Owner's Manual

CONCEPT 12.0D

Introduction

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 a wide-band circuit with no capacitors or filters between the output transistors and the speakers. Sound is passed directly to the speakers even at extremely low frequencies. 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 use fuses in the speaker lines. Your Concept dealer can give you advice.

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 12.0D 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.

A number of design innovations make the Concept 12.0D a truly remarkable instrument. All-electronic tuning with a quartz crystal reference makes precise tuning as simple as the touch of a button. Electronic memories store up to six of your favorite stations for instant access.

The Concept 12.0D power amplifier section employs high-gain voltage amplification followed by rugged output transistors in a carefully stabilized, high-speed configuration. A large toroidal power transformer efficiently supplies power for the most demanding musical passages. The result is a unit that can amplify rapidly changing audio signals while producing the lowest possible distortion.

The hallmark of the Concept 12.0D 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.

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 12.0D weighs 51 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.

Operation

CAUTION: If you connect extra pairs 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.

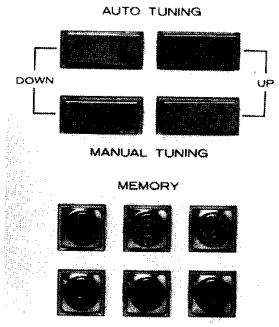
You should be certain your speakers are connected in phase, so that they will work in unison rather than in opposition. The positive terminal on the speaker (usually marked + or 8 ohms) should be connected to the *red* receiver terminal; the negative speaker terminal (marked – or 0) should be connected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

Tuning

The Concept 12.0D digital display shows the received frequency more accurately than a pointer on a linear scale. Its quartz referenced electronic tuner always goes to the exact center of the broadcast channel for the best possible reception. The "Quartz Lock" light indicates when the electronic tuner has stabilized on a new frequency. The SIGNAL QUALITY display charts the strength of the incoming signal. The "STEREO" light is illuminated when you tune to an FM station broadcasting in stereo.

There are four ways to tune the Concept 12.0D.

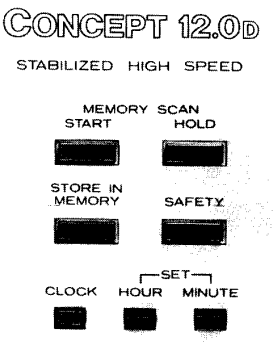
1. AUTO TUNING. At the touch of a button, the tuner scans up or down to the next station of acceptable signal strength. Note that when the tuner scans to either end of the band, it starts over at the opposite end.



2. MANUAL TUNING. A brief touch of a button steps the tuner one channel up or down (0.2 MHz). Holding the button down for about 1½ seconds causes the tuner to scan rapidly until released.

3. MEMORY. Memory positions allow the storage of six different station frequencies. The tuner will go directly to the station at the touch of the appropriate memory button. Loading the memory positions is easy. Simply tune to the station you wish to store using either the AUTO or MANUAL TUNING buttons. Then push the STORE IN MEMORY button. The "STORE IN MEMORY" light indicates that the tuner is ready to load the displayed frequency as soon as you indicate which preset it should load. Touch any one of the six memory buttons to store the displayed frequency in that location. The memory positions will retain the frequency information until you store another frequency there. They will hold information even when you turn off the 12.0D, but will lose the information if you unplug the 12.0D from AC power.

4. MEMORY SCAN. After you have loaded your favorite stations in the memory presets, you can quickly survey the programs on those stations with a single touch of the START button. The tuner will skip to preset, pausing about five seconds at each station. Simply press the HOLD button to stop the tuner on the station you want to hear.



Because the 12.0D's touch tuning systems are so easy to operate, the SAFETY button is provided to guard against accidental change of station. A touch of the SAFETY button disengages all the tuning controls and extinguishes the digital readout. A second touch restores normal operation. Use the SAFETY button when you are taping from FM or otherwise do not want the tuner disturbed.

