IC-7800 ADJUSTMENT PROCEDURES

1 PREPARATION BEFORE SERVICING

■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GREDE AND RANGE	
AC outlet	Voltage	: 85 V–265 V
RF power meter (terminated type)	Measuring range Frequency range Impedance SWR	: 10–200 W : 1.8–100 MHz : 50 Ω : Less than 1.2 : 1
Frequency counter	Frequency range Frequency accuracy Sensitivity	: 0.1–100 MHz : ±0.5 ppm or better : 100 mV or better
RF voltmeter	Frequency range Measuring range	: 0.1–100 MHz : 0.01–10 V
FM deviation meter	Frequency range Measuring range	: DC–500 MHz : 0 to ±5 kHz
Modulation analyzer	Frequency range Measuring range	: At least 90 MHz : 0–100 %
Distortion meter	Frequency range Measuring range	: 1 kHz ±10 % : 1–100 %
Oscilloscope	Frequency range Measuring range	: DC–20 MHz : 0.01–20 V

EQUIPMENT	GREDE AND RENGE	
Audio generator	Frequency range Measuring range	: 300–3000 Hz : 1–500 mV
Standard signal generator (SSG)	Frequency range Output level	: 0.1–100 MHz : 0.1 µV–32 mV (–127 to –17 dBm)
Digital multimeter	Imput impeadance	: 10 MΩ/DC or beter
AC millivoltmeter	Measuring range	: 10 mV–10 V
DC voltmeter	Input impedance	: 50 kΩ/V DC or better
DC ammeter	Measurement capability	: 1 A/30 A
Spectrum analyzer	Frequency range Spectraum bandwidth	: At least 90 MHz : 100 kHz or more
Attenuator	Power attenuation Capacity	: 50 or 60 dB : 150 W or more
External speaker	Input impedance Capacity	: 8 Ω : 5 W or more
Terminator	Resistance Capacity	: 50 and 150 Ω : 150 W or more

2 OSC UNIT ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
REFERENCE OUTPUT	1	• Set the OSC unit to the external reference mode on the set mode. • MAIN display frequency : 10.000 MHz • Connect an SSG to J71 on the OSC unit and set as : Frequency : 10.000 MHz Level : 71 mV* (–10 dBm) Modulation : OFF • Terminates J73 with 50 Ω. • Receiving	OSC	Connect an RF voltmeter to the J72.	Maximum voltage	OSC	L61, L62
REF IN OUTPUT	2	• MAIN display frequency : 10.000 MHz • Receiving	OSC	Connect an RF voltmeter to the J72.	0 dBm ±3.0 dB		Verify
		• Terminates J72 with 50 Ω. • SUB display frequency : 10.000 MHz • Receiving		Connect an RF voltmeter to the J73.	0 dBm ±3.0 dB		Verify
REF OUT OUTPUT	3	• Set the OSC unit to the internal reference mode on the set mode. • MAIN display frequency : 10.000 MHz • Receiving	OSC	Connect an RF voltmeter to the J71.	–10.0 dBm ±3.0 dB		Verify
		• Terminates J73 with 50 Ω. • SUB display frequency : 10.000 MHz • Receiving		Connect an RF voltmeter to the J72.	0 dBm ±3.0 dB		Verify
		• Terminates J72 with 50 Ω. • SUB display frequency : 10.000 MHz • Receiving		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	• MAIN display frequency : 40.000 MHz • Mode : USB • Receiving	RX PLL-A	Connect an RF voltmeter to the CP701 (40MHz).	Maximum voltage	RX PLL-A	L702, L703
LPL LOCK VOLTAGE	1	• MAIN display frequency : 0.030 MHz • Mode : USB • Receiving	RX PLL-A	Connect a DC voltmeter to the CP1 (LV1).	2.0 V ±0.1 V	RX PLL-A	C154
	2	• MAIN display frequency : 7.999 MHz • Mode : USB • Receiving			Less than 3.0 V		Verify
HPL LOCK VOLTAGE (VCO1)	1	• MAIN display frequency : 7.999 MHz • Mode : USB • Receiving	RX PLL-A	Connect a DC voltmeter to the CP2 (LV2).	6.0 V ±0.1 V	RX PLL-A	C222
(VCO2)	2	• MAIN display frequency : 14.999 MHz • Mode : USB • Receiving			6.0 V ±0.1 V		C232
(VCO3)	3	• MAIN display frequency : 21.999 MHz • Mode : USB • Receiving			6.0 V ±0.1 V		C242
(VCO4)	4	• MAIN display frequency : 29.999 MHz • Mode : USB • Receiving			6.0 V ±0.1 V		C252
(VCO5)	5	• MAIN display frequency : 44.999 MHz • Mode : USB • Receiving			6.0 V ±0.1 V		C262
(VCO6)	6	• MAIN display frequency : 60.000 MHz • Mode : USB • Receiving			6.0 V ±0.1 V		C272
(VCO1)	7	• MAIN display frequency : 0.030 MHz • Mode : USB • Receiving	RX PLL-A	Connect a DC voltmeter to the CP2 (LV2).	1.8 V–2.8 V		Verify
(VCO2)	8	• MAIN display frequency : 8.000 MHz • Mode : USB • Receiving			1.8 V–2.8 V		Verify
(VCO3)	9	• MAIN display frequency : 15.000 MHz • Mode : USB • Receiving			1.8 V–2.8 V		Verify
(VCO4)	10	• MAIN display frequency : 22.000 MHz • Mode : USB • Receiving			1.8 V–2.8 V		Verify
(VCO5)	11	• MAIN display frequency : 30.000 MHz • Mode : USB • Receiving			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	• MAIN display frequency : 45.0 MHz • Mode : USB • Receiving	RX PLL-A	Connect a DC voltmeter to the CP2 (LV2).	1.8 V–2.8 V		Verify
R1 LO OUTPUT	1	• MAIN display frequency : 14.999 MHz • Mode : USB • Receiving	RX PLL-A	Connect an DC voltmeter to the J351 (R1LO).	2.25 dBm ±0.25 dB	RX PLL-A	R357
2LO LOCK VOLTAGE	1	• MAIN display frequency : 14.100 MHz • Mode : USB • Receiving	RX PLL-A	Connect an DC voltmeter to the CP3.	1.5 V ±0.3 V	RX PLL-A	C546
R2 LO OUTPUT	1	• MAIN display frequency : 14.100 MHz • Mode : USB • Receiving	RX PLL-A	Connect a spectrum analyzer to the J831 (R2LO).	Maximum level (–10 dBm ±3.0 dB)	RX PLL-A	L801, L834
T2 LO OUTPUT	1	• MAIN display frequency : 14.100 MHz • Mode : USB • Receiving	RX PLL-A	Connect a spectrum analyzer to the J561 (T2LO).	Maximum level (3.0 dBm ±3.0 dB)	RX PLL-A	L565, L566
RX SENSITIVITY	1	Pre-set the IC-7800 as below condition.	RX PLL-A	Connect a DC voltmeter to the CP1102.	4.5 V ±0.1 V	RX PLL-A	R1101
		• MAIN display frequency : 14.150 MHz • Mode : USB • Dual watch : OFF • MAIN Ant. : ANT1 • Pre-amp. 1 : ON • SUB AF : Minimum level • Set R1228 to center position. • Rotate L1058 to 8.5 turns in clockwise direction. • Rotate L1401 to 2 turns in clockwise direction. • Rotate L1402 to 2 turns in clockwise direction. • Rotate L1403 to 3.5 turns in clockwise direction. • Rotate L1404 to 3.5 turns in clockwise direction. • Receiving		Connect a DC voltmeter to the CP1103.	4.5 V ±0.1 V	RX PLL-A	R1132
(HF)	2	• MAIN display frequency : 14.150 MHz • Mode : USB • Connect an SSG to [ANT1] connector and set as : Frequency : 14.1515 MHz Level : 1 µV* (–107 dBm) Modulation : OFF • Receiving	Rear panel	Connect an AC millivolt meter to the [EXT SP] jack with 8 Ω load.	Maximum audio level	RX PLL-A	L1408, L1058
IMAGE RESPONSE	1	• MAIN display frequency : 14.150 MHz • Mode : USB • Connect an SSG to [ANT1] connector and set as : Frequency : 14.0765 MHz Level : 50 mV* (–13 dBm) Modulation : OFF • Receiving	Rear panel	Connect a spectrum analyzer to the [EXT SP] jack with 8 Ω load.	Mimimum 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	• MAIN display frequency : 50.020 MHz • Mode : USB • Pre-amp. 2 : ON • Connect an SSG to [ANT1] connector and set as : Frequency : 50.0215 MHz Level : 0.32 µV* (–117 dBm) Modulation : OFF • Receiving	Rear panel	Connect an AC millivolt meter to the [EXT SP] jack with 8 Ω load.	Maximum audio level	RX PLL-A	L1222
IF THROUGH (50 MHz)	1	• MAIN display frequency : 50.020 MHz • Mode : USB • Connect an SSG to [ANT1] connector and set as : Frequency : 64.455 MHz Level : 50 mV* (–13 dBm) Modulation : OFF • Receiving	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	• Dual watch : ON • SUB display frequency : 40.000 MHz • Mode : USB • Receiving	RX PLL-B	Connect an RF voltmeter to the CP701 (40MHz).	Maximum voltage	RX PLL-B	L702, L703
LPL LOCK VOLTAGE	1	• SUB display frequency : 60.000 MHz • Mode : USB • Receiving	RX PLL-B	Connect a DC voltmeter to the CP1 (LV1).	2.0 V ±0.1 V	RX PLL-B	C154
	2	• SUB display frequency : 1.499 MHz • Mode : USB • Receiving			Less than 4.0 V		Verify
HPL LOCK VOLTAGE (VCO1)	1	• SUB display frequency : 7.999 MHz • Mode : USB • Receiving	RX PLL-B	Connect a DC voltmeter to the CP2 (LV2).	6.0 V ±0.1 V	RX PLL-B	C222
(VCO2)	2	• SUB display frequency : 14.999 MHz • Mode : USB • Receiving			6.0 V ±0.1 V		C232
(VCO3)	3	• SUB display frequency : 21.999 MHz • Mode : USB • Receiving			6.0 V ±0.1 V		C242
(VCO4)	4	• SUB display frequency : 29.999 MHz • Mode : USB • Receiving			6.0 V ±0.1 V		C252
(VCO5)	5	• SUB display frequency : 44.999 MHz • Mode : USB • Receiving			6.0 V ±0.1 V		C262
(VCO6)	6	• SUB display frequency : 60.000 MHz • Mode : USB • Receiving			6.0 V ±0.1 V		C272
(VCO1)	7	• SUB display frequency : 0.030 MHz • Mode : USB • Receiving	RX PLL-A	Connect a DC voltmeter to the CP2 (LV2).	1.8 V–2.8 V		Verify
(VCO2)	8	• SUB display frequency : 8.000 MHz • Mode : USB • Receiving			1.8 V–2.8 V		Verify
(VCO3)	9	• SUB display frequency : 15.000 MHz • Mode : USB • Receiving			1.8 V–2.8 V		Verify
(VCO4)	10	• SUB display frequency : 22.000 MHz • Mode : USB • Receiving			1.8 V–2.8 V		Verify
(VCO5)	11	• SUB display frequency : 30.000 MHz • Mode : USB • Receiving			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	• SUB display frequency : 45.000 MHz • Mode : USB • Receiving	RX PLL-B	Connect a DC voltmeter to the CP2 (LV2).	1.8 V–2.8 V		Verify
S1 LO OUTPUT	1	• SUB display frequency : 14.999 MHz • Mode : USB • Receiving	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	• SUB display frequency : 14.100 MHz • Mode : USB • Receiving	RX PLL-B	Connect a DC voltmeter to the CP3.	1.5 V ±0.3 V	RX PLL-B	C546
2LO OUTPUT	1	• MAIN display frequency : 14.100 MHz • Mode : USB • Receiving	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. • SUB display frequency : 14.150 MHz • Mode : USB • Dual watch : ON • MAIN Ant. : ANT2 • SUB Ant. : ANT1 • Pre-amp. 1 : ON • MAIN AF : Minimum level • Set R1228 to center position. • Rotate L1401 to 2 turns in clockwise direction. • Rotate L1402 to 2 turns in clockwise direction. • Rotate L1403 to 3.5 turns in clockwise direction. • Rotate L1404 to 3.5 turns in clockwise direction. • Receiving	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	• SUB display frequency : 14.150 MHz • Mode : USB • Connect an SSG to [ANT1] connector and set as : Frequency : 14.1515 MHz Level : 1 µV* (–107 dBm) Modulation : OFF • Receiving	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	• SUB display frequency : 14.150 MHz • Mode : USB • Connect an SSG to [ANT1] connector and set as : Frequency : 14.0765 MHz Level : 50 mV* (–13 dBm) Modulation : OFF • Receiving	Rear panel	Connect a spectrum analyzer to the [EXT SP] jack with 8 Ω load.	Mimimum 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	• SUB display frequency : 50.020 MHz • Mode : USB • Pre-amp. 2 : ON • Connect an SSG to [ANT1] connector and set as : Frequency : 50.0215 MHz Level : 0.32 µV* (–117 dBm) Modulation : OFF • Receiving	Rear panel	Connect an AC millivolt meter to the [EXT SP] jack with 8 Ω load.	Maximum audio level	RX PLL-B	L1222
IF THROUGH (50 MHz)	1	• SUB display frequency : 50.020 MHz • Mode : USB • Connect an SSG to [ANT1] connector and set as : Frequency : 64.455 MHz Level : 50 mV* (–13 dBm) Modulation : OFF • Receiving	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	• Preset R301, R407, R410 on the PA200W unit to max. CCW. • [MIC] gain : max. CCW • Main display frequency : 14.100 MHz • Mode : USB • Apply no audio signals to the [MIC] connector. • Transmitting	PA200W	Connect an ammeter between W1 and the transceiver.	1.0 A higher	PA200W	R301
(For final amplifier)	2	• Transmitting			1.0 A higher		R407 R425
	3	• Transmitting			1.0 A higher		R410 R426

6 TUNER UNIT ADJUSTMENT

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
SWR DETECTOR	1	• Main display frequency : 24.950 MHz • Mode : FM • [RF POWER] : Max. CW (200W) • [TUNER] : Through • APC : OFF • Connect a 50 Ω terminator to [ANT1] connector. • Transmitting	CTRL	Connect a digital multimeter or oscilloscope to the check point CP101 (REF).	Minimum voltage	CTRL	C104
		ADJUSTMENT CONDITION	**DISPLAY**		**OPERATION**		
TUNER REFERENCE	1	• Enter the tuner adjustment mode: ① Turn power OFF. ② Terminate the [REMOTE] jack with a 3.5(d) mm mini-plug. ③ While pushing [M.SCOPE] and [EXIT/SET], turn power ON.	TUNER-ADJUST MODE		Push [F-7 (START)] to start tuning.		
	2		-- TUNER -- Adjusting Now		Verify the display shows “Adjusting Now”.		
	3		-- TUNER -- OK		Verify the display shows “OK”.		

