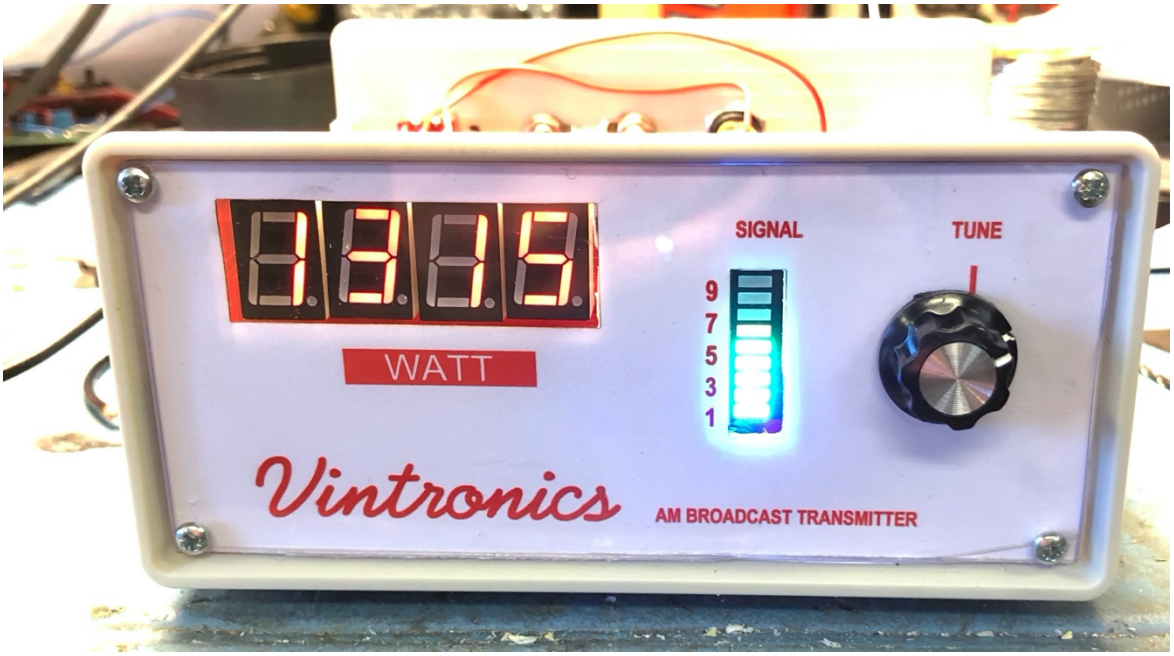
AM PLL Professional Medium-Wave Transmitter

This AM Transmitter operates between 1024KHz and 1600KHz in the Medium Waveband (AM Band) and is designed to be a reliable and stable unit.
It is capable of delivering over 1 watt of RMS power into a short length aerial. It can usually deliver 1.5 watts cleanly driven to 100% modulation.
The Transmitter circuit design employs a Colpitts FET oscillator in a Phase-locked loop circuit for accuracy and ease of frequency selection. It is also very stable and therefore does not drift off frequency. The Phase Lock circuit provides selection in 1KHz steps, so that the unit can be used in either Europe, which has 9KHz spacing between channels, or in the USA and other parts of the World where 10kHz is used between channels. A rugged Power MOSFET is also used on the RF output stage, which drives the output toroid and variable tuning capacitor. High voltage rated components are used in the output section.
Audio modulation is series-derived using a pair of Darlington Power Transistors. These are in turn driven by an audio level control chip which allows the transmitter to achieve maximum modulation at all times, whatever the audio source and nominal level is, within reason. (CD player, mixer, PC etc)
Housed in a Steel box with ABS front and rear panels. Ventilation holes to improve air flow for component cooling. A fan is used on higher output models.



POWER SUPPLY --- IMPORTANT --- PLEASE NOTE

Power is provided from an external plug-top power unit. A transmitter is supplied with a specific power unit, as certain components inside the transmitter are voltage sensitive and could burn-out if the wrong power voltage is applied. Therefore, only use the supplied power unit, otherwise damage may well occur.

It will be evident whether a wrong power unit has been used which in turn causes internal damage!!

The transmitter comes already set up for use, together with a mains power supply and wire aerial.

Setup

1. Insert stripped end of wire into the Aerial terminal and screw into place
2. Hang aerial as vertically as possible at least 30cm away from walls etc
3. Adjust frequency using DIP switches on the rear as per required settings.
4. Connect phono audio cable (L and R) to transmitter and audio source.
5. Connect power supply to DC socket and turn on unit from power switch
6. Adjust aerial tune knob for maximum power on output power display

Advanced setup and troubleshooting

Internally, there is a selector link on the output coil (toroid) which is used for better aerial matching. At higher frequencies in particular, if the tuning capacitor is at one end, use the link to select a lower inductance for improved matching. Much better matching can be achieved by moving the link. Remove top cover to gain access.

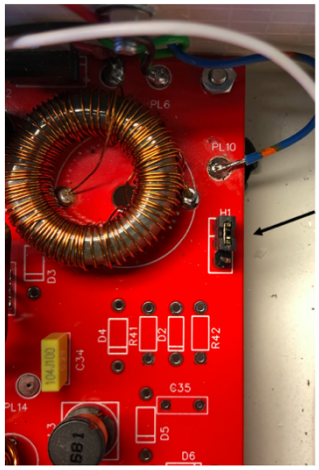
NB. On the 4-watt and 8-watt versions, the cooling fan is attached to the upper lid, therefore please remove it cautiously as the power cable for the fan is near the rear left-hand side of the lid (as seen from the front). It may become disconnected!

