SINGLE-LEVEL BILL OF MATERIALS REPORT

WITHOUT PHANTOM BLOW THROUGH

BILL	REVISION	TYPE	U/M	DESCRIPTION
5A628	B0 (CURRENT)	STANDARD	EACH	PCA,SPI Spoofer

LAST USED: 12/20/01 MAX LOT SIZE: 0
DRAWING: 628

COMPONENT	REV	TYP	QTY/BILL	U/M	DESCRIPTION	FIND#	STEP
0P628			1.00	EACH	PCB,SPI Spoofer, G2N		
1C112-180			2.00	EACH	Cap,cer,5%,NPO,0805,50V,18pF C1,C3		
1C117-107			2.00	EACH	*Cap,tant,20%,10V,D case,100uF C29,C30		
1C143-101			22.00	EACH	Cap,cer,10%,X7R,0805,50V,100pF C23,C24,C42,C43,C44,C45,C46,C47,C48,C49,C50,C51, C53,C54,C55,C56,C58,C60,C61,C62,C63,C67		
1C143-104			38.00	EACH	Cap,cer,10%,X7R,0805,50V,0.1uF C2,C4,C5,C6,C7,C8,C9,C10,C11,C12,C13,C14,C15,C16, C17,C18,C19,C20,C21,C22,C25,C26,C27,C31,C32,C33, C34,C37,C38,C39,C40,C41,C52,C57,C59,C64,C65,C66		
1C483-106			1.00	EACH	Cap,elec,SMT,50V,10uF,6.3x5.4 C28		
1C509-336			2.00	EACH	Cap,tant,20%,35V,D case,33uF,L C35,C36		
1D145-DL4001			1.00	EACH	Diode,Rectifier,SMT,DL1 case,1 D2		
1D149-140LT3			1.00	EACH	Diode,Schottky Power Rectifier D3		
1D362-G			2.00	EACH	Diode, LED, SMT,Green,2.79x3.2 D4,D5		
1D362-R			2.00	EACH	Diode, LED, SMT,Red,2.79x3.20, D1,D6		
1J120-9M			1.00	EACH	Connector,D sub,9 pin male, Ri P4		
1J136-3M			1.00	EACH	Connector,jack,DC power,3.0mm P3		
1J155-A9S			2.00	EACH	Connector,Header,9 Pins,1x9,.1 P6,P7		
1J222-10C			2.00	EACH	Connector,10 pin header,flat c P1,P2		
1J381-SP15C			1.00	EACH	Connector, Dual port D-Sub, 15 J5		
1J381-SS09C			2.00	EACH	Connector,Dual port D-Sub,09 p J1,J3		
1L137-0S0			2.00	EACH	Inductor,Ferrite bead,SMT,1806 FB1,FB2		
1L627-334			1.00	EACH	Inductor,330 uH,Power,SMT L1		
1Q122-1036AI			1.00	EACH	IC,Microcontroller,Flash,5V,6M U1		
1Q125-26C31TM			2.00	EACH	IC,Differential Line Driver,Qu U11,U12		
1Q125-3232BD			1.00	EACH	IC,RS232 Driver/Receiver,SMT,S U3		
1Q125-65176B			2.00	EACH	IC, Differential Bus Transceiv U7,U10		
1Q127-2597HVM5			1.00	EACH	IC,Regulator,5V,Switching,60V U4		
1Q128-74HC14M			2.00	EACH	IC,CMOS,Hex Inverter,SOIC-14,- U8,U9		
1Q131-EP1K30			1.00	EACH	IC,PLD,TQFP-144 U2		
1Q415-823M			1.00	EACH	IC,Power Supply Monitor w/ Wat U6		
1Q504-1			1.00	EACH	IC,VREG,Low dropout,Dual Outpu U5		
1R104-100			1.00	EACH	Res,5%,SMT,0805,10 ohm R12		
1R104-101			23.00	EACH	Res,5%,SMT,0805,100 ohm R13,R14,R15,R16,R17,R18,R19,R20,R21,R22,R23,R24, R25,R26,R27,R28,R29,R30,R31,R32,R33,R34,R48		
1R104-102			9.00	EACH	Res,5%,SMT,0805,1k R1,R2,R3,R4,R5,R6,R7,R8,R10		
1R104-104			10.00	EACH	Res,5%,SMT,0805,100k R39,R40,R41,R42,R43,R44,R45,R46,R47,R49		

BILL	REVISION	TYPE	U/M	DESCRIPTION
5A628	B0 (CURRENT)	STANDARD	EACH	PCA,SPI Spoofer

COMPONENT	REV	TYP	QTY/BILL	U/M	DESCRIPTION	FIND#	STEP
1R104-471			4.00	EACH	Res,5%,SMT,0805,470 ohm R9,R36,R37,R38		
1R104-472			2.00	EACH	Res,5%,SMT,0805,4.7k R11,R35		
1S134-415			1.00	EACH	Switch,SMT,push,horizontal SW1		
1X232-0R5			1.00	EACH	Fuse,SMT,0.5A,w/holder F1		
1Y210-6.144			1.00	EACH	Crystal,6.144 Mhz,HC-49,50ppm Y1		
5A628-MFG			1.00	EACH	MFG of Assy,SPI Spoofer,G2N		

