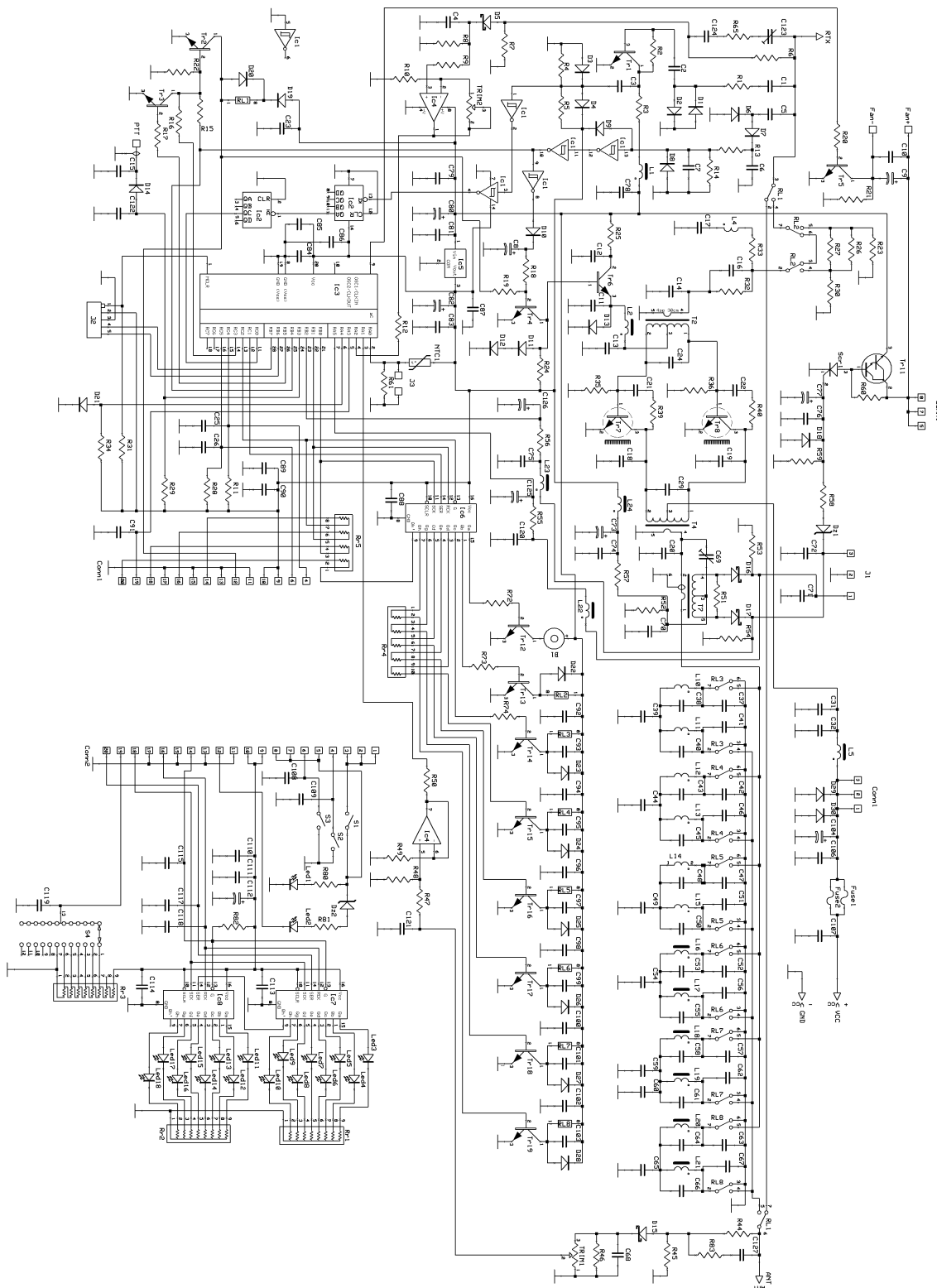
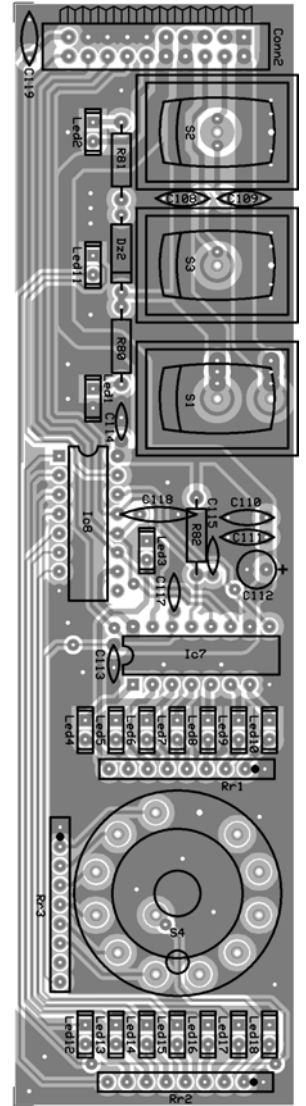
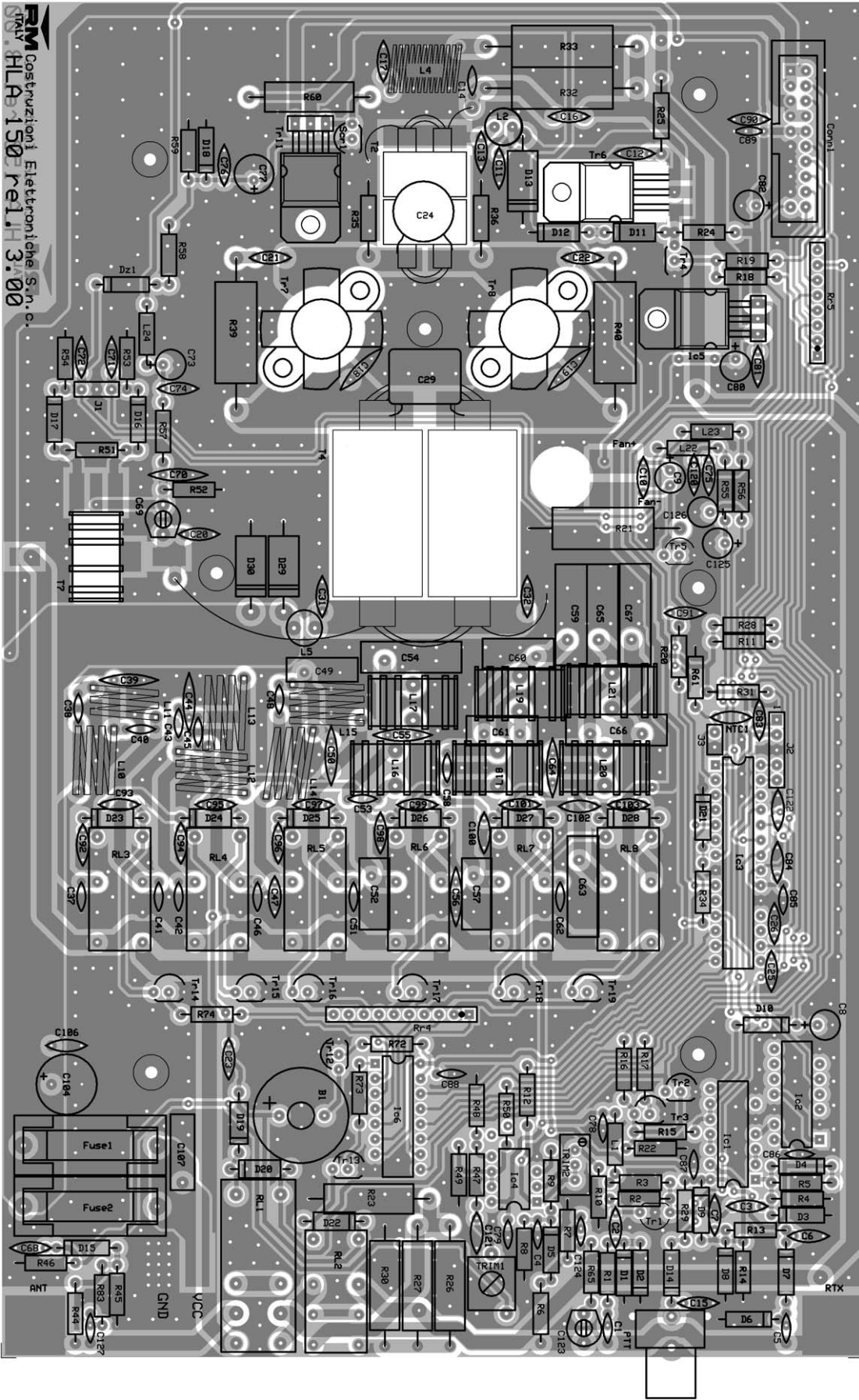


# HLA 150 Plus linear amplifier

Schematic diagram

Version 3.01





## List of components

C <sub>1</sub> = 10 pF	50 V	NP0	C <sub>64</sub> = 270 pF	500 V	N750
C <sub>2</sub> = 100 nF	50 V		C <sub>65</sub> = 1600 pF	500 V	Silveredmica
C <sub>3</sub> = 10 nF	50 V		C <sub>66</sub> = 620 pF	500 V	Silveredmica
C <sub>4</sub> = 1,0 µF	50 V	Multilayer	C <sub>67</sub> = 560 pF	500 V	Silveredmica
C <sub>5</sub> = 4,7 pF	50 V	NP0	C <sub>68</sub> = 10 nF	50 V	
C <sub>6</sub> = 100 nF	50 V		C <sub>69</sub> = 3-10 pF	Trimmer	NP0
C <sub>7</sub> = 10 nF	50 V		C <sub>70</sub> = 470 pF	50 V	NP0
C <sub>8</sub> = 2,2 µF	25 V		C <sub>71</sub> = 100 nF	50 V	
C <sub>9</sub> = 22 µF	25 V		C <sub>72</sub> = 100 nF	50 V	
C <sub>10</sub> = 100 nF	50 V		C <sub>73</sub> = 22 µF	25 V	
C <sub>11</sub> = 100 nF	50 V		C <sub>74</sub> = 100 nF	50 V	
C <sub>12</sub> = 100 nF	50 V		C <sub>75</sub> = 100 nF	50 V	
C <sub>13</sub> = 100 nF	50 V		C <sub>76</sub> = 100 nF	50 V	
C <sub>14</sub> = 68 pF	50 V	NP0	C <sub>77</sub> = 47 µF	25 V	
C <sub>15</sub> = 100 nF	50 V		C <sub>78</sub> = 220 nF	50 V	Multilayer
C <sub>16</sub> = 100 pF	500 V	NP0	C <sub>79</sub> = 220 nF	50 V	Multilayer
C <sub>17</sub> = 10 nF	50 V		C <sub>80</sub> = 10 µF	25 V	
C <sub>18</sub> = 220 pF	500 V	N750	C <sub>81</sub> = 100 nF	50 V	
C <sub>19</sub> = 220 pF	500 V	N750	C <sub>82</sub> = 22 µF	25 V	
C <sub>20</sub> = 47 pF	1 KV	NP0	C <sub>83</sub> = 100 nF	50 V	
