

INTRODUCTION

You are the owner of one of the most sophisticated and versatile audio instruments on the market. To obtain the full sound quality from your stereo receiver, it must be combined with speaker systems and other accessories of equally high standards. Your GTE dealer will be happy to advise you when selecting accessories.

Before operating this receiver, carefully read the instructions contained in this booklet. It is recommended that this booklet be kept with the receiver for future reference.

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WARNING: TO AVOID POSSIBLE FIRE OR SHOCK HAZARD, NEVER EXPOSE THIS UNIT TO RAIN OR MOISTURE. IF SUCH EXPOSURE OCCURS, REMOVE THE PLUG FROM THE ELECTRICAL OUTLET AND HAVE THE EXPOSED UNIT CHECKED BY A COMPETENT SERVICE TECHNICIAN.

FEATURES

TUNER SECTION

- FM Front End uses a FET in a grounded gate configuration for excellent sensitivity and superb overload rejection.
- PLL stereo multiplex circuitry using an integrated circuit for low distortion and high stability providing excellent stereo separation over long term use.
- IF amplifier section utilizes ceramic filters which provide excellent image and alternate channel rejection.
- Center tune and signal strength meters make possible outstanding tuning accuracy.

AMPLIFIER SECTION

- Direct-coupled OCL circuitry utilizing input differential matched transistor pairs through to the complimentary output transistors. Because the OCL circuitry has no output capacitor, the power bandwidth in the low frequencies is extended beyond audibility, providing maximum low frequency performance and excellent dampening characteristics. The complimentary PNP-NPN output stages also reduces significantly the higher order harmonic distortion products, resulting in clean high frequency reproduction.
- Tone controls utilize Baxandall feedback cut boost circuitry for precise adjustment of bass and treble frequencies.
- Phono pre-amp distortion and noise are kept to a minimum by using low noise high gain devices in a 2 stage Darlington pre-amp design.

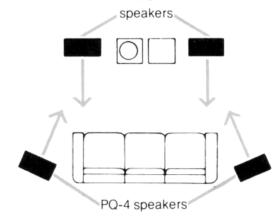
MUTE CIRCUIT

This receiver incorporates a FET audio mute circuit which is activated by the Function Buttons and when the receiver is turned on and off. Attenuation of the audio signal prevents annoying clicks and pops.

PHASE Q-4 STEREO

Now you can experience total dimensional sound . . . sound from every corner of the room. The GTE Phase Q-4 matrix system, with four speakers in the same room, gives the effect of four-channel sound. In almost any live listening situation, you hear sounds from a number of directions. Sound from the front for example, is reflected off rear and side walls. GTE's Phase Q-4 approximates a live listening situation, giving you a new dimension in stereo sound. This remarkable effect is achieved with the speakers in the positions indicated in the diagram. Notice the rear speakers are closer to the listener than the main speakers. This arrangement compensates for a slightly lower audio level from the rear speakers.

NOTE: This system is designed to operate with stereo or four-channel matrix program material only. When listening to monaural programming, the PQ-4 speakers should be turned OFF.



PROTECTIVE CIRCUITS

Your receiver incorporates four protective systems to guard against abnormal operating conditions that could cause damage to the receiver or speakers.

• Electronic Current Limiting

Protects the amplifier from improperly connected speakers. If the output is shorted or excessively loaded, the amplifier will automatically limit the output signal to safe levels.

Thermal Switch

Will shut off the power supply to the amplifier section if the internal temperature becomes excessive. The unit will automatically come back on when it has cooled.

AC Power Overload Protection

This protection is provided by a FUSE which will shut off your receiver in case of an AC power overload.

Electronic Speaker Protection

Provides speaker protection in case of component failure in the power amplifier. This electronic circuit will detect any abnormal DC voltage at the speaker terminals and will automatically shut down the power amplifier section. Normal signal power capability of the amplifier is not impaired by this circuit.

If all speakers automatically shut off while the dial remains lighted, turn your set OFF. Wait for 1 minute and then turn the set back ON. If the speakers operate momentarily and again automatically shut off, unplug the set from the electrical outlet and consult your GTE dealer.

