

Service Manual

Erledigt

MODEL SUPERSTAR 7000DX
(SS-7000DX)

280 CH. AM/FM/SSB MOBILE TRANSCEIVER
with FREQUENCY READ-OUT

SERVICE MANUAL

SUPER STAR 7000DX

PLL SECTION

1. Aligning 10.240MHz:

Connect a frequency counter to the IC side leadwire of C47 capacitor which gives 10.240MHz output from IC5, and adjust at CT1. (less than +/-10Hz)

2. Adjusting Lock Voltage:

Connect a voltmeter to the leadwire of R30 resistor, and rotate L1 till the meter reads 1.0V on channel 40 of G Band.

3. Aligning Lock Waveform:

Connect an oscilloscope and a frequency counter to the leadwire of C218 at the collector output of Q6, and adjust L1 till counter reads 4.06MHz on Channel 40 of G Band, while the waveform is to be locked at 0.92MHz on Channel 40 of G Band through VCO coil L1.

4. Aligning 10.695MHz:

Place the set in transmit mode, and connect a frequency counter to the leadwire of R170, and conduct the following procedures.

- (1) Adjust to 10.69350MHz by CT6 under LSB Mode.
- (2) Adjust to 10.69650MHz by CT4 under USB Mode.
- (3) Adjust to 10.69500MHz by CT5 under FM Mode.
- (4) Repeat above steps (1) through (3), and make sure deviation falls to less than +/-20Hz.

5. Aligning VCO Frequency:

Connect a frequency counter to the Q25 gate under receive mode, and set FINE and COARSE level controls at center position, and check at channel 1 on D-Band, as follows:

- (1) Adjust to 37.6615MHz by L2 under USB Mode.
- (2) Adjust to 37.6585MHz by CT3 under LSB Mode.
- (3) Adjust to 37.6600MHz by CT2 under FM Mode.
- (4) Repeat above steps (1) through (3), and check so as to get deviation less than +/-50Hz.

Place the set in transmit mode, and rotate VR14 till 37.6615MHz is read under USB Mode.

DISPLAY SECTION

1. Adjusting Reference Frequency:

Adjust TC4 to get 3.2768MHz using No. 2 pin of IC6. It is not necessary to adjust in the band range A through G if only the displayed frequency is within the tolerance.

2. Connect a counter to the gate of Q25 on the main p.c. board, and make the following alignments on Channel 1 of D Band:

- (1) Adjust FINE level control to get 37.6615MHz under USB Mode, and adjust CT3 till 26.9650 is displayed.
- (2) Adjust FINE level control to obtain 37.6585MHz under LSB Mode, and adjust CT2 till 26.9650 is displayed.
- (3) Adjust FINE level control for 37.6600MHz under FM Mode, and adjust CT1 to get 26.9650 on the display.
- (4) Repeat steps (1) through (3), and check so as to get deviation less than $\pm 100\text{Hz}$.

3. Checking the Tactil Switch on the Panel:

Make sure that NB lamp will light but other RB, ANL, and TONE lamps will not when the power is switched ON. Also check if it will light when the switches are respectively kept pressed.

4. Check the Channel LED, Frequency LED, and S&R LED should be all lit.

TRANSMITTER SECTION

1. Adjusting RF Power Level:

1-1. Connect a power meter, oscilloscope, counter, and spectrum analyzer to the ANT connector, and check below under FM Mode:

- (1) Adjust L18 on Channel 1 of A Band so as to get maximum power output and spurious level less than -50dB.
- (2) Adjust L3 on Channel 40 of G Band so as to get maximum power output and spurious level less than -50dB.
- (3) Adjust L4 on Channel 40 of D Band, and get maximum power output and spurious level less than -50dB.
- (4) Repeat steps (1) through (3), and make A through G bands flat.

Note: Steps (1) and (2) are to be repeated several times, when it is suggested to rotate the tuning rod a little reversedly.

1-2. Place the unit in USB Mode, and supply a 1Vrms 1KHz single tone to the MIC connector. Put the MIC gain level to the maximum, and rotate VR3 and VR5 so that output power becomes maximum, while coil PL1 and PL5 in the POWER unit section are to be adjusted so that output power on Channels 1 through 40 in A through G Bands is measured over 100W.

1-3. Make the following adjustments on Channel 20 of D Band:

POWER LO - Adjust VR10 for 5W under FM Mode.
POWER MID - Adjust VR9 for 25W under FM Mode.
POWER HI - Adjust VR8 for 50W under FM Mode.

Supply 1000Hz 10mV modulation under USB HI power mode, and set MIC gain at maximum. Then adjust VR5 for 100W, and adjust VR3 to decrease power to about 95W. Increase modulation input to 1V, and rotate VR3 so as not to exceed 110W.

Supply 1000Hz 1V modulation under USB MID power mode, and adjust VR6 for about 50W. Likewise, adjust VR7 for about 10W at LO power mode.

2. Modulation:

2-1 Execute adjustment below on Channel 20 of D Band under AM Mode with MIC input 1000Hz 10mV so that modulation will read 90%.

POWER LO - Adjust VR13.
POWER MID - Adjust VR12.
POWER HI - Adjust VR11.

2-2. Use an FM linear detector, and adjust VR1 with 1000Hz 1V MIC input on Channel 20 of D Band under FM Mode so that 3KHz/dev. will be obtained at deviation $P-P1/2$.

2-3. Turn off microphone input signal on Channel 20 of D Band under USB Mode, and adjust VR2 for the minimum carrier level on the spectrum analyzer. Then turn the mode to LSB, and make sure it still reads less than -50dB. Supply microphone input signal, and adjust VR7 for 10W PEP at LO power, VR6 for 50W PEP at MID power, and VR5 for 100W PEP at HI power, respectively.

3. Adjusting Digital Meter:

Adjust VR15 till the two red lamps in the digital meter light at 50W output under HI power FM mode on Channel 20 of D Band.

4. PA

Connect a speaker to the PA output terminal. Place the BAND switch in PA position, and supply 1000Hz 10mV signal to the microphone input. Control MIC gain for maximum, and adjust AF level control till over 2V output is obtained, while no RF output should be established at ANTenna.

