SCOTT NEWS

NEWS OF LATEST DEVELOPMENTS IN THE SCOTT RESEARCH LABORATORIES

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Announcing

Two New Revolutionary Wide Band Frequency Modulation Receivers

During the past few months you have undoubtedly read or heard about a revolutionary new system of radio reception called Frequency Modulation, that makes possible better, clearer, quieter reception, with a faithfulness of tone never before achieved.

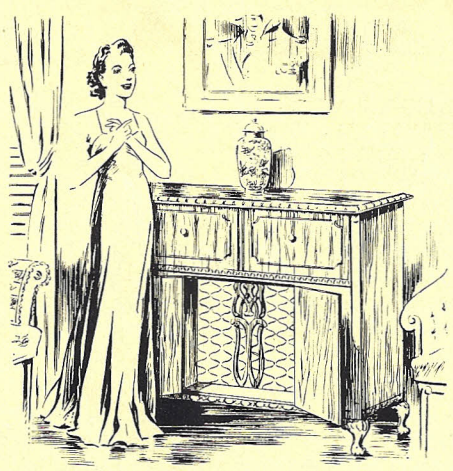
The first real news that came to the general public about this sensational new development was a six page feature article that appeared in the October, 1939, issue of "Fortune" magazine. Since that time articles have appeared in magazines and newspapers not only in practically every city of the United States, but all over the world.

There have been many important developments in radio receiver design since the invention of the basic superheterodyne circuit nearly 20 years ago, but they have largely been means for improving the results secured with this type of circuit.

The invention of the superheterodyne provided so much greater efficiency in radio reception, that it quickly obsoleted the old tuned radio frequency or TRF circuits previously used. Now the inventor of the superheterodyne has perfected a system of radio transmission and reception which I am certain is destined to again revolutionize radio receiver design, for the Armstrong system of Wide Band Frequency Modulation *is not simply an improvement* over our present method of broadcasting, *but is an entirely new system of radio transmission and reception.*

This new virtually static-less high fidelity system of Wide Band Frequency Modulation is the invention of Major Edwin H. Armstrong, who has probably contributed more than any other individual to the advancement of modern radio, for it was his regenerative, superregenerative, and superheterodyne circuits that have made long distance world-wide reception possible. His new invention is the culmination of over sixteen years of intensive research, during which he made over 100,000 measurements and experiments before finally achieving success.

I can think of no better way of telling you what Wide Band Frequency Modulation accomplishes in radio reception than by describing what I saw and heard on a recent trip to New York, following a visit to my Chicago laboratories by Major Armstrong. This will also explain why this issue of the SCOTT NEWS announces two new instruments that will tune in both Wide Band Frequency and Narrow Band Amplitude Modulation broadcasts, and in addition, a new Scott FM Tuner that will enable every one who now owns a standard receiver with a good audio and speaker system to tune in programs from the many new FM transmitters now being erected in various parts of the country.



WIDE BAND FREQUENCY MODULATION TRANSMISSION WITH ITS COMPLETE FREQUENCY AND DYNAMIC RANGE APPEARS TO BRING VOICE OF ARTIST OUT OF SPEAKER GIVING THE ILLUSION OF PHYSICAL PRESENCE OF ARTIST IN ROOM..

Demonstration During Thunder Storm

The demonstration of Frequency Modulation took place in Major Armstrong's apartment at River House in Manhattan. The weather was anything but favorable for the demonstration of a new radio receiving system, for even the programs from local New York stations were marred by bursts of static. It was the kind of day one prefers to spend indoors with a good book—and the radio turned off.

However, judging from the Major's smile as he greeted me, the atmospherics did not appear to be worrying him very much, and before the afternoon was over I understood the reason for his confidence.

The first thing he did was to turn on a standard type of receiver in the living room and bring in programs from one or two local stations to convince me (as if I needed it) that there was static in the air. About 60 seconds of this reception was quite enough to verify that there was

static—and plenty of it. The standard receiver was then switched off and we went into the next room where the FM receiver was installed.

Reception on Frequency Modulation Extremely Quiet

The transmission I listened to came from a small FM station located in Yonkers, and operated by C. R. Runyon, a friend of Major Armstrong from his amateur days. I had noticed him go over to the FM receiver and apparently switch it on, but after about a minute had passed I heard nothing, and remarked that the FM receiver seemed to take a little longer to warm up than a regular receiver. "I was waiting for that," the Major said, "for it is the first difference I want you to notice between Amplitude Modulation and Frequency Modulation transmission." (Amplitude Modulation, or AM, is the term used for the type of transmission at present in use.) "I suppose you are listening for the 'carrier.' Well, I'm afraid you will have to listen for a long time to hear it on an FM receiver.

"You notice that there is silence except when music or voice is coming out of the speaker. When one of our present receivers is tuned to a station and no program is coming thru you can hear the typical tube hiss of the carrier which tells you that the receiver is operating, but when an FM program is tuned in *the only way you can tell whether the FM receiver is actually operating or not is by looking at the dial to see if it is lighted.* When a speaker pauses between sentences, or an orchestra rests between numbers, it will seem as if the set is turned off, for when no sound is being broadcast, the FM receiver is silent."

Just a few minutes before, I heard very definite proof that there was plenty of static in the air by the sounds which came crashing out of the standard AM receiver. Yet here was the FM receiver in full operation, *but without a sound coming from the speaker to indicate that the air was full of static.*

The actual demonstration began when the Major called the operator at the FM station at Yonkers by telephone. He was evidently wearing headphones (similar to those used by telephone operators) for instead of replying to the Major's queries by the regular telephone line, he spoke into the microphone connected to the FM transmitter, and his replies came out of the loudspeaker in the FM receiver.

Marvelous—Only Way To Describe Reproduction

The effect was rather startling for two reasons: (1) There was no static and (2) as FM transmission covers the complete audible range of the human ear, I heard a real demonstration of true 100% high fidelity reproduction. Certainly, I never before had heard speech reproduced thru a loud speaker in a radio receiver with such remarkable naturalness, and I have been working with high fidelity reproduction for a long time.

Some Intensely Interesting Experiments in Radio Reception

After Major Armstrong and the FM operator had talked back and forth for a few minutes, the demonstration of FM high fidelity started with the reception of sounds which are very difficult to transmit *naturally*, with any system of reproduction.

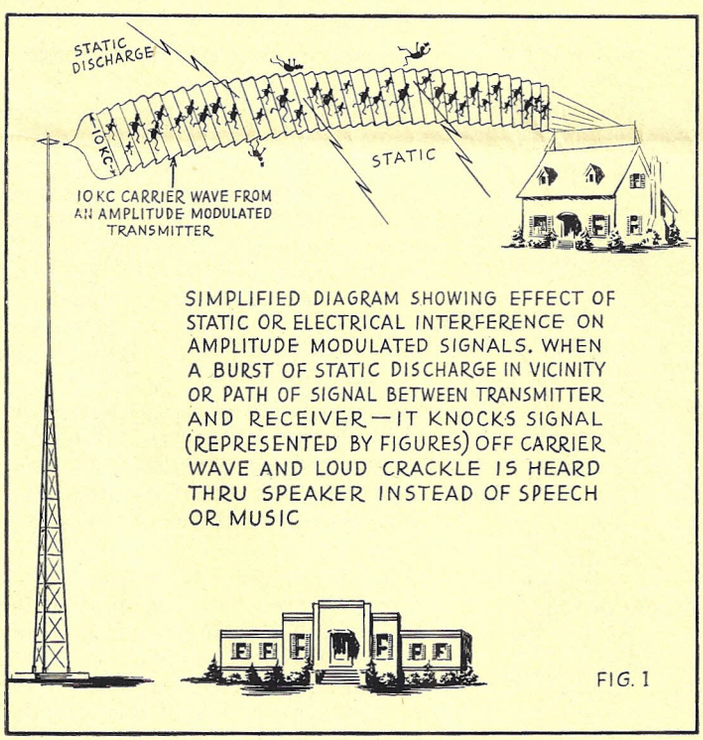
First, some water was poured into a glass directly in front of the microphone, and was so absolutely realistic that the water seemed as if it were actually being poured out right in front of my eyes. If the demonstration had taken place in a darkened room and my life had depended on my ability to tell, with certainty, whether the water was actually being poured into a glass in front of me, or whether this sound was being reproduced thru a radio speaker, my life would have been in extreme danger, for it would just have been a guess to tell which was which.

The Major then said he would like a little ice in the water, and the next sound we heard was the ice shovel going under the ice cubes, then tumbling and tinkling against the sides of the glass as they slipped down off the shovel into the water.

This was followed by the transmission of sounds from various sized bells, to demonstrate how perfectly the fundamental tones and overtones are transmitted. First a blow was struck on what must have been a fairly large bell. The naturalness was startling and demonstrated how perfectly the lower tones were reproduced. You almost felt as if you could reach out and grasp the reverberations or waves of sound as they left the bell and floated off into space. Then several smaller bells were struck to demonstrate how perfectly the very high tones and overtones were reproduced.

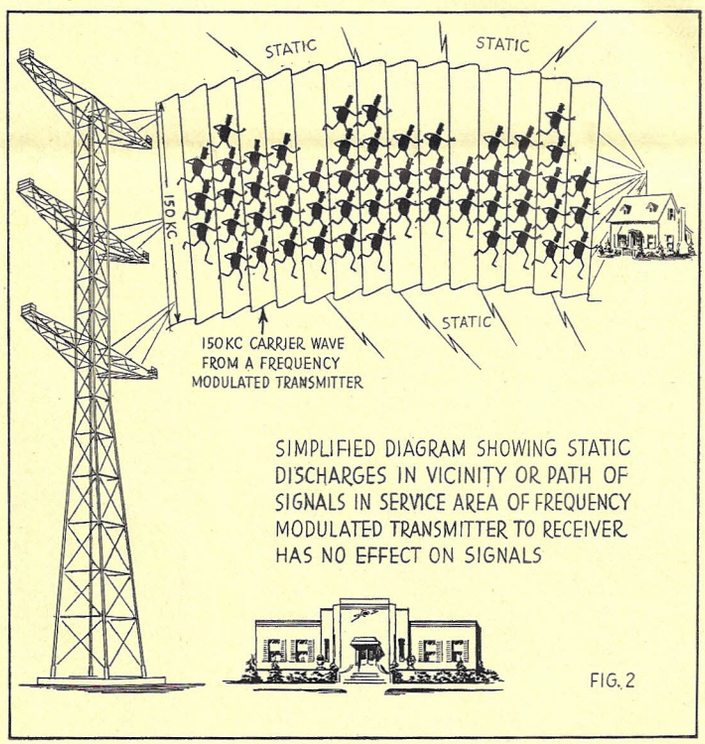
Only the Natural Speech, Music, or Sounds Picked Up at Microphone

Finally, selections were played on a piano, a particularly hard instrument to reproduce naturally, and the notes came



SIMPLIFIED DIAGRAM SHOWING EFFECT OF STATIC OR ELECTRICAL INTERFERENCE ON AMPLITUDE MODULATED SIGNALS. WHEN A BURST OF STATIC DISCHARGE IN VICINITY OR PATH OF SIGNAL BETWEEN TRANSMITTER AND RECEIVER—IT KNOCKS SIGNAL (REPRESENTED BY FIGURES) OFF CARRIER WAVE AND LOUD CRACKLE IS HEARD THRU SPEAKER INSTEAD OF SPEECH OR MUSIC

FIG. 1



SIMPLIFIED DIAGRAM SHOWING STATIC DISCHARGES IN VICINITY OR PATH OF SIGNALS IN SERVICE AREA OF FREQUENCY MODULATED TRANSMITTER TO RECEIVER HAS NO EFFECT ON SIGNALS

FIG. 2

thru the loud speaker so crystal clear and pure you had to pinch yourself to realize that the piano was not in the room with you. I have heard piano reproduction before that I thought could never be improved upon, but this demonstration simply proved that no matter how perfect we believe anything to be, someone is liable to come along and show that it can be done even better.

