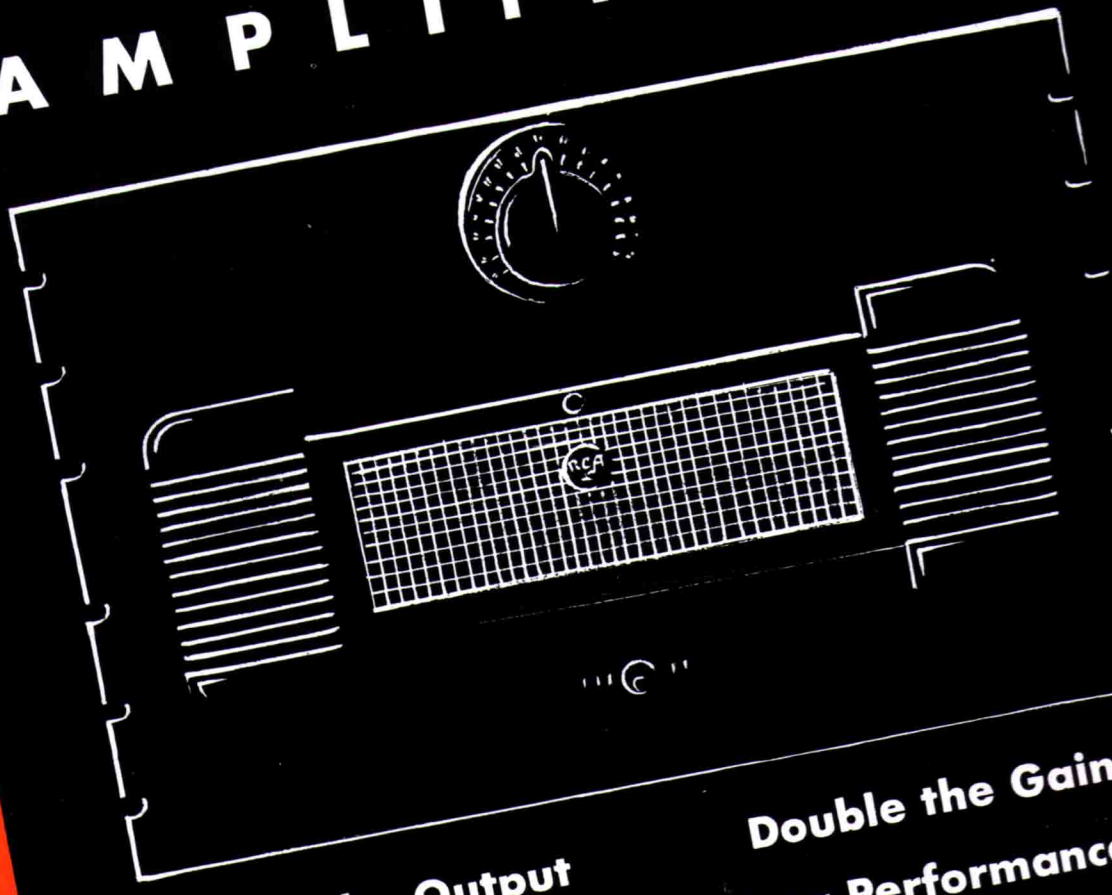
RCA TYPE 94-C

MONITORING AMPLIFIER



Double the Output **Double the Gain**

Greater Flexibility **Finer Performance**

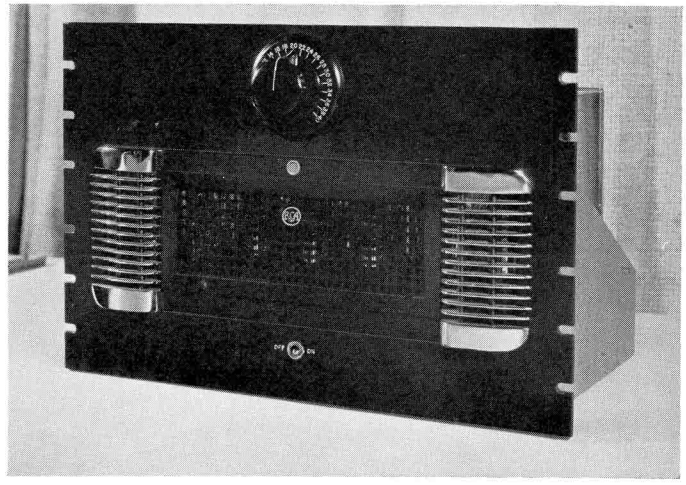
New-type Constructional Assembly in the Finest of all Monitoring Equipment.

