

Prepared (also subject responsible if other) EAB/RWG/RB Larry Lindström		No. B5KAROJ1192233-1		
Approved KI/EAB/RWG/RB (L Lindström)	Checked	Date 2003-12-12	Rev A	Reference

Exhibit 10 – Components, Tune Up

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1 2.1033 (c) (10) Function of Active Circuit Devices

1.1 Transceiver TRXB WCDMA ROJ 119 2233/1

1.1.1 Printed Board ROJ 119 2233/1

Product
ROJ 119 2233/1
Revision G

Pos	Prod name/Func des	Product number
D1	OSCILLATOR/SPXO 19.44MHz +-30ppm 0 to +70	RTL 201 629/24
D2	ASIC DBC	ROP 101 1175/1
D3	MICROCIRCUIT/74'162245 LVTH TSSOP48 16x BUS	RYT 329 6002/3C
D4	MICROCIRCUIT/74'162245 LVTH TSSOP48 16x BUS	RYT 329 6002/3C
D5	MICROCIRCUIT/FLASH TB 2M16 90NS 3.3V I	RYT 118 6152/6
D6	MICROCIRCUIT/FLASH TB 2M16 90NS 3.3V I	RYT 118 6152/6
D7	MICROCIRCUIT/SDRAM CL=3 8M16 125M 3.3V C	RYT 119 6130/1
D8	MICROCIRCUIT/SDRAM CL=3 8M16 125M 3.3V C	RYT 119 6130/1
D10	MICROCIRCUIT/74'08 LVC TSSOP14 Nor gate, qu	RYT 331 0008/3C
D11	MICROCIRCUIT/FLASH TB 2M16 90NS 3.3V I	RYT 118 6152/6
D12	MICROCIRCUIT/FLASH TB 2M16 90NS 3.3V I	RYT 118 6152/6
D13	MICROCIRCUIT/74'08 LVC,Z1G SSOP5-P-A 1x 2-I	RYT 326 6008/42C
D1201	MICROCIRCUIT/LVDS SERIALIZER 10-BIT SSOP28	RYT 109 6143/C
D1202	MICROCIRCUIT/BLVDS CLK BUFFER/TRANSC 1:6 TS	RYT 109 6191/C
D1203	MICROCIRCUIT/LVDS QUAD LINE RECEIVER SOP16/	RYT 109 127/5C
D1204	MICROCIRCUIT/LVDS SERIALIZER 10-BIT SSOP28	RYT 109 6143/C
D1205	MICROCIRCUIT/LVDS QUAD LINE RECEIVER SOP16/	RYT 109 127/5C
D1206	MICROCIRCUIT/LVDS QUAD LINE RECEIVER SOP16/	RYT 109 127/5C
D1207	MICROCIRCUIT/74'244 LVC SSOP20 8x BUFFER NO	RYT 331 0244/C
D1300	ASIC SURVEYOR_2, TRX-DIG	ROP 101 25/2
D1301	MICROCIRCUIT/74'244 LVC SSOP20 8x BUFFER NO	RYT 331 0244/C
D1303	MICROCIRCUIT/ECL 100LVELT23 TSSOP8 TRANSLAT	RYT 407 6008/C
D1304	MICROCIRCUIT/ECL 100LVELT23 TSSOP8 TRANSLAT	RYT 407 6008/C
D1305	MICROCIRCUIT/74'32374 ALVCH LFBGA96 32xD FF	RYT 331 6017/C
D1307	MICROCIRCUIT/ECL 100LVELT23 TSSOP8 TRANSLAT	RYT 407 6008/C
D1308	MICROCIRCUIT/74'04 Z1G SSOP5-P-A 1x INVERTE	RYT 326 6004/42C
D1309	MICROCIRCUIT/74'74 LVT TSSOP14 2xD FLIP-FLO	RYT 329 0074/C
D1310	MICROCIRCUIT/ECL 100LVELT23 TSSOP8 TRANSLAT	RYT 407 6008/C
D1313	MICROCIRCUIT/74'244 LVC SSOP20 8x BUFFER NO	RYT 331 0244/C
D1315	MICROCIRCUIT/ECL 100LVELT23 TSSOP8 TRANSLAT	RYT 407 6008/C
D1316	MICROCIRCUIT/10-bit serial AD conv. 0.5LSB	RYT 120 6070/1
D1317	MICROCIRCUIT/10-bit serial AD conv. 0.5LSB	RYT 120 6070/1

