

## AM PLL 50W & 100W PWM Medium-Wave Transmitters



The latest to our range of High-Power AM Transmitters, this version operates between 700KHz and 1600KHz over the Medium Waveband (AM Band) and is designed for high quality audio and a stable RF signal. Two different output filters are available across the frequency range, 700 – 1100KHz and 1100 – 1600KHz. Selection is therefore made at point of order.

Two versions, delivering either 50 watts or 100 watts of RMS power into a 50-ohm load. This equates to over 120 or 220 watts peak power driven up to 100% modulation. The DC-Balanced Power Amplifier is wideband, and the output is filtered to suit the frequency.

This transmitter employs a Pulse Width Modulator which makes the transmitter very efficient. With approximately 70% efficiency little energy is lost through heat from the circuitry.

The Transmitter circuit design uses a CMOS oscillator in a Phase-locked loop circuit for accuracy and ease of frequency selection. It is very stable and therefore does not drift off frequency. The Phase Lock circuit provides selection in 9KHz steps, so that the unit can be used in the UK or Europe, for the 9KHz spacing between channels.

For use in the USA and other parts of the World where 10kHz is used between channels a different Crystal will be fitted as requested. Four rugged Power MOSFETs are also used on the RF output stage, which drives the output transformer. High voltage rated components are used in the output section.

Audio input is via an XLR socket Balanced input 0dB to +8dB for 100% adjustable by the volume control on the front panel.

The transmitter is housed in a Steel box with an Aluminium front panel.

Ventilation holes to improve air flow for component cooling. Cooling fans are used on this model which are used to force cool the power transistor block.



## POWER SUPPLY

The unit is mains powered 110 – 230VAC mains.

Internally there are two power supplies, 13 volts for the Oscillator, fans and PWM controller, and a High Voltage supply for the Power Amplifier.



## Setup

1. Set operating frequency using DIP switches on the rear as per required settings.
2. Adjust your ATU for best match for the operating frequency.
3. Connect RF output via Coaxial cable to you SWR Meter and Aerial.
4. Connect XLR audio and Mains cables to transmitter.
5. Switch power on and quickly confirm low SWR and power output.

6. Adjust Volume control for desired Modulation, as observed using Oscilloscope.

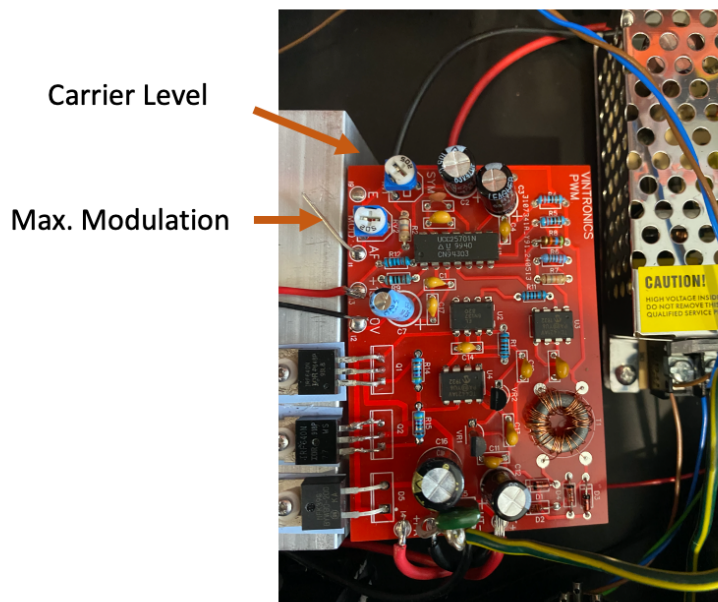


## Advanced setup

On the PWM board there are 2 presets.

One is for input gain/modulation level, the other is for Carrier set. (preset prior to shipping)

No other adjustments are available.



PWM Board Inside the chassis.

## TYPICAL AERIAL ARRANGEMENT

Recommended arrangement using long wire. Minimum length 12Metres.

