LUXMAN 300

OPERATION MANUAL

FM/AM STEREO TUNER

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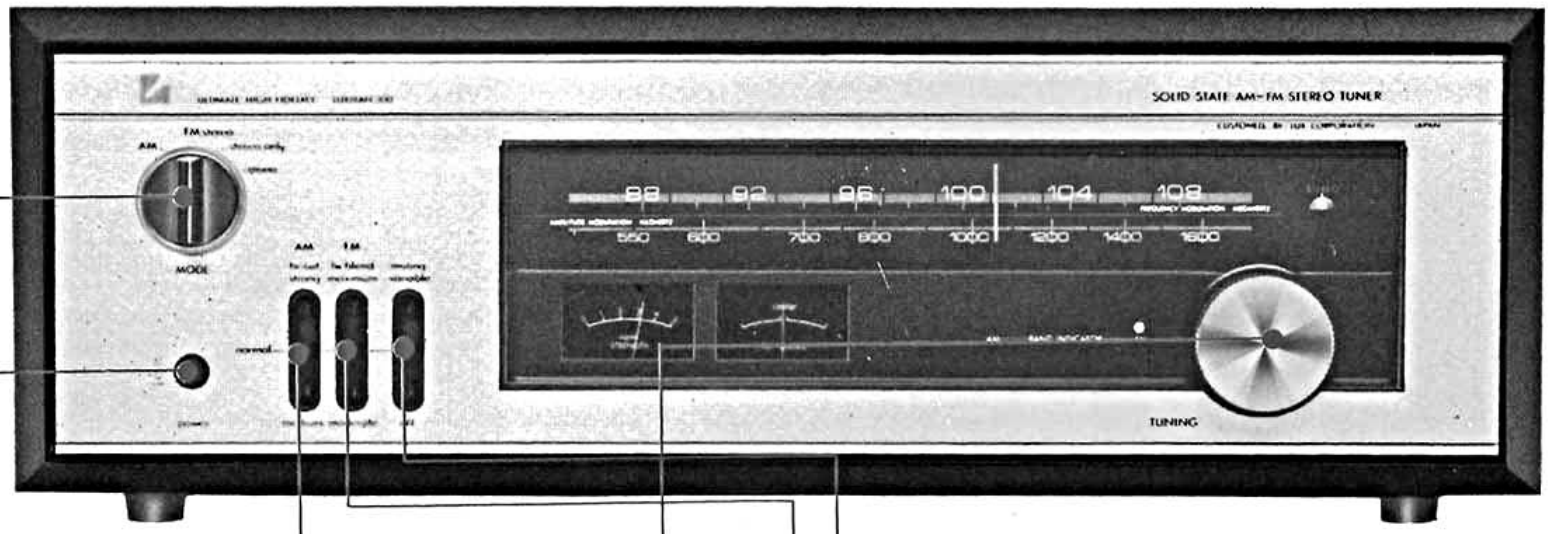
Thank you for purchasing one of our quality products, the LUXMAN T-300. With natural care, it will give you many years of outstanding performance and personal delight. Please read this Owner's Manual carefully before operating the unit. The first section diagrams the various controls/connections and summarizes their operation; Keep it handy for quick and convenient reference. The second section gives detailed descriptions and operating procedures for the electronic and mechanical components of the T-300. Again, thank you for your selection, and may "good listening" be your daily pleasure.

Outline of Control Functions & Connections



MODE:
Select either AM (MW) or FM (VHF) broadcasts.

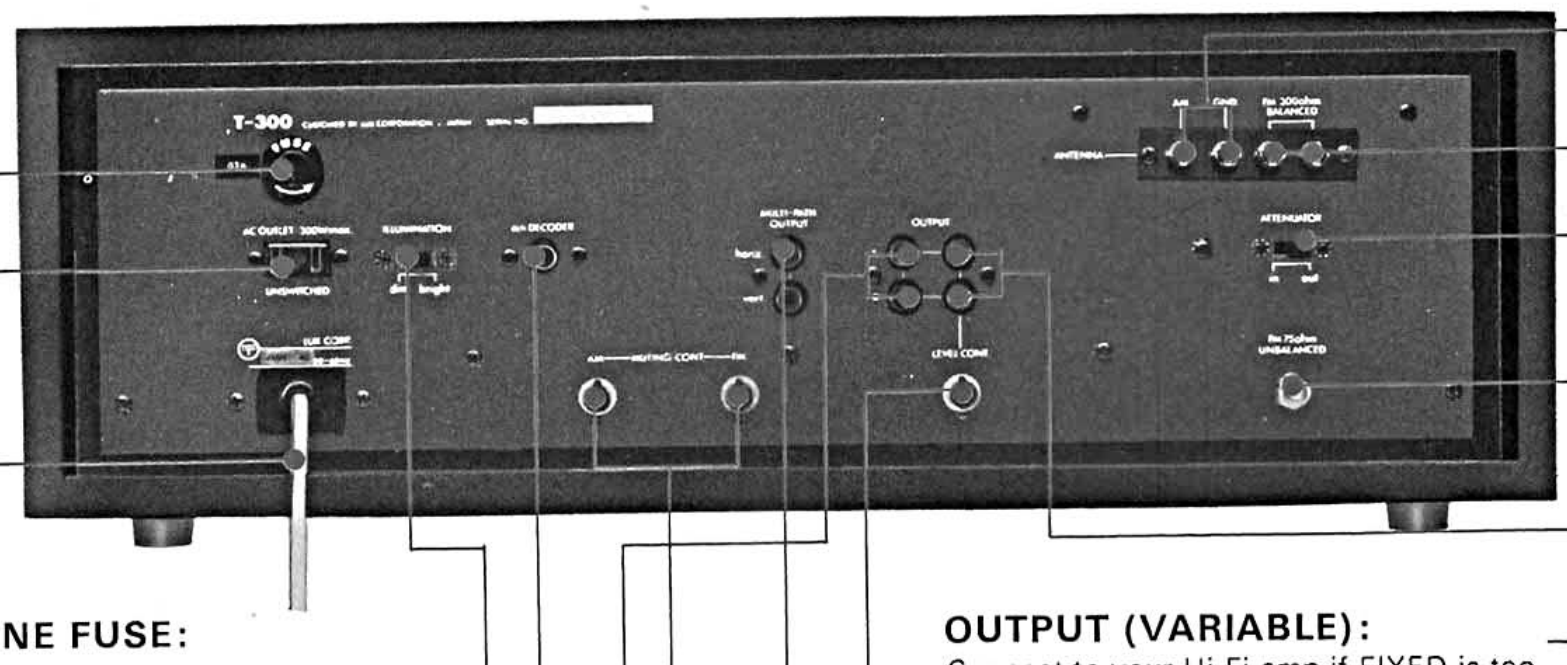
TUNING:
For both AM and FM tuning of your favourite stations.

