

# IC-7800 ADJUSTMENT PROCEDURES

## 1 PREPARATION BEFORE SERVICING

### ■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GREDE AND RANGE	EQUIPMENT	GREDE AND RENGE
AC outlet	Voltage : 85 V–265 V	Audio generator	Frequency range : 300–3000 Hz Measuring range : 1–500 mV
RF power meter (terminated type)	Measuring range : 10–200 W Frequency range : 1.8–100 MHz Impedance : 50 Ω SWR : Less than 1.2 : 1	Standard signal generator (SSG)	Frequency range : 0.1–100 MHz Output level : 0.1 μV–32 mV (–127 to –17 dBm)
Frequency counter	Frequency range : 0.1–100 MHz Frequency accuracy : ±0.5 ppm or better Sensitivity : 100 mV or better	Digital multimeter	Input impedance : 10 MΩ/DC or beter
RF voltmeter	Frequency range : 0.1–100 MHz Measuring range : 0.01–10 V	AC millivoltmeter	Measuring range : 10 mV–10 V
FM deviation meter	Frequency range : DC–500 MHz Measuring range : 0 to ±5 kHz	DC voltmeter	Input impedance : 50 kΩ/V DC or better
Modulation analyzer	Frequency range : At least 90 MHz Measuring range : 0–100 %	DC ammeter	Measurement capability: 1 A/30 A
Distortion meter	Frequency range : 1 kHz ±10 % Measuring range : 1–100 %	Spectrum analyzer	Frequency range : At least 90 MHz Spectraum bandwidth : 100 kHz or more
Oscilloscope	Frequency range : DC–20 MHz Measuring range : 0.01–20 V	Attenuator	Power attenuation : 50 or 60 dB Capacity : 150 W or more
		External speaker	Input impedance : 8 Ω Capacity : 5 W or more
		Terminator	Resistance : 50 and 150 Ω Capacity : 150 W or more

## 2 OSC UNIT ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
REFERENCE OUTPUT	1 <ul style="list-style-type: none"> <li>Set the OSC unit to the external reference mode on the set mode.</li> <li>MAIN display frequency : 10.000 MHz</li> <li>Connect an SSG to J71 on the OSC unit and set as : <ul style="list-style-type: none"> <li>Frequency : 10.000 MHz</li> <li>Level : 71 mV* (-10 dBm)</li> <li>Modulation : OFF</li> </ul> </li> <li>Terminates J73 with 50 Ω.</li> <li>Receiving</li> </ul>	OSC	Connect an RF voltmeter to the J72.	Maximum voltage	OSC	L61, L62
REF IN OUTPUT	2 <ul style="list-style-type: none"> <li>MAIN display frequency : 10.000 MHz</li> <li>Receiving</li> </ul>	OSC	Connect an RF voltmeter to the J72.	0 dBm ±3.0 dB		Verify
	<ul style="list-style-type: none"> <li>Terminates J72 with 50 Ω.</li> <li>SUB display frequency : 10.000 MHz</li> <li>Receiving</li> </ul>		Connect an RF voltmeter to the J73.	0 dBm ±3.0 dB		Verify
REF OUT OUTPUT	3 <ul style="list-style-type: none"> <li>Set the OSC unit to the internal reference mode on the set mode.</li> <li>MAIN display frequency : 10.000 MHz</li> <li>Receiving</li> </ul>	OSC	Connect an RF voltmeter to the J71.	-10.0 dBm ±3.0 dB		Verify
	<ul style="list-style-type: none"> <li>Terminates J73 with 50 Ω.</li> <li>SUB display frequency : 10.000 MHz</li> <li>Receiving</li> </ul>		Connect an RF voltmeter to the J72.	0 dBm ±3.0 dB		Verify
	<ul style="list-style-type: none"> <li>Terminates J72 with 50 Ω.</li> <li>SUB display frequency : 10.000 MHz</li> <li>Receiving</li> </ul>		Connect an RF voltmeter to the J73.	0 dBm ±3.0 dB		Verify

\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.

### 3 RX PLL-A UNIT ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
40M OUTPUT	1 <ul style="list-style-type: none"> <li>MAIN display frequency : 40.000 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>	RX PLL-A	Connect an RF voltmeter to the CP701 (40MHz).	Maximum voltage	RX PLL-A	L702, L703
LPL LOCK VOLTAGE	1 <ul style="list-style-type: none"> <li>MAIN display frequency : 0.030 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>	RX PLL-A	Connect a DC voltmeter to the CP1 (LV1).	2.0 V $\pm$ 0.1 V	RX PLL-A	C154
	2 <ul style="list-style-type: none"> <li>MAIN display frequency : 7.999 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>			Less than 3.0 V		Verify
HPL LOCK VOLTAGE (VCO1)	1 <ul style="list-style-type: none"> <li>MAIN display frequency : 7.999 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>	RX PLL-A	Connect a DC voltmeter to the CP2 (LV2).	6.0 V $\pm$ 0.1 V	RX PLL-A	C222
(VCO2)	2 <ul style="list-style-type: none"> <li>MAIN display frequency : 14.999 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>			6.0 V $\pm$ 0.1 V		C232
(VCO3)	3 <ul style="list-style-type: none"> <li>MAIN display frequency : 21.999 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>			6.0 V $\pm$ 0.1 V		C242
(VCO4)	4 <ul style="list-style-type: none"> <li>MAIN display frequency : 29.999 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>			6.0 V $\pm$ 0.1 V		C252
(VCO5)	5 <ul style="list-style-type: none"> <li>MAIN display frequency : 44.999 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>			6.0 V $\pm$ 0.1 V		C262
(VCO6)	6 <ul style="list-style-type: none"> <li>MAIN display frequency : 60.000 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>			6.0 V $\pm$ 0.1 V		C272
(VCO1)	7 <ul style="list-style-type: none"> <li>MAIN display frequency : 0.030 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>			RX PLL-A		Connect a DC voltmeter to the CP2 (LV2).
(VCO2)	8 <ul style="list-style-type: none"> <li>MAIN display frequency : 8.000 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>	1.8 V–2.8 V	Verify			
(VCO3)	9 <ul style="list-style-type: none"> <li>MAIN display frequency : 15.000 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>	1.8 V–2.8 V	Verify			
(VCO4)	10 <ul style="list-style-type: none"> <li>MAIN display frequency : 22.000 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>	1.8 V–2.8 V	Verify			
(VCO5)	11 <ul style="list-style-type: none"> <li>MAIN display frequency : 30.000 MHz</li> <li>Mode : USB</li> <li>Receiving</li> </ul>	1.8 V–2.8 V	Verify			

## RX PLL-A UNIT ADJUSTMENTS—Continued

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
HPL LOCK VOLTAGE (VCO6)	12 <ul style="list-style-type: none"> <li>• MAIN display frequency : 45.0 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-A	Connect a DC voltmeter to the CP2 (LV2).	1.8 V–2.8 V		Verify
R1 LO OUTPUT	1 <ul style="list-style-type: none"> <li>• MAIN display frequency : 14.999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-A	Connect an DC voltmeter to the J351 (R1LO).	2.25 dBm $\pm$ 0.25 dB	RX PLL-A	R357
2LO LOCK VOLTAGE	1 <ul style="list-style-type: none"> <li>• MAIN display frequency : 14.100 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-A	Connect an DC voltmeter to the CP3.	1.5 V $\pm$ 0.3 V	RX PLL-A	C546
R2 LO OUTPUT	1 <ul style="list-style-type: none"> <li>• MAIN display frequency : 14.100 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-A	Connect a spectrum analyzer to the J831 (R2LO).	Maximum level (–10 dBm $\pm$ 3.0 dB)	RX PLL-A	L801, L834
T2 LO OUTPUT	1 <ul style="list-style-type: none"> <li>• MAIN display frequency : 14.100 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-A	Connect a spectrum analyzer to the J561 (T2LO).	Maximum level (3.0 dBm $\pm$ 3.0 dB)	RX PLL-A	L565, L566
RX SENSITIVITY	1 <ul style="list-style-type: none"> <li>• Pre-set the IC-7800 as below condition.</li> <li>• MAIN display frequency : 14.150 MHz</li> <li>• Mode : USB</li> <li>• Dual watch : OFF</li> <li>• MAIN Ant. : ANT1</li> <li>• Pre-amp. 1 : ON</li> <li>• SUB AF : Minimum level</li> <li>• Set R1228 to center position.</li> <li>• Rotate L1058 to 8.5 turns in clockwise direction.</li> <li>• Rotate L1401 to 2 turns in clockwise direction.</li> <li>• Rotate L1402 to 2 turns in clockwise direction.</li> <li>• Rotate L1403 to 3.5 turns in clockwise direction.</li> <li>• Rotate L1404 to 3.5 turns in clockwise direction.</li> <li>• Receiving</li> </ul>	RX PLL-A	Connect a DC voltmeter to the CP1102.	4.5 V $\pm$ 0.1 V	RX PLL-A	R1101
			Connect a DC voltmeter to the CP1103.	4.5 V $\pm$ 0.1 V	RX PLL-A	R1132
(HF)	2 <ul style="list-style-type: none"> <li>• MAIN display frequency : 14.150 MHz</li> <li>• Mode : USB</li> <li>• Connect an SSG to [ANT1] connector and set as : Frequency : 14.1515 MHz Level : 1 <math>\mu</math>V* (–107 dBm) Modulation: OFF</li> <li>• Receiving</li> </ul>	Rear panel	Connect an AC millivolt meter to the [EXT SP] jack with 8 $\Omega$ load.	Maximum audio level	RX PLL-A	L1408, L1058
IMAGE RESPONSE	1 <ul style="list-style-type: none"> <li>• MAIN display frequency : 14.150 MHz</li> <li>• Mode : USB</li> <li>• Connect an SSG to [ANT1] connector and set as : Frequency : 14.0765 MHz Level : 50 mV* (–13 dBm) Modulation: OFF</li> <li>• Receiving</li> </ul>	Rear panel	Connect a spectrum analyzer to the [EXT SP] jack with 8 $\Omega$ load.	Mimumum image	RX PLL-A	R1516, C1656

\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.

## RX PLL-A UNIT ADJUSTMENTS—Continued

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
RX SENSITIVITY (50 MHz)	1 <ul style="list-style-type: none"> <li>• MAIN display frequency : 50.020 MHz</li> <li>• Mode : USB</li> <li>• Pre-amp. 2 : ON</li> <li>• Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> <li>Frequency : 50.0215 MHz</li> <li>Level : 0.32 <math>\mu</math>V* (-117 dBm)</li> <li>Modulation: OFF</li> </ul> </li> <li>• Receiving</li> </ul>	Rear panel	Connect an AC millivolt meter to the [EXT SP] jack with 8 $\Omega$ load.	Maximum audio level	RX PLL-A	L1222
IF THROUGH (50 MHz)	1 <ul style="list-style-type: none"> <li>• MAIN display frequency : 50.020 MHz</li> <li>• Mode : USB</li> <li>• Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> <li>Frequency : 64.455 MHz</li> <li>Level : 50 mV* (-13 dBm)</li> <li>Modulation: OFF</li> </ul> </li> <li>• Receiving</li> </ul>	Front panel	S-meter	Mimimum level	RX PLL-A	C1265

\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.

## 4 RX PLL-B UNIT ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
40M OUTPUT	1 <ul style="list-style-type: none"> <li>• Dual watch : ON</li> <li>• SUB display frequency : 40.000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-B	Connect an RF voltmeter to the CP701 (40MHz).	Maximum voltage	RX PLL-B	L702, L703
LPL LOCK VOLTAGE	1 <ul style="list-style-type: none"> <li>• SUB display frequency : 60.000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-B	Connect a DC voltmeter to the CP1 (LV1).	2.0 V $\pm$ 0.1 V	RX PLL-B	C154
	2 <ul style="list-style-type: none"> <li>• SUB display frequency : 1.499 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			Less than 4.0 V		Verify
HPL LOCK VOLTAGE (VCO1)	1 <ul style="list-style-type: none"> <li>• SUB display frequency : 7.999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-B	Connect a DC voltmeter to the CP2 (LV2).	6.0 V $\pm$ 0.1 V	RX PLL-B	C222
(VCO2)	2 <ul style="list-style-type: none"> <li>• SUB display frequency : 14.999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			6.0 V $\pm$ 0.1 V		C232
(VCO3)	3 <ul style="list-style-type: none"> <li>• SUB display frequency : 21.999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			6.0 V $\pm$ 0.1 V		C242
(VCO4)	4 <ul style="list-style-type: none"> <li>• SUB display frequency : 29.999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			6.0 V $\pm$ 0.1 V		C252
(VCO5)	5 <ul style="list-style-type: none"> <li>• SUB display frequency : 44.999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			6.0 V $\pm$ 0.1 V		C262
(VCO6)	6 <ul style="list-style-type: none"> <li>• SUB display frequency : 60.000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			6.0 V $\pm$ 0.1 V		C272
(VCO1)	7 <ul style="list-style-type: none"> <li>• SUB display frequency : 0.030 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-A	Connect a DC voltmeter to the CP2 (LV2).	1.8 V–2.8 V		Verify
(VCO2)	8 <ul style="list-style-type: none"> <li>• SUB display frequency : 8.000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			1.8 V–2.8 V		Verify
(VCO3)	9 <ul style="list-style-type: none"> <li>• SUB display frequency : 15.000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			1.8 V–2.8 V		Verify
(VCO4)	10 <ul style="list-style-type: none"> <li>• SUB display frequency : 22.000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			1.8 V–2.8 V		Verify
(VCO5)	11 <ul style="list-style-type: none"> <li>• SUB display frequency : 30.000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>			1.8 V–2.8 V		Verify

## RX PLL-B UNIT ADJUSTMENTS—Continued

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
HPL LOCK VOLTAGE (VCO6)	12 <ul style="list-style-type: none"> <li>• SUB display frequency : 45.000 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-B	Connect a DC voltmeter to the CP2 (LV2).	1.8 V–2.8 V		Verify
S1 LO OUTPUT	1 <ul style="list-style-type: none"> <li>• SUB display frequency : 14.999 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-B	Connect an RF voltmeter to the J351 (S1LO).	2.25 dBm ±0.25 dB	RX PLL-B	R357
2LO LOCK VOLTAGE	1 <ul style="list-style-type: none"> <li>• SUB display frequency : 14.100 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-B	Connect a DC voltmeter to the CP3.	1.5 V ±0.3 V	RX PLL-B	C546
2LO OUTPUT	1 <ul style="list-style-type: none"> <li>• MAIN display frequency : 14.100 MHz</li> <li>• Mode : USB</li> <li>• Receiving</li> </ul>	RX PLL-B	Connect a spectrum analyzer to the J561 (2LO).	Maximum level (–9.0 dBm ±3.0 dB)	RX PLL-B	L565, L566
RX SENSITIVITY	1 Pre-set the IC-7800 as below condition. <ul style="list-style-type: none"> <li>• SUB display frequency : 14.150 MHz</li> <li>• Mode : USB</li> <li>• Dual watch : ON</li> <li>• MAIN Ant. : ANT2</li> <li>• SUB Ant. : ANT1</li> <li>• Pre-amp. 1 : ON</li> <li>• MAIN AF : Minimum level</li> <li>• Set R1228 to center position.</li> <li>• Rotate L1401 to 2 turns in clockwise direction.</li> <li>• Rotate L1402 to 2 turns in clockwise direction.</li> <li>• Rotate L1403 to 3.5 turns in clockwise direction.</li> <li>• Rotate L1404 to 3.5 turns in clockwise direction.</li> <li>• Receiving</li> </ul>	RX PLL-B	Connect a DC voltmeter to the CP1102.	4.5 V ±0.1 V	RX PLL-B	R1101
			Connect a DC voltmeter to the CP1103.	4.5 V ±0.1 V	RX PLL-B	R1132
(HF)	2 <ul style="list-style-type: none"> <li>• SUB display frequency : 14.150 MHz</li> <li>• Mode : USB</li> <li>• Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> <li>Frequency : 14.1515 MHz</li> <li>Level : 1 μV* (–107 dBm)</li> <li>Modulation: OFF</li> </ul> </li> <li>• Receiving</li> </ul>	Rear panel	Connect an AC millivolt meter to the [EXT SP] jack with 8 Ω load.	Maximum audio level	RX PLL-B	L1408, L1058
IMAGE RESPONSE	1 <ul style="list-style-type: none"> <li>• SUB display frequency : 14.150 MHz</li> <li>• Mode : USB</li> <li>• Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> <li>Frequency : 14.0765 MHz</li> <li>Level : 50 mV* (–13 dBm)</li> <li>Modulation: OFF</li> </ul> </li> <li>• Receiving</li> </ul>	Rear panel	Connect a spectrum analyzer to the [EXT SP] jack with 8 Ω load.	Mimumum image	RX PLL-B	R1516, C1656

\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.

## RX PLL-B UNIT ADJUSTMENTS—Continued

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
RX SENSITIVITY (50 MHz)	1 <ul style="list-style-type: none"> <li>• SUB display frequency : 50.020 MHz</li> <li>• Mode : USB</li> <li>• Pre-amp. 2 : ON</li> <li>• Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> <li>Frequency : 50.0215 MHz</li> <li>Level : 0.32 <math>\mu</math>V* (-117 dBm)</li> <li>Modulation: OFF</li> </ul> </li> <li>• Receiving</li> </ul>	Rear panel	Connect an AC millivolt meter to the [EXT SP] jack with 8 $\Omega$ load.	Maximum audio level	RX PLL-B	L1222
IF THROUGH (50 MHz)	1 <ul style="list-style-type: none"> <li>• SUB display frequency : 50.020 MHz</li> <li>• Mode : USB</li> <li>• Connect an SSG to [ANT1] connector and set as : <ul style="list-style-type: none"> <li>Frequency : 64.455 MHz</li> <li>Level : 50 mV* (-13 dBm)</li> <li>Modulation: OFF</li> </ul> </li> <li>• Receiving</li> </ul>	Front panel	S-meter	Mimimum level	RX PLL-B	C1265

\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.



#### 4-5 PA200W BOARD ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
IDLING CURRENT (For driver)	1	PA200W	Connect an ammeter between W1 and the transceiver.	1.0 A higher	PA200W	R301
	2			1.0 A higher		R407 R425
	3			1.0 A higher		R410 R426
(For final amplifier)						

## 6 TUNER UNIT ADJUSTMENT

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
SWR DETECTOR	1	<ul style="list-style-type: none"> <li>• Main display frequency : 24.950 MHz</li> <li>• Mode : FM</li> <li>• [RF POWER] : Max. CW (200W)</li> <li>• [TUNER] : Through</li> <li>• APC : OFF</li> <li>• Connect a 50 <math>\Omega</math> terminator to [ANT1] connector.</li> <li>• Transmitting</li> </ul>	CTRL	Connect a digital multimeter or oscilloscope to the check point CP101 (REF).	Minimum voltage	CTRL	C104
		<b>ADJUSTMENT CONDITION</b>	<b>DISPLAY</b>		<b>OPERATION</b>		
TUNER REFERENCE	1	<ul style="list-style-type: none"> <li>• Enter the tuner adjustment mode:               <ol style="list-style-type: none"> <li>① Turn power OFF.</li> <li>② Terminate the [REMOTE] jack with a 3.5(d) mm mini-plug.</li> <li>③ While pushing [M.SCOPE] and [EXIT/SET], turn power ON.</li> </ol> </li> </ul>	TUNER-ADJUST MODE		Push [F-7 (START)] to start tuning.		
	2		<pre> -- TUNER -- Adjusting Now           </pre>		Verify the display shows "Adjusting Now".		
	3		<pre> -- TUNER --       OK           </pre>		Verify the display shows "OK".		