If the reception on the station you want to hear is noisy and antenna adjustments don't help, depressing the MPX BLEND button may make a station more listenable, while maintaining most stereo separation. If the signal is still too noisy, depress the MUTE DEFEAT/STEREO MONO button. This will cause the Concept to switch to the monophonoic mode, further reducing noise.

The muting circuit normally suppresses the loud hiss heard between broadcast stations. A reed relay circuit allows only signals of acceptable quality to be heard. If the station you wish to hear has only a very low signal strength in your area, you may have to defeat the muting circuit. The LED in the MUTE DEFEAT button glows red to indicate when the muting circuit is blocking reception. 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.

Connections

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

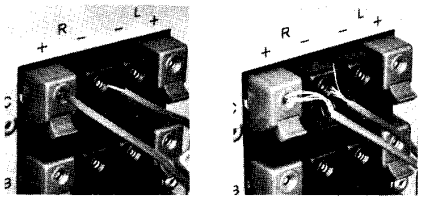
Your speaker wire should be of sufficiently heavy gauge. We recommend 18-gauge lamp cord ("zip cord"). If you need more than 50 feet to reach a speaker, you should use 16-gauge wire. Wire that is too thin will reduce power transfer and impair frequency response; heavier wire offers less electrical resistance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

Speakers

The Concept 12.0D 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.

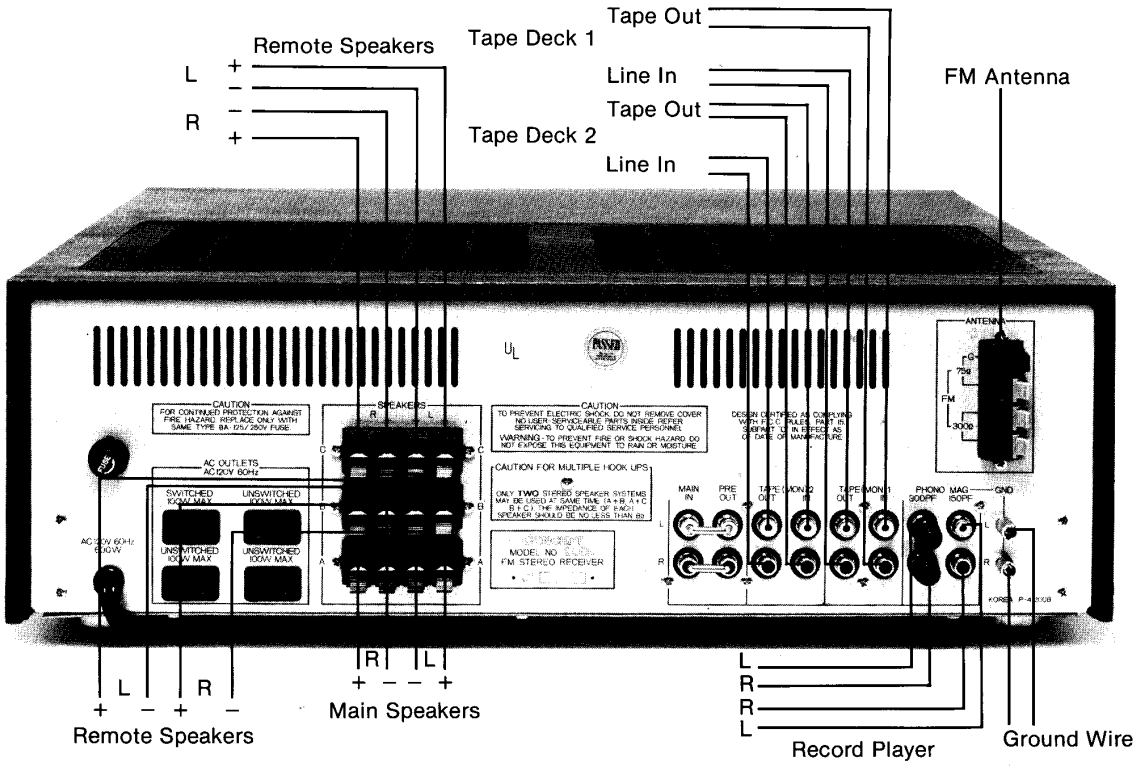
To connect the speaker wires to the receiver, first strip off *only ¼-inch* of insulation and twist the strands tightly together. Press in on the movable part of the terminal and insert the bare wire in the center hole; release and the speaker is connected.

