

# Owner's Manual

# CONCEPT

# 4.5D



# Introduction

Thank you for choosing Concept. We think you'll appreciate this product most if you understand its design philosophy. Take a few minutes and read this manual before you set up your new receiver. It will save you time and will help you get top performance.

The Concept 4.5D continues the Concept tradition: stereo receivers without compromise. Every detail, from the action of the controls to the size of the internal heat sinks, has been carefully crafted by a distinguished international team of designers and production engineers. Concept receivers combine performance of laboratory standards with bold visual definition. But above all else, your new Concept is a fine instrument for the discerning audiophile.

A number of design innovations make the Concept 4.5D a truly remarkable instrument. A digital frequency display makes precise tuning easy. Excellent AM and FM reception is assured by the tuner assembly which features a full quadrature detector, hand-picked filter elements and the latest phase-locked loop circuitry.

The Concept 4.5D power amplifier section incorporates single strata voltage amplifier devices and rugged, high-speed output transistors. The result is a carefully stabilized high-speed configuration that can amplify rapidly changing audio signals while producing the lowest possible distortion.

The hallmark of the Concept 4.5D is a standard of accuracy unmarred by audible distortion. This has been achieved by selecting only premium-quality parts and operating them far below their capabilities. The result is consistent performance for years of trouble-free service.

## A Note on High-Powered Receivers

The high power output capability of your Concept receiver will enable you to hear undistorted musical peaks, and bring fresh clarity and detail to your music. There are, however, a few things you should keep in mind regarding high power capacity and what it can do.

Concept's amplifier is direct-coupled, with no capacitors or filters between the output transistors and the speakers. Sound is passed directly to the speakers, no matter how low the frequency. Thus, any sonic deficiencies in your other components will become very apparent. For this reason, you should use only the highest quality equipment with your new Concept.

You should be especially careful when using your record player. Dropping the tonearm on the record, or flicking dust from the stylus, with the volume up, can send a power surge that may damage your speakers. It's also a good practice to turn the volume down whenever you're changing a record.

Check the power-handling capacity of your speakers; if it's low, you might want to fuse them. Your Concept dealer can give you advice. Prolonged operation at very high volume levels can also cause excessive heat to build up in the voice coils of your speakers, shortening their lifespan. This is particularly true of the relatively inefficient, acoustic-suspension, book-shelf type speakers. Sonically, this type of speaker benefits most from the high power afforded by your new Concept, but prolonged overdriving can lead to premature speaker failure.

## Unpacking

Save the shipping carton and all packing materials. They'll keep your receiver safe should you ever move or ship it.

Record the serial number and purchase date in the space provided here. This information will be needed if your receiver should require warranty service or is stolen.

SERIAL NUMBER: \_\_\_\_\_

DATE OF PURCHASE: \_\_\_\_\_

## Placement

You should, of course, place your receiver where it's most convenient. However, keep it away from direct sunlight or any other heat source. Be sure not to block the vents on the bottom, top, or back of the unit. Also, as the Concept 4.5D weighs 30 pounds, you should be sure it's on a sturdy shelf.

**CAUTION:** To prevent fire and to avoid shock hazard, do not expose the receiver to rain or moisture.

# Connections

**Be sure the power is switched off before you make any connections.**

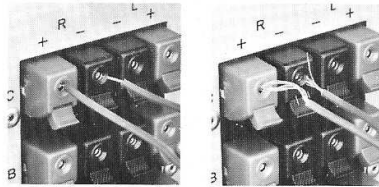
Your speaker wire should be of sufficiently heavy gauge. We recommend 18-gauge lamp cord ("zip cord"). If you need more than 50 feet to reach a speaker, you should use 16-gauge cord. Wire that is too thin will reduce power transfer and impair frequency response; heavier wire offers less electrical resistance and is therefore a more efficient conductor.

## Speakers

The Concept 4.5D receiver uses spring-loaded push terminals for all speaker connections; these are not only easier to use than the standard screw terminals, but they also greatly reduce the possibility of a stray wire strand short-circuiting the receiver.

