

Neighbourhood AM Medium-Wave Pole Transmitters



Pic 1.

Three versions of this AM Transmitter has been designed for use where there is limited space for a conventional long-wire aerial. It instead uses a telescopic 15 metre vertical pole and so can be retracted when not in use. This makes the transmitter portable in a way. It operates between 1024KHz and 1620KHz in the Medium Waveband (AM Band) and is designed to be a reliable and stable unit.

Typical range has been measured as 600 metres at 1602KHz and 400 metres at 1287KHz for the 1W version and double the distance for the 4Watt version. (1km – 1.3km)

A 10 Watt version gives a robust signal at 1km and up to 2km radius.

Housed in an ABS waterproof box the transmitter attaches to a pole or other superstructure in the garden by bolts at either end of the housing. The use of a copper tube for this would also act as an earth connection, which is ideal for creating a better signal and as a route for lightning protection.

A spark suppressor is fitted internally for additional protection from lightning.

The transmitter comes with a telescopic aerial which can extend to a maximum length of 5 metres. Version 1 can usually deliver between 1 and 1.5 watts cleanly driven to 100% modulation, version 2 is approximately 4 Watts in output, version 3 is approximately 10 Watts.

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)

The indoor unit which complements the transmitter is used to feed audio and power to the outdoor unit via a 3-core cable. FST is best (foil screen twin) which is a twisted pair within a foil-lapped shroud with earth conductor, 7/0.2mm. Maximum power handling is 1 Amp. Up to 20 metres cable can be used between the two units.

WARNING do NOT operate the transmitter near any overhead cables. You could accidentally get electrocuted. DEADLY and I do not take responsibility for any outcome in event of any accident with this misuse.



Pic 2.

The indoor unit with Jack socket audio input, peak LED and Volume control. A power LED is on the far right.

POWER SUPPLY --- IMPORTANT --- PLEASE NOTE

Power is provided from an external plug-top power unit. It plugs into the indoor unit, which in turn feeds the transmitter outdoors. The transmitter and indoor unit 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 a 15Volt DC 1A supply for the lower output version, 19 Volt for the 4 Watt version and 24 Volt for 10 Watt version.

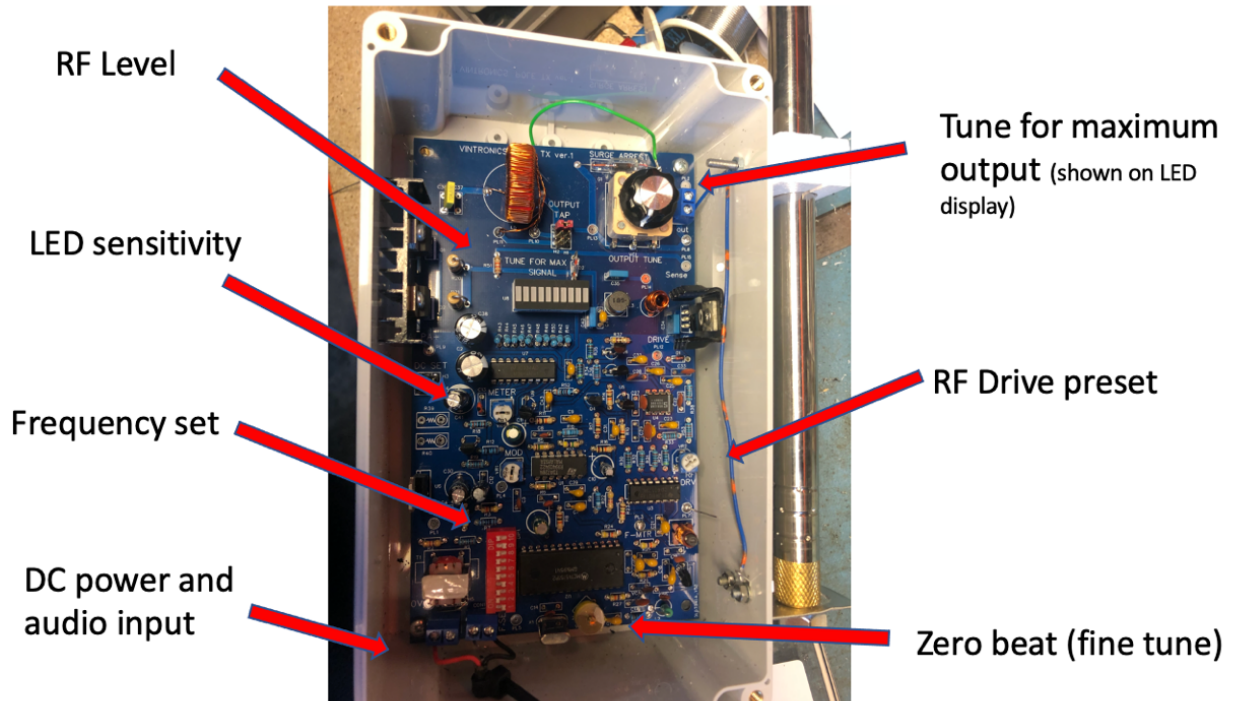
DAMAGE WILL OCCUR IF USING THE WRONG SUPPLY IN THE WRONG UNIT.

The transmitter comes already set up for use, together with a suitable mains power supply

Setup

1. Remove lid and adjust frequency using DIP switches as per required settings.
2. Insert stripped ends of the cable into the screw terminals as per picture 5.
3. Locate suitable position for the transmitter, bolting it to a wall or pole or fence.
4. Bolt transmitter so that the aerial pole will rise vertically.
5. Fully extend aerial – ensuring that it does not interfere with any overhead cables etc
6. Run cable indoors and connect to indoor driver unit.
7. Connect power supply to DC socket and audio feed into jack socket.
8. Switch on power and on the outdoor unit, adjust aerial tune knob for maximum power on output power display.
9. The LED sensitivity meter may need to be adjusted to allow a peak to be seen on the LED display.
10. Apply audio and monitor on AM radio, adjusting AF level if distorted. (Although this is already pre-set prior to shipping)

Pole Transmitter adjustments



Pic 3.

