126	0.01001	0.00901	0.00820	0.00751
	C_1	5.617	0.562	0.375	0.281	0.225	0.1873	0.1605	0.1404	0.1247	0.1123	0.1022	0.0937
	C_2	5.512	0.551	0.367	0.276	0.220	0.1836	0.1575	0.1377	0.1224	0.1102	0.1002	0.0918
	C_3	11.164	1.116	0.744	0.558	0.446	0.372	0.319	0.279	0.248	0.223	0.203	0.1860
0.7	L_1	0.2352	0.0235	0.01568	0.01176	0.00941	0.00784	0.00672	0.00588	0.00523	0.00470	0.00428	0.00392
	L_2	0.5470	0.0547	0.0365	0.0274	0.0219	0.01823	0.01562	0.01367	0.01215	0.01094	0.00995	0.00912
	L_3	0.2953	0.0295	0.01970	0.01476	0.01182	0.00985	0.00844	0.00738	0.00656	0.00591	0.00537	0.00492
	C_1	4.889	0.489	0.326	0.244	0.1955	0.1629	0.1396	0.1222	0.1086	0.0978	0.0889	0.0815
	C_2	4.636	0.464	0.309	0.232	0.1853	0.1545	0.1324	0.1157	0.1030	0.0927	0.0842	0.0772
	C_3	10.714	1.071	0.714	0.536	0.428	0.357	0.306	0.268	0.238	0.214	0.1948	0.1786
0.8	L_1	0.2155	0.0216	0.01436	0.01078	0.00862	0.00718	0.00616	0.00539	0.00479	0.00431	0.00392	0.00359
	L_2	0.7066	0.0707	0.0471	0.0353	0.0283	0.0235	0.0202	0.01766	0.01571	0.01414	0.01286	0.01178
	L_3	0.5178	0.0518	0.0345	0.0259	0.0207	0.01726	0.01478	0.01295	0.01150	0.01035	0.00942	0.00863
	C_1	4.880	0.488	0.325	0.244	0.1950	0.1626	0.1394	0.1220	0.1083	0.0975	0.0887	0.0813
	C_2	3.582	0.358	0.239	0.1791	0.1432	0.1193	0.1023	0.0895	0.0796	0.0716	0.0652	0.0597
	C_3	11.727	1.173	0.782	0.586	0.469	0.391	0.335	0.293	0.261	0.234	0.213	0.1953
0.9	L_1	0.2303	0.0230	0.01535	0.01151	0.00921	0.00768	0.00658	0.00576	0.00512	0.00460	0.00419	0.00384
	L_2	0.7783	0.0778	0.0519	0.0389	0.0311	0.0260	0.0222	0.01945	0.01730	0.01556	0.01415	0.01296
	L_3	0.6121	0.0612	0.0408	0.0306	0.0245	0.0204	0.01746	0.01530	0.01360	0.01224	0.01112	0.01020
	C_1	4.133	0.413	0.276	0.207	0.1654	0.1378	0.1182	0.1033	0.0919	0.0827	0.0752	0.0689
	C_2	3.252	0.325	0.217	0.1626	0.1301	0.1084	0.0930	0.0813	0.0723	0.0650	0.0591	0.0542
	C_3	10.997	1.100	0.733	0.550	0.440	0.367	0.314	0.275	0.244	0.220	0.200	0.1835

All **L** values are in Henries; all **C** values in Microfarads.

