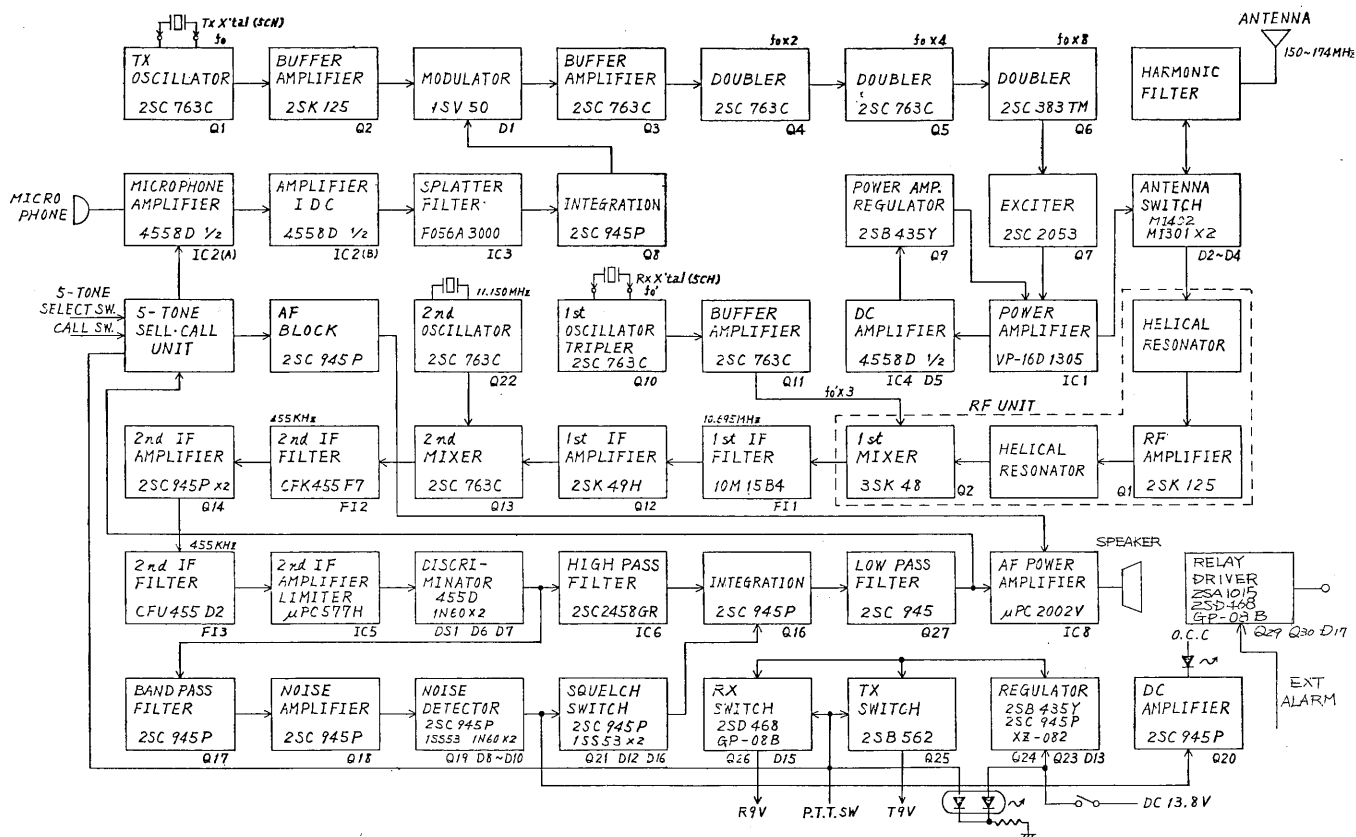


Service manual

handic 2801



handic
electronic ab



SPECIFICATIONS

GENERAL

Size
160mm(W), 50mm(H), 215mm(D)
Weight
Frequency range
Channels
Power supply voltage
Channel spacing
Operating temperature

150 - 174 MHz
5
13.8 V $\pm$ 10%
20/25 kHz
-25 - +55 degree C.