## 7 MAIN UNIT ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT		
		UNIT	LOCATION		UNIT	ADJUST	
MAXIMUM OUTPUT POWER	1	<ul style="list-style-type: none"> <li>• Turn the power OFF</li> <li>• Push and hold [F-INP] and [MW], and then turn the power ON.</li> <li>• Preset R93 to 3 o'clock position.</li> <li>• MAIN display frequency : Any</li> <li>• Mode : USB</li> </ul>	MAIN	Connect a digital multimeter or oscilloscope to the check point CP82.	0.5 V $\pm$ 0.2 V	MAIN	R69
	2	<ul style="list-style-type: none"> <li>• Connect an audio generator to the [MIC] connector and set as: Frequency : 1.5 kHz Level : 1 mV</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to the [ANT1] connector.	Maximum output power	MAIN	L505 C576 L512
RESIDUAL AM	3	<ul style="list-style-type: none"> <li>• Mode : FM</li> <li>• Connect an audio generator to the [MIC] connector and set as: Frequency : 1.0 kHz Level : 10 mV</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to the [ANT1] connector.			verify
	4	<ul style="list-style-type: none"> <li>• Apply no audio signals to the [MIC] connector.</li> <li>• Transmitting</li> </ul>					Minimum level difference between an audio generator is ON and OFF.
TX TOTAL GAIN	1	<ul style="list-style-type: none"> <li>• MAIN display frequency : Any</li> <li>• Mode : USB</li> <li>• [MIC] GAIN : 12 o'clock position</li> <li>• Connect an audio generator to the [MIC] connector and set as: Frequency : 1.5 kHz Level : 1 mV</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to the [ANT1] connector.	130 W	MAIN	R538
HIGH POWER (HF) (50 MHz)	1	<ul style="list-style-type: none"> <li>• MAIN display frequency : 14.100 MHz</li> <li>• Mode : RTTY</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to the [ANT1] connector.	200 W	MAIN	R81
	2	<ul style="list-style-type: none"> <li>• MAIN display frequency : 50.100 MHz</li> <li>• Mode : RTTY</li> <li>• Transmitting</li> </ul>			200 W		R79
AM CARRIER POWER	1	<ul style="list-style-type: none"> <li>• MAIN display frequency : 14.100 MHz</li> <li>• Mode : AM</li> <li>• Apply no audio signals to the [MIC] connector.</li> <li>• Transmitting</li> </ul>	Rear panel	Connect an RF power meter to the [ANT1] connector.	55 W	MAIN	R82
Id-APC	1	<ul style="list-style-type: none"> <li>• MAIN display frequency : 14.100 MHz</li> <li>• Mode : RTTY</li> <li>• Connect CP81 to GND.</li> <li>• Preset R93 to 90° CCW.</li> <li>• Transmitting</li> </ul>	PA	Connect an ammeter between the PA unit and the W1.	12 A	MAIN	R93

## 4-8 SCOPE UNIT ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
		UNIT	LOCATION		UNIT	ADJUST
S3 LO LOCK VOLTAGE	1 Pre-set the IC-7800 as below condition. <ul style="list-style-type: none"> <li>• Dual watch : OFF</li> <li>• Pre-amp. : OFF</li> <li>• Attenuator : OFF</li> <li>• Scope : ON</li> <li>• Scope attenuator: OFF</li> <li>• MAIN display frequency : 14.200 MHz</li> <li>• Mode : CW</li> <li>• Span : ±25 kHz</li> <li>• Receiving</li> </ul>	SCOPE	Connect a digital voltmeter to the CP801.	2.5 V	SCOPE	C824
SCOPE	1 • Connect an SSG to the [ANT1] connector and set as : Frequency : 14.200 MHz Level : 500 $\mu$ V* (-53 dBm) Modulation: OFF • Receiving	Front panel	Scope wave on the LCD.	Maximum wave form	SCOPE	L203 L202 L201 L5 L6 C41
	2 • Connect an SSG to J1 and set as: Frequency : 71.715 MHz Level : 100 mV* (-7 dBm) Modulation: OFF • Receiving			Mimimum wave form		C41
	3 • Set an SSG as: Frequency : 14.200 MHz Level : 500 $\mu$ V* (-53 dBm) Modulation: OFF • Receiving			Maximum wave form		L5 L6
SCOPE GAIN	1 • MAIN display frequency : 14.200 MHz • Mode : CW • Connect an SSG to J1 and set as: Frequency : 14.200 MHz Level : 500 $\mu$ V* (-53 dBm) Modulation: OFF • Receiving	Front panel	Scope wave on the LCD.	Set peak of scope wave form to 6 marks on the LCD.	SCOPE	R416
SCOPE ATTENUATOR	1 • MAIN display frequency : 14.200 MHz • Mode : CW • Scope attenuator: 30 dB • Connect an SSG to J1 and set as: Frequency : 14.200 MHz Level : 500 $\mu$ V* (-53 dBm) Modulation: OFF • Receiving	Front panel	Scope wave on the LCD.	Set peak of scope wave form to 3 marks on the LCD.	SCOPE	R11

\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.

## 9 AUTOMATICALLY ADJUSTMENTS

ADJUSTMENT	ADJUSTMENT CONDITION	DISPLAY	OPERATION
ENTERING ADJUSTMENT MODE	1 <ul style="list-style-type: none"> <li>Enter the adjustment mode: <ol style="list-style-type: none"> <li>Turn power OFF.</li> <li>Terminate the [REMOTE] jack with a 3.5(d) mm mini-plug.</li> <li>While pushing [SSB] and [CW/RTTY], turn power ON.</li> </ol> </li> </ul>	ADJUST MODE	<p>Push [F-1 (METER)], [F-2 (TX)] or [F-3 (RX)] to select each adjustment mode.</p> <p>Once entering adjustment mode, use [F-1 (▼)] to skip items, or [F-2 (EXIT)] to return the opening display.</p>
	<p><b>CAUTION:</b>  <b>NEVER</b> select adjustment items [F-2 (TX)] while transceiver is connected to an SSG. Because transceiver automatically transmits when transmit item in the [F-2 (TX)] is selected.</p>		
HF PO METER	1 <ul style="list-style-type: none"> <li>Connect an audio generator to the [MIC] connector and set as:  Frequency : 1.5 kHz  Level : 10 mVrms</li> </ul>	HF POWER 0W	Push [F-7 (SET)] to set the 0 W meter automatically, to store the "0 W" meter into memory, and to step next.
	2 <ul style="list-style-type: none"> <li>Connect an RF power meter to the [ANT1] connector.</li> </ul>	HF POWER 10W	Set the RF power meter to 20 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "20 W" meter into memory, and to step next.
	3 <ul style="list-style-type: none"> <li>Connect a load which becomes SWR is 2 to the [ANT2] connector.</li> </ul>	HF POWER 50W	Set the RF power meter to 50 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "50 W" meter into memory, and to step next.
	4 <ul style="list-style-type: none"> <li>Push [F-2 (TX)] to enter the meter scale adjustment.</li> </ul>	HF POWER 100W	Set the RF power meter to 100 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "100 W" meter into memory, and to step next.
	5	HF POWER 200W	Set the RF power meter to 195 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "200 W" meter into memory, and to step next.
50 MHz PO METER	1	50M POWER 0W	Push [F-7 (SET)] to set the 0 W meter automatically, to store the "0 W" meter into memory, and to step next.
	2	50M POWER 10W	Set the RF power meter to 20 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "20 W" meter into memory, and to step next.
	3	50M POWER 50W	Set the RF power meter to 50 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "50 W" meter into memory, and to step next.
	4	50M POWER 100W	Set the RF power meter to 100 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "100 W" meter into memory, and to step next.
	5	50M POWER 200W	Set the RF power meter to 195 W using [MAIN DIAL]. Then push [F-7 (SET)] to store the "200 W" meter into memory, and to step next.
ALC METER	1	ALC	Push [F-7 (SET)] to set the ALC meter automatically, to store the "ALC" meter into memory, and to step next.
DRIVE LEVEL	1	DRIVE	Push [F-7 (SET)] to set the DRIVE meter automatically, to store the "DRIVE" meter into memory, and to step next.
Vd METER	1	Vd48V	Push [F-7 (SET)] to set the Vd meter automatically, to store the "Vd" meter into memory, and to step next.

## AUTOMATICALLY ADJUSTMENTS—Continued

ADJUSTMENT	ADJUSTMENT CONDITION	DISPLAY	OPERATION	
Id METER	<ul style="list-style-type: none"> <li>Connect an audio generator to the [MIC] connector and set as: Frequency : 1.5 kHz Level : 10 mVrms</li> <li>Connect an RF power meter to the [ANT1] connector.</li> <li>Connect a load which becomes SWR is 2 to the [ANT2] connector.</li> </ul>	Id 0A	Push [F-7 (SET)] to set the 0 A meter automatically, to store the “0 A” meter into memory, and to step next.	
		Id 5A	Set the Id meter (Front panel) to 5 A using [MAIN DIAL]. Then push [F-7 (SET)] to store the “5 A” meter into memory, and to step next.	
		Id 10A	Set the Id meter (Front panel) to 10 A using [MAIN DIAL]. Then push [F-7 (SET)] to store the “10 A” meter into memory, and to step next.	
		SWR	Push [F-7 (SET)] to set the SWR meter automatically, to store the “SWR” meter into memory, and to step next.	
SWR METER	1			
HF TOTAL GAIN	<ul style="list-style-type: none"> <li>Connect an SSG to the [ANT1] connector and set as: Frequency : 14.1515 MHz Level : 1 mV* (–47 dBm) Modulation : OFF</li> <li>Connect an AC millivolt meter to [SP] jack with an 8 Ω load.</li> </ul>	Total Gain A HF PRE OFF	Set the AF output level to 0 dB.	
			Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.	
	2	<ul style="list-style-type: none"> <li>Set the SSG as: Level : OFF</li> </ul>	Total Gain A HF PRE ON	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	3			Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	4		Total Gain A 50M PRE OFF	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	5		Total Gain A 50M PRE ON	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	6	<ul style="list-style-type: none"> <li>Set the SSG as: Level : 1 mV* (–47 dBm)</li> </ul>	Total Gain B HF PRE OFF	Set the AF output level to 0 dB.
	7	<ul style="list-style-type: none"> <li>Set the SSG as: Level : OFF</li> </ul>		Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HF B total gain into memory, and to step next.
	8		Total Gain B HF PRE ON	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HFB total gain into memory, and to step next.
	9		Total Gain B 50M PRE OFF	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HFB total gain into memory, and to step next.
10		Total Gain B 50M PRE ON	Set the AF output level to –30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HFB total gain into memory, and to step next.	

\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.

## AUTOMATICALLY ADJUSTMENTS—Continued

ADJUSTMENT	ADJUSTMENT CONDITION	DISPLAY	OPERATION
EXTERNAL AGC	1	AGC(RX-DSP)A	<ul style="list-style-type: none"> <li>Connect an SSG to the [ANT1] connector and set as:            Frequency : 14.1515 MHz            Level : 3.2 mV* (-37 dBm)            Modulation : OFF</li> </ul>
	2		
S-METER	1	HF S0 LEVEL	<ul style="list-style-type: none"> <li>Push [F-7 (SET)] to set the S0 meter automatically, to store the S0 meter into memory, and to step next.</li> <li>Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.</li> </ul>
	2	HF S9 LEVEL	<ul style="list-style-type: none"> <li>Push [F-7 (SET)] to set the S9 meter automatically, to store the S9 meter into memory, and to step next.</li> <li>Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.</li> </ul>
	3	S9+60 LEVEL	<ul style="list-style-type: none"> <li>Push [F-7 (SET)] to set the S9+60 meter automatically, to store the S9+60 meter into memory, and to step next.</li> <li>Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.</li> </ul>
50 MHz TOTAL GAIN	1	Total Gain A 50M PRE OFF	<ul style="list-style-type: none"> <li>Connect an SSG to the [ANT1] connector and set as:            Frequency : 14.1515 MHz            Level : 1 mV* (-47 dBm)            Modulation : OFF</li> <li>Connect an AC millivolt meter to [SP] jack with an 8 Ω load.</li> </ul>
	2		
	3	Total Gain A 50M PRE ON	Set the AF output level to -30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	4	Total Gain A 50M PRE OFF	Set the AF output level to -30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	5	Total Gain A 50M PRE ON	Set the AF output level to -30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF A total gain automatically, to store the HF A total gain into memory, and to step next.
	6	Total Gain B 50M PRE OFF	Set the AF output level to 0 dB.
	7	Total Gain B 50M PRE ON	<ul style="list-style-type: none"> <li>Set the SSG as:            Level : OFF</li> </ul>
	8		Set the AF output level to -30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HF B total gain into memory, and to step next.

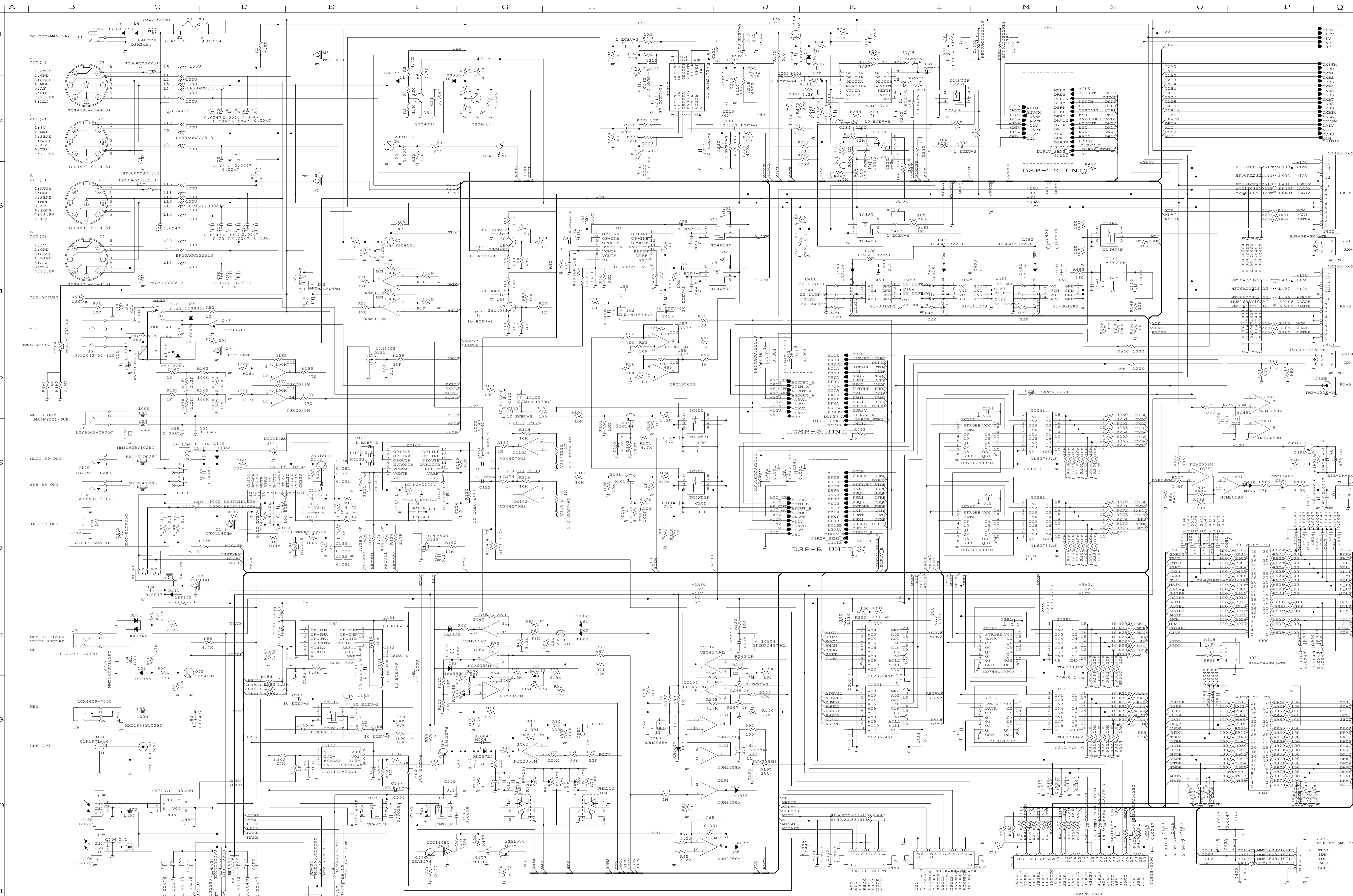
\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.

