

CONFIDENTIALITY REQUESTED**Function of RF Semiconductors & Other Active Devices**

Part Number	Reference Designator	Application	Description
4802233J09	D3758, D3757	Charge pump diode	ROHM, IMN10T108 DIODE TRIPLE
4802245J92	D3258	Receiver Mixer	QUAD CROSSOVER RING MI
4802482J02	D3701, D3702, D3704, D3705	Antenna switch	M/A-Com MA4P959 PIN DIODE SMD
4804188K01	Q3401, Q3252, Q3252	Amplifier LNA	NEC, TSTR NPN RF NE85634
4805218N63	Q3000	Second RX VCO	RF TRANS SOT 323 BFQ67
4805656W28	D3001	Sample Clock Varactor	DIODE VARACTOR 18PF@1V
4805656W39	VR0411	ESD Suppressor	QUAD ESD SUPPRESSOR AR
4808115L17	D3255	RX Protection Diode	TEKELEK, PIN DIODE
4808115L23	D3254, D3252, D3253, D3254	RX mode Switching	SkyWorks, SMP1322-079, PIN Diode
4809527E41	Q3757, Q3758, Q3759, Q3760, Q3761, Q3769	Prescalar buffer amplifier	Infineon, IRF949TE6700 Transistor
4809579E16	Q0954	Power control	Vishay, TN0200T-T1 N-channel MOSFET
4809877C13	D3000	Second VCO Varactor	DIODE VARACTOR ISV305
4813824A17	Q3756	Charge pump amplifier	On Semiconductor MMBT3904LT1 Transistor
4813825A19	D3256	Power limiting Diode	TEKELEK, DIODE SCHOTTKY BARRIER
4813828C45	Q3550	RFPA	SPS, MRF1550TSTR, VHF 50W 12.5 VOLT
4813833B24	D3400	Power limiting Diode	On-Semi, DIODE SCHOTTKY DL SERI
4813833C02	D0950, D0951,	Power control	ON Semiconductor MMBD6100LT1 diode

	D0952, D3750, D3751		
4885844C01	Q0952	Power control	Vishay, P-channel MOSFET
5185143E07	Y3750	16.8 MHz reference oscillator	Toyocom, ISD4-2A-5624
5185143E16	U0953	Power control	Analog Devices AD7812 analog to digital converter
5185353D35	U0952, D0202	Power control	Maxim MAX5452 digital potentiometer
5185794L01	U0204	AUDIO AMPIFIER	Philips, EDA1519C
5185956E24	U0956	Power control	National Semiconductor LM6484 operational amplifier
5185963A15	U3560	TEMPERTURE SENSOR	National Semiconductor LM50C
5185963A27	U3751	Frequency synthesizer	Atmel, AT25016-0T2T
4804188K01	Q3252, Q3255, Q3401	Low Noise Amplifier	CALIFORNIA EASTERN LABORATORIES NE85634-T1-RE
4880048M03	Q3768	Buffer	Rohm DTC144EETL
4886212B01	Q3530	Controlled stage amplifier	MOTOROLA SPS MRF1518T1
4804188K14	Q3762	VCO Buffer	CALIFORNIA EASTERN LABORATORIES NE46134
5185963A85	U3000	IF Digitizing Subsystem	Analog Devices, AD9874 IC-ABACUS III-LP

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 substitution.

TUNE- UP PROCEDURE

Setup Procedures

1. Connect radio to the computer using programming cable.
2. Connect radio antenna port to Modulation Analyzer.
3. Power up radio and all equipment.
4. Launch the XTL 5000 radio tuner software and click on the “read device” icon. A window will open with a list of the various parameters that may be tuned on this radio. Double click on the parameter to be tuned and follow the instructions below.

Transmitter Alignment Procedure

PA Bias 1

1. Set power supply voltage and current limit.
2. Enter PA Bias 1 alignment screen. When screen is entered, radio enters special bias tune mode and radio current increases by approximately 100 mA.
3. Read baseline current from current meter on power supply.
4. Add baseline current to device bias current to calculate target current.
5. Left-click the Bias Toggle button to apply bias to gate of device.
6. Adjust softpot value until target current is achieved.
7. Left-click the Bias Toggle button to remove bias from gate of device.
8. Left-click the Program All button to save tuned value.
9. Left-click Close button to close the screen and return to the Transmitter Alignment menu.

