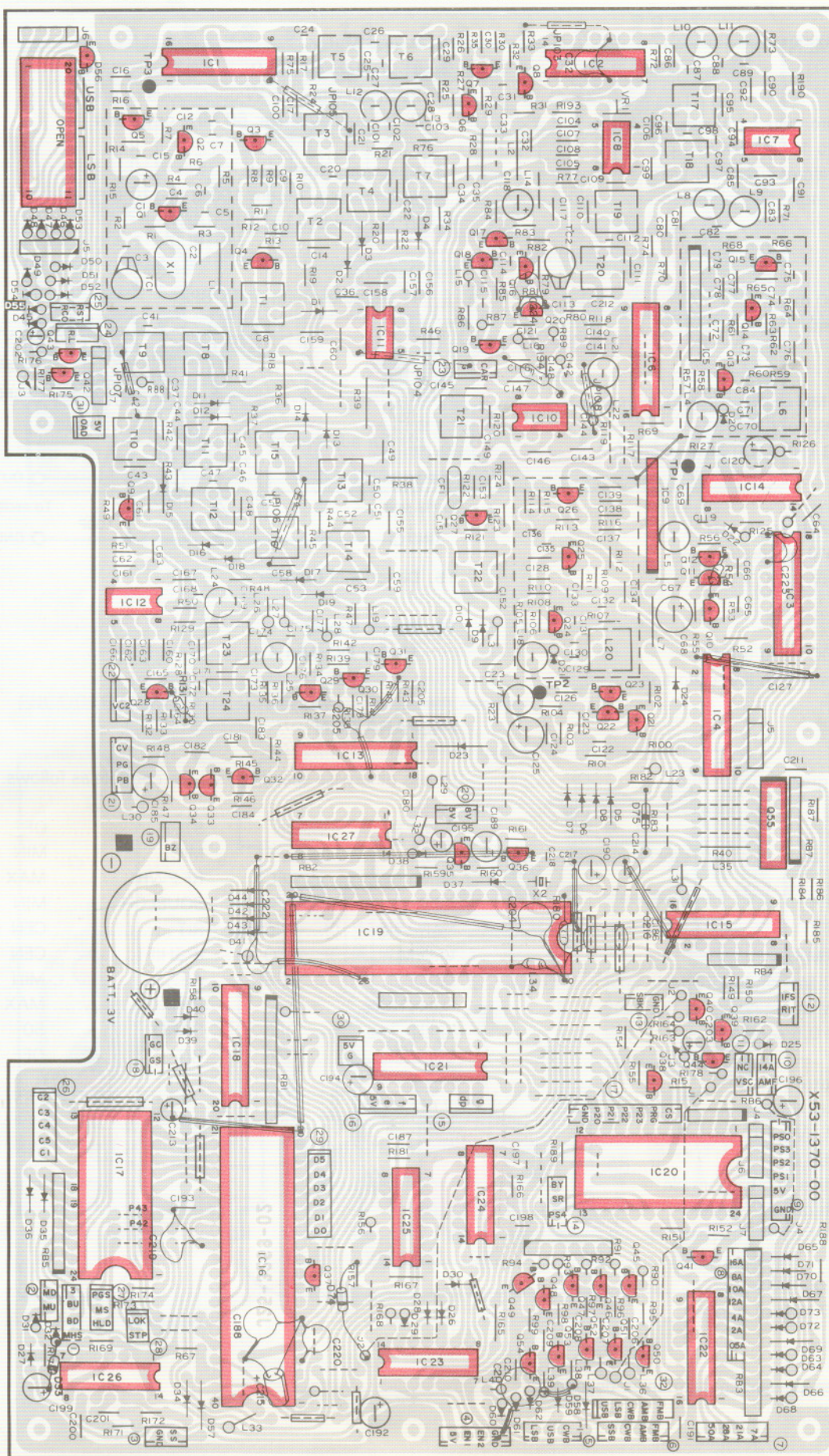


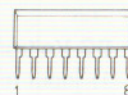
PC BOARD VIEW

CONTROL UNIT (X53-1370-00)

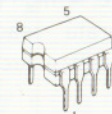
Component side view



M54459L



SN16913P



2SC460

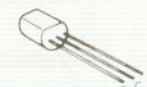


2SA1015

2SC1815

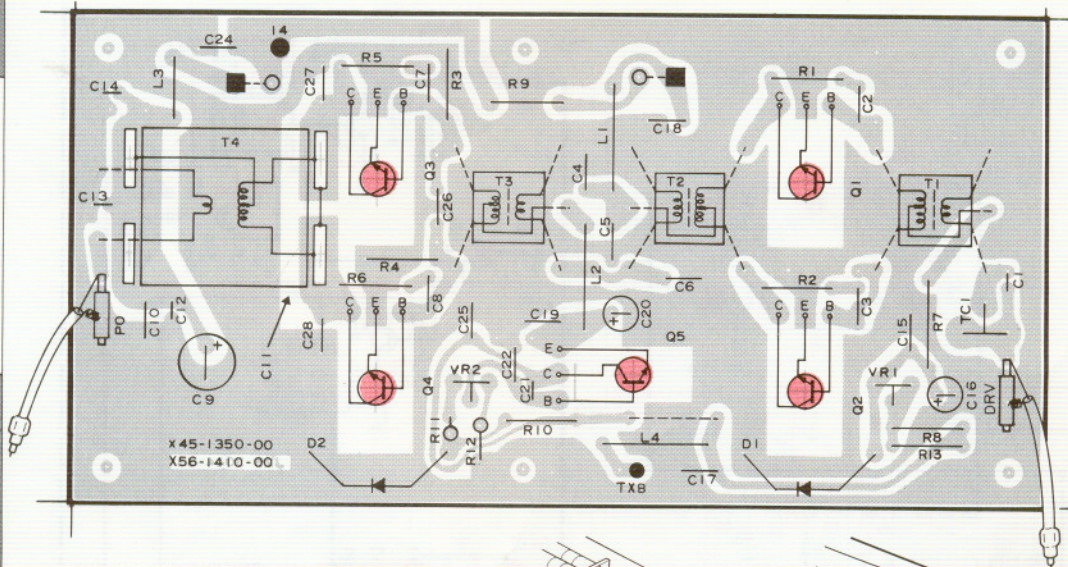
2SC1923

2SC1775



TS-670 PC BOARD VIEW

FINAL UNIT (X45-1350-00) Component side view



C11 Attachment method



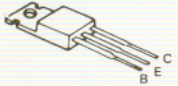
- 1 Cut wire short as possible on C11
- 2 Bend C11 as shown left after solder confirm not over edge.

C27 and C28 should be installed as shown above. Do not install them as indicated in the PC board with silk printed pattern.

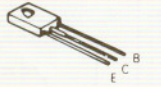
C30 should be installed externally and directly as shown above

(Cover the C30 leads with ilux tubes (212-1019-05); the leads length should be minimum.)

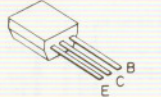
2SC1971
2SC2509



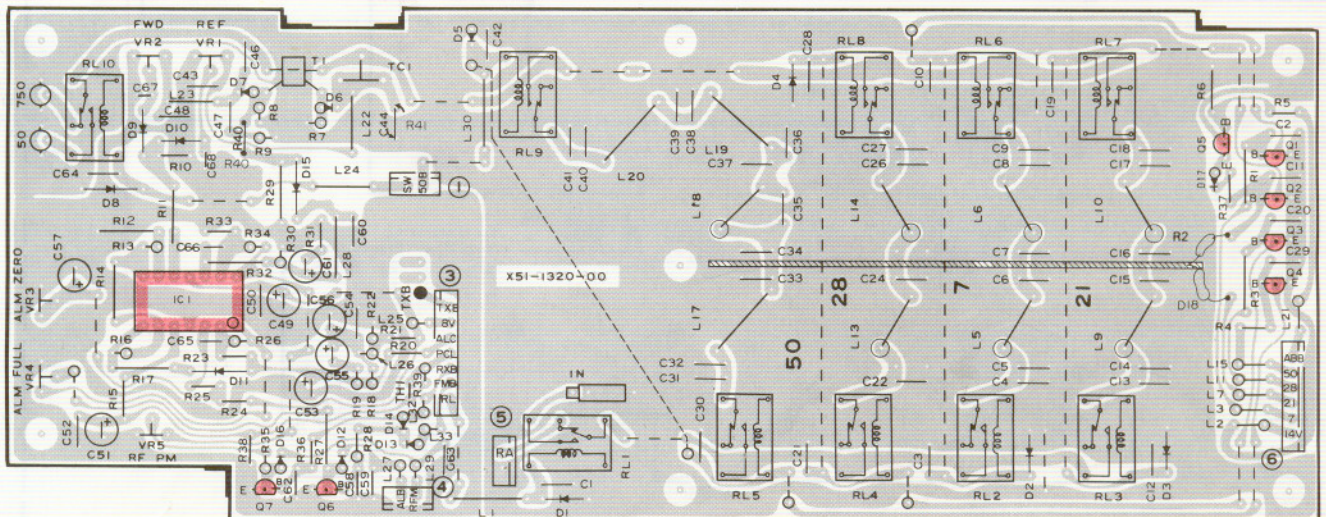
2SC496



2SA562
2SA1115
2SC1815



FILTER UNIT (X51-1320-00) Component side view

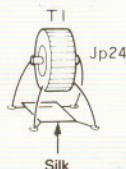


Q1~4: 2SA562(Y) Q5: 2SA1115(E) Q6, 7: 2SC1815(Y) IC1: MB3614 CR LM324 D1~5, 8, 11~14: 1S1555 D6, 7: 1N60 D9, 10, 15, 16: 1SS101 D17: MTZ3.9JA

Attachment method of L5, 6, 9, 10, 13, 14, 18.



