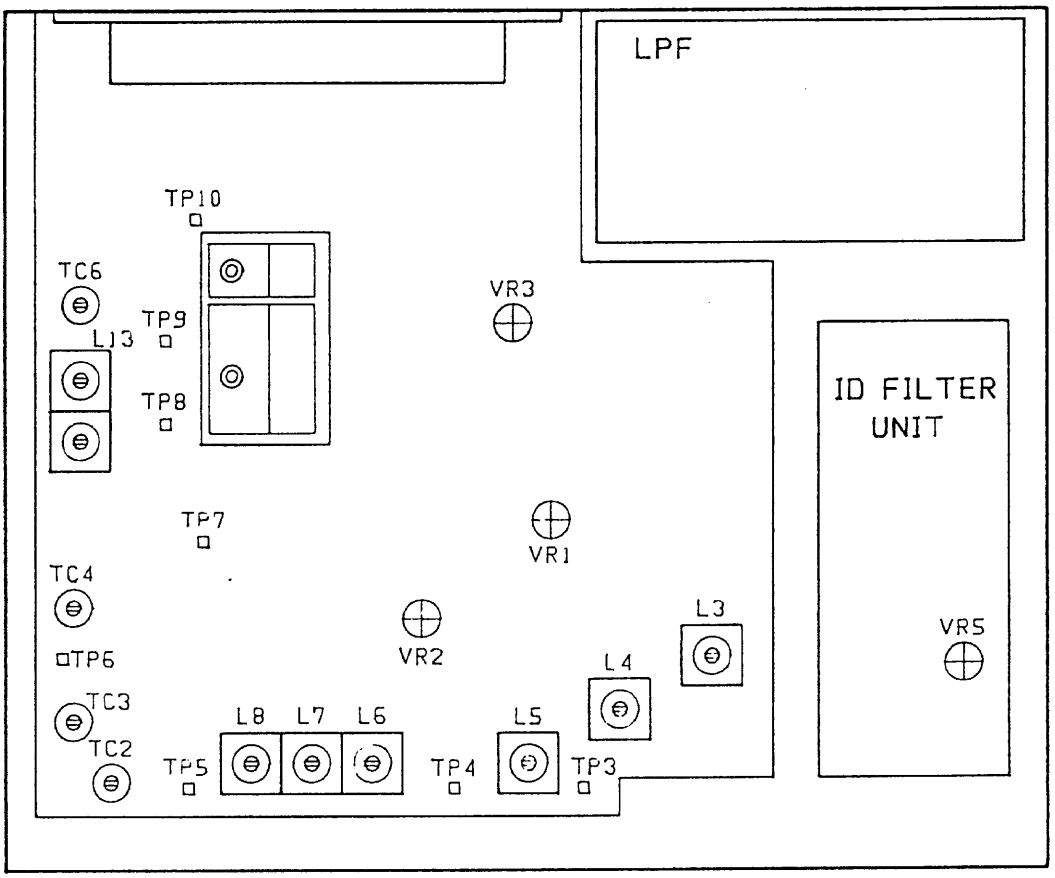
4. ADJUSTMENT

Item	Condition	Measurement			Adjustment			Specifications/ remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
1. AVR	Apply rated AC source	DC Volt meter	AVR	TP1	AVR	VR1		13.8±0.1V Pilot lamp on
2. Voltage check	(1) RECEIVE	DC Volt meter	TX	Q13 Pin 1 Pin 6				7.8 – 8.6V DC
	(2) TRANSMIT			Q13 Pin 8				
3. RX local OSC.	(Tuning) (1)	DC Volt meter	RX	TP2	RX	L9,10	MAX	
	(2)	RF Volt meter	RX	TP3	RX	TC7 TC8	MAX	
	(3) (Frequency adjustment)	FREQ. counter	RXOSC	TP1	RXOSC	TC1 to TC6	$\frac{fr - 21.6\ (MHz)}{12}$	±200 Hz
4. RX Sensitivity	(1) SSG out 60 to –12 dBμ MOD off Terminate PHONE jack with 8 ohm load.	AF VTVM		PHONE jack	RX	TC1 to TC8	Obtain min. noise level	
	(2) SSG out 60 dBμ MOD 3 kHz	Dist. meter		PHONE jack	RX	L1, L16	Obtain min. distortion	
	(3) SSG out –6dBμ MOD 3 kHz	Dist. meter		PHONE jack	RX	TC1 to TC8	MAX sensitivity	SINAD more than 12 dB
5. AF Distortion	SSG out 30 dBμ MOD 3 kHz	Dist. meter AF VTVM		PHONE jack		AF GAIN	Output 4V/8 ohm	less than 10%
6. Squelch	(1) SSG off	INCOMING indicator				SQUELCH CONTROL	Adjust squelch just close (threshold position)	8 : 00 – 10 : 00
	(2) SSG out –6 dBμ							Squelch should open indicator lights
	(3) SSG out 10 to 100 dBμ (tight squelch position)					SQUELCH CONTROL	Trun CW	
7. CTCSS	● SSG out –12dBμ (1) Modulated with required tone freq. (deviation 0.2 kHz) ● DIP SW on the CTCSS (2) unit should be set to the code for the required tone. ● Squelch CONTROL Turn CCW ● VR3 Turn CCW				RX	VR1	Squelch just open	INCOMING indicator lights
					CTCSS	DIP SW 7, 8	Most easy to light the indicator	
	SSG off							Squelch close
8. Residual noise	AF GAIN Min. Squelch CCW	AF VTVM		PHONE jack				less than 3 mV
9. REC terminal	AF GAIN Min. SSG 30 dBμ Dev. 3kHz	AF VTVM		Rec terminal				200 to 300 mV
10. TX OSC		DC Volt meter	TX	TP4 TP5 TP6	TX	L3 to 5 L6 to 8 TC2,3	MAX. MAX. MAX.	Reference value 0.6V 1.2V 1.3V
		freq. counter	TX OSC	TP1	TX OSC	TC1 to TC6	Adjust frequency to $\frac{ft}{18}$	±200 Hz
11. POWER OUTPUT		Power meter			TX	TC4 TC6 L13	MAX.	
					TX	VR3	Adjust to 11 W	TRANSMIT indicator lights

