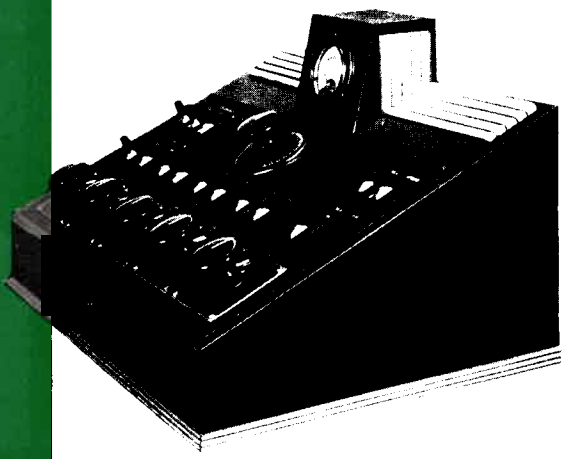
RCA TYPE 78-A

2 STUDIO SPEECH INPUT EQUIPMENT

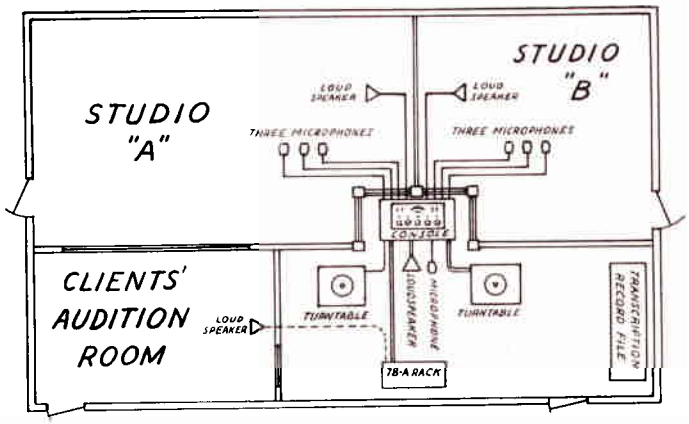


RCA

A Console Controlled Studio Equipment

A Speech Equipment for Small Stations Experience has proven that smaller broadcast stations require equipment equal in performance—particularly in fidelity—to that of the largest station and networks. Fortunately, by careful planning, it is possible for these stations to use equipment identical in all respects except size, to that of the finest network installations. The RCA 78-A Speech Input Equipment is a complete, ready-made installation, which guarantees accomplishment of this desirable end with a maximum of economy and convenience. Completely A.C. operated.

Two-Studio Operating Facilities In most stations—even the smallest—it is usually found desirable to have two studios. These may be of somewhat different size and characteristics, thus adapting them to programs of different nature. Moreover, rehearsals, or auditions, may be carried on from one studio while a program originates in the other. Most important of all, operation is greatly facilitated—particularly where one studio program succeeds another. This desirable arrangement is fully provided for by the 78-A Equipment, which includes all essential facilities for handling programs originating in two studios, plus facilities for reproduction of transcriptions and control of pick-ups from remote points.



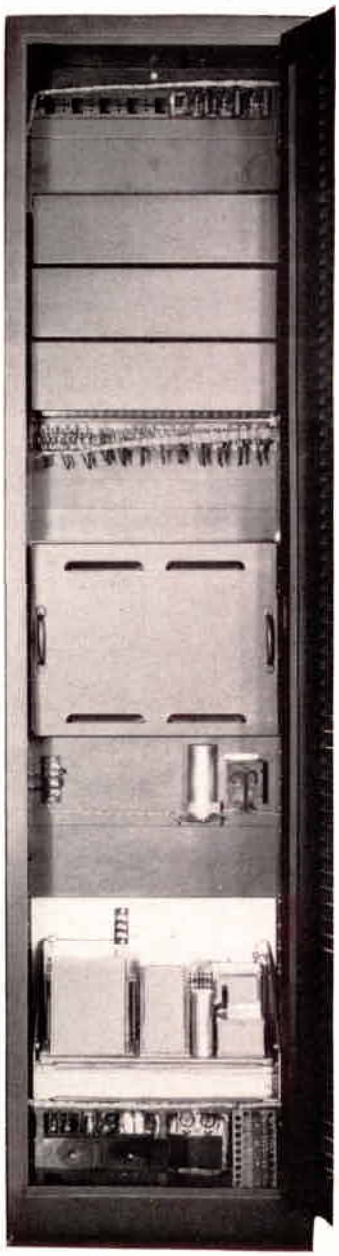
Factory Assembled, Wired and Tested The 78-A Equipment consists of three units; a rack with amplifiers, a control console, and a small 12-volt rectifier which furnishes power for operating the relays. This equipment is furnished complete and ready for operation. Designed by RCA engineers, assembled and wired by skilled RCA workmen, and given a complete overall test before it leaves the factory, this equipment insures freedom from those difficulties—feedback, hum pickup, and the like—usually attendant on the assembly of speech input units in the field. Complete instructions and diagrams are furnished making it possible to install the equipment with a minimum of labor.