7 MAIN UNIT ADJUSTMENTS

ADJUSTMENT		ADJUSTMENT CONDITION	MEASUREMENT		VALUE	ADJUSTMENT POINT	
			UNIT	LOCATION		UNIT	ADJUST
MAXIMUM OUTPUT POWER	1	• Turn the power OFF • Push and hold [F-INP] and [MW], and then turn the power ON. • Preset R93 to 3 o'clock position. • MAIN display frequency : Any • Mode : USB	MAIN	Connect a digital multimeter or oscilloscope to the check point CP82.	0.5 V ±0.2 V	MAIN	R69
	2	• Connect an audio generator to the [MIC] connector and set as: Frequency : 1.5 kHz Level : 1 mV • Transmitting	Rear panel	Connect an RF power meter to the [ANT1] connector.	Maximum output power	MAIN	L505 C576 L512
RESIDUAL AM	3	• Mode : FM • Connect an audio generator to the [MIC] connector and set as: Frequency : 1.0 kHz Level : 10 mV • Transmitting	Rear panel	Connect an RF power meter to the [ANT1] connector.			verify
	4	• Apply no audio signals to the [MIC] connector. • Transmitting			Minimum level difference between an audio generator is ON and OFF.	MAIN	C576
TX TOTAL GAIN	1	• MAIN display frequency : Any • Mode : USB • [MIC] GAIN : 12 o'clock position • Connect an audio generator to the [MIC] connector and set as: Frequency : 1.5 kHz Level : 1 mV • Transmitting	Rear panel	Connect an RF power meter to the [ANT1] connector.	130 W	MAIN	R538
HIGH POWER (HF)	1	• MAIN display frequency : 14.100 MHz • Mode : RTTY • Transmitting	Rear panel	Connect an RF power meter to the [ANT1] connector.	200 W	MAIN	R81
(50 MHz)	2	• MAIN display frequency : 50.100 MHz • Mode : RTTY • Transmitting			200 W		R79
AM CARRIER POWER	1	• MAIN display frequency : 14.100 MHz • Mode : AM • Apply no audio signals to the [MIC] connector. • Transmitting	Rear panel	Connect an RF power meter to the [ANT1] connector.	55 W	MAIN	R82
Id-APC	1	• MAIN display frequency : 14.100 MHz • Mode : RTTY • Connect CP81 to GND. • Preset R93 to 90˚ CCW. • Transmitting	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. • Dual watch : OFF • Pre-amp. : OFF • Attenuator : OFF • Scope : ON • Scope attenuator: OFF • MAIN display frequency : 14.200 MHz • Mode : CW • Span : ±25 kHz • Receiving	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 µV* (–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 µV* (–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 µV* (–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 µV* (–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	• Enter the adjustment mode: ① Turn power OFF. ② Terminate the [REMOTE] jack with a 3.5(d) mm mini-plug. ③ While pushing [SSB] and [CW/RTTY], turn power ON.	ADJUST MODE	Push [F-1 (METER)], [F-2 (TX)] or [F-3 (RX)] to select each adjustment mode. Once enterring adjustment mode, use [F-1 (▼)] to skip items, or [F-2 (EXIT)] to return the opening display.
		CAUTION: **NEVER** select ajustment 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.		
HF PO METER	1	• Connect an audio generator to the [MIC] connector and set as: Frequency : 1.5 kHz Level : 10 mVrms • Connect an RF power meter to the [ANT1] connector. • Connect a load which becomes SWR is 2 to the [ANT2] connector. • Push [F-2 (TX)] to enter the meter scale adjustment.	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		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		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		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	1	• Connect an audio generator to the [MIC] connector and set as: Frequency : 1.5 kHz Level : 10 mVrms • Connect an RF power meter to the [ANT1] connector. • Connect a load which becomes SWR is 2 to the [ANT2] connector.	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 METER	1		SWR	Push [F-7 (SET)] to set the SWR meter automatically, to store the "SWR" meter into memory, and to step next.
HF TOTAL GAIN	1	• Connect an SSG to the [ANT1] connector and set as: Frequency : 14.1515 MHz Level : 1 mV* (–47 dBm) Modulation : OFF • Connect an AC millivolt meter to [SP] jack with an 8 Ω load.	Total Gain A HF PRE OFF	Set the AF output level to 0 dB.
	2	• Set the SSG as: Level : 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.
	3		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.
	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	• Set the SSG as: Level : 1 mV* (–47 dBm)	Total Gain B HF PRE OFF	Set the AF output level to 0 dB.
	7	• Set the SSG as: Level : 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 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	• Connect an SSG to the [ANT1] connector and set as: Frequency : 14.1515 MHz Level : 3.2 mV* (–37 dBm) Modulation : OFF	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.
S-METER	1	• Set the SSG as: Level : OFF	HF S0 LEVEL	• Push [F-7 (SET)] to set the S0 meter automatically, to store the S0 meter into memory, and to step next. • Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
	2	• Set the SSG as: Level : 50 µV* (–73 dBm)	HF S9 LEVEL	• Push [F-7 (SET)] to set the S9 meter automatically, to store the S9 meter into memory, and to step next. • Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
	3	• Set the SSG as: Level : 50 mV* (–13 dBm)	S9+60 LEVEL	• Push [F-7 (SET)] to set the S9+60 meter automatically, to store the S9+60 meter into memory, and to step next. • Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
50 MHz TOTAL GAIN	1	• Connect an SSG to the [ANT1] connector and set as: Frequency : 14.1515 MHz Level : 1 mV* (–47 dBm) Modulation : OFF • Connect an AC millivolt meter to [SP] jack with an 8 Ω load.	Total Gain A 50M PRE OFF	Set the AF output level to 0 dB.
	2	• Set the SSG as: Level : 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.
	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	• Set the SSG as: Level : 1 mV* (–47 dBm)	Total Gain B 50M PRE OFF	Set the AF output level to 0 dB.
	7	• Set the SSG as: Level : 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 HF B total gain into memory, and to step next.
	8		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
50 MHz TOTAL GAIN	9	• Connect an SSG to the [ANT1] connector and set as: Frequency : 14.1515 MHz Level : 1 mV* (–47 dBm) Modulation : OFF • Connect an AC millivolt meter to [SP] jack with an 8 Ω load.	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.
50 MHz EXTERNAL AGC	1	• Connect an SSG to the [ANT1] connector and set as: Frequency : 14.1515 MHz Level : 3.2 mV* (–37 dBm) Modulation : OFF	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	• Set the SSG as: Level : OFF	50M S0 LEVEL	• Push [F-7 (SET)] to set the S0 meter automatically, to store the S0 meter into memory, and to step next. • Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
	2	• Set the SSG as: Level : 50 µV* (–73 dBm)	50M S9 LEVEL	• Push [F-7 (SET)] to set the S9 meter automatically, to store the S9 meter into memory, and to step next. • Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
	3	• Set the SSG as: Level : 50 mV* (–13 dBm)	S9+60 LEVEL	• Push [F-7 (SET)] to set the S9+60 meter automatically, to store the S9+60 meter into memory, and to step next. • Sounds 2 beep after 1 sec. since sounds 1 beep, then step next.
REFERENCE FREQUENCY	1	• Connect a frequency counter to the MAIN unit, J490. ***NOTE:*** This adjustment need to adjust after more than 5 minitues past since IC 7800 is power ON.	REF OSC	Set the Reference frequency to 10.0000000 MHz using [MAIN DIAL]. Then push [F-7 (SET)] to store the Reference frequency into memory, and to step next.

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

DC OUT(MAX 1A)

DSP-TX UNIT

DSP-A UNIT

DSP-B UNIT

SCOPE UNIT

MAIN SP OUT

SUB SP OUT

INT SP OUT

METER OUT MAIN(TX)/SUB

ALC ADJUST

ALC

SEND RELAY

MEMORY KEYER VOICE RECORD

MUTE

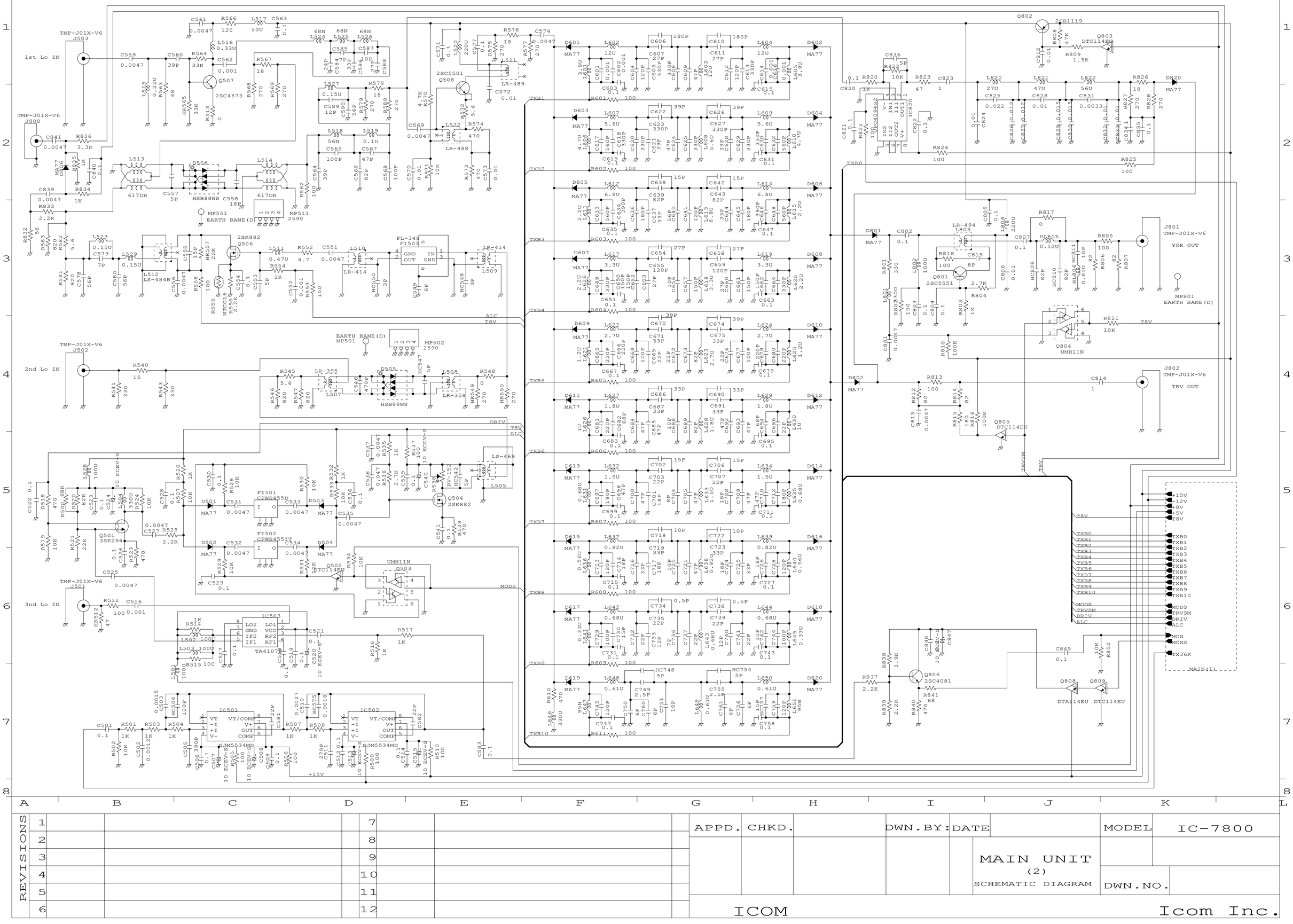
KEY

REF I/O

REVISIONS		APPD.	CHKD.	DWN.BY.	DATE	MODEL	IC-7800
1	7					MAIN UNIT	
2	8					(1)	
3	9					SCHEMATIC DIAGRAM	DWN.NO.
4	10						
5	11						
6	12						

ICOM

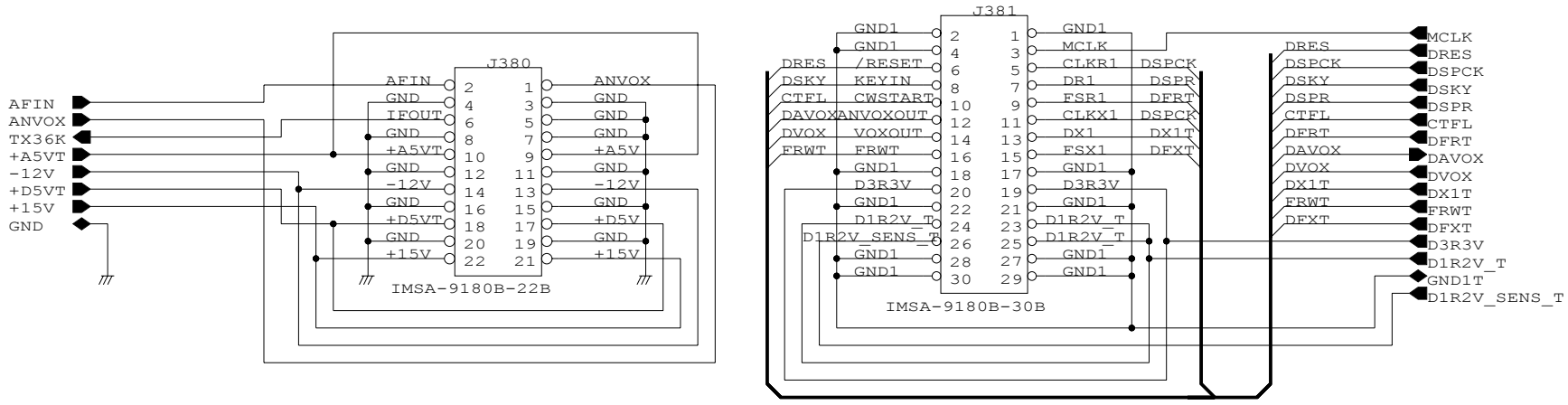
Icom Inc



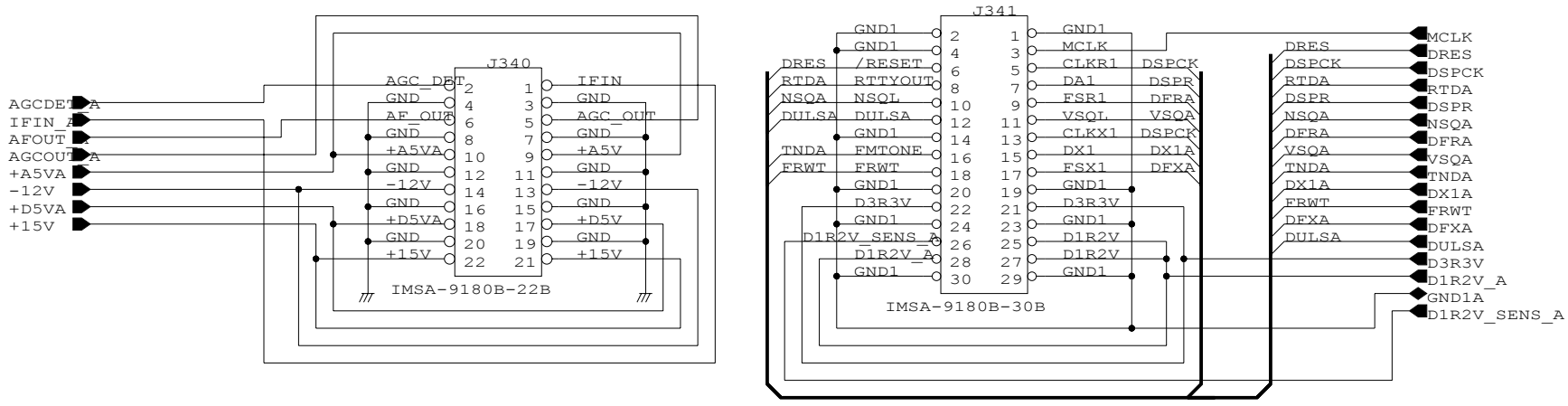
REVISIONS			
1		7	
2		8	
3		9	
4		10	
5		11	
6		12	

APPD.	CHKD.		DWN. BY:	DATE		MODEL	IC-7800
				MAIN UNIT (2) SCHEMATIC DIAGRAM		DWN. NO.	
ICOM							Icom Inc.

