

AAREFF

TRANSMISSION SYSTEMS

250W ERP SYSTEM CONFIGURATION



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 of the 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 CONTENTS

1 x STEREO CODER AUDIO LIMITER / 1 WATT FM DRIVER EXCITER 13.8V DC (ALSCB & 1WPLLb)
1 x 200W FM POWER AMPLIFIER
1 x DC LEAD TO DC LEAD (DC CONNECTIONS FROM ALSCB TO 1WPLLb)
1 x MPX AUDIO LEAD (AUDIO CONNECTION FROM ALSCB TO 1WPLLb)
1 x BNC TO BNC LEAD (RF CONNECTION FROM 1WPLLb TO 100WNTAP)
1 x 13.8V DC SWITCH MODE AC POWER SUPPLY (2.5 AMP)
1 x IEC AC CORD
8 x M6 SCREW, NUT AND WASHERS
2 x 19 INCH 3 x 2U CLAMPING BARS
1 x 2TDA HIGH POWER STACK DIPOLE ANTENNA
1 x 20 METERS LMR400 CABLE WITH PLUGS FITTED

PRE-INSTALLATION

Before the transmitter and limiter can be used, it is necessary that the antennas and the LMR400 50 ohm coaxial cable are installed. Please ensure that all antenna connections are sound, this is important as poor connections and soldered joints will cause severe noise to the transmission and will use excessive RF bandwidth. **IMPORTANT! PLEASE READ THE NEXT PAGE THOUGHLY ABOUT THE ANTENNA SYSTEM.**

SYSTEM SPECIFICATIONS

Power Supply	90-260 VAC 50/60 Hz
Power Amplifier RF Power Output	100 Watts +/- 0.5 dB from -20 to +40 Deg C
Freq Stability	Better than +/- 2 KHz from -20 to +40 Deg C, +/- 300 Hz typ.
Freq Range	100 KHz steps from 87.5 to 108 MHz
Freq Adj. Accuracy	+/- 50 Hz
Deviation Sensitivity Stability	+/- 2 % max
Spurious Emissions	Better than -75dB ref to carrier
Harmonic Emissions	Better than -70dB ref to carrier
RF Bandwidth	200 KHz (+/-100 KHz @ -40 dB rtc)
Output Connectors	SO239 (or optional N type)
RF Ruggedness	Any VSWR, any phase, any length of time
Audio Input Sensitivity	0dBu 775 mV rms adjustable
Audio Inputs Connector	Phono/ RCA socket
Audio S/N Ratio	Better than 70 dB, Typ 90 dB
Audio Freq Response	30 Hz to 15 KHz +/- 0.5 dB
Audio Distortion	better than 0.1% at +/-75 KHz dev
Stereo Crosstalk	35 dB
Pre-emphasis	50 uS (75uS USA) or None
Pilot Tone Freq	19 KHz
Pilot Tone Stability	0.2 Hz
Antenna Polarisation	Vertical
Antenna Gain	+4.8 dBi
Antenna Cable Loss	-0.8 dB 20m LMR400 foam cable
Antenna RF Power Output	251 Watts ERP +/- 0.5 dB from -20 to +40 Deg C using 20m of LMR400 foam antenna cable and stacked dipole supplied.

! IMPORTANT ! PLEASE READ INSTRUCTIONS

The antenna is the most important part of the transmission system and must be correctly installed before proceeding further and before any transmission equipment is connected.

Ideally this antenna should be mounted 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 mounted at 20 meters in height off ground and using 400 watts of transmitter power, power flux density measurements made at ground level directly under the antenna show less than 1 W/m². This figure will be less at this systems transmitter power of 200 watts. 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 THE ANTENNA BE MOUNTED AND USED AT GROUND LEVEL OR WITHIN A FEW METERS OF PERSONNEL.**

