

# DENON

HiFi Stereo AM-FM Tuner

## SERVICE MANUAL

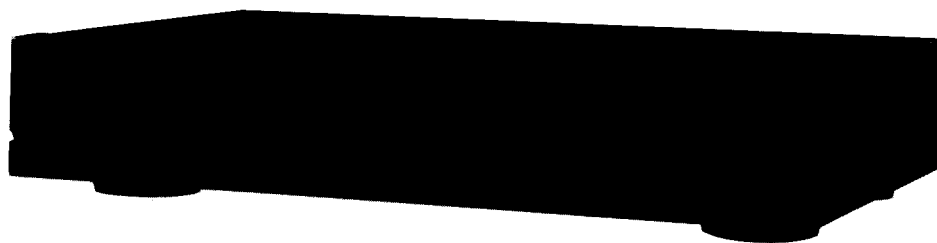
# MODEL TU-800/800L

**TU-800**

**2-BAND(AM-FM)STEREO TUNER**

**TU-800L**

**3-BAND(LW-MW-FM)STEREO TUNER**



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**NIPPON COLUMBIA CO., LTD.**

## SPECIFICATIONS

## FM SECTION

<b>Frequency Range:</b>	87.5 MHz ~ 108 MHz
<b>Antenna Terminals:</b>	75 ohm unbalanced
<b>Usable Sensitivity:</b>	0.8 $\mu$ V (9.3 dBf) (DIN) 0.9 $\mu$ V (10.2 dBf) (IHF)
<b>S/N 50 dB Sensitivity:</b> (The $\mu$ V is at 75 ohm and 0 dBf at $10^{-15}$ W) (new IHF Standard)	Monaural: 1.6 $\mu$ V (15.3 dBf) Stereo: 20 $\mu$ V (37.2 dBf)
<b>Image Rejection:</b>	100 dB
<b>IF Rejection:</b>	100 dB
<b>AM Suppression:</b>	70 dB
<b>Effective Selectivity:</b>	Wide 50 dB ( $\pm$ 400 kHz) Narrow 80 dB ( $\pm$ 400 kHz), DIN 80 dB ( $\pm$ 400 kHz) Supper Narrow 80 dB ( $\pm$ 300 kHz)
<b>Capture Ratio:</b>	1.2 dB
<b>Frequency Response:</b>	20 Hz to 15 kHz $\begin{matrix} +0.5 \\ -1.5 \end{matrix}$ dB
<b>Signal-to-noise Ratio:</b>	Monaural: DIN 92 dB For Europe Stereo: DIN 84 dB Monaural: 96 dB (IHF-A) For U.S.A. Stereo: 92 dB
<b>Total Harmonic Distortion:</b>	
Monaural	1 kHz 0.02%
Stereo	1 kHz 0.04%, 0.03% (DIN)
<b>Stereo Separation:</b>	1 kHz 60 dB
<b>Muting Operation Level:</b>	Low 10 $\mu$ V High 20 $\mu$ V
<b>Output Level (at 100% modulation):</b>	0.6 V

## AM SECTION

<b>MEDIUM WAVE</b>	
<b>Frequency Range:</b>	522 kHz ~ 1611 kHz (For Europe) 520 kHz ~ 1710 kHz (For USA and Canada)
<b>Antenna Terminal:</b>	Terminal Type, with Loop Antenna
<b>Usable Sensitivity:</b>	18 $\mu$ V
<b>Selectivity:</b>	50 dB (9 kHz) (For Europe) 55 dB (10 kHz) (For USA and Canada)
<b>Signal-to-noise Ratio:</b>	53 dB
<b>Image Rejection:</b>	45 dB
<b>Output Level (at 30% modulation):</b>	0.18 V
<b>LONG WAVE</b>	
<b>Frequency Range:</b>	153 kHz ~ 360 kHz
<b>Usable Sensitivity:</b>	30 $\mu$ V
<b>Selectivity:</b>	50 dB ( $\pm$ 9 kHz) For Europe
<b>Signal-to-noise Ratio:</b>	50 dB
<b>Image Rejection:</b>	50 dB
<b>OTHERS</b>	
<b>Power Supply:</b>	AC 220 V/50 Hz (for Europe) AC 240 V/50 Hz (for U.K. and Australia) AC 120 V/60 Hz (for U.S.A. and Canada) AC 110/120/220/240 V, 50/60 Hz (Multiple) (Asia)
<b>Power Consumption:</b>	AC 18 W
<b>Dimensions:</b>	434 mm (17-3/32") W x 88 mm (3-15/32") H x 320 mm (12-19/32") D
<b>Net Weight:</b>	4.0 kg (8 lbs, 13 oz)

Design and specifications are subject to change without prior notice.

