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User Manual 1 Watt Band II VHF FM **Broadcasting Transmitter**



INTENDED USE

i. The various pieces of equipment in this document are only for use permanently at a pre-defined location with a license or authorisation from the radio spectrum regulator in your country or EU member state.

ii. The installer must have competent RF engineering skills at their disposal, be EMC aware and understand radio frequency systems. The final installation should be in accordance with the site engineering document at http://www.aareff.com/ETR132.pdf The radio station management must assign a responsible person to the transmission equipment and installation.

PACKAGE CHECKLIST

Qty	Description	Item
1	Stereo coder audio limiter / 1 watt FM driver exciter 15V DC (ALSCB & 1WPLLB)	
1	MPX audio lead	
2	DC to DC Lead (DC connection from ALSCB to 1WPLLB)	

If the 1W transmitter is supplied as a single stand alone unit, or with a 100W or 200W amplifier, then it will include this power supply.

Qty	Description	Item
1	Power Supply 15V DC	

If the 1W transmitter is supplied with a 12W amplifier or 4 Way Distribution Amplifier, then it will use the power supply and cables included with the 12W amplifier shown below.

Qty	Description	Item
1	60W Power Supply 15V DC	
1	RNC to RNC lead (RE connection from 1)/(PLL B to 12)/(NITA)	

1	DC to DC Lead (DC connection 1WPLLB to 12WNTA)	

If the 1W transmitter is supplied with a 30W amplifier or 8 Way Distribution Amplifier, then it will use the power supply and cables included with the 30W amplifier shown below.

Qty	Description	Item
1	90W Power Supply 15V DC	
1	BNC to BNC lead (RF connection from 1WPLLB to 12WNTA)	
1	DC to DC Lead (DC connection 1WPLLB to 12WNTA)	

DESIGN

This equipment is two separate units that can be used stand alone, independent of each other. The first unit, ALSCB, contains two audio limiter modules that have fast attack on high peak audio levels to prevent excessive FM deviation. The two left and right audio signals are converted to a single MPX output. The second unit, 1WPLLB, uses a low power VHF oscillator amplified to 1 watt of power. It is phase locked to a reference quartz oscillator. The 1 watt RF signal is low pass filtered at the final output. The two sets are housed in metal enclosures fully screened to protect the user from direct contact with RF voltages and to prevent unwanted emissions, local interference and provide the RF unit with adequate immunity for the proper functioning in an industrial environment.

USA TECHNICAL REQUIREMENTS

This transmitter includes internal audio limiting which will limit audio and in turn the maximum FM deviation. The final adjustment for this limit on maximum deviation must be made by the customer or operator, it is not something we can factory set as it depends on whether other sub carriers such as SCA or RDS or being used. The deviation, including, pilot tone and if sued RDS and SCA, should be set to maintain compliance with the FCC rules and technical requirements. More information on this is at is in section 2.1047 Modulation characteristics and section 2.1049 Occupied bandwidth at:

http://www.gpo.gov/fdsys/granule/CFR-2011-title47-vol1/CFR-2011-title47-vol1-sec2-1047/content-detail.html

EU REGULATORY REQUIREMENTS

This transmitter includes internal audio limiting which will limit audio and in turn the maximum FM deviation. The final adjustment for this limit on maximum deviation must be made by the customer or operator, it is not something we can factory set as it depends on whether other sub carriers such as SCA or RDS or being used. The deviation, including, pilot tone and if used RDS and SCA, should be set to maintain compliance with EU standards. More information on this in section 8 Audio Processing Limiter at http://www.aareff.com/ETR132.pdf

This product complies with EMC directive of the European Union. To meet this directive the user or installer must follow the wiring instructions in the this user manual

This equipment is not intended for installation by an unqualified end user, the installer must have competent RF engineering skills and EMC knowledge at their disposal. The whole transmission system, including the antenna system and external audio limiting, should be installed in the EU in accordance with document ETR132, a copy of this is available at http://www.aareff.com/ETR132.pdf

ANTENNA

Even at 1W incorrect antenna and /or bad feeder cable connections can cause light RF burns and levels of RF exposure above the recommended limits for personnel

The RF output of this unit should be connected to:

- drive the 50 ohm input of another amplifier or;
- connected to an antenna and feeder cable that presents 50 ohm load (SWR 1.4 or less, 16 dB or more return loss) at the operating frequency.