POWER SWITCH:

MUTING:
Normal (fixed) at centre. Off or variable with the back panel adjuster.

AM HI CUT
Three positions: strong, normal (off) and medium.

FM HI BLEND
Three positions; maximum, normal (off) and moderate.



AC LINE FUSE:

AC OUTLET (unswitched):
Power is always available.

MAINS POWER CORD:

ILLUMINATION:
For the panel lighting; dim or bright.

4 CH DECODER:
For use with 4 channel FM decoders.

MULTI-PATH OUTPUT:
Horizontal and Vertical; to be connected to an oscilloscope to observe correct tuning and receiving conditions.

OUTPUT (FIXED):
Fixed level to connect to your Hi Fi amplifier.

OUTPUT (VARIABLE):
Connect to your Hi Fi amp if FIXED is too high a level.

LEVEL CONTROL:
For VARIABLE output.

MUTING CONTROLS:
To adjust FM or AM threshold independently.

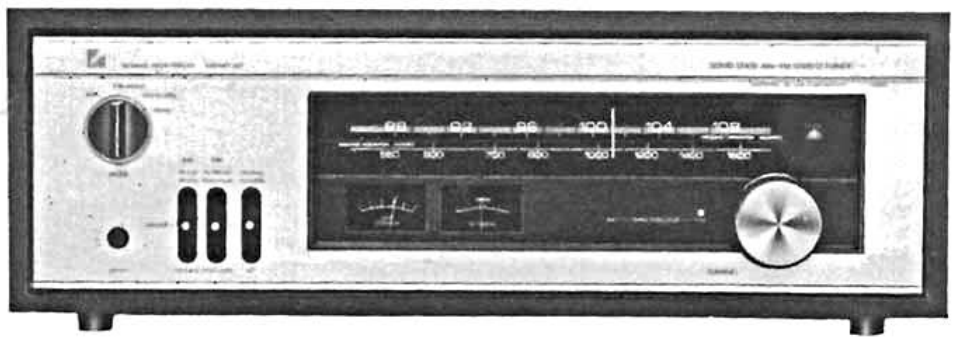
FM 75 ohm UNBALANCED:
Use with co-axial antenna feeder.

ATTENUATOR:
To reduce the FM sensitivity if you have very strong broadcasts. Normally, leave at OUT.

ANTENNA TERMINALS:
AM; normally not required.
GND; connect to earth or water pipe.

FM 300 ohm BALANCED:
For strip type feeder.

Switches & Controls



MODE:
Select either AM or FM bands. In FM, there are 3 positions; stereo (auto), stereo only (mono stations are not heard) and mono only (stereo becomes mono). Useful for listening to weak or noisy FM stations.

POWER (Mains switch):
Press alternately for ON or OFF.

MUTING (for both FM and AM):
Normal at the centre position; all signals below a predetermined level will be muted automatically. At OFF, no muting occurs. Useful when tuning-in weak signals. At VARIABLE, the level at which muting occurs can be adjusted with the controls on back panel (AM Muting Level or FM Muting Level). E.g., if the FM control is turned clockwise, only the strongest stations will be audible. When tuning from one station to another at the other end of the scale, there will be no interstation noise.

AM HI CUT
This 18 dB/octave switchable filter (3 positions) is complemented with a 3-stage IF amplifier to help clarify noisy stations.

FM HI BLEND
This 3-position switch activates a special circuit for blending (mixing) the trebles of both channels to eliminate annoying background noise and hiss without loss of useful separation.

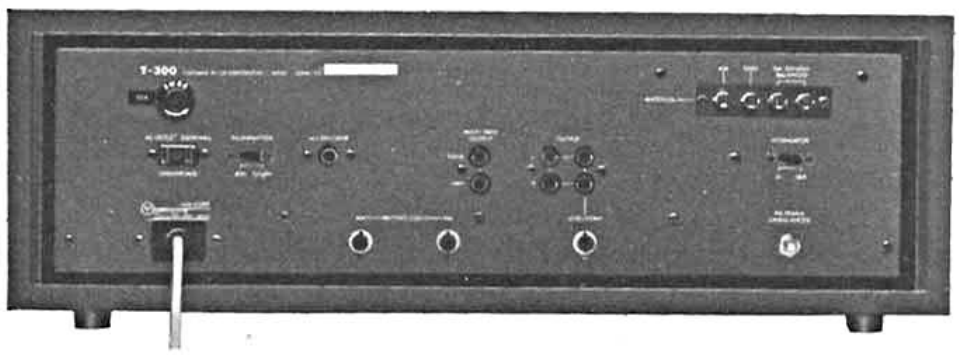
CENTRE TUNE METER (FM only):
When there is no signal, this meter remains at centre. As you tune to a broadcast, the needle will swing to one side, and as you approach the correct tuning point, the needle will again move towards the centre. When it indicates centre, it is correctly tuned.

SIGNAL STRENGTH METER:
In normal AM or FM broadcasts, this meter indicates the signal strength of the broadcast. When it reads higher than No. 3, satisfactory results will be obtained from stereo broadcasts.

TUNING CONTROL:
Use this control to tune to desired stations. It will move the pointer across the scale.

POINTER:
Glows red for FM and yellow for AM.

Input & Output Terminals



MAINS POWER CORD:
Connect this cord either to your amplifier's AC outlet or to the wall power socket. (Check your supply voltage; this tuner is normally set at the factory).

AC OUTLET:
Can be connected with the mains cord of other equipment, such as a tape deck.

LINE FUSE:
Replace with correct fuse only if the tuner ceases to function or the fuse is suspect.

4 CHANNEL DECODER:
This composite audio output may be used for an additional 4 channel decoder designed for FM.

MULTIPATH OUTPUT (FM only):
Horizontal and Vertical are connected to the respective inputs of an oscilloscope to observe if spurious or reflected signals are being picked up and causing deterioration of the FM broadcast quality. However, these outputs do not have to be used for normal tuner operation.