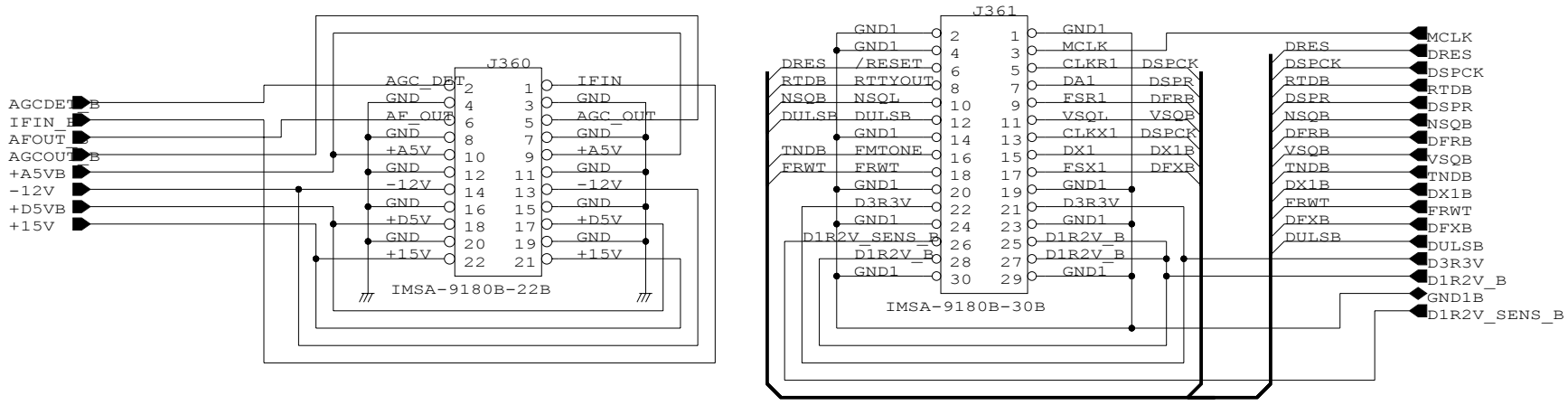
DSP-TX UNIT



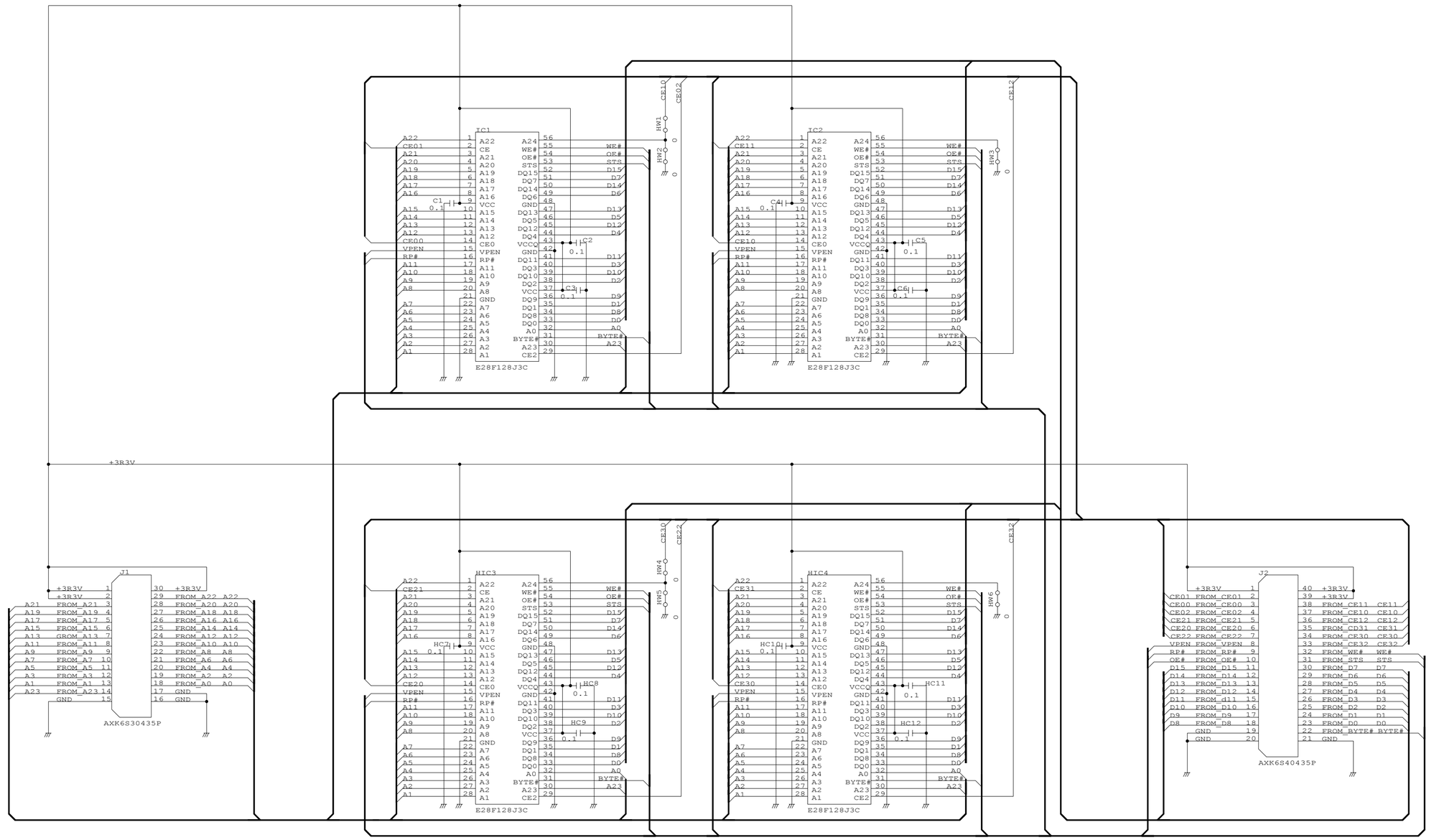
DSP-A UNIT



DSP-B UNIT



REVISIONS							
	1				DATE		MODEL IC-7800
	2				MAIN UNIT (3) SCHEMATIC DIAGRAM		DWN.NO.
	3						
	4				APPD.	CHKD.	DWN.BY:
	5						
	6						
	7						
	8				ICOM		Icom Inc.



REVISIONS							
1			7				
2			8				
3			9				
4			10				
5			11				
6			12				

APPD.	CHKD.		DWN. BY:	DATE		MODEL	IC-7800
					MEMORY BOARD SCHEMATIC DIAGRAM		
						DWN. NO.	

ICOM

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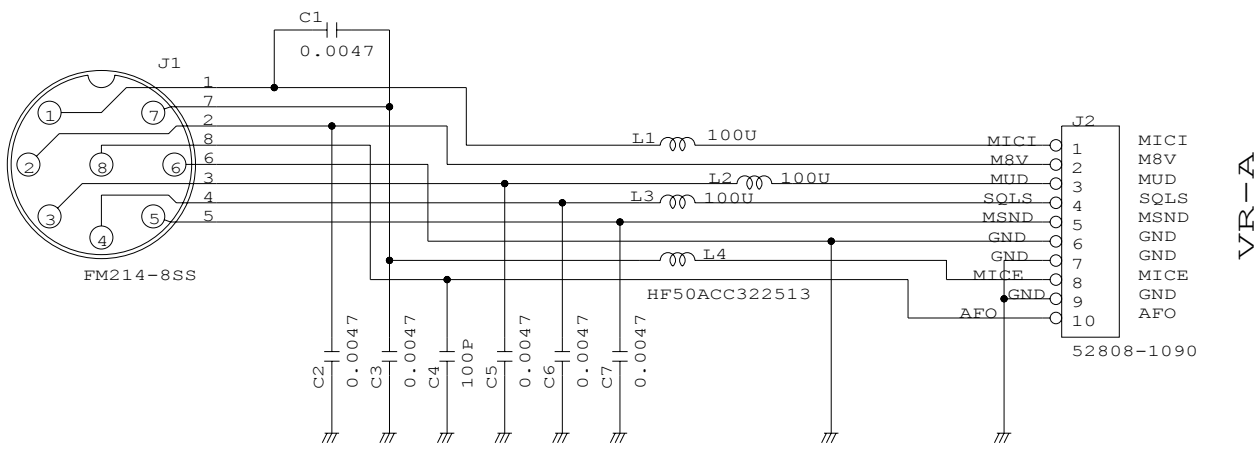

REVISIONS						
1				DATE		MODEL IC-7800
2				MIC BOARD		
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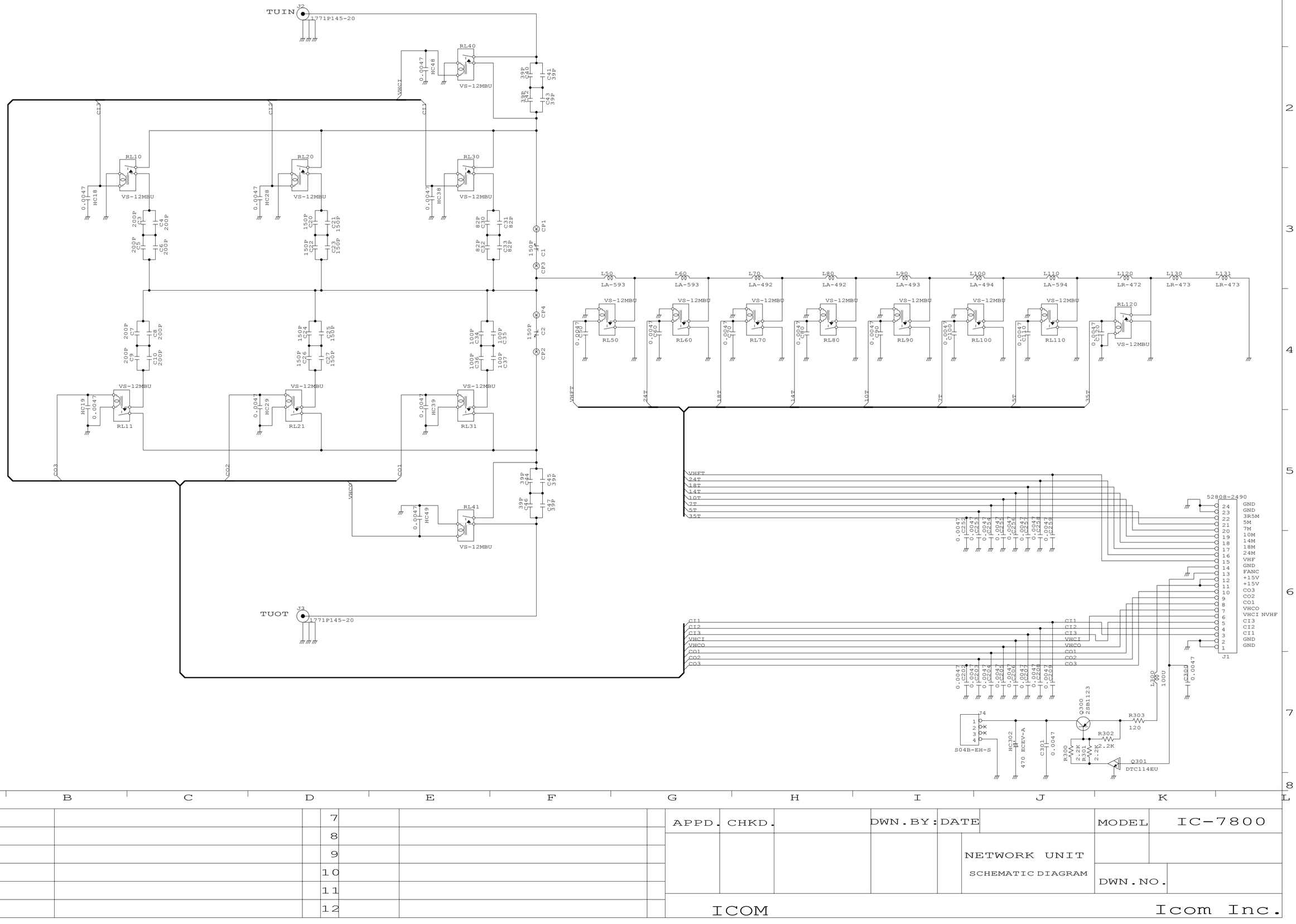
8				ICOM		Icom Inc.



REVISIONS					
1		7			
2		8			
3		9			
4		10			
5		11			
6		12			

APPD.	CHKD.		DWN. BY:	DATE		MODEL	IC-7800
					NETWORK UNIT SCHEMATIC DIAGRAM		
						DWN. NO.	

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REVISIONS			
1		7	
2		8	
3		9	
4		10	
5		11	
6		12	

APPD.	CHKD.		DWN. BY:	DATE		MODEL	IC-7800
				OSC UNIT (REF IN/OUT) SCHEMATIC DIAGRAM		DWN. NO.	