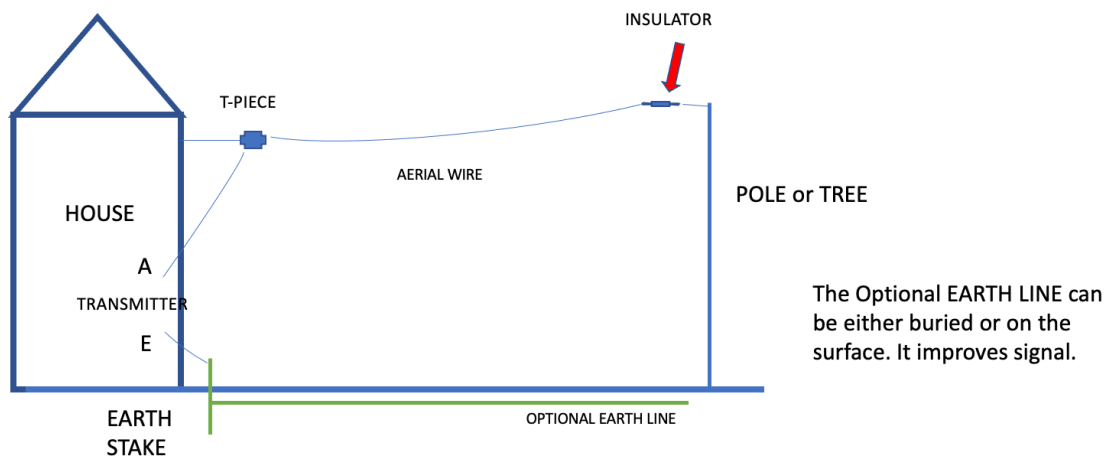
A longer aerial wire can be used with the transmitter and will give a better range. Excellent results have been obtained around 1400KHz using a single long wire of approximately 18 metres length as shown in the diagram. The aerial is essentially the length of the back garden, using insulators that radio hams use. Roof top is the end of the wire, suspended via a tree at the other end.

The use of a good Earth will significantly help with signal range. A copper stake in the ground is a good start. Search the Internet for further advice.

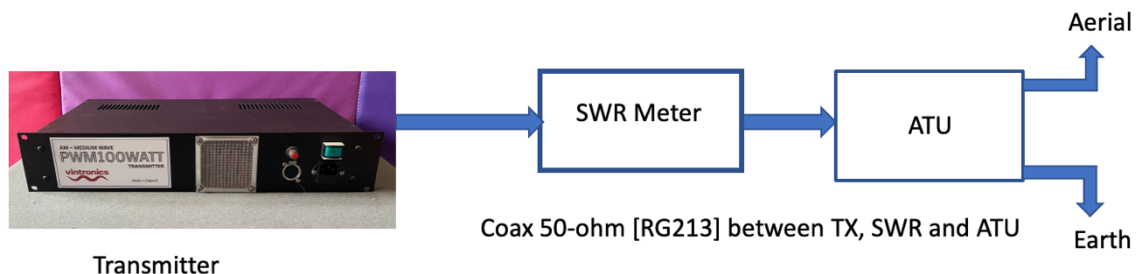
The use of an Aerial Tuning Unit is necessary to match the 50 Ohm output to your Aerial.

Lower operating frequencies require a longer length aerial.

There are other aerial arrangements, for example, Inverted L, Tee, Base Loaded Vertical etc.



## AERIAL ARRANGEMENT



Adjust ATU for best match, i.e., minimum SWR.

## Frequency setting

### Setting frequency using dip switches

At the rear of the transmitter there are a set of dip switched numbered 1 to 8.

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

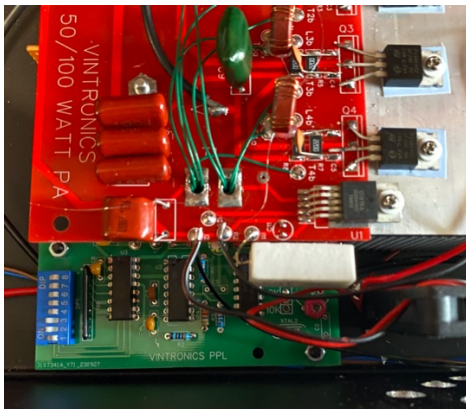
If your desired frequency is 873 KHz, look it up in the table below and you will see its binary setting.

As we can see the binary position for 873KHz is 01100000

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

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

It looks like this:



Inside the unit, the Oscillator sits just below the Power Amplifier and behind the front panel. The DIP switches determine the operating frequency. (In this case, switch to the right is 'off' and to the left is 'on'. Set here as 873KHz)

PLEASE NOTE: EUROPEAN CHANNELS ARE IN BLUE BELOW.

The transmitter is supplied for EU/UK use unless requested at time of purchase.