"High-Fidelity" Specifications Throughout The RCA 78-A Speech Input Equipment is tested and designed to the same high-fidelity specifications as those laid down for the largest installations. The frequency response is uniform, from 30 to beyond 10,000 cycles. The distortion is less than one-third of one percent arithmetic total, and the combined hum and noise level (unweighted) is approximately 60 db below normal output. These, it should be noted, are overall measurements—the tolerances on individual units are even lower.

Standard Rack and Panel Construction The 78-A Equipment follows the time-tested rack and panel construction which is specified, almost without exception, by experienced broadcast engineers. All of the various units of the system—except the controls—are mounted in an improved-type cabinet-rack, which is finished in a soft black. This is not a cut-down-size rack, such as is often furnished with small equipments, but rather a standard Type 9-AJX Rack, 82⅞″ in height. This means that similar racks may be added later with assurance of a correct match.

Even more important to the small broadcaster, is the fact that every one of the units incorporated in the Type 78-A Assembly is a standardized item identical to those which are supplied separately—and which are carried in stock as regular items. Not only is this absolute assurance that quality has not been sacrificed in this assembly, but also it means that the units of this equipment provide the maximum adaptability for use with other units which may be added later—and for standardization of equipment which future network tie-in would make desirable.

Complete Control From Console While all the main items of the 78-A Equipment—that is amplifiers, jack panels, etc., are assembled on the cabinet rack, the complete control of the equipment is centered in the console cabinet. This is a sloping-front unit designed to be placed on an operating table commanding a view of the two studios. It is beautifully finished in dark gray with silver trim. It contains, besides the mixers, master gain-control, monitor gain-control, and volume indicator meter, a total of fourteen key-switches, which provide complete control and switching of the entire equipment. Ordinarily the operator need not touch anything on the rack, and, in fact, this may be located some distance away. A jack is provided on the side of the console for headphone monitoring.

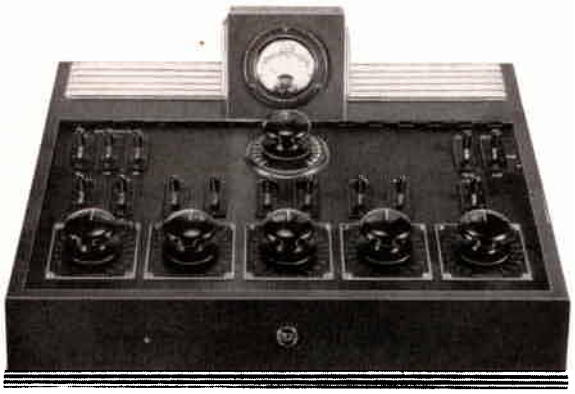


REAR VIEW OF THE 78-A RACK

Six Microphone-Inputs Provided The three key switches at the upper left of the console control the six microphone inputs—which are arranged in pairs. In the "up" position they connect to the microphone outlets in Studio A, and in the "down" position in those in Studio B —or the six outlets may be otherwise distributed between studios as desired. These switches feed directly into the pre-amplifiers. This arrangement doubles the number of microphone inputs permanently connected, and avoids the undesirable course of connecting these inputs to jacks. As shipped, the inputs are for 250 ohms—but the amplifier input connections can easily be changed to accommodate low impedance microphones.

Three Separate Pre-Amplifiers High-quality transmission requires that microphone outputs be amplified before mixing. The 78-A Equipment includes three Type 41-B Pre-amplifiers. These are the standard-type units used in most of the major studio installations. A feature of these is the very low background-level, which is obtained by careful shielding of the input circuits—a special input transformer, mounted in a heavy nicaloi case, being used. Two stages of amplification provide a gain of 40 db. The use of RCA-1603 Radiotrons—which are special low noise and non-microphonic tubes—is illustrative of the superior design of the RCA speech units used in this equipment.