Right way **Wrong way**



Wire stripping: Strip off only ¼-inch of insulation. Stripping more will leave bare wire exposed and could cause a short circuit.

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 each of the rows of terminals marked "B" and "C".



Using the Controls

The Concept 12.0D offers the control flexibility you need to help you enjoy top performance from your other components.

Loudness Control

The 12.0D's LOUDNESS control is unique to Concept. "Loudness" differs from "volume" because volume is quantifiable—it can be measured on an absolute scale. Loudness is the *perceived* volume level rather than the *actual* level. Human ears don't perceive the frequency extremes as well at low volume levels; bass and treble seem to disappear. A "loudness" contour circuit compensates for that. Concept's special design is adjustable in 22 1-dB increments, and is far more useful than conventional on-off circuits.

When the VOLUME control is set for high listening levels, you'll want the LOUDNESS control set at "0," because your ears don't require any special frequency compensation. To reduce the listening level, use the LOUDNESS control instead of the volume control. Turning the LOUDNESS control counter-clockwise will lower the level without sacrificing the perceived frequency balance; you'll still be able to hear bass and treble in their proper balance.

Because loudspeakers have different energy requirements and tonal characteristics, you'll want to experiment with the relative positions of the LOUDNESS and VOLUME controls to find the optimum settings for your listening room and personal taste. There are 880 possible combinations of these controls.

WARNING: The immense power reserves of the 12.0D can damage many speakers if full loudness compensation is used with very high volume settings. Use the loudness circuit to reduce listening levels, not to increase bass response at high volumes.

Tone Controls

A flexible tone control/equalizer array is provided on the Concept 12.0D. Four separate controls allow the adjustment of the frequency extremes as well as the critical mid-band frequencies which influence the perceived presence of voices and most instruments. (See the Specifications for further information on tone control action.) The PRESENCE 1 and 2 controls have 10 position of 2 dB change; the extreme BASS and TREBLE controls have 20 positions of 1 dB change.

Experiment with the tone controls. They'll let you add depth to many recordings, or compensate for your listening room acoustics. You can use the four tone controls as an equalizer, and make precise adjustments to the sound at useful points in the frequency spectrum. You can add just a little more bass, or emphasize the vocals. The BASS control can be used effectively to reduce low frequency and subsonic rumble. The treble control can be used to enhance definition and spaciousness.

Because the bass and treble controls operate at the extreme of the frequency spectrum, they can have a very subtle effect on the sound. Their full effect may be apparent only with well-recorded sources played through wide-range loudspeakers.

The Concept 12.0D has a TONE DEFEAT button which removes the tone controls from the circuit restoring the amplifier to flat frequency response. You may find this switch useful when setting your tone controls to achieve proper listening room equalization. TONE DEFEAT allows you to make instantaneous comparisons of the flat and equalized reponses.

The HIGH FILTER rolls off the high frequencies with a steadily increasing effect above 7 kHz. It can be used to reduce tape hiss, record surface noise, and the excessive noise from weak FM signals. By using the high filter and the treble control together, noise can be reduced still further.

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

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.

Useful Information

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: for example, FM 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 instantaneous comparison between your recording and the original source. This comparison is know 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 chooses between the source and the tape recording. In 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, *never* set the SELECTOR to TAPE 2. These selections could cause a howling fedback 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 one or two sets of headphones into the Concept front panel. Any headphones of 8 ohms impedance (or higher) are suitable.

Digital Clock

The Concept 12.0D contains a convenient 24-hour clock. The digital readout displays the time of day at the touch of a button. The clock display can be left visible when the receiver is turned off.