Under no circumstances should the RF OUT be left open and unconnected if the power output of the unit is set higher than zero.

Ideally the antenna should be mounted at least 20 meters high and clear of any surrounding objects to get maximum range and more importantly to reduce risk of radio frequency radiation to personnel. When an antenna with 3dBi or higher gain towards the horizon is mounted at least 20 meters in height off ground and using up to 200 watts of transmitter power, power flux density measurements made at ground level directly under the antenna show less than 1 W/m2. Several European countries use a value for the power flux density of 10 W/m2 as a basis for considering whether or not an area is safe. The issue of radio frequency radiation limits is a contentious one and work in this field is continuing worldwide. **Under no circumstances should an antenna be mounted and used at ground level or within a few meters of personnel**.

Under NO CIRCUMSTANCES should the antenna be mounted and used at ground level next to personnel.

If this transmitter is going to be connected directly to an antenna, 50 ohm coaxial cable should be used. The antenna should present a return loss ideally of 16dB (SWR 1.4) or better at the operating frequency. The RF plug should be PL259 (UHF) or N type, depending which is fitted to the transmitter.

Ensure that all antenna connections are sound, this is important as poor connections and soldered joints can cause RF burns to personnel, severe noise to the transmission and excessive RF bandwidth. Do NOT connect the antenna to the transmitter yet.

INSTALLING THE TRANSMITTER

The installation must be by an engineer that has skills and competence in EMC and radio frequency systems. The final installation should be in accordance with the site engineering document at http://www.aareff.com/ETR132.pdf

Front Panel



Back Panel

	↓ ² ↓ ³	₽4	5	₽ 6	₽7	₽8	₽ 9	↓ 10	↓ ¹¹	↓ ¹²
	CEO		15V DC 600mA	15V DC		15V DC	15V DC	MPX OUTPUT (nom. DdBu)	AUDIO INPUT (1) (-10dBu to +20dBu	(2) 1000 NPUT 0 (-10dBu to +20dBu)
1	MODEL 1WPLLB	MPX NPUT (nom. OdBu)	DC INPUT	DC AUX OUT	1W 50 OHM RF OUT	DC INPUT	DC AUX OL	л		
13	1W BAND II FM EXCITER	INPORTANT	E! ANTES DE USAR E	L EQUIPO POR FAVOR	LEA EL MANUAL DE USUARIO EN:		STER	EO MPX GENERA	TOR WITH AUDIO	PROCESSING AND LIMITING
	ZONA FRANCA PISANO - SANTAIGO DOMINICAN REPUBLIC	aa	areff.net/1wp	IISI19 PASSV	vord: 1wpilsi19	CE		MODEL A ZONA FRANCA PISA DOMINICAN RI	LSCB	AAREFT
	14		15	5		12		1	14	13

1	Antenna Connection Warning
2	CE Marking
3	Restrictions in EU
4	MPX INPUT 0dBu 10K
5	DC INPUT 15V
6	Auxiliary DC OUTPUT 15V
7	Output 1W 50 Ohm 15V
8	DC INPUT 15V
9	Auxiliary DC OUTPUT 15V
10	OUTPUT MPX 0dBu
11	Input 0dBu Standard Audio
12	Input 0dBu Standard Audio
13	Manufacturer Brand
14	Manufacturer Address

Bottom Panel



VR2	RF Power Control / RF PWR. ADJ
S2 and S1	6 Way Dip Switches S2 and S1
VR1	Deviation Control DEV. ADJ
VC1	VCO Frequency Lock FREQ. ADJ

CAL DON'T APPLY THE POWER SUPPLY JUST YET

A) FIRST !! Set the RF Output to Zero

Locate VR2 RF PWR on the bottom panel. **BE CAREFUL** not to be too heavy handed, these controls are only small pcb mounted pots and switches and can be damaged with excessive force. You will need to use a small electrical screwdriver to adjust these controls.

Turn VR2, carefully, anti clockwise, until it reaches the stop. At this position there should be no RF output when the DC power is applied.