RCA

A True High-Fidelity Equipment Specifically Designed to Meet the Most Exacting Broadcast Standards

The Finest in Monitoring Equipment

The RCA Type 94-C Monitoring Amplifier is the newest of the well-known 94 series amplifiers—recognized throughout the radio industry as the ultimate in high-quality monitoring equipment. It is not an equipment built-to-a-price in order to meet competition, but rather the finest equipment which can be built regardless of price — an equipment which is unprecedented and unchallenged in its field. The Type 94-C Amplifier, offering, as it does, still better characteristics and flexibility than the 94-B (which is presently being used by NBC, CBS, Texas Quality Network, and outstanding independent stations such as WGN and KNX), is by a large margin the finest monitoring amplifier yet produced, and should be the unquestioned choice for new high-fidelity studio installations.



High Gain, High Undistorted Output

The Type 94-C Amplifier has several distinct advantages over previous designs—one of the most important of which is nearly double gain and output. This has been accomplished by using four stages instead of three, and by employing RCA-2A3's, instead of RCA-45's, in the output stage. Where the Type 94-B Amplifier had an undistorted output of 10 watts, the new Type 94-C Amplifier has an undistorted output of 20 watts. This complies with the increasing trend toward higher audio output capability. Moreover, it makes it possible, if desired, to drive several monitoring speakers from one amplifier. The Type 94-C Amplifier provides a total gain of 80 db., as compared to the 40 db. gain which the Type 94-B Amplifier provided. This greatly increases flexibility, and makes the amplifier particularly adaptable to simplified auditioning and transcription-reproducing arrangements — thus providing desirable standardization by allowing use of one type of amplifier for a wide variety of applications. Taps are provided so that the overall gain of the amplifier may be reduced from 80 db. to 70 db., to 60 or 50 db., as desired.

Adaptable to a Wide Variety of Applications The high gain and wide operating range of the Type 94-C Amplifier make it well-adapted to all monitoring and similar applications. Several of these applications are illustrated below. Figure 1 illustrates the most common, that is, as the monitoring amplifier of a standard speech channel. The amplifier is bridged across the outgoing line, thus furnishing an aural check on overall operation. In addition to the monitoring amplifiers so used, it is usual, in large studio installations, to provide an amplifier for each office and audition room. This allows each of these monitoring points to be bridged on any studio or program circuit as desired. The several amplifiers may be either grouped on racks in the control room or mounted separately in the loudspeaker consoles. Figure 2 shows an arrangement suitable for use in booking offices, agencies and the like, where it is desirable to have a transcription-reproducing equipment complete in itself. The gain, output and operating level of the Type 94-C Amplifier are ideal for this use. Figure 3 shows an arrangement which provides a particularly convenient auditioning system that is complete in itself and may be used independently of the regular speech input system. This combination of the Type 58-A Tri-amplifier and the Type 94-C Monitoring Amplifier provides a three-position high-fidelity channel which is surprisingly economical. If only one microphone input is needed, a single Type 41-B Pre-amplifier may be used instead of the Type 58-A Tri-amplifier.