Whispered Speech Comes In As Clearly and Naturally As If Speaker Were Seated Across the Table

The Major then asked the operator to talk to him in a whisper instead of his usual speaking voice. Here was a difficult test indeed, but as the whispered words came out of the speaker it seemed as if the operator was seated across the table from us. This test showed in a very remarkable way how much entire absence of background noise due to tube and circuit hiss in the carrier adds to the illusion of a person speaking or of an instrument being played in the room with you, instead of miles away in some studio.

Finally, when it was suggested that the operator might enjoy a cigarette, I heard the sound of the cigarette being drawn out of the pack, then the crackle of the match as it struck against the box, the soft sound of his breath as he quietly blew out the match, and the sigh of satisfaction as he took a deep puff and exhaled.

As a result of this demonstration I came back to Chicago and immediately started to work in our research laboratories to design an FM receiver that would do full justice to this, in my opinion, the most significant development in radio in the last twenty years.

What Kind of Frequency Modulation Programs Can I Pick Up Now?

At present the majority of the FM transmitters on the air are using regular chain programs, the fidelity of which is generally limited to about 5,000 cycles. For this reason, if you make a comparison between FM and AM reception on one of these broadcasts you may notice little difference, but on studio programs *which are sent direct to the FM transmitter by lines good up to 15,000 cycles,* you will be able to notice a tremendous difference in quality between the fidelity of FM and AM reception.

A Semi-Technical Description Of The New Wide Band Armstrong Frequency Modulation System

All regular radio programs up to this time have been transmitted by Amplitude Modulation (which will be referred to hereafter as AM). To make music, speech or other sounds ride on the carrier wave radiated from the broadcasting station to the receiver in your home, something must be varied or modulated, and in the case of AM broadcasting stations the "carrier wave" *is varied or modulated in amplitude or height* (hence the term Amplitude Modulation). The sounds entering the microphone are soft or weak one instant, and loud or strong the next, but the *frequency* of the AM station remains constant.

While the AM carrier wave has lots of power, unfortunately it also picks up interference that is in the air in the form of crashes of static, man-made interference created by diathermy machines, X-ray, and sparking electric motors, electric signs, etc., *because they all transmit waves that have much the same characteristics as the modulated voice or music on the AM carrier wave.*

How Effect of Static Is Reduced On Wide Band Frequency Modulated Broadcasts

In the new wide band Frequency Modulation system (or as it will be referred to hereafter, FM) *the amplitude of the carrier wave remains constant at all times and never varies,* and the sound is impressed on the carrier by rapidly varying or "wobbling" the *frequency* over a wave band as wide as 150 Kc. When a loud tone or sound enters the microphone, the frequency band automatically widens, while with a soft tone it narrows, so that the *width* of the "wobble" represents the *loudness* of sound, while the *rapidity* represents its *pitch.* The FM receiver is so designed that it receives only the *Frequency* Modulation. *The fundamental principle in Armstrong Wide Band Frequency Modulation consists of inducing into the transmitted wave a characteristic which is utterly different from static or man-made electrical interference. The receiving system is not responsive to waves of natural origin, but only to waves having the special characteristics. This makes possible a system which transmits only the speech, music or other sounds sent out from the broadcasting station. The result is that the effects of interference such as static, either natural or man-made, are reduced to such a low point within the service area of the FM station that the signal is received practically free of noise.*

For those who find it difficult to follow the above explanation, perhaps the very simplified graphic charts below will be more understandable. Fig. No. 1 represents an AM transmitter and receiver with the AM carrier wave between them. Each figure at the top of the carrier wave represents a messenger carrying a musical sound or note, and as the path the messengers must follow is very narrow (only 10 Kc. wide) they must travel in single file.

Amplitude Modulated Signals Badly Affected By Static

When a discharge of static or electrical interference occurs, the signal sent out by the AM broadcasting station is knocked off the carrier, *and as static has the same characteristics as music or speech, you hear the crackle or crash of the impact thru the speaker of your radio, instead of the speech or music.* The large figures on the carrier wave represent a messenger carrying a loud tone or passage; the medium size figures a normal tone, and the small figures a soft tone. The figures shown knocked off the carrier wave are the tones affected by the static.

Static Has Virtually No Effect On Frequency Modulated Signals

Fig. No. 2 shows graphically an FM transmitter and an FM receiver with the FM carrier wave between them. As the band width of the FM carrier wave is 150 Kc. wide, (fifteen times that of the AM transmitter) we have up to fifteen messengers to carry the sound, instead of only one as in Amplitude Modulation. If interference strikes the carrier, it affects only one or two figures, the other twelve or fourteen carry on the tone. Hence any interference affects only a small percentage of messengers or tones at any time, and is so slight that the signal is virtually free of noise. This is a very simplified explanation of the basic difference between FM and AM, but I believe it will convey the general idea.

How Wide Band FM At Last Makes Possible Full and Natural 100% Fidelity

To provide a sufficient number of channels, every station on the broadcast and shortwave bands using AM is required to keep its transmitter within a band width of 10 Kc. (10,000 cycles). However, for practical purposes, an AM transmitter on either the regular broadcast or shortwave bands never transmits frequencies over 8,500 cycles, for if the full 10,000 cycles were transmitted by

Booklet Issued by Frequency Modulation Broadcasters

Further evidence of the tremendous interest this new system of broadcasting has aroused throughout the radio industry is the fact that a new association has been formed, the FM Broadcasters, Inc. with headquarters at 20 Brookline Avenue in Boston, Massachusetts. I have just received a copy of an interesting 18-page booklet they have issued which they call "Broadcasting's Better Mousetrap." This makes extremely entertaining reading to those who are interested in this new system of radio transmission and reception.

every AM broadcast station, you would not be able to listen with any degree of pleasure to *any* program, because there would be "monkey chatter" or interference on even local stations caused by a 50% overlap between stations on adjacent channels. To reduce this interference as much as possible, you find your local stations each separated by a wide margin, *but even then you find stations on the same wave length separated several thousand miles apart interfering with each other.* For example reception from WGN Chicago on 720 Kc. is frequently interferred with by CMK, a Cuban station on the same wave length. Another example is WCFL on 970 Kc. whose reception is badly interferred with practically every night by CMCK, another Cuban station which operates on the same wave length. *If these stations were operating on Wide Band Frequency Modulation, there would not be a trace of interference.* A study of the chart showing the frequency range of the principal musical instruments and the human voice will clearly show why any system of transmission that does not send out the complete range of frequencies from 30 to 15,000 cycles will never sound completely natural.

Fidelity Limited in AM Broadcasting to Maximum of 8,500 Cycles

To reproduce perfectly all of the fundamental tones and overtones audible to the human ear, all frequencies between 30 and 15,000 cycles must be reproduced, *but as AM stations with their 10 Kc. channel must keep their transmission within a maximum of 8,500 cycles, it is impossible to transmit any of the frequencies above 8,500 cycles which are required to give the reproduction a quality as full and natural as the original.* As a matter of fact, the regular telephone lines used by the broadcasting chains are only good up to about 5,000 cycles. This means that only on the few programs broadcast direct from the studio of your local stations do you ever hear as high as 8,500 cycles. However, if a system of FM relay stations are adopted for the transmission of chain programs, instead of the telephone lines now used, *then at last a dream will come true, high fidelity reproduction on every program that goes out over the air.* Tests made during the last few weeks have proved that it is quite simple, by means of FM transmitters with beam antennas, to relay chain programs from the studios *hear these programs at points all over the country with practically the same degree of fidelity as the original studio program.*

The fact that the new FM transmitters operate on a channel sufficiently wide to transmit all the frequencies of the audible range simply means we are at last able to enjoy reproduction of every fundamental tone and overtone without the noise that has so often marred programs from AM transmitters. A comparison of the chart showing the fidelity ranges of AM and FM broadcasts, will show at a glance just what the frequency range of the wide band FM system of transmission means in high fidelity reproduction.

Complete Dynamic Volume Range Transmitted With Wide Band Frequency Modulation

Seated at the control board of every AM transmitter is a monitoring engineer whose duty it is to closely watch a set of meters before him. Suppose the music from a fine symphony orchestra is being broadcast. When a crashing crescendo comes thru, the needle on one of these meters flies over to the end of the scale, *and the monitoring engineer immediately turns a control which cuts down the strength of the passage.* If it had been allowed to go thru the transmitter at its original volume, the sudden surge of voltage thru the amplifier might have been sufficient to overload it, and perhaps blow out one or more of the large power tubes, which often cost $1,000 each.

