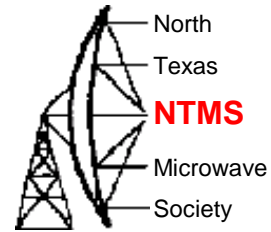


PY2BS Patch Feeds built by W5LUA

Al Ward

November 11, 2016

PY2BS 33 cm Patch Feed



Patch feeder for 33cm

Reflector : diameter 210 mm (inside the choke skirt) / 1.5 mm thick.

Choke height: 45 mm (from reflector's surface to the rim).

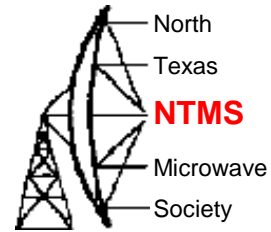
Patch disc: 159.3 mm dia / 1.5 mm thick

Feeding points: two, 90 degrees apart, 32.5 mm measured from the center of the disc. May need to be adjusted a bit for best SWR on your reflector.

Feeding posts: 3mm diameter (from the "N" connector to the patch disc).

Patch to reflector spacing : 12.2mm from surface to surface

PY2BS 33 cm Patch Feed



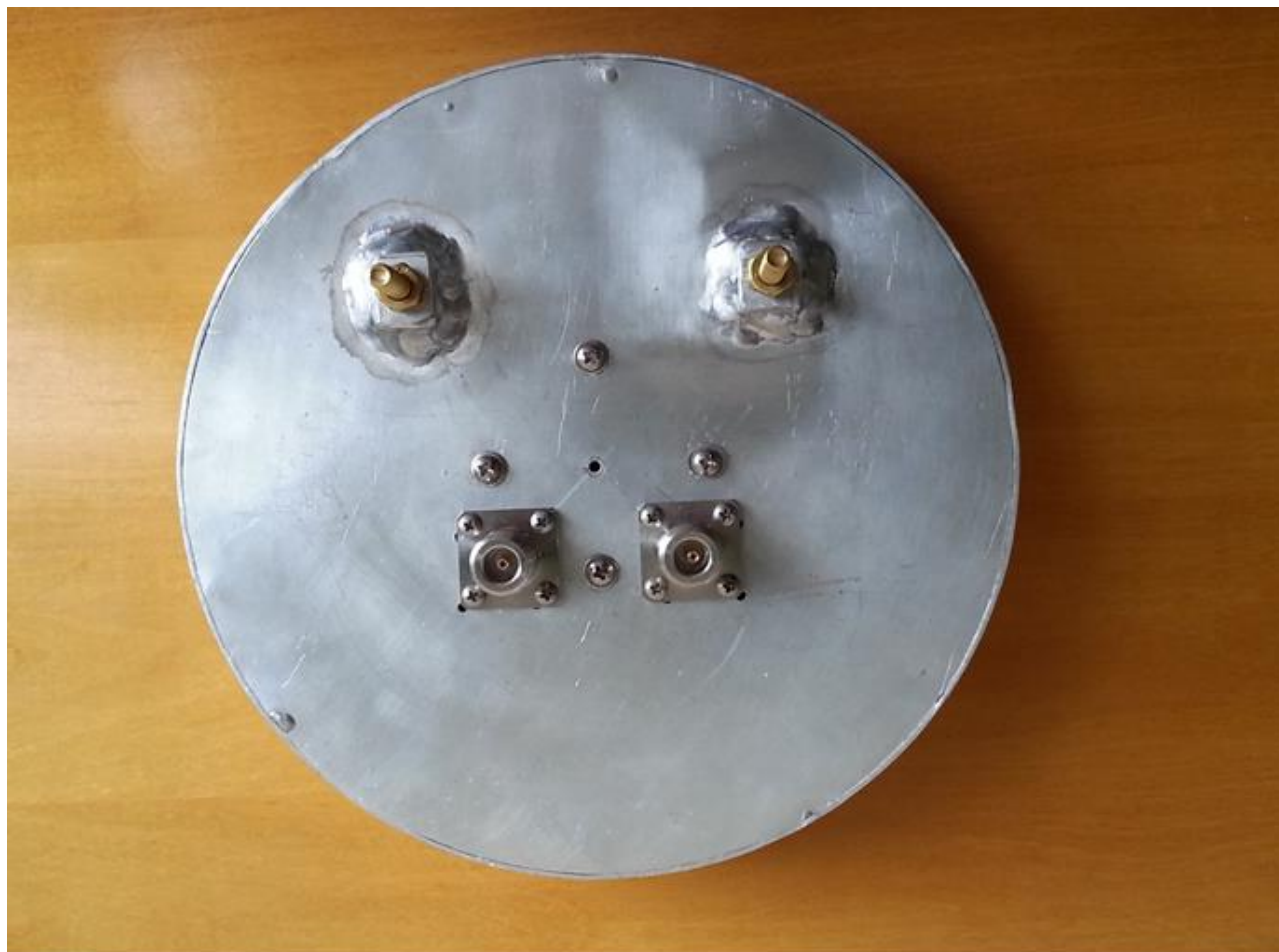
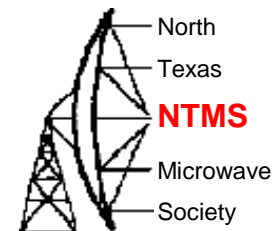
4 teflon spacers: I used 10.5mm in diameter, forming an 40mm x 40 mm square (dimensions are not critical) 45 degrees apart from the feeding points . The spacers posts must be made of insulating material, and the screws on their top kept as short as possible. There are two short screws, one on each side of the post, please don't run a single screw from one side to another one.

