

# RESISTANCE vs. RTD TEMPERATURE SPECIFICATIONS

## Temperature (°C) vs. Resistance (Ω)

°C	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	/C°
-200	18.52										
-100	60.26	56.19	52.11	48.00	43.88	39.72	35.54	31.34	27.10	22.83	.415
0	100.00	99.09	92.16	88.22	84.27	80.31	76.33	72.33	68.33	64.30	.357
°C	0	10	20	30	40	50	60	70	80	90	/C°
0	100.00	103.90	107.79	111.67	115.54	119.40	123.24	127.08	130.90	134.71	.385
100	138.51	142.29	146.07	149.83	153.58	157.33	161.05	164.77	168.48	172.17	.374
200	175.86	179.53	183.19	186.84	190.47	194.10	197.71	201.31	204.90	208.48	.361
300	212.05	215.61	219.15	222.68	226.21	229.72	233.21	236.70	240.18	243.64	.350
400	247.09	250.53	253.96	257.38	260.78	264.18	267.56	270.93	274.29	277.64	.339
500	280.98	284.30	287.62	290.92	294.21	297.49	300.75	304.01	307.25	310.49	.327
600	313.71	316.92	320.12	323.30	326.48	329.64	332.79	335.93	339.06	342.18	.316
700	345.28	348.38	351.46	354.53	357.59	360.64	363.67	366.70	369.71	372.71	.304
800	375.70	378.68	381.65	384.60	387.55	390.48					

### JMS Type B (Industry standard)

Temperature (°C)	-250	-220	-200	-100	0	100	200	300	400	500	600	700	800	850
Tolerance (±°C)	1.6	1.4	1.3	0.8	0.3	0.8	1.3	1.8	2.3	2.8	3.3	3.8	4.3	4.6
(± Ω)	1.0	0.7	0.6	0.3	0.1	0.3	0.5	0.6	0.8	0.9	1.1	1.3	1.4	1.5

## Temperature (°F) vs. Resistance (Ω)

°F	0	-10	-20	-30	-40	-50	-60	-70	-80	-90	/F°
-200	48.49										
-100	71.01	68.78	66.55	64.31	62.07	59.82	57.57	55.31	53.04	50.77	.225
0	93.03	90.85	88.66	86.47	84.27	82.07	79.87	77.66	75.45	73.23	.220
°F	0	10	20	30	40	50	60	70	80	90	/F°
0	93.03	95.21	97.39	99.56	101.73	103.90	106.06	108.22	110.37	112.53	.216
100	114.67	116.82	118.96	121.10	123.23	125.36	127.49	129.61	131.73	133.85	.213
200	135.96	138.07	140.18	142.28	144.38	146.48	148.57	150.66	152.74	154.82	.209
300	156.90	158.97	161.04	163.11	165.17	167.23	169.29	171.34	173.39	175.44	.206
400	177.48	179.52	181.56	183.59	185.61	187.64	189.66	191.68	193.69	195.70	.202
500	197.71	199.71	201.71	203.71	205.70	207.69	209.68	211.66	213.64	215.61	.199
600	217.58	219.55	221.51	223.47	225.43	227.39	229.34	231.28	233.23	235.17	.195
700	237.10	239.03	240.96	242.89	244.81	246.73	248.64	250.55	252.46	254.37	.192
800	256.27	258.16	260.06	261.95	263.83	265.72	267.60	269.47	271.34	273.21	.188
900	275.08	276.94	278.80	280.65	282.50	284.35	286.19	288.03	289.87	291.70	.185
1000	293.53	295.36	297.18	299.00	300.82	302.63	304.44	306.24	308.04	309.84	.181
1100	311.64	313.43	315.22	317.00	318.78	320.56	322.33	324.10	325.86	327.63	.177
1200	329.30	331.03	332.79	334.56	336.34	338.11	340.00	342.00	344.00	346.00	.169
1300	347.50	348.38	350.07	351.77	353.46	355.16	356.85	358.55	360.25	361.94	.162
1400	363.67	365.17	366.67	368.17	369.67	371.17	372.67	374.18	375.68	377.12	.150
1500	378.68	380.58	382.48	384.38	386.30	388.21	390.12				

### JMS Type B (Industry standard)

Temperature (°F)	-200	-100	0	32	100	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1560
Tolerance (±°F)	1.8	1.1	0.7	0.6	0.7	0.9	1.5	2.0	2.7	3.3	3.9	4.5	5.4	6.0	6.5	7.0	7.6	8.4	9.0	9.4
(± Ω)		0.3	0.2	0.1	0.2	0.2	0.3	0.4	0.6	0.7	0.8	.09	1.0	1.1	1.1	1.2	1.3	1.4	1.5	1.5

### Nominal Resistance

The platinum element of the standard industrial type RTD has a base reference resistance of 100 Ω at 0°C.

