

■ ADJUSTMENTS

● Before adjustment

- 1) After the power switch is pushed on, wait for 5 minutes before measuring, to be sure of the most stable operation.
- 2) Adjust the OSC coil and IFT with a nonferrous screw driver.
- 3) Set the switches to the following positions.

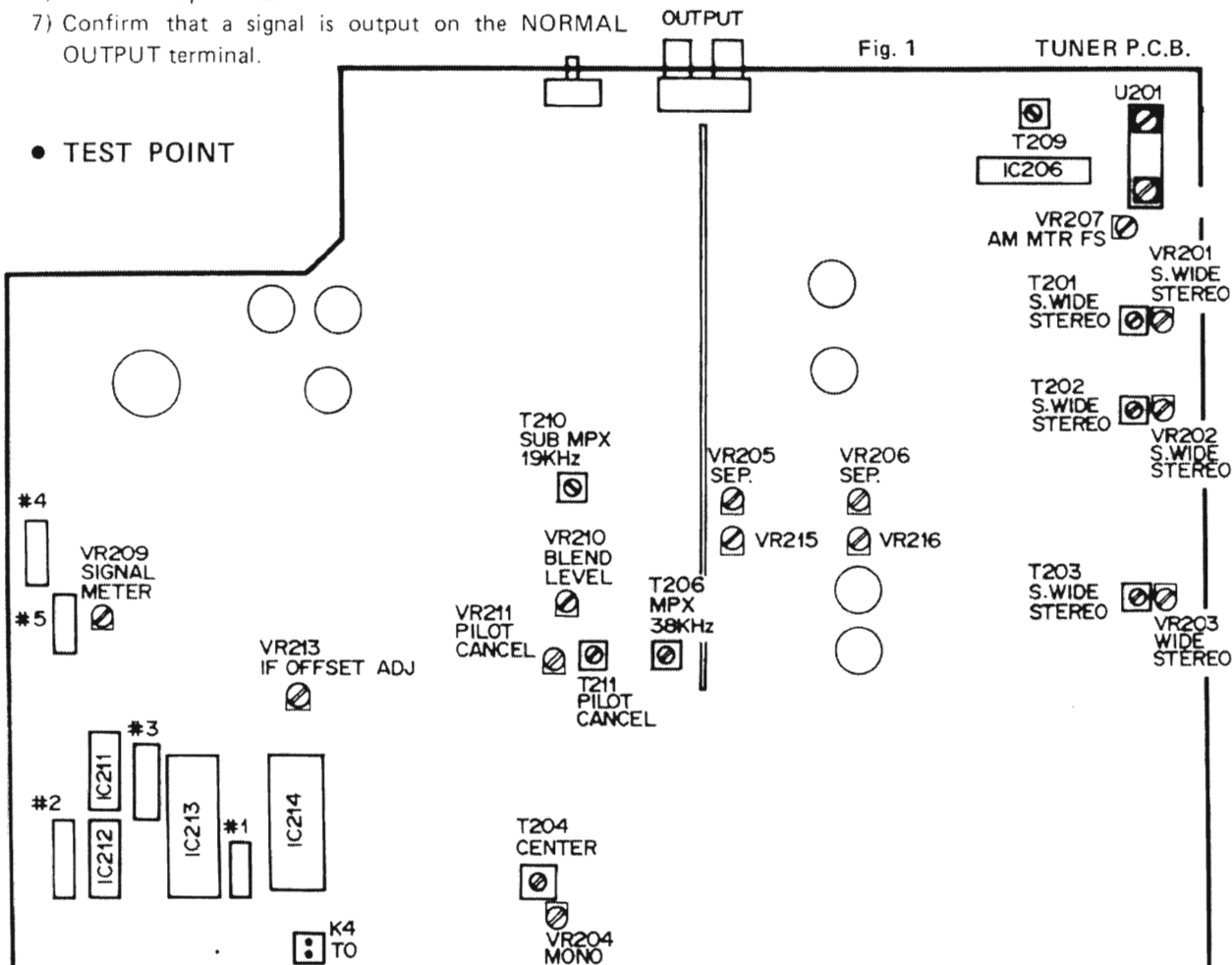
TUNING MODE AUTO
RECEIVING MODE AUTO

- 4) Proceed with the AM section adjustments after having finished the FM section adjustment.
- 5) $0 \text{ dB}\mu = 1 \mu\text{V}$ Ex: $60 \text{ dB}\mu = 1 \text{ mV}$
- 6) $\text{dBf} = \text{xx dB}\mu + 11.2$
- 7) Confirm that a signal is output on the NORMAL OUTPUT terminal.