NOTE: This Service Manual is prepared based on European for Black Version.

## PRECAUTIONS

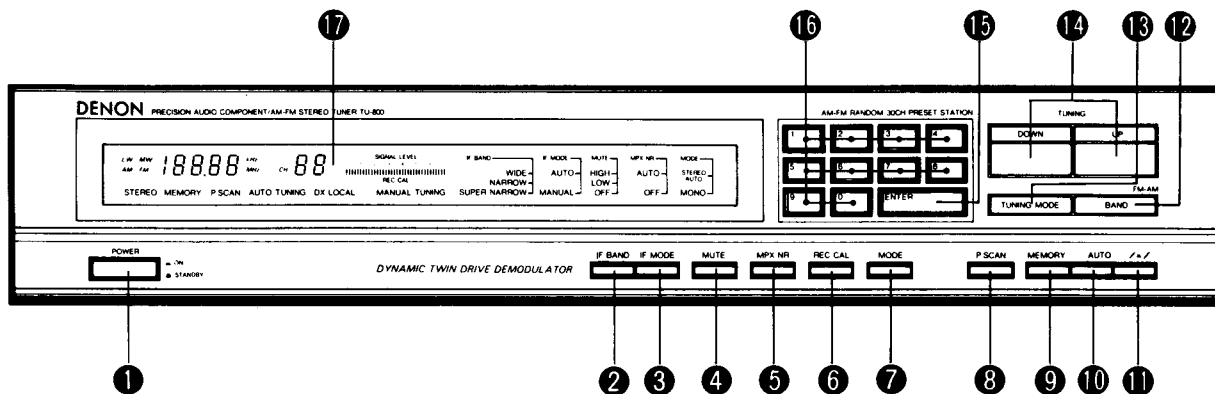
- AVOID HEAT
- AVOID MOISTURE AND DUST
- HANDLE THE POWER LEAD CAREFULLY
- UNPLUG POWER CORD IN YOUR LONG ABSENCE
- PUT NOTHING INSIDE THE UNIT
- CHEMICAL CLEANERS, SOLVENTS AND INSECTICIDES WILL DAMAGE THE CABINET
- DO NOT OPEN THE COVER
- DO NOT BLOCK VENT

