•SCOTT NEWS

THE STRADIVARIUS OF RADIO RECEIVERS

NEWS OF LATEST DEVELOPMENTS IN THE SCOTT RESEARCH LABORATORIES

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First Announcement
OF NEW INVENTION THAT MAKES A RADIO A REAL MUSICAL INSTRUMENT

THE credit for an invention that enables a radio receiver to reproduce all musical instruments just as you hear them in the studio or concert hall, must go to Mr. Erno Tauscher, a skilled craftsman who has been making fine violins for over 40 years. Tauscher violins have long been the proud possession of many leading artists in our symphony orchestras both here and abroad. In tests recently made, professional musicians found it practically impossible to detect any difference between (1) the sound of the actual instruments and (2) these same instruments reproduced through a Scott equipped with Mr. Tauscher's revolutionary new Violin Sound Board Unit.

The tone of stringed instruments *as reproduced by radio* never completely satisfied Mr. Tauscher, for to his sensitive ears, trained by a lifetime of building fine violins, the deep, rich, singing tone of the violin was missing in both radio and record reproduction. Twelve years ago he started his first experiments, and in 1931, they had advanced to the point where he secured his first U. S. patent for a special sounding board unit, the result of his painstaking and extensive research.

How Tauscher Sound Board Improves Reproduction

The Tauscher combination sound boards, for there are actually three of them, one behind the other, are placed in front of the speaker cone, thus making a sound chamber for the reproducing system. Their function is described in the specifications of the first patent which was granted to Mr. Tauscher in 1931. It reads: "The object of this invention . . . may be defined as being . . . a series of sound boards so relatively arranged and varied in dimensions as to harmonize low, middle, and high register sound waves . . . as produced by voice, chorus, musical instruments, or orchestras, etc."

But you may be asking: "Won't the tonal quality of the speaker be altered by placing a sound board unit in front of it?" That was the first question I asked Mr. Tauscher when he first discussed his invention with me, for in all my seventeen years of experience in designing radio receivers, I believed that anything put in front of the speaker would certainly impair, not improve, the tone.

Mr. Scott With Mr. Tauscher, Inventor of the Revolutionary Violin Sounding Board Unit

A New Theory in Sound Reproduction

To this question Mr. Tauscher replied by asking: "When a violinist plays his fiddle where does the sound come from, the strings themselves or from the sound chamber of the violin?" I replied that the sound came from the sound chamber of the violin.

"You are right," said Mr. Tauscher, "and the fact that the sound chamber does not alter the *original* quality of the vibrations or tones and overtones set up by the violin strings is easily proved by listening first to the tone of a 'muted' fiddle and then to a regular violin. A 'muted' fiddle is an instrument which simply has the strings stretched over a bare sound board, often used by artists who wish to practice and not disturb others nearby. The principle difference you will notice is that the 'muted' violin has little 'carrying' power, and cannot be heard very far, while in the regular violin the tones are radiated thru the forte holes and the sound chamber from all parts of the surfaces of the front and back, and are thus heard clearly in all parts of the room or concert hall."

Mr. Tauscher then asked, "When a piano is played, does the sound come directly from the strings or does it come from the sound board of the piano?" Again I had to reply that I thought it came from the sound board. "And here again it is the

sounding board of the piano that largely determines the richness or quality of the tone. You have noticed that the tone of some pianos is thin and 'tinny' while the tone of others is rich, full and resonant, so that even with their eyes closed, most people can tell the difference between a cheap piano and a high grade instrument by its tone.

"When you listen to a radio receiver where does the sound come from?" was Mr. Tauscher's next question. I replied that it came partly from the vibrations set up in the cone of the loud speaker and partly from those set up in the baffle board to which the loud speaker is attached.

Simple Experiment Shows Why Tone Best Directly Opposite Speaker

Most people know that some programs, and especially musical programs, sound better when you are sitting directly across the room facing the front of the loud speaker. The effect may be compared with a flash light with its light bulb in the center of the small curved reflector which focuses a large part of the light in a narrow beam straight ahead, yet still gives a certain amount of light on either side of the beam which becomes poorer and poorer as you move away from the main light beam. (See Fig. 1.) The reason the tone seems clearer and better when seated directly in front of the receiver is that the higher tones or frequencies come largely from the center part of the speaker cone, and are extremely directional, being focused strongly in a comparatively narrow beam in front of the speaker. (See Fig. 2.) This is the reason you get the clearest tone when you are sitting across the room directly in front of the speaker, with poorer tone as you move over to the side of the room out of the sound beam, as the higher tones and overtones gradually disappear as you move away from the front of the speaker.

What Better Distribution of Higher Frequencies and Overtones Accomplishes

"My theory was that if these very directional high tones or frequencies from the speaker were distributed more evenly over a wider area in front of the radio receiver, instead of being concentrated in a narrow sound beam, it would not only reduce the piercing artificial quality often noticed, especially on the higher tones and overtones of most musical instruments when sitting directly opposite the radio, but this more even distribution of the sound would give a more pleasant and natural reproduction.

"The principle can be easily proved by using a flat reflector with a light bulb instead of the usual curved reflector. You will find with the flat reflector the light is distributed over the wall in front evenly, not concentrated largely on one spot—(See Fig. 3)—just as all sound frequencies from the surface of my sound board unit are distributed evenly and are thus heard perfectly in all parts of the room."

Comparative Test Gives Real Musical Thrill

NOTE: In our studios we have a demonstration which proves beyond all question that the Tauscher Sound Board Unit gives practically perfect distribution of all frequencies from the speaker equipped with it—from the highest to the lowest—in all parts of the room. In this demonstration, a studio program from one of the new FM stations is tuned in on two receivers—one equipped with a regular speaker, the other with the Tauscher Sound Board Unit installed in front of the speaker. You find that the tone on the receiver equipped with the regular speaker is very good, in fact, practically perfect when seated directly in front of the receiver. However, as you move over to the side of the room you begin to notice a slight loss in brilliance as you sit farther and farther out of the sound beam of the speaker. This is clearly shown in Fig. 2 which illustrates the directional beams of various frequencies from a cone speaker.

When you listen to a program on the receiver equipped with the Tauscher Sound Board Unit, *you find that it is impossible to notice the slightest loss in the higher frequencies or overtones, and that no matter in what part of the room you listen, they sound exactly the same, whether you are seated directly in front of the receiver, as shown in Zone 1, or at side of room in Zone 4, as illustrated in Fig. 4.* You

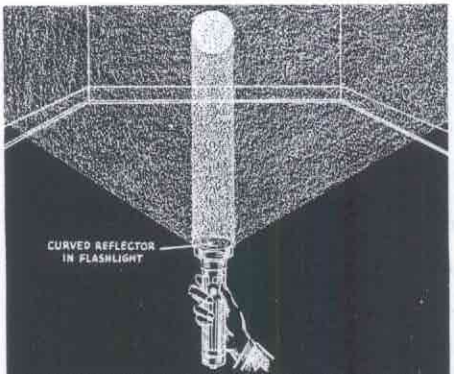


DIAGRAM SHOWING UNEVEN DISTRIBUTION OF LIGHT FROM CURVED LIGHT REFLECTOR-STRONG IN ZONE OF BEAM-WEAK OUTSIDE ZONE OF BEAM-CORRESPONDING TO UNEVEN DISTRIBUTION OF ALL SOUND FREQUENCIES FROM CURVED SPEAKER CONE BECAUSE HIGHER SOUND FREQUENCIES ARE CONCENTRATED LARGELY ON A NARROW BEAM DIRECTLY IN FRONT OF LOUD SPEAKER

FIG. 1

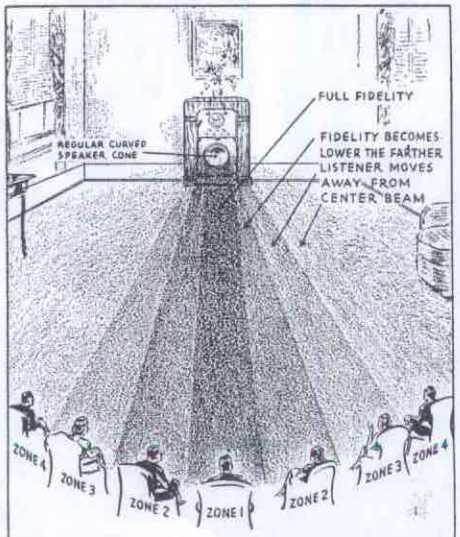


DIAGRAM SHOWING UNEVEN DISTRIBUTION OF SOUND FREQUENCIES IN VARIOUS ZONES OF ROOM-OWING TO THE STRONG DIRECTIONAL SOUND BEAMS FROM CURVED CONE OF SPEAKER

FIG. 2

will agree, after making the above comparative tone test, that the reproduction you hear from the Scott equipped with the Tauscher Sound Board Unit is not only the most perfect musical reproduction you have ever heard in your life, but is so absolutely *REAL* it gives you a thrill such as you have never experienced before.

Why Tauscher Sound Board Unit Gives Perfect Distribution

"When the loud speaker is equipped with my sound board unit," said Mr. Tauscher, "the tones or vibrations from the speaker cone are transferred to one of the sounding boards (there are three) in the sounding board unit. The vibrations from the rear and middle sounding boards are transmitted thru the sounding board posts connecting them to the main sounding board, and from its wide surface all tones, both high and low, are distributed evenly over the whole room, instead of being largely concentrated in a very narrow sound beam directly in front of the speaker. (See Fig. 4.)

"The reason why the reproduction of all musical instruments and voice sound so much more natural with my sound board unit, as compared to reproduction directly from the speaker, is because the higher frequencies or overtones, instead of reaching your ears in concentrated beams of sound directly from the funnel-shaped cone of the loud speaker, are evenly distributed over the whole surface of my sound board unit (See Fig. 6) installed in front of the speaker, reaching your ears just as naturally as they would were the artist playing or singing in the room in front of you.

Smoother and Finer Reproduction in All Parts of Room

"We know that when an artist sings, or plays an instrument, the sound of the voice or instrument spreads out evenly over the whole room or concert hall, and that the higher tones are not concentrated largely within a certain narrow area directly in front of the audience, and my sound board unit, in evenly distributing the sounds of music or voice from its wide flat surface, more closely approaches the original in natural timbre and quality than, I believe, has ever before been achieved in reproduction coming *directly* from the cone of the loud speaker.

Many Years of Experiment Behind Design of Tauscher Sound Board Unit

"But it required many years of experimentation to design a sounding board for a radio receiver that would not alter the quality or typical tone of each instrument it reproduced, be it an organ, violin, piano, brass instruments, or the human voice. I found the solution of this problem in not one single sounding board, but a series of three, a larger one that completely covers the mouth of the loud speaker, with two smaller ones placed directly behind the larger one.

"Many hundreds of experiments were made with sounding boards of varying thicknesses, various sizes of the forte holes in the main sounding boards, and the correct size and thickness for the two smaller

sounding boards behind the main sounding board, so that each one would pick up the various high and low vibrations or frequencies. Finally the design of the sounding board unit was perfected, and natural, mooth reproduction, with all of the typical tone quality of each instrument, preserved.