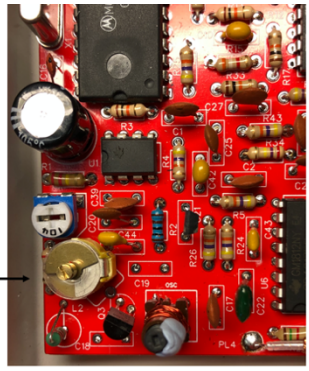
A longer aerial wire can be used with the transmitter and will give a better range. Excellent results have been obtained using a single long wire of approximately 18 metres length as shown in the diagram. The aerial is essentially the length of the back garden, using insulators that radio hams use. Roof top is the end of the wire, suspended via a tree at the other end. Also, the use of a good Earth helps with signal efficiency and distance. A copper stake in the ground is a good start. Search the Internet for further advice.

The link is located on the main circuit board by the circular toroid. There are 3 selections, 60 turns, 80 turns and 100 turns. Select ‘1-3’ for minimum (60 turns tapped) inductance, ‘2-3’ for mid-range inductance (80 turns) and NO LINK for maximum inductance (100 turns). The tap gives less inductance for much better match to the longer aerial. Maximise the signal level with the tuning control, whilst observing the signal level LED display. Or even better is the use of a Field Strength Meter, which are readily available on eBay.

Note- if link isn’t required, just leave it on any pin sideways and therefore not linked.

An option for 50 Ω output instead of ‘long-wire’ can be requested when ordering.

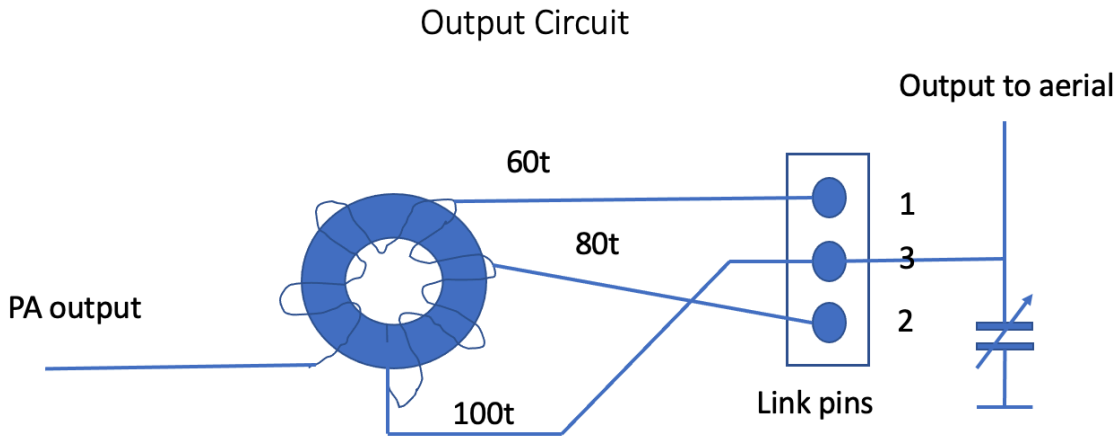




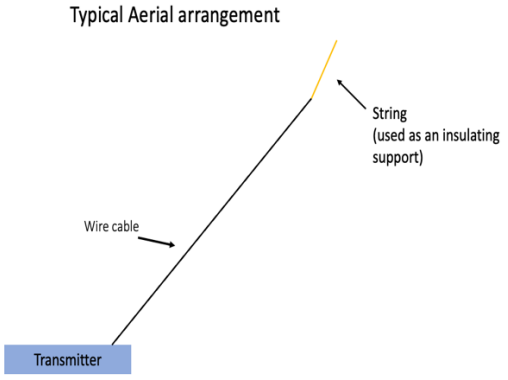
It is possible to fine-tune the operating frequency by adjusting VC1 on the main circuit board. (see pic) This adjustment is for ‘zero-beat’ of the signal (in comparison to another signal*) but is not an essential adjustment and can be left if not required. (cap may look different)

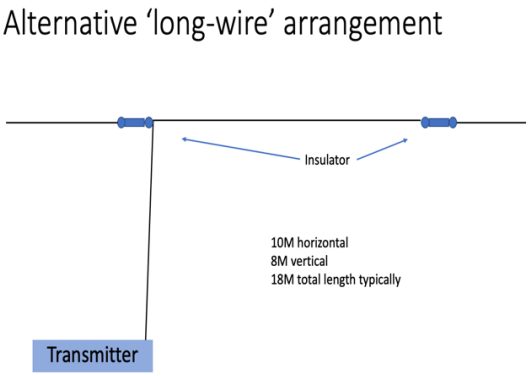
*is an enhanced user requirement

<u>Aerial Matching</u>



If you experience hum (normally most noticeable the further the receiver is away from the transmitter) then reposition transmitting antenna or receiver.
When used indoors the wiring running through the house picks up the signal causing “hum spots”.
Repositioning to a ‘non hum’ area will cure this.





Arrangement using supplied Aerial

Alternative arrangement using long-wire

<u>Frequency setting</u>

Setting frequency using dip switches

At the rear of the transmitter there are a set of dip switched numbered 1 to 10.
Using the frequency table set the switches to the desired frequency.
For example, if your desired frequency is 1400Khz, look it up in the table and you will see its binary setting to the left.
As we can see the binary position for 1315 is 0011101101

The switch positions are up for 0 and down for 1. So therefore, starting from the left-most switch and working our way to the right we get the following:

Binary number	0	0	1	1	1	0	1	1	0	1
Switch position	off	off	on	on	on	off	on	on	off	on

It looks like this:

On the rear of the unit, the DIP switches determine the frequency.
(in this case up is off and down is on)

