

This is Palomar 2400; Factory Alignment Proceedure; re-written slightly for the experienced technician.

Equipment Suggested: Audio Generator; RF VTVM; DC Power Supply (13.8VDC, 4A); Freq. Counter; Oscilloscope; RF Wattmeter & Dummy Load (over 15W desired); Sig. Gen. (capable of 1KHz at 100% mod and FM); Speaker Dummy Load (Resistive 8 ohm, 5W); VOM-20K ohm/V min.; Pulse Gen. (0-500Hz, 0-1V).

PLL ALIGNMENT

A. Reference Frequency Alignment:

1. Connect freq. cntr. to Pin 3, IC-1; should read 10.24000MHz.
Tolerance \pm 200Hz; replace xtal if off; X-1 (10.24MHz).

B. 10.695MHz Alignment:

1. Mode Selector to USB
2. Freq. cntr. to TP-4
3. Adjust CT-11 to 10.695MHz; \pm 0Hz, -100Hz
4. Mode Selector to LSB
5. Adjust CT-10 to 10.692MHz; \pm 0Hz, -100Hz

C. Off-set Frequency Alignment:

1. Freq. cntr. to TP-1 (Pin 4, IC-2).
2. Mode select to USB - CLARIFIERS CENTERED, BOTH!
3. Band select to A; adjust CT-2 for 19.655MHz, \pm 50Hz.
4. Band select to B; adjust CT-2 for 19.655MHz, \pm 50Hz.
5. Band select to C; adjust CT-3 for 19.880MHz, \pm 50Hz.
6. Band select to D; adjust CT-3 for 19.880MHz, \pm 50Hz.
7. Band select to E; adjust CT-4 for 20.555MHz, \pm 50Hz.
8. Band select to F; adjust CT-4 for 20.555MHz, \pm 50Hz.

D. LSB Off-set Frequency Alignment:

1. Mode select to LSB, Band select to C.
2. Freq. cntr: same as Step C-1.
3. Adjust CT-5 for 20.1035MHz.
4. Check that all off-set frequencies are 1.5KHz lower than those in Step C-3 thru C-8. Tolerance \pm 300Hz.

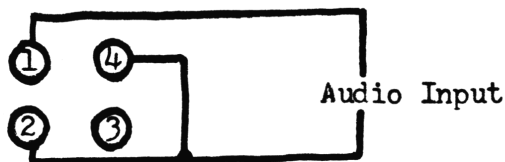
E. VCO Alignment:

1. Band select to F, Chnl. select to 40
2. VOM to TP-3
3. Adjust core of VCO-unit, cased - to 0.6V, \pm 0.1V
4. Band select to A, Chnl. select to 1
5. VOM should read less than 5.5V

TRANSMITTER ALIGNMENT

Adjust RV-6 (SSB Power Output) down to about 3W for easier alignment.

Also you might want to make a dummy plug wired for transmit mode, and separate audio input...diagram below:



Dummy Microphone Plug wired to Transmit Mode..

TRANSMITTER ALIGNMENT

A. RF Power Amplifier Alignment:

1. Set Mode selector to USB.
2. Apply 2.4KHz/20mV audio to mike input.
3. Set the Band select to F, Ch. select to 40.
4. Adjust T-1 and T-3 for maximum RF output.
5. Set the Band select to D, Ch. select to 1.
6. Adjust T-2 and T-4 for maximum RF output.
7. Repeat steps 3-6 until no further improvement can be made.
8. Set the Band select to C, Ch. select to 40.
9. Adjust T-5 and CT-8 for maximum RF output.
10. Set the Band select to A, Ch. select to 1.
11. Adjust CT-9 for maximum RF output.
12. Repeat steps 8-11 until no further improvement can be made.

B. Carrier Leakage Alignment:

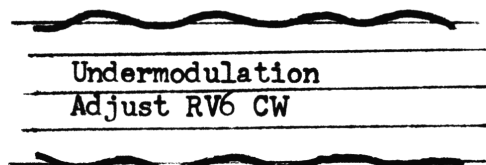
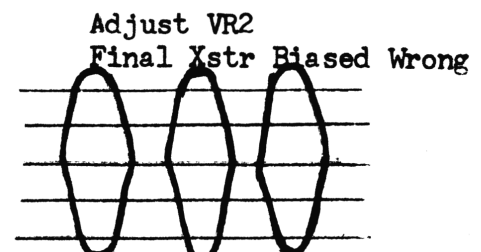
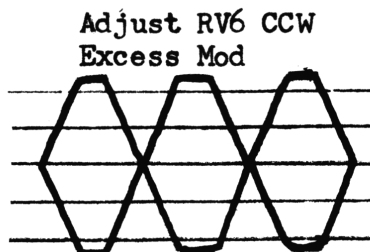
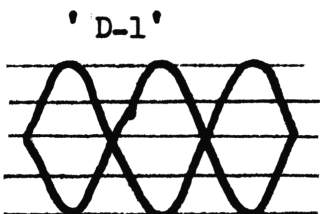
1. Set Mode select to LSB.
2. Remove audio signal at dummy microphone plug.
3. Adjust RV-5 for minimum (Ideal condition is none) RF Output - any amount is carrier leakage!
4. Apply 2.4KHz/10mV audio to dummy mike plug. RF power output should be 40 db greater than the carrier-leak output.
5. Check step 4 in USB mode, same spec's with tone on/off.