STEREO SYSTEM SETUP

- When installing and during the operation of this receiver, care must be taken not to close off the vent area located on the top of the receiver. One inch minimum clearance is recommended for safe and reliable performance.
- Placement of your speaker systems will vary with room size, acoustics, and personal preference. The following information will assist you in the final placement of your speaker systems.
 Generally, the speaker systems should be placed at approximately ear level height, and spaced at least six to eight feet apart. As the distance between speaker systems increases, the stereo

separation becomes more pronounced.

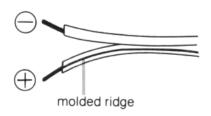
- When wider spacing is used, angle the speaker systems slightly so that the principal listening area in the room is covered.
- With a high power stereo system, improper placement of the turntable can result in acoustic feedback (a rumbling or howling sound). Acoustic feedback is caused by vibrations from the loud speakers reaching the turntable and being reamplified.

Placing the turntable on a sturdy shelf or cabinet, and not on or close to a speaker cabinet will reduce the occurence of feedback.

SPEAKER SYSTEM CONNECTION

 Three sets of speaker terminals (A, B & PQ-4) are provided on the receiver which allow the connection of three sets of speakers. Use no smaller than 18 gauge wire to connect speakers to output terminals. Always be sure positive and negative outputs are connected to corresponding positive and negative terminals on the speakers. CAUTION: BE CAREFUL THAT THE WIRES DO NOT "SHORT" EACH OTHER OUT AT THE SPEAKER TERMINALS.

Helpful Hint: Most lamp cord or "ZIP" cord has a molded ridge along one side to identify polarity. See illustration below.



- Speaker switches are conveniently located on the front of the receiver so that you can change from one speaker system to another without disconnecting and re-connecting accessory speakers.
- You can listen privately to your favorite stereo music by plugging accessory headphones into the built-in stereo phone jack.

 For rear (PQ-4) speakers to operate, System A Speaker switch and PQ-4 switch (located on the rear of the receiver) must be in the ON position. Helpful Hint: When using the Phase Q-4 matrix system, it is recommended that front speakers be connected to SPEAKER B terminals and rear speakers to PQ-4 terminals. With speakers connected in this manner, you can turn rear speakers off simply by switching SYSTEM A Speaker switch OFF.

When remote speakers are used, it is recommended that front speakers be connected to SPEAKER A terminals, rear speakers to PQ-4 terminals and remote speakers to SPEAKER B terminals. With speakers connected in this manner, rear speakers can be turned off by sliding PQ-4 switch OFF.

CAUTION: CONNECT ONLY SPEAKERS WHICH ARE RECOMMENDED FOR USE WITH AMPLIFIERS RATED AT 55 WATTS OR HIGHER. USE OF SPEAKERS RECOMMENDED FOR AMPLIFIERS RATED AT LESS THAN 55 WATTS MAY RESULT IN PERMANENT DAMAGE TO THE SPEAKERS AND THE RECEIVER IF PLAYED AT HIGH LEVELS.

ANTENNA CONNECTIONS

AM ANTENNA CONNECTION

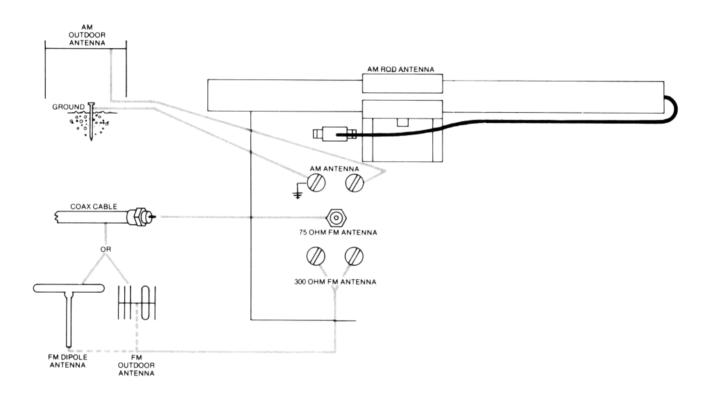
- Slide ferrite rod AM antenna assembly (contained in separate bag) into holder and plug-in connector.
- An External Long Line AM Antenna may be attached by connecting lead-in wire from antenna to right AM ANTENNA terminal and connecting ground (left) terminal to a good earth ground, such as a water pipe.

