Some Ideas for Microwave Stations

Bob Lear W4ZST

I have built several microwave stations over the years to use for our W4NH portable operations and for my own use both portable, roving and at home. I once had an idea to put it all in a box to make a complete portable station. Even though I was much younger then and in better shape, it turned out the box took 3 people to lift so it really didn't turn out to be a very good portable choice and I also found it was quite difficult to work on anything if there was a problem.

I have published articles before about the W4NH portable VHF stations (SVHFS conference 2015, Morehead KY) and those really originated from my microwave station first put in a portable wooden rack. I had put the microwave station together like this back in 2003 or 2004 after some experience with trying to put everything together out of boxes of loose transverters, sequencers, radios, wattmeters and cables at the portable destination. I then put the ideas to the VHF stations later. This worked quite well and saved an immense amount of setup time. Many contests I had the four microwave bands on the air before any of the VHF stations were set up. This was because I had mounted as much of the equipment that was reasonable by weight and pre-wired it as much as possible. Basically I only had to connect a DC cable from a Power Supply on the floor (learned not to try to put that into the rack the hard way), insert the IF rig in it's reserved spot and connect its cables and then put 4 bird wattmeters on the output coaxes of each band and connect the antennas to the wattmeters. It really was pretty simple and easy. Getting all the interconnections done and tested in the comfort of the shack rather than on a mountain top was much of the key to success. I have since reduced to one wattmeter for all bands.

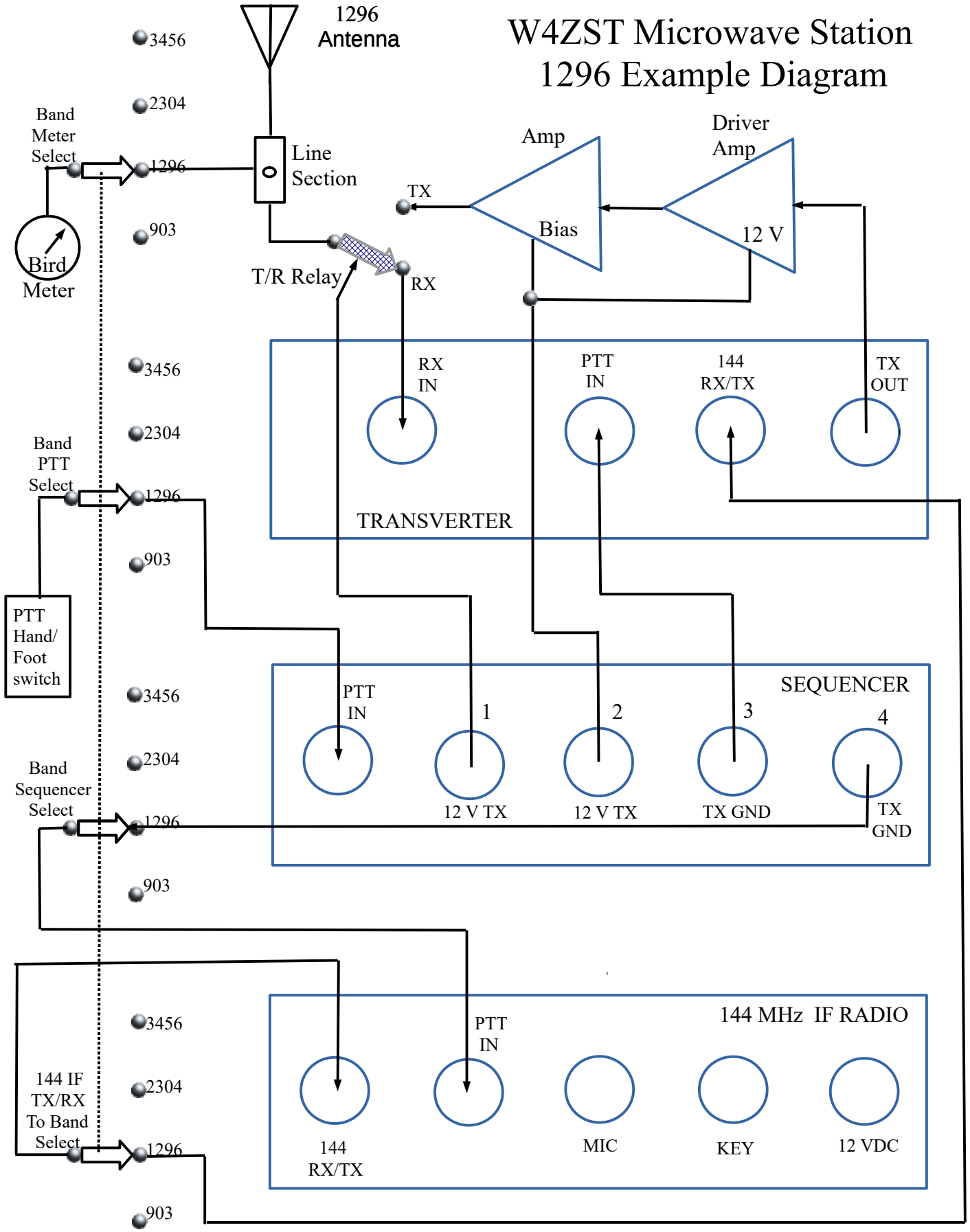
Even though I haven't made so many Q's, the Southeast not being a microwave hotspot region, the station has been reliable and other operators were able to easily use it with minimum training. Even when I was asleep, which was one of my main self-appointed contest duties!!

