SECTION VII

CALIBRATION

7-1. GENERAL

7-2. This section contains instructions for aligning the Model 762-2 system, and for calibrating the individual subassemblies. A complete alignment of the system is necessary when parts have been replaced, or when periodic performance checks reveal out-of-tolerance conditions. Calibration of individual subassemblies, including circuit boards and the microwave chassis, is necessary when components have been replaced, or when the system fails to align in some respects.

7-3. TOOLS AND TEST EQUIPMENT

7-4. Table 7-1 lists items of tools and test equipment required for system alignment and calibration procedures.

7-5. ADJUSTMENT PROCEDURES

7-6. Unless otherwise indicated, as in the case of an individual circuit board which has been repaired, conduct adjustments in the sequence given in tables 7-2, 7-3 and 7-4. Refer to figure 5-1 for location of components and adjustment controls. Remove instrument covers as necessary for access. Alignment and calibration of the timing unit in conjunction with display unit is advisable, and is facilitated by use of extender cable, Part No. 109618 (paragraph 1-4).

Table 7-1. Required Test Equipment

NOTE: Equivalent substitutes may be used

Comb Generator	1, 10, 100 MHz	HP 8406A
Low Pass Filter	1.8 GHz	K&L Microwave 5L380-1800-0
Oscilloscope		HP 1202A
Digital Voltmeter		S-D 7050
Spectrum Analyzer	260 MHz	S-D 762-2A
Power Meter		HP 431C
Calibrated Signal Generator		HP 8614A
Function Generator		Wavetek 115
Impedance Pad	6 dB	Commercially available
Impedance Pad	20 dB	Commercially available
Crystal Detector		HP 420A

Table 7-2. System Alignment

Adjustment	Reference Designation	Location	Reference Paragraph No.
V		Front Panel (712-2A)	7-8
H		Front Panel (712-2A)	7-8
ASTIG		Front Panel (712-2A)	7-8
TRACE ALIGN		Front Panel (712-2A)	7-8
VERT GAIN		Rear Panel (712-2A)	7-8
FREQUENCY TUNE		Front Panel (809-2A)	7-10
FREQ	A208R46	Side Panel (809-2A)	7-10
LO FREQ	A208R36	Side Panel (809-2A)	7-10
1ST MIXER BIAS ADJ. (bands 1-4)	A208R1, R3, R4, R5	Top Panel (809-2A)	7-11
DC LEVEL ADJ	A209R37	Top Panel (809-2A)	7-12

7-7. SYSTEM ALIGNMENT

7-8. DISPLAY UNIT. Refer to Operating Instructions, paragraph 3-7, and adjust display unit front panel controls as directed. Then, connect a signal generator to the RF INPUT connector, and set up signal generator for a 1 GHz CW signal. Select band 1, and obtain a full-scale display in the logarithmic display mode. Introduce 10 dB of IF attenuation with the IF ATTEN switches, and adjust VERT GAIN control on rear panel so that signal peak is at -10 dB graticule line. If unable to obtain satisfactory adjustments, refer to Calibration Instructions, paragraph 7-13, and adjust individual controls as required.

7-9. TUNING UNIT. Alignment of the tuning unit will require calibrated signals in some instances. Test equipment listed in table 7-1 should suffice. Test setup will be in accordance with figure 7-1.

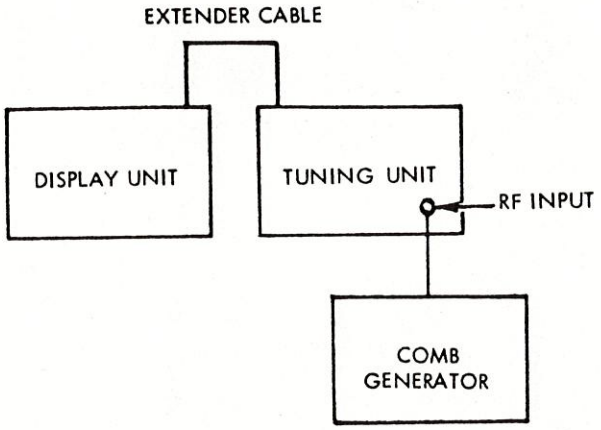


Figure 7-1. Tuning Unit Alignment Setup

CAUTION

SOME OF THE ACCESSIBLE CONTROLS IN THE TUNING ARE FACTORY ADJUSTED AND MAY ALSO BE SEALED. ONLY THE CONTROLS IDENTIFIED IN THE PROCEDURE AND IN TABLE 7-2 NORMALLY REQUIRE ATTENTION IN THE FIELD.

7-10. FIRST MIXER BIAS ADJUSTMENTS. On the Model 809-2A top panel are four adjustments, labeled 1ST MIXER BIAS ADJ, BAND 1, 2, 3, and 4. Set up the tuning unit for a logarithmic display. Then, select each of the bands indicated below, introduce a CW signal of the frequency specified, adjust level for a full-scale display, and adjust the indicated first mixer bias adjustment for a peak response:

Selected Band	CW Input Frequency	First Mixer Bias Adjust
1	1 GHz	A208R1
2	3.5 GHz	A208R3
3	7.0 GHz	A208R4
4	10.7 GHz	A208R5

7-11. PHASE LOCK OFFSET ADJUSTMENT. If signal jumps off screen when STAB/OFF control is placed to STAB, adjust DC LEVEL control R37 to obtain a condition where the phase locked signal remains in convenient display position when control set to STAB.

7-12. CALIBRATIONS

7-13. Follow the sequence of adjustments as detailed for each subassembly and summarized in table 7-3.

Table 7-3. Calibration Adjustments

Function	Control	Location	Reference Paragraph
+12V HI	R29	A101 Power Supply	7-15
+12V	R2	A101 Power Supply	7-15
+200V	R18	A101 Power Supply	7-15
-6V	R22	A101 Power Supply	7-15
Dispersion Zero Balance	R1	A102 Sweep & Vert. Amp.	7-16
Dispersion Width	R70	A102 Sweep & Vert. Amp.	7-16
VERT GAIN	R109	Display Unit Rear Panel	7-16
D. C. Level	R50	A102 Sweep & Vert. Amp.	7-16

Table 7-3. Calibration Adjustments (Cont)