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D2602	FILTER/1960MHz 60MHz BP 10x13.5mm	RTN 202 814/02
D2603	MICROCIRCUIT/OPAMP x2 3.6-16V 1.40MHz	RYT 101 6043/2C
D2604	FILTER/1946.5MHz 35MHz BP 10x12mm (WC	RTN 202 1007/02
D2605	FILTER/1973.5MHz 35MHz BP 10x10mm	RTN 202 1008/02
D2702	FILTER/1960MHz 60MHz BP 10x13.5mm	RTN 202 814/02
D2704	FILTER/1946.5MHz 35MHz BP 10x12mm (WC	RTN 202 1007/02
D2705	FILTER/1973.5MHz 35MHz BP 10x10mm	RTN 202 1008/02
D2706	MICROCIRCUIT/OPAMP x2 3.6-16V 1.40MHz	RYT 101 6043/2C
D3130	FILTER/1880MHz 60MHz BP 10x10mm (WCDM	RTN 202 1006/02
D3230	FILTER/1880MHz 60MHz BP 10x10mm (WCDM	RTN 202 1006/02
D3301	FILTER/208MHz 4.2MHz BP 9x5mm SAW	RTN 201 402/02
D3302	FILTER/208MHz 4.2MHz BP 9x5mm SAW	RTN 201 402/02
D3303	ASIC KIRKE2	ROP 101 10/2
D5021	MICROCIRCUIT/PWM CMOS	RYT 113 479/C
D5051	MICROCIRCUIT/REG SW DUAL.CONTR 3V-7V +/-1%	RYT 113 6225/2
D6100	MICROCIRCUIT/PLL BGA64 1:5 PLL Clock Synchr	RYT 102 050/C
D6101	MICROCIRCUIT/74'08 LVC,Z1G SSOP5-P-A 1x 2-I	RYT 326 6008/42C
D6102	OSCILLATOR/61.44MHz VCXO	RTL 202 631/02
D6200	MICROCIRCUIT/74HC04	RYT 306 2007/C
D6207	MICROCIRCUIT/74'08 LVC,Z1G SSOP5-P-A 1x 2-I	RYT 326 6008/42C
D6296	OSCILLATOR/10 MHz VCXO,SMD	RTL 202 631/01
D6298	MICROCIRCUIT/RF PLL Frequency Synthesizer	RYT 102 240/C
D6299	MICROCIRCUIT/74'08 LVC,Z1G SSOP5-P-A 1x 2-I	RYT 326 6008/42C
D6302	MICROCIRCUIT/161.92 MHz	RYT 901 6199/2
D6303	MICROCIRCUIT/SI-MMIC-AMPLIFIER, SMD (PLAST)	RYT 101 274/17C
D6360	MICROCIRCUIT/74'08 LVC,Z1G SSOP5-P-A 1x 2-I	RYT 326 6008/42C
D6400	MICROCIRCUIT/SI-MMIC-AMPLIFIER, SMD (PLAST)	RYT 101 274/17C
D6401	MICROCIRCUIT/272.64 MHz	RYT 902 6033/2
D6402	MICROCIRCUIT/SI-MMIC-AMPLIFIER, SMD (PLAST)	RYT 101 274/17C
D6460	MICROCIRCUIT/74'08 LVC,Z1G SSOP5-P-A 1x 2-I	RYT 326 6008/42C
D6501	MICROCIRCUIT/74'08 LVC,Z1G SSOP5-P-A 1x 2-I	RYT 326 6008/42C
D6601	MICROCIRCUIT/74'08 LVC,Z1G SSOP5-P-A 1x 2-I	RYT 326 6008/42C
H1	LED pure green 3-10mcd(10mA)	RKZ 433 25/4
H2	LED yellow 6-20mcd(10mA) sidel	RKZ 433 25/2
H3	LED super-red 6-20mcd(10mA) S	RKZ 433 25/3
N1	MICROCIRCUIT/SUP.V 3.08V +/-2.3% L/HI RESET	RYT 113 6065/7
N500	MICROCIRCUIT/Thermal Watchdog 2-Wire,see 13	RYT 124 6018/2
N621	MICROCIRCUIT/OPAMP R/R 1.8-23V standard	RYT 101 130/2C
N2000	MICROCIRCUIT/12-Bit 165Msps TxDAC	RYT 120 102/1
N2001	MICROCIRCUIT/REG LIN+ 3.3V 150mA 0.165V	RYT 113 6156/6
N2002	MICROCIRCUIT/REG LIN+ 3.3V 150mA 0.165V	RYT 113 6156/6
N2100	MICROCIRCUIT/12-Bit 165Msps TxDAC	RYT 120 102/1
N2300	MICROCIRCUIT/AH1-1, selekterad AH1	RYT 101 6898/2
N2301	ASIC GUTE	ROP 101 1147/1
N2302	ASIC GRAIP	ROP 101 1148/2

