

ADJUSTMENT

Common Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Setting	1) BATT terminal voltage:13.6V 2) SSG standard modulation [Wide] MOD:1kHz,DEV:3kHz [Narrow] MOD:1kHz,DEV:1.5kHz							
2. LCD contrast	1) Adj item:[CNTR] Adjust:[***] Press [PF3] key to store the adjustment value.					[Right Up] [Right Down]	Adjust the LCD contrast by looking. Fixed Digit : 120	
3. Assist voltage [RX]	1) Adj item:[RAST] Adjust:[***] 2) Adj item:[L RAST]→[L' RAST]→[C RAST]→[H' RAST]→[H RAST] Adjust:[***] Press [PF3] key to store the adjustment value.					[Right Up] [Right Down]	The display on the left of LCD shows PLL lock voltage. Change the adjustment value within the limit of the specified voltage.	3.0V±0.1V
[TX]	1) Adj item:[TAST] Adjust:[***] 2) Adj item:[L TAST]→[L' TAST]→[C TAST]→[H' TAST]→[H TAST] Adjust:[***] PTT : ON Press [PF3] key to store the adjustment value.					[Right Up] [Right Down]		
4. RTC oscillation frequency adjust	1) Adj item:[RTC] Adjust:[***]					[Triangle]	Press [Triangle] key. After automatic adjustment adjusted value is displayed on LCD. Press [PF3] key to store the adjustment value.	
5. Frequency adjust *1	1) Adj item:[FREQ] SSG output : -20dBm (CW(without modulation)) Adjust:[****]	SSG		ANT		[Triangle]	The display on the left of LCD shows internal temperature (by centigrade) of radio. Press [Triangle] key. After automatic adjustment adjusted value is displayed on LCD.	

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		Test-equipment	Unit	Terminal	Unit	Parts	Method	
							Press [PF3] key to store the adjustment value.	

*1 The reference oscillator frequency may drift due to shock (jarring the radio) or operating conditions. We recommend that the Frequency adjustment be checked each time the radio is serviced, or at least once per year. Maintenance should only be performed under 25°C±2°C.

Transmitter Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency check	[Panel test mode] 1) CH-Sig : 1-1 PTT : ON	f. counter		ANT			Check @+25°C	UHF : +0.05~+0.55ppm +24.2Hz~+266.8Hz @365.1MHz
2.High power Limitter adjust	1) Adj item:[HILMT] Adjust:[****] 2) Adj item:[L HILMT]→[L' HILMT]→ [C HILMT]→[H' HILMT]→[H HILMT] Adjust:[****] PTT : ON Press [PF3] key to store the adjustment value.	Power meter Ammeter		ANT		[Right Up] [Right Down]	NX-800H (K3) : 48.0W	±3.0W
3.Low power Limitter adjust	1) Adj item:[LOLMT] Adjust:[****] 2) Adj item:[L LOLMT]→[L' LOLMT] →[C LOLMT]→[H' LOLMT]→[H LOLMT] Adjust:[****] PTT : ON Press [PF3] key to store the adjustment value.	Power meter Ammeter		ANT		[Right Up] [Right Down]	NX-800H (K3) : 25.0W	±1.0W
4. High power adjust	1) Adj item:[HIPWR] Adjust:[****] 2) Adj item:[L HIPWR]→[L' HIPWR]→ [C HIPWR]→[H' HIPWR]→[H HIPWR] Adjust:[****] PTT : ON Press [PF3] key to store the	Power meter Ammeter		ANT		[Right Up] [Right Down]	NX-800H (K3) : 45.0W	±1.0W 13.0A less :NX-800H(K3) or

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
	adjustment value.							
5. Low power adjust	1) Adj item:[LOPWR] Adjust:[****] 2) Adj item:[L LOPWR]→[L' LOPWR] →[C LOPWR]→[H' LOPWR]→[H LOPWR] Adjust:[****] PTT : ON Press [PF3] key to store the adjustment value.	Power meter Ammeter		ANT		[Right Up] [Right Down]	NX-800H (K3) : 10.0W	±0.5W 8.0A or less :NX-800H(K3)
6. Balance adjust *3	1) Adj item:[BAL] Adjust:[***] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item:[L BAL]→[L' BAL]→[C BAL]→[H' BAL]→[H BAL] Adjust:[***] PTT : ON Press [PF3] key to store the adjustment value.	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	The display on the left of LCD shows the single tone frequency that DSP generates. The tone frequency is alternately switched to 20Hz and 2kHz by pressing [Square] key while transmitting. Change the adjustment value to get same deviation at 100Hz and 2kHz within the limit of the specified voltage.	2kHz Tone deviation is within 1.0% of 100Hz tone deviation.
7. NXDN Deviation adjust *3 [Narrow]	1) Adj item:[Nn NDEV] Adjust:[****] Deviation meter LPF : 3kHz HPF : OFF 2) Adj item:[NnL NDEV]→[NnL' NDEV]→[NnC NDEV]→[NnH' NDEV]→[NnH NDEV] Adjust:[****] PTT : ON Press [PF3] key to store the adjustment value.	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	3056Hz	2995~3117Hz
[Very Narrow]	1) Adj item:[Nv NDEV] Adjust:[****] 2) Adj item:[NvL NDEV]→[NvL' NDEV]→[NvC NDEV]→[NvH' NDEV]→[NvH NDEV] Adjust:[****] PTT : ON	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	1337Hz	1311~1363Hz

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
	Press [PF3] key to store the adjustment value.							
8. Analog Deviation adjust *3 [Narrow]	1) Adj item:[An ADEV] Adjust:[****] Deviation meter LPF : 15kHz HPF : OFF 2) Adj item:[AnL ADEV]→[AnL' ADEV]→[AnC ADEV]→[AnH' ADEV]→[AnH ADEV] Adjust:[****] PTT : ON Press [PF3] key to store the adjustment value.	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	2100Hz	2050~2150Hz
[Wide]	1) Adj item:[Aw ADEV] Adjust:[****] 2) Adj item:[AwL ADEV]→[AwL' ADEV]→[AwC ADEV]→[AwH' ADEV]→[AwH ADEV] Adjust:[****] PTT : ON Press [PF3] key to store the adjustment value.	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	4200Hz	4150~4250Hz
9. MIC sensitivity check	[Panel test mode] 1) CH-Sig : 1-1 AG : 1kHz PTT : ON	Deviation meter Oscilloscope		ANT			Adjust AG input to get a standard MOD	5.0mV±1.0mV
10. QT Deviation adjust *3 [Narrow]	1) Adj item:[An QT] Adjust:[****] Deviation meter LPF : 3kHz HPF : OFF PTT : ON Press [PF3] key to store the adjustment value.	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	0.35kHz	0.30~0.40kHz
[Wide]	1) Adj item:[Aw QT] Adjust:[****] PTT : ON Press [PF3] key to store the adjustment value.	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	0.75kHz	0.70~0.80kHz
11. DQT Deviation adjust *3	1) Adj item:[An DQT] Adjust:[****] Deviation meter	Deviation meter		ANT		[Right Up]	0.35kHz	0.30~0.40kHz

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
[Narrow]	LPF : 3kHz HPF : OFF PTT : ON Press [PF3] key to store the adjustment value.	Oscilloscope				[Right Down]		
[Wide]	1) Adj item:[Aw DQT] Adjust:[****] PTT : ON Press [PF3] key to store the adjustment value.	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	0.75kHz	0.70~0.80kHz
12. LTR Deviation adjust *3 [Narrow]	1) Adj item:[An LTR] Adjust:[****] Deviation meter LPF : 3kHz HPF : OFF PTT : ON Press [PF3] key to store the adjustment value.	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	0.75kHz	0.65~0.85kHz
[Wide]	1) Adj item:[Aw LTR] Adjust:[****] PTT : ON Press [PF3] key to store the adjustment value.	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	1.00kHz	0.90~1.10kHz
13. DTMF Deviation adjust *3 [Narrow]	1) Adj item:[An DTMF] Adjust:[****] Deviation meter LPF : 15kHz HPF : OFF PTT : ON Press [PF3] key to store the adjustment value.	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	1.25kHz	1.15~1.35kHz
[Wide]	1) Adj item:[Aw DTMF] Adjust:[****] PTT : ON Press [PF3] key to store the adjustment value.	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	2.50kHz	2.40~2.60kHz
14. TONE Deviation adjust *3 [Narrow]	1) Adj item:[An TONE] Adjust:[****] Deviation meter LPF : 15kHz HPF : OFF PTT : ON	Deviation meter Oscilloscope		ANT		[Right Up] [Right Down]	1.50kHz	1.40~1.60kHz

*3 Necessary adjustment and order for each signaling is shown as below.

Mode	Signaling	Necessary adjustment and order		
		Wide	Narrow	Very Narrow
Analog	Audio	1. Balance adjust 2. Analog Deviation adjust [Wide]	1. Balance adjust 2. Analog Deviation adjust [Narrow]	---
	QT	1. Balance adjust 2. Analog Deviation adjust [Wide] 3. QT Deviation adjust [Wide]	1. Balance adjust 2. Analog Deviation adjust [Narrow] 3. QT Deviation adjust [Narrow]	---
	DQT	1. Balance adjust 2. Analog Deviation adjust [Wide] 3. DQT Deviation adjust [Wide]	1. Balance adjust 2. Analog Deviation adjust [Narrow] 3. DQT Deviation adjust [Narrow]	---
	LTR	1. Balance adjust 2. Analog Deviation adjust [Wide] 3. LTR Deviation adjust [Wide]	1. Balance adjust 2. Analog Deviation adjust [Narrow] 3. LTR Deviation adjust [Narrow]	---
	DTMF	1. Balance adjust 2. Analog Deviation adjust [Wide] 3. DTMF Deviation adjust [Wide]	1. Balance adjust 2. Analog Deviation adjust [Narrow] 3. DTMF Deviation adjust [Narrow]	---
	2TONE	1. Balance adjust 2. Analog Deviation adjust [Wide] 3. TONE Deviation adjust [Wide]	1. Balance adjust 2. Analog Deviation adjust [Narrow] 3. TONE Deviation adjust [Narrow]	---
	MSK(Fleet sync)	1. Balance adjust 2. Analog Deviation adjust [Wide] 3. MSK Deviation adjust [Wide]	1. Balance adjust 2. Analog Deviation adjust [Narrow] 3. MSK Deviation adjust [Narrow]	---
NXDN	---	1. Balance adjust 2. NXDN Deviation adjust [Narrow]	1. Balance adjust 2. NXDN Deviation adjust [Very Narrow] 3. CWID Deviation adjust [Very Narrow]	

Receiver Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. AF level setting	[Panel test mode] 1)CH-Sig : 1-1 SSG output : -47dBm (MOD : 1kHz /±1.5kHz)	SSG DVM AF VTVM Dummy load(4ohm)		ANT Ext.SP connector		[Left Up] [Left Down]	Volume Up/Down to obtain 2.83V AF output. (2.0W @4ohm load)	2.83V±0.3V
2. Sensitivity1 fixed value write	1) Adj item:[SENS1] Adjust:[***] 2) Adj item:[L SENS1]→[L' SENS1]→[C SENS1]→[H' SENS1] →[H SENS1] Adjust:[***] Press [PF3] key to store the adjustment value.					[Right Up] [Right Down]		Write the value as followings [HK3] [L SENS1] : 72 [L' SENS1] : 97 [C SENS1] : 129 [H' SENS1] : 158 [H SENS1] : 184
3. Sensitivity adjust 2	1) Adj item:[SENS2] Adjust:[***] 2) Adj item:[L SENS2]→[L' SENS2]→[C SENS2]→[H' SENS2] →[H SENS2] Adjust:[***] Press [PF3] key to store the adjustment value.					[Right Up] [Right Down]		Write the value as followings [HK3] [L SENS2] : 47 [L' SENS2] : 71 [C SENS2] : 113 [H' SENS2] : 150 [H SENS2] : 185
4. Sensitivity check	[Panel test mode] 1) CH-Sig : 1-1 SSG output Wide 5k : -118dBm (0.28[V] (MOD : 1kHz/±3kHz) Narrow : -118dBm (0.28[V] (MOD : 1kHz/±1.5kHz)	SSG AF VTVM Oscilloscpe		ANT Ext.SP connector			Check	12dB SINAD or more
5. RSSI reference adjust [Analog Narrow] [Analog Wide]	1) Adj item:[An RRSSI] Adjust:[***] 2) Adj item:[AnL RRSSI]→[AnL' RRSSI]→[AnC RRSSI]→[AnH' RRSSI]→[AnH RRSSI] SSG output:12dB SINAD level -3dB (MOD:1kHz/±1.5kHz) 1) Adj item:[Aw RRSSI] Adjust:[***] 2) Adj item:[AwL RRSSI]→[AwL'	SSG AF VTVM Oscilloscpe		ANT Ext.SP connector			After input signal from SSG, press [PF3] key to store the adjustment value.	

