

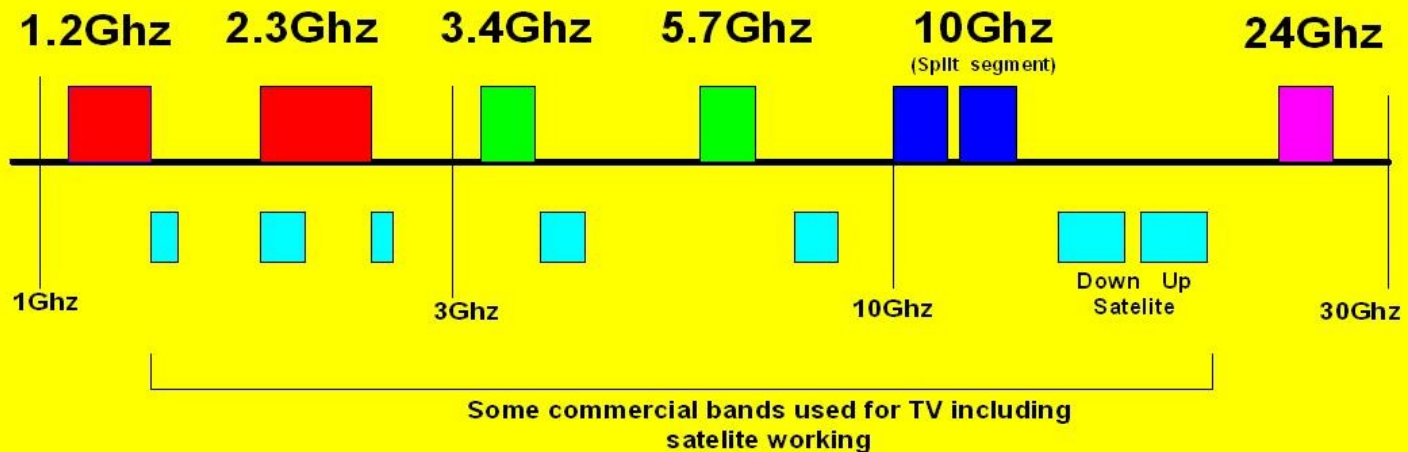
Using Microwaves for transmission of Television

Peter Blakeborough G3PYB

Frequency bands for TV

Amateur microwave bands

(Approximate representation))



CW Oscillators for Transmitters and Receivers

Large 2W 850Mhz cavity oscillator at 850Mhz with multiplier to 6.5Ghz



Cavity tuned 1.5Ghz transistor oscillator



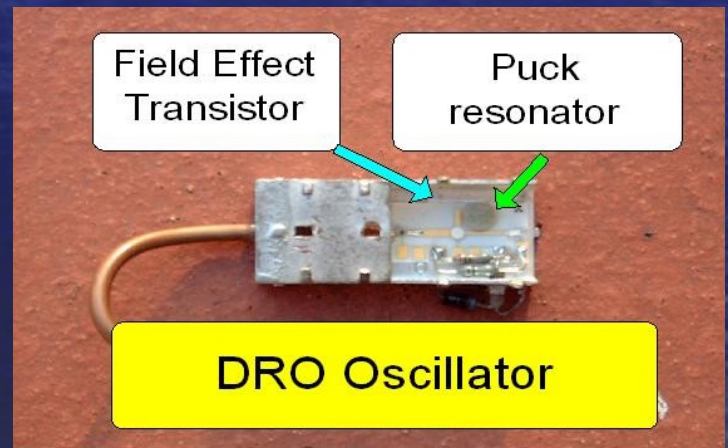
Gun diode oscillator module



Field Effect Transistor

Puck resonator

DRO Oscillator



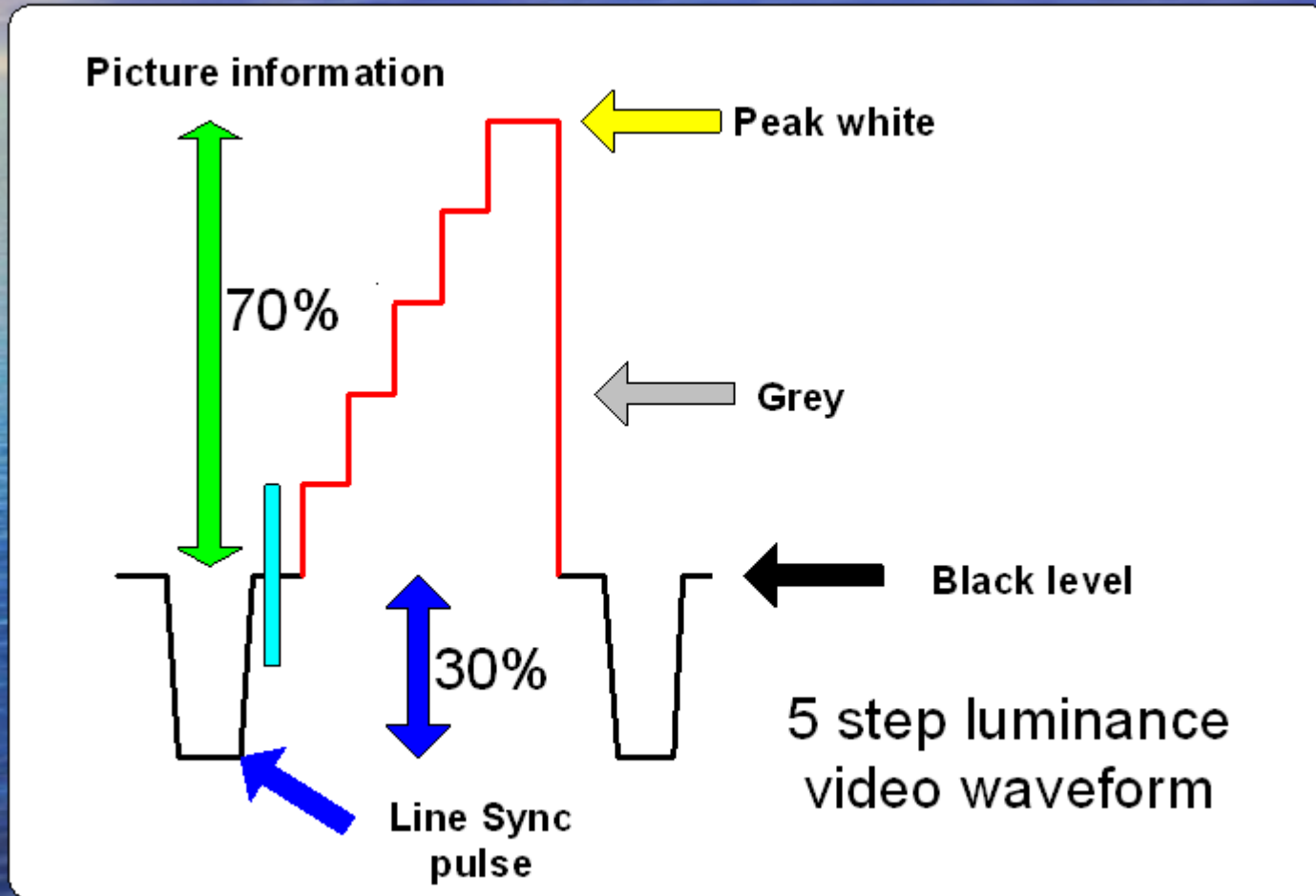
Factors affecting the stability of oscillators