AEROVOX BUILT BETTER CONDENSERS AND RESISTORS

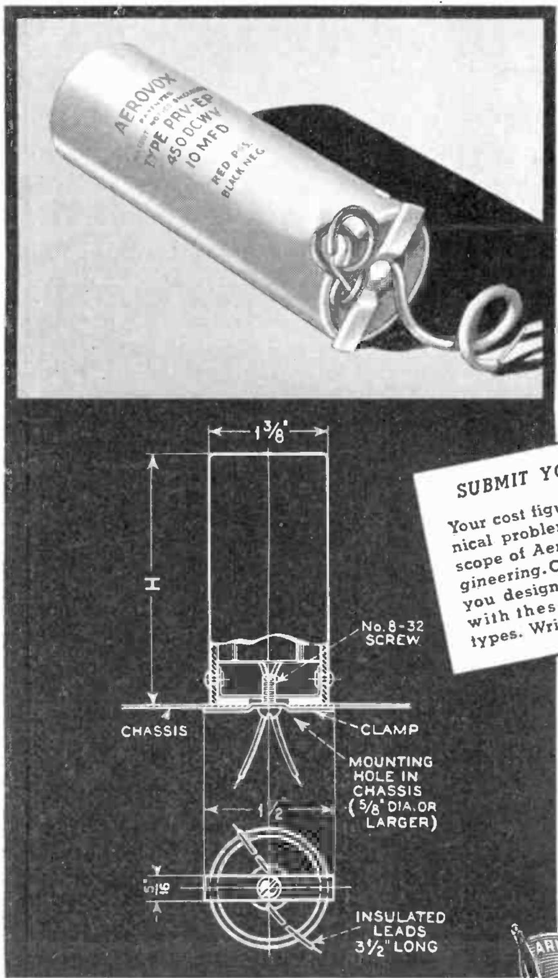
CHART 4 — Shunt-Derived Band-Pass Filters (R=500 Ohms)