PLEASE NOTE: EUROPEAN CHANNELS ARE UNDERLINED BELOW

Binary switch positions

SWITCH POSITION	FREQ	SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10		1 2 3 4 5 6 7 8 9 10	
1 1 1 1 1 1 1 1 1 1	1024	0 0 0 0 1 0 1 1 1 1	1071
0 1 1 1 1 1 1 1 1 1	1025	1 1 1 1 0 0 1 1 1 1	1072
1 0 1 1 1 1 1 1 1 1	1026	0 1 1 1 0 0 1 1 1 1	1073
0 0 1 1 1 1 1 1 1 1	1027	1 0 1 1 0 0 1 1 1 1	1074
1 1 0 1 1 1 1 1 1 1	1028	0 0 1 1 0 0 1 1 1 1	1075
0 1 0 1 1 1 1 1 1 1	1029	1 1 0 1 0 0 1 1 1 1	1076
1 0 0 1 1 1 1 1 1 1	1030	0 1 0 1 0 0 1 1 1 1	1077
0 0 0 1 1 1 1 1 1 1	1031	1 0 0 1 0 0 1 1 1 1	1078
1 1 1 0 1 1 1 1 1 1	1032	0 0 0 1 0 0 1 1 1 1	1079
0 1 1 0 1 1 1 1 1 1	1033	1 1 1 0 0 0 1 1 1 1	1080
1 0 1 0 1 1 1 1 1 1	1034	0 1 1 0 0 0 1 1 1 1	1081
0 0 1 0 1 1 1 1 1 1	1035	1 0 1 0 0 0 1 1 1 1	1082
1 1 0 0 1 1 1 1 1 1	1036	0 0 1 0 0 0 1 1 1 1	1083
0 1 0 0 1 1 1 1 1 1	1037	1 1 0 0 0 0 1 1 1 1	1084
1 0 0 0 1 1 1 1 1 1	1038	0 1 0 0 0 0 1 1 1 1	1085
0 0 0 0 1 1 1 1 1 1	1039	1 0 0 0 0 0 1 1 1 1	1086
1 1 1 1 0 1 1 1 1 1	1040	0 0 0 0 0 0 1 1 1 1	1087
0 1 1 1 0 1 1 1 1 1	1041	1 1 1 1 1 1 0 1 1 1	1088
1 0 1 1 0 1 1 1 1 1	1042	0 1 1 1 1 1 1 1 1 1	1089
0 0 1 1 0 1 1 1 1 1	1043	1 0 1 1 1 1 0 1 1 1	1090
1 1 0 1 0 1 1 1 1 1	1044	0 0 1 1 1 1 0 1 1 1	1091
0 1 0 1 0 1 1 1 1 1	1045	1 1 0 1 1 1 0 1 1 1	1092
1 0 0 1 0 1 1 1 1 1	1046	0 1 0 1 1 1 0 1 1 1	1093
0 0 0 1 0 1 1 1 1 1	1047	1 0 0 1 1 1 0 1 1 1	1094
1 1 1 0 0 1 1 1 1 1	1048	0 0 0 1 1 1 0 1 1 1	1095
0 1 1 0 0 1 1 1 1 1	1049	1 1 1 0 1 1 0 1 1 1	1096
1 0 1 0 0 1 1 1 1 1	1050	0 1 1 0 1 1 0 1 1 1	1097
0 0 1 0 0 1 1 1 1 1	1051	1 0 1 0 1 1 0 1 1 1	1098
1 1 0 0 0 1 1 1 1 1	1052	0 0 1 0 1 1 0 1 1 1	1099
0 1 0 0 0 1 1 1 1 1	1053	1 1 0 0 1 1 0 1 1 1	1100
1 0 0 0 0 1 1 1 1 1	1054	0 1 0 0 1 1 0 1 1 1	1101
0 0 0 0 0 1 1 1 1 1	1055	1 0 0 0 1 1 0 1 1 1	1102
1 1 1 1 1 0 1 1 1 1	1056	0 0 0 0 1 1 0 1 1 1	1103
0 1 1 1 1 0 1 1 1 1	1057	1 1 1 1 0 1 0 1 1 1	1104
1 0 1 1 1 0 1 1 1 1	1058	0 1 1 1 0 1 0 1 1 1	1105
0 0 1 1 1 0 1 1 1 1	1059	1 0 1 1 0 1 0 1 1 1	1106
1 1 0 1 1 0 1 1 1 1	1060	0 0 1 1 0 1 0 1 1 1	1107
0 1 0 1 1 0 1 1 1 1	1061	1 1 0 1 0 1 0 1 1 1	1108
1 0 0 1 1 0 1 1 1 1	1062	0 1 0 1 0 1 0 1 1 1	1109
0 0 0 1 1 0 1 1 1 1	1063	1 0 0 1 0 1 0 1 1 1	1110
1 1 1 0 1 0 1 1 1 1	1064	0 0 0 1 0 1 0 1 1 1	1111
0 1 1 0 1 0 1 1 1 1	1065	1 1 1 0 0 1 1 0 1 1	1112
1 0 1 0 1 0 1 1 1 1	1066	0 1 1 0 0 1 0 1 1 1	1113
0 0 1 0 1 0 1 1 1 1	1067	1 0 1 0 0 1 0 1 1 1	1114
1 1 0 0 1 0 1 1 1 1	1068	0 0 1 0 0 1 0 1 1 1	1115