Function	Control	Location	Reference Paragraph
Horiz. Gain	R55	A102 Sweep & Vert. Amp.	7-16
D. C. Level	R63	A102 Sweep & Vert. Amp.	7-16
Manual Sweep	R10	A103 Fast Sweep/Sync Amp.	7-17
Maximum Intensity	R16	A104 High Voltage Divider/ Blanking	7-18
-13 VDC	R41	A208 RF Board (internal)	7-21
-18 VDC	R51	A208 RF Board (internal)	7-21
Low Freq	R36	A208 RF Board (external)	7-23
High Freq	R46	A208 RF Board (external)	7-23
2nd L. O. Freq	Tuning Slug	Y202 2nd L. O.	7-25
2050 MHz IF	Slugs A, B, C	A208 RF Board (external)	7-26
Oscillator Adj	C7	A201 3rd Converter Board (oscillator)	7-21
Oscillator Compensation	R69	A201 3rd Converter Board (oscillator)	7-21
Scan Cal, Fine	R25	A201 3rd Converter Board	7-21
Scan Cal, Coarse	R74	A201 3rd Converter Board	7-21
Amplitude Peaking	C44	A205 LIN-LOG Board	7-22
LIN Adj	R58	A205 LIN-LOG Board	7-22
Zero Adj	R62	A205 LIN-LOG Board	7-22
LOG Adj	R45	A205 LIN-LOG Board	7-30
Sweep Amp. Cal Adj	R3	A206 Harmonic Atten/ Video Duration - BW	7-31
10 KHz Adj	R93	A204 6.5 MHz Control Filter Board	7-32
1 KHz Adj	R87	A204 6.5 MHz Crystal Filter Board	7-32
300 MHz Adj	R86	A204 6.5 MHz Crystal Filter Board	7-32

Table 7-3. Calibration Adjustments (Cont)

Function	Control	Location	Reference Paragraph
100 kHz Amp Adj	R13	A203 100 kHz B. P. Filter Board	7-33
Symmetry Adj	C13	A203 100 kHz B. P. Filter Board	7-33
Symmetry Adj	C15	A203 100 kHz B. P. Filter Board	7-33
Symmetry Adj	C17	A203 100 kHz B. P. Filter Board	7-33
Symmetry Adj	C19	A203 100 kHz B. P. Filter Board	7-33
Ba[illegible]width Adj	C3	A202 Fourth Converter Board	7-34
Bandwidth Adj	C12	A202 Fourth Converter Board	7-34
Bandwidth Adj	C20	A202 Fourth Converter Board	7-34
Bandwidth Adj	C37	A202 Fourth Converter Board	7-34
Symmetry Adj	C26	A202 Fourth Converter Board	7-34
Symmetry Adj	C27	A202 Fourth Converter Board	7-34
Symmetry Adj	C30	A202 Fourth Converter Board	7-34
Symmetry Adj	C32	A202 Fourth Converter Board	7-34
Symmetry Adj	C33	A202 Fourth Converter Board	7-34
0 dB Ref Adj	R37	A202 Fourth Converter Board	7-34
60 dB Ref Adj	R35	A202 Fourth Converter Board	7-34

7-14. DISPLAY UNIT. Calibrations of individual circuit boards are conducted with boards installed in the display unit.

7-15. A101 POWER SUPPLY BOARD. Refer to table 7-4 and set D. C. voltage controls as indicated. Use a digital voltmeter (table 7-1).

CAUTION

NO SHORT CIRCUIT PROTECTION IS PROVIDED IN THIS ASSEMBLY. MAKE CERTAIN VOLTMETER IS SET FOR CORRECT VOLTAGE RANGE. OTHERWISE, BURNOUT OF VOLTMETER AND D.C. CIRCUIT MAY RESULT.

Table 7-4. A101 Power Supply Board D.C. Voltage Adjustments

D.C. Voltage	Control	Pin No.	Limits - VDC
+12V HI	R29	21	+11.9 to 12.1
+12V	R2	19	+11.9 to 12.1
+200V	R18	10	+198 to 202
-6V	R22	9	-6.06 to -5.94

7-16. A102 SWEEP AND VERTICAL AMPLIFIER BOARD. Set oscilloscope as indicated for each test point (figure 7-2). Proceed as follows:

(1) With display unit controls SYNC at INT, STD SWEEP at 3 msec/DIV, and oscilloscope set to 1V/DIV vertical, 5 ms/DIV horizontal, apply probe to pin 19. Adjust Dispersion Zero Balance R1 to position base of ramp (A, figure 7-2) at -2.6V ±0.05V. Adjust Dispersion Width R70 to position peak of ramp at +2.6V ±0.05V.

NOTE

Unless otherwise specified, waveforms of figure 7-2 are nominal. Voltages can be within ±10%.

(2) Set oscilloscope for 10V/DIV vertical, 5 ms/DIV horizontal. Connect function generator (table 7-1) to J107-24 (figure 7-3). Apply probe to pin 8.

NOTE

Make certain that baseline of wave is not at ground potential and cut off by amplifier. Check pin 8 and pin 7. Adjust D.C. level R63 if necessary, keeping D.C. level as low as possible.

(3) Adjust V front panel control to position baseline of wave on bottom line of graticule. Adjust VERT GAIN rear panel control to obtain 1/2-screen display (4 divisions). Now adjust D.C. level R50 to obtain 85V peak (F and G, figure 7-2). Readjust V and VERT GAIN controls if necessary.