C <sub>21</sub> = 47 nF	50 V		C <sub>84</sub> = 100 nF	50 V	
C <sub>22</sub> = 47 nF	50 V		C <sub>85</sub> = 220 nF	50 V	Multilayer
C <sub>23</sub> = 100 nF	50 V		C <sub>86</sub> = 220 nF	50 V	Multilayer
C <sub>24</sub> = 2 x 470 pF	50 V	N750	C <sub>87</sub> = 220 nF	50 V	Multilayer
C <sub>25</sub> = 100 nF	50 V		C <sub>88</sub> = 220 nF	50 V	Multilayer
C <sub>26</sub> = 100 nF	50 V		C <sub>89</sub> = 220 nF	50 V	Multilayer
C <sub>29</sub> = 1300 pF	500 V	Silveredmica	C <sub>90 to C<sub>103</sub></sub> = 100 nF	50 V	
C <sub>31</sub> = 100 nF	50 V		C <sub>104</sub> = 470 µF	25 V	
C <sub>32</sub> = 100 nF	50 V		C <sub>106</sub> = 100 nF	50 V	
C <sub>37</sub> = 47 pF	500 V	NP0	C <sub>107</sub> = 470 nF	100 V	Polyester
C <sub>38</sub> = 12 pF	500 V	NP0	C <sub>108</sub> = 100 nF	50 V	
C <sub>39</sub> = 150 pF	500 V	NP0	C <sub>109</sub> = 100 nF	50 V	
C <sub>40</sub> = 39 pF	500 V	NP0	C <sub>110</sub> = 10 nF	50 V	
C <sub>41</sub> = 39 pF	500 V	NP0	C <sub>111</sub> = 100 nF	50 V	
C <sub>42</sub> = 82 pF	500 V	NP0	C <sub>112</sub> = 22 µF	25 V	
C <sub>43</sub> = 18 pF	500 V	NP0	C <sub>113</sub> = 220 nF	50 V	Multilayer
C <sub>44</sub> = 220 pF	500 V	N750	C <sub>114</sub> = 220 nF	50 V	Multilayer
C <sub>45</sub> = 39 pF	500 V	NP0	C <sub>115</sub> = 1,0 nF	50 V	
C <sub>46</sub> = 68 pF	500 V	NP0	C <sub>117</sub> = 1,0 nF	50 V	
C <sub>47</sub> = 100 pF	500 V	NP0	C <sub>118</sub> = 470 pF	50 V	N750
C <sub>48</sub> = 56 pF	500 V	NP0	C <sub>119</sub> = 100 nF	50 V	
C <sub>49</sub> = 220 pF	500 V	Silveredmica	C <sub>120</sub> = 100 nF	50 V	