On the other hand, when one of the beautiful soft passages comes thru, he must *raise* the volume to a point where it is louder than the tube hiss, or any

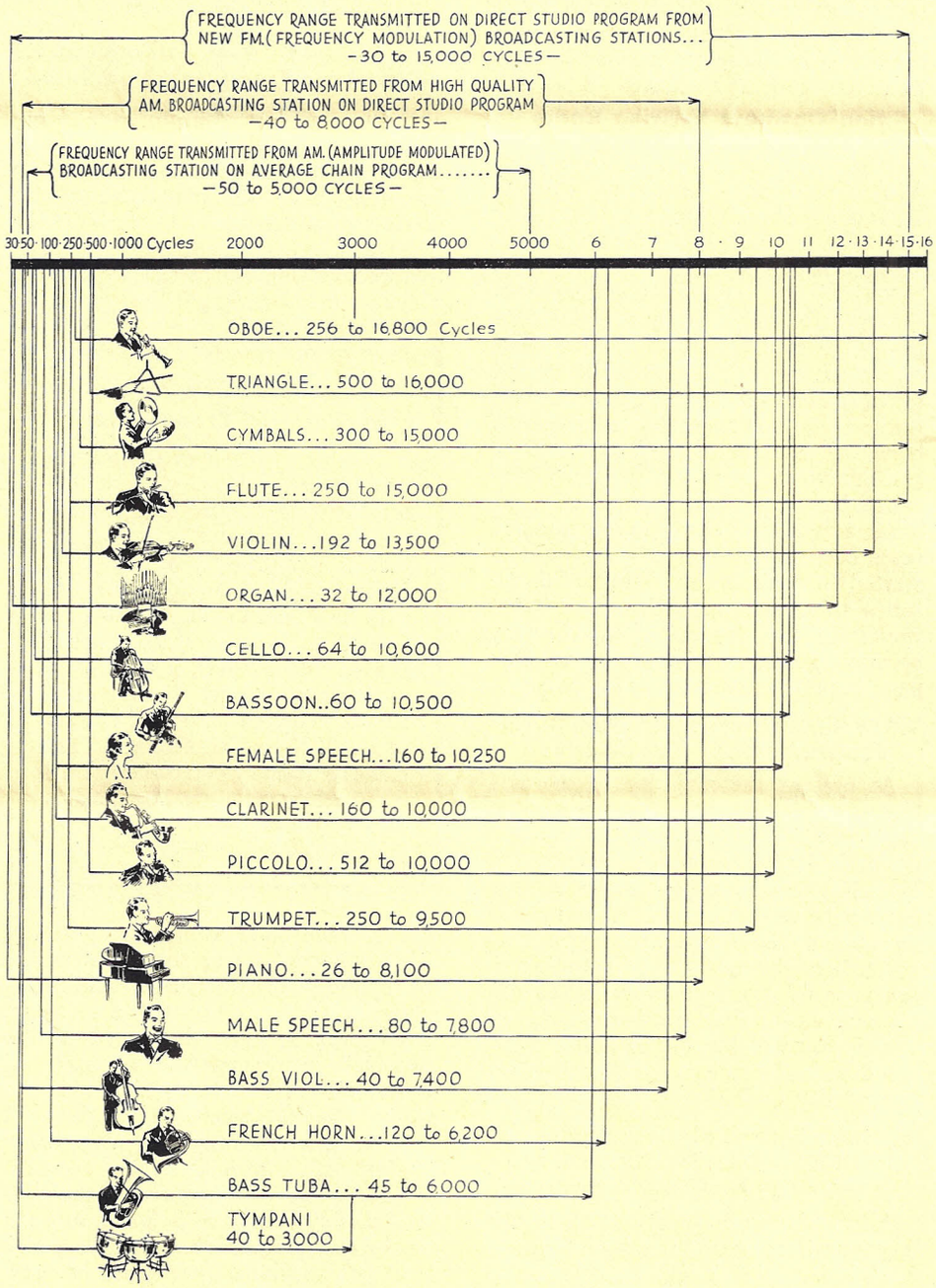


CHART SHOWING THE FREQUENCY RANGE (FUNDAMENTAL AND OVERTONES) OF THE PRINCIPAL MUSICAL INSTRUMENTS AND HUMAN VOICE. THIS COMPLETE RANGE OF TONES MUST BE TRANSMITTED AND RECEIVER MUST BE CAPABLE OF REPRODUCING THEM TO SECURE TRUE NATURAL TONE

noise picked up over the air as the signal travels from the transmitter to your set. In other words, you hear very few programs from an AM station *with the original dynamic volume contrasts* as you would hear them in the studio or concert hall.

In Wide Band FM transmission, the amplitude of the carrier wave is constant at all times, and as the noise level is astonishingly low, practically no monitoring of the program is necessary. This means that the dynamic range from the loudest to the softest tones are transmitted exactly as they enter the microphone. The FM programs come to you exactly as you would have heard them had you been in the studio or concert hall—naturally, and without distortion due to compression of the dynamic range.

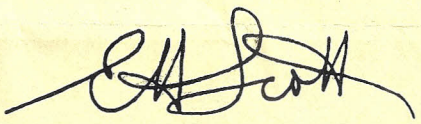
Does Wide Band Frequency Modulation Obsolete Existing Radio Receivers?

Another question that may occur to you is: Does this new system of FM transmission immediately obsolete our existing radio receivers? I do not think so. Up to this time no one has discovered how to secure *consistent* long distance reception on the ultra high frequencies, and for this reason those living any distance outside the metropolitan areas must still depend on AM transmitters for their entertainment. FM transmission is limited to the ultra high frequencies, and while signals from FM transmitters have been received as far as 300 miles away, the service area in which the full benefits of FM reception can be obtained consistently varies between 30 and 100 miles, depending on the power of the FM transmitter and the elevation of its antenna.

It is my opinion that the transition from AM to FM will be gradual, with the larger broadcasting stations probably operating an FM transmitter in conjunction with their present AM transmitter, sending out their programs simultaneously on both AM and FM in order to give the radio listener his choice of listening to the program on either system.

For this reason if you want to receive everything on the air your new receiver should be a *combination instrument*—one that will receive both the AM (our present programs) and the new FM (frequency modulation) programs.

The advantages of FM reception are great, not only from the standpoint of a higher fidelity and the elimination of static, but also for many other reasons. It is inevitable, as more and more FM stations come on the air, that we will tune to their quieter and finer programs in preference to those transmitted by AM stations. More of these advantages will be explained in later issues of the SCOTT NEWS.



WHERE CAN I HEAR FREQUENCY MODULATION STATIONS?

As we go to press there are 21 FM stations on the air on an experimental basis. These stations at present are transmitting either the regular CBS, NBC, or local studio programs.

So many applications for permission to erect Frequency Modulated stations have been filed with the Federal Communications Commission within the past sixty days (85 up to February 28th) that the Commission has decided to defer action on granting such permission to the other 64 until after the hearing on Frequency Modulation which is scheduled in Washington starting March 18th. After this hearing action will be taken on the applications already filed.

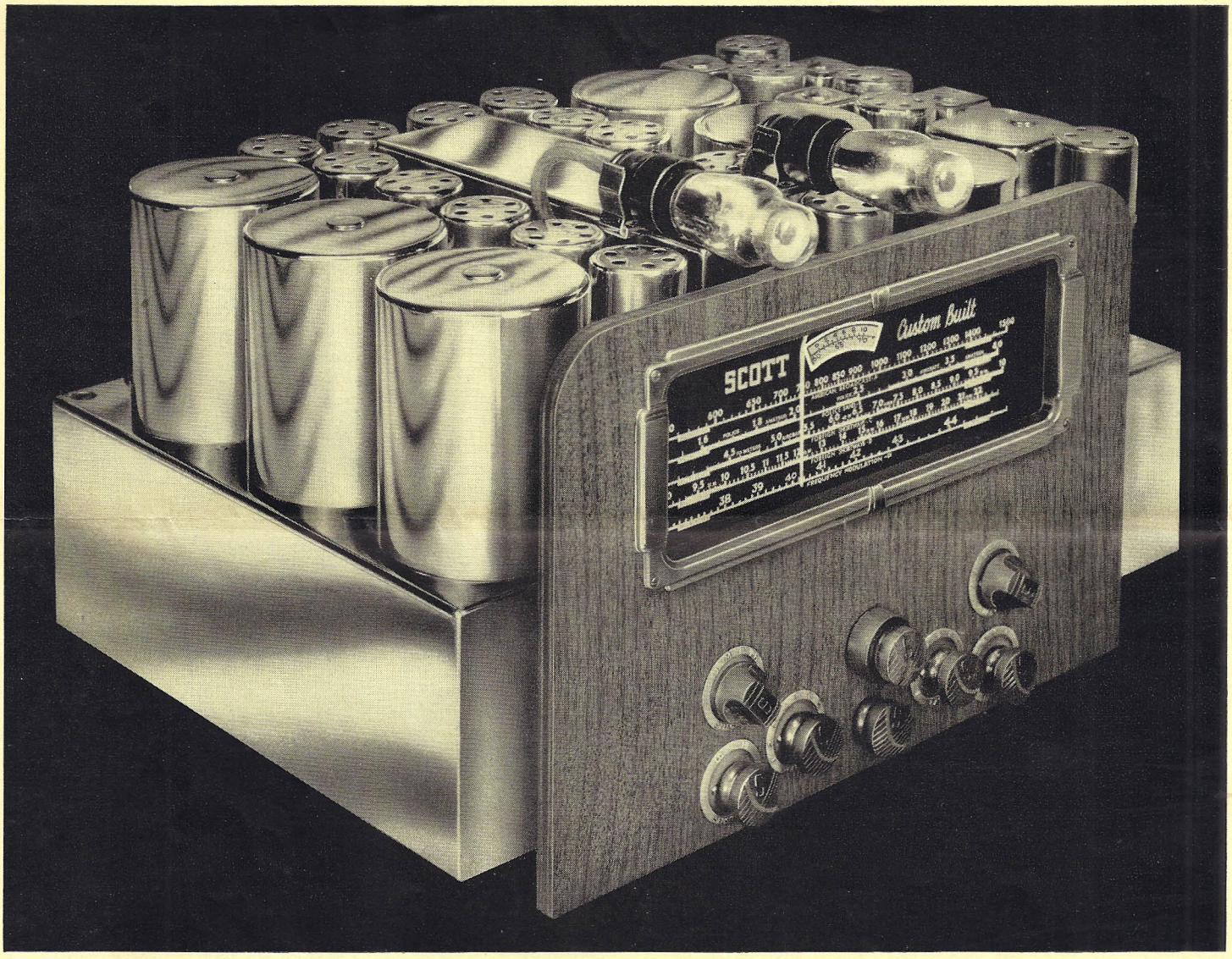
As an indication of the intense interest among the broadcasters in Frequency Modulation 6 applications were filed in October; 11 in November; 8 in December; 10 in January and 24 in February. At this rate it would appear that within a comparatively short time we will be able to enjoy reception from the new FM stations in practically all of the metropolitan centers of the country.