Attachment method of JP24 as shown following.



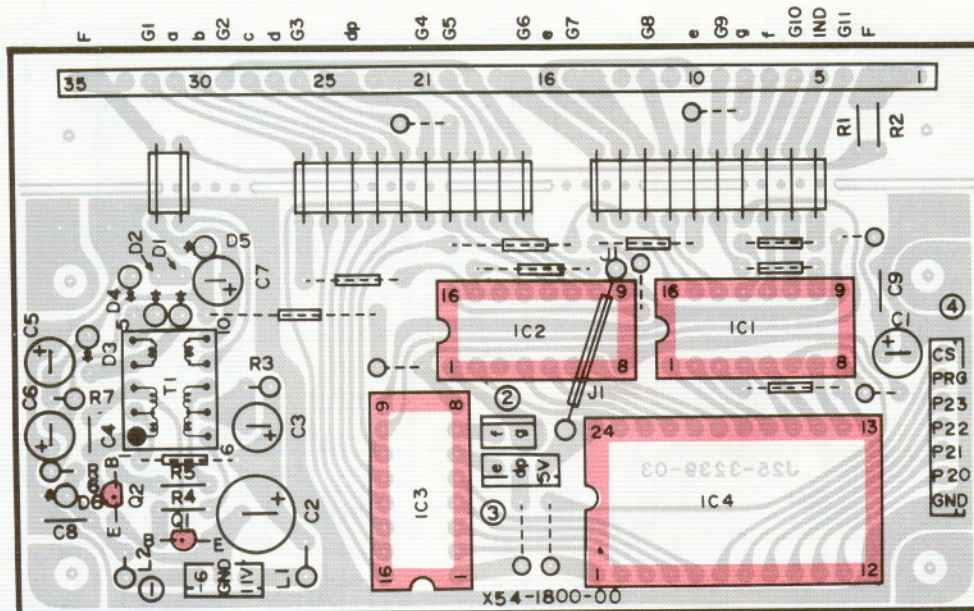
MB3614
LM324



3SK73(GR)



DISPLAY UNIT (X54-1800-00) Component side view



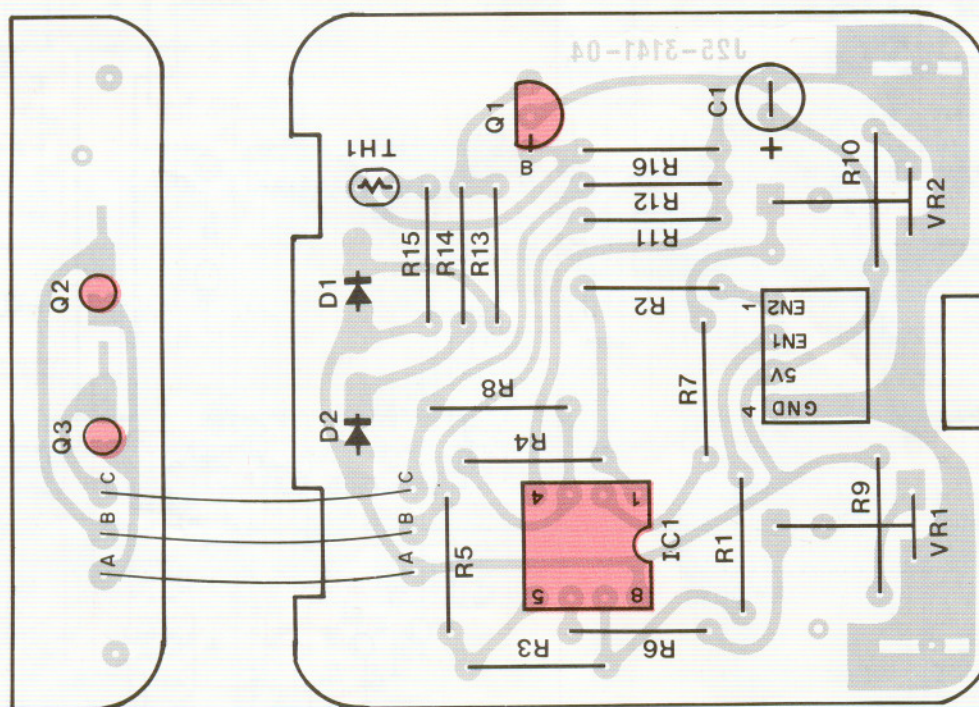
DISPLAY TUBE
FIP11FM7

Place	Character
G 1	RIT
G 2	-
G 3	+
G 4	AL
G 5	-
G 6	SPLIT
G 7	B
G 8	VFO
G 9	A
G10	T
G11	M.CH

IC4 (μ PD8243C)

Terminal No.	Terminal name
24	Vcc
2	P40
3	P41
4	P42
5	P43
6	CS
7	PROG
8	P23
9	P22
10	P21
11	P20
12	GND
13	P70
14	P71
15	P72
16	P73
17	P63
18	P62
19	P61
20	P60
21	P53
22	P52
23	P51
1	P50

ENCODER UNIT (W02-0328-10) Component side view



ADJUSTMENT

REQUIRED TEST EQUIPMENT

1. DC Voltmeter

- 1) Input resistance: More than 1 M Ω
- 2) Voltage range: 1.5 to 1000 V AC/DC

NOTE: A high-precision multimeter may be used. However, accurate readings can not be obtained for high-impedance circuits.

2. DC Ammeter

- 1) Current range: 150 mA, 500 mA, 2 A, 10 A, High-precision ammeter may be used.

3. RF VTVM

- 1) Input impedance: 1 M Ω and less than 3 pF, min.
- 2) Voltage range: 10 mV to 300 V
- 3) Frequency range: 10 kHz ~ 100 MHz or greater

4. AF Voltmeter

- 1) Frequency range: 50 Hz to 10 kHz
- 2) Input resistance: 1 M Ω or greater
- 3) Voltage range: 10 mV to 30 V

5. AF Generator (AG)

- 1) Frequency range: 200 Hz to 5 kHz
- 2) Output: 1 mV or less ~ 1 V, low distortion

6. AF Dummy Load

- 1) Impedance: 8 Ω
- 2) Dissipation: 3 W or greater

7. Oscilloscope

Requires high sensitivity, and external synchronizaton capability.

8. Sweep Generator

- 1) Center frequency: 5 MHz ~ 60 MHz
- 2) Frequency deviation: Maximum ± 16 MHz
- 3) Output voltage: 0.1 V or greater
- 4) Sweep rate: At least 0.5 sec/cm

9. Standard Signal Generator (SSG)

- 1) Frequency range: 8 to 60 MHz
- 2) Output: -20 dB/0.1 μ V ~ 120 dB/1 V
- 3) Output impedance: 50 Ω
- 4) AM and FM modulation can be possible.

NOTE: Generator must be frequency stable.

10. Frequency Counter

- 1) Minimum input voltage: 50 mV
- 2) Frequency range: 60 MHz or greater

11. Noise Generator

Must generate ignition noise containing harmonics beyond 60 MHz.

12. Power Meter

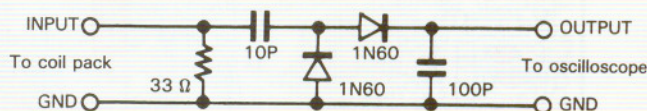
- 1) Impedance: 50 Ω
- 2) Dissipation: 15 W continuous or greater
- 3) Frequency limits: 60 MHz or greater

13. Spectrum Analyzer

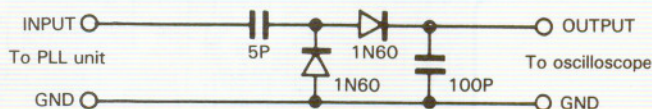
- 1) Frequency range: 100 K to 110 MHz or greater
- 2) Bandwidth: 1 kHz to 3 MHz

14. Detector

- 1) For adjustment of TX BPF



- 2) For adjustment of PLL BPF



15. Directional Coupler

16. Power supply

13.8 V DC. Min 4 A

PREPARATION

Unless otherwise specified, set the controls as follows.