Advanced setup

Output Matching

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.

The link is located on the main circuit board by the circular toroid as shown below. There are 3 selections, 60 turns, 80 turns and 100 turns. The TOP LINK is for maximum inductance (100 turns). Middle link is for 80 turns and bottom link for 60 turns. These taps give less inductance and can give a better aerial match at higher frequencies. Maximise the signal level with the tuning control, whilst observing the signal level LED display. The use of a Field Strength Meter, which are readily available on eBay, is ideal for checking RF signal level.

The use of a Ground plane will help with range. Use wire radials connected to the metal mounting strip on the rear of the transmitter box. A minimum of 3 wires spread evenly apart and held down on the ground around the transmitter. (more can be added)

A suitable ground plane wiring harness is available for an additional £20. Please enquire when ordering. This is strongly advised as it helps with the range of the transmitter.

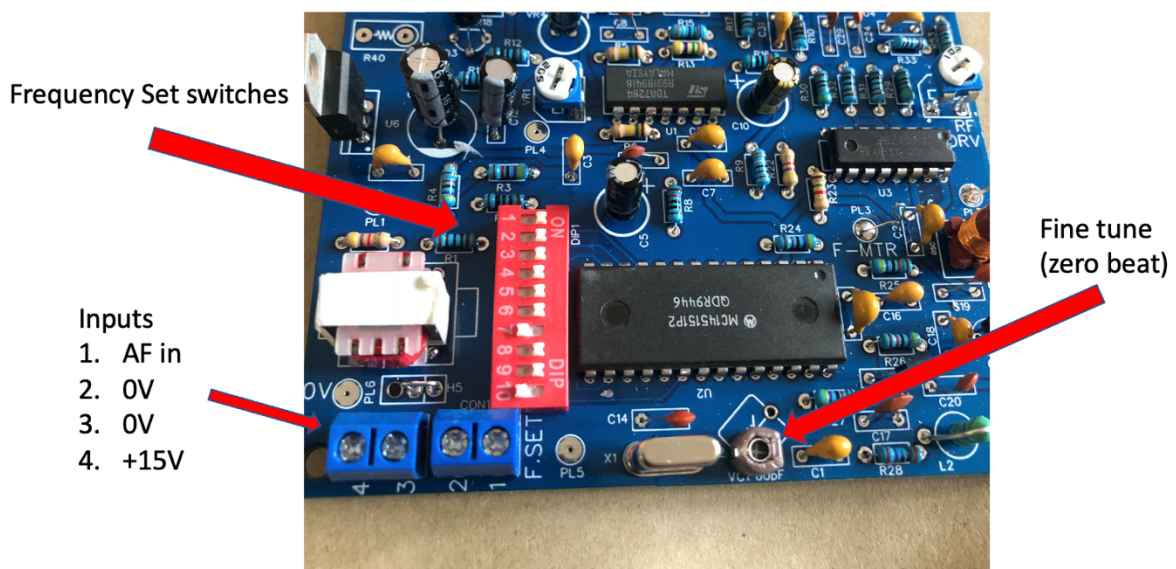


Pic 4.

LIGHTNING PROTECTION --- IMPORTANT --- PLEASE NOTE

It cannot be stressed strong enough, the transmitter could be struck by Lightning when the aerial is extended.

It is therefore strongly advised that the telescopic aerial is retracted if Lightning is forecast. In any case, there is a protection device within the transmitter which will route any static charge to the rear metal mounting strip. It is therefore important to provide a route to Earth from the mounting strip. A copper pole sunk into the ground would be a good idea.



Pic 5.

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)

* an enhanced user requirement.



Frequency setting

Setting frequency using dip switches

At the rear of the transmitter there are a set of dip switched numbered 1 to 10.

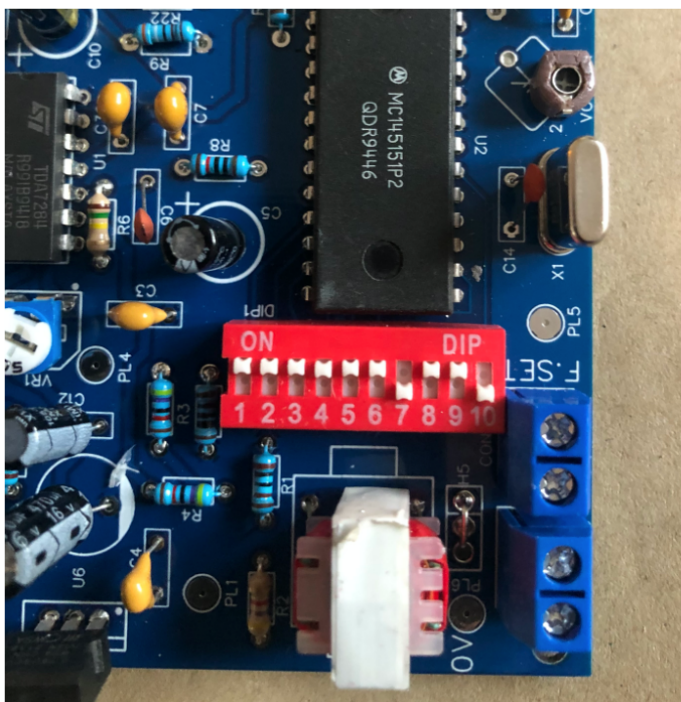
Using the frequency table set the switches to the desired frequency.

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



FREQUENCY SETTING

Set as 1600KHz-
1,1,1,1,1,1,0,1,1,0
for example

The DIP switches determine the frequency, shown as above.