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

LOCATION	CALL LETTERS	POWER	FREQUENCY
Alpine, N. J.	W2XMN	40 kw	42.8 megs.
Albany, N. Y.	W2XOY	150 watts	43.2 megs.
Meridian, Conn.	W1XPW	1 kw	43.4 megs.
Washington, D. C.	W3XO	1 kw	43.2 megs.
Paxton, Mass.	W1XOJ	50 kw	43. megs.
Schenectady, N. Y.	W2XDA	50 kw	43.2 megs.
New York, N. Y.	W2XQR	1 kw	43.2 megs.
Springfield, Mass.	W1XSN	1 kw	42.6 megs.
Rochester, N. Y.	W8XBV	1 kw	43.2 megs.
Avon, Conn.	W1XSO	1 kw	43.2 megs.
Superior, Wisc.	W9XYH	1 kw	43. megs.
Boston, Mass.	W1XK	1 kw	42.6 megs.
Holden, Mass.	W1XTG	1 kw	43.4 megs.
Milwaukee, Wisc.	W9XAO	1 kw	42.6 megs.
New York, N. Y.	W2XWG	1 kw	42.6 megs.
Whippany, N. J.	W3XPY	5 kw	43.2 megs.
Rochester, N. Y.	W8XAD	1 kw	42.6 megs.
New York, N. Y.	W2XOR	1 kw	43.4 megs.
Chicago, Ill.	W9XEN	1 kw	42.8 megs.
Bethesda, Md.	W3XMC	100 watts	42.6 megs.
Columbus, Ohio	W8XVH	250 watts	43. megs.

Frequency Modulation Stations for Which Applications Have Been Filed But Issuance of Construction Permit Pending

LOCATION	COMPANY APPLYING FOR PERMIT	CALL LETTERS	POWER	FREQUENCY
Marshall-Utica, N.Y.	W1BX, Inc.	New	1 kw	43.4 megs.
Portland, Maine	Portland Brdg. System, Inc.	New	1 kw	43.4 megs.
Mt. Washington, N.H.	Yankee Net Work, Inc.	New	5 kw	42.6 megs.
Alpine, N.J.	Yankee Net Work, Inc.	New	50 kw	43. megs.
Syracuse, N.Y.	Onondaga Radio Brdg. Co.	New	1 kw	43. megs.
Philadelphia, Pa.	Pennsylvania Brdg. Corp.	New	1 kw	43.4 megs.
Atlanta, Ga.	W. J. Holley	New	100 watts	42.2 megs.
Los Angeles, Cal.	May Department Store Co.	New	1 kw	43. megs.
Kansas City, Mo.	Midland Broadcasting Co. Inc.	New	1 kw	42.6 megs.
Philadelphia, Pa.	Westinghouse Electric Mfg. Co.	New	1 kw	42.6 megs.
Allison Park, Pa.	Westinghouse Electric Mfg. Co.	New	1 kw	42.6 megs.
New York, N.Y.	Columbia Broadcasting System	W2XDV	50 watts	42.3 megs.
Boston and vicinity	Columbia Broadcasting System	W9XHW	1 kw	42.8 megs.
Dayton, Ohio	Miami Valley Broadcasting Corp.	New	1 kw	42.6 megs.
Boston, Mass.	Boston Edison Company	New	250 watts	43.2 megs.
Binghamton, Mass.	Howitt-Wood Radio Co., Inc.	New	1 kw	42.6 megs.
Syracuse, N.Y.	Central N.Y. Broadcasting Corp.	New	1 kw	43.2 megs.
Greensboro, N.C.	N.C. Broadcasting Co., Inc.	New	250 watts	42.6 megs.
St. Louis, Mo.	Star Times Pub. Co.	New	250 watts	43. megs.
Providence, R.I.	The Outlet Company	New	1 kw	43.4 megs.
Chicago, Ill.	WGN, Inc.	New	1 kw	43.2 megs.
Addison, Ill.	Moody Bible Institute	New	1 kw	43. megs.
Detroit, Mich.	James F. Hopkins, Inc.	New	1 kw	43.4 megs.
Atlanta, Ga.	J. F. Woodruff-Atlanta Brdg. Co.	New	1 kw	42.8 megs.
Columbus, Ga.	Columbus Broadcasting Co., Inc.	New	1 kw	43. megs.
New Scotland, N.Y.	WOKO, Inc.	New	250 watts	43.4 megs.
New York, N.Y.	Muzak Corp.	New	1 kw	43.6 megs.
Cincinnati, Ohio	Crosley Corp.	New	1 kw	43.2 megs.
Peoria, Ill.	Peoria Broadcasting Co.	New	1 kw	43.4 megs.
Detroit, Mich.	WJR-The Goodwill Station	New	1 kw	42.8 megs.
Chattanooga, Tenn.	WDOD Broadcasting Corp.	New	1 kw	42.6 megs.
Toledo, Ohio	The Fort Industry Co.	New	1 kw	43.2 megs.
Canton, Ohio	The Ohio Broadcasting Co.	New	1 kw	43.6 megs.
Los Angeles, Calif.	Don Lee Broadcasting System	New	1 kw	42.6 megs.
New York, N.Y.	Greater N.Y. Broadcasting Corp.	New	1 kw	43.8 megs.
Chicago, Ill	WJJD, Inc	New	250 watts	43.4 megs.
Providence, R.I.	Cherry & Webb. Broadcasting Co.	New	1 kw	42.8 megs.
Cincinnati, Ohio	Cincinnati Times Star Co.	New	1 kw	43.4 megs.
Philadelphia, Pa.	Jerome R. Popkin-Clurman	New	1 kw	43. megs.
Mitchellville, Iowa	Central Brdg. Co. (Davenport)	New	1 kw	43. megs.
Davenport, Iowa	Tri-City Broadcasting Co.	New	1 kw	42.6 megs.
Chicago, Ill.	Agricultural Broadcasting Co.	New	1 kw	43.4 megs.
Detroit, Mich.	Evening News Association	New	1 kw	43. megs.
Lexington, Ky.	American Brdg. Corp. of Ky.	New	1 kw	43.2 megs.
Brooklyn, N.Y.	Frequency Broadcasting Corp.	New	50 kw	42. megs.
Jacksonville, Fla.	The Metropolis Co.	New	1 kw	42.7 megs.
Indianapolis, Ind.	Indianapolis Broadcasting Inc.	New	1 kw	43. megs.
Ashland, Ky.	Ashland Broadcasting Co.	New	1 kw	43.2 megs.
Kalamazoo, Mich.	WXZO, Inc.	New	1 kw	42.6 megs.
Grand Rapids, Mich.	WXZO, Inc.	New	1 kw	43.4 megs.
Philadelphia, Pa.	William Penn Broadcasting Co.	New	1 kw	43.2 megs.
Amarillo, Texas	Amarillo Broadcasting Co.	New	1 kw	43.2 megs.
Fall River, Mass.	Daughty & Welch Elec. Co., Inc.	New	1 kw	43.2 megs.
New York, N.Y.	Marcus Loew Booking Agency	New	1 kw	43.2 megs.
Chattanooga, Tenn.	W. A. Patterson	New	1 kw	43.4 megs.
New York, N.Y.	Jerome R. Popkin-Clurman	New	1 kw	42.4 megs.
Salt Lake City, Utah	Radio Service Corp. of Utah	New	1 kw	42.8 megs.
Youngstown, Ohio	WXBN Broadcasting Corp.	New	1 kw	43.4 megs.
Cory, N.C.	WPTF Radio Co. (Raleigh, N.C.)	New	1 kw	43. megs.
Nashville, Tenn.	National Life & Accident Ins. Co.	New	1 kw	42.8 megs.
Kansas City, Mo.	Commercial Radio Equipment Co.	New	500 watts	43.2 megs.



The New Scott Phantom De Luxe Frequency Modulation Model

The SCOTT PHANTOM DELUXE combination Frequency-Amplitude Modulation receiver uses 28 of the latest type tubes, including the rectifier, voltage regulator, and tuning indicator. It is practically two receivers mounted on one chassis, for it has two RF stages, and two Oscillators. In addition, it incorporates two IF amplifiers, one to receive Frequency Modulated broadcasts, the other to bring in the Amplitude Modulated signals.

Overall Fidelity Automatically Adjusted For Maximum Response

The overall Fidelity on direct studio programs from FM (Frequency Modulation) stations is flat from 30 to 15,000 cycles, which assures natural reproduction of the *full range* of all orchestral instruments and sounds audible to the human ear. When switched over to receive programs from our present AM (Amplitude Modulation) stations, the IF system automatically adjusts the Fidelity range to 8,500 cycles which is the maximum Fidelity transmitted by these stations.

Greater Power Output Reproduces Full Dynamic Range Without Distortion

One of the greatest advantages of Frequency Modulation is the fact that it is possible to transmit the full dynamic range of even the largest symphony orchestra without monitoring or compressing the volume range. Orchestral music does not sound as natural in your home as it does when you hear it in the concert hall because on AM (Amplitude Modulation) programs a monitoring engineer reduces the strength of loud passages to prevent overloading the transmitter amplifier and to avoid the blurring and distortion resulting from the inability of the ordinary speaker to handle these peaks. In FM (Frequency Modulation) transmissions the full dynamic range can be broadcast without compression and the program can be heard exactly as it sounds in the studio or concert hall.

However, in order to reproduce heavy passages on FM programs, the audio amplifier of the receiver must be able to "handle" all ranges of volume easily and without distortion so that the full grandeur and magnificence of the music can be enjoyed. This is obtained by incorporating in the SCOTT PHANTOM DELUXE combination FM-AM model, one of the finest power amplifiers ever developed for a radio receiver. It has an undistorted output of 25 watts pure class A (approximately 8 times the handling capacity of the average radio receiver) and the total harmonic distortion is less less than 3%.

Many people are under the impression that a high power output merely results in more volume. This is decidedly erroneous.

Increased power output is incorporated in the SCOTT PHANTOM DELUXE to prevent fuzziness and distortion on comparatively loud passages when the receiver is played at low or normal volume.

The first time you listen to a fine musical broadcast from the studio of a Frequency Modulation station and reproduced thru the 25 watt audio system of the SCOTT PHANTOM DELUXE, you will be thrilled at the degree of perfection attained. If there be such a thing as third dimension in sound, FM has made it possible.

Dual Tuning Indicator System

Two separate tuning indicators are pro-

vided for accurately tuning both FM and AM programs. For FM programs a special Zero Center tuning indicator system is used to assure perfect tuning of weak as well as strong signals.

Sensitivity Control For All Reception Conditions

A separate Variable Sensitivity control is provided for both FM and AM operation so that the receiver can be adjusted for quietest and clearest possible reception in your particular location.