Eight Mixer-Input Positions The 78-A Equipment is provided with four high-quality mixers having a total attenuation of 38 db in two db steps, plus an "off" position. The utility of these is greatly increased by the fact that the input to each is connected to the center of a double-throw switch. These are the left-hand key switches of the pairs mounted just above each mixer. In the "up" position, the three furthest to the left connect to the three pre-amplifiers, and in the "down" position to two line inputs and a position for a booth announce microphone—while the fourth connects to two additional line inputs.



CONSOLE UNIT FOR THE 78-A

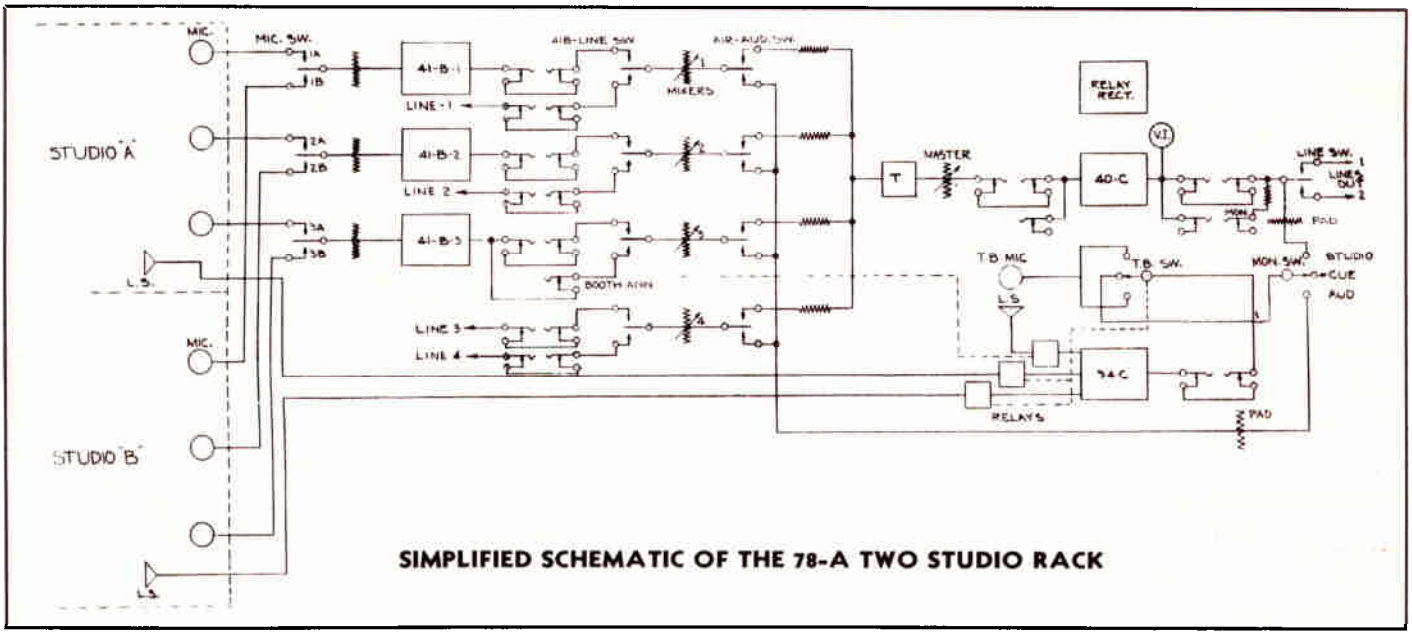
Four Line Inputs It will be noted that the above arrangement provides a total of four 250 ohm line connections. Thus four inputs—as, for instance, two turntables and two remotes—may be permanently connected in. By normalling the latter through jacks, they may, whenever desired, be replaced by other inputs from additional remotes, or the like. This arrangement combines a high degree of convenience with more overall flexibility than is offered by any comparable equipment.