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N2350	MICROCIRCUIT/AH1-1, selekterad AH1	RYT 101 6898/2
N2351	ASIC GUTE	ROP 101 1147/1
N2352	ASIC GRAIP	ROP 101 1148/2
N2600	DIRECTION COUPLER/1960MHz 19dB coupler	UND 106 084/1
N2601	MICROCIRCUIT/AH1-1, selekterad AH1	RYT 101 6898/2
N2602	MICROCIRCUIT/RF Amplifier LNA p-1=18dBm	RYT 101 6503/1
N2604	MICROCIRCUIT/DS1620 DIG TERM 2.7-5.5V	RYT 124 004/2C
N2605	MICROCIRCUIT/AD8313	RYT 101 6976/1
N2606	TRANSISTOR/P CHAN,FET,1.8V,1.25W,SOT-23	RYN 122 630/1
N2607	TRANSISTOR/P CHAN,FET,1.8V,1.25W,SOT-23	RYN 122 630/1
N2608	MICROCIRCUIT/SW-395	RYT 101 6464/1
N2609	MICROCIRCUIT/SW-395	RYT 101 6464/1
N2610	MICROCIRCUIT/RF Amplifier LNA p-1=18dBm	RYT 101 6503/1
N2611	TRANSISTOR/NPN SS 45V 100mA SOT23 hFE200-	RYN 121 37/1
N2612	TRANSISTOR/NPN SS 45V 100mA SOT23 hFE200-	RYN 121 37/1
N2700	DIRECTION COUPLER/1960MHz 19dB coupler	UND 106 084/1
N2701	MICROCIRCUIT/AH1-1, selekterad AH1	RYT 101 6898/2
N2702	MICROCIRCUIT/RF Amplifier LNA p-1=18dBm	RYT 101 6503/1
N2703	TRANSISTOR/P CHAN,FET,1.8V,1.25W,SOT-23	RYN 122 630/1
N2704	TRANSISTOR/P CHAN,FET,1.8V,1.25W,SOT-23	RYN 122 630/1
N2705	MICROCIRCUIT/AD8313	RYT 101 6976/1
N2706	MICROCIRCUIT/SW-395	RYT 101 6464/1
N2707	MICROCIRCUIT/SW-395	RYT 101 6464/1
N2708	MICROCIRCUIT/RF Amplifier LNA p-1=18dBm	RYT 101 6503/1
N2710	TRANSISTOR/NPN SS 45V 100mA SOT23 hFE200-	RYN 121 37/1
N2711	TRANSISTOR/NPN SS 45V 100mA SOT23 hFE200-	RYN 121 37/1
N3010	MICROCIRCUIT/Attenuator DC-3GHz 3bit 1dB LS	RYT 115 6043/1
N3012	MICROCIRCUIT/Downconversion Mixer 2GHz	RYT 102 6120/1
N3020	MICROCIRCUIT/Attenuator DC-3GHz 3bit 1dB LS	RYT 115 6043/1
N3022	MICROCIRCUIT/Downconversion Mixer 2GHz	RYT 102 6120/1
N3310	MICROCIRCUIT/DS1620 DIG TERM 2.7-5.5V	RYT 124 004/2C
N3601	MICROCIRCUIT/A/D CONV 14-BIT 65MSPS	RYT 120 104/1
N3650	MICROCIRCUIT/A/D CONV 14-BIT 65MSPS	RYT 120 104/1
N5021	MICROCIRCUIT/SUP.V 4.63V L/NIN RESET	RYT 113 6166/4
N5022	MICROCIRCUIT/SUP.V 4.63V L/NIN RESET	RYT 113 6166/4
N6250	MICROCIRCUIT/REG LIN+ 3.3V 150mA 0.165V	RYT 113 6156/6
N6300	MICROCIRCUIT/REG LIN+ 4.20V 150mA 0.165V	RYT 113 6156/3
N6305	MICROCIRCUIT/REG LIN+ 3.3V 150mA 0.165V	RYT 113 6156/6
N6400	DIRECTION COUPLER/273MHz 3dB	UND 106 086/1
N6401	MICROCIRCUIT/REG LIN+ 4.20V 150mA 0.165V	RYT 113 6156/3
N6499	MICROCIRCUIT/REG LIN+ 3.3V 150mA 0.165V	RYT 113 6156/6
N6500	MICROCIRCUIT/1672 MHz RF-synth.	RYT 902 6031/1
N6501	DIRECTION COUPLER/1600MHz 3dB	UND 106 085/1
N6502	MICROCIRCUIT/RF Amplifier. MGA-81563 SOT	RYT 101 6873/1
N6503	MICROCIRCUIT/REG LIN+ 4.20V 150mA 0.165V	RYT 113 6156/3