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
[NXDN Very Narrow]	RRSSI]→[AwC RRSSI]→[AwH' RRSSI]→[AwH RRSSI] SSG output: 12dB SINAD level -3dB (MOD: 1kHz/±3kHz) 1) Adj item:[Nv RRSSI] Adjust:[***] 2) Adj item:[NvL RRSSI]→[NvL' RRSSI]→[NvC RRSSI]→[NvH' RRSSI]→[NvH RRSSI] SSG output: 12dB SINAD level for analog Narrow -3dB (MOD: 1kHz/±1.5kHz)							
6. Squelch(Preset) [Analog Narrow]	1) Adj item:[An SQL] Adjust:[***] 2) Adj item:[AnL SQL]→[AnL' SQL]→[AnC SQL]→[AnH' SQL]→[AnH SQL] SSG output: 12dB SINAD level +1dB (MOD: 1kHz/±1.5kHz)	SSG AF VTVM Oscilloscpe		ANT Ext.SP connector			After input signal from SSG, press [PF3] key to store the adjustment value.	
[Analog Wide]	1) Adj item:[Aw SQL] Adjust:[***] 2) Adj item:[AwL SQL]→[AwL' SQL]→[AwC SQL]→[AwH' SQL]→[AwH SQL] SSG output: 12dB SINAD level +1dB (MOD: 1kHz/±3kHz)							
[NXDN Very Narrow]	1) Adj item:[Nv SQL] Adjust:[***] 2) Adj item:[NvL SQL]→[NvL' SQL]→[NvC SQL]→[NvH' SQL]→[NvH SQL] SSG output: 12dB SINAD level for analog Narrow -2dB (MOD:Non)							
7. RSSI at -118dBm adjust [Analog Narrow]	1) Adj item:[An LRSSI] Adjust:[***] 2) Adj item:[AnL LRSSI]→[AnL' LRSSI]→[AnC LRSSI]→[AnH' LRSSI]→[AnH LRSSI]	SSG AF VTVM Oscilloscpe		ANT Ext.SP connector			After input signal from SSG, press [PF3] key to store the adjustment value.	

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
[Analog Wide]	SSG output : -118dBm (MOD:1kHz/±1.5kHz)							
	1) Adj item:[Aw R LRSSI] Adjust:[***] 2) Adj item:[AwL LRSSI]→[AwL' LRSSI]→[AwC LRSSI]→[AwH' LRSSI]→[AwH LRSSI] SSG output : -118dBm (MOD:1kHz/±3kHz)							
[NXDN Very Narrow]	1) Adj item:[Nv LRSSI] Adjust:[***] 2) Adj item:[NvL LRSSI]→[NvL' LRSSI]→[NvC LRSSI]→[NvH' LRSSI]→[NvH LRSSI] SSG output : -118dBm (MOD:1kHz/±1.5kHz)							
8. RSSI at -80dBm adjust [Analog Narrow]	1) Adj item:[An HRSSI] Adjust:[***] 2) Adj item:[AnL HRSSI]→[AnL' HRSSI]→[AnC HRSSI]→[AnH' HRSSI]→[AnH HRSSI] SSG output : -80dBm (MOD:1kHz/±1.5kHz)	SSG AF VTVM Oscilloscpe		ANT Ext.SP connector			After input signal from SSG, press [PF3] key to store the adjustment value.	
[Analog Wide]	1) Adj item:[Aw R HRSSI] Adjust:[***] 2) Adj item:[AwL HRSSI]→[AwL' HRSSI]→[AwC HRSSI]→[AwH' HRSSI]→[AwH HRSSI] SSG output : -80dBm (MOD:1kHz/±3kHz)							
[NXDN Very Narrow]	1) Adj item:[Nv HRSSI] Adjust:[***] 2) Adj item:[NvL HRSSI]→[NvL' HRSSI]→[NvC HRSSI]→[NvH' HRSSI]→[NvH HRSSI] SSG output : -80dBm (MOD:1kHz/±1.5kHz)							
9. Squelch(Tight) [Analog Narrow]	1) Adj item:[An SQLT] Adjust:[***] 2) Adj item:[AnL SQLT]→[AnL' SQLT]→[AnC SQLT]→[AnH' SQLT]→[AnH SQLT]	SSG AF VTVM Oscilloscpe		ANT Ext.SP connector			After input signal from SSG, press [PF3] key to store the adjustment value.	

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
	SSG output:12dB SINAD level +6dB (MOD:1kHz/±1.5kHz)							
[Analog Wide]	1) Adj item:[Aw SQLT] Adjust:[***] 2) Adj item:[AwL SQLT]→[AwL' SQLT]→[AwC SQLT]→[AwH' SQLT]→[AwH SQLT] SSG output:12dB SINAD level +6dB (MOD:1kHz/±3kHz)							

Radio check Section

Item	Condition	Measurement			Adjustment			Specifications/Remarks
		Test-equipment	Unit	Terminal	Unit	Parts	Method	
1. Frequency check	[Panel test mode] 1) CH-Sig : 1-1 PTT : ON	f. counter		ANT			Check	UHF : +0.05~+0.55ppm +24.2Hz~+266.8Hz @365.1MHz
1. High power check	[Panel test mode] 1) CH-Sig : 1-1 PTT : ON	Power meter Ammeter		ANT			Check	NX-800H(K3) : 40W~50W 13.0A or less
	2) CH-Sig : 2-1 PTT : ON							
	3) CH-Sig : 3-1 PTT : ON							
1. Low power check	[Panel test mode] 1) CH-Sig : 1-1 PTT : ON							NX-800H(K3) : 8W~12W 8.0A or less
	2) CH-Sig : 2-1 PTT : ON							
	3) CH-Sig : 3-1 PTT : ON							
4. Sensitivity check	[Panel test mode] 1) CH-Sig : 1-1 SSG output Wide 5k : -118dBm (0.28[V] (MOD : 1kHz/±3kHz) Narrow : -118dBm (0.28[V] (MOD : 1kHz/±1.5kHz)	SSG AF VTVM Oscilloscpe		ANT Ext.SP connector			Check	12dB SINAD or more

X54-3680 Parts List

REF.NO	PARTNO	DESCRIPTION	PART NAME
D901	AVRM1608080MAA	Surge absorption (DM/KVL)	VARISTOR
D902	AVRM1608080MAA	Surge absorption (HK/RXD)	VARISTOR
D903	02DZ18F-X	OVER DC Supply protection	ZENER DIODE
D904	AVRM1608080MAA	Surge absorption (BLC/AFO)	VARISTOR
D906	MINISMDC020F	LINE protection(SB)	VARISTOR
D907	02DZ18F-X	OVER DC Supply protection	ZENER DIODE
D908	HSC119	KEY MATRIX	DIODE
D910	1SS416	Reverse Current Prevention(HK/RXD)	DIODE
D911	HSC119	KEY MATRIX	DIODE
D912	HSC119	KEY MATRIX	DIODE
D913	DA204U	LINE protection(PTT/TXDO)	DIODE
D914	B30-2151-05	TX/RX LED	LED
D915	B30-2281-05	LCD BACK LIGHT	LED
D916	B30-2281-05	LCD BACK LIGHT	LED
D917	B30-2281-05	LCD BACK LIGHT	LED
D918	B30-2281-05	LCD BACK LIGHT	LED
D919	B30-2281-05	LCD BACK LIGHT	LED
D920	B30-2281-05	LCD BACK LIGHT	LED
D921	B30-2281-05	LCD BACK LIGHT	LED
D922	B30-2281-05	LCD BACK LIGHT	LED
D923	B30-2281-05	LCD BACK LIGHT	LED
D924	B30-2281-05	LCD BACK LIGHT	LED
D925	B30-2281-05	LCD BACK LIGHT	LED
D926	B30-2281-05	LCD BACK LIGHT	LED
D927	B30-2282-05	KEY BACK LIGHT	LED
D928	B30-2282-05	KEY BACK LIGHT	LED
D929	B30-2282-05	KEY BACK LIGHT	LED
D930	B30-2282-05	KEY BACK LIGHT	LED
D931	B30-2282-05	KEY BACK LIGHT	LED
D932	B30-2282-05	KEY BACK LIGHT	LED
D933	B30-2282-05	KEY BACK LIGHT	LED
D934	B30-2282-05	KEY BACK LIGHT	LED
D935	B30-2282-05	KEY BACK LIGHT	LED
D936	B30-2282-05	KEY BACK LIGHT	LED
D937	1SS416	Reverse Current Prevention(SRAM WR)	DIODE
IC901	TC7W66FK-F	AFO/BLC SW	MOS-IC
IC902	TC75S51FE(F)	AF Buffer AMP(AFO)	MOS-IC
IC903	XC6204B502PR	Voltage regulator(5C)	MOS-IC
IC904	XC6204B332M	Voltage regulator(33C)	MOS-IC
IC905	TC7SH126FU-F	Bus Buffer(TXD0)	MOS-IC
IC906	LM2682MMX	DC/DC Converter(N100C)	MOS-IC
IC907	TC7WH126FU-F	Dual Bus Buffer(RXD0/RXD1)	MOS-IC
IC908	TC7SH08FU-F	AND Gate(TXD1/RXD0)	MOS-IC
IC909	LMC7101BIM5	Buffer AMP(LCD Contrast ADJ)	MOS-IC
IC910	TC7MZ245FK	Bus Buffer(D0-D7)	MOS-IC
IC911	30620SPGPU3C	CPU	MPU IC
IC912	TC7WZ245FK-F	Bus Buffer(A1-A2)	MOS-IC
IC913	39VF16274IEKE	Flash ROM	ROM IC
Q901	SSM3K15TE(F)	AFO SW	FET
Q902	DTC144EE	HK/RXD0 SW	TRANSISTOR
Q904	DTC144EE	HK/RXD0 SW	TRANSISTOR
Q905	DTC114EE	TX/RX LED(TX)	TRANSISTOR
Q906	DTC114EE	TX/RX LED(BUSY)	TRANSISTOR
Q908	DTC114EE	LCD BACK LIGHT SW	TRANSISTOR

Q909	DTC114EE	DIMER SW(LCD BACK LIGHT)	TRANSISTOR
Q910	12A02CH	LCD BACK LIGHT SW	TRANSISTOR
Q911	SSM3K15TE(F)	DIMER SW(LCD BACK LIGHT)	FET
Q912	SSM3K15TE(F)	WR SW(Flash ROM)	FET
Q913	UPA672T-A	LCD RESET SW	FET