To connect the speaker wires to the receiver, first strip off *only 1/4-inch* of insulation and twist the strands tightly together. Press in on the movable part of the terminal and insert the bare wire in the center hole; release and the speaker is connected.

Connect your main set of speakers to the "A" row of terminals. The right-hand speaker should be connected to the two "R" terminals, the left speaker to the "L" pair. You may connect a pair of extension speakers to the row of terminals marked "B".



Right way

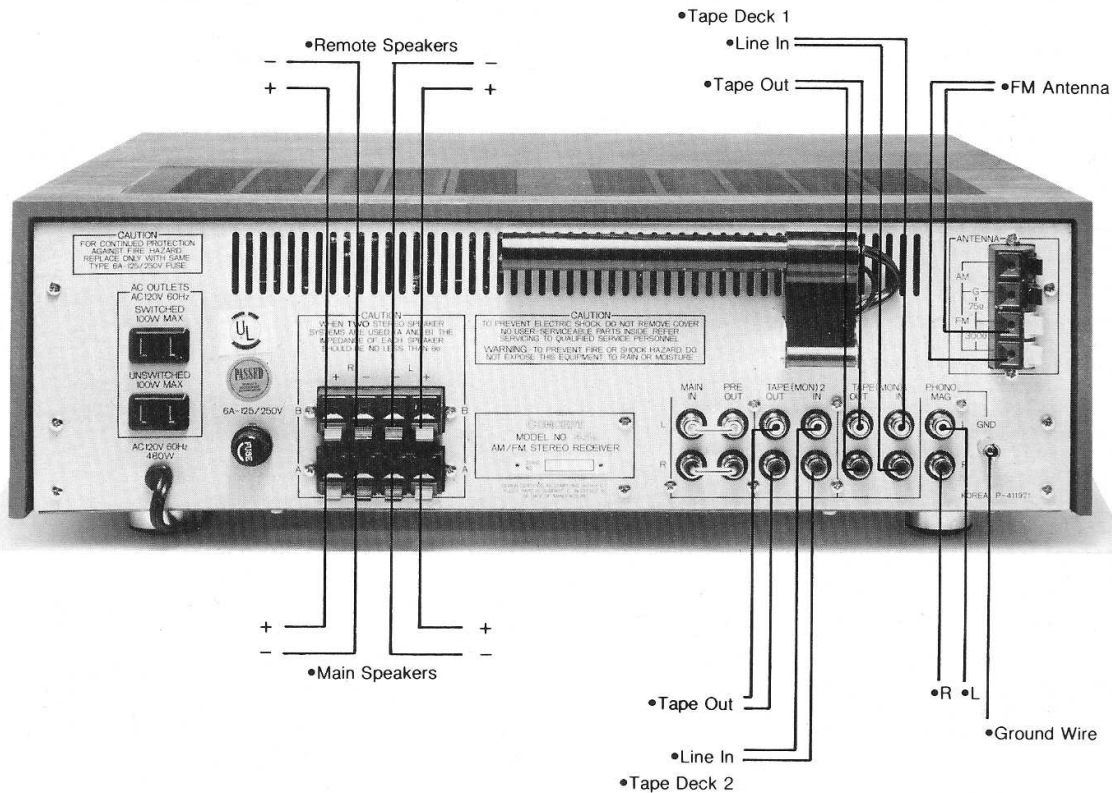
Wrong way

**Wire stripping:** Strip off only 1/4-inch of insulation. Stripping more will leave bare wire exposed and could cause a short circuit.

**CAUTION:** If you connect an extra pair of speakers, make sure that all your speakers are rated at 8 ohms or higher. Do not connect more than one pair of speakers if they are rated at 4 ohms.

**CAUTION:** If you are operating only one loudspeaker, connect it to either "L" or "R", but not both. Never make any speaker connections that join two red receiver terminals. This does not increase output and it could cause serious damage to the amplifier.

You should be certain your speakers are connected in phase, so that they will work in unison rather than in opposition. The positive terminal on the speaker (usually marked + or 8 ohms) should be connected to the *red* receiver terminal; the negative speaker terminal (marked - or 0) should be connected to the *black* receiver terminal. For a simple phase test, see the **Useful Information** section of this manual.