ANTENNA PACKAGE CONTENTS CHECKLIST

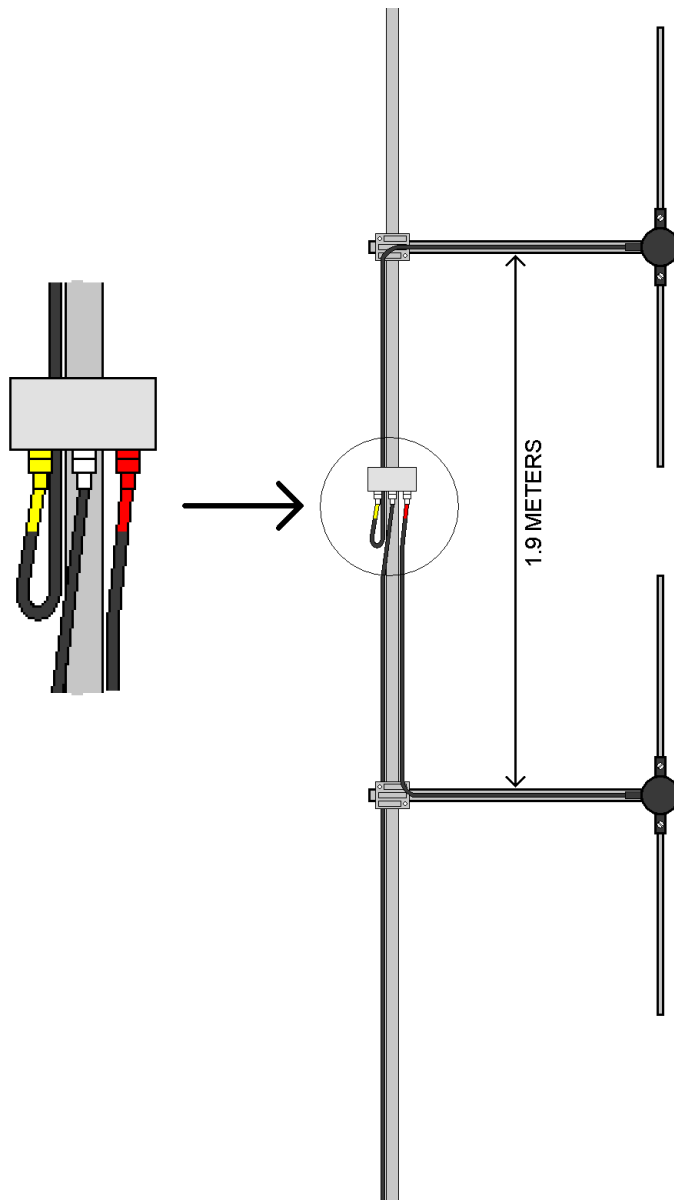
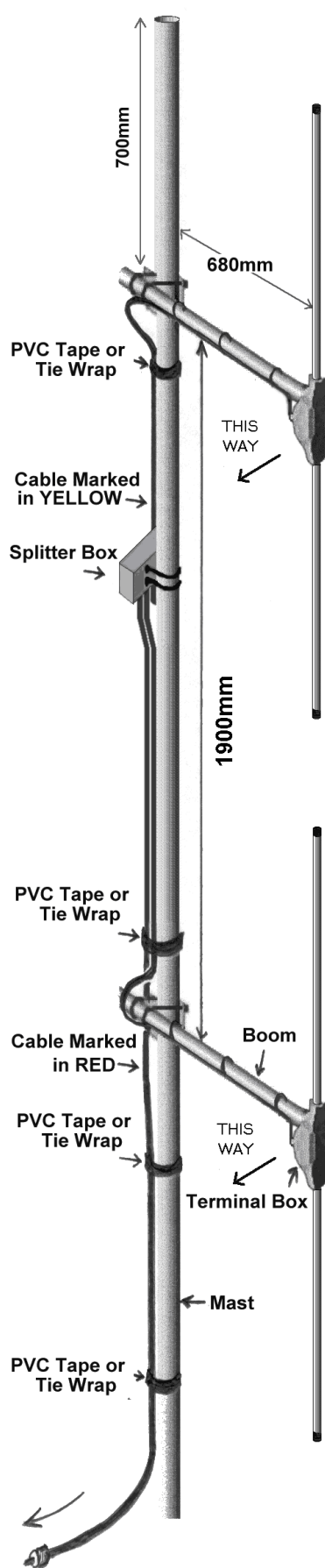
- 1 x Dipole (YELLOW marked cable + 53 cm RG59 cable)
- 1 x Dipole (RED marked cable + 53 cm RG59 cable)
- 4 x 65cm radiator rods
- 4 x Bolt, wing nut and plastic spacer
- 1 x RF connector 3 way plastic junction box
- 2 x Mast fixing clamp
- 10 x Cable ties

TO ERECT THIS ANTENNA YOU WILL NEED TO PROVIDE

- 1. PVC insulation tape and/or Self Amalgamating Tape
- 2. Tape Measure with mm
- 3. 10mm and 13mm Spanner
- 4. A secure mounting mast with a diameter of 45-50mm and clear length of at least 4 meters for mounting the dipoles to.