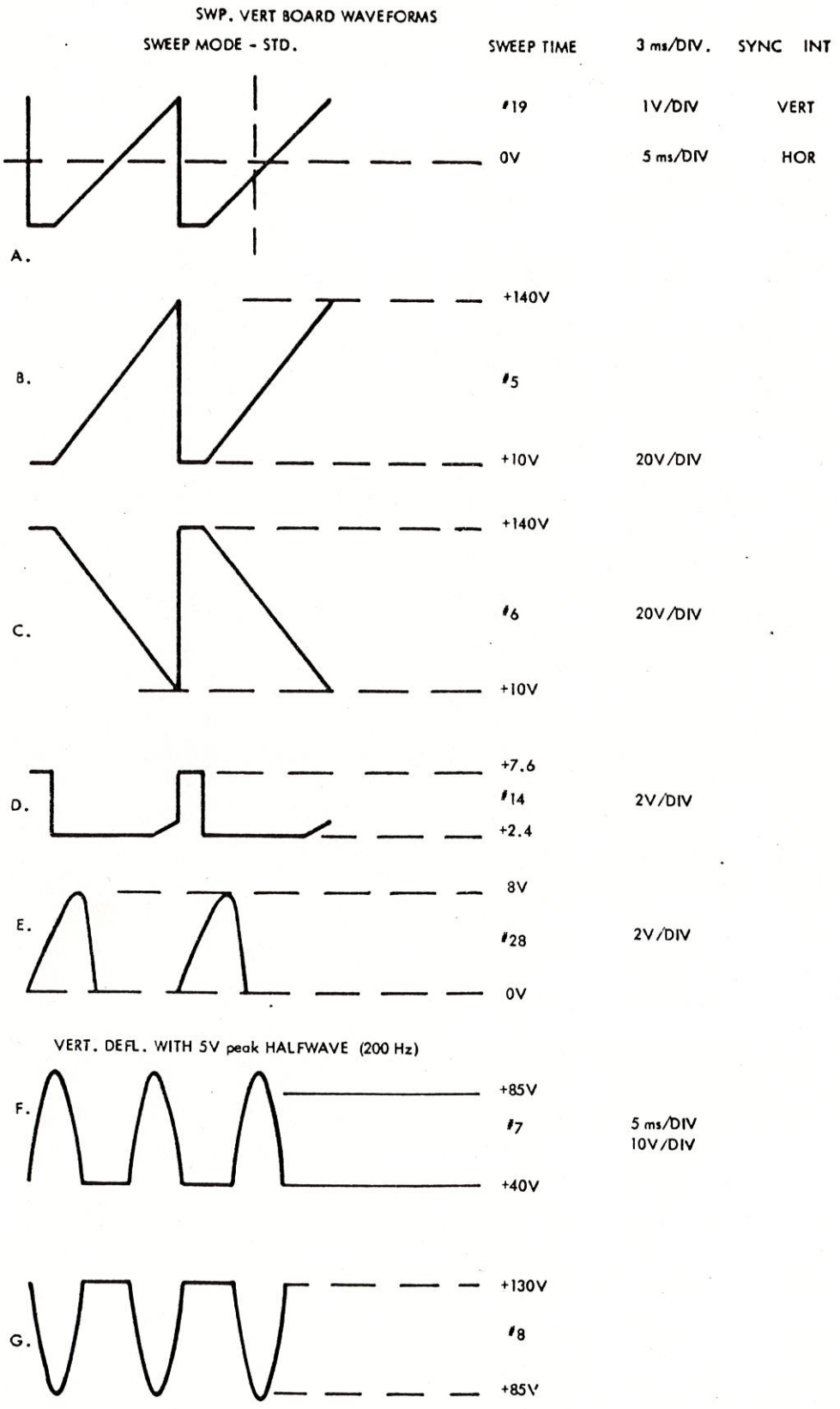


Figure 7-2. A102 Waveforms

(4) Set oscilloscope for 20V/DIV. Apply probe to pin 5 and adjust H front panel control to obtain start of trace at left of screen one minor division (0.2 Div.) outside left hand vertical line of graticule. Adjust Horiz. Gain R55 for full scale horizontal deflection, so that trace extends one minor division (0.2 Div.) outside right hand vertical line of graticule. Adjust D.C. Level R63 to center the wave on the oscilloscope (B, figure 7-2).

(5) Check for retrace pulse with probe applied to pin 14 (D, figure 7-2); check for hold-off pulse with probe applied to pin 28 (E, figure 7-2).

7-17. A103 FAST SWEEP/SYNC AMPLIFIER BOARD. Adjust Manual Sweep control R10 to obtain full excursion across graticule when SWEEP VAR/MAN front panel control is rotated fully clockwise.

7-18. A104 HIGH VOLTAGE DIVIDER AND BLANKING BOARD. With function generator (table 7-1) connected to J107-24 as shown in figure 7-3, set for 10V sawtooth, 1 kHz. Rotate INTENSITY front panel control fully clockwise, and adjust Maximum Intensity R16 so that display just avoids blooming at extreme CW setting of INTENSITY control. Set function generator amplitude and frequency for a full screen display pattern, and adjust Distortion R28 to obtain a rectilinear display.

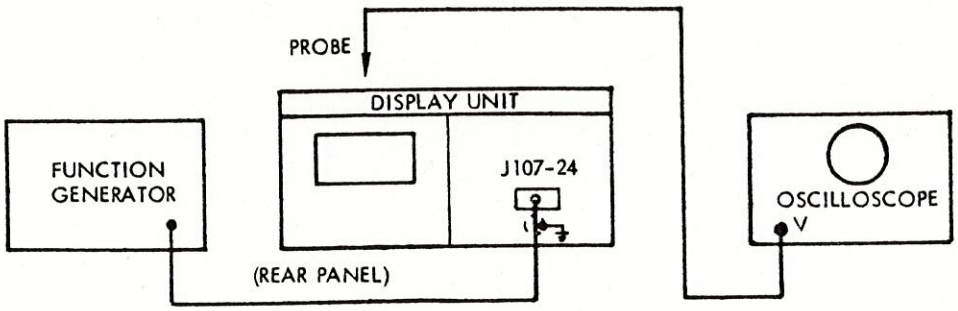


Figure 7-3. A102 Sweep and Vertical Amplifier Board Test Setup

7-19. TUNING UNIT. Calibrations of microwave chassis (RF section) must be conducted with the RF and IF sections separated. To separate RF and IF sections, proceed as follows:

(1) Remove four 6-32 screws and bottom cover.

(2) Disconnect W215 ribbon cable from A206J1 and remove A206 board.

(3) Remove FREQUENCY TUNE knob and 50-ohm termination from EXT MXR.

NOTE

The EXT MXR front panel connector will have the 50-ohm termination applied at all times except when in use.

(4) With unit in upright position, remove three 6-32 screws from each side and two 6-32 screws from rear of microwave chassis. Then slide microwave chassis away from front panel to clear frequency tune shaft and EXT MXR connector and lift straight up.

(5) Disconnect IF cable W213 at AR201J2.

(6) Assemble the RF and IF sections by following the foregoing steps in reverse sequence.

7-20. MICROWAVE CHASSIS CALIBRATION. These procedures may be accomplished using external D.C. power sources and an external oscilloscope. The extender cable will permit calibrations using the display unit for D.C. power and the display unit screen for signal displays.

7-21. D.C. REFERENCE VOLTAGES, A208 RF BOARD. With a digital voltmeter (table 6-1) check for -13.02 to -12.98 VDC at A208TP1. Adjust -13 VDC control R41 as necessary. Check for -18.05 to -17.95 VDC at A208 - pin 2. Adjust -18 VDC control R51 as necessary.