5. COARSE:

Place the unit in transmit mode, and supply 1000Hz 10mV signal to the microphone input under USB mode, and check transmit frequency on Channel 20 of D Band in HI power mode to read as follows:

27.2160MHz or more when COARSE level control is set to extreme + direction.
27.1960MHz or less when COARSE level control is set to extreme - direction.
Also, transmit frequency should not vary even when FINE level control is adjusted.

6. RB:

Confirm if the unit is modulated by more than 100% with an about 1500Hz tone for 0.5 second when the RB tactil switch on the panel is turned ON to change over to receive from transmit, and then TX LED goes off to indicate the unit fell to receive mode with no RF output.

7. AWI:

Remove ANT connector, and transmit in HI power under USB mode. Confirm that about a second after this, AWI LED should be lit, and less than two green lamps on the digital meter will light. Stop transmitting, and attach the the connector which has been short circuited with ANT connector, and transmit. Confirm the digital meter will not light then, but about a second later, AWI LED will go on. Power current should read less than 5A while AWI is lit.

RECEIVER SECTION (to be measured with speaker output 2Vrms at 8 ohms with NB on, ANL off, TONE on.)

1. Adjusting Sensitivity:

Supply 1uV, 1KHz 30% modulated signal to ANT under AM mode, and set RF GAIN at maximum, COARSE and FINE controls to center, and proceed as follows:

- (1) Adjust L5 on Channel 1 of D Band.
- (2) Adjust L6 on Channel 1 of A Band.
- (3) Adjust L7 on Channel 40 of G Band.
- (4) Repeat steps (1) through (3), and align for minimum sensitivity gap.
- (5) Adjust L8, L9, and L19 on Channel 20 of D Band.
- (6) Check S/N ratio, which should be more than 10dB on each channel and band.

2. Aligning FM:

Set the unit in FM mode, and supply 1uV, 1KHz modulation signal with 1.5KHz/dev. from SG to ANT. Place RF GAIN position to maximum, COARSE and FINE controls to center. Adjust L10 for maximum output waveform and minimum distortion, when S/N ratio should be more than 20dB.

3. Adjusting Digital Meter:

Set the unit in AM mode, and supply 1mV, 1KHz 30% modulated signal from SG to ANT. Place RF GAIN position to maximum, and COARSE and FINE controls to center. Adjust VR16 so that two red lamps on the digital meter will light.

4. Aligning Squelch:

Set the unit in AM mode, and supply 1mV, 1KHz 30% modulated signal from SG to ANT. Place RF GAIN to maximum, and COARSE and FINE controls to center. Rotate Squelch control to maximum direction, and rotate VR4 till a sound will come out. Then adjust VR4 again so that the sound goes off when input level from SG is changed to -10dB (0.3mV). Again, increase input level to 1mV, and the sound come out.

5. USB, LSB, FINE Control:

Set the unit in USB mode, and supply 0.3uV non-modulated signal from SG to ANT. Place RF GAIN level to maximum and COARSE control to center, and rotate FINE control to + direction till output sound will read 1KHz, when S/N ratio should read over 10dB.

Then set the unit in LSB mode, and rotate FINE control to - direction till output sound is measured 1KHz, when S/N ratio should read more than 10dB, and FINE control should vary by more than 1KHz when rotated.

6. ANL:

Give the output from a noise generator to ANT. Speaker noise should be decreased when ANL is on under AM mode with no SG output.

7. TONE:

Speaker noise should sound in high tone when TONE is off under FM mode with no SG output.

8. NB:

Supply the noise generator output to ANT. Speaker noise should decrease when NB is ON under USB mode, and increase when it is OFF.

PARTS LIST

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PARTS NAME	TYPE	REFERENCE NO.
Printed Circuit Board	MAIN P.C.B.	PCB1
Integrated Circuit	TA78008AP	IC1
	TA7222AP	IC2
	HD14568BP	IC3
	HD14569BP	IC4
	TC5082P	IC5
	TC4008BP	IC6,7
	TA7310P	IC8,9,10
	TA7130P	IC11
	uPC1037H	IC12
	TC4011BP	IC13,14
	TC4069UBP	IC15,16
	TA7612AP	IC17
	TA78L008AP	IC18
	TA78009AP	IC19
Transistor	2SC1969	Q1
	2SC2078	Q2
	2SC2314	Q3
	2SK192AY	Q4,22,25,26,36
	2SC1815Y	Q39
	2SC1674L	Q33,35
	2SC2787	Q5,6,7,8,10,11,12,13,14,15,16, 17,18,19,20,21,23,24,30,34,43 44
	2SC2001	Q37,38,40
	2SA1048	Q27,28,29,41,42
	2SD313	Q45
Diode	1S1588	D1,2,3,4,5,6,7,8,9,10,11,12, 13,14,15,16,17,18,19,20,21,22 23,24,25,26,27,28,29,30,31,32 33,34,35,36,37,38,39,40,41,42 43,44,45,46,47,48,49,50,51,52 53,54,55,56,57,58,59,60,61,62 63,64,65,66,67,68,69,70,71,72 73,74,75,81,82,85,86,87,88,89 90,91,95,97,98
	SR1K2	D79
	RD5.6E	D77,94
	1K60	D79,80,83,84
	15U50	DU1
	FC52M	DU6
	MU1Y	BD1,2

PARTS LIST

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PARTS NAME	TYPE	REFERENCE NO.
Quartz Crystal	17.700MHz HC18T	X1
	10.240MHz HC18U	X2
	10.695MHz HC18U	X3
Crystal Filter	10L02B	XF1
	10L06AM	XF2
Ceramic Filter	CFU455H2	CF1
Resistor Circuit	1048 IAM (100K x8)	RA1,2
Coil	310017	L1
	310016	L2
	311005	L3,18
	LP-4	L4
	LA-4	L5
	311012	L6,7
	LI-4	L8
	330005	L9
	330004	L10
	327004	L11
	SR464	L12
	SR465	L13
	LCH-4A	L17
	LI-3A	L19
	0.47uH	L14
	3.9uH	L15
	56uH	L16
Transformer	TCH-2	TC1
Relay	G2R-1117P-U-US	RL1
	G2E-187P-M	RL2
Rotary Switch	GPS-0335	LSW1 (Channel)
	GPS-0634	POWER
	GPS-0505	MODE
	GPS-0599	BAND
Ceramic Trimmer Capacitor	20PF	CT1,2,4
	50PF	CT3,5,6
Potentionmeter	RHBOC 470 ohm	UR8,11
	RHBOC 2.2 Kohm	UR9,12
	RHBOC 4.7 Kohm	UR10,13
	RHBOC 10 Kohm	UR1,2,3
	RHBOC 47 Kohm	UR4
	RHBOC 100 Kohm	UR5,6,7,15,16
	10 Kohm(3P)	UR14