# Operation

## Music Sources

Connect your record player to the PHONO MAG receiver inputs. To realize the full potential of the Concept receiver, use only a high-quality magnetic cartridge in your record player. *Never* use a ceramic cartridge. The left channel lead from the turntable should be firmly plugged into the upper jack, the right channel lead to the lower. If the record player has a ground wire (most do), it should be connected to the GND post on the receiver. Grounding the record player to the receiver chassis nearly always prevents hum.

The leads from the record player should be kept away from any AC cords. This is another precaution against unwanted hum interference. To avoid loss of high frequencies, use only the 3- or 4-foot leads supplied with the record player.

If you have a tape recorder, connect it to the TAPE (MON) 1 jacks on the Concept 4.5D. The *output* leads from the tape deck go to the IN pair of jacks, and the *input* jacks on the deck (often labeled "line in") should be connected to the OUT pair of jacks on the Concept.

A second tape recorder may be connected to the TAPE (MON) 2 jacks. Hookup procedure is identical.

Either set of TAPE jacks may also be used to connect a component other than a tape deck. The leads from that component should go to the IN jacks.

## Signal Processors

Components such as equalizers can be connected between the PRE OUT and MAIN IN jacks. First be sure the power to the 4.5D is turned off, then remove (and save) the pins connecting the PRE OUT and MAIN IN jacks. The equalizer's *inputs* should be connected to the PRE OUT jacks and its *outputs* to the MAIN IN jacks. Other components which may be connected to these jacks include electronic crossovers and some time delay or reverberation units. Do not remove the connecting pins unless you are hooking up a component to the PRE OUT and MAIN IN jacks. **DO NOT TOUCH OR REMOVE THE PINS WHILE POWER IS ON.**

## Accessory Power

There are two AC convenience outlets on the Concept 4.5D. One of them is SWITCHED, and will provide power only when the Concept's power switch is on. Plug components such as equalizers or head amplifiers in the the *switched* outlet. The other outlet is UNSWITCHED and will provide power whenever the Concept is plugged in. A record player or tape deck should be plugged into this outlet. These components contain mechanical parts that can be damaged if their AC power is shut off during play.

## Antenna

An external antenna is required for FM reception. A T-shaped FM antenna, called a folded dipole, is included with the Concept 4.5D. It should be connected to the blue (300 ohm) antenna terminals. If you use an outdoor antenna with flat twin-lead, connect it to the blue terminals also. If your antenna uses 75-ohm coaxial cable, you can use the 75-ohm antenna terminals without the necessity of a matching transformer. The center portion of the cable goes to the 75-ohm terminal; the outer "shield" goes to the antenna ground. If you use a balun or matching transformer, its two leads go to the blue (300-ohm) terminals.

An AM antenna is attached to the back panel. Do not use it as a handle. It is not designed to hold the weight of the receiver. The AM antenna is hinged, so leave enough space behind the receiver to swing the antenna away from the receiver's back panel for best reception.

After you've made all the connections, you're ready to plug the power cord into a wall socket and begin operation.

First, be sure the receiver is plugged in and the *volume* control is turned down (fully counterclockwise).

Use the SELECTOR knob to choose the program source, then depress the POWER button. The indicator in the button will initially glow red, then change to green. (It takes about 5 seconds for the Concept's main protection relay to activate; the slight click you'll hear is normal.) Depress the appropriate SPEAKER button(s). Then slowly turn the volume control clockwise until the sound reaches the desired level. The volume control is precisely calibrated with 40 detents; each step is approximately a 1/2-dB increase in sound level.

## Tuning

The Concept 4.5D displays the received frequency in lighted numbers more accurately than a pointer on a linear scale. In addition, two indicators aid in getting the best possible FM reception. The SIGNAL QUALITY display charts the strength of the incoming signal. The "Tuned" light indicates when you have reached the center of the FM channel where distortion is at a minimum.

The large tuning knob is attached to a heavy internal flywheel and operates freely to help you make fine adjustments.