Platinum 100 Ω, temperature coefficient = 0.00385/Ω/°C.

This meets the ASTM standard 1137 and also meets the IEC 751. All readings based on ITS 90 - International Temperature Scale 1990.

# TEMPERATURE vs RESISTANCE TABLE

**Din 43760, 100Ω Platinum RTD  
Alpha=.00385**

Temp. (degrees C)	0	(-10)	(-20)	(-30)	(-40)	(-50)	(-60)	(-70)	(-80)	(-90)
-200	18.53	14.36	10.41							
-100	60.20	56.13	52.04	47.93	43.80	39.65	35.48	31.28	27.05	22.78
0	100.00	96.07	92.13	88.17	84.21	80.25	76.28	72.29	68.28	64.25
	0	(10)	(20)	(30)	(40)	(50)	(60)	(70)	(80)	(90)
0	100.00	103.90	107.79	111.67	115.54	119.40	123.24	127.07	130.89	134.70
100	138.50	142.28	146.06	149.82	153.57	157.32	161.04	164.76	168.47	172.16
200	175.84	179.51	183.17	186.82	190.46	194.08	197.70	201.30	204.88	208.46
300	212.03	215.58	219.13	222.66	226.18	229.69	233.19	236.67	240.15	243.61
400	247.06	250.50	253.93	257.34	260.75	264.14	267.52	270.89	274.25	277.60
500	280.93	284.26	287.57	290.87	294.16	297.43	300.70	303.95	307.20	310.43
600	313.65	316.86	320.05	323.24	326.41	329.57	332.72	335.86	338.99	342.10

**NOTE:** Due to the interchangeability tolerance of the RTD's, the JMS type E matches both DIN 43760 / IEC 751, and British Standard BS 1904 curves.

**BS 1904, 100Ω Platinum RTD  
Alpha=.00385**

Temp. (degrees C)	0	(-10)	(-20)	(-30)	(-40)	(-50)	(-60)	(-70)	(-80)	(-90)
-200	18.56	14.40	10.45							
-100	60.28	56.21	52.12	48.01	43.88	39.72	35.54	31.34	27.11	22.83
0	100.00	96.09	92.16	88.23	84.29	80.32	76.34	72.35	68.34	64.32
	0	(10)	(20)	(30)	(40)	(50)	(60)	(70)	(80)	(90)
0	100.00	103.90	107.79	111.67	115.54	119.40	123.24	127.07	130.89	134.70
100	138.50	142.29	146.06	149.82	153.57	157.31	161.04	164.76	168.46	172.16
200	175.83	179.50	183.16	186.82	190.45	194.07	197.69	201.29	204.88	208.46
300	212.02	215.58	219.12	222.66	226.18	229.69	233.19	236.68	240.16	243.61
400	247.08	250.52	253.95	257.37	260.77	264.17	267.56	270.94	274.29	277.64
500	280.98	284.31	287.67	290.93	294.22	297.50	300.76	304.02	307.27	310.51
600	313.72	316.93	320.12	323.31	326.50	329.60	332.80	335.90	339.10	342.20

**NOTE:** Due to the interchangeability tolerance of the RTD's, the JMS type E matches both DIN 43760 / IEC 751, and British Standard BS 1904 curves.