Music or Voice Comes to Your Ears From Sounding Board Instead of Directly From Cone of Loud Speaker

"When the sound board unit I have designed is placed in front of the speaker cone, *the result is a sound chamber that is comparable to that of a violin.* Instead of the vibrations reaching you *directly* from the cone of the speaker, they are transmitted to one or other of the sound boards in front of the cone of the speaker, *then* are transferred to your ears from the whole surface of the main sounding board with the forte holes. (See Fig. 7.) The result is a much purer and sweeter quality of tone, because in addition to the peaks and dips of the various frequencies coming directly from the speaker cone being smoothed out, all tones and overtones are evenly distributed over the whole room by the large sounding board in front of the speaker. The result is a natural quality of tone that transforms a radio receiver into a real musical instrument.

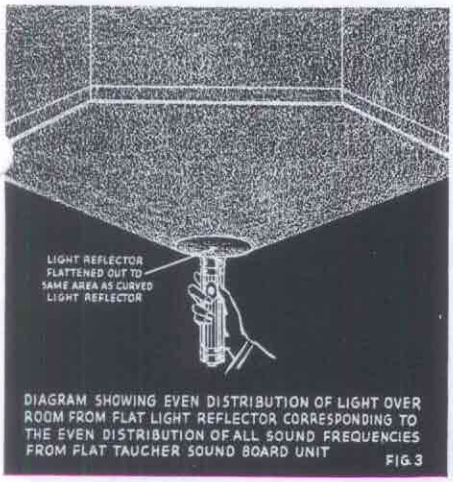


DIAGRAM SHOWING EVEN DISTRIBUTION OF LIGHT OVER ROOM FROM FLAT LIGHT REFLECTOR CORRESPONDING TO THE EVEN DISTRIBUTION OF ALL SOUND FREQUENCIES FROM FLAT TAUCHER SOUND BOARD UNIT FIG.3

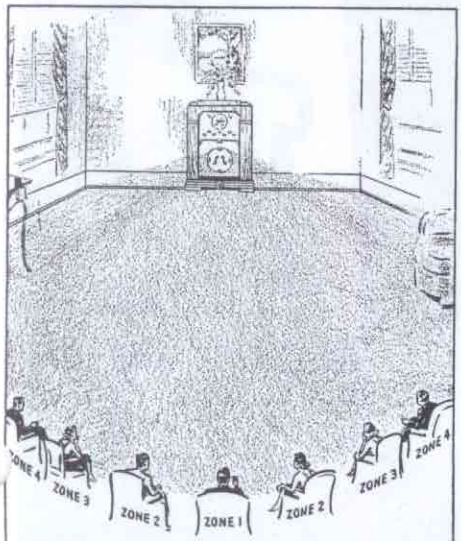


DIAGRAM SHOWING THE EVEN DISTRIBUTION OF ALL SOUND FREQUENCIES IN ALL ZONES OF ROOM FROM TAUSCHER SOUND BOARD UNIT FIG.4

Why Copies of Stradivarius Violins Do Not Have the Stradivarius Tone

"All music lovers who have listened to a beautiful old violin such as a Stradivarius played by an accomplished violinist, are inspired by its beautiful, rich, singing tones. Altho Stradivarius made his first violin over 200 years ago, the possession of one of his instruments is the dream of every violinist. Unfortunately, few can ever realize this ambition, for today they are valued up to as high as $85,000.00 each. The Ex-King Maximilian Joseph of Bavaria's Stradivarius, dated 1709, the 'Primadonna' of Stradivarius violins, is valued at $85,000.00. The Ex-Prince Knevenhueller's Stradivarius made in 1733 is another beautifully preserved Stradivarius valued at $55,000.00, while the Ex-May-Jaquet, dated 1714, is another fine Stradivarius valued at $40,000.00.

"What is the difference between a Stradivarius and an ordinary violin? Stradivarius violins have been minutely examined, carefully measured, and copied in the same woods, and thickness of each part, until they are almost exact duplicates of a Stradivarius, *but still these duplicates do not produce the deep, rich singing Stradivarius Italian tone. Where does the difference lie?*

Believes Secret Lies in Varnish Used by Stradivarius

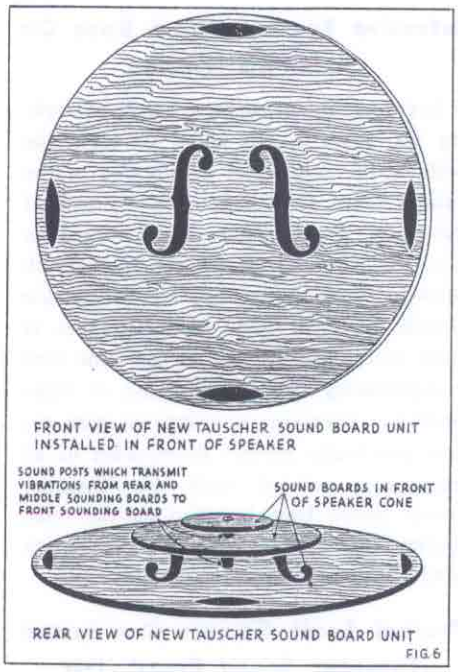
"There are many theories for the marvelous tone of a Stradivarius," said Mr. Tauscher, "but after a lifetime of experience, both in making fine violins and repairing them, I believe the secret lies in the varnish used by Stradivarius. In 1892 I started to learn the art of violin making from my grandfather, Ernest Neumarker. After I had served my apprenticeship with him I went to London and gained further experience with Hill and Sons, one of the greatest authorities in Europe on old violins, and in 1903 came to Chicago where I have been making violins for many years. During these years many fine violins, including both Stradivarius and Guarnerius, as well as hundreds of fine violins other than those made by these old masters, were brought to me for expert attention.

"For over twenty years," said Mr. Tauscher, "I have experimented in the search for the formula of the varnish used on the old Italian violins, dissolving various combinations of varnish gums and mixtures, and with various ways of applying the varnish to the wood. I believe I have discovered the secret of the formula of the varnish similar to that used by Stradivarius, for violins I made over fifteen years ago, just after I had perfected my varnish formula, still have the same fine, rich, singing Italian tone that they had when I first delivered them to their owners.

Why Varnish Treatment Is As Important On Sound Board Unit As It Is On Violin

"I know that many will find it difficult to believe that the varnish used on a violin can affect the tone of the instrument. Many violinists have also refused to believe it, and as a consequence many, many thousands of fine violins have been ruined. Many violinists had an instrument which they were very attached to, and thinking it would better preserve it, had their violins revarnished, then discovered to their sorrow that after the re-varnishing, its beautiful singing tone had disappeared. Fortunately, today, most people who own really fine old violins are familiar with the fact that the tone of their instrument is dependent not only on the woods used and careful workmanship, but also on the varnish with which it was finished.

"While the final design of the actual Sound Board Unit took several years to perfect, the varnish treatment given is extremely important, in fact, just as much as it is in a fine violin. My Sound Board Units, finished with the same varnish I use on my violins, will, I believe, retain their original beauty of tone indefinitely, just as have the violins I made many years ago, and just as those of the old masters made hundreds of years ago have retained their tone."



FRONT VIEW OF NEW TAUSCHER SOUND BOARD UNIT INSTALLED IN FRONT OF SPEAKER

REAR VIEW OF NEW TAUSCHER SOUND BOARD UNIT FIG.6

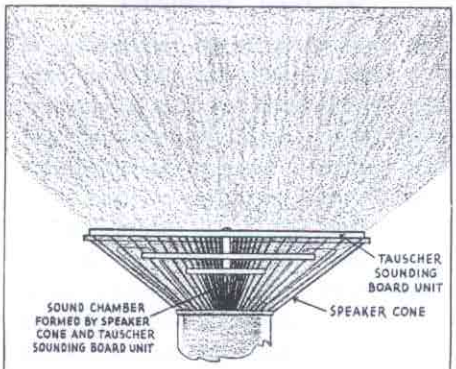


DIAGRAM SHOWING HOW VIBRATIONS OR SOUND FREQUENCIES FROM CURVED SPEAKER CONE ARE TRANSFERRED TO SOUND BOARDS IN TAUSCHER SOUND BOARD UNIT, THEN EVENLY DISTRIBUTED FROM FLAT SURFACE OF MAIN SOUND BOARD TO ALL PARTS OF ROOM FIG. 7

Result of Direct Comparison Sound Test With and Without Tauscher Sound Boards

To fully test his theory of sound reproduction, Mr. Tauscher supplied me with several of his Sound Board Units, and tests were made by directly comparing the tone of two receivers, one equipped with a speaker system with Mr. Tauscher's Sound Board Unit, the other equipped with the same speaker system, but without the Tauscher Sound Board, and these tests fully confirmed Mr. Tauscher's theory of sound reproduction.

I know there will be many thousands of Scott owners who, when they read this announcement, will be extremely hard to convince that it is possible to improve the beautiful tonal quality of the receiver they now own, for it is difficult to realize that it can be finer, until an actual comparison test is made with and without the Tauscher Sound Board Unit.

Extensive Previous Work Done On Sound Distribution

Every acoustical engineer has been working for years in the effort to solve the problem of more equal distribution of the various sound frequencies to every part of the room. We ourselves have worked on it and in 1934 introduced the Tone-Truth console. In 1935 we introduced the Laureate Grande with its sound diffusing vanes in front of the console, and at the same time a reproducing system consisting of three speakers. However, as compared with the now practically perfect distribution of all frequencies secured with the Tauscher Sound Board Unit installed on the large speaker, the best previous distribution would be figured at approximately 50%.

Present Scott Owners Can Install Tauscher Sound Board Unit On Their Receivers

The reproducing system incorporated in every Scott receiver that has been built during recent years has been a very advanced design, and all that present Scott owners need to do to bring the reproducing system of their receiver up to date is install the Tauscher Sound Board Unit in front of the speaker. I am sure this will be good news to all Scott owners, for it will provide a complete sound reproducing system that recreates the tone of musical instruments and the human voice with a realism even greater than they have heard up to this time from their receivers.

Scott Receiver Equipped With Tauscher Sound Board Unit Has Rich, Singing, Resonant Quality of Fine Musical Instrument

The invention of the revolutionary Tauscher Sound Board Unit has so improved the quality of the reproduction we have up to this time heard on a radio receiver, that I believe the description "radio receiver," as applied to a Scott with its speaker system fitted with the Tauscher Sound Board Unit, is no longer accurate, for a Scott, equipped with the Tauscher Sound Board Unit has the rich, resonant, singing quality of a fine musical instrument. Here is a music lover's dream, for now you can enjoy your favorite music on either radio or records as you never have enjoyed it before.

One of Most Important Advances in Musical and Voice Reproduction

There is not very much more that can be added. Undoubtedly, the Tauscher Sound Board Unit will be generally regarded as one of the most important advances in musical and voice reproduction since the invention of the loud speaker. With this new development in musical instruments a Scott is no longer merely a radio, for combined with the skill of the master violin maker, we have produced a finer musical instrument than ever before, one that is breath-taking to listen to, and that will for many years to come be a most treasured possession of all who love fine music.

New Regent Speaker Console With Tauscher Sound Board Unit

DIRECT COMPARISON PIANO TONE TEST AMAZES PROFESSIONAL PIANISTS

IN ACTUAL TONE TESTS MADE DURING PAST FEW WEEKS PROFESSIONAL MUSICIANS HAVE FOUND IT IMPOSSIBLE TO DETECT ANY DIFFERENCE BETWEEN THE ACTUAL AND THE REPRODUCED PIANO TONE

IT is generally recognized that the tone of the piano is one of the most difficult sounds to reproduce *naturally* on a radio receiver. It was for this reason that we have installed a Steinway Grand in our new Chicago Studios at 737 North Michigan Avenue.