SINGLE-LEVEL BILL OF MATERIALS REPORT

WITHOUT PHANTOM BLOW THROUGH

BILL	REVISION	TYPE	U/M	DESCRIPTION
5A456	C3 (CURRENT)	STANDARD	EACH	PCA,SPI,G2BT

LAST USED: 01/09/02 MAX LOT SIZE: 0
DRAWING: 456

COMPONENT	REV	TYP	QTY/BILL	U/M	DESCRIPTION	FIND#	STEP
0P456			1.00	EACH	PCB,SPI interface, G2BT		
1C112-101			5.00	EACH	Cap,cer,5%,NPO,0805,50V,100pF C9,C14,C20,C22,C29		
1C112-221			1.00	EACH	Cap,cer,5%,NPO,0805,50V,220,pF C3		
1C119-106			4.00	EACH	Cap,tant,20%,35V,D case,10uF C4,C8,C18,C21		
1C143-103			11.00	EACH	Cap,cer,10%,X7R,0805,50V,0.01u C1,C2,C5,C6,C7,C10,C15,C16,C17,C19,C28		
1C143-104			2.00	EACH	Cap,cer,10%,X7R,0805,50V,0.1uF C24,C25		
1C424-101			5.00	EACH	Cap,4up,100pF,1206,50V,10% C11,C12,C13,C23,C27		
1C573-476			2.00	EACH	Cap,Tant,20%,16V,D case,47uF,L C26,C30		
1D149-BAR74			1.00	EACH	Diode,Hi-Speed,Switching,SOT-2 D1		
1J120-15F			1.00	EACH	Conn,D sub,15P,Fem,Straight,Fr J3		
1J120-15M1			1.00	EACH	Conn,D sub,15P,Male,Straight J2		
1J120-37M			1.00	EACH	Connector,D sub,37 Pin,Male,St J1		
1J155-A10D			1.00	EACH	Connector,header,10 pins,2X5,. J4		
1L137-1206-601			2.00	EACH	Inductor,ferrite bead,SMT,1206 FB2,FB3		
1Q125-65176B			3.00	EACH	IC, Differential Bus Transceiv U3,U4,U5		
1Q126-LM50B1Z			1.00	EACH	IC,Temp sensor,-40 to +125,TO- U8		
1Q127-40401F41			1.00	EACH	IC,Volt Ref,4.1V,SOT23 D2		
1Q132-542ID			1.00	EACH	IC,A/D Converter,8-bit,Serial U1		
1Q368-7064SLI			1.00	EACH	IC,Programmable Logic Device,P U2		
1Q415-33064D-5			1.00	EACH	IC, Undervoltage Sensing,SO-8, U7		
1R104-000			4.00	EACH	Res,jumper,SMT,0805,0 ohm R8,R9,R10,R11		
1R104-100			3.00	EACH	Res,5%,SMT,0805,10 ohm R16,R17,R19		
1R104-102			5.00	EACH	Res,5%,SMT,0805,1k R24,R25,R26,R27,R28		
1R104-103			4.00	EACH	Res,5%,SMT,0805,10k R3,R22,R23,R29		
1R104-222			3.00	EACH	Res,5%,SMT,0805,2.2k R18,R20,R21		
1R108-1001			4.00	EACH	Res,1%,SMT,0805,1.00k R12,R13,R14,R15		
1R108-1330			3.00	EACH	Res,1%,SMT,0805,133 ohm R2,R5,R7		
1R108-1621			3.00	EACH	Res,1%,SMT,0805,1.62k R1,R4,R6		
1R230-103			1.00	EACH	Resistor array,10k X 4,SMT RP1		
5A456-MFG			1.00	EACH	MFG of Assy,SPI		
NP			0.00	EACH	No placement for this referenc FB1,U6		

FUNCTION OF RF SEMICONDUCTORS AND OTHER ACTIVE DEVICES

SCHEMATIC KEY	MOTOROLA PART NUMBER	DEVICE TYPE	CIRCUIT APPLICATION	OPERATING FREQUENCY
		EXCITER MODULE		
INTERCONNECT				
Q3000	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3001	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3002	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3003	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3004	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3005	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3006	4813824A10	MMBT3904	SWITCHING	4.8 MHz
Q3007	4813824A10	MMBT3904	SWITCHING	4.8 MHz
Q3008	4813824A10	MMBT3904	SWITCHING	4.8 MHz
Q3009	4813824A10	MMBT3904	SWITCHING	4.8 MHz
Q3010	4813824A10	MMBT3904	SWITCHING	4.8 MHz
Q3011	4813824A10	MMBT3904	SWITCHING	4.8 MHz
U3000	5113808A20	MC74AC138A	DECODER/DEMUX IC	BASEBAND
U3002	5113808A38	MC74HC244A	LINE DRIVER	BASEBAND
U3006	5185370U01	25C02	EEPROM	BASEBAND
U3007	5184288T01	SN65176BD	TRANSCEIVER	BASEBAND
U3008	5184288T01	SN65176BD	TRANSCEIVER	BASEAND
U3009	5184288T01	SN65176BD	TRANSCEIVER	BASEBAND
VR3000	4813830A15	MMBZ523	5.6 V Zener	DC
TRANLIN IC MODULE/INTERFACE				
CR2800	4813833C10	MMBD6	DIODE	DC
Q2800	4813824A10	MMBT3904	SWITCHING	4.8 MHz
Q2801	4813824A10	MMBT3904	SWITCHING	4.8 MHz
Q2802	4813824A10	MMBT3904	SWITCHING	1.2 MHz
Q2803	4813824A10	MMBT3904	SWITCHING	1.2 MHz
Q2804	4813824A17	MMBT3906	SWITCHING	BASEBAND
Q2805	4813824A17	MMBT3906	SWITCHING	BASEBAND
Q2806	4813824A17	MMBT3906	SWITCHING	BASEBAND
Q2807	4813824A17	MMBT3906	SWITCHING	BASEBAND
U2801	5184288T01	SN65176BC	TRANSCEIVER	4.8 MHz
U2803	5184288T01	SN65176BC	TRANSCEIVER	1.2 MHz
U2802	5113819A05	MC33074	QUAD OP AMP	BASEBAND
U2804	5113805A04	74HC04AD	INVERTER	BASEBAND
U2805	5182384W01	AD1866R	DUAL D/A	BASEBAND
U2900	5182388W01	MAX297	SW CAP LPF FILTER	BASEBAND
U2901	5182388W01	MAX297	SW CAP LPF FILTER	BASEBAND
U2903	5113819A05	MC33074	QUAD OP AMP	BASEBAND
U3600	5182387W01	Custom IC	MODULATOR/ LINEARIZER	214.8 Mhz
U3601	5113818A03	MC33072	DUAL OP AMP	DC
Q3600	4813824A10	MMBT3904	NPN 40V TRANS	DC
Q3601	4813824A17	MMBT3906T	PNP 40V TRANS	DC
Q3602	4813827A11	MMBR5031LT1	AMPLIFIER	107.4 MHz
Q3603	4813827A11	MMBR5031LT1	AMPLIFIER	107.4 MHz
Q3604	4813827A11	MMBR5031LT1	AMPLIFIER	107.4 MHz
Q3605	4813827A11	MMBR5031LT1	AMPLIFIER	107.4 MHz