7-22. NOISE LEVEL CHECK. Connect display unit and tuning unit as shown in figure 7-4. Set controls as follows:

Control	Setting
SWEEP MODE	FREE RUN
STD SWEEP	3 msec/DIV
BAND SELECT	6
SCANWIDTH/DIV	Any position
BANDWIDTH - kHz	100
LIN/LOG	LOG
VIDEO DURATION - BW	1 KHz
IF ATTEN - dB	0
IF GAIN - VAR	60 dB

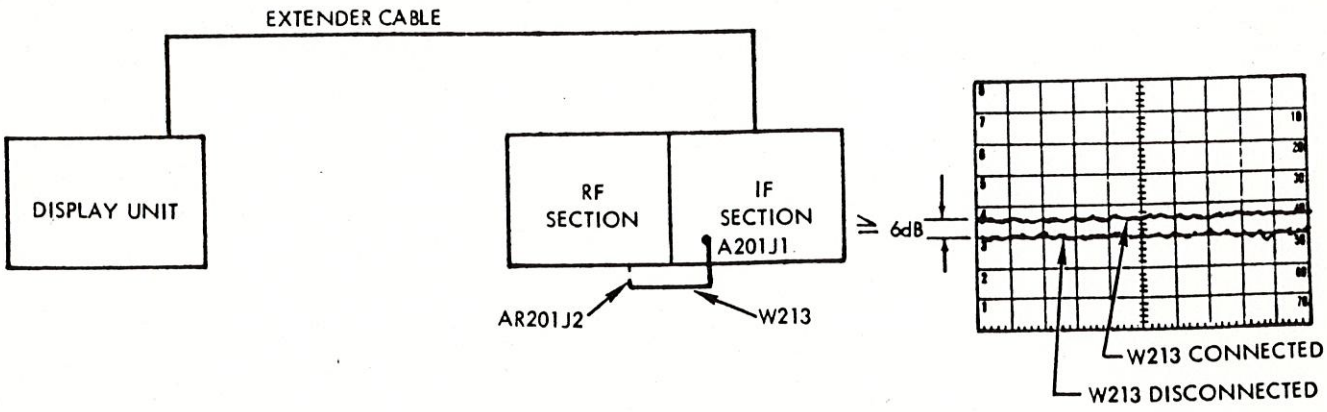


Figure 7-4. Noise Level Test Setup

(1) Disconnect RF cable W213 and check noise level of display.

(2) Connect W213 and check screen for approx. 5 dB increase in noise level (see figure 7-4).

7-23. DIAL TRACKING CALIBRATION. Connect comb generator, low pass filter, 6 dB pad (table 7-1) as shown in figure 7-5. Set controls as follows:

Control	Setting
STD SWEEP	3 msec/DIV
BAND SELECT	1
SCANWIDTH/DIV	20 MHz
BANDWIDTH - KHz	100
LIN/LOG	LOG
VIDEO DURATION - BW	OFF

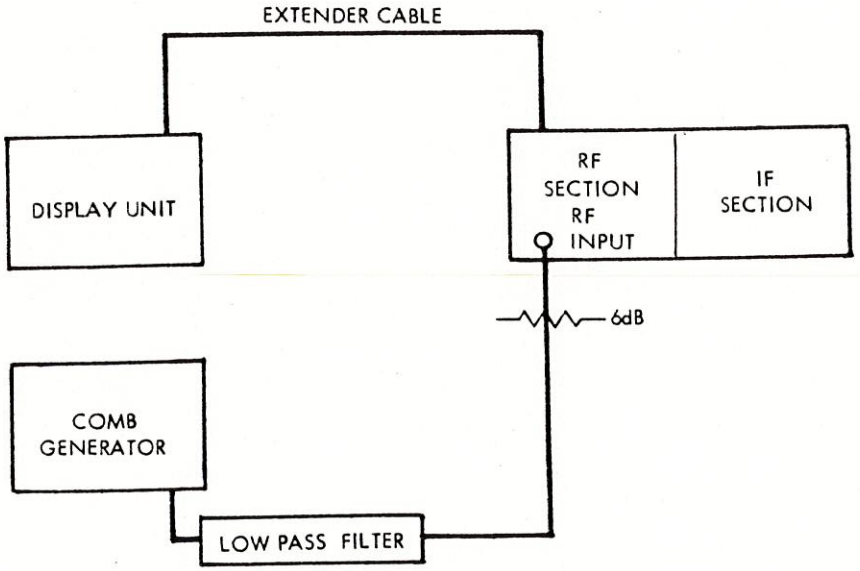


Figure 7-5. Dial Tracking Test Setup

(1) Rotate FREQUENCY TUNE knob counterclockwise to stop and check that pointer stops on the dot to left of scale zero. Rotate FREQUENCY TUNE knob clockwise to stop and check that pointer stops on the dot to right of 2.0 GHz scale reading.

(2) Set comb generator for 100 MHz, adjust BASELINE BLANKING front panel control to take out noise. Set FINE TUNE control to Mid-range, FREQUENCY TUNE dial pointer to zero. Adjust A208R36 (Low Frequency) control to position the beat signal at center of screen.

(3) Slowly rotate FREQUENCY TUNE knob clockwise until dial pointer reaches 1.9 GHz, counting the 100 MHz comb lines at the right of the beat signal as they translate to the left, making certain to identify the 19th line (1.9 GHz). Adjust A208R46 (High Frequency) control to position this 19th line exactly on center of screen.

(4) Repeat steps 2 and 3 until beat signal and 19th line can be positioned respective at screen center when dial reading is zero and 1.9 GHz.

7-24. FIRST L.O. (Y201) POWER AND RESPONSE. Connect oscilloscope, detector, 20 dB pad (table 7-1) as shown in figure 7-6. Set controls as follows:

Control	Setting
STD SWEEP	3 msec/DIV
BAND SELECT	Noted
STAB	FULL SWEEP
SCANWIDTH/DIV	Any MHz setting
BANDWIDTH - KHz	100
LIN/LOG	LOG
EXT MXR BIAS	0 V (Fully CCW)
Oscilloscope VERT	10 mV/DIV
HORIZ	0.5 V/DIV

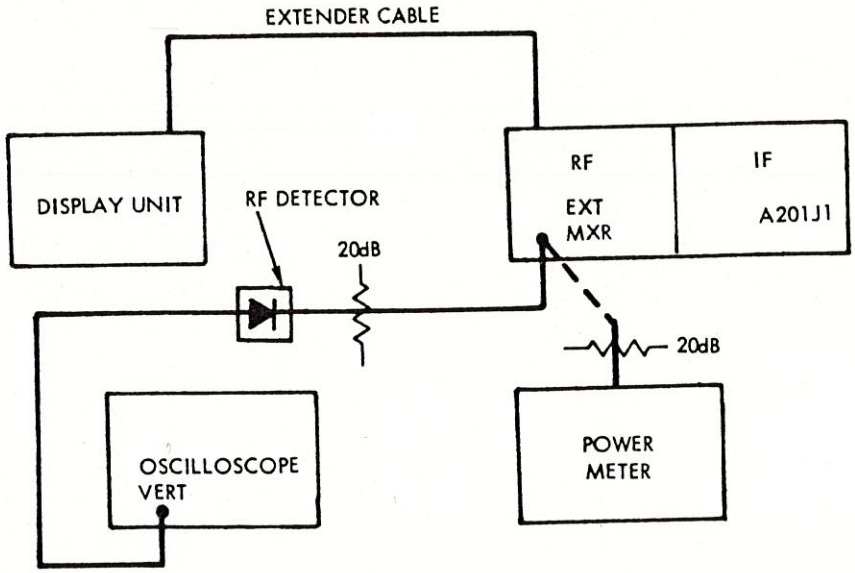


Figure 7-6. Y201 First L.O. Test Setup

(1) Check bands 1 and 5 for flatness.