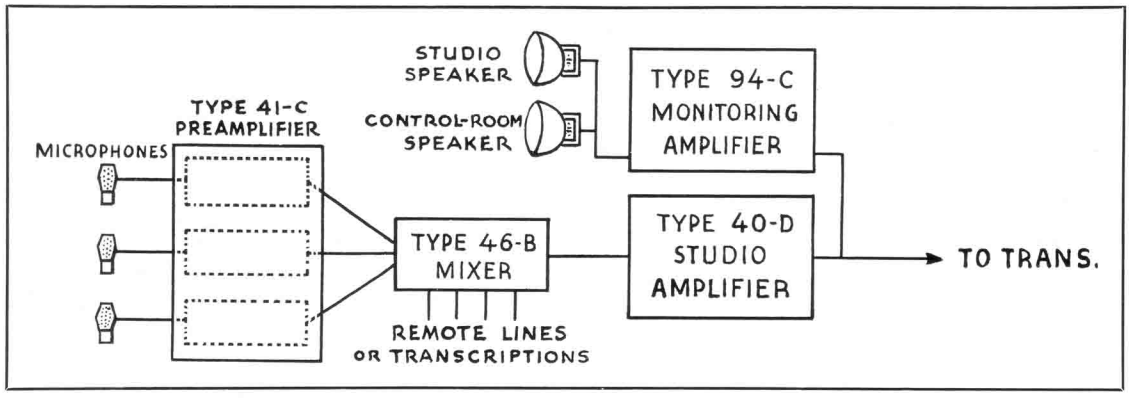
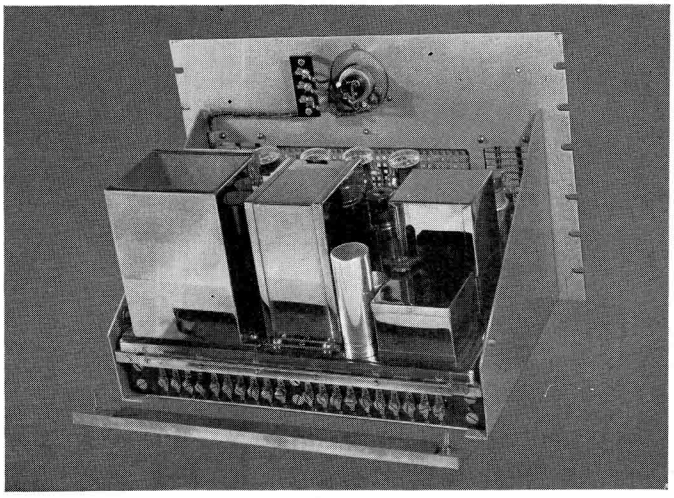


Figure 1. Outline of a typical high-fidelity speech input channel. In smaller stations and in control booths of larger stations, the Type 58-A Tri-amplifier can be used in place of the separate pre-amplifiers and mixer.



Remember RCA Speech Input Equipment Is Used In An Overwhelming Majority Of The Finest Broadcast Studio Installations . . . Ample Proof of RCA Superiority

Electrical Design Featuring Four Push-Pull Stages

The high gain and high output with low distortion of the Type 94-C Amplifier are due to the "oversize" design of the electrical circuits. Four push-pull stages, using ten tubes, are employed. The input transformer has primary taps providing impedances of 500 ohms and 20,000 ohms. The RCA-1603's in the first stage are resistance and capacity coupled to a second stage employing a pair of RCA-1603's, which are in turn resistance-capacity coupled to a third stage employing a pair of RCA-89's. These are transformer coupled to the final stage which comprises four RCA-2A3's in push-pull parallel. The output transformer has secondary taps to match 7½, 15 or 500 ohms—that is, connections for one or two 15-ohm speakers or a 500-ohm line. A bridging type volume control is provided which has an input impedance of 20,000 ohms and an output impedance of 500 ohms and a variation in control of 46 db. This volume control may, if desired, be mounted externally at a distance from the amplifier. Each of the first two stages has an alternative grid connection allowing the fixed gain of the amplifier to be reduced in three steps, as previously noted. Plate voltages for all stages are furnished by a built-in rectifier which utilizes an RCA-5Z3 in a full-wave circuit. The circuits are arranged so that the field coils of the two speakers act as filter chokes. Where this arrangement is inconvenient, Type XT-1304 reactors may be used instead.

Provisions are included in the amplifier to equalize gain of both sides of the push-pull circuit, thereby reducing even order harmonics to an absolute minimum. For special cases, the frequency response of the Amplifiers can be made flat by simple alterations.