Tuning discs: two 24 mm discs, 64 mm from the reflector's center, 180 degrees apart from each feeding point.

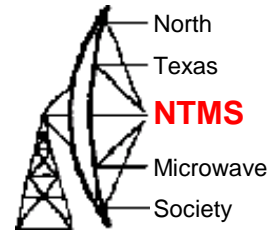
Space between the tuning discs and the patch: to be adjusted for resonance

Phase center is at choke's edge plane.

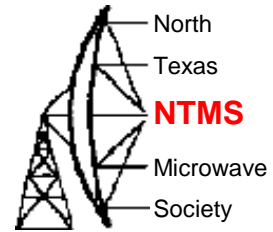
PY2BS 33 cm Patch Feed



PY2BS 33 cm Patch Feed

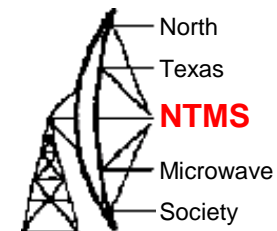


PY2BS 33 cm Patch Feed



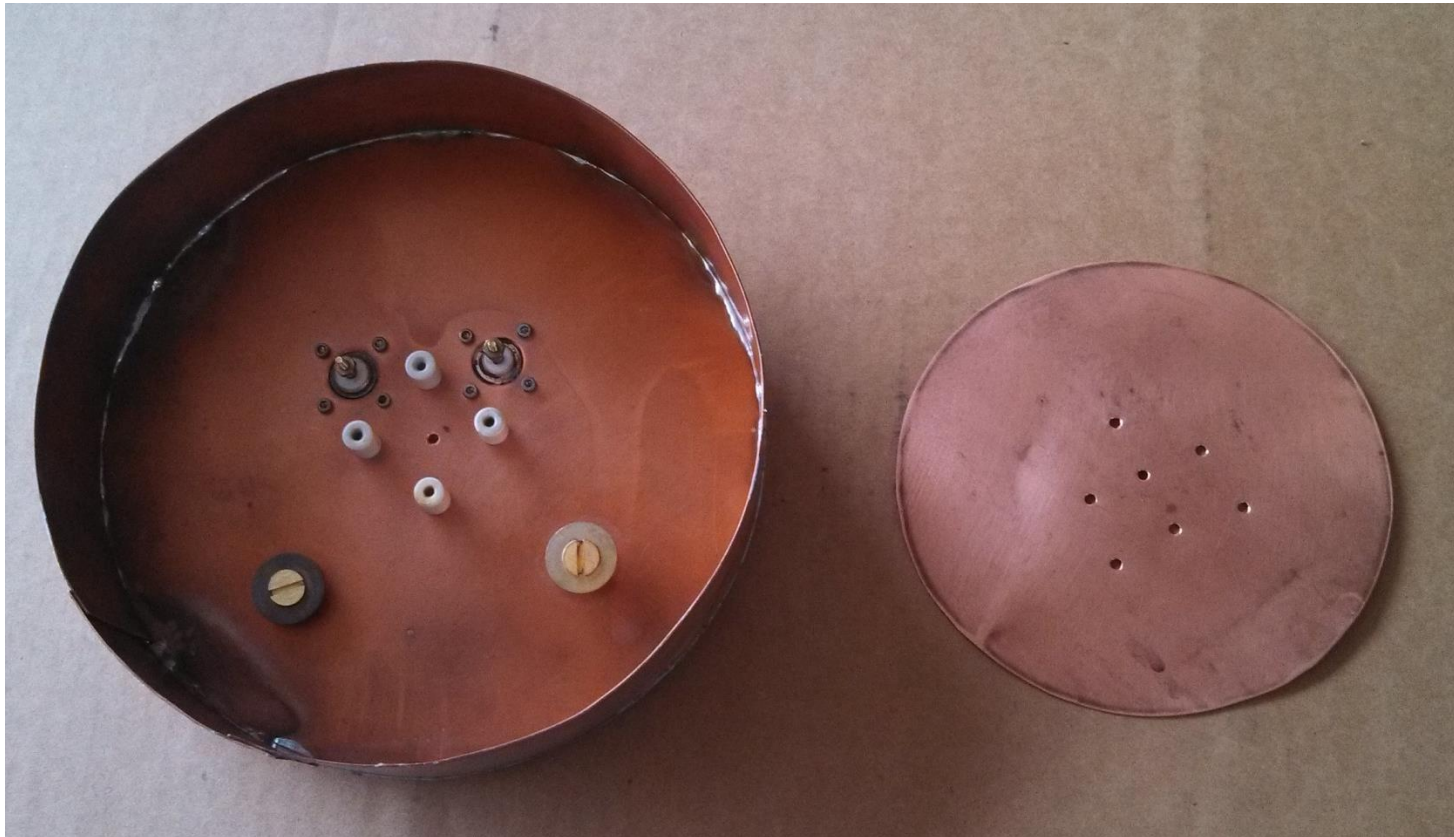
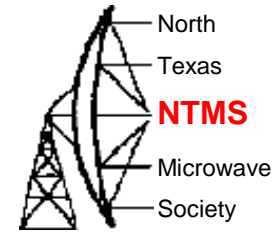
Bruce said he had to adjust the feedpoint locations inwards a bit for best match

W5LUA built 33 cm Patch Feed based on PY2BS dimensions

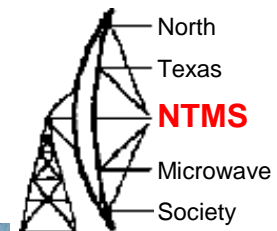


- The next few slides show a version I built based on Bruce's dimensions
- The disk is .023 inch thickness copper
- The back side ground plane and scalar ring are .040 inch thickness copper.

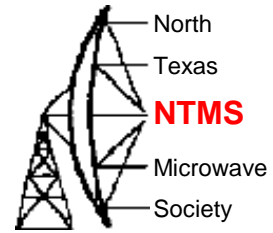
Inside View w/ Patch Removed



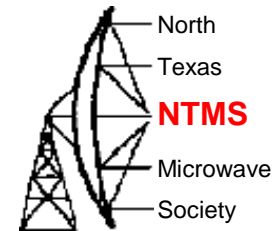
Feed with Patch Installed



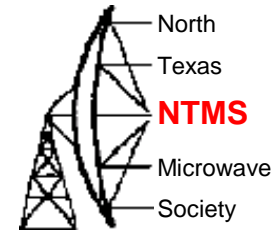
Back View showing both Horizontal and Vertical ports