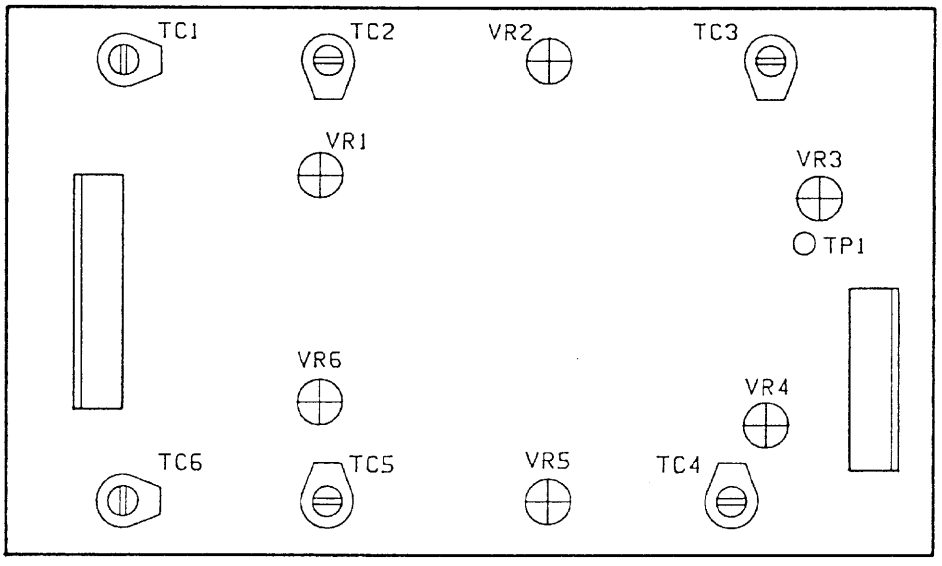
Item	Condition	Measurement			Adjustment			Specifications/ remarks
		Test equipment	Unit	Terminal	Unit	Parts	Method	
12. Deviation	RPT/MIC SW MIC side Mic input 30 mV 1 kHz	Audio GEN. Deviation meter			TX	VR2	Adjust to ±4.5kHz When signaling modulator in the OSC unit is adjusted, re-adjustment of VR2 is needed.	±4.5 kHz
	Mic input 1 to 5 mV						Check the Mic input level obtaining 3 kHz deviation.	less than 5 mV
13. Repeat Gain	RPT/MIC SW RPT side SSG output 30 dBμ Dev. 3 kHz The 4th bit of the DIP switch on the CONTROL unit should be turned to "OPEN". (Carrier access mode)	Deviation meter			TX	VR1	Adjust to ±3 kHz	±3 kHz
14. ID modulation					ID FILTER	VR5	Turn on the manual ID switch and adjust ID deviation.	±1 kHz
15. SIGNALING modulation	Apply the signal to pin 4 of JZ on the TX OSC unit.	Deviation meter			TX OSC	VR1 to VR6	Adjust the deviation to required value.	Reference value 0.5 kHz