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PAI

PAO

J1 TMP-J01X-V6

Q101 RD01MUS1

Q201 PD55003

Q301 SD2918

Q401 SD2931

Q402 SD2931

IC2 TA78L08F

Q1 2SB1119

Q2 DTC114EU

D1 RD2.7M

J401 1811P342

J2 B5B-PH-SM3-TB

J5 S4B-PH-SM3-TB

EP501 OT-009

EP502 OT-009

EP503 FSOH090RN

LR-474

LR-475

LR-95

LR-296

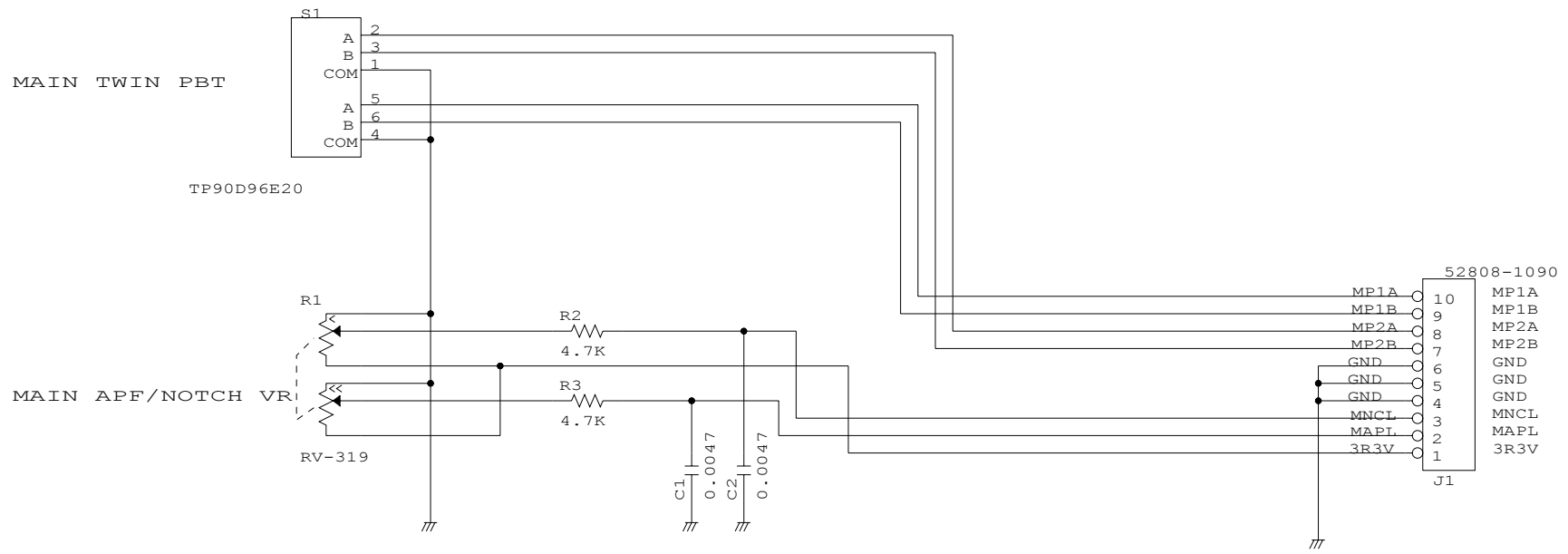
LR-230

+15V

+48HV

3V

THL



REVISIONS						
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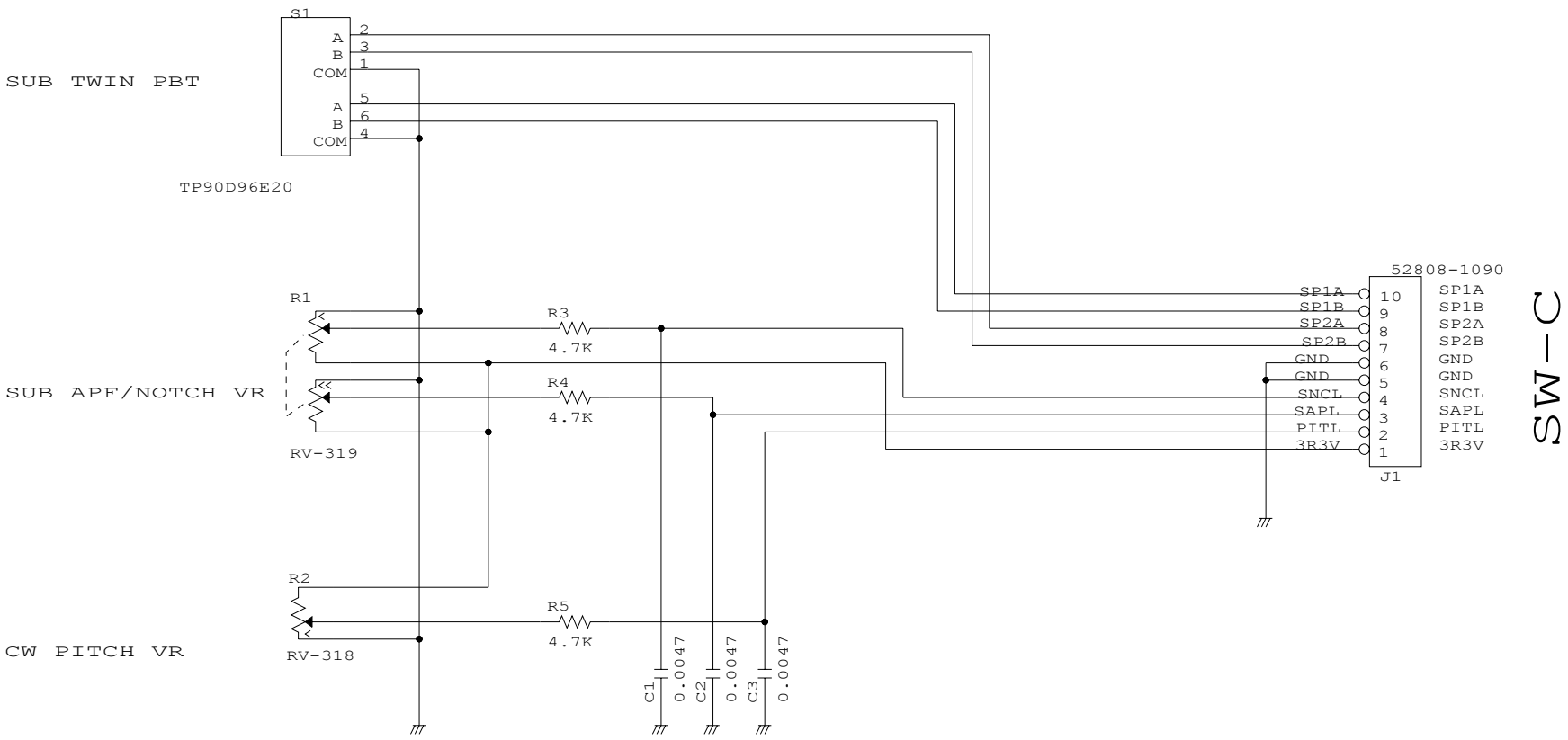
8				ICOM		Icom Inc.



C-MS

REVISIONS						
1				DATE		MODEL IC-7800
2				PBT2 BOARD SCHEMATIC DIAGRAM		
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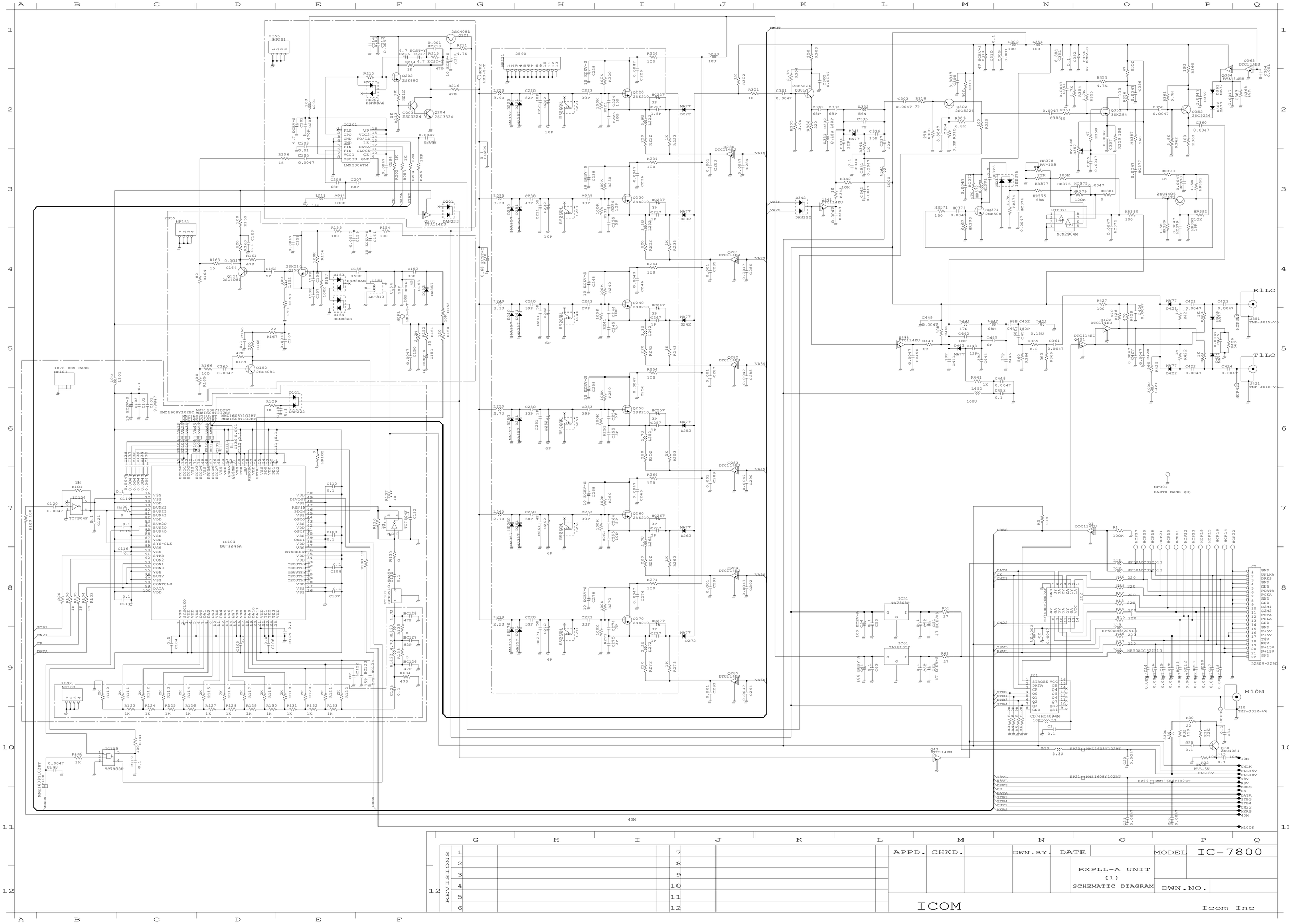
8				ICOM		Icom Inc.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IC103
TC7808F
IC201
LMX2306TM
MP151
MP103
MP201
MP101
1876 DDS CASE
MP301
EARTH BANE (D)
Q201
DTA114EU
Q202
2SK880
Q203
2SC3324
Q204
2SC3324
Q151
2SC4081
Q152
2SC4081
Q221
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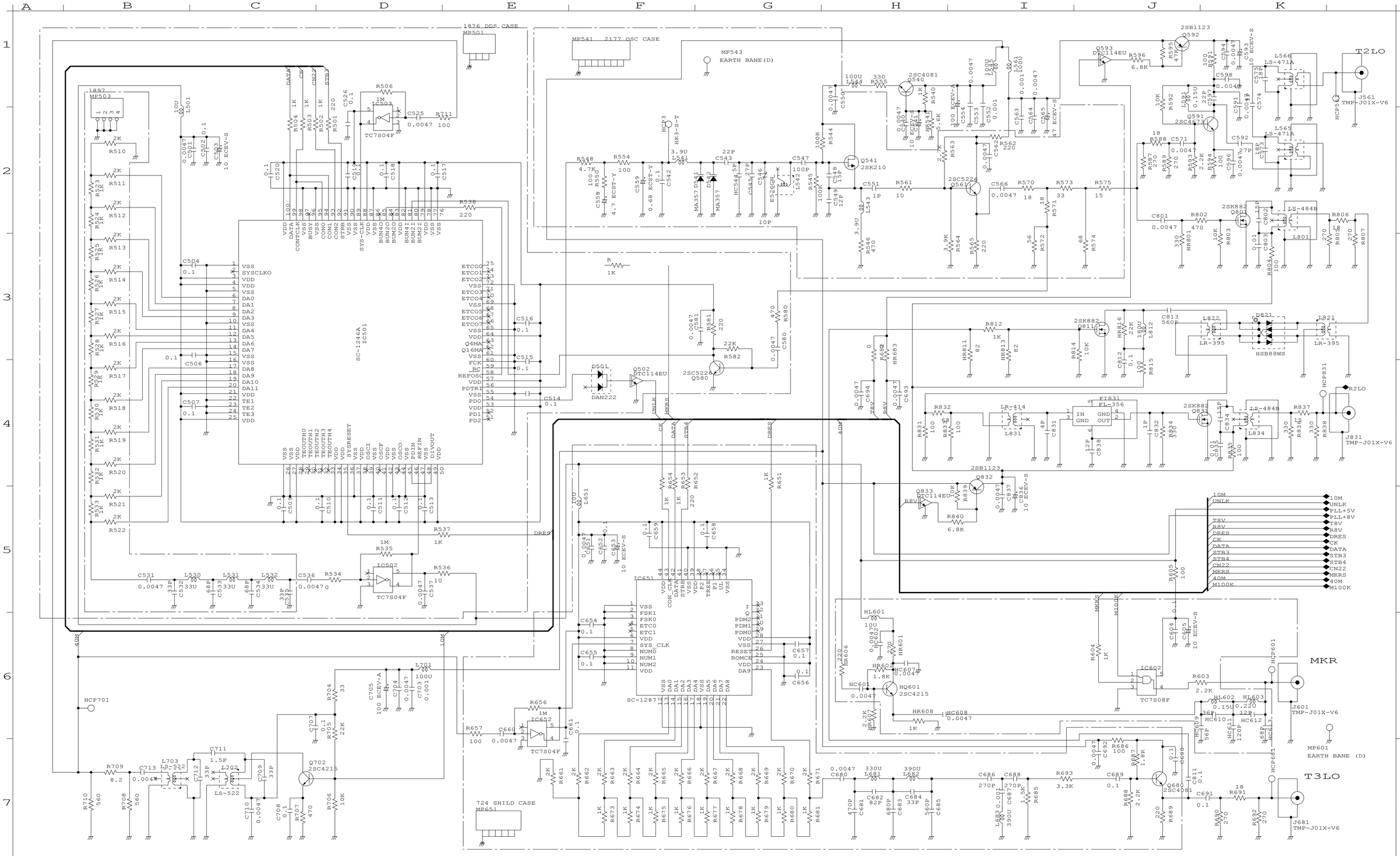