NOTE: The AM ferrite rod must remain attached for proper operation.

FM ANTENNA CONNECTIONS

- Connect leads from the FM dipole antenna (supplied with receiver) to the 300 OHM FM ANTENNA terminals
- To attach a 300 Ohm External FM Antenna, connect the leads from the antenna to the 300 OHM FM ANTENNA terminals.
- If a 75 Ohm External FM Antenna is to be used, connect the coaxial cable to the 75 OHM FM ANTENNA jack.

NOTE: Use only one FM antenna either 75 ohm or 300 ohm at any one time.

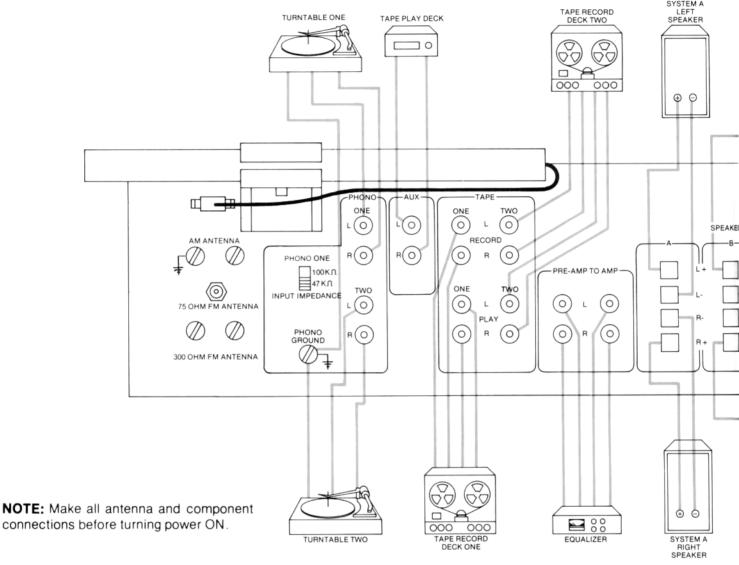


POWER SOURCE

After connecting all components to the receiver, plug in AC line cord to a 120 Volt, 60 Hertz (cycle) alternating currect (AC) only. Never connect the receiver to an electrical outlet having a different frequency or voltage. Permanent damage to your system may result.

Note: If your receiver will not operate or it suddenly goes off, check fuse. If fuse has burned out replace with fuse having same amperage rating. If replacement fuse also burns out, consult your authorized GTE dealer.

COMPONENT



PHONO JACKS

The two phono inputs allow for the use of two turntables.

- Select either the PHONO ONE or TWO jacks and plug turntable cables into the appropriate left and right jacks. Connect ground wire under PHONO GROUND terminal (★).
- PHONO ONE input impedance may be selected for 47k as well as 100k Check cartridge specifications for impedance value.
 Slide PHONO ONE switch to appropriate input
 - Slide PHONO ONE switch to appropriate input impedance. PHONO TWO input impedance is $47k\Omega$ only.

AUX JACKS

Plug the output of accessory equipment into the appropriate left and right jacks. Typical accessories are:

- 8-track, cassette, or reel to reel tape play deck.
- Microphone or musical instrument with preamplifier.

TAPE JACKS

The two sets of tape jacks allow for the use of two tape decks.

Record

 Connect the record LINE INPUT jacks of the tape deck to the TAPE ONE (or TWO) RECORD jacks.

Play

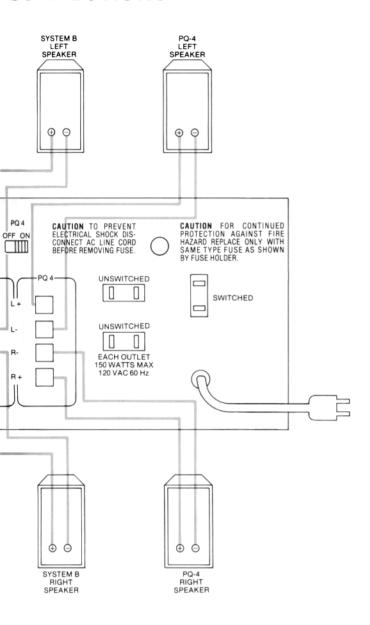
 Connect the playback LINE OUTPUT jacks of the tape deck to the TAPE ONE (or TWO) PLAY.