**SAMA RC21-4 1966, 98.1Ω Platinum RTD  
Alpha=.003923  
JMS TYPE F [3-22]**

Temp. (degrees C)	0	(-10)	(-20)	(-30)	(-40)	(-50)	(-60)	(-70)	(-80)	(-90)
-200	16.67									
-100	58.40	54.34	50.26	46.15	42.02	37.87	33.69	29.48	25.24	20.97
0	98.13	94.22	90.29	86.36	82.41	78.44	74.47	70.47	66.47	62.44
	0	(10)	(20)	(30)	(40)	(50)	(60)	(70)	(80)	(90)
0	98.13	102.03	105.92	109.80	113.67	117.52	121.37	125.20	129.02	132.83
100	136.63	140.41	144.19	147.95	151.70	155.44	159.17	162.89	166.06	170.29
200	173.97	177.64	181.30	184.95	188.58	192.22	195.83	199.43	203.02	206.60
300	210.17	213.73	217.27	220.80	224.33	227.84	231.34	234.83	238.30	241.77
400	245.22	248.66	252.09	255.51	258.92	262.32	265.70	269.07	272.43	275.78
500	279.12	282.45	285.76	289.07	292.36	295.64	298.91	302.17	305.42	308.65
600	311.88									

# TEMPERATURE vs RESISTANCE TABLE

**JISC 1604-1981, 100Ω Platinum RTD**  
**Alpha=.003916**  
**JMS TYPE G**

Temp. (degrees C)	0	(-10)	(-20)	(-30)	(-40)	(-50)	(-60)	(-70)	(-80)	(-90)
-200	17.05									
-100	59.57	55.43	51.28	47.10	42.90	38.67	34.41	03.12	25.80	21.44
0	100.00	92.03	92.03	88.02	84.00	79.97	75.92	71.86	67.78	63.68
	0	(10)	(20)	(30)	(40)	(50)	(60)	(70)	(80)	(90)
0	100.00	103.97	107.93	111.87	115.81	119.73	123.64	127.54	131.42	135.30
100	139.16	143.01	146.85	150.68	154.49	158.30	162.09	165.87	169.64	173.40
200	177.14	180.87	184.60	188.30	192.00	195.69	199.36	203.03	206.68	210.31
300	213.94	217.56	221.16	224.75	228.33	231.90	235.46	239.00	242.53	246.05
400	249.56	253.06	256.55	260.02	263.48	266.93	270.37	273.80	277.21	280.61
500	284.00	287.38	290.75	294.11	297.45	300.78	304.10	307.41	310.71	313.99
600	317.27	320.53	323.78							

**Laboratory Grade, 100Ω Platinum RTD**  
**Alpha=.003925**  
**JMS TYPE L**

Temp. (degrees C)	0	(-10)	(-20)	(-30)	(-40)	(-50)	(-60)	(-70)	(-80)	(-90)
0	100.00	96.02	92.02	88.01	83.99	79.96	75.91			
	0	(10)	(20)	(30)	(40)	(50)	(60)	(70)	(80)	(90)
0	100.00	103.97	107.93	111.88	115.82	119.75	123.66	127.56	131.45	135.33
100	139.20	143.06	146.90	150.73	154.55	158.36	162.16	165.94	169.72	173.48
200	177.23	180.97	184.69	188.41	192.11	195.80	199.48	203.15	206.80	210.45
300	214.08	217.70	221.31	224.91	228.50	232.07	235.63	239.19	242.72	246.25
400	249.76	253.27	256.76	260.24	263.71	267.16	270.61	274.04	277.46	280.88
500	284.27	287.66	291.03	294.40	297.75	301.09	304.42	307.73	3011.04	314.33
600	317.61	320.88	324.14	327.38	330.62	333.84	337.05	340.25	343.44	346.61

**NOTE:** Based on NIST Supplementary ITS-90. These values were available at time of publication but subject to approval by ASTM as laboratory grade.

**Uncommon American 100Ω Platinum RTD**  
**Alpha=.003902**  
**JMS TYPE H**

Temp. (degrees C)	0	(-10)	(-20)	(-30)	(-40)	(-50)	(-60)	(-70)	(-80)	(-90)
-100	59.69									
0	100.00	96.03	92.06	88.06	84.06	80.04	76.01	71.96	67.89	63.80
	0	(10)	(20)	(30)	(40)	(50)	(60)	(70)	(80)	(90)
0	100.00	103.96	107.90	111.83	115.75	119.66	123.55	127.44	131.31	135.17
100	139.02	142.86	146.68	150.50	154.30	158.09	161.87	165.64	169.39	173.14
200	176.87	180.59	184.30	188.00	191.68	195.35	199.02	202.67	206.31	209.93
300	213.55	217.15	220.74	224.32	227.89	231.45	234.99	238.52	242.05	245.56
400	249.05	252.54	256.01	259.48	262.93	266.37	269.79	273.21	276.62	280.01
500	283.39	286.76	290.11	293.46	296.79	300.12	303.43	306.73	310.01	313.29
600	316.55	319.80	323.04	326.27	329.49	332.70				