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	<u>0 0 0 0 1 0 1 1 1 1</u>	<u>1071</u>
0 1 1 1 1 1 1 1 1 1	1025	1 1 1 1 0 0 1 1 1 1	1072
<u>1 0 1 1 1 1 1 1 1 1</u>	<u>1026</u>	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	<u>1 1 1 0 0 0 1 1 1 1</u>	<u>1080</u>
1 0 1 0 1 1 1 1 1 1	1034	0 1 1 0 0 0 1 1 1 1	1081
<u>0 0 1 0 1 1 1 1 1 1</u>	<u>1035</u>	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	<u>0 1 1 1 1 1 1 1 1 1</u>	<u>1089</u>
0 0 1 1 0 1 1 1 1 1	1043	1 0 1 1 1 1 0 1 1 1	1090
<u>1 1 0 1 0 1 1 1 1 1</u>	<u>1044</u>	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	<u>1 0 1 0 1 1 0 1 1 1</u>	<u>1098</u>
1 1 0 0 0 1 1 1 1 1	1052	0 0 1 0 1 1 0 1 1 1	1099
<u>0 1 0 0 0 1 1 1 1 1</u>	<u>1053</u>	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	<u>0 0 1 1 0 1 0 1 1 1</u>	<u>1107</u>
0 1 0 1 1 0 1 1 1 1	1061	1 1 0 1 0 1 0 1 1 1	1108
<u>1 0 0 1 1 0 1 1 1 1</u>	<u>1062</u>	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	<u>1 1 0 0 0 1 0 1 1 1</u>	<u>1116</u>
1 0 0 0 1 0 1 1 1 1	1070	0 1 0 0 0 1 0 1 1 1	1117

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	
1000010111	1118	0100111011	1165
0000010111	1119	1000111011	1166
1111100111	1120	0000111011	1167
0111100111	1121	1111011011	1168
1011100111	1122	0111011011	1169
0011100111	1123	<u>1011011011</u>	<u>1170</u>
1101100111	1124	0011011011	1171
<u>0101100111</u>	<u>1125</u>	1101011011	1172
1001100111	1126	0101011011	1173
0001100111	1127	1001011011	1174
1110100111	1128	0001011011	1175
0110100111	1129	1110011011	1176
1010100111	1130	0110011011	1177
0010100111	1131	1010011011	1178
1100100111	1132	<u>0010011011</u>	<u>1179</u>
0100100111	1133	1100011011	1180
<u>1000100111</u>	<u>1134</u>	0100011011	1181
0000100111	1135	1000011011	1182
1111000111	1136	0000011011	1183
0111000111	1137	1111101011	1184
1011000111	1138	0111101011	1185
0011000111	1139	1011101011	1186
1101000111	1140	0011101011	1187
0101000111	1141	<u>1101101011</u>	<u>1188</u>
1001000111	1142	0101101011	1189
<u>0001000111</u>	<u>1143</u>	1001101011	1190
1110000111	1144	0001101011	1191
0110000111	1145	1110101011	1192
1010000111	1146	0110101011	1193
0010000111	1147	0110101011	1194
1100000111	1148	0010101011	1195
0100000111	1149	1100101011	1196
1000000111	1150	<u>0100101011</u>	<u>1197</u>
0000000111	1151	1000101011	1198
<u>1111111011</u>	<u>1152</u>	0000101011	1199
0111111011	1153	1111001011	1200
1011111011	1154	0111001011	1201
0011111011	1155	1011001011	1202
1101111011	1156	0011001011	1203
0101111011	1157	1101001011	1204
1001111011	1158	0101001011	1205
0001111011	1159	<u>1001001011</u>	<u>1206</u>
1110111011	1160	0001001011	1207
<u>0110111011</u>	<u>1161</u>	1110001011	1208
1010111011	1162	0110001011	1209
0010111011	1163	1010001011	1210
1100111011	1164	0010001011	1211