Unchallenged Superiority of Performance

In general, the various units which make up a speech input channel are designed so that each has a flat frequency characteristic in itself. However, since loudspeakers do not provide a flat response, it is desirable to consider the characteristics of the monitoring amplifier and the monitoring loudspeaker together, rather than separately. The Type 94-C Amplifier is designed to be used with the Type 64-A Monitoring Loudspeaker or with Type UZ-4209 double voice-coil speaker units mounted in a large flat baffle. These speakers are by far the finest units yet developed. They have a very uniform response over the range of 90 to 8,000 cycles and a useful response of 30 to 14,000 cycles. To further improve the overall response, the characteristic of the Type 94-C Amplifier has been made to compensate for the falling off of the speaker characteristic at the high and low frequencies, so that the combination provides an overall response which is practically flat over the range of 50 to 12,000 cycles. It is hardly necessary to point out that such a response is superior by a large margin to anything else available. And this exceptional frequency characteristic is accompanied by distortion and noise characteristics which are equally good. At maximum output the overall distortion is approximately 5½% R. M. S.—and, of course, is much less at lower outputs. Background noise and hum are also unusually low. At a gain of 60 db.—which is normal for complete high-fidelity channels such as that shown in Fig. 1—the unweighted noise level is —40 db., or more than 70 db. below maximum output. When the full gain of the amplifier is used—as in Fig. 2 or Fig. 3—the noise level is —20 db., thus insuring adequate margin even in arrangements which use the amplifier up to full capacity.

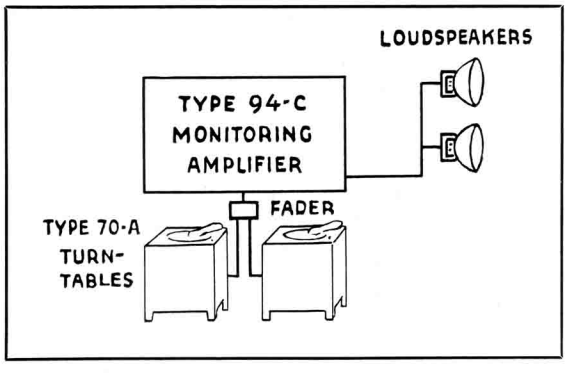


Figure 2. A high-fidelity transcription-reproducing system particularly suitable for agencies, booking offices and the like.

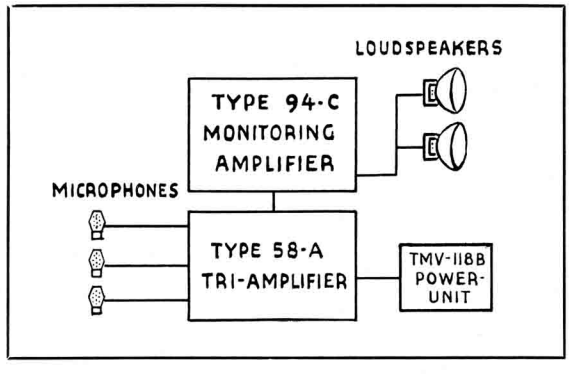
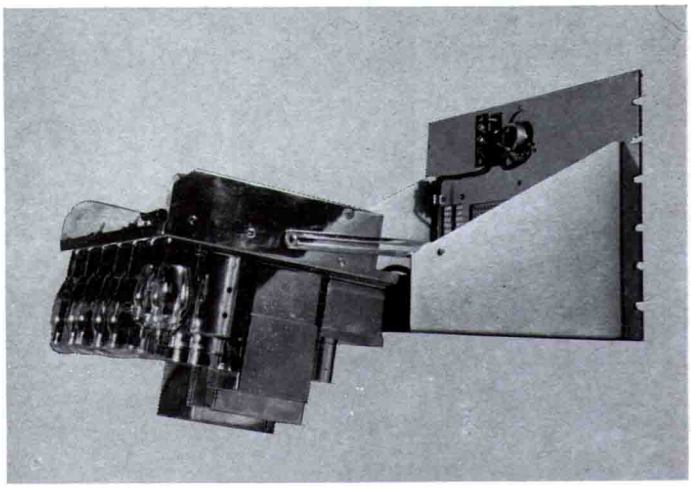
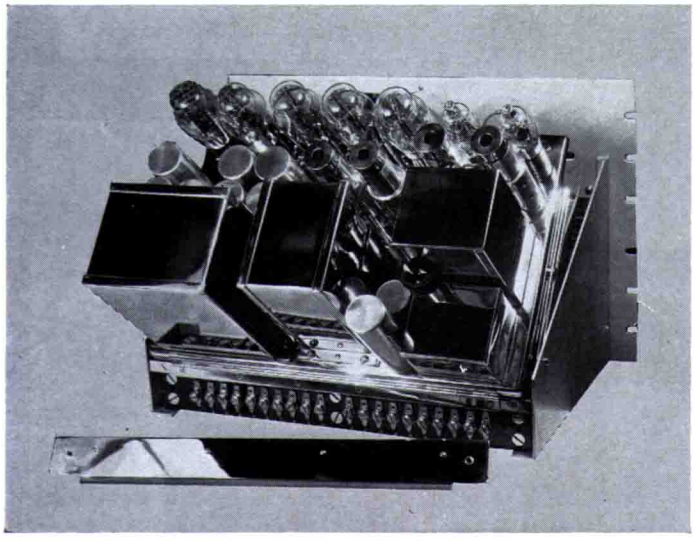