REVISIONS					
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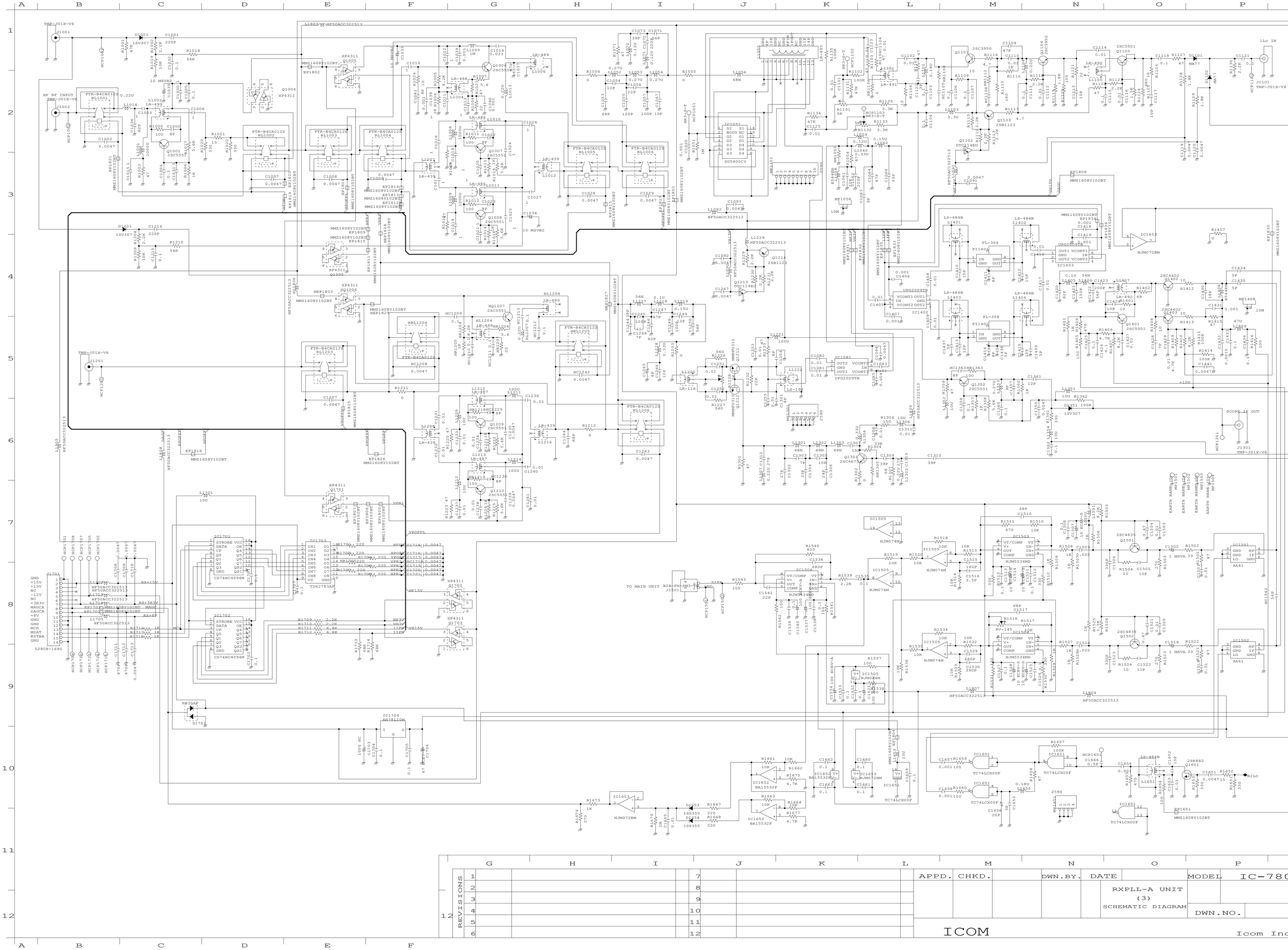
APPD.	CHKD.		DWN. BY:	DATE		MODEL	IC-7800
				RXPLL-A UNIT (2) SCHEMATIC DIAGRAM		DWN. NO.	

ICOM

Icom Inc.



REVISIONS			
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APPD. CHKD. DWN.BY. DATE

MODEL IC-7800

RXPLL-A UNIT
(3)
SCHEMATIC DIAGRAM

DWN.NO.

ICOM

Icom Inc

REVISIONS			
1		7	
2		8	
3		9	
4		10	
5		11	
6		12	

APPD. CHKD. DWN.BY. DATE

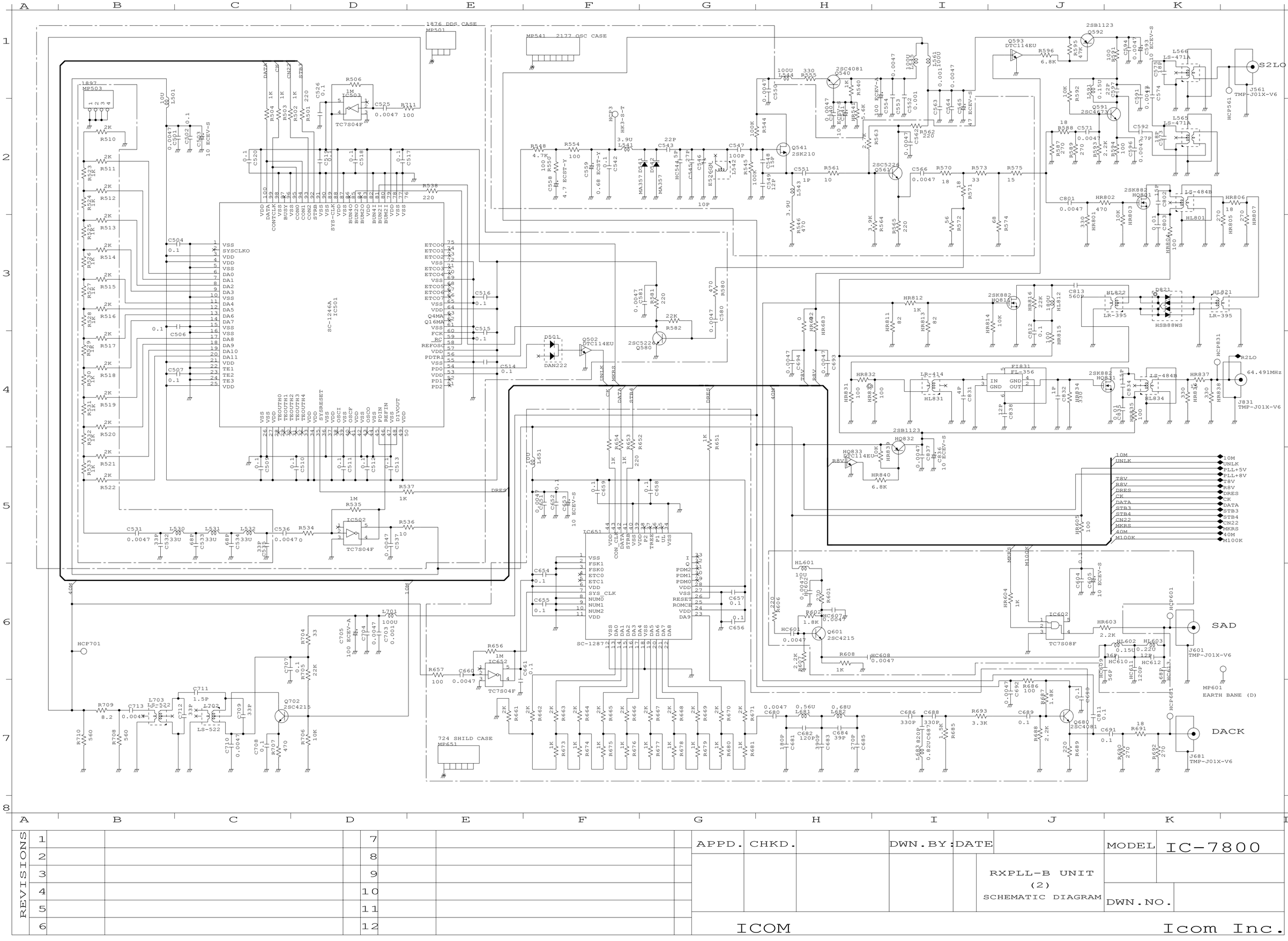
MODEL IC-7800

RXPLL-B UNIT
(1)
SCHEMATIC DIAGRAM

DWN.NO.

ICOM

Icom Inc



REVISIONS					
1			7		
2			8		
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4			10		
5			11		
6			12		

APPD.	CHKD.		DWN. BY:	DATE		MODEL	IC-7800
				RXPLL-B UNIT (2) SCHEMATIC DIAGRAM		DWN. NO.	

ICOM

Icom Inc.

TMP-J01X-V6
J1001
HF RF INPUT
J1002
50M RF INPUT
J1201
1Lo IN
J1101
SCOPE IF OUT
J1301
J1701
52808-1690
FTR-B4CA012Z RL1001
FTR-B4CA012Z RL1002
FTR-B4CA012Z RL1003
FTR-B4CA012Z RL1004
FTR-B4CA012Z RL1005
FTR-B4CA012Z RL1006
FTR-B4CA012Z RL1201
FTR-B4CA012Z RL1202
FTR-B4CA012Z RL1203
FTR-B4CA012Z RL1204
FTR-B4CA012Z RL1205
FTR-B4CA012Z RL1206
SD5400CV
IC1051
MP1101
IC1402
UPG2009TB
IC1403
NJM072BM
IC1501
IC1502
IC1503
IC1504
IC1505
IC1506
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Q1007 2SC5551
Q1008 2SC5551
Q1101 DTC114EU
Q1102 DTC114EU
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Q1105 2SC5501
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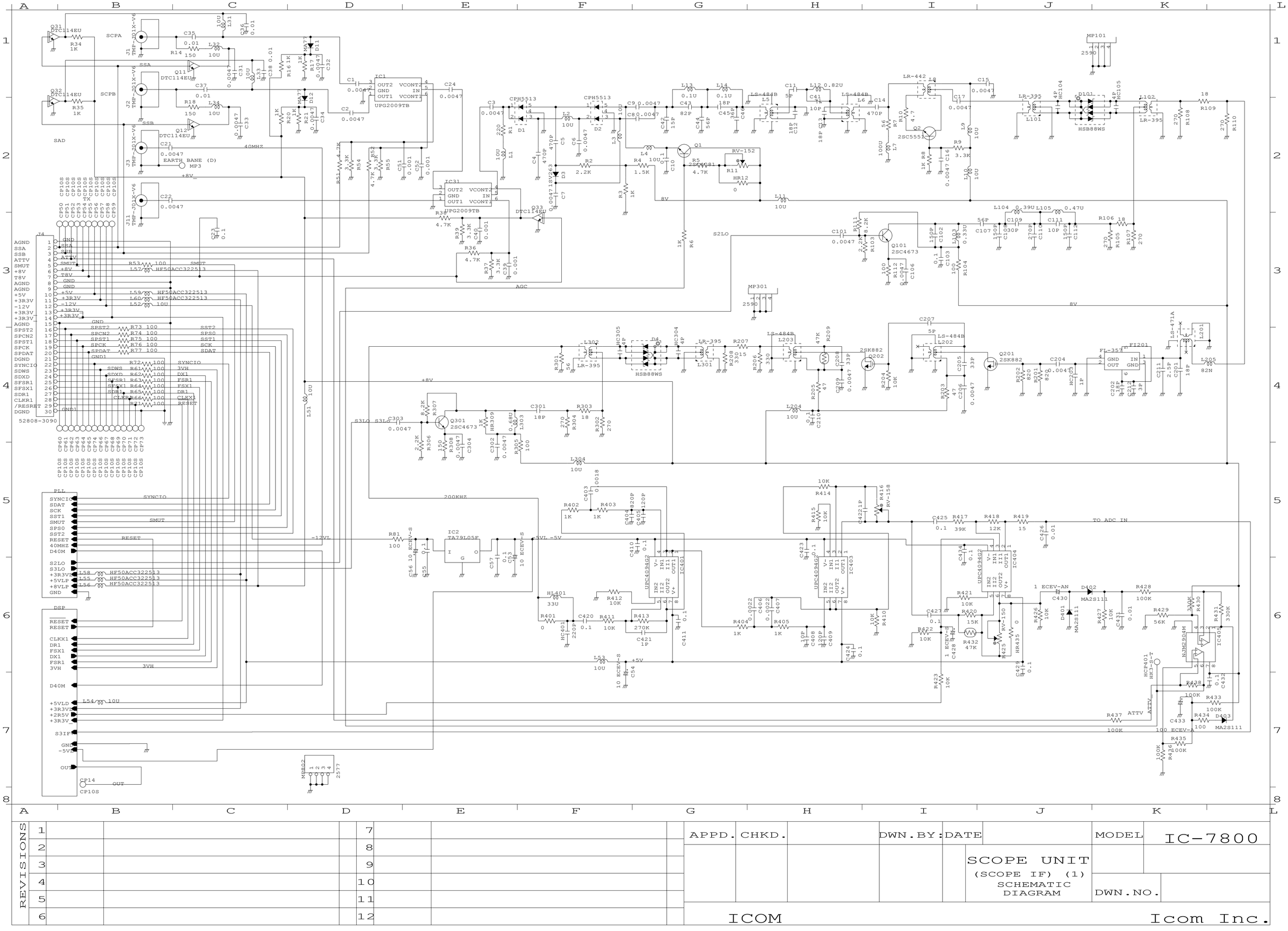

REVISIONS					
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6			12		

APPD.	CHKD.		DWN. BY:	DATE		MODEL	IC-7800
					SCOPE UNIT (SCOPE IF) (1) SCHEMATIC DIAGRAM		
						DWN. NO.	
ICOM							Icom Inc.

REVISIONS					
1		7			
2		8			
3		9			
4		10			
5		11			
6		12			

APPD.	CHKD.		DWN.BY.	DATE		MODEL	IC-7800
				SCOPE UNIT (SCOPE Lo) (2) SCHEMATIC DIAGRAM		DWN.NO.	