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 0 0 0 0 1 0 1 1	1212	0 0 1 0 1 0 0 0 1 1	1259
0 1 0 0 0 0 1 0 1 1	1213	<u>1 1 0 0 1 0 0 0 1 1</u>	<u>1260</u>
1 0 0 0 0 0 1 0 1 1	1214	0 1 0 0 1 0 0 0 1 1	1261
<u>0 0 0 0 0 0 1 0 1 1</u>	<u>1215</u>	1 0 0 0 1 0 0 0 1 1	1262
1 1 1 1 1 1 0 0 1 1	1216	0 0 0 0 1 0 0 0 1 1	1263
0 1 1 1 1 1 0 0 1 1	1217	1 1 1 1 0 0 0 0 1 1	1264
1 0 1 1 1 1 0 0 1 1	1218	0 1 1 1 0 0 0 0 1 1	1265
0 0 1 1 1 1 0 0 1 1	1219	1 0 1 1 0 0 0 0 1 1	1266
1 1 0 1 1 1 0 0 1 1	1220	0 0 1 1 0 0 0 0 1 1	1267
0 1 0 1 1 1 0 0 1 1	1221	1 1 0 1 0 0 0 0 1 1	1268
1 0 0 1 1 1 0 0 1 1	1222	<u>0 1 0 1 0 0 0 0 1 1</u>	<u>1269</u>
0 0 0 1 1 1 0 0 1 1	1223	1 0 0 1 0 0 0 0 1 1	1270
<u>1 1 1 0 1 1 0 0 1 1</u>	<u>1224</u>	0 0 0 1 0 0 0 0 1 1	1271
0 1 1 0 1 1 0 0 1 1	1225	1 1 1 0 0 0 0 0 1 1	1272
1 0 1 0 1 1 0 0 1 1	1226	0 1 1 0 0 0 0 0 1 1	1273
0 0 1 0 1 1 0 0 1 1	1227	1 0 1 0 0 0 0 0 1 1	1274
1 1 0 0 1 1 0 0 1 1	1228	0 0 1 0 0 0 0 0 1 1	1275
0 1 0 0 1 1 0 0 1 1	1229	1 1 0 0 0 0 0 0 1 1	1276
1 0 0 0 1 1 0 0 1 1	1230	0 1 0 0 0 0 0 0 1 1	1277
0 0 0 0 1 1 0 0 1 1	1231	<u>1 0 0 0 0 0 0 0 1 1</u>	<u>1278</u>
1 1 1 1 0 1 0 0 1 1	1232	0 0 0 0 0 0 0 0 1 1	1279
<u>0 1 1 1 0 1 0 0 1 1</u>	<u>1233</u>	1 1 1 1 1 1 1 1 0 1	1280
1 0 1 1 0 1 0 0 1 1	1234	0 1 1 1 1 1 1 1 0 1	1281
0 0 1 1 0 1 0 0 1 1	1235	1 0 1 1 1 1 1 1 0 1	1282
1 1 0 1 0 1 0 0 1 1	1236	0 0 1 1 1 1 1 1 0 1	1283
0 1 0 1 0 1 0 0 1 1	1237	1 1 0 1 1 1 1 1 0 1	1284
1 0 0 1 0 1 0 0 1 1	1238	0 1 0 1 1 1 1 1 0 1	1285
0 0 0 1 0 1 0 0 1 1	1239	1 0 0 1 1 1 1 1 0 1	1286
1 1 1 0 0 1 0 0 1 1	1240	<u>0 0 0 1 1 1 1 1 0 1</u>	<u>1287</u>
0 1 1 0 0 1 0 0 1 1	1241	1 1 1 0 1 1 1 1 0 1	1288
<u>1 0 1 0 0 1 0 0 1 1</u>	<u>1242</u>	0 1 1 0 1 1 1 1 0 1	1289
0 0 1 0 0 1 0 0 1 1	1243	1 0 1 0 1 1 1 1 0 1	1290
1 1 0 0 0 1 0 0 1 1	1244	0 0 1 0 1 1 1 1 0 1	1291
0 1 0 0 0 1 0 0 1 1	1245	1 1 0 0 1 1 1 1 0 1	1292
1 0 0 0 0 1 0 0 1 1	1246	0 1 0 0 1 1 1 1 0 1	1293
0 0 0 0 0 1 0 0 1 1	1247	1 0 0 0 1 1 1 1 0 1	1294
1 1 1 1 1 0 0 0 1 1	1248	0 0 0 0 1 1 1 1 0 1	1295
0 1 1 1 1 0 0 0 1 1	1249	<u>1 1 1 1 0 1 1 1 0 1</u>	<u>1296</u>
1 0 1 1 1 0 0 0 1 1	1250	0 1 1 1 0 1 1 1 0 1	1297
<u>0 0 1 1 1 0 0 0 1 1</u>	<u>1251</u>	1 0 1 1 0 1 1 1 0 1	1298
1 1 0 1 1 0 0 0 1 1	1252	0 0 1 1 0 1 1 1 0 1	1299
0 1 0 1 1 0 0 0 1 1	1253	1 1 0 1 0 1 1 1 0 1	1300
1 0 0 1 1 0 0 0 1 1	1254	0 1 0 1 0 1 1 1 0 1	1301
0 0 0 1 1 0 0 0 1 1	1255	1 0 0 1 0 1 1 1 0 1	1302
1 1 1 0 1 0 0 0 1 1	1256	0 0 0 1 0 1 1 1 0 1	1303
0 1 1 0 1 0 0 0 1 1	1257	1 1 1 0 0 1 1 1 0 1	1304
1 0 1 0 1 0 0 0 1 1	1258	<u>0 1 1 0 0 1 1 1 0 1</u>	<u>1305</u>