## AUTOMATICALLY ADJUSTMENTS—Continued

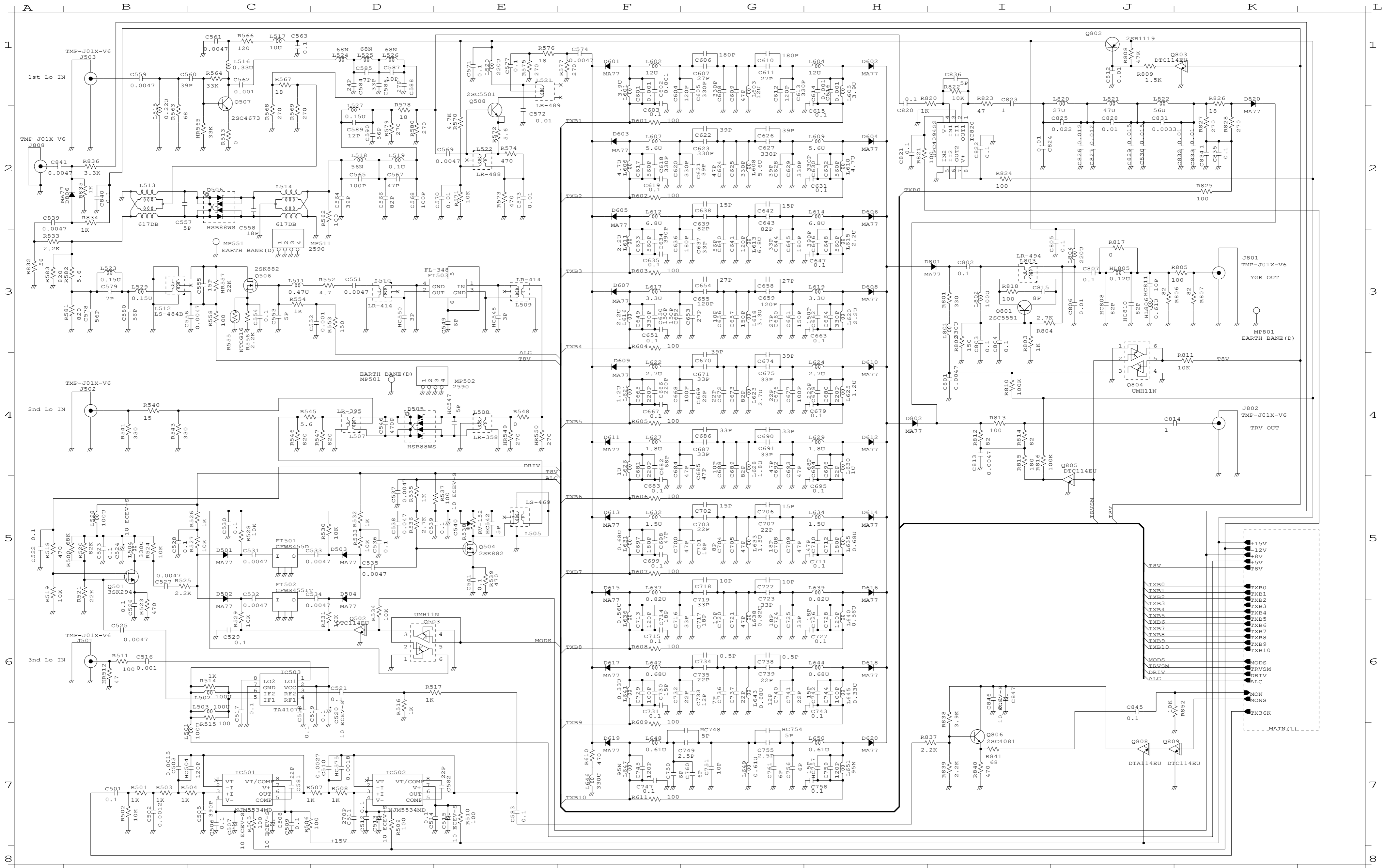
ADJUSTMENT	ADJUSTMENT CONDITION	DISPLAY	OPERATION
50 MHz TOTAL GAIN	9	Total Gain B 50M PRE OFF	Set the AF output level to -30 dB using [MAIN DIAL]. Then push [F-7 (SET)] to set the HF B total gain automatically, to store the HFB total gain into memory, and to step next.
	10		
50 MHz EXTERNAL AGC	1	AGC(RX-DSP)A	Push [F-7 (SET)] to set the external AGC automatically, to store the external AGC into memory, and to step next.
	2	AGC(RX-DSP)B	Push [F-7 (SET)] to set the external AGC automatically, to store the external AGC into memory, and to step next.
50 MHz S-METER	1	50M S0 LEVEL	<ul style="list-style-type: none"> <li>• Push [F-7 (SET)] to set the S0 meter automatically, to store the S0 meter into memory, and to step next.</li> <li>• Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.</li> </ul>
	2	50M S9 LEVEL	<ul style="list-style-type: none"> <li>• Push [F-7 (SET)] to set the S9 meter automatically, to store the S9 meter into memory, and to step next.</li> <li>• Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.</li> </ul>
	3	S9+60 LEVEL	<ul style="list-style-type: none"> <li>• Push [F-7 (SET)] to set the S9+60 meter automatically, to store the S9+60 meter into memory, and to step next.</li> <li>• Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.</li> </ul>
REFERENCE FREQUENCY	1	REF OSC	Set the Reference frequency to 10.000000 MHz using [MAIN DIAL]. Then push [F-7 (SET)] to store the Reference frequency into memory, and to step next. <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <p><b>NOTE:</b> This adjustment need to adjust after more than 5 minutes past since IC 7800 is power ON.</p> </div>

\*This output level of a standard signal generator (SSG) is indicated as SSG's open circuit.



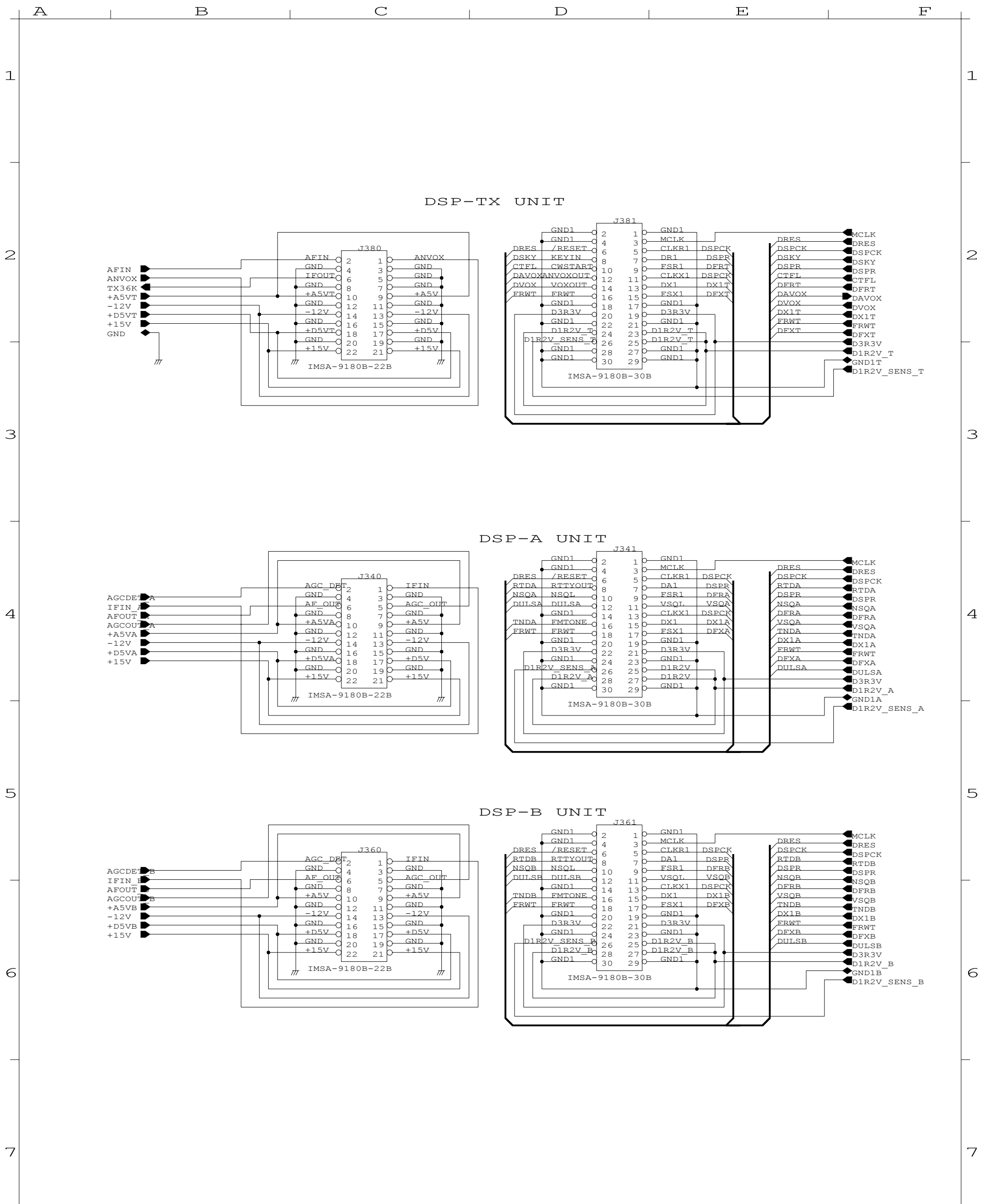


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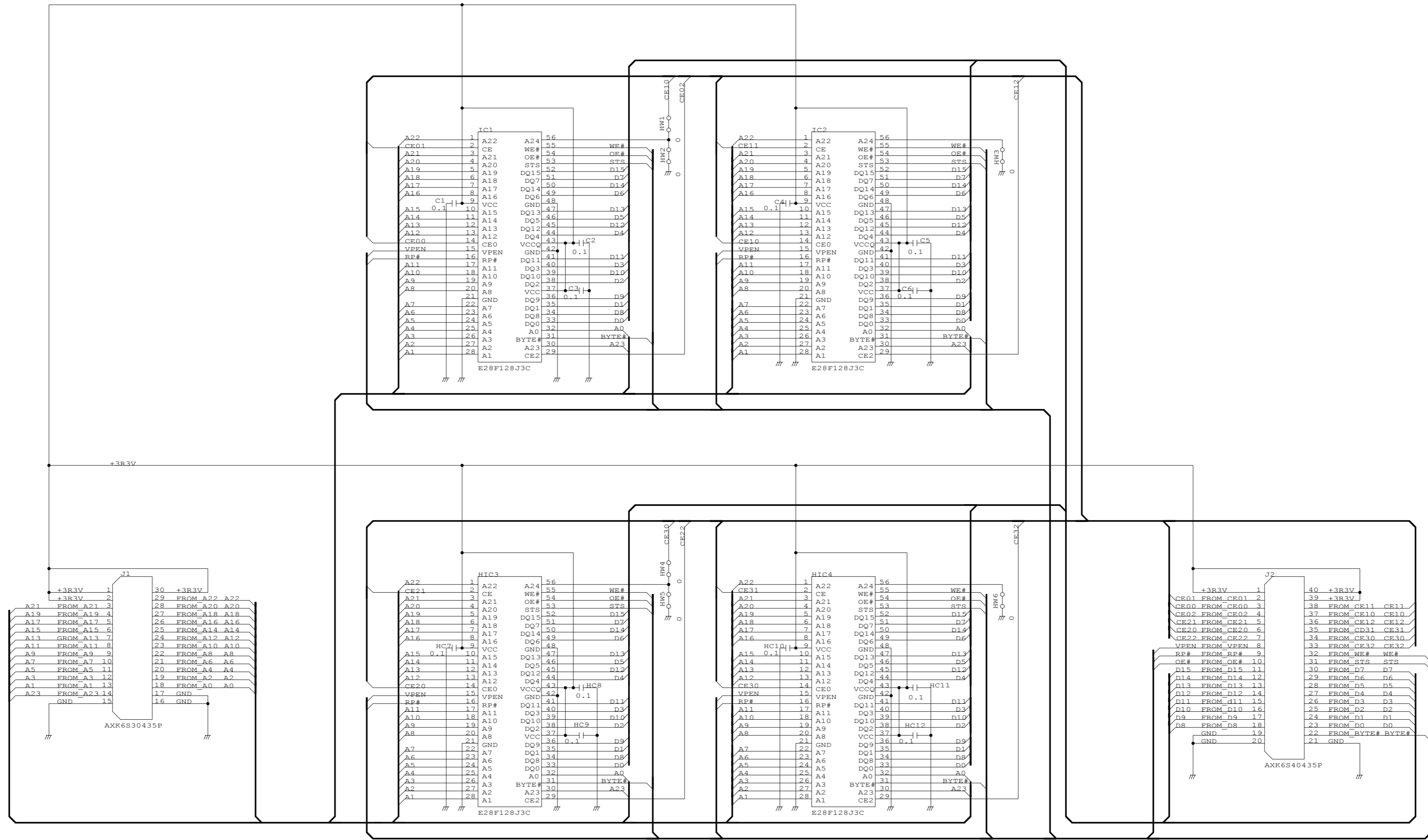


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Icom Inc.



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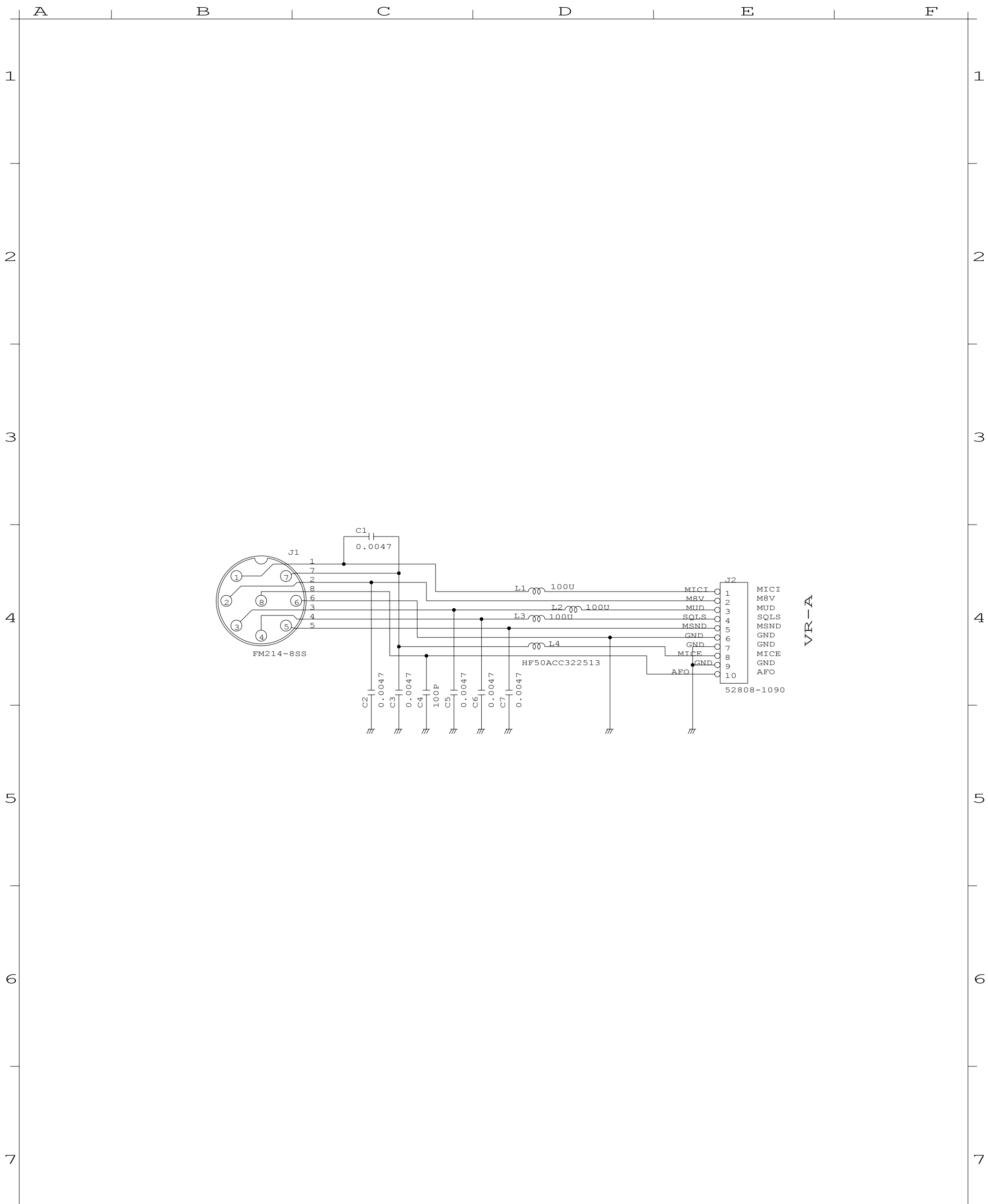
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**MEMORY BOARD SCHEMATIC DIAGRAM**

