ANYWAVE

ATSC 140W DTV Transmitter

Quick Start Guide

Version 1.3 – September 29, 2014

Copyright Notice

FCC Compliance

This equipment complies with relevant portions of Parts 2, 73, & 74 of the FCC rules governing LPTV operation.

Disclaimer

Information provided by Anywave Communication Technologies is believed to be accurate and complete; however, no liability can be assumed for its use.

The manufacturer makes no representations or warranties, either expressed or implied, by or with respect to anything in this manual, and shall not be liable for any implied warranties of fitness for a particular purpose or for any indirect, special, or consequential damages. Information in this document is subject to change without notice and does not represent a commitment on the part of the manufacturer.

USE OF THIS PRODUCT IN A MANNER OTHER THAN DESCRIBED IN THIS MANUAL MAY RESULT IN DAMAGE TO THE EQUIPMENT AND/OR PERSONAL INJURY.

PLEASE READ THIS MANUAL IN ITS ENTIRETY BEFORE ATTEMPTING TO INSTALL THE EQUIPMENT. CONTACT ANYWAVE WITH ANY QUESTIONS OR CONCERNS YOU MAY HAVE.

Anywave Communication Technologies Inc.
300 Knightsbridge Parkway, Suite 150, Lincolnshire, IL 60069
Tel: (847) 415-2258
Fax: (847) 415-2112
http://www.anywavecom.com/en/

Unpacking

Carefully unpack the equipment and perform a visual inspection to determine if any apparent damage has occurred during shipment. Please notify the delivery carrier and Anywave immediately if shipment damage has occurred. Retain all original shipping materials.

Please locate and reference the Packing Check List to verify you have received all components of your system. Retain the Packing Check List for future reference.

Also, please identify and remove all packing materials and supports (foam pads, etc.) prior to initial turn on of the equipment.

Returns and Exchanges

Written approval and a Return Authorization Number (RAN) are required from Anywave for all equipment returns. Please direct all return inquiries to the Anywave Service Department at support_us@anywavecom.com, providing the Sales Order number and Serial Number(s) of the equipment. Complete details regarding the nature and circumstances of your return must be included in your RAN request. Proper handling and return shipping instructions will be provided with an approved RAN number.

Technical Support

Technical support and troubleshooting assistance for Anywave Transmitters is available through the Anywave Service Department during normal business hours (8:00 AM - 5:00 PM CST) at (847) 415-2258. Email questions to support_us@anywavecom.com.

Note: For all service and support requests, you will need to provide the Serial Number of the equipment with your Sales Order number. For future reference, please record that information here:_____

WARNING

THE VOLTAGES, CURRENTS, AND RF ENERGY IN THIS EQUIPMENT ARE DANGEROUS. PERSONNEL MUST AT ALL TIMES OBSERVE ALL SAFETY WARNINGS, INSTRUCTIONS, AND REGULATIONS.

IN THE CASE OF EMERGENCY, ENSURE THAT ALL POWER HAS BEEN DISCONNECTED.

ALWAYS DISCONNECT POWER BEFORE REMOVING COVERS, ENCLOSURES, OR SHIELDS. DO NOT PERFROM SERVICE ON THE EQUIPMENT WHEN ALONE OR FATIGUED. KNOW YOUR EQUIPMENT AND DO NOT TAKE RISKS.

This manual is provided as a general guide for trained and qualified personnel well aware of the dangers inherent in handling potentially hazardous electrical transmission equipment.

The installation, operation, maintenance and service of this equipment involves risks both to personnel and equipment, and must ONLY be performed by qualified personnel exercising due care. Anywave Communication Technologies, Inc. shall not be responsible for injury or damage resulting from improper handling or from the use of improperly trained or inexperienced personnel performing such tasks.

All local building and electrical codes as well as fire protection standards must be observed in the installation and operation of the equipment.

Contents

1 Introduction

This Quick Start Guide contains instructions to safely setup and turn on the Anywave 140W DTV Transmitter. Please note that trained and qualified personnel are required to install, maintain, and service this transmission equipment.

2 Organization of Manual

This Manual is broken up into several sections.

- Section 3 - TX system Overview: Provides a general overview of the 140W Transmitter System
- Section 4 – TX System Interconnect: Overview of interconnections of the major subassemblies contained in the Transmitter system
- Section 5 – Initial Turn On: How to safely turn on your Transmitter

3 TX System Overview

Final assembly and test of each transmitter is performed at the Anywave factory. The Exciter is setup on the desired channel frequency and the TX is tested with the complete RF system (if purchased) at full power into a load. All TX operating parameters are optimized and the Transmitter Forward and Reflected power meters are properly calibrated. Linear and Nonlinear precorrection is performed and automatically stored in non-volatile memory inside the Exciter. A Factory Test Report is completed for each system, providing a record of full power operating parameters and performance. The TX then goes through a final 24-hour burn-in period and check out before being shut done and packed up for shipment.

In your shipment, you should receive a copy of the following documentation.