(2) Using a power meter and 20 dB pad, check for approximately +10 dBm power level at EXT MXR connector.

7-25. SECOND L.O. (Y202) FREQUENCY. Connect digital voltmeter and comb generator (table 7-1) as shown in figure 7-7. Set controls as follows:

Control	Setting
STD SWEEP	10 msec/DIV
BAND SELECT	2 and noted
STAB	OFF
SCANWIDTH/DIV	5 MHz and noted
BANDWIDTH - KHz	100 kHz
LIN/LOG	LOG
IF ATTEN - dB	0 and noted
VIDEO DURATION - BW	OFF
Comb Generator	10 MHz and noted

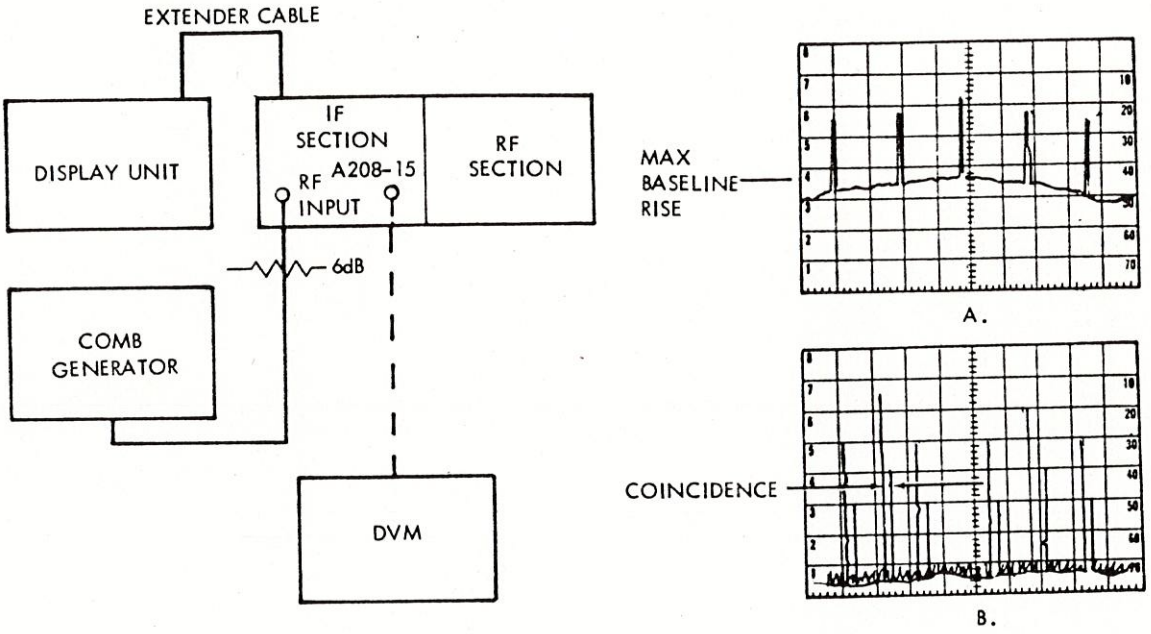


Figure 7-7. Y202 Second L.O. Test Setup

(1) Check A208 pin 15 for -13.02 to -12.98 VDC. Adjust A208R41 if necessary.

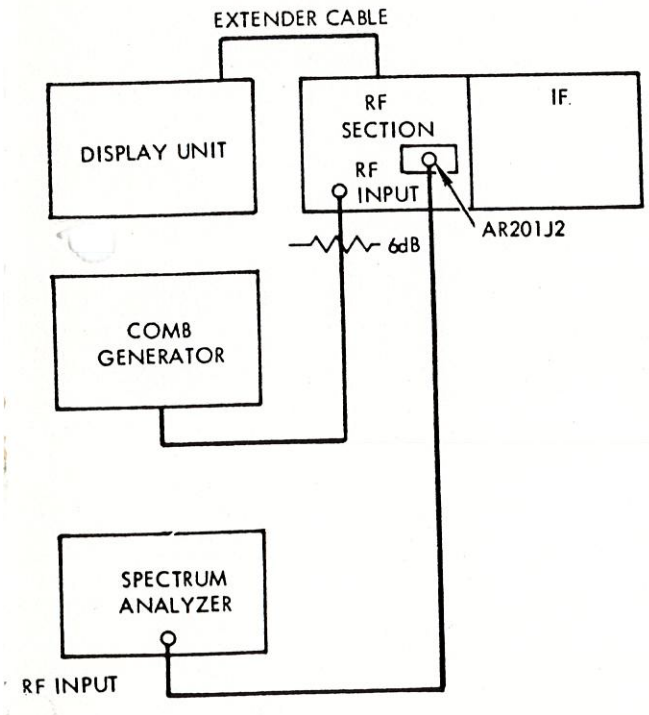
(2) With above settings, adjust FINE TUNE control for maximum baseline rise (A, figure 7-7). In the steps which follow, do not vary FINE TUNE control.

(3) Set BAND SELECT to 1, FREQUENCY TUNE to 260 MHz, SCANWIDTH/DIV to 20 MHz, IF ATTEN - dB to 20 dB, Comb Generator to 100 MHz. Adjust BASELINE BLANKING control to take out noise.

(4) Adjust 2nd L.O. tuning slug to obtain coincidence between short and tall lines of comb (B, figure 7-7).