B) Power Supply and DC Input

The DC INPUT and DC AUX OUT on both ALSCB and 1WPLLB are simply connected together inside the units. The purpose of this is to allow other DC equipment to be connected in "daisy chain" and share the same power supply. The current capacity of the DC connectors is 5 amps, so if the external power source can provide 5 amps and exciter consumes 0.6 amps, this leaves 4.4 amps of power available for other equipment using the AUX OUT DC. The DC input connectors are 5.5 mm in outer diameter and 2.1 mm in diameter in the central pin. The central pin is positive and the negative or ground outside. Both units have reverse polarity protection.

IF YOU ARE USING YOUR OWN POWER SUPPLY please read this, otherwise please skip this and go to section C) Setting the <u>Frequency</u>

In the traditional power supplies (non switch mode linear type with heavy 50/60 Hz transformers) you should pay particular attention to the rectifier diodes placing 1nF ceramic disc capacitors directly across each of them. Power supplies CE Marked usually are suppressed and have no problem. To comply with the Low Voltage Directive and to provide safe operation the external power supply must be current limited or fused to no more than 5 amps. This will prevent the connectors and wiring failing in a fault condition. We recommend that 5 amps or more red and black, figure of 8 cable is used for wiring DC To comply with EMC directive this cable should NOT exceed 3 meters in length

To comply with the R&TTE directive the transmitter output power remains in compliance with +/- 0.5 dB, if the power source delivers a constant level of output voltage. The DC can be between 12 and 14.5V, but it must be with +/- 6% of the nominal value over the temperature range of 0 – 40 degrees Celsius with a current consumption of 200 to 600 mA. This applies to all types of power supplies including, batteries, solar panels, photo voltaic, wind generators or any other energy sources that are innovative or a combination of the above. The AC power supply not be more than 150mV ripple in DC output.

C) Setting the Frequency

Locate the two banks of 6 way dip switches S2 and S1. At the very end of this user manual you can locate the section DIL SWITCH (S2 and S1). This table shows all the frequencies from 87.5 to 108 MHz and the corresponding DIP switch settings. Look up your frequency in the table and then set the tiny dip switches to the ON or OFF position as shown in the table. These switches will determine the start up frequency for the transmitter, so, it's very important they are correct. If they are not correct it's possible to transmit on an unauthorised frequency

Double check again with the DIL SWITCH (S2 and S1) table that the dip switches are in the correct positions. Make sure they are pushed fully into the ON position or OFF position, not halfway between.

D) Powering the Transmitter

Double check the power is reduced to minimum as described in A) above. At this point the RF OUT should still be disconnected.

Go to the back panel:



- 1. Using the MPX Audio Lead, connect MPX OUTPUT to MPX INPUT 2. Using the DC to DC Lead, connect DC AUX OUT on the ALSCB to the DC INPUT on the 1WPLLB
- 3. Connect the 15V DC Power Supply to the DC INPUT on the ALSCB

Observe the front panel blue OUTPUT POWER LED. The LED should be completely extinguished. If it is not zero, disconnect the 15V DC power supply immediately and double check the power is reduced to minimum as described in A) above.

The PLL UNLOCK LED on the front panel should light up RED, this may change to the PLL LOCKED LED going BLUE after a few seconds, if it does great, if it doesn't, don't worry at this point, this is also normal.

E) Locking the PLL

It may be by chance that the PLL is close to lock and the PLL LOCKED LED has lit up in BLUE. If this is not the case and the PLL UNLOCKED LED is lit up in RED, then adjust in any direction VC1 FREQ. ADJ. slowly.



PLEASE be careful, this control is delicate. Be patient and continue to turn slowly until the PLL LOCKED LED lights up BLUE, then STOP turning. The BLUE light indicates PLL lock. The OUTPUT POWER LED should continue to indicate zero, if the OUTPUT POWER LED is showing any light, remove the AC and please check again paragraph A) Set The RF Output To Zero

F) Checking The Transmitter Frequency

WITH AN EXTERNAL FREQUENCY COUNTER

Connect the transmitter to an 1W or higher power Attenuator or Dummy Load and a Frequency Counter. Adjust VR2 RF PWR. ADJ a little to show a little power on OUTPUT POWER LED, this should be enough to get a reading on the Frequency Counter. If the frequency is not correct then work through previous section again carefully.

WITHOUT A FREQUENCY COUNTER.

Place the antenna of a digital radio receiver as close as possible to your transmitter enclosure. Tune the radio receiver to your transmitter frequency. You should hear the transmitter FM carrier. To verify this connect an audio signal temporally to the transmitter MPX INPUT socket and you should hear this audio on the radio receiver. If you do not hear any FM carrier or audio, work through previous section again carefully.