INTERIOR OF THE RECTIFIER UNIT

Special Transcription Mixer-Position In many stations, transcriptions represent a major source of program material—and thus deserve some special attention. In the 78-A Equipment the two turntables ordinarily used can be connected to the two key-switch-controlled inputs to the fourth mixer. Thus, this particular mixer—except, perhaps, on special occasions—is used exclusively for transcriptions, and the operator becomes accustomed to this arrangement. The advantage of this is the convenience with which he can handle a transcription program, while at the same time monitoring an audition pickup from one of the studios, which may involve one, or all, of the other three mixer positions.

Booth Announce Microphone In a small station there are frequent periods during which the operator in the booth will make a portion, or all, of the announcements. Provision for accomplishing this conveniently has been made by providing that one of the input switches—that to the third mixer—will cut in a microphone located in the booth. This switch, when it is thrown to the "booth announce" position, also operates a relay which cuts off the loud speaker in the booth. Thus announcements can be made easily—and with automatic precision.

"Air-Audition" Key-Switches The outputs of the four mixer-positions, like the inputs, are connected to the center of two-position key-switches. These allow any of the mixers to be individually connected to either the program channel or the audition channel. The switches are mounted just above each mixer position. In the "up" position they connect the respective mixer, or mixers, through the master gain-control and program amplifier, to the output lines; in the "down" position, to the monitoring amplifier and monitoring speaker. This arrangement makes possible any operating combination desired—as, for instance, carrying a regular program from two microphones in one studio, and simultaneously auditioning from a third microphone in another studio—or any other combination of transcriptions, remotes and studio programs which is desired. It provides essentially complete two-channel operation with the economy of single-channel equipment.



SIMPLIFIED SCHEMATIC OF THE 78-A TWO STUDIO RACK

"Master" Gain-Control on Console It has been found that the best and most convenient operating procedure requires this master gain-control in addition to the separate mixers. By placing it on the console, it is used with the same ease as the mixers and, all controls are concentrated.

Output-Line Selector Switch The output of the program amplifier is intended to feed the line to the transmitter directly. A key switch—mounted just above the "master gain" on the console—allows this output to be connected to either one of two lines.

Double-Jacks In All Circuits The normal operation of this equipment does not involve use of patch cords. However, it has been found that flexibility is increased by providing jacks at all important points in the circuit. This practice has been followed in the 78-A Equipment.

High-Fidelity Monitoring System The monitoring system provided in the 78-A Equipment is exceptional. Whereas other small-station equipments provide only for low-power magnetic speakers, or relatively inferior dynamic types. The Type 94-C "De Luxe Model" Monitoring Amplifier incorporated in this equipment is the very latest and finest in high-fidelity performance. Used in conjunction with RCA "High-fidelity" Loudspeakers it provides for overall *reproduction substantially* uniform from 50 to 10,000 cycles, and useful from 30 to 12,000 cycles. It is the identical system used in all RCA high-fidelity installations. No other small station equipment provides anything approaching this system—and no other equipment, of any make or size, excels it. Field supply power is included for two high-fidelity loudspeakers. The undistorted output of 20 watts provides monitoring facilities in excess of any normal requirements.

GENERAL SPECIFICATIONS FOR THE 78-A SPEECH INPUT

1. Power Supply—105/125 volts 50/60 cycles.
2. Standard Speech Input Panels are used throughout. Standard Jack Strip includes 48 Jacks.
3. Weight of rack and console—525 pounds.
4. Facilities provided for two-studio operation. Talkback circuits to either studio controlled by a single switch.
5. Facilities available for conducting an audition during programs.
6. Provisions made for announcing or using talkback from control booth without acoustic feedback.
7. Four 250 ohm inputs available for transcription or line use.
8. Three-position Input provided on monitoring key switch for cue purposes or for monitoring rectified output of transmitter carrier.
9. Blank space is available on the rack, which permits an additional 41-B Pre-amplifier or Line Equalizing Equipment. Space is also available for adding additional jack panels.
10. Relay rectifier has capacity for operating additional relays or indicating lights.
11. Audio circuits are normal through jacks so that patch cords are not necessary for regular operation.
12. Overall noise level from pre-amplifier input to line output, with volume controls at normal setting, −60 db. or better—unweighted.
13. Over-all frequency characteristic is flat within 1 db from 30 to 5000 cycles with increasing high frequency compensation up to +2.5 db at 10,000 cycles to compensate for high frequency losses in microphones, etc.
14. Distortion from microphone input to line output at normal operation levels less than .5 of 1% r.m.s. at 400 cycles.

Transmitter Section

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