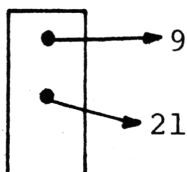


REALISTIC TRC-451

FREQUENCY EXPANSION:

For Low and High Frequencies (26.515-26.955; 26.965-27.405; 27.415-27.855) Use our Kit #106 and install @C72. Full instructions included with kit.

For high frequency coverage, (27.415-27.855) remove the uPD 2824C Chip (1C2) and install a uPD 2816C in its place. Connect pin 20 to 21 (ground). Connect a SPST Switch to pin 9 as follows:



L14 is the VCO Coil. Adjust as necessary to get all channels. The HI frequency channels come out on "even" frequencies, such as 27.410. But 15KC of slide can easily be installed by following instructions below:

CLARIFIER:

1. Clip D32 Switching Diode.
2. On Clarifier control, locate the White, Yellow and Brown wires.
3. Ground the Brown Wire.
4. Cut off the White Wire.
5. Run a new wire from where White wire was on Clarifier to cathode of D50. This supplies a constant 8 Volts to the Clarifier circuit.
6. Remove D30 Varactor and replace with a "Super Diode" for maximum slide.

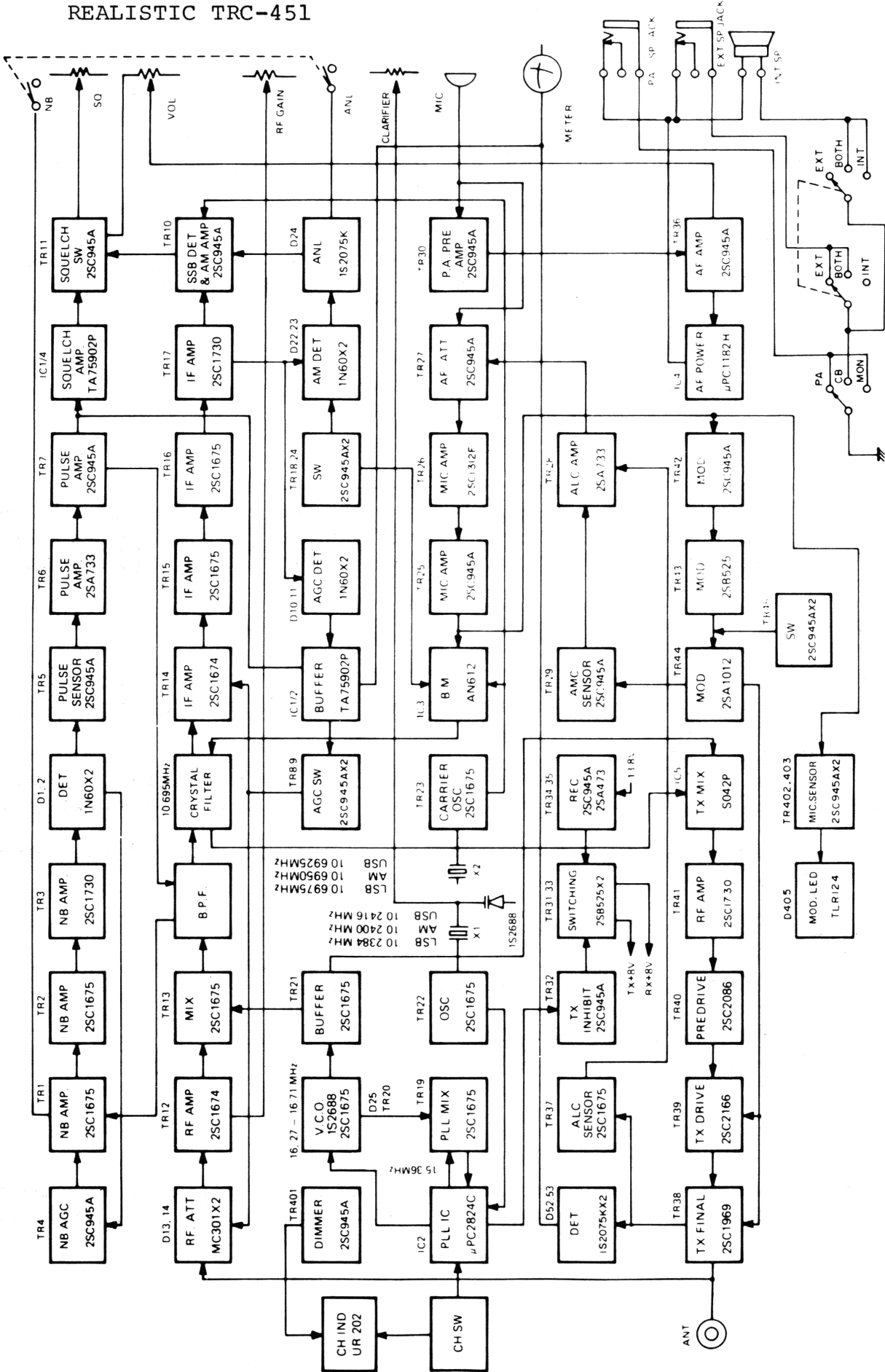
XMTR TUNE-UP:

VR9 Driver Bias 10MA, USB, No Modulation.
VR8 Final Bias 100MA, USB, No Modulation.
VR6 SSB ALC-adjust for max. power.
VR10 AM Power.
VR7 RF Power Meter.
VR5 A.M.C.
VR4 Balance.
Peak L40, L39, L38, L37, L27.

Since this chassis is very popular, we are including a Block Diagram and a description of how the circuit operates on the following pages.

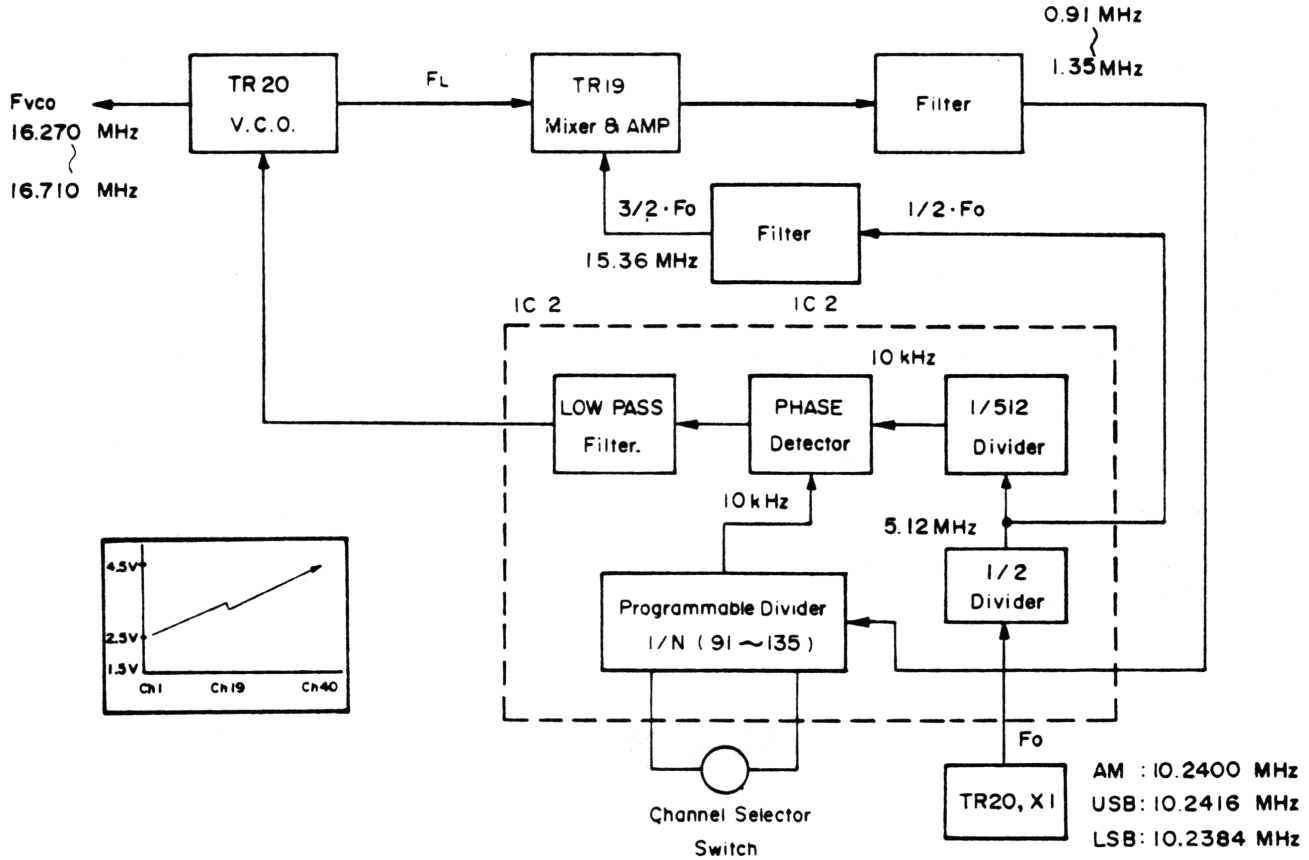
BLOCK DIAGRAM

REALISTIC TRC-451



CIRCUIT OPERATION

The Phase Locked Loop consists of 6 Major Components; Voltage Controlled Oscillator, 1/N Divider, Reference Oscillator, 1/1024 Divider, Phase Detector and Low Pass Filter.



The VCO is an Oscillator whose oscillation frequency varies in accordance with input voltage changes. 1/N Divider is a programmable Divider; the "N" is varied by the Channel Selector Switch. A portion of the VCO output is mixed with a signal from TR22 by TR19, "In-Loop mixer". It is used to shift the VCO frequency. TR22, "In-Loop Local Oscillator", generates 10.24 MHz frequency (AM: 10.2400 MHz, USB: 10.2416 MHz and LSB: 10.2384 MHz). This 10.24 MHz signal is fed to TR19, Mixer, passing through the 1/2 Divider and Filter. VCO frequency is down mixed with a signal from Tripler providing 0.91 MHz through 1.35 MHz (see frequency table). The signal is fed to the 1/N Divider through the Filter. The Filter eliminates harmonics. 1/N Divider produces the 10 kHz frequency and it is fed to the Phase Detector.