Temperature Compensation Prevents Signal Drift

One of the most difficult problems in connection with the design of an ultra high frequency receiver is the prevention of signal "drift." In the SCOTT PHANTOM DELUXE special Temperature Compensated Oscillator Circuits are incorporated which automatically compensate for drift as the receiver heats up.

In addition to this refinement in design, a VR-150 voltage regulator tube on both FM and AM Oscillators maintains the plate voltage constant at all times, providing maximum Oscillator stability under conditions of wide line voltage variations.

Separate IF Amplifiers For FM And AM Assure Maximum Efficiency

To secure maximum efficiency and fidelity on both FM and AM signals, separate IF amplifiers are used. As FM signals are received on the ultra high frequencies (approximately 7 meters) a four stage IF amplifier tuned to 2,100 Kc. is used to secure maximum efficiency and adequate image rejection ratio without introducing undesirable feedback. However, as AM signals are received on short-wave, as well as the broadcast band, an advanced design high gain 3-stage iron core IF amplifier peaked at 456 Kc. is used to assure maximum performance on these bands.

On both the AM and FM Intermediate Frequency amplifiers, individual shielding is used between each stage to prevent inter-stage coupling, instability, and undesirable phase distortion.

RF Stage On Both Frequency And Amplitude Modulation

A separate extremely efficient RF stage provides maximum sensitivity and signal-to-noise ratio on weak signals when receiving programs either from FM or AM stations.

Double Limiter Used In Frequency Modulation IF Amplifier

One of the most important features in an FM receiver is the Limiter, a circuit which has an important bearing on the quietness with which FM signals will be received. In the SCOTT PHANTOM DELUXE combination FM-AM receiver, not one but two Limiters are used in order to provide a constant detector output from 50 mv. to 1 v. of signal input. While a single Limiter will provide sufficient noise reduction on strong signals, it will often not prove fully effective in giving sufficient noise reduction on weak signals. The first FM Limiter in the SCOTT PHANTOM DELUXE provides noise reducing action on strong signals, while the second Limiter provides noise reduction on weak signals by taking up the action where the first Limiter leaves off.

A further refinement is (1) the incorporation of audio filters to eliminate any circuit noise which might feed through the power supply system, and (2) a balanced FM antenna transformer system to provide noise-free reception at signal levels below the Limiter threshold.

Double Automatic Volume Control System

In order to keep programs from distant AM stations at an even volume level, a highly developed double Automatic Volume Control System (instead of the usual single system) is incorporated in the SCOTT PHANTOM DELUXE.

Bass and Treble Fidelity Continuously Variable

One tremendous advantage of the new FM transmissions is that it is not necessary to have variable Selectivity, for there is no overlapping or mixing of signals on adjoining wavelengths.

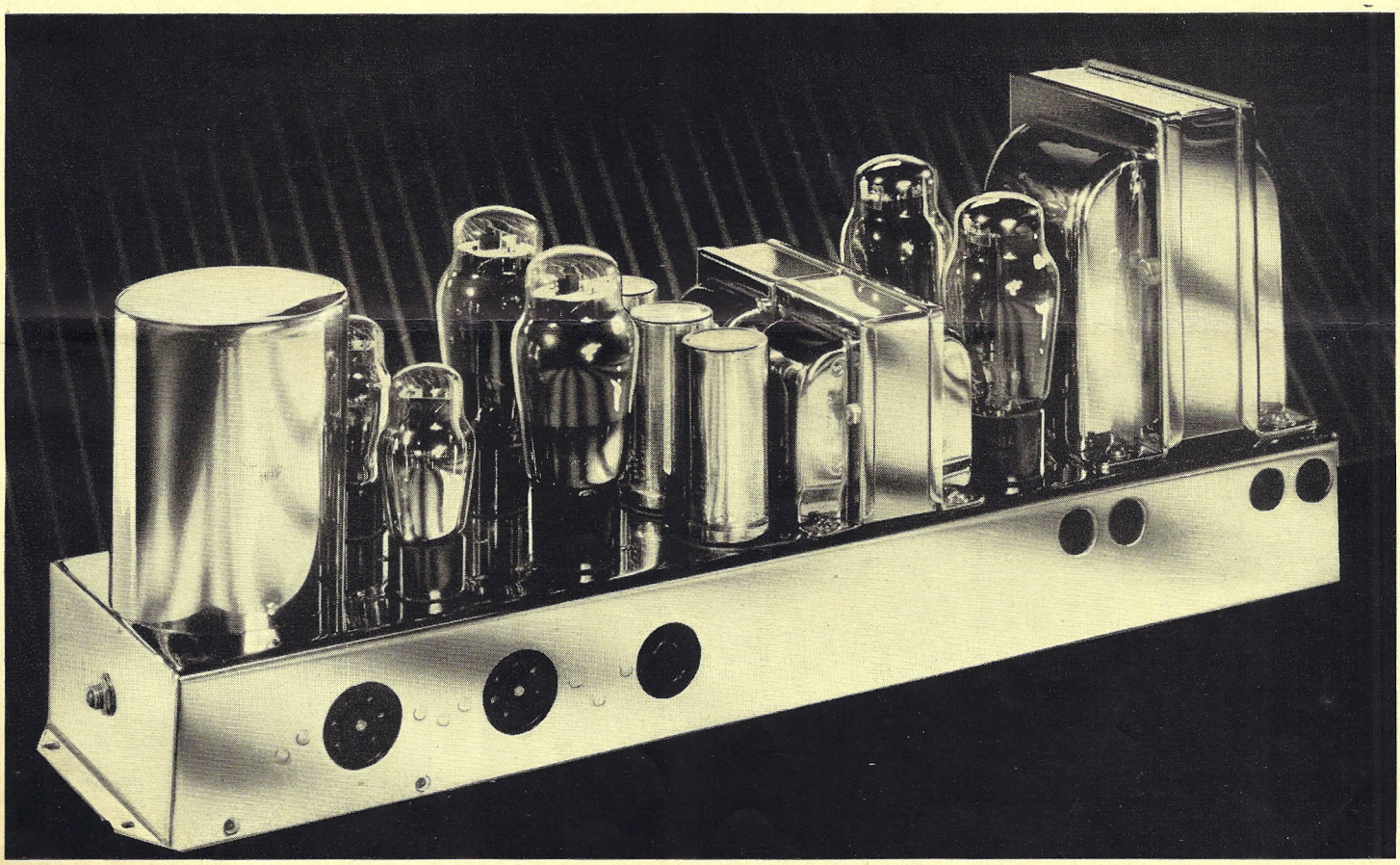
However, in order to provide AM reception that is free of interference from stations on adjacent channels, it is often necessary to increase the Selectivity of the receiver. For this reason a variable control is provided so that the Selectivity can be varied from 3.5 Kc. for DX reception to 12.5 Kc. for high fidelity reception.

When it is necessary to increase the Selectivity in AM reception to eliminate interference, the continuously variable Treble control enables you to secure the finest reproduction possible from the station you wish to hear.

Noise Reduced on Amplitude Modulated Programs By Special Circuits

In order to secure the quietest possible AM reception, the improved Scott Supershield Antenna Coupling System tremendously reduces interference *of a continuous nature* now picked up on the antenna lead-in from vacuum cleaners, oil burners, and other electrical appliances.

The new Dickert Noise Limiter reduces the effects of automobile ignition noise and other



Power Amplifier for Custom Built Scott Phantom Deluxe

intermittent types of electrical interference, making possible the reception of many foreign shortwave programs which are virtually blotted out by such noise on the ordinary radio.

European Type Dial With Micrometer Logging Scale

The etched, indirect lighted dial, accurately and precisely calibrated in Kilocycles and Megacycles with large block-type lettering, makes it easy to locate the various bands and frequencies. The Micrometer logging scale automatically enlarges each reading on the main dial into several divisions. Once a shortwave station has been logged, it is a simple and easy matter to locate it again in a second.

Two tuning speeds are provided, one for tuning from one end of the dial to the other, and the second for precise adjustment when tuning elusive distant shortwave stations.

Separate Antenna Connections Provided For FM and AM Reception

The antenna required for maximum reception on FM programs is quite short, in fact, it usually consists of a few feet of wire run around the wall of the room. However, for reception of programs from AM transmitters on shortwaves and broadcast band, maximum efficiency will be secured with the Scott Super Double-Doublet Antenna. For this reason separate connections are provided for the use of two antennas if desired.

High Fidelity Record Reproduction

One of the outstanding features of the SCOTT PHANTOM DELUXE when used with the SCOTT record player, is its very beautiful reproduction of the new high fidelity records. The full fidelity range of 30 to 16,000 cycles is available for record reproduction. This will be of great interest to music lovers, as I understand that some of the newer records have a top limit of 10,000 cycles. Both Bass and Treble controls can be used to balance record reproduction to its most pleasing blend.

Needle Scratch Suppressed On Records

Needle Scratch or surface noise is particularly noticeable on recordings of piano, violin, and voice. The Scott Automatic Needle Scratch Suppressor enables you to listen to these records without any scratch or surface noise, even at lowest volumes. Reproduction of the higher frequencies or overtones is not affected at normal volumes.

High Fidelity Loud Speaker

A heavy duty specially designed high fidelity loud speaker is provided which incorporates the very latest developments in loud speaker design, including a curvilinear cone, heavy voice coil, and with high frequency diffuser. This speaker covers all frequencies from 30 to 8,500 cycles.

Inverse Feedback System Provides Finer Speaker Response

The acoustical curves of even the best loud speakers show many "peaks" and "dips" in the speaker response at various frequencies. This means that certain notes coming in at the "peak" of the speaker are unduly accentuated or made louder than they should be, while the tones coming in on the "dips" are not heard with sufficient volume.

To overcome this imperfection, the new Inverse Feedback System built into the SCOTT PHANTOM DELUXE audio amplifier flattens out the speaker response by a ratio of 2 to 1, giving pure and more natural reproduction. It also eliminates the annoying "paper rasp" produced by many speakers when certain tones or frequencies are reproduced.