● TEST POINT

● Measuring instruments abbreviation

FM SG : FM signal generator
SSG : Stereo signal generator
AM SG : AM signal generator
DIST.M : Distortion meter
FC : Frequency counter
ACVM : AC voltmeter
DCVM : DC voltmeter



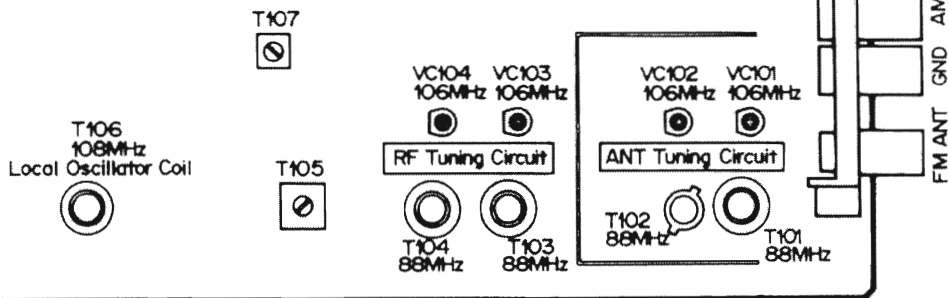


Fig. 1

FRONT-END P.C.B.

<CHECK OF POWER SUPPLY SECTION>

Check that the following voltages are obtained respectively across each test point and ground on tuner circuit.

Test Point	Rating or Standard	Remark
+12	+12.5 V \pm 0.5 V	Make sure that AC line voltage comes within
+5.6	+5.6 V \pm 0.5 V	
+30	+30 V \pm 3 V	
-6	-6.0 V \pm 0.5 V	
FB	At FM Reception mode +12 V \pm 1 V	
	At AM reception mode 0 V	
AB	At FM reception mode 0 V	
	At AM reception mode +12 V \pm 1 V	

Models	AC line voltage
U, C	120 V \pm 10%
G	220 V \pm 10%
A, B	240 V \pm 10%

<PRESET SECTION>

- Shorting K4 T0 while set at FM will result in automatic memory of each preset from P1/P11 to P10/P20 as given in the right table. This is convenient when making an adjustment.

P1/P11	P2/P12	P3/P13	P4/P14	P5/P15
AM 630 kHz	AM 1080 kHz	AM 1440 kHz	FM 87.5 MHz	FM 95.1 MHz
P6/P16	P7/P17	P8/P18	P9/P19	P10/P20
FM 98.1 MHz	FM 101.5 MHz	FM 108.0 MHz	FM 88.0 MHz	FM 106.0 MHz

- Use 19 kHz L.P.F. to measure the output.
- On step 1 and 2 connect the auxiliary center meter (ji00036 or similar) to confirm the best tuned point.
- 100% modulation means that the Frequency Deviation is 75 kHz.
- Connect the audio measuring equipments (Distortion meter, Oscilloscope, and Level meter) to the output terminals of tuner.
- Connect a tuning meter (Ji00036 or equivalent, current sensitivity of around 250 μ A) to between the terminals Sout and E (see Fig. 2).

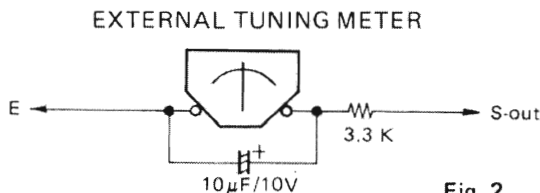


Fig. 2

- Use a lowpass filter with an exception for CARRIER LEAK ADJUSTMENT.
- Unless otherwise specified: TUNING MODE, IF MODE, DYNAMIC BLEND → AUTO MODE → AUTO STEREO, RF MODE → NORMAL
- Equipments: FM SG, STEREO SG, DISTORTION METER, OSCILLOSCOPE, TUNING METER (SG signal is applied to 75 Ω ANT terminal)