The "STEREO" light glows when you tune to an FM station broadcasting in stereo. If the reception is noisy and antenna adjustments don't help, depressing the MPX BLEND button may make a station more listenable. Deactivating FM muting causes the Concept to switch to the monophonic mode, thus reducing noise.

The FM muting circuit normally suppresses the loud hiss heard between FM stations. A reed relay circuit allows only signals of acceptable quality to reach the amplifier. If the station you wish to listen to has only a very low signal strength in your area, you may have to deactivate the muting circuit in order to hear it. The LED in the MUTE DEFEAT button glows red to indicate when the muting circuit is blocking reception or when muting is defeated. When you reach a station with an acceptable signal, the LED changes to green. The LED also glows red when the muting circuit has been defeated.

For AM, only the SIGNAL DISPLAY operates. Tune for the strongest indication. There is no muting for AM.

### Using the Controls

The Concept 4.5D offers the control flexibility you need to help you enjoy top performance from your other components.

### Tone Controls

The BASS and TREBLE controls each have 20 positions of 1 dB change. Don't hesitate to use the tone controls. They will let you add depth to many recordings or compensate for your listening room acoustics. In their center positions the tone controls have no effect on sound quality.

The HIGH FILTER rolls off the high frequencies. It can be used to reduce tape hiss, record surface noise, and excess noise in FM reception. It also cuts out any musical material at those frequencies.

Use the BALANCE control to shift the stereo image from left to right, to keep the image centered when the source is too strong in one channel, or when your listening position favors one speaker.

The LOUDNESS button provides controlled low- and high-frequency boost for low volume listening. Its compensation conforms to the latest research on the Fletcher-Munson effect in human hearing at low levels.

### Tape Playback and Recording

The TAPE (MON) 1 jacks on the rear panel correspond to the TAPE 1 controls on the front panel. A deck connected to those jacks will be referred to as "deck 1" in the subsequent instructions. Similarly, the TAPE (MON) 2 jacks correspond to the TAPE 2 controls, and a deck connected there will be called "deck 2."

*To listen to deck 1:* First push in the left hand MONITOR button to change from SOURCE to TAPE. The LED will change from green to red. Leave the right hand MONITOR button in the "out" position to select TAPE 1. The LED will remain green.

*To listen to deck 2:* Proceed as with deck 1 above, but push the right hand MONITOR button in to select TAPE 2. The LED will change to red. (Note: when the left hand MONITOR button is returned to SOURCE (the "out" position) both LED's return to green.)

*To record:* Make sure your deck is in the record mode. (Refer to the tape deck instruction manual for proper record level settings.) Turn the SELECTOR to the program you wish to record, FM, for example, if you want to tape an FM radio program; PHONO for taping one of your records.

*Monitoring:* Tape recorders with a separate playback head (three-head decks) allow you to make an instant comparison between the recording and the original source. This comparison is known as monitoring.

To monitor a recording, simply follow the above instructions for listening to a tape deck. Again, the right-hand MONITOR button selects deck 1 or deck 2; the left-hand MONITOR button lets you make an instant comparison between the source and the tape recording. This way you can check on the quality of your recording.

The Concept's flexible tape monitor arrangement also permits *dubbing*, i.e. copying tapes. To dub a recording from deck 1 to deck 2, turn the SELECTOR to TAPE 1. To monitor that recording, follow the procedure for listening to deck 2.

To dub a recording from deck 2 onto deck 1, turn the SELECTOR to TAPE 2. To monitor, follow the procedure for listening to deck 1.

**CAUTION:** If you are recording onto deck 1, *never* set the SELECTOR to TAPE 1. If you are recording onto deck 2, *never* set the SELECTOR to TAPE 2. This would cause a howling feedback sound to build up, and could damage your speakers in a few seconds. As a matter of good practice, use only the MONITOR buttons to listen to tape.

### Headphones

For private listening, you can plug two sets of headphones into the Concept front panel. Any headphones of 8 ohms impedance (or higher) are suitable.



# Useful Information

## FM Reception Problems

If you're getting good FM reception, you can skip this section. If not, the following may help.