PRE-AMP

The pre-amplifier signals are relayed from the PRE-AMP jacks to the AMP jacks by the use of jumpers. These jumpers may be replaced with accessory equipment such as:

 Environmental Equalizer — to shape frequency response to suit room acoustics.

CONNECTIONS



- Slave Power Amplifier to drive multiple speaker systems.
- Crossover Network and a Slave Power Amplifier to convert receiver to bi-amp operation.

CAUTION: REMOVING JUMPERS WITH POWER ON MAY RESULT IN PERMANENT DAMAGE TO SPEAKERS AND RECEIVER.

To connect an environmental equalizer:

- Turn power OFF.
- Remove jumpers.
- Plug cables from PRE-AMP jacks to environmental equalizer input jacks.
- Plug cables from AMP jacks to environmental equalizer output jacks.
- Check channel connections for proper hook-up before turning power ON.

To connect a slave power amplifier:

- Turn power OFF.
- Remove jumpers.
- Using a commercially available "Y" connector, connect left channel (L) PRE-AMP and AMP jacks to left channel (L) slave amplifier jack.
- Repeat above step to connect right channel.
- Check channel connections for proper hook-up before turning power ON.

NOTE: You will be able to control the slave amplifier through the receiver VOLUME, BALANCE and TONE controls.

To connect a crossover network and a slave power amplifier:

- Turn power OFF.
- Remove jumpers.
- Plug cable from left (L) PRE-AMP jack to left crossover network input jack.
- Plug cable from left channel low-frequency section of crossover network to left channel jack of amplifier having higher power rating.
- Plug cable from left channel high-frequency section of crossover network to left channel jack of amplifier having lower power rating.
- Repeat above steps to connect right channel.
- Check channel connections for proper hook-up before turning power ON.

NOTE: When using a crossover network and a slave power amplifier for bi-amp operation, you will be able to utilize both the receiver amplifier and slave amplifier; and be able to control both through the receiver VOLUME, BALANCE and TONE controls.

UNSWITCHED AC OUTLETS

Plug accessory components such as turntables or tape decks into these outlets. The outlets remain on when the receiver power switch is turned off.

SWITCHED AC OUTLET

Plug associated electronic components such as an environmental equalizer or slave amplifier into this outlet. This outlet will be off when the receiver power is off.

NOTE: Do not use this outlet for turntables, tape decks or other motor driven accessories.

WARNING: TO AVOID A POSSIBLE SHOCK HAZARD, DO NOT CONNECT ANY ACCESSORY WHICH DOES NOT HAVE A MANUFACTURER SUPPLIED AUDIO OUTPUT JACK.

FRONT

AM DIAL — INDICATES AM STATION FREQUENCIES 520 TO 1630 kHz.

FM MPX INDICATOR—LIGHT GLOWS WHEN YOU HAVE TUNED IN A STEREO BROADCAST.

NOTE: INDICATOR WILL NOT LIGHT WHEN MONO BUTTON IS DEPRESSED EVEN IF TUNED TO STEREO BROADCAST.

FM TUNING METER — INDICATES BEST FM TUNING WHEN POINTER IS CENTERED.

SIGNAL-STRENGTH METER — INDICATES BEST AM AND FM RECEPTION WHEN POINTER IS AS FAR RIGHT AS POSSIBLE. IT IS ALSO USEFUL FOR ORIENTING ANTENNA FOR OPTIMUM SIGNAL STRENGTH ON FM

MIC JACK — FOR MICROPHONE OR MUSICAL INSTRUMENT INPUT.

POWER — TO TURN RECEIVER ON AND OFF.