TRANSMITTER

RF Output impedance
RF Output level
Spurious emission
Frequency stability
Maximum deviation
Audio input impedance
Audio input for full deviation
Adjacent channel power
Channel spread
Current drain

50 Ohm
15W -3 - +2dB
< 2.5 uW
+2 kHz
-25 - +55 degree C.
+4 kHz
600 Ohm
2-50 mW
< 0.2uW
4 MHz
3.7 A

RECEIVER

Sensitivity
Adjacent channel rejection
Spurious response rejection
Intermodulation
Channel spread
Audio output impedance
Audio output power
IF frequencies
Input impedance
Current drain in Standby

0.3 uV PD. (12 dB SINAD)
70dB
70dB
70dB
2.5 MHz
4 - 8 Ohm
2W (8 Ohm)
10.695 and .455 MHz
50 Ohm
0.3 A

TRANSISTOR VOLTAGES

TX MODE				RX MODE			
Bas	Collector	Emitter		Bas	Collector	Emitter	
Main board:							
Q1	3.8	7.3	3.0				
Q2	0	4.6	1.2				
Q3	1.4	6.4	1.2				
Q4	0.5	7.6	0.65				
Q5	0.6	6.8	E				
Q6	0.1	5.1	E				
Q7	0.6	7.1	E				
Q8	0.5	1.3	E				
Q9	10.5	8.5	11.5	13.2	0	13.5	
Q10				3.0	6.2	2.3	
Q11				1.3	7.8	0.8	
Q12				0	8.1	E	
Q13				1.6	6.2	1.0	
Q14				0.6	0.6	1.0	
Q15				0.6	0.7	E	
Q16				0.6	2.5	E	
Q17				1.4	8.7	0.8	
Q18				1.2	8.0	0.6	
Q19				0.4	6.6	E	
Q20				0.7	0	E	
Q21				1.4	0.7	E	
Q22				1.6	4.8	2.8	
Q23	8.1	13.0	7.5	8.1	13.0	7.5	
Q24	13.0	9.1	13.5	13.0	9.1	13.5	
Q25	8.2	8.9	9.0	9.8	0.1	9.1	
Q26	0	9.0	0.6	9.8	9.1	9.1	
Q27				2.4	8.4	1.9	
Q28				0.7	0	E	
Q29	13.0	0	12.5	13.0	0.5	13.5	
Q30	0	0	E	0.5	0	E	
RF board:							
Q1				E	6.6	1.0	
Q2				0	9.0	E	
AF filter board:							
Q1				3.4	7.8	5.1	

IC VOLTAGES TX MODE:														
Pin no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC 1	0	10	E	12.0	7.4	*	*	*	*	*	*	*	*	*
IC 2	4.4	4.4	4.3	E	4.3	2.3	4.4	8.1	*	*	*	*	*	*
IC 3	3.4	7.6	E	3.9	E	*	*	*	*	*	*	*	*	*
IC 4	8.8	6.0	5.7	E	-	-	-	11.0	*	*	*	*	*	*
IC 5	0	0	0	E	0	0	0	*	*	*	*	*	*	*
IC 6	*	*	*	*	*	*	*	*	*	*	*	*	*	*
IC 7	*	*	*	*	*	*	*	*	*	*	*	*	*	*
IC 8	0.4	0.7	E	5.8	11.5	*	*	*	*	*	*	*	*	*

IC VOLTAGES RX MODE:														
Pin no.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC 1	0	0	E	13.5	0	*	*	*	*	*	*	*	*	*
IC 2	0	0	E	0	0	0	0	0	*	*	*	*	*	*
IC 3	0	0	E	0	0	E	*	*	*	*	*	*	*	*
IC 4	13.0	0.8	6.4	E	-	-	-	13.5	*	*	*	*	*	*
IC 5	4.8	1.4	1.5	E	5.3	2.5	6.8	*	*	*	*	*	*	*
IC 6	*	*	*	*	*	*	*	*	*	*	*	*	*	*
IC 7	*	*	*	*	*	*	*	*	*	*	*	*	*	*
IC 8	0.4	0.7	E	6.6	13.5	*	*	*	*	*	*	*	*	*