## FOR ASIA MODEL ONLY

## Setting the line voltage

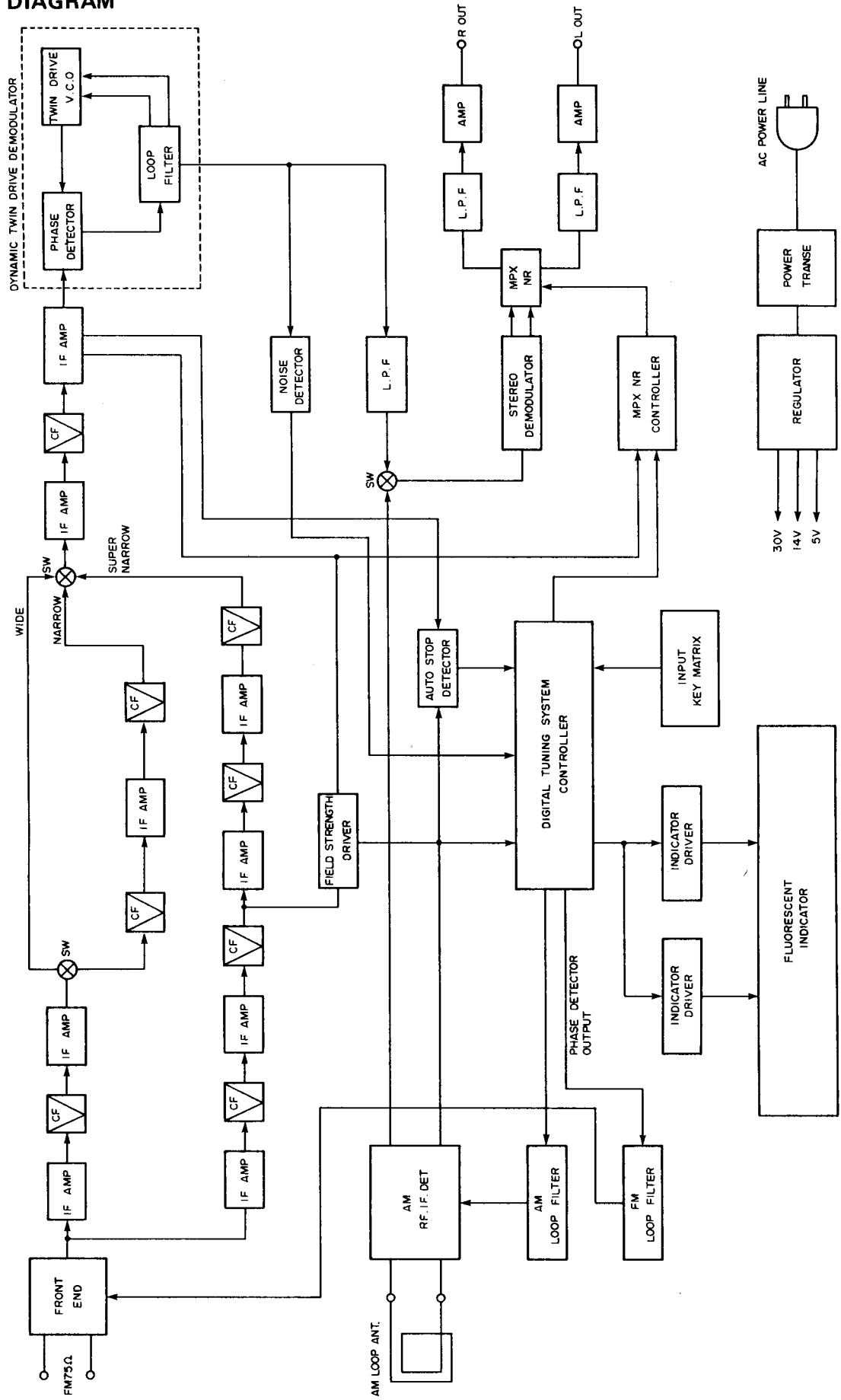
- The customer can set the VOLTAGE SELECTOR KNOB on the back panel for appropriate line voltage by using a screwdriver.
- Do not use excessive force in setting the VOLTAGE SELECTOR KNOB – you may damage it.
- If the VOLTAGE SELECTOR KNOB does not turn smoothly, call qualified service personnel.