As shown in the photographs below, a microphone installed beside the piano in the studio picks up the sound and transmits it to a Frequency Modulation Signal Generator which is installed in another room. This is a miniature FM broadcasting station, but instead of putting out a signal over the air, it transmits it through a wire connected to the Scott FM receiver in an adjoining room that is equipped with a Tauscher Sound Board Unit on the speaker behind the grill cloth.

Test Between Actual and Reproduced Tone

The pianist plays a selection for the persons making the tone test. When the actual tone of the piano is thoroughly impressed on their ears, they walk into the adjoining room and close the door *so that they now hear the piano as reproduced on the FM Scott equipped with the Tauscher Sound Board Unit.* Already a number of distinguished pianists have made this test, and have been amazed to find the reproduction of a piano could be so perfect.

Direct Comparison Tone Tests Made With Chimes, Bells, Musical Instruments

In addition to the piano test, we also have a number of other tone tests which prove the astonishing degree of naturalness now attained in musical reproduction. Among these tests is the transmission over our FM Signal Generator of sounds from various types of bells, two different types of Deagan chimes, the tones of the triangle, and the sound of water being poured into a glass. All of these sounds and musical tones are reproduced with amazing realism.

These demonstrations are designed for just one purpose, and that is to enable anyone interested in the purchase of a Scott *to personally verify in an actual direct tone test of his own, with actual musical instruments, the fact that a Scott equipped with the Tauscher Sound Board Unit is capable of giving practically perfect reproduction of all musical instruments and the human voice.*

PIANIST PLAYS BEFORE MICROPHONE IN FRONT OF PIANO IN STUDIO AT RIGHT. THIS IS TRANSMITTED BY WIRE TO THE FREQUENCY MODULATED SIGNAL GENERATOR (ACTUALLY A MINIATURE FM BROADCASTING STATION) IN ROOM AT LEFT. THE SIGNAL GENERATOR MODULATES THE SIGNAL THEN SENDS IT BY WIRE TO SCOTT FM RECEIVER IN CENTER STUDIO. TONE TEST IS MADE BY FIRST LISTENING TO ACTUAL TONE OF PIANO IN STUDIO AT RIGHT, THEN QUICKLY PASSING INTO ADJOINING ROOM—CLOSING DOOR AND LISTENING TO PIANO TONE AS REPRODUCED ON SCOTT FM RECEIVER EQUIPPED WITH TAUSCHER SOUND BOARD UNIT.

THE SYMPHONY ORCHESTRA AND CONCERT ARTIST COME TO YOUR HOME

WHEN you listen to an orchestra in the concert hall you have perfect listening conditions, because all instrumental or vocal sound is heard naturally, as the tones and overtones flow thru the air directly to your ears with nothing between you and the instruments, so are heard exactly as they are played. This condition is illustrated in Fig. 8 below.

However, suppose we were to set up high "V" shaped wings on either side of the orchestra. You will readily see that only those seated in that part of the auditorium inside the wings would hear all instruments perfectly, while those on the other side would miss a large part, especially of the higher tones and overtones of many of the instruments. Take away the wings, and again you would hear perfectly.

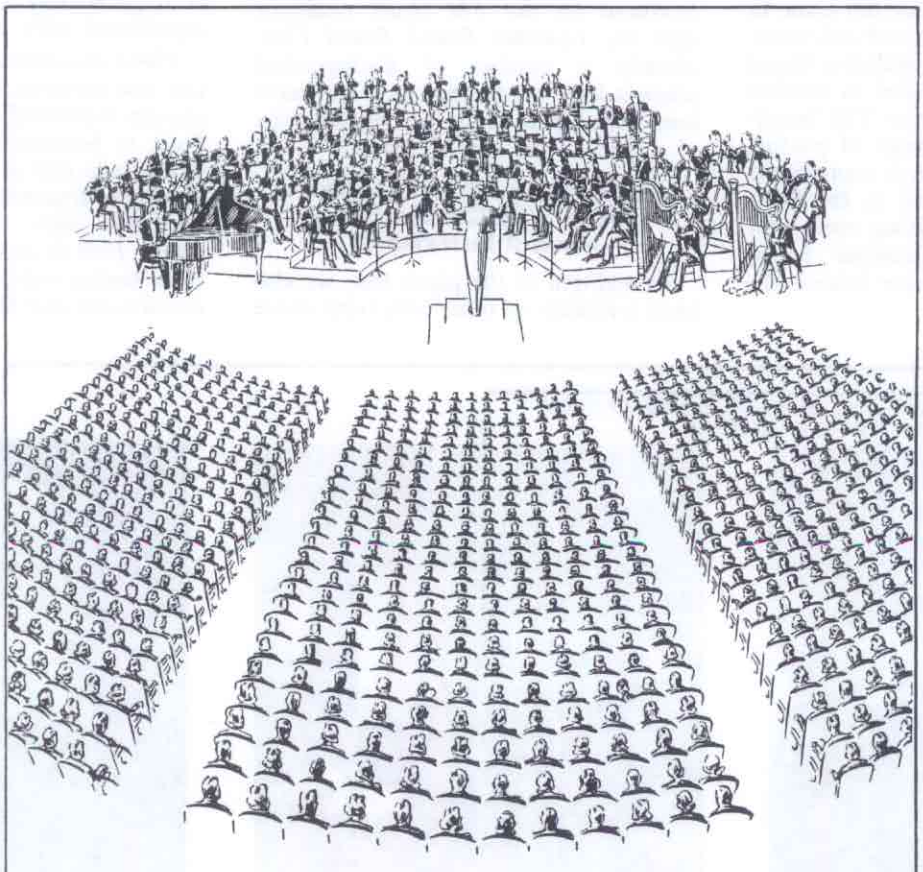
Music Natural When All Tones Heard in Proportion

The reason all instruments would be heard perfectly when you were inside the wings in the auditorium *is because you would hear all of the natural tones in exact proportion, with the high, medium and low frequencies unchanged in any way.* When you were seated behind the wings the lower tones were heard quite well, but many of the higher tones and overtones—which give vividness and life to music—were stopped by the wings and so prevented from reaching your ears.

An Interesting Experiment Made in the Home

You can experiment with this condition in your own home by listening to someone play or sing in one room, then pass into another room so that the sound reaches your ears thru the door opening and the wall partitions. You will find that the tones of the voice or the instrument being played become very "mellow," and lose the brilliance and vividness you noticed when listening to the instrument or voices in the same room; or, in other words, the higher tones and overtones are missing.

When the music of an orchestra or artist is broadcast, the musical sounds from the various instruments or the artist are collected by the microphone and fed into the transmitter at the broadcasting station. The transmitter then sends them out on the air to be picked up by your antenna. When you listen to the music of an orchestra or an individual artist in your home, it is necessary to reproduce these sounds thru a radio speaker, *but owing to the "V" shaped cone of the speaker, the distribution of these sounds will vary according to where you sit in the room.* Unfortunately, the higher frequencies collect near the center of the speaker cone and come out of it in a comparatively narrow beam of sound directly in front of speaker widening out as the frequencies become lower. The effect of this in the reproduction of an orchestra from a broadcasting station or a record with and without the speaker equipped with the Tauscher Sound Board Unit, is illustrated in Figs. 9 and 10.



WHEN ORCHESTRA IS HEARD IN CONCERT HALL-TONES AND OVERTONES OF ALL INSTRUMENTS ARE DISTRIBUTED EVENLY THROUGHOUT THE CONCERT HALL-SO THAT ALL FREQUENCIES FROM THE HIGHEST OVERTONE OF THE OBOE TO THE LOWEST TONE OF THE BASS TUBA ARE HEARD PERFECTLY IN ALL PARTS OF THE CONCERT HALL

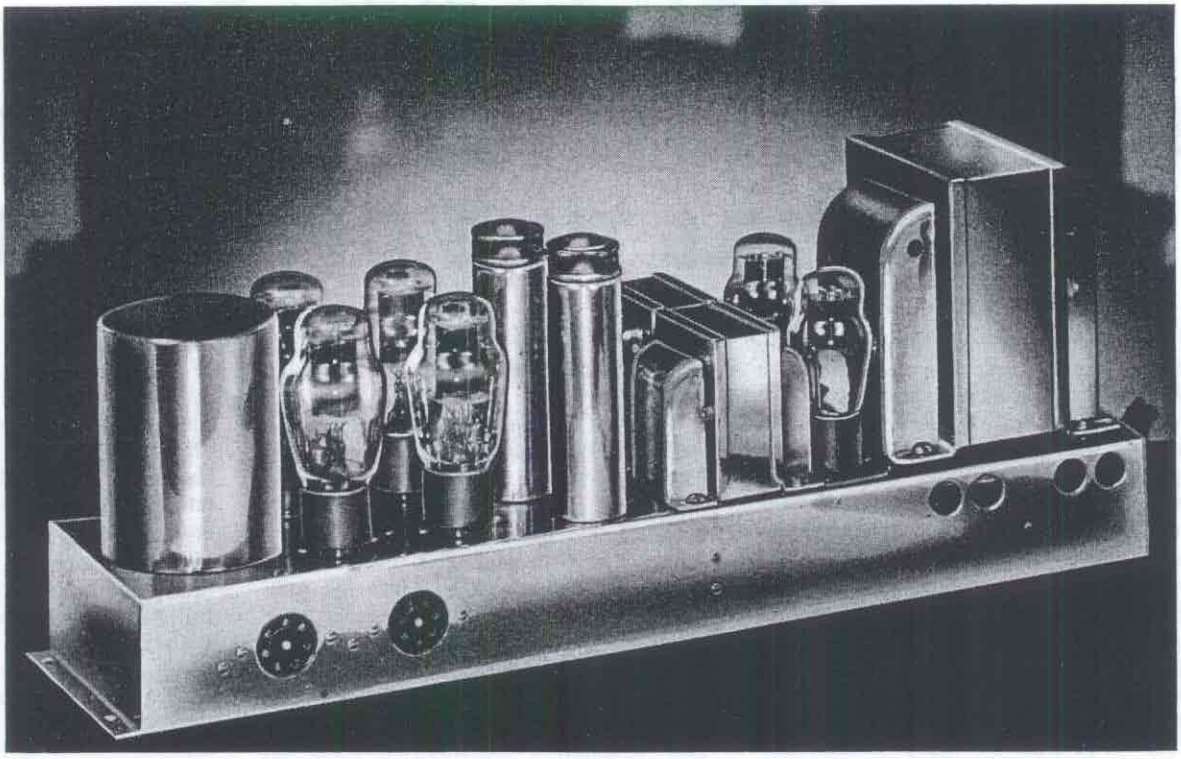
FIG. 8

Degree of Perfection in Reproduction Also Depends on Amplifying and Speaker System Incorporated in Receiver