- Early valve devices used complex mechanical cavities.
 - High level of mechanical work
 - Thermal changes to metalwork.
 - High voltage power supply voltages changes.
 - Mechanical shock produced microphony effects.
- Semiconductor devices Gunn diodes /IMPATTs
 - Lower drift due to heating effects
 - Simpler mechanical cavities
 - Simpler lower voltage Power supplies.
- Field Effect Transistors using DRO
 - Good regulated power supplies
 - Higher efficiency with less drift.
 - Compact with thermal correction.

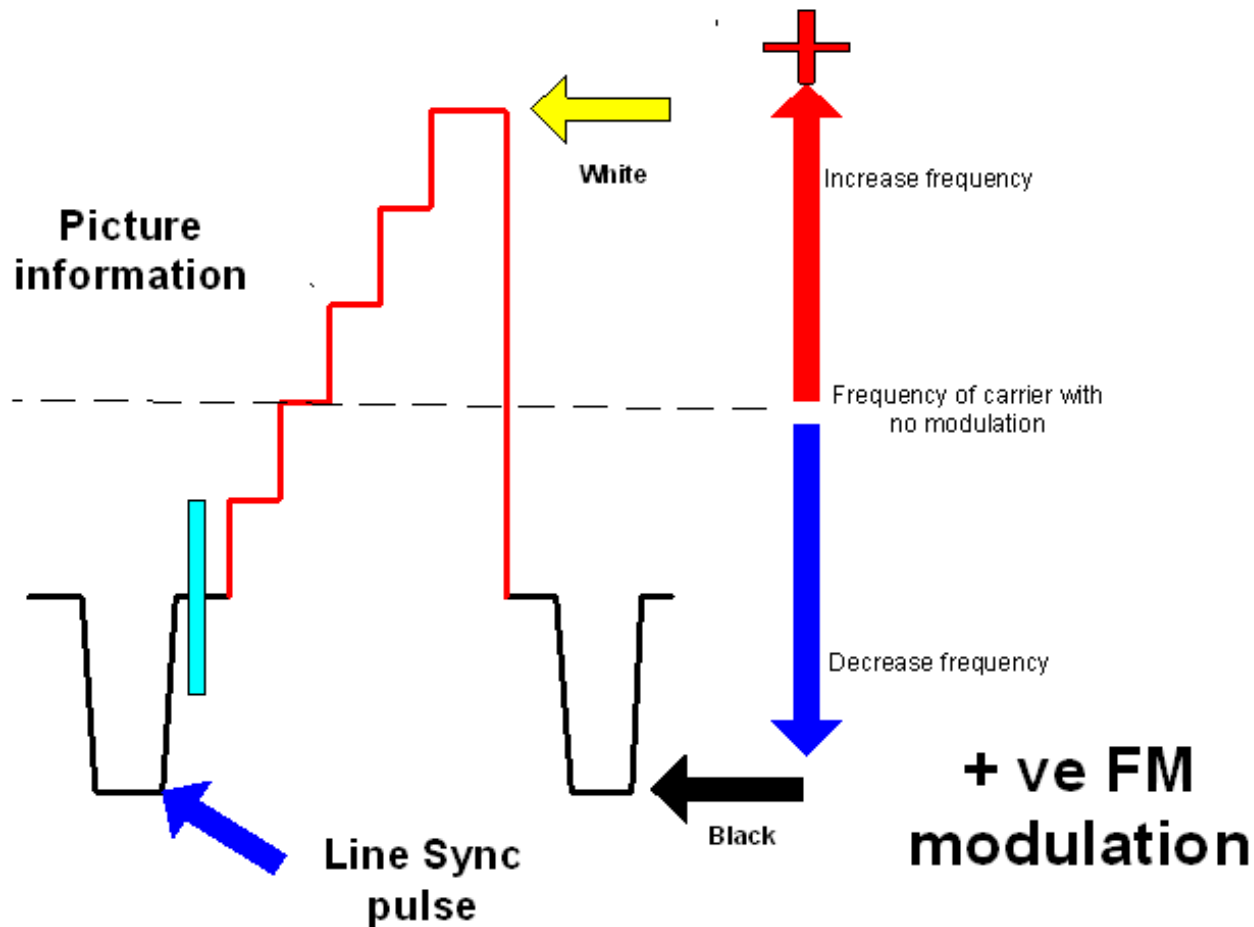
Modulation

- Superimposing the video signal on the CW carrier with high frequency information up to 5MHz and down to low frequencies near DC.
- Choices:-
 - Amplitude modulation (AM)
 - Frequency modulation (FM)
 - Digital modulation.