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**ICOM**

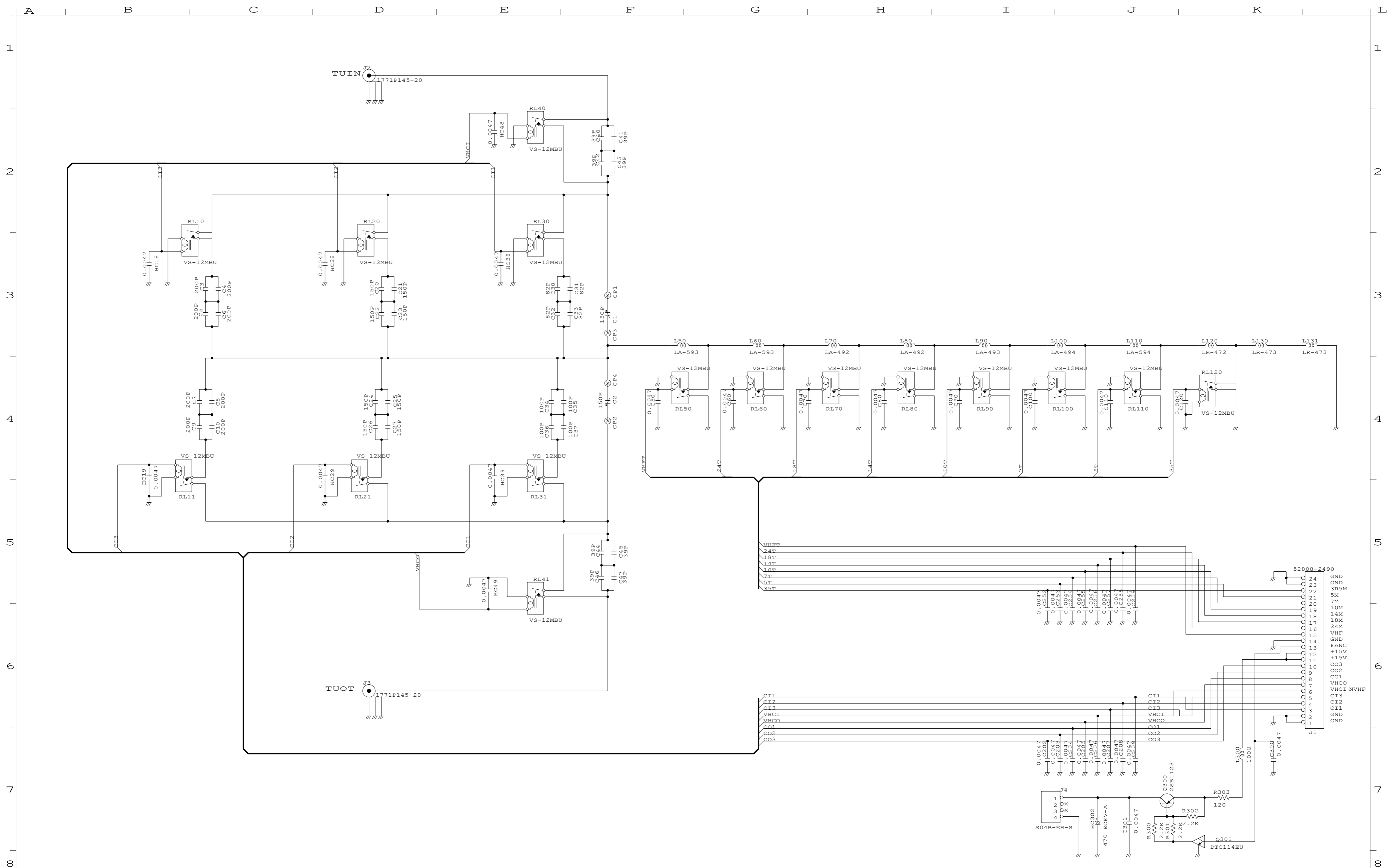
**Icom Inc.**



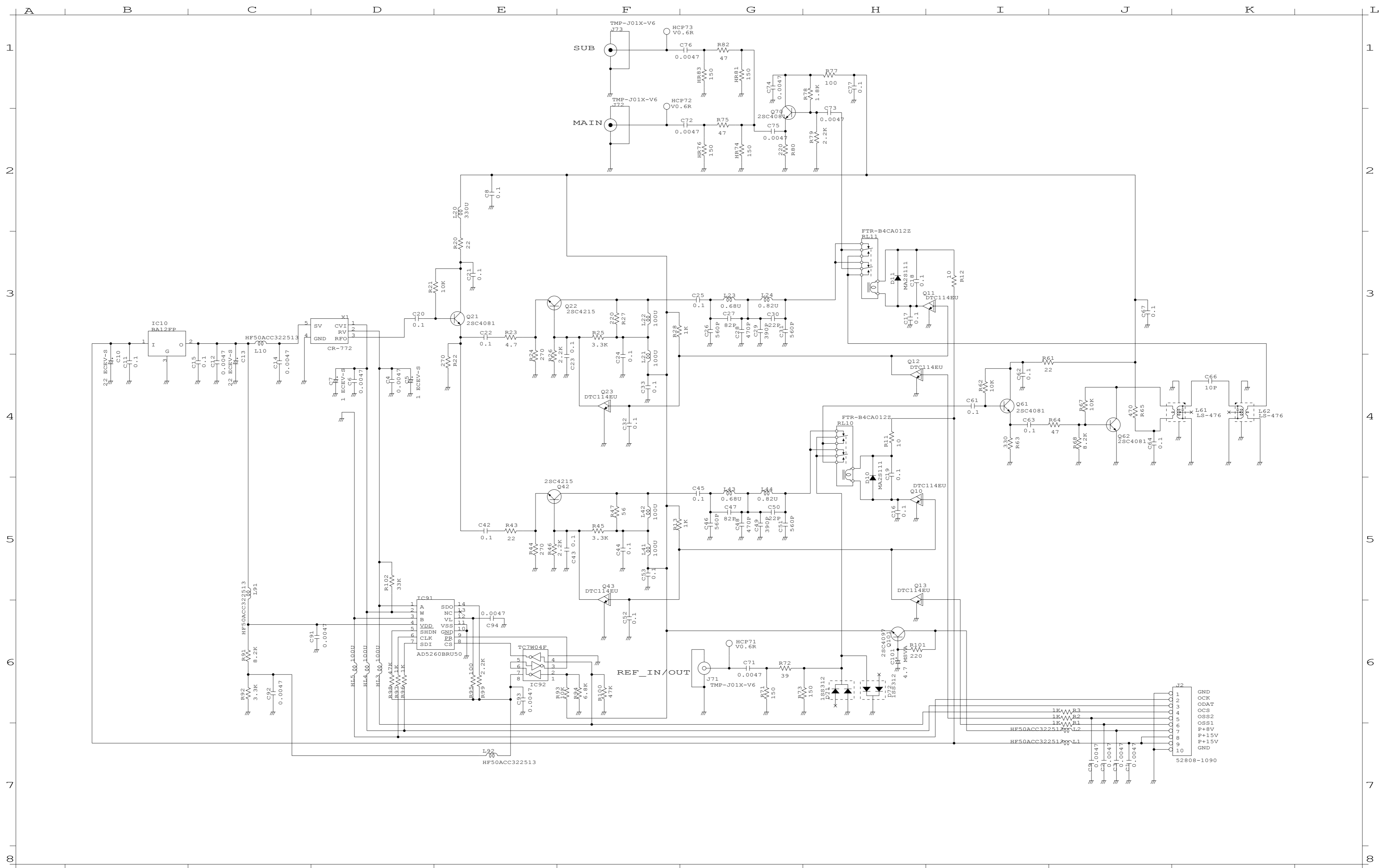
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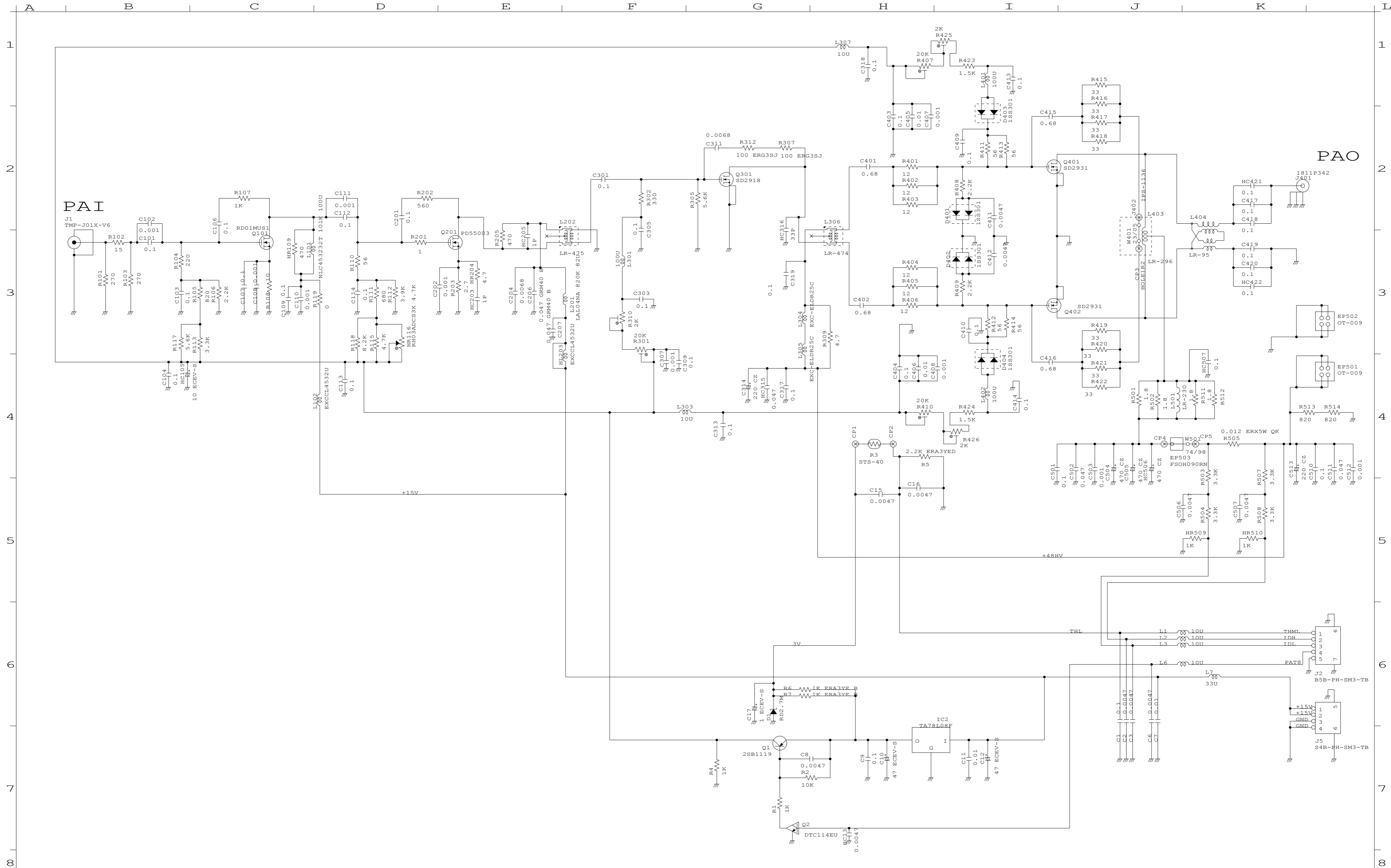
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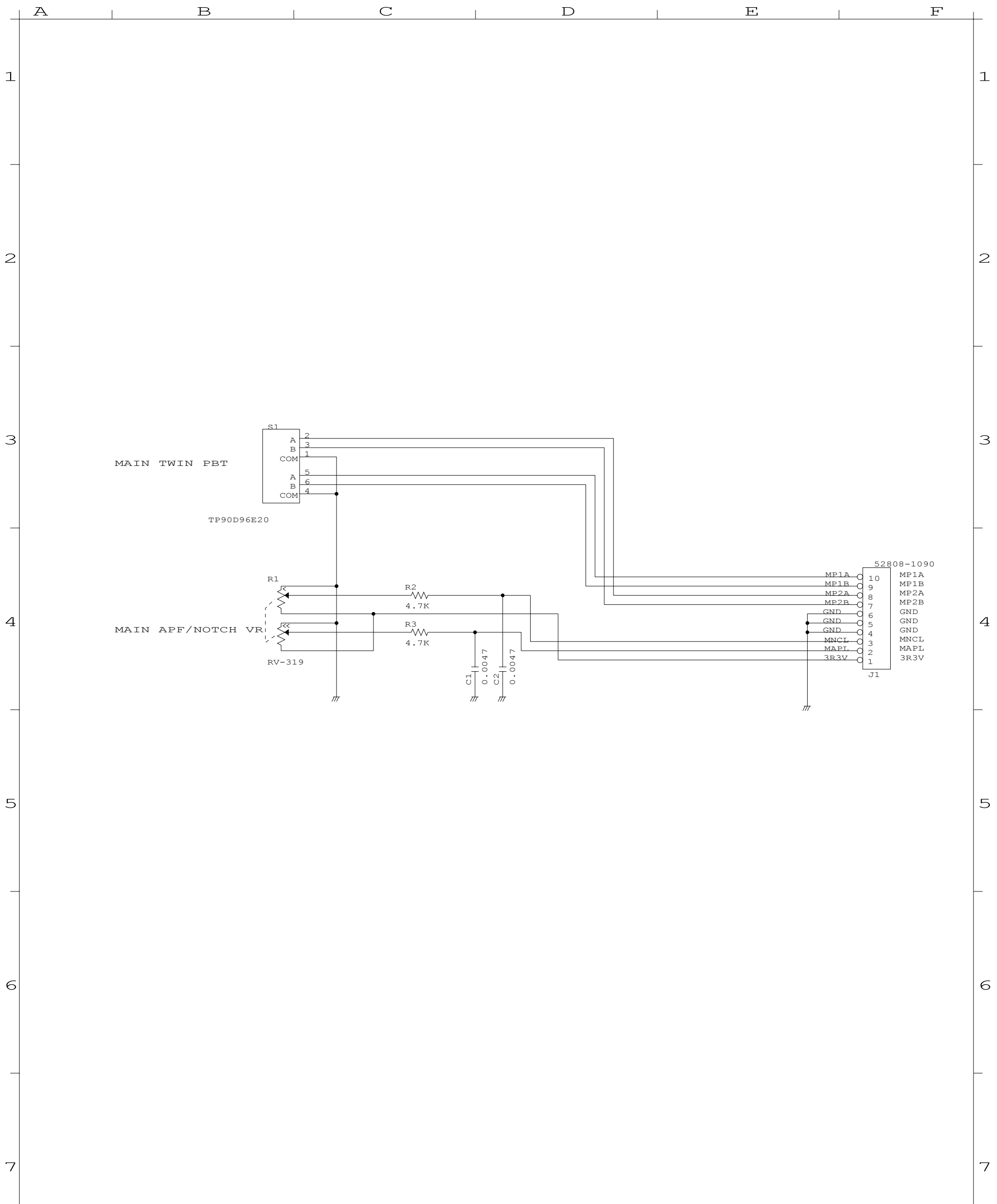


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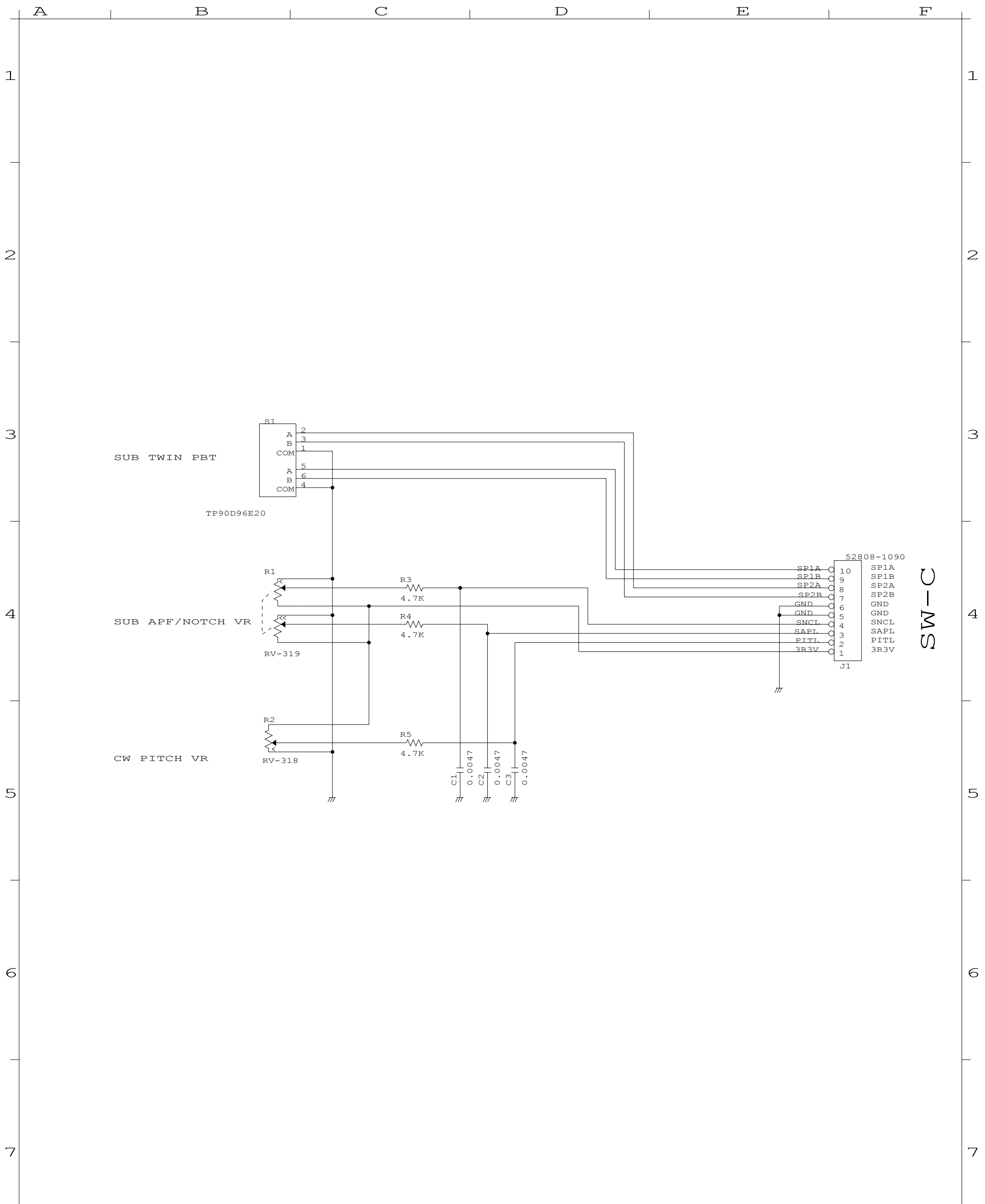


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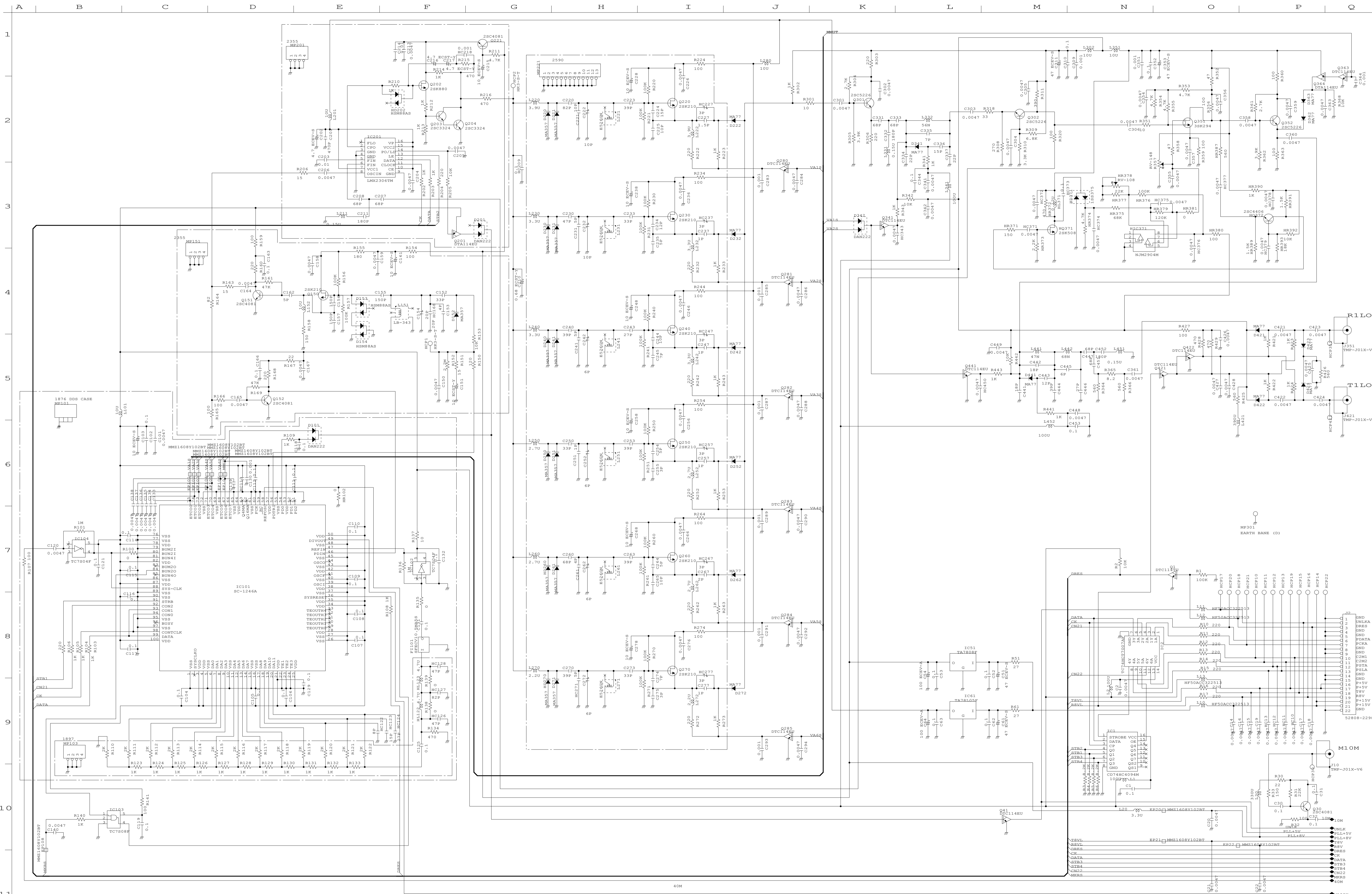


