

Eyal Gal 11GHz Transceiver by Roger Ray G8CUB

These units with the part number 6031-01 will work un-modified at 10.368GHz. They consist of a receive LNA & mixer, plus a transmit amplifier & output monitor. Thus just needing an LO, Tx mixer and filter, and a couple of relays to make a simple 10GHz transverter.

Measured performance on receive with a 432MHz IF, is as follows:

Conversion gain +22dB

System noise figure 2.9dB

Image rejection (9.94GHz LO) -24.5dB

Performance on transmit:

+32dBm output - 1dB compression

+53dB gain

Saturated power output on transmit is >2W.

Supply requirements:

	Receive (Tx Inhibited)	Full Output
+8.0V	380mA	720mA
+12V	50mA	1.93A
-12V	105mA	105mA

The IF response is flat 75-1700MHz, but a 144MHz IF would only give you 2dB image rejection, so is not practical. With the high transmit gain, it is necessary to either use an input attenuator, or use the AGC control to turn the gain down.

In my 10GHz system I use the Eyal Gal block with an Alcatel synthesiser and 10MHz reference. The block dissipates a fair amount of heat, so don't remove the aluminium slab base plate.

As you can see in the picture of my complete transverter I have done just that! But, I have replaced it with an L-bracket to the base plate, which works just as well. A specification sheet was available on the web www.eyal-microwave.com/eyal-emi/09042006100536@6031-00.pdf but no connection details, so I had to work those out.

The output power measured was much greater than that indicated by the specification sheet (harmonics are quoted with a +26dBm power, and IP3 as >+38.5dBm). I can only put that down to the fact that I am using it at the bottom end of its frequency range.

Pin-out on the two connectors as pictured above, left to right, is as follows.

Connector 1 (6 way)

1	2	3	4	5	6
n/c	+8V	-12V	0V	n/c	+12V

Connector 2 (5 way)

7	8	9	10	11
n/c	Tx Det	AGC	0V	Tx Mute

Connections to the unit are by two, 0.1" pitch single in line connectors. It is quite easy to solder wires straight on if you don't have suitable mating plugs. In my system, the 8.0V supply is provided by a 7808 regulator. The 12V supply is a direct battery feed. Both are internally regulated, so the exact voltage is not critical. The -12V is provided by a block DC-DC converter.

I have not had the courage to remove the -12V supply to see if the unit is internally protected, but equally I have not blown one up yet!

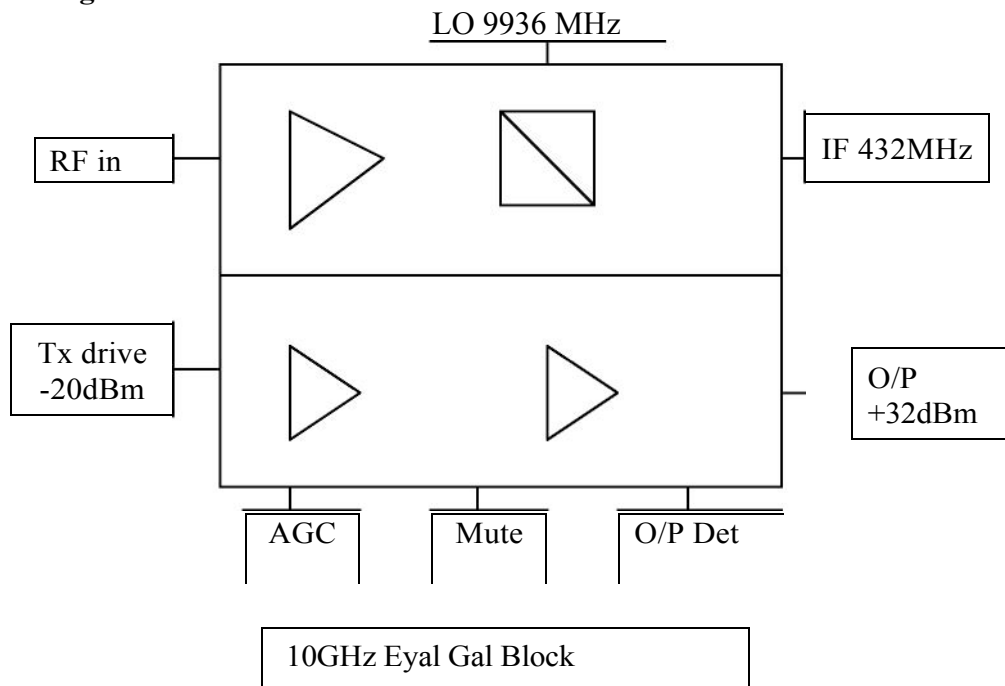
Tx Mute – 0V to inhibit

Tx Det – DC proportional to dB output power (log detector) Max ~ 4.3V

AGC – 0- 5V Control - from the data sheet turning the power down more than 10dB will limit the output power (I have not tried this, just left the pin o/c)

Local oscillator power required is +3 to +6dBm (9.936GHz). Around -21dBm Tx drive will give you full output (at max gain). The 2 SMA output connectors allow easy use of a coax relay, or the addition of a single stage low noise amp and/or PA.

Block diagram



Complete early transverter in operation