X57-7750- Parts List

REF.NO	PARTNO	DESCRIPTION	PART NAME
D1	HSC119	Ripple filter	DIODE
D2	DA221	Bypass diode	DIODE
D3	1SV325F	Frequency control	VARIABLE CAPACITANCE DIODE
D4	1SV325F	Frequency control	VARIABLE CAPACITANCE DIODE
D7	1SV282-F	Frequency control	VARIABLE CAPACITANCE DIODE
D8	1SV282-F	Frequency control	VARIABLE CAPACITANCE DIODE
D9	1SV282-F	Frequency control	VARIABLE CAPACITANCE DIODE
D10	1SV282-F	Frequency control	VARIABLE CAPACITANCE DIODE
D11	1SV282-F	Frequency control	VARIABLE CAPACITANCE DIODE
D12	1SV282-F	Frequency control	VARIABLE CAPACITANCE DIODE
D13	HSC119	Ripple filter	DIODE
D14	1SV278F	TX modulation	VARIABLE CAPACITANCE DIODE
D101	HVC131	T/R SW	DIODE
D102	02DZ5.6F-X,Y	PM DRAIN BIAS protection	ZENER DIODE
D103	L407CDB	Antenna switch (NX-800H(K2)only)	DIODE
D104	L407CDB	Antenna switch	DIODE
D106	L7091CER	Antenna switch	DIODE
D108	HSM88AS-E	Power Det	DIODE
D109	HSM88AS-E	Power Det	DIODE
D110	HSM88AS-E	Power Det	DIODE
D201	DAN235E	CF SW(W/N)	DIODE
D202	DAN235E	CF SW(W/N)	DIODE
D205	HVC131	T/R SW	DIODE
D206	HSC119	Ripple filter	DIODE
D207	1SV286F	Vari-Cap tune	VARIABLE CAPACITANCE DIODE
D208	1SV286F	Vari-Cap tune	VARIABLE CAPACITANCE DIODE
D209	1SV286F	Vari-Cap tune	VARIABLE CAPACITANCE DIODE
D210	1SV286F	Vari-Cap tune	VARIABLE CAPACITANCE DIODE
D212	1SV286F	Vari-Cap tune	VARIABLE CAPACITANCE DIODE
D213	1SV286F	Vari-Cap tune	VARIABLE CAPACITANCE DIODE
D216	HVC131	Antenna switch	DIODE
D401	02DZ18F-X	OVER DC Supply protection	ZENER DIODE
D403	1SS416	Reverse Current Prevention	DIODE
D404	22ZR-10D	Surge absorption	VARISTOR
D405	DSA3A1	Reverse protection	DIODE
D406	HSC119	Reverse Current Prevention(BLVL)	DIODE
D407	CRS02-Q	DC/DC Converter(50M)	DIODE
D408	1SS301F	Reverse Current Prevention(OR 33M/SBC 2)	DIODE
D409	1SS388F	DC/DC Converter(50M)	DIODE
D410	1SS388F	Reverse Current Prevention(Buck UP Battery)	DIODE
D411	1SS388F	Reverse Current Prevention(33BU)	DIODE
D501	1SS416	Line protection	DIODE
D502	1SS416	Line protection	DIODE
D503	1SS416	Reverse Current Prevention(PCS RF)	DIODE
D504	1SS416	Reverse Current Prevention(RXD)	DIODE
D506	1SS416	Reverse Current Prevention(OR G_RXD2)	DIODE
D507	1SS416	Reverse Current Prevention(OR RXD2)	DIODE
D508	DA204U	Line protection	DIODE
D509	1SS416	Reverse Current Prevention	DIODE
D510	1SS416	Reverse Current Prevention	DIODE
D511	DA204U	Line protection(RXD2)	DIODE
D512	DA204U	Line protection(AID9)	DIODE
D702	HSC119	SQ Voltage Control	DIODE
D703	RB706F-40	Noise Detector(SQ)	DIODE
D704	RB706F-40	AF Detector(LIMIT)	DIODE
D705	RB706F-40	AF Detector(LIMIT)	DIODE
D706	EMZ6.8N	Line protection(DI)	ZENER DIODE
D707	EMZ6.8N	Line protection(DEO)	ZENER DIODE
D901	DA204U	Line protection(BER CK)	DIODE
D902	DA204U	Line protection(BER DT)	DIODE

D903	DA204U	Line protection(AUXIO1)	DIODE
D904	DA204U	Line protection(AUXIO2)	DIODE
D905	02DZ18F-X	OVER DC Supply protection	ZENER DIODE
D906	02DZ18F-X	OVER DC Supply protection	ZENER DIODE
D907	DA204U	Line protection(AUXIO3)	DIODE
D908	DA204U	Line protection(AUXIO4)	DIODE
D909	1SS355	Reverse Current Prevention(SB)	DIODE
D910	02DZ18F-X	OVER DC Supply protection	ZENER DIODE
D911	DA204U	Line protection(AUXIO8)	DIODE
D912	DA204U	Line protection(AUXIO5)	DIODE
D913	1SS355	Reverse Current Prevention(SB)	DIODE
D914	02DZ18F-X	OVER DC Supply protection	ZENER DIODE
IC1	LM73CIMKX-0	Temp sensor	MOS-IC
IC2	LMC7101BIM5	Buffer AMP(TCXO modulation)	MOS-IC
IC3	SKY72300-362	PLL IC	MOS-IC
IC4	LMC7101BIM5	Buffer AMP(VCO tune)	MOS-IC
IC5	TC75W51FK(F)	VCO modulation/Buffer AMP(CV)	MOS-IC
IC101	TA75W01FUF	Auto Power Control	MOS-IC
IC102	RA30H4047M123	Final AMP(RF Power Module) for NX-800(K2)	MOS-IC
IC102	RA55H4047A123	Final AMP(RF Power Module) for NX-800H(K2)	MOS-IC
IC103	TA75W01FUF	Auto Power Control	MOS-IC
IC201	MCP6021-E/OT	Buffer AMP(2nd IF DET)	MOS-IC
IC202	TK10931VTL-G	IF IC	ANALOGUE IC
IC203	TC75W51FK(F)	Buffer AMP (RSSI/VAGC)	MOS-IC
IC204	SPM5001	1st Mixer	MOS-IC
IC205	LMC7101BIM5	Buffer AMP (BPF tune)	MOS-IC
IC206	LMC7101BIM5	Buffer AMP (BPF tune)	MOS-IC
IC401	XC6108C23CMN	Voltage Detector(BINT)	MOS-IC
IC402	XC6204B332P1	Voltage regulator(33M)	MOS-IC
IC403	NJM78M08FA-ZB	Voltage regulator(80C)	MOS-IC
IC404	TA7805FQ	Voltage regulator(50C)	MOS-IC
IC405	LT1616ES6-PBF	DC/DC Converter(50M)	ANALOGUE IC
IC406	TK71733S	Voltage regulator(33C)	BI-POLAR IC
IC407	XC6204B332M	Voltage regulator(33GPS)	MOS-IC
IC408	XC6204B332M	Voltage regulator(33A)	MOS-IC
IC409	XC6205B152PRN	Voltage regulator(15M)	ANALOGUE IC
IC410	XC9101D09AKR	DC/DC Converter(150C)	ANALOGUE IC
IC501	29PL032J70BFI	FLASH ROM	ROM IC
IC502	320VC5416ZU12	DSP	MPU IC
IC503	L1024GL-70LLI	SRAM	SRAM IC
IC504	RV5C386A	RTC	MOS-IC
IC505	TC7SH08FU-F	DELAY	MOS-IC
IC506	XC6109C29ANN	RESET(CPU)	MOS-IC
IC507	TC7SH126FU-F	Buffer AMP(OP:20pin BER CLK/BER DATA)	MOS-IC
IC508	SM5023CNDH-G	Buffer AMP(18.432MHz)	MOS-IC
IC509	TC7WT125FUF	Buffer AMP(BER CLK/BER DATA)	MOS-IC
IC510	BU7317GUKW1	CPU	MOS-IC
IC511	TC7SH08FU-F	AND (PCS RF/HD2)	MOS-IC
IC512	TC7SET08FU-F	LEVEL SHIFT(AND ITXD1/SCTXD)	MOS-IC
IC513	TC7SET08FU-F	Buffer AMP(TXD2)	MOS-IC
IC514	TC7WBD125AFK	LEVEL SHIFT(I2CCK/I2CDT)	MOS-IC
IC515	TC7WT126FU-F	LEVEL SHIFT(TXDO/RTSO)	MOS-IC
IC516	TC7WH126FU-F	LEVEL SHIFT(RXDO/CTSO)	MOS-IC
IC517	PCA9535RGE	I/O EXPANDER	MOS-IC
IC518	ADM202EARNZ	RS-232C Driver	MOS-IC
IC701	TC75S51FE(F)	LPF(RXAF)	MOS-IC
IC702	TC75W51FK(F)	LPF(MOD)	MOS-IC
IC703	TC75W51FK(F)	LPF(APC/DEO)	MOS-IC
IC704	MCP6021-E/OT	Buffer AMP(2nd IF DET)	MOS-IC
IC705	TC75W51FK(F)	BRF/Buffer AMP (SQ)	MOS-IC
IC706	TC75W51FK(F)	LPF/SUM AMP	MOS-IC
IC707	TC7W53FK(F)	RXAF/RXEI SW	MOS-IC
IC708	TC7W53FK(F)	AF SW(TXO/TXI)	MOS-IC

IC709	TC75W51FK(F)	SUM AMP(AI/TONE/MI1 MI2)/(MOD/DI)	MOS-IC
IC710	TC7W53FK(F)	AF SW(AI TONE OPT9/VREF)	MOS-IC
IC711	TC75W51FK(F)	SUM AMP(AF)/VREF	MOS-IC
IC712	M62364FP-F	DAC	MOS-IC
IC713	TC7W53FK(F)	AO SW	MOS-IC
IC714	TC75S51FE(F)	LEVEL SHIFT(TXD)	MOS-IC
IC715	LA4425A	AF Power AMP	ANALOGUE IC
Q1	2SC5383-T111	Ripple filter	TRANSISTOR
Q3	2SC5636	Buffer AMP(PLL Fin)	TRANSISTOR
Q4	2SC5383-T111	Ripple filter	TRANSISTOR
Q5	2SK508NV(K52)	VCO	FET
Q6	2SK508NV(K52)	VCO	FET
Q7	SSM6L05FU-F	T/R SW(VCO)	FET
Q8	SSM3J05FU-F	T/R SW(VCO)	FET
Q9	2SC5636	Buffer AMP(VCO)	TRANSISTOR
Q10	2SC5636	Buffer AMP(RF)	TRANSISTOR
Q11	2SK1215-E(E)	Buffer AMP(19.2MHz)	FET
Q101	2SC5108(Y)F	RF Pre-Drive AMP	TRANSISTOR
Q102	2SC5455-A	RF Drive AMP	TRANSISTOR
Q105	DTC114EE	SW(RF Pwer H/L)	TRANSISTOR
Q106	2SK1830F	SW(RF Pwer H/L)	FET
Q201	DTA114EE	SW(W/N)	TRANSISTOR
Q202	DTC144EE	SW(W/N)	TRANSISTOR
Q203	2SC5636	2nd Local buffer AMP(X3)	TRANSISTOR
Q204	2SC3356(R23)	1st IF AMP	TRANSISTOR
Q205	2SC3356(R23)	1st IF AMP	TRANSISTOR
Q208	2SC5636	Buffer AMP(Local)	TRANSISTOR
Q209	2SC5383-T111	Ripple filter	TRANSISTOR
Q210	2SC3357-A	LNA	TRANSISTOR
Q401	DTC114EE	SW (OVER DC Supply protection)	TRANSISTOR
Q402	DTC114EE	DC SW(SB)	TRANSISTOR
Q403	DTC114TE	DC SW(IGN)	TRANSISTOR
Q404	2SJ645	DC SW(SB)	FET
Q405	2SA1955A-F	DC SW(SCTAM1)	TRANSISTOR
Q406	UPA672T-A	DC SW(33BU)	FET
Q407	12A02CH	DC SW(80T)	TRANSISTOR
Q408	12A02CH	DC SW(80R)	TRANSISTOR
Q409	12A02CH	DC SW(50R)	TRANSISTOR
Q410	SSM3K15TE(F)	DC SW(50MC)	TRANSISTOR
Q411	2SA1955A-F	DC SW(33BU)	TRANSISTOR
Q412	2SA1955A-F	DC SW(50MC)	TRANSISTOR
Q413	DTC114EE	DC SW(80T)	TRANSISTOR
Q414	DTC114EE	DC SW(80R)	TRANSISTOR
Q415	DTC114EE	DC SW(50R)	TRANSISTOR
Q416	SSM6L05FU-F	DC SW(50IF)	FET
Q417	SSM5H01TU-F	DC SW	FET
Q501	UPA672T-A	DC SW	FET
Q702	2SC4617(Q)	Noise AMP	TRANSISTOR
Q703	SSM3K15TE(F)	TONE SW	FET
Q704	2SC4738(GR)F	LIMIT	TRANSISTOR
Q705	2SA1832(GR)F	LIMIT	TRANSISTOR
Q706	2SJ243-A	MUTE(MI1)	FET
Q707	2SJ243-A	MUTE(MI2)	FET
Q708	2SA1832(GR)F	OPT10 SW	TRANSISTOR
Q709	DTC114EE	DC SW	TRANSISTOR
Q710	DTC363EU	AF MUTE	TRANSISTOR
Q901	QSX6	DC SW(AUXO1)	TRANSISTOR
Q902	QSX6	DC SW(AUXO1)	TRANSISTOR

CIRCUIT DESCRIPTION (NX-800)

1. Overview

NX-800H(K3) is a UHF Mobile transceiver designed to operate in the frequency range of 380 to 400MHz. The unit consists of receiver, transmitter, phase-locked loop (PLL) frequency synthesizer, base band parts, power supply, and control circuits.