C. RF Power Stage Alignment:

1. After finishing Step B above: change audio level to 2.4KHz/20mV input to dummy plug input.
2. Mode select to USB
3. Rotate RV-3 and RV-6, FULLY COUNTERCLOCKWISE.
4. Band select to E, Ch. select to 40.
5. Adjust T-5 and L-16 for Maximum RF output.

D. Two-Tone Alignment:

1. Apply 500Hz and 2.4KHz/20mV audio tones to dummy plug input at the same time. Use two audio signal generators for this.
2. Adjust test audio levels of 500Hz signal with attenuator on the generator so the scope presents wave figure as below at the dummy plug input. (Wave Form D-1)
3. Adjust RV-6 to 12W P-to-P RF Power Output. Scoped RF Output should look like D-1.



PALOMAR 2400, ALIGNMENT (Cont.)

TRANSMITTER ALIGNMENT (Cont.)

E. AM RF Power Output Alignment:

1. Set mode select to AM.
2. Band select to C.
3. Ch. select to 20.
4. Adjust RV-11 for 7.5W RF power output.

F. AM Modulation Alignment:

1. Apply 2.4KHz/7mV audio signal to dummy plug.
2. Adjust RV-12 for modulation depth of greater than 90%....

G. FM RF Power Output Alignment:

1. Set mode select to FM.
2. Adjust RV-3 for 10W RF power output.
CHECK RF POWER ON ALL CHANNELS - SHOULD BE IN EXCESS OF 9W.

H. FM Deviation Alignment:

1. Mode selector should still be at FM.
2. Apply 1,250Hz/20mV audio to dummy plug.
3. Check RF output with Deviation Meter for 2-3KHz of deviation, adjust RV-1 if needed.

I. RF Power Meter Alignment:

1. Set Mode select to AM.
2. Compare the external RF power reading against the built-in meter.
Adjust RV-4 for equal indication.
3. REMOVE DUMMY PLUG.....

RECEIVER ALIGNMENT

A. SSB AGC Alignment:

1. Set mode select to USB.
2. RF gain to maximum, (DX/Loc to DX).
3. Adjust RV-7 for 2VDC, at terminal #28.
4. Mode select to AM, make sure the voltage in vicinity of 1.8-2.3VDC.

B. SSB Sensitivity Alignment:

1. R.F. Gen. input to antenna input, output in: USB 26.965MHz; attenuate signal as to not overload RF Amp in unit.
2. Adjust for maximum audio output: T-8, T-9, T-10, T-11, T-12, and T-7.
Attenuate the RF Gen if needed.
3. Make sure the noise blanker is ON when adjusting.
4. Also make sure the Clarifier and Fine are at center!

C. AM Sensitivity Alignment:

1. RF Gen input to AM mode, (1_mV, 1KHz/30% mod.). Unit to AM Mode also.
2. Adjust for maximum audio: T-8, T-9, T-10, T-11, T-12, T-13, and T-14.
3. Turn the peaked T-9 by $\frac{1}{4}$ to $\frac{1}{2}$ clockwise to minimize channel difference.
4. Adjust T-11 and T-12 again, if maximum audio output isn't enough.

PALOMAR 2400, ALIGNMENT (Cont.)

RECEIVER ALIGNMENT (Cont.)

D. FM Sensitivity Alignment:

1. RF Gen to FM Mode, (1_mV, 1KHz mod., 1.5KHz deviation.) Disconnect from antenna connector.
2. Mode select to FM on unit.
3. Adjust T-16 for maximum noise.
4. Connect RF Gen to unit, adjust T-15 and T-16 for maximum audio output.
(Note: T-16 has three peak points, choose the one with maximum)

E. Sensitivity Specifications-Check:

- AM - less than 1 micro volt, S/N 10db.
FM - less than 1 micro volt, S/N 20db.
SSB - less than 0.5 micro volt, S/N 10db.

F. S-Meter Alignment:

1. Adjust SSB mode first... 100_mV input (40db) at the antenna jack.
2. Adjust RV-9 for needle swing to 'S-9'
3. Adjust RV-8 for needle swing to 'S-9' in the AM mode.

G. Squelch Alignment:

1. Change generator output to 200_mV (46db) in AM mode.
2. Set Squelch to maximum in unit, then adjust RV-10 for no audio output.
3. Check that squelch functions in all modes, within the range of 40-56db.

H. RF Gain (Dx/Loc) Check:

1. Set Sig Gen at sensitivity of S/N 10db on AM mode. Unit to AM and DX.
2. Adjust Volume for audio output of 2V (500mW), radio's volume control!
3. Dx/Loc to Loc, readjust the Sig Gen in output until the audio output of radio is 2V (500mW) again.
4. Difference in Sig Gen output should be between 15db-35db.

I. N.B. Check:

1. Connect 2-input pad to antenna connector.
2. Signal #1 to be 100Hz 1_mV; Signal #2 to be 100Hz, 1_mSec Pulse Width, 500mV P-P.
3. Should be at least 7db S/N ratio between NB OFF and NB ON.

END OF PALOMAR 2400 ALIGNMENT..

REALISTIC PRO-22, VHF-H/U,AIR,UHF PORTABLE SCANNER

NOTE: The external power jack is wired for tip NEGATIVE! If you find one on the outs - check Q-15 and R-80.. - might have been lucky! If not, there is going to be plenty to keep you busy...(Cuss, that high-priced Engineer!)

SPECIAL NOTES:

Citizens Radio ? - supposed to be the same as Colt 1200..

Orbit-Sonic ? - supposed to be the same as Kraco KCB-40003? (try KCB-4003 1st)!