POWER	ON	STEP	OFF
NB	OFF	MIC	MIN
SEND/REC	REC	RF PWR	MAX
ATT	OFF	SQUELCH	MIN
NAR/WIDE	WIDE	RIT	CEN
VFO/M	VFO	IF SHIFT	CEN
MODE	VSB	AF	MIN
FUNCTION	A	RF	MAX
SPLIT	OFF	BAND	50
LOCK	OFF	RIT	OFF

ADJUSTMENT

VOLTAGE ADJUSTMENT

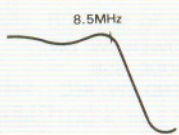
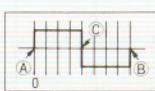
Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
Voltage adjustment and confirmation	POWER SW: ON MODE: SSB SEND SW: REC	DC VM	IF						
	(1) 8V			22 -1				8.55 ~ 9.45V	
	(2) -6V			22 -2				-5.9 ~ -6.1V	
	(3) 14V			22 -3				13.5V ± 0.3V	
	5V			22 -4				4.75 ~ 5.25V	
	(4) RFG			25 -1	SWITCH	VR6		2.6V ± 0.05_V	
	(5) RXB			23 -2				11.0V ± 0.3V	
	(6) RXB			5 -2				8.0V ~ 9.0V	
	(7) RL			34 -3			SEND SW: ON	0V ON AIR (IND) lights	
	(8) TXB			5 -1	IF	VR6	SEND SW: ON	13.2V ± 0.2V	
	(9) TXB			5 -1			: OFF	0V ON AIR (IND) goes off	
	(10) Li BATT		CONTROL	+			SEND SW: OFF	8.8V ± 0.1V	
								0V	
								More than 3.0V	

CONTROL ADJUSTMENT

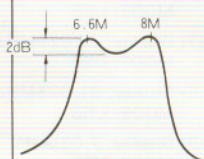
Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
1. Adjustment of standard oscillation	(1) Use synroscope probe (2) 24MHz	F COUNTER	CONT	TP3	CONT	TC1	ADJ to 24.000.000Hz	± 7Hz	
2. Voltage adjustment and confirmation	(1) VCO3 (2) Display: 50.050.0MHz (3) MODE: FM	DC VM		TP1		L6	ADJ to 6.8V	6.8V (FM)	
	(4) VCO2			TP2		L20	ADJ to 6.8V	2.1V ± 0.3V (LSB)	Confirm
								6.8V (FM)	
3. CAR LEVEL	(1) CAR	RF V.M		Hot terminal		TC2	ADJ to 0.32V	1.7V ± 0.3V (USB)	Confirm
4. VCO COIL	(1) Display: 51.025MHz	RF VM	CONT	D3 ANODE	CONT	T1	ADJ to MAX output	0.32V (1.0V P-P)	
	(2) Display: 28.025MHz					T2		About 0.32V	48MHz MATCHING COIL
	(3) Display: 7.025MHz					T3,4		About 0.2V	24MHz MATCHING COIL
	(4) Display: 21.025MHz							About 0.25V	6MHz MATCHING COIL
	(5) Display: 21.025MHz			IC2 14		T5,6		About 0.54V	18MHz MATCHING COIL
	(6) Display: 50.025MHz MODE: USB			D3 ANODE		T7		About 0.2V	
	(7) Display: 28.025MHz MODE: USB			IC12 2		T8,9, 10		About 0.24V	48MHz BPF COIL
	(8) Display: 21.025MHz MODE: USB			IC12 3		T11,12		About 0.35V	24MHz BPF COIL
	(9) Display: 7.025MHz MODE: USB					T13,14		About 0.25V	18MHz BPF COIL
	(10) CAR output					T15,16		About 0.24V	6MHz BPF COIL
	(11) CAR output			IC8 1		T17,18		About 0.15V	2.83MHz BPF COIL
	(12) Display: 51.025MHz MODE: USB			Hot terminal		T19,20 TC2	ADJ to 0.32V	0.32V	8.831MHz BPF COIL
				D9 ANODE		T21,22	ADJ to MAX output	About 0.35V	0.15 ~ 0.4MHz BPF COIL

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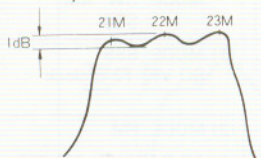
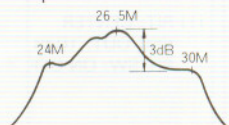
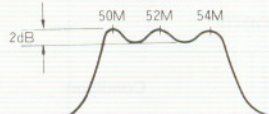
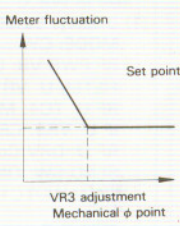
ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
	(13) Display: 50.025MHz Connection •IC12 1 SWEEP •Q31 E Detector	SWEEP SCOPE	CONT	IC12 2 Q31 E	CONT	T23,24	Adjust to 8.5MHz as shown at right.		1.05 ~ 7.55MHz BPF COIL
5. Encoder adjustment	(1) Remove the VFO knob and motor-drive the encoder at approx. 300rpm.	SCOPE	CONT	4 -3					Point C may be located anywhere. When a motor is not available, manually turn the VFO to check the duty ratio.
	(2) EN1 duty ratio adjustment: Turn a motor CW and CCW.				Encoder	VR1			
	(3) EN2 duty ratio adjustment: Turn a motor in the both direction.			4 -2		VR2	Adjust until intervals D and E are equal to each other with point C placed at the center.		After adjusting with the VFO control turned CW, check that intervals D and E are also identical when the VFO control is turned CCW.
6. VCO adjustment	(1) Voltage adjustment MODE: FM	DC VM	RF	TP5	RF				
	7.990 7.499MHz					T28	ADJ to 6.0V	6.0V	
	6.660 6.600MHz							1.5V ~ 2.5V	Confirm
	24.790 24.790MHz					T29	ADJ to 6.5V	6.5V	
	21.000 21.000MHz							1.3V ~ 2.2V	Confirm
	29.990 29.999MHz					T30	ADJ to 6.5V	6.5V	
	24.800 24.800MHz							1.3V ~ 2.2V	Confirm
	53.990 53.999MHz					T31	ADJ to 6.5V	6.5V	
	50.000 50.000MHz							1.3V ~	Confirm
	(2) All BAND 7.00MHz 53.000MHz	RF VM		TP3			Confirm all BAND by pushing BAND SW.	0.9V ~ 2 dB	Comfirm

RX ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
1. RX B-P-F	(1) Display: 7 MHz BAND MODE: FM Connection •RF U 2 : SWEEP •RF U D3: DETECTOR •Preset core of RF U ,T2,T3,T19 att the way inside. P.S 1 : T2,3,19 is IF trap coil See item No. 4 2 : 7,12,28MHz BANDs are adjust under TX BPF	SWEEP SCOPE DETECTOR	RF	D3 (cathode)	RF		Confirm waveform as shown at right.	6.6M 8M 2dB 	Confirm

ADJUSTMENT

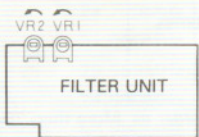
Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
1. RX B-P-F	(2) Display: 21MHz BAND	SWEEP SCOPE DETECTOR	RF	D3 (cathode)	RF		1dB 21M 22M	23M	Confirm
									
	(3) Display: 28MHz BAND						24M 26.5M 3dB	30M	Confirm
									
	(4) Display: 50MHz BAND					T4,5,6 7,8	2dB 50M 52M	54M	Confirm
									
2. NULL	(1) RF GAIN VR: CCW MAX IF SHIFT VR: CENTER	RF VM	IF	R46	IF	TC1 VR1	LEVEL MIN adjust back and forth.		
3. RX AMP	(1) Display: 7.150MHz MODE: CW SSG OUT: -6 dB RF GAIN VR: CW MAX	AF VM SSG SCOPE S.P		EXT.SP	IF	L1,2 L4	ADJ AF output MAX.		* L2 must realign at FTEM6 S. meter. * T24 will realign at NB alignment.
					RF	T20 T22 T23 T24 T25 VR1	ADJ AF output MAX. Repeat 2~3 times this ADJ.		
4. IF TRAP	(1) Display: 7.990MHz SSG display: 8.830MHz SSG ATT: 80dB	AFVM SSG SCOPE S.P	IF	EXT.SP	RF	T2,3 T19	Align to MIN order as T19, 2, 3.	More than 70dB	
5. NB AMP	(1) Display: 50MHz BAND ANT: NOISE GENERATOR NB SW: ON	N.G. SCOPE S.P	IF	EXT.SP	RF	T26,27 T24	•Adjust T26,27 to will work point de- creasing N.G output. •Align slug out point.	Confirm under high input (SSG + 30dB) and low input (SSG + 3 dB).	
6. S METER	(1) Display: 28.900.0MHz MODE: CW NO SIGNAL	SSG		S meter	IF	VR3	Set to mechanical start point.		
					RF	T9	ADJ AF output MAX.		
					IF	L2	S1 adjust CCW from peak (turn slug out)	S1 (8 ± 3dB)	Confirm
					IF	VR4	S9	S9 (30 ± 6dB)	
							Adjust repeat (2.), (3).		
	(5) MODE: FM SSG OUT: 30dB (MOD 1kHz DEV 5kHz)				FM	VR2	Adjust at 52.010.00	RF meter "20" (30 ± 6dB)	