Special Three Speaker System With Dividing Net Work Designed To Reproduce All Frequencies From 30 to 15,000 Cycles

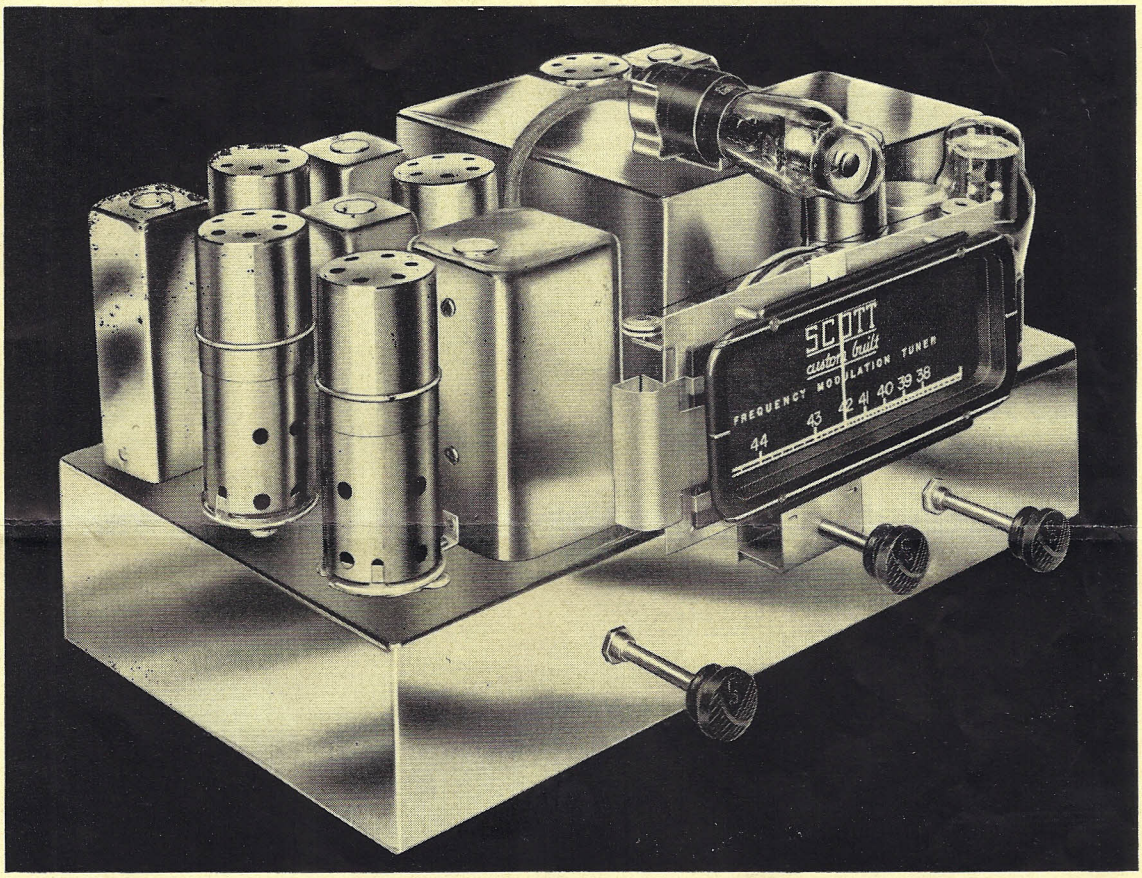
The new FM transmissions covering the complete audible range from 30 to 15,000 cycles cannot be handled by the ordinary single speaker. For those who desire the ultimate in high fidelity reproduction, an entirely new reproducing system has been developed which covers the complete audible range. It consists of a large heavy duty low frequency reproducer which handles all frequencies from 30 to 2,000 cycles, a highly developed dividing Net Work crossing over at 2,000 cycles, and two high frequency reproducers covering the range from 2,000 to 15,000 cycles. This specially designed combination provides one of the most perfect sound systems that has ever been available to anyone outside of our great acoustical laboratories. It can be supplied at a small additional cost.

Guaranteed For Five Years

Every SCOTT PHANTOM DELUXE is custombuilt in limited numbers by skilled technicians here in my modern and completely equipped Laboratories to the highest standards which only specialized hand craftsmanship can attain. Every part is of such high quality, with all vital parts impregnated and hermetically sealed the same as other fine scientific instruments, that each receiver is fully guaranteed (except tubes) for Five Years. Defective parts will be replaced free of charge, when returned to the Laboratories, provided chassis seals are not broken.

Special Reproducing System Available as Optional Equipment

Above is illustrated the new High Fidelity sound reproducing system consisting of a Low Frequency reproducer to handle all frequencies from 30 to 2,000 cycles, two High Frequency reproducers for frequencies from 2,000 to 15,000 cycles, and a special Dividing Net work with cross-over at 2,000 cycles—one of the most perfect sound systems ever developed not only for Frequency Modulation broadcasting but also for record reproduction.



New Scott Frequency Modulation Tuner

CONVERTS YOUR RADIO INTO A FREQUENCY MODULATION COMBINATION

While the new SCOTT Frequency Modulation Tuner has been designed primarily for owners of older model SCOTT receivers, *it can also be used with any radio receiver having a high quality audio and speaker system.*

SCOTT owners who have receivers built in 1935 or later are fortunate in that they have a set equipped with a high fidelity audio amplifier whose response is practically flat from 30 to 16,000 cycles. The new FM tuner can be connected to any SCOTT receiver in approximately two minutes. All that is required to put it in operation is (1) Connect a shielded wire from the FM tuner to the phono post on the SCOTT, (2) plug in the AC cord from the FM tuner, and (3) connect a few feet of wire to the antenna post on the tuner. If you are within the service area of an FM station, you can be listening to FM programs in about ten seconds.

The SCOTT FM tuner is entirely self-contained in a small compact table type cabinet. It can be located either at the receiver or placed on a small table up to 20′ distant.

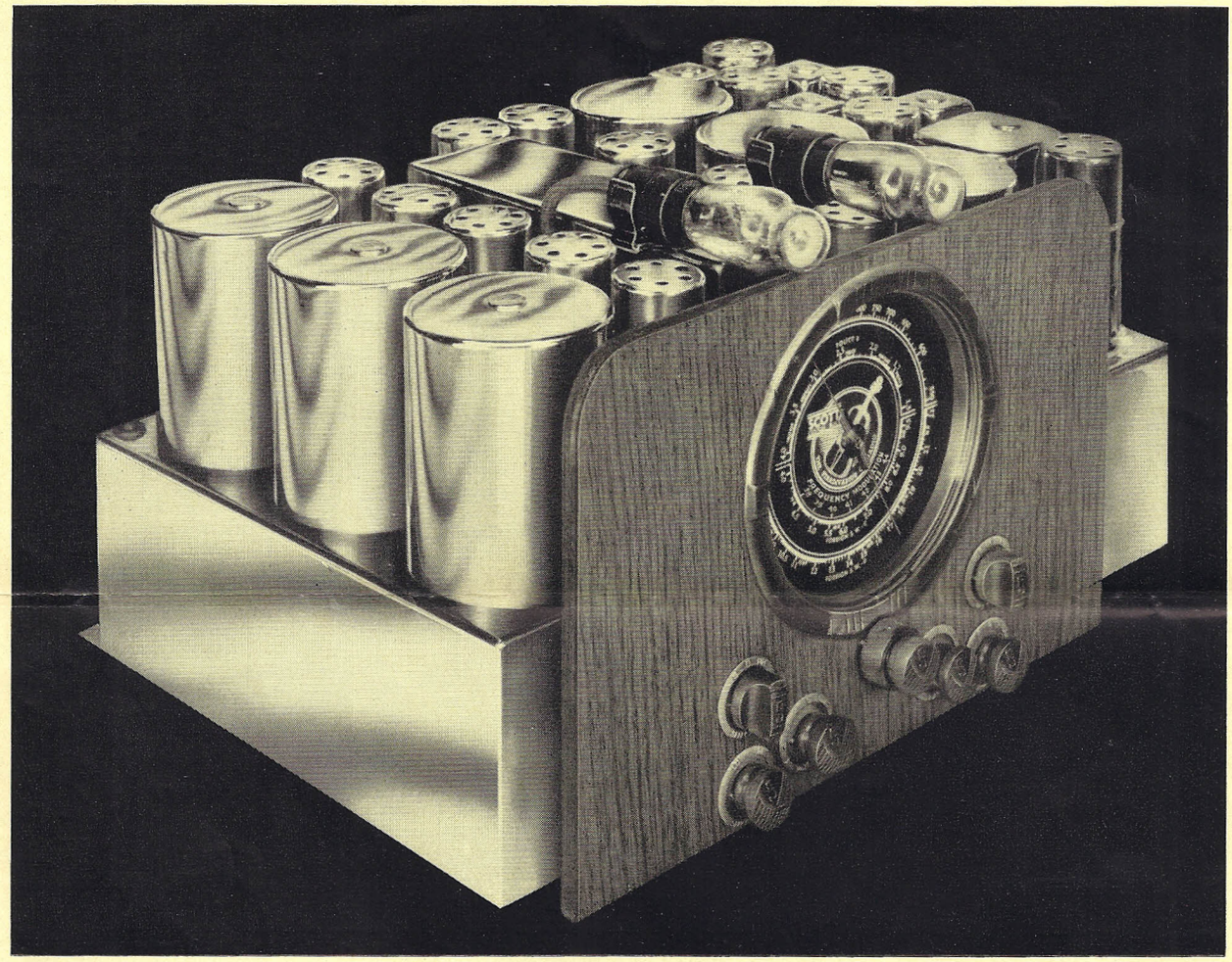
A total of ten tubes are used, including the rectifier, tuning indicator, and voltage regulator tubes. It has exactly the same highly developed circuits as are incorporated in the new SCOTT PHANTOM DELUXE and SCOTT MASTERPIECE for FM reception.

A careful study of the technical details will also show why it should not be confused with simple FM "adapters." Actually, the SCOTT FM tuner is *a complete radio receiver without the audio amplifier and speaker,* except that it has its own tuning condenser, dial, and power supply. It uses the same parts and tubes as are used for FM reception in the combination models.

Briefly, the technical details are as follows: Highly efficient RF stage—Temperature Compensated Oscillator to prevent "drift"—Double Limiters for maximum noise reduction—Four IF stages including Limiter—Symmetrically aligned IF system to secure minimum distortion under all conditions—Individual shielding of each IF stage to eliminate undesirable phase distortion due to feedback—Double spaced full size variable condenser and air trimmers to secure maximum circuit efficiency and stability—Litzendrath air tuned discriminator circuit to provide Linear Audio response plus or minus 100 Kc. deviation range with high degree of Sensitivity and Selectivity —Sensitivity control for obtaining best reception in your locality—Voltage Regulator on oscillator and tuning indicator tubes to provide maximum tuning stability under conditions of varying line voltage—Inductance and resistance filters on the power supply to eliminate audio hum voltage and hum modulation —Telescopic power transformer shielding to eliminate hum pick-up due to stray electrostatic fields—Balanced Antenna transformer system to reduce electrical interference picked up on antenna lead-in, thus permitting noise-free reception at signal levels below Limiter threshold—Special switch to permit selection of either FM programs or record reproduction without changing receiver connections—Tuning range from 38 to 44 megs.