The T-shaped folded dipole antenna will give you adequate reception in most metropolitan areas. You can get the best possible indoor reception by moving the wire to face the transmitter.

"Fuzzy" stereo reception is usually the result of *multipath*, a phenomenon that causes the "ghosts" on a TV screen.

FM radio waves are like light. They travel along a straight "line-of-sight" path. They will go through plaster walls and such, but they are reflected by geographical features, massive concrete structures, metal surfaces and other dense objects common to cities and mountainous terrain. Not only does the signal reach your antenna directly from the transmitter, but it *also* gets there along one or more "bounce paths." These reflected signals travel farther and therefore arrive just slightly after the direct signal arrives. This causes the multiple images on a TV screen, and audible distortion in your stereo system.

Concept's advanced tuner circuits minimize the effects of multipath interference, so any audible problem should be an antenna problem. Try to get your antenna as high as possible, to give the direct signal a better chance at a clear path to it. A reflected signal can still give you good sound, but *multiple* reflections hurt; that's why proper orientation of your antenna may require some experimentation.

In difficult reception areas, an outdoor antenna may be necessary; a good directional outdoor antenna is not only positioned higher, but it can make a better selection between the desired signal and unwanted reflections. Your Concept dealer can advise you on an outdoor antenna.

## FM Cable Connections

If you have cable FM, your cable service will provide the proper connecting hardware. You should know, though, that cable services sometimes transpose the frequency of some or all of the FM signals they deliver. Your cable service may also import FM signals from outside your broadcast area. Ask your cable service to furnish you with a list of the stations and their cable frequencies.

## AM Antenna

To get satisfactory AM reception, the hinged AM antenna must be swung away from the back of the receiver. If you live in a fringe reception area, you can improve AM reception with an outdoor AM antenna. This can be a single piece of insulated wire, strung outdoors between two insulators. Place it as high as possible. The outdoor portions of the wire should be 25 to 75 feet long. Connect it directly to the AM antenna terminal on the Concept's rear panel. To reduce possible interference, and for safety reasons, you must use a ground with an outdoor AM antenna. Connect the antenna ground terminal to an *earth ground*, such as a metal water pipe.

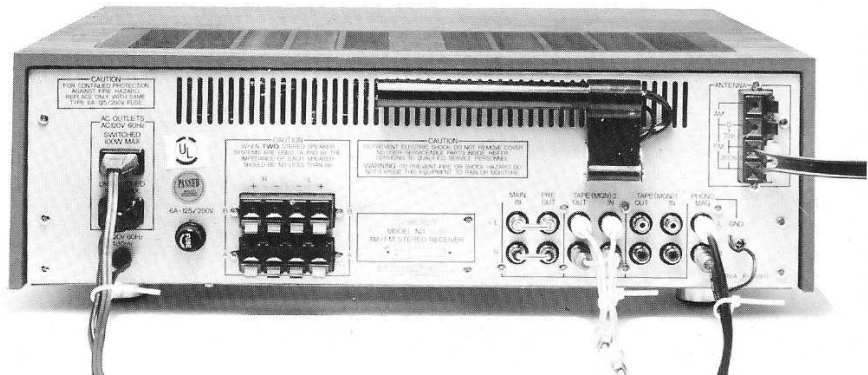
## Speaker Phasing

You can double-check your speaker phasing with a simple listening test. First move the speakers together facing each other about 4 inches apart. With a stereo record playing, slightly advance the bass control on the receiver, and switch between stereo and mono. If there seems to be less bass in the mono position, *turn off* the receiver, reverse the leads at *one* speaker and repeat the test. When the quantity of bass seems similar in stereo *and* mono, the speakers are phased correctly.

## Protection Circuits

The Concept 4.5D receiver has many devices to protect against damage from short circuits and overload conditions. One of these devices is a special relay that disconnects all of your speakers. Should the speaker wires accidentally touch and cause a short circuit, the protection circuit shuts off the receiver and the green LED in the POWER button changes to red. If this happens, turn off the POWER button and check all speaker connections. Make corrections where necessary. Wait 15 seconds before turning the power back on. If the condition which caused the fault has been corrected, you will be able to resume listening.