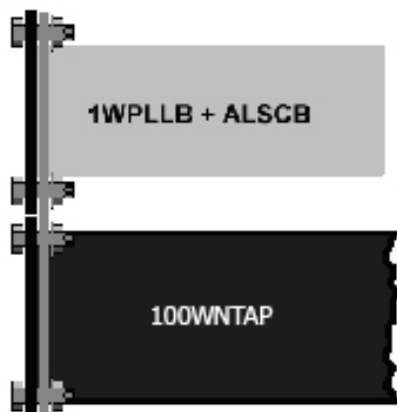
CONSTRUCTION

- 1. Mount the tuned dipoles to the mast using the clamps provided. It is IMPORTANT for correct operation that the dimensions on the diagram opposite are followed as closely as possible. For the system to work properly with maximum gain and to give full tuned bandwidth from 88-108 MHz, the following are very important;
 - BOTH DIPOLES MUST BE DIRECTLY ABOVE EACH OTHER
 - BOTH 'TERMINAL BOXES' MUST BE FACING THE SAME WAY
 - DIPOLE WITH THE RED MARKED CABLE AT THE BOTTOM
- 2. Mount the aluminium junction box with the three RF connectors using the tie wraps provided on the mast between the dipoles as shown on the diagram. The aluminium junction box RF connectors need to face down as shown in the diagram. This will shield any direct rain or snow from getting inside or onto the connectors.
- 3. Connect the main feeder cable from the transmitter to the CENTER connector of the aluminium junction box.
- 4. Connect the Top dipole to one of the OUTER connector the plastic junction box using the cable marked in YELLOW. Connect the Bottom dipole to the remaining OUTER connector the plastic junction box using the cable marked RED. There will be excess cable, simply coil this neatly and tape or tie it to the mast (DO NOT CUT IT BACK AND REFIT THE PLUG). The cables marked with YELLOW and RED on each dipole are critical phased lengths and must never be altered in length.
- 5. Wrap PVC or Self Amalgamating tape tightly around and all over the plugs on the Splitter Box to waterproof them.
- 6. Securely fix the cables using PVC tape or large cable ties to the mast as shown in the diagram opposite. Make sure the cables are not going to flap around in the wind.
- 7. Make sure that all fixings are tight and are not going to work loose over time with wind.



FOR THIS SYSTEM TO WORK CORRECTLY AND GIVE 500 WATTS ERP TO THE HORIZON IT IS VERY IMPORTANT THAT:

1. THE DIPOLE WITH THE YELLOW CABLE IS AT THE TOP
2. THE DIPOLE WITH THE RED CABLE IS AT THE BOTTOM
3. THE CONNECTORS ARE TIGHT AND SECURE ON THE ALUMINIUM JUNCTION BOX
4. THE CONNECTORS HAVE PVC TAPE OR SELF AMALGAMATING TAPE WRAPPED AROUND TO PROTECT FROM WATER
5. THE ANTENNAS ARE MOUNTED STRAIGHT VERTICAL AS SHOWN IN THE DIAGRAM
6. THE ANTENNAS ALL LINE UP WITH EACH OTHER.

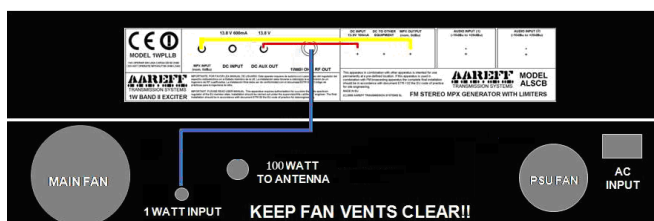


Arrange the units as shown in diagram to the left. Use the supplied M6 screws, nuts, washers and drilled bars to clamp the 2U 19 inch driver and 2U 19 inch power amplifier. The power amplifier is much heavier, so this should be at the bottom. The driver is light and will suspend in the air and does not need any support at the back.

Alternatively you can mount the units in a professional 19 inch enclosure and integrate the units with other equipment that you supply.

Arrange the units as shown in the picture above. The picture shows the view of the rear panels.

It is self explanatory from the rear panel where the power supplies plug in, **DO NOT plug in the power supplies at this stage.**



1. Connect the output from the 100W power amp to the 20m cable coming down from the dipole antennas.

2. Using the cable supplied terminated with BNC connectors to connect the 1W input on the 100W power amp to the 1W driver output.

3. There is a 13.8V DC adapter. Plug the adapter into the ALSCB DC INPUT. Then connect the ALSCB DC TO OTHER EQUIPMENT to 1WPLL B DC INPUT using the DC to DC cable. Then connect the AC mains power to the adapter.

4. Turn on the mains power to all units. The driver will lock after a few seconds and then the 200W power amp should indicate power on the front panel meter. The switch on the front panel of the power amplifier should be set to 'FWD'

5. Provide an audio input to the ALSCB Stereo Generator and Limiters and you are on air.

ALWAYS KEEP THE VENTS AND FANS CLEAR.

EQUIPMENT COMPLIANCE

This system is:

- i. designed and tested to comply with the European Harmonised Standard for Telecommunications ETS 300384 when used as shown in this document. It is generally considered and accepted that harmonized standards reflect state of the art performance and a presumption of conformity.
- ii. designed to be compliant throughout its useful working life of typically 5 to 10 years.
- iii. not for use by the unqualified general market consumer.
- iv. specifically designed and only intended for installation by an engineer with other similar apparatus in a fixed installation at a permanently pre-defined location.

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 its 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.

LEGAL ADVICE

It is the customer's responsibility to check relevant laws, directives, regulations and licensing requirements before putting this product into service with an antenna system. You, the customer agree to defend, indemnify and hold harmless Aareff Systems Limited, its 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 product.