New Scott Frequency Modulation Tuner in Compact Table Cabinet

For those who now own a high quality radio receiver and do not wish to invest in a combination FM-AM instrument, the SCOTT FM Tuner will provide a very worthwhile addition to your present equipment.



The New Scott Masterpiece Frequency Modulation Model

The new SCOTT MASTERPIECE Frequency-Amplitude Modulation receiver uses 22 of the latest type tubes including rectifier, voltage regulator, and tuning indicator tubes. It has a tuning range from 550 Kc. to 23 megs. on the regular AM broadcast and shortwave bands, and from 38 to 44 megs. on the Frequency Modulation band.

Overall Fidelity on Frequency Modulated Programs From 30 to 15,000 Cycles—On Amplitude Modulated Programs from 30 to 7,500 Cycles

The overall Fidelity on direct studio programs received from FM (Frequency Modulation) stations with Treble and Bass Controls at normal position is flat from 30 to 15,000 cycles. When switched over to receive programs from AM (Amplitude Modulation) stations the SCOTT MASTERPIECE reproduces every frequency from 30 to 7,500 cycles (approximately twice the range of the ordinary radio).

Power Output—Fifteen Watts

The SCOTT MASTERPIECE has a total power handling capacity of 15 watts, about three times that of the average receiver. At 9 watts (approximately twice the total output of the ordinary radio) the harmonic distortion is only 3%, a degree so low that it is not detectable by the human ear.

Dual Tuning Indicator Systems

Two separate tuning indicators are provided for accurately tuning FM and AM programs. On FM programs a special Zero Center Tuning Indicator system is used which assures perfect tuning of weak as well as strong signals.

Variable Sensitivity Control

A variable Sensitivity control is provided for both FM and AM operation so that the receiver may be adjusted for quietest and clearest reception in your particular location.

Temperature Compensated Oscillator Circuit

A special Temperature Compensated oscillator circuit is incorporated in the SCOTT MASTERPIECE which automatically compensates for drift in reception from both AM and FM stations. A VR-150 voltage regulator tube is also used on both FM and AM oscillators to maintain plate voltage constant at all times, and to provide maximum oscillator stability even under widely varying line voltage variations.

Separate IF Amplifiers for FM and AM

Separate IF amplifiers are used for FM and AM signals. In the FM amplifier a total of four IF stages are incorporated (including the two Limiters) and are tuned to 2,100 Kc. In the AM IF amplifier a high gain three stage IF amplifier peaked at 456 Kc. is used to secure maximum performance on both shortwave and broadcast bands. Individual shielding is used between each IF stage in both the AM and FM Intermediate Frequency amplifiers to prevent interstage coupling, instability, and phase distortion.

RF Stage Used On Both FM and AM

To secure maximum efficiency and provide best possible signal-to-noise ratio when receiving weak signals, a separate extremely efficient RF stage is used in both the FM and AM sections of the receiver.

Double Limiters Used Provide Quietest Possible Reception

Two Limiters are used to assure maximum noise limiting action on all Frequency Modulated signals. One provides noise reduction action on strong signals, while the second Limiter provides noise reduction on weak signals by taking up the limiting action where the first Limiter leaves off. In addition to the double Limiter, audio filters are incorporated to eliminate any circuit noise which might feed through the power amplifier system. A balanced FM antenna transformer system is used to provide noise free reception at signal levels below the Limiter threshold.

Selectivity Variable—Sharp for DX, Broad for High Fidelity Reproduction

To bring in distant stations it is necessary that a receiver be highly selective so that interference between stations on adjacent channels may be eliminated. In the SCOTT MASTERPIECE two degrees of Selectivity are available, one extremely sharp (5 Kc.) for tuning weak distant stations on channels adjacent to powerful locals, the other one broad (12 Kc.) for high fidelity reception of local or nearby stations.

Bass and Treble Fidelity Continuously Variable

In the reception of FM programs the Bass and Treble controls may be left in their normal positions.

However, on AM reception as it is often necessary to increase Selectivity in order to eliminate interference from stations on adjacent channels, the Fidelity is naturally reduced. Therefore the continously variable Treble and Bass controls enable you to balance reproduction when the receiver is used in selective position. When the Selectivity Control is in the broad position both the Treble and Bass controls are set to give normal reproduction on all frequencies.

On certain types of programs, owing to studio acoustics or the Fidelity of the AM transmitter, higher overtones are sometimes considerably reduced. When this happens, simply advance the Treble control in order to strengthen the higher overtones actually being received. This simple adjustment makes possible the most pleasing and natural reproduction of either voice or music.

Scott Supershield Antenna Coupling System Reduces Noise on AM Programs

Built into the SCOTT MASTERPIECE is the Scott Supershield Antenna Coupling System, and when used with the new Scott Super Double-Doublet Antenna quiet AM reception may be obtained in many locations where electrical interference is so high that reception is ordinarily very unsatisfactory.

Separate Antenna Connections Provided For FM and AM Reception

The antenna required for maximum reception on FM programs is quite short, in fact, it usually consists of a few feet of wire run around the wall of the room. However, for reception of programs from AM transmitters on shortwaves and broadcast band, maximum efficiency will be secured with the Scott Super Double-Doublet Antenna. For this reason separate connections are provided for the use of two antennas if desired.

High Fidelity Record Reproduction

The great majority of Scott receivers sold today are for use with either a single or automatic record changer. Connections are provided on the SCOTT MASTERPIECE for a pick-up with a control on the front panel which allows the receiver to be instantly adjusted either for reproduction of programs off the air or from records.

Both the Treble and Bass controls are available on records as well as on programs received off the air. This means that if a record is lacking, to your ear, in either bass tones or higher frequencies, the reproduction can instantly be adjusted until it is exactly as you desire it. It is an open secret that one of the many reasons why a SCOTT enjoys such remarkable popularity, and has so many enthusiasts among the really great figures in the musical world today, is its truly remarkable record reproduction.

High Fidelity Loud Speaker

A heavy duty specially designed 12" loud speaker is used with the SCOTT MASTERPIECE, and efficiently covers all frequencies from 30 to 7,500 cycles.

Inverse Feedback System Improves Acoustical Response of Speaker

Even the very finest loud speakers have a greater response to some frequencies than they have to others. This means that certain tones are accentuated or made louder, while other tones are not heard with enough volume. The Inverse Feedback system used with the SCOTT MASTERPIECE flattens out the acoustical response of the loud speaker by automatically cutting down "peaks" and bringing up the "dips," thereby giving finer and more natural reproduction.

Special Three Speaker System With Dividing Net Work Designed To Reproduce All Frequencies From 30 to 15,000 Cycles

The new FM transmissions covering the complete audible range from 30 to 15,000 cycles cannot be handled by the ordinary single speaker. For those who desire the ultimate in high fidelity reproduction, an entirely new reproducing system has been developed which covers the complete audible range. It consists of a large heavy duty low frequency reproducer which handles all frequencies from 30 to 2,000 cycles, a highly developed dividing Net Work crossing over at 2,000 cycles, and two high frequency reproducers covering the range from 2,000 to 15,000 cycles. This specially designed combination provides one of the most perfect sound systems that has ever been available to anyone outside of our great acoustical laboratories. It can be supplied at a small additional cost.

Every Scott Masterpiece Guaranteed Against Defects for Five Years

The tuning condenser is a special low-loss wide-spaced unit with Steatite insulation between the rotor and stator plates. All coils, chokes, and transformers are thoroughly impregnated, and metal parts of the chassis and amplifier are chromium plated to prevent breakdown in humid climates, or in locations near the sea coast where the salt air causes the metal parts on the usual type of receiver to rust and corrode.

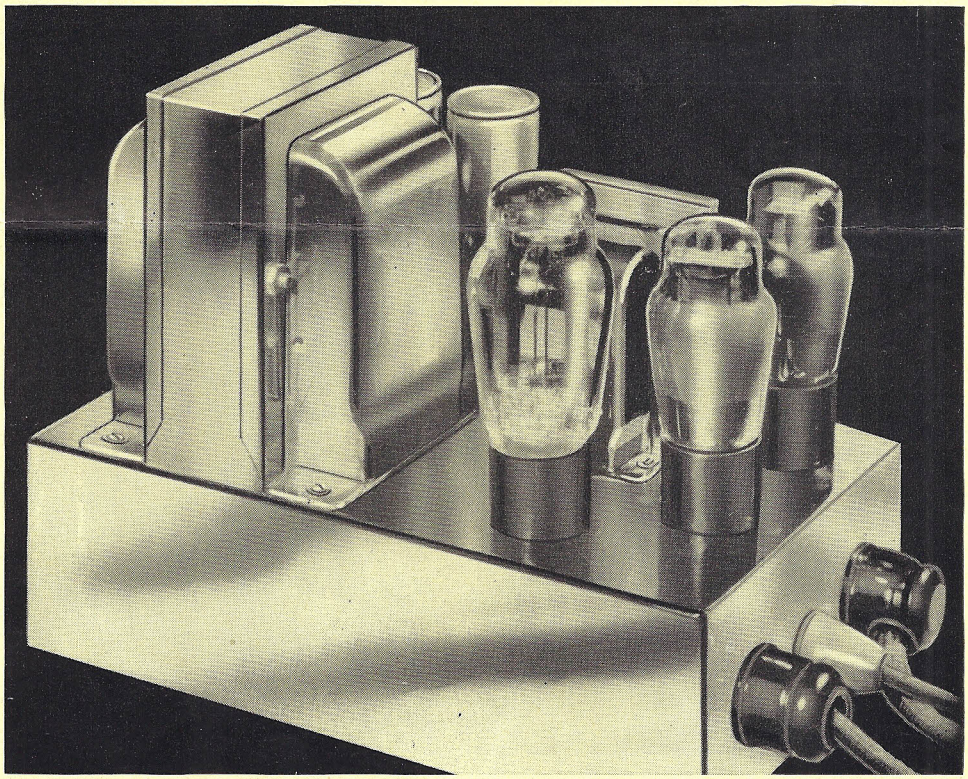
Every part of the new SCOTT MASTERPIECE is fully guaranteed against defects for FIVE YEARS, and will be replaced free of charge when returned to the Laboratories. provided chassis seals are not broken.