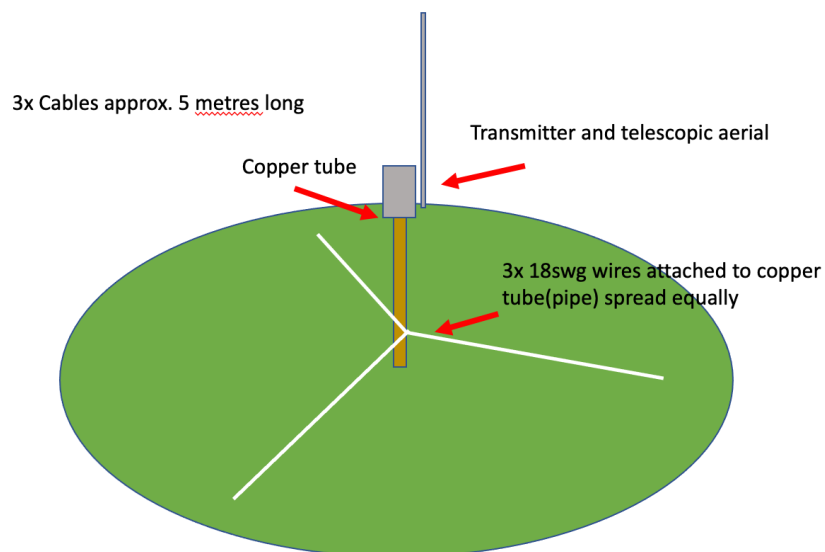
SWITCH POSITION	FREQ	SWITCH POSITION	FREQ
1 2 3 4 5 6 7 8 9 10		1 2 3 4 5 6 7 8 9 10	
1 0 1 0 0 1 1 1 0 1	1306	0 1 1 0 1 1 0 1 0 1	1353
0 0 1 0 0 1 1 1 0 1	1307	1 0 1 0 1 1 0 1 0 1	1354
1 1 0 0 0 1 1 1 0 1	1308	0 0 1 0 1 1 0 1 0 1	1355
0 1 0 0 0 1 1 1 0 1	1309	1 1 0 0 1 1 0 1 0 1	1356
1 0 0 0 0 1 1 1 0 1	1310	0 1 0 0 1 1 0 1 0 1	1357
0 0 0 0 0 1 1 1 0 1	1311	1 0 0 0 1 1 0 1 0 1	1358
1 1 1 1 1 0 1 1 0 1	1312	<u>0 0 0 0 1 1 0 1 0 1</u>	1359
0 1 1 1 1 0 1 1 0 1	1313	1 1 1 1 0 1 0 1 0 1	1360
<u>1 0 1 1 1 0 1 1 0 1</u>	1314	0 1 1 1 0 1 0 1 0 1	1361
0 0 1 1 1 0 1 1 0 1	1315	1 0 1 1 0 1 0 1 0 1	1362
1 1 0 1 1 0 1 1 0 1	1316	0 0 1 1 0 1 0 1 0 1	1363
0 1 0 1 1 0 1 1 0 1	1317	1 1 0 1 0 1 0 1 0 1	1364
1 0 0 1 1 0 1 1 0 1	1318	0 1 0 1 0 1 0 1 0 1	1365
0 0 0 1 1 0 1 1 0 1	1319	1 0 0 1 0 1 0 1 0 1	1366
1 1 1 0 1 0 1 1 0 1	1320	0 0 0 1 0 1 0 1 0 1	1367
0 1 1 0 1 0 1 1 0 1	1321	<u>1 1 1 0 0 1 0 1 0 1</u>	1368
1 0 1 0 1 0 1 1 0 1	1322	0 1 1 0 0 1 0 1 0 1	1369
<u>0 0 1 0 1 0 1 1 0 1</u>	1323	1 0 1 0 0 1 0 1 0 1	1370
1 1 0 0 1 0 1 1 0 1	1324	0 0 1 0 0 1 0 1 0 1	1371
0 1 0 0 1 0 1 1 0 1	1325	1 1 0 0 0 1 0 1 0 1	1372
1 0 0 0 1 0 1 1 0 1	1326	0 1 0 0 0 1 0 1 0 1	1373
0 0 0 0 1 0 1 1 0 1	1327	1 0 0 0 0 1 0 1 0 1	1374
1 1 1 1 0 0 1 1 0 1	1328	0 0 0 0 0 1 0 1 0 1	1375
0 1 1 1 0 0 1 1 0 1	1329	1 1 1 1 1 0 0 1 0 1	1376
1 0 1 1 0 0 1 1 0 1	1330	<u>0 1 1 1 1 0 0 1 0 1</u>	1377
0 0 1 1 0 0 1 1 0 1	1331	1 0 1 1 1 0 0 1 0 1	1378
<u>1 1 0 1 0 0 1 1 0 1</u>	1332	0 0 1 1 1 0 0 1 0 1	1379
0 1 0 1 0 0 1 1 0 1	1333	1 1 0 1 1 0 0 1 0 1	1380
1 0 0 1 0 0 1 1 0 1	1334	0 1 0 1 1 0 0 1 0 1	1381
0 0 0 1 0 0 1 1 0 1	1335	1 0 0 1 1 0 0 1 0 1	1382
1 1 1 0 0 0 1 1 0 1	1336	0 0 0 1 1 0 0 1 0 1	1383
0 1 1 0 0 0 1 1 0 1	1337	1 1 1 0 1 0 0 1 0 1	1384
1 0 1 0 0 0 1 1 0 1	1338	0 1 1 0 1 0 0 1 0 1	1385
0 0 1 0 0 0 1 1 0 1	1339	<u>1 0 1 0 1 0 0 1 0 1</u>	1386
1 1 0 0 0 0 1 1 0 1	1340	0 0 1 0 1 0 0 1 0 1	1387
<u>0 1 0 0 0 0 1 1 0 1</u>	1341	1 1 0 0 1 0 0 1 0 1	1388
1 0 0 0 0 0 1 1 0 1	1342	0 1 0 0 1 0 0 1 0 1	1389
0 0 0 0 0 0 1 1 0 1	1343	1 0 0 0 1 0 0 1 0 1	1390
1 1 1 1 1 1 0 1 0 1	1344	0 0 0 0 1 0 0 1 0 1	1391
0 1 1 1 1 1 0 1 0 1	1345	1 1 1 1 0 0 0 1 0 1	1392
1 0 1 1 1 1 0 1 0 1	1346	0 1 1 1 0 0 0 1 0 1	1393
0 0 1 1 1 1 0 1 0 1	1347	1 0 1 1 0 0 0 1 0 1	1394
1 1 0 1 1 1 0 1 0 1	1348	<u>0 0 1 1 0 0 0 1 0 1</u>	1395
0 1 0 1 1 1 0 1 0 1	1349	1 1 0 1 0 0 0 1 0 1	1396
<u>1 0 0 1 1 1 0 1 0 1</u>	1350	0 1 0 1 0 0 0 1 0 1	1397
0 0 0 1 1 1 0 1 0 1	1351	1 0 0 1 0 0 0 1 0 1	1398
1 1 1 0 1 1 0 1 0 1	1352	0 0 0 1 0 0 0 1 0 1	1399

