

## CIRCUIT DESCRIPTION

UB299Z

### GENERAL INFORMATION

#### 1. Tuning Range

520 kHz - 1720 kHz  
29.000 MHz - 54.000 MHz  
88.000 MHz - 108.000 MHz  
137.000 MHz - 174.000 MHz  
406.000 MHz - 512.000 MHz

#### 2. Frequency Range of the Local Oscillators

##### a) 1st Local Oscillation Frequencies:

970 kHz - 2170 kHz (For 520 kHz- 1720 kHz Band)  
50.4 MHz - 75.4 MHz (For 29 - 54 MHz Band)  
98.7 MHz - 118.7 MHz (For 88 - 108 MHz Band)  
115.6 MHz - 152.6 MHz (For 137 - 174 MHz Band)  
128.2 MHz - 163.533 MHz (For 406 - 512 MHz Band)

##### b) 2nd Local Oscillation Frequency: 20.95 MHz (Expect 520 - 1720 kHz Band and 88 - 108 MHz Band )

#### 3. Intermediate Frequencies

1st IF: 21.4 MHz      2nd IF: 450 kHz

IF: 10.7 MHz ( 88 - 108 MHz Band )  
IF 450 kHz ( 520 - 1720 kHz Band )

### CIRCUIT DESCRIPTION

This equipment is the double conversion type receiver. From a signal input, the above operating frequencies are coupled through separate tuned RF Amplifying and Mixing stages to the common First intermediate Frequency (21.4 MHz).

The first local oscillator signal is delivered from the PLL synthesizer (IC701) and VCO circuit (Q702,703). The VCO frequency is divided down by the programmable counter which is preset from memory and compared to a reference frequency.

Any frequency or phase difference produces a correction signal to change the VCO tuning voltage. This tuning voltage then forces the VCO to oscillate at the frequency which required for the counter to produce output that is in phase with change the frequency.

Thus, changing the modules of the counter will change the frequency of the VCO. The second oscillator (X701/20.95 MHz) is used for mixing down to the 450 kHz second IF before the signal is limited and demodulated.

The second mixing and the FM demodulation are done at IC101.

88 - 108 MHz Band of local oscillator signal is delivered from the PLL synthesizer (IC501) and VCO circuit (D503, IC503). The VCO frequency is divided down by the programmable counter which is preset from memory and compared to a reference frequency.

The FM demodulation are done at IC503.

520 - 1720 kHz Band of local oscillator signal is delivered from the PLL synthesizer (IC501) and VCO circuit (FT502, IC503). The VCO frequency is divided down by the programmable counter which is preset from memory and compared to a reference frequency.

Also the AM demodulation are done at IC503 .

The demodulated audio signal is then coupled to the audio amplifier (IC105) and also filtered for proper squelch activation. The frequency program is entered from the decimal keyboard into the micro-processor (IC301) where it is multiplexed to drive the LCD display and decoded to enter the proper binary code in the memory to control the PLL synthesizer(IC701 and IC501)