Setting the Clock

Whenever you connect the 12.0D to a power source, you will have to set the correct time. When power is restored to the clock circuits, the display will read 0:00 and begin counting. To set the correct time:

1. Use SET MINUTE button to advance to the correct minute. The minutes will advance one-at-a-time with each single stroke of the button. Holding the button in will advance the minutes at high speed.
2. Use SET HOUR button to advance to the correct hour. Once again each stroke advances the hour by one, but holding the button advances them rapidly. As you advance the hour, you'll notice the prime mark (') which indicates P.M. hours. Be sure to advance the hour to the correct day part so that 7:30 at night, for instance, reads "'7:30".

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.

In some ways 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.

For the Technically Curious

This section provides 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.

Phono Input Capacitance

For those who want a more accurate way to determine the optimum input for their cartridge and turntable combination, we provde the following procedure. First consult the instruction sheet that came with your phono cartridge for the recommended capacitive load—expressed in pico-Farards (pF). Next, measure the length of one of the audio cables that will connect the turntable to the 12.0D. (If you intend to use an extension cable, measure it also.) Check the table below to determine the capacitance-per-foot of the cables supplied with your turntable. (Also note the capacitance of your extension cable.) Multiply the capacitance-per-foot times the number of feet to find the capacitance of your particular cables. (Add the capacitance of any extension cable to determine the capacitance of the whole run.) Now subtract the total cable capacitance (in pico-Farads) from the recommended cartridge loading capacitance. This new figure is the optimum amplifier load for your particular cartridge and turntable combination (including extension). You should now choose the Phono input which offers a capacitive load closest to your calculated optimum load.

CABLE TYPE	CAPACITANCE pf per foot
German low capacitance	17
Japanese low capacitance	15
Standard replacement cable	90

Protection Circuits

The Concept 12.0D 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 normal capacity (for instance, if you try to drive two sets of 4-ohm speakers simultaneously at high power).

The receiver has a 125-Volt, 7-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.

Tuner Section

A grounded substrate, dual-GATE MOS FET provides the Concept with excellent signal sensitivity and an immunity to overloading from very strong local signals. Eight matched, back-to-back varactor diodes control the front-end tuned circuits in response to signals from a microprocessor-controlled phase-locked loop. A buffer amplifier and pre-scaler process the tuning oscillator signal for constant comparison with the frequency generated by a quartz-referenced oscillator. The result is precise electronic tuning with push-button control and quartz-locked accuracy.

The IF section utilizes six linear-phase crystal resonators to maximize selectivity and keep distortion extremely low. Balanced IF amplifiers provide extremely high gain. Precise impedance matching of the amplifiers is another technique used to minimize distortion.

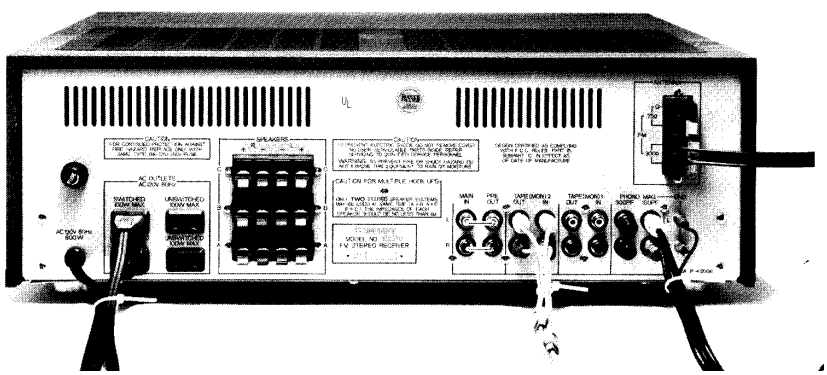
Concept uses six stages of high-gain symmetrical limiting to assure noise-free performance even in the presence of natural or man-made interference. The critical conversion of the FM signal to audio is done with a wide-band, low distortion full quadrature detector using a double-tuned reference coil. This arrangement assures low distortion reception on even the weakest signals.