The protection circuit also activates if the receiver is driven beyond its capacity (for instance, if you try to drive two sets of 4-ohm speakers simultaneously at high power).



## For the Technically Curious

The reed relay that switches the muting circuit also protects Concept's circuits and your speakers from thumping switching transients when you change signal sources. You will actually see the MUTE DEFEAT LED flash red briefly as you select a different input.

The receiver has a 125-Volt, 6-Amp AC line fuse. Should this fuse fail, replace it only with an identical fuse. Use of a larger fuse will invalidate the warranty. Generally, if the fuse blows, it's an indication of malfunction and you should contact your Concept dealer.

*Reminder:* Never make any speaker connections that join two red receiver terminals. Rather than increasing output power, it will cause serious damage to the receiver.

For a neat and professional-looking installation, use the plastic cable ties included with this manual. Loop them around the wires with the beaded edge facing outward, pull tight and clip off the unused portion.

This section is a brief description of Concept's many innovative circuit features. It may prove helpful in understanding why Concept is unique among receivers and why Concept delivers performance comparable to the best separate components.

### FM Section

A MOS FET front-end provides the Concept with excellent sensitivity and immunity to overloading from very strong local signals. Concept also has an extremely steep quieting curve to achieve an outstanding signal-to-noise ratio on weak signals.

The IF section utilizes three hand-picked, linear-phase ceramic filters to maximize selectivity and keep distortion extremely low. Precise impedance matching of the IF amplifiers to the filters is another technique used to minimize distortion.

Concept uses three high-gain symmetrical limiters to assure noise-free performance even in the presence of natural or man-made interference. The critical conversion of the FM signal to audio is done with a wide-band, low distortion full quadrature detector, assuring noise-free, low distortion reception on even the weakest signals.

A phase-locked loop IC in the multiplex decoder keeps the tuner perfectly synchronized to the transmitter's pilot tone to achieve maximum stereo separation *and* the lowest possible distortion. Pilot cancelling eliminates any spurious signals that might interfere when recording a tape using the Dolby™ process.

### Preamplifier Section

Concept uses a three stage phono preamp circuit with a differential pair input stage. A three-stage design insures that the circuit will have sufficient loop gain to conform to the RIAA playback standard accurately, even at the very lowest frequencies. Transistors are especially selected to provide noise-free amplification.

The differential pair input stage provides the highest degree of immunity to RF interference, an important consideration in light of the growth in the use of CB equipment—especially in urban areas. It also isolates the feedback network from the input signal, making the Concept more tolerant of wide variations in cartridge inductance and allowing you to realize the full potential of virtually any high-quality cartridge.

Concept's tone controls have completely independent negative feedback circuits to provide more effective compensation. The circuits can provide up to 10 dB of boost or cut at the frequency extremes. Control is offered in 1 dB increments.

When the controls are in the "0" (center) position, the circuit balance insures that the frequency response will be absolutely uniform at all frequencies.

Another important feature is complete isolation of the tape deck outputs. Special emitter follower buffer amplifiers insure that the Concept's frequency response will be unaffected by the loading of external equipment connected to the TAPE OUT jacks. Other receivers may demonstrate flat frequency response when no external devices are connected but can suffer audible deterioration in frequency response when loaded by tape decks, equalizers, or other accessories.

## Power Amplifier Section

The Concept 4.5D's power amplifier uses direct-coupled, fully-complementary driver and output stages, with rugged high-speed output transistors to increase reliability. These transistors are mounted on extruded aluminum heat sinks for maximum heat dissipation, another measure promoting long transistor life. Two differential gain stages provide the lowest possible distortion at any power level.

Voltage amplifier circuits are on a single stratum to achieve thermal stability and thus less distortion under all operating conditions. All active components in the voltage amplifier stages are mounted on common blocks so they are exposed to exactly the same thermal conditions. In this way low distortion linear gain can be assured with excellent stability.

The combination of these and other design factors result in what we call a stabilized high speed amplifier. The amplifier contains very fast active elements with precisely controlled feedback. It's an amplifier with the ability to reproduce rapidly changing signals without producing significant distortion.