## Binary switch positions

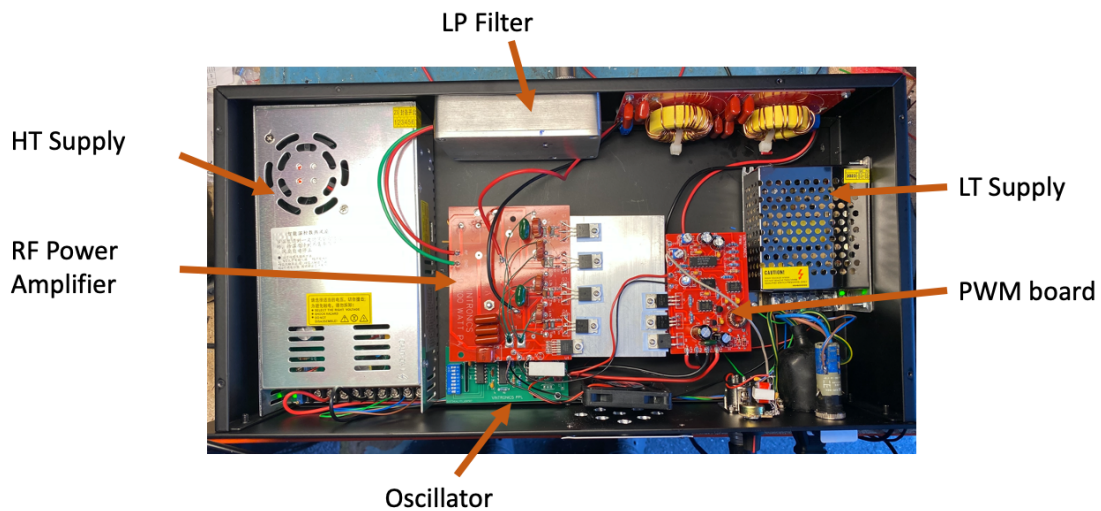
Frequency Setting on S1 (kHz) Blue=UK/EU. Red=USA

Pre-set    S1 S2 S3 S4 S5 S6 S7 S8

UK-EU    USA

477	540	00110101	594	660	01000001	702	780	01001101
495	550	00110110	603	670	01000010	711	790	01001110
504	560	00110111	612	680	01000011	720	800	01001111
513	570	00111000.	621	690	01000100	729	810	01010000
522	580	00111001	630	700	01000101	738	820	01010001
531	590	00111010	639	710	01000110	747	830	01010010
540	600	00111011	648	720	01000111	756	840	01010011
549	610	00111100	657	730	01001000	765	850	01011100
558	620	00111101	666	740	01001001	774	860	01010101
567	630	00111110	675	750	01001010	783	870	01010110
576	640	00111111	684	760	01001011	792	880	01010111
585	650	01000000	693	770	01001100	801	890	01011000
810	900	01011001	918	1020	01100101	1026	1140	01110001
819	910	01011010	927	1030	01100110	1035	1150	01110010
828	920	01011011	936	1040	01100111	1044	1160	01110011
837	930	01011100	945	1050	01101000	1053	1170	01110100
846	940	01011101	954	1060	01101001	1062	1180	01110101
855	950	01011110	963	1070	01101010	1071	1190	01110110
864	960	01011111	972	1080	01101011	1080	1200	01110111
873	970	01100000	981	1090	01101100	1089	1210	01111000
882	980	01100001	990	1100	01101101	1098	1220	01111001

891	990	01100010	999	1110	01101110	1107	1230	01111010
900	1000	01100011	1008	1120	01101111	1116	1240	01111011
909	1010	01100100	1017	1130	01110000	1125	1250	01111100
1134	1260	01111101	1242	1380	10001001	1350	1500	10010101
1143	1270	01111110	1251	1390	10001010	1359	1510	10010110
1152	1280	01111111	1260	1400	10001011	1368	1520	10010111
1161	1290	10000000	1269	1410	10001100	1377	1530	10011000
1170	1300	10000001	1278	1420	10001101	1386	1540	10011001
1179	1310	10000010	1287	1430	10001110	1395	1550	10011010
1188	1320	10000011	1296	1440	10011111	1404	1560	10011011
1197	1330	10000100	1305	1450	10010000	1413	1570	10011100
1206	1340	10000101	1314	1460	10010001	1422	1580	10011101
1215	1350	10000110	1323	1470	10010010	1431	1590	10011110
1224	1360	10000111	1332	1480	10010011	1440	1600	10011111
1233	1370	10001000	1341	1490	10010100	1449	1610	10100000
1458	1620	10100001	1521	1690	10101000	1584	1760	10111111
1467	1630	10100010	1530	1700	10101001	1593	1770	10110000
1476	1640	10100011	1539	1710	10101010	1602	1780	10110001
1485	1650	10100100	1548	1720	10101011	1611	1790	10110010
1494	1660	10100101	1557	1730	10101100	1620	1800	10110011
1503	1670	10100110	1566	1740	10101101	1629		10110100
1512	1680	10100111	1575	1750	10101110	1638		10110101



### Technical Specifications

Size - 2U 19inch Rack Case. 220mm wide, 240mm depth, 80mm high

Weight. - 5Kg

Power requirement - 110 -230VAC IEC Socket (specify when ordering)

Frequency Range - 700KHz to 1600KHz in 9KHz steps (10KHz steps can be made on request)

Audio input – XLR Line Level, 0dB to +8 for 100% modulation.

Audio Bandwidth (+ -3dB) - 60Hz to 6KHz

Modulation level – up to 100% (symmetrical)

RF Output level – 50 Watts RMS (120w peak)

100 Watts RMS (220w peak)

RF Output Connector – SO239

Ventilation and cooling – Fan forced air and convection