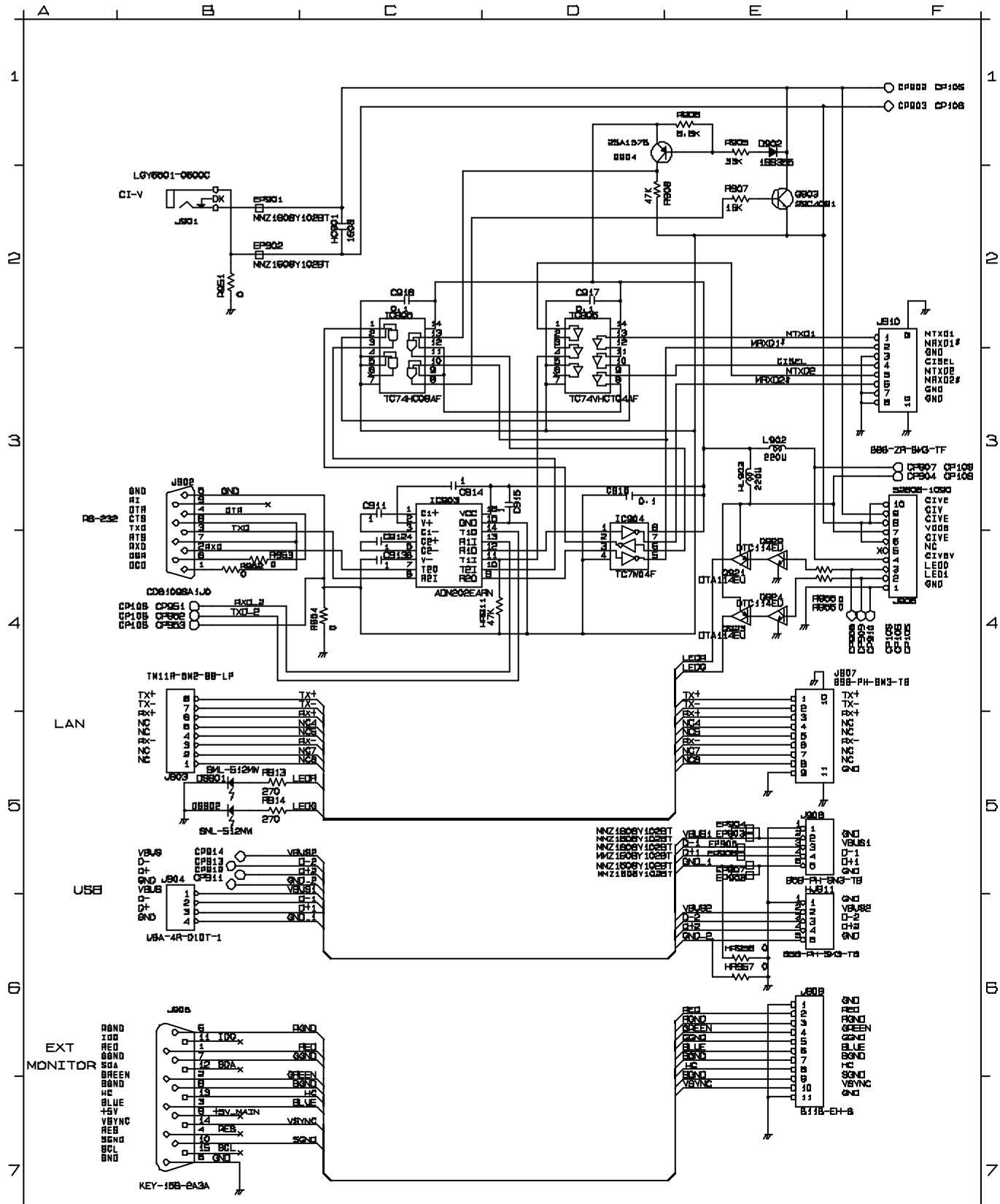
ICOM

REVISIONS					
1			7		
2			8		
3			9		
4			10		
5			11		
6			12		

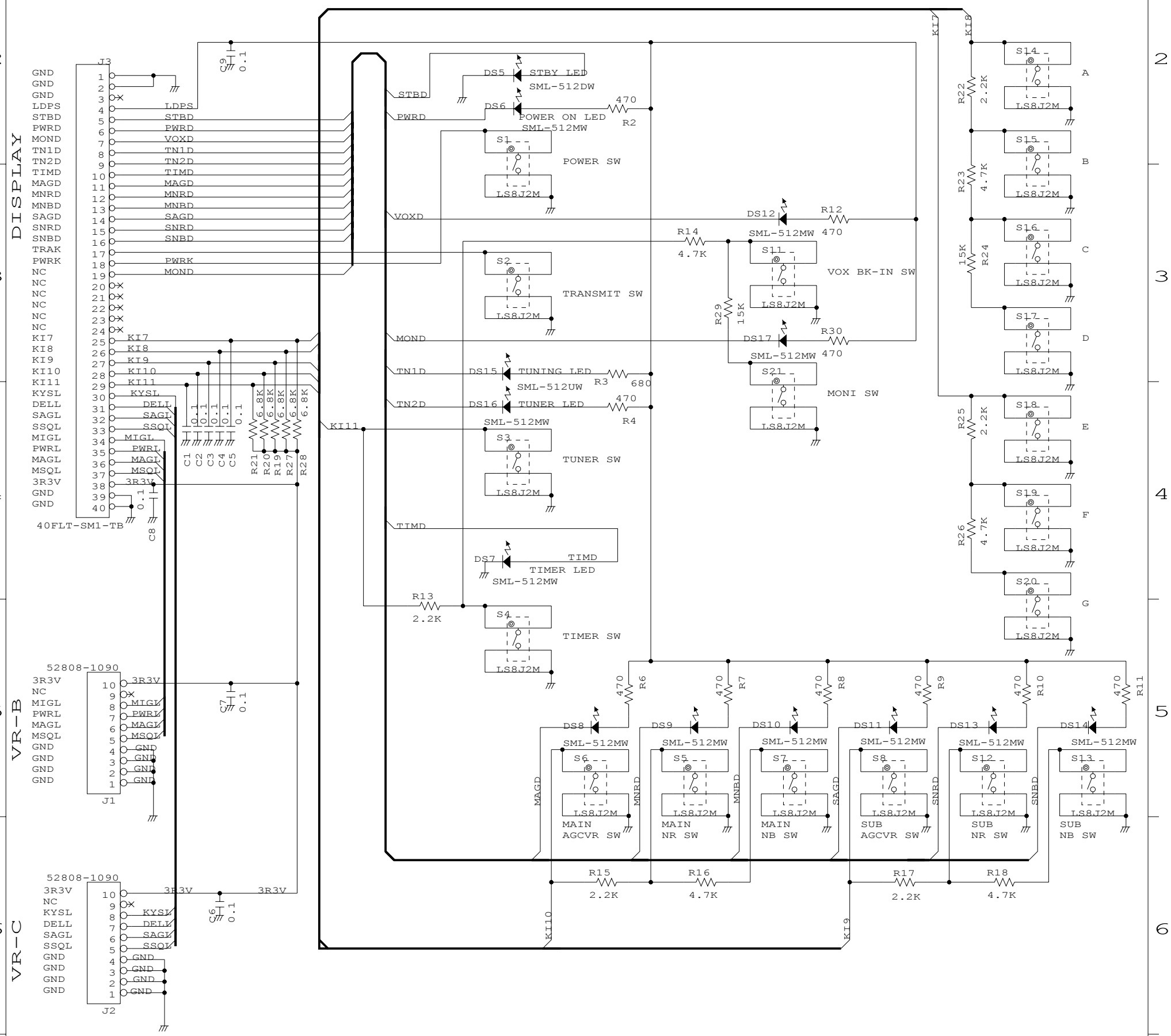
APPD.	CHKD.		DWN. BY:	DATE		MODEL	IC-7800
				SCOPE UNIT (SCOPE DSP) (3) SCHEMATIC DIAGRAM			
						DWN. NO.	

ICOM

Icom Inc.



REVISIONS						
1			DATE		MODEL	IC-7800
2			SCOPE UNIT (4)			
3			SCHEMATIC DIAGRAM		DWN. NO.	
4			APPD.	CHKD.		DWN. BY:
5						
6						
7						
8			ICOM			Icom Inc.



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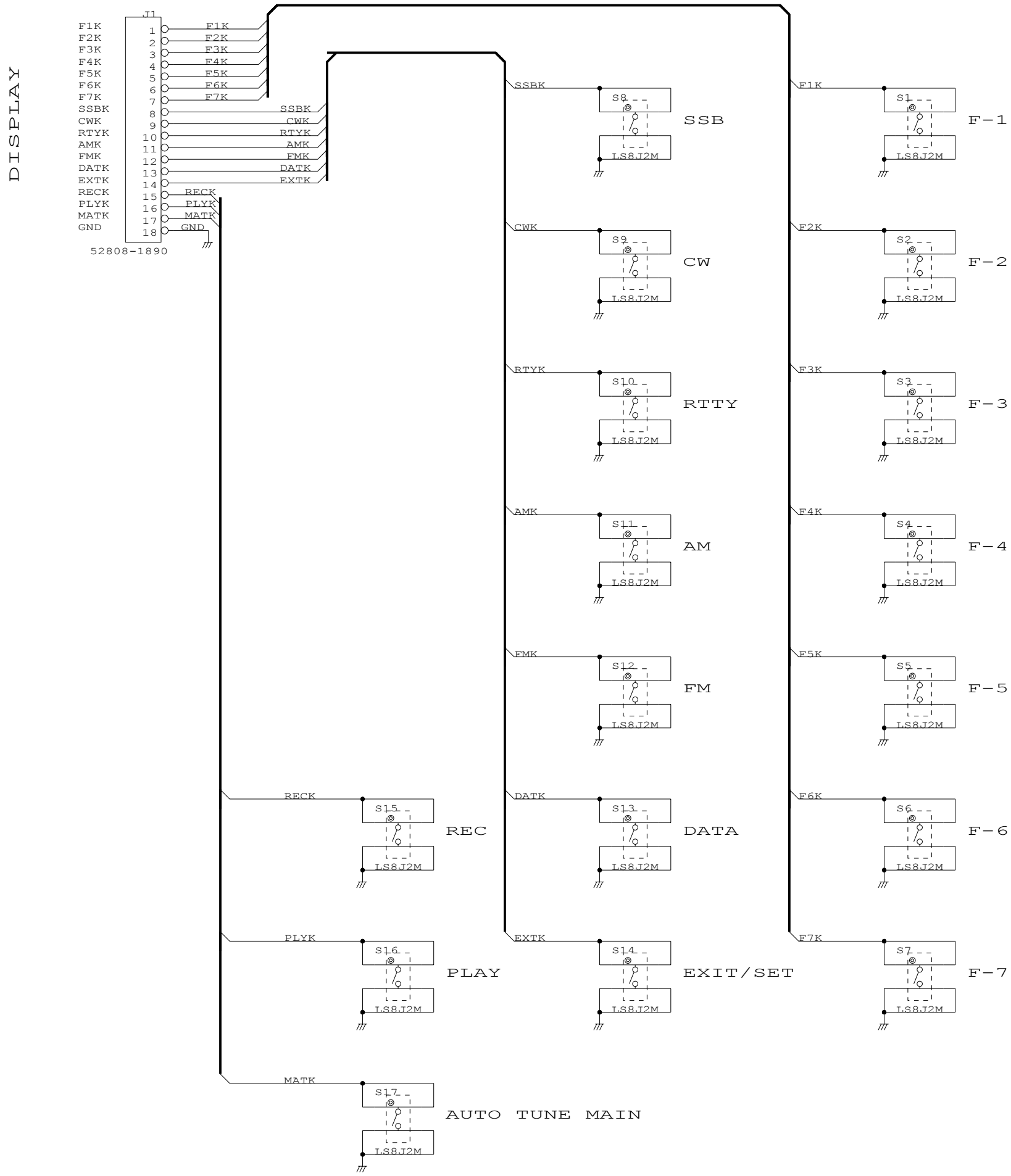
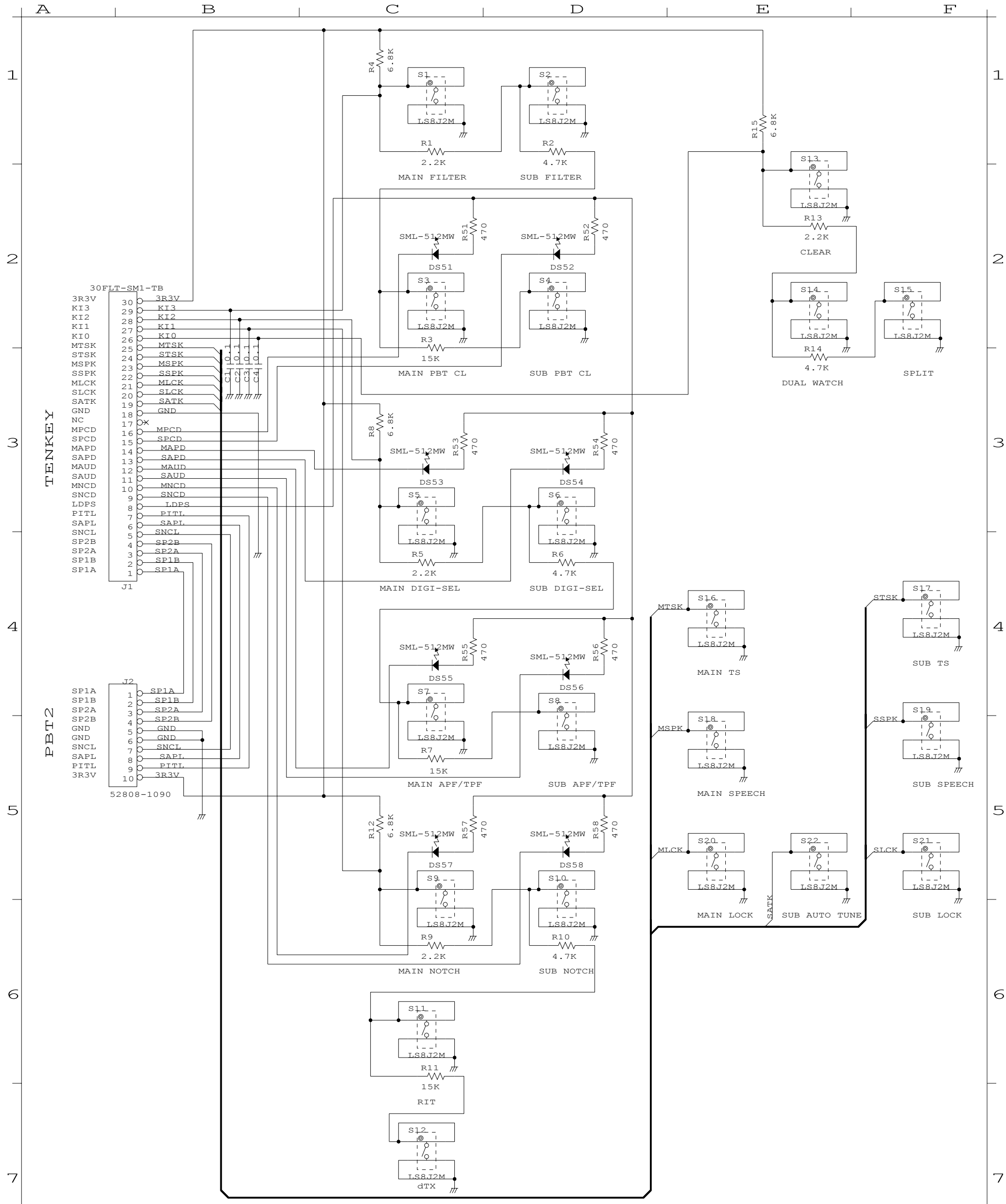
	8				ICOM	Icom Inc.