2. Frequency Configuration

The receiver is a double-conversion super heterodyne using first intermediate frequency (IF) of 58.05MHz and second IF of 450kHz. Incoming signals from the antenna are mixed with the local signal from the PLL circuit to produce the first IF of 58.05MHz. This is then mixed with the 57.6MHz second local oscillator output to produce the 450kHz second IF. The transmit signal frequency is generated by the PLL VCO, and modulated by the signal from the DSP. It is then amplified and fed to the antenna.

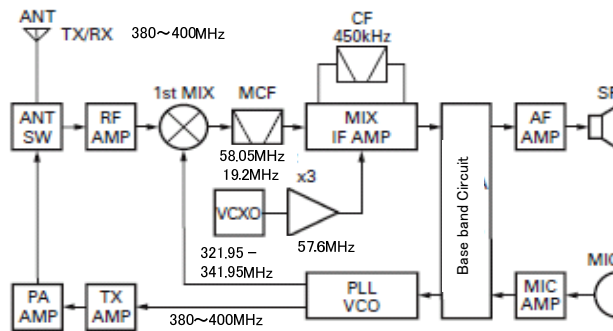


Fig. 1 Frequency configuration

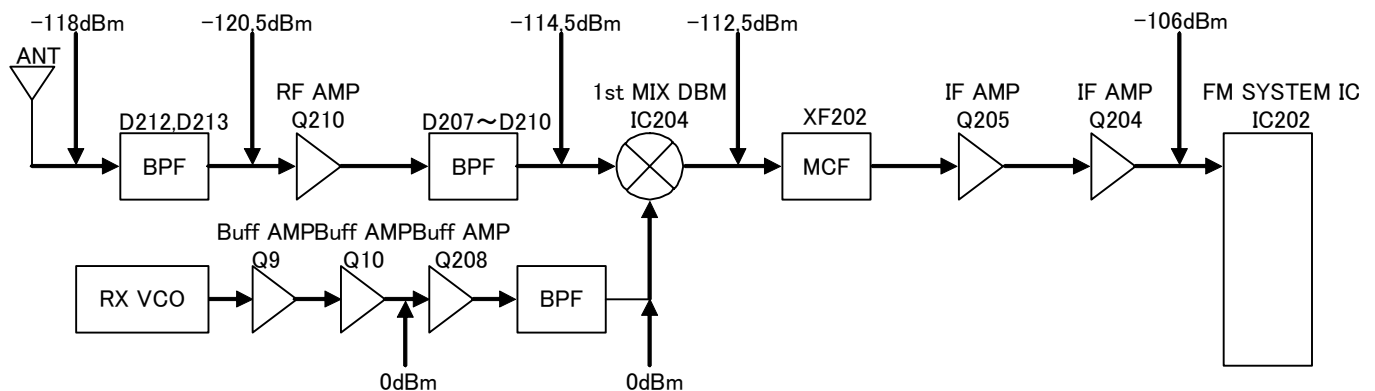
3. Receiver System

3-1. RF circuit

The front-end circuit consists of former BPF(D212,D213),RF amplifier Q210, and latter BPF(D207,D208,D209 and D210).

The BPF covers frequency ranges 450 to 520MHz.

The latter BPF(D207,D208,D209 and D210) attenuates the unwanted signals, and sends only the necessary signal to the first mixer.



3-2. First Mixer

The signal from the BPF is heterodyned with the first local oscillator signal from the PLL frequency synthesizer circuit at the first mixer DBM(IC204) to become a 58.05MHz first intermediate frequency(IF) signal.

The first IF signal is fed through a monolithic crystal filter(XF202) to further remove spurious signals.

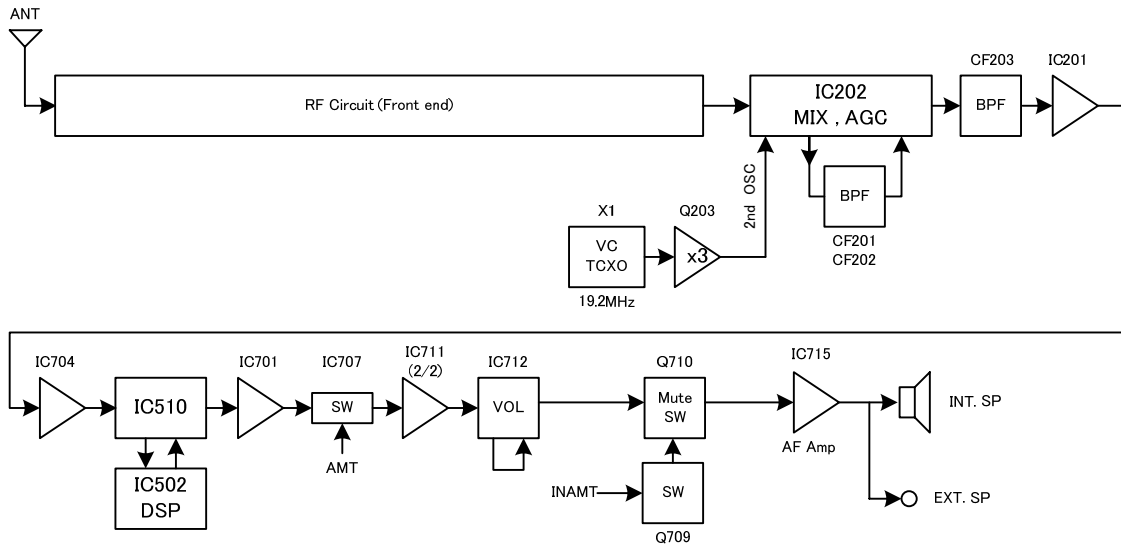
3-3. IF circuit

The first IF signal is passed through a four-pole monolithic crystal filter (XF202) to reject adjacent channel signal. The filtered first IF signal is amplified by the first IF amplifier (Q204,Q205) and then applied to the IF system IC (IC202). The IF system IC provides a second mixer, AGC amplifier, and RSSI (Received Signal Strength Indicator).

The second mixer mixes the first IF signal with the 57.6MHz of second local oscillator output and produces the second IF signal of 450kHz.

The second IF signal is passed through the ceramic filter (CF201,CF202) to reject the adjacent channel signal. The filtered second IF signal is amplified by AGC amplifier.

The signal from AGC amplifier is input to AD converter (IC510) through ceramic filter (CF203) and operational amplifier (IC201 and IC704).



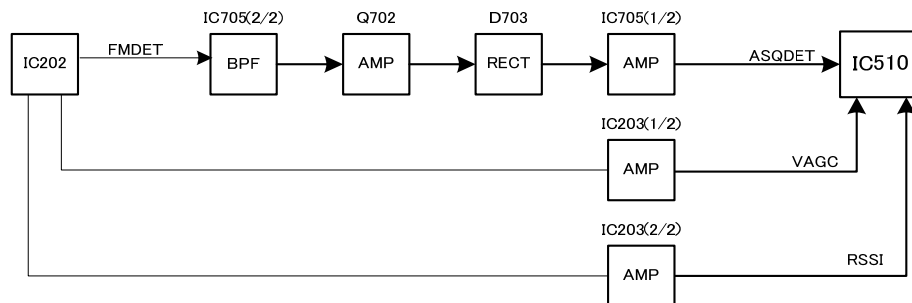
3-4. Audio amplifier circuit

Audio processing (high-pass filter, low-pass filter, de-emphasized and so on) at FM mode and decoding at NXDN mode are processed by DSP. Audio signal from IC510, IC502 goes through the amplifier (IC701). The signal then goes through mute switch (IC707), amplifier (IC711), and electronic volume control (IC712).

While busy, INAMT becomes High, turn switch (Q709) on and Mute switch (Q710) off, and signal is fed to AF Power Amp (IC715). While Non-busy, INAMT is become Low, turn switch (Q709) off and Mute switch (Q710) on, then there is not AF output.

3-5. Squelch Circuit

It amplifies the demodulated noise signal from IC202 after filtering through BPF circuit. Then, the amplified signal is converted to DC signal by the detection circuit. The converted signal is fed back to IC510.



4. Transmitter System

4-1. Audio Band Circuit

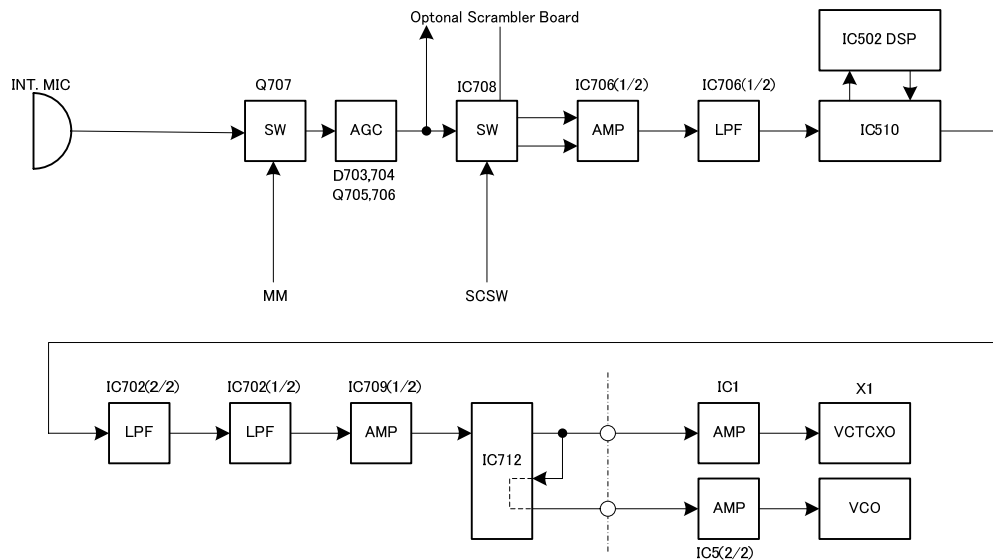
The signal from the microphone goes through the mute switch (Q706), the Mic-Mute signal (MM) becomes Low, then mute switch (Q706) is turned off. The signal from microphone goes through Mic-AGC (Q704,Q705,D704,D705), and goes through switch IC (IC708), and amplified by Mic-Amp IC706 (1/2), LPF IC706 (2/2) works as anti-aliasing filter.

If an optional scrambler board is installed, the switch (IC708) adjusts the signal path so that the audio signal is input to the scrambler board.

4-2. Base Band Circuit

The audio signal output from the base band circuit is converted to digital data of a sampling frequency of 48 kHz. This digital data is sent to the DSP (IC502), and voice signals of 300Hz or lower and frequencies of 3kHz or higher are cut off and an audio range 300Hz to 3kHz is extracted. The audio signal is then pre-emphasized in FM mode and synthesized with the signals, such as QT and DQT, as required, and is then output from the IC510. In Digital mode, the audio signal is converted to the 4-Level FSK base band signal and output from the IC510. The DTMF and MSK base band signals are also generated by the DSP and output by the IC510.

LPF (IC702) works as smoothing filter. The DAC (IC712) assigns the base band signal to the VCO and VCTCXO (X1). At this time, the level output according to the transmit carrier is fine-adjusted according to each modulation method.

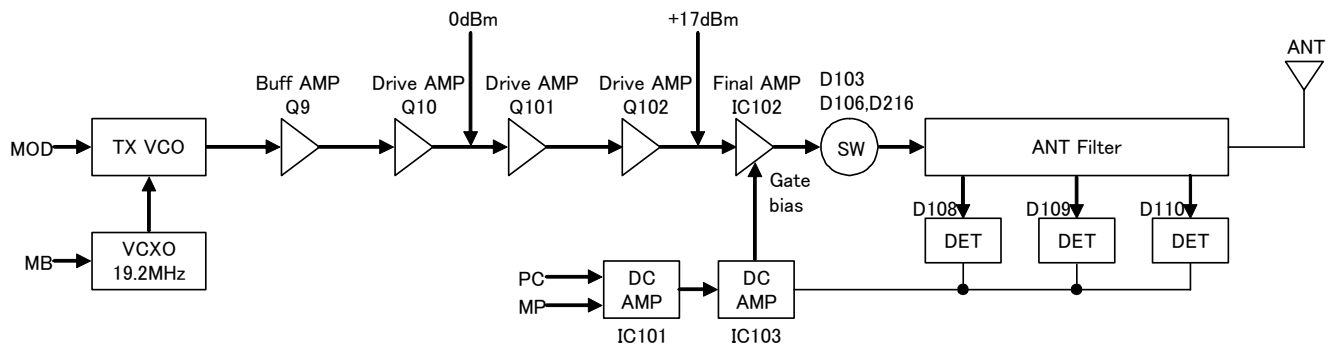


4-3. Drive and Final amplifier

The transmit signal obtained from the TX VCO buffer amplifier Q9, is amplified to approximately +17dBm by the driver amplifiers Q10, Q101 and Q102. This amplified signal is passed to the power amplifier module(power module)IC102, which consists of a MOS-FET amplifier and capable of transmission output power.