Active protection circuitry senses excessive current in the output stages or any dangerous offset voltages. Whenever a fault condition is detected, a high-current relay disconnects all speakers to prevent any possible damage.

The power supply consists of an oversized power transformer, heavy-duty bridge rectifier, and two 6,800 uF high-voltage electrolytic capacitors. Supply circuits for each section of the receiver are carefully isolated and regulated so that current drawn by the output amplifier cannot effect operation of the other stages.

Industrial grade speaker switches assure that all available power is transferred to the speakers. Imperfect power transfer across output switch terminals can increase distortion from even the finest amplifier design.

The highest quality connectors have been used throughout your Concept 4.5D to facilitate service, should it ever be required. In addition, the internal layout has been carefully organized to reduce hum and crosstalk as well as to insure consistent performance from one receiver to the next.

## In Case of Difficulty

If there appears to be a malfunction of the unit, turn it off and *check all connections*. Frequently the cause of the trouble is a loose connection rather than any receiver malfunction.

There are a number of noises which may occur from time to time and interfere with your listening. Usually these are caused by external conditions. The following section lists the most common noises and their most likely causes.

### When listening to the Radio

*Buzzing*, continuous or intermittent, is often caused by fluorescent lights, or electric motors (blenders, or electric trains, for instance). These sources may also cause hum interference. The best solution is to remove the source. If this isn't possible, try a better antenna, ground the receiver properly, or reverse the AC plug in its outlet.

*Static* on FM may be caused by interference from automobile or truck ignitions. This is likely to occur on weaker signals, and the best solution may be an outdoor antenna with shielded connecting cable.

*Hiss* on AM reception can be caused by interference from a strong station adjacent to the one being tuned, or by a TV set being operated in close proximity to the receiver. This interference is practically impossible to remove. Try moving the TV set away from the receiver, or just don't operate them simultaneously.

### When Playing Records

*Hum* or *buzz* can be caused by loose connections, poor grounding, or by AC line cords (particularly from fluorescent lamps) being too close to the shielded phono leads. Check your connections, ground the record player chassis to the receiver, or move the offending cords. Severe hum in only one channel is usually the result of a faulty tonearm headshell contact or cartridge wiring.

*Poor tone quality* or *fuzzy sound* may result from a worn stylus or record, an incorrectly mounted cartridge or a dirty stylus. Check the stylus condition, the mounting, and the tracking force. Keep your records clean. Your Concept dealer stocks a number of effective record and stylus cleaning aids.

*Howling* and *rumble* sounds may be caused by feedback. Vibrations from the speakers can actually recirculate through the record player. Keep your turntable as far as possible from the speakers, and mount the turntable on as rigid a surface as you can.

Thousands of hours of research, lab-testing, field-testing, and re-evaluation have evolved into your Concept 4.5D. Certainly it is without peer in performance, styling and convenience. We feel that it will be one of the finest receivers available for quite some time. There will, no doubt, be attempts to copy Concept, but you own an original. We'd be grateful to know that this product creates the satisfaction for which it was intended. We urge you to write us with your comments.



# Specifications

## Power Amplification Section\*

Continuous power output of 45 watts per channel minimum RMS, 20-20,000 Hz, both channels driven into 8 ohms, with no more than 0.04% total harmonic distortion. (16.53dBW)  
Frequency Response: 20-20,000 Hz  $\pm$  0.5 dB  
IM Distortion (50 Hz:7kHz = 4:1): Less than 0.04%  
Damping Factor: Greater than 150 at 20 Hz  
Hum and Noise: -86 dB, weighted  
Outputs: Speakers A or B; 2 Lo-Z headphone

\*Power measured in accordance with the Federal Trade Commission's rule on power output claims.