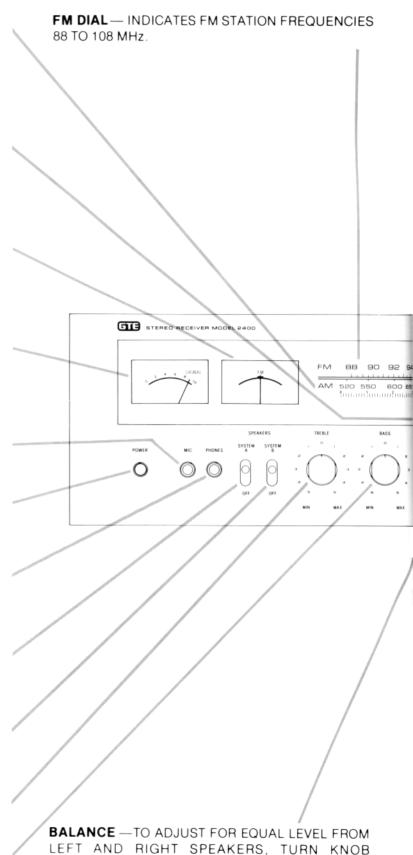
PHONES JACK — TO PLUG IN STEREO HEAD-PHONES.

SYSTEM A SPEAKER SWITCH — TO SELECT SYSTEM A AND PQ-4 SPEAKER SYSTEMS.

SYSTEM B SPEAKER SWITCH — TO SELECT SYSTEM B SPEAKER SYSTEM.

TREBLE— TO CUT OR BOOST HIGH FREQUENCY TONES SUCH AS FLUTES OR VIOLINS.

 ${\bf BASS}$ — TO CUT OR BOOST LOW FREQUENCY TONES, SUCH AS KETTLE DRUMS OR ORGAN PEDAL NOTES.



CLOCKWISE TO REDUCE LEVEL IN LEFT CHANNEL.

COUNTERCLOCKWISE TO REDUCE LEVEL IN RIGHT

CHANNEL.

PANEL

LOG SCALE — QUICK REFERENCE TUNING GUIDE THAT PROVIDES LOG SCALE REFERENCE NUMBERS WHICH CAN BE USED TO RELOCATE FAVORITE STATIONS.

VOLUME—TO ADJUST AUDIO LEVEL, TURN KNOB CLOCKWISE TO INCREASE VOLUME.

NOTE: ALWAYS SET VOLUME TO MIN "0"
POSITION BEFORE TURNING ON RECEIVER.

TUNING — TO SELECT AM & FM STATIONS.

MONO — ENGAGES SYSTEM FOR MONAURAL SOURCES. IT ALSO SWITCHES FM TUNER TO MONO; THIS WILL REDUCE THE NOISE ON WEAK FM STEREO STATIONS.

LOUDNESS — TO INCREASE BASS FREQUENCIES FOR PROPER TONAL BALANCE AT LOW LISTENING LEVELS.

FM — TO ENGAGE SYSTEM FOR FM RECEPTION.

FM MUTE — ELIMINATES INTERSTATION NOISE AND WEAK NOISY FM STATIONS. PUSH TO MUTE. SHOULD YOU WISH TO SEARCH FOR OR LISTEN TO WEAK SIGNAL STATIONS RELEASE MUTE BUTTON.

AM — TO ENGAGE SYSTEM FOR AM RECEPTION.

AUX — TO ENGAGE SYSTEM FOR AUXILIARY COMPONENTS.

HIGH AND LOW FILTERS — HIGH FILTER REDUCES HIGH FREQUENCY TAPE HISS, RECORD SCRATCH NOISE AND CUTS OFF FREQUENCIES ABOVE 10kHz. LOW FILTER REDUCES TURNTABLE RUMBLE AND ACOUSTICAL FEEDBACK.

PHONO ONE OR TWO — TO ENGAGE SYSTEM FOR PHONOGRAPH PLAY.

MIC — TO ENGAGE SYSTEM FOR MICROPHONE USE.

TAPE ONE AND TWO — TO ENGAGE SYSTEM FOR ACCESSORY TAPE PLAY OR TAPE MONITORING.

NOTE: TAPE BUTTONS MUST BE RELEASED

FOR FM, AM, PHONO, MIC, OR AUX FUNCTIONS.

SOUND SYSTEM OPERATION

Before turning the power ON, set controls and switches as follows:

- VOLUME control to MIN position.
- TREBLE, BASS, and BALANCE controls to center (0) position.
- Switch appropriate speaker system ON. See "Speaker System Connection."
- TAPE ONE and TWO buttons to OFF (unpushed) position.