4-4. APC circuit

The Automatic transmission power control(APC) circuit stabilizes the transmitter output power at a predetermined level by detecting the power module output with a diodes D108,D109 and D110. Diodes D108,D109 and D110 apply a voltage to DC amplifier IC103(1/2). IC103(2/2) compares the APC control voltage (PC) generated by microprocessor IC510 and DC amplifier IC101(1/2,2/2) with the detection output voltage from IC103 (1/2) to control the V_{gg} Pin of IC102, and stabilizes transmission output. The APC circuit is configured to protect over-current of the power module due to fluctuations of the load at the antenna end and to stabilize transmission output at voltage and temperature variations.



5. PLL Frequency Synthesizer

5-1. VCTCXO (X1)

VCTCXO (X1) generates a reference frequency of 19.2MHz for the PLL frequency synthesizer. This reference frequency is applied to pin 9 of the PLL IC (IC3) and connected to IF circuit as a 2nd local signal through Tripler. The VCTCXO oscillation frequency is determined by DC voltage of VC terminal. The VC voltage is fixed to 1.65V by R1 and R2, and supplied to VC terminal through IC2. Modulation signal is also fed to VC terminal through IC2.

The frequency adjustment is achieved by switching the ratio of dividing frequency that is not adjusted by the DC voltage impressed to VC. The resolution of adjusting frequency is approximately 4Hz.

5-2. VCO

There is a RX VCO and a TX VCO.

The TX VCO (Q6) generates a transmit carrier and the RX VCO (Q5) generates a 1st local signal. For the VCO oscillation frequency, the transmit carrier is 450 to 520 MHz and the 1st local signal is 391.95 to 461.95MHz.

The VCO oscillation frequency is determined by one system of operation switching terminal "T/R" and two systems of voltage control terminals "C/V" and "V-assist".

The operation switching terminal, "T/R", is controlled by the control line (/T_R) output from the CPU (IC510). When the /T_R logic is low, the VCO outputs the transmit carrier and when it is high, it outputs a 1st local receive signal.

The voltage control terminals, "CV" and "V-assist", are controlled by the PLL IC (IC3) and CPU (IC510) and the output frequency changes continuously according to the applied voltage. For the modulation input terminal, "VCOIMOD", the output frequency changes according to the applied voltage. This is used to modulate the VCO output. "VCOMOD" works only when "/T_R" is low.

5-4. PLL IC (IC3)

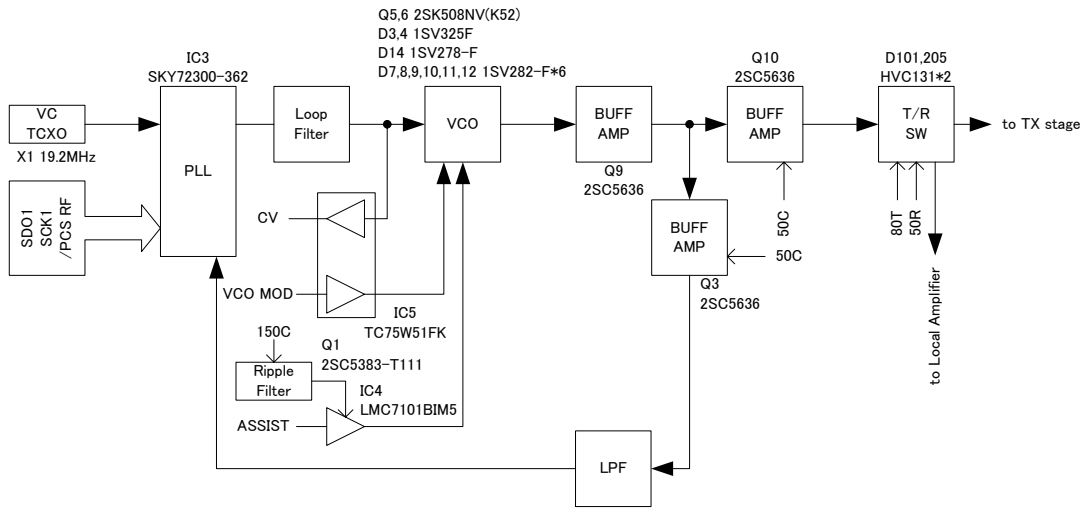
PLL IC compares the differences in phases of the VCO oscillation frequency and the VCTCXO reference frequency, returns the difference to the VCO CV terminal and realizes the "Phase Locked Loop" for the return control. This allows the VCO oscillation frequency to accurately match (lock) the desired frequency.

When the frequency is controlled by the PLL, the frequency convergence time increases as the frequency difference increases when the set frequency is changed. To supplement this, the CPU is used before control by the PLL IC to bring the VCO oscillation frequency close to the desired frequency. As a result, the VCO CV voltage does not change and is always stable at approx. 3.0V.

The desired frequency is set for the PLL IC by the CPU (IC510) through the 3-line "SDO1", "SCK1", "PCS_RF" serial bus. Whether the PLL IC is locked or not is monitored by the CPU through the "PLD" signal line. If the VCO is not the desired frequency (unlock), the "PLD" logic is low.

5-6. Local Switch (D101, D205)

The connection destination of the signal output from the buffer amplifier (Q10) is changed with the diode switch (D101) that is controlled by the transmission power supply, 80T, and the diode switch (D205) that is controlled by the receive power supply, 50R. If the 80T logic is high, it is connected to a send-side pre-drive (Q101). If the 80T logic is low, it is connected to a local amplifier (Q208).



6. Control Circuit

The control circuit consists of CPU (IC510) and its peripheral circuits. IC510 mainly performs the following;

- 1) Switching between transmission and reception by PTT signal input.
- 2) Reading system, zone, frequency, and program data from the memory circuit.
- 3) Sending frequency program data to the PLL.
- 4) Controlling squelch on/off by the DC voltage from the squelch circuit.
- 5) Controlling the audio mute circuit by decode data input.

6-1. CPU

The CPU (IC510) is 32bit RISC processor, equipped with peripheral function and ADC/DAC.

This CPU operates at 18.432MHz clock and 3.3V /1.5V DC. Controls the flash memory, SRAM, DSP, the receive circuit, the transmitter circuit, the control circuit, and the display circuit and transfers data to or from an external device.

6-2. Memory Circuit

Memory circuit consists of the CPU (IC510) and the SRAM(IC503),the flash memory (IC501). The flash memory has capacity of 32Mbit that contains the transceiver control program for the CPU and stores the data. It also stores the data for transceiver channels and operating parameter that are written by the FPU. This program can be easily written from external devices. The SRAM has capacity of 1Mbit that contains work area and data area.

■ Flash memory

Note : The flash memory stores the data that is written by the FPU (KPG-111D), tuning data (Deviation, Squelch, etc.) ,and firmware program (User mode, Test mode, Tuning mode, etc.). This data must be rewritten when replacing the flash memory.

■ SRAM (static memory)

Note : The SRAM has temporary data area and work area.

When the power supply is off, it is backed up by an internal secondary lithium battery. Therefore, the save data does not break.

■ Real-time clock

The clock function is based on real-time clock IC (IC504). When the power supply is off, it is backed up by an internal secondary lithium battery

6-3. Display Unit

The display unit is composed of the CPU (IC911) and the memory IC (IC913), and the LCD & Key backlight etc. The LCD Ass'y (with LCD Driver) is controlled using the bus lines on the connector (CN905) of the display unit. It corrects the LCD contrast voltage using IC909.

6-4. Key Detection Circuit

Keys are detected using Key scan circuit in IC911. The /KI* and KO* signals that are normally pulled up go low when any key is pressed.

6-5. DSP

The DSP circuit consists of a DSP (IC502) and processes the base band signal. The DSP operates on an external clock of 18.432MHz (the same as the IC510), the I/O section operates at 3.3V and the core section operates at 1.5V. The DSP carries out the following processes:

- 4Level FSK processing
- Analog FM pre-emphasis/de-emphasis
- Vocoder processing between audio codec and modulation/demodulation
- CAI processing, such as error correction encoding
- QT/DQT encoding/decoding
- DTMF encoding/decoding
- MSK encoding/decoding
- 2-tone encoding/decoding
- Compressor/expander processing
- Voice scrambler processing
- Transmit/receive audio filtering processing
- Microphone amplifier AGC processing
- Audio mute processing
- Modulation level processing

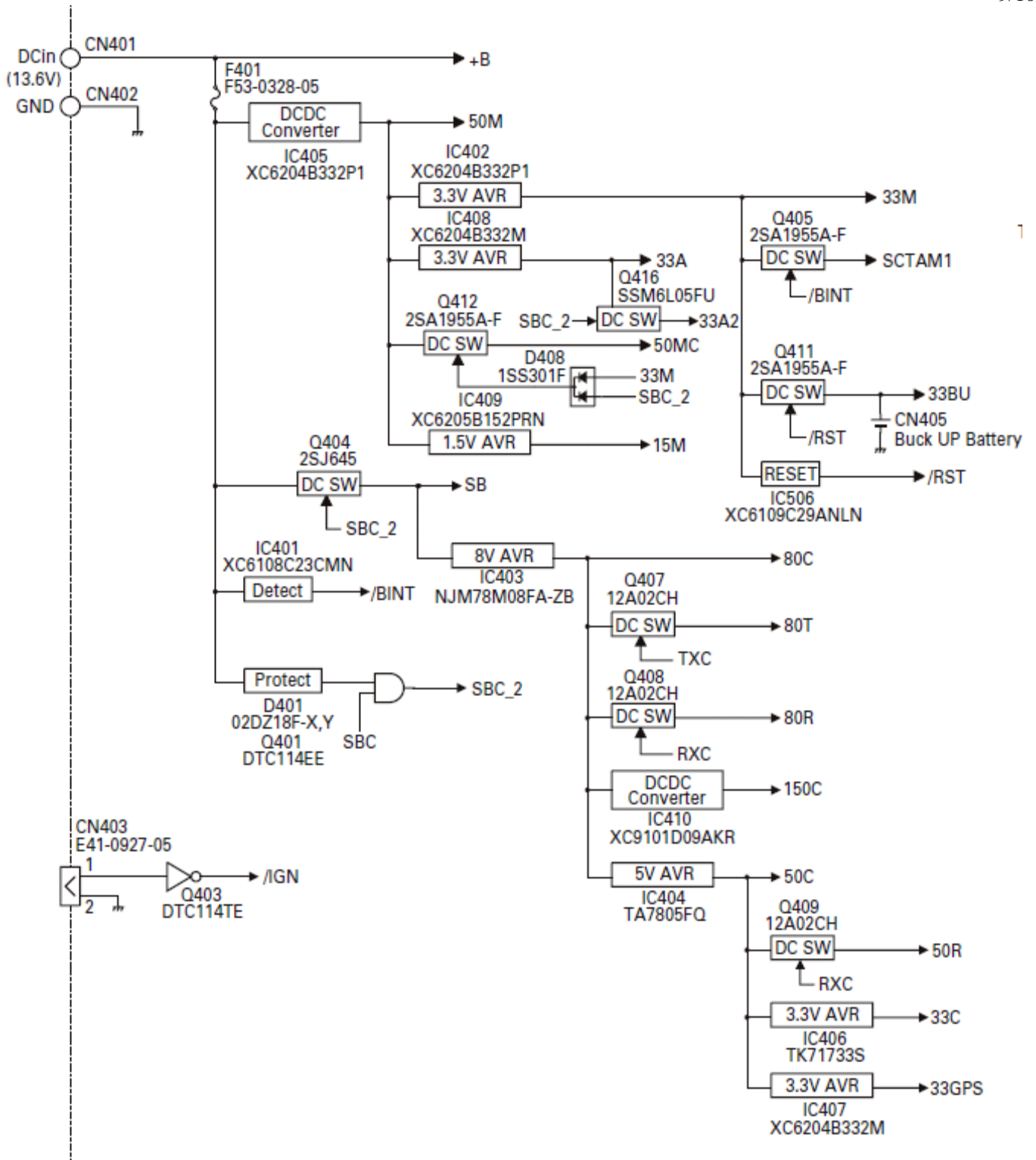
7. Power Supply Circuit

+B is connected to Final amplifier and DC/DC converter IC (IC405). IC405 regulates +B voltage to 5.0V (50M). 50M operates whenever +B is supplied. IC402 (33M), IC408 (33A) and IC409 (15M) are enabled while the 50M are operating. And Q412 are controlled by SBC_2 signal. If the SBC_2 signal becomes High, operates and Q412 (33A2 SW) is turned on. And Q416 are controlled by SBC_2 or 33M signal via D408. If the SBC_2 or 33M signal becomes High, operates and Q416 (50MC SW) is turned on.