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N6505	MICROCIRCUIT/RF Amplifier. MGA-81563 SOT	RYT 101 6873/1
N6508	MICROCIRCUIT/REG LIN+ 3.3V 150mA 0.165V	RYT 113 6156/6
N6600	MICROCIRCUIT/1672 MHz RF-synth.	RYT 902 6031/1
N6601	DIRECTION COUPLER/1600MHz 3dB	UND 106 085/1
N6602	MICROCIRCUIT/RF Amplifier. MGA-81563 SOT	RYT 101 6873/1
N6603	MICROCIRCUIT/REG LIN+ 4.20V 150mA 0.165V	RYT 113 6156/3
N6605	MICROCIRCUIT/RF Amplifier. MGA-81563 SOT	RYT 101 6873/1
N6608	MICROCIRCUIT/REG LIN+ 3.3V 150mA 0.165V	RYT 113 6156/6
T2000	TRANSFORMER/0.4 TO 800 MHZ SMD	REG 735 22/5
T2100	TRANSFORMER/0.4 TO 800 MHZ SMD	REG 735 22/5
T2300	TRANSFORMER/SMD TRANSFORMER 4:1	REG 135 55/1
T2301	TRANSFORMER/SMD TRANSFORMER 4:1	REG 135 55/1
T2302	TRANSFORMER/SMD TRANSFORMER 4:1	REG 135 55/1
T2303	BALUN/1900MHz 3216 200ohm 1W	REG 735 58/16
T2304	BALUN/1700MHz 3216 200ohm 1W	REG 735 58/5
T2350	TRANSFORMER/SMD TRANSFORMER 4:1	REG 135 55/1
T2351	TRANSFORMER/SMD TRANSFORMER 4:1	REG 135 55/1
T2352	TRANSFORMER/SMD TRANSFORMER 4:1	REG 135 55/1
T2353	BALUN/1900MHz 3216 200ohm 1W	REG 735 58/16
T2354	BALUN/1700MHz 3216 200ohm 1W	REG 735 58/5
T3303	TRANSFORMER/SMD TRANSFORMER 4:1	REG 135 55/1
T3304	TRANSFORMER/SMD TRANSFORMER 4:1	REG 135 55/1
T3600	TRANSFORMER/SMD TRANSFORMER 4:1	REG 135 55/1
T3601	TRANSFORMER/SMD TRANSFORMER 4:1	REG 135 55/1
T5021	TRANSFORMER/	REG 232 2305
T5022	TRANSFORMER/	REG 232 2305
V3020	DIODE/SWI x2 70V 200mA SOT23 serial	RKZ 123 03/1
V3030	DIODE/SWI x2 70V 200mA SOT23 serial	RKZ 123 03/1
V3100	TRANSISTOR/RF PHEMT, 450-6000 MHz; ATF-5	RYN 123 1639/1
V3101	TRANSISTOR/PNP SS 45V 100mA SOT23 hFE>250	RYN 120 614/1
V3200	TRANSISTOR/RF PHEMT, 450-6000 MHz; ATF-5	RYN 123 1639/1
V3201	TRANSISTOR/PNP SS 45V 100mA SOT23 hFE>250	RYN 120 614/1
V5001	RECTIFIER/REC 600V 3A SMC	RKZ 123 465/2
V5002	RECTIFIER/REC 600V 3A SMC	RKZ 123 465/2
V5003	TRANSISTOR/NPN SS 45V 100mA SOT23 hFE>250	RYN 121 629/1
V5004	ZENERDIODE/ZEN 5.6V 7% 0.2W SOT23	RKZ 223 01/10
V5005	TRANSISTOR/NPN SS 45V 100mA SOT23 hFE>250	RYN 121 629/1
V5006	TRANSISTOR/NFET 100V 35A D2PAK 45mohm(10V	RYN 123 6010/1
V5021	ZENERDIODE/ZEN 33.0V 6% 0.2W SOT23	RKZ 223 01/28
V5022	TRANSISTOR/NPN SS 65V 100mA SOT23 hFE200-	RYN 121 37/2
V5023	ZENERDIODE/ZEN 15.0V 5% 0.2W SOT23	RKZ 223 01/20
V5024	TRANSISTOR/PNP 80V 1A SOT223 hFE63-160(15	RYN 120 615/1
V5025	TRANSISTOR/PNP SS 300V 100mA SOT23 hFE>25	RYN 120 15/1
V5026	TRANSISTOR/PNP SS 300V 100mA SOT23 hFE>25	RYN 120 15/1
V5027	TRANSISTOR/NFET 200V 1.2A SO8 0.73ohm(10V	RYN 123 6036/1