Meanwhile, the 10.24 MHz frequency generated by X1, is changed to 10 kHz by 1/1024 Divider and is fed to another input of the Phase Detector. Thus the Phase Detector receives two signals (both 10kHz).

It compares the phase difference of the two and generates an error voltage which acts on the VCO to bring the two frequencies exactly in phase. When this condition occurs, the PLL circuit is "Locked". A Low Pass Filter is used to change the AC signal to DC.

Then the VCO output is up-mixed with Local Oscillator frequency (X2 and TR23) and the resulting 27 MHz frequencies are transmitted.

By Varying the constant N, the output frequency from the VCO can be varied in 10 kHz steps. The Constant N is controlled by the Channel Selector Switch. A frequency shift of 2.5 kHz (required for AM, USB and LSB) is obtained by switching Diodes D29 (LSB), D28 (USB) and D27 (AM).

TR23 is a carrier oscillator which generates 10.6925 MHz, 10.6975 MHz or 10.6950 MHz.

In USB mode, X2 functions by D35 switching; so TR23 oscillates on 10.6925 MHz.

In LSB mode, X2 functions by D36 switching and TR 23 oscillates on 10.6975 MHz.

In AM mode, when the unit is in transmitting, X2 functions by D34 switching and also TR21 oscillates on 10.6950 MHz.

Therefore TR23 oscillates on 10.6950 MHz when receiving on AM modes.

The carrier output goes to the receiver circuit for demodulation of SSB signal or goes to transmitter circuit for modulation.

NOTES