5. ADJUSTING POINTS

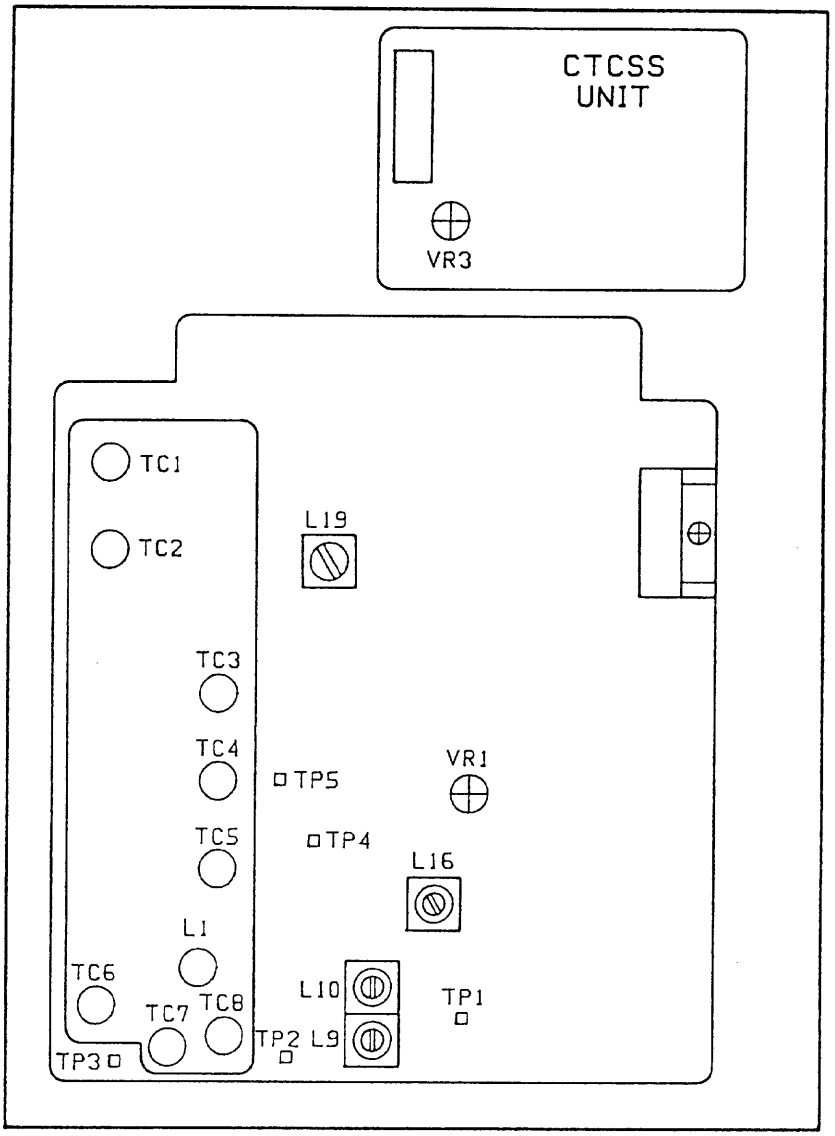
TX UNIT



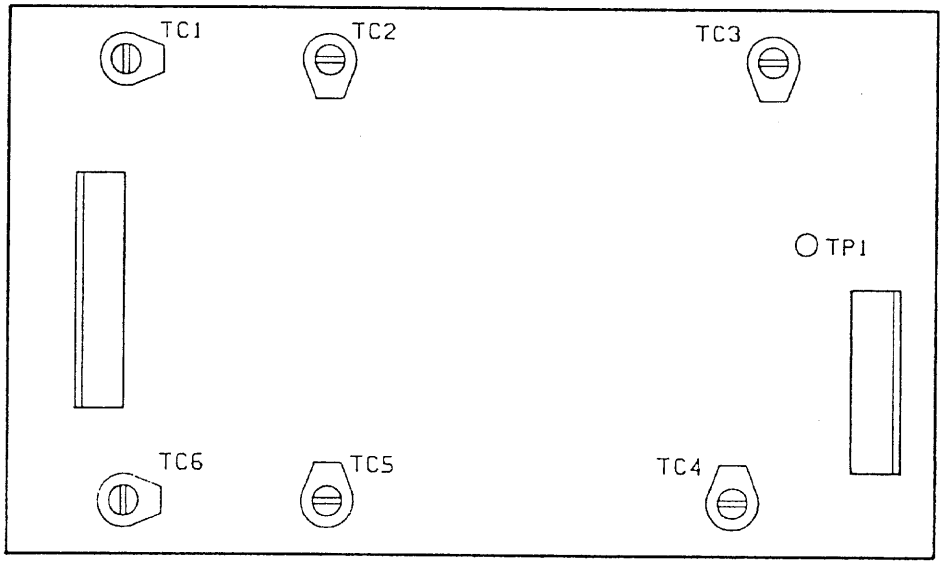
TX OSC UNIT



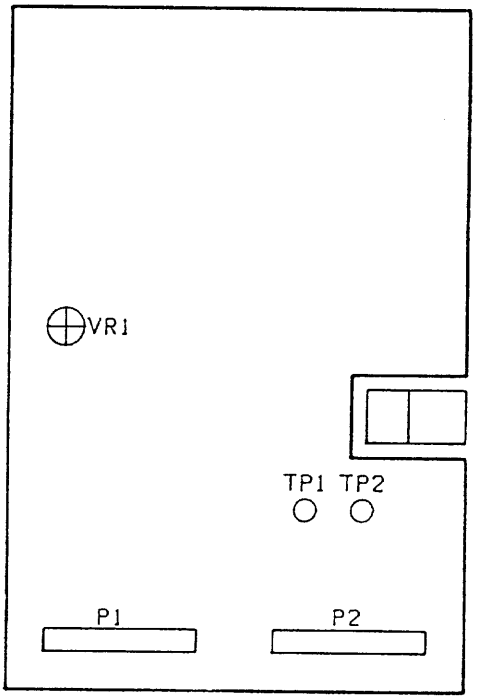
RX UNIT/CTCSS UNIT



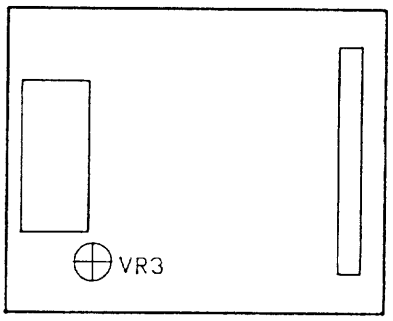
RX OSC UNIT



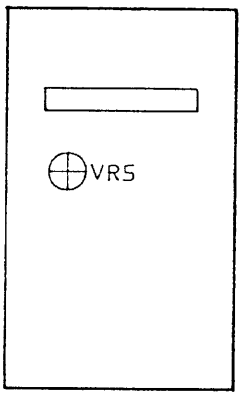
AVR UNIT



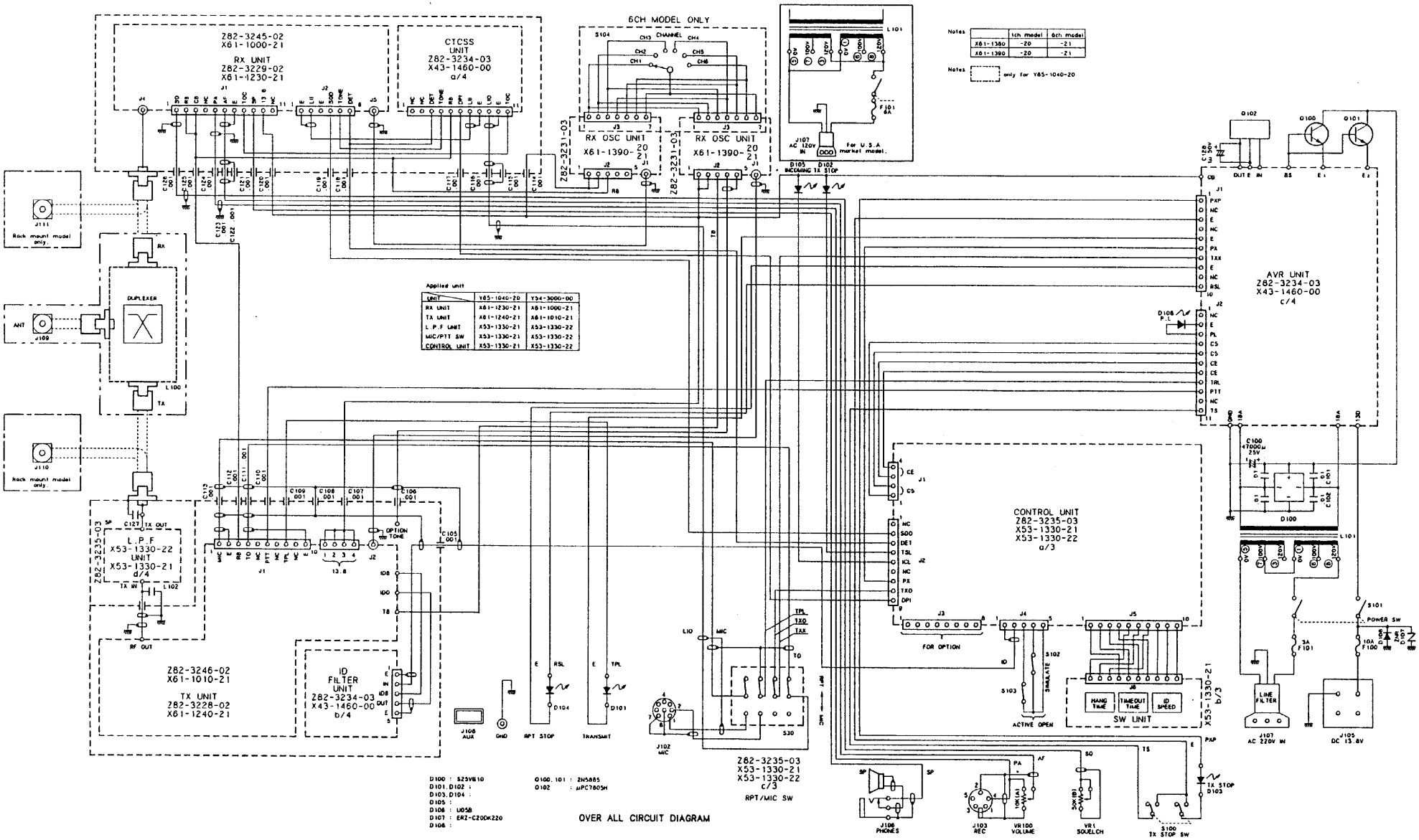
CTCSS UNIT

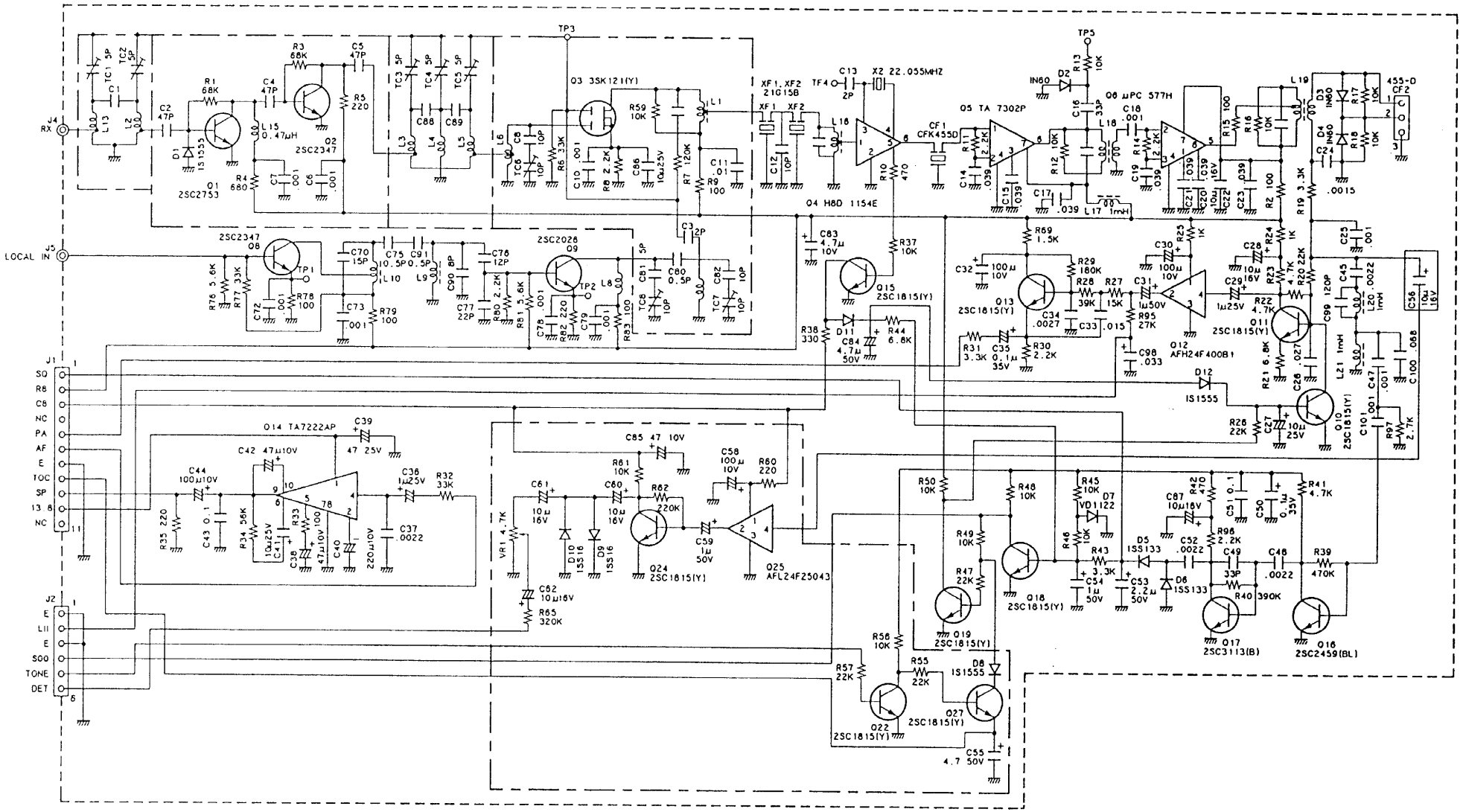


ID FILTER UNIT

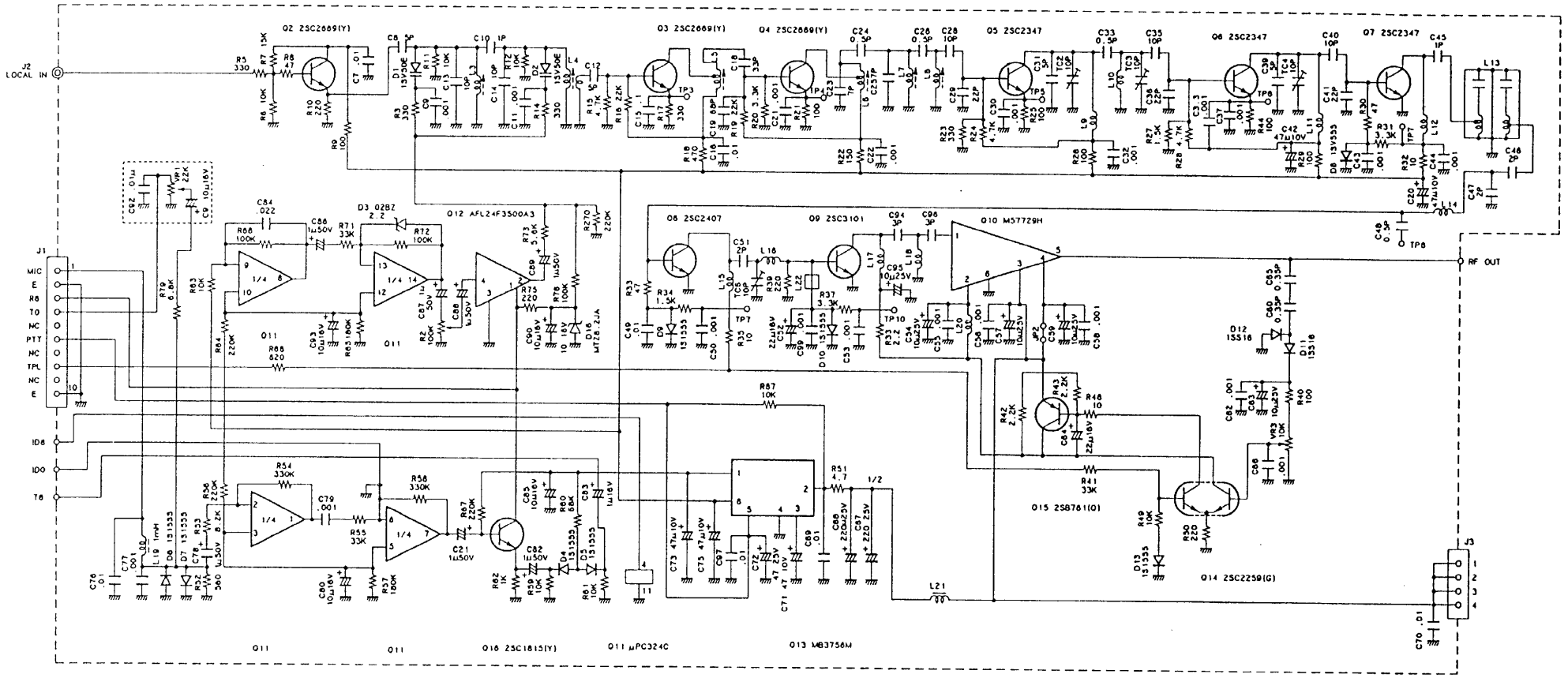