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ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specification	Remarks	
		Test equipment	Unit	Terminal	Unit	Parts	Method			
7. AGC	(1) SSG OUT: 30dB MODE: CW. AM : SSB	AF VM SCOPE		EXT.SP				CW. AM→FAST SSB→SLOW	Confirm	
8. SQ	(1) MODE: SSB SQ VR: 12 o'clock				IF	VR2	Adjust VR slowly and step at threshold.	Confirm		
	(2) MODE: FM								8:30 ~ 9:30	
9. BEEP tone	(1) AF GAIN VR: CENTER BAND SW: UP AND DOWN Connect IF U 27 hot line to GND.					IF	VR5	Adjust "PEE" tone.	100mV	
10. RIT	(1) RIT: CENTER SSG OUT: 10dB RIT SW: ON OFF					SW	VR5	RIT SW ON, OFF equal level	Same AF tone. RIT RIT ON, RIT IND light on.	
		FRONT PANEL	RIT VR		± 1.1kHz	Comfirm				
11. RF ATT						RF ATT ON, OFF	About 30dB DOWN	Comfirm		

TX adjustment

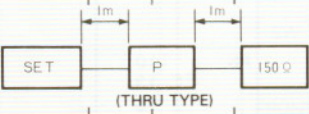
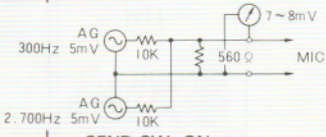
Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
1. Base current	(1) Display: 28.800MHz MODE: USB MIC VR: CCW MAX RF PWR VR: CCW MAX FILTER U : VR1, VR2 CCW MAX	DC AM	FINAL	A	FINAL	VR1	If adjustment to 300mA is not possible. 200mA or more at position where reduced about 10mA from about 10mA from VR MAX.	300mA (200 ~ 300mA)	
	 FILTER UNIT								
	SEND SW: ON			B		VR2		200mA	
	(2) SEND SW: OFF POWER SW: OFF								
2. POWER	(1) Display: 52.000.000MHz MODE: CW RF PWR VR: CW MAX FILTER U VR1,2: CW MAX RF U TC4: MAX CAP IF U VR9: CENTER RF U DRV Connect terminal SEND SW: ON FINAL U TC1: MAX CAP	POWER METER SCOPE		ANT (50-7)			•Adjust to MAX power output. •Repeat adjust RF U TC1 ~ 3.		
					RF	TC1 2 3 T41 42			
					IF	L10			
					FINAL	TC1	If power is over 10W reduce to 10W with VR and adjust.		
3. TX-BPF	MODE: FM Connection RF U R123: SWEEP RF U VR2: CCW MAX RF U DRV: 50Ω DUMM and SPECTRUM ANA- LYZER	SWEEP SPECT- RUM ANALY- ZER 50Ω DUMMY					Adjust as shown at right with MAX gain and band width.	*Following wave- form has measured 2 dB/div scale.	
	(1) Display: 7MHz BAND						Slug out over 3 turn on RF U T34, 35		



ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
	SEND SW: ON								
	(2) Display: 21MHz BAND					T11 14 17			
	(3) Display: 28MHz BAND				RF	T10 13 16			
	(4) Display: 50MHz BAND					TC3 2 T37 42	TC3,2 has adjusted for gain up.		
4. POWER SET	SEND SW: OFF								
	(1) Display: 53.999MHz MODE: USB AG OUT: 1.5kHz 10mV SEND SW: ON adjust power to 15W by MIC VR.	POWER METER AG AF VM		ANT 50 ~ 7	FILTER	VR2	Adjust to 11W	11W	
	(2) RF PWR VR: CCW				SW	VR9	Adjust to 1.5W	2.5W or less	
	(3) SEND SW: OFF								
	(4) MODE: CW RF PWR VR: CW MAX SEND SW: ON				IF	VR9	Adjust to 11W		
	SEND SW: OFF								
5. ALC METER	(5) Confirm power each BAND edge.							10W ~ 12W	
	(1) MODE: USB MIC VR: CCW MAX RF PWR VR: CW MAX SEND SW: ON RF/ALC SW: ALC	POWER METER AG AF VM		METER	FILTER	VR3	Adjust mechanical ϕ point.		
	(2) AG out: 1.5kHz 5mV MIC VR: set to S1					VR4	AG out: increase 6dB from 5mV.	Adjust ALC full scale.	
	(3) MIC input: OFF RF PWR VR: CCW MAX							No ALC METER swing	Confirm
	SEND SW: OFF								

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
6. PROTECTION	(1) Display: 53.499MHz MODE: CW RF PWR: CW MAX FILTER U VR1: CCW MAX SEND SW: ON	POWER METER V METER		ANT (50-7) Both end of VR1	FILTER	TC1	Minimum voltage	About 100mV or less	
	SEND SW: OFF								
	(2) Display: 21.499MHz : 28.499MHz ANT: 150Ω load SEND SW: ON	POWER METER 150Ω LOAD				VR1	Adjust VR1 to 9W another side of 28.499MHz or 21.499MHz high power side.	9W	
	SEND SW: OFF								
	(3) Confirm at 4 points 7.499MHz, 50.499MHz 52.499MHz, 53.499MHz							4W or more	
									
7. SPRIOUS	(1) Display: 50.000MHz MODE: CW SEND SW: ON	POWER METER SPE-ANA		ANT (7-50)	RF	VR2 VR4 T33	Adjust to minimize spurious at ±8.83MHz (Repeat VR2, 4 twice)		
	SEND SW: OFF								
	(2) Confirm at 52.990MHz							60dB or less	
	(3) Display: 53.999MHz MODE: AM SEND SW: ON				CONT	VR1	Adjust to MIN spurious at ±100kHz		
	(4) Display: 21.499MHz SEND SW: ON				RF	VR3	Adjust to minimize spurious.		
	SEND SW: OFF								
	(5) Display: 7.499MHz SEND SW: OFF					T34,35	Adjust minimize spurious at ±1.33MHz. (Repeat T34, 35 twice)		
8. SSB MODE FREQUENCY RESPONSE	(1) AG out: 5mV				CONTROL	DIP S/W			
	 SEND SW: ON MIC VR: 9 o'clock						 Frequency has set by DIP SW.  Adjust to cross each point.		
	SEND SW: OFF								
9. CAR BALANCE	(1) Display: 28.8MHz MODE: USB, LSB MIC VR: CCW MAX RF POWER VR: CW MAX SEND SW: ON	POWER METER SCOPE AG 2 SET AF VM		ANT (7-50)	IF	VR7 VR8	Adjust repeatedly to minimize.	-50dB or less	
	SEND SW: OFF								

ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
10. TX. RF FREQ-ENCY ERROR	RF POWER: CCW MAX MODE: USB, LSB, CW	POWER METER F COUNTER	IF	30 -1	SW	VR7 VR8 VR10	SEND: Adjust at OFF as ON frequency USB LSB CW	USB: LSB: TX..RX equal frequency CW: Same as USB frequency	
11. RF POWER METER	(1) MODE: FM RF PWR: CW MAX SEND SW: ON RF/ALC SW: RF	POWER METER		ANT METER	FILTER	VR5	RF PWR VR: Adjust to 10W.	RF METER "10".	Confirm
	(2) RF PWR VR: Adjust 2W						Confirm	RF METER 2W $\pm$ 1W	
	SEND SW: OFF								
12. HF: VHF LEVEL ERROR	(1) Display: 53.499MHz, 7.499MHz MODE: CW SEND SW: ON RF/ALC SW: ALC	POWER METER		METER	RF	TC4	Adjust to equal fluctuation on ALC meter between 53.499MHz and 7.499MHz	If 53.499 is low as 7.499 adjust to MAX and within 6dB.	
	SEND SW: OFF								
13. SIDE TONE	(1) MODE: CW AF GAIN VR: 12 o'clock KEY JACK: KEY SEND SW: ON	POWER METER AF VM		EXT.SP	IF	VR10	KEY DOWN	0.63V/8 Ω about 800Hz Low distortion.	Confirm
14. CW BREAK IN	(1) SEND SW: OFF				RF	VR5	KEY DOWN TIME CONSTANT VR5: CCW longer : CW shorter	Breake in time changeble. VR5: 5V ~ 2V	