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V5028	TRANSISTOR/NFET 200V 1.2A SO8 0.73ohm(10V	RYN 123 6036/1
V5029	RECTIFIER/REC SCH x2 30V 2x6A DPAK	RKZ 323 6047/1
V5030	RECTIFIER/REC SCH 25V 2A SMB	RKZ 323 6038/1
V5031	RECTIFIER/REC SCH x2 30V 2x6A DPAK	RKZ 323 6047/1
V5032	RECTIFIER/REC SCH x2 30V 2x6A DPAK	RKZ 323 6047/1
V5034	TRANSISTOR/NPN SS 45V 100mA SOT23 hFE200-	RYN 121 37/1
V5035	TRANSISTOR/PFET 8V 8A TSSOP8 27mohm(1.8V)	RYN 122 676/1
V5036	DIODE/SWI x2 70V 200mA SOT23 serial	RKZ 123 03/1
V5053	RECTIFIER/REC SCH 25V 2A SMB	RKZ 323 6038/1
V5054	TRANSISTOR/NFET 30V 14A SO8 10mohm(4.5V)	RYN 123 6012/1
V5055	TRANSISTOR/NFET 30V 14A SO8 10mohm(4.5V)	RYN 123 6012/1
V5056	DIODE/SWI SCH 20V 500mA SOD123 0.39V	RKZ 323 6011/1
V5057	DIODE/SWI SCH 20V 500mA SOD123 0.39V	RKZ 323 6011/1
V5058	TRANSISTOR/NFET 30V 14A SO8 10mohm(4.5V)	RYN 123 6012/1
V5059	TRANSISTOR/NFET 30V 14A SO8 10mohm(4.5V)	RYN 123 6012/1
V5060	TRANSISTOR/NPN SS 45V 100mA SOT23 hFE200-	RYN 121 37/1
V5061	TRANSISTOR/NPN SS 45V 100mA SOT23 hFE200-	RYN 121 37/1
V5062	TRANSISTOR/NPN SS 45V 100mA SOT23 hFE200-	RYN 121 37/1
V6500	DIODE/SWI x2 70V 200mA SOT23 serial	RKZ 123 03/1
V6501	DIODE/SWI x2 70V 200mA SOT23 serial	RKZ 123 03/1
V6600	DIODE/SWI x2 70V 200mA SOT23 serial	RKZ 123 03/1
V6601	DIODE/SWI x2 70V 200mA SOT23 serial	RKZ 123 03/1
V6700	DIODE/SWI SCH x2 70V 70mA SOT23 com.	RKZ 323 08/1
V6800	DIODE/SWI SCH x2 70V 70mA SOT23 com.	RKZ 323 08/1