6. SCHEMATIC DIAGRAM

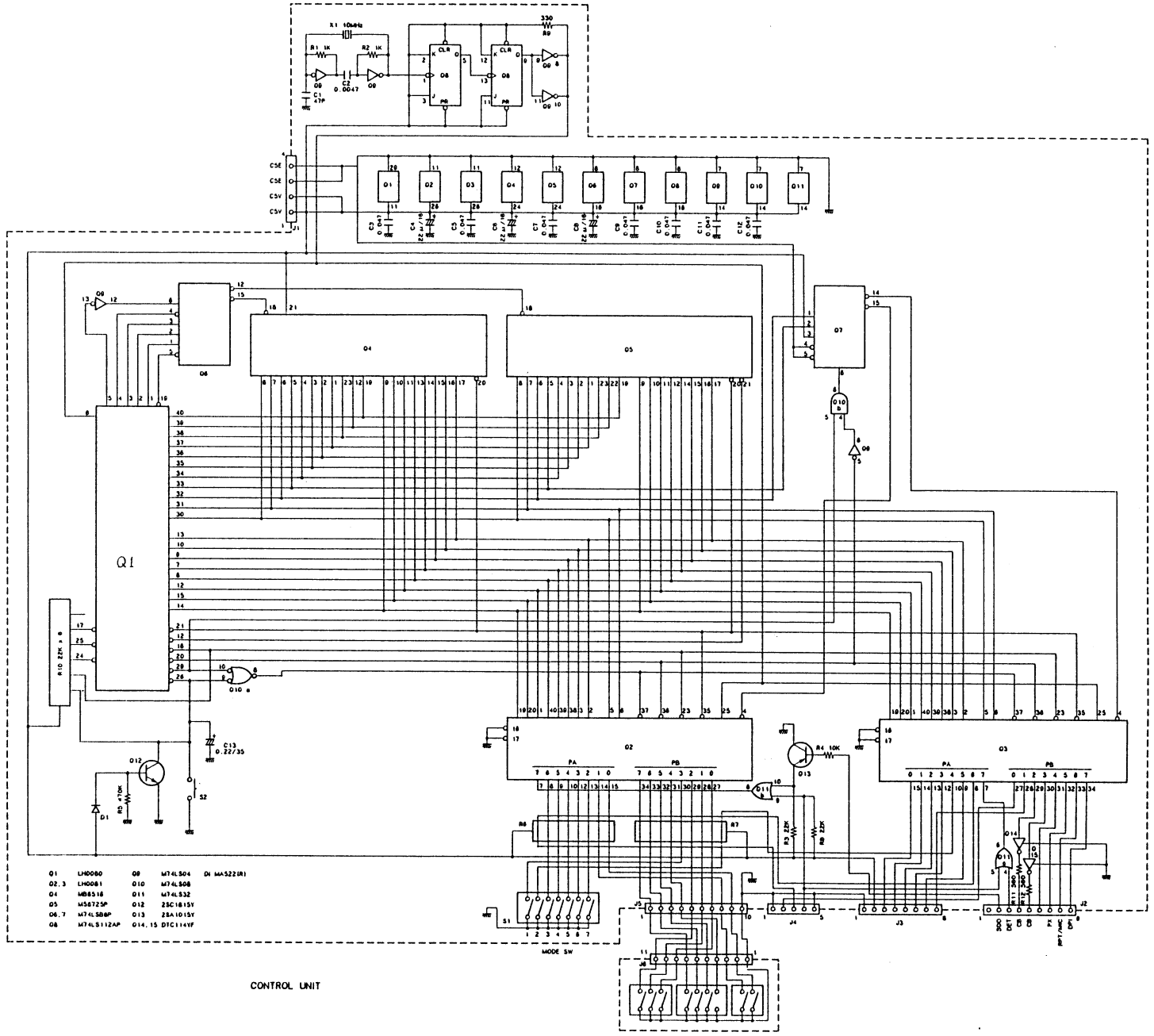



RX
LOCAL IN
J1
SQ
RB
CB
NC
PA
AF
E
TOC
SP
13.8
NC
J2
E
LII
E
SQO
TONE
DET
Q1 2SC2753
Q2 2SC2347
Q3 3SK121(Y)
Q4 H8D 1154E
Q5 TA 7302P
Q6 μPC 577H
Q7 2SC2347
Q8 2SC2347
Q9 2SC2026
Q10 2SC1815(Y)
Q11 2SC1815(Y)
Q12 AFH24F400B1
Q13 2SC1815(Y)
Q14 TA7222AP
Q15 2SC1815(Y)
Q16 2SC2459(BL)
Q17 2SC3113(B)
Q18 2SC1815(Y)
Q19 2SC1815(Y)
Q22 2SC1815(Y)
Q24 2SC1815(Y)
Q25 AFL24F25043