PA Bias 2

1. Set power supply voltage and current limit.
2. Enter PA Bias 2 alignment screen. When screen is entered, radio enters special bias tune mode and radio current increases by approximately 100 mA.
3. Read baseline current from current meter on power supply.
4. Add baseline current to device bias current to calculate target current.
5. Left-click the Bias Toggle button to apply bias to gate of device.
6. Adjust softpot value until target current is achieved.
7. Left-click the Bias Toggle button to remove bias from gate of device.
8. Left-click the Program All button to save tuned value.
9. Left-click Close button to close the screen and return to the Transmitter Alignment menu.

Reference Oscillator

1. Enter Reference Oscillator alignment screen.
2. For R-2670 analyzer, enter test frequency displayed in "RF control" section and under "Meter" section choose RF DISPLAY.
3. Left-click PTT Toggle button to transmit at indicated frequency.
4. Wait five seconds so that analyzer stabilizes and then adjust softpot value to obtain frequency as close as possible to indicated frequency.
5. Left-click the PTT Toggle button to disable transmit mode.
6. Left-click the Program All button to save tuned value.
7. Left-click Close button to close the screen and return to the Transmitter Alignment menu.

Power Detection Calibration

1. Set power supply voltage and current limit.
2. Enter Power Detection Calibration alignment screen.
3. Left-click the PTT Toggle button to transmit at indicated frequency.
4. Adjust softpot value until target power is achieved.
5. Left-click the PTT Toggle button to disable transmit mode.
6. Left-click the Program All button to save tuned value.
7. Left-click Close button to close the screen and return to the Transmitter Alignment menu.

Tx Power Characterization

1. Set power supply voltage and current limit.
2. Enter Tx Power Characterization alignment screen.
3. Left-click in upper left box under Measured Power 1. Green circle will appear to the left of box indicating active characterization point.
4. Left-click the PTT Toggle button to transmit at indicated frequency and record power measurement with 0.1 W resolution.
5. Left-click the PTT Toggle button to disable transmit mode.
6. Enter power measurement with 0.1 W resolution overwriting any value that may reside in the box from previous tuning.
7. Left-click in upper left box under Measured Power 2. Green circle will appear to the left of box indicating active characterization point.
8. Repeat 4-6.
9. Repeat 3-8 for all frequencies (rows) indicated.
10. Left-click the Program All button to save tuned value.
11. Left-click Close button to close the screen and return to the Transmitter Alignment menu.

Tx Current Limit

1. Set power supply voltage and current limit.
2. Enter Tx Current Limit alignment screen.
3. Adjust any one of the softpots to maximum (255) and left-click Program All button. This disables current limiting.
4. Left-click in first (top) frequency softpot box.
5. Left-click the PTT Toggle button to transmit and record radio transmit current. Radio will transmit at high power level indicated by CPS.
6. Left-click the PTT Toggle button to disable transmit mode.
7. Repeat 4-6 for all test frequencies.
8. Left-click in softpot box for test frequency with highest current.
9. Left-click PTT Toggle button and adjust the softpot until transmit power drops 5%.
10. Add required offset to softpot value and left-click PTT Toggle button to disable transmit mode.
11. Left-click Program All to save tuned value.
12. Left-click Close button to close the screen and return to the Transmitter Alignment menu.

Tx Deviation Balance

1. Enter Tx Deviation Balance alignment screen.
2. Left-click PTT Tone Low button.
3. Left-click in first (top) test frequency softpot box.
4. Left-click the PTT Toggle button to transmit and wait 5 seconds so that voltage on R-2670 or deviation shown on 8901 series analyzer stabilizes.
5. Measure and record the ac voltage value from the R-2670 analyzer or deviation value from 8901 series analyzer.
6. Left-click PTT Tone High button.
7. Adjust the softpot value until measured deviation/voltage is within +/- 1.5% of the value recorded for low tone.
8. Left-click PTT Toggle button to disable transmit mode.
9. Repeat 2-8 for all test frequencies indicated.
10. Left-click Program All to save tuned value.
11. Left-click Close button to close the screen and return to the Transmitter Alignment menu.

Tx Deviation Limit

1. Enter Tx Deviation Limit alignment screen.
2. Left-click in first (top) test frequency softpot box.
3. Left-click the PTT Toggle button to transmit and wait 5 seconds so that deviation/voltage displayed on analyzer stabilizes.
4. Adjust softpot deviation limit to within 0.158-0.163 Vac (2.785-2.885 kHz) on R-2670.
5. Left-click PTT Toggle button to disable transmit mode.
6. Repeat 2-5 for all test frequencies indicated.
7. Left-click Program All to save tuned value.
8. Left-click Close button to close the screen and return to the Transmitter Alignment menu.