PARTS LIST

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PARTS NAME	TYPE	REFERENCE NO.
Variable Resistor	50KBx50KB/SW	VOLUME, SQUELCH, POWER
	50KBx50KB	MIC, RF
	10KBx10KB	FINE, COARSE
P.C.B. Connector	W-P-9004 (4Pin)	CN5, 8, 9
	W-P-9005 (5Pin)	CN6, 10
	W-P-9009 (9Pin)	CN2
	W-P-9011 (11Pin)	CN3, 7
	W-P-9012 (12Pin)	CN4
	W-P-9014 (14Pin)	CN1

PARTS LIST

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PARTS NAME	TYPE	REFERENCE NO.
Ceramic Capacitor	0.5 PF CH	C98
	2 PF CH	C47
	5 PF CH	C48, 81, 170, 229
	10 PF CH	C14, 21, 66
	12 PF CH	C69
	15 PF CH	C62
	22 PF CH	C33, 45, 52, 230
	27 PF CH	C54, 64, 75, 228
	33 PF CH	C53, 116, 201
	39 PF CH	C29, 218
	47 PF CH	C28, 173
	56 PF CH	C26, 46, 57, 273
	82 PF CH	C1, 224
	100 PF RH	C12, 30, 31, 32
	100 PF B	C55, 113
	150 PF CH	C172, 200
	180 PF CH	C2
	220 PF SH	C87
	470 PF B	C105, 240
	470 PF XB	C7
	0.001 uF B	C3, 16, 19, 25, 35, 50, 51, 77, 80, 83, 84, 88, 92, 95, 96, 100, 112, 174, 176, 193, 215, 242
	0.047 uF YF	C119, 214
	0.01 uF YF	C61, 65, 70, 74, 76, 78, 106, 122, 136, 156, 167, 175, 194, 231
	0.1 uF XB	C4, 10, 11, 13, 15, 18, 20, 37, 40, 44, 68, 71, 79, 82, 90, 94, 99, 101, 102, 103, 110, 115, 125, 131, 132, 145, 168, 191, 192, 195, 197, 203, 205, 208, 210, 211, 212, 213, 216, 217, 219, 220, 223, 239, 243, 244, 245, 246, 247, 248
Aluminum Electrolytic Capacitor	0.1 uF 50V	C198
	0.33 uF 50V	C182
	1 uF 50V	C73, 126, 141, 144, 149, 150, 227, 236, 241
	2.2 uF 50V	C39
	3.3 uF 50V	C177
	4.7 uF 35V	C114, 134
	10 uF 16V	C5, 6, 27, 34, 36, 38, 41, 43, 49, 56, 58, 60, 67, 72, 85, 109, 111, 117, 120, 123, 124, 127, 148, 151, 157, 158, 159, 163, 165, 171, 179, 185, 186, 187, 188, 189, 190, 209, 221, 222
	22 uF 16V	C118
	47 uF 35V	C130, 135, 138, 140, 160, 225, 226
	100 uF 16V	C139, 147, 183
	330 uF 16V	C133
	2200 uF 16V	C129

PARTS LIST

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PARTS NAME	TYPE	REFERENCE NO.
Polyester Film	0.0047 uF	C204
Capacitor	0.022 uF	C128
	0.01 uF	C154,155
	0.1 uF	C137
Carbon Fixed Film	1/4W 2.2 ohm	R22,24,131,142
Resistor	10 ohm	R2,124,270
	22 ohm	R4,6,13,108,109
	33 ohm	R216
	47 ohm	R17,18,31,37,39,94,122,169,209 248,276
	56 ohm	R8
	100 ohm	R49,93,99,183,184,199,200,201, 202,203,204,233,236,240,245, 253,281,282
	220 ohm	R1,52,56,59,73,104,116,168,170
	270 ohm	R242
	330 ohm	R10,21,30,40,58
	390 ohm	R145,205,206,207,208
	470 ohm	R3,5,27,71,215
	1 Kohm	R9,34,38,46,82,97,101,102,106, 110,111,133,134,135,136,138, 146,151,153,164,167,174,178, 179,181,185,186,187,188,189, 190,191,192,193,194,195,196, 197,198,210,214,243,246,251, 254,259,273,274,276,277,279,
	1.2 Kohm	R85
	2.2 Kohm	R11,25,72,100,165,180,182,217, 219,220,222,223,225,226,228, 249,255,263,266
	2.7 Kohm	R43,147,161
	3.3 Kohm	R35,143,150
	3.9 Kohm	R105
	4.7 Kohm	R44,45,148,160,171,172,173, 247,275
	5.6 Kohm	R47,57,60,69,84,87,88,89,90, 91,92,123,126,130,260,271,280
	6.8 Kohm	R63,213,300
	10 Kohm	R19,20,50,62,67,118,120,121, 128,129,144,149,152,154,155, 158,163,166,176,211,250,256, 257,262,272
	15 Kohm	R112
	22 Kohm	R51,53,79,96,175,212,241,252, 267
	27 Kohm	R98,156
	33 Kohm	R229,230,231,232
	47 Kohm	R14,28,29,36,117,137,140,141, 157,177,278

PARTS LIST

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PARTS NAME	TYPE	REFERENCE NO.
Carbon Fixed Film Resistor	1/4W 68 Kohm	R42
	100 Kohm	R54, 55, 76, 113, 119, 132, 244
	220 Kohm	R41, 107, 162, 218, 221, 224, 227
	330 Kohm	R95
	1 Mohm	R74, 75, 77, 78, 127, 234, 235, 237, 238
	3.3 Kohm	W104-W95
	2W 5 ohm	R301