AUX

- Connect accessory unit to rear of receiver. See "Component Connections".
- Depress AUX button.
- Adjust TREBLE, BASS and VOLUME controls for preferred loudness and tone.

AM RECEPTION

- Depress AM button.
- Rotate TUNING control to select desired station as indicated on AM dial. Reception is optimum when pointer on SIGNAL-STRENGTH METER is as far to right as possible.
- Adjust TREBLE, BASS and VOLUME controls for preferred loudness and tone.

FM RECEPTION

- Depress FM button.
- Rotate TUNING control to select desired station as indicated on FM dial. Reception is optimum when pointer of FM TUNING METER is centered and SIGNAL-STRENGTH METER is as far to the right as possible.
- Adjust TREBLE, BASS and VOLUME controls for preferred loudness and tone.

PHONO

- Connect turntable to rear of receiver. See "Component Connections".
- Depress appropriate PHONO button.
- When playing monaural records, depress MONO button.
- Adjust TREBLE, BASS and VOLUME controls for preferred loudness and tone.
- For additional information refer to instructions supplied with your turntable.

MICROPHONE

- Connect the microphone or musical instrument to MIC jack. Use either a mono or stereo type phone plug (See Note).
- Depress MONO pushbutton if mono type phone plug is used.
- Depress both PHONO ONE and TWO buttons. Both buttons must be depressed to select the microphone input.

NOTE: The microphone jack used on this receiver is a 3 circuit type similar to a stereo headphone jack. To use (2) stereo microphones, a commercially available "Y" adapter should be used.

TAPE PLAY

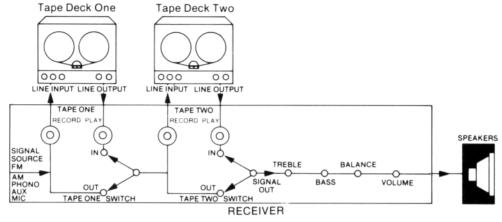
- Connect tape equipment to TAPE PLAY jacks on rear of receiver. See "Component Connections".
- Depress appropriate TAPE button.
- Adjust TREBLE, BASS and VOLUME controls for preferred loudness and tone.
- For additional information consult the instructions supplied with your tape deck.

TAPE RECORDING

- Connect tape equipment to TAPE RECORD jacks on rear of receiver. See "Component Connections".
- Select program source as described under sections AUX, AM, FM, PHONO or MICROPHONE. The program source signal is always present at the TAPE ONE (and TWO) RECORD jacks allowing simultaneous recording of signal sources. Signal source is not affected by the settings of the TREBLE, BASS, VOLUME or BALANCE controls.
- If the tape deck is a 3-head tupe equipped with a tape monitor function, the recording can be monitored by depressing the appropriate TAPE button. Both the PLAY and RECORD jacks must be connected to the tape deck. See illustration on page 11.
- For additional information consult the instructions supplied with your tape deck.

RECORDING TAPE 1 ONTO TAPE 2

- Connect tape deck 1 to TAPE ONE jacks and connect tape deck 2 to TAPE TWO jacks.
- Depress TAPE ONE button.
- A tape played on tape deck 1 can now be recorded on tape deck 2.
- If tape deck 2 is a 3-head type equipped with a monitor function, push the TAPE TWO button to monitor the recording. See Illustration on page 11.



SPECIFICATIONS

AMPLIFIER RATED CONTINUOUS AVERAGE POWER OUTPUT: 55 WATTS PER CHANNEL. MIN. RMS, INTO 4-8 OHMS FROM 20 HZ TO 20 KHZ, WITH NO MORE THAN 0.1% TOTAL HARMONIC DISTORTION (BOTH CHANNELS DRIVEN TO RATED PER-CHANNEL POWER).

Measured persuant to Federal Trade Commission Regulation rule on Power Output Claims for Amplifiers.