6. FIRST MIXER (Z202) AND BP-LP FILTER (FL201) RESPONSE. Connect
ıb generator and spectrum analyzer (table 7-1) as shown in figure 7-8. Set
trols as follows:

Control		Setting
STD SWEEP		10 msec/DIV and noted
BAND SELECT		1
STAB		OFF
SCANWIDTH/DIV		50 MHz
BANDWIDTH - KHz		100
IF ATTEN - dB		4
LIN/LOG		LOG
VIDEO DURATION - BW		OFF
Comb Generator		10 MHz
Spectrum Analyzer	Frequency	260 MHz
	Bandwidth	100 KHz
	Scanwidth	5 MHz/DIV
	Sweep	STD
	Sweep Rate	3 msec/DIV



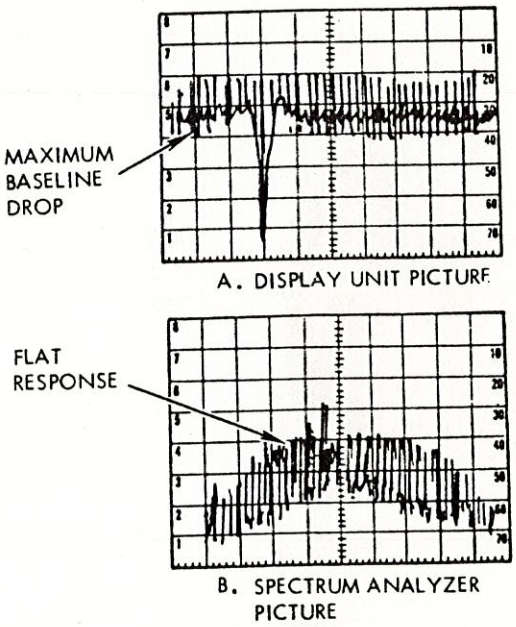


Figure 7-8. Z202 First Mixer and BP-LP Filter Test Setup

(1) Check the display on external spectrum analyzer, center the 260 MHz response, and adjust slugs A, B, C on FL201 to obtain flat response at least from 255 to 265 MHz (B, figure 7-8).

7-27. 2050 MHz I. F. SENSITIVITY. Connect signal generator (table 7-1) as shown in figure 7-9. Provide a power meter (table 7-1). Set controls as follows:

Control	Setting
STD SWEEP	3 msec/DIV
BAND SELECT	5
FREQUENCY TUNE	15.0 GHz
STAB	OFF
SCANWIDTH/DIV	100 MHz
BANDWIDTH - KHz	100
IF ATTEN - dB	5
LIN/LOG	LOG
VIDEO DURATION - BW	1 kHz
Signal Generator Frequency	2050 MHz
Level	Noted
IF GAIN - VAR	60

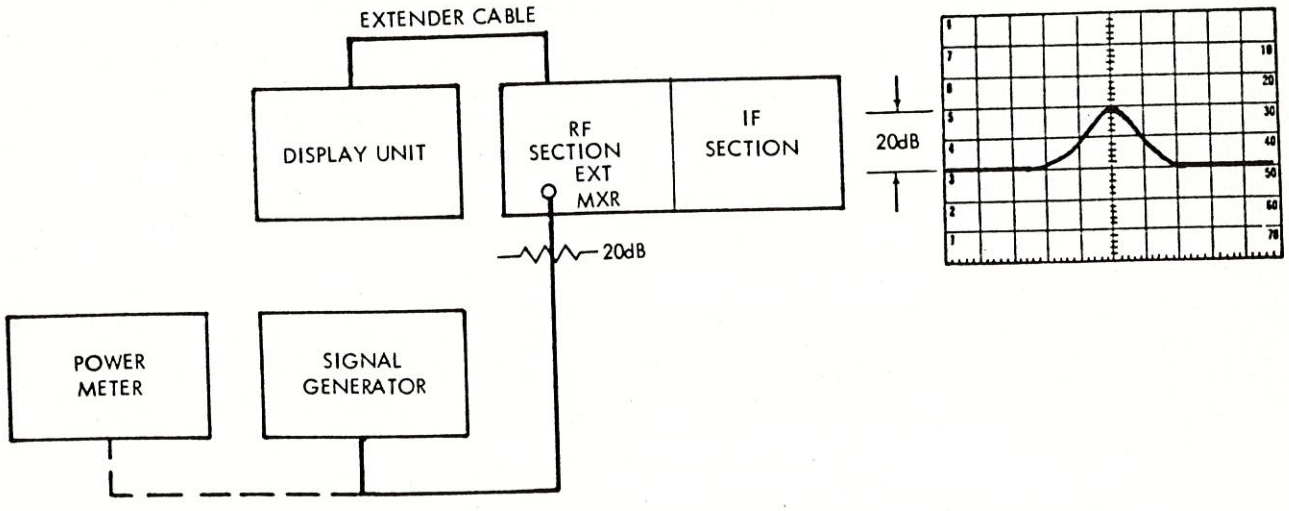


Figure 7-9. 2050 MHz I. F. Sensitivity Test Setup

(1) With power meter, calibrate output level of signal generator at -7 dBm setting.

(2) Use FINE TUNE control to center the 2050 MHz response. Reduce signal generator output until response is 20 dB above noise level. Calibrated signal input to EXT MXR shall be -102 dBm or lower level, calibrated from signal generator output reading + pad level + signal level above noise.

8. IF SECTION CALIBRATION. Calibrations are normally conducted with tuning unit assembled, with bottom cover removed. External power supplies and oscilloscope may be applied, but the extender cable, part of optional Maintenance Kit, Part No. 37000-610, is convenient for utilizing the display unit for power source and readout. Access to controls on circuit boards is obtained by using the extender card furnished in the optional kit.

NOTE

Circuit board calibrations will be performed as much as possible with the board installed in operating position. Make certain that good ground contact is obtained when re-installing boards after finishing with extender card.

7-29. THIRD CONVERTER BOARD (A201). Connect digital voltmeter, comb generator and low pass filter (table 7-1) as shown in figure 7-10. Disconnect 260 MHz input cable W213 from J1. With extender card installed, connect an RF cable between circuit board connector J2 and receptacle on chassis for A202J2. Set controls as follows:

Control	Setting
STD SWEEP	3 msec/DIV
BAND SELECT	1
STAB	OFF
SCANWIDTH/DIV	1 MHz and noted
BANDWIDTH - KHz	10
LIN/LOG	LOG
Comb Generator	10 MHz and 1 MHz Modulation