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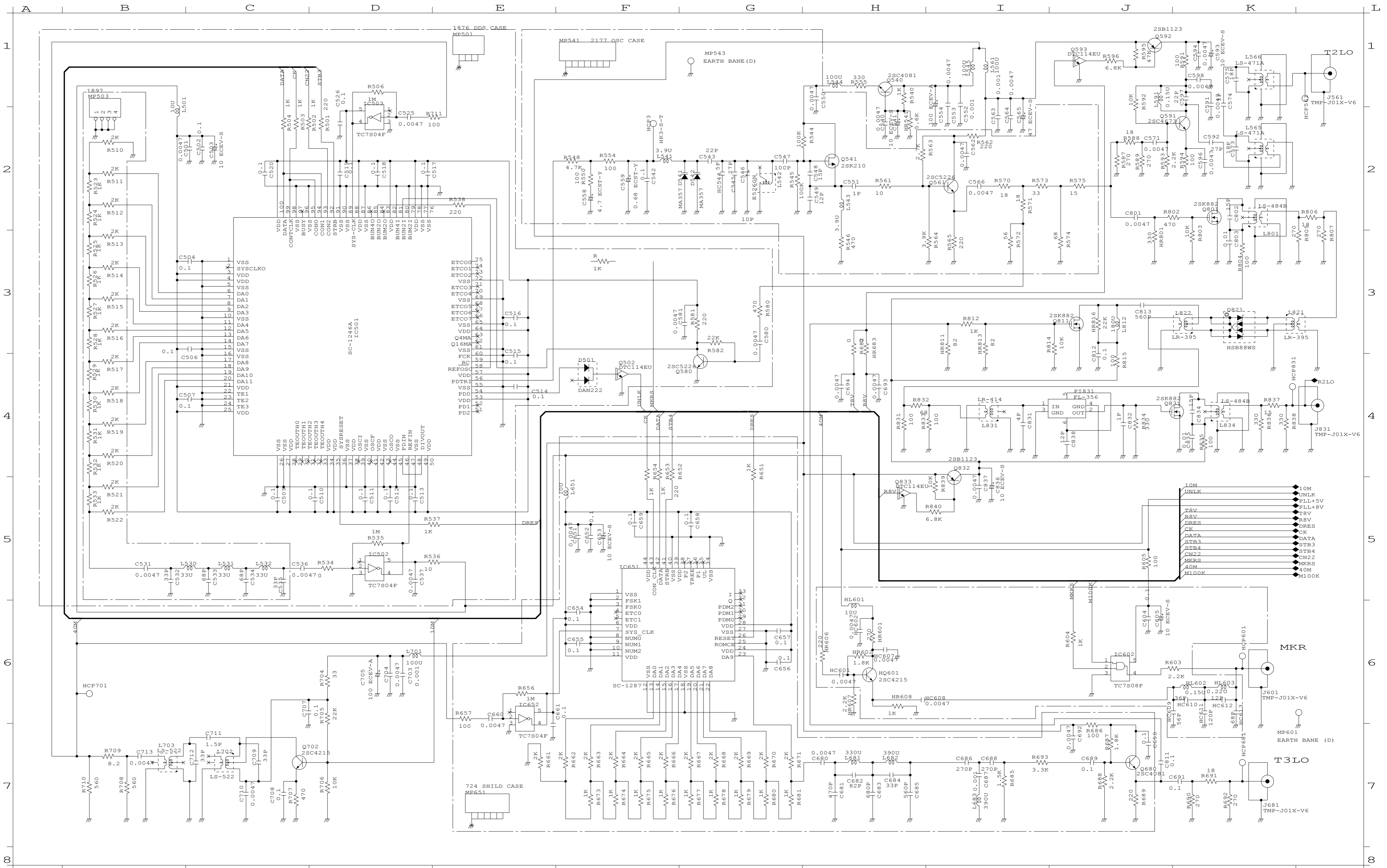
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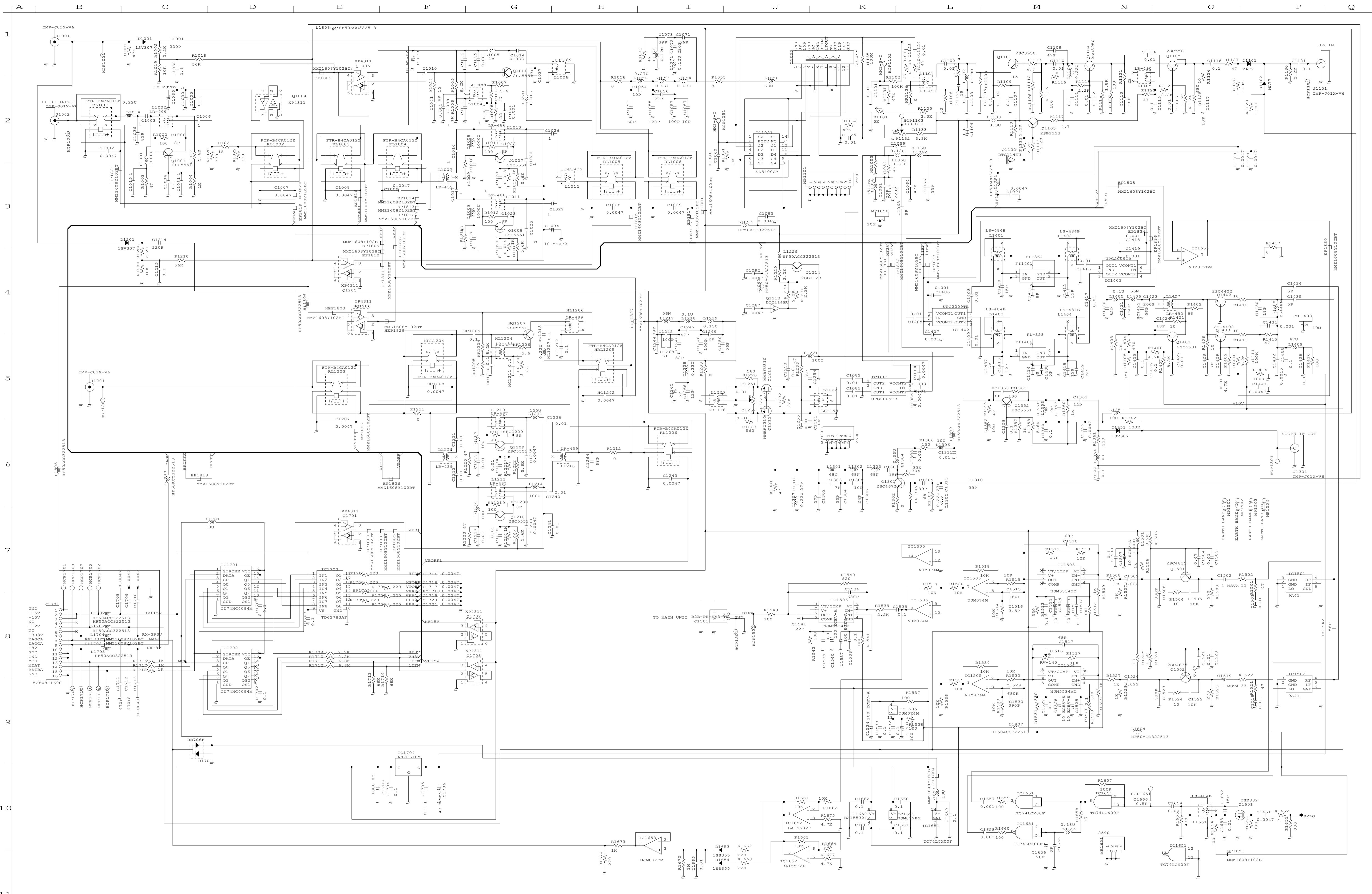


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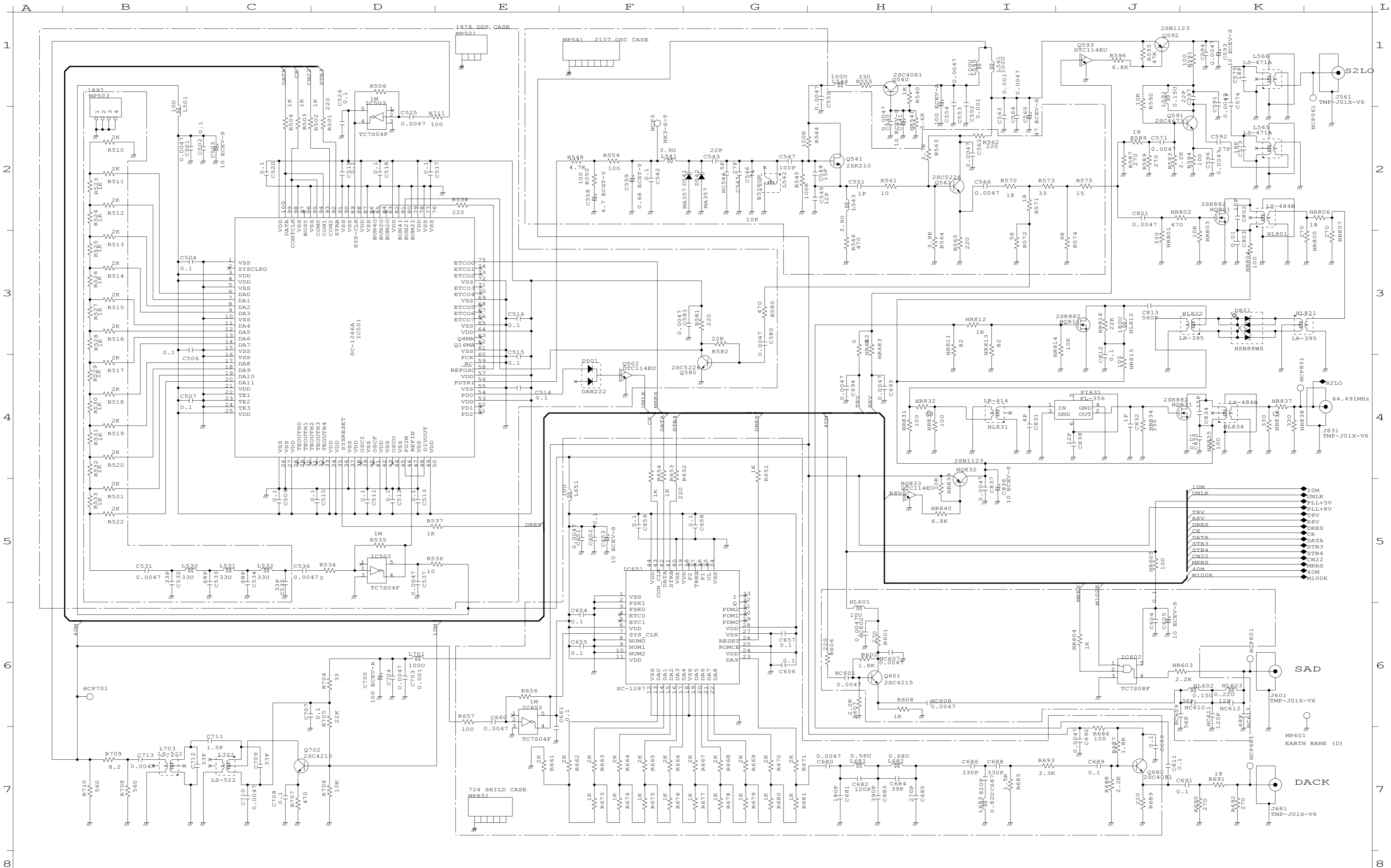
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 RXPLL-A UNIT (2)  
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RXPLL-A UNIT  
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 SCHEMATIC DIAGRAM  
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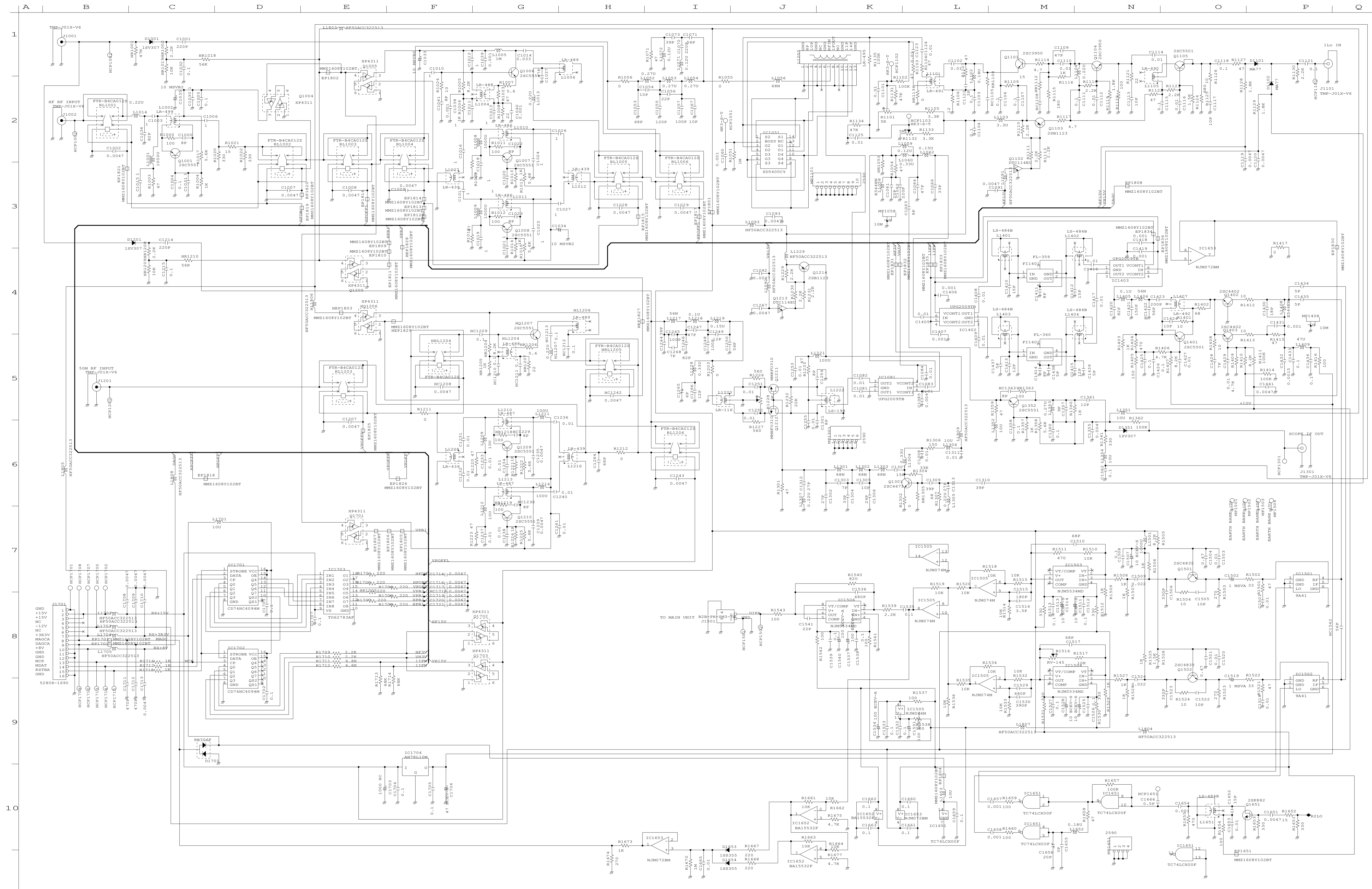
MODEL IC-7800

RXPLL-B UNIT  
(2)  
SCHEMATIC DIAGRAM

DWN. NO.

ICOM

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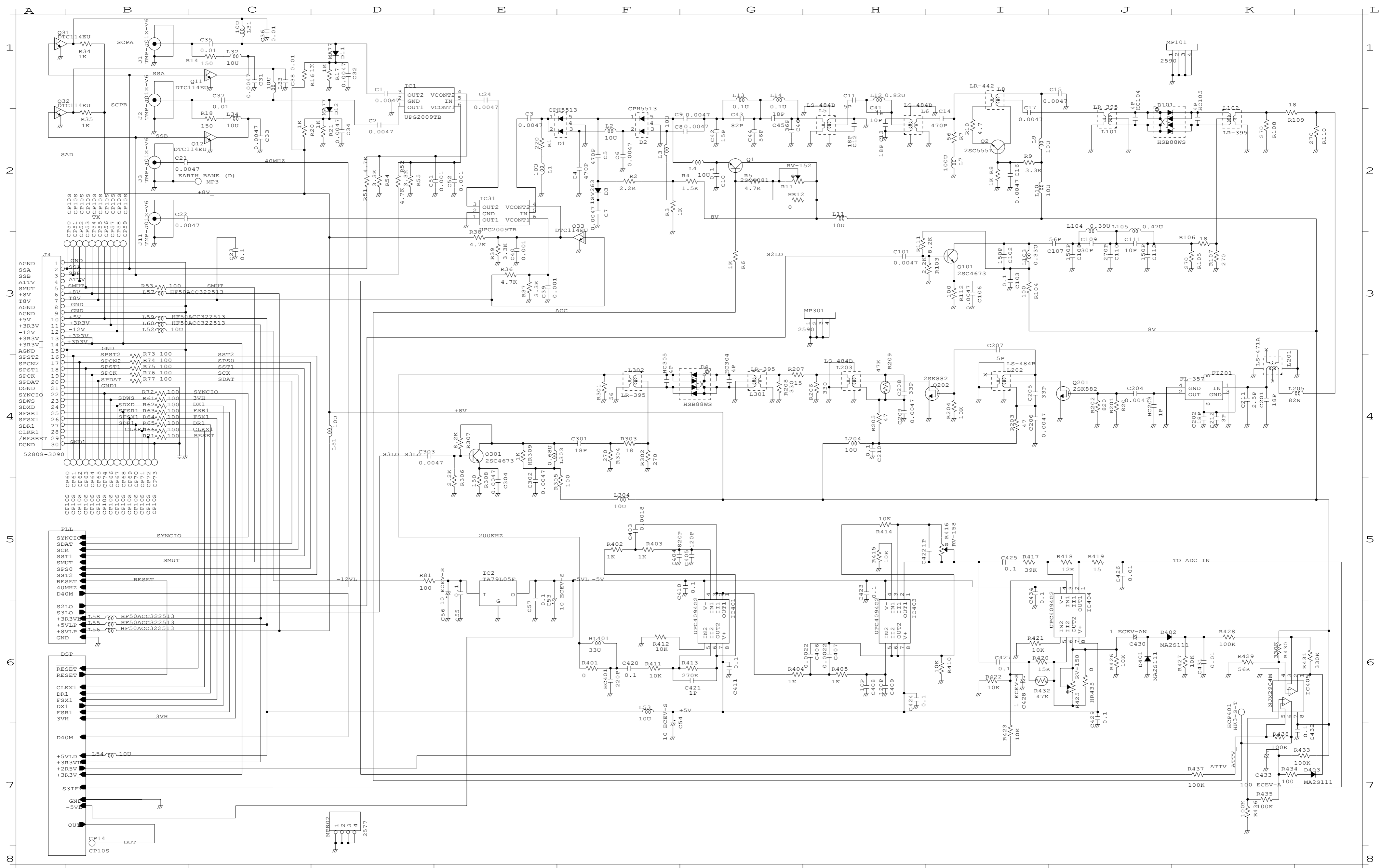