Figure 3. A simplified high-fidelity auditioning system. Where only one microphone is required a 41-B Pre-amplifier may replace the 58-A Tri-amplifier.

Improved-Type Constructional Assembly

The Type 94-C Monitoring Amplifier embodies a new type of mechanical construction developed exclusively for RCA speech input units. The unique features of this new type of construction will be obvious from the several views of the unit which are shown. The advantages of a horizontal sub-panel—on which are located all of the components except the volume control and power switch—are obtained, while the disadvantages ordinarily attending such an arrangement (in particular the inaccessibility of wiring) are overcome by hinging this sub-panel. Not only is the wiring placed beneath the sub-panel out of sight but, due to the U-construction of the supporting bracket, it is protected from the bottom as well as the top. The sub-panel and all of the components are finished in polished nickel—an unusual touch which emphasizes the outstanding superiority of this unit and makes it suitable for any mounting. The front panel is finished in standard soft black and the ventilating louvers in polished chromium, thus providing a very modernistic and attractive appearance.





Servicing Made Easy, Dependability Maximum

The protection which this new-type construction affords the wiring, and the various small parts mounted beneath the sub-panel, has been mentioned. It should be noted, however, that this has not—as in usual constructions—been obtained at the sacrifice of ease of servicing. Complete accessibility of every part and every terminal has long been emphasized in RCA equipment. In the new construction embodied in the Type 94-C Amplifier such accessibility has been continued, and even improved upon, by hinging the sub-panel so that the entire assembly can be opened to the rear, thus bringing all parts and connections into suitable position for testing and servicing. A feature of this arrangement is that the terminal board remains fixed, allowing the use of shielded cable for inter-unit wiring. As in all RCA broadcast equipment, the components and materials used are the finest obtainable, and have been tested individually and in combination to insure the very utmost in dependability. Moreover, the unit is guaranteed against defective material and workmanship for a full year. It can be counted upon to provide the uninterrupted continuity of service so essential in broadcast equipment.

Specifications of the Type 94-C Monitoring Amplifier

Maximum gain	80 db.
Fixed gain taps	70 db., 60 db., 50 db.
Maximum undistorted output	20 watts
Frequency response	30 to 17,000 cycles
Distortion at maximum output	less than 5½% R.M.S.
Background level at 60 db. gain	—40 db.
Background level at full gain	—20 db.
Input impedances	500 and 20,000 ohms
Output impedances	7½, 15 and 500 ohms
Volume control range	46 db.
Output stage	four RCA-2A3
Power required, 210 watts, 100/120 volts, 50 to 60 cycles	
Amplifier panel height	12¼"
Amplifier weight	70 lbs.

TRANSMITTER SECTION

RCA MANUFACTURING CO., INC., Camden, N. J.

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