

**EUROPEAN ORGANIZATION FOR NUCLEAR RESEARCH
ORGANISATION EUROPEENNE POUR LA RECHERCHE NUCLEAIRE**

CERN - PS DIVISION

PS/ RF/ Note95-09

**0.4 - 20 MHZ VCO
(PS/RF-HC 3194)**

M. Paoluzzi

Geneva, Switzerland
15 March 1995

1. CIRCUIT DESCRIPTION

The Voltage Controlled Oscillator (Figure 1) uses the dedicated MAX038CPP chip (IC1) which provides the basic VCO function.

Prior to being applied to the VCO input (IC1 pin 10) the control voltage goes through a non-linear amplifier (IC2, VR3, VR3 and D1) required for linearization of the VCO f_{out} vs. V_{ctrl} response. The linearity obtained in this way is $< \pm 10\%$.

The VCO rf output signal is boosted by Q1 and thus applied to the two rf outputs.

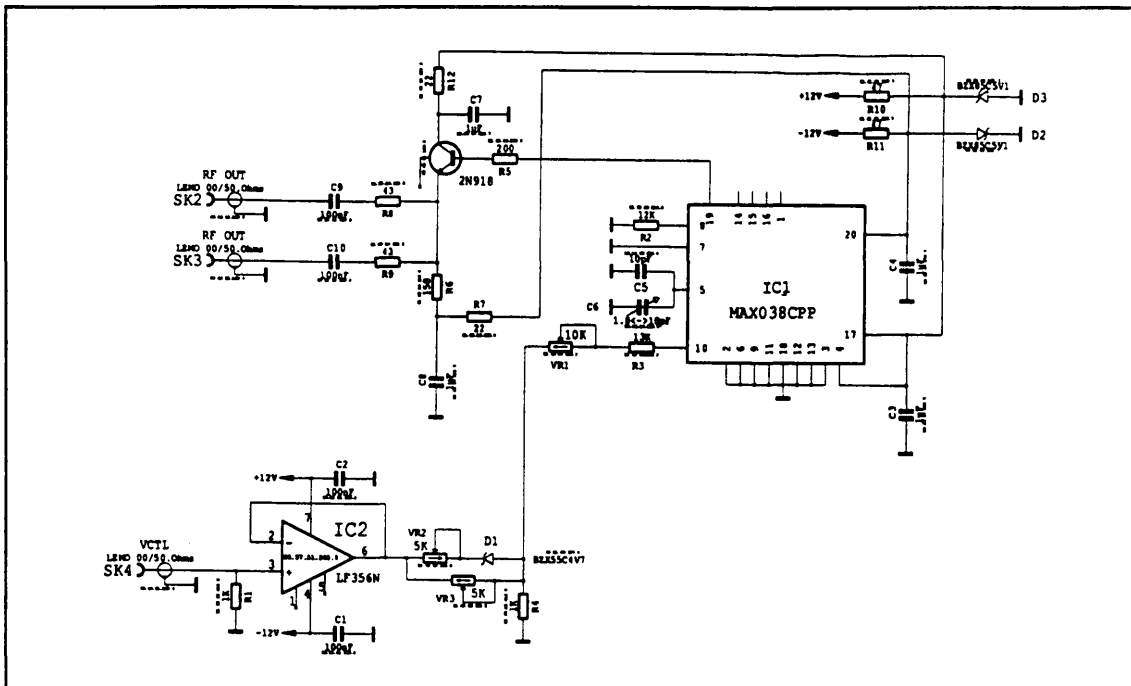


Figure 1. Amplifier Circuit Diagram.

2. ADJUSTMENT

1	Preliminary Test
1.1	By visual inspection verify that the module does not present evident manufacture errors and verify that it has been properly cleaned.
2	Scaling Adjustment
2.1	Prepare the test set-up shown in Figure 2 and adjust the pulse generator to supply a triangular wave with the following characteristics : Period : 0.4 seconds Vmin : 200 mV Vmax : 10 V

2.2	Apply a control voltage of 10 V on SK4 and adjust C5 so as to obtain $f_{out}=20$ MHz (measure on the frequency counter).
2.3	Apply a control voltage of 10V on SK4 and adjust VR1 so as to obtain $f_{out}=400$ kHz (measure on the frequency counter).
2.4	Repeat points 2.1 and 2.2 until the error at the 2 frequency limits is $< \pm 1.0\%$
2.5	Apply the triangular wave signal defined at point 2.1 to SK4 and adjust VR2, VR3 so as to obtain the best fit of the frequency to voltage converter output to the triangular wave signal (measure on the oscilloscope).
2.6	Repeat points 2.1 through 2.6 until the error at the 2 frequency limits is $< \pm 1.0\%$ and the error over the whole frequency range is $< \pm 10\%$.
2.7	Verify that the rf output voltage swing is 500 Vp \pm 100 mV over the whole frequency range.