PARTS LIST

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PARTS NAME	TYPE	REFERENCE NO.
Printed Circuit Board	DISPLAY & CONTROL P.C.B.	PCB2
Light Emitting Diode	TLV333E	LED1,2
	TLG332E	LED3,4,5,6,7
	LT-9200D	LED8
	LT-9200H	LED9,10
	LT-9200N	LED11
	GL-9PR22	LED13,14,15,16
	GL-9NG22	LED17,18,19,20,21,22
	TLR-226	LED27,28,29,30
Carbon Fixed Film Resistor	1/4W 220 ohm	LR1,2
	47 ohm	LR3
Contact Switch	KHH10908	SW101,102,103,104

PARTS LIST

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PARTS NAME	TYPE	REFERENCE NO.
Printed Circuit Board	DIGITAL SUB P.C.B.	PCB3
Integrated Circuit	TC5032P	SIC1
	TC4069UBP	SIC2
	TD62303P	SIC3
	TC4511BP	SIC4
	TD62783AP	SIC5
	TC5036P	SIC6
	TC4017BP	SIC7
Transistor	2SC2787	SQ1,2,3,4
Diode	1S1588	SD1
Quartz Crystal	3.2768MHz HC18U	SX1
	15.3475MHz HC18U	SX2
Coil	0.33uH	SL1
	22uH	SL2,3
Ceramic Trimmer	20PF	SCT1,2,3
Capacitor	50PF	SCT4
Ceramic Capacitor	10 PF CH	SC19
	22 PF CH	SC20,22
	33 PF CH	SC18
	56 PF CH	SC1
	82 PF CH	SC14
	100 PF B	SC31
	220 PF SL	SC15,16
	0.01 uF VF	SC17
	0.1 uF M	SC24,25
Aluminum	47 uF 16V	SC23
Electrolytic	100 uF 16V	SC12
Capacitor	330 uF 16V	SC13
Carbon Fixed Film	1/4W 47 ohm	SR16
Resistor	56 ohm	SR2,3,4,5,6,7,8
	100 ohm	SR17
	330 ohm	SR19
	10 Kohm	SR22,23
	47 Kohm	SR18,24
	100 Kohm	SR21
	330 Kohm	SR20
	1 Mohm	SR1
P.C.B. Connector	W-P-9005 (5Pin)	SST2
	W-P-9014 (14Pin)	SST1

PARTS LIST

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PARTS NAME	TYPE	REFERENCE NO.
Printed Circuit Board	POWER P.C.B.	PCB4
Transistor	25C2879 25D313	PQ1 PQ2
Diode	MI301 151588	PD1,2 PD3,4
Coil	320009 320010 320011 320012 320013	PL3 PL5 PL1 PL6 PL4,7
Ceramic CaPacitor	1 PF CH 5 PF CH 470 PF XB 680 PF SL 0.1 uF M	PC24 PC31 PC1 PC3,34 PC4,6,7,9,10,12,25,27
Aluminum Electrolytic CaPacitor	10 uF 16V 47 uF 16V	PC11 PC5
Mica CaPacitor	39 PF HR04 68 PF HR05 100 PF HR05	PC22,23 PC17 PC13,14,15,16,20,28,29,30,31,32,33
Carbon Fixed Film Resistor	1/4W 2.2 ohm 22 ohm 330 ohm 1 Kohm 1/2W 220 ohm 2W 100 ohm	PR8 PR7 PR5 PR6 PR4 PR2

MODEL: SUPERSTAR 7000 DX

Specifications

GENERAL

Frequency Range : 25.615 - 28.755 MHz
Channels : 280 CH.
Channel Space : 10 KHz
Power Supply : 13.8 V DC Negative Ground
Fuse : 20 A
Power Consumption : Receiver - 1.2 Amp., Transmit - 15 Amp.

TRANSMITTER

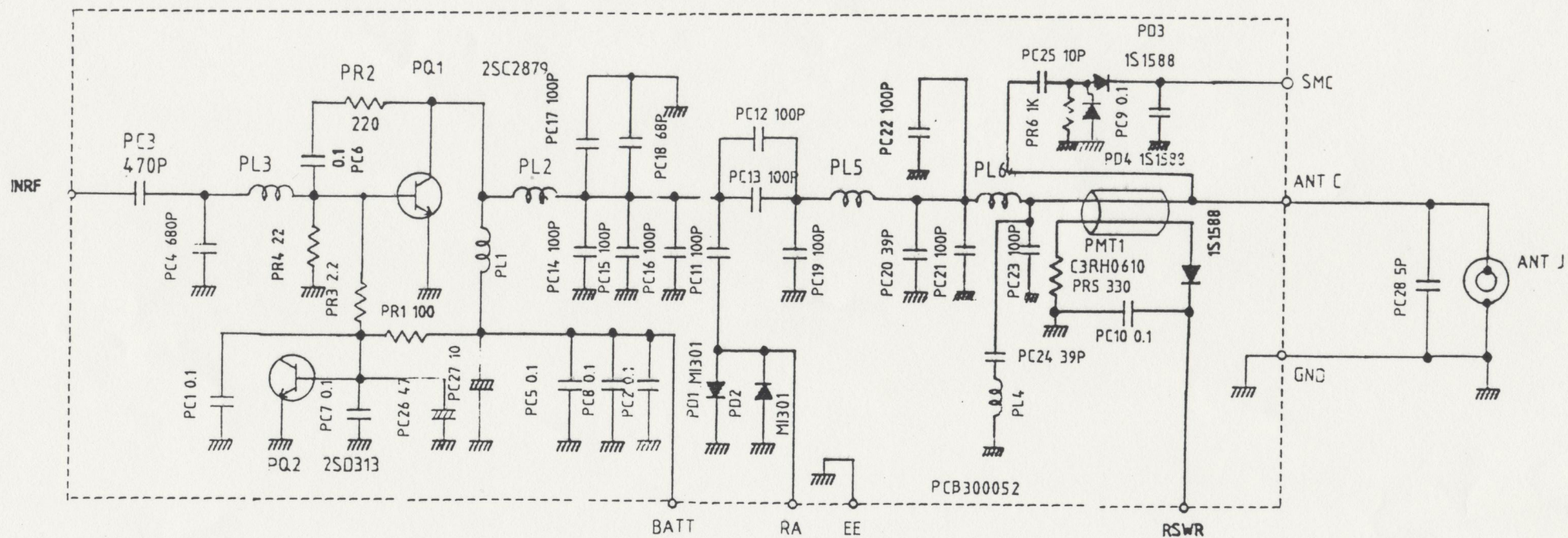
Power Output	:		<u>HI</u>	<u>MID</u>	<u>LO</u>
		AM (W)	50	25	5
		FM (W)	50	25	5
		SSB (W)	100	50	10