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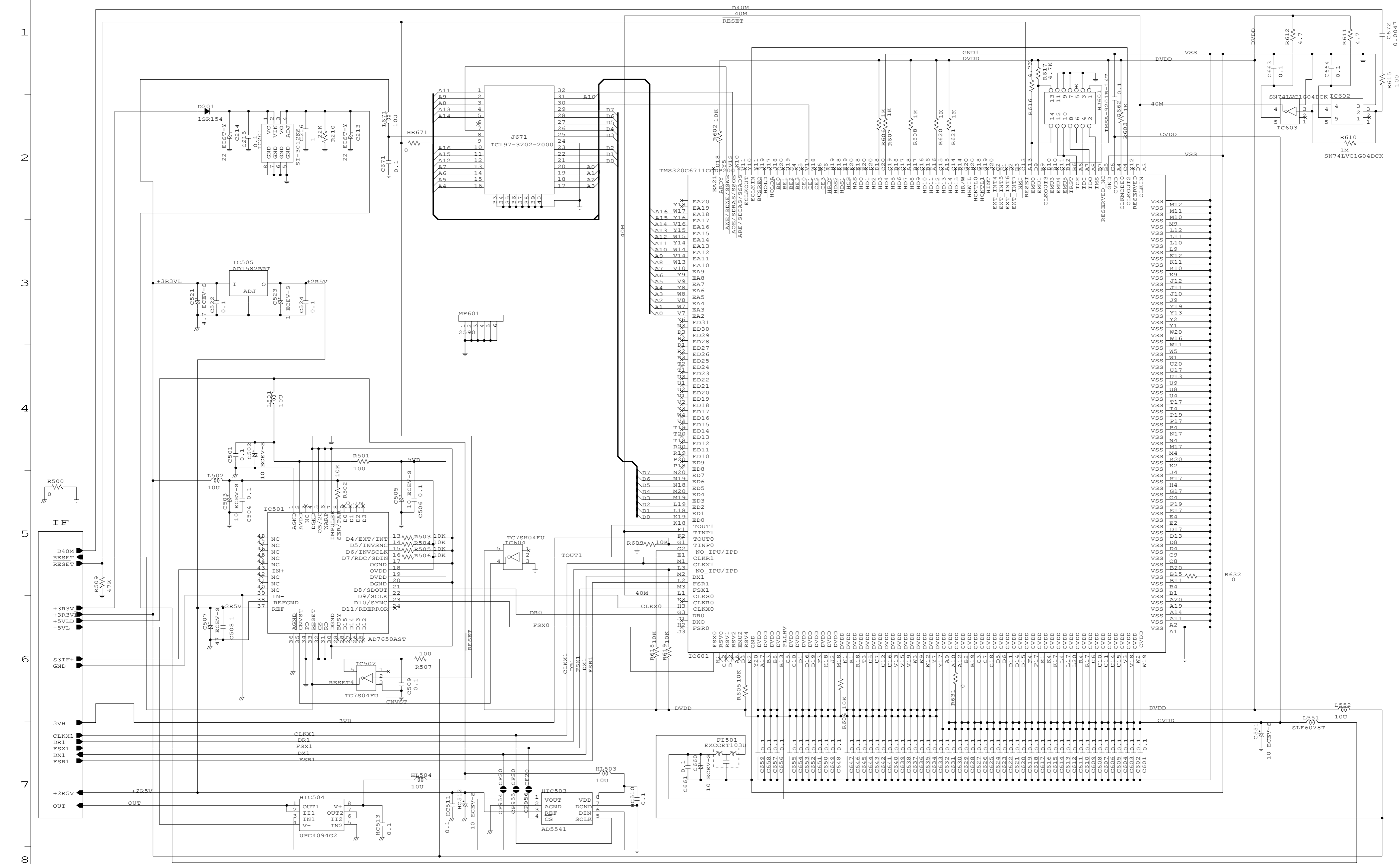
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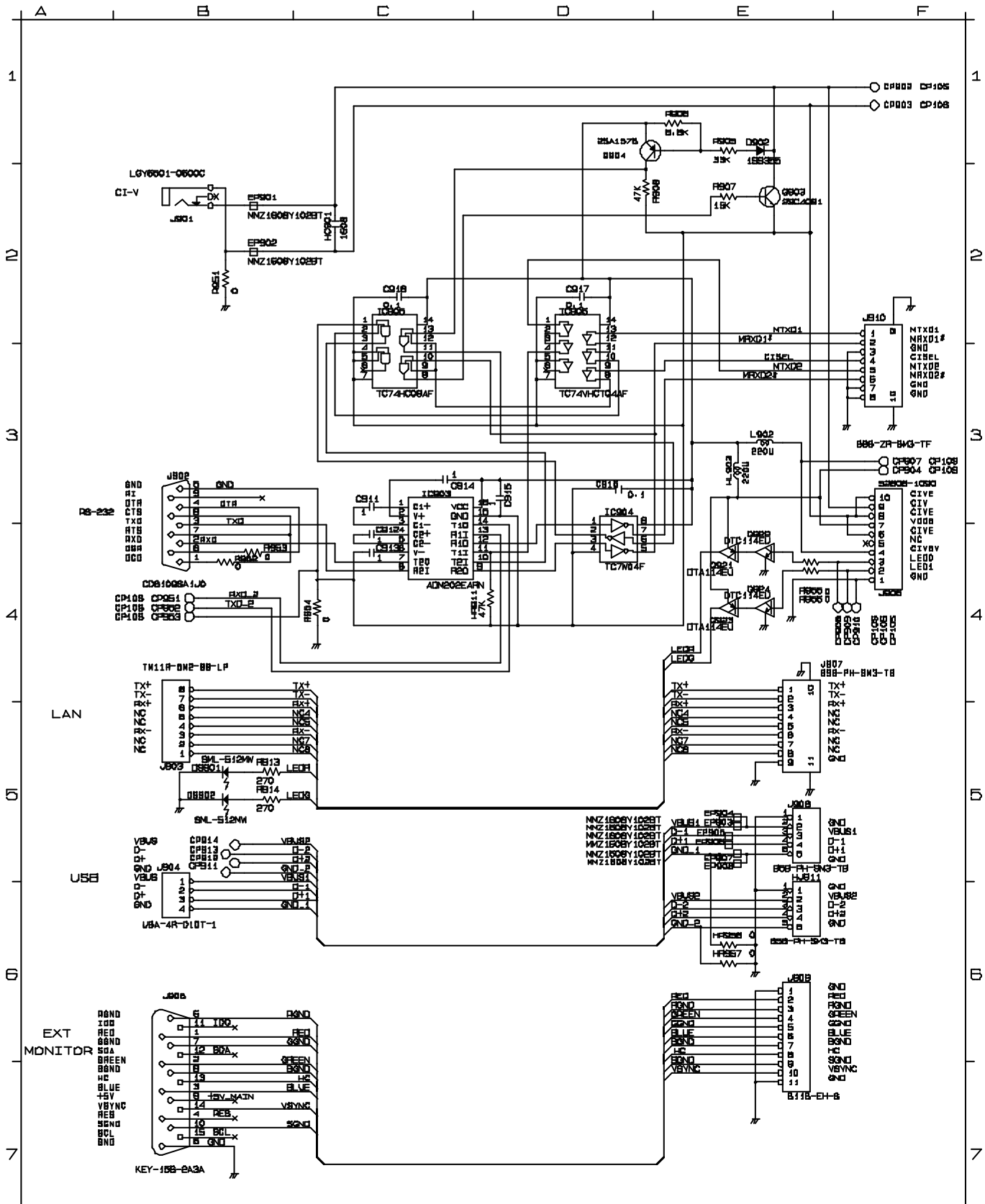


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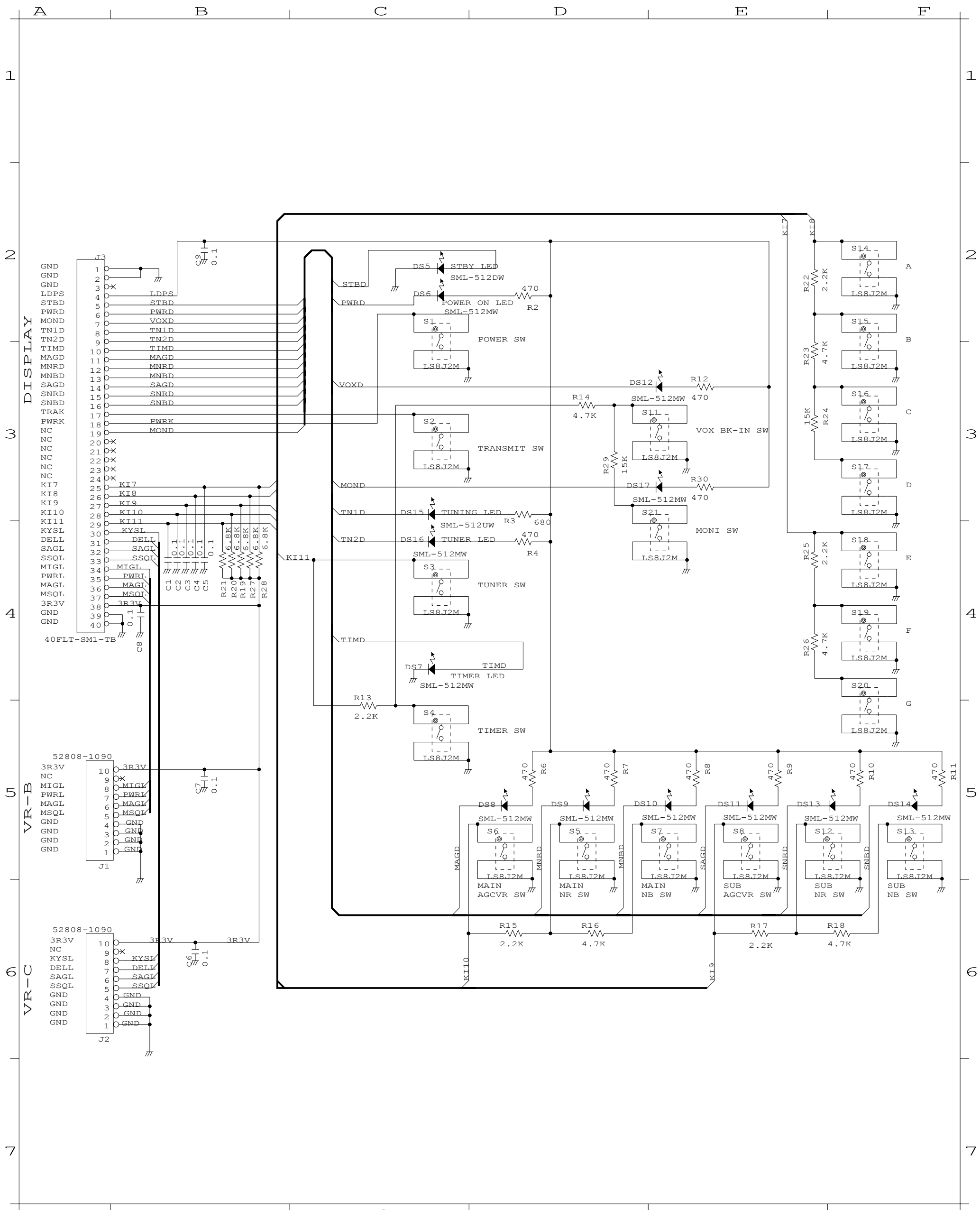


REVISIONS 1 2 3 4 5 6	7											MODEL	IC-7800		
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	9														
	10														
	11														
	12														
ICOM										DWN .BY DATE		SCOPE UNIT (SCOPE DSP) (3) SCHEMATIC DIAGRAM		DWN .NO.	
Icom Inc.															

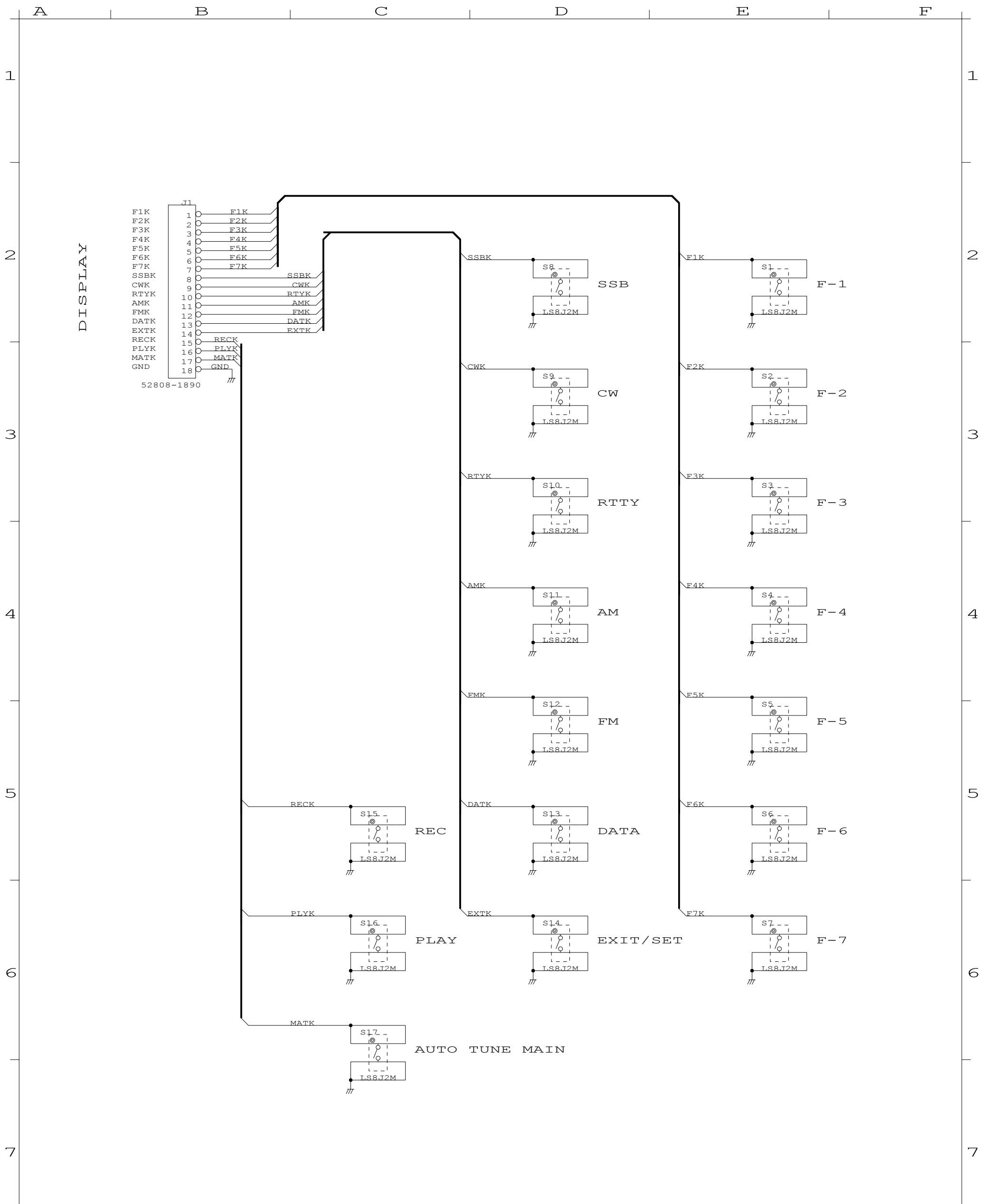


REVISIONS	1		DATE		MDEL	IC-7800
	2		SCOPE UNIT (4)			
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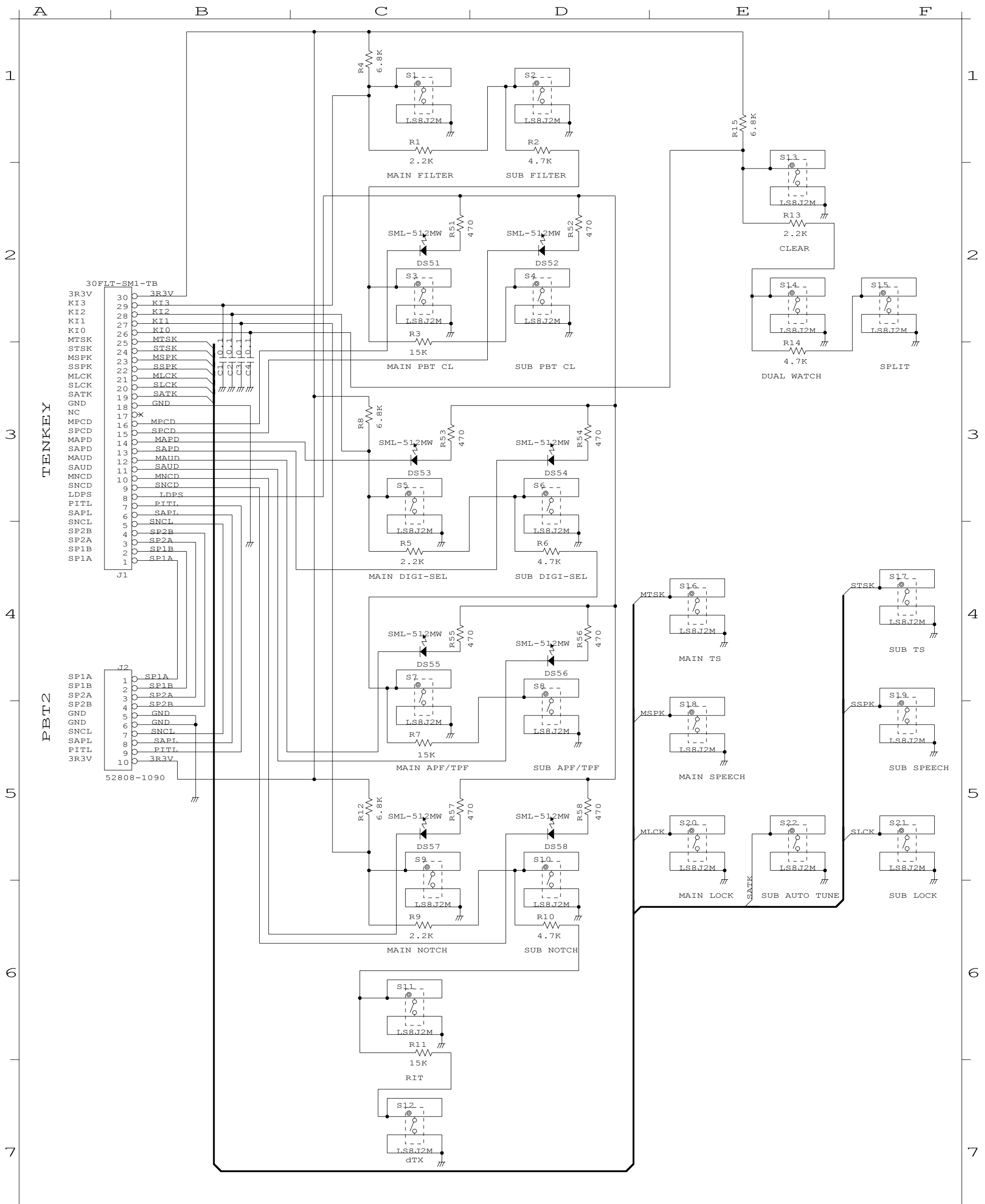
ICOM Icom Inc.



