

Function of RF Semiconductors & Other Active Devices

Schematic Key	Designator Non/Motorola	Device	Circuit Type	Application	Source
U101	X974		SW-391	Antenna Switch	MaCom
U801	57W78		RF IC	ULTZIF	Motorola
U901	14S84		HC11E09MicroProcessor	Motorola	
U1101	LP2986		DC Regulator	DC Voltage	National
U301	Gaicho		RF IC	LNA/PA	Motorola
Q601	NE68530		NPN	VCO	NEC

COMMENTS: The Motorola designators are special code numbers for active devices used in Motorola radios. These devices are either identical or derived from the device family listed under Source, by the manufacturer or are proprietary to Motorola. Service people do not have access to any cross-references or given any information on proprietary devices and are prevented from making unauthorized substitutions.

TUNE UP PROCEDURE

The following tune-up procedure is for the factory only. There will be no customer tuning.

Reference Oscillator Warp

This application is used to tune the uPCLK line output to as close as possible to 8.4 MHz.

1. Assume that radio is ON and operates in test mode at the default frequency.
2. Send a serial command Read_data_REQ to read the ULTZIF's byte 0 from the radio codeplug.
3. Modify bit 4 to 7 of that byte to {1110} to set the uPCLK Div ratio to 2 (assume that the radio uses 16.8Mhz crystal).
4. Send a WRITE_DATA_REQ command to radio to change the ULTZIF's byte 0 of the radio codeplug to the value in step 3, and the ULTZIF's byte 1 to all 0's.
5. Measure the frequency of the signal clock on the uPCLK test point via the antenna port on HP8920B.
6. If the frequency is greater than 8.4 MHz, initialize a byte data x to 0, and repeatedly set byte 7 to bit 0 of that byte to 1. For each bit, send a WRITE_DATA-REQ command to change the ULTZIF's byte 1 on the codeplug to the value x and measure the uPCLK. If the frequency is less 8,400,000 Hz, reset that bit to 0 before setting the next bit. If the frequency is equal to 8.4 MHz, go to step 7.
7. Calculate the frequency error.

VCO Tune

This application is used to tune The LO VCO tank circuit for each channel to insure that the assigned frequency will be in the middle of the operating frequency range of the VCO at which the VCO control voltage is in between 1 to 2 volts.

1. Assume that radio is ON.
2. Send a serial command READ-DATA-REQ to read the ULTZIF's byte 7 of the radio codeplug.
3. Binary And that byte with the hexadecimal byte "F8" to zero out the least significant three bits (bit 59 to bit 60 on the ULTZIF image).
4. Set the radio to receive at a given channel.
5. Measure the VCO control Voltage.
6. If the voltage reading is below 1 or greater than 2, change the setting of the three bits from step 3 from "000" to "111" until the reading is between 1 and 2.