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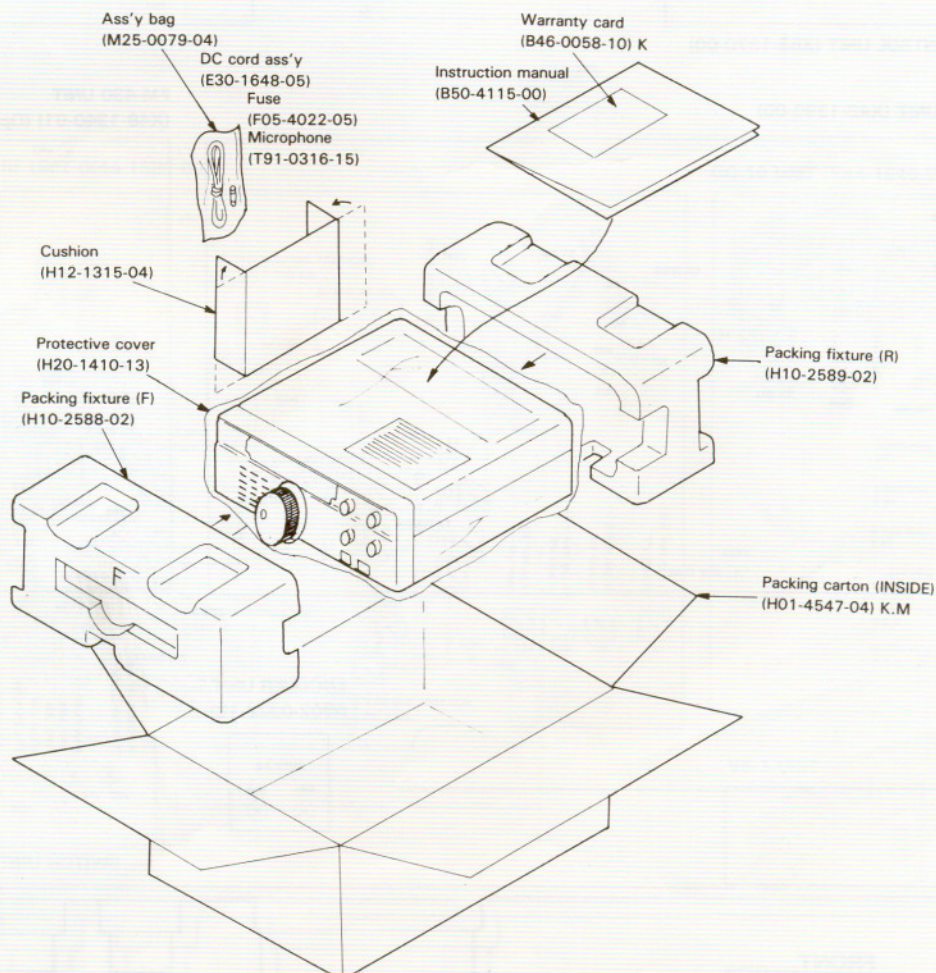
ADJUSTMENT

MICROPROCESSOR OPERATION CHECK

Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
1. BAND	(1) POWER PLUG: CONNECT : (13.8V) POWER: ON			Display				METER CAMP: light on VFO A 50.000.00	
	(2) UP: Push							Display: 51.000.00 Confirm "PEE" tone.	Confirm light dosen't change.
	(3) UP: Continue push							7.000.00—21.000.00—28.000.00 ↓ 29.000.00 ↓ 50.000.00 ↓ 53.000.00—52.000.00—51.000.00	
	(4) DOWN: Push						Confirm light doesn't change.	Display changes down 1MHz or 1 BAND and "PEE" TONE.	
	(5) DOWN: Continue push							Back words of UP switch.	
								Confirm continues display as above and "PEE" tone.	
6. FUNCTION	(1) ANT: 7 - 28, 50 ANTS A/B SW: VFO A and VFO B MODE: ULB	POWER METER SET	DISPLAY	DISPLAY			SEND SW OFF→ON→OFF	VFO A shows VFO A VFO B shows VFO B	
	SPLIT: ON A/B SW: VFO B						SEND SW OFF ↓ ON ↓ OFF	VFO B ↓ VFO A As display ↓ VFO B	
	A/B SW: VFO A							Back words function of VFO B	
	SPLIT SW: ON								
3. F. STEP	(1) F. STEP: OFF MODE: SSB, CW, AM						Confirm frequency change: CW: High freq. CCW: Low freq.	One knob rotate about 10kHz change	
	(2) F. STEP: ON							About 100kHz change IND light on	
	(3) MODE: FM							About 100kHz change	
	(4) F. STEP: OFF							About 500kHz change IND light on	
4. F. LOCK	(1) F. LOCK: ON						Confirm by knob rotate.	Display doesn't change. IND light on	
	(2) F. LOCK: OFF							IND goes off	
5. MEMORY	(1) POWER OFF→ON HOLDING HOLD SW.							Display: VFO A : 50.000.00 : USB All RESET	
	(2) VFO/MEMO: ON						Confirm each memo by 10 KEY which frequency has same as entered previously.	Confirm all memo call back.	
	(3) MS: ON						Confirm at SEND SW ON, OFF.	Scan time: about 2 sec. each channel.	

ADJUSTMENT/PACKING

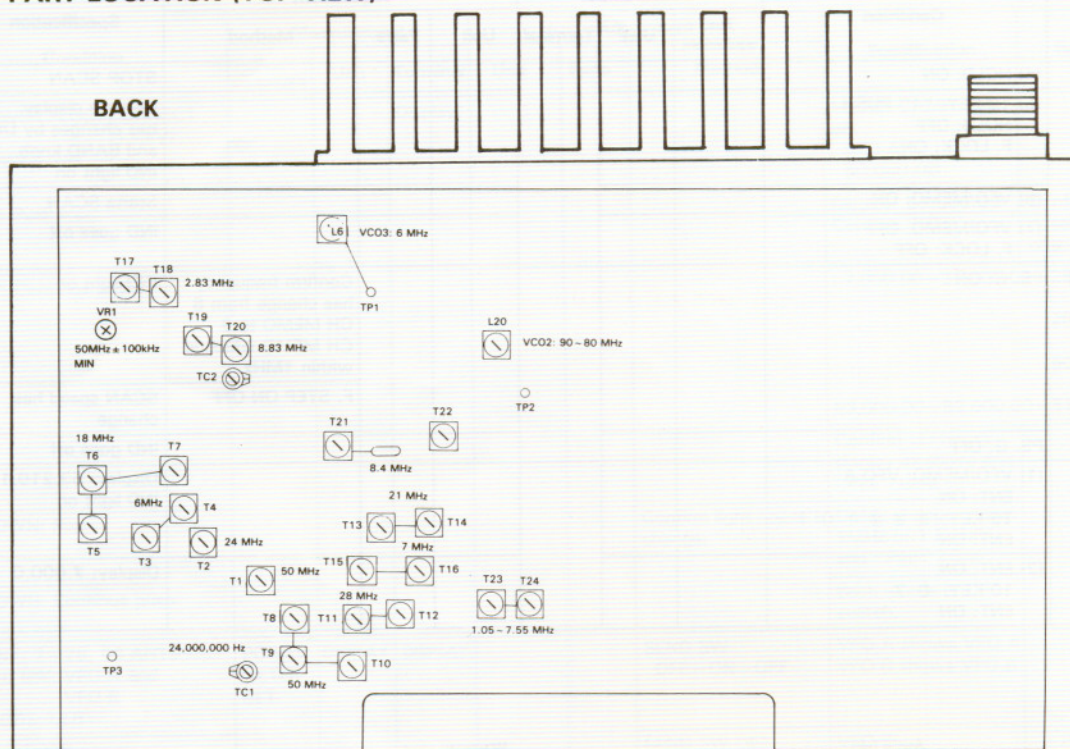
Item	Condition	Measurement			Adjustment			Specification	Remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method		
	(4) HOLD: ON							STOP SCAN	
	(5) 10 KEY: "1" PUSH HOLD: OFF F. LOCK: ON							Confirm display has changes by DIAL and BAND knob. IND light on	
	(6) VFO/MEMO: ON							Starts SCAN	
	(7) VFO/MEMO: OFF F. LOCK: OFF							IND goes off	
6. PROGRAM SCAN	PS. G: ON						Confirm frequency has change from 8 CH MEMO to 9 CH MEMO which is within 1MHz.	IND light on	
							F. STEP ON-OFF	SCAN speed has change	
	PS. G: OFF							IND goes off	
7. ENTER	(1) VFO/MEMO: VFO A ENT: ON 10 KEY: 5 3 2 1 0 1 ENT: ON							Display: 53.210.1 IND light on	
	(2) ENT: ON 10 KEY: 0 7 ENT: ON							Display: 7.000.0	



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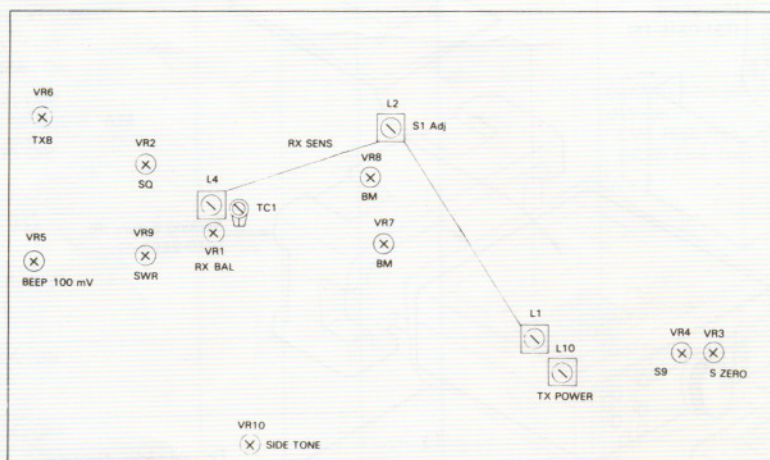
ADJUSTMENT