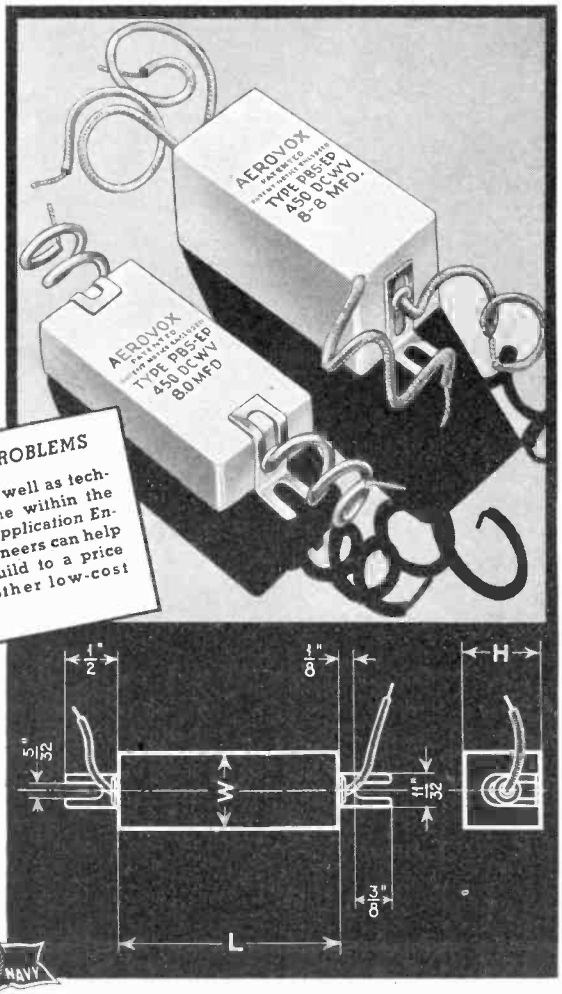
Band Width		f_m=6500	7000	7500	8000	8500	9000	9500	10 kc.	100 kc.	1 Mc.	10 Mc.
0.05	L_1	0.00465	0.00432	0.00403	0.00378	0.00355	0.00336	0.00318	0.00302	0.000302	0.0000302	0.00000302
	L_2	0.000322	0.000299	0.000279	0.000261	0.000246	0.000232	0.000220	0.000209	0.0000209	0.00000209	0.000000209
	L_3	0.00538	0.00500	0.00467	0.00438	0.00412	0.00389	0.00368	0.00350	0.000350	0.0000350	0.00000350
	C_1	0.1113	0.1033	0.0965	0.0905	0.0851	0.0804	0.0762	0.0723	0.00723	0.000723	0.0000723
	C_2	1.856	1.724	1.608	1.508	1.419	1.341	1.270	0.1206	0.1206	0.01206	0.001206
	C_3	0.1286	0.1193	0.1113	0.1044	0.0983	0.0929	0.0880	0.0836	0.00836	0.000836	0.0000836
0.1	L_1	0.00332	0.00309	0.00288	0.00270	0.00254	0.00240	0.00227	0.00216	0.000216	0.0000216	0.00000216
	L_2	0.000728	0.000676	0.000631	0.000591	0.000556	0.000525	0.000498	0.000473	0.0000473	0.00000473	0.000000473
	L_3	0.00411	0.00382	0.00356	0.00334	0.00314	0.00297	0.00281	0.00267	0.000267	0.0000267	0.00000267
	C_1	0.1456	0.1352	0.1262	0.1183	0.1113	0.1052	0.0997	0.0946	0.00946	0.000946	0.0000946
	C_2	0.823	0.764	0.713	0.669	0.629	0.594	0.563	0.535	0.0535	0.00535	0.000535
	C_3	0.1798	0.1670	0.1560	0.1462	0.1376	0.1298	0.1231	0.1169	0.01169	0.001169	0.0001169
0.15	L_1	0.00346	0.00321	0.00300	0.00281	0.00264	0.00250	0.00236	0.00225	0.000225	0.0000225	0.00000225
	L_2	0.001178	0.001094	0.001021	0.000958	0.000902	0.000851	0.000806	0.000766	0.0000766	0.00000766	0.000000766
	L_3	0.00430	0.00400	0.00373	0.00350	0.00329	0.00311	0.00294	0.00280	0.000280	0.0000280	0.00000280
	C_1	0.1393	0.1293	0.1207	0.1132	0.1065	0.1006	0.0953	0.0905	0.00905	0.000905	0.0000905
	C_2	0.509	0.472	0.441	0.413	0.389	0.367	0.348	0.331	0.0331	0.00331	0.000331
	C_3	0.1734	0.1611	0.1502	0.1409	0.1326	0.1253	0.1187	0.1127	0.01127	0.001127	0.0001127
0.2	L_1	0.00298	0.00276	0.00258	0.00242	0.00228	0.00215	0.00204	0.001934	0.0001934	0.00001934	0.000001934
	L_2	0.001700	0.001578	0.001473	0.001382	0.001300	0.001228	0.001163	0.001105	0.0001105	0.00001105	0.000001105
	L_3	0.00395	0.00367	0.00343	0.00321	0.00302	0.00285	0.00270	0.00257	0.000257	0.0000257	0.00000257
	C_1	0.1514	0.1406	0.1312	0.1230	0.1158	0.1093	0.1036	0.0984	0.00984	0.000984	0.0000984
	C_2	0.352	0.327	0.305	0.286	0.269	0.254	0.241	0.229	0.0229	0.00229	0.000229
	C_3	0.201	0.1869	0.1744	0.1635	0.1538	0.1453	0.1377	0.1309	0.01309	0.001309	0.0001309
0.25	L_1	0.00352	0.00327	0.00305	0.00286	0.00269	0.00254	0.00241	0.00229	0.000229	0.0000229	0.00000229
	L_2	0.00216	0.00200	0.001868	0.001750	0.001648	0.001557	0.001474	0.001401	0.0001401	0.00001401	0.000001401
	L_3	0.00499	0.00463	0.00432	0.00405	0.00381	0.00360	0.00341	0.00324	0.000324	0.0000324	0.00000324
	C_1	0.1202	0.1117	0.1042	0.0977	0.0920	0.0869	0.0823	0.0782	0.00782	0.000782	0.0000782
	C_2	0.278	0.259	0.241	0.226	0.213	0.201	0.1906	0.1810	0.01810	0.001810	0.0001810
	C_3	0.1705	0.1582	0.1478	0.1385	0.1303	0.1232	0.1166	0.1108	0.01108	0.001108	0.0001108
0.3	L_1	0.00358	0.00332	0.00310	0.00291	0.00274	0.00258	0.00245	0.00233	0.000233	0.0000233	0.00000233
	L_2	0.00269	0.00250	0.00233	0.00219	0.00206	0.001945	0.001842	0.001750	0.0001750	0.00001750	0.000001750
	L_3	0.00534	0.00496	0.00463	0.00434	0.00409	0.00386	0.00365	0.00347	0.000347	0.0000347	0.00000347
	C_1	0.1122	0.1042	0.0973	0.0912	0.0858	0.0811	0.0768	0.0729	0.00729	0.000729	0.0000729
	C_2	0.222	0.206	0.1922	0.1803	0.1696	0.1602	0.1518	0.1442	0.01442	0.001442	0.0001442