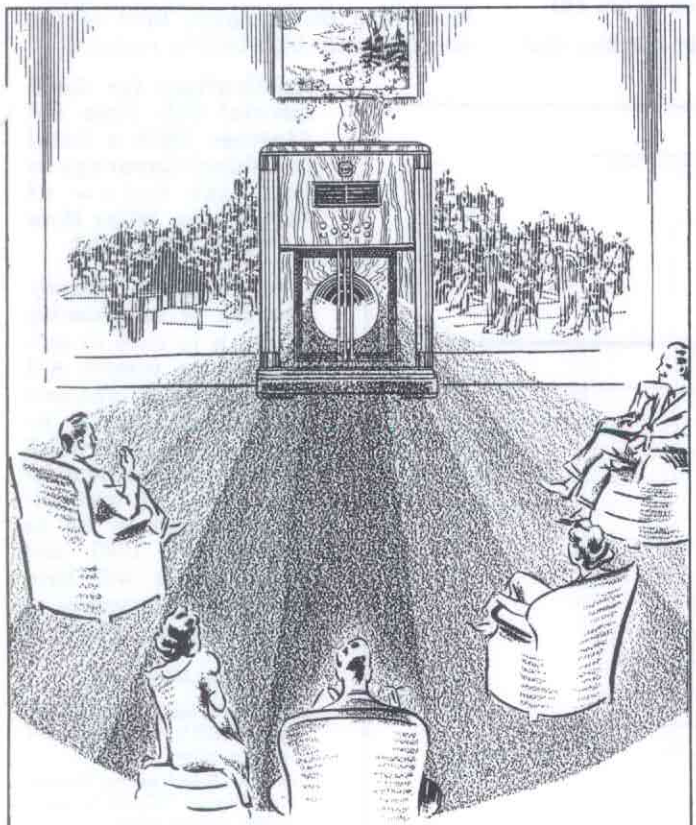
Naturally, the degree of perfection in the reproduction will

depend on the quality of the amplifying and speaker system used with the Tauscher Sound Board Unit, for if the audio and speaker systems are incapable of reproducing the higher frequencies, they will not be heard either with or without the Tauscher Sound Board Unit.

We sincerely believe that in a Scott we have incorporated one of the finest amplifying and speaker systems ever built into a radio receiver because it has been designed with just one single thought—to be the finest that advanced radio engineering can build.

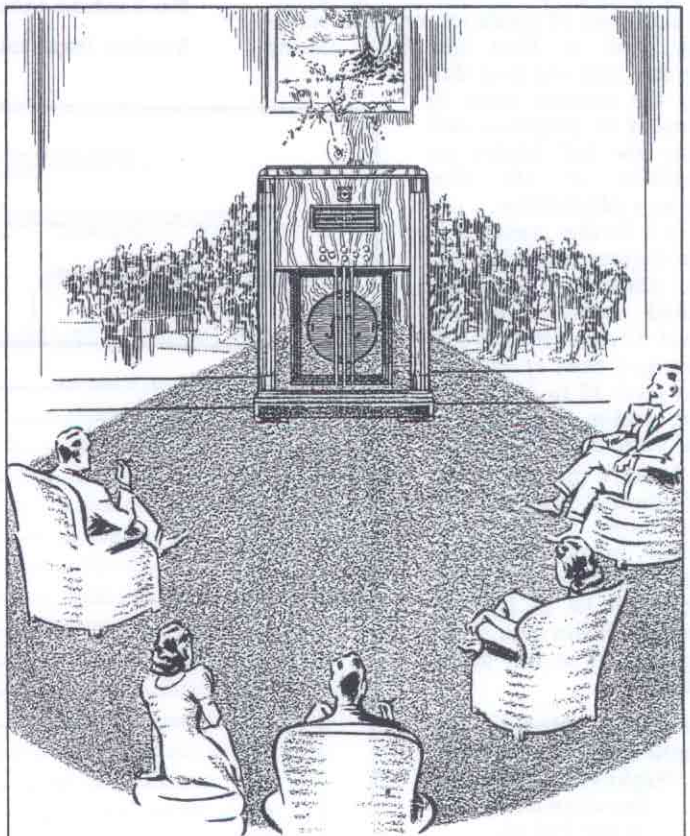


The Highly Developed Audio Power Amplifier Incorporated in the Scott FM-AM Philharmonic.
View of Philharmonic Tuning Chassis on Page 13.



WHEN ORCHESTRA IS HEARD DIRECT FROM CONE OF SPEAKER-THE HIGHER FREQUENCIES AND OVERTONES OF THE VARIOUS INSTRUMENTS ARE HEARD AT ORIGINAL VOLUME-**ONLY WHEN LISTENER IS SEATED DIRECTLY IN FRONT OF SPEAKER.** THESE TONES BECOME WEAKER AND ARE OFTEN INAUDIBLE ALTOGETHER WHEN LISTENER IS AT EITHER SIDE OF ROOM-BECAUSE CURVED CONE OF SPEAKER SENDS THE VARIOUS FREQUENCIES TO YOU IN BEAMS OF SOUND

FIG. 9



WHEN ORCHESTRA IS HEARD FROM RECEIVER EQUIPPED WITH TAUSCHER SOUND BOARD UNIT-**ALL TONES INCLUDING THE HIGHEST OVERTONES TRANSMITTED OR ON THE RECORD** ARE HEARD WHEN LISTENED TO IN ANY PART OF THE ROOM-BECAUSE THE TAUSCHER SOUND BOARD UNIT ELIMINATES BEAMS OF SOUND-DISTRIBUTING ALL TONES AND OVERTONES EVENLY THROUGHOUT THE ROOM

FIG. 10

HIGH FIDELITY FM STATIONS NOW APPROVED BY F.C.C. FOR FULL TIME OPERATION

Since the last issue of the Scott News several very important developments in FM broadcasting have taken place. The most outstanding of these are, commencing January 1st, 1941: (1) the Federal Communications Commission has approved the operation of full time *commercial* high powered FM stations and has now issued rules and regulations governing their operation and requirements, and (2) more than 40 applications for commercial FM broadcasting licenses (mostly for high power) under these new rules have been made by the leading broadcasters of the country, and many more plan to apply in the near future. Already over twenty experimental FM stations are now on the air.

The rules for the commercial FM broadcasting stations call for a minimum of six hours of operation on each weekday, and at least one hour during the day, and one hour during the evening *must be devoted to programs utilizing the full fidelity capabilities of the Frequency Modulation.*

It is further specified in the engineering rules that the transmitter and associated studio equipment *must be capable of broadcasting a band of frequencies from 50 to 15,000 cycles within 2 decibels of the level at 1,000 cycles.*

Another important specification is that noise in the output of the transmitter in the frequency range of 50 to 15,000 cycles shall be at least 60 decibels below the audio signal level at full modulation.

New FM Station Requirements Assure Highest Quality Broadcasting Ever Put on the Air

These requirements insure that the new commercial FM transmitters will be capable of handling high fidelity programs in their finest form, so that within the service area of the FM station high fidelity noise-free service is assured.

The FCC has also defined the service area of FM transmitters using Major Armstrong's FM system, and the new commercial applications are now made in terms of square mile coverage. This rule means that each FM station must have sufficient power to cover the area which it is licensed to serve, and that there will be no question about whether one is inside or outside of the service area of a given station. However, with a sensitive FM receiver it is quite likely that reasonably satisfactory reception will be obtained somewhat beyond the legally defined limit of an FM transmitter.

No Station Interference On FM

Another important rule specifies that stations serving all or a substantial part of the same area will not be assigned adjacent channels. This means that there will be at least one channel between each of your local FM stations, so that there will be no danger of signals from one transmitter overlapping or infringing upon those of another transmitter.

On January 1, 1941, the new FM broadcast band is to be opened up for full FM commercial operation on a par with the present standard Amplitude (AM) broadcasting stations now in use. The new FM broadcasters realize that they must provide a different program schedule, to a good degree, from that heard over the regular stations. It will be to their advantage to operate much longer than the six hour daily minimum, and also to their advantage to originate more than the minimum limit of two hours of truly high fidelity material.

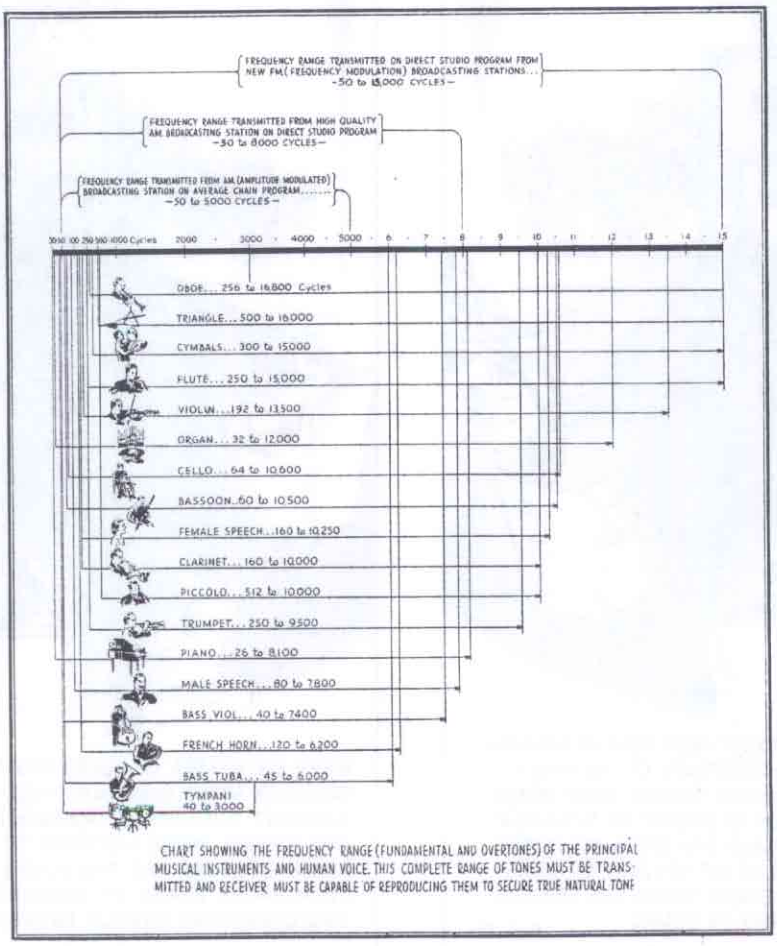


CHART SHOWING THE FREQUENCY RANGE (FUNDAMENTAL AND OVERTONES) OF THE PRINCIPAL MUSICAL INSTRUMENTS AND HUMAN VOICE. THIS COMPLETE RANGE OF TONES MUST BE TRANSMITTED AND RECEIVER MUST BE CAPABLE OF REPRODUCING THEM TO SECURE TRUE NATURAL TONE

Applications for Commercial Full Time FM Stations With a Total Individual Coverage as Per List Below of 460,367 Sq. Miles Now Filed with FCC

In short, an entirely new era of broadcasting service is in store to supplement the present AM service for those who own combination FM-AM receivers. The list which follows of applications for commercial FM transmitters is complete up to October 1st, 1940, and these stations will have an individual coverage of 460,367 square miles.

CALIFORNIA

Earle C. Anthony, Inc., Los Angeles (KFI), to cover 1,371 square miles.

Don Lee Broadcasting System, Los Angeles (KHJ), to cover 6,944 square miles.

Don Lee Broadcasting System, San Francisco (KFRC), to cover 3,080 square miles.

Echo Park Evangelistic Association, Los Angeles (KFSG), to cover 1,344 square miles.

Standard Broadcasting Company, Los Angeles (KFVD), to cover 1,427 square miles.