## FUNCTIONS OF PANEL CONTROLS



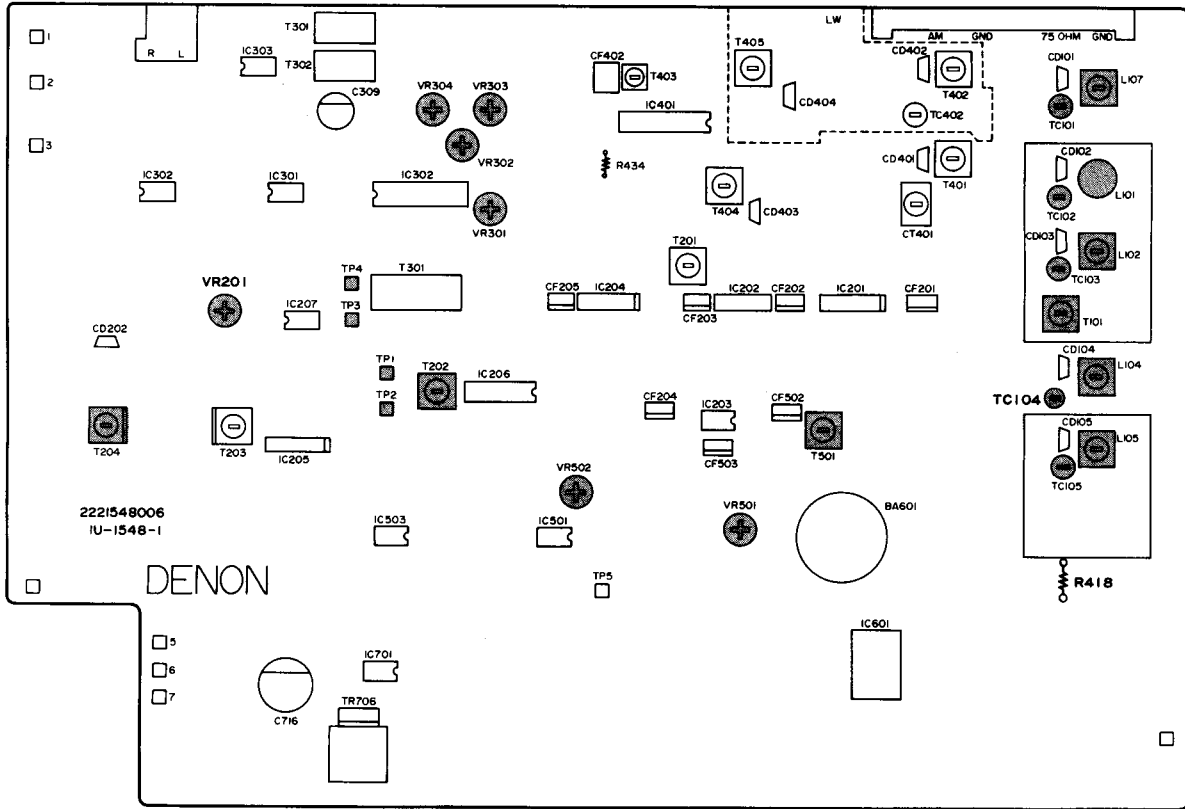
- 1 POWER (Power On/Off Switch)**  
The unit works 2-3 seconds after this switch is turned on.
- 2 IF BAND (IF Band Selector Button)**  
Selects the selectivity of the FM intermediate frequency amplification band from 3 ranges, "WIDE", "NARROW" and "SUPER NARROW".  
This switch is not effective during "Preset Scan" and "AUTO MEMORY".
- 3 IF MODE (IF Mode Button)**  
Selects "AUTO" or "MANUAL" IF Band selection.  
AUTO: The optimum IF band is set automatically for each FM station being received.  
MANUAL: The IF band remains fixed.
- 4 MUTE (Mute Button)**  
Switches between 3 muting levels, "OFF", "LOW" and "HIGH".
- 5 MPX NR (MPX NR Button)**  
Switches MPX NR "OFF" or "AUTO."  
AUTO: Suppresses noise when a stereo broadcast with a weak signal is being received.  
OFF: Does not carry out the above operation.
- 6 REC CAL (Rec Calibration Button)**  
Used to set the recording level of tape deck for FM broadcast recording. The output is adjusted to approximately half the peak level of the FM broadcast. Refer to the user's manual for your tape deck or other recording device.
- 7 MODE (Mode Button)**  
Switches "STEREO AUTO" or "MONO".  
STEREO AUTO and MONO are set automatically by the internal microcomputer. Monaural is set when a station with a weak signal is being received, at which time this button does not operate.
- 8 P. SCAN (Preset Scan Button)**  
Used when checking the content of preset stations. After a station has been received for about 5 seconds, the next station in memory is scanned. Stations in memory which signal level is not strong enough to be received by Auto Stop cannot be received.
- 9 MEMORY (Memory Button)**  
Used to store the frequency of the station currently received.  
Pressing **MEMORY**, **1**, **2**, **ENTER** in order stores the station on channel 12 in memory. Up to 30 channels of either FM or AM can be stored in memory.
- 10 AUTO (Auto Button)**  
Used to store the frequency of a station in memory automatically. Stations which can be stored in memory are those stations with Auto Stop set. During use, be sure to specify of the desired memory number for Auto Memory. Memory numbers 1-30 can be used.  
Pressing **AUTO**, **3**, **/=**, **2**, **0**, **ENTER** in order causes stations to be stored in memory automatically from memory positions 3 to 20.  
**TU-800L:** Not available in this model, during reception of LW only.
- 11 /=/**  
This button is used to specify the memory number for Auto Memory as described in item 10.  
**TU-800L:** Not available in this model, during reception of LW only.
- 12 BAND (Band Button)**  
Selects between FM or AM.  
**TU-800L:** Pressing this button changes the tuner from FM to MW to LW, then back to FM, in that order.
- 13 TUNING MODE (Tuning Mode Button)**  
Switches between Auto Tuning and Manual Tuning.  
AUTO TUNING: Pressing the Up key causes the tuner to begin tuning to a higher frequency and pressing the Down key causes the tuner to begin tuning to a lower frequency.  
Auto stop changes in accordance with the muting level as shown below.  
Mute: Off, Low Auto stop is executed even for a comparatively weak signal.  
High Auto stop is executed for strong stations.
- 14 TUNING (Tuning Buttons)**  
Used to change the received frequency to a higher frequency (UP) or a lower frequency (DOWN).
- 15 ENTER (Enter Button)**  
Used for setting Memory, Auto Memory and Preset Call.
- 16 TEN KEYS (Ten Key Buttons)**  
Used to specify numbers for Memory, Auto Memory and Preset Call. Channels 1-30 can be specified using these buttons.  
Preset Call Setting Method  
A station that has already been preset can be fetched by the following method.  
Pressing **1**, **2**, **ENTER** in order fetches the station preset in memory for channel 12.
- 17 LARGE FLUORESCENT INDICATORS**  
This large fluorescent indicator indicates the receiving conditions, operating conditions and other informations clearly.