Transmitter Mode : AM - Amplitude Modulation
FM - Frequency Modulation
USB - Upper Side Band Carrier
LSB - Lower Side Band Carrier

Harmonic Suppression : More than 50 dB Down

RECEIVER

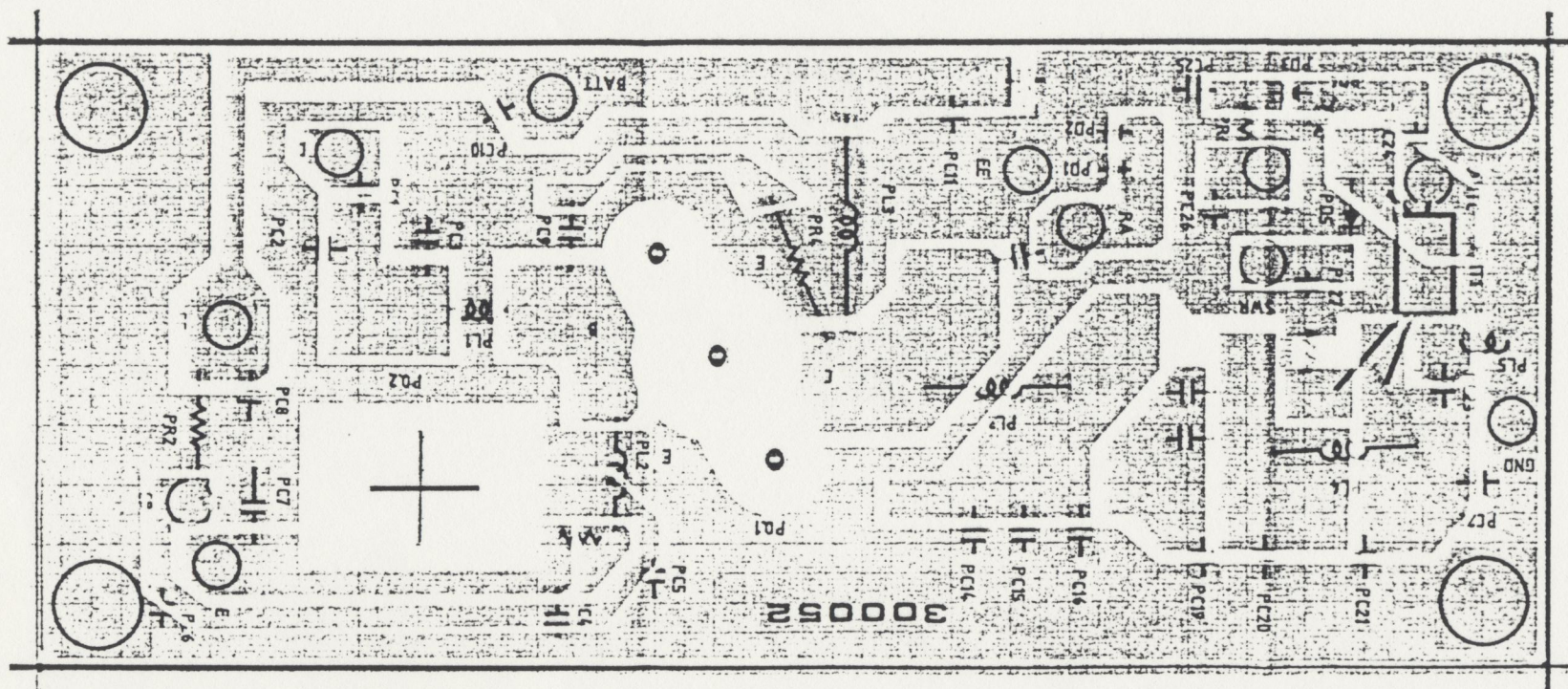
System : Dual Conversion Superhetrodyne
IF : 1 st. - 10.695 MHz, 2 nd. - 455 KHz
Sensitivity : AM - 1 μ V for 10 dB S/N
FM - 1 μ V for 20 dB S/N
SSB - 0.3 μ V for 10 dB S/N
Selectivity : AM : +/- 3 KHz -6dB, +/- 10 KHz -60dB
FM : +/- 3 KHz -6dB, +/- 10 KHz -60dB
SSB : 2 KHz -6dB, 10 KHz -60dB
Audio Output : 2 Watts at 8 Ohms

