

INSTRUCTION BOOK

CB-14 TURNTABLE

10PET

Rabouel

AXM-364

blue mercedes

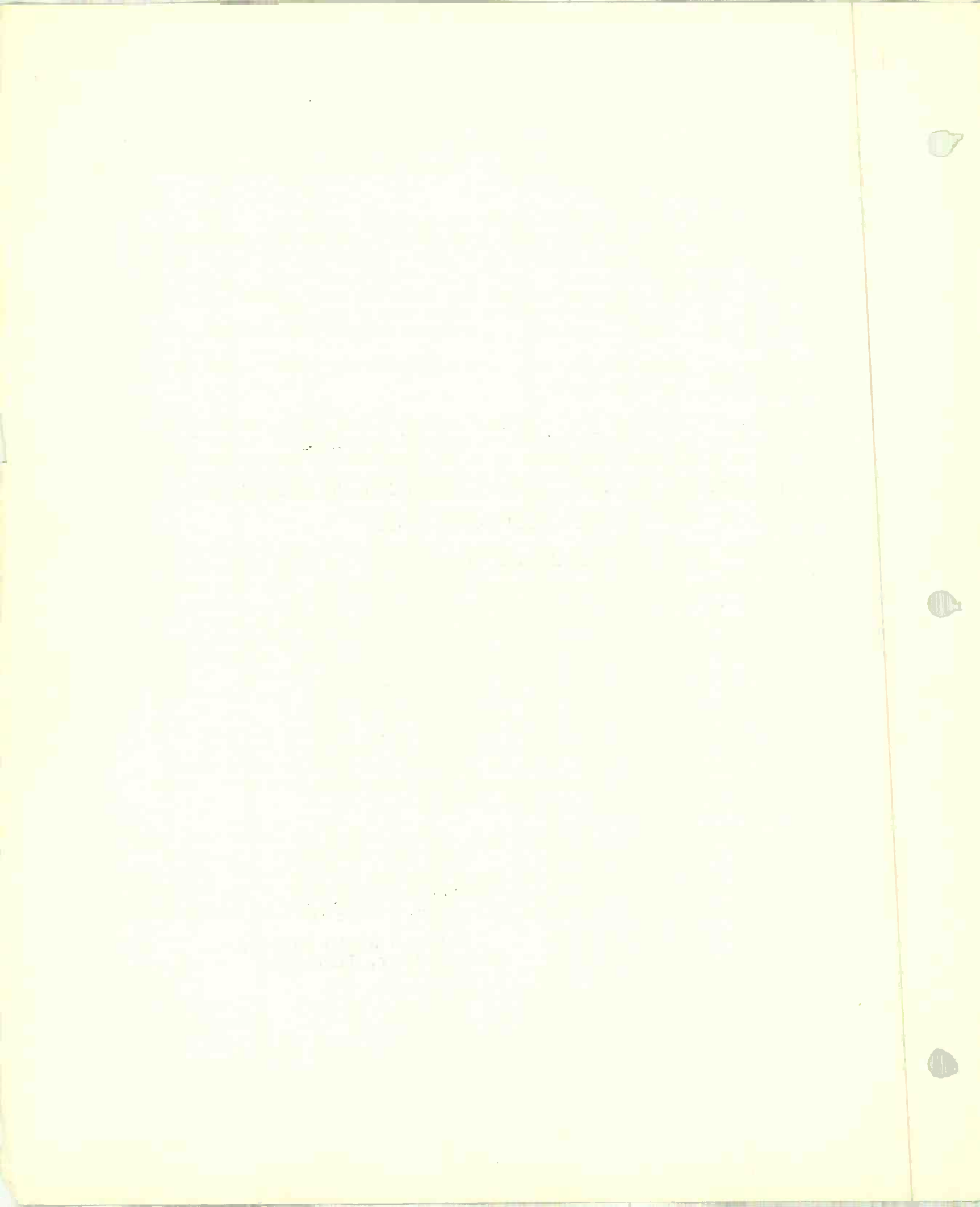
Gates Radio Company

MANUFACTURING ENGINEERS SINCE 1922

QUINCY, ILLINOIS

INSTRUCTIONS FOR INSTALLATION, OPERATION AND MAINTENANCE
OF THE GATES' MODEL CB-14
TRANSCRIPTION TURNTABLE

Gates Radio Company,
Quincy, Illinois.