CONNECTICUT

The Travelers Broadcasting Service Corp., Hartford (WTIC), to cover 14,768 square miles.
WDRC, Incorporated, Hartford, to cover 13,944 square miles.

FLORIDA

om M. Bryan, Miami (WFTL), to cover 2,150 square miles.

ILLINOIS

The Chicago Tribune, Chicago (WGN), to cover 16,822 square miles.
The Moody Bible Institute, Chicago (WMBI), to cover 15,300 square miles.
National Broadcasting Company, Chicago, to cover 12,520 square miles.
WHFC, Incorporated, Cicero, to cover 2,885 square miles.
WJJD, Incorporated, Chicago, to cover 3,700 square miles.
Zenith Radio Corporation, Chicago, to cover 10,760 square miles.

INDIANA

Evansville on the Air, Inc. (WGBF-WEDA), to cover 8,398 square miles.

KENTUCKY

American Broadcasting Corp. of Ky., Lexington (WLAP), to cover 7,290 square miles.
Ashland Broadcasting Company, Ashland (WCMI), to cover 5,119 square miles.

LOUISIANA

Alexandria Broadcasting Co., Inc., Alexandria (KALB), to cover 3,025 square miles.
Baton Rouge Broadcasting Co., Inc., Baton Rouge (KJBO), to cover 8,100 square miles.

MARYLAND

The A. S. Abell Company, Baltimore, to cover 15,489 square miles.

MASSACHUSETTS

Worcester Telegram Publishing Co., Inc., Worcester (WTAG), to cover 20,437 square miles.

MICHIGAN

The Evening News Association, Detroit (WWJ), to cover 25,280 square miles.
John Lord Booth, Detroit (WMBC), to cover 4,400 square miles.
James F. Hopkins, Inc., Detroit (WJBK), to cover 3,050 square miles.
WJR, The Goodwill Station, Detroit, to cover 14,144 square miles.

MISSOURI

Commercial Radio Equipment Co., Kansas City, to cover 2,995 square miles.
The Pulitzer Publishing Co., St. Louis (KSD), to cover 6,564 square miles.
St. Louis University, St. Louis (WEW), to cover 13,500 square miles.
Star-Times Publishing Co., St. Louis (KXOK), to cover 9,900 square miles.

NEW HAMPSHIRE

The Yankee Network, Mount Washington, to cover 35,500 square miles.

NEW YORK

Capitol Broadcasting Co., Inc., Schenectady, to cover 6,589 square miles.
William G. H. Finch, New York City, to cover 4,400 square miles.
General Electric Company, Schenectady (WGY), to cover 16,030 square miles.
Howitt-Wood Radio Co., Inc., Binghamton (WBNF), to cover 18,000 square miles.
Marcus Loew Booking Agency, New York City (WHN), to cover 12,949 square miles.
National Broadcasting Company, New York City, to cover 16,880 square miles.

OHIO

William F. Maag, Jr., Youngstown (WFMJ), to cover 12,304 square miles.
WBNS, Incorporated, Columbus, to cover 12,400 square miles.

PENNSYLVANIA

Walker & Downing Radio Corp., Pittsburgh (WWSW), to cover 8,400 square miles.
WCAU Broadcasting Company, Philadelphia, to cover 13,574 square miles.

RHODE ISLAND

The Outlet Company, Providence (WJAR), to cover 16,370 square miles.

TENNESSEE

The National Life & Accident Insurance Co., Nashville (WSM), to cover 16,000 square miles.

UTAH

Radio Service Corp. of Utah, Salt Lake City (KSL), to cover 623 square miles.

WISCONSIN

The Journal Company, Milwaukee (WTMJ), to cover 15,642 square miles.

Cities in Which FM Stations Are Constructed and Now in Operation Transmitting Experimental FM Programs

LOCATION	CALL LETTERS	POWER
Alpine, N. J.	W2XMN	40 kw
Albany, N. Y.	W2XOY	150 watts
Meridian, Conn.	W1XPW	1 kw
Washington, D. C.	W3XO	1 kw
Paxton, Mass.	W1XOJ	50 kw
Schenectady, N. Y.	W2XDA	50 kw
New York, N. Y.	W2XQR	1 kw
Springfield, Mass.	W1XSN	1 kw
Rochester, N. Y.	W8XBV	1 kw
Avon, Conn.	W1XSO	1 kw
Superior, Wisc.	W9XYH	1 kw
Boston, Mass.	W1XK	1 kw
Holden, Mass.	W1XTG	1 kw
Milwaukee, Wisc.	W9XAO	1 kw
New York, N. Y.	W2XWG	1 kw
Whippany, N. J.	W3XPY	5 kw
Rochester, N. Y.	W8XAD	1 kw
New York, N. Y.	W2XOR	1 kw
Chicago, Ill.	W9XEN	1 kw
Bethesda, Md.	W3XMC	100 watts
Columbus, Ohio	W8XVH	250 watts

High Fidelity Capabilities of the Wide Band FM Broadcasting System

The high fidelity transmission standards set for FM equipment insure that at last the full range of all audio frequencies from 50 to 15,000 cycles will be broadcast during studio programs, or in the playing of high fidelity transcriptions which have a range extending to these limits. The development of FM relay stations or the use of better quality telephone lines, which are now available in some instances, will result in a tremendous improvement in the quality of chain programs, bringing them up to at least 8.000 cycles in many instances, and even to 15,000 cycles where the proper steps are taken.

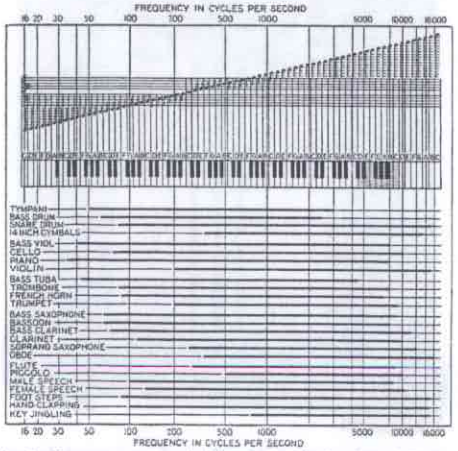


FIG. 3.—Frequency range required for the reproduction of musical instruments, voice, and noise without noticeable distortion.

Reprinted from "Radio Engineering Handbook" (McGraw-Hill Book Company)

One of the most common misconceptions about FM broadcasting is that only direct studio programs can be transmitted with full fidelity. At the present time W2XOR, the FM station operated by WOR in New York City uses three miles of telephone line capable of transmitting flat a response from 20 to 22,000 cycles between their studio and transmitter. Much longer lines are available with the lower fidelity standard mentioned above. The line is not a limitation to high fidelity sound programs.

Why New FM Stations Will Broadcast Over Twice Fidelity Range Now On Present AM Stations

Few people realize, at the present time, the tremendous difference the new FM system of broadcasting will provide in natural reproduction. The chart below shows the fundamental tones and overtones of musical instruments with a piano keyboard. It is impossible for present AM broadcasting stations to transmit more than half of the true tones of these instruments perfectly, but it is only when a chart such as this is examined that it can be realized what a large part of the musical tones we have been missing when we listen to musical broadcasts over our present AM broadcasting stations. You can clearly see why you never hear the upper overtones of practically every musical instrument, as most of them are over 8,000 cycles, and present broadcasting AM stations are not capable of transmitting these frequencies. Only when you listen to the instruments of an orchestra over one of the new FM stations will you hear all of the tones and overtones of every musical instrument.

In addition to this chart we are again reproducing the chart (which is now reproduced linearly) showing the fundamental and overtone range of musical instruments, together with the part of the range we listen to on (1) AM chain broadcasts, (2) AM studio broadcasts and (3) an FM broadcast. It will be immediately apparent that only when you hear musical instruments over an FM station is it possible to hear the full range of each instrument.

FM Programs Will Broadcast Full Dynamic Volume Range

An equally important advantage of FM broadcasting to the music lover especially, *is its ability to handle the full*

dynamic volume range of even a large symphony orchestra. The volume range of such an orchestra is 60 db.

When you listen to such an orchestra over our present AM stations, you hear slightly less than half its volume range, as it must, for technical reasons, compress this range to approximately 27 db., so that you never hear the pp, ppp, ff, or the fff passages exactly as they were played by the orchestra in studio or auditorium.

On very soft pp and ppp passages the monitoring engineer in the control room of the AM station turns a control and makes these passages louder to increase the volume at the transmitter in order to over-ride any line or atmospheric noise. On the very loud ff and fff passages it is necessary for the monitoring engineer to turn down the volume to prevent overloading the output stages of the transmitter. If the control engineer did not turn the volume down on the very heavy passages it might overload the output tubes in the transmitter, burning them out, and throw the station off the air. The net result of this is that when you listen to any program with a large dynamic range it is drastically compressed, especially in the forte region. This increase of volume on weak passages and the decrease of volume on strong passages simply means that the dynamic range of the orchestral program is compressed so that you hear music less dynamic than you would hear it if you listened in the auditorium.

Chart Shows Why AM Broadcasts Do Not Have Complete Dynamic Volume Range

In the accompanying chart a comparison of the volume range of a typical AM line program with the true symphonic range is shown. Since FM permits full dynamic volume range to be transmitted due to the fact that only the frequency is being varied, the true symphonic volume range is retained on FM, and you hear all shades of expression from the softest pianissimo to the triple forte, exactly as you would hear them when played by the orchestra.

The Requirements of a Good FM Receiver

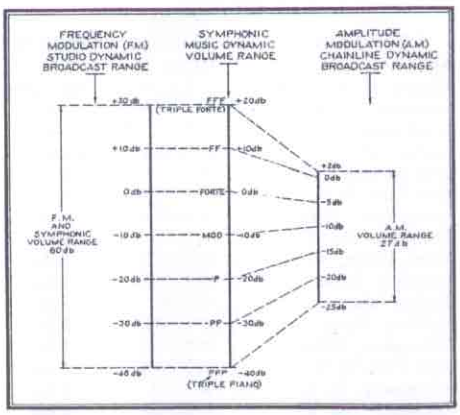
In order to secure the full advantage of the high fidelity FM broadcasts, it is necessary that the FM receiver be capable of reproducing the program in a form as near to the original as possible, with high fidelity, freedom from noise and interference, and true volume or dynamic range.

Scott FM Receiver Assures Full Fidelity From FM Stations

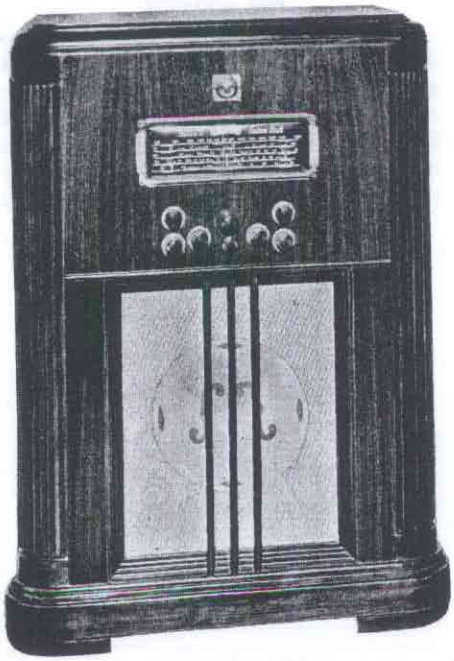
It is one thing to have high fidelity in the audio amplifier and another to have it both in the amplifier and loudspeaker system. The audio amplifiers of Scott receivers have been capable of reproducing audio frequencies from 30 to 15,000 cycles for several years. Now for FM we have a loudspeaker system employing the Tauscher sound unit, with a special dividing network feeding one low frequency speaker and two high frequency speakers to permit the realization of acoustic output in the full high fidelity range offered by FM broadcasting.