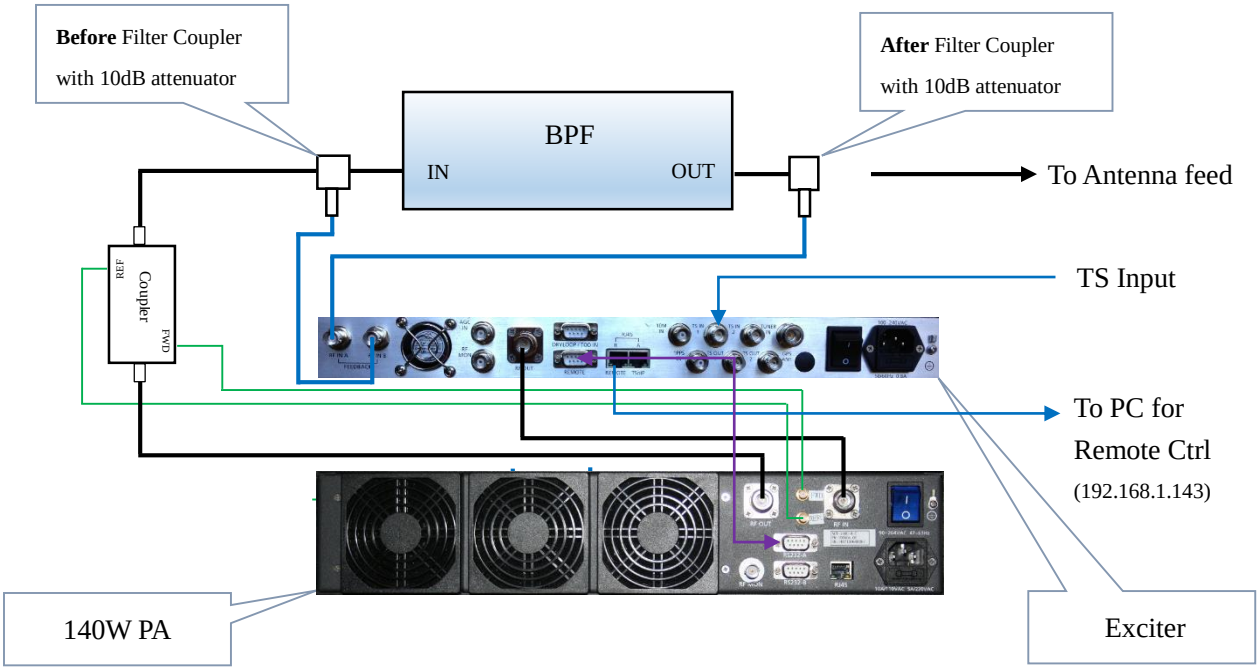
- Packing Checklist
- Transmitter Factory Test Report
- 140W TX Quick Start Guide
- 140W PA and Exciter User Manuals

Carefully unpack and inspect all your equipment and please review the Packing Checklist when you receive your system to be certain you have received all your system components. Also, please be sure to identify and remove all packing materials and supports (foam pads, etc.) prior to initial turn on of the equipment.

All Single PA TX systems ship with an AC power cord included with the Exciter and PA. The PA shipment also includes an RS232 cable, for Exciter to PA communications, and a CAT5 Ethernet cable, for Exciter to PC built-in web interface Remote Monitoring and Control.

4 TX System Interconnect

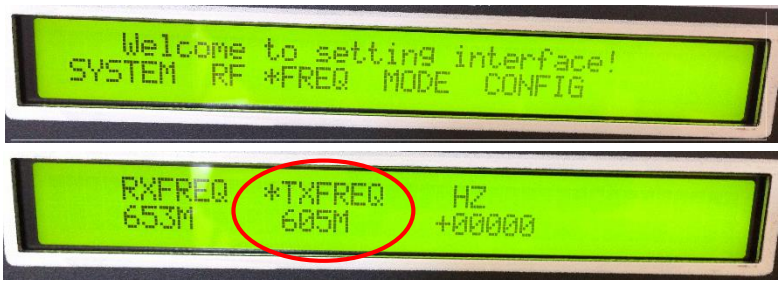
The Anywave ATSC 140W DTV Transmitter consists of an Exciter, 140W PA, Directional Coupler (50dB for PA FWD and REF samples), and a BPF (optional) with two additional single port couplers for Exciter feedback samples (optional). The diagram below shows the overall system interconnect between the system components.



5 Initial Turn On

Please locate and have handy for reference a copy of your **140W TX Factory Test Report** as well as the **140W TX Quick Start Guide**, and **140W PA and Exciter User Manuals.**

1. With all equipment turned OFF, please make the cable connections according to the System Interconnect Diagram of section 4. Make sure the BPF or PA output is properly connected to your Antenna feed or a suitable station load before proceeding further.
2. Turn ON the Exciter via its rear panel AC switch.
3. Check Exciter settings. Check the operating Frequency of the Exciter by navigating to the Exciter FREQ submenu (simultaneously press Left and Right buttons)



Check the Exciter drive level is set to -25dBm by navigating to the Exciter RF submenu (from above, press ESC button then enter the RF submenu).

