

## How to Operate Pedestrian Mobile on PSK and RTTY

### The Idea

I always wanted to operate on digital modes while out hiking on the trails, but I could never see myself hiking around a big QWERTY keyboard strapped to my chest.

I have used the PRC319 EMU (Electronic Message Unit) that has a keyboard and found that it is hard to walk and enter data into the unit using the keyboard without stumbling.

For some time I have had my eye on the American QRP Club NUE-PSK Modem <http://www.nue-psk.com/> but it was not going to work for me because it required a keyboard. Then they issued Version 5.00. This new version (5.00 and up) has software that will receive Morse paddle input and convert it to PSK or RTTY. (It actually converts it to ASCII and then to PSK, RTTY or back to CW). It will receive PSK, RTTY and CW but the CW has to be accurately spaced for it to decode correctly. The Elecraft K3 and KX3 probably use the same technique.

Typing and walking at the same time is pretty difficult but sending Morse on a single lever paddle, and walking, is not very hard at all. You can send Morse and keep your head up, looking around. When you are receiving data on the NUE-PSK Modem, you do have to look down at the display. Probably a familiar operating posture if you use a front mounted radio control head.



The NUE-PSK doesn't have a built in paddle, so I added a single lever paddle to it and it is just as easy to hike around and send CW with it as it is using a KX1. The paddle is made of an ALPS SSCF210300 Two Way Detector switch which is mounted on the side of the NUE-PSK case. It is useable up to 20 wpm. The NUE-PSK is just a little bit bigger than an Elecraft KX1.

## **Deciding to build the kit...**

This kit is difficult with a 64 pin TQFP and many SMD's. I would not recommend building it unless you are familiar with SMD assembly, and you will need a microscope. There are used Modems for sale occasionally on the NUE-PSK Yahoo Group. The Kit has a few issues but they can be overcome if you know about them in advance. Like: The through hole ribbon cable is too short and you need to solder the pins in to the PTH's on one side and lap solder the cable to the pads on the other end or it won't fit correctly. The Modem needs a lot of decoupling at 25W when operating Pedestrian Mobile. If you get RF into it, it will just drop out and reboot. When operating pedestrian mobile you must get all the RF off of your modem cable using ferrite beads or a cable trap.

## **Operation**

I did a power budget calculation and it turned out that a short macro message on PSK or RTTY requires about the same battery energy as that same message sent on CW at 20 wpm. Of course if you sent that message at 40 wpm the energy required would be half. The Modem has seven Macro memories so you don't have to do a lot of paddle sending. Of course the Modem can be used with a keyboard for base station use and for entering data into the Macros.

Most PSK and RTTY guys send you Macros so that don't have to retype the same thing over and over again. My Modem has a Macro for CQ CQ, Report RST Name, Information on my location and my equipment. So my actual paddle sending time is only about twenty percent.

The Modem tone levels are controlled by a pot on the top panel so you can adjust your output power when ever that rare DX comes along. Your SSB radio power should be set back about twenty-five percent to prevent overheating it. The Modem tone levels should be adjusted for minimum distortion, you don't want to overdrive your radio. Any PSK operator will gladly tell you your intermodulation distortion levels.

The NUE-PSK Modem has options for data logging and software updating, mine is the basic model. The Modem runs on two 9-Volt batteries that just barely fit into the case. I quickly removed them and replaced them with four 14500-style Li-Ion batteries.

The Modem comes with a computer cable to interface to your radio. You only need to attach the proper connectors and you will be on the air. The PRC319 connector wiring information is on the PRC319 Yahoo Group. I set the Modem to a high level audio signal output connecting to the PRC319 in Mode X. This prevents RF feedback into the radio microphone circuit.

## Receive

Receiving and tuning is simple but you have only one station at a time that will decode. You set your USB transceiver to 14070 kHz and do the tuning with the Modem. You have a full band waterfall but It is not like Digipan where all stations in the passband will be decoded all the time. The Modem has AFC and will lock on to another stations frequency. Since it receives only one frequency at a time, I have assigned 1000 (14071 kHz) to be the Pedestrian Mobile calling frequency. Some of the NUE-PSK users use 2000.

## Transmit

To transmit you just send the Modem 'KA', which is the symbol for Attention. Then you send a delimiter "UU" 1 and "UU" to choose and send Macro number #1. When the message in the Macro see a "K" or SK" it switches back to receive. So you can send your CQ Macro with only four 'operators'.

## Carrying the Modem

The Modem can be carried in your hand just like the KX1 or it can be mounted to a small tray and hung around your neck. I use the front tray method for hands free operation. You might want to mount your radio control head on the tray also.

## Results

I have worked over 60 stations to date and get good reports on PSK and RTTY. I just worked Cuba and Madeira Island on 18 MHz using the PRC319 on a 10 foot whip.



73,

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