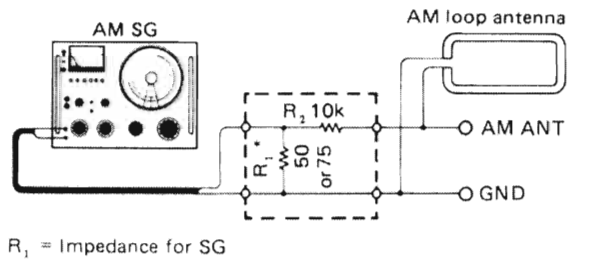
Step	Item	Input signal (Frequency)	Adjustment Point	Adjustment/Confirmation	Reference
1	Discriminator balance		T204	As operating SEARCH, adjust T204 to the tuning meter 0-point.	Use EXTERNAL TUNING METER connected to S-out terminal
2	Confirmation of tuning center	98 MHz 70 dB μ	Up or DOWN SW	Confirm that the signal is received at around 0 point	
3	Local oscillator coil	108 MHz	T106	Confirm a change of V_T with adjusting the oscillator coil (T106) – PLL lock Adjust T106 to $V_T = +25 \pm 0.2$ V	Connections: Same as the finished tuner TUNING MODE: → MANUAL
		87.5 MHz	–	Confirm – $V_T > 5$ V	
4	RF tuning circuit	88 MHz	T103	Adjust T103 to the maximum sensitivity	
		106 MHz	VC103	Adjust VC103 to the maximum sensitivity	
		88 MHz	T104	Adjust T104 to the maximum sensitivity	
		106 MHz	VC104	Adjust VC104 to the maximum sensitivity	
				Repeat the above adjustments	
5	ANT tuning circuit	88 MHz	T101	Adjust T101 to the maximum sensitivity	
		106 MHz	VC101	Adjust VC101 to the maximum sensitivity	
		88 MHz	T102	Adjust T102 to the maximum sensitivity	
		106 MHz	VC102	Adjust VC102 to the maximum sensitivity	
				Repeat the above adjustment	
6	Confirmation of sensitivity	88 MHz 98 MHz 106 MHz	–	Confirm that the sensitivity on the each frequency is satisfied the specifications	

Step	Item	IF MODE	Input Signal	Adjustment Point	Adjustment/ Confirmation	Rating	Reference
7	MONO distortion	S. WIDE	Mono 100 Hz (400 Hz) 100% MOD	VC201 VR204 (MONO)	Adjust to the minimum distortion		
8	PLL input phase		STEREO (L-R) 1 kHz 100% MOD	T206 T210 (SUB)	Adjust to the maximum (TUNER OUTPUT)		
9	STEREO distortion	S. WIDE	STEREO (L or R) 1 kHz 100% MOD	T107 T201, VR201 T202, VR202 (STEREO)	Adjust to the minimum distortion	< -56 dB (0.2%)	
10		WIDE		T203 VR203 (STEREO)	Adjust to the minimum distortion		
11	Confirmation of STEREO distortion	NARROW				< -40 dB (1%)	
12		S. NARROW				< -30 dB (3%)	
13	Confirmation of MONO distortion	S. WIDE	MONO 1 kHz 100% MOD			< -56 dB (0.2%)	
14	Separation	S. WIDE	STEREO L, R 1 kHz 100% MOD	VR205 VR206	Adjust to the maximum separation	> 40 dB	
		WIDE		VR215 VR216			
15	Pilot cancel		Pilot 9% MOD only	T211 VR211 (PILOT CANCEL)	Adjust to the minimum carrier leak	< -50 dB	
16	Discriminator balance confirmation		-10 dB μ (1.2 dBff) or detune		Confirm that the tuning meter indicates 0 while searching		If not: Repeat from step-1
17	Signal meter full-scale	S. WIDE	80 dB μ (91.2 dBf)	VR209	Adjust to the point all LEDs light up and –		
			detuning		All fade out		
18	Blend level	S. NARROW	20 dB μ (31.2 dBf) STEREO (L-R) 1 kHz, 30% MOD	VR210	Adjust to the point that the detector output is 0.2 dB down from the maximum level		
19	IF off-set		98 MHz \pm 1 kHz 70 dB μ (81.2 dBf) No modulation	VR213	With each shorting of the terminals K4 and T0, the frequency display shifts 1 digit, so that adjust VR213 for 10 kHz position comes to 9 or 0		CSL reception K4, K0 short
20	Confirmation of Auto-search (UP/DOWN SW)	AUTO	20 dB μ 1 kHz, 100% MOD		Confirm Auto-reception by operating UP/DOWN SW. Also confirm that the mute is working while searching		K4, T0: open
21	Confirmation of RF MODE				Confirm a decline of sensitivity with RF MODE SW at DIRECT position		Observe waveform

<AM TUNER SECTION>

- FM Adjustment must be completed.
- Equipments: AM SG, Dummy Ant, Oscilloscope, Distortion meter.
- Connect the AM loop antenna to the AM ANT terminals.
- Connect the AM dummy antenna for adjustment.