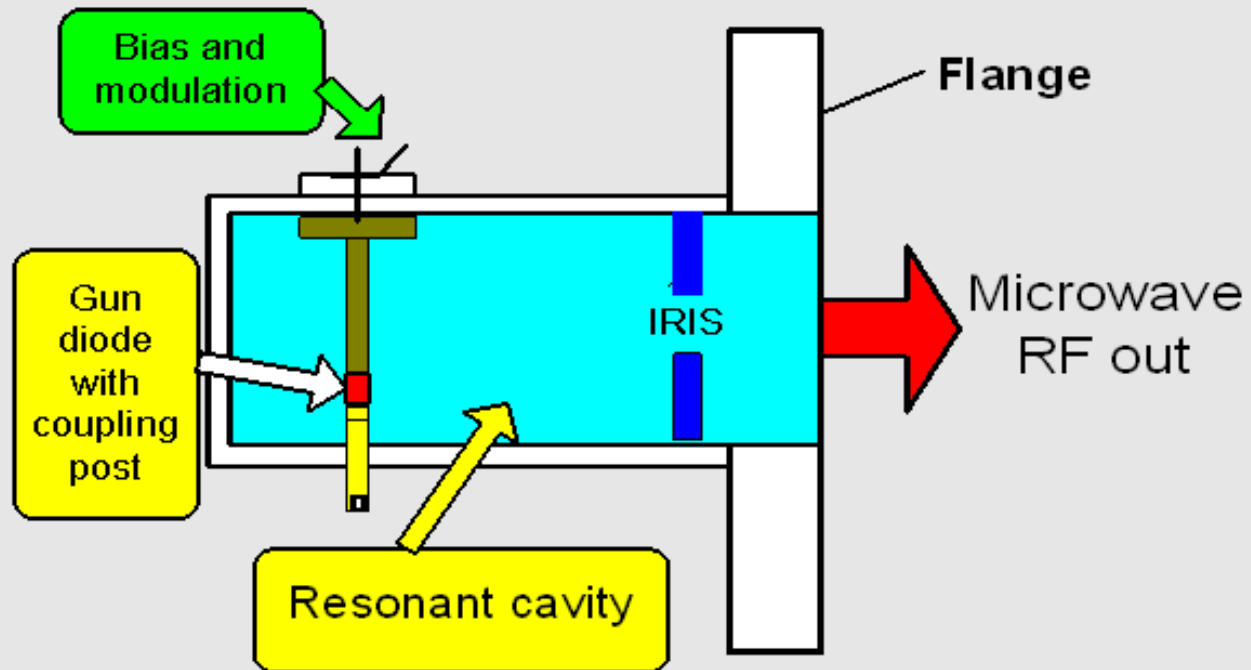
Video signal waveform



Frequency modulation

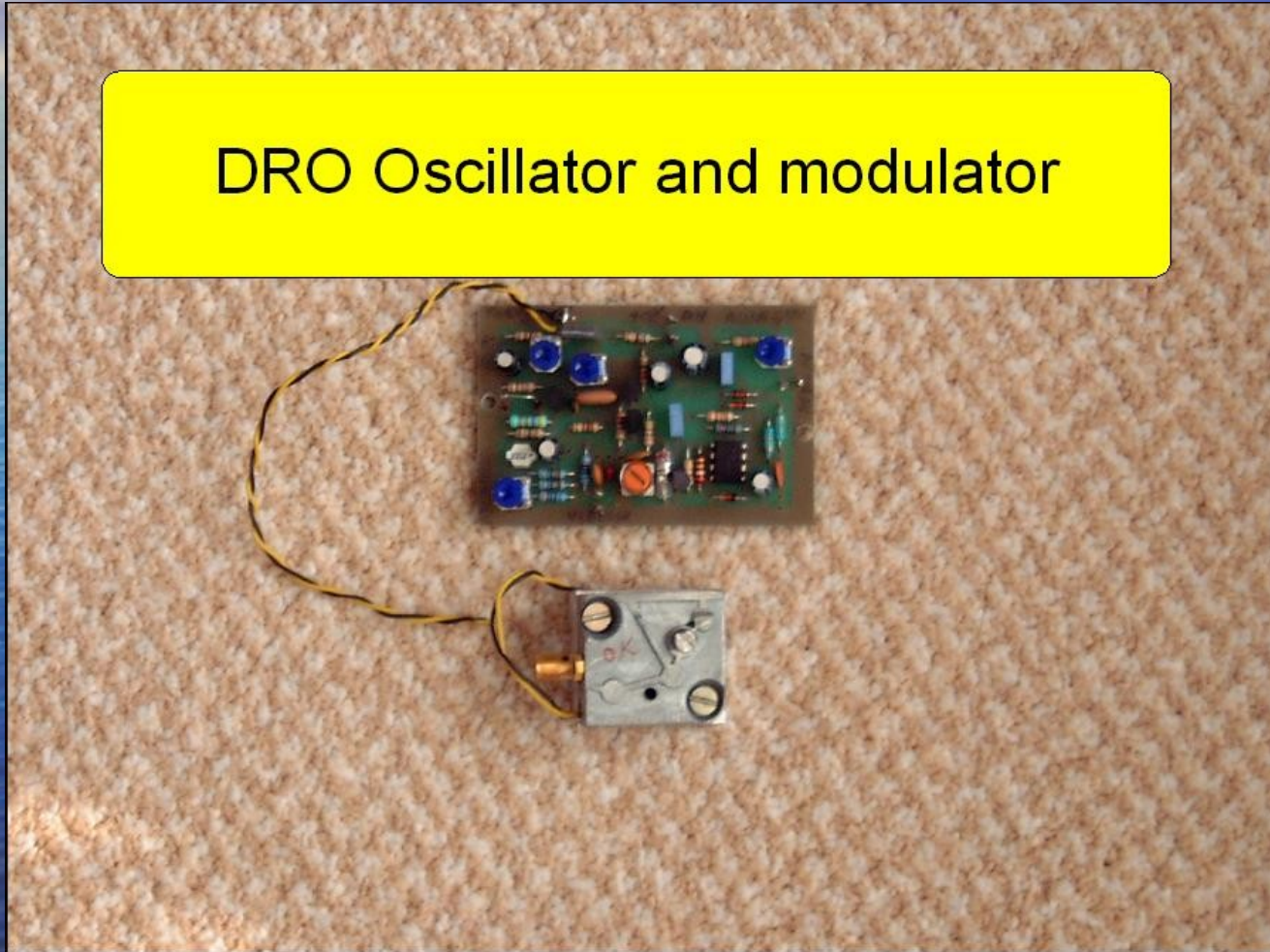