33M and 15M provide the power to CPU, DSP, and Flash memory. At this time CPU starts working. Voltage detector IC (IC401) watches +B voltage. If +B voltage is higher than 8.6V, IC401 (/BINT) outputs High. If the /BINT signal is high, Q404 (SB SW) is turned on by SBC_2 signal from CPU. (High : SB=ON, Low : SB=OFF). When the SB is turned on, IC403 (80C), IC404 (50C), IC406 (33C), IC407 (33GPS) and IC410 (150C) start working.

The CPU controls the TXC signal to High during transmission to supply power (80T) for transmission circuit. The CPU controls the RXC signals to High during reception to supply power (80R, 50R) for reception circuit.

When the CPU detects the PSW (Power switch) signal, IGN (Ignition sense) signal or /BINT signal, it controls the SBC signal to Low, and turns the transceiver power (SB) off. When D401 and Q401 detect over-voltage condition, they turns Q404 (SB SW) off. But the CPU still works.



8. Signaling Circuit

8-1. Encode (QT/DQT/DTMF/MSK/2TONE)

Each signaling data signal of QT, DQT, DTMF and MSK is generated by the DSP circuit, superposed on a modulation signal and output from IC510. The modulation balance of the QT/DQT signal is adjusted by the D/A converter(IC712) and the resulting signal is routed to the modulation input of the VCO and VCXO (X1). The each deviation of the TX QT, DQT, DTMF and MSK tone is adjusted by changing the output level of the IC108 and the resulting signal is routed to VCO and VCXO. The RX DTMF tone is routed to the receive audio signal system, and is output from the speaker.

8-2. Decode (QT/DQT/DTMF/2-tone/MSK)

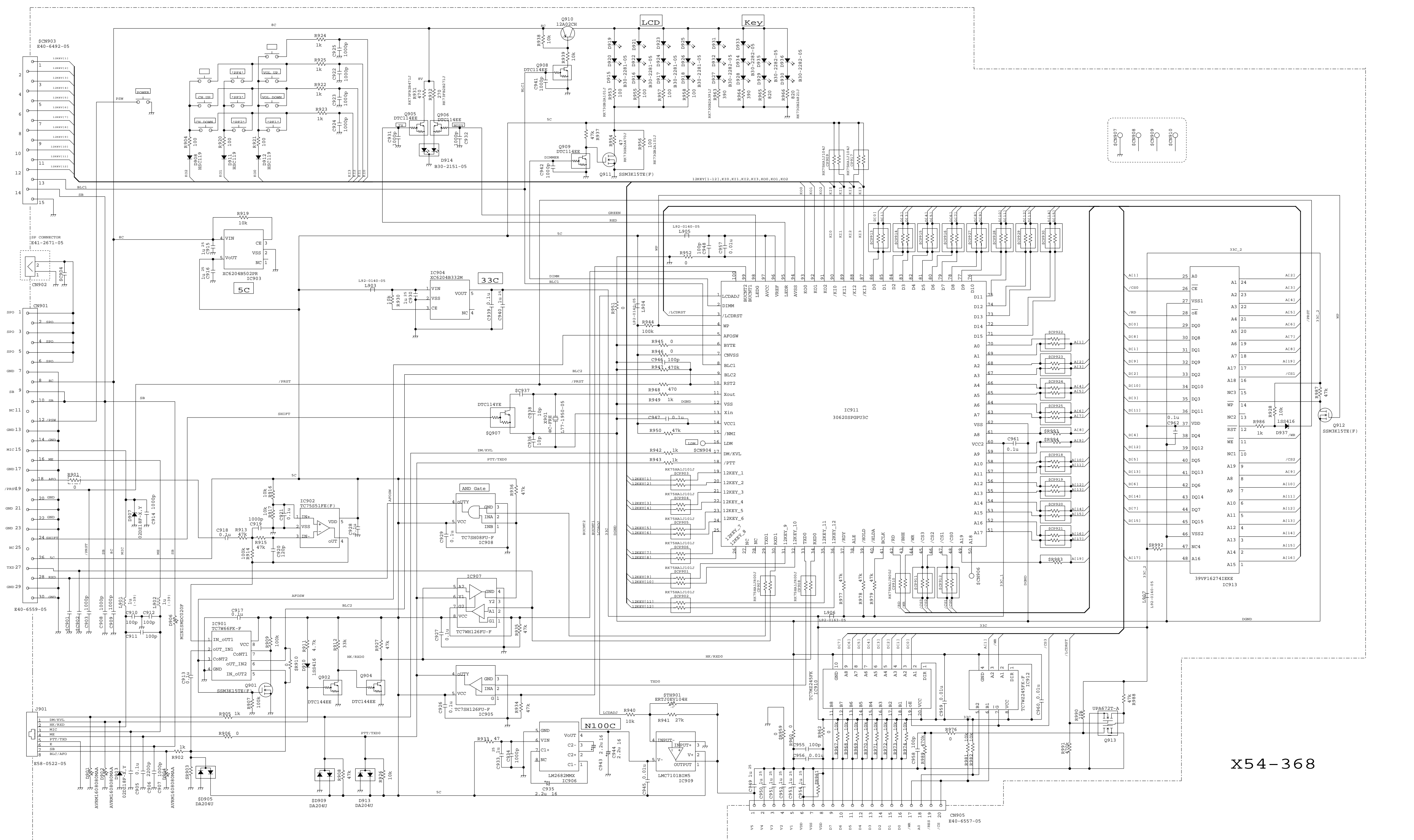
The audio signal is removed from the FM detection signal sent to the DSP circuit and the resulting signal is decoded.

9. Comander Circuit

The term “comander” means compressor and expander. The comander reduces noise by utilizing a compressor and an expander. The NX-800 contains DSP(IC502) to perform this operation. The NX-800 comander can be turned on or off using the FPU.

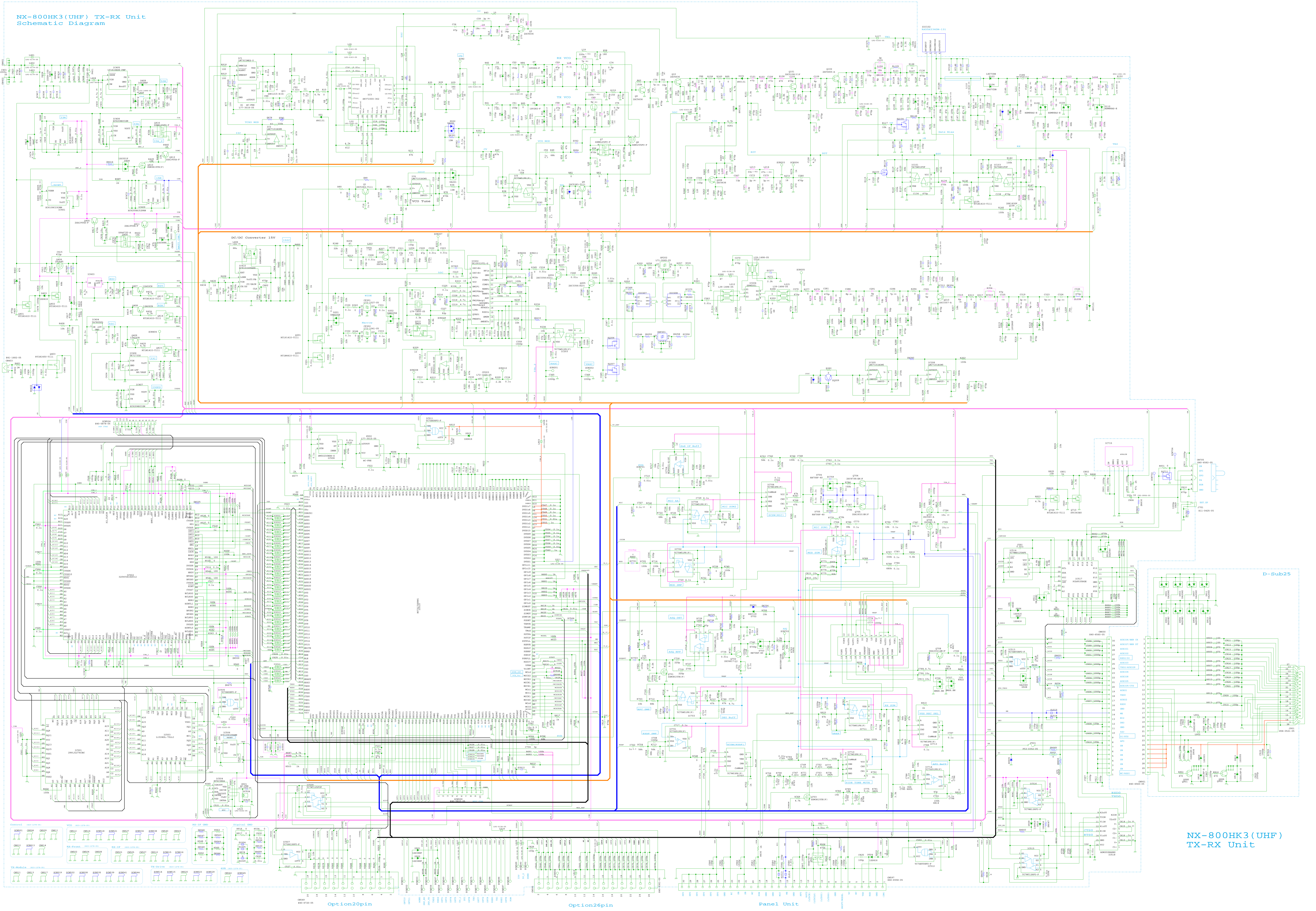
PARTNO	UNIT	PART NAME(E)	RATING/FEATURES	REMARKS
Z83-3261-03	1	INTERCONNECTION DIAGRAM		
X54-3680-10	1	DISPLAY UNIT		
X57-7750-18	1	TX-RX UNIT		
X57-7750-19	1	TX-RX UNIT		
A01-2194-11	1	METALLIC CABINET		
A10-4117-11	1	CHASSIS		
A62-1162-12	1	PANEL ASSY		
B09-0681-03	1	CAP		KAP
B11-1871-04	1	FILTER		LCD
B38-0922-15	1	LCD ASSY		
B41-1837-04	1	CAUTION STICKER		HOT SURFACE
B42-7325-04	1	SERIAL NUMBER STICKER		
B42-7417-04	1	STICKER		NEXEDGE
B44-1000-00	1	POS LABEL	'FOR PRINTING *(ROHS)	
B44-2163-04	1	UPC CODE LABEL		ITEM CARTON
B44-2165-04	5	UPC CODE LABEL		OUTER
B59-1653-20	1	PAMPHLET	'P.002,PRA,A4,1	HOT SURFACE
B62-2146-00	1	INSTRUCTION MANUAL		3 LANGUAGES
B72-2646-04	1	MODEL NAME-PLATE		NX-800HK3
E04-0167-15	1	RF COAXIAL RECEPTACLE(M)		
E30-7520-25	1	DC CORD		PIG TAIL
E30-7523-55	1	DC CORD ASSY		ACC
E37-1118-05	1	LEAD WIRE WITH CONNECTOR		SHORT CABLE
E37-1124-05	1	LEAD WIRE WITH CONNECTOR		2P/SP
E37-1448-05	1	FLAT CABLE		30P/D-SUB
E37-1449-05	1	FLAT CABLE		30P/PANEL
F10-2488-12	1	SHIELDING PLATE		CHASSIS
F10-2490-13	1	SHIELDING CASE		VCO
F10-3032-14	1	SHIELDING CASEASSY		FINAL
F10-3112-03	1	SHIELDING CASE		PM
F52-0024-05	1	FUSE(BLADE TYPE)	'15A/32V	
G10-1342-04	1	FIBROUS SHEET		BIRITSUKI
G10-1802-04	1	FIBROUS SHEET		LCD
G11-4343-04	1	SHEET		STEP
G13-2018-04	1	CUSHION		FINAL
G13-2047-04	1	CUSHION		DC SCREW
G13-2071-04	1	CONDUCTIVE CUSHION		PLL
G13-2101-04	1	CONDUCTIVE CUSHION		PM BACK
G13-2102-04	1	CONDUCTIVE CUSHION		PM TOP
G13-2279-04	1	CUSHION		PLATE-FFC
G53-1613-11	1	PACKING		SHIELDPLATE
G53-1616-03	1	PACKING		PHONE JACK
G53-1626-03	1	PACKING		D-SUB OUTER
G53-1643-04	1	PACKING		DC CORD
G53-1645-03	1	PACKING		D-SUB INNER
G53-1662-04	1	PACKING		ANT
G53-1676-03	1	PACKING		ZENSHU
H02-0624-13	1	INNER CARTON CASE		
H12-4274-03	1	PACKING FIXTURE		UPPER
H12-4275-02	1	PACKING FIXTURE		LOWER
H25-0747-04	1	PROTECTION BAG	'250X350	RADIO
H25-0763-04	1	PROTECTION BAG	'160/350/0.03	MANUAL
H52-2306-02	1	ITEM CARTON CASE		NX-800H
H62-1993-03	5	OUTER CARTON CASE		NX-800H
J19-1584-15	1	HOLDER		ACC MIC
J19-5464-13	1	HOLDER		SP