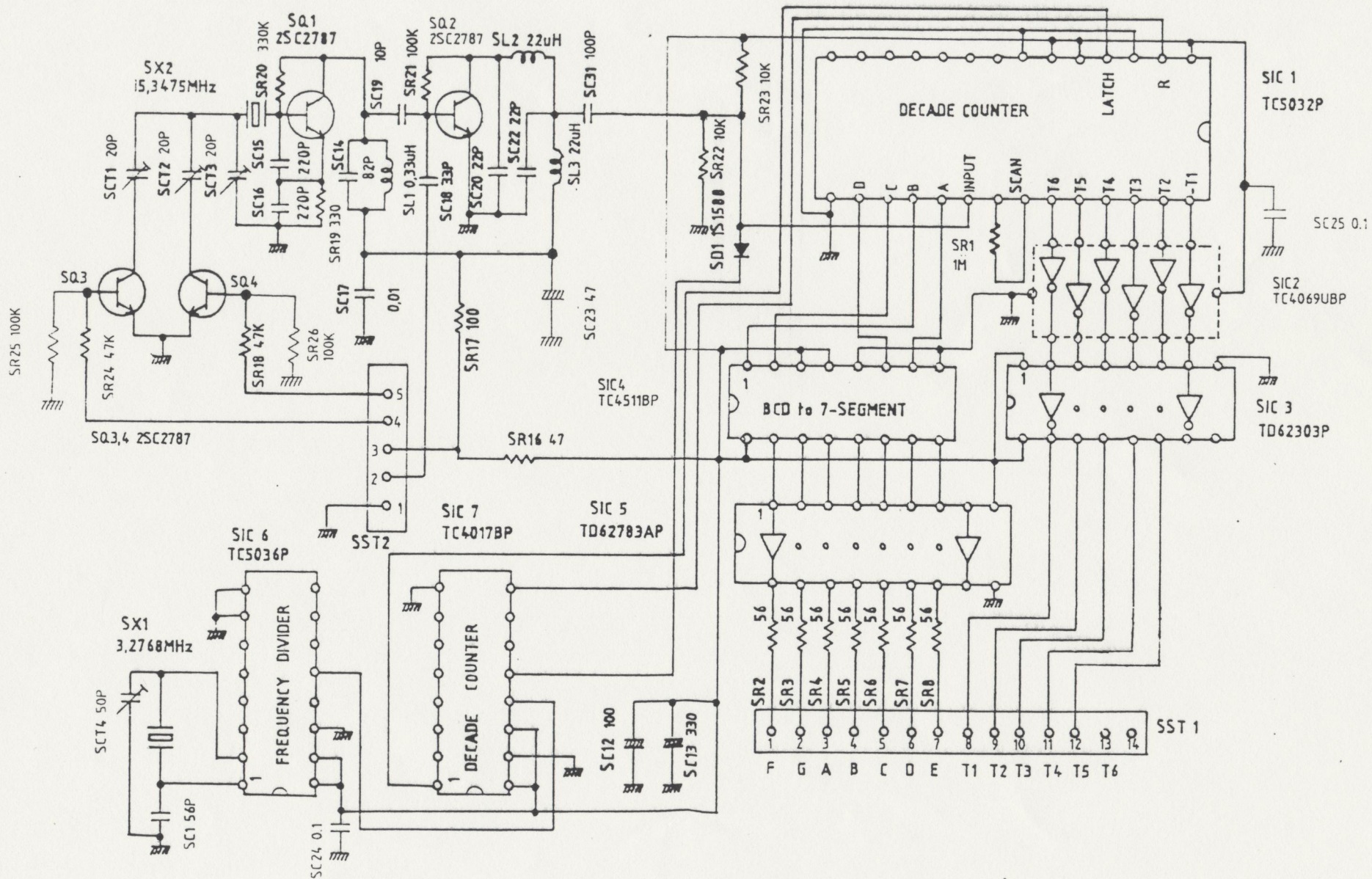


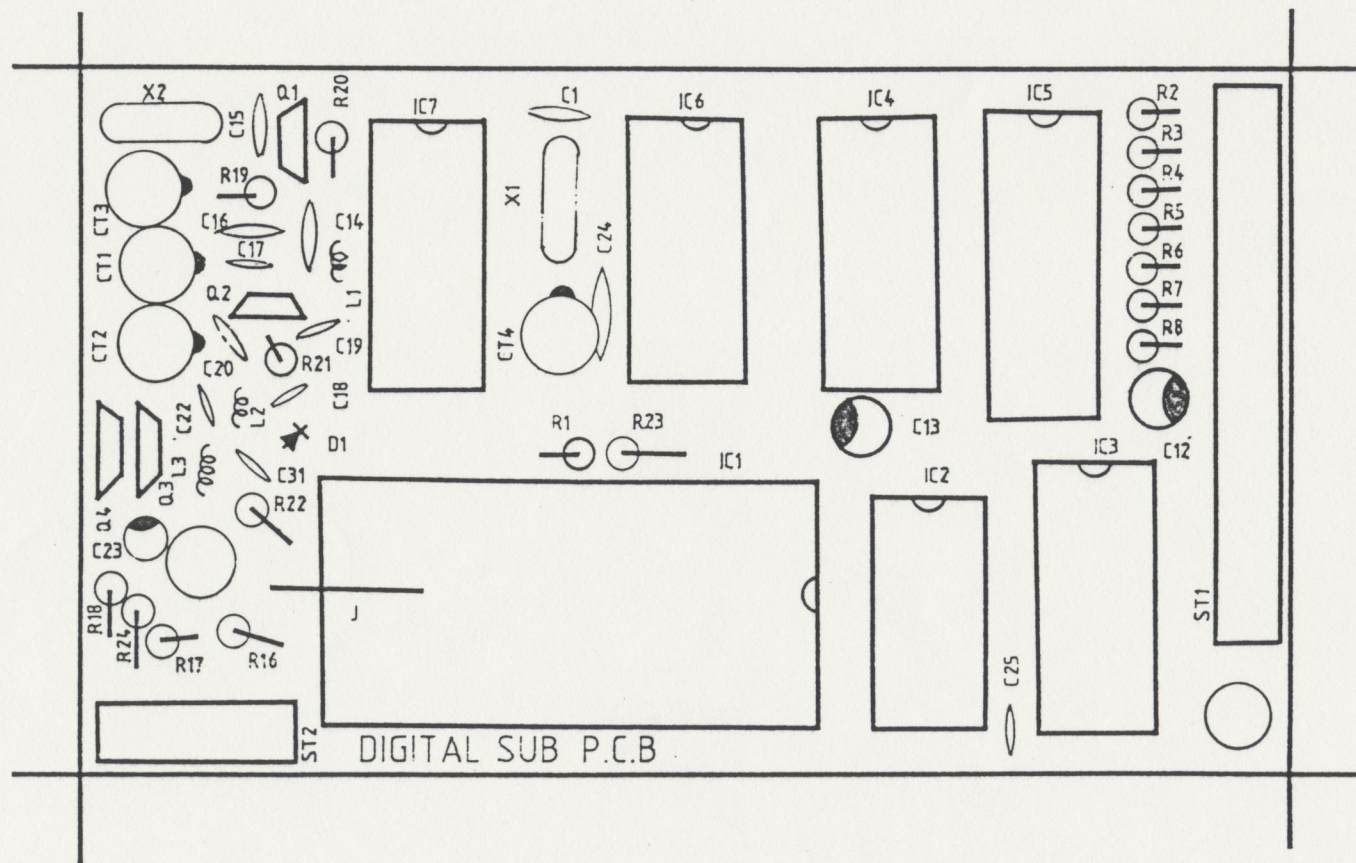
COIL PL1 320011
 PL3 320009
 PL4 320013
 PL5 320010
 PL6 320012
 PL7 320013