# BLOCK DIAGRAM



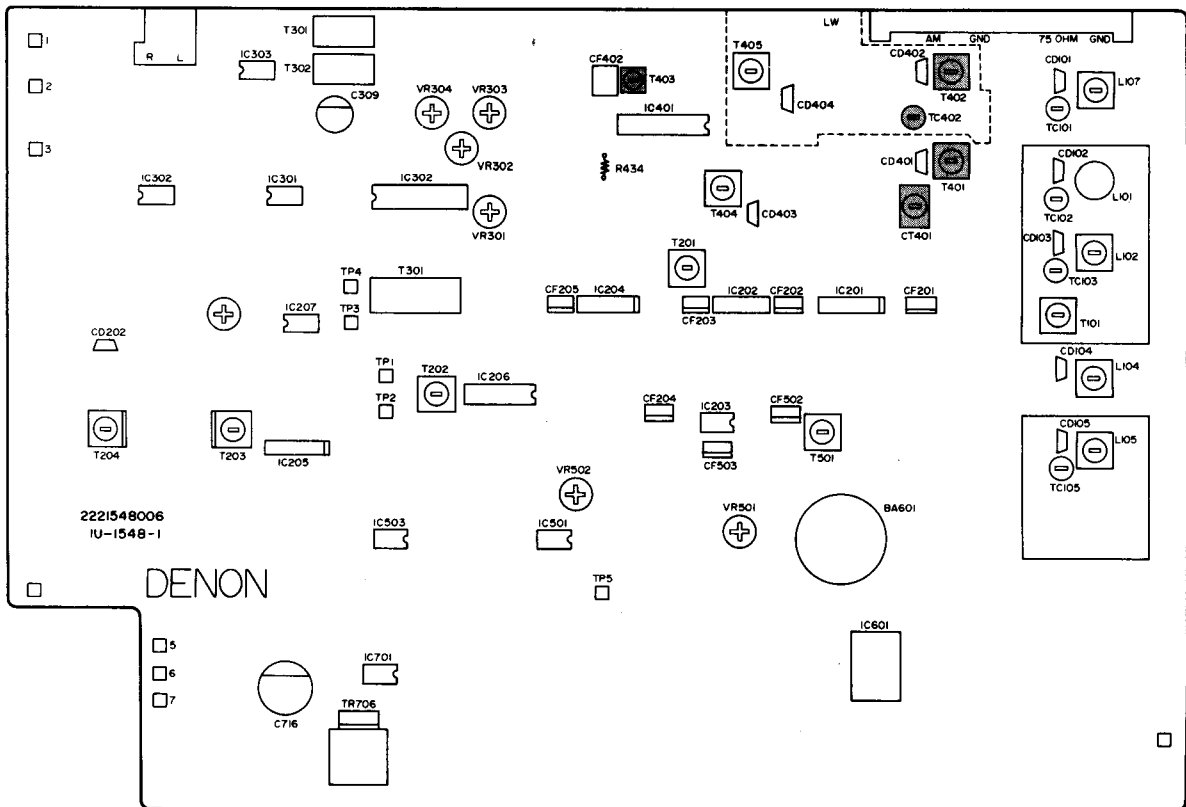
# 1U-1548 TUNER UNIT FM Alignment Points

(Component Side)