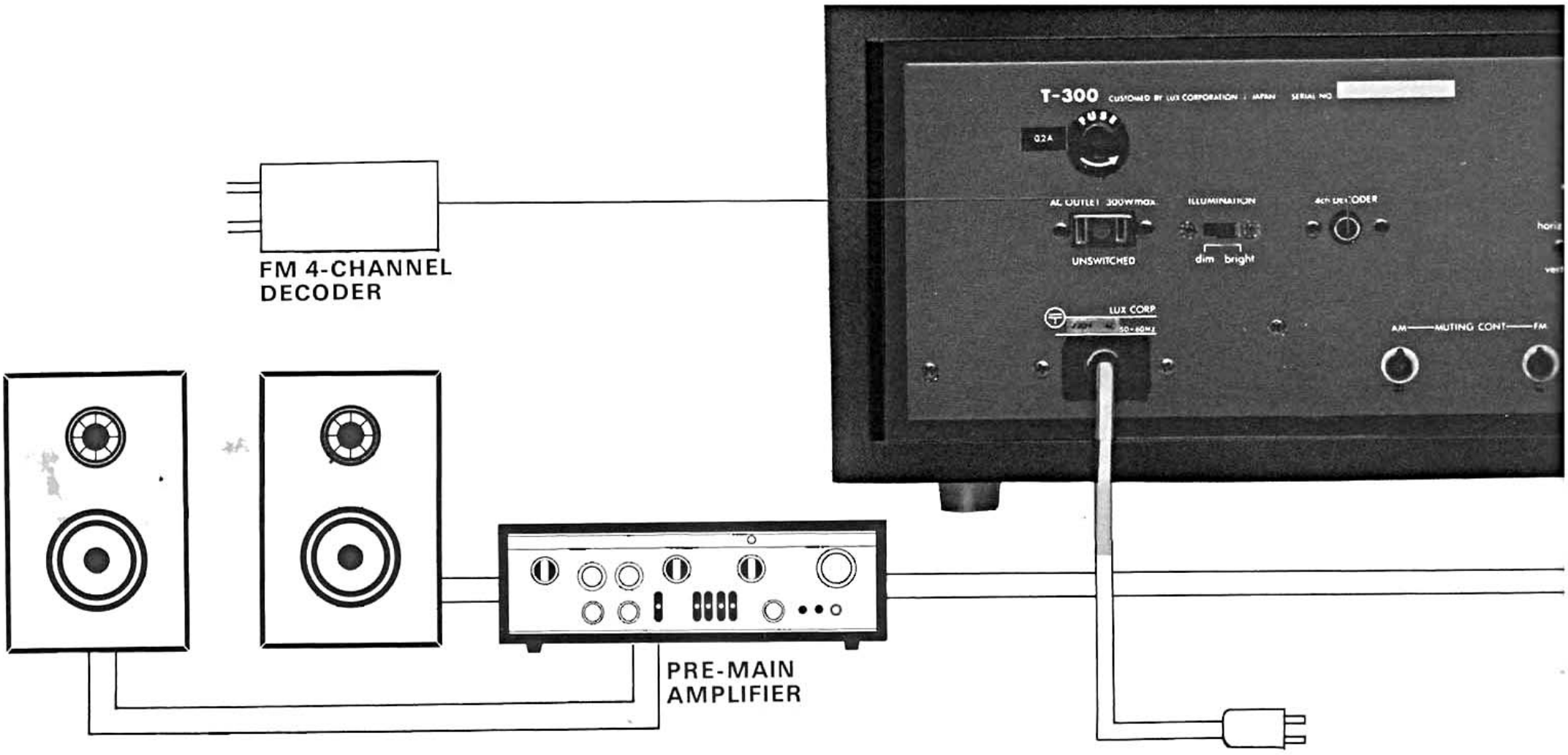
ANTENNA TERMINALS:
A long outdoor antenna (approx. 30 meters) can be connected to the AM terminal to improve poor AM reception of distant stations. Normally, the built-in AM ferrite antenna is adequate for high quality reception. Either a simple indoor T Type antenna or a proper external antenna using 300Ω balanced feeder can be connected to the 300Ω terminals, or if you use 75Ω shield feeder, use one of the 300Ω terminals for the inner conductor and the other shield feeder connected to the GND terminal.

ATTENUATOR (FM only):
Normally left at the OUT position, but if you are very close to the broadcast station, and are experiencing problems with that station, switch to IN. It reduces sensitivity by 12 db (by ¼).

FM 75 ohm UNBALANCED:
If you are using shield feeder cable and have the correct connector, use this in preference to what was suggested in the paragraph on ANTENNA TERMINALS.

OUTPUTS:
One pair of outputs is at a fixed level. The other pair can be controlled by the level control below. Either of these are to be connected to your amplifier. (Output impedance is about 600Ω at 1.8 volts; to be used with amplifier input impedance that is greater than 5 KΩ).

MUTING CONTROLS (AM and FM):
These controls allow individual adjustment on the muting level of either AM or FM. They are active when the Muting Switch on the front panel is set at Variable.



Connection Procedure

Power Cord:

Plug in the pin plug connectors on the attached power cord, one end to mains power connector of the tuner and the other end to an appropriate mains outlet. Push the power switch of the tuner to "ON" position, and the tuner starts to operate.

Output Terminals and Connection to Audio Amplifier:

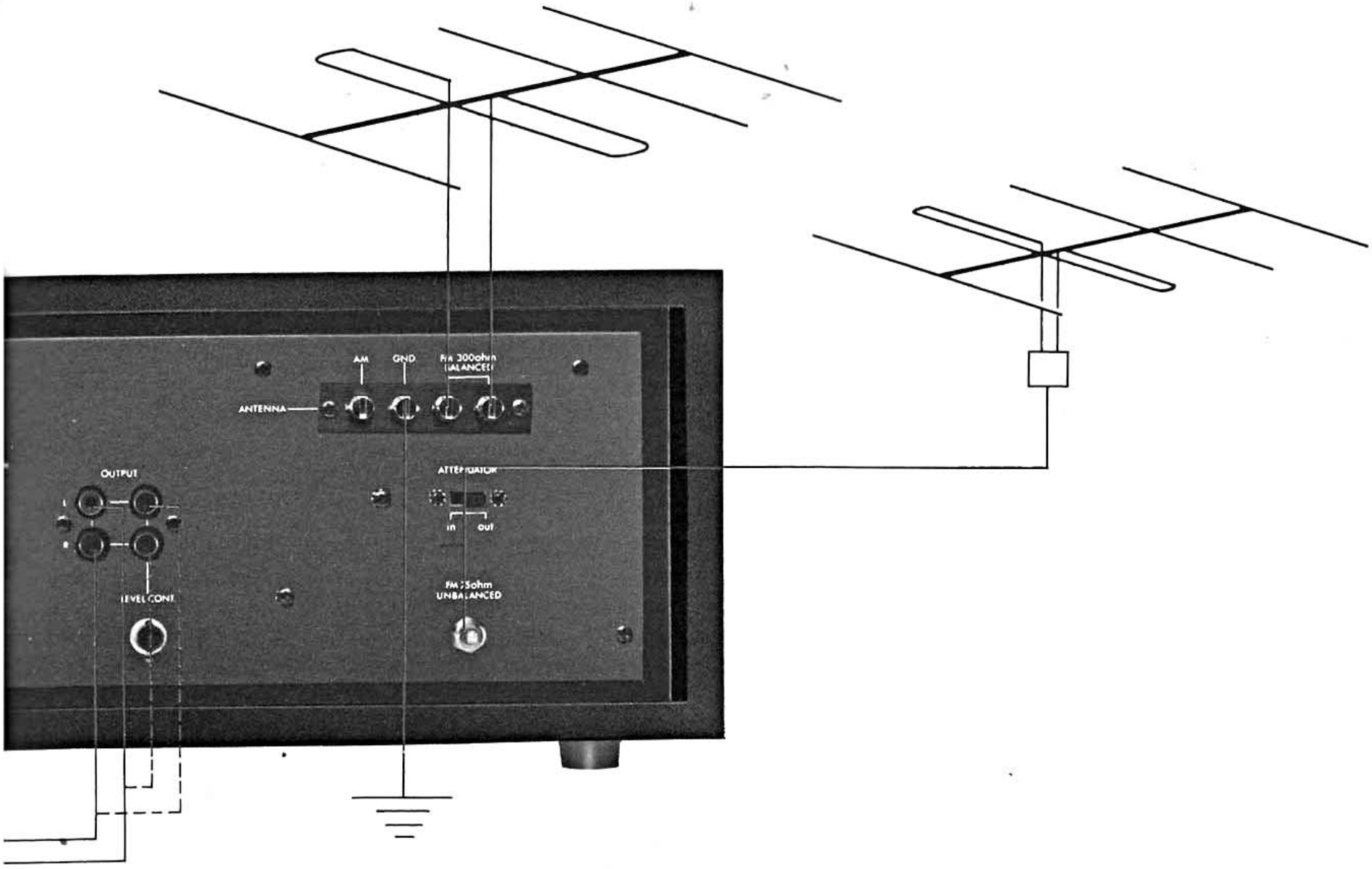
Connect optional set of output connectors to the AUX or TUNER connectors of the audio amplifier using a pin jack cord. Caution is necessary to make the correct connection—right channel output to right channel input of the amplifier.

FM Antenna:

The greatest advantage of FM broadcasting is that the playback sound is superior. It is, first of all, important to catch the transmission wave perfectly in order to enjoy the radio programme under good tonal quality. For this purpose, not only the tuner itself must be of high sensitivity, but also the antenna must be appropriate. It must correspond to the electric field strength. In such places where relatively strong radio waves are available, perfect FM reception is possible with simple antennas such as di-pole (T type) antenna. Since FM waves and a simple antenna have directivity, the direction of horizontal plane of the antenna should be carefully set up by rotation so that the optimum FM reception is feasible. Select the direction of antenna plane so that the pointer of the signal strength meter gives the maximum swing and so that the highest sensitivity and best tonal quality are obtained with minimum noise.

When the tuner is installed in weak radio wave zones far from the stations or behind mountains, buildings etc., it is necessary to provide an exclusive FM antenna. There are various types of antenna available on the market, and selection of the optimum type of antenna and its proper installation may be made at your nearest audio shop. As the number of antenna elements increases from 3 to 5, or to 7 etc., the gain and directivity are improved propotionately.

The location of antenna is so selected that it is clear from any surrounding obstacles, and also it is recommended to set it as



high as possible. Against possible pick-up of car ignition noise, care should be taken to set it up as far as possible from roads. After the erection and location of the antenna is fixed, connect the antenna with the tuner. The FM antenna has 300Ω impedance, and it should be connected to the FM antenna terminal (300Ω) via ribbon feeder for TV.
In order to avoid external noise or loss by the feeder cable, it is possible to make use of coaxial cable (with the matching transformer 300Ω: 75Ω near the antenna). In this case the coaxial cable is connected to the FM coaxial connector (75Ω). Connection to this connector is easily done without soldering.

AM Antenna:

The tuner is equipped with a ferrite rod antenna for AM reception which is invisible from outside.
Where sufficiently strong AM radio waves are available, a full scale outdoor antenna is not necessary. If complete AM reception is desired in a weak radio wave zone or in a ferro-concrete building, however, connection to an outdoor antenna may be necessary.
In this case, connect the antenna wire to the AM external antenna terminal.
The standard dimension of an outdoor antenna is as follows:

Length : 15m
Height (from ground) : 7.5m
Length of lead-in wire :..... .....10m
In many cases, however, a PVC covered lead wire of proper length can be used as an antenna. It is recommended to build an outdoor antenna far from the building.
In case a simple antenna is used, a ground connection is not necessary, as it sometimes induces less sensitivity of the tuner. It is effective to eliminate noise in case a full scale antenna is used.
The end of the ground wire from the GND terminal should be buried into ground with a grounding bar or may be connected to a water supply pipe. The ferrite rod antenna of this tuner is horizontally installed on the upper centre of the rear panel. If the mains power cord comes close to this place, a buzz modulation hum may sometimes come out when tuned to AM.
Furthermore, if a metal plate, as a bottom panel of the amplifier, is put near the top of the bonnet, sensitivity for AM reception decreases when the inside ferrite rod antenna is used.
Therefore, refrain as much as possible from putting the amplifier etc., close to the tuner.