0 1 0 0 1 0 1 1 1 1	1069
1 0 0 0 1 0 1 1 1 1	1070

SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10	
1 0 0 0 0 1 0 1 1 1	1118
0 0 0 0 0 1 0 1 1 1	1119
1 1 1 1 1 0 0 1 1 1	1120
0 1 1 1 1 0 0 1 1 1	1121
1 0 1 1 1 0 0 1 1 1	1122
0 0 1 1 1 0 0 1 1 1	1123
1 1 0 1 1 0 0 1 1 1	1124
0 1 0 1 1 0 0 1 1 1	1125
1 0 0 1 1 0 0 1 1 1	1126
0 0 0 1 1 0 0 1 1 1	1127
1 1 1 0 1 0 0 1 1 1	1128
0 1 1 0 1 0 0 1 1 1	1129
1 0 1 0 1 0 0 1 1 1	1130
0 0 1 0 1 0 0 1 1 1	1131
1 1 0 0 1 0 0 1 1 1	1132
0 1 0 0 1 0 0 1 1 1	1133
1 0 0 0 1 0 0 1 1 1	1134
0 0 0 0 1 0 0 1 1 1	1135
1 1 1 1 0 0 0 1 1 1	1136
0 1 1 1 0 0 0 1 1 1	1137
1 0 1 1 0 0 0 1 1 1	1138
0 0 1 1 0 0 0 1 1 1	1139
1 1 0 1 0 0 0 1 1 1	1140
0 1 0 1 0 0 0 1 1 1	1141
1 0 0 1 0 0 0 1 1 1	1142
0 0 0 1 0 0 0 1 1 1	1143
1 1 1 0 0 0 0 1 1 1	1144
0 1 1 0 0 0 0 1 1 1	1145
1 0 1 0 0 0 0 1 1 1	1146
0 0 1 0 0 0 0 1 1 1	1147
1 1 0 0 0 0 0 1 1 1	1148
0 1 0 0 0 0 0 1 1 1	1149
1 0 0 0 0 0 0 1 1 1	1150
0 0 0 0 0 0 0 1 1 1	1151
1 1 1 1 1 1 1 0 1 1	1152
0 1 1 1 1 1 1 0 1 1	1153
1 0 1 1 1 1 1 0 1 1	1154
0 0 1 1 1 1 1 0 1 1	1155
1 1 0 1 1 1 1 0 1 1	1156
0 1 0 1 1 1 1 0 1 1	1157
1 0 0 1 1 1 1 0 1 1	1158
0 0 0 1 1 1 1 0 1 1	1159
1 1 1 0 1 1 1 0 1 1	1160
0 1 1 0 1 1 1 0 1 1	1161
1 0 1 0 1 1 1 0 1 1	1162
0 0 1 0 1 1 1 0 1 1	1163

1 1 0 0 0 1 0 1 1 1	1116
0 1 0 0 0 1 0 1 1 1	1117

SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10	
0 1 0 0 1 1 1 0 1 1	1165
1 0 0 0 1 1 1 0 1 1	1166
0 0 0 0 1 1 1 0 1 1	1167
1 1 1 1 0 1 1 0 1 1	1168
0 1 1 1 0 1 1 0 1 1	1169
1 0 1 1 0 1 1 0 1 1	1170
0 0 1 1 0 1 1 0 1 1	1171
1 1 0 1 0 1 1 0 1 1	1172
0 1 0 1 0 1 1 0 1 1	1173
1 0 0 1 0 1 1 0 1 1	1174
0 0 0 1 0 1 1 0 1 1	1175
1 1 1 0 0 1 1 0 1 1	1176
0 1 1 0 0 1 1 0 1 1	1177
1 0 1 0 0 1 1 0 1 1	1178
0 0 1 0 0 1 1 0 1 1	1179
1 1 0 0 0 1 1 0 1 1	1180
0 1 0 0 0 1 1 0 1 1	1181
1 0 0 0 0 1 1 0 1 1	1182
0 0 0 0 0 1 1 0 1 1	1183
1 1 1 1 1 0 1 0 1 1	1184
0 1 1 1 1 0 1 0 1 1	1185
1 0 1 1 1 0 1 0 1 1	1186
0 0 1 1 1 0 1 0 1 1	1187
1 1 0 1 1 0 1 0 1 1	1188
0 1 0 1 1 0 1 0 1 1	1189
1 0 0 1 1 0 1 0 1 1	1190
0 0 0 1 1 0 1 0 1 1	1191
1 1 1 0 1 0 1 0 1 1	1192
0 1 1 0 1 0 1 0 1 1	1193
0 1 1 0 1 0 1 0 1 1	1194
0 0 1 0 1 0 1 0 1 1	1195
1 1 0 0 1 0 1 0 1 1	1196
0 1 0 0 1 0 1 0 1 1	1197
1 0 0 0 1 0 1 0 1 1	1198
0 0 0 0 1 0 1 0 1 1	1199
1 1 1 1 0 0 1 0 1 1	1200
0 1 1 1 0 0 1 0 1 1	1201
1 0 1 1 0 0 1 0 1 1	1202
0 0 1 1 0 0 1 0 1 1	1203
1 1 0 1 0 0 1 0 1 1	1204
0 1 01 0 0 1 0 1 1	1205
1 0 0 1 0 0 1 0 1 1	1206
0 0 0 1 0 0 1 0 1 1	1207
1 1 1 0 0 0 1 0 1 1	1208
0 1 1 0 0 0 1 0 1 1	1209
1 0 1 0 0 0 1 0 1 1	1210