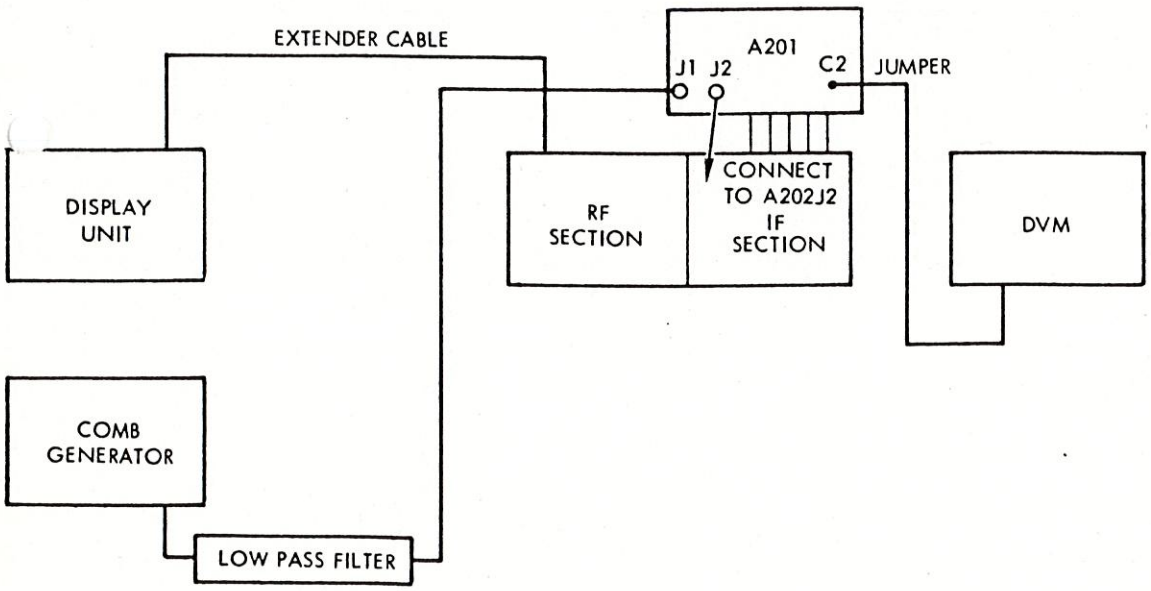


Figure 7-10. A201 Third Converter Board Test Setup

(1) Adjust FINE TUNE front panel to obtain 6.95 to 7.05 VDC reading on DVM.

(2) Set SCANWIDTH/DIV to 500 kHz and adjust tuning capacitor C7 (through hole in cover) to center the 260 MHz response.

(3) Set comb generator for 1 MHz interpolation markers to obtain at least five side bands on each side of 260 MHz response (not simultaneously visible). Tune FINE TUNE control in clockwise direction until all five sidebands to right of 260 MHz responses are exposed.

NOTE

Depending upon nature of repair to 3rd converter board, it may be necessary to improve linearity by adjusting R69 on oscillator boardk adjacent to C7. This adjustment requires removal of cover.

(4) Adjust R74 and R25 to obtain uniform spacing of sidebands, aligned on graticule lines two divisions apart, plus or minus one minor division.

7-30. LIN-LOG BOARD (A205). Connect comb generator (table 7-1) as shown in figure 7-11. Set controls as follows:

Control	Setting
STD SWEEP	3 msec/DIV
BAND SELECT	1
STAB	OFF
SCANWIDTH/DIV	200 kHz
BANDWIDTH - KHz	100 and noted
LIN/LOG	LIN and noted
IF ATTEN - dB	Noted
Comb Generator	10 MHz
VIDEO DURATION - BW	1 KHz
IF GAIN - VAR	Noted

(1) Use FREQUENCY TUNE and FINE TUNE controls to select a comb signal. Use IF GAIN - VAR and IF ATTEN - dB controls to set signal amplitude near full scale. With LIN-LOG board on extender card, adjust C44 for peak amplitude.

(2) Set BANDWIDTH - KHz to 1.0 and adjust zero control R62 to align trace on graticule baseline.

(3) Using comb generator output level control and IF ATTEN - dB, BANDWIDTH - kHz at 100, set signal level to 2.5 DIV. Remove 10 dB of attenuation and adjust LIN control R58 for full scale signal. Then repeat steps 2 and 3 as needed.

(4) Switch to LOG, remove all IF attenuation, and set comb generator for maximum output. Then check signal level at settings of IF ATTEN - dB of 10, 20, 30.

(5) Signal shall be reduced on screen by 10 dB ±2 dB at each step. To obtain this condition, adjust LOG control R45.

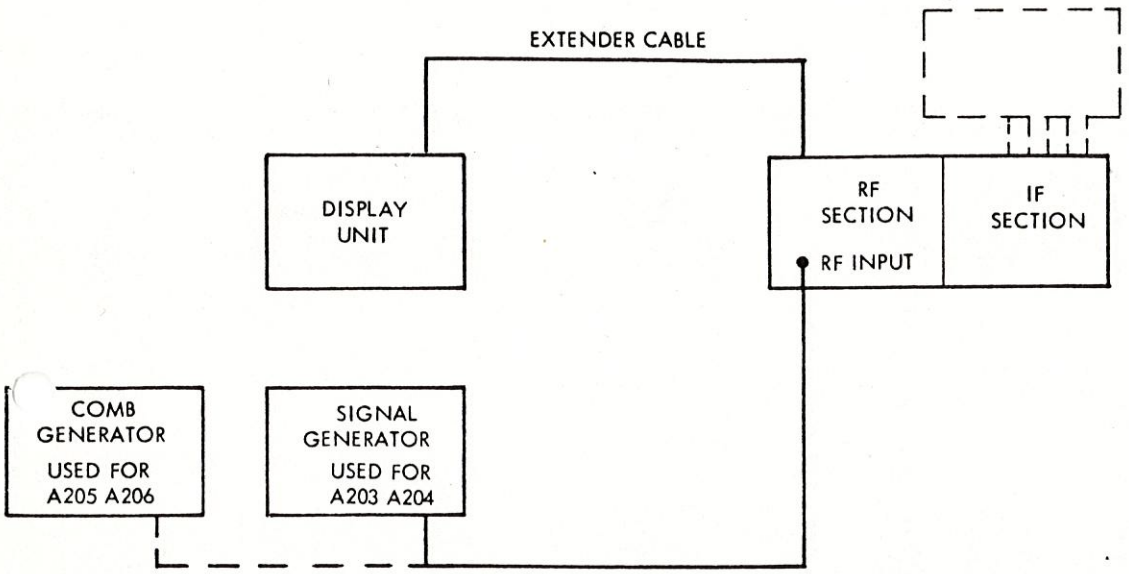


Figure 7-11. IF Section Circuit Boards Test Setup

7-31. HARMONIC ATTENUATOR/VIDEO FILTER/DURATION BOARD (A206). Connect comb generator (table 7-1) as shown in figure 7-11. Set controls as follows:

Control	Setting
STD SWEEP	3 msec/DIV
BAND SELECT	1 and noted
STAB	OFF and noted
SCANWIDTH/DIV	10 MHz and noted
BANDWIDTH - KHz	100 and noted
LIN/LOG	LOG
IF ATTEN - dB and IF GAIN - VAR	For convenient signal level
Comb Generator	10 MHz

(1) Adjust Sweep Amplifier calibration adjust R3 to align responses on vertical lines of graticule.

(2) Check operation of FULL SWEEP switch. Then check operation of VIDEO DURATION - BW control in SHORT, LONG, and 1 kHz positions.

(3) Set SCANWIDTH/DIV to 1 kHz and check operation of STAB control. Adjust BANDWIDTH - KHz as SCANWIDTH is reduced.

(4) Set SCANWIDTH/DIV to 10 MHz and check operation of harmonic attenuator in bands 2 (2nd harmonic) and 3 (3rd harmonic).