Speaker Phasing

When properly phased, your speakers will work together to provide maximum bass and a convincing stereo image. You can check for correct phasing with the following procedure.

1. Place your speakers together with the grilles facing one another.
2. Push in STEREO/MONO button on the 12.0D and play music at a moderately low level.
3. Turn off the 12.0D and interchange the leads to *one* of the speakers. Turn on the 12.0D and listen for a change in the level of the bass. Leave the speakers connected in the arrangement which gives the most bass.

Plastic cable ties in position.



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* and the lowest posible distortion. Multi-pole, ultrasonic filters isolated by output buffer amplifiers eliminate any spurious signals that might interfere with tape recording.

Concept uses a three-stage phono preamp circuit with a differential pair input stage for high common mode rejection. The 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. The transistors are specially selected for low-noise amplification.

The differential pair input stage provides the highest degree of immunity to RF interference, an important consideration in urban areas and in light of the widespread use of CB equipment. It also isolates the feedback network from the input signal, making the Concept more tolerant of variations in cartridge inductance.

Concept engineers have also built in the option of presenting two different capacitive loads to your phono cartridge. By properly selecting the input capacitance, you can insure the most uniform frequency response from your combination of turntable and cartridge. Follow the procedure in the USEFUL INFORMATION section of this manual to determine which phono input to use.

Concept's tone controls use completely independent, negative feedback circuits, each with its own turnover point to provide more effective, useful compensation. The circuits together can provide up to 20 dB of boost or cut at the frequency extremes. Control is provided in 1 and 2 dB increments. The TONE DEFEAT button eliminates the tone controls from the circuit. It allows quick and easy evaluation of equalization settings by providing an instaneous comparison between flat and equalized signals.

The Loudness compensation circuit is unique to Concept. It is a variable slope, variable turnover filter, precisely calibrated in one decibel increments. Both low-end and high-end boost correspond to the most recent research on the Fletcher-Munsen effect in human hearing at low levels.

Internal muting is achieved with a reed relay circuit at the output of the tone control section. The reed relay avoids the "thump" of other types of muting controls. It is used to eliminate switching transients when changing from one signal source to another. Such protection is especially important at high volumes. The same reed relay also operates as a part of the FM muting circuit.

Another important feature is complete isolation of the tape 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. Competitive units 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 12.0D's power amplifier uses direct-coupled, fully-complementary driver and output stages, with rugged high-speed output transistors for high-reliability. These transistors are mounted on extruded aluminum heat sinks for maximum heat dissipation, a measure that promotes long transistor life. Two differential gain stages provide the lowest possible distortion at any power level.

The Concept's power amplifier contains very fast active elements with precisely controlled feedback. High f_t signal devices combined with carefully contoured feedback create a stabilized high-speed amplifer. This design philosophy delivers the audible benefits of vanishingly low transient distortion with the rugged reliability of intentionally limited bandwidth response.

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

The Concept 12.0D features a power transformer like those that power the special low-noise circuits used by professional recording studios. The transformer's coils are wound on a doughnut-shaped core called a toroid. This design offers dramatically reduced external magnetic and electrical hum fields which can cause serious problems for low-level amplifier circuits. The toroidal transformer design handles more power than a conventional transformer of the same physical dimensions and is mechanically quieter than conventional designs.

The power supply consists of the toroidal transformer, a heavy-duty bridge rectifier, and two 15,000 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 will not affect the operation of other stages.

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

The internal layout of the Concept 12.0D has been carefully designed to reduce hum and minimize any chance of oscillation. The highest quality connectors are used throughout to facilitate service.

The preceding section describes just a few of the design characteristics which truly make the Concept 12.0D the ultimate in sound reproduction.

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 a 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.

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 a rigid surface.