# NON STANDARD RESISTORS

## NON STANDARD, BUT COMMONLY USED RTD'S

*Letter Designation	Standard	Alpha	Resistor Tolerance at 0°C	Reference page
F	SAMA	.003923	0.1	3-22
G	JISC	.003916	0.1	3-21
L	NIST	.003925	0.007	3-21
H	NONE	.003902	0.15	3-21

\* May be used for symbol #2 (page 3-1)

### ADDITIONAL RTD ELEMENT TYPES

The following are available in addition to the RTD element types listed on page 3-1. Elements may be specified with an "X" in the part number.

ALPHA	RESISTANCE VALUE	TOLERANCE
Platinum - 0.003750	1000 ohms @ 0 deg. C	±0.2%
Platinum - 0.003850	10 ohms @ 0 deg.C	±0.2%
Platinum - 0.003850	10 ohms @ 20 deg. C	±0.2%
Platinum - 0.003850	10 ohms @ 25 deg. C	±0.2%
Platinum - 0.003850	20 ohms @ 0 deg. C	±0.2%
Platinum - 0.003850	50 ohms @ 0 deg. C	±0.2%
Platinum - 0.003850	200 ohms @ 0 deg. C	±0.1%
Platinum - 0.003850	500 ohms @ 0 deg. C	±0.1%
Platinum - 0.003850	1000 ohms @ 0 deg. C	±0.1%
Platinum - 0.003900	100 ohms @ 0 deg. C	±0.2%
Platinum - 0.003900	130 ohms @ 0 deg. C	±0.1%
Platinum - 0.003910	8 ohms @ 0 deg. C	±0.5%
Platinum - 0.003910	10 ohms @ 0 deg. C	±0.5%
Platinum - 0.003910	32 ohms @ 0 deg. C	±0.5%
Platinum - 0.003910	98.129 ohms @ 0 deg. C	±0.1%
Platinum - 0.003910	100 ohms @ 0 deg. C	±0.5%
Platinum - 0.003910	500 ohms @ deg. C	±0.5%
Platinum - 0.003920	100 ohms @ 0 deg. C	±0.1 deg. C
Platinum - 0.003920	200 ohms @ 0 deg. C	±0.1 deg. C
Platinum - 0.003920	500 ohms @ 0 deg. C	±0.1 deg. C
Platinum - 0.003926	25.5 ohms @ 0 deg. C	±0.1%
Platinum - 0.003926	100 ohms @ 0 deg. C	±0.5%
Platinum - 0.003926	200 ohms @ 0 deg. C	±0.5%
Platinum - 0.003926	470 ohms @ 0 deg. C	±0.5%
Platinum - 0.003926	500 ohms @ 0 deg. C	±0.5%
Nickel - N/A	110 ohms @ 0 deg. C	±0.5%
Ni Fe - N/A	1000 ohms deg. @ 21.1 deg. C	±0.5%
Ni Fe - N/A	2000 ohms @ 21.1 deg. C	±0.5%
Copper - N/A	100 ohms @ 25 deg.C	±0.2%