G) Connecting the Audio / Baseband

In the previous section D) Powering the Transmitter, the MPX Audio Lead was connected between MPX OUTPUT and the MPX INPUT. If you wish to use an external audio processor or RDS unit, it can be inserted into the MPX signal at this point.

Apply your stereo audio signal at standard line level of between -10dBu and +20dBu to the unbalanced RCA/Phono inputs AUDIO INPUT (1) and AUDIO INPUT (2). If the level is correct you should see the AUDIO CHANNEL 1/2 LEDs flashing on the front panel.

I) Checking the Audio Deviation

During manufacture and test the audio deviation will be set broadcast standard line of +8dBu peak for +/-75KHz peak deviation at 88.0 MHz. There is a high possibility that this will not be the same level as the audio source feed from your studio, external audio processing device, MPX stereo generator and/or RDS generator. You need to check this as excessive deviation can cause adjacent channel interference to other users of the radio spectrum.

WITHOUT TEST EQUIPMENT

Audio deviation is difficult to measure without proper test equipment and the method described here cannot replace proper test equipment, however if your regulator permits this method it is possible to check the deviation very close to correct level by using a relative comparison. Use a radio receiver tuned to a known high quality, high budget and reputed radio station. For example in the United Kingdom this would be a national BBC station. Feed the audio output of the radio receiver into some VU meter or level indication on a mixer or other audio equipment. Look carefully at the metering level peaks. You will notice the meter peak constantly at a specific level, make a note of this. Place the antenna of radio receiver as close as possible to your transmitter enclosure. Re-tune the radio receiver to your transmitter frequency. Look at the metering again. Adjust VR1 DEV. ADJ. so that your audio constantly peaks at a little lower than the level you noted. When you have achieved this your deviation is a little lower or close to the legal level. The reason for this setting is that it is legal to under deviate, but not-legal to over deviate, with a lack of test equipment

It is better to be under deviating in order to prevent adjacent channel interference until you have proper test equipment available.

WITH TEST EQUIPMENT

Connect the transmitter via a coupler and dummy load to a Spectrum Analyzer, Modulation Analyzer or Deviation Meter. Adjust VR2 RF PWR. to full. Adjust VR1 DEV. ADJ. for the correct deviation on the test equipment.

I) Connecting The Antenna

Do NOT connect antenna to the transmitter until you have followed all the previous instructions in this section fully.

The OUTPUT POWER LED should be showing zero, if not section c) above Reducing The RF Output To Zero.

If the OUTPUT POWER LED is showing zero, then connect to the external amplifier input or plug the antenna cable into the transmitters BNC RF OUT connector. Make sure this tight as poor and loose connections can cause RF burns to personnel, severe noise to the transmission and excessive RF bandwidth.

J) Setting the Power

Locate the power control VR2 RF PWR. ADJ. and set it to full. The OUTPUT POWER LED should be bright blue. THE TRANSMITTER IS NOW ON AIR!

MAINTENANCE

This unit does not need any regular maintenance, it's internals are completely sealed from the outside environment. You can expect 10 years of continuous 24/7 use from this unit.

LEGAL ADVICE

We sell this equipment to professionals and organizations in good faith it will be used correctly and legally. Nearly every country in the world require licensing for this type of equipment. It is the customer's responsibility to check relevant laws, directives, regulations and licensing requirements before installing or putting this product into service with an antenna system. You, the customer or user agree to defend, indemnify and hold harmless Aareff Systems Limited, it's employees and agents, from and against any claims, actions or demands, including without limitation legal and accounting fees, alleging or resulting from improper or unlawful use of this equipment.