Gunn diode oscillator

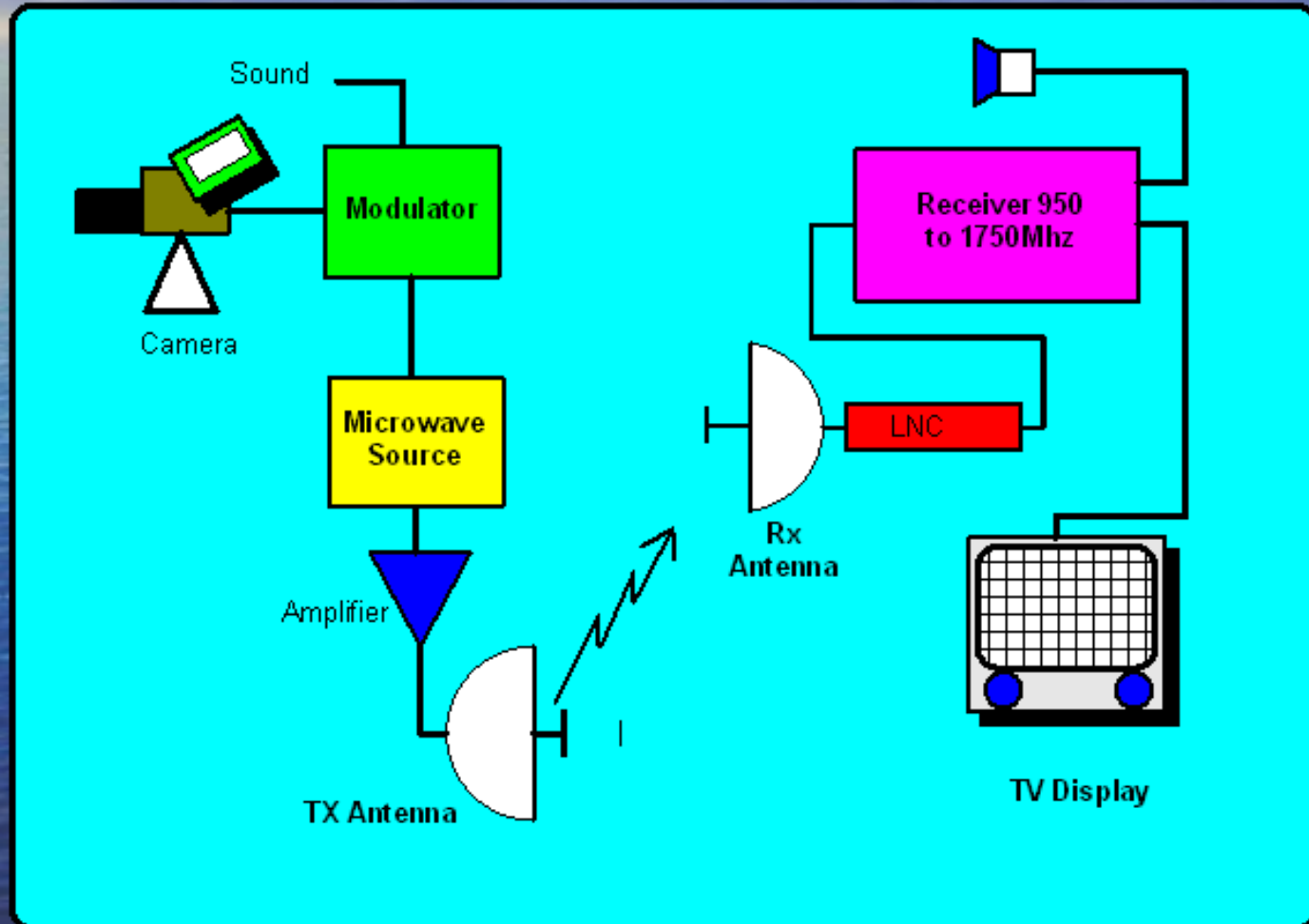


FET DRO oscillator

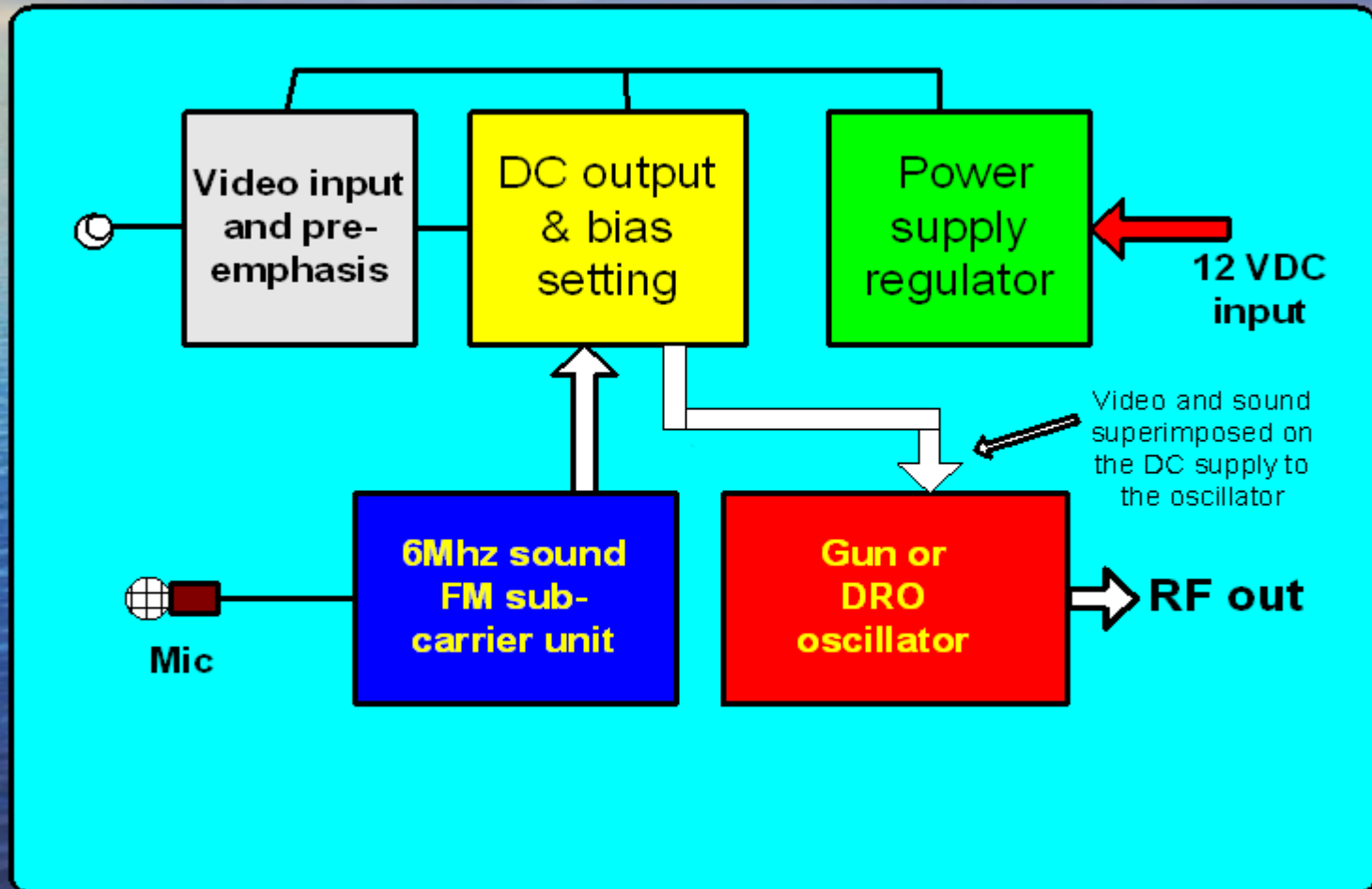