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

DISPLAY

DISPLAY

SW-C

PBT1

LED

SUB SENSOR

RIT SENSOR

J6 B04B-EH-S

J7 B4B-PH-SM3-TB

J1 30FLT-SM1-TB

J2 30FLT-SM1-TB

J3 30FLT-SM1-TB

J4 52808-1090

J5 52808-1090

R1 2.2K
R2 4.7K
R3 15K
R4 6.8K
R5 2.2K
R6 4.7K
R7 15K
R8 6.8K
R9 2.2K
R10 4.7K
R11 15K
R12 6.8K

C1 0.1
C2 0.1
C3 0.1
C4 0.1
C5 0.1

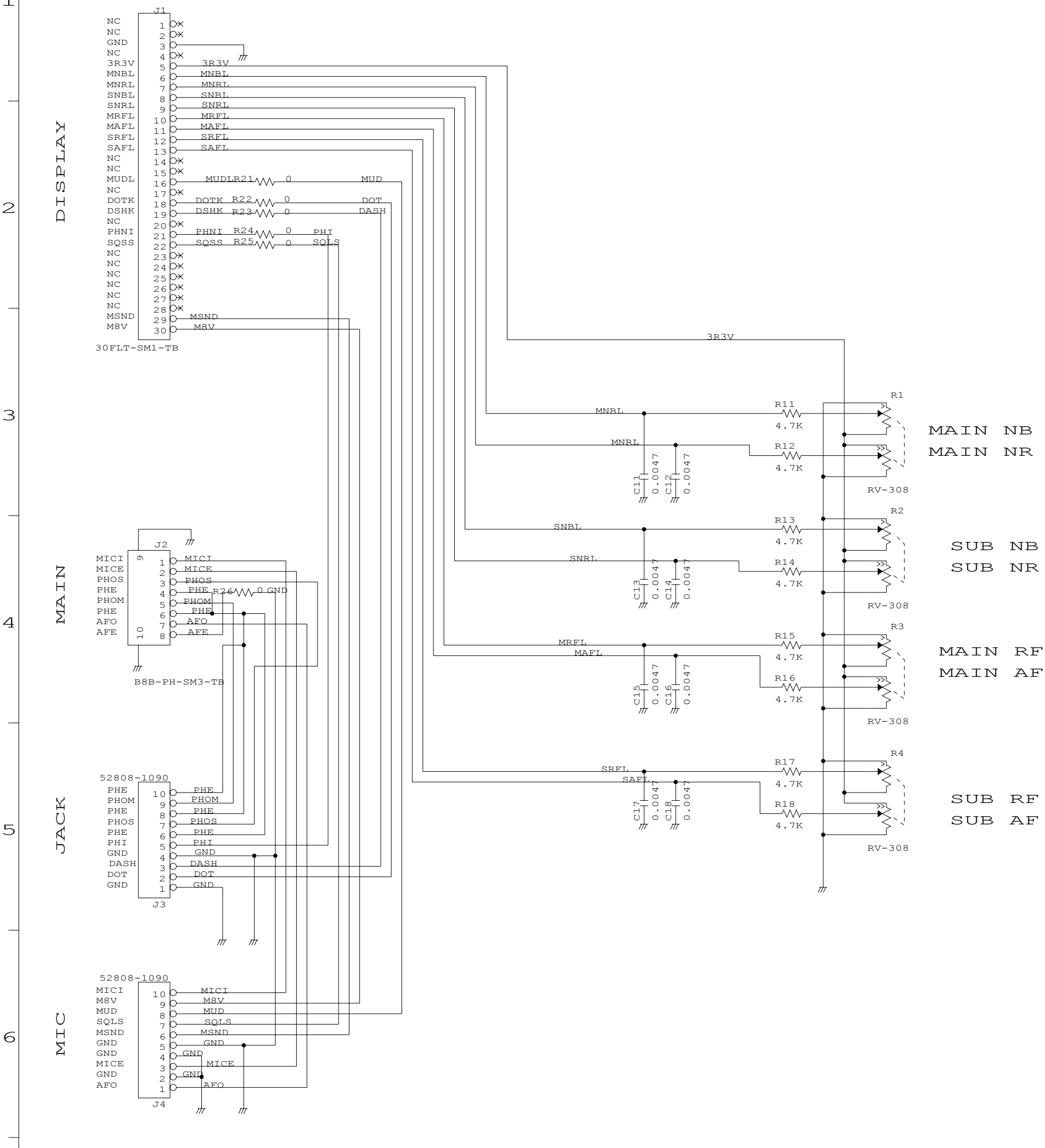
S11 LS9J2M — 1.8(1)
S12 LS9J2M — 10(4)
S13 LS9J2M — 21(7)
S14 LS9J2M — GENT(.)
S15 LS9J2M — 3.5(2)
S16 LS9J2M — 14(5)
S17 LS9J2M — 24(8)
S18 LS9J2M — 50(0)
S19 LS9J2M — 7(3)
S20 LS9J2M — 18(6)
S21 LS9J2M — 28(9)
S22 LS9J2M — F-INP(ENT)

S1 SSB122M — UP
S2 SSB122M — DOWN
S3 SSB122M — V/M
S4 SSB122M — MP-W
S5 SSB122M — MW
S6 SSB122M — MP-R
S7 SSB122M — XFC
S8 SSB122M — MAIN
S9 SSB122M — M=S
S23 SSB122M — SUB
S24 SSB122M — CHANGE

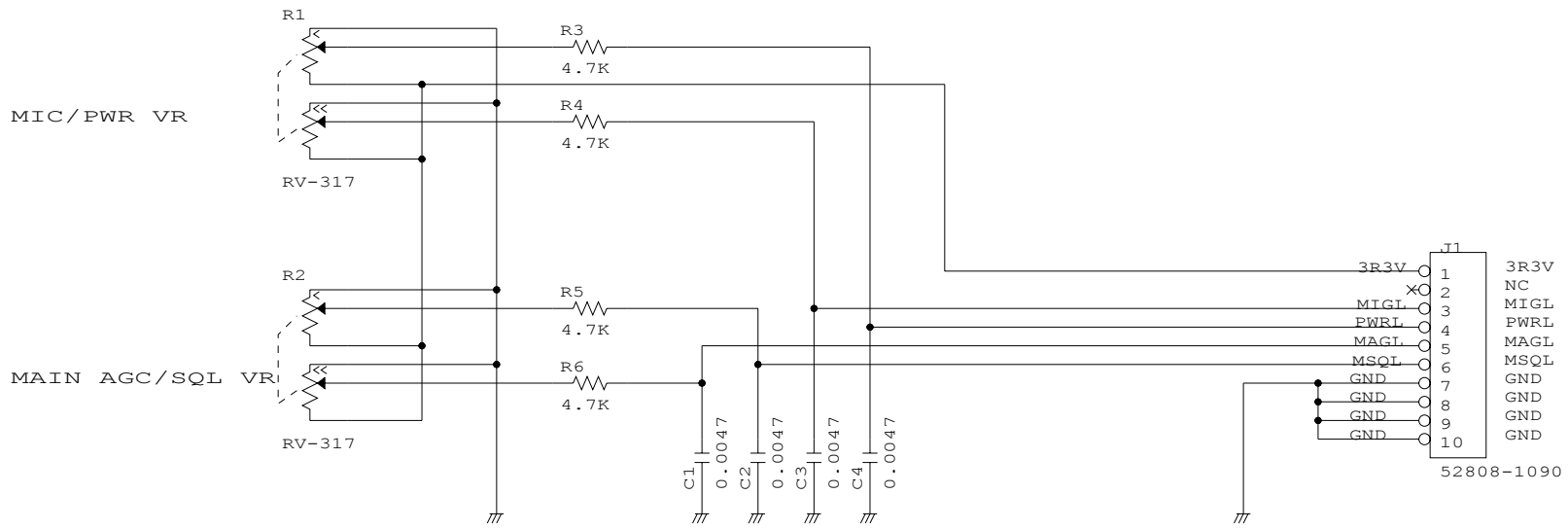
DS1 SML-512DW — R75 1.5K
DS2 SML-512DW — R76 1.5K

IC1 BU2099FV
IC2 BU2099FV

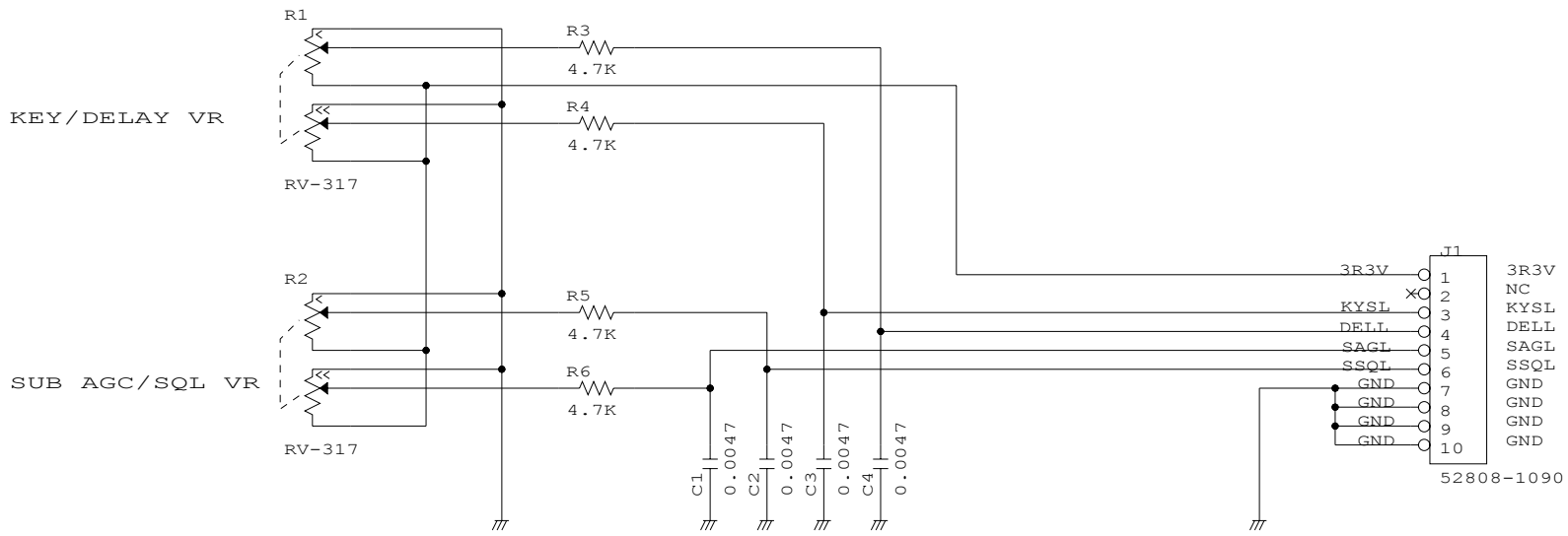
REVISIONS					
1		7		APPD.	CHKD.		DWN.BY:	DATE		MODEL	IC-7800
2		8									
3		9						TENKEY BOARD SCHEMATIC DIAGRAM			
4		10								DWN.NO.	
5		11									
6		12		ICOM						Icom Inc.	



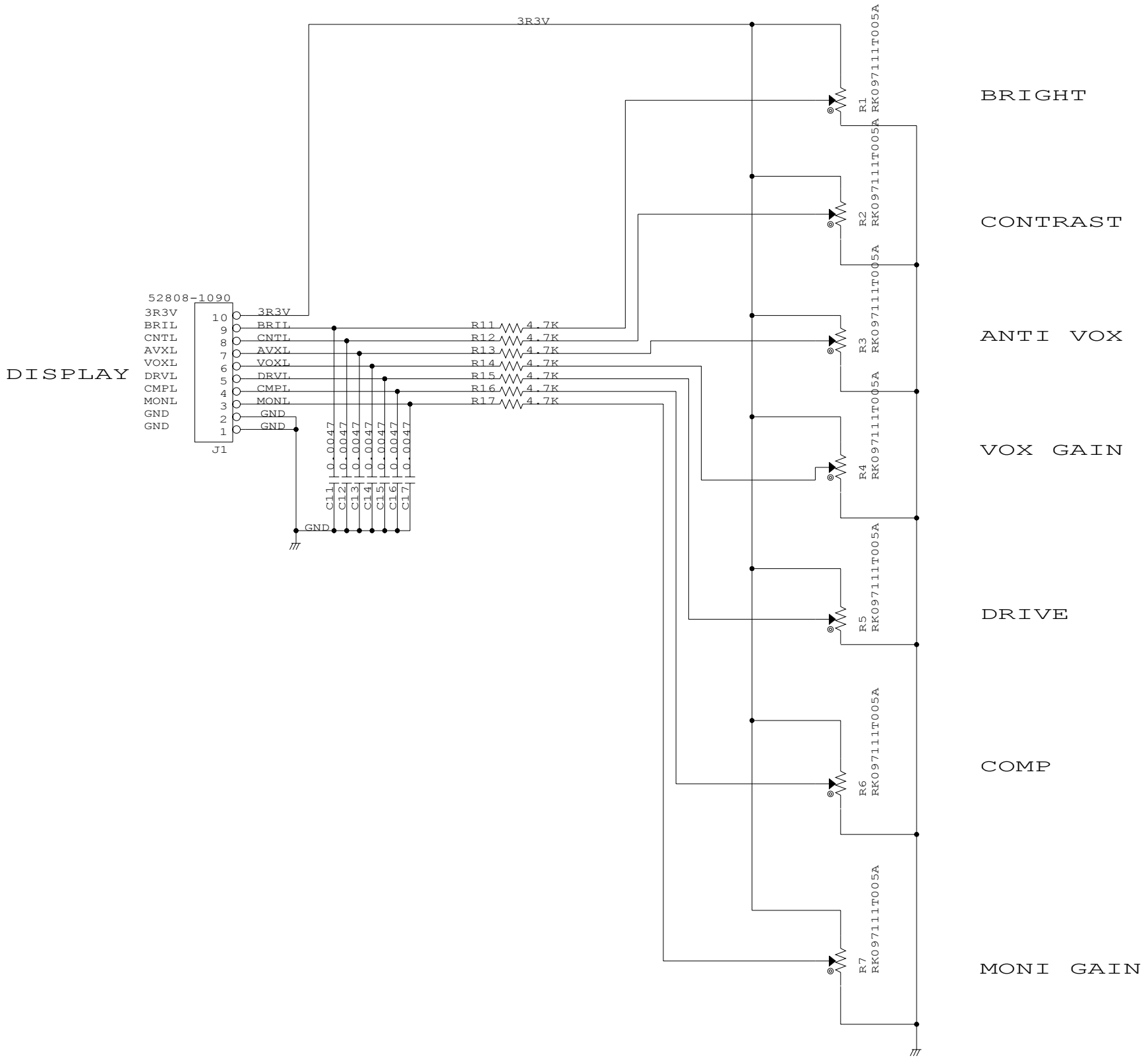
REVISIONS						
1				DATE		MODEL IC-7800
2				VR-A BOARD		
3				SCHEMATIC DIAGRAM		DWN.NO.
4				APPD.	CHKD.	DWN.BY:
5						
6						
7						
8				ICOM		Icom Inc.