AN IMPORTANT WORD ABOUT TRANSCRIPTION
PICKUPS

Gates does not manufacture pickups but purchases them and installs them on our turntables. There are essentially three types supplied; they are:

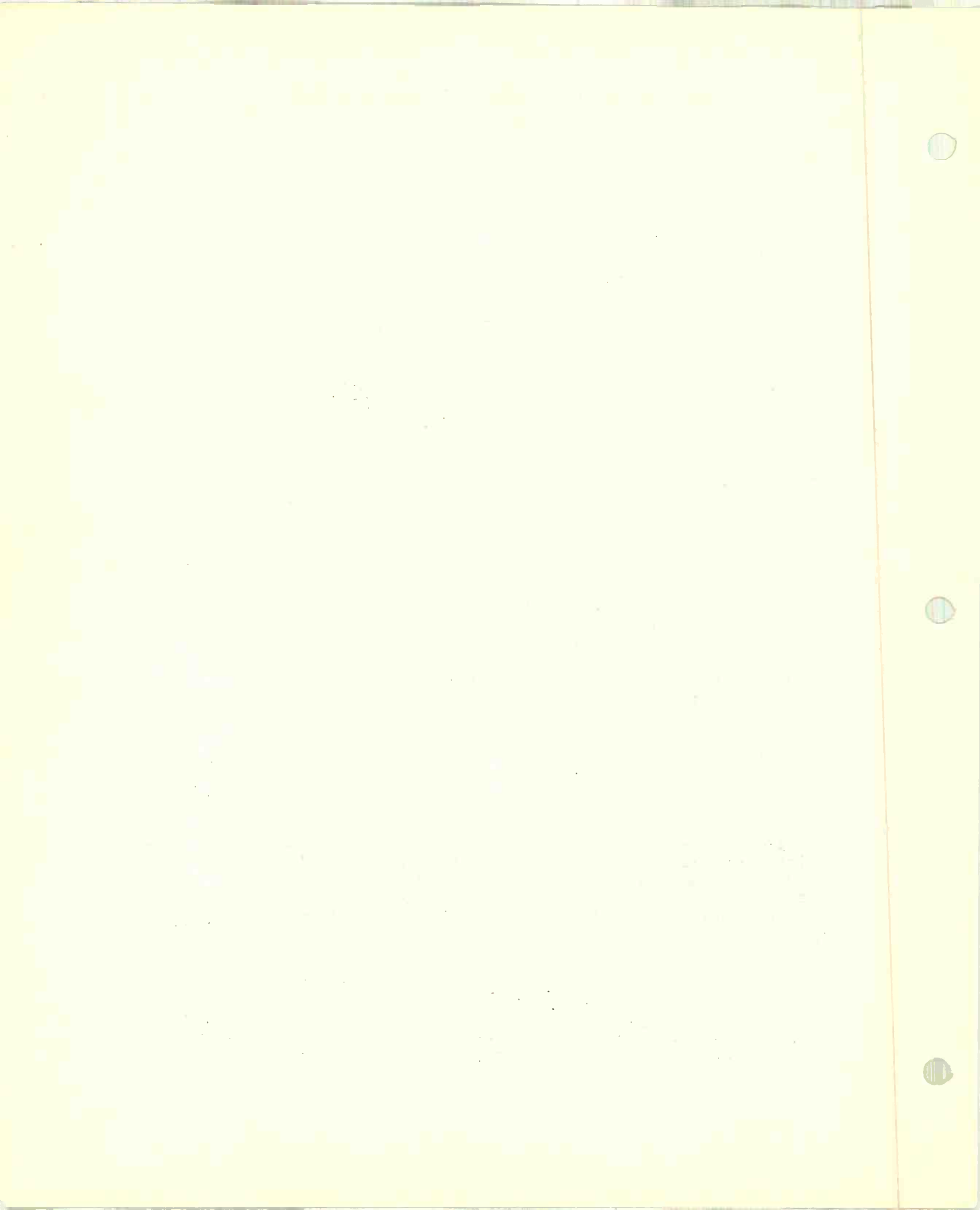
- (a) RCA Type MI-4875G vertical-lateral pickup.
- (b) Western Electric Type 109A vertical-lateral pickup.
- (c) Gray Research pickup assembly consisting of:
General Electric variable reluctance cartridge, diamond stylus for lateral operation,
Gray Research transcription arm type 103S,
No. 602 Equalizer, 4 position filter and switch.

Also on specified orders from the customer any other type of pickup will be installed.

Because of the above it is firmly pointed out that any pickup supplied is not a Gates' product and is provided as a convenience to you so that the equipment will be complete. The guarantee of the pickup is the manufacturer's guarantee and service may best be obtained, in case of necessary repairs, by sending to or contacting the manufacturer of the pickup direct.

Where the RMC vertical or lateral pickup is supplied, this is manufactured by the Radio Music Corporation of East Port Chester, Conn. Where the Pickering Type 161 is supplied, this is manufactured by the Pickering Company, 127 Atlantic Ave., Ocean Side, N. J., and where the Audak pickup is supplied this is manufactured by the Audak Company, 500 Fifth Ave., New York City. If Western Electric 109A pickup is supplied, this is serviced by your Graybar dealer and RCA is serviced by RCA, Camden, N. J. Service on the Gray arm can be obtained from the Gray Research & Development Co., Inc., 565 Fifth Ave., New York 17, N. Y., or the factory which is at Hartford, Conn. Information on service of G. E. cartridges may be obtained from your nearest General Electric office. If in need of repairs or adjustment on pickups, contact these sources as applied to the type being used.

Radio broadcasting stations should always carry at least one spare pickup and preferably two. The spare may be either a head or complete arm. Operating with only the two pickups used on a pair of turntables is like operating a car without a spare tire; you may have a flat in the middle of a very important broadcasting day.