C <sub>50</sub> = 180 pF	500 V	N750	C <sub>121</sub> = 100 nF	50 V	
C <sub>51</sub> = 22 pF	500 V	NP0	C <sub>122</sub> = 100 nF	50 V	
C <sub>52</sub> = 390 pF	500 V	Silveredmica	C <sub>123</sub> = 1-5 pF	Trimmer	NP0
C <sub>53</sub> = 56 pF	500 V	NP0	C <sub>124</sub> = 1,0 pF	50 V	NP0
C <sub>54</sub> = 620 pF	500 V	Silveredmica	C <sub>125</sub> = 22 µF	25 V	
C <sub>55</sub> = 180 pF	500 V	N750	C <sub>126</sub> = 22 µF	25 V	
C <sub>56</sub> = 180 pF	500 V	N750	C <sub>127</sub> = 1,0 pF	50 V	NP0
C <sub>57</sub> = 390 pF	500 V	Silveredmica	R <sub>1</sub> = 22 KΩ	¼W	
C <sub>58</sub> = 56 pF	500 V	NP0	R <sub>2</sub> = 47 KΩ	¼W	
C <sub>59</sub> = 560 pF	500 V	Silveredmica	R <sub>3</sub> = 1,0 KΩ	¼W	
C <sub>60</sub> = 330 pF	500 V	Silveredmica	R <sub>4</sub> = 100 KΩ	¼W	
C <sub>61</sub> = 390 pF	500 V	Silveredmica	R <sub>5</sub> = 100 KΩ	¼W	
C <sub>62</sub> = 82 pF	500 V	NP0	R <sub>6</sub> = 22 KΩ	¼W	
C <sub>63</sub> = 560 pF	500 V	Silveredmica	R <sub>7</sub> = 8,2 KΩ	¼W	

R 8 = 4,7 K $\Omega$	1/4W	Rr 1 = 8 x 270 $\Omega$	L 10 = ANRA958/2
R 9 = 10 K $\Omega$	1/4W	Rr 2 = 8 x 270 $\Omega$	L 11 = ANRA958/1
R 10 = 10 K $\Omega$	1/4W	Rr 3 = 8 x 470 $\Omega$	L 12 = ANRA958/4
R 11 = 4,7 K $\Omega$	1/4W	Rr 4 = 5 x 4,7 K $\Omega$	L 13 = ANRA958/3
R 12 = 1,0 K $\Omega$	1/4W	Rr 5 = 4 x 47 $\Omega$	L 14 = ANRA958
R 13 = 10 K $\Omega$	1/4W	NTC <sub>1</sub> = 4,7 K $\Omega$ $\varnothing$ 5mm	L 15 = ANRA958/3
R 14 = 1,0 M $\Omega$	1/4W	Trim <sub>1</sub> = Timmer PT10 220 K $\Omega$	L 16 = ANRA 700/6
R 15 = 4,7 K $\Omega$	1/4W	Trim <sub>2</sub> = Timmer 10 K $\Omega$ Multi	L 17 = ANRA 700/5