# 1U-1548 TUNER UNIT AM (MW, LW Alignment Points)

(Component Side)

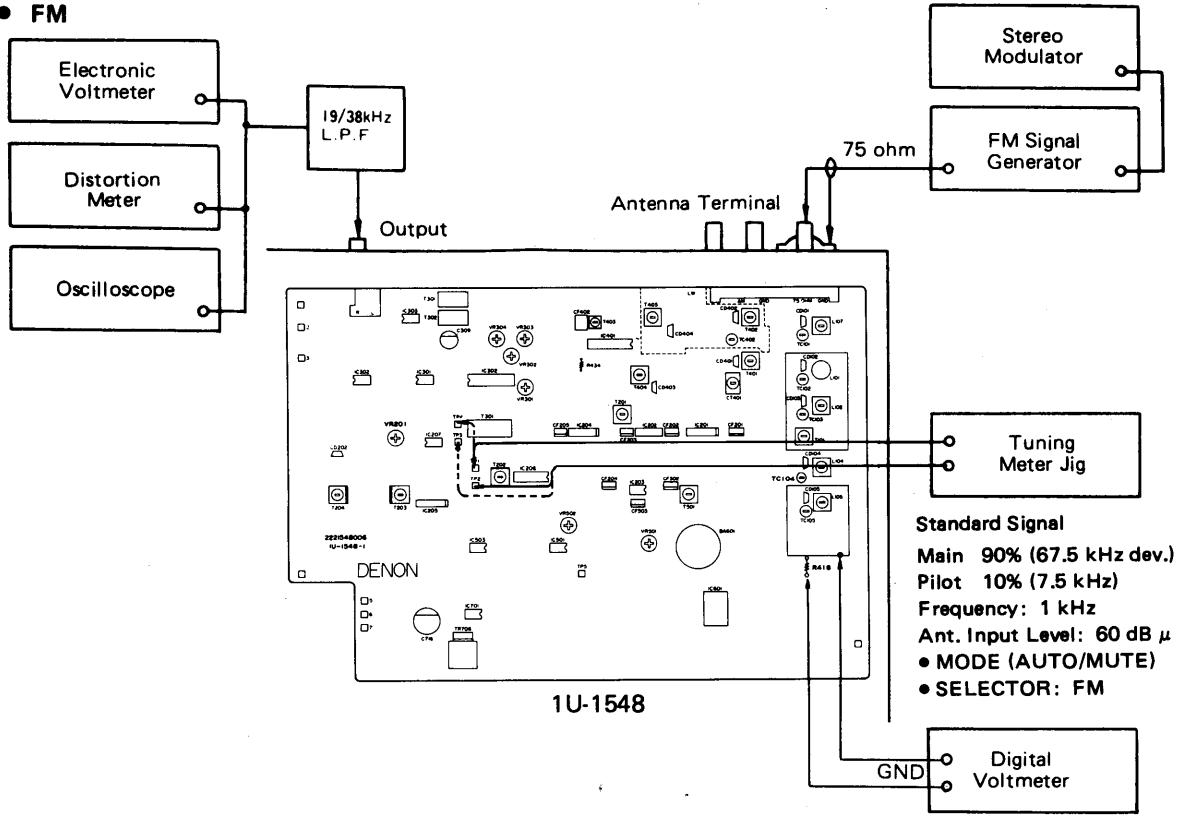


## METHOD OF ADJUSTMENTS

### CONNECTION DIAGRAM OF MEASURING INSTRUMENTS

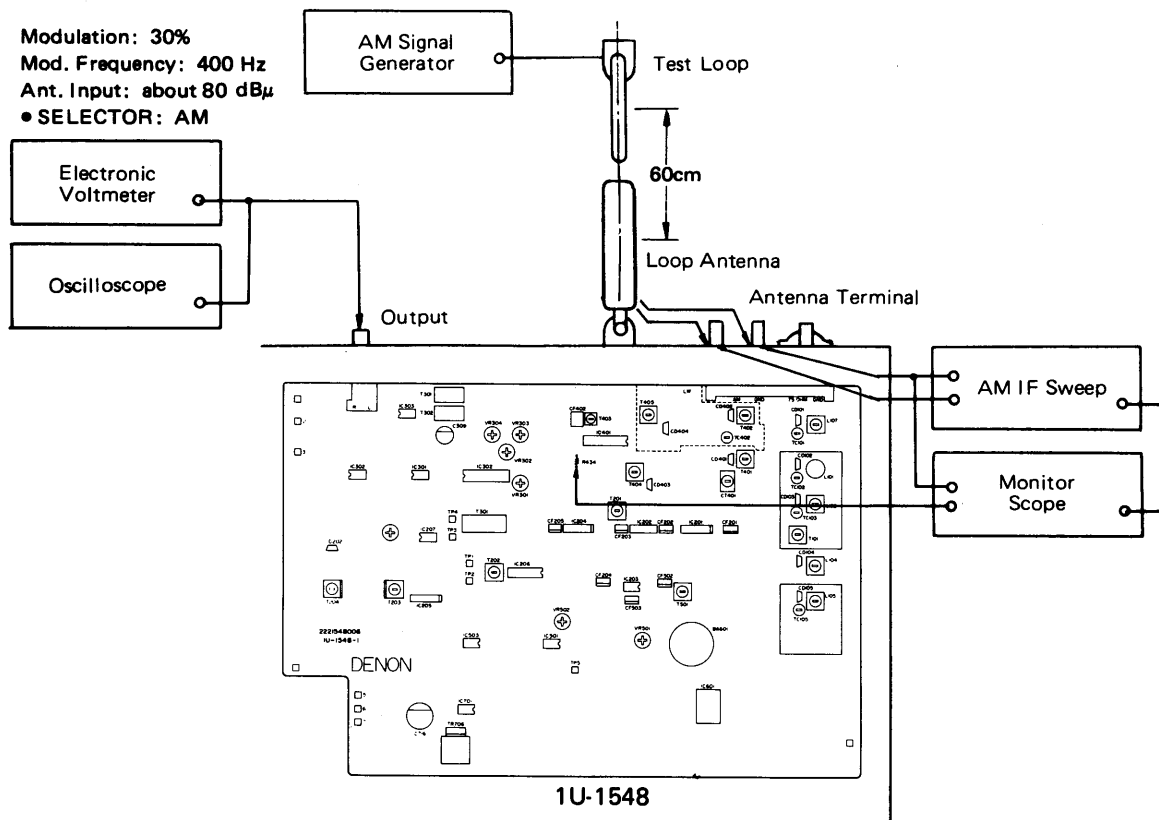
When making adjustments, be sure the power supply is at the rated voltage and the room air is on normal conditions with respect to temperature and humidity.

● **FM**



● **AM**

Modulation: 30%  
Mod. Frequency: 400 Hz  
Ant. Input: about 80 dB $\mu$   
● SELECTOR: AM



## FRONTEND ALIGNMENT

Item	Alignment Item	Tuning frequency Setting	Input					Output		Adjustment		Remarks
			Type	Frequency	Input Level	Modulation	Coupling	Type	Connect to	Points	Adjust to	
1	Tuning Voltage	108 MHz	FMSSG	108 MHz	0 dB $\mu$	Mono 1 kHz 100%	Antenna Terminal	DC Voltmeter	R418	TC105	21.0 V	IF BAND : WIDE MUTE : off
2		88 MHz	FMSSG	88 MHz	0 dB $\mu$	Mono 1 kHz 100%	Antenna Terminal	DC Voltmeter	R418	L105	3.0 V	
3	Repeat several times from 1 to 2 to obtain accurate tuning voltage.											
4	Tracking Alignment	108 MHz	FMSSG	108 MHz	0 dB $\mu$	Mono 1 kHz 100%	Antenna Terminal	AC Voltmeter	Output Terminal (L)	TC101~104	Maximum Output	
5		88 MHz	FMSSG	88 MHz	0 dB $\mu$	Mono 1 kHz 100%	Antenna Terminal	AC Voltmeter	Output Terminal (L)	L101~104, 107	Maximum Output	
6	Repeat several times from 4 to 5 obtain maximum output level.											

