Simple 10 GHz SSB/CW Station for the Beginner

by

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Basic Components

- 2 meter I/F transceiver
- Down East Microwave 10 GHz Transverter Kit
- Relay and rigid coax
- Dish or Horn antenna
2 Meter Multimode I/F Radio

- My choice is the ICOM IC-706. Affordable and readily available
- 10 Watts out on 2 meters, adjustable to 0.5 watts out
- Built-in keyer, Accessory jack for transceiver interface

- FT-817
- FT-857
- IC-202
- FT-290
- IC-251
- TS-700A
DEMI Transverter Kit

Top View

- Osc/multiplier
- Pipe Cap Filters
- DC Control Board
DEMI Transverter Kit

144 MHz in/out
10 GHz in
10 GHz out (10 mW)

Surface mount construction

Bottom View
Relays

SPDT 28 VDC
0-18 GHz - SMA

Transfer Relay
0-18 GHz - SMA
Hardline Coax
Dish Antenna

- 18 inch offset dish
- Readily available
- High gain typically 30 dB
Low Noise Block Converter with integral Feedhorn (LNBF)
Designing the New Feed
WR90 Waveguide to Coax Transition
Building the Feed Horn
Solder it all together
New Horn and Waveguide Transition
Setting Correct Angle
Adjustability
Finding the Focal Point

Measure Dimensions

- Vertical Length (mm)
- Horizontal Length (mm)
- Dish Depth (mm)
- Max Depth to Bottom Length (mm)
W1GHZ Online Microwave Antenna Book

http://www.w1ghz.org/antbook/contents.htm

Software Page:

Run HDL_ANT.exe

Select “Offset Dish Calculations”

Enter measured dish dimension data
Enter Dimensions

Frequency in MHz: 10368.1  
Diameter of Large axis of dish in mm: 490  
Diameter of small axis of dish in mm: 452  
Depth of dish at deepest point in mm: 45  
Distance of deepest point from bottom edge along large axis in mm: 218  

Results  
Focal length = 256 mm  
The focal point of the dish is 255.98 mm from the bottom edge of the reflector and 452.68 mm from the top edge of the reflector.  
The large axis is tilted forward 66.3 degrees above the horizontal.
String and knot method to find phase center

RF

453 mm

256 mm

66.3 degrees tilt
10 GHz Portable Station

IC-706
DEMI Transverter
Sequencer
PA Pwr Supply
Relay
2W PA
Conclusion

• Building a 10 GHz station is not difficult
• Parts are readily available online or at hamfests.
• 10 GHz is one of the fastest growing microwave bands.
• North Texas Microwave Society offers support and welcomes newcomers to the microwave amateur community.