TECHNICAL DATA

(All stated measurements were made at 220VAC at 26 Degrees Celsius ambient temperature unless stated)

RF and AF Parameters

Power Output Adj.	1mW to 1000mW into 50 ohms
Freq Range	87.5 to 108 MHz
Spurious Emissions	Less than -66 dB ref to carrier
Harmonic Emissions	Less than -66 dB ref to carrier
Out of Lock RF Muting	Less than -66 dB ref to carrier
Freq Stability	Less than +/- 2 KHz between -20 and +40 C
Freq Fine	Adj +/- 1000 Hz
Freq Adj. Accuracy	+/- 50 Hz
Deviation Sensitivity Stability	+/-2 % max
Residual AM	Less than 0.5 %
Synchronous AM	Less than 0.5 %
RF Output Connector	BNC Female 50 ohm
RF Ruggedness	Any VSWR, phase, length of time
MPX Audio Input	Connector Phono/ RCA type unbalanced
Pre-emphasis	(50uS/ 75uS/ None)
MPX Audio Input Sensitivity	Nom. 0.775 V rms for +/- 75 KHz Dev. User adj.
MPX Signal To Noise Ratio	More than 72 dB rel. +/-75 KHz dev.
MPX Audio Freq Response	Less than +/-0.5 dB between 30 Hz and 76 KHz
MPX Audio Distortion	Less than 0.2 % THD
Operating Temp	-20 to +40 Deg C

DC Power Requirements

Input Voltage	12-15 V DC
Input Current	Nominal 500mA, Absolute Max. 800mA
Ripple and Noise	Requires less than 2% to comply with EU Standards

AC Power Supply (optional extra)

Model	Meanwell GE12 15-P1J
Input Voltage	90~264 VAC 47-63 Hz 135~370 VDC
Input Power	12W max.
Output Voltage	15V DC +/-3%
Output Ripple and Noise	150 mV p-p or 1%
Working Humidity	20 ~ 90% RH non-condensing
Safety Standards	UL60950-1, CSA C22.2, TUV EN60950 -1, AS/NZS 60950.1, CCC GB4943 approved
EMC Emission	Compliance to EN55022, EN61000-3-2,3, FCC part15, GB9254, GB17625.1
EMC Immunity	Compliance to EN61000-4-2,3,4,5,6,8,11, light industry level, criteria A
Withstand Voltage	I/P-O/P:4242VDC
Isolation Resistance	I/P-O/P:100M Ohms / 500VDC / 25 / 70% RH

DIL SWITCH (S2 and S1)

MHz	1	2	3	4	5	6	1	2	3	4	5	6
87.5	ON	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	ON	OFF	ON
87.6	ON	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	ON	OFF	OFF
87.7	ON	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	ON	ON
87.8	ON	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	ON	OFF
87.9	ON	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	ON
88	ON	ON	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF
88.1	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	ON	ON	ON	ON
88.2	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	ON	ON	ON	OFF
88.3	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	ON	ON	OFF	ON
88.4	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	ON	ON	OFF	OFF
88.5	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	ON	ON
88.6	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	ON	OFF
88.7	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	ON
88.8	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF
88.9	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	ON	ON
89	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	ON	OFF
89.1	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	ON
89.2	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF
89.3	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	ON
89.4	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF
89.5	ON	ON	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON
89.6	ON	ON	OFF	OFF	ON	OFF						
89.7	ON	ON	OFF	OFF	OFF	ON						
89.8	ON	ON	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON	OFF
89.9	ON	ON	OFF	OFF	OFF	ON	ON	ON	ON	ON	OFF	ON
90	ON	ON	OFF	OFF	OFF	ON	ON	ON	ON	ON	OFF	OFF
90.1	ON	ON	OFF	OFF	OFF	ON	ON	ON	ON	OFF	ON	ON
90.2	ON	ON	OFF	OFF	OFF	ON	ON	ON	ON	OFF	ON	OFF
90.3	ON	ON	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	ON
90.4	ON	ON	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF	OFF
90.5	ON	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON	ON	ON
90.6	ON	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON	ON	OFF
90.7	ON	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON	OFF	ON
90.8	ON	ON	OFF	OFF	OFF	ON	ON	ON	OFF	ON	OFF	OFF
90.9	ON	ON	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	ON	ON