ADJUSTMENT PART LOCATION (TOP VIEW)

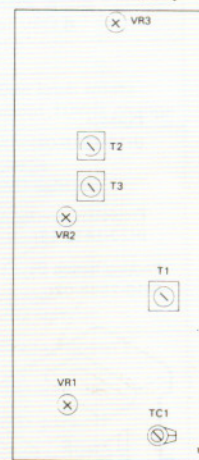


CONTROL UNIT (X53-1370-00)

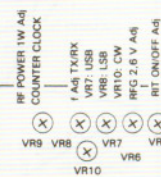
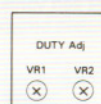
IF UNIT (X48-1390-00)



FM-430 UNIT (X48-1340-01) (Option)



ENCODER UNIT (W02-0328-10)

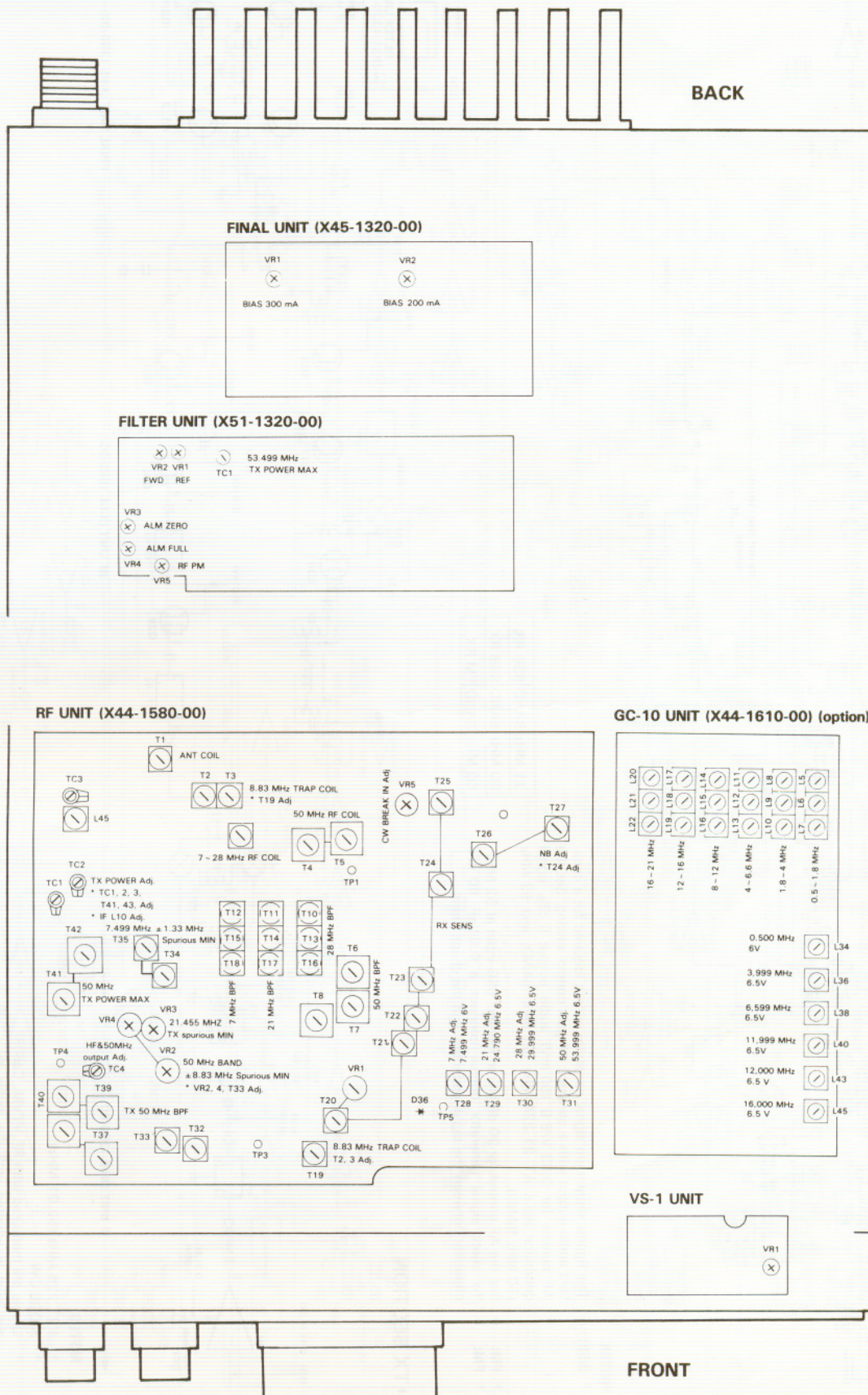


SWITCH UNIT

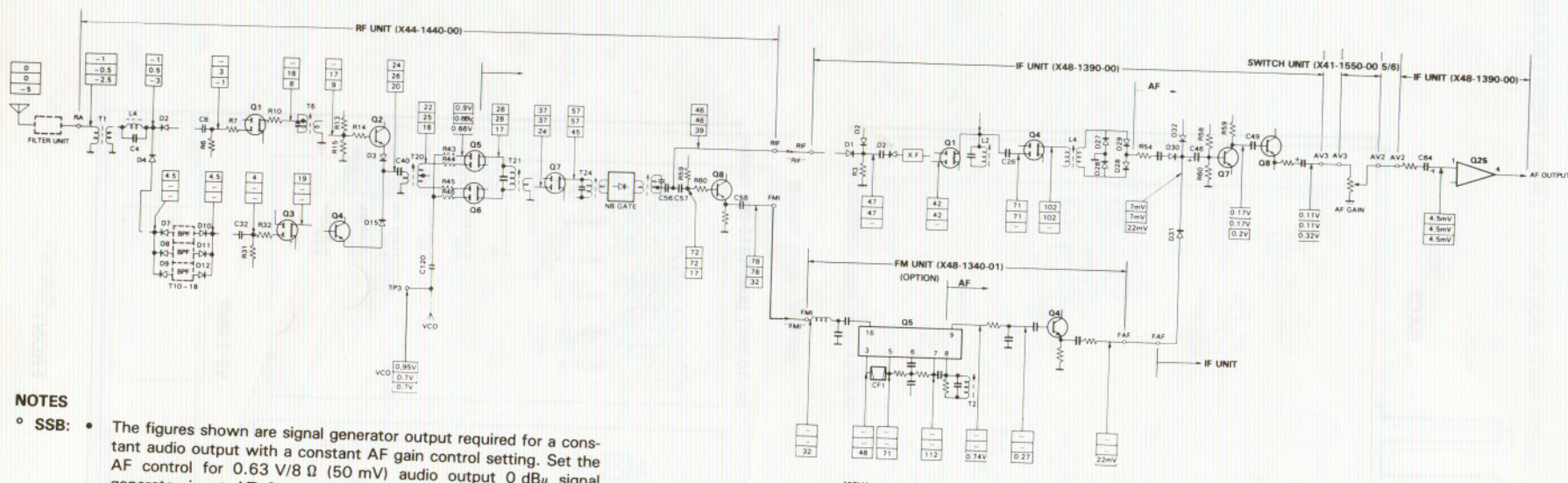
FRONT

ADJUSTMENT

ADJUSTMENT PART LOCATION (BOTTOM VIEW)



- RX SECTION

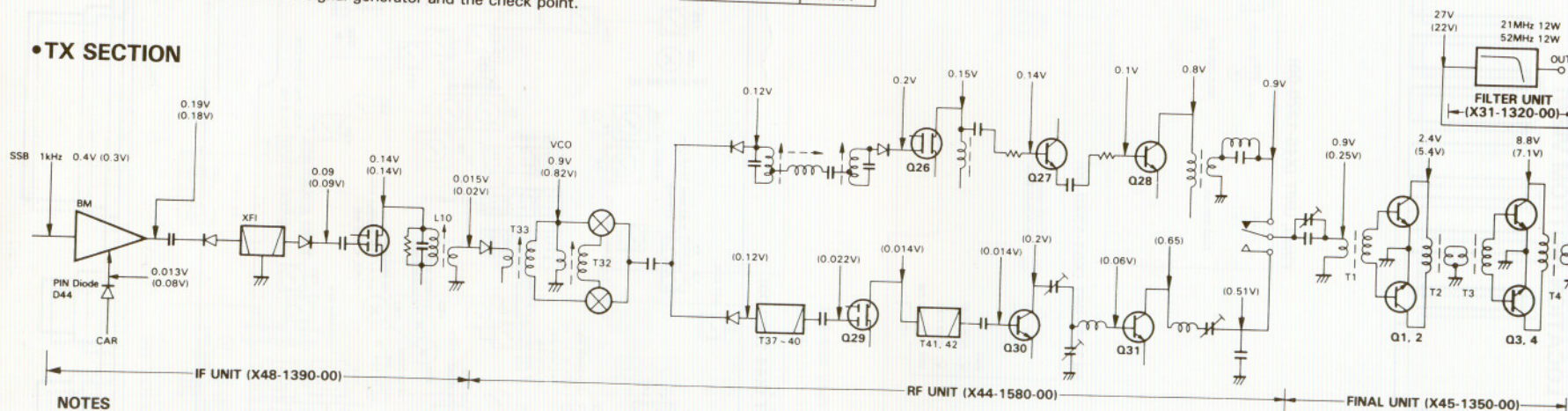


NOTES

- **SSB:** The figures shown are signal generator output required for a constant audio output with a constant AF gain control setting. Set the AF control for 0.63 V/8 Ω (50 mV) audio output 0 dB μ signal generator input AT 21.225 MHz (21 MHz BAND) and 52 MHz (50 MHz BAND).
- **FM:** Set the AF control for 20 dB NQ at FM and SSG input at 52 MHz.
- **FM:** To inject signal generator output connect a 0.01 μ F 50 WV capacitor between the signal generator and the check point.