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 0 0 0 0 1 0 1	1400	0 0 0 1 1 0 1 0 0 1	1447
0 1 1 0 0 0 0 1 0 1	1401	1 1 1 0 1 0 1 0 0 1	1448
1 0 1 0 0 0 0 1 0 1	1402	<u>0 1 1 0 1 0 1 0 0 1</u>	<u>1449</u>
0 0 1 0 0 0 0 1 0 1	1403	1 0 1 0 1 0 1 0 0 1	1450
<u>1 1 0 0 0 0 0 1 0 1</u>	<u>1404</u>	0 0 1 0 1 0 1 0 0 1	1451
0 1 0 0 0 0 0 1 0 1	1405	1 1 0 0 1 0 1 0 0 1	1452
1 0 0 0 0 0 0 1 0 1	1406	0 1 0 0 1 0 1 0 0 1	1453
0 0 0 0 0 0 0 1 0 1	1407	1 0 0 0 1 0 1 0 0 1	1454
1 1 1 1 1 1 1 0 0 1	1408	0 0 0 0 0 0 1 0 0 1	1455
0 1 1 1 1 1 1 0 0 1	1409	1 1 1 1 0 0 1 0 0 1	1456
1 0 1 1 1 1 1 0 0 1	1410	0 1 1 1 0 0 1 0 0 1	1457
0 0 1 1 1 1 1 0 0 1	1411	<u>1 0 1 1 0 0 1 0 0 1</u>	<u>1458</u>
1 1 0 1 1 1 1 0 0 1	1412	0 0 1 1 0 0 1 0 0 1	1459
<u>0 1 0 1 1 1 1 0 0 1</u>	<u>1413</u>	1 1 0 1 0 0 1 0 0 1	1460
1 0 0 1 1 1 1 0 0 1	1414	0 1 0 1 0 0 1 0 0 1	1461
0 0 0 1 1 1 1 0 0 1	1415	1 0 0 1 0 0 1 0 0 1	1462
1 1 1 0 1 1 1 0 0 1	1416	0 0 0 1 0 0 1 0 0 1	1463
0 1 1 0 1 1 1 0 0 1	1417	1 1 1 0 0 0 1 0 0 1	1464
1 0 1 0 1 1 1 0 0 1	1418	0 1 1 0 0 0 1 0 0 1	1465
0 0 1 0 1 1 1 0 0 1	1419	1 0 1 0 0 0 1 0 0 1	1466
1 1 0 0 1 1 1 0 0 1	1420	<u>0 0 1 0 0 0 1 0 0 1</u>	<u>1467</u>
0 1 0 0 1 1 1 0 0 1	1421	1 1 0 0 0 0 1 0 0 1	1468
<u>1 0 0 0 1 1 1 0 0 1</u>	<u>1422</u>	0 1 0 0 0 0 1 0 0 1	1469
0 0 0 0 1 1 1 0 0 1	1423	1 0 0 0 0 0 1 0 0 1	1470
1 1 1 1 0 1 1 0 0 1	1424	0 0 0 0 0 0 1 0 0 1	1471
0 1 1 1 0 1 1 0 0 1	1425	1 1 1 1 1 1 0 0 0 1	1472
1 0 1 1 0 1 1 0 0 1	1426	0 1 1 1 1 1 0 0 0 1	1473
0 0 1 1 0 1 1 0 0 1	1427	1 0 1 1 1 1 0 0 0 1	1474
1 1 0 1 0 1 1 0 0 1	1428	0 0 1 1 1 1 0 0 0 1	1475
0 1 0 1 0 1 1 0 0 1	1429	<u>1 1 0 1 1 1 0 0 0 1</u>	<u>1476</u>
1 0 0 1 0 1 1 0 0 1	1430	0 1 0 1 1 1 0 0 0 1	1477
<u>0 0 0 1 0 1 1 0 0 1</u>	<u>1431</u>	1 0 0 1 1 1 0 0 0 1	1478
1 1 1 0 0 1 1 0 0 1	1432	0 0 0 1 1 1 0 0 0 1	1479
1 0 1 0 0 1 1 0 0 1	1433	0 1 1 0 1 1 0 0 0 1	1480
0 0 1 0 0 1 1 0 0 1	1434	0 1 1 0 1 1 0 0 0 1	1481
1 1 0 0 0 1 1 0 0 1	1435	1 0 1 0 1 1 0 0 0 1	1482
1 1 0 0 0 1 1 0 0 1	1436	0 0 1 0 1 1 0 0 0 1	1483
0 1 0 0 0 1 1 0 0 1	1437	1 1 0 0 1 1 0 0 0 1	1484
1 0 0 0 0 1 1 0 0 1	1438	<u>0 1 0 0 1 1 0 0 0 1</u>	<u>1485</u>
0 0 0 0 0 1 1 0 0 1	1439	1 0 0 0 1 1 0 0 0 1	1486
<u>1 1 1 1 1 0 1 0 0 1</u>	<u>1440</u>	0 0 0 0 1 1 0 0 0 1	1487
0 1 1 1 1 0 1 0 0 1	1441	1 1 1 1 0 1 0 0 0 1	1488
1 0 1 1 1 0 1 0 0 1	1442	0 1 1 1 0 1 0 0 0 1	1489
0 0 1 1 1 0 1 0 0 1	1443	1 0 1 1 0 1 0 0 0 1	1490
1 1 0 1 1 0 1 0 0 1	1444	0 0 1 1 0 1 0 0 0 1	1491
0 1 0 1 1 0 1 0 0 1	1445	1 1 0 1 0 1 0 0 0 1	1492
1 0 0 1 1 0 1 0 0 1	1446	0 1 0 1 0 1 0 0 0 1	1493