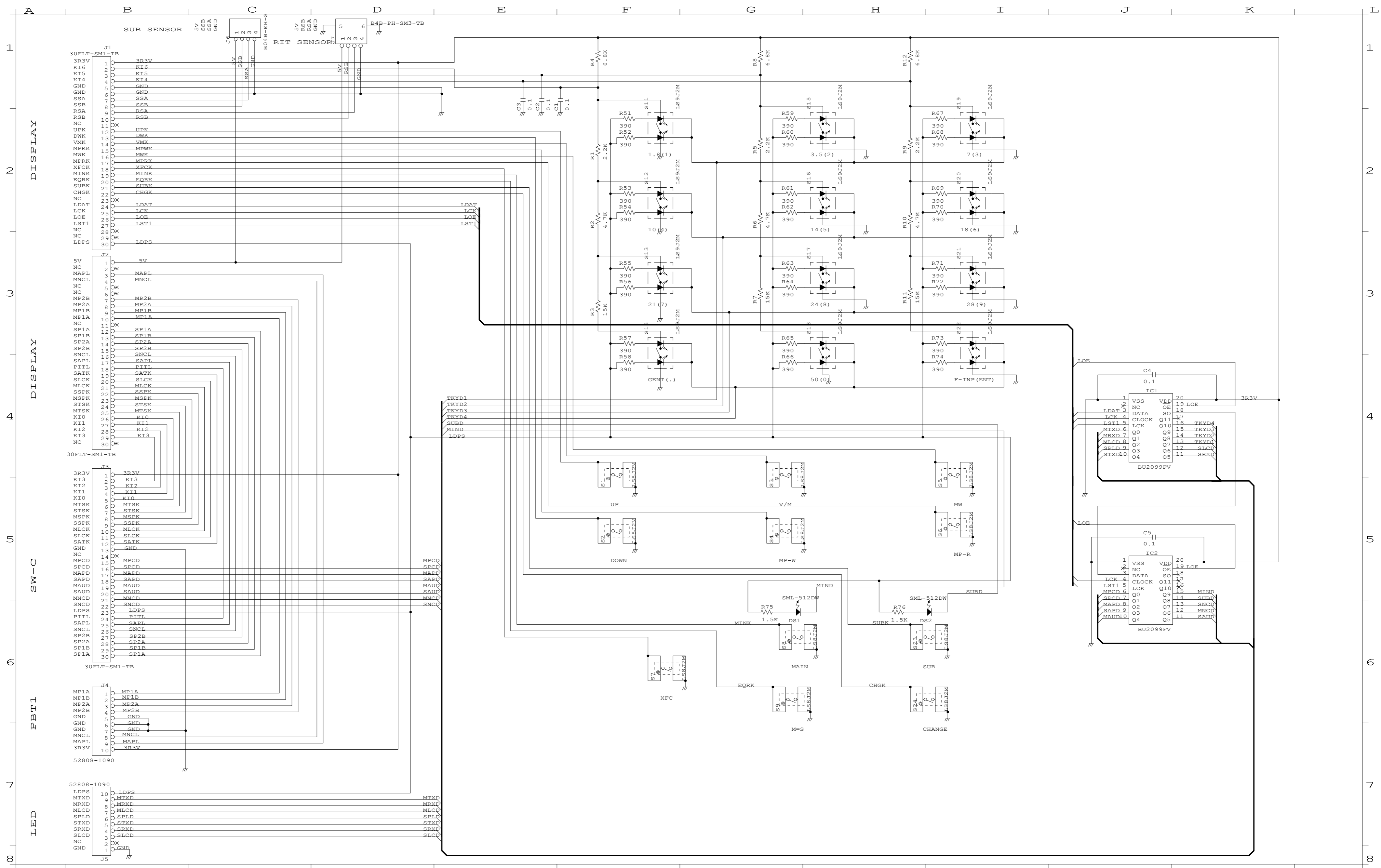
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	4			APPD.	CHKD.		DWN. BY:
	5						
	6						
	7						
	8			ICOM			Icom Inc.



REVISIONS	1			DATE		MODEL	IC-7800
	2			SW-B BOARD SCHEMATIC DIAGRAM		DWN. NO.	
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	4			APPD.	CHKD.	DWN. BY :	
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	8			ICOM			Icom Inc.

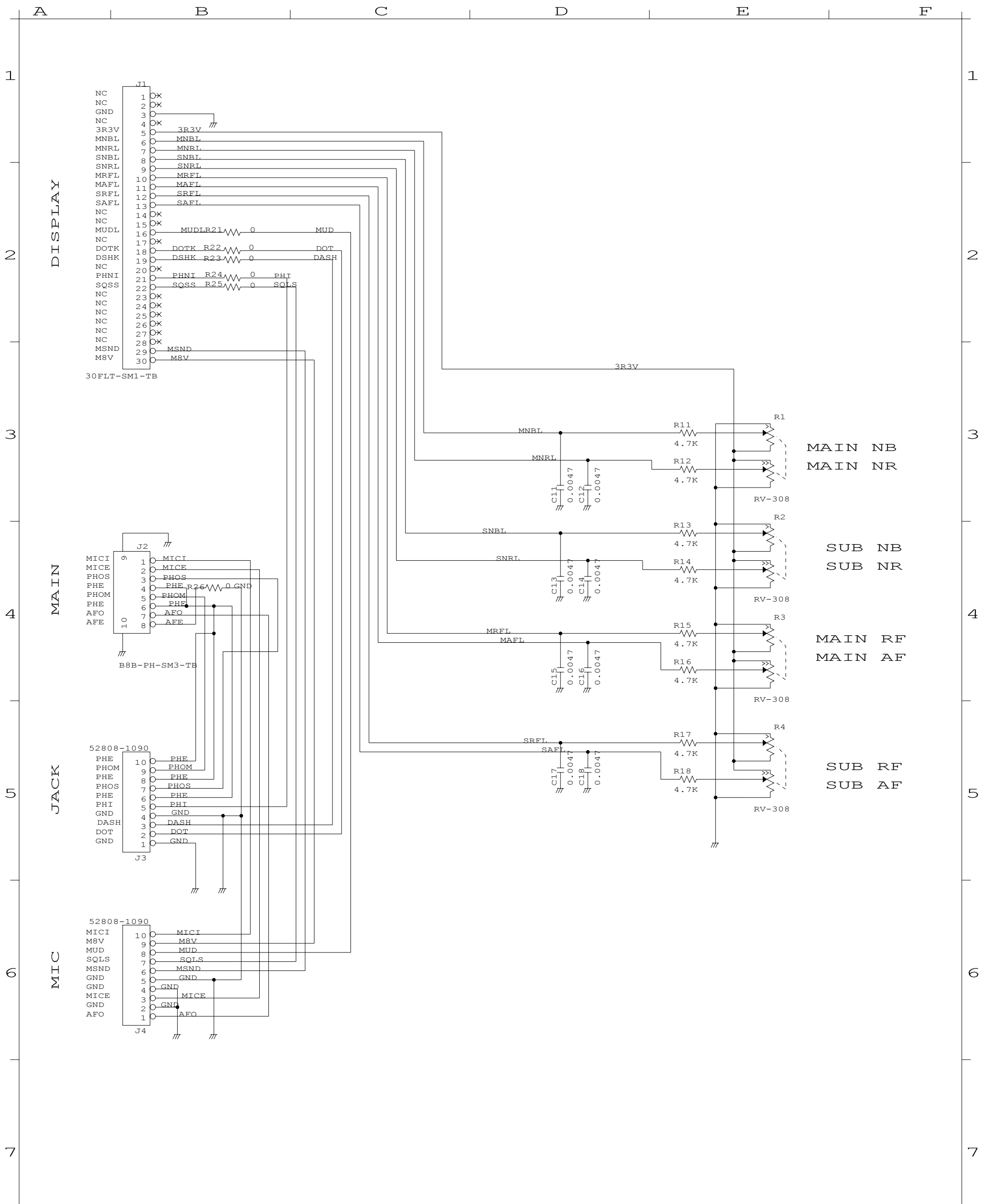


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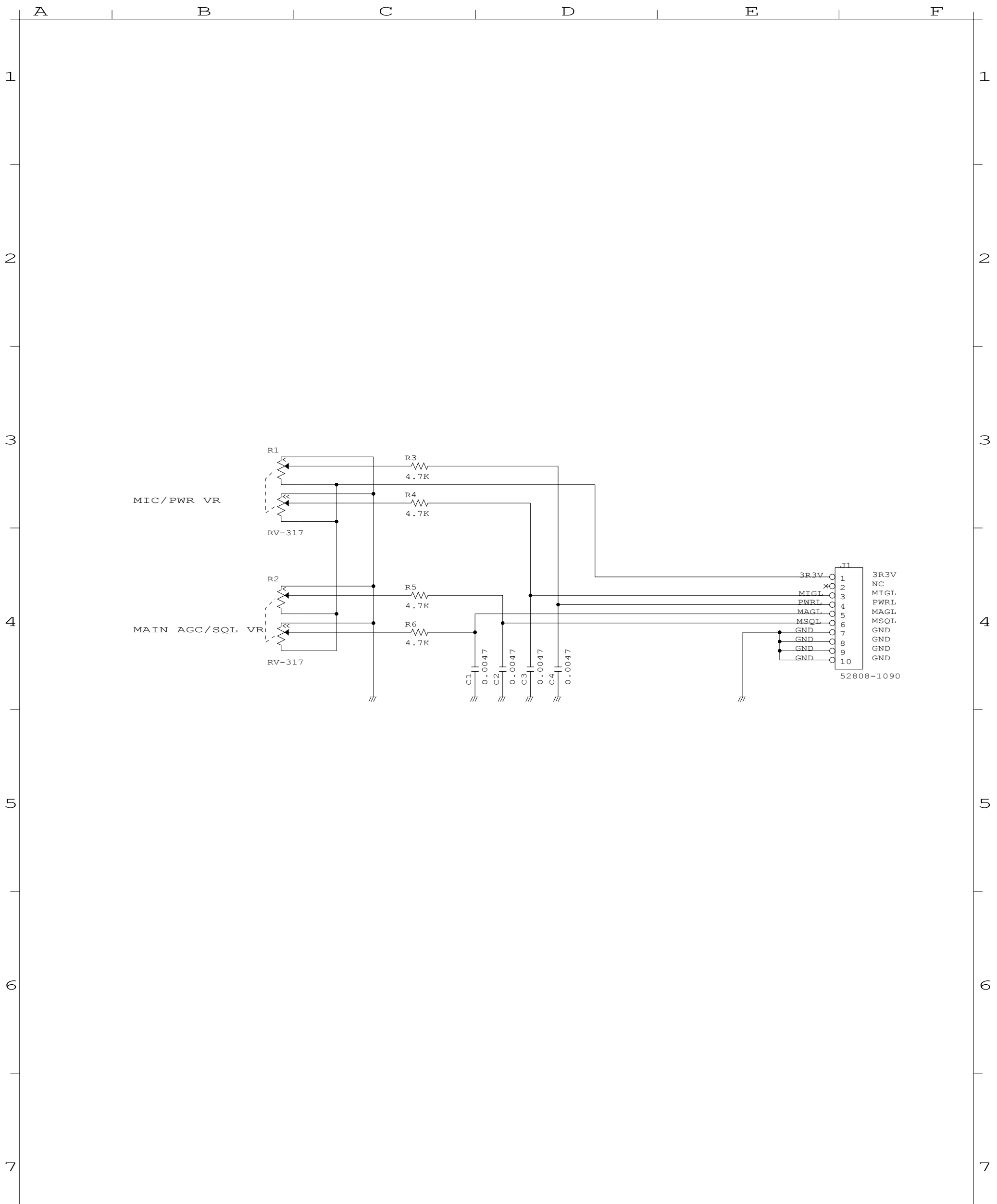


REVISIONS	1		7	APPD.	CHKD.	DWN. BY:	DATE	MODEL	IC-7800	
	2		8							
	3		9							
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	5		11			SCHEMATIC		DWN. NO.		
	6		12			DIAGRAM				
					ICOM		Icom Inc.			

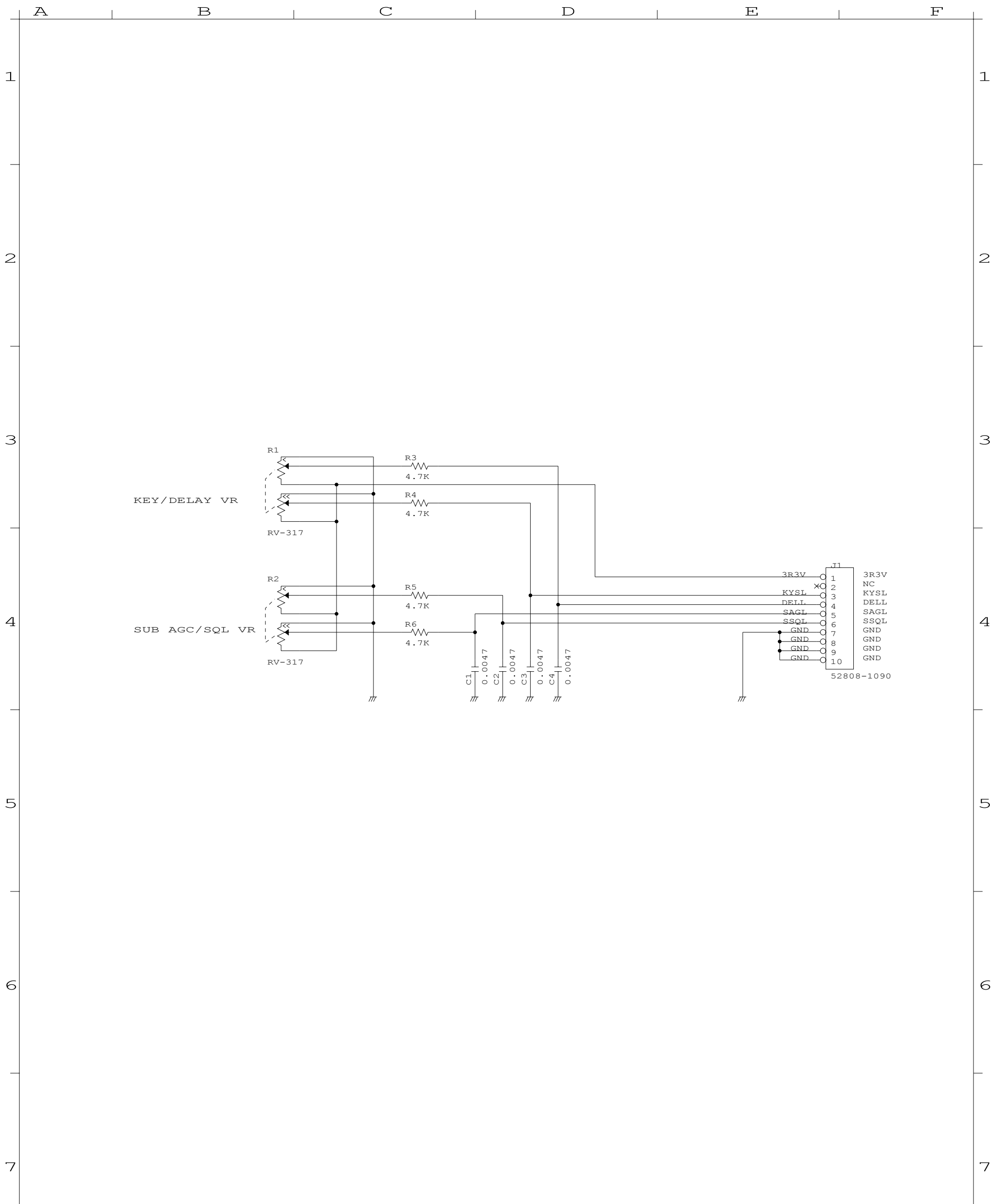




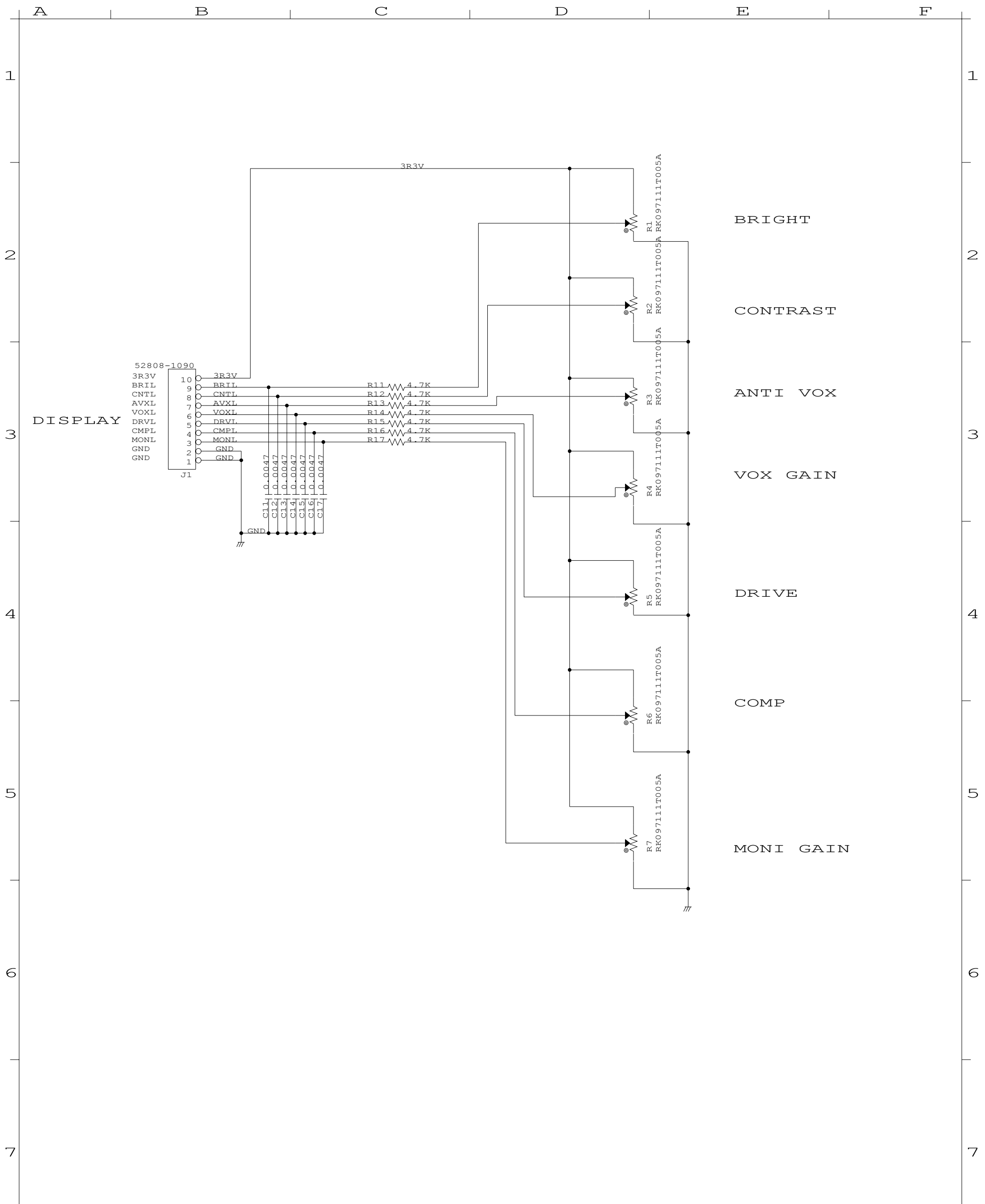
REVISIONS	1			DATE		MODEL	IC-7800
	2			VR-A BOARD			
	3			SCHEMATIC DIAGRAM		DWN. NO.	
	4			APPD.	CHKD.	DWN. BY.:	
	5						
	6						
	7						
	8				ICOM		Icom Inc.