1 1 0 0 1 1 1 0 1 1	1164

SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10	
1 1 0 0 0 0 1 0 1 1	1212
0 1 0 0 0 0 1 0 1 1	1213
1 0 0 0 0 0 1 0 1 1	1214
0 0 0 0 0 0 1 0 1 1	1215
1 1 1 1 1 1 0 0 1 1	1216
0 1 1 1 1 1 0 0 1 1	1217
1 0 1 1 1 1 0 0 1 1	1218
0 0 1 1 1 1 0 0 1 1	1219
1 1 0 1 1 1 0 0 1 1	1220
0 1 0 1 1 1 0 0 1 1	1221
1 0 0 1 1 1 0 0 1 1	1222
0 0 0 1 1 1 0 0 1 1	1223
1 1 1 0 1 1 0 0 1 1	1224
0 1 1 0 1 1 0 0 1 1	1225
1 0 1 0 1 1 0 0 1 1	1226
0 0 1 0 1 1 0 0 1 1	1227
1 1 0 0 1 1 0 0 1 1	1228
0 1 0 0 1 1 0 0 1 1	1229
1 0 0 0 1 1 0 0 1 1	1230
0 0 0 0 1 1 0 0 1 1	1231
1 1 1 1 0 1 0 0 1 1	1232
0 1 1 1 0 1 0 0 1 1	1233
1 0 1 1 0 1 0 0 1 1	1234
0 0 1 1 0 1 0 0 1 1	1235
1 1 0 1 0 1 0 0 1 1	1236
0 1 0 1 0 1 0 0 1 1	1237
1 0 0 1 0 1 0 0 1 1	1238
0 0 0 1 0 1 0 0 1 1	1239
1 1 1 0 0 1 0 0 1 1	1240
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1 1 1 0 1 0 0 0 1 1	1256
0 1 1 0 1 0 0 0 1 1	1257
1 0 1 0 1 0 0 0 1 1	1258

0 0 1 0 0 0 1 0 1 1	1211

SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10	
0 0 1 0 1 0 0 0 1 1	1259
1 1 0 0 1 0 0 0 1 1	1260
0 1 0 0 1 0 0 0 1 1	1261
1 0 0 0 1 0 0 0 1 1	1262
0 0 0 0 1 0 0 0 1 1	1263
1 1 1 1 0 0 0 0 1 1	1264
0 1 1 1 0 0 0 0 1 1	1265
1 0 1 1 0 0 0 0 1 1	1266
0 0 1 1 0 0 0 0 1 1	1267
1 1 0 1 0 0 0 0 1 1	1268
0 1 0 1 0 0 0 0 1 1	1269
1 0 0 1 0 0 0 0 1 1	1270
0 0 0 1 0 0 0 0 1 1	1271
1 1 1 0 0 0 0 0 1 1	1272
0 1 1 0 0 0 0 0 1 1	1273
1 0 1 0 0 0 0 0 1 1	1274
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0 1 0 1 0 1 1 1 0 1	1301
1 0 0 1 0 1 1 1 0 1	1302
0 0 0 1 0 1 1 1 0 1	1303
1 1 1 0 0 1 1 1 0 1	1304
0 1 1 0 0 1 1 1 0 1	1305

SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10	
1 0 1 0 0 1 1 1 0 1	1306
0 0 1 0 0 1 1 1 0 1	1307
1 1 0 0 0 1 1 1 0 1	1308
0 1 0 0 0 1 1 1 0 1	1309
1 0 0 0 0 1 1 1 0 1	1310
0 0 0 0 0 1 1 1 0 1	1311
1 1 1 1 1 0 1 1 0 1	1312
0 1 1 1 1 0 1 1 0 1	1313
1 0 1 1 1 0 1 1 0 1	1314
0 0 1 1 1 0 1 1 0 1	1315
1 1 0 1 1 0 1 1 0 1	1316
0 1 0 1 1 0 1 1 0 1	1317
1 0 0 1 1 0 1 1 0 1	1318
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1 1 1 0 1 0 1 1 0 1	1320
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1 0 0 0 1 0 1 1 0 1	1326
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0 1 0 1 1 1 0 1 0 1	1349
1 0 0 1 1 1 0 1 0 1	1350
0 0 0 1 1 1 0 1 0 1	1351
1 1 1 0 1 1 0 1 0 1	1352

SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10	
0 1 1 0 1 1 0 1 0 1	1353
1 0 1 0 1 1 0 1 0 1	1354
0 0 1 0 1 1 0 1 0 1	1355
1 1 0 0 1 1 0 1 0 1	1356
0 1 0 0 1 1 0 1 0 1	1357
1 0 0 0 1 1 0 1 0 1	1358
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1 1 1 1 0 1 0 1 0 1	1360
0 1 1 1 0 1 0 1 0 1	1361
1 0 1 1 0 1 0 1 0 1	1362
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1 0 0 1 0 1 0 1 0 1	1366
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1 0 1 0 0 1 0 1 0 1	1370
0 0 1 0 0 1 0 1 0 1	1371
1 1 0 0 0 1 0 1 0 1	1372
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1 1 0 1 0 0 0 1 0 1	1396
0 1 0 1 0 0 0 1 0 1	1397
1 0 0 1 0 0 0 1 0 1	1398
0 0 0 1 0 0 0 1 0 1	1399

SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10	
1 1 1 0 0 0 0 1 0 1	1400
0 1 1 0 0 0 0 1 0 1	1401
1 0 1 0 0 0 0 1 0 1	1402
0 0 1 0 0 0 0 1 0 1	1403
1 1 0 0 0 0 0 1 0 1	1404
0 1 0 0 0 0 0 1 0 1	1405
1 0 0 0 0 0 0 1 0 1	1406
0 0 0 0 0 0 0 1 0 1	1407
1 1 1 1 1 1 1 0 0 1	1408
0 1 1 1 1 1 1 0 0 1	1409
1 0 1 1 1 1 1 0 0 1	1410
0 0 1 1 1 1 1 0 0 1	1411
1 1 0 1 1 1 1 0 0 1	1412
0 1 0 1 1 1 1 0 0 1	1413
1 0 0 1 1 1 1 0 0 1	1414
0 0 0 1 1 1 1 0 0 1	1415
1 1 1 0 1 1 1 0 0 1	1416
0 1 1 0 1 1 1 0 0 1	1417
1 0 1 0 1 1 1 0 0 1	1418
0 0 1 0 1 1 1 0 0 1	1419
1 1 0 0 1 1 1 0 0 1	1420
0 1 0 0 1 1 1 0 0 1	1421
1 0 0 0 1 1 1 0 0 1	1422
0 0 0 0 1 1 1 0 0 1	1423
1 1 1 1 0 1 1 0 0 1	1424
0 1 1 1 0 1 1 0 0 1	1425
1 0 1 1 0 1 1 0 0 1	1426
0 0 1 1 0 1 1 0 0 1	1427
1 1 0 1 0 1 1 0 0 1	1428
0 1 0 1 0 1 1 0 0 1	1429
1 0 0 1 0 1 1 0 0 1	1430
0 0 0 1 0 1 1 0 0 1	1431
1 1 1 0 0 1 1 0 0 1	1432
1 0 1 0 0 1 1 0 0 1	1433
0 0 1 0 0 1 1 0 0 1	1434
1 1 0 0 0 1 1 0 0 1	1435
1 1 0 0 0 1 1 0 0 1	1436
0 1 0 0 0 1 1 0 0 1	1437
1 0 0 0 0 1 1 0 0 1	1438
0 0 0 0 0 1 1 0 0 1	1439
1 1 1 1 1 0 1 0 0 1	1440
0 1 1 1 1 0 1 0 0 1	1441
1 0 1 1 1 0 1 0 0 1	1442
0 0 1 1 1 0 1 0 0 1	1443
1 1 0 1 1 0 1 0 0 1	1444
0 1 0 1 1 0 1 0 0 1	1445
1 0 0 1 1 0 1 0 0 1	1446

SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10	
0 0 0 1 1 0 1 0 0 1	1447
1 1 1 0 1 0 1 0 0 1	1448
0 1 1 0 1 0 1 0 0 1	1449
1 0 1 0 1 0 1 0 0 1	1450
0 0 1 0 1 0 1 0 0 1	1451
1 1 0 0 1 0 1 0 0 1	1452
0 1 0 0 1 0 1 0 0 1	1453
1 0 0 0 1 0 1 0 0 1	1454
0 0 0 0 0 0 1 0 0 1	1455
1 1 1 1 0 0 1 0 0 1	1456
0 1 1 1 0 0 1 0 0 1	1457
1 0 1 1 0 0 1 0 0 1	1458
0 0 1 1 0 0 1 0 0 1	1459
1 1 0 1 0 0 1 0 0 1	1460
0 1 0 1 0 0 1 0 0 1	1461
1 0 0 1 0 0 1 0 0 1	1462
0 0 0 1 0 0 1 0 0 1	1463
1 1 1 0 0 0 1 0 0 1	1464
0 1 1 0 0 0 1 0 0 1	1465
1 0 1 0 0 0 1 0 0 1	1466
0 0 1 0 0 0 1 0 0 1	1467
1 1 0 0 0 0 1 0 0 1	1468
0 1 0 0 0 0 1 0 0 1	1469
1 0 0 0 0 0 1 0 0 1	1470
0 0 0 0 0 0 1 0 0 1	1471
1 1 1 1 1 1 0 0 0 1	1472
0 1 1 1 1 1 0 0 0 1	1473
1 0 1 1 1 1 0 0 0 1	1474
0 0 1 1 1 1 0 0 0 1	1475
1 1 0 1 1 1 0 0 0 1	1476
0 1 0 1 1 1 0 0 0 1	1477
1 0 0 1 1 1 0 0 0 1	1478
0 0 0 1 1 1 0 0 0 1	1479
0 1 1 0 1 1 0 0 0 1	1480
0 1 1 0 1 1 0 0 0 1	1481
1 0 1 0 1 1 0 0 0 1	1482
0 0 1 0 1 1 0 0 0 1	1483
1 1 0 0 1 1 0 0 0 1	1484
0 1 0 0 1 1 0 0 0 1	1485
1 0 0 0 1 1 0 0 0 1	1486
0 0 0 0 1 1 0 0 0 1	1487
1 1 1 1 0 1 0 0 0 1	1488
0 1 1 1 0 1 0 0 0 1	1489
1 0 1 1 0 1 0 0 0 1	1490
0 0 1 1 0 1 0 0 0 1	1491
1 1 0 1 0 1 0 0 0 1	1492
0 1 0 1 0 1 0 0 0 1	1493

SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10	
1 0 0 1 0 1 0 0 0 1	1494
0 0 0 1 0 1 0 0 0 1	1495
1 1 1 0 0 1 0 0 0 1	1496
0 1 1 0 0 1 0 0 0 1.	1497
1 0 1 0 0 1 0 0 0 1	1498
0 0 1 0 0 1 0 0 0 1	1499
1 1 0 0 0 1 0 0 0 1	1500
0 1 0 0 0 1 0 0 0 1	1501
1 0 0 0 0 1 0 0 0 1	1502
0 0 0 0 0 1 0 0 0 1	1503
1 1 1 1 1 0 0 0 0 1	1504
0 1 1 1 1 0 0 0 0 1	1505
1 0 1 1 1 0 0 0 0 1	1506
0 0 1 1 1 0 0 0 0 1	1507
1 1 0 1 1 0 0 0 0 1	1508
0 1 0 1 1 0 0 0 0 1	1509
1 0 0 1 1 0 0 0 0 1	1510
0 0 0 1 1 0 0 0 0 1	1511
1 1 1 0 1 0 0 0 0 1	1512
0 1 1 0 1 0 0 0 0 1	1513
1 0 1 0 1 0 0 0 0 1	1514
0 0 1 0 1 0 0 0 0 1	1515
1 1 0 0 1 0 0 0 0 1	1516
0 1 0 0 1 0 0 0 0 1	1517
1 0 0 0 1 0 0 0 0 1	1518
0 0 0 0 1 0 0 0 0 1	1519
1 1 1 1 0 0 0 0 0 1	1520
0 1 1 1 0 0 0 0 0 1	1521
1 0 1 1 0 0 0 0 0 1	1522
0 0 1 1 0 0 0 0 0 1	1523
1 1 0 1 0 0 0 0 0 1	1524
0 1 0 1 0 0 0 0 0 1	1525
1 0 0 1 0 0 0 0 0 1	1526
0 0 0 1 0 0 0 0 0 1	1527
1 1 1 0 0 0 0 0 0 1	1528
0 1 1 0 0 0 0 0 0 1	1529
1 0 1 0 0 0 0 0 0 1	1530
0 0 1 0 0 0 0 0 0 1	1531
1 1 0 0 0 0 0 0 0 1	1532
0 1 0 0 0 0 0 0 0 1	1533
1 0 0 0 0 0 0 0 0 1	1534
0 0 0 0 0 0 0 0 0 1	1535
1 1 1 1 1 1 1 1 1 0	1536
0 1 1 1 1 1 1 1 1 0	1537
1 0 1 1 1 1 1 1 1 0	1538
0 0 1 1 1 1 1 1 1 0	1539
1 1 0 1 1 1 1 1 1 0	1540

SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10	
0 1 0 1 1 1 1 1 1 0	1541
1 0 0 1 1 1 1 1 1 0	1542
0 0 0 1 1 1 1 1 1 0	1543
1 1 1 0 1 1 1 1 1 0	1544
0 1 1 0 1 1 1 1 1 0	1545
1 0 1 0 1 1 1 1 1 0	1546
0 0 1 0 1 1 1 1 1 0	1547
1 1 0 0 1 1 1 1 1 0	1548
0 1 0 0 1 1 1 1 1 0	1549
1 0 0 0 1 1 1 1 1 0	1550
0 0 0 0 1 1 1 1 1 0	1551
1 1 1 1 0 1 1 1 1 0	1552
0 1 1 1 0 1 1 1 1 0	1553
1 0 1 1 0 1 1 1 1 0	1554
0 0 1 1 0 1 1 1 1 0	1555
1 1 0 1 0 1 1 1 1 0	1556
0 1 0 1 0 1 1 1 1 0	1557
1 0 0 1 0 1 1 1 1 0	1558
0 0 0 1 0 1 1 1 1 0	1559
1 1 1 0 0 1 1 1 1 0	1560
0 1 1 0 0 1 1 1 1 0	1561
1 0 1 0 0 1 1 1 1 0	1562
0 0 1 0 0 1 1 1 1 0	1563
1 1 0 0 0 1 1 1 1 0	1564
0 1 0 0 0 1 1 1 1 0	1565
1 0 0 0 0 1 1 1 1 0	1566
0 0 0 0 0 1 1 1 1 0	1567
1 1 1 1 1 0 1 1 1 0	1568
0 1 1 1 1 0 1 1 1 0	1569
1 0 1 1 1 0 1 1 1 0	1570
0 0 1 1 1 0 1 1 1 0	1571
1 1 0 1 1 0 1 1 1 0	1572
0 1 0 1 1 0 1 1 1 0	1573
1 0 0 1 1 0 1 1 1 0	1574
0 0 0 1 1 0 1 1 1 0	1575
1 1 1 0 1 0 1 1 1 0	1576
0 1 1 0 1 0 1 1 1 0	1577
1 0 1 0 1 0 1 1 1 0	1578
0 0 1 0 1 0 1 1 1 0	1579
1 1 0 0 1 0 1 1 1 0	1580
0 1 0 0 1 0 1 1 1 0	1581
1 0 0 0 1 0 1 1 1 0	1582
0 0 0 0 1 0 1 1 1 0	1583
1 1 1 1 0 0 1 1 1 0	1584
0 1 1 1 0 0 1 1 1 0	1585
1 0 1 1 0 0 1 1 1 0	1586
0 0 1 1 0 0 1 1 1 0	1587

SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10	
1 1 0 1 0 0 1 1 1 0	1588
0 1 0 1 0 0 1 1 1 0	1589
1 0 0 1 0 0 1 1 1 0	1590
0 0 0 1 0 0 1 1 1 0	1591
1 1 1 0 0 0 1 1 1 0	1592
0 1 1 0 0 0 1 1 1 0	1593
1 0 1 0 0 0 1 1 1 0	1594
0 0 1 0 0 0 1 1 1 0	1595
1 1 0 0 0 0 1 1 1 0	1596
0 1 0 0 0 0 1 1 1 0	1597
1 0 0 0 0 0 1 1 1 0	1598
0 0 0 0 0 0 1 1 1 0	1599
1 1 1 1 1 1 0 1 1 0	1600
0 1 1 1 1 1 0 1 1 0	1601
1 0 1 1 1 1 0 1 1 0	1602
0 0 1 1 1 1 0 1 1 0	1603
1 1 0 1 1 1 0 1 1 0	1604
0 1 0 1 1 1 0 1 1 0	1605
1 0 0 1 1 1 0 1 1 0	1606
0 0 0 1 1 1 0 1 1 0	1607
1 1 1 0 1 1 0 1 1 0	1608
0 1 1 0 1 1 0 1 1 0	1609
1 0 1 0 1 1 0 1 1 0	1610

Adjustment and alignment.

PLL alignment setting.
The PLL is set by selecting the switches to 1600 KHz.
Adjust the Oscillator coil slug so that by turning the slug clockwise the frequency counter moves up in frequency until it just reaches 1600. The PLL should 'lock' and further adjustment of the slug (inwards) does NOT increase the frequency reading. If necessary, turn the slug back out of the coil (anticlockwise) for it to be screwed back inwards to 're-lock' on the PLL.
Now set the switches to 1024 and make sure the PLL follows on the display.
There is a 'sweet spot' where the tuning slug will allow full frequency range to be selectable.

