

4-4 POWER SUPPLY CIRCUITS

4-4-1 VOLTAGE LINES

LINE	DESCRIPTION
HV	The voltage from the external power connector.
VCC	The same voltage as the HV line which is controlled by PWON signal from the CPU using a switching FET(Q14)
CPU5V	HV line converted at the 5V regulator IC(IC3). This voltage is supplied to the CPU regardless of the power switch.
+5V	CPU5V converted from the HV line at 5V line as the reference voltage.
+8V	VCC line converted at IC2.
R8V	Receive 8V controlled by TXC signal from the IC13. this voltage is converted from the VCC line at Q10 and D15 using the +8V line as the reference voltage.
T8V	Transmit 8V controlled by R8V . This voltage is converted from the VCC line at Q8 and D14 using the +8V line as the reference voltage.
NWC	Wide 5V controlled by NWC signal from the IC13.

***** Trimmer Control Software for IC-F300 Series ***** Rev. 1.0

Connected

DC voltage → A/D VIN 165: A5h 12.94V
 Internal teperature → A/D TEMPS 173: ADh 24.81'C
 PLL lock voltage → A/D LVIN 47: 2Fh 0.92V
 DTCS balance level → D/A DTCS BL 149: 95h 58.43%
 SQL level → D/A SQL Lev 0: 00h 0.00%

D/A BP T1 98: 62h 2.03V
 D/A BP T2 49: 31h 1.41V
 D/A BP T3 41: 29h 1.31V
 D/A T4/POW 43: 2Bh 1.34V
 D/A REF 147: 93h 2.40V
 D/A AF/Dev 0: 00h 0.00%

RX: 440.20000MHz TX: 440.10000MHz POW:High MODE: Wide

Operating channel →

RF output power →

FM deviation →

DTCS balance →

Reference frequency →

Recieve sensitivity →

Memory CH: 1
 Power(Hi): 174
 Power(L2): 0
 Power(L1): 50
 M O D N : 84
 M O D W : 176
 DTCS N : 68
 DTCS W : 149
 TXF SET :

BPF T1 : 40
 BPF T2 : -9
 BPF T3 : -17
 BPF T4 : -15
 AF Vol.L: 0
 S Q L : 0

[Space]: A/D,D/A Read
 [TAB]: Display parameters [F8] at BPF: Sweep [F9] at BPF T1: Sweep T1-T4
 [Enter] at TXF:REF Set Mode / :Cursor Up/Down / :-/+ ESC:Quit

ADJUSTMENT PROCEDURES

5-1 PREPARATION

■ REQUIRED TEST EQUIPMENT

EQUIPMENT	GRADE AND RANGE	EQUIPMENT	GRADE AND RANGE
DC power supply	Output voltage :13.6 V DC Current capacity :11 A or more	Audio generator	Frequency range:300-3000 Hz Output level :1-500 mv
RF power meter (terminated type)	Measuring range :1-100W Frequency range :120-1000MHz Impedance :50 Ω SWR :Less than 1.2:1	Attenuator	Power attenuation:50 or 60dB Capacity :50W or more
Frequency counter	Frequency range :0.1-1000MHz Frequency accuracy:±1ppm or better Sensitivity :100 mV or better	Standard signal generator (SSG)	Frequency range:120-1000MHz Output level :0.1uV-32 mV (-127 to -17dBm)
		DC voltmeter	Input impedance:50K Ω/V DC or better
FM deviation meter	Frequency range :DC-1000MHz Measuring range :0 to +5 kHz	Oscilloscope	Frequency range:DC-20 MHz Measuring range:0.01 -20 V
Digital multimeter	Input impedance :10 MΩ/V DC or better	AC millivoltmeter	Measuring range:10 mV-10 V

■ TRIMMER ADJUSTMENT

When you adjust the contents on page 5-3,5-4 TRIMMER ADJUSTMENT, the optional EX-2057 FIELD PROGRAMMING SOFTWARE and OPC-427,OPC-592 CLONING CABLE are required.