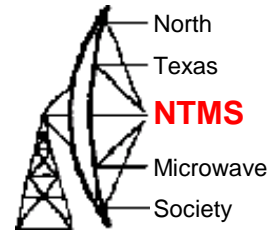
D Type Relay used to Switch Between H & V Polarities



902 Feed installed in 1296 MHz Septum Feed @ W5LUA



PY2BS 70 cm patch Feed



Patch feeder for 70cm

Reflector : diameter 438 mm (inside the choke skirt) / 2mm thick.

Choke height: 94 mm (from reflector's surface to the rim).

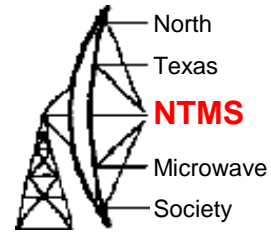
Patch disc: 334.2 mm dia / 1.5 mm thick

Feeding points: two, 90 degrees apart, 77 mm measured from the center of the disc. May need to be adjusted a bit for best SWR on your reflector.

Feeding posts: 3mm diameter (from the "N" connector to the patch disc).

Patch to reflector spacing : 25mm from surface to surface

PY2BS 70 cm patch Feed



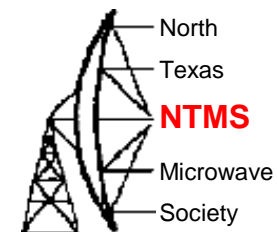
4 teflon spacers: 15mm in diameter, forming an 80mm x 80 mm square, 45 degrees apart from the feeding points. The spacers posts must be made of insulating material, and the screws on their top kept as short as possible. There are two short screws, one on each side of the post, please don't run a single screw from one side to another one.

Tuning discs: two 40 mm discs, 144 mm from the reflector's center, 180 degrees apart from each feeding point.

Space between the tuning discs and the patch: about 5 - 6 mm (needs to be adjusted for resonance on the dish)

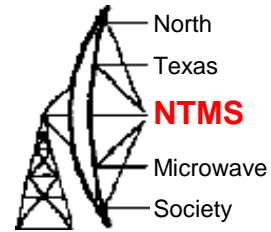
Phase center is at choke's edge plane.

W5LUA Modification



- I noticed that the natural resonant frequency of Bruce's 33 cm patch feed was closer to 930 MHz which is also where the port to port isolation appeared to be optimum.
- I then decided to scale the 930 MHz patch down to 432 MHz in hopes of not requiring any additional tuning in hopes of possibly improving the port to port isolation

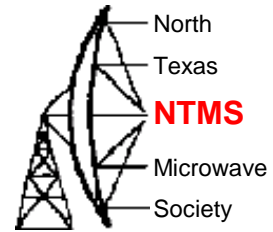
W5LUA Modification (continued)



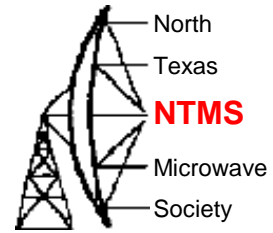
- Scaling $930/432 = 2.153$ ratio
- Taking the 930 MHz patch diameter of 159.3 mm and scaling to 432 MHz produces a new diameter of 2.153×159.3 mm = 343 mm = 13.5 inches
- I kept everything else the same
- Results were 27 dB return loss at each port with a port to port isolation of 22 dB