# RESISTANCE / TEMPERATURE TABLE

COPPER 10Ω AT 25°C

°C	0	1	2	3	4	5	6	7	8	9
-190	1.471	1.430	1.389	1.348	1.306	1.265	1.223	1.182	1.140	1.009
-180	1.884	1.843	1.802	1.761	1.719	1.678	1.637	1.596	1.554	1.513
-170	2.295	2.254	2.213	2.172	2.131	2.090	2.049	2.008	1.967	1.925
-160	2.705	2.664	2.623	2.582	2.541	2.500	2.459	2.418	2.377	2.336
-150	3.112	3.072	3.031	2.990	2.949	2.909	2.868	2.827	2.786	2.745
-140	3.519	3.478	3.437	3.397	3.356	3.316	3.275	3.234	3.194	3.153
-130	3.923	3.883	3.842	3.802	3.762	3.721	3.681	3.640	3.600	3.559
-120	4.326	4.286	4.246	4.206	4.165	4.125	4.085	4.044	4.004	3.964
-110	4.728	4.688	4.648	4.608	4.567	4.527	4.487	4.447	4.407	4.366
-100	5.128	5.088	5.048	5.008	4.968	4.928	4.888	4.848	4.808	4.768
-90	5.526	5.486	5.446	5.407	5.367	5.327	5.287	5.247	5.208	5.168
-80	5.923	5.883	5.844	5.804	5.764	5.725	5.685	5.645	5.606	5.566
-70	6.318	6.279	6.239	6.200	6.160	6.121	6.081	6.042	6.002	5.962
-60	6.712	6.672	6.633	6.594	6.554	6.515	6.476	6.436	6.397	6.358
-50	7.104	7.064	7.025	6.986	6.947	6.908	6.869	6.830	6.790	6.751
-40	7.490	7.451	7.413	7.374	7.335	7.296	7.258	7.220	7.181	7.142
-30	7.876	7.838	7.799	7.761	7.722	7.683	7.645	7.606	7.568	7.529
-20	8.263	8.224	8.185	8.147	8.108	8.070	8.031	7.992	7.954	7.915
-10	8.649	8.610	8.572	8.533	8.494	8.456	8.417	8.378	8.340	8.301
0	9.035	9.996	9.958	8.919	8.881	8.842	8.805	8.765	8.726	8.687
0	9.035	9.074	9.112	9.151	9.189	9.228	9.267	9.305	9.344	9.383
10	9.421	9.460	9.498	9.537	9.576	9.614	9.653	9.692	9.730	9.769
20	9.807	9.846	9.885	9.923	9.962	10.000	10.039	10.078	10.116	10.155
30	10.194	10.232	10.271	10.309	10.348	10.387	10.425	10.464	10.502	10.541
40	10.580	10.618	10.657	10.696	10.734	10.773	10.811	10.850	10.889	10.927
50	10.966	11.005	11.043	11.082	11.120	11.159	11.198	11.236	11.275	11.313
60	11.352	11.391	11.429	11.468	11.507	11.545	11.584	11.622	11.661	11.700
70	11.738	11.777	11.816	11.854	11.893	11.931	11.970	12.009	12.047	12.086
80	12.124	12.163	12.202	12.240	12.279	12.318	12.356	12.395	12.433	12.472
90	12.511	12.549	12.588	12.627	12.665	12.704	12.742	12.781	12.820	12.858
100	12.897	12.935	12.974	13.013	13.051	13.090	13.129	13.167	13.206	13.244
110	13.283	13.322	13.360	13.399	13.437	13.476	13.515	13.553	13.592	13.631
120	13.669	13.708	13.746	13.785	13.824	13.862	13.901	13.940	13.978	14.017
130	14.055	14.094	14.133	14.171	14.210	14.248	14.287	14.326	14.364	14.403
140	14.442	14.480	14.519	14.557	14.596	14.635	14.673	14.712	14.751	14.789
150	14.828	14.867	14.906	14.945	14.984	15.022	15.061	15.100	15.139	15.178
160	15.217	15.256	15.295	15.334	15.373	15.412	15.451	15.490	15.529	15.568
170	15.607	15.646	15.685	15.724	15.763	15.802	15.840	15.879	15.918	15.957
180	15.996	16.035	16.074	16.113	16.152	16.191	16.230	16.269	16.308	16.347
190	16.386	16.425	16.464	16.503	16.542	16.581	16.620	16.659	16.698	16.737
200	16.776	16.815	16.854	16.893	16.932	16.971	17.010	17.049	17.088	17.127
210	17.166	17.205	17.244	17.283	17.321	17.360	17.399	17.438	17.477	17.516
220	17.555	17.594	17.633	17.672	17.711	17.750	17.789	17.828	17.867	17.906
230	17.945	17.984	18.023	18.062	18.101	18.140	18.179	18.218	18.257	18.296
240	18.335	18.374	18.413	18.452	18.491	18.530	18.569	18.608	18.648	18.687
250	18.726	18.765	18.804	18.843	18.882	18.921	18.960	18.999	18.038	18.077
260	19.116									