I will describe the equipment, much of which is quite old but still serviceable and the ideas of integrating the equipment, prewiring as much as possible, the switching scheme, and mounting in a portable enclosure that can be easily gotten to for troubleshooting and testing are the takeaways.

I described the addition of extra control wiring switch contacts to a BNC rotary RF switch previously (SVHFS conference 2005, Charlotte NC). This is one of the major items that make the station versatile. It was not difficult. I have seen many of these similar switches available at hamfests and conference fleamarkets. One could use an electronically controlled switch as they are also available.

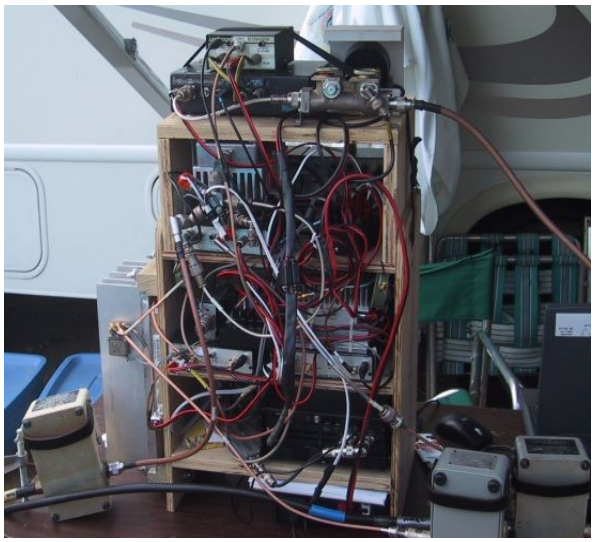
A few pictures and a block diagram will be instructive. I hope these ideas will be useful for setting up your own microwave stations or modifying them with some of these ideas.

There was an article in QST January 2005 (Tom Williams WA1MBA, The Home Microwave Station – Part 1) about a multi-band station that used one sequencer switched to service all the separate radios and amps. I had thought about doing that when I first put this station together but the wiring seemed even more excessive than what I'm doing and with the further thought that if the single sequencer has a problem, then you are off all your bands. With multiple sequencers, you'd only lose the band that one was on. You'd also have the option then of swapping a working sequencer to a more active band if needed. I am a firm believer in sequencers and don't think of them as an expensive item in putting a station together, but a necessity.


W4ZST Microwave Station
1296 Example Diagram
1296
Antenna
3456
2304
1296
903
Band
Meter
Select
Line
Section
Bird
Meter
T/R Relay
TX
RX
Amp
Bias
Driver
Amp
12 V
RX
IN
PTT
IN
144
RX/TX
TX
OUT
TRANSVERTER
Band
PTT
Select
PTT
Hand/
Foot
switch
SEQUENCER
PTT
IN
1
2
3
4
12 V TX
12 V TX
TX GND
TX
GND
Band
Sequencer
Select
144 MHz IF RADIO
PTT
IN
144 IF
TX/RX
To Band
Select
144
RX/TX
MIC
KEY
12 VDC

Four Band Station in use at portable mountain-top contest

Four bands in use UHF contest portable



Back view of wiring (yes, it's wireless!)

The rotary switch contacts added to rotary RF switches