AMPLIFIER		OUTPUT IMPEDANCE	
Damping Factor	35	Tape Out	5,000 ohms
, •		Preamp Output	5,000 ohms
DISTORTION		Phono Overload	80mV @ 1kHz
Total harmonic distortion		Thomas of the contract	G IKIL
(THD) at rated continuous power	Less than 0.1%	CICNAL TO NOICE DATIO (UNIME	OUTED
IM distortion (60/7000 4:1) at	Less than 0.1 /6	SIGNAL TO NOISE RATIO (UNWEI	
rated continuous power	Less than 0.1%	Phono	80dB below
rated continuous power	Less than 0.1%	_	10mV input
FREQUENCY RESPONSE		Tape	86dB below
	2011- 120111- + 140		250mV input
Tape Input Phono RIAA standard	20Hz → 20kHz ± 1dB	Aux	86dB below
Phono RIAA Standard	± 1.0dB		250mV input
		Mic	70dB below
FILTERS			10mV input
High Filter @ 20kHz	-20dB		
	12dB/octave		
Low Filter @ 20 kHz	-20dB	FM TUNER	
	12dB/octave	Usable Sensitivity (IHF)	*10.3dBf (1.8 µV)
		20dB Signal to Noise	8.7dBf(1.5µV)
LOUDNESS CONTOUR		50dB quieting sensitivity	14.8dBf(3.0µV)
Volume Control (Mid Position)		Signal to Noise Ratio 100% mod.	70dB
100 Hz	+ 8dB	Capture Ratio (IHF)	1.5dB
1000 Hz	0dB	Full Limiting (1dB)	
		Image Rejection	6.8dBf(1.2µV)
TONE CONTROL ACTION		Alternate Channel Rejection	55dB
Bass Control, 100 Hz	± 10dB		67dB
Treble Control, 10kHz	± 10dB	IF Rejection @ 98MHz	65dB
Trout Control, Tomas	002	Spurious Response (½IF)	80dB
INPUT SENSITIVITY		AM Suppression	45dB
For rated continuous power		Total Harmonic Distortion (THD) FM Mono	0.00/
Power Amp	1.5V		0.3%
Tape 1 and 2	250mV	FM Stereo	0.3%
Aux	250mV	Stereo Separation	
Phono		1kHz	40dB
Mic	2.5mV	50Hz/10kHz	30dB
MIC	2.5mV	FM Muting Threshold	13.9dBf(2.7μV)
INDUT IMPERANCE			
INPUT IMPEDANCE			
Tape 1 and 2	50,000 ohms	AM TUNED	
Aux	50,000 ohms	AM TUNER	
Phono 1	47,000/100,000 ohms	Sensitivity 20dB S/N	
Phono 2	47,000 ohms	30% mod., 400Hz, 1.4MHz	200µV/m
Mic	47,000 ohms	Image Rejection 1.4MHz	63ďB
		Selectivity + 10 kHz, 1.4MHz	35dB
OUTPUT LEVEL		AGC Figure	
For rated continuous power		of merit 1.4 MHz	43dB
Tape Output	350mV		45
Preamp Output	250mV	* New IHF rating in femtowatts 0dBf :	= 10 ⁻¹⁵ W = .55 μV
r reamp Output	1.5V	into 300 ohms.	

CARE OF YOUR CABINET

GTE cabinets are quality constructed and crafted in durable finishes. Occasionally wipe cabinet surfaces with a clean cloth. Apply a thin, even coat of a good grade commercial wax or polish to the cabinet surfaces. Rub the waxed surfaces gently with a soft dry cloth to obtain the desired luster.

Whenever it becomes necessary to clean the non-wood parts of your instrument be sure to observe the following precaution.

- Cleaning (WARNING: TO AVOID POSSIBLE SHOCK HAZARD, BE SURE THE SET IS UN-PLUGGED FROM THE ELECTRICAL OUTLET BEFORE CLEANING.) Use a clean, soft cloth, chamois, or sponge dampened with a solution of cool clear water and a mild soap or detergent. Gently wipe the nonwood surfaces.
- Dry the wiped surfaces with a clean, soft cloth.

CONSUMER RELATIONS

If at any time this product does not fulfill your expectations, and your GTE Dealer is unable to make a satisfactory adjustment, please write to the following address:

GTE Sylvania Incorporated Consumer Relations 17 Masse Place Batavia, New York 14020

We welcome the opportunity to assure your faith in the quality of our products.

We advise you use GTE Recommended Replacement Parts

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



Entertainment Products Group, 700 Ellicott Street, Batavia, New York 14020

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