SCHEMATIC KEY	MOTOROLA PART NUMBER	DEVICE TYPE	CIRCUIT APPLICATION	OPERATING FREQUENCY
EXCITER IC MODULE				
U3500	5105329V87	5191W33	UP/DOWN MIX	928 - 941 MHz
VOLTAGE CONTROLLED OSCILLATOR 3 (LO1-VCO)				
Q3200	4813824A10	MMBT3904	NPN 40V TRANS	DC
CR3200	4813825A01	DUAL VARACTOR	DUAL VARACTOR	DC
CR3201	4882290T01	HSMS-2800-3	DIODE SI HOT CARRIER	214.8 MHz
Q3201	4813823A06	MMBFJ310LT	N CHANNEL JFET	214.8 MHz
Q3202	4813827A03	MMBR901LT1	VCO BUFFER	214.8 MHz
VOLTAGE CONTROLLED OSCILLATOR 1 (LO2-VCO-1)				
Q3300	4813824A10	MMBT39041	NPN 40V TRANS	DC
Q4301	4882347W01	MSA-0386	VCO BUFFER	820 - 834 MHz
U3300	5105279V20	Enterprize	HYBRID VCO	820 - 834 MHz
U3301	5180534P02	SW349	SPST Switch	820 - 834 MHz
U3303	5180534P02	SW349	SPST Switch	820 - 834 MHz
U3302	5113805A04	74HC04AD	HEX INVERTER	BASEBAND
U3304	58805033PO2	ISOLATOR	ISOLATOR	820 - 834 MHz
VOLTAGE CONTROLLED OSCILLATOR 2 (LO2-VCO-2)				
Q4300	4813824A10	MMBT39041	NPN 40V TRANS	DC
Q4301	4882347W01	MSA-0386	VCO BUFFER	820 - 834 MHz
U4300	5105279V20	Enterprize	HYBRID VCO	820 - 834 MHz
U4301	5180534P02	SW349	SPST Switch	820 - 834 MHz
U4303	5180534P02	SW349	SPST Switch	820 - 834 MHz
U4302	5113805A04	74HC04AD	HEX INVERTER	BASEBAND
U4304	58805033PO2	ISOLATOR	ISOLATOR	820 - 834 MHz
RF SWITCH				
U4201	5113805A04	74HC04AD	HEX INVERTER	BASEBAND
U4202	5180534P01	SW277	SPDT Switch	820 - 834 MHz
TRANSMIT FREQUENCY SYNTHESIZER-1 (LO2-SYNTH-1)				
CR3401	4813833C10	MMBD6	DIODE	BASEBAND
CR3402	4813833C10	MMBD6	DIODE	BASEBAND
Q3400	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3401	4813824A17	MMBT3906	SWITCHING	BASEBAND
Q3402	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3403	4813827A03	MMBR901LT1	BUFFER/AMP	820 - 834 MHz
Q3404	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3405	4813824A17	MMBT3906	SWITCHING	BASEBAND
Q3406	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3407	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3408	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3409	4813824A10	MMBT3904	BUFFER/AMP	2.1 MHz
U3400	5184602T03	C42C	SYNTHESIZER IC	820 - 834 MHz
U3401	5113819A08	MC33184DR2	BUFFER AMP	BASEBAND
U3402	5113805A86	MC74HC4066	ANALOG GATING	BASEBAND
TRANSMIT FREQUENCY SYNTHESIZER -2 (LO2-SYNTH-2)				
CR4401	4813833C10	MMBD6	DIODE	BASEBAND
CR4402	4813833C10	MMBD6	DIODE	BASEBAND
Q4400	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q4401	4813824A17	MMBT3906	SWITCHING	BASEBAND
Q4402	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q4403	4813827A03	MMBR901LT1	BUFFER/AMP	820 - 834 MHz
Q4404	4813824A10	MMBT3904	SWITCHING	BASEBAND