Many of hours of research, lab-testing, field-testing, and re-evaluation have evolved into your Concept 12.0D. 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 120 watts per channel minimum RMS, 20-20,000 Hz, both channels driven into 8 ohms, with no more than 0.02% total harmonic distortion. (20.8dBW)

Continuous power output of 180 watts per channel minimum RMS, 20-20,000 Hz, both channels driven into 4 ohms with no more than 0.05% total harmonic distortion. (22.6dBW)

Frequency Response: 20-20,000 Hz ± 0.2 dB

IM Distortion (50 Hz: 7kHz = 4:1): Less than 0.02%

Damping Factor: Greater than 400 at 20 Hz

Hum and Noise: − 90dB, "A" weighted

Outputs: Speakers A, B, C or any 2 together; 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: 50 k

Tape 1, Tape 2, Main in: 20 k

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 ± 0.2 dB to RIAA curve

Tone Controls
- Bass: ± 10 dB at 100 Hz in 1 dB steps
- Presence 1: ± 10 dB at 800 Hz in 2 dB steps
- Presence 2: ± 10 dB at 1600 Hz in 2 dB steps
- Treble: ± 10 dB at 10,000 Hz in 1 dB steps

Loudness Contour at − 30 dB: + 8 dB at 100 Hz, + 4 dB at maximum setting: + 8 dB at 100 Hz, + 4 dB at 10,000 Hz

High Filter: − 10 dB at 20,000 Hz, 6 dB/octave

Volume Control Balance: within 0.3 dB tracking

Signal-to-Noise Ratio
- Phono: 78 dB unweighted, 84 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: 88.1-107.9 MHz

Sensitivity
- IHF: 9.8 dBf (1.7 uV) at 300
- 50 dB quieting (mono): 13.8 dBf (2.7 uV)
- (stereo) 36.3 dBf (36 uV)

Signal-to-Noise Ratio at 65 dBf: 72 dB

Stereo Separation
- At 1 kHz: Better than 50 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 ± 0.5 dB

Capture Ratio: 0.8 dB

Alternate Channel Selectivity: 85 dB

Spurious Response Ratio: Better than 100 dB

Image Response Ratio: Better than 100 dB

IF Response Ratio: Better than 100 dB

Muting Sensitivity: 16.1 dBf (3.5 uV)

Stereo Threshold: 16.1 dBf (3.5 uV)

General

Dimensions
- Width: 50.95 cm (20 1/16")
- Height: 17.78 cm (7")
- Depth: 43.18 cm (17")

Weight: 23.1 kg (50.75 lbs.)

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.