7-32. 6.5 MHz CRYSTAL FILTER BOARD (A204). Connect signal generator (table 7-1) as shown in figure 7-11. Set controls as follows:

Control	Setting
STD SWEEP	10 msec/DIV
BAND SELECT	1
STAB	OFF
SCANWIDTH/DIV	50 MHz and noted
BANDWIDTH - KHz	AUTO and noted
LIN/LOG	LOG and noted
IF ATTEN - dB	0
Signal Generator Frequency	400 MHz
Calibrated Level	-30 dBm

(1) Adjust IF GAIN - VAR for full-scale display.

(2) Set BANDWIDTH - KHz to 1000 and check for full scale display, plus or minus 2 dB. Now set BANDWIDTH - KHz to 100 and check for same level display (full scale ±2 dB).

(3) Set BANDWIDTH - KHz to 10, decrease SCANWIDTH/DIV as necessary for convenient display, set STAB to ON, and adjust 10 KHz control R93 for full scale display, plus or minus 2 dB.

NOTE

If necessary to calibrate at 1 kHz bandwidth, the procedure is similar to steps 3 or 4, using 1 kHz control R87 to adjust for full scale display.

(4) Set BANDWIDTH - KHz to 0.3, adjust SCANWIDTH/DIV for convenient display, and adjust 300 Hz control R86 for full scale display, plus or minus 2 dB.

(5) Switch to LIN, set BANDWIDTH - KHz to 1000, SCANWIDTH/DIV to 1 MHz, adjust signal generator for 7 divisions amplitude and check signal width at 2 divisions down for 1 division plus or minus 1 minor division.

(6) Repeat step 4 at BANDWIDTH - KHz of 10, SCANWIDTH/DIV of 10 kHz.

(7) Repeat step 4 at BANDWIDTH - KHz of 1, SCANWIDTH/DIV of 1 kHz.

(8) Set BANDWIDTH - KHz to 0.3, SCANWIDTH/DIV to 1 kHz, adjust signal level for 7 divisions, and check signal width at 2 divisions down for 0.3 division, plus or minus 1 minor division.

NOTE

The bandwidth checks will determine if the 6.5 MHz crystal filter board is serviceable. If checks are unsatisfactory, return the board to factory.

7-33. 100 KHz B.P. FILTER BOARD (A203). Connect signal generator (table 7-1) as shown in figure 7-11. Set controls as follows:

Control	Setting
STD SWEEP	10 msec/DIV
BAND SELECT	1
STAB	OFF
SCANWIDTH/DIV	500 kHz
BANDWIDTH - KHz	1000 and noted
LIN/LOG	LOG and noted
IF ATTEN - dB	0 and noted
Signal Generator Frequency	400 MHz
Calibrated Level	-30 dBm

(1) Adjust IF GAIN - VAR for full scale display at initial settings.

(2) Set BANDWIDTH - KHz to 100, SCANWIDTH/DIV to 100 KHz, adjust FINE TUNE to center the signal on the 6.5 MHz response, and adjust R13 for full scale signal.

(3) Switch to LIN and adjust IF GAIN - VAR and IF ATTEN - dB for signal peak at the 7 division line. Check for band width of one division at two divisions down from peak.

(4) With BANDWIDTH - KHz set at 100, adjust C13, C15, C17, C19 to obtain peak amplitude and best symmetry of signal centered on the 10 kHz response.

7-34. FOURTH CONVERTER BOARD (A202). Connect comb generator and low pass filter (table 7-1) as shown in figure 7-12. Set controls as follows:

Control	Setting
STD SWEEP	3 msec/DIV
BAND SELECT	1
STAB	OFF
SCANWIDTH/DIV	500 kHz
BANDWIDTH - KHz	10 and noted
LIN/LOG	LIN and noted
IF ATTEN - dB	Noted
Comb Generator	10 MHz

(1) Adjust FINE TUNE to center 10 MHz response.

(2) Set BANDWIDTH - KHz to 1000 and adjust IF ATTEN - dB to position signal peak at the 7 division line. Check for bandwidth of 2 divisions, plus or minus one minor division.

(3) Adjust C3, C12, C20, C26, C27, C30, C32, and C37 capacitors to obtain the specified bandwidth, with a symmetrical signal, centered on the 10 MHz response of Step 1.

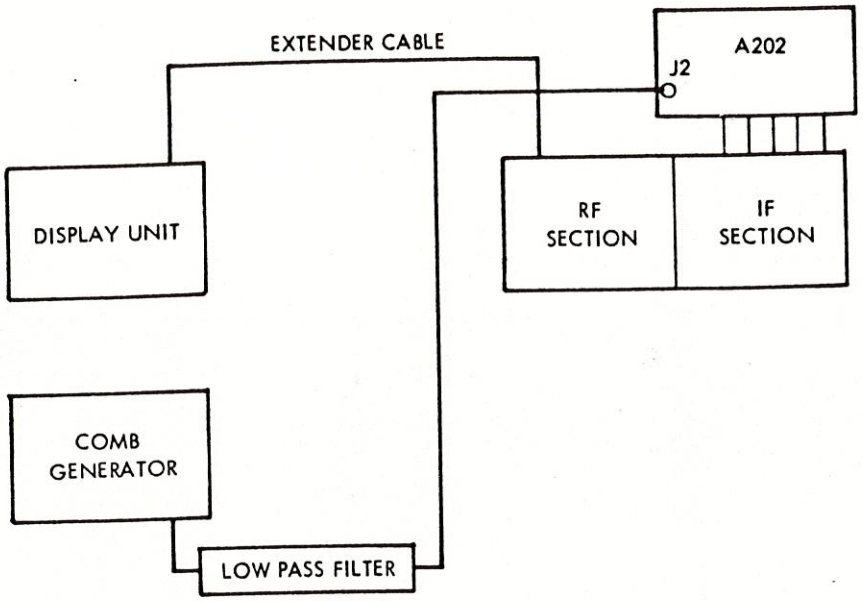


Figure 7-12. A202 Fourth Converter Board Test Setup

(4) Remove test connections. Set LIN/LOG switch to LOG. Connect signal generator to RF INPUT connector, and set signal generator output for 400 MHz at a calibrated level of -60 dBm. Remove all IF attenuation (IF ATTEN switches all set to down position), and set front-panel CAL screwdriver adjustment to mid-range.

(5) Set IF GAIN - VAR control to 60 dB. Adjust R35 for full-scale deflection.

(6) Set IF GAIN - VAR control for 0 dB. Adjust R37 so that signal peak is 60 dB down from full-scale.

(7) Repeat steps 5 and 6 so as to obtain a 60 dB range for the IF GAIN - VAR control.