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	
<u>1 0 0 1 0 1 0 0 0 1</u>	1494	0 1 0 1 1 1 1 1 1 0	1541
0 0 0 1 0 1 0 0 0 1	1495	1 0 0 1 1 1 1 1 1 0	1542
1 1 1 0 0 1 0 0 0 1	1496	0 0 0 1 1 1 1 1 1 0	1543
0 1 1 0 0 1 0 0 0 1	1497	1 1 1 0 1 1 1 1 1 0	1544
1 0 1 0 0 1 0 0 0 1	1498	0 1 1 0 1 1 1 1 1 0	1545
0 0 1 0 0 1 0 0 0 1	1499	1 0 1 0 1 1 1 1 1 0	1546
1 1 0 0 0 1 0 0 0 1	1500	0 0 1 0 1 1 1 1 1 0	1547
0 1 0 0 0 1 0 0 0 1	1501	<u>1 1 0 0 1 1 1 1 1 0</u>	1548
1 0 0 0 0 1 0 0 0 1	1502	0 1 0 0 1 1 1 1 1 0	1549
<u>0 0 0 0 0 1 0 0 0 1</u>	1503	1 0 0 0 1 1 1 1 1 0	1550
1 1 1 1 1 0 0 0 0 1	1504	0 0 0 0 1 1 1 1 1 0	1551
0 1 1 1 1 0 0 0 0 1	1505	1 1 1 1 0 1 1 1 1 0	1552
1 0 1 1 1 0 0 0 0 1	1506	0 1 1 1 0 1 1 1 1 0	1553
0 0 1 1 1 0 0 0 0 1	1507	1 0 1 1 0 1 1 1 1 0	1554
1 1 0 1 1 0 0 0 0 1	1508	0 0 1 1 0 1 1 1 1 0	1555
0 1 0 1 1 0 0 0 0 1	1509	1 1 0 1 0 1 1 1 1 0	1556
1 0 0 1 1 0 0 0 0 1	1510	<u>0 1 0 1 0 1 1 1 1 0</u>	1557
0 0 0 1 1 0 0 0 0 1	1511	1 0 0 1 0 1 1 1 1 0	1558
<u>1 1 1 0 1 0 0 0 0 1</u>	1512	0 0 0 1 0 1 1 1 1 0	1559
0 1 1 0 1 0 0 0 0 1	1513	1 1 1 0 0 1 1 1 1 0	1560
1 0 1 0 1 0 0 0 0 1	1514	0 1 1 0 0 1 1 1 1 0	1561
0 0 1 0 1 0 0 0 0 1	1515	1 0 1 0 0 1 1 1 1 0	1562
1 1 0 0 1 0 0 0 0 1	1516	0 0 1 0 0 1 1 1 1 0	1563
0 1 0 0 1 0 0 0 0 1	1517	1 1 0 0 0 1 1 1 1 0	1564
1 0 0 0 1 0 0 0 0 1	1518	0 1 0 0 0 1 1 1 1 0	1565
0 0 0 0 1 0 0 0 0 1	1519	<u>1 0 0 0 0 1 1 1 1 0</u>	1566
1 1 1 1 0 0 0 0 0 1	1520	0 0 0 0 0 1 1 1 1 0	1567
<u>0 1 1 1 0 0 0 0 0 1</u>	1521	1 1 1 1 1 0 1 1 1 0	1568
1 0 1 1 0 0 0 0 0 1	1522	0 1 1 1 1 0 1 1 1 0	1569
0 0 1 1 0 0 0 0 0 1	1523	1 0 1 1 1 0 1 1 1 0	1570
1 1 0 1 0 0 0 0 0 1	1524	0 0 1 1 1 0 1 1 1 0	1571
0 1 0 1 0 0 0 0 0 1	1525	1 1 0 1 1 0 1 1 1 0	1572
1 0 0 1 0 0 0 0 0 1	1526	0 1 0 1 1 0 1 1 1 0	1573
0 0 0 1 0 0 0 0 0 1	1527	1 0 0 1 1 0 1 1 1 0	1574
1 1 1 0 0 0 0 0 0 1	1528	<u>0 0 0 1 1 0 1 1 1 0</u>	1575
0 1 1 0 0 0 0 0 0 1	1529	1 1 1 0 1 0 1 1 1 0	1576
<u>1 0 1 0 0 0 0 0 0 1</u>	1530	0 1 1 0 1 0 1 1 1 0	1577
0 0 1 0 0 0 0 0 0 1	1531	1 0 1 0 1 0 1 1 1 0	1578
1 1 0 0 0 0 0 0 0 1	1532	0 0 1 0 1 0 1 1 1 0	1579
0 1 0 0 0 0 0 0 0 1	1533	1 1 0 0 1 0 1 1 1 0	1580
1 0 0 0 0 0 0 0 0 1	1534	0 1 0 0 1 0 1 1 1 0	1581
0 0 0 0 0 0 0 0 0 1	1535	1 0 0 0 1 0 1 1 1 0	1582
1 1 1 1 1 1 1 1 1 1 0	1536	0 0 0 0 1 0 1 1 1 0	1583
0 1 1 1 1 1 1 1 1 1 0	1537	<u>1 1 1 1 1 0 0 1 1 1 0</u>	1584
1 0 1 1 1 1 1 1 1 1 0	1538	0 1 1 1 0 0 1 1 1 0	1585
<u>0 0 1 1 1 1 1 1 1 1 0</u>	1539	1 0 1 1 0 0 1 1 1 0	1586
1 1 0 1 1 1 1 1 1 1 0	1540	0 0 1 1 0 0 1 1 1 0	1587