· STARTING TRIMMER ADJUSTMENT

Turn ON power to the transceiver, connect a computer to the [MIC] jack using the optional OPC-427, OPC-592 CLONING CABLE, then start up the ",ADJUST" program in EX-2057.

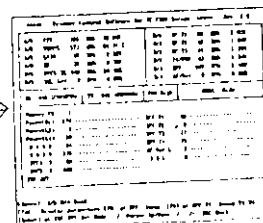
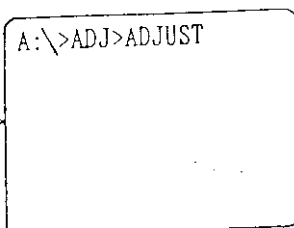
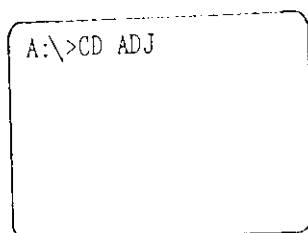
· STARTING THE PROGRAM

- ① Boot up DOS.
- ② Insert the EX-2057 backup disk into drive A.

- ③ Type the following to start up the program:
ADJ>ADJUST [Enter]

*The adjustment screen appears after reading set data from the transceiver.

- ④ After the adjustment screen appears, set or modify the data as desired.



Boot up DOS, and change the directory.

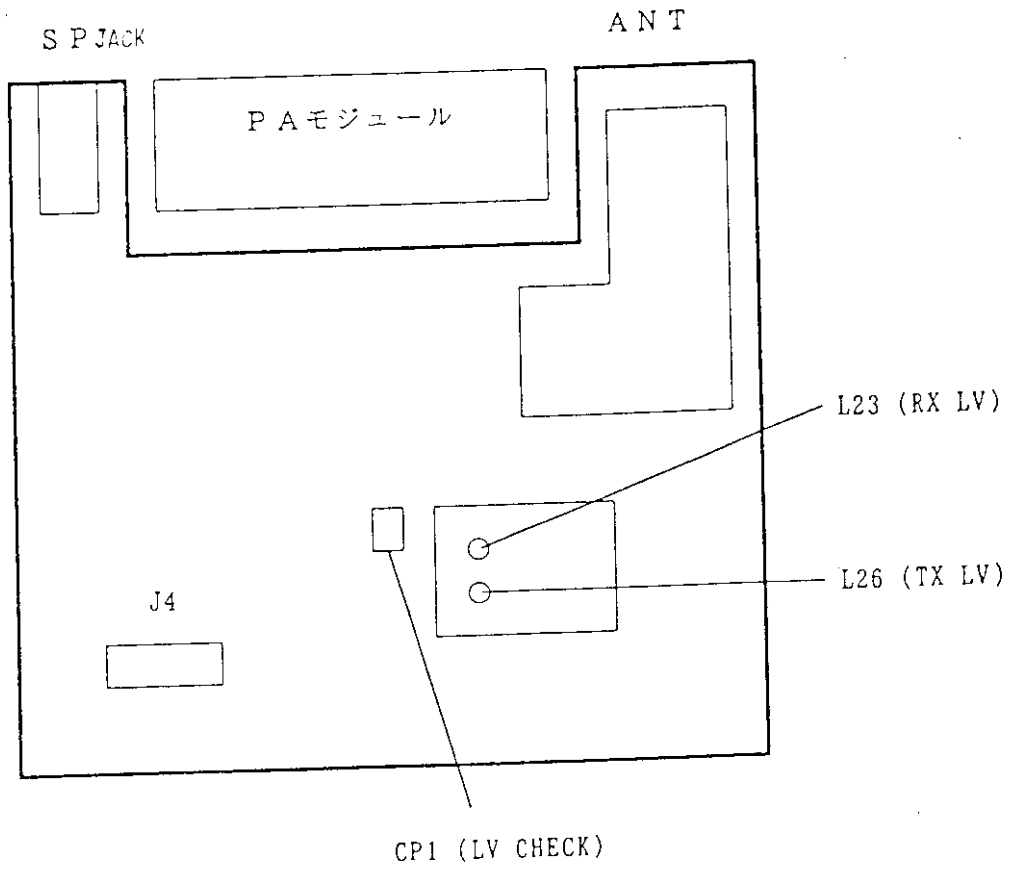
Startup command.