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2 2.1033(c)(9) Tune-Up Procedure

All the necessary adjustments will be set in the factory, and no adjustments are needed. The maximum output power level is remotely controlled by the Base Station Controller (BSC). If the TRXB is not able to maintain the requirements for power output, frequency stability, etc an alarm is sent to the BSC. On severe faults the TRXB will disable transmission.

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3 2.1033(c)(9,10) Power Tune-Up – Power Limiting

The TRXB measures the output power at its output connector via a RF-detector and the detected value is used by the power loop control block to steer the variable gain amplifiers in the exciter amplifier. The dynamic power control included in the WCDMA system is controlled by the exciter amplifier in the TRXB.

The TRXB frequency chain is as follows:

The TRXB have two stabilizing clock circuits, one 10 MHz VCXO and one 61.44 MHz VCXO. Both these clocks are phase-locked to a incoming 30.72 MHz clock reference.

The 61.44 MHz clock is fed to the Digital to Analog Converter in the transmit chain and to the Analog to Digital Converter in the receive chain. The base band signal fed to the Digital to Analog Converter is digitally QPSK IQ-modulated. The output from the Digital to Analog Converter have a frequency of 15.36 MHz. This signal is mixed with a 272.64 MHz signal from the Transmit Intermediate Local Oscillator (PLL) to 288 MHz. The Transmit Intermediate Local Oscillator is phase-locked to the 10 MHz signal from the VCXO above.

The 288 MHz signal is then mixed with a signal of 1644.5 to 1699.5 MHz from one of two Local Oscillators to 1932.5 to 1987.5 MHz. The Local Oscillators are phase-locked to the same 10 MHz signal from the VCXO above. (In this case is the output frequency locked to the range 1932.5 to 1967.5 MHz – LO frequency of 1644.5 to 1679.5 MHz).

The 30.72 MHz clock reference is generated in a voltage controlled oscillator placed in the Timing Unit Board (TUB). This clock is phase-locked to a 8 kHz oscillator also placed in the TUB. This oscillator is in turn locked to the extracted frame-sync of 8 kHz from the Exchange TerMinal board (ETM). The ETM is connected to the incoming PCM-link, where the frame-sync from the PCM is extracted. As an option can the TUB be directly connected to external PCM-links or a 10 MHz source.