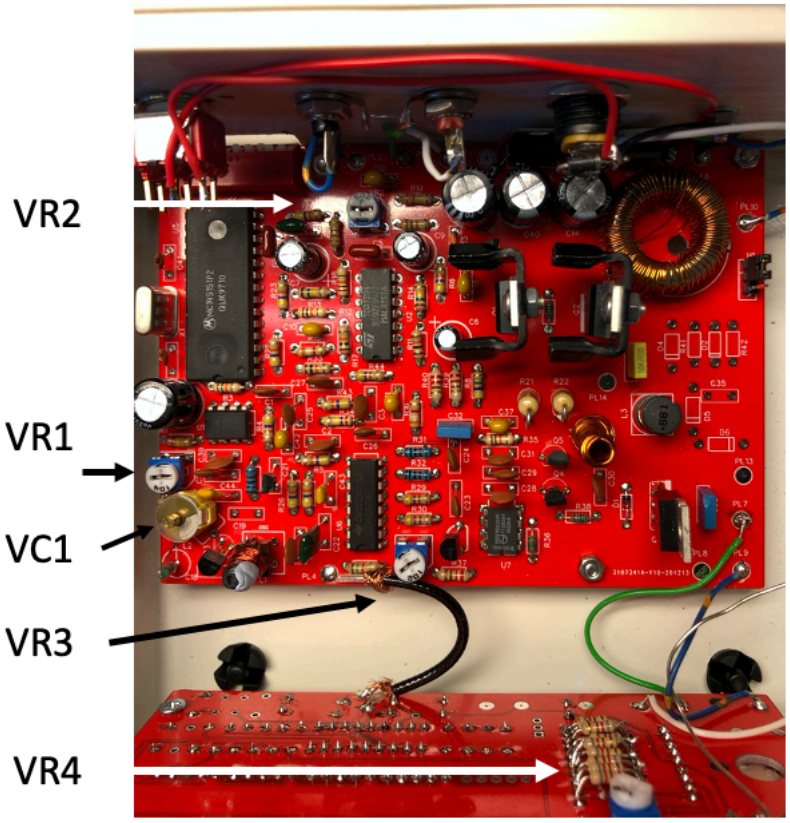
RF Drive.
The preset VR3 Is used to adjust the signal drive to the output FET.
Observing the output signal 'Bargraph' display, adjust the potentiometer to achieve maximum signal output. Or use an oscilloscope to observe drain and gate voltages on the output FET.

Audio Level
Adjust preset VR2 for maximum modulation, ideally using an oscilloscope for maximum (but not over) modulation depth. Without breaking carrier. (solid line at 0%)

Hum cancel
This is accomplished by adjustment of VR1. This is best done whilst operational. It introduces a low level 30 -60 Hz signal into the drive.

RF level monitor
The Bargraph is a visual representation of carrier level and Modulation. The signal is detected by the mini RF sniffer aerial inside and this converts to the LED scale. The sensitivity of this is adjusted by VR4 on the front panel PCB and by moving the sniffer nearby to the RF Capacitor conductor between the main board and the front panel board.

Aerial Matching
Internally on some models, especially the High Power, there is a selector link on the output coil (toroid) which is used for better aerial matching. At higher frequencies in particular, if the tuning capacitor is at one end, use the link to select a lower inductance for matching. The link is located on the main circuit board by the circular toroid. Select '1' for less inductance, '2' for mid inductance and none for maximum inductance.
It is particularly useful for use with longer aerial systems. A better match can be achieved whilst observing the LED tuning indicator.



Please Note. A variant is available with output matching to 50 Ω load. This is at the same cost, but the tuning capacitor is ineffective, so too is the signal meter.

Technical Specifications

1 Watt Unit

Size - 150mm wide, 150mm depth, 75mm high
Weight. - 0.7Kg
Power requirement - DC 12 -15 V @ 1A max
Audio input – RCA Phono sockets, left and right audio between 75mV and 775mV RMS
Audio Bandwidth (+ −3dB) - 80Hz to 6KHz
Modulation level – up to 100%
RF Output level – 1 Watt (dependant on Aerial Match)
RF Output Capacitor – 370pF variable
RF connection – screw terminal for signal and earth connection
Display -
Signal level – 10 segment Bar-Graph multi-colour LED
Frequency – 4 7-segment LED display
Ventilation – passive convection

4 Watt Unit

Size - 150mm wide, 150mm depth, 75mm high
Weight. - 1Kg
Power requirement - DC 17-18 V @ 1A max
Audio input – RCA Phono sockets, left and right audio between 75mV and 775mV RMS
Audio Bandwidth (+ −3dB) - 80Hz to 6KHz
Modulation level – up to 100%
RF Output level – 3 - 5 Watts (dependant on Aerial Match)
RF Output Capacitor – 400pF variable, 300v
RF connection – screw terminal for signal and earth connection
Display -
Signal level – 10 segment Bar-Graph multi-colour LED
Frequency – 4 7-segment LED display
Ventilation - Cooling fan forced airflow

8 Watt Unit

Size - 150mm wide, 150mm depth, 75mm high
Weight. - 1.1Kg
Power requirement - DC 24 V @ 1.5A max
Audio input – RCA Phono sockets, left and right audio between 75mV and 775mV RMS
Audio Bandwidth (+ −3dB) - 80Hz to 6KHz
Modulation level – up to 100%
RF Output level – 6 - 10 Watts (dependant on Aerial Match)
RF Output Capacitor – 340pF variable, 750v
RF connection – screw terminal for signal and earth connection
Display -
Signal level – 10 segment Bar-Graph multi-colour LED

Frequency – 4 7-segment LED display

Ventilation - Cooling fans (2) forced airflow