.062 inch double sided PCB used in construction

I taped the edges of the patch but no big difference

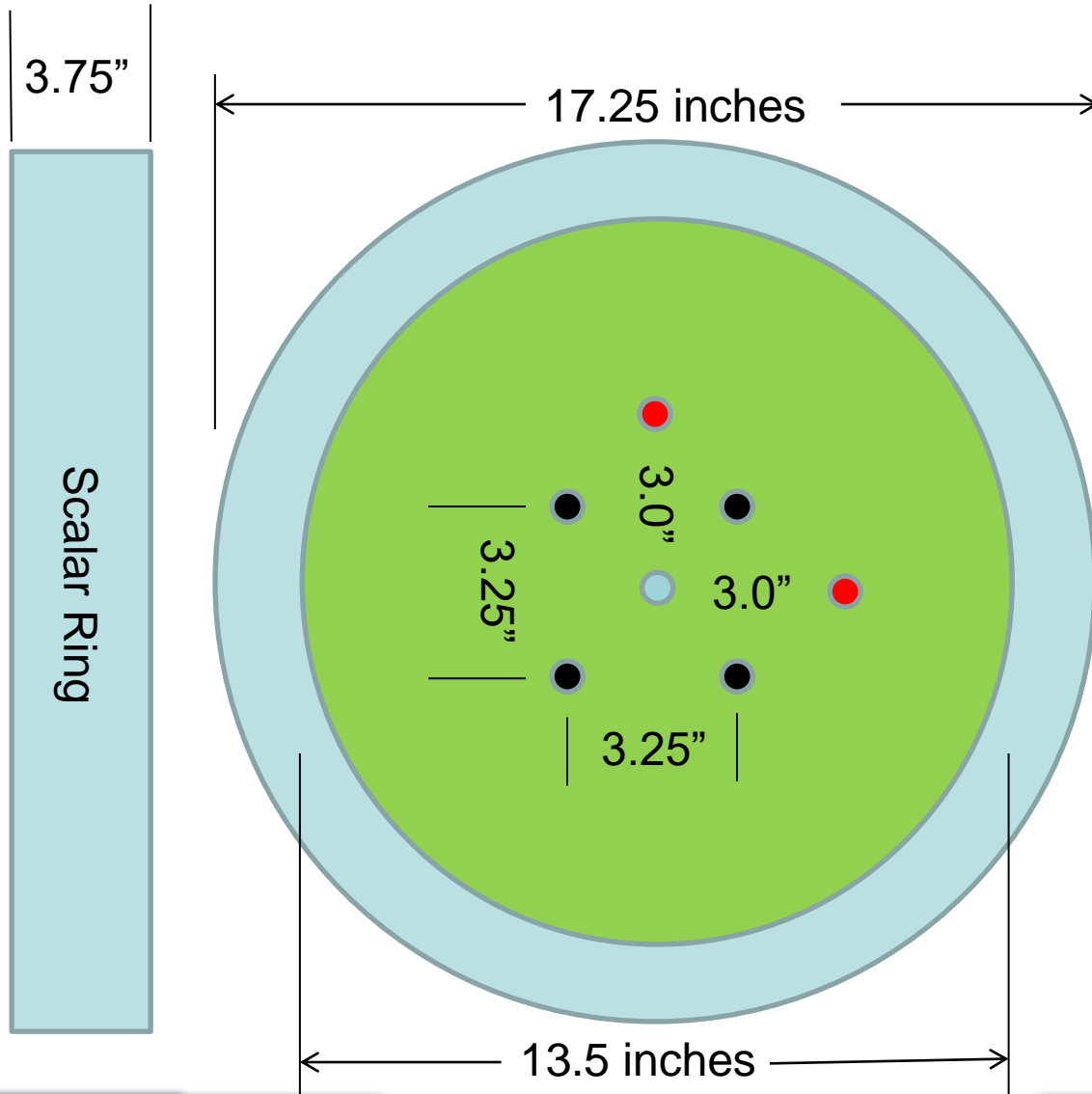
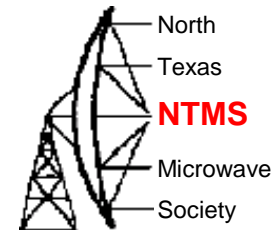


432 MHz Patch Feed in position at W5LUA in mouth of 1296 MHz septum feed



Not at focal point but still works well

Scaled to 432 MHz



- Center hole just for alignment
- Locations of 1 inch ceramic spacers with nylon screws. The 4 spacers make a 3.25 inch square box centered on the disk
- The H and V probes are located 3.0 inches from the center of the disk