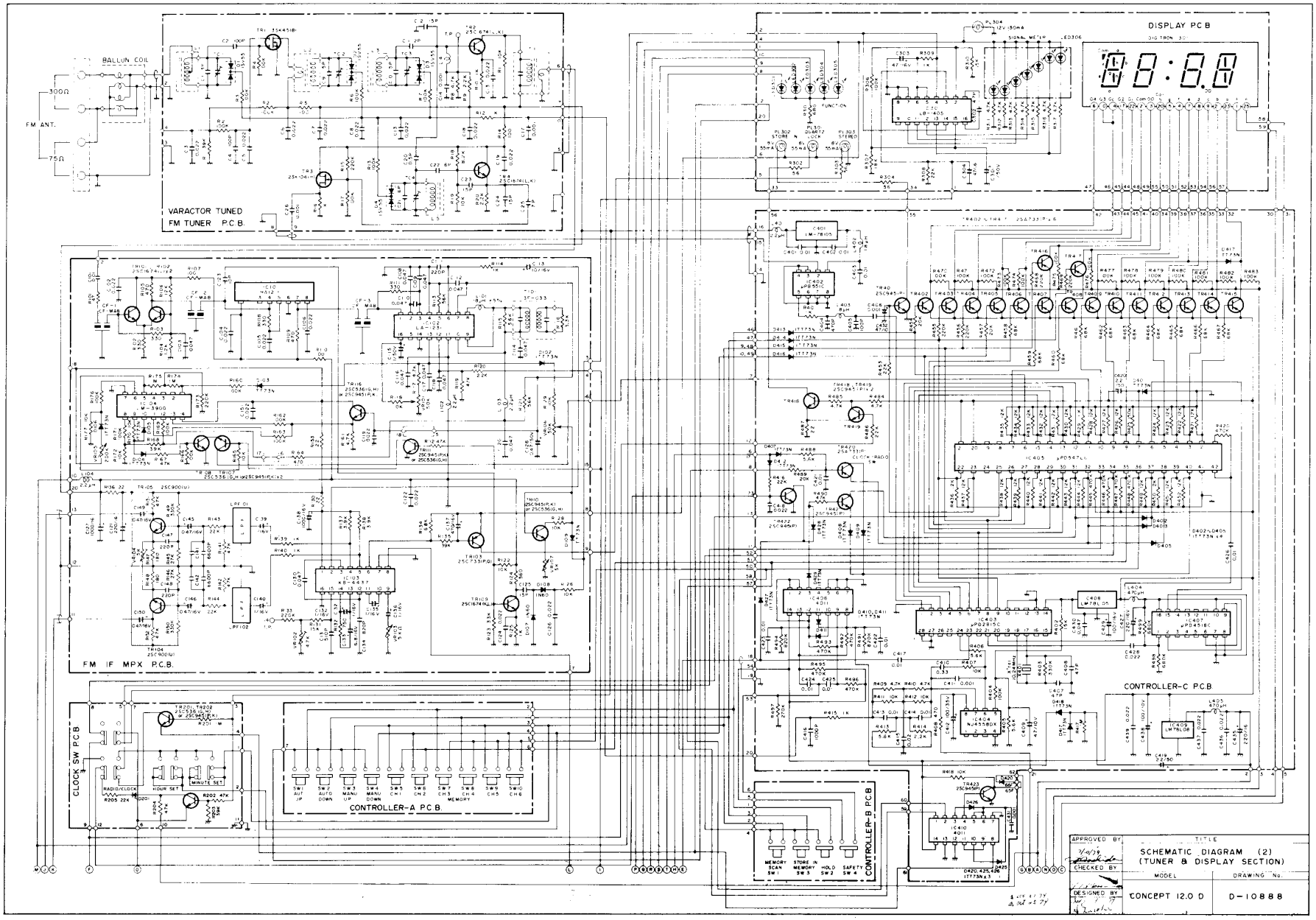
Charges for unauthorized service and transportation costs are not reimbursable under this warranty. Any damage or defect resulting from unauthorized parts or services is not covered by this warranty. Any services performed by other than a dealer authorized to perform such services are not reimbursable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

