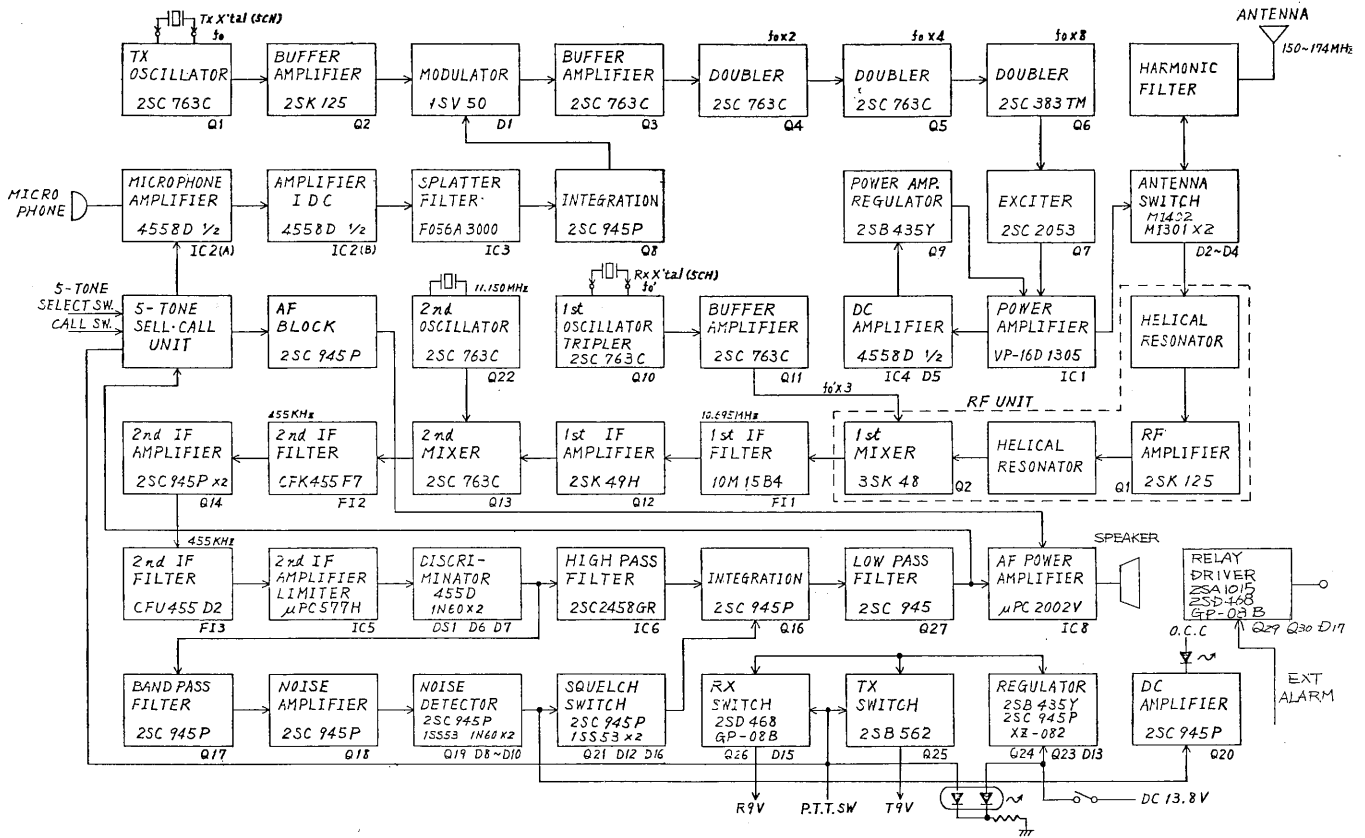


Service manual

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 + -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 mV
< 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	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	*	*	*	*	*	*	*	*	*