	C_3	0.1676	0.1556	0.1452	0.1362	0.1282	0.1212	0.1147	0.1089	0.01089	0.001089	0.0001089
0.4	L_1	0.00341	0.00316	0.00295	0.00277	0.00260	0.00246	0.00233	0.00221	0.000221	0.0000221	0.00000221
	L_2	0.00415	0.00385	0.00359	0.00337	0.00317	0.00299	0.00284	0.00269	0.000269	0.0000269	0.00000269
	L_3	0.00559	0.00519	0.00484	0.00454	0.00427	0.00403	0.00382	0.00363	0.000363	0.0000363	0.00000363
	C_1	0.1073	0.0997	0.0931	0.0872	0.0822	0.0776	0.0735	0.0698	0.00698	0.000698	0.0000698
	C_2	0.1443	0.1340	0.1250	0.1172	0.1102	0.1042	0.0988	0.0938	0.00938	0.000938	0.0000938
	C_3	0.1762	0.1636	0.1527	0.1432	0.1347	0.1272	0.1205	0.1145	0.01145	0.001145	0.0001145
0.5	L_1	0.00339	0.00315	0.00294	0.00275	0.00259	0.00245	0.00232	0.00220	0.000220	0.0000220	0.00000220
	L_2	0.00567	0.00526	0.00492	0.00461	0.00433	0.00410	0.00388	0.00368	0.000368	0.0000368	0.00000368
	L_3	0.00612	0.00568	0.00531	0.00497	0.00468	0.00442	0.00418	0.00398	0.000398	0.0000398	0.00000398
	C_1	0.0979	0.0909	0.0849	0.0795	0.0749	0.0707	0.0670	0.0636	0.00636	0.000636	0.0000636
	C_2	0.1055	0.0980	0.0915	0.0858	0.0807	0.0762	0.0722	0.0686	0.00686	0.000686	0.0000686
	C_3	0.1767	0.1642	0.1532	0.1436	0.1352	0.1277	0.1210	0.1149	0.01149	0.001149	0.0001149
0.6	L_1	0.00349	0.00324	0.00302	0.00283	0.00267	0.00252	0.00238	0.00227	0.000227	0.0000227	0.00000227
	L_2	0.00707	0.00657	0.00613	0.00574	0.00541	0.00510	0.00484	0.00460	0.000460	0.0000460	0.00000460
	L_3	0.00693	0.00644	0.00601	0.00563	0.00530	0.00500	0.00474	0.00450	0.000450	0.0000450	0.00000450
	C_1	0.0864	0.0803	0.0750	0.0702	0.0661	0.0624	0.0591	0.0562	0.00562	0.000562	0.0000562
	C_2	0.0848	0.0788	0.0735	0.0689	0.0649	0.0612	0.0580	0.0551	0.00551	0.000551	0.0000551
	C_3	0.1716	0.1594	0.1488	0.1394	0.1312	0.1240	0.1174	0.1116	0.01116	0.001116	0.0001116
0.7	L_1	0.00362	0.00336	0.00314	0.00294	0.00277	0.00261	0.00247	0.00235	0.000235	0.0000235	0.00000235
	L_2	0.00842	0.00782	0.00730	0.00684	0.00644	0.00608	0.00576	0.00547	0.000547	0.0000547	0.00000547
	L_3	0.00454	0.00422	0.00394	0.00369	0.00347	0.00328	0.00311	0.00295	0.000295	0.0000295	0.00000295
	C_1	0.0752	0.0698	0.0652	0.0611	0.0575	0.0543	0.0514	0.0489	0.00489	0.000489	0.0000489
	C_2	0.0713	0.0662	0.0618	0.0579	0.0545	0.0515	0.0488	0.0464	0.00464	0.000464	0.0000464
	C_3	0.1648	0.1532	0.1428	0.1340	0.1262	0.1191	0.1128	0.1071	0.01071	0.001071	0.0001071
0.8	L_1	0.00331	0.00308	0.00287	0.00269	0.00253	0.00240	0.00227	0.00216	0.000216	0.0000216	0.00000216
	L_2	0.01087	0.01010	0.00943	0.00883	0.00832	0.00785	0.00744	0.00707	0.000707	0.0000707	0.00000707
	L_3	0.00796	0.00740	0.00690	0.00648	0.00609	0.00575	0.00545	0.00518	0.000518	0.0000518	0.00000518
	C_1	0.0751	0.0697	0.0650	0.0610	0.0574	0.0542	0.0513	0.0488	0.00488	0.000488	0.0000488
	C_2	0.0551	0.0512	0.0478	0.0448	0.0421	0.0398	0.0377	0.0358	0.00358	0.000358	0.0000358
	C_3	0.1804	0.1675	0.1563	0.1466	0.1380	0.1303	0.1234	0.1173	0.01173	0.001173	0.0001173
0.9	L_1	0.00354	0.00329	0.00307	0.00288	0.00271	0.00256	0.00242	0.00230	0.000230	0.0000230	0.00000230
	L_2	0.01197	0.01112	0.01037	0.00973	0.00916	0.00865	0.00819	0.00778	0.000778	0.0000778	0.00000778
	L_3	0.00942	0.00874	0.00816	0.00765	0.00720	0.00680	0.00644	0.00612	0.000612	0.0000612	0.00000612
	C_1	0.0636	0.0591	0.0551	0.0517	0.0486	0.0459	0.0435	0.0413	0.00413	0.000413	0.0000413
	C_2	0.0500	0.0465	0.0434	0.0406	0.0383	0.0362	0.0343	0.0325	0.00325	0.000325	0.0000325
	C_3	0.1694	0.1572	0.1467	0.1375	0.1294	0.1222	0.1157	0.1100	0.01100	0.001100	0.0001100