Q27 2SC1815(Y)
D1 1S1555
D2 IN60
D3 IN60
D4 IN60
D5 1SS133
D6 1SS133
D7 VD1122
D8 1S1555
D9 1SS16
D10 1SS16
D11
D12 1S1555
CF1 CFK455D
CF2 455-D
XF1, XF2 21G15B
X2 22.055MHZ
TF4
TP1
TP2
TP3
TP5
L15 0.47μH
L17 1mH
L19
L20 .0022 1mH
L21 1mH
VR1 4.7K

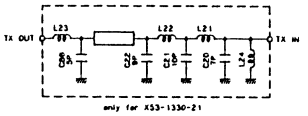
RX UNIT

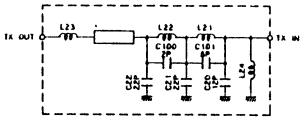

J2
LOCAL IN
Q2 2SC2669(Y)
Q3 2SC2669(Y)
Q4 2SC2669(Y)
Q5 2SC2347
Q6 2SC2347
Q7 2SC2347
J1
MIC
E
RB
TO
NC
PTT
NC
TPL
NC
E
ID8
ID0
T8
Q8 2SC2407
Q9 2SC3101
Q10 M57729H
RF OUT
Q12 AFL24F3500A3
Q15 2SB761(O)
Q14 2SC2259(G)
J3
Q11
Q11
Q16 2SC1815(Y)
Q11 μPC324C
Q13 MB3756M

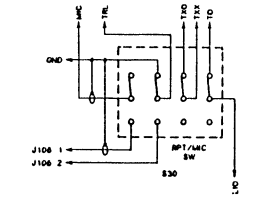
TX UNIT

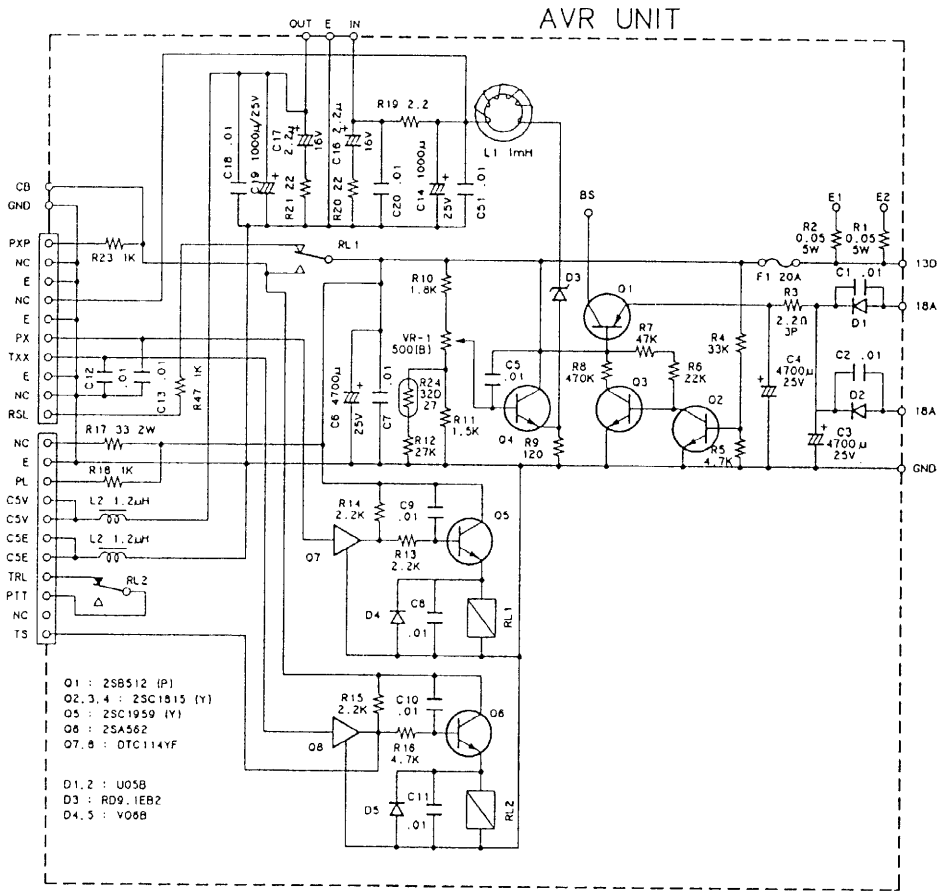

CONTROL UNIT
MODE SW
Q1 LH0080
Q2, 3 LH0081
Q4 MB8516
Q5 M56725P
Q6, 7 M74LS08P
Q8 M74LS112AP
Q9 M74LS04
Q10 M74LS08
Q11 M74LS32
Q12 2SC1815Y
Q13 2SA1015Y
Q14, 15 DTC114YF
D1 MA522(R)