SCHEMATIC KEY	MOTOROLA PART NUMBER	DEVICE TYPE	CIRCUIT APPLICATION	OPERATING FREQUENCY
EXCITER IC MODULE				
U3500	5105329V87	5191W33	UP/DOWN MIX	928 - 941 MHz
VOLTAGE CONTROLLED OSCILLATOR 3 (LO1-VCO)				
Q3200	4813824A10	MMBT3904	NPN 40V TRANS	DC
CR3200	4813825A01	DUAL VARACTOR	DUAL VARACTOR	DC
CR3201	4882290T01	HSMS-2800-3	DIODE SI HOT CARRIER	214.8 MHz
Q3201	4813823A06	MMBFJ310LT	N CHANNEL JFET	214.8 MHz
Q3202	4813827A03	MMBR901LT1	VCO BUFFER	214.8 MHz
VOLTAGE CONTROLLED OSCILLATOR 1 (LO2-VCO-1)				
Q3300	4813824A10	MMBT39041	NPN 40V TRANS	DC
Q4301	4882347W01	MSA-0386	VCO BUFFER	820 - 834 MHz
U3300	5105279V20	Enterprize	HYBRID VCO	820 - 834 MHz
U3301	5180534P02	SW349	SPST Switch	820 - 834 MHz
U3303	5180534P02	SW349	SPST Switch	820 - 834 MHz
U3302	5113805A04	74HC04AD	HEX INVERTER	BASEBAND
U3304	58805033PO2	ISOLATOR	ISOLATOR	820 - 834 MHz
VOLTAGE CONTROLLED OSCILLATOR 2 (LO2-VCO-2)				
Q4300	4813824A10	MMBT39041	NPN 40V TRANS	DC
Q4301	4882347W01	MSA-0386	VCO BUFFER	820 - 834 MHz
U4300	5105279V20	Enterprize	HYBRID VCO	820 - 834 MHz
U4301	5180534P02	SW349	SPST Switch	820 - 834 MHz
U4303	5180534P02	SW349	SPST Switch	820 - 834 MHz
U4302	5113805A04	74HC04AD	HEX INVERTER	BASEBAND
U4304	58805033PO2	ISOLATOR	ISOLATOR	820 - 834 MHz
RF SWITCH				
U4201	5113805A04	74HC04AD	HEX INVERTER	BASEBAND
U4202	5180534P01	SW277	SPDT Switch	820 - 834 MHz
TRANSMIT FREQUENCY SYNTHESIZER-1 (LO2-SYNTH-1)				
CR3401	4813833C10	MMBD6	DIODE	BASEBAND
CR3402	4813833C10	MMBD6	DIODE	BASEBAND
Q3400	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3401	4813824A17	MMBT3906	SWITCHING	BASEBAND
Q3402	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3403	4813827A03	MMBR901LT1	BUFFER/AMP	820 - 834 MHz
Q3404	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3405	4813824A17	MMBT3906	SWITCHING	BASEBAND
Q3406	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3407	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3408	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q3409	4813824A10	MMBT3904	BUFFER/AMP	2.1 MHz
U3400	5184602T03	C42C	SYNTHESIZER IC	820 - 834 MHz
U3401	5113819A08	MC33184DR2	BUFFER AMP	BASEBAND
U3402	5113805A86	MC74HC4066	ANALOG GATING	BASEBAND
TRANSMIT FREQUENCY SYNTHESIZER -2 (LO2-SYNTH-2)				
CR4401	4813833C10	MMBD6	DIODE	BASEBAND
CR4402	4813833C10	MMBD6	DIODE	BASEBAND
Q4400	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q4401	4813824A17	MMBT3906	SWITCHING	BASEBAND
Q4402	4813824A10	MMBT3904	SWITCHING	BASEBAND
Q4403	4813827A03	MMBR901LT1	BUFFER/AMP	820 - 834 MHz
Q4404	4813824A10	MMBT3904	SWITCHING	BASEBAND

SCHEMATIC KEY	MOTOROLA PART NUMBER	DEVICE TYPE	CIRCUIT APPLICATION	OPERATING FREQUENCY
POWER AMPLIFIER: DRIVER - PTLF4002C				
Q1	4813828A01	MRF897	AMPLIFIER	928-944 MHz
Q2	4813822A01	MJD31T4	TSTR NPN	DC
Q3	4813822A01	MJD31T4	TSTR NPN	DC
Q4	4813828D17	MRF899	AMPLIFIER	928-944 MHz
Q6	5113816A10	MC78M15BDTRK	15V REGULATOR	DC
CR1	4813824A13	MMBTA06LT1	BIAS	DC
CR2	4813824A13	MMBTA06LT1	BIAS	DC
CR3	4813824A13	MMBTA06LT1	BIAS	DC
CR4	4882290T04	HSMS2812	SCHOTTKY DIODE	DC
CR5	4813824A13	MMBTA06LT1	BIAS	DC
POWER AMPLIFIER: 200W DDM - PTLF4004A				
Q5409	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5410	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5411	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5412	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5413	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5414	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5424	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5425	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5426	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5427	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5428	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5429	4813824A13	MMBTA06LT1	AMPLIFIER	DC
Q5420	4883330T08	SRF7016	AMPLIFIER	928-944 MHz
Q5421	4883330T08	SRF7016	AMPLIFIER	928-944 MHz
Q5422	4883330T08	SRF7016	AMPLIFIER	928-944 MHz
Q5423	4883330T08	SRF7016	AMPLIFIER	928-944 MHz
VR5403	5113816A07	MC78M05BDTRK	5V REGULATOR	DC
VR5404	5113816A07	MC78M05BDTRK	5V REGULATOR	DC
POWER AMPLIFIER: DC METERING BOARD - 0180622P01				
VR300	4813825A02	MMBV105GLT1	VARACTOR	928-944 MHz
VR301	4813825A02	MMBV105GLT1	VARACTOR	928-944 MHz
VR302	4813825A02	MMBV105GLT1	VARACTOR	928-944 MHz
VR303	4813825A02	MMBV105GLT1	VARACTOR	928-944 MHz
DZ400	4813830A14	MMBZ5231B	ZENER DIODE	DC
DZ500	4813830A14	MMBZ5231B	ZENER DIODE	DC
DZ501	4813830A14	MMBZ5231B	ZENER DIODE	DC
DZ600	4813830A14	MMBZ5231B	ZENER DIODE	DC
DZ601	4813830A14	MMBZ5231B	ZENER DIODE	DC
DZ700	4813830A14	MMBZ5231B	ZENER DIODE	DC
DZ701	4813830A14	MMBZ5231B	ZENER DIODE	DC
DZ800	4813830A14	MMBZ5231B	ZENER DIODE	DC
DZ801	4813830A14	MMBZ5231B	ZENER DIODE	DC
DZ1000	4813830A14	MMBZ5231B	ZENER DIODE	DC
DZ1001	4813830A14	MMBZ5231B	ZENER DIODE	DC
DZ1002	4813830A14	MMBZ5231B	ZENER DIODE	DC
D200	4882030V01	HSMP3800L31	PIN DIODE	928-944MHz
D201	4882030V01	HSMP3800L31	PIN DIODE	928-944MHz