DRO Oscillator and modulator



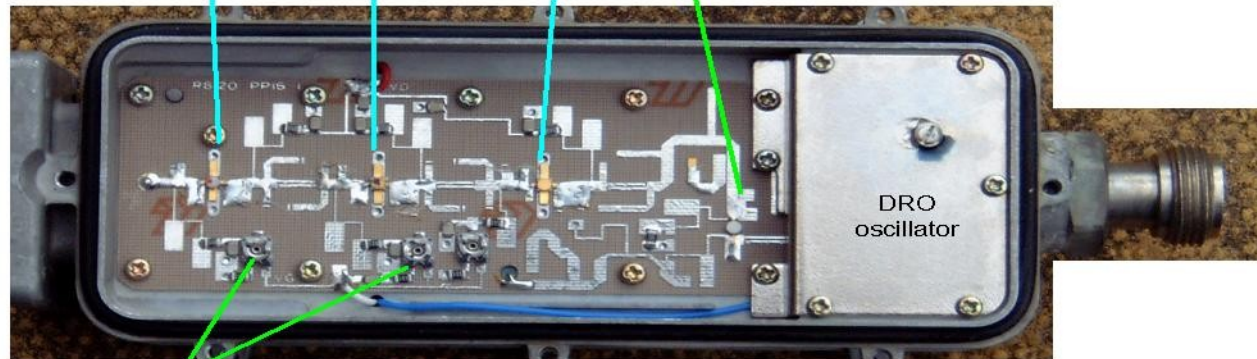
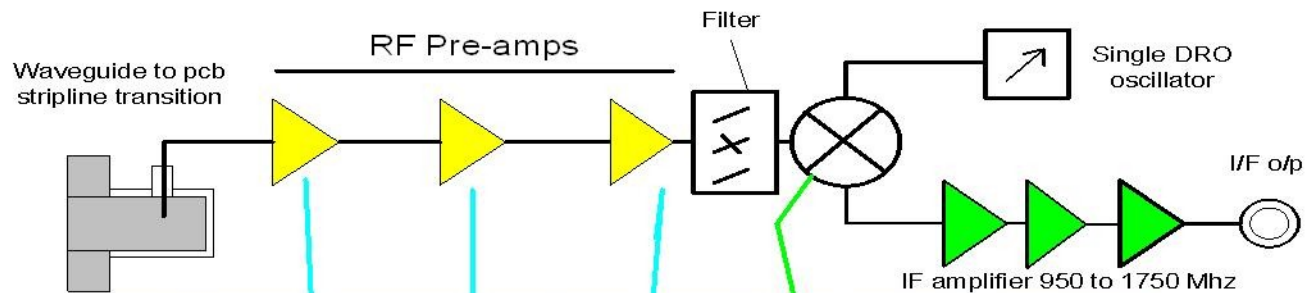
Simplified TX and RX system diagram