R 16 = 4,7 K $\Omega$	1/4W	D <sub>1</sub> - D <sub>4</sub> = 1N4148	L 18 = ANRA 700/7
R 17 = 4,7 K $\Omega$	1/4W	D <sub>5</sub> = 1N5711	L 19 = ANRA 700/6
R 18 = 10 K $\Omega$	1/4W	D <sub>6</sub> - D <sub>10</sub> = 1N4148	L 20 = ANRA 700/10
R 19 = 10 K $\Omega$	1/4W	D <sub>11</sub> = 1N4007	L 21 = ANRA 700/9
R 20 = 1,0 K $\Omega$	1/4W	D <sub>12</sub> = 1N4007	L 22 = 10 $\mu$ H
R 21 = 33 $\Omega$	5W	D <sub>13</sub> = 1N5400	L 23 = 10 $\mu$ H
R 22 = 10 K $\Omega$	1/4W	D <sub>14</sub> = 1N4148	L 24 = 10 $\mu$ H
R 23 = 330 $\Omega$	2W	D <sub>15</sub> - D <sub>17</sub> = 1N5711	B <sub>1</sub> = Buzzer 12V ARIMB12A12
R 24 = 470 $\Omega$	1/4W	D <sub>18</sub> = 1N4148	S <sub>1</sub> - S <sub>3</sub> = Int A12131900
R 25 = 1,0 $\Omega$	1/2W	D <sub>19</sub> = 1N4007	S <sub>4</sub> = Switch 1 way 7 positions
R 26 = 39 $\Omega$	2W	D <sub>20</sub> = 1N4007	
R 27 = 39 $\Omega$	2W	D <sub>21</sub> = not present	
R 28 = 4,7 K $\Omega$	1/4W	D <sub>22</sub> - D <sub>28</sub> = 1N4007	
R 29 = 4,7 K $\Omega$	1/4W	D <sub>29</sub> = 1N5402	
R 30 = 330 $\Omega$	2W	D <sub>30</sub> = 1N5402	
R 31 = 4,7 K $\Omega$	1/4W	Dz <sub>1</sub> = Zener 5,1 V 1/2W	
R 32 = 47 $\Omega$	5W	Dz <sub>2</sub> = Zener 5,1 V 1/2W	
R 33 = 68 $\Omega$	5W	Led <sub>1</sub> = Green	
R 34 = 4,7 K $\Omega$	1/4W	Led <sub>2</sub> = Red	
R 35 = 10 $\Omega$	1/2W	Led <sub>3</sub> = Red	
R 36 = 10 $\Omega$	1/2W	Led <sub>4</sub> - Led <sub>10</sub> = Green	
R 39 = 68 $\Omega$	5W	Led <sub>11</sub> = Yellow	
R 40 = 68 $\Omega$	5W	Led <sub>12</sub> - Led <sub>17</sub> = Green	