## Preamplifier Section

Input Sensitivity:  
Phono: 1.9 mV  
Tape 1, Tape 2: 160 mV  
Phono Overload: 220 mV  
Input Impedance  
Phono: 47 k $\Omega$ , 200 pF  
Tape 1, Tape 2, Main in: 20 k $\Omega$   
Output Level  
Tape 1, Tape 2: 600 mV at 1 kHz, referenced to 100% FM modulation or 10 mV phono.  
Phono Frequency Response:  
30-15,000 Hz  $\pm$  0.2 dB to RIAA curve  
Tone Controls  
Bass:  $\pm$  10 dB at 100 Hz in 2 dB steps  
Treble:  $\pm$  10 dB at 10,000 Hz in 2 dB steps  
Loudness Contour at -30 dB: +8 dB at 100 Hz, +4 dB at 10,000 Hz  
High Filter: -10 dB at 20 kHz, 6 dB/octave  
Volume Control Balance: within 0.3 dB tracking  
Signal-to-Noise Ratio  
Phono: 76 dB unweighted, 80 dB weighted  
Tape 1, Tape 2: 85 dB  
Main in: 90 dB  
Residual Hum and Noise: 0.5 mV  
Crosstalk at 1 kHz: -65 dB

## FM Tuner Section

Tuning Range: 87.5-109 MHz  
Sensitivity  
IHF: 10.3 dBf (1.8  $\mu$ V) at 300 $\Omega$   
50 dB quieting  
(mono): 14.1 dBf (2.8  $\mu$ V)  
(stereo): 36.8 dBf (38  $\mu$ V)  
Signal-to-Noise Ratio at 65 dBf: 72 dB  
Stereo Separation  
At 1 kHz: Better than 48 dB  
At 100 Hz: Better than 40 dB  
At 10 kHz: Better than 38 dB  
Total Harmonic Distortion at 65 dBf:  
0.1% (mono), 0.1% (stereo)  
Frequency Response: 30-15,000 Hz  $\pm$  0.5 dB  
Capture Ratio: 1.0 dB  
Alternate Channel Selectivity: 78 dB  
Spurious Response Ratio: Better than 88 dB  
Image Response Ratio: Better than 90 dB  
IF Response Ratio: Better than 95 dB  
Muting Sensitivity: 16.1 dBf (3.5  $\mu$ V)  
Stereo Threshold: 16.1 dBf (3.5  $\mu$ V)

## AM Tuner Section

Tuning Range: 520-1650 kHz  
IHF Sensitivity: 175  $\mu$ V/m  
Image Response Ratio: 50 dB  
Signal-to-Noise Ratio: 40 dB

## General

Dimensions  
Width: 483 mm (19 in.)  
Height: 165 mm (6.5 in.)  
Depth: 406 mm (16.0 in.)  
Weight: 13.6 kg (30.0 lb.)

# Limited Warranty

Your Concept receiver is covered by a limited warranty against defects in materials and workmanship for a period of three years from the date of purchase. Warranty repair will be performed only when your purchase receipt is shown as proof of ownership. Defective parts will be repaired or replaced without charge if this Concept receiver is returned to your dealer's store, as shown on your purchase receipt, or to any branch of that store where, in all cases, authorized service will be available. Check the yellow pages or white pages of your telephone directory for the location nearest you. If additional assistance is required, please write to the Service Manager, Concept Receiver Division, at the address below describing the problem, and the Service Manager will send directions in writing.

Charges for unauthorized service and transportation costs are not reimbursable under this warranty. Any damage or defect resulting from unauthorized parts or services is not covered by this warranty. Any services performed by other than a dealer authorized to perform such services are not reimbursable under this warranty.

This warranty becomes void if the serial number is defaced or removed, or if the product has been damaged by alteration, misuse, accident or neglect. *THE WARRANTOR ASSUMES NO LIABILITY FOR PROPERTY DAMAGE OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGE WHATSOEVER WHICH MAY RESULT FROM THE FAILURE OF THIS PRODUCT.* Any and all warranties of *MERCHANTABILITY* and of *FITNESS* implied by law are limited to the duration of this expressed limited warranty.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitations may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights and you may also have other rights which vary from state to state.

Service Manager  
Concept Receiver Division  
CBS Inc.  
1313 53rd Street  
Emeryville, California 94608

# CONCEPT

The Ultimate in Sound Reproduction

CBS, Inc.  
1313 53rd Street  
Emeryville, California 94608

© 1980 CBS Inc.  
Printed in USA