(FM Section)	
Frequency Range:	88 MHz～108 MHz
IHF Sensitivity:	1.7μV/98 MHz
Sensitivity for 50 dB S/N:	2.2μV
Alternate Channel Selectivity:	75 dB/98 MHz, 100μV, ±400 KHz
AM Suppression:	53 dB/98 MHz, 1 mV
Capture Ratio:	1.5 dB/98 MHz, 1 mV
Image Rejection:	90 dB/98 MHz
IF Rejection:	100 dB/98 MHz
S/N Ratio:	75 dB/98 MHz, 1 mV, mono
Frequency Response:	20～15,000 Hz/stereo, +0.2 dB −1.8 dB 20～15,000 Hz/mono, −1.8 dB
THD:	0.2%/50 Hz, stereo 0.12%/400 Hz, stereo 0.3%/10 KHz, stereo 0.1%/400 Hz, mono
Stereo Separation:	42 dB/400 Hz 30 dB/50～10 KHz
Carrier Leak:	−66 dB
Muting Threshold:	5μV/98 MHz, 400 Hz, 30% mod. 4～30μV/98 MHz, variable
Antenna Impedance:	300Ω (balanced) 75Ω (unbalanced)
Output Level:	1.7V/98 MHz, 400 Hz, 100% mod.
Output Impedance:	300Ω
(AM Section)	
Frequency Range:	525 KHz～1605 KHz
IHF Sensitivity:	14μV(250μV/m/1 MHz)
Image Rejection:	80 dB/1 MHz, EXT. ANT.
IF Rejection:	80 dB/1 MHz, EXT. ANT.
Frequency Response:	40～5,000 Hz/1MHz, 30% mod.
THD:	0.6%/1 MHz, 10 mV, 400 Hz, 30% mod.
S/N Ratio:	48 dB/1 MHz, 10 mV, 400 Hz, 30% mod.
Muting Threshold:	320μV/m/1 MHz, 400 Hz, 30% mod. 140～1000μV/m/1 MHz, 400 Hz, 30% mod. variable
Output Level:	400 mV/1 MHz, 400 Hz, 30% mod.

(FM Section)	
Frequency Range:	88 MHz～108 MHz
IHF Sensitivity:	1.7μV/98 MHz
Sensitivity for 50 dB S/N:	2.2μV
Alternate Channel Selectivity:	75 dB/98 MHz, 100μV, ±400 KHz
AM Suppression:	53 dB/98 MHz, 1 mV
Capture Ratio:	1.5 dB/98 MHz, 1 mV
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Frequency Response:	20～15,000 Hz/stereo, +0.2 dB −1.8 dB
	20～15,000 Hz/mono, −1.8 dB
THD:	0.2%/50 Hz, stereo
	0.12%/400 Hz, stereo
	0.3%/10 KHz, stereo
	0.1%/400 Hz, mono
Stereo Separation:	42 dB/400 Hz
	30 dB/50～10 KHz
Carrier Leak:	−66 dB
Muting Threshold:	5μV/98 MHz, 400 Hz, 30% mod.
	4～30μV/98 MHz, variable
Antenna Impedance:	300Ω (balanced)
	75Ω (unbalanced)
Output Level:	1.7V/98 MHz, 400 Hz, 100% mod.
Output Impedance:	300Ω
(AM Section)	
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IHF Sensitivity:	14μV(250μV/m/1 MHz)
Image Rejection:	80 dB/1 MHz, EXT. ANT.
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THD:	0.6%/1 MHz, 10 mV, 400 Hz, 30% mod.
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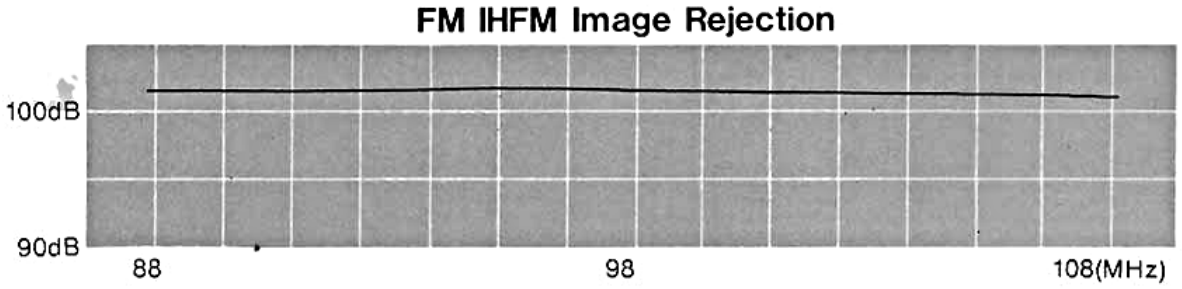
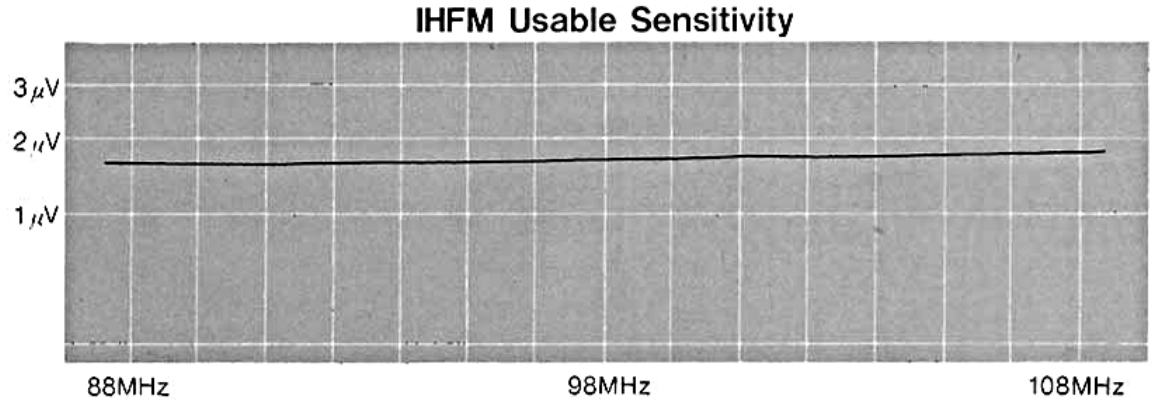
	140～1000μV/m/1 MHz, 400 Hz, 30% mod. variable
Output Level:	400 mV/1 MHz, 400 Hz, 30% mod.