SCHEMATIC KEY	MOTOROLA PART NUMBER	DEVICE TYPE	CIRCUIT APPLICATION	OPERATING FREQUENCY
D202	4882030V01	HSMP3800L31	PIN DIODE	928-944MHz
D1000	4882290T04	HSMS2812L31	DIODE	928-944MHz
U912	5109714C06	DS1867	EEPOT	DC
U906	5113808A01	MC74AC00	NAND QUAD 2 INPUT	DC
U908	5113808A20	AC138D	1OF8 DECODER	DC
U909	5113808A38	MC74AC244DWR2	LINE DRIVER	DC
U910	5113811A08	MC145041FNR2	A/D	DC
U911	5113811A08	MC145041FNR2	A/D	DC
U100	5113816A07	MC78M05BDTRK	5V REGULATOR	DC
U102	5113816A07	MC78M05BDTRK	5V REGULATOR	DC
U101	5113816A10	MC78M15BDTRK	15V REGULATOR	DC
U1000	5113819A02	LM2902	OP AMP	DC
U400	5113819A05	MC33074ADR2	OP AMP	DC
U700	5113819A05	MC33074ADR2	OP AMP	DC
U913	5113819A05	MC33074ADR2	OP AMP	DC
U900	5184288T01	SN65176BDR	TRI-STATE BUFFER	DC
U901	5184288T01	SN65176BDR	TRI-STATE BUFFER	DC
U902	5184288T01	SN65176BDR	TRI-STATE BUFFER	DC
U903	5184288T01	SN65176BDR	TRI-STATE BUFFER	DC
U904	5184288T01	SN65176BDR	TRI-STATE BUFFER	DC
U905	5184288T01	SN65176BDR	TRI-STATE BUFFER	DC
U907	5185370U01	X25C02S1	EEPROM	DC
POWER AMPLIFIER: COMBINER BOARD - PTLF4005A				
CR10	4882290T04	HSMS2812L31	DIODE	928-944MHz

REFERENCE MODULE

D/A NETWORK				
U300	5113819A05	MC33074	HIGH PERF SINGLE SUPP IC	BASEBAND
U301	5182276R86	MAX543	12 BIT SERIAL INP DAC	BASEBAND
A/D NETWORK				
U200	5113811A08	MC145041	8 BIT A/D CONV	BASEBAND
GPS INTERFACE				
Q600	4813824A10	MMBT39041	NPN 40V TRANSISTOR	DC
Q601	4813824A10	MMBT39041	NPN 40V TRANSISTOR	DC
U600	5184288T01	SN65ALS176B	DIFFERENTIAL TX/RX	BASEBAND
U601	5184288T01	SN65ALS176B	DIFFERENTIAL TX/RX	BASEBAND
U602	5184288T01	SN65ALS176B	DIFFERENTIAL TX/RX	BASEBAND
OSC BUFFER				
Q400	4813824A10	MMBT39041	NPN 40V TRANSISTOR	DC
Q401	4813824A17	MMBT3906T	PNP 40V TRANSISTOR	928-941 M
Q402	4813824A10	MMBT39041	NPN 40V TRANSISTOR	DC
10V REGULATOR				
Q500	4813822A01	MJD31T4	NPN POWER TRANSISTOR	DC
Q501	4813822A09	MJD32T4	PNP TRANSISTOR	DC
Q502	4813822A09	MJD32T4	PNP TRANSISTOR	DC
Q503	4813824A10	MMBT39041	NPN 40V TRANSISTOR	DC
I/O INTERFACE				
U100	5113808A38	74AC244	LINE DRIVER	BASEBAND
U101	5113808A22	MC74AC139DR2	DECODER/DEMUX IC	BASEBAND
U102	5113805A13	MC74HC32ADR2	QUAD 2 INP OR	BASEBAND
SCHEMATIC	MOTOROLA	DEVICE	CIRCUIT	OPERATING

KEY	PART NUMBER	TYPE	APPLICATION	FREQUENCY
	RF-BATON! CONTROL MODULE			
U600	5180693P01	74ACT16244DL	16 bit line driver	BASEBAND
U601	5180693P01	74ACT16244DL	16 bit line driver	BASEBAND
U602	5180693P02	74ACT16245DL	16 bit line driver	BASEBAND
U603	5180693P02	74ACT16245DL	16 bit line driver	BASEBAND
U604	5113808A13	74ACT14	Inv hex Schmitt trig	BASEBAND
U605	5113808A08	74ACT08	Quad And	BASEBAND
U606	5113815A02	MC33064D	Undervolt sensing ckt	DC
U607	5113805A89	74HC4538	Dual Multivibrator	BASEBAND
U608	5113808A15	74ACT32	Quad Or	BASEBAND
U609	5113805A03	74HC03	Quad NAND	BASEBAND
U610	5182046W01	CGS74CT2524MX	Clock IC	25MHz
U700	5113808A61	74ACT273	Oct FLIP-FLOP	BASEBAND
U701	5180693P03	74ACT16373	16 bit latch	BASEBAND
U702	5180693P03	74ACT16373	16 bit latch	BASEBAND
U704	5180693P01	74ACT16244DL	16 bit line driver	BASEBAND
U705	5180693P01	74ACT16244DL	16 bit line driver	BASEBAND
U706	5113808A08	74ACT08	Quad And	BASEBAND
U707	5184529T02	SCN68681	DuArt IC	BASEBAND
U800	5113808A26	74ACT153	Dual Mux	BASEBAND
U801	5113808A28	74ACT157	Quad 2 input Mux	BASEBAND
U802	5113808A28	74ACT157	Quad 2 input Mux	BASEBAND
U803	5113808A28	74ACT157	Quad 2 input Mux	BASEBAND
U900	5113804A11	MCM6206	SRAM	BASEBAND
U1100	5113805B16	74HC393	Dual ripple cntr	BASEBAND
U1200	5185227U04	XC3000	FPGA	BASEBAND
U1300	5113805A06	74HC08	Quad And	BASEBAND
U1301	5113805A01	74HC00	QUAD 2 INP NAND	BASEBAND
U1302	5113805A41	74HC163ADR2	Presetable cntr	BASEBAND
U1303	5113805A31	74HC139	Decoder/Demux IC	BASEBAND
U1304	5113805B12	74HC253DR2	Dual 4 input mux w/3 state	BASEBAND
U1305	5113805B12	74HC253DR2	Dual 4 input mux w/3 state	BASEBAND
U1400	5113812A10	MC145170	Synthesizer	928-941MHz
U1401	5113805A89	74HC4538	Dual Multivibrator	BASEBAND
U1402	5113805A86	74HC4066	Quad analog sw/mux/demux	BASEBAND
U1403	5184726T02	PENDULUM	Ref Osc	16.8 MHz
U1404	5113805A09	74HC14	Inv hex Schmitt trig	BASEBAND
U1500	5113808A23	74ACT139	Decoder/Demux IC	BASEBAND
U1501	5113808A21	74ACT138	1 of 8 decoder/demux	BASEBAND
U1502	5180673P02	MAX211EAI	RS232 Xcvr	BASEBAND
U1503	5180673P01	MAX202ESE	RS232 Xcvr	BASEBAND
U1504	5180673P02	MAX211EAI	RS232 Xcvr	BASEBAND
U1505	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1506	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1507	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1508	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1509	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1510	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1511	5184288T01	SN65176BDR	Xcvr bus	BASEBAND