Custombuilt by Skilled Technicians

Every SCOTT MASTERPIECE is custombuilt in limited numbers under my personal supervision, in modern and completely equipped Laboratories by skilled technicians who have been trained for many years in precision work. It is only when you actually see the high quality parts, the precision workmanship, the careful testing and checking of every receiver that you can realize the tremendous difference in quality and workmanship between the production type receiver and the custombuilt SCOTT MASTERPIECE. For this reason I am always glad to welcome visitors to the Laboratories and show them exactly how SCOTT receivers are built and tested.

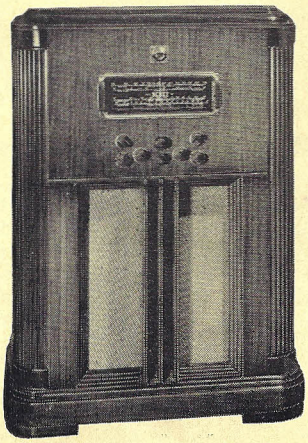
30 Day Trial To Prove Superiority

Remember, there are no "if's" or "and's" about the 30 day trial. Your order is taken with the distinct understanding that you are to have 30 days after the new SCOTT MASTERPIECE is installed in your home to make any kind of comparative test against any other make of radio. If the SCOTT does not have finer tone—purer undistorted reproduction—greater selectivity—if it does not bring in weak distant foreign stations with more volume and greater clarity—AND YOU ARE TO BE THE SOLE JUDGE OF THAT SUPERIORITY—you can return it any time within 30 days (you to pay only the transportation charges) and every dollar you paid will be promptly refunded.

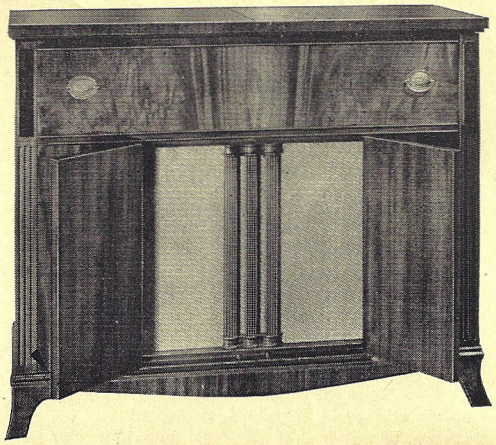


The New Scott Masterpiece Power Amplifier

Scott Custom Built Consoles



The Braemar



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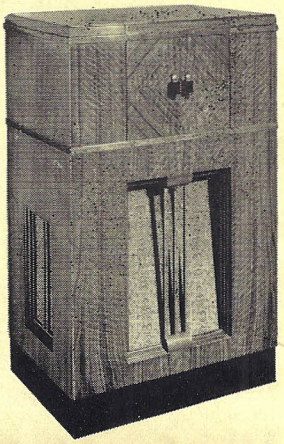
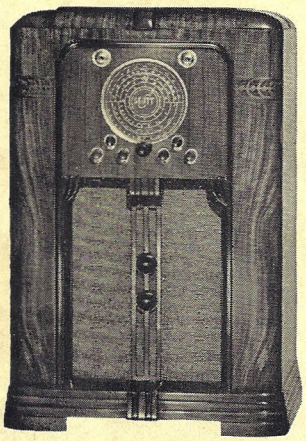


The Acousticraft



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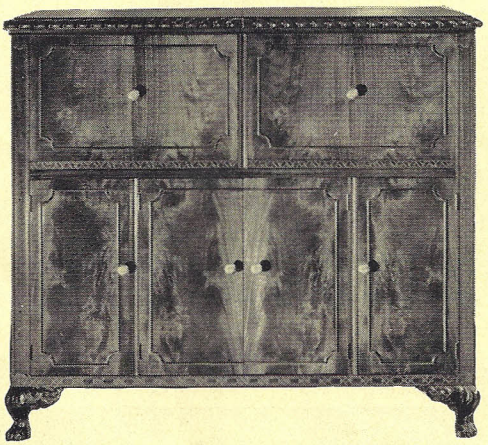
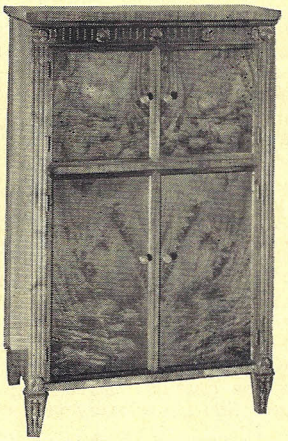
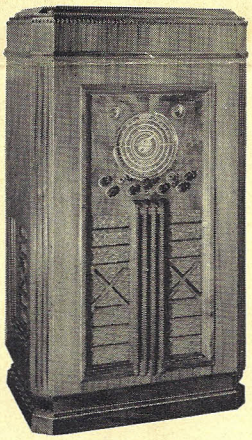


The Chippendale Grande

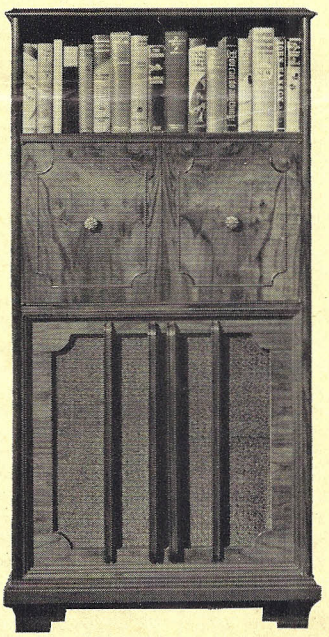


The Buckingham



The Waverly Grande

The Georgian



The Stratford

THE E. H. SCOTT RADIO LABORATORIES, INC.

4450 RAVENSWOOD AVENUE, CHICAGO, ILLINOIS

NEW YORK DETROIT BUFFALO LOS ANGELES

Scott Leadership is Easily Proved

The reputation of a Custom Built Scott as the World's Finest Radio is largely due to the fact that it is a precision instrument of advanced design, built to high laboratory standards, and incorporating features not found in any other radio receiver. The Scott Laboratories are the *only* radio manufacturers who have designed and constructed nothing but superheterodyne receivers for the past 17 years, and some of the most important advances in receiver design were developed and pioneered by our own Research Laboratories. Below are a few reasons why a Scott has always been from one to four years ahead:

(1) A Scott was the FIRST radio to successfully incorporate more than one tuned stage in the IF amplifier, a development which pointed the way to the powerful super-selective superheterodyne as we know it today.

(2) A Scott was the FIRST radio to incorporate the 210 power tube as an integral part of the chassis design. The use of this tube gave the musical world a new idea of what fine undistorted reproduction could be secured from a radio receiver.

(3) A Scott was the FIRST radio to successfully incorporate the screen grid tube. The Scott in which it was first used tuned in stations from Australia, Japan, England, Germany, and South America. At that time, *nearly two decades ago,* the reception of stations more than 1,000 miles away was considered an event.

(4) A Scott was the FIRST "all wave" radio offered to the general public. It was developed in 1928, four years before this type of receiver was introduced by production radio manufacturers.

(5) A Scott was the FIRST superheterodyne tuning from 15 to 550 meters that was entirely AC operated.

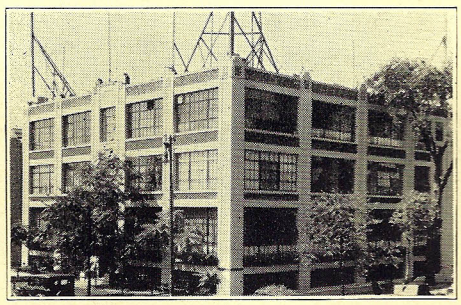
(6) A Scott was the FIRST superheterodyne which efficiently tuned from 15 to 500 meters *without plug-in coils.* This development was instrumental in taking short wave tuning out of the laboratory and making it practical for the home.

(7) A Scott was the FIRST "all wave" superheterodyne which perfectly tracked more than one tuned circuit on short waves as well as the broadcast band *by means of a single dial.*

(8) A Scott was the FIRST radio to incorporate triple grid super control type 57 and 58 tubes in its design.

(9) A Scott was the FIRST radio to employ a perfected system of visual tuning, that is, an indicator projected in the same aperture as the tuning dial scale.

(10) A Scott was the FIRST radio having a Useable *minimum* sensitivity of .025 microvolts per meter at 600 KC, and



a *maximum* sensitivity of .006 microvolts per meter at 1400 KC. Many receivers have what may be called, "fractional microvolt sensitivity," but the noise level is usually in the order of 80% noise and 20% signal, making it impossible to use the full sensitivity of the receiver.

(11) A Scott was the FIRST radio to provide 10 KC selectivity at a field strength of 600 to 1.

(12) A Scott was the FIRST commercial receiver to be equipped with a transmission type Noise Reducing short wave antenna.

(13) A Scott was the FIRST true high-fidelity radio capable of reproducing the entire audible range of the human ear from 30 to 1600 cycles, and to the best of our knowledge, it is still the only instrument capable of this high degree of overall fidelity.

(14) A Scott was the FIRST radio to incorporate a circuit for needle scratch suppression which effectively reduced surface noise on records at low volume, but did not affect fidelity at normal volumes.

(15) A Scott was the FIRST receiver to incorporate Variable Selectivity whereby both RF and IF circuits are controlled.

(16) A Scott was the FIRST radio to have all parts chromium plated and all coil windings hermetically sealed or otherwise treated to protect them against extreme climatic conditions.

(17) A Scott was the FIRST, and we believe it is still the only radio to be accurately calibrated with 1% of the broadcast band and 3% on all short wave bands.

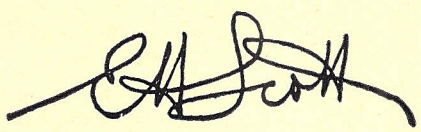
(18) A Scott was the FIRST radio which was priced without the cabinet so that the purchaser could have a choice of several exclusive and distinctive console designs.

(19) A Scott was the FIRST, and we believe it is still the ONLY radio which is designed on the basic principle of "immediate adoption of all worthwhile improvements." That is, new developments are, whenever possible, built into receivers on order instead of being witheld for a "new" model.

(20) A Scott was the FIRST, and we believe is still the ONLY radio sold with the distinct understanding that the purchaser can return it 30 days after delivery if it does not outperform any other make of radio.

(21) A Scott was the FIRST radio that could be equipped for tuning as high as 2,000 meters without the use of plug-in coils.

Lack of space makes it impossible to list more than a very few of the advances in receiver design which were pioneered by the Scott Laboratories. The brief listings above, however, will, I believe, conclusively prove that when you buy a Scott, you are investing in an instrument which should be modern and up-to-date many years to come.



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