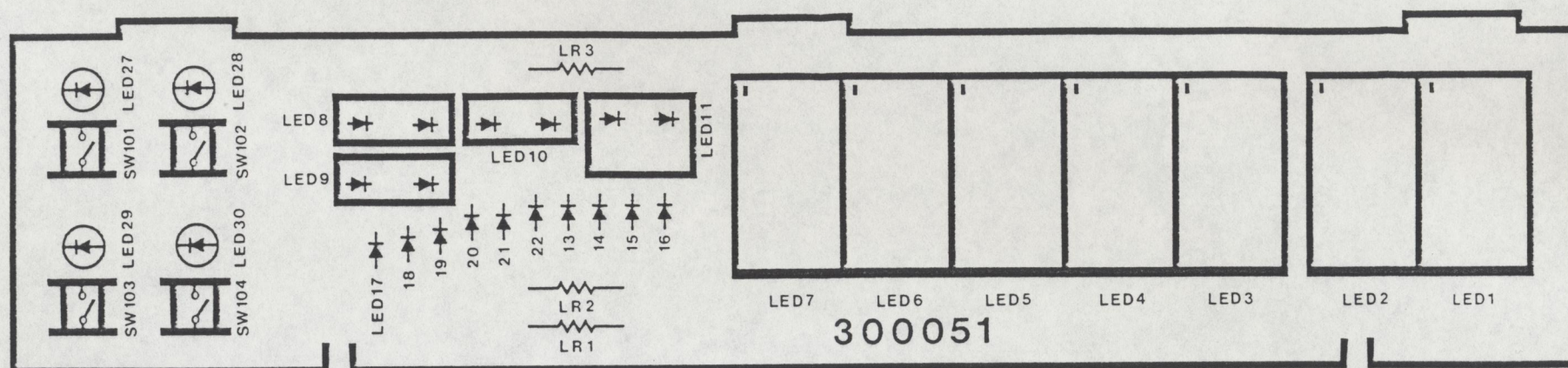
SUPERSTAR7000DX POWER UNIT CIRCUIT

				記号	年月日
POWER UNIT カイロス				300052	
品名			部品番号		材質
設計	検図	承認	三角法	機種名	SUPE
Enomoto S61-2-25			単位: m/m		図番
			尺度: /		
Shimozono Satoh					