SCHEMATIC	MOTOROLA	DEVICE	CIRCUIT	OPERATING

KEY	PART NUMBER	TYPE	APPLICATION	FREQUENCY
U1512	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1513	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1514	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1515	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1700	5113811G07	MC68160	E-net Xcvr	BASEBAND
U1800	5180673P02	MAX211EAI	RS232 Xcvr	BASEBAND
U1801	5180673P02	MAX211EAI	RS232 Xcvr	BASEBAND
U1802	5180673P02	MAX211EAI	RS232 Xcvr	BASEBAND
X600	4882336V01	SG615 25.00 Mhz 100PPM		25 MHz
X700	4883793T04	XTAL 2PPM	DUART Clock X-tal	3.6864 MHz
X1600	4884450T12	XTAL 100PPM	Clock Xtal	20 MHz
Q700	4813824A10	MMBT39041	NPN 40V TRANSISTOR	DC
Q1400	4813824A10	MMBT39041	NPN 40V TRANSISTOR	DC
Q1401	4813824A17	MMBT3906T	PNP 40V TRANSISTOR	DC
Q1402	4813824A10	MMBT39041	NPN 40V TRANSISTOR	DC

RF-ORCHESTRA! CONTROL MODULE

U501	5180693P01	74ACT16244DL	16 Bit Line driver	BASEBAND
U502	5180693P01	74ACT16244DL	16 Bit Line driver	BASEBAND
U503	5180693P02	74ACT16245DL	16 Bit Line driver	BASEBAND
U504	5180693P02	74ACT16245DL	16 Bit Line driver	BASEBAND
U505	5113805A89	74HC4538	Dual Multivibrator	BASEBAND
U506	5113815A02	MC33064D	Undervolt sensing ckt	DC
U507	5113808A15	74ACT32	Quad Or	BASEBAND
U508	5113805A03	74HC03	Quad NAND	BASEBAND
U509	5113808A08	74ACT08	Quad And	BASEBAND
U511	5113808A13	74ACT14	Inv hex Schmitt trig	BASEBAND
U601	5113808A61	74ACT273	Oct FLIP-FLOP	BASEBAND
U602	5180693P03	74ACT16373	16 bit latch	BASEBAND
U603	5180693P03	74ACT16373	16 bit latch	BASEBAND
U604	5180693P01	74ACT16244DL	16 Bit Line driver	BASEBAND
U605	5180693P01	74ACT16244DL	16 Bit Line driver	BASEBAND
U606	5113808A39	74ACT244	Line driver	BASEBAND
U701	5113808A26	74ACT153	Dual Mux	BASEBAND
U702	5113808A28	74ACT157	Quad 2 input Mux	BASEBAND
U703	5113808A28	74ACT157	Quad 2 input Mux	BASEBAND
U704	5113808A28	74ACT157	Quad 2 input Mux	BASEBAND
U803	5113804A11	MCM6206	SRAM	BASEBAND
U1000	5113808A08	74ACT08	Quad And	BASEBAND
U1001	5113804A11	MCM6206	SRAM	BASEBAND
U1002	5113804A11	MCM6206	SRAM	BASEBAND
U1003	5113804A11	MCM6206	SRAM	BASEBAND
U1004	5113804A11	MCM6206	SRAM	BASEBAND
U1005	5113804A11	MCM6206	SRAM	BASEBAND
U1009	5113804A11	MCM6206	SRAM	BASEBAND
U1010	5113804A11	MCM6206	SRAM	BASEBAND
U1011	5113804A11	MCM6206	SRAM	BASEBAND
U1100	5113803A12	DSP56166FE	DSP	BASEBAND
U1200	5113803A13	DSP56002FC66	DSP	BASEBAND
U1201	5113803A13	DSP56002FC66	DSP	BASEBAND
U1300	5113804A11	MCM6206	SRAM	BASEBAND
SCHEMATIC	MOTOROLA	DEVICE	CIRCUIT	OPERATING