Standard Curves

FM IHFM Image Rejection

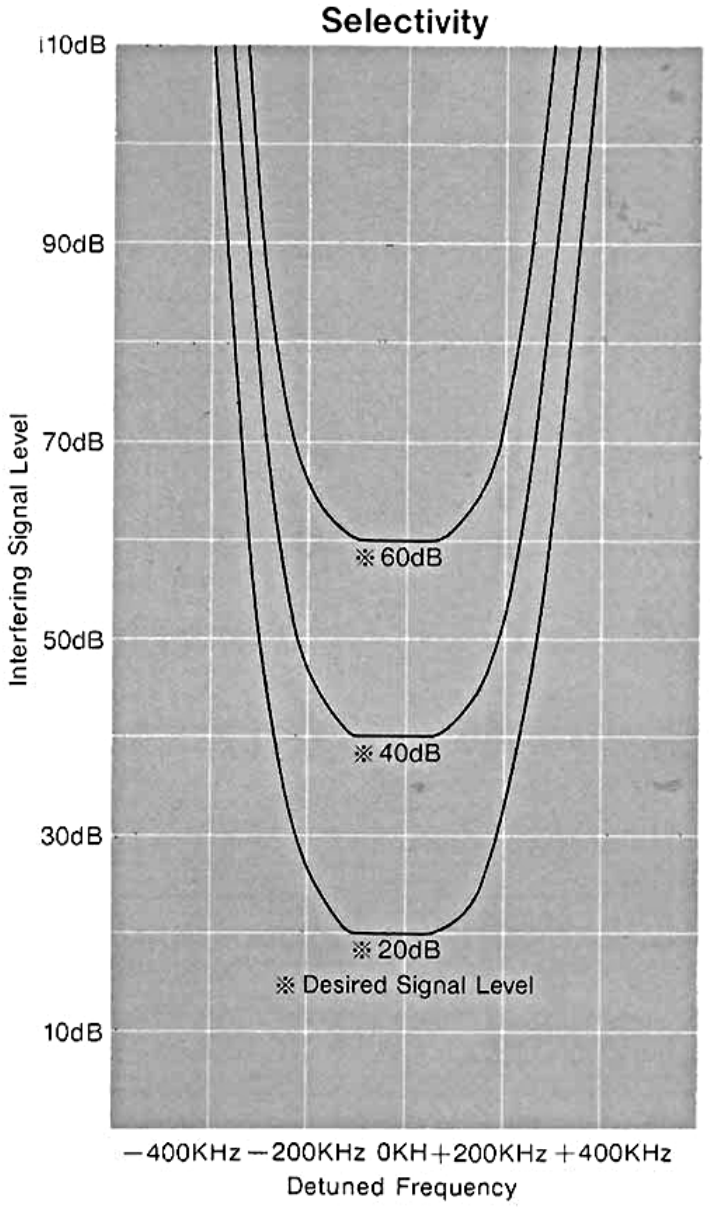


IHFM Usable Sensitivity

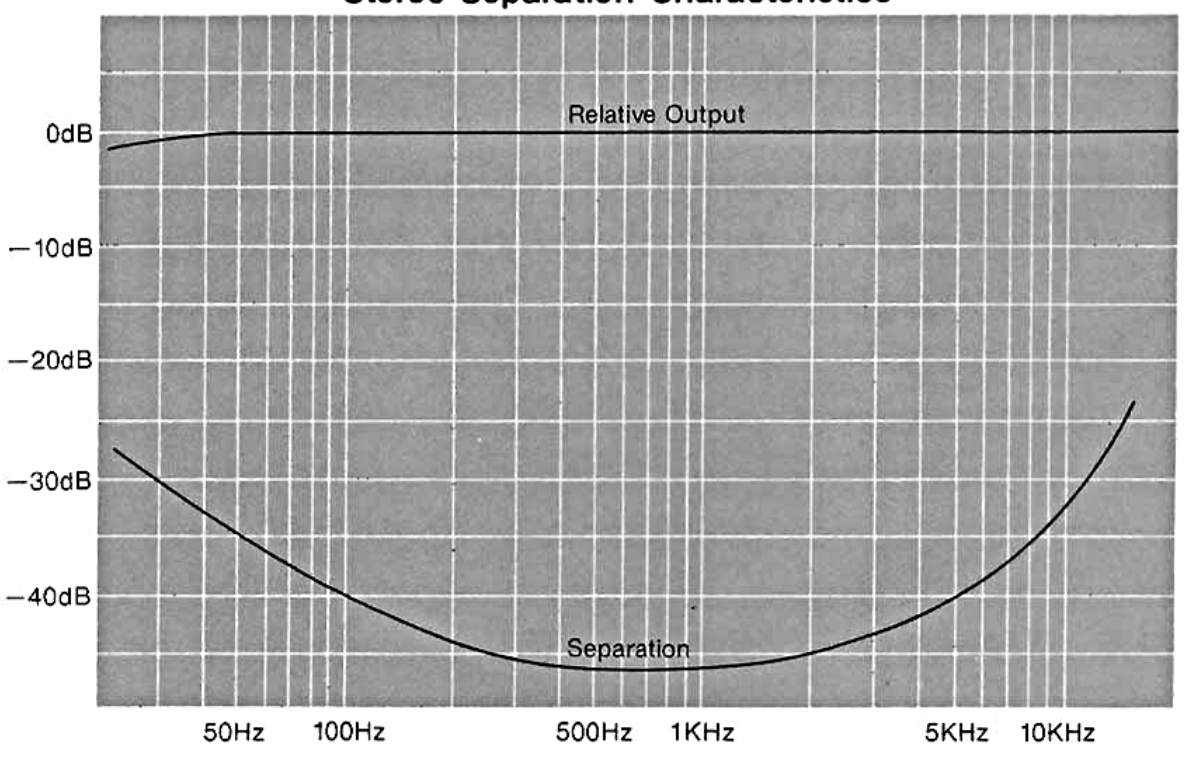


THD

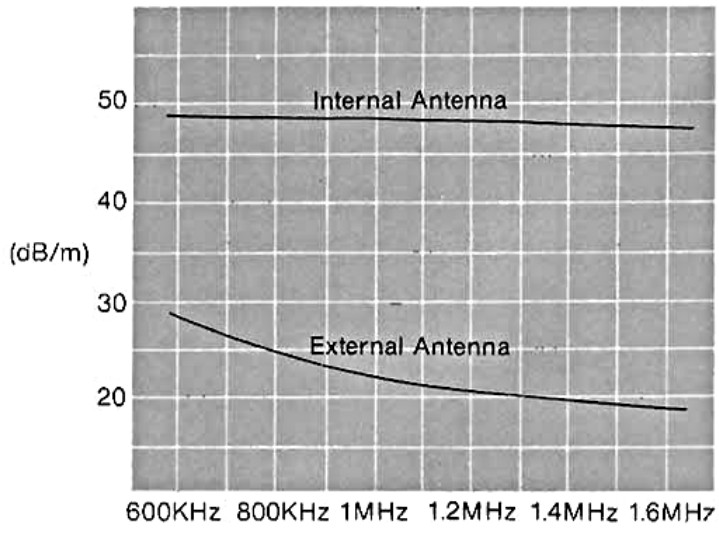
Selectivity



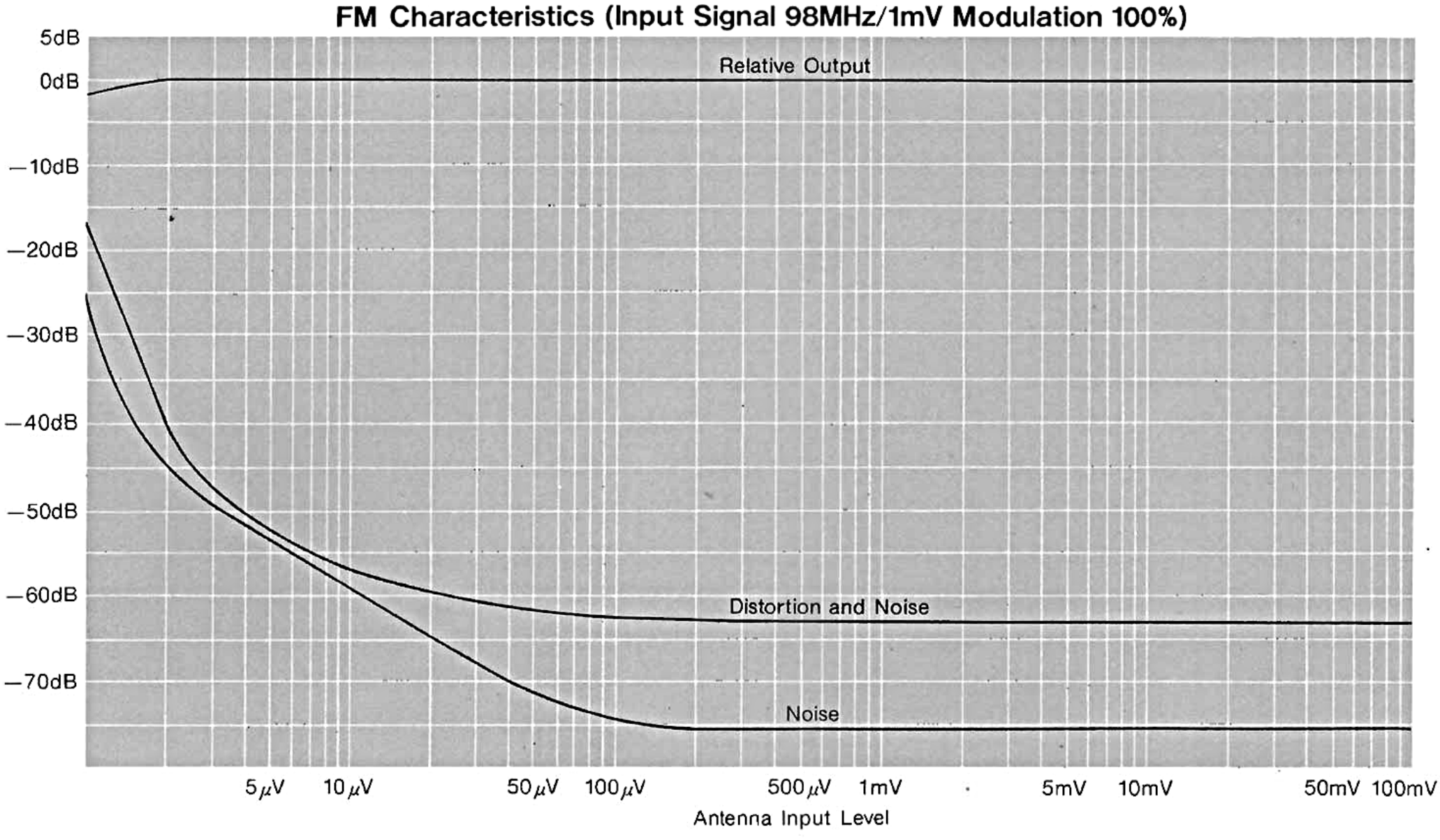
Stereo Separation Characteristics



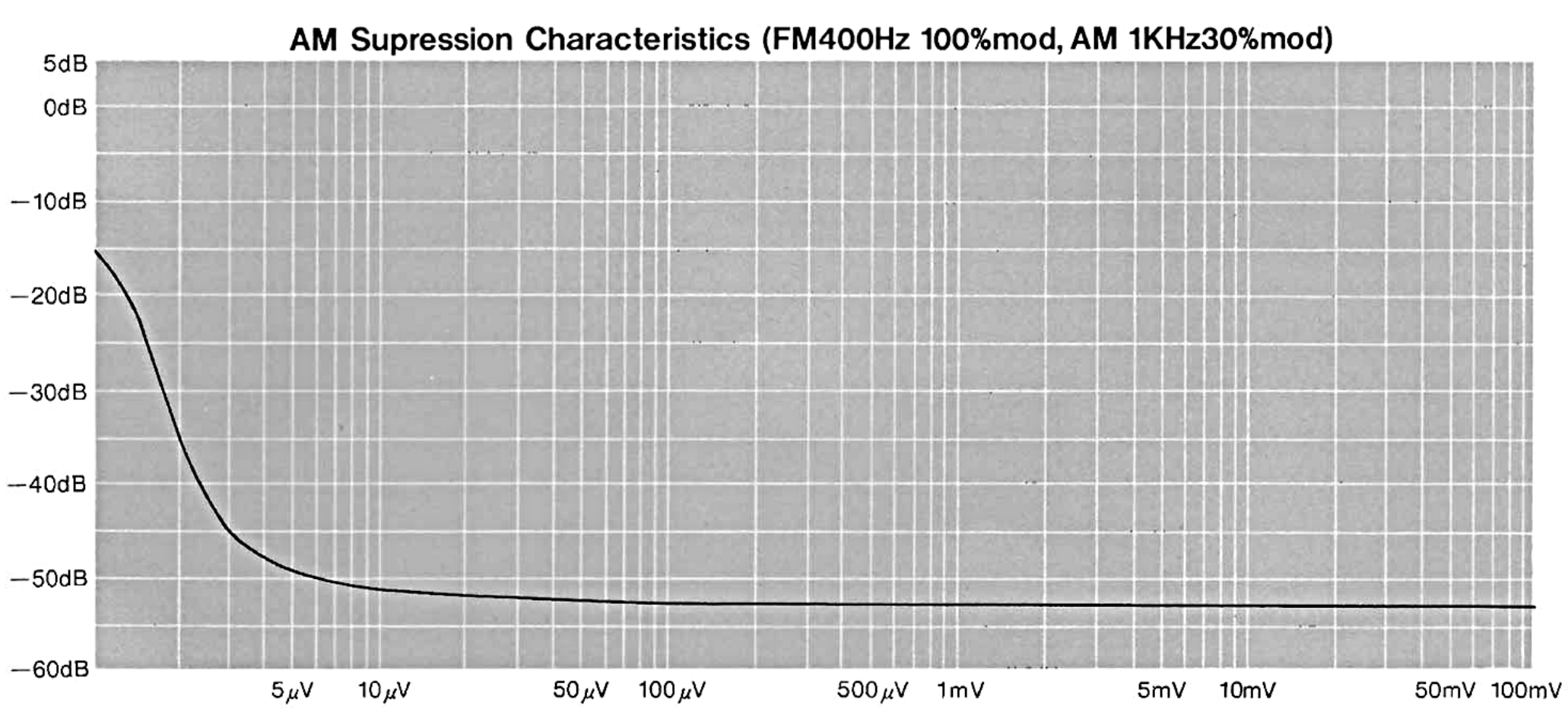