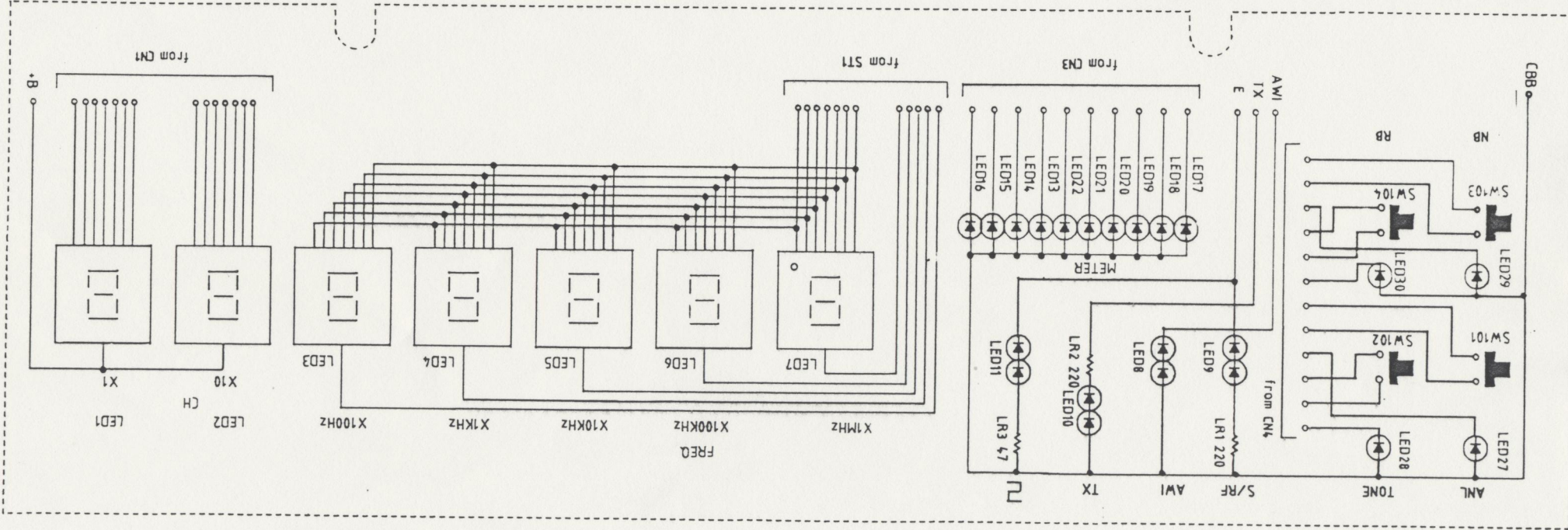


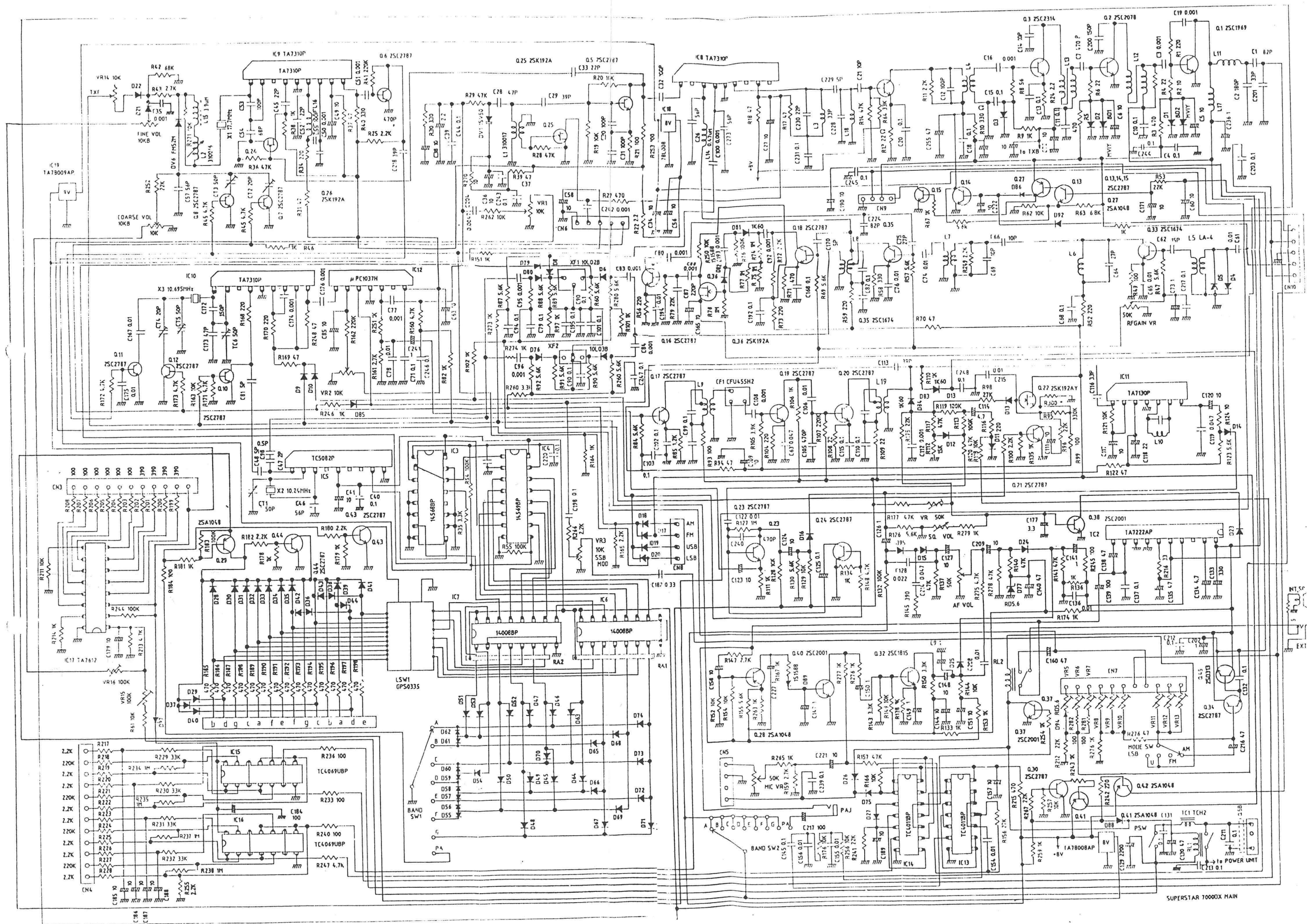






SUPERSTAR 7000DX CONTROL SUB PCB CIRCUIT



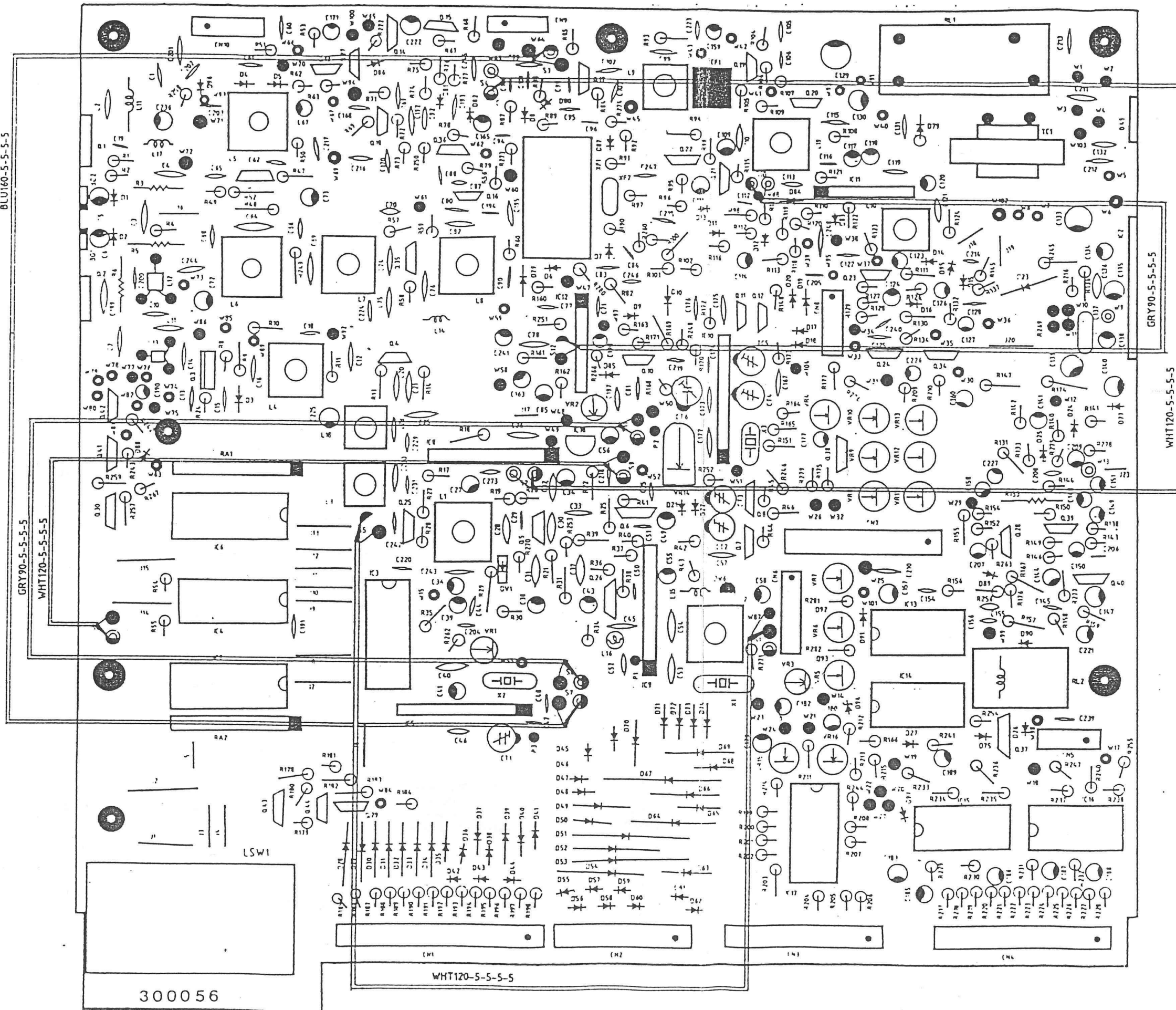


SUPERSTAR 70000X MAIN



300056

BLU160-5-5-5



300056

WHT120-5-5-5