## FM ALIGNMENT

1	Center Adjustment	98 MHz	FMSSG	98 MHz	60 dB $\mu$	Mono 1 kHz 100%	Antenna Terminal	Tuning Meter Jig	Tp. 1, 2	T202	Tuning Meter Center	IF BAND: WIDE
2	Center Adjustment	98 MHz	FMSSG	98 MHz	60 dB $\mu$	"	"	"	Tp. 3, 4	T204	"	IF BAND: WIDE
3	Distortion	98 MHz	FMSSG	98 MHz	60 dB $\mu$	"	"	Distortion Meter	Output Terminal (L)	VR201	Minimum Distortion	IF BAND: WIDE
4	Distortion	98 MHz	FMSSG	98 MHz	60 dB $\mu$	Stereo (L) 1 kHz 100%	"	"	"	T101	"	IF BAND: WIDE
5	Distortion	98 MHz	FMSSG	98 MHz	60 dB $\mu$	"	"	"	"	T501	"	IF BAND: SUPPER NARRON
6	Pilot Cancell	98 MHz	FMSSG	98 MHz	60 dB $\mu$	Pilot (10%) only	"	AC Voltmeter	R326	VR301	Minimum Pilot Leakage	IF BAND: WIDE
7	Separation	98 MHz	FMSSG	98 MHz	60 dB $\mu$	Stereo (L) 1 kHz 100%	"	"	Output Terminal (R)	VR304	Maximum Separation	IF BAND: WIDE
8	Separation	98 MHz	FMSSG	98 MHz	60 dB $\mu$	"	"	"	Output Terminal (L)	VR303	"	IF BAND: WIDE
9	Signal Level	98 MHz	FMSSG	98 MHz	20 dB $\mu$	off	"	DC Voltmeter	Tp. 5	VR502	0.9 V	IF BAND: WIDE
10	Signal Level	98 MHz	FMSSG	98 MHz	80 dB $\mu$	off	"	"	Tp. 5	VR501	4.6 V	IF BAND: WIDE
11	REC CAL.	-	-	-	-	-	-	-	Output Terminal (L)	VR302	Half Voltage of Output Level	REC CAL: on

## AM ALIGNMENT

• MW & LW ( ): U.S.A. and Canada models.

1	1F	-	IF Sweep	-	Input Level is not over to work A.G.C.	-	Antenna Terminal	Oscilloscope	R434	T403	Maximum Height and Best Symmetry Curve	Function: MW Center of Wave Form: 450 kHz
2	Tracking Alignment AM or MW	603 kHz (600)	AM SSG	603 kHz (600)	Input Level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M.	Output Terminal (L)	T401	Maximum Output	Function: MW
		1404 kHz (1500)	AM SSG	1404 kHz (1500)	Input Level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M.	Output Terminal (L)	TC401	Maximum Output	Function: MW
3	Tracking Alignment LW	163 kHz	AM SSG	163 kHz	Input Level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M.	Output Terminal (L)	T402	Maximum Output	Function: LW
		330 kHz	AM SSG	330 kHz	Input Level is not over to work A.G.C.	400 Hz 30%	Loop Antenna	Audio V.T.V.M.	Output Terminal (L)	TC402	Maximum Output	Function: LW

Output	Adjustment		Remarks
	Connect to	Adjust to	
R418	TC105	21.0 V	IF BAND : WIDE MUTE : off
R418	L105	3.0 V	
Output Terminal (L)	TC101~104	Maximum Output	
Output Terminal (L)	L101~104, 107	Maximum Output	
level.			

Tp. 1, 2	T202	Tuning Meter Center	IF BAND: WIDE
Tp. 3, 4	T204	"	IF BAND: WIDE
Output Terminal (L)	VR201	Minimum Distortion	IF BAND: WIDE
"	T101	"	IF BAND: WIDE
"	T501	"	IF BAND: SUPPER NARRON
R326	VR301	Minimum Pilot Leakage	IF BAND: WIDE
Output Terminal (R)	VR304	Maximum Separation	IF BAND: WIDE
Output Terminal (L)	VR303	"	IF BAND: WIDE
Tp. 5	VR502	0.9 V	IF BAND: WIDE
Tp. 5	VR501	4.6 V	IF BAND: WIDE
Output Terminal (L)	VR302	Half Voltage of Output Level	REC CAL: on

R434	T403	Maximum Height and Best Symmetry Curve	Function: MW Center of Wave Form: 450 kHz
Output Terminal (L)	T401	Maximum Output	Function: MW
Output Terminal (L)	TC401	Maximum Output	Function: MW
Output Terminal (L)	T402	Maximum Output	Function: LW
Output Terminal (L)	TC402	Maximum Output	Function: LW

## TUNING METER JIG