This special four unit speaker system can be supplied at $29.50 extra. The high fidelity speaker regularly supplied with Scott receivers reproduces all frequencies from 50 to 8,500 cycles.

In choosing an FM receiver it is extremely important that the loudspeaker



system be capable of reproducing the full tonal range of 50 to 15,000 cycles. The benefits of a good audio amplifier are wasted on FM if its output is fed into a small single speaker which may have only a feeble response above 6,000 or 7,000 cycles.



X-Ray View Showing Tauscher Sound Board Unit Installed on Speaker Behind Grill Cloth on Scott Phantom in Braemar Console.

Why Limiter in FM Receiver Important

Another important consideration i whether the FM receiver will actually eliminate the noise which should not be present in FM reception. There are two vital parts of an FM receiver which govern its ability to reduce or eliminate noise and interference. One is the limiter and the other is the frequency detector. The function of the limiter is suggested by its name. Since only the frequency of an FM signal varies, we may compress its amplitude as much as we like. Noise disturbances cause the amplitude to fluctuate more or less depending upon their intensity. By using a limiter in the FM receiver these disturbances may be ironed out so that when the signal reaches the detector it has only its original frequency characteristic which carries the high fidelity program.

All of Scott FM receivers use two limiters to iron out the unwanted disturbances and noise impulses. These are called "cascade limiters" because one follows the other to complete the "smoothing out" process better than a single one.

Complete Dynamic Volume Range Reproduced on Scott FM-AM Receiver

A final consideration is the ability the FM receiver to actually handle the wide dynamic volume ranges, such as those encountered in symphonic FM programs. All of the Scott FM-AM receivers have an ample power handling capacity. The maximum undistorted power of the Phantom Deluxe is 25 watts, and that of the Philharmonic is 40 watts, which assures perfect reproduction of every shade of volume from the softest to the loudest passages without distortion or fuzziness.

A Prediction On the Radio Receiver of the Future

Once you have listened to a few programs over an FM station you will realize that it is the broadcasting system of the future. While I do not believe our present AM system of broadcasting will ever be completely obsoleted by FM, I do believe anyone who purchases a radio receiver today for use in any city or even town of moderate size, is purchasing an instrument that will lose its value rapidly within the next two years. FM is one of those developments that can't be kept back, because it makes possible finer and better tone than anything we have today in the world broadcasting. I feel certain before th time next year you will find it difficult to purchase a new receiver that is not equipped for the reception of both FM and AM programs.

SOME INTERESTING FACTS ABOUT AUTOMATIC RECORD PLAYERS AND RECORDS

NOW that recorded music is enjoying such popularity, many prospective purchasers find it difficult to choose just the right type of automatic record playing combination from among the many offered today. As we have been active in pioneering the use of automatic record players, and today sell about 75% of all Scott receivers with one, I believe our experience will be of definite value in helping you make the most satisfactory and economical purchase.

How Records Are Made

You will find it easier to make an intelligent selection of a record player if you first understand just how records are made. The orchestra or artist plays or sings directly before a microphone in the recording studio, just as if the music were being broadcast. As the music enters the microphone, mechanical vibrations are set up and are transferred to the recording machine on which a blank record is revolving. The physical transference of the sound is by means of a cutting needle which cuts a groove into the record.

As the music varies in loudness and pitch, this cutting needle vibrates laterally, that is, back and forth, and the width of this vibration is in direct proportion to the loudness or softness of the musical passage. For example, on a very loud passage the lateral movement is considerable, and the groove in the record is wide, whereas on a soft or pianissimo passage only a barely perceptible, very narrow groove is cut by the needle. If you examine a record you will notice that some grooves are fine, while others are coarse, the fine groove indicating soft passages, while the coarse groove indicates the loud passages.

The Most Important Part of All Record Changers

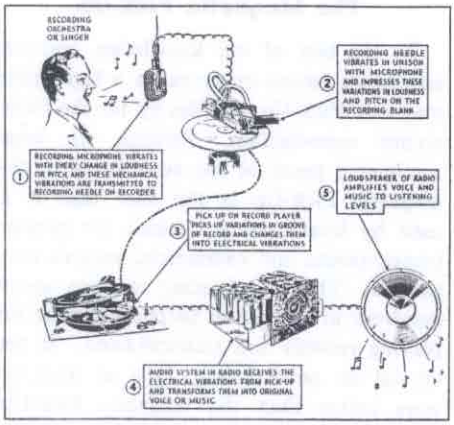
To sum up, the microphone in the recording studio transforms the music into *mechanical vibrations* which are transferred to the record by the cutting needle in the recorder. When the record is played through an automatic record player, the process is reversed, that is, the mechanical vibrations are transformed back again into music by means of the needle in the record-player Pick-Up.

The Pick-Up is the unit on the end of the arm which holds the needle, *and is actually the most important part of any automatic record player,* for on its quality largely depends the kind of reproduction you will hear from your records. The electrical vibrations from the Pick-Up are fed into the audio amplifier of the receiver where they are transformed back into the original voice or music, then from the amplifier to the speaker, so that they will be audible at normal listening volumes.

A skeleton outline of this system is shown in the accompanying sketch. If you study it carefully it will greatly simplify your problem of selecting an automatic record player.

Why High Quality Pick-Up Essential

The Pick-Up is the "heart" of all record players, because if it is not sensitive enough to detect all the delicate shadings of the low and high overtones on the records, *then the full fidelity range of the record will not be fed into the audio system.* This simply means that no matter how fine the audio system of the radio may be, and no matter how perfectly the loud speaker reproduces, *overall reproduction will always be limited by the fidelity range of the Pick-Up.* However, it must be realized that in order to secure the finest reproduction of the record, all three units—the Pick-Up, the Audio System, and the Speaker must be capable of *completely* reproducing everything that is recorded on the record.



Mechanism of Changer Has Nothing to Do With Reproduction

Many people do not realize that the only function of the changing mechanism itself is to change the records, and has nothing whatever to do with the reproduction. It is surprising the large number of people who are under the impression that *the larger and more complicated the automatic changer mechanism, the better the reproduction will be,* but a little thought will quickly show that this is not true. There are several methods of automatically changing records, and it is interesting to follow the history of the various types of record changers. As you will see, the evolution and simplification of record changer mechanisms has closely followed developments in the recording field.

Recordings First Made On One Side Only

Many years ago, when disc-type records were first introduced, there were no automatic record changers available. When the record finished playing, the listener walked over to the phonograph, stopped it, and replaced the record with another one, because for some time music was recorded on one side only, the other side being left blank.

How First Symphonies, Concertos, Operas Were Recorded

Due to public pressure, the recording companies soon began to record an additional selection on the other side, thus giving purchasers two selections for the price of one. After the repertoire of such perennials as the Sextette from "Lucia," the Quartette from "Rigoletto," the Miserere from "Il Trovatore," "Humoresque," "Home Sweet Home," and about a dozen others were exhausted, the public began to demand longer selections, such as symphonies, instrumental concertos, complete operas, chamber music, and various other extended works which must, of necessity, cover several records. As no automatic record changers were in existence at this time, recording companies merely started the record on the recorder and the orchestra continued playing until there was no more room on the recording blank. The conductor then stopped the orchestra, a new recording blank was put on the recorder, and the selection continued. This process was repeated until the composition was complete on several records. As all records were turned over individually by hand in those days, there was no need for arranging the sequence in any other way.

Turn-Over Changer Introduced to Play First Double Side Records

The "turn-over" automatic type of record changers were first introduced about twelve years ago, in the Spring of 1928, and were designed for use with this early type recording. The Scott and Autotrope "turn-over" record changers that were so popular a few years ago were of the "turn-over" type, playing first one side of the record, then turning it over and playing the other side. Although rather costly, these were two of the finest changers of the "turn-over" type available.

However, one objection to "turn-over" changers was the length of time required to change from one side of the record to another—about 19 seconds as against only 9 seconds for the modern changer. Another objection was the fact that the complicated mechanism was rather noisy in operation. Before you buy any record changer you should check the time required to make the change from one record to another, as some take considerably longer than others, and watch the changing operation to see if records are handled in such a way that they are not likely to be damaged during the changing process. At the same time,

the QUIETNESS of the changing operation should be carefully noted.

New Type Recordings Make Simpler and More Compact Record Changers Possible

The passing of the "turn-over" changer began several years ago when Victor and Columbia started recording their extended works in such a manner that in an album of say eight records, the first half would be recorded on the top sides of the records, with the second half recorded on the bottom sides, thus eliminating the necessity for turning each record over in order to play through an album in sequence.

Victor and Columbia Announce New Type Album

Just a few weeks ago both Victor and Columbia announced an improved method of recording. Albums of the more extended works now being released can be obtained in what is know as the "MM" sequence. When all of the top sides of the records in an album are played, you merely turn over the entire set of records *in one movement,* and as this only takes five or six seconds, the continuity of the symphony or opera is not interrupted, and you can sit back and enjoy a full hour of fine music with the records being changed silently and automatically.

How to Judge the Pick-Up

As the Pick-Up determines the quality of reproduction you will secure, it is advisable to carefully check this unit of the record player you are considering purchasing. Pick-Ups are divided into three types as follows: (1) the crystal type, (2) the photoelectric type, and (3) the magnetic type.

The Crystal Pick-Up

Due largely to its low cost, the crystal Pick-Up will be found in most of the low and medium priced record players. The principal advantage of a crystal Pick-Up is its very low first cost, and for the manufacturer who must keep the price of his product low, this is a primary consideration. However, the fidelity response of a crystal varies with temperature changes, and it is difficult to make them uniform in fidelity characteristics. Another bad feature is the difficulty of securing a good response on the important middle frequencies between 2,000 and 4,000 cycles, giving reproduction a rather "thin" quality, or lack of depth, creating in most people's ears a very unnatural reproduction in certain zones of the frequency range. After all, what is desired is a *natural* reproduction. Scott and Garrard automatic record players can be supplied with crystal Pick-Ups for those who desire them, but for music lovers who want the finest tonal quality reproduction obtainable, we recommend the Magnetic Pick-Up.

The Photoelectric Cell Pick-Up

The second type of pick-up operates by means of a photoelectric cell, the variations in the record groove being picked up and mirrored by means of a light beam, the same principle that has been used for a great many years in motion picture sound films. However, there is a great difference between taking the sound from the groove of a record, and taking it from the sound track of a film. My suggestion is that you take your own high fidelity records with you and make your own tests. If possible, listen to them first on a high grade magnetic Pick-Up, then on the photoelectric Pick-Up. Listen carefully especially to the reproduction of the middle register, and the higher overtones on each type of Pick-Up. I believe you will have no difficulty in making your decision after such a test.