3	Labeling
3.1	Put a drop of paint on all adjustable components.
3.2	Label the module 'OK+Date'

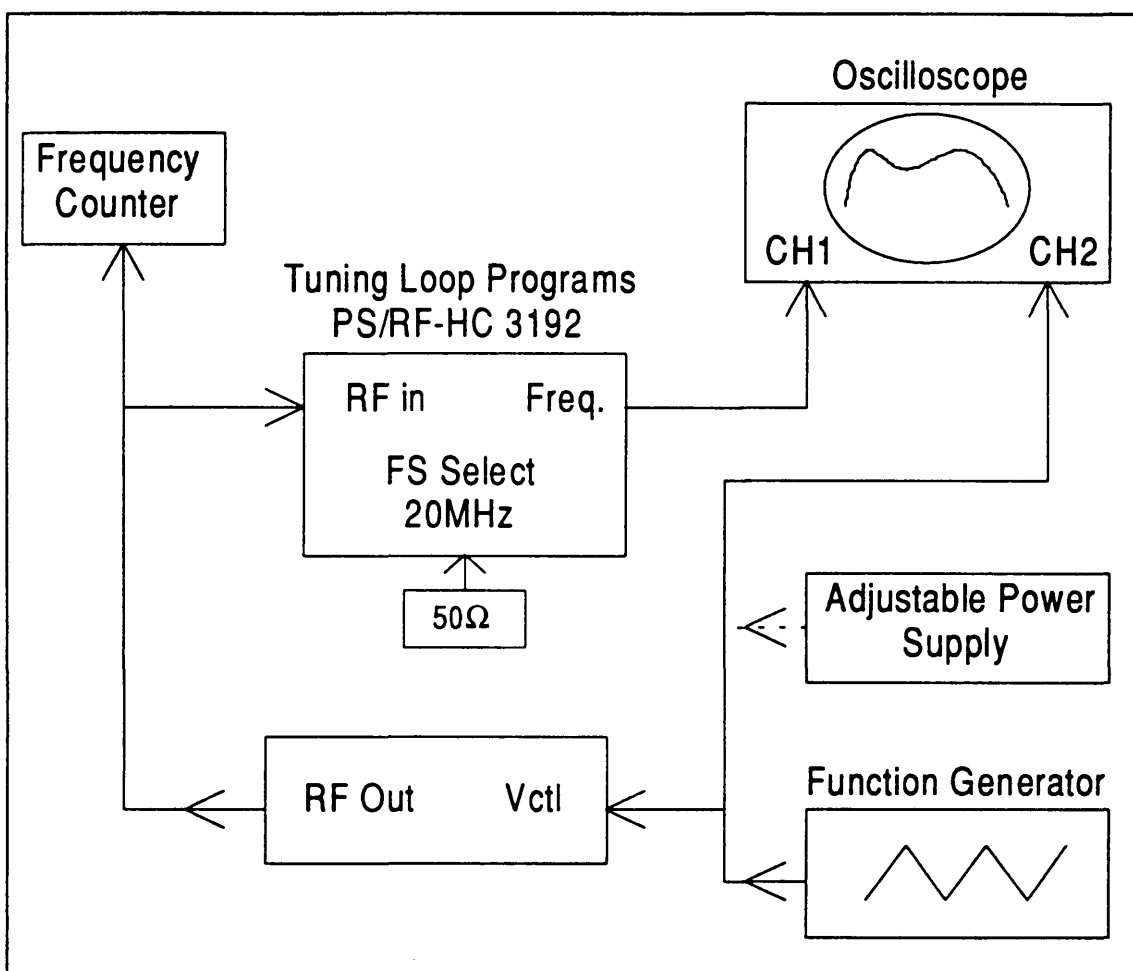


Figure 2. Adjustment Set-Up.

Distribution :

**R. Garoby
PS-RF-HC Section**