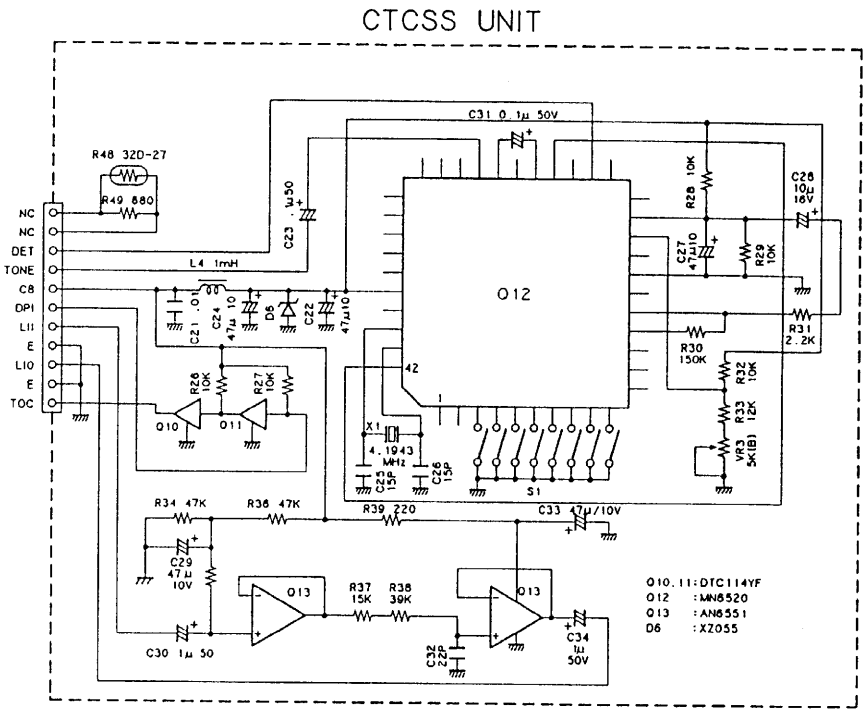
LPF UNIT

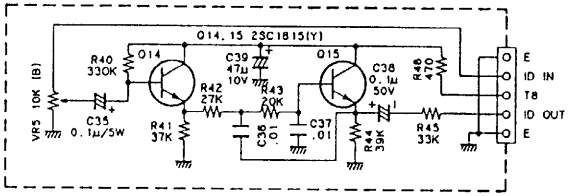

TX OUT
TX IN
only for X53-1330-21


TX OUT
TX IN
only for X53-1330-22

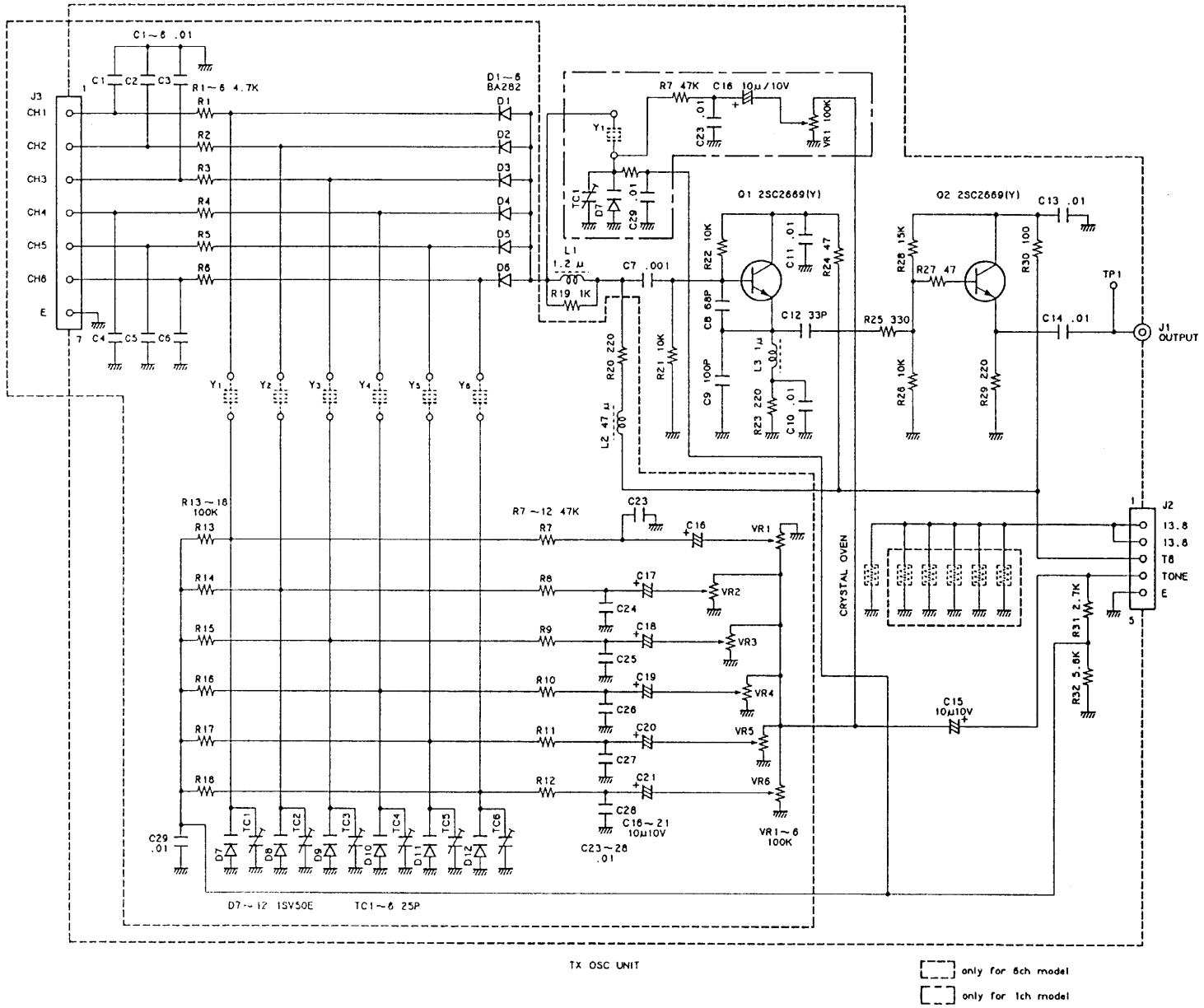

GND
J106 1
J106 2
PTT/MIC SW
J30

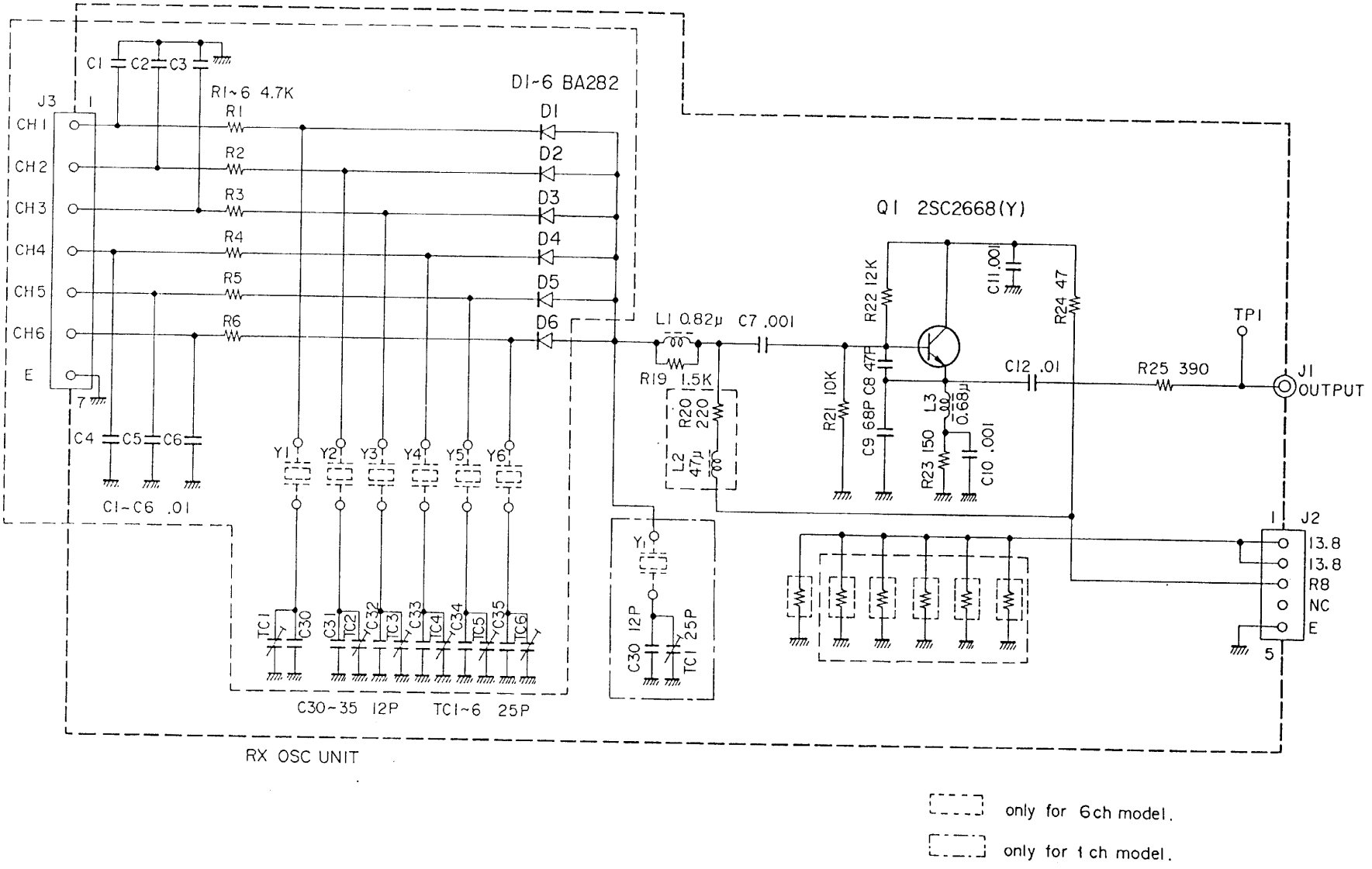






ID FILTER UNIT


C1~6 .01
J3
CH1
CH2
CH3
CH4
CH5
CH6
E
R1~6 4.7K
D1~6 BA282
R7 47K
C16 10μ/10V
VR1 100K
Y1
TC1
D7
C29 .01
C23 .01
Q1 2SC2669(Y)
Q2 2SC2669(Y)
C13 .01
L1 1.2μ
R19 1K
C7 .001
R22 10K
C11 .01
R24 47
C8 68P
C12 33P
R25 330
R28 15K
R27 47
R30 100
TP1
C14 .01
J1 OUTPUT
R20 220
R21 10K
L2 47μ
C9 100P
L3 1μ
R23 220
C10 .01
R26 10K
R29 220
R13~18 100K
R7~12 47K
C23
C16
VR1
R13
R7
R14
R8
C17
VR2
C24
R15
R9
