RF HAMDESIGN
Microwave Equipment & Parts

RF HAMDESIGN 1296 / 2320 / 3400 MHz
Dual Mode Dish Feed

Type CIR-1296 – CIR-2320 – CIR-3400 (septum)

On 1296, 2320 and 3400 MHz circular polarization:

For HAM Radio EME the standard is to transmit in RHCP and receive in LHCP. RH=right hand; LH=left hand and refers to which direction the RF wave rotates. The easiest way to visualize it is by thinking of how a nut rotates on a bolt on RH thread vs LF thread. The reason two senses of CP are required is that CP is reversed upon reflection from the surface of the Moon.

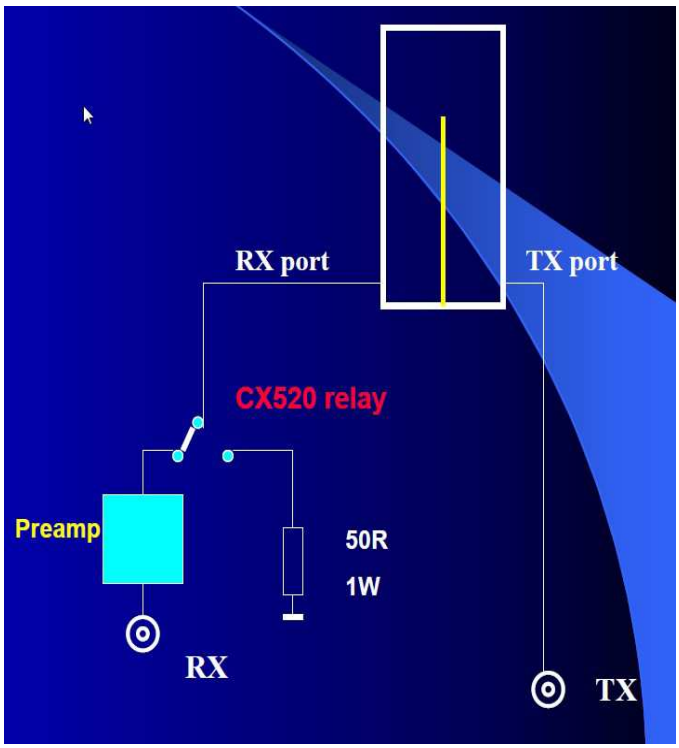
Picture: 1296 MHz Septum Dish Feed

To generate a circular polarized signal there are two basic methods:

1) using a hybrid to feed two probes inside a horn at right angles to each other with RF phased by 90-degrees, or
2) using this septum feed horn which has a stepped center plate running down the middle of a section of waveguide (either square or cylindrical shape).
This plate is called the septum and it separates two probes inside the horn.
One is used for Rx and the other for Tx and the nature of the septum is that is produces circular polarization of both senses but opposite at each probe.

In this septum dish feed the two polarities are produced without need of external hybrids (which add loss) and fairly high isolation exists between Rx and tx (typically 24-dB).
This eliminates use of high power TR relays.

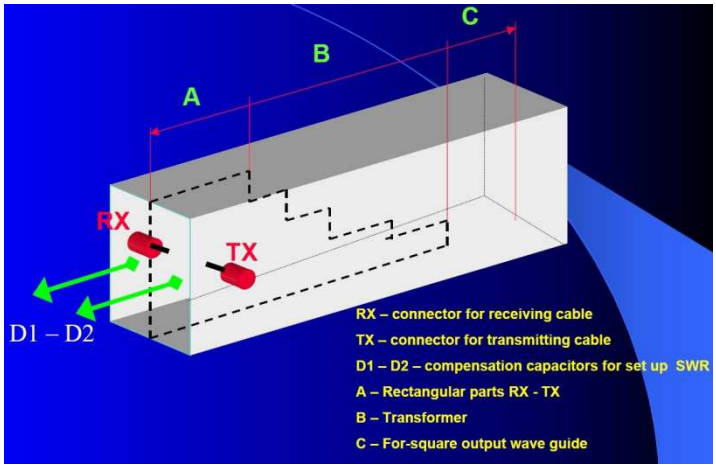
One needs typically 60-dB isolation (for power up to 1kW) so a fairly low-power relay can be used on the Rx port to add isolation (typically a mw sma relay). e.g. 1000w (+60 dBm) - 24-dB = +36 dBm (4w).
The relay must be able to handle 4w (easy) and have more than 36-dB isolation (also easy).
The relay needs very low insertion loss (not easy).
Refer to the drawing on this page.



2320 MHz Septum Dish Feed

How does a Dual Mode Circular Dish feed Work ?

The RX and TX ports are tuned to 1296 or 2320 or 3400 MHz. it is recommended to fine tune the dish feed after you placed the feed in front of the dish, but if you prefer it can be done by use of a scalar network analyzer to setup the ports for minimum VSWR.
At the picture right you can see how the Dish feed is build and uses the inside parts of the wave guide.



Add a scalar ring ?

A scaler ring is really a choke ring and used to control RF fields at the mouth of the horn. It can be used on this septum feed. Typically, it is needed for dishes < f/d = 0.4 (f/d= focal distance/diameter and is a measure of how deep a dish is)
This means, when you ordered a RF HAMDESIGN Dish, you do NOT have to add a scalar ring.

Ready to use:

This Circular Dual Mode Dish feed is ready to use, it is tuned at 1296 or 2320 o 3400 MHz @ max return loss in free space (>35dB 1296MHz / >30dB 2320MHz / 28dB 3400MHz) RX and TX ports are marked. (Refer attached measurement report)

Important note: Add a extra relay to the RX Port, when TX comes in, this relay must be switched to 50ohm ground.

Specifications Circular Dish Feed

Description	1296 MHz	2320 MHz	3400 MHz
Return loss RX / TX port	>35 dB	>30 dB	>27 dB
Isolation RX <> TX port	> 20 dB	> 20 dB	>20 dB
Weight Circular dish feed	2.9 Kg	1.1 Kg	0,570 Kg
Weight Available dish feed bracket	2.9 Kg	1.0 Kg	N.A.
Connector RX / TX	N-Connector Female (option 7/16 DIN F)	N-Connector Female	N-Connector Female

Dish Feed Bracket: RF HAMDESIGN can offer you a CNC Milled dish feed bracket for model CIR-1296 and CIR-2320 which is used to mount the dish feed in front of the dish. When the dish feed is mounted in the bracket, you can slide easy the dish feed forwards / backwards to find the max gain / distance for you dish. (Picture type CLX-05)