All **L** values are in Henries; all **C** values in Microfarads.

MAXIMUM CAPACITANCE

at minimum cost . . .





SUBMIT YOUR PROBLEMS

Your cost figures, as well as technical problems, come within the scope of Aerovox Application Engineering. Our engineers can help you design and build to a price with these and other low-cost types. Write us.

CLAMP-MOUNTING ELECTROLYTICS

● **Price** with inbuilt Aerovox *Quality*—that's the prime objective of the ingenious Type PRV one-hole-mounting paper-cased electrolytic. • Wax sealed. Impregnated cardboard-tube container. Suitable for commercial and other applications where extreme operating conditions are not encountered and metal-can types are not essential. • Note ingenious clamp and center-screw mounting means. This type can take the place of various other vertical-mounting electrolytics such as twist-prong, spade-lug, screw-base, etc. • Normally with etched foil. Also available in plain foil. High-purity aluminum elements throughout. Positive and negative lead for each section. 450 and 600 v. D.C.W. 4 to 40 mfd.; 8-8 to 20-20 mfd. 1-3/8" dia.; 3 to 4-3/4" high.

CARDBOARD-CASE ELECTROLYTICS

● **Price** with inbuilt Aerovox *Quality*—that's the prime objective of this popular Type PBS rectangular cardboard-case dry electrolytic. • Sections housed in sturdy cardboard containers. Patented Aerovox Adjustimount or swivel metal flange permits mounting flatwise or on narrow side according to space limitations. Also, PBS units may be stacked and held together by overlapping metal flange and soldering securely. • Normally with etched foil. Plain foil also available. High-purity aluminum elements throughout. Made in single and multiple sections. Separate sections with positive and negative leads for each section. • 450 and 600 v. D.C.W. 4 to 16 mfd.; 8-8, 8-16 and 8-8-8 mfd. Dimensions: *L*, 2-7/16 to 3-3/16"; *W*, 3/4 to 1-1/2"; *H*, 1/2 to 1-7/16". A good general-purpose electrolytic for normal service.