KEY	PART NUMBER	TYPE	APPLICATION	FREQUENCY
U1512	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1513	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1514	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1515	5184288T01	SN65176BDR	Xcvr bus	BASEBAND
U1700	5113811G07	MC68160	E-net Xcvr	BASEBAND
U1800	5180673P02	MAX211EAI	RS232 Xcvr	BASEBAND
U1801	5180673P02	MAX211EAI	RS232 Xcvr	BASEBAND
U1802	5180673P02	MAX211EAI	RS232 Xcvr	BASEBAND
X600	4882336V01	SG615 25.00 Mhz 100PPM		25 MHz
X700	4883793T04	XTAL 2PPM	DUART Clock X-tal	3.6864 MHz
X1600	4884450T12	XTAL 100PPM	Clock Xtal	20 MHz
Q700	4813824A10	MMBT39041	NPN 40V TRANSISTOR	DC
Q1400	4813824A10	MMBT39041	NPN 40V TRANSISTOR	DC
Q1401	4813824A17	MMBT3906T	PNP 40V TRANSISTOR	DC
Q1402	4813824A10	MMBT39041	NPN 40V TRANSISTOR	DC

RF-ORCHESTRA! CONTROL MODULE

U501	5180693P01	74ACT16244DL	16 Bit Line driver	BASEBAND
U502	5180693P01	74ACT16244DL	16 Bit Line driver	BASEBAND
U503	5180693P02	74ACT16245DL	16 Bit Line driver	BASEBAND
U504	5180693P02	74ACT16245DL	16 Bit Line driver	BASEBAND
U505	5113805A89	74HC4538	Dual Multivibrator	BASEBAND
U506	5113815A02	MC33064D	Undervolt sensing ckt	DC
U507	5113808A15	74ACT32	Quad Or	BASEBAND
U508	5113805A03	74HC03	Quad NAND	BASEBAND
U509	5113808A08	74ACT08	Quad And	BASEBAND
U511	5113808A13	74ACT14	Inv hex Schmitt trig	BASEBAND
U601	5113808A61	74ACT273	Oct FLIP-FLOP	BASEBAND
U602	5180693P03	74ACT16373	16 bit latch	BASEBAND
U603	5180693P03	74ACT16373	16 bit latch	BASEBAND
U604	5180693P01	74ACT16244DL	16 Bit Line driver	BASEBAND
U605	5180693P01	74ACT16244DL	16 Bit Line driver	BASEBAND
U606	5113808A39	74ACT244	Line driver	BASEBAND
U701	5113808A26	74ACT153	Dual Mux	BASEBAND
U702	5113808A28	74ACT157	Quad 2 input Mux	BASEBAND
U703	5113808A28	74ACT157	Quad 2 input Mux	BASEBAND
U704	5113808A28	74ACT157	Quad 2 input Mux	BASEBAND
U803	5113804A11	MCM6206	SRAM	BASEBAND
U1000	5113808A08	74ACT08	Quad And	BASEBAND
U1001	5113804A11	MCM6206	SRAM	BASEBAND
U1002	5113804A11	MCM6206	SRAM	BASEBAND
U1003	5113804A11	MCM6206	SRAM	BASEBAND
U1004	5113804A11	MCM6206	SRAM	BASEBAND
U1005	5113804A11	MCM6206	SRAM	BASEBAND
U1009	5113804A11	MCM6206	SRAM	BASEBAND
U1010	5113804A11	MCM6206	SRAM	BASEBAND
U1011	5113804A11	MCM6206	SRAM	BASEBAND
U1100	5113803A12	DSP56166FE	DSP	BASEBAND
U1200	5113803A13	DSP56002FC66	DSP	BASEBAND
U1201	5113803A13	DSP56002FC66	DSP	BASEBAND
U1300	5113804A11	MCM6206	SRAM	BASEBAND
SCHEMATIC	MOTOROLA	DEVICE	CIRCUIT	OPERATING

Applicant: Motorola

Equipment type: LX696FC4002

SCHEMATIC KEY	MOTOROLA PART NUMBER	DEVICE TYPE	CIRCUIT APPLICATION	OPERATING FREQUENCY
U201	5113804A11	MCM6206	SRAM	BASEBAND
U203	5113803A12	DSP56166FE	DSP	BASEBAND
U300	5113804A11	MCM6206	SRAM	BASEBAND
U301	5113804A11	MCM6206	SRAM	BASEBAND
U303	5113803A12	DSP56166FE	DSP	BASEBAND
U400	5113804A11	MCM6206	SRAM	BASEBAND
U401	5113804A11	MCM6206	SRAM	BASEBAND
U403	5113803A12	DSP56166FE	DSP	BASEBAND

Sonik Technologies Corporation

ITEMS REQUIRED FOR AN FCC CERTIFICATION SUBMITTAL
FCC Part 2, Paragraph 2.1033

1. Tune-up procedure.

A. UHSO Steering Line Verification and Alinement.

The UHSO steering line will be adjusted to verify that the station 10 MHz reference can be disciplined by the GPS. GPS disciplining will be monitored, then the UHSO will be steered to 10 MHz +/- 5ppb.

Execute the following commands via the BCM FIPS session:

1) Check steering line.

   w 800 0; verify 10,000,002 Hz < reference frequency < 100,000,006 Hz
   w 800 4095; verify 9,999,993 Hz < reference frequency < 9,999,997 Hz

2) Monitor the GPS steering activity.

   a 192 SASM 34

3) Watch the UHSO frequency and the BCM FIPS session. Verify that after 2 minutes maximum the UHSO frequency changes and the BCM FIPS session displays that the steering line has been adjusted down towards 1900. This verifies that UHSO is being disciplined by the GPS

4) Align the UHSO to 10,000,000.00 +/- .05 Hz adjusting **w 800** between **0** and **4095**; typical level is 1890. Eventually the GPS will discipline the UHSO better than 1 ppb stability (10 MHz +/- 0.01 Hz)

5) Turn off trace by executing the BCM command : **a 193 SASM 34**

B. GPS Operation Verification

Verify that LED 6 (GPS okay) is active.

1) The following BCM commands should be should be executed to record GPS status:
   a 200: Latitude
   a 201: Longitude
   a 202: Height
   a 203: XDOP type.
   a 204: XDOP value.
   a 207: application type
   a 208: records GPS receiver status and satellite condition.
   a 213: Position hold mode.
   a 214: Date
   a 215: Time (GMT Time Zone – London)
   a 218: Self test should show “PASS” after each test (Note: Reset the station after self-test has been

performed).