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

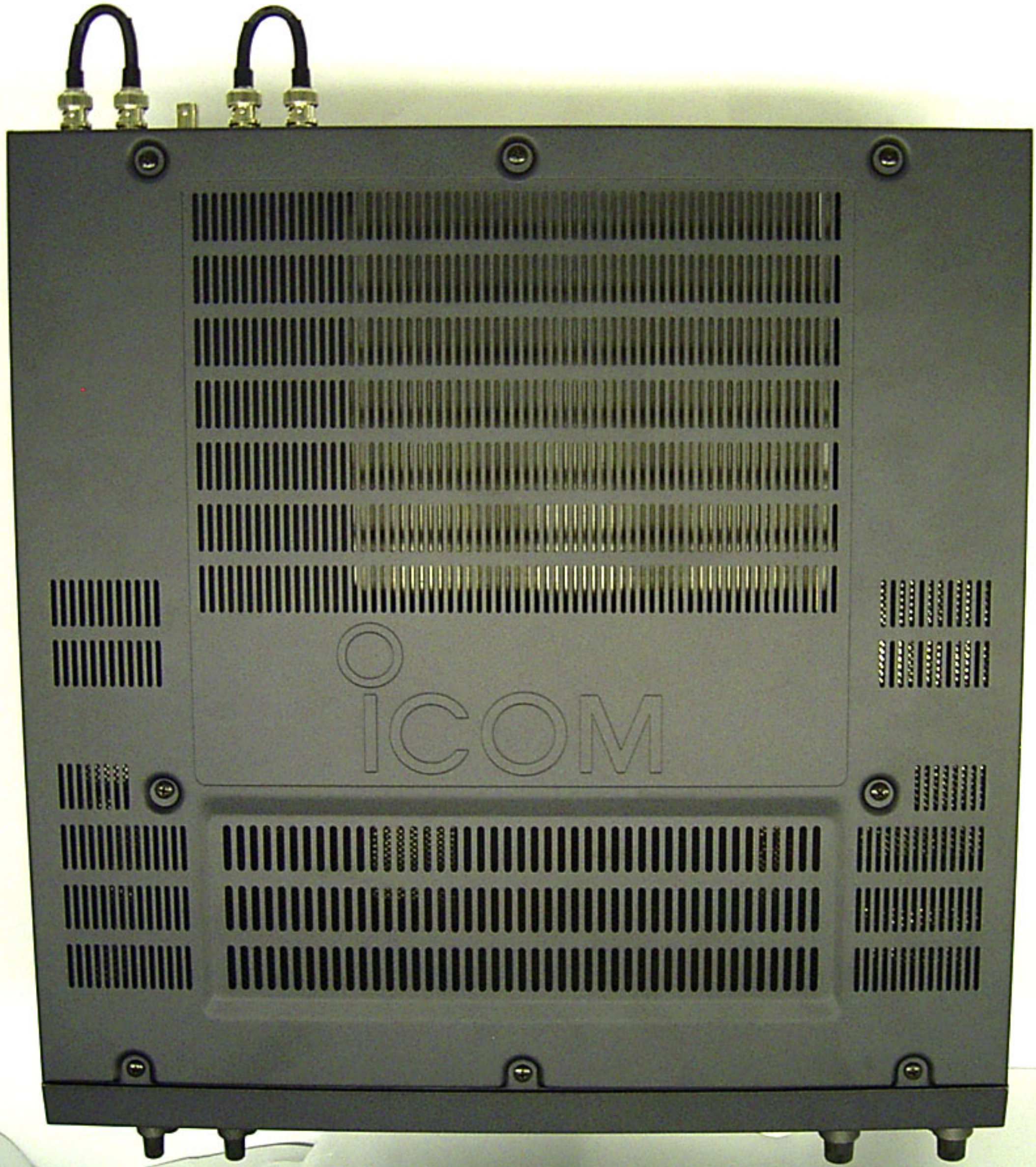


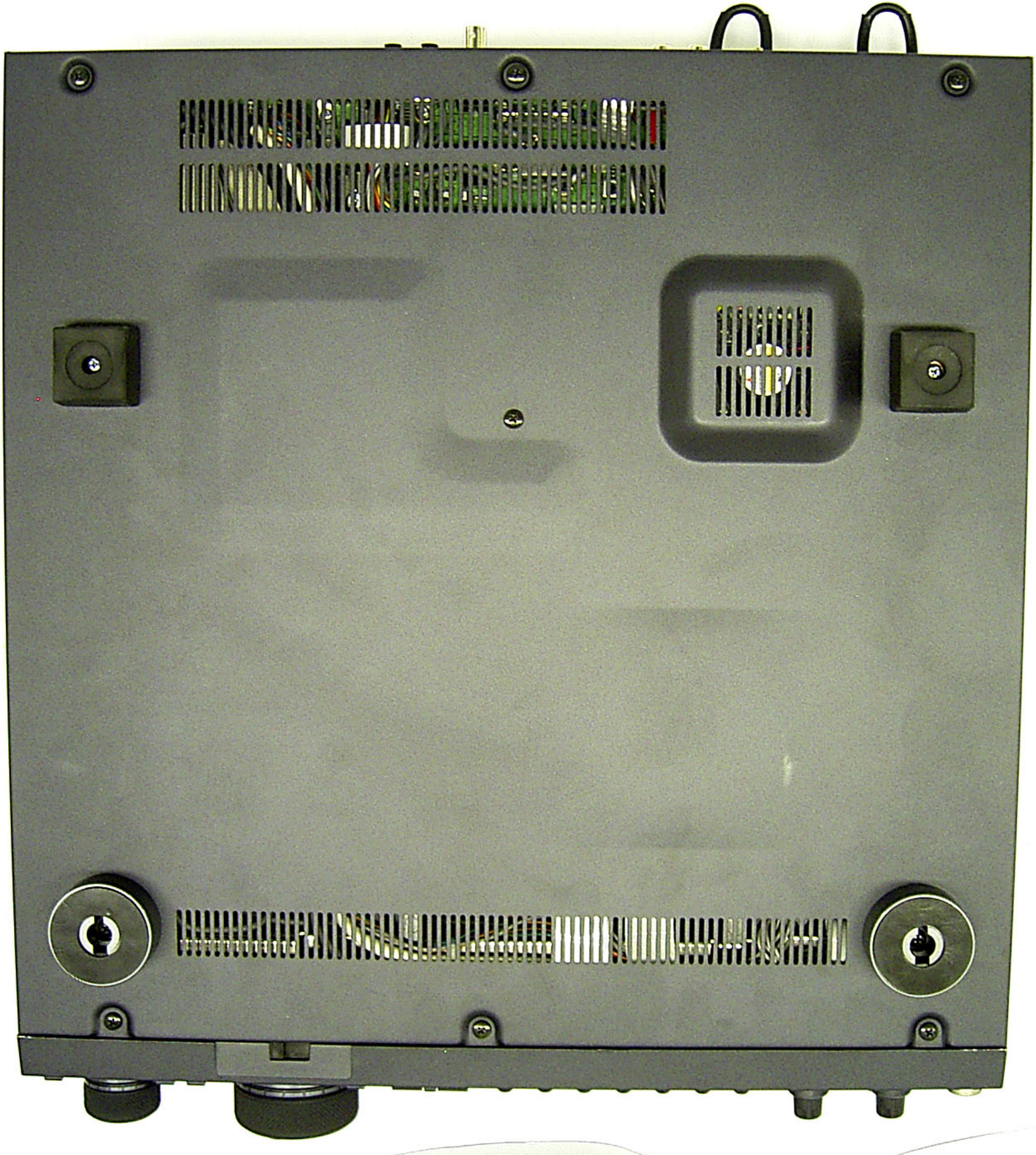
REVISIONS						
1				DATE		MODEL IC-7800
2				VR-C BOARD		
3				SCHEMATIC DIAGRAM		DWN.NO.
4				APPD.	CHKD.	DWN.BY:
5						
6						
7						
8				ICOM		Icom Inc.

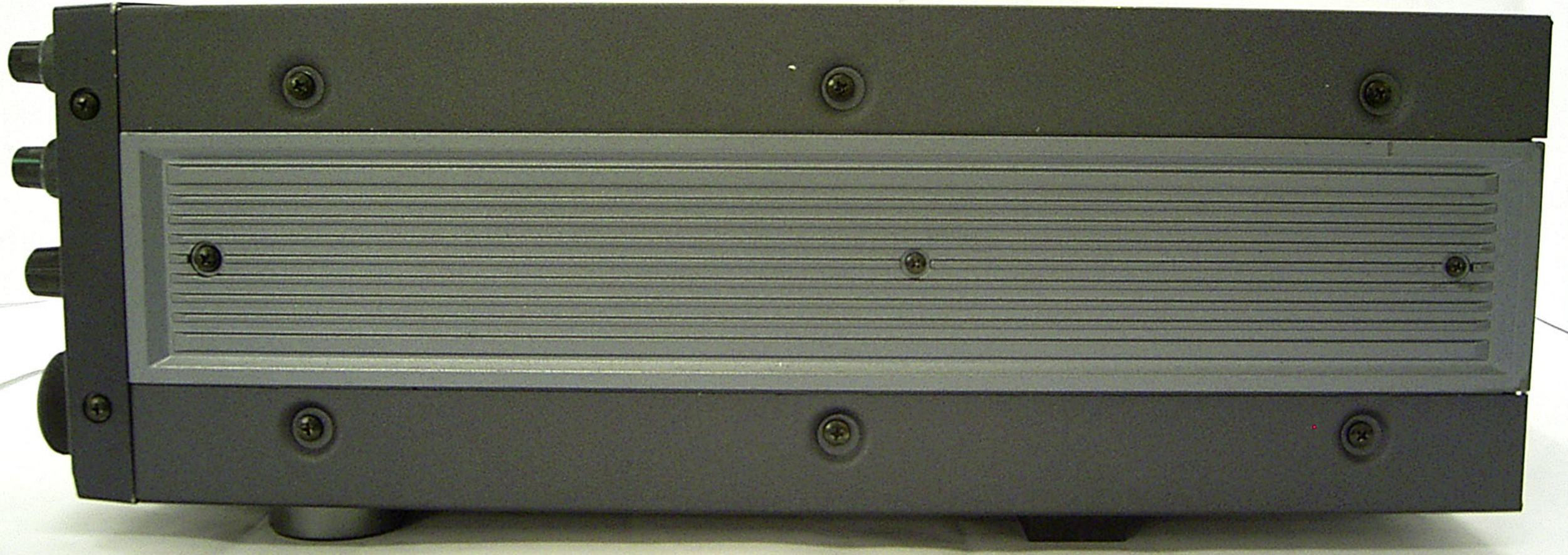


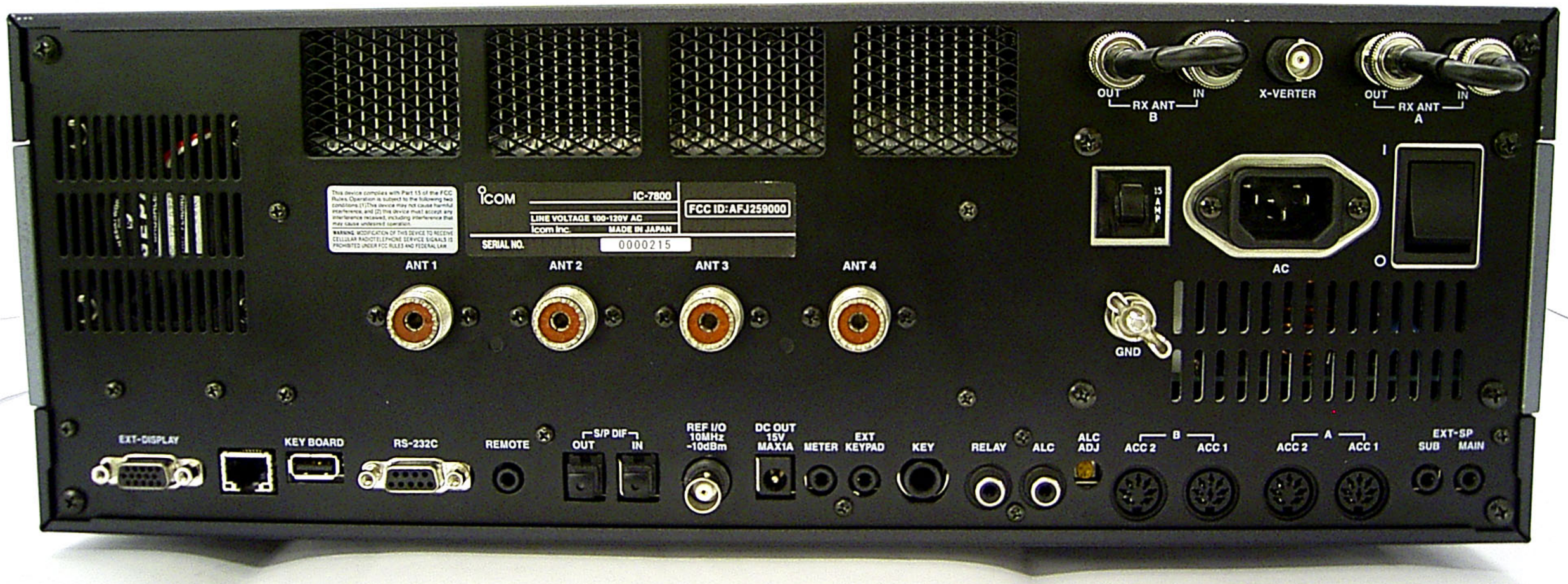
REVISIONS						
1				DATE		MODEL IC-7800
2				VR-D BOARD SCHEMATIC DIAGRAM		
3						DWN. NO.
4				APPD.	CHKD.	DWN. BY:
5						
6						
7						
8				ICOM		Icom Inc.


ICOM
IC-7800
HF / 50MHz TRANSCEIVER
MIC RF PWR
KEY SPEED DELAY
POWER
TRANSMIT
TUNER
TIMER
PHONES
ELEC-KEY
MIC
CF CARD
MAIN AGC SQL SUB
AGCVR NR NB AGCVR NR NB
MAIN NR NB SUB
MAIN AF RF SUB
TX RX LOCK MAIN
SPLIT
TX RX LOCK SUB
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
MONI GAIN COMP DRIVE VOX GAIN ANTI VOX CONTRAST BRIGHT
VOICE MEMORY
REC PLAY
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
XFC
MAIN SUB
M=S CHANGE
MAIN TWIN PBT SUB
FILTER
PBT CLEAR
MAIN DIGI-SEL NOTCH SUB
DIGI-SEL
APF/TPF
NOTCH
RIT/⊿TX
RIT
⊿TX
CLEAR
CW PITCH
DUALWATCH SPLIT
TS
SPEECH
LOCK
AUTO TUNE
TS
SPEECH
LOCK


iCOM






OUT
IN
RX ANT
B
X-VERTER
OUT
IN
RX ANT
A
15 AMP
AC
I
O
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
LINE VOLTAGE 100-120V AC
Icom Inc.
MADE IN JAPAN
FCC ID:AFJ259000
SERIAL NO.
0000215
ANT 1
ANT 2
ANT 3
ANT 4
GND
EXT-DISPLAY
KEY BOARD
RS-232C
REMOTE
S/P DIF
OUT
IN
REF I/O
10MHz
-10dBm
DC OUT
15V
MAX1A
METER
EXT
KEYPAD
KEY
RELAY
ALC
ALC
ADJ
B
ACC 2
ACC 1
A
ACC 2
ACC 1
EXT-SP
SUB
MAIN

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.

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

ANT 1