MHz	1	2	3	4	5	6	1	2	3	4	5	6
91	ON	ON	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	ON	OFF
91.1	ON	ON	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	ON
91.2	ON	ON	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	OFF
91.3	ON	ON	OFF	OFF	OFF	ON	ON	OFF	ON	ON	ON	ON
91.4	ON	ON	OFF	OFF	OFF	ON	ON	OFF	ON	ON	ON	OFF
91.5	ON	ON	OFF	OFF	OFF	ON	ON	OFF	ON	ON	OFF	ON
91.6	ON	ON	OFF	OFF	OFF	ON	ON	OFF	ON	ON	OFF	OFF
91.7	ON	ON	OFF	OFF	OFF	ON	ON	OFF	ON	OFF	ON	ON
91.8	ON	ON	OFF	OFF	OFF	ON	ON	OFF	ON	OFF	ON	OFF
91.9	ON	ON	OFF	OFF	OFF	ON	ON	OFF	ON	OFF	OFF	ON
92	ON	ON	OFF	OFF	OFF	ON	ON	OFF	ON	OFF	OFF	OFF
92.1	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	ON	ON
92.2	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	ON	OFF
92.3	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	ON
92.4	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	OFF
92.5	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	ON	ON
92.6	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	ON	OFF
92.7	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	ON
92.8	ON	ON	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
92.9	ON	ON	OFF	OFF	OFF	ON	OFF	ON	ON	ON	ON	ON
93	ON	ON	OFF	OFF	OFF	ON	OFF	ON	ON	ON	ON	OFF
93.1	ON	ON	OFF	OFF	OFF	ON	OFF	ON	ON	ON	OFF	ON
93.2	ON	ON	OFF	OFF	OFF	ON	OFF	ON	ON	ON	OFF	OFF
93.3	ON	ON	OFF	OFF	OFF	ON	OFF	ON	ON	OFF	ON	ON
93.4	ON	ON	OFF	OFF	OFF	ON	OFF	ON	ON	OFF	ON	OFF
93.5	ON	ON	OFF	OFF	OFF	ON	OFF	ON	ON	OFF	OFF	ON
93.6	ON	ON	OFF	OFF	OFF	ON	OFF	ON	ON	OFF	OFF	OFF
93.7	ON	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	ON	ON
93.8	ON	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	ON	OFF
93.9	ON	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	ON
94	ON	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	OFF	OFF
94.1	ON	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	ON	ON
94.2	ON	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	ON	OFF
94.3	ON	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	ON
94.4	ON	ON	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF	OFF
94.5	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	ON	ON	ON	ON
94.6	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	ON	ON	ON	OFF
94.7	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	ON	ON	OFF	ON
94.8	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	ON	ON	OFF	OFF
94.9	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	ON	ON
95	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	ON	OFF
95.1	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	ON
95.2	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF	OFF
95.3	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	ON	ON
95.4	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	ON	OFF
95.5	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	ON
95.6	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF	OFF
95.7	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	ON

MHz	1	2	3	4	5	6	1	2	3	4	5	6
95.8	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON	OFF
95.9	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	ON
96	ON	ON	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
96.1	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	ON
96.2	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON	OFF
96.3	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	ON
96.4	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF	OFF
96.5	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	ON	ON
96.6	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	ON	OFF
96.7	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	ON
96.8	ON	ON	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF
96.9	ON	ON	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	ON	ON
97	ON	ON	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	ON	OFF
97.1	ON	ON	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	OFF	ON
97.2	ON	ON	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	OFF	OFF
97.3	ON	ON	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	ON
97.4	ON	ON	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	ON	OFF
97.5	ON	ON	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	ON
97.6	ON	ON	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF	OFF
97.7	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	ON	ON	ON
97.8	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	ON	ON	OFF
97.9	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	ON	OFF	ON
98	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	ON	OFF	OFF
98.1	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	ON
98.2	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	ON	OFF
98.3	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	ON
98.4	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF	OFF
98.5	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON	ON	ON
98.6	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON	ON	OFF
98.7	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	ON
98.8	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF	OFF
98.9	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	ON
99	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON	OFF
99.1	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	ON
99.2	ON	ON	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
99.3	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON
99.4	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	OFF
99.5	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	ON
99.6	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	OFF
99.7	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	ON
99.8	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	ON	OFF
99.9	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	ON
100	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF	OFF
100.1	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON	ON	ON
100.2	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON	ON	OFF
100.3	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	ON
100.4	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF	OFF
100.5	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON	ON