J19-5485-12	1 HOLDER		PANEL
J19-5502-03	1 HOLDER		LCD
J21-8479-02	1 MOUNTING HARDWARE		D-SUB
J21-8481-03	1 MOUNTING HARDWARE		SP
J21-8569-03	1 MOUNTING HARDWARE		LCD
J29-0726-03	1 BRACKET		ACC
J30-1289-04	1 SPACER		SP SHEET
K29-9401-03	1 KEY TOP		
N09-2292-05	1 HEXAGON HEAD SCREW		
N67-3008-48	1 PAN HEAD SEMS SCREW		
N87-2606-43	1 BRAZIER HEAD TAPTITE SCREW		
N87-2608-48	1 BRAZIER HEAD TAPTITE SCREW		
N99-2039-05	1 SCREW SET		ACC
T07-0757-15	1 SPEAKER		
T91-0639-55	1 MICROPHONE		ACC
LA4425A	1 MOS-IC	'SIP/5P	AF AMP
NJM78M08FA-ZB	1 ANALOGUE IC	'TO220F,3PIN,2.54MM	80C
RA55H3340M131	1 MOS-IC	'PM/4P	

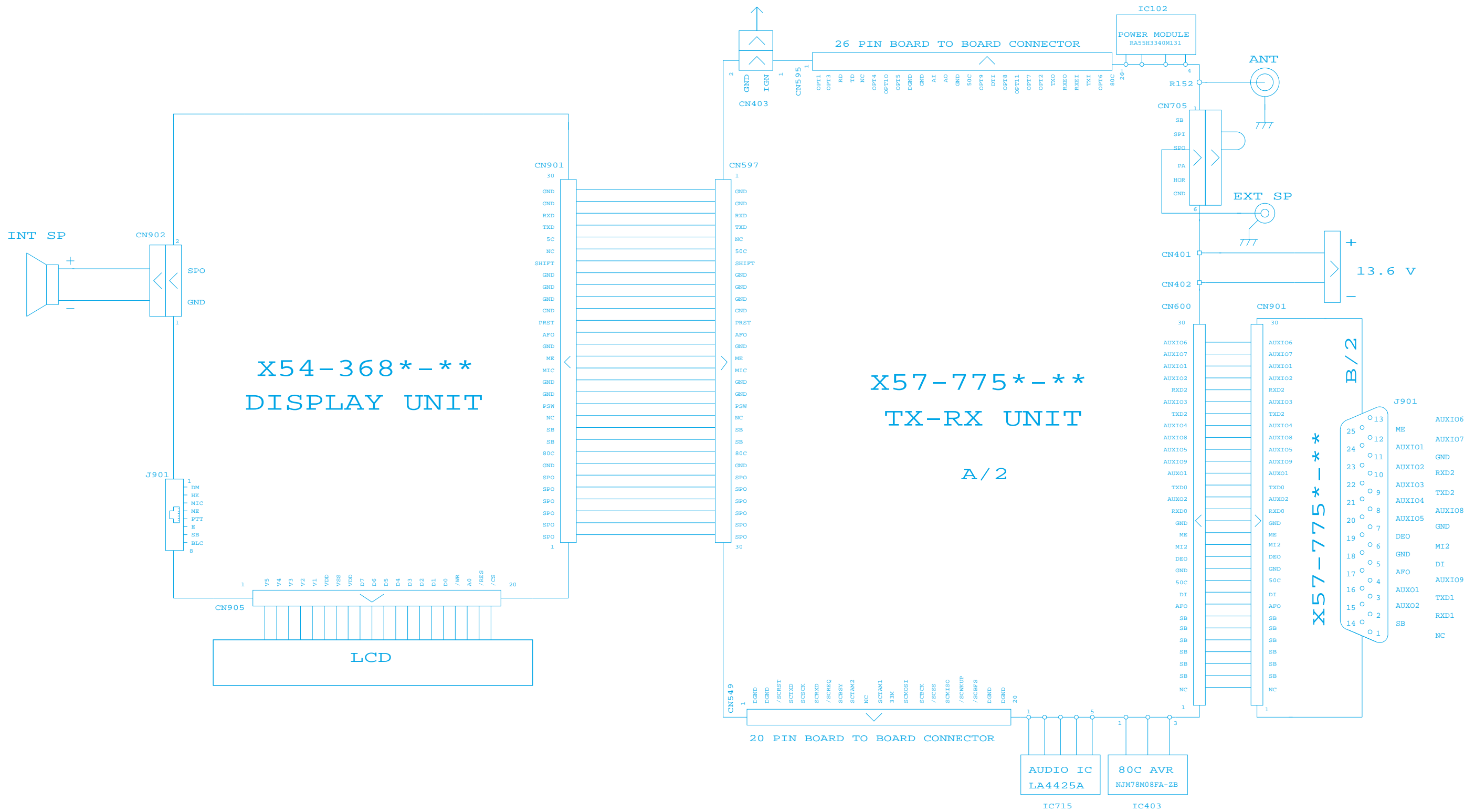


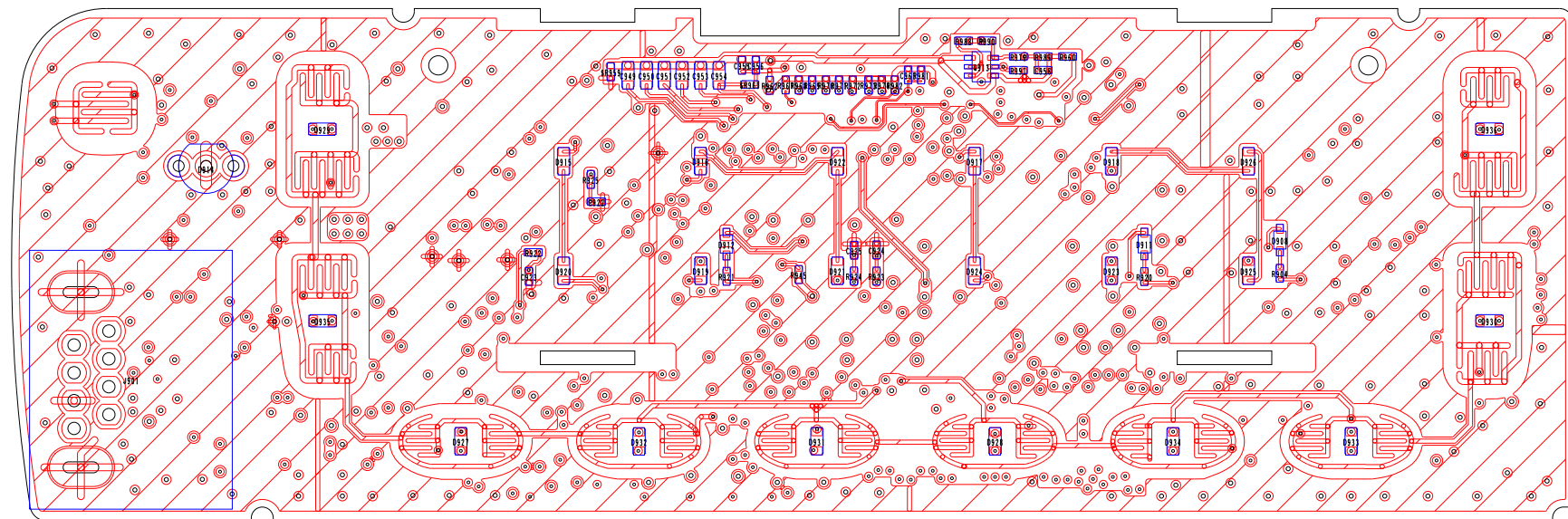
X54-368

NX-800HK3 (UHF) TX-RX Unit
Schematic Diagram

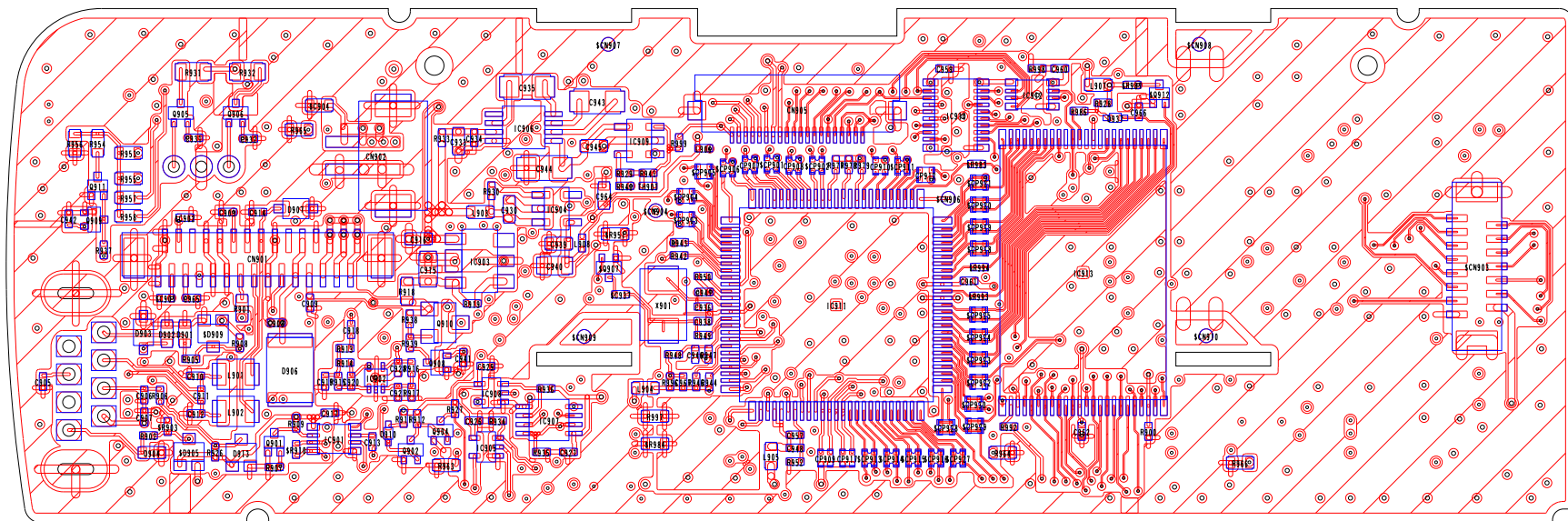


NX-800HK3 (UHF)
TX-RX Unit

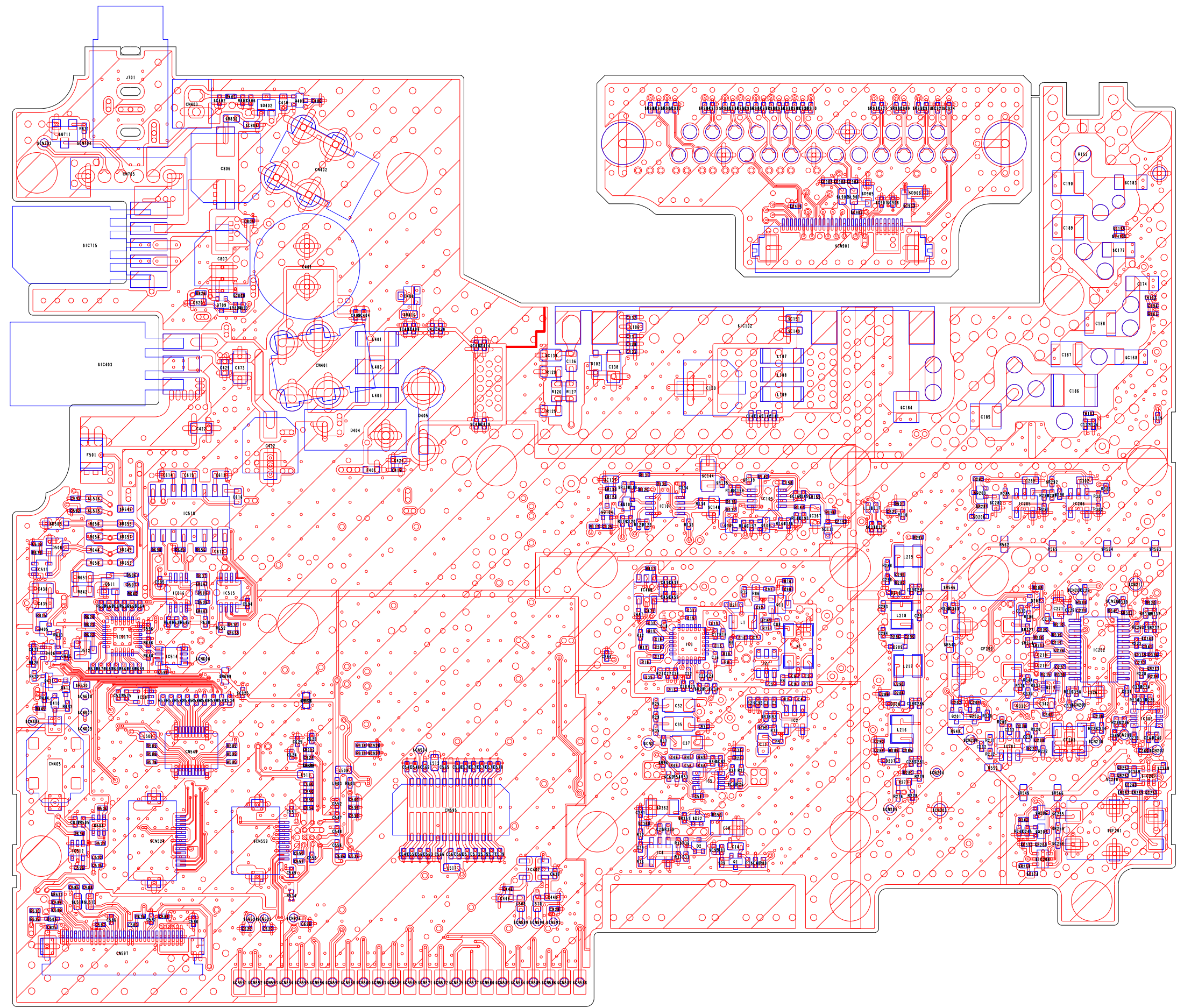




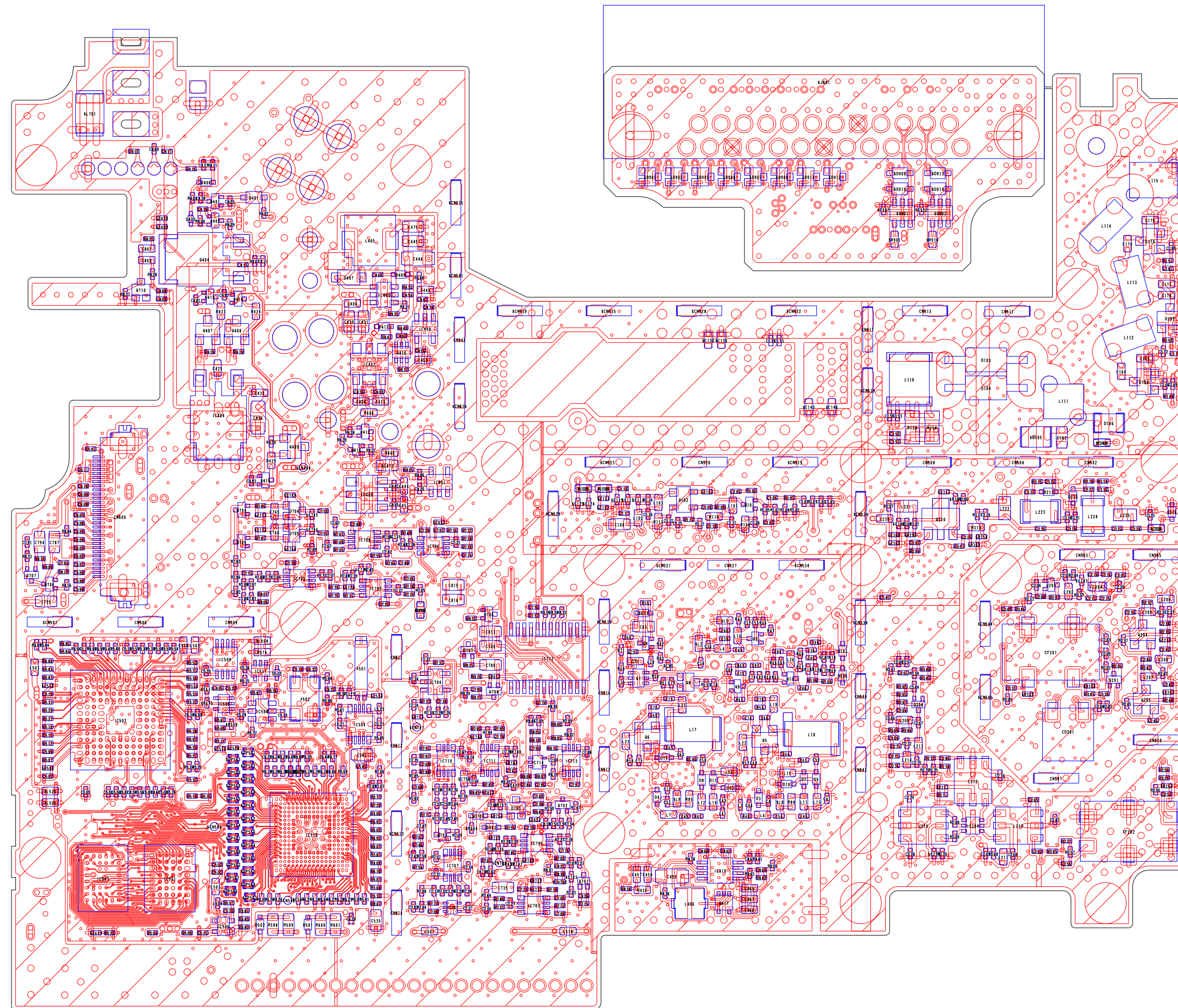
Layer 1



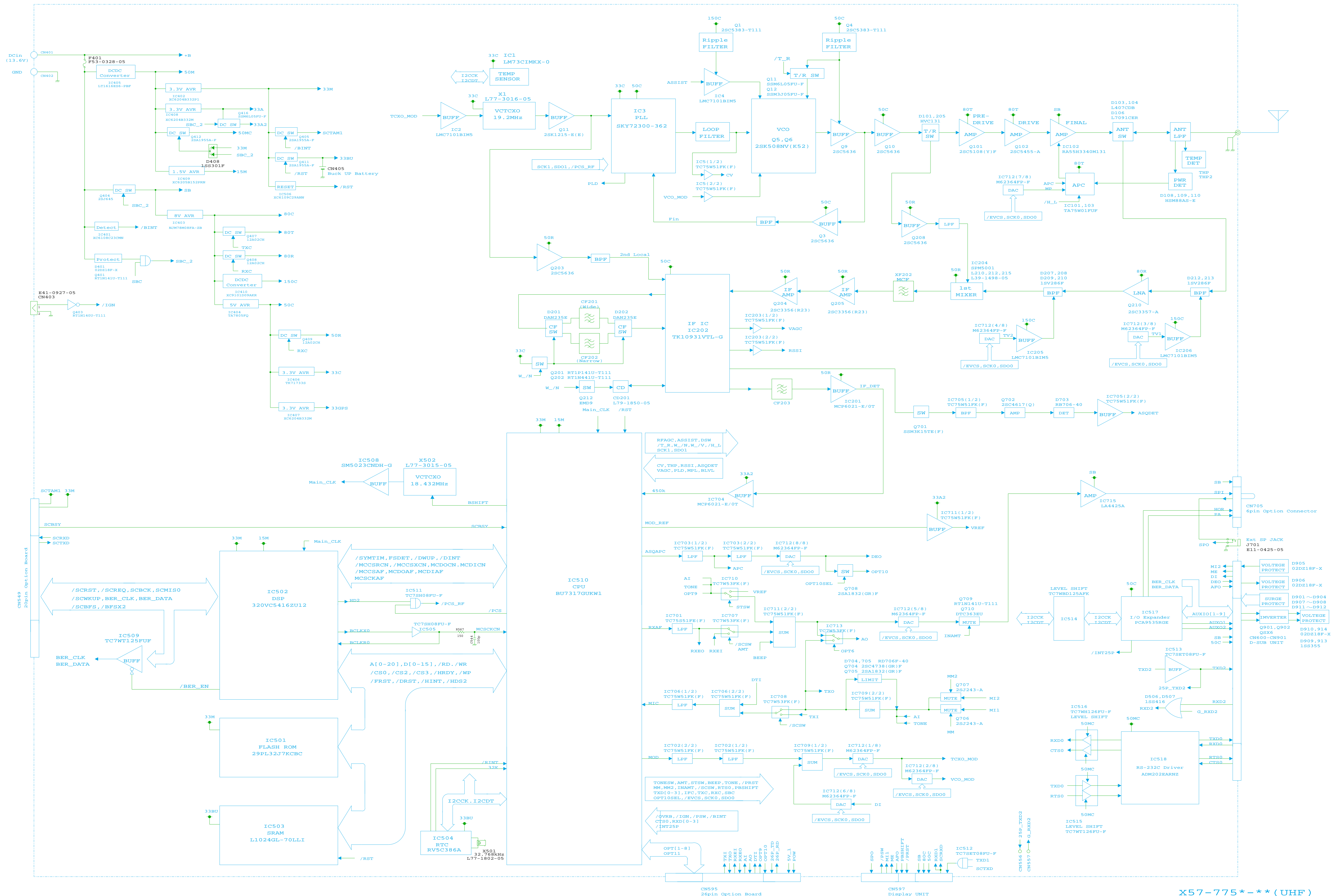