The Magnetic Pick-Up

To the best of our knowledge, and our experience covers many years, a high grade magnetic Pick-Up provides by far the finest record reproduction. Perhaps the most convincing proof of the superiority of the magnetic Pick-Up is the fact that it is used by broadcasting stations for playing transcriptions and commercial records over the air. The broadcasting stations spend hundreds of dollars on their equipment for playing records and transcriptions. If the crystal or photoelectric type of Pick-Up were better than the magnetic Pick-Up, you can be assured the broadcasting stations would use them. The Scott Deluxe Automatic Record Changer, the RM-10, or RM-30 Garrard, which we can also furnish, are all equipped with magnetic Pick-Ups.

Best Way to Check Fidelity Pick-Up

The best way to check the fidelity of a record player Pick-Up is to take your own records with you, records that you know, and have them played on the various machines. You will be surprised to note how much better your records will sound on some machines as compared with others. If you are interested in the purchase of a record player, we welcome such tests on Scott machines.

If you hear no scratch or surface noise when a record is played on one record player, but notice a certain amount of scratch when it is played on another machine, you can be fairly certain that the changer on which no scratch is heard DOES NOT REPRODUCE THE RANGE OF FREQUENCIES BETWEEN 4,000 AND 6,000 CYCLES VERY WELL, for if the Pick-Up is of a type that will reproduce the high frequencies properly, you will hear the needle scratch as well as the music. To eliminate the scratch it is only necessary to turn back the fidelity control. BUT REMEMBER BY DOING THIS THE HIGHER OVERTONES ON THE RECORD ARE ALSO SUBDUED OR EVEN ENTIRELY ELIMINATED. Incidentally, it will be a surprise to many to know *that the surface noise on a record is caused by the small amount of abrasive which is mixed with the shellac filler out of which commercial records are made to keep the point of the needle in Pick-Up polished.*

Why Record Changer Motor Should Have Sufficient Reserve Power

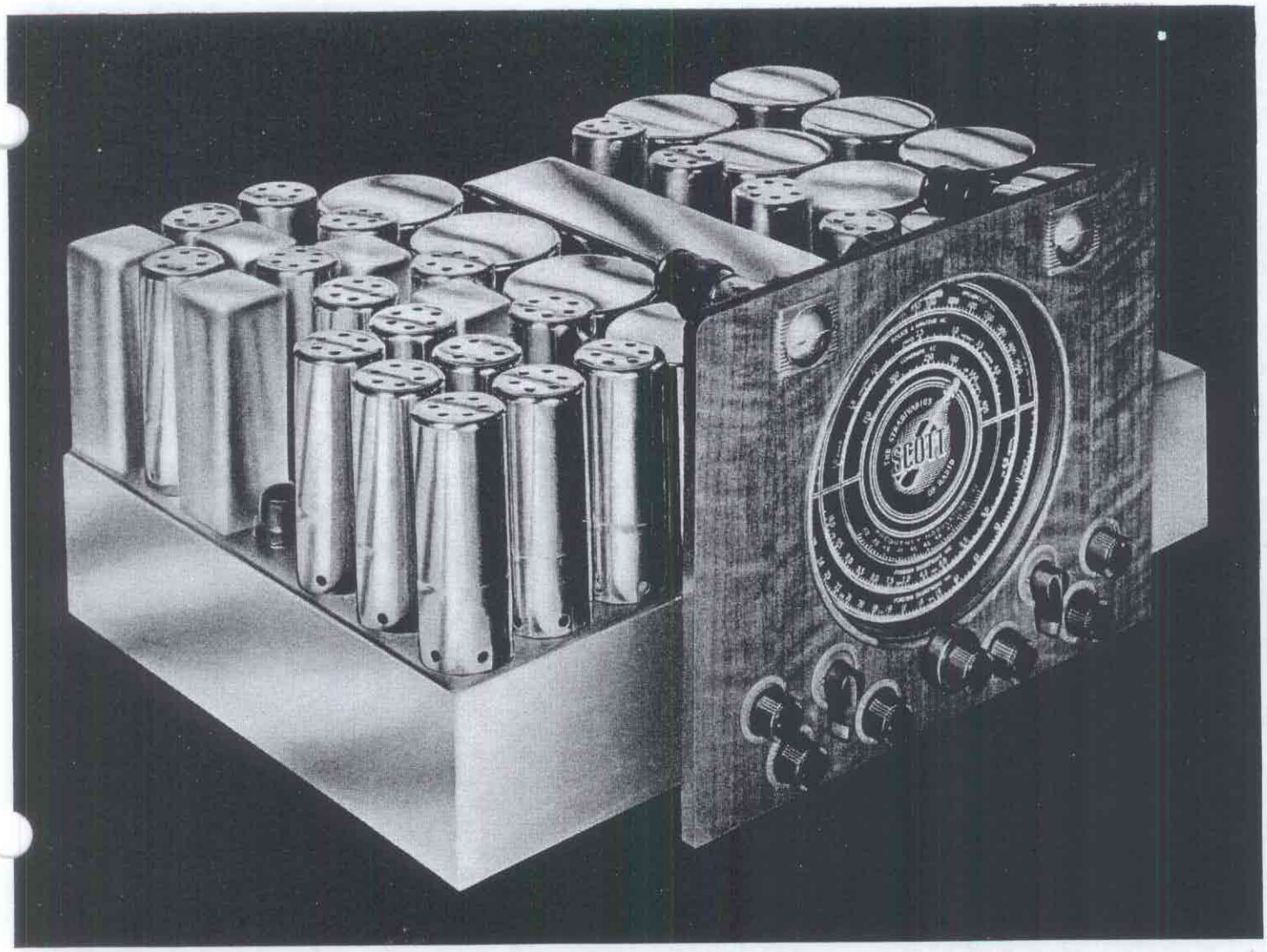
Next in importance to the Pick-Up on a record changer is the motor which revolves the turntable. It must be strong enough to "pull" a 12" record at an absolutely uniform speed. In the cheaper record changers, where reserve power of the motor may be low, you may notice "wows" on the record, a defect caused by the motor slowing down temporarily. It is important, therefore, that you make sure your record changer has a powerful motor with good voltage and speed regulation.

The Changing Mechanism

The remainder of the record changer mechanism can be simple or complicated, depending upon what you want it to do. There are a number of record changers with slightly different methods of changing the records, but it is well to remember that the chief requirement of a good record playing machine *is the ability to change records as quickly as possible, and in a way that is not likely to cause any damage to the record during the changing process.* We have tested and sold most record changers now on the market, accumulating a wide and varied experience with these instruments. Some change records quickly, but jam easily and damage the records, while others change them too slowly and make too much noise during the changing process.

The Scott Deluxe Record Changer

As a result of our tests made over a period of several years, we recommend either the Garrard RM-10 or RM-30, with magnetic heads, to those who desire a good modestly priced changer, and the Deluxe Scott changer (which is made to our specifications by the Garrard Company and has a very high quality magnetic head) for those who want the finest money can buy.



Tuning Chassis of Scott FM-AM Philharmonic

SCOTT FM-AM PHILHARMONIC

"WORLD'S FINEST" RADIO RECEIVER, INCORPORATING NEW ARMSTRONG WIDE BAND FREQUENCY MODULATION—AND AM SHORT WAVE AND BROADCAST BANDS FROM 13 TO 2,000 METERS

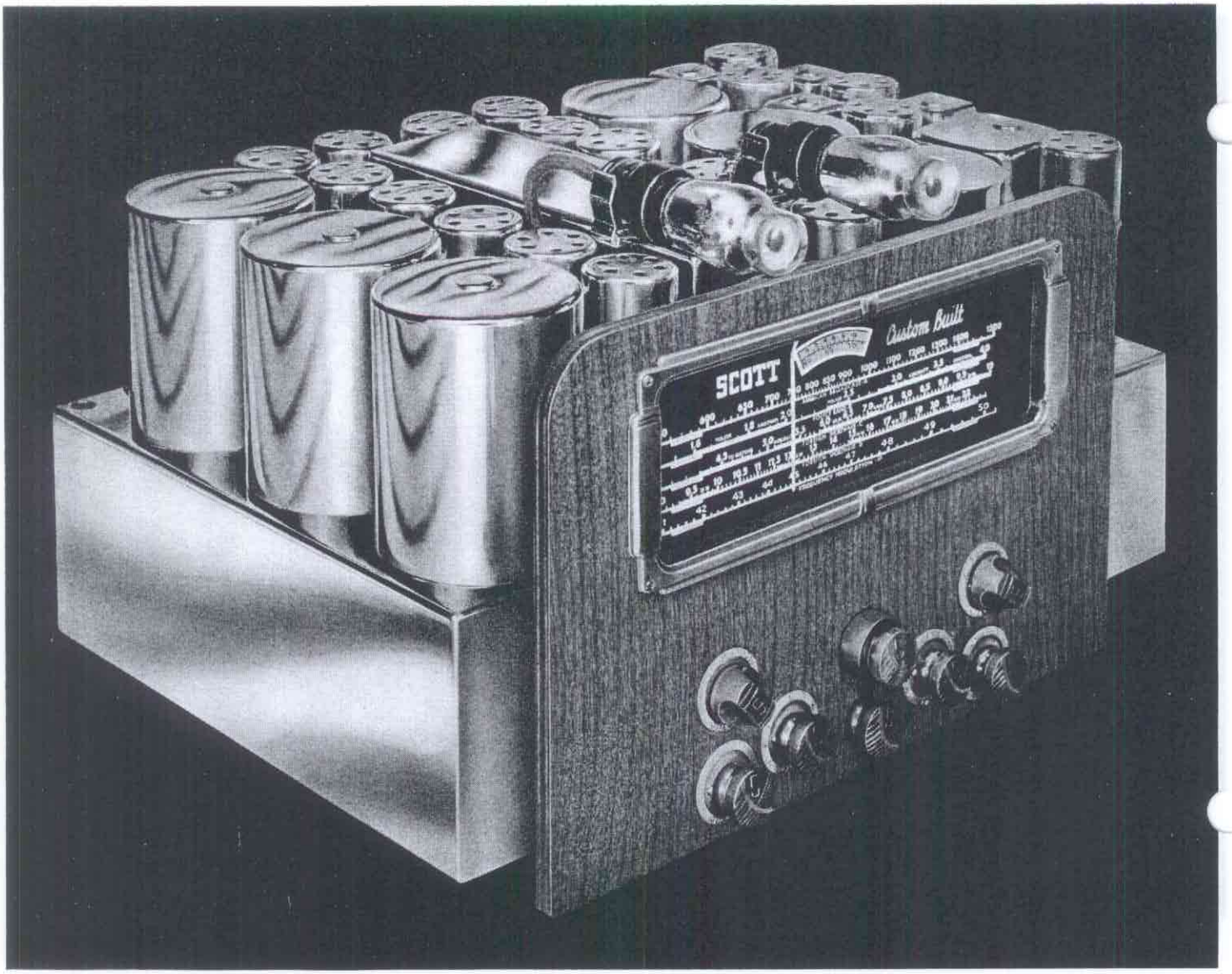
THIS deluxe instrument, incorporating 33 tubes (including tuning indicators and rectifiers) is the result of nearly two decades of research and experiment, and is designed to receive broadcasts from the new FM stations as well as the regular AM stations. It represents the ultimate in radio luxury and today occupies an honored place in fine homes throughout the world.