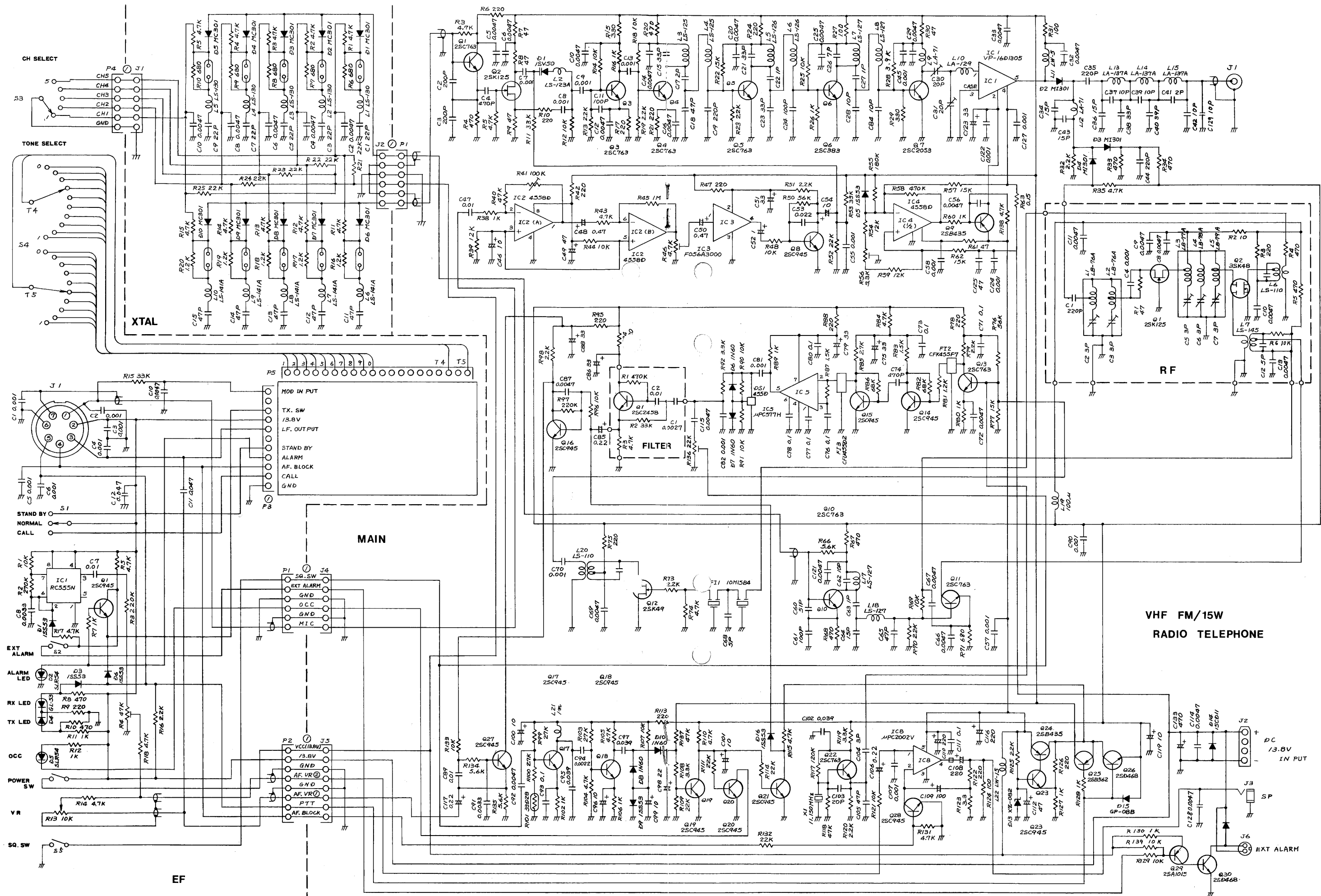
Crystal specifications

	RX	TX
Freq range	43.0-49 MHz	17.0-20.0 MHz
Mode	3 rd over-tone	3 rd over-tone
Type	HC-25/U	HC25/U

ELECTRICAL SPECIFICATIONS

Freq tolerance	+/-10 ppm (at 25 deg. C)	+/-10 ppm
Temp.charact.	+/- 5 ppm (0 to 50 deg.C)	+/- 5 ppm
Circuit mode	Series	Series
Drive level	1 mW	1mW
Eff.resistance	<30 Ohm	<30 Ohm
Insulation	>500 MOhm	>500 MOhm
(at DC 100V)		
Parallell cap	<6 pf	<7 pf

Calculation:
(F0-10.695)/3 F0/8



TX ALIGNMENT:

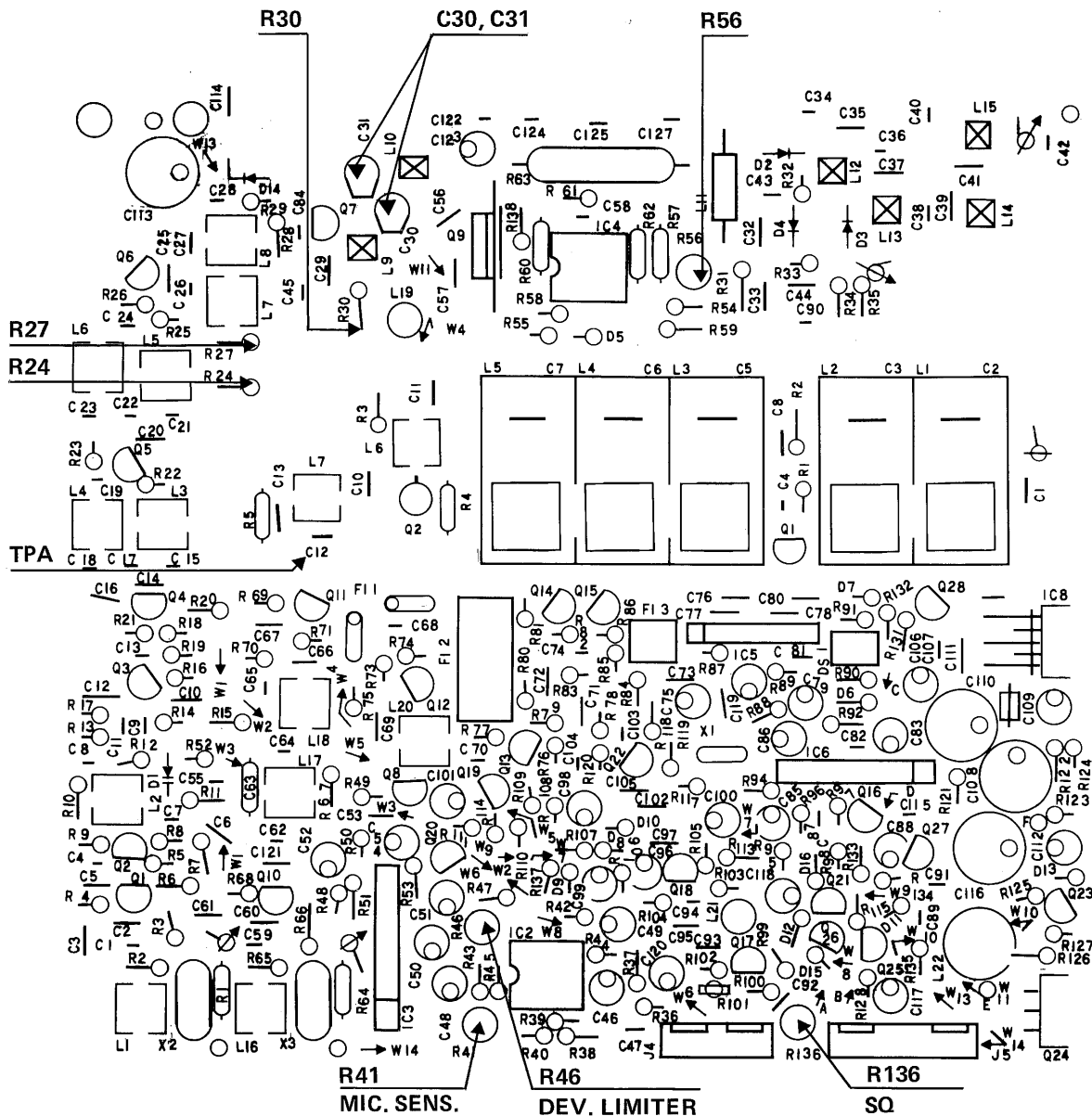
1. Attach powermeter and wattmeter to the set.
2. Set R56 completely clockwise.
3. Mount TX-crystal at the rear crystal holder. Channel 1 is leftmost position.
4. Turn on the power supply, attach a multimeter to R24 and ground. Adjust L4, L3 for minimum voltage on meter.
5. Attach the multimeter to R27 and adjust L5, L6 for minimum voltage.
6. Attach the multimeter to R30 and adjust L7, L8 for minimum voltage.
7. Turn R56 fully counterclockwise and adjust C30, C31 for max output power.
8. Adjust R56 for 15 Watts output.

MODULATION ALIGNMENT:

1. Attach deviation meter, distortion meter and audio generator.
2. Set R41, R46 on the modulation circuit to the center position.
3. Set the audio generator at 1 kHz, 15mV and inject the signal to pin 1 at mic. jack. Calibrate the deviation and distortion meter at this level.
4. The 1 kHz signal should now be monitored at the scope.
5. The audio generator level should then be reduced by 20 dB to 1.5 mV and the core of L2 turned for maximum deviation and minimum distortion.
6. With the audiogenerator's output at 1 kHz, 15 mV adjust R46 for maximum legal deviation (3.8 - 4.0 kHz).
7. With the audio generator again at 1 kHz and 1.5 mV adjust R41 to 2.8 kHz deviation. R41 adjusts the microphone sensitivity and can be set to fit different circumstances (low gain for noisy locations).
8. At this point the distortion meter should show below 6% THD and give a clear wave on the scope.