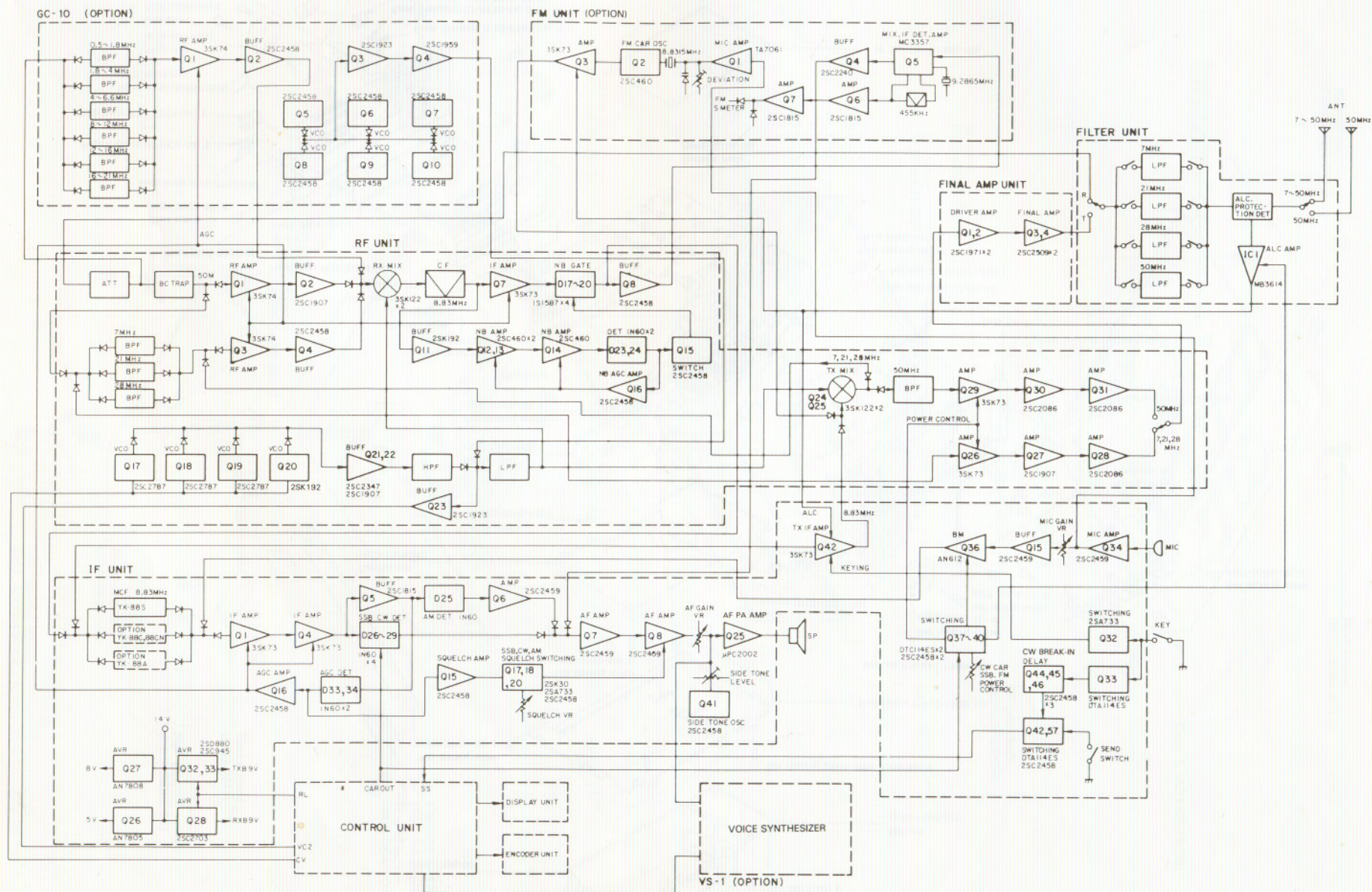
21 MHz BAND	SSB RX
50 MHz BAND	SSB RX
50 MHz BAND	FM RX

•TX SECTION



NOTES

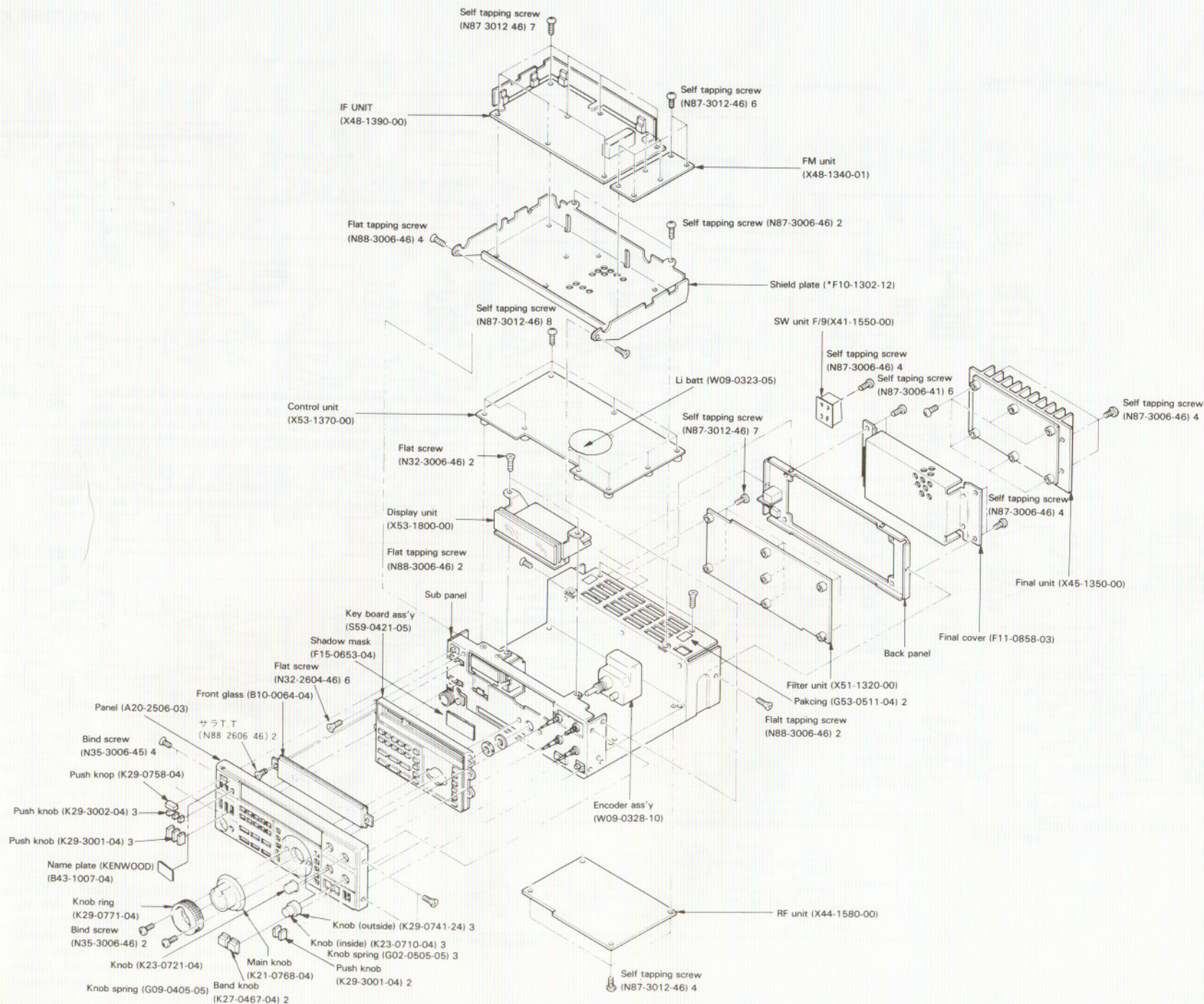
- o f 21.225 MHz (52.01 MHz)
- o MODE CW
- o Levels are measured with RF VTVM. Carrier level is adjusted until the meter indicates the MAX ALC reading.
- o A probe with a capacitance is less than 3 pF should be used and the ground should be made near the point of measurement.