REVISIONS	1			DATE		MODEL	IC-7800
	2			VR-B BOARD SCHEMATIC DIAGRAM		DWN.NO.	
	3						
	4			APPD.	CHKD.	DWN.BY.:	
	5						
	6						
	7						
	8			ICOM			Icom Inc.



REVISIONS	1			DATE		MODEL	IC-7800
	2			VR-C BOARD SCHEMATIC DIAGRAM		DWN. NO.	
	3						
	4			APPD.	CHKD.	DWN. BY :	
	5						
	6						
	7						
	8				ICOM		Icom Inc.



				DATE		MODEL	IC-7800
REVISIONS	1			VR-D BOARD SCHEMATIC DIAGRAM		DWN. NO.	
	2					DWN. BY :	
	3						
	4						
	5						
	6						
	7						
	8				ICOM		Icom Inc.

ICOM

TX RX LOCK SPLIT SUB TX RX LOCK

HF / 50MHz TRANSCEIVER

IC-7800

MIC → RF PWR KEY SPEED → DELAY

VOX BK- VOX

MAIN → AGC → SQL → SUB

MOI

AGCVR NR NB AGCVR NR NB

MAIN → NR → NB → SUB

PHONES

ELEC-KEY

MAIN → AF → RF → SUB

MIC

CF CARD



F-1 F-2 F-3 F-4 F-5 F-6 F-7

SSB CW RTTY/PSK AM/FM DATA M.SCOPE EXIT/SET

VOICE MEMORY

REC PLAY

MONI GAIN COMP DRIVE VOX GAIN ANTI VOX CONTRAST BRIGHT

AUT. TUNE

1.8 1	3.5 2	7 3
10 4	14 5	18 6
21 7	24 8	28 9
GENE	50 0	F-INP ENT

▲ ▼

V/M MW

MP-W MP-R

MAIN SUB

XFC

M=S CHANGE

MAIN TWIN PBT SUB

FILTER

PBT CLEAR

MAIN DIGI-SEL → NOTCH → SUB

DIGI-SEL

APF/TPF

NOTCH

RIT/ΔTX

RIT

ΔTX

CLEAR

CW PITCH

DUALWATCH SPLIT

TS

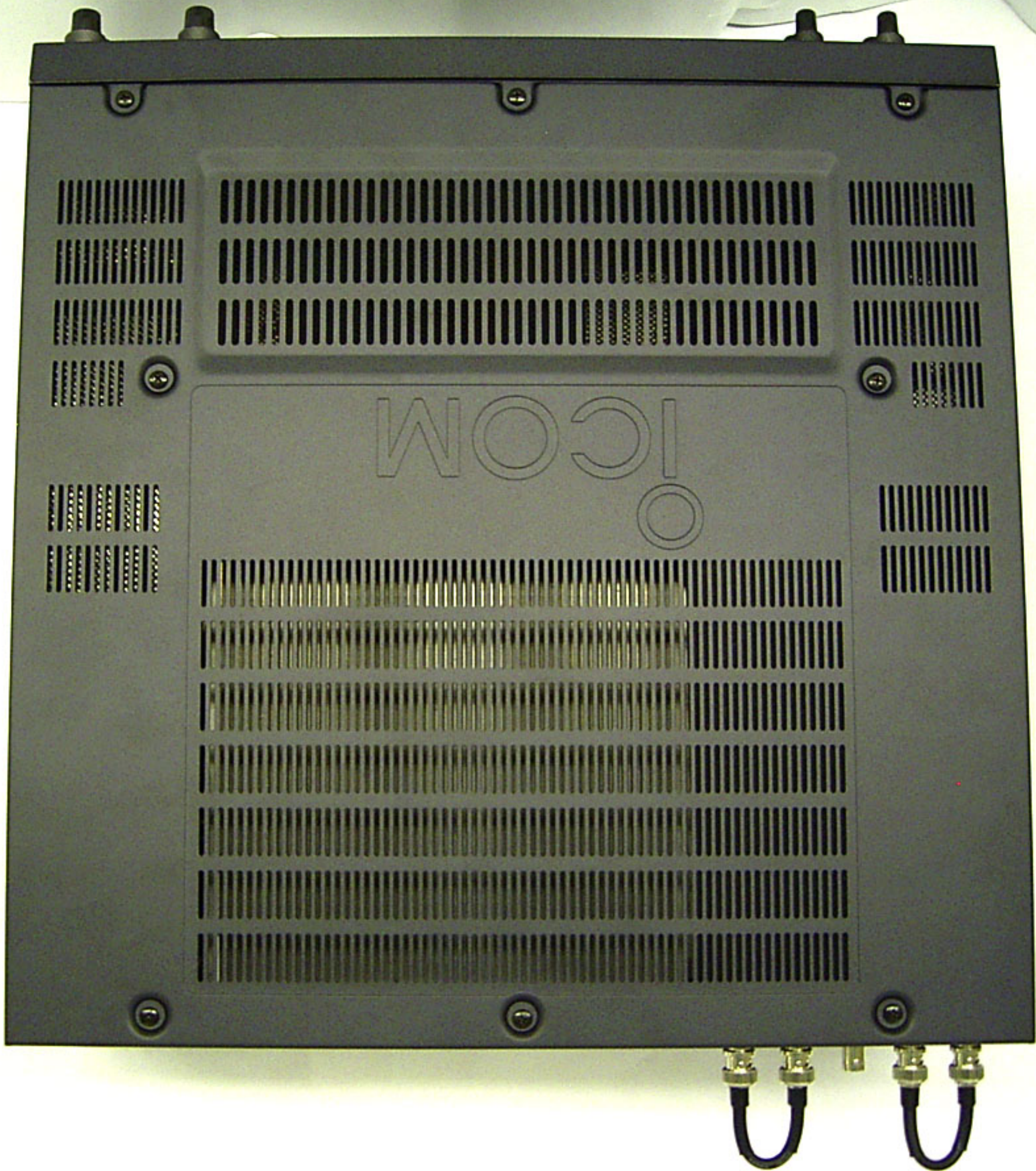
SPEECH

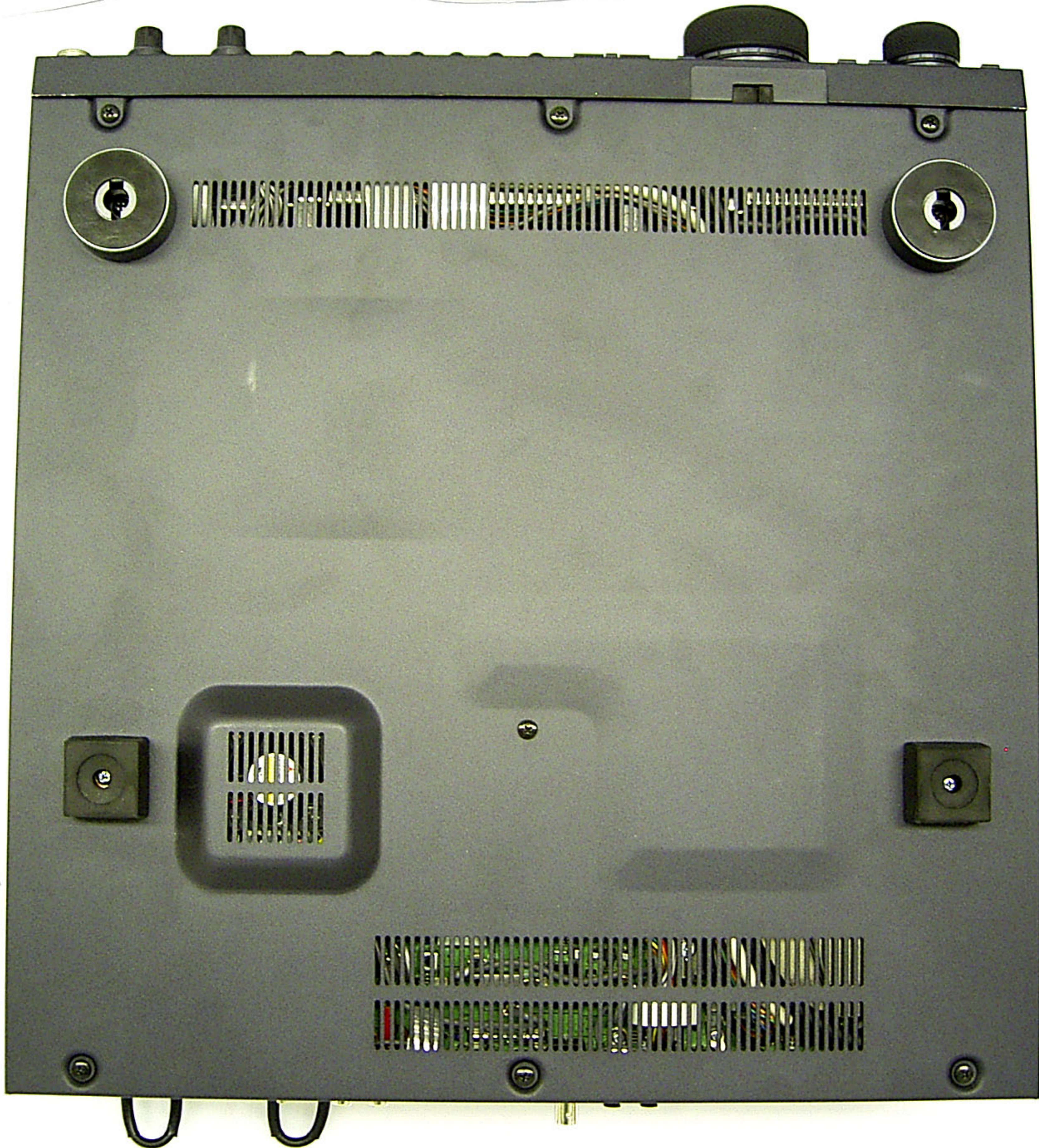
LOCK AUTO TUNE

TS

SPEECH

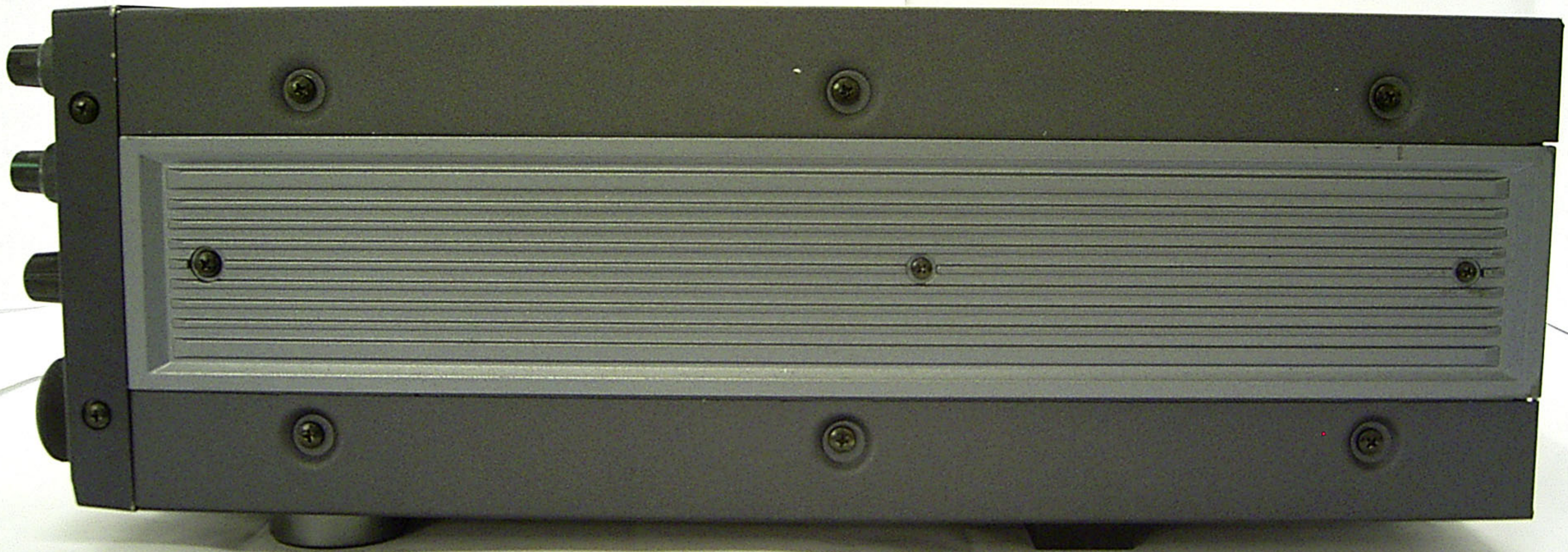
LOCK





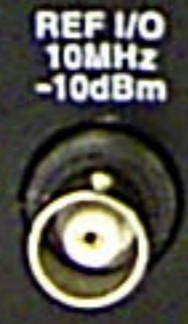
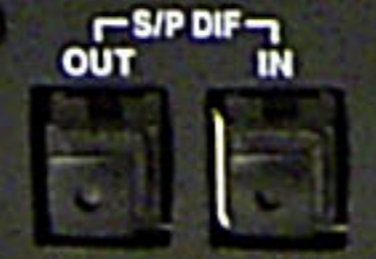
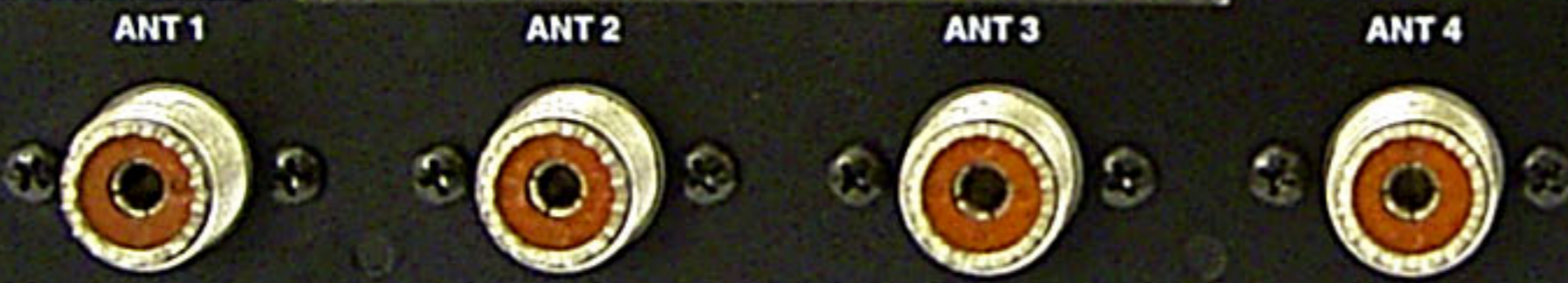
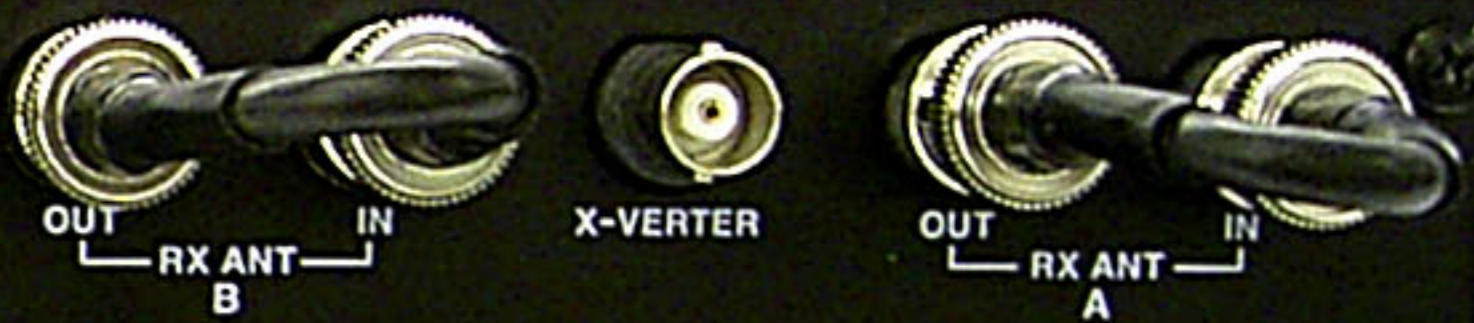
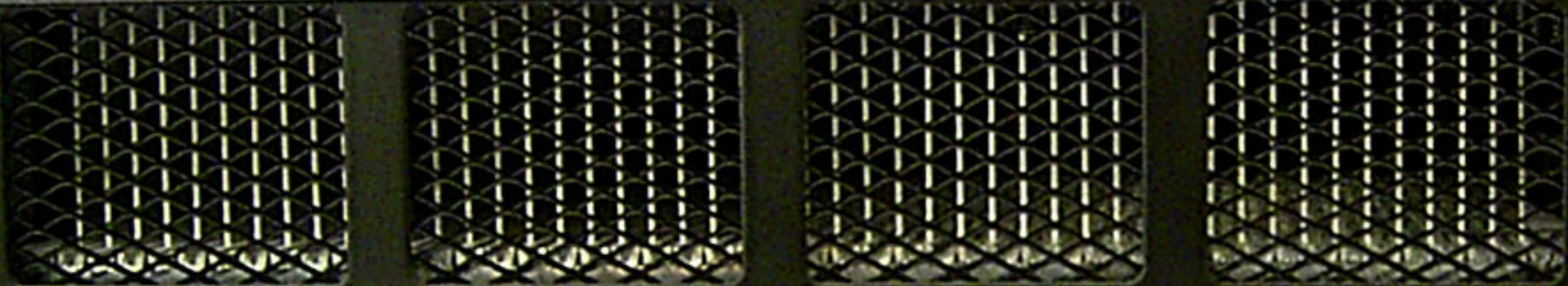






This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.  
WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIOTELEPHONE SERVICE SIGNALS IS PROHIBITED UNDER FCC RULES AND FEDERAL LAW.

**ICOM** **IC-7800** **FCC ID: AFJ259000**  
LINE VOLTAGE 100-120V AC  
Icom Inc. MADE IN JAPAN  
SERIAL NO. 0000215



**ICOM**

**IC-7800**

**LINE VOLTAGE 100-120V AC**

**Icom Inc.**

**MADE IN JAPAN**

**FCC ID: AFJ259000**

**SERIAL NO.**

**0000215**

**ANT 2**



**ANT 3**



**S/P DIF**

**REF I/O  
10MHz**

**DC OUT  
15V**

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

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**WARNING: MODIFICATION OF THIS DEVICE TO RECEIVE CELLULAR RADIOTELEPHONE SERVICE SIGNALS IS PROHIBITED UNDER FCC RULES AND FEDERAL LAW.**

**ANT 1**