MHz	1	2	3	4	5	6	1	2	3	4	5	6
100.6	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON	OFF
100.7	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	ON
100.8	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
100.9	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON
101	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	OFF
101.1	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	ON
101.2	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	OFF	OFF
101.3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON	ON
101.4	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	ON	OFF
101.5	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	ON
101.6	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF	ON	OFF	OFF	OFF
101.7	ON	ON	OFF	ON	ON	ON						
101.8	ON	ON	OFF	ON	ON	OFF						
101.9	ON	ON	OFF	ON	OFF	ON						
102	ON	ON	OFF	ON	OFF	OFF						
102.1	ON	ON	OFF	ON	ON							
102.2	ON	ON	OFF	ON	OFF							
102.3	ON	ON	OFF	ON								
102.4	ON	ON	OFF									
102.5	ON	OFF	ON									
102.6	ON	OFF	ON	OFF								
102.7	ON	OFF	ON	OFF	ON							
102.8	ON	OFF	ON	OFF	OFF							
102.9	ON	OFF	ON	OFF	ON	ON						
103	ON	OFF	ON	OFF	ON	OFF						
103.1	ON	OFF	ON	OFF	OFF	ON						
103.2	ON	OFF	ON	OFF	OFF	OFF						
103.3	ON	OFF	ON	ON	ON	ON	ON	ON	OFF	ON	ON	ON
103.4	ON	OFF	ON	ON	ON	ON	ON	ON	OFF	ON	ON	OFF
103.5	ON	OFF	ON	ON	ON	ON	ON	ON	OFF	ON	OFF	ON
103.6	ON	OFF	ON	ON	ON	ON	ON	ON	OFF	ON	OFF	OFF
103.7	ON	OFF	ON	ON	ON	ON	ON	ON	OFF	OFF	ON	ON
103.8	ON	OFF	ON	ON	ON	ON	ON	ON	OFF	OFF	ON	OFF
103.9	ON	OFF	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	ON
104	ON	OFF	ON	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF
104.1	ON	OFF	ON	ON	ON	ON	ON	OFF	ON	ON	ON	ON
104.2	ON	OFF	ON	ON	ON	ON	ON	OFF	ON	ON	ON	OFF
104.3	ON	OFF	ON	ON	ON	ON	ON	OFF	ON	ON	OFF	ON
104.4	ON	OFF	ON	ON	ON	ON	ON	OFF	ON	ON	OFF	OFF
104.5	ON	OFF	ON	ON	ON	ON	ON	OFF	ON	OFF	ON	ON
104.6	ON	OFF	ON	ON	ON	ON	ON	OFF	ON	OFF	ON	OFF
104.7	ON	OFF	ON	ON	ON	ON	ON	OFF	ON	OFF	OFF	ON
104.8	ON	OFF	ON	ON	ON	ON	ON	OFF	ON	OFF	OFF	OFF
104.9	ON	OFF	ON	ON	ON	ON	ON	OFF	OFF	ON	ON	ON
105	ON	OFF	ON	ON	ON	ON	ON	OFF	OFF	ON	ON	OFF
105.1	ON	OFF	ON	ON	ON	ON	ON	OFF	OFF	ON	OFF	ON
105.2	ON	OFF	ON	ON	ON	ON	ON	OFF	OFF	ON	OFF	OFF
105.3	ON	OFF	ON	ON	ON	ON	ON	OFF	OFF	OFF	ON	ON