SECTION 3

# RESISTANCE / TEMPERATURE TABLE

NICKEL 120Ω AT 0°C

°C	0	1	2	3	4	5	6	7	8	9
-70	73.10	72.45	71.80	71.15	70.50	69.85	69.20	68.55	67.90	67.25
-60	79.62	78.97	78.31	77.66	77.01	76.36	75.71	75.06	74.40	73.75
-50	86.17	85.51	84.86	84.20	83.55	82.89	82.84	81.58	80.93	80.27
-40	92.76	92.10	91.44	90.78	90.12	89.46	88.80	88.14	87.48	86.83
-30	99.41	98.74	98.07	97.41	96.74	96.07	95.41	94.75	94.08	93.42
-20	106.15	105.47	104.79	104.11	103.44	102.77	102.09	101.42	100.75	100.08
-10	113.00	112.31	111.62	110.93	110.25	109.56	108.87	108.19	107.51	106.83
0	120.00	119.29	118.58	117.88	117.17	116.47	115.77	115.08	114.38	113.69
0	120.00	120.71	121.42	122.13	112.85	123.57	124.28	125.00	125.72	126.45
10	127.17	127.90	128.63	129.36	130.09	130.82	131.56	132.29	133.03	133.77
20	134.52	135.26	136.01	136.76	137.51	138.26	139.02	139.77	140.53	141.29
30	142.06	142.82	143.59	144.36	145.13	145.90	146.68	147.46	148.23	149.01
40	149.79	150.58	151.36	152.15	152.94	153.74	154.53	155.33	156.13	156.93
50	157.74	158.55	159.36	160.17	160.98	161.80	162.62	163.44	164.26	165.08
60	165.90	166.73	167.56	168.38	169.21	170.05	170.88	171.72	172.56	173.40
70	174.25	175.10	175.95	176.80	177.66	178.51	179.37	180.24	181.10	181.97
80	182.84	183.71	184.59	185.46	186.34	187.22	188.10	188.98	189.87	190.75
90	191.64	192.53	193.42	193.42	195.21	196.11	197.01	197.91	198.82	199.73
100	200.64	201.55	202.46	203.38	204.30	205.22	206.14	207.06	207.99	208.92
110	209.85	210.78	211.72	212.66	213.60	214.54	215.49	216.44	217.39	218.34
120	219.29	220.25	221.21	222.17	223.14	224.10	225.07	226.04	227.01	227.99
130	228.96	229.94	230.92	231.90	232.89	233.88	234.87	235.86	236.85	237.85
140	238.85	239.85	240.85	241.86	242.86	243.87	244.88	245.89	246.91	247.93
150	248.95	249.97	251.00	242.02	253.05	254.09	255.12	256.16	257.21	258.25
160	259.30	260.35	261.40	262.45	263.51	264.57	265.63	266.60	267.76	268.83
170	269.91	270.98	272.06	273.14	274.22	275.30	276.39	277.48	278.57	279.67
180	280.77	281.87	282.98	284.09	285.21	286.33	287.45	288.57	289.70	290.83
190	291.96	293.10	294.24	295.38	296.52	297.67	298.82	299.97	301.13	302.29
200	303.46	304.62	305.80	306.97	308.15	309.34	310.52	311.72	312.91	314.11
210	315.31	316.52	317.72	318.94	320.15	321.37	322.59	323.82	325.05	326.29
220	327.53	328.77	330.02	331.27	332.52	333.78	335.05	336.32	337.59	338.86
230	340.14	341.42	342.71	344.00	345.30	346.59	347.90	349.20	350.51	351.82
240	353.14	354.46	355.79	357.12	358.45	359.79	361.13	362.47	363.82	365.18
250	366.53	376.89	369.26	370.62	372.00	373.37	374.75	376.13	377.52	378.91
260	380.31	381.70	385.11	384.52	385.93	387.34	388.77	390.19	391.62	393.05
270	394.49	395.93	379.38	398.82	400.28	401.73	403.19	404.66	406.12	407.60
280	409.07	410.55	412.03	413.52	415.01	416.51	418.01	419.51	421.02	422.53
290	424.05	425.57	427.09	428.62	430.16	431.70	433.24	434.78	436.33	437.89
300	439.44	441.00	442.57	444.13	445.70	447.28	448.86	450.44	452.02	453.61
310	455.20	456.80	458.40	460.00	461.60	463.20	464.80	466.40	468.00	46.60
320	471.20									

SECTION 3