C. Power Out Set

1) Consult Chart 2.0 "STD" column for the appropriate power level to set the station. These are pre-cavity settings. The Power Reference must be connected to the pre-cavity point.

2) Generate an FM transmission 10/11 frames. (BCM) **a 195 1 2 3 4**
(BCM) **a 196 1**
(BCM) **a 176 0 8 0 0 0 1 10 4 1**

3) Measure Power Out and adjust register 974 until Chart 2.0 STD value +/- 3 Watts is achieved. Use the following 974 equation: 974(new) = 974(old) + { 10 log(P(old)/P(new)) * 26 counts/dB}. Increment or decrement 974 until Chart 2.0 STD value +/- # Watts is achieved. Record pre-cavity panel power. Note that decreasing 974 increases power out.

4) Leave transmitter keyed for next measurement.

D. Internal Power Meter Alignment

This procedure will align the RFO! Power meter to a reference power meter. The reference must be at least 3% accurate and traceable to the National Institute of Standards (NIST). Any errors in the reference will be passed on to the RFO! Power meter.

All connections will be referenced to Figure 1.

1) Initialize the cal factor on the OCM with the command : **a 72 0 0 0 0 0.**
2) Reset the OCM
3) Connect the reference power meter to the RF cable at the cavity input. If no X263 Option, then connect to the antenna port at the top of the station.
4) Key the transmitter for 10/11 blocks with the BCM command : **a 176 0 8 0 0 0 1 10 5 1**
5) Power should be set to 75 watts with the above command.
6) Increase the power to 200 watts by adjusting the OCM register 2054 to [11680 *(200/Po) $^{1/2}$](19200). The power meter must be calibrated at 200 watts +/- 5%.
7) Read the RFO! Power meter using the OCM command: **a 79 0**.
8) Using the "Last power read" verify that the RFO! Power meter and the reference power meter are within +/- 20%.
9) Align the internal power meter to the reference power meter by sending the OCM command: **a 71 0 xxx**, where xxx is the reading of the reference power meter and "0" indicates the internal power meter.
10) Calibration takes a maximum of 75 seconds. Verify that calibration takes place by noting the calibration factor.
11) Dekey radio using the BCM command: **a 117**
12) Return OCM register 2054 to 11680: **w 2054 11680**
13) Reset OCM (**a 117**). The RFO! Internal power meter will be calibrated on the return from reset.

ITEMS REQUIRED FOR AN FCC CERTIFICATION SUBMITTAL
FCC Part 2, Paragraph 2.1033

E. Transmitter Frequency Check and Microphonic Screen

The Spectrum Analyzer will be used to verify that the transmitter is on the desired frequency. It must be using an external reference with a stability > .5 pbb. Switch the Spectrum Analyzer to "external reference" via the "Aux cntl/Rear panel" key.

1) Set deviation to 0 Hz by executing OCM command: "**w 2053 0**". The default is 4800.
2) Set analyzer RBW, VBW and Sweep to "auto".
3) Set analyzer center frequency and marker to subchannel frequency.
4) Transmitter should be keyed from the previous test. If not, execute the BCM command: **a 177** to stop data from the last key and then execute the key command "**a 176 0 8 0 0 0 1 11 4 1**".
5) Hit "Marker Delta" and then "Peak Search" when the Tx is keyed.
6) Set analyzer span to 500 Hz.
7) The indicated Delta frequency should be < +/- 10 Hz.
8) Verify that discrete spurious signals (not noise) are at least 30 dB below carrier > +/- 100 Hz from the carrier.
9) Leave the transmitter keyed for the next measurement.

F. Carrier Feed-through (CFT) and Image Null

The carrier feed-through is an undesired by-product of the I/Q modulator. The carrier is nulled by alternately adjusting the DC-offset on the I cahnnel and the DC offset on the Q channel via the OCM FIPS using the **w 979** and **w 980** commands respectively.

1) Using the OCM command **w 2053 1** set this value to 1.
2) Set the analyzer span to 20 kHz and RBW to 300 Hz; center remains on Tx center.
3) Transmitter should be keyed from previous test. If not, execute the OCM command: "**a 177**. To stop the data from the last key and then execute the key command :**176 0 8 0 0 0 1 11 4 1**.
4) Hit "Marker Normal" then "Peak Search" while transmitting to capture the +0 Hz deviated subchannel. This is used as a level reference.
5) Move the "Marker Delta" over to the carrier by pressing "Mkr Delta " and then "Next Peak Left" Verify that this is the center of the channel. If not, dial over to the carrier feed through spur. This is approximately –6.25 to –6.27 kHz from the subchannel.
6) Adjust the I DC offset using "**w 979**" until a minimum point is achieved. Default is 0 and the optimum point could be between -3000 and + 3000. Try increments of 200. If outside of this range, fail the exciter.
7) Adjust the Q-channel offset using the "**w 980**" command until a minimum is achieved and then go back a re-adjust the I offset at smaller increments. Try initial increments of 200.
8) Continue adjustment until CFT is < -60 dBc. Record CFT level, 979 setting, 980 setting, and 974 setting.
9) Small changes in ambient temperature can cause large changes in the carrier feed-thru. Any subsequent testing using the same r 974, r 779, r 980 values will be needed to meet the minimum spec of –45 dBc.

Image Null- An image of the desired channel is also an undesired by-product. This image is reduced by the "w 981" command between –5.0 and +5.0.

1) Set Marker Delta over-to image(-12.5 kHz)
2) Adjust "w 981" until image is < -40 dBc. Record image and 981 value.
3) If further measurements are desired leave transmitter keyed.

ITEMS REQUIRED FOR AN FCC CERTIFICATION SUBMITTAL
FCC Part 2, Paragraph 2.1033