AM DUMMY ANTENNA CONNECTION



	Item	Conditions	Adjustment Point	Adjustment	Confirmation
0		AM/FM SW → FM Short K4 and T0	The following frequencies are automatically preset in P1-10/P11-20 MEMORIES.		
1	Confirmation of sensitivity	400 Hz, 30% MOD		Obtain AM SG output level where distortion become 10%.	
		630 kHz	P1/P11		< 58 dB μ (69.2 dBf)
		1080 kHz	P2/P12		< 58 dB μ (69.2 dBf)
		1440 kHz	P3/P13		< 58 dB μ (69.2 dBf)
2	Signal meter full-scale	1080 kHz 80 dB μ (91.2 dBf)	VR207 (AM MTR FS)	Adjust to the point all LEDs light up.	P2/P12
		Detuning		All LEDs goes off	
3	Confirmation of auto-search (UP/DOWN SW)	60 dB μ (71.2 dBf)	UP/DOWN SW	Confirm auto-reception by operating UP/DOWN SW	Tuning mode: → AUTO

Connections: Same as FM, AM SECTION

Equipments: Same as FM, AM SECTION

Input Signal: FM – 98 MHz, 70 dBμ (81.2 dBf), STEREO (L or R), 100% MOD

AM – 1080 KHz, 80 dBμ (91.2 dBf), 400 Hz, 30% MOD

	Item	Condition/Procedure	Confirmation	Reference
1	Confirmation of Power supply mute and Initial State	Operate POWER SW On ⇌ OFF	Confirm the function of Muting circuit.	
2	Preset memory	AM/FM SW → FM	Confirm that the indicator shows FM band's frequency and "FM", "MHz" indications	
		Operating TUNING MODE SW	Confirm that the MODE is alternately switched AUTO ⇌ MAN'L	Check by AUTO-INDICATOR
		Press UP/DOWN SW repeatedly	Confirm that f-indication changes by 100 kHz-step (A, E, B models and G model are 50 kHz-step)	TUNING MODE SW: → MAN'L
		Press UP/DOWN SW continuously	Confirm that f-indication changes by 100 kHz-step continuously	
		Press MEMORY SW	MEMORY INDICATOR flashes	TUNING MODE: AUTO RF MODE: DIRECT IF MODE: AUTO DYNAMIC BLEND: AUTO MODE: AUTO STEREO
		Set P1-10 and press P1	MEMORY INDICATOR goes off and P1-LED lights up (preset has done)	
		Function → AM	Confirm that "AM" "kHz" indicators light up	
		Press UP/DOWN SW repeatedly	Confirm that f-indication changes by 9 kHz-step (U, C models and G model are 10 kHz-step)	
		Press UP/DOWN SW continuously	Confirm that f-indication changes by 9 (10) kHz-step continuously	
		Press MEMORY SW	MEMORY INDICATOR flashes	
		Press P2	MEMORY INDICATOR goes off and P2-LED lights up (preset has done)	
		Confirmation: Press P1 (P2)	Confirm that the content is read out and P1 (P2)-LED lights up	
		Press P11-20	P11-20 LED flashes	
		Press MEMORY SW	MEMORY INDICATOR flashes	
		Press P11	MEMORY LED goes off and P11-20 LED lights up (Content of P2 was preset in P11)	
		Confirmation: Press P11	Confirm that the content is read out and P11-LED lights up	
3	MODE AUTO STEREO/MONO	MODE SW → MONO Receive STEREO signal	Confirm it results FORCED-MONO reception	
4	FINE TUNING	Press P1 and P2	Read out P1 and P2	
		Press FINE TUNING SW + or -	Confirm FINE TUNING IND lights up	Digit of 10 kHz indicates Q on FM (except A, B, and E models)
		Press again	Confirm searching action FM per 10 kHz, AM per 1 kHz	
5	IF MODE	Press P1	Read out P1	Also check LEDs properly switched over
		AUTO/MAN'L SW → AUTO Press IF MODE SW	Confirm that MODE is automatically switched over to MANUAL when whichever the IF MODE SW (S, WIDE, WIDE, NARROW, and S. NARROW) and pressed	
		AUTO/MAN'L SW → AUTO IF MODE: S. WIDE Gradually reduce ANT input level	Confirm IF MODE automatically switched over from S. WIDE through S. NARROW	
6	Last station memory	PWER SW → OFF → ON again 5 sec. later	Read out PRESET Confirm PRESET is read out	P1-LED lights up