TPX-720 Alignment

Pwr Input $-^{+}$12.50 VDC. at 80-90 ma

Synthesizer

1. Set 10.24 + check 11.07
2. Set V Tune (^{108}1.00 ; ^{118}2.1-2.35 ; ^{135}6.4-6.85)
3. Align exc. filter and set Freq. (set at 108 + ✓ at 118 + 135)

Reciever (118.0)

1. Align RF + IF at 118.0.
2. Check S+N/N and AGC and squelch.
3. Check audio out (use 8 Ω).

Transmitter

1. Preset pots.
2. Check for 5w min. (1.5amps)
3. Adjust Hi + Lo pwr
4. Check frequency + spurs. (set at 118 + ✓ at 135)

Modulation

1. Crack R82, R90, + R126
2. .5v in, set R90 for knee
3. Adjust R82 + R126 for Hi + Lo mod.
4. Check for mod spurs.
5. check mic.

If No Tx at hi end (unlock) adjust C39 to 33 + C54 to 3.9, In extreme cases change R53 to 47K

Adjust T12 for minimum spurs at 135 + T9 for min at 108.

		.000	.025	.050	.075
IC4	p3	0	0	1	1
	p4	0	1	0	1

TPX-720 Tune-up & Alignment

Input Power - 12.50 VDC at 100ma Rx / 1.5a TX

Presets

1. R82 + R126 (Hi + Lo Mod) - max CCW
2. R90 (Compression) - max CCW
3. R122 + R124 (Hi + Lo PWR) - max CW
4. T1 - T4 (RCVR) - slug to top
5. T8 - T13 (Exc. Filt) - slug to bottom
6. Squelch - max CW
7. Hi/Lo PWR switch - Hi (toward channel sw.)

A. Synthesizer

1. Adjust C35 for 10.2400 MHz at IC6-P9
2. Adjust L6 (VCO) for 1.00v at 108 MHz. (see at V tune Res.)
3. Check for 2.1 - 2.35v at 118 and 6.4 - 6.85 at 135 mhz.
   If voltage is off, adjust value of C50 or C51. (C↑ = E↓)
4. Filter Alignment
   a. At 108 MHz, adjust T8 - T13 for maximum RF at R133. Use second peak up.
   b. Repeat at 135 mhz. Should have ≈ 100 mv.
   c. Check frequency at R133 + adjust C43 for:

Channel Select Switch	Freq. Reading
108.000	118.7000
118.000	128.7000
135.000	145.7000

Synth. T-shooting

- Check Constants: 11.07, 10.00, switching, VCO, & operating voltages.
- If you can't set V tune at hi end, change CR19, Q8, and/or L6 (All free determining components).
- When setting V-tune you are actually setting the freerunning frequency of the VCO, so that it takes a higher or lower voltage to "lock it in".

Note: Rough Set Tx pwr and adjust T9 at 118 and T12 at 135 for good spurs before performing Reciever alignment.

B. Reciever

1. RF/IF Alignment
   a. Set channel switch & sig gen to 118.0.
   b. Connect sig gen to ant. connector.
   c. Connect test cable from phone jack to test panel.
   d. Use alligator clip to jump phone jack.
   e. With sig gen set to -107dbm, increase RF level until AGC at IC3-P5 begins to rise.
   f. Adjust T1-T7 for max, Keeping the AGC below 200mv by decreasing the RF level as you tune. Stop decreasing at -107dbm (1μv).
2. S+N/N check
   a. Insure sig gen is set to 1μv 30% mod.
   b. set reference on db scale with volume control.
   c. Remove modulation from sig gen and note change.
   d. Insure at least 6db change at 118, 125.5, and 135 mhz.
   e. Set sig gen for 108 mhz, 4μv, 30% mod.
   f. Repeat step B.2.c. and insure at least 6db change.
3. AGC Check
   a. Set sig gen for 118, 10μv, 30% mod.
   b. With radio on 118 and sig gen connected, set reference on sinadder with volume control.
   c. Increase RF level gradually to 10 mv. and insure no more than 3db change in audio level.
4. Squelch Check
   a. Set sig gen for 1μv 80% mod.
   b. With RF cable disconnected, adjust Squelch just into quieting.

- no Rx noise usually means 2nd mixer is bad.

- with volume set to max, unloaded -

Signal Levels Required For 1VAC at Speaker

CR7	Cathode	—
Q23	B	—
	C	—
IC2	- P2	—
	- P5	—

B. Reciever cont.

c. Reconnect RF cable and increase RF level until squelch opens, should be 5μv maximum.

5. Audio Output Check

a. Set sig gen for 100μv (-67dbm) and adjust volume control to maximum. Should have ≥ 1.5VRms

-Frequency-

C. Transmitter (Set C41 for 118.0000 + check all channels)

1. Power Out Adjustment

a. Insure 5watts maximum.

b. At 118.0 set R174 for .5watts Lo pwr and R122 for 2.0watts Hi power.

c. Check at 135.975 and, if necessary, adjust T14-T18 for good power balance.

d. Check at 122.250 and 125.550. Power should be 2.0 minimum and 2.8 maximum on Hi power and .5 minimum and .9 maximum on Lo power.

2. Modulation Adjustment.

a. Set channel switch for 135.975, pwr to Hi.

b. Hook mic jack to test panel with test cable.

c. Adjust sinadder for .5VRms into mic jack with radio keyed.

d. Key radio, crack R82 (Hi mod) and adjust R90 (mic gain) for compression knee.

e. Adjust R82 for 85-90%, switch to Lo power and adjust R126 for same.

- T18 has most effect at 118.
- Positioning T16+17 wires closer to board usually raises power at low end.
- Key down noise caused by bad CR32
- T15 has 4 windings T16-2 ; T17-1

C. Transmitter cont.

3. Spurs

a. Check at 118.0, 125.0, and 135.975. Insure all spurs ≥ 50 db down from the main carrier.

4. Speaker check

a. Key radio from mic jack, insure no modulation from speaker.

b. Key radio from PTT switch, insure good speaker modulation.

Engineering Changes

#6 To Improve Sensitivity

change C1 to 27pf + connect to C2

change C2 to 6.8pf

Delete T1, R1, CR2, + CR31

To Reduce High Freq. Rolloff

change C23 to 470pf

change R29 to 2.2m