

DATA SHEET

TP1 - PRO TUNING PULSER & SSB STANDARD



The problem is that there is not a repeatable way to do this. This is where the TP1 SSB standard comes in. The typical duty factor of SSB voice operation is much lower (5-15%) than that of CW operation. This depends on the voice. No two voices are alike. However, an average voice has certain characteristics in terms of frequency spectrum and duty factor.

The TP1 provides a modulation envelope consisting of a 2.5 KHz burst with an adjustable duty cycle between 10ms to 25ms and rep rate of 20-50 Hz. The calibrated setting for a Crest factor

Amplifier Tuning and Power Considerations

The TP1 is a precision pulse generator to safely tune power amplifiers (often called linear amps) at high power levels. It is also a calibrated burst generator simulating the average sound levels of the “human voice” when evaluating power amplifiers

High power amplifiers are generally rated at their maximum power for SSB voice operation using PEP specifications. For example, one amplifier may be rated at 800 Watt PEP (Peak envelope power) and 500 Watt for continuous power (CW). Another amplifier might be rated at 1KW watts PEP and 500 watts for continuous power (CW). These two amplifiers have identical CW power specifications. However, the latter amplifier lists higher PEP power.

How is that possible? The answer is the amplifier power supply and the nature of the human voice. Some amplifiers rely on capacitor banks in the high voltage power supply to provide the energy for the brief PEP during speech. To check the max PEP power, some hams actually utter certain words “X-ray” to mimic human speech.

of C-20dB is 10ms and 25 Hz. This setting is repeatable and can be used as a standard when evaluating amplifier performance. The waveform shown is the recommended tuning waveform.



Another well established recommendation is to tune power amplifiers at their maximum power level. However, when tuning at that level, the duty factor has to be very low or damage to the amplifier can occur. The TP1 allows for precise duty factor and rep rate control. The duty factor can be adjusted from 2.5% up to about 20%. For a 1000W PEP amplifier, the maximum dissipation will be less than 25W.



Precision Ham Radio Measurements

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Amplifier Tuning

Connect the TP1 between the microphone and the receiver microphone input. If needed, a universal 8 pin interface cable set is available as an option. Set the internal DIP switch to match your transceiver type.

Adjust the 2.5KHz burst duration and repetition rate based on your requirements.

Key the microphone. This transmits the tuning pulses only. Tune and or measure your amplifier's PEP output power. This will take a fast responding PEP Watt meter. Note that the PEP to average power rating will be remarkable. The PEP power will be close to maximum, yet the average power will be quite a bit lower.

Amplifier Performance Evaluation

Use the calibrated setting marked on the front panel. for a Crest factor of C-20dB is 10ms and 25 Hz. Key the microphone. This transmits the tuning pulses only. measure your amplifier's PEP output power. This will take a fast responding PEP Watt meter. Repeat this measurement on another amplifier to get a consistent comparison of SSB PEP power.



Specifications:

Burst Frequency: 2.5KHz +/- 200 Hz

Burst Duration: 10ms to 25 ms +/- 2 ms

Rep Rate: 20Hz to 50Hz +/- 5 Hz

Pulse Output Z: 600 ohms

Power Source: Microphone line or external 9-12 VDC

Pressing PTT enables pulse output. Releasing PTT reverts microphone to normal operation.

Aux In: suitable for Two Tone test generator such as the PreciseRF model TTG

All products are calibrated and tested to meet or exceed published specifications. The optional NIST calibration certificate is provided for users needing a calibration reference showing the actual performance achieved. This calibration is done using NIST traceable instruments. Some test and measurement equipment was calibrated at the PreciseRF laboratory using NIST traceable instruments. The item calibrated may be used as a calibration reference only, and shall not be used as a NIST calibration standard. This certificate shall not be reproduced without the express written permission from the calibration facility. PreciseRF warrants its products to be free from defects in material and workmanship for one (1) year from the date of purchase. If you need support or service for your PreciseRF product, whether the product is under warranty or otherwise, please contact PreciseRF and arrange for a return or repair authorization. Manufacture's Suggested Retail Price (MSRP). Prices and specifications subject to change without notice. (c) 2016 all right reserved.



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