FM Modulation of Gunn and DRO oscillators



Using Low Noise Convertors for ATV receivers.



Gate bias adjustment

IF amplifiers and power regulator on reverse side

Maspro LNC single band waveguide input

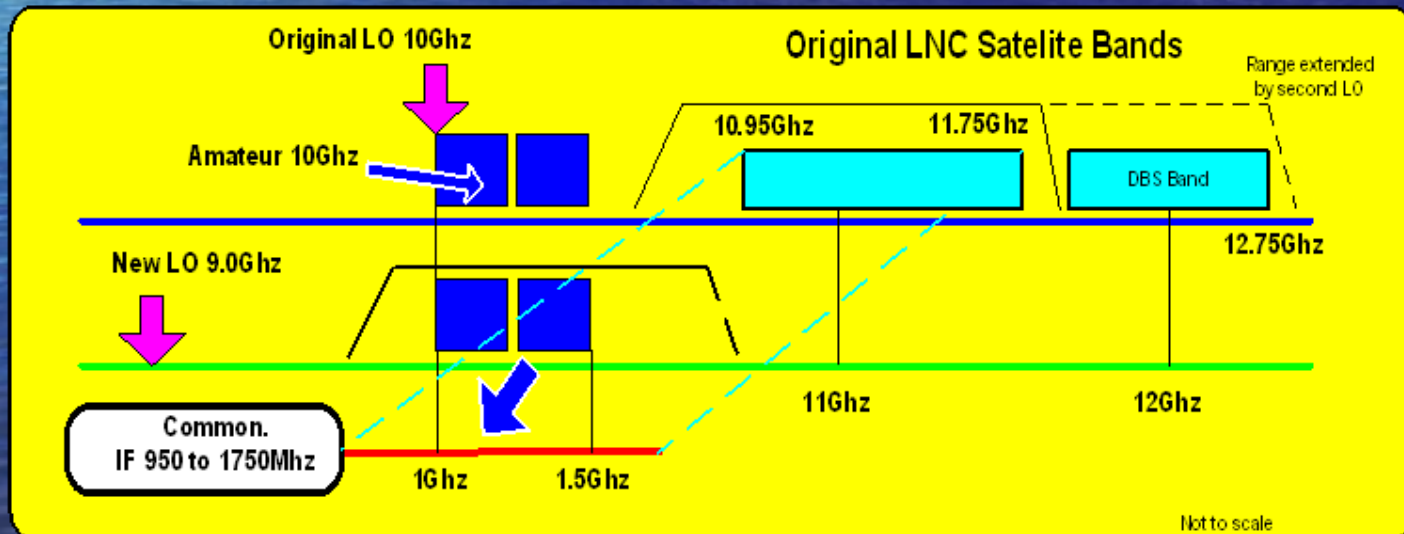
LNC choice for ATV use.