MHz	1	2	3	4	5	6	1	2	3	4	5	6
105.4	ON	OFF	ON	ON	ON	ON	ON	OFF	OFF	OFF	ON	OFF
105.5	ON	OFF	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	ON
105.6	ON	OFF	ON	ON	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
105.7	ON	OFF	ON	ON	ON	ON	OFF	ON	ON	ON	ON	ON
105.8	ON	OFF	ON	ON	ON	ON	OFF	ON	ON	ON	ON	OFF
105.9	ON	OFF	ON	ON	ON	ON	OFF	ON	ON	ON	OFF	ON
106	ON	OFF	ON	ON	ON	ON	OFF	ON	ON	ON	OFF	OFF
106.1	ON	OFF	ON	ON	ON	ON	OFF	ON	ON	OFF	ON	ON
106.2	ON	OFF	ON	ON	ON	ON	OFF	ON	ON	OFF	ON	OFF
106.3	ON	OFF	ON	ON	ON	ON	OFF	ON	ON	OFF	OFF	ON
106.4	ON	OFF	ON	ON	ON	ON	OFF	ON	ON	OFF	OFF	OFF
106.5	ON	OFF	ON	ON	ON	ON	OFF	ON	OFF	ON	ON	ON
106.6	ON	OFF	ON	ON	ON	ON	OFF	ON	OFF	ON	ON	OFF
106.7	ON	OFF	ON	ON	ON	ON	OFF	ON	OFF	ON	OFF	ON
106.8	ON	OFF	ON	ON	ON	ON	OFF	ON	OFF	ON	OFF	OFF
106.9	ON	OFF	ON	ON	ON	ON	OFF	ON	OFF	OFF	ON	ON
107	ON	OFF	ON	ON	ON	ON	OFF	ON	OFF	OFF	ON	OFF
107.1	ON	OFF	ON	ON	ON	ON	OFF	ON	OFF	OFF	OFF	ON
107.2	ON	OFF	ON	ON	ON	ON	OFF	ON	OFF	OFF	OFF	OFF
107.3	ON	OFF	ON	ON	ON	ON	OFF	OFF	ON	ON	ON	ON
107.4	ON	OFF	ON	ON	ON	ON	OFF	OFF	ON	ON	ON	OFF
107.5	ON	OFF	ON	ON	ON	ON	OFF	OFF	ON	ON	OFF	ON
107.6	ON	OFF	ON	ON	ON	ON	OFF	OFF	ON	ON	OFF	OFF
107.7	ON	OFF	ON	ON	ON	ON	OFF	OFF	ON	OFF	ON	ON
107.8	ON	OFF	ON	ON	ON	ON	OFF	OFF	ON	OFF	ON	OFF
107.9	ON	OFF	ON	ON	ON	ON	OFF	OFF	ON	OFF	OFF	ON
108	ON	OFF	ON	ON	ON	ON	OFF	OFF	ON	OFF	OFF	OFF

SCHEMATIC



DECLARATION OF CONFORMITY

Paul Hollings



In Zurgena, Almería, Spain on 01 of November 2009, hereby declare:

European Union

This equipment meets the essential requirements of the R&TTE directive, EMC directive and the LVD by compliance with the following standards in the sections applicable.

• ETS 300384 or ETSI EN 302018-1 V1.2.1 (2005-12) when used with the audio compressor limiter included with the product.

• EN 301489-11 V1.3.1 (2006-05) EMC Electromagnetic Compatibility when used with 1 meter AC mains cord supplied. If the installation engineer needs to extend this cord, this and the audio input cable should be no more than 3 meters in length to remain in compliance with EMC directive. • 2006/95/EC Directive (2006-12) LVD Low Voltage Directive.

Equipment compliance is possible using equipment from and in conjunction from other manufacturers, but since this is beyond the control of Aareff Systems, Aareff Systems cannot or be expected to guarantee compliance in this situation.

United States

This equipment has not been independently tested by an FCC recognised listed laboratory and for this reason it is not certified. The following list are the technical requirements for the certification of this transmitter. We hereby declare and verify that this transmitter complies with the following FCC technical requirements.

47 CFR Chapter I Federal Communications Commission sections:

- 73.1560, 2.1046 RF Power
- 73.1545, 2.1055 Frequency Stability
- 73.317, 2.1049 (e)(3) Emission Limitation, Emission Mask
- 73.317, 2.1057, 2.1051 Emission Limits, Spurious Emissions at Antenna Terminal
- 73.317, 2.1057, 2.1053 Emission Limits, Field Strength of Spurious Emissions

ROHS

All components used in this apparatus are RoHS compliant and do not contain above the specified limits in any of the following restricted substances:

- Lead
- Hexavalent Chromium
- Mercury
- Cadmium
- Polybrominated Biphenyls (PBB's)
- Polybrominated Diphenylethers (PBDE's)

PRODUCT END OF LIFE

This apparatus must NOT be disposed of with other domestic waste.

We are fully committed to maintaining our responsibilities to the environment. Owners of apparatus that has reached the end of it's useful life can return it to us for recycling, recondition, reuse or proper disposal. You will be required to pay lowest cost postal service available to ship the apparatus to us. Before shipping please contact us for more important information.

NEED TO BUY ONE?

Price includes delivery to DOMINICAN REPUBLIC Change Country (RD\$) (US\$) (EU€) (UK£)

TRANSMITTER DRIVER 1W STEREO WITH AUDIO PROCESSING 90-260V AC / 12-15V DC 19 INCH (*1wplls119p*) Add To Cart

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