C18
VR3
C25
R16
R10
C19
VR4
C26
R17
R11
C20
VR5
C27
R18
R12
C21
VR6
C28
C16~21 10μ10V
C23~28 .01
VR1~6 100K
C29 .01
D7~12 1SV50E
TC1~6 25P
CRYSTAL OVEN
C15 10μ10V
J2
13.8
13.8
T6
TONE
E
R31 2.7K
R32 5.6K
TX OSC UNIT
only for 6ch model
only for 1ch model


C1 C2 C3
R1~6 4.7K
D1~6 BA282
J3
CH1
CH2
CH3
CH4
CH5
CH6
E
R1
R2
R3
R4
R5
R6
D1
D2
D3
D4
D5
D6
L1 0.82μ
C7 .001
Q1 2SC2668(Y)
R22 12K
C11 .001
R24 47
TP1
R19 1.5K
R20 220
L2 47μ
R21 10K
C8 47P
C9 68P
L3 0.68μ
C12 .01
R25 390
J1
OUTPUT
R23 150
C10 .001
C4 C5 C6
C1~C6 .01
Y1 Y2 Y3 Y4 Y5 Y6
TC1 C30 C31 TC2 C32 TC3 C33 TC4 C34 TC5 C35 TC6
C30~35 12P
TC1~6 25P
Y
C30 12P
TC1 25P
J2
13.8
13.8
R8
NC
E
5
RX OSC UNIT
only for 6ch model.
only for 1ch model.