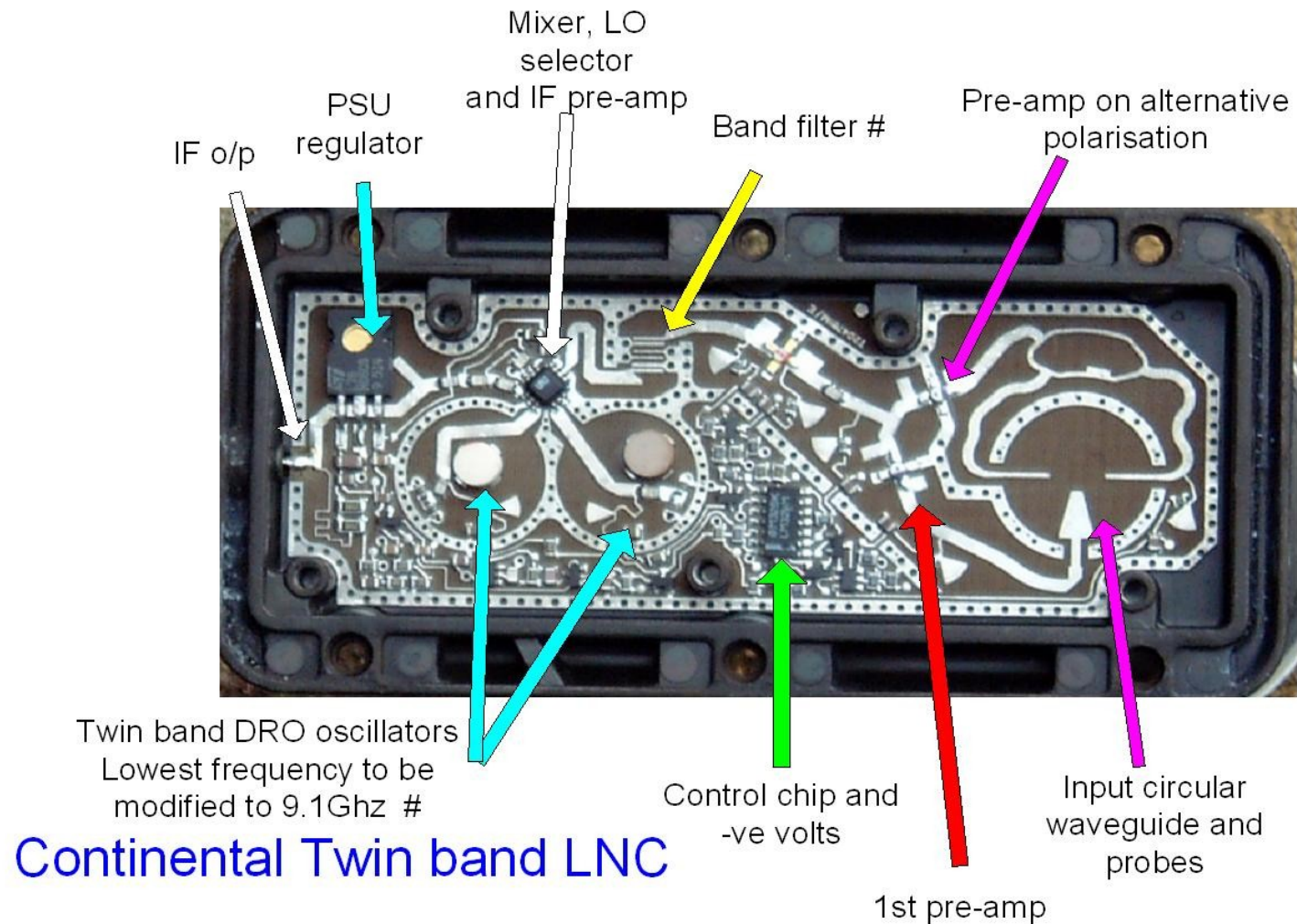
- LNC with integral horn antennas
- LNC with rectangular waveguide flange for separate antenna connection
- LNC with coaxial input (more difficult to modify)

Choosing the LNC to modify

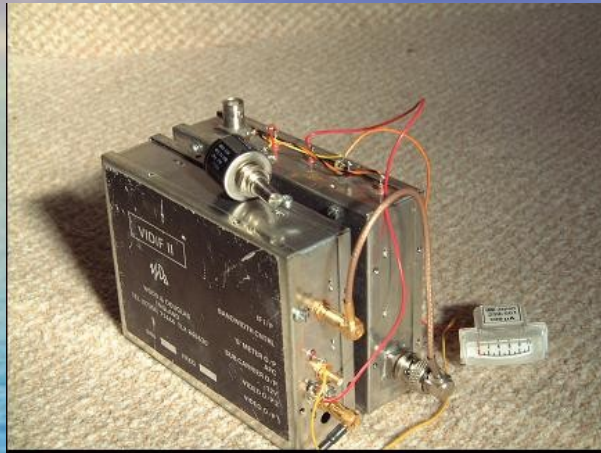
- Select the original band nearest to the amateur allocation
- Amateur segment is 10 to 10.125 and 10.225 to 10.5 GHz
- Most single band LNC were 10.95 to 11.7GHz for non DBS
- Universal dual band LNCs with the upper DBS band were 10.7-12.75GHz.
- Sky/Astra used a lower band limit for a time, closer to the amateur allocation.