As a noted and loved musical leader once told me, "To compare its performance with that of any similar product is heresy; there is as much difference between a Scott Philharmonic and other instruments of its kind as there is between a music box and a 90-piece symphony orchestra." While my own estimate of its merit is far more conservative, I nevertheless recommend it as the *ne plus ultra* in receiver design. In order that as close an approach to perfection as possible might be achieved there was no compromise with material, or expense. Each individual circuit has been developed to the most refined point known to engineering science, and we believe it stands alone and unchallenged, and the finest in radio receiving equipment designed for the home.

Words are entirely inadequate to describe one's sensations when first hearing this amazing instrument. The full brilliance and splendor of really great music, when heard through a Scott FM-AM Philharmonic, is an experience that will be treasured for a lifetime. It seems as if you were carried directly into the physical presence of the orchestra, with all its precision, glory, and majesty. Here in our day, is a "miracle of perfection," to use the exact words of the great Toscanini in describing his Scott.

The spoken voice no longer emanates from a horn inside a cabinet, but seems to speak directly into your ears with all the sibilants and fricatives intact. You can even detect the delicate variation in dynamics when the speaker or singer turns his head.

Distance reception, by short wave or standard broadcast, reaches you across the vast expanse of water and land, with hardly a trace of the many annoyances so common on the average radio. For those who have never heard how really good distance reception can be, Scott performance will leave you with an entirely new conception of what is actually possible today.



Tuning Chassis of Scott FM-AM Phantom Deluxe

The SCOTT FM-AM PHANTOM DELUXE

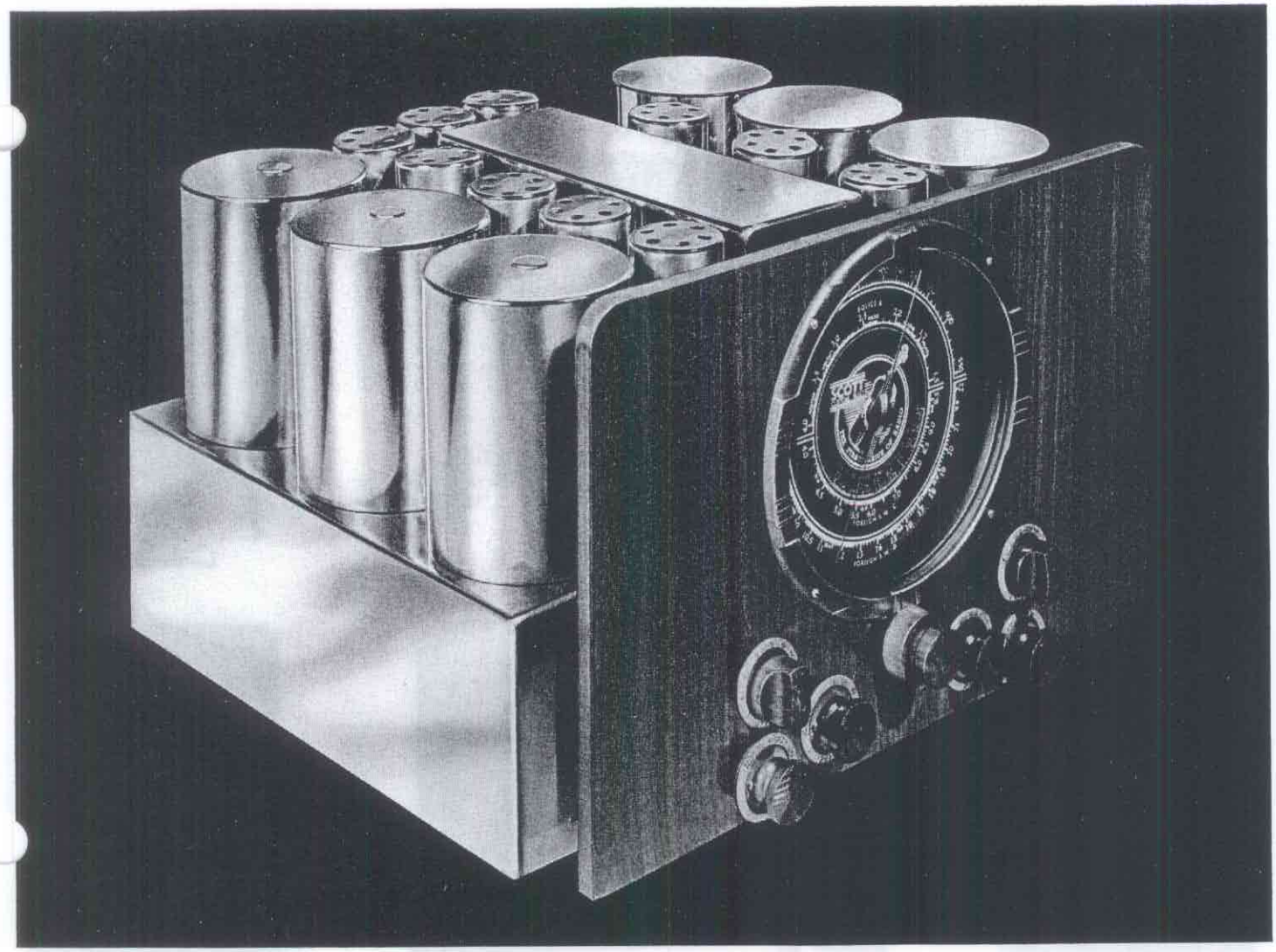
A DE LUXE INSTRUMENT FOR RECEPTION OF NEW ARMSTRONG WIDE BAND FREQUENCY MODULATION—FOREIGN SHORT WAVE AND BROADCAST BAND AM STATIONS

ON THE opposite page the Scott Masterpiece is compared with the highest priced radio receivers now being offered. Such an appraisal of a Scott FM-AM Phantom Deluxe, however, is not applicable, as its performance is, we believe, so far superior that it can be compared only with the finest type of professional equipment.

While it incorporates the same fine quality of parts and precision workmanship found in the Scott Masterpiece, the various performance features are carried out to an infinitely higher degree of development and it is designed to receive the new FM stations as well as our present AM stations. The instrument uses a total of 28 tubes, (including tuning indicators and rectifiers) and we believe its performance is years ahead. Particular attention was paid to development of the audio system in order to achieve a tonal response that would rival the original interpretation, bringing out the third dimensional quality of depth, natural resonance, and clarity that is not usually present in even the best production receivers. There is no indistinguishable blur of tone ordinarily heard when listening to a symphony, a full concert orchestra is as enjoyable as a string quartet.

One of the primary reasons why this remarkable instrument enjoys such universal acceptance in the musical world is because its design includes features that were once available only in the $2,500 Scott Quaranta, probably the finest radio receiver ever built. It is a matter of record that literally scores of those who never cared particularly for so-called "classical music" became ardent and enthusiastic devotees after having heard a few records through a Scott Phantom Deluxe. On the other hand, while you may not be overly fond of popular music, I believe I am quite safe in saying you will find it an entirely new experience to tune in a really *good* dance band, for you will now hear such music in its *entirety*, nothing added or taken away.

If a radio or record playing combination represents a long-time investment for you, as it does for most people, then the Scott FM-AM Phantom Deluxe i recommended as a logical choice, for you will find it so highly perfected and so advanced in design that I believe it will be many years before you will want to invest in a later model Scott.



Tuning Chassis of Scott Masterpiece

The New SCOTT MASTERPIECE

FOR STANDARD SHORT WAVE AND BROADCAST AMPLITUDE MODULATION STATIONS

MY one purpose in designing the Scott Masterpiece was to develop an instrument that would easily meet our exacting standards of performance, a receiver capable of satisfying fully the most critical test of its owner. Its versatility in handling every phase of radio reception and record reproduction has quickly established the Masterpiece as one of the most popular Scott receivers ever offered. The compact efficiency of the Masterpiece makes possible a maximum in results with a minimum in size.

Other things being equal, the greater the number of tubes in a radio receiver, the finer its tone, the quieter its operation, and the better its long distance performance. For those who want detailed proof of this statement, we have prepared a highly interesting non-technical survey of tube functions which will be mailed on request. This concise summary will be of great value in helping you classify every brand of radio receiver and record-playing combination now being offered to the public.

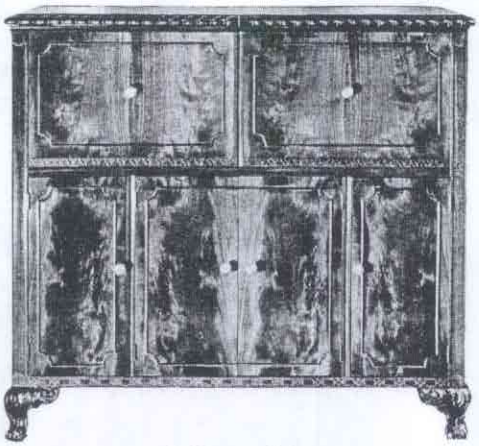
Those who have carefully checked all radio receivers available today know that the average console radio in the $300 and up class incorporates only about 10 tubes. The Scott Masterpiece priced at less than $200, contains a total of 14 tubes including tuning indicators and rectifiers.

Important as tubes may be, however, this is only one of the many differences between a Scott Masterpiece and other receivers. Its greater naturalness of reproduction on records and radio broadcasts, increased ability to separate interfering stations, greater sensitivity to otherwise weak or inaudible stations at great distances, ability to minimize annoying crackling or electrical interference—all these features and many more are chiefly due to the fact that each Scott is largely HANDMADE from oversized parts of high quality. Proof of this statement is that every unit of a Scott excepting tubes is guaranteed for five years.

Briefly, a Scott Masterpiece is designed as an "introduction" to Scott performance. It is an instrument especially intended for those who have "graduated" from the highest priced mass-production radios, and are now looking for something finer. The Scott Masterpiece, incorporating proved modern developments in radio design, also includes many additional exclusive features which are not found in receivers available through the usual channels.

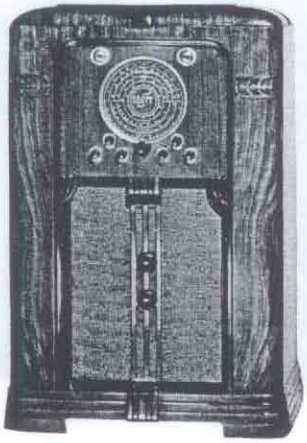
Scott Craftsman Consoles

Regent



Chippendale

Louis XV

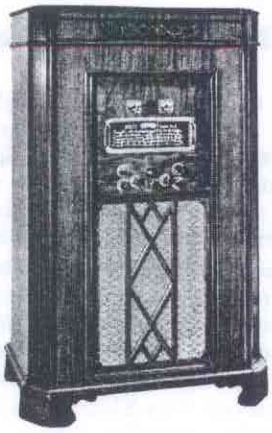


Warrington

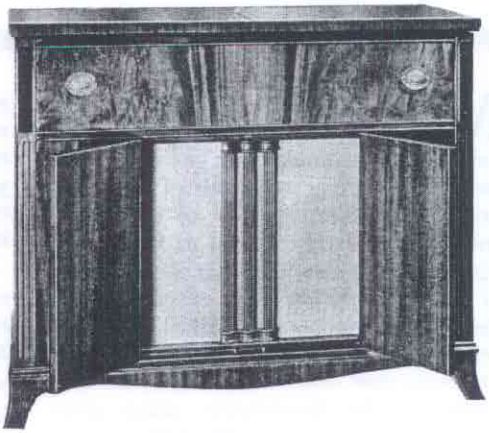
Victorian

Braemar

Georgian



Wellington



Sheraton

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