AM IHFM Usable Sensitivity

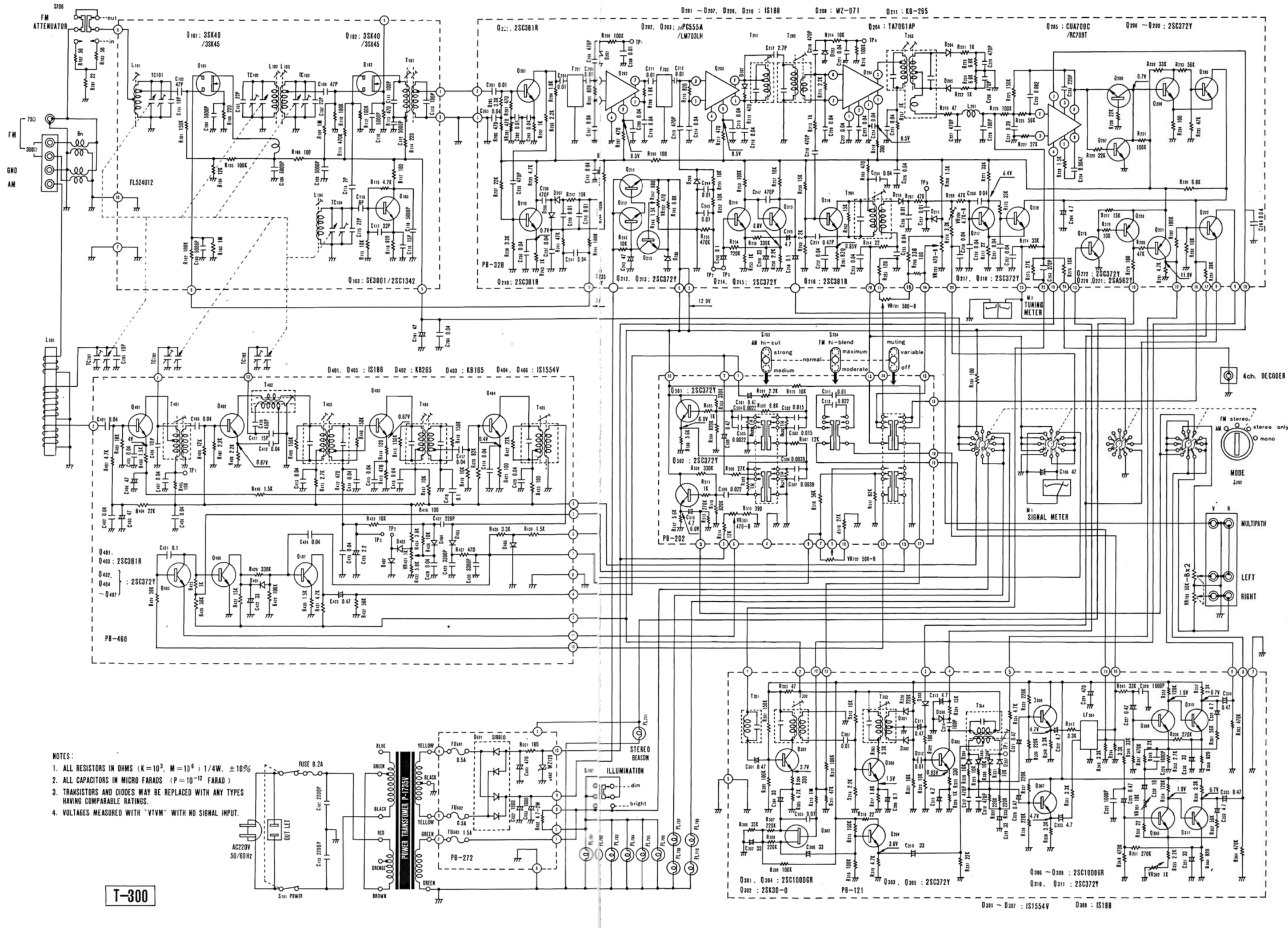


FM Characteristics (Input Signal 98MHz/1mV Modulation 100%)



AM Supression Characteristics (FM400Hz 100%mod, AM 1KHz30%mod)





NOTES:

1. ALL RESISTORS IN OHMS ($K=10^3$, $M=10^6$) 1/4W. ±10%
2. ALL CAPACITORS IN MICRO FARADS ($P=10^{-12}$ FARAD)
3. TRANSISTORS AND DIODES MAY BE REPLACED WITH ANY TYPES HAVING COMPARABLE RATINGS.
4. VOLTAGES MEASURED WITH "VTVM" WITH NO SIGNAL INPUT.

T-300

Note: Due to continued research for improvements, LUX reserves the right to alter the circuit and specifications without notice.

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