Layer 4



Layer1



Layer6



X57-775*-** (UHF)
 NX-800HK3 TX-RX UNIT BLOCK DIAGRAM

NX-800H-K3 Specifications

1. General

Model Name	NX-800H-K3
Description of Product	UHF DIGITAL TRANSCEIVER
Category	Mobile Device
Frequency Ranges	380MHz to 400MHz
Number of Channels:	Zone 128max. Channels 250max. (per Zone)
Type of Emission	16K0F3E, 14K4F1D, 11K0F3E, 8K30F1E, 8K30F1D, 8K30F7W, 8K10F1E, 8K10F1D, 4K00F1E, 4K00F1D, 4K00F7W, 4K00F2D
Power Supply Voltage:	DC 13.6V \pm 20%
Antenna Impedance:	50 Ω
Operating Temperature:	-30 °C to +60 °C
Dimension:	W 160 mm x D 171.5 mm x H 45 mm
Weight:	1.38 kg

2. RECEIVER

Conversion type	Double conversion
Intermediate freq	1st 58.05MHz (Lower) 2nd 450 kHz (Lower)

3. TRANSMITTER

Output Power	45W (Power output continuously variable to 10 W)
Maximum deviation:	\pm 5 kHz (16K0F3E) / \pm 2.5 kHz (11K0F3E)
Frequency stability:	\pm 1.0 ppm (-30 to +60 °C)
Current consumption:	13.0 A max.