Program starts up, then the adjustment screen appears after reading set data from the transceiver.

5-2 PLL ADJUSTMENT for IC-F420

ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		ADJUSTMENT		
		UNIT	LOCATION	VALUE	UNIT	ADJUST
PLL LOCK VOLTAGE	1 Operating freq.: 490.000 MHz Receiving	MAIN	Connect a multi-meter to check point CP1.	1.5 V	MAIN	L23
	2 Transmitting			1.5 V		L26

MAIN unit



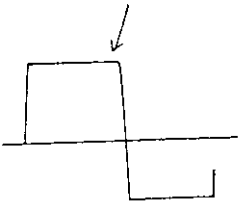
5-3 TRIMMER ADJUSTMENT for IC-F420

Select an operation using [↑]/[↓] keys, then set the specified value using [←]/[→] keys on the connected computer keyboard.

ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE
		UNIT	LOCATION	
REFERENCE FREQUENCY	1 Operating freq.: 490.000 MHz	MAIN	Loosely couple a frequency counter to the antenna connector.	490.000000 MHz
OUTPUT POWER	1 Operating freq.: 490.000 MHz High/Low switch : High Transmitting	MAIN	Connect an RF power meter to the antenna connector.	35.0 W
	2 High/Low switch : Low Transmitting			3.5 W
FM DEVIATION	1 Operating freq.: 490.000 MHz High/Low switch : Low Connect an audio generator to the [MIC] jack and set as: 1 kHz/ 40 mV Set an FM deviation meter as: HPF :OFF LPF :20 kHz De-emphasis:OFF Detector :(P-P)/2 Transmitting	MAIN	Connect an FM deviation meter to the antenna connector through an attenuator.	±4.2 kHz (W-type) ±2.1 kHz (N-type)
BPF1-BPF4	1 Operating freq. 490.000 MHz Set an SSG as: Level :-10dBu Modulation :1 kHz Deviation :±3.5 kHz (W-type) ±1.75 kHz (N-type) Receiving	MAIN	Connect an SSG to the antenna connector and a SINAD meter with an 4 Ω load to the [SP] jack.	Maximum sensitivity level
<p>CONVENIENT:The BPF1-BPF4 can be adjusted automatically.</p> <p>①-1 Set each to 0, then push the [F9] key. (The cursor must be set to the BPF1 position.)</p> <p>②-1 The connected PC tunes BPF1-BPF4 to peak levels.</p> <p style="text-align:center">or</p> <p>①-2 Set the cursor to one of BPF1, 2, 3 or 4 as desired.</p> <p>②-2 Push [F8] to start tuning.</p> <p>③-2 Repeat ①-2 and ②-2 to perform additional BPF tuning.</p>				

5-4 TRANSMITTER ADJUSTMENT for IC-F420

Select an operation using [↑]/[↓] keys, then set the specified value using [←]/[→] keys on 5-2. on the connected computer keyboard.

ADJUSTMENT	ADJUSTMENT CONDITIONS	MEASUREMENT		VALUE
		UNIT	LOCATION	
DTCS WAVE at wave	1 Operating freq.: 501.000 MHz High/Low switch : Low No audio applied to the [MIC] jack. Transmitting	MAIN	Connect an FM deviation meter to the antenna connector through an attenuator.	Set to flat wave form 
SQUELCH	1 Operating freq.: 490.000 MHz	MAIN	Connect an SSG to the antenna connector and SINAD meter with an 4 Ω load to the antenna connector.	
	2 Set an SSG as: Level :-10dBu Modulation :1 kHz Deviation : ±3.5 kHz (W-type) ±1.75 kHz (N-type)			At the point where the audio signals just appears.