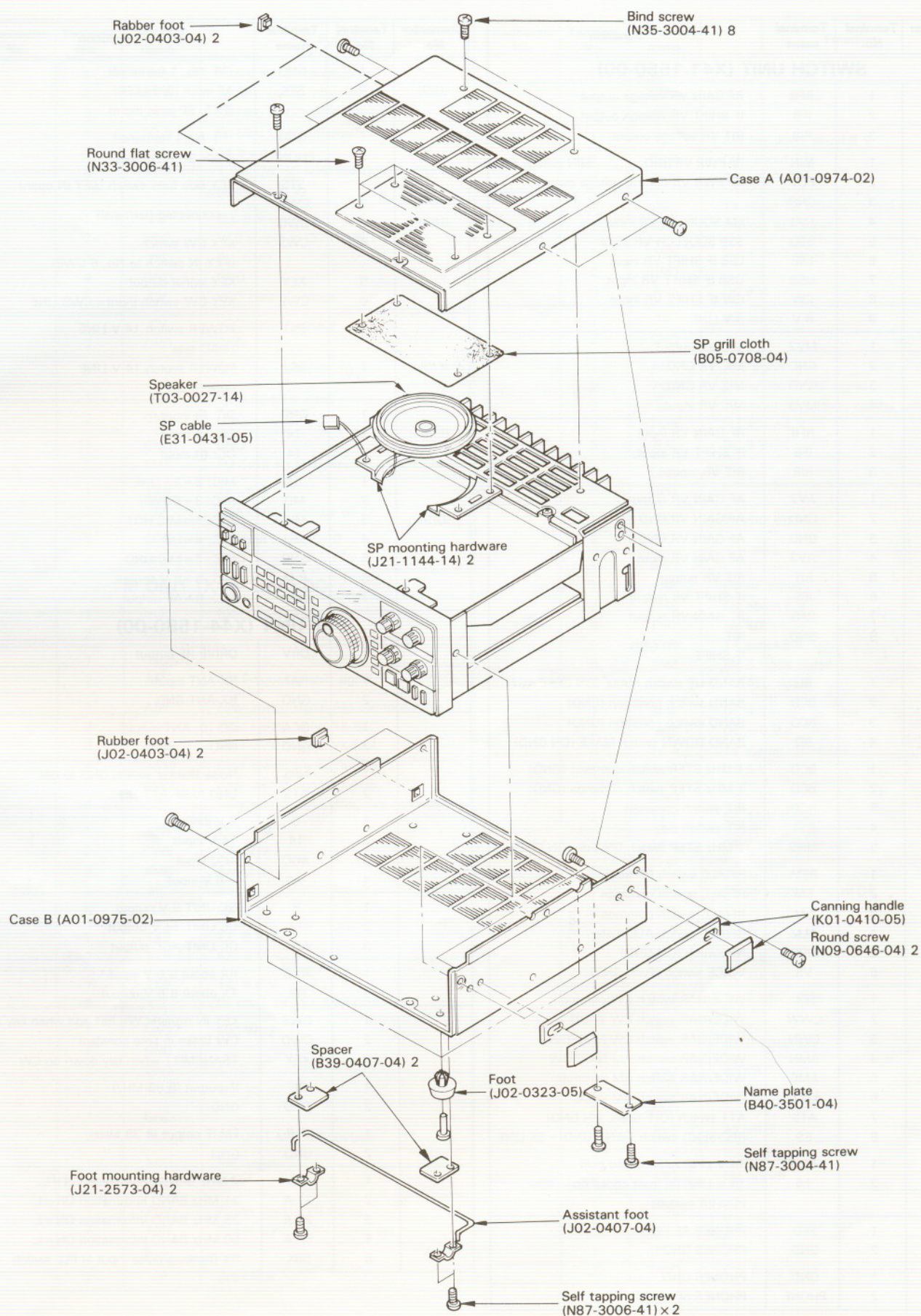
BLOCK DIAGRAM

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TS-670 DISASSEMBLY



DISASSEMBLY



TERMINAL FUNCTIONS

Connector No.	Terminal No.	Terminal name	Function
SWITCH UNIT (X41-1550-00)			
(A/9)	1	RFB	RF GAIN VR voltage output
	2	IFB	IF SHIFT VR voltage output
	3	RIB	RIT VR voltage output
(A/9)	1	MIN	RF PWR VR GND MIN voltage AOS
	2	PCV	RF PWR VR control voltage output
	3	GND	
	4	FSQ	FM SQUELCH VR input
	5	SSQ	SSB SQUELCH VR input
	6	LSB	LSB IF SHIFT VR input
	7	USB	USB IF SHIFT VR input
	8	CW	CW IF SHIFT VR input
	9	8 V	8 V LINE
(A/9)	1	MV2	MIC VR output
	2	GND	MIC VR GND
	3	GND	MIC VR GND
	4	MV3	MIC VR input
	1	RFB	RF GAIN VR input
	2	IFB	IF SHIFT VR input
	3	RIB	RIT VR input
	1	AV2	AF GAIN VR output
	2	GND	AF GAIN VR GND
	3	GND	AF GAIN VR GND
	4	AV3	AF GAIN VR input
	5	RIT	RIT VR output
	6	IFS	IF SHIFT VR output
	7	RFG	RF GAIN VR output
	8	GND	RIT VR GND IF SHIFT
(C/9)	1	BU	BAND UP switch MAKE (ON CONTACT)
	2	BCD	BAND switch common (GND)
	3	BCD	BAND switch common (GND)
	4	BD	BAND DOWN switch MAKE (ON GND)
(E/9)	1	BCD	1 MHz STEP switch common (GND)
	2	BCD	1 MHz STEP switch common (GND)
	3	RCO	RIT switch common
	4	RST	RIT switch side
	5	MHS	1 MHz STEP switch ON side (ON GND)
(I/9)	1	RFM	RF/ALC switch RF meter
	2	SM	RF/ALC switch common
	3	SM	RF/ALC switch common
	4	ALM	RF/ALC switch ALC meter
	5	NBS	NB switch (ON GND)
	6	VS	VOICE switch (Push GND)
(I/9)	1	SCC	WIDE/NAR switch CW common
	2	CWW	WIDE/NAR switch CW WIDO
	3	CWN	WIDE/NAR switch CW NARROW
	4	AMN	WIDE/NAR switch AM NARROW
	5	AMC	WIDE/NAR switch AM common
	6	AMW	WIDE/NAR switch AM WIDE
	7	ATS	ATT switch (OFF open, ON GND)
	8	SS	REC/SEND switch (SEND GND) = SS LINE
(F/9)	1	14 A	14 V LINE (after choke coil)
	2	14	14 V LINE (in front choke coil = after POWER switch)
(G/9)	1	SPO	PHONES AF input
	2	GND	PHONES GND
(G/9)	1	GND	PHONES GND
	2	PHONE	PHONES SP output

Connector No.	Terminal No.	Terminal name	Function
(H/9)	1	GND	14 No. 1 (terminal)
	2	SPK	AF input (SPEAKER) (EXT. SP jack, input)
(H/9)	1	GND	13 No.1 (terminal)
	2	PHONE	inside SP AF output
(H/9)	1	STS	KEY side tone switch (KEY IN open)
	2	CWD	connected (terminal)
	3	CWD	
	4	CWS	KEY CW switch (KEY IN switch to No. 6 CWB)
	5	KEY	KEY signal output
	6	CWB	KEY CW switch input = CWB LINE
(F/9)	1	PS1	POWER switch 14 V LINE LOAD side
	2	PS2	POWER switch 14 V LINE outlet side
(F/9)	1	GND	DC: ⊖ input
	2	14	DC: ⊕ input
	3	14	DC: ⊕ input
(D/9)	1	SS	MIC: 2 = SS LINE
	2	MD	MIC: 3 = DOWN
	3	MIC	MIC: 1 = MIC HOT
	4	MU	MIC: 4 = UP
	5	GND	MIC: 7 = MIC GND
	6	8 M	MIC: 5 = 8 V source
	7	SPO	MIC: 6 = AF output
RF UNIT (X44-1580-00)			
	1	DRV	DRIVE RF output
	1	RAT	RX ANT input
	2	GND	RX ANT GND
	1	GCA	GC-10: ANT output
	2	GND	GND
	1	NBS	Noise Blanker switch GND to ON
	2	ATS	GND to RF ATT ON
	1	8	8 V input
	2	14	14 V input
	3	AGC	AGC input
	4	-6	-6 V input
	1	8	GC UNIT 8 V output
	2	14	GC UNIT 14 V output
	3	AGC	GC UNIT AGC output
	1	RXB	RX about 8.5 V input
	2	TBL	TX about 8.5 V output
	1	CWS	KEY IN signal • CWB has add when key in.
	2	CWD	CW Brake in time constant
	3	KEY	TRANSMITT when key down on CW
	1	RIF	IF output (8.83 MHz)
	2	GND	GND
	1	FMI	FM IF output (8.38 MHz)
	2	GND	GND
	1	7 A	7 MHz BAND information ON = L
	2	21 A	21 MHz BAND information ON = L
	3	28 A	28 MHz BAND information ON = L
	4	50 A	50 MHz BAND information ON = L
	5	SBK	RX Blanking pulse input at PLL switch