R 44 = 100 K $\Omega$	1/4W	Led <sub>18</sub> = Yellow	
R 45 = 12 K $\Omega$	1/4W	Tr <sub>1</sub> = BF 199	
R 46 = 47 K $\Omega$	1/4W	Tr <sub>2</sub> - Tr <sub>4</sub> = BC 547 B	
R 47 = 10 K $\Omega$	1/4W	Tr <sub>5</sub> = BC 337-25	
R 48 = 8,2 K $\Omega$	1/4W	Tr <sub>6</sub> = 2SD2012	
R 49 = 10 K $\Omega$	1/4W	Tr <sub>7</sub> - Tr <sub>8</sub> = SD 1446	
R 50 = 1,0 K $\Omega$	1/4W	Tr <sub>11</sub> = BDX 53 BFP	
R 51 = 47 $\Omega$	1/4W	Tr <sub>12</sub> - Tr <sub>19</sub> = BC 547 B	
R 52 = 1,0 K $\Omega$	1/4W	Scr <sub>1</sub> = P0102	
R 53 = 22 K $\Omega$	1/4W	Ic <sub>1</sub> = 74HC14	
R 54 = 22 K $\Omega$	1/4W	Ic <sub>2</sub> = 74HC393	
R 55 = 2,2 K $\Omega$	1/4W	Ic <sub>3</sub> = PIC 18F2420	
R 56 = 2,2 K $\Omega$	1/4W	Ic <sub>4</sub> = LM 358	
R 57 = 22 K $\Omega$	1/4W	Ic <sub>5</sub> = LM 7805	
R 58 = 470 $\Omega$	1/4W	Ic <sub>6</sub> - Ic <sub>8</sub> = 74HC595	
R 59 = 10 K $\Omega$	1/4W	Rl <sub>1</sub> = 4152.9.012	
R 60 = 330 $\Omega$	2W	Rl <sub>2</sub> - Rl <sub>8</sub> = 3022.7.012	
R 61 = 4,7 K $\Omega$	1/4W	Fuse <sub>1</sub> = 12 A Fast	
R 65 = 6,8 K $\Omega$	1/4W	Fuse <sub>2</sub> = 12 A Fast	
R 72 = 4,7 K $\Omega$	1/4W	T <sub>2</sub> = Input Transformer 3 turn	
R 73 = 4,7 K $\Omega$	1/4W	T <sub>4</sub> = Output Transformer	
R 74 = 4,7 K $\Omega$	1/4W	T <sub>7</sub> = ANRA 700/12	
R 80 = 1,0 K $\Omega$	1/4W	L <sub>1</sub> = 10 $\mu$ H	
R 81 = 1,0 K $\Omega$	1/4W	L <sub>2</sub> = FH002100	
R 82 = 4,7 K $\Omega$	1/4W	L <sub>4</sub> = ANRA883	
R 83 = 1,0 K $\Omega$	1/4W	L <sub>5</sub> = FH002110	