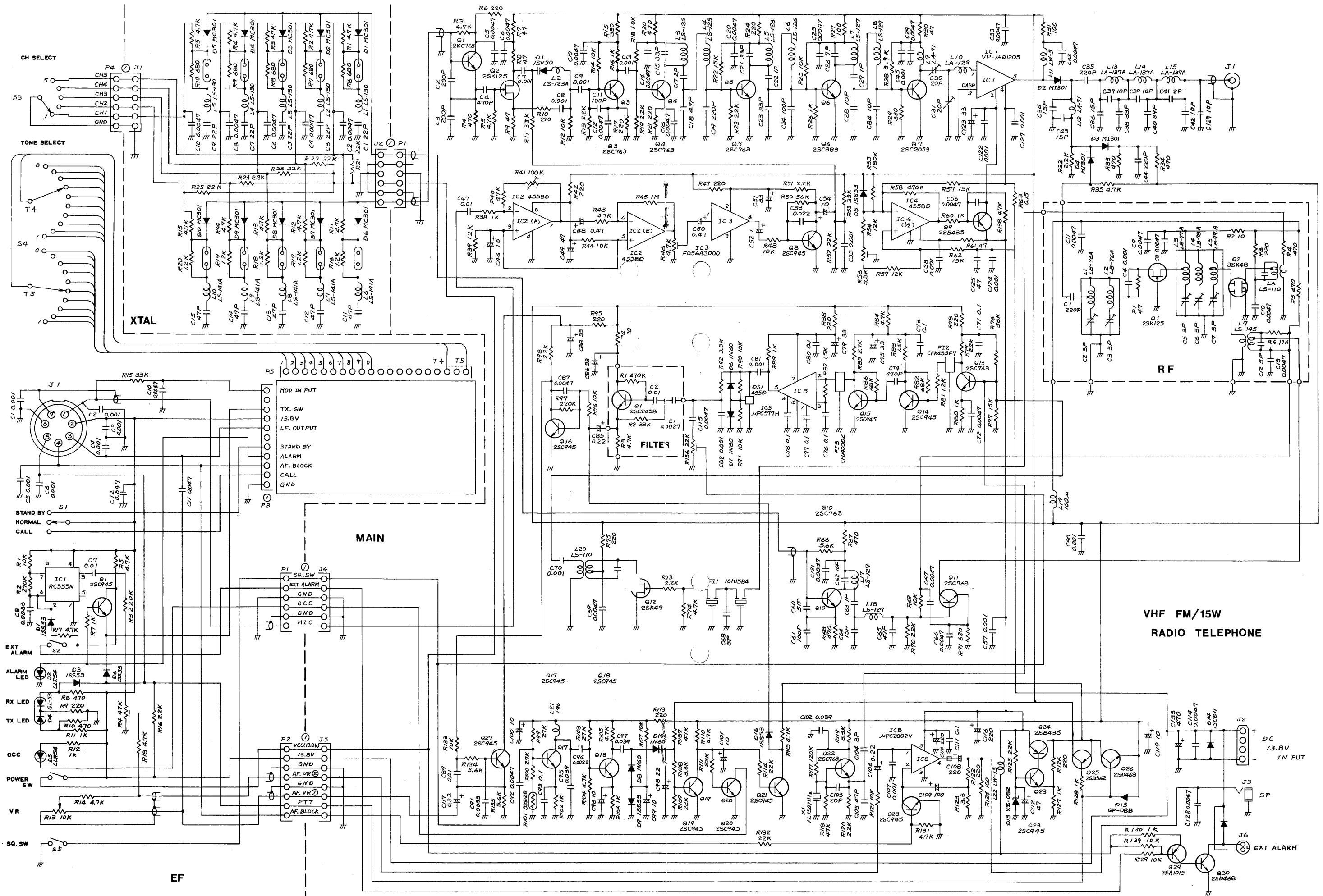
Crystal specifications

	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	HC-25/U

ELECTRICAL SPECIFICATIONS

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

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



VHF FM/15W
RADIO TELEPHONE

TX ALIGNMENT:

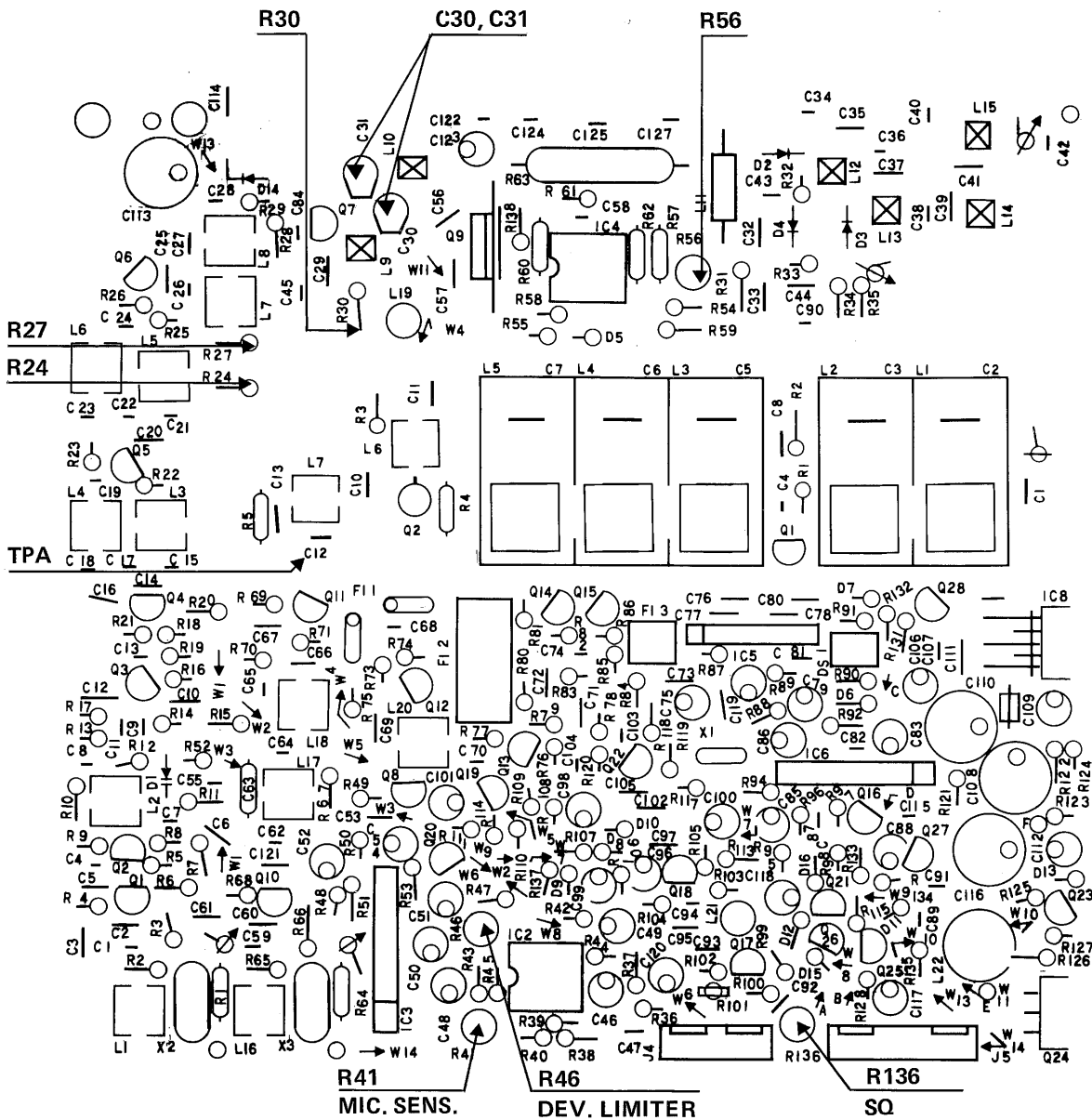
1. Attach powermeter and wattmeter to the set.
2. Set R56 completely clockwise.
3. Mount TX-crystal at the rear crystal holder. Channel 1 is leftmost position.
4. Turn on the power supply, attach a multimeter to R24 and ground. Adjust L4, L3 for minimum voltage on meter.
5. Attach the multimeter to R27 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 distortionmeter 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 quietening. 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 quietening. The coils in IF circuit do no need adjustment except after replacement of parts in IF circuit.
6. The 20 dB noise quietening (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