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 0 1 0 0 1 1 1 0	1588	<u>0 0 1 0 1 1 0 1 1 0</u>	<u>1611</u>
0 1 0 1 0 0 1 1 1 0	1589	1 1 0 0 1 1 0 1 1 0	1612
1 0 0 1 0 0 1 1 1 0	1590	0 1 0 0 1 1 0 1 1 0	1613
0 0 0 1 0 0 1 1 1 0	1591	1 0 0 0 1 1 0 1 1 0	1614
1 1 1 0 0 0 1 1 1 0	1592	0 0 0 0 1 1 0 1 1 0	1615
<u>0 1 1 0 0 0 1 1 1 0</u>	<u>1593</u>	1 1 1 1 0 1 0 1 1 0	1616
1 0 1 0 0 0 1 1 1 0	1594	0 1 1 1 0 1 0 1 1 0	1617
0 0 1 0 0 0 1 1 1 0	1595	0 0 1 1 0 1 0 1 1 0	1618
1 1 0 0 0 0 1 1 1 0	1596	1 1 0 1 0 1 0 1 1 0	1619
0 1 0 0 0 0 1 1 1 0	1597	<u>0 1 0 1 0 1 0 1 1 0</u>	<u>1620</u>
1 0 0 0 0 0 1 1 1 0	1598	1 0 0 1 0 1 0 1 1 0	1621
0 0 0 0 0 0 1 1 1 0	1599	0 0 0 1 0 1 0 1 1 0	1622
1 1 1 1 1 0 1 1 1 0	1600	1 1 1 0 0 1 0 1 1 0	1623
0 1 1 1 1 0 1 1 1 0	1601	0 1 1 0 0 1 0 1 1 0	1624
<u>1 0 1 1 1 0 1 1 1 0</u>	<u>1602</u>	1 0 1 0 0 1 0 1 1 0	1625
0 0 1 1 1 0 1 1 1 0	1603	0 0 1 0 0 1 0 1 1 0	1626
1 1 0 1 1 0 1 1 1 0	1604	1 1 0 0 0 1 0 1 1 0	1627
0 1 0 1 1 0 1 1 1 0	1605	0 1 0 0 0 1 0 1 1 0	1628
1 0 0 1 1 0 1 1 1 0	1606	<u>1 0 0 0 0 1 0 1 1 0</u>	<u>1629</u>
0 0 0 1 1 0 1 1 1 0	1607	0 0 0 0 0 1 0 1 1 0	1630
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		

Ground plane arrangement



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 pre-set VR2 (RF DRV) 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 pre-set VR1 (MOD) for maximum modulation, ideally using an oscilloscope for maximum (but not over) modulation depth. Without breaking carrier. (solid line at 0%)

RF level monitor

The Bargraph is a visual representation of carrier level and Modulation. The signal is detected by a mini RF pickup aerial internally and this converts to the LED scale. The sensitivity of this is adjusted by VR4 (METER) on the PCB.

Technical Specifications

Transmitter Size - 150mm wide, 180mm depth, 75mm high

Indoor unit size - 115mm wide, 110mm depth, 55mm high

Transmitter Weight. - 1 - 1.3Kg (depending on version)

Power requirement - 1 Watt: DC 15 V @ 1A max.

4 Watt: DC 19 V @ 1A max

10 Watt: DC 24V @ 1.5A max

Frequency range – 1024KHz to 1620KHz

Audio input – Stereo Jack socket, left and right audio between 75mV and 775mV RMS

Audio Bandwidth (+ –3dB) - 80Hz to 6KHz

Modulation level – up to 100%

RF Output level – 1 – 10 Watts dependant on unit plus Aerial Match and frequency

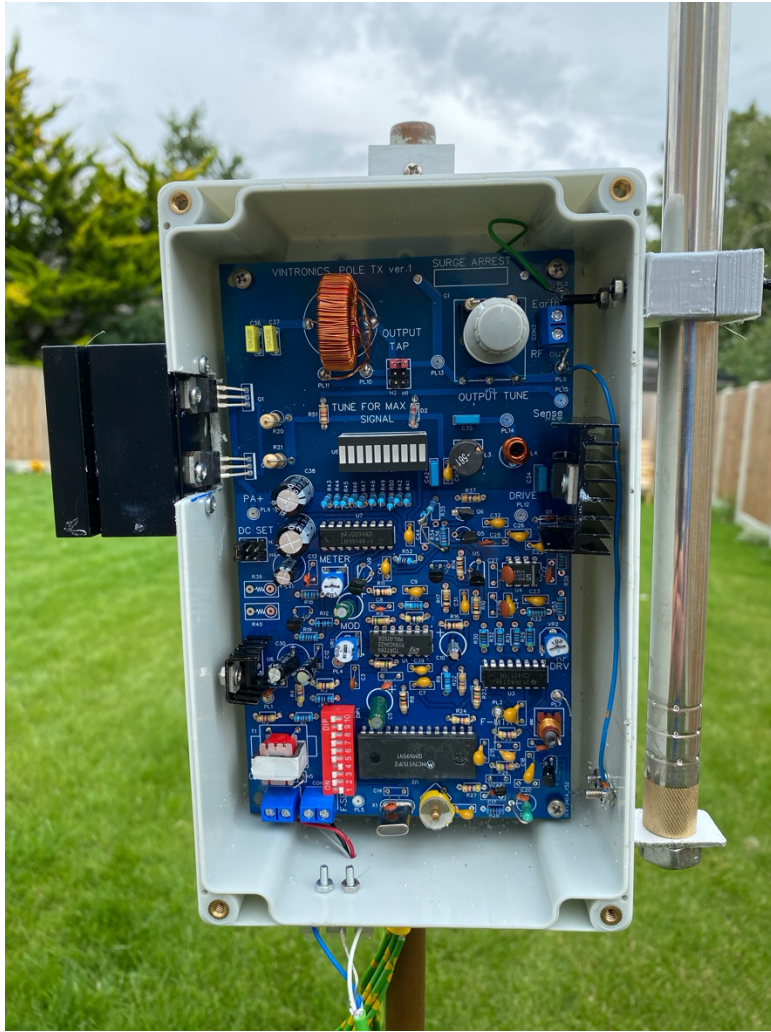
RF Output Capacitor – 370pF variable (400pF high voltage on 10W version)

RF connection – internal screw terminal connected to telescopic mast.

Earth Connection via rear plate. (Attach to ground – for lightning safety)

Display - Signal level – 10 segment Bar-Graph multi-colour LED

Ventilation – passive convection



10 Watt Version with external Heatsink and Upgraded Output tuning Capacitor.