PRECAUTIONS:

- A. Be careful of L2's core - since it is small it will break easily.
- B. When aligning for TX frequencies within 160-170 MHz it may be necessary to adjust the core of L2 to set deviation and adjust R46 and R41 to achieve exact alignment.



RX ALIGNMENT

1. Mount channel 1 RX X-tal at far left position of the front row of crystal holders
2. Connect a RF-millivoltmeter or a suitable diode probe to testpoint A (TPA) on the RF-board. Adjust L17, L18 and L7 for maximum deflection on the meter.
3. Connect a frequency counter to TP A and adjust 1st local oscillator frequency on L5 located on crystal board. The frequency should be adjusted to operating frequency-10.695 MHz.
4. Connect a signal generator with the receiver frequency, no modulation and a output level of 500 uV, to the antenna jack. Adjust C2, C3, C5, C6 and C7 for maximum noise quitening. The signal generator level have to be reduced gradually and the adjustment repeated until no further improvement is possible
5. Again adjust L17, L18 and L7. This time for optimum noise quitening. The coils in IF circuit do no need adjustment except after replacement of parts in IF circuit.
6. The 20 dB noise quitening (NQ) should now be 0.5 uV p.d. or better.
7. Squelch level is set by R136.

PRECAUTION

Be careful of the cores - use only unmagnetic tuning tools.

PARTLIST

SEMICONDUCTORS:

Main board

Symbol	Typ
IC 1	VP-16D11305
IC 2	4558D
IC 3	F056A3000
IC 4	4558D
IC 5	uPC577H
IC 8	uPC2002V

Diodes:

D 1	1SV50	L13	LA-137A
D 2	MI402	L14	LA-137A
D 3	MI301	L15	LA-137A
D 4	MI301	L17	LS-127
D 5	1SS53	L18	LS-127
D 6	1N60	L19	L4 101J
D 7	1N60	L20	LS-110
D 8	1N60	L21	L4 102
D 9	1SS53	L22	LW-15
D10	1N60		
D13	XZ-082		
D14	15CD11		
D15	GP-08B		
D16	1SS53		
D17	GP-08B		

Crystal pcb

L1-L5	LS-130
L6-L10	LS141-A

Transistors:

Q 1	2SC763C
Q 2	2SK125
Q 3	2SC763C
Q 4	2SC763C
Q 5	2SC763C
Q 6	2SC383TM
Q 7	2SC2053
Q 8	2SC945P
Q 9	2SB435Y
Q10	2SC763C
Q11	2SC763C
Q12	2SK49H
Q13	2SC763C
Q14	2SC945P
Q15	2SC945P
Q16	2SC945P
Q17	2SC945P
Q18	2SC945P
Q19	2SC945K
Q20	2SC945P
Q21	2SC945P
Q22	2SC763C
Q23	2SC945P
Q24	2SB435Y
Q25	2SB562
Q26	2SD468
Q27	2SC945
Q28	2SC945P
Q29	2SA1015
Q30	2SD468

Front pcb.

IC 1	555N
Q1	2SC945
D1	1SS53
D2	SLR54GG
D3	1SS53
D4	GL-53RG
D5	SLR54UR
D6	1SS53

Receiver RF-pcb	
Q1	2SK125
Q2	3SK48

COILS

Main pcb	
L2	LS-123A
L3	LS-125
L4	LS-125
L5	LS-126
L6	LS-126
L7	LS-127
L8	LS-127
L9	LA-71
L10	LA-129
L11	LW-5
L12	LA-71

Receiver RF-pcb

L1	LB-76A
L2	LB-76A
L3	LB-77A
L4	LB-78A
L5	LB-79A
L6	LS-110
L7	LS-145

MISCHELLANEOUS:

FI 1	10M15B4
FI 2	CFK455F7
FI 3	CFU455 D2
DS 1	DISC 455D
X1	11.150MHz HC43/U
S1	SEL.CALL.SW.MS-340-D
S2	EXT.AL.SW.SS22-114
S3	CHANNELSW.SRN1025N
S4	SQ.SW.TS3100A2
S5	ON/VOLYM.SRU-1022
MIC.JACK	FM14RS-7H
SPK.JACK	SJ296
ANT.JACK	S0239
EXT.AL.	FM-214-2SS
R136	SQ.VR.22KH0651A
R41	MIC.SENS.100K H0651A
R46	DEV.LIM. 4.7 H0651A
R56	APC. 3.3K H0651A
C30	TX.RF.CV05D 2001
C31	TX.RF.CV05D 2001



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