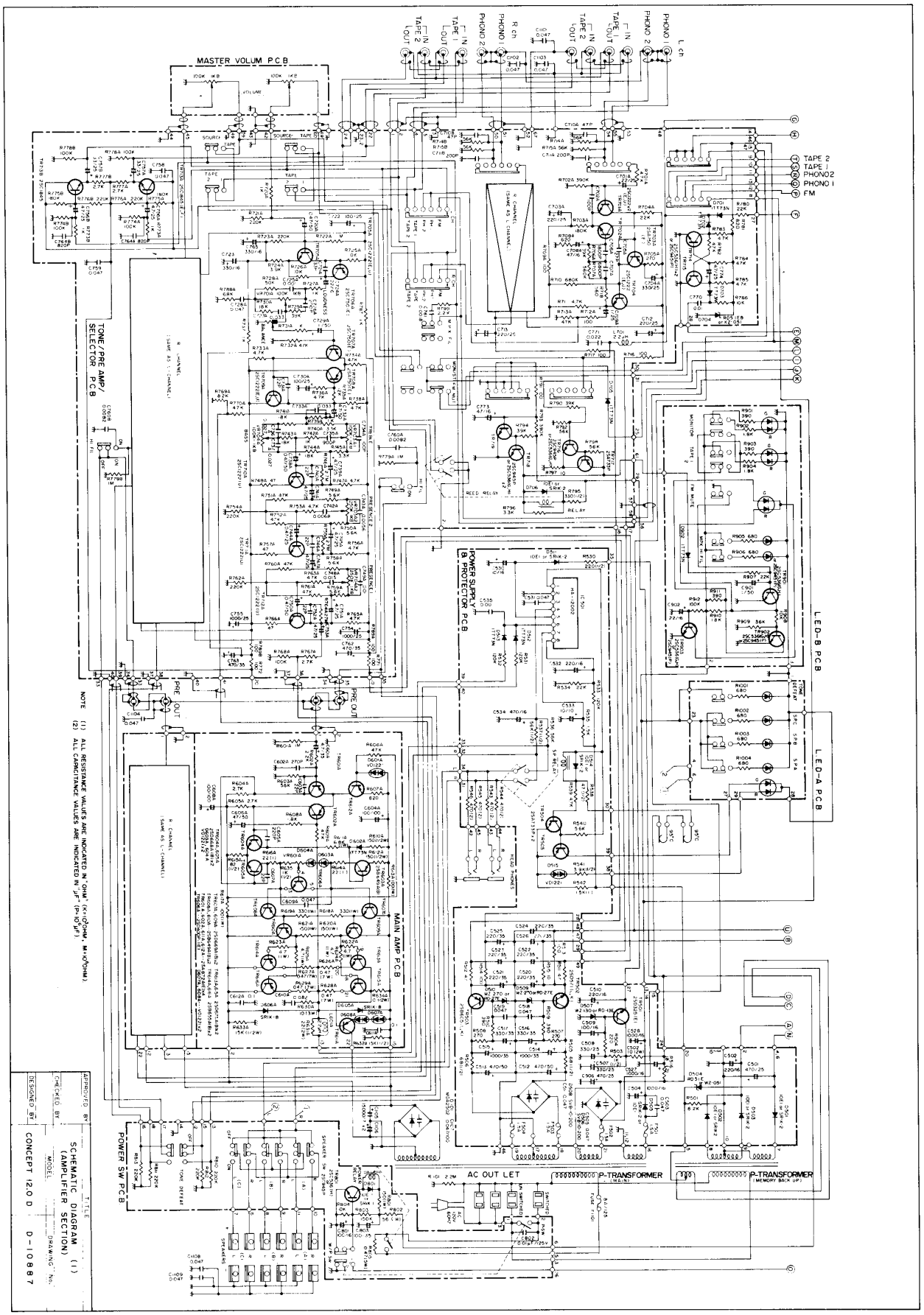
This warranty becomes void if the serial number is defaced or removed, or if the product has been damaged by alteration, misuse, accident or neglect. *THE WARRANTOR ASSUMES NO LIABILITY FOR PROPERTY DAMAGE OR ANY OTHER INCIDENTAL OR CONSEQUENTIAL DAMAGE WHATSOEVER WHICH MAY RESULT FROM THE FAILURE OF 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


DISPLAY P.C.B
BALUN COIL
300Ω
FM ANT.
75Ω
VARACTOR TUNED
FM TUNER P.C.B.
FM IF MPX P.C.B.
CLOCK SW P.C.B
CONTROLLER-A P.C.B.
CONTROLLER-B P.C.B.
CONTROLLER-C P.C.B.
SCHEMATIC DIAGRAM (2)
(TUNER & DISPLAY SECTION)
CONCEPT 12.0 D
D-10888


MASTER VOLUM P.C.B
TONE/PRE AMP/ SELECTOR P.C.B
POWER SUPPLY & PROTECTOR P.C.B
MAIN AMP P.C.B
POWER SW P.C.B
LED-B P.C.B
LED-A P.C.B
TAPE 2
TAPE 1
PHONO2
PHONO 1
FM
PRE OUT
AC OUT LET
P-TRANSFORMER
P-TRANSFORMER
NOTE
(1) ALL RESISTANCE VALUES ARE INDICATED IN "OHM" (K=10³OHM, M=10⁶OHM)
(2) ALL CAPACITANCE VALUES ARE INDICATED IN "μF" (P=10⁻⁶μF)
SCHEMATIC DIAGRAM (1)
(AMPLIFIER SECTION)
CONCEPT 120 D
D-10887