Changes to LNC marked with



Receivers for ATV demodulation

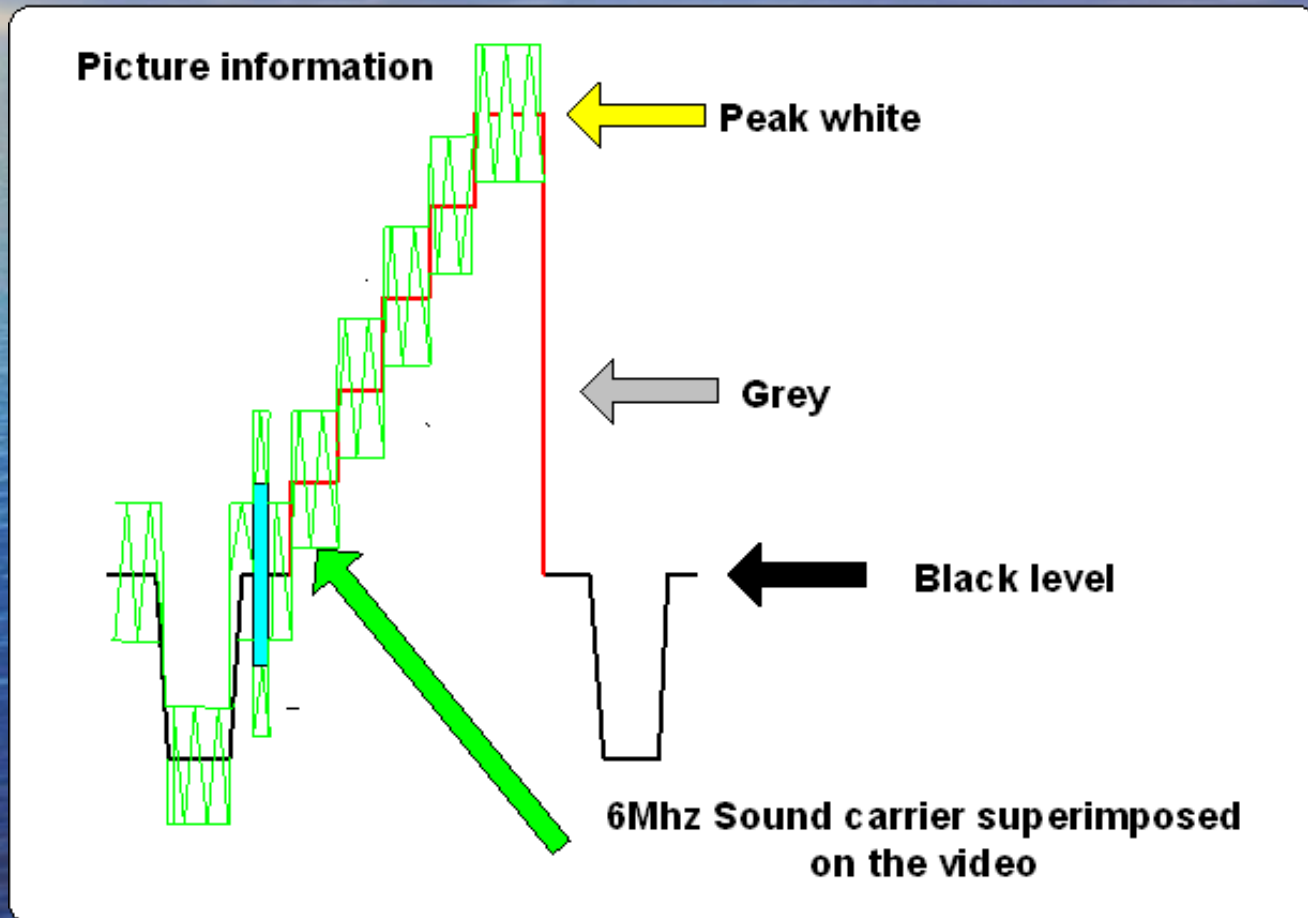


- 1250MHz Converter
- and 70MHz IF modules
- 12v DC supplies



- * Surplus analogue
- * Satellite receivers
- * 950-1750MHz in

Adding sound to the video transmission



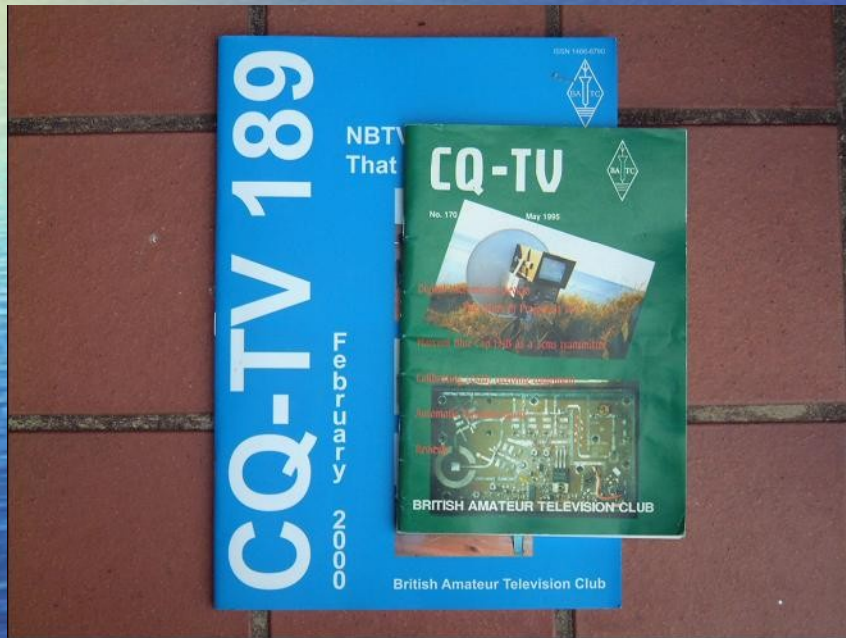
Recovering sound from the video waveform



Typical low power ATV video transmission equipment



Where to find information



- BATC British amateur Television Club.
- **www.batc.org.uk**
- Back copies of magazines on-line and available on CD

Reference sites & articles

- CQ-TV Blue Cap LNB modification pg. 39
- CQ-TV LNC LO conversion G4LXC pg. 40
- www.atvinderby.co.uk
- www.gb3hv.com/start/kits.htm
- bob_platts@hotmail.com
- pa3gco.com LNB used as a transmitter

BOB PLATTS G8OZP

Specialist in 3CMs ATV (Amateur TeliVision) equipment.

Supplier of:

3CMs LNB's (Low Noise Block) receive convertors.

Covering 10.000 – 10.500GHz input and providing an IF output of 1.000 – 1.500GHz. Noise figures of about 0.3db.

Available with input via a horn antenna for direct fitting to a dish.

WG16 waveguide, or SMA connector.

ATV transmitters with DRO (Dielectric Resonance Oscillator).

A range of output powers, with waveguide or SMA output.

With or without intercarrier sound.

Other related product also available. Please contact:

Bob Platts G8OZP

43 Ironwalls Lane

Tutbury

DE13 9NH

01283 813392 (7 – 9PM preferd)

bob_platts@hotmail.com



**3CMs LNB for direct mounting
upon a broadcast satellite dish.**

**Provides an IF output of
1 – 1.5GHz**

- LNC modified and set-up on 10GHz
- DRO oscillators
- DRO ATV modulators with sound included