(Please refer to your Exciter User Manual for help with detailed operation of the Exciter).

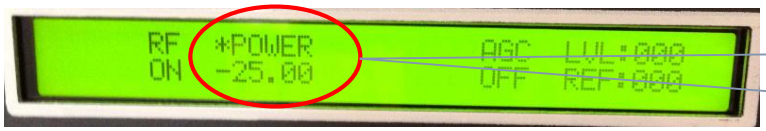
4. Turn the 140W PA ON via the PA rear panel breaker, then press the front panel PA RF On/Off button to turn ON the PA - which should turn BLUE when ON.

5. The built-in FWD and REF power metering in your 140W TX has already been calibrated at the factory. The Exciter PAC submenu contains the System Forward and Reflected power meter readings PA_Fwd and PA_Ref. Visit the PAC menu on the Exciter LCD (under Advanced submenu) or Web interface

and verify that the voltages (Vol_9 and Vol_50) and current (Cur1_50) are showing real values and not all 0s.

6. You are now ready to bring the TX up to power. To accomplish this, slowly increase the drive level out of the Exciter by increasing the POWER setting in the Exciter RF submenu while watching the PA_Fwd power increase accordingly on the PAC submenu (you will need to navigate between the Exciter RF and PAC submenus).

   Begin to slowly raise the FWD System power by using the UP button on the Exciter, while monitoring the PA_Fwd system power meter on the Controller HOME screen as shown below.



Slowly increase to raise FWD SYS POWER

Monitor FWD SYS POWER

7. Continue to slowly raise the FWD power until you reach the full 140W, or your desired TPO. Be careful to make small increases in the value of POWER as you approach the desired output level.

8. Check the SNR and Shoulder (LIMD and UIMD) RF performance of your system on the Exciter hi level status screen as shown below. Linear and Non-Linear corrections were already performed and optimized at a TPO of 140W in the factory and so the stored correction coefficients should produce good results.

   If you are operating at a TPO less than 140W and wish to rerun corrections, please proceed with the following steps, otherwise please skip ahead to step 12.

9. (*Optional Step* - Rerunning Corrections) If you are operating at reduced power and wish to rerun corrections to achieve better performance, you may now perform Linear and Non-Linear corrections. (Please refer to the Exciter User Manual for detailed instructions on running corrections). Before running corrections, it is important to verify proper feedback signal levels. There are two feedback signal samples used to compute corrections. "RF IN A" (After BPF) is used to calculate Linear correction coefficients while "RF IN B" (Before BPF) is used to compute the Non-Linear correction coefficients.

10. (*Optional Step*) Navigate to the Exciter "DPD" submenu in the Advanced User menu (simultaneously press Left and Right buttons, then simultaneously press UP and Down buttons). Be sure the value of Feedback Sample Signal Input (FSSI) for both A (after) and B (before) reads somewhere between 45% and 75% - which roughly corresponds to a value of -15 to -5 dBm as measured on a power meter (note: the FSSI indicator toggles between A and B and will "flash" when the signal level is out of range, too high or too low). Add or remove the appropriate attenuator padding to achieve feedback signal levels in the desired range. Note the AFTER filter feedback sample is used to compute the SNR and Shoulder Metrics displayed.

11. (*Optional Step*) Navigate to the Exciter "SYSTEM" submenu and select UPDATE under ADPC to run corrections. The exciter will then proceed through 4 stages of correction, computing Linear and Non-Linear corrections, and automatically saving the coefficients into non-volatile memory upon completion. The correction process typically takes from 8-10 minutes to complete while real-time performance metrics of SNR and Shoulder performance are displayed on the LCD.

12. Check RF Performance metrics (SNR, LIMD, UIMD) on the front panel screen of the exciter.

    Your TX should now be up and running properly into your load or on-air antenna. Continue to monitor system parameters as you allow the transmitter to operate and stabilize at full output power for another 30 minutes.

13. Navigate to the CAL setting under the AD3 Advanced submenu and select CAL then press OK to calibrate the FWD PWR meter on the Exciter front panel to 100%.

14. To turn the TX On/Off, please use the RF On/OFF control in the RF submenu of the exciter LCD or the exciter web interface.

15. For Remote TX Monitoring and Control, you may network to the Exciter REMOTE RJ-45 rear panel connection at 192.168.1.143 – you can change the exciter ipaddress by navigating to the CONFIG submenu (simultaneously press Left and Right buttons) and change the value of IP (please reference your Exciter User Manual for details).

16. If using the Exciter Built-in remote web interface for remote control, please be sure to set the Exciter to REMOTE mode (set CTL to RMT) before leaving the transmitter site. The Remote/Local setting is located under the SYSTEM submenu. Most of the Local TX controls are available on the remote web interface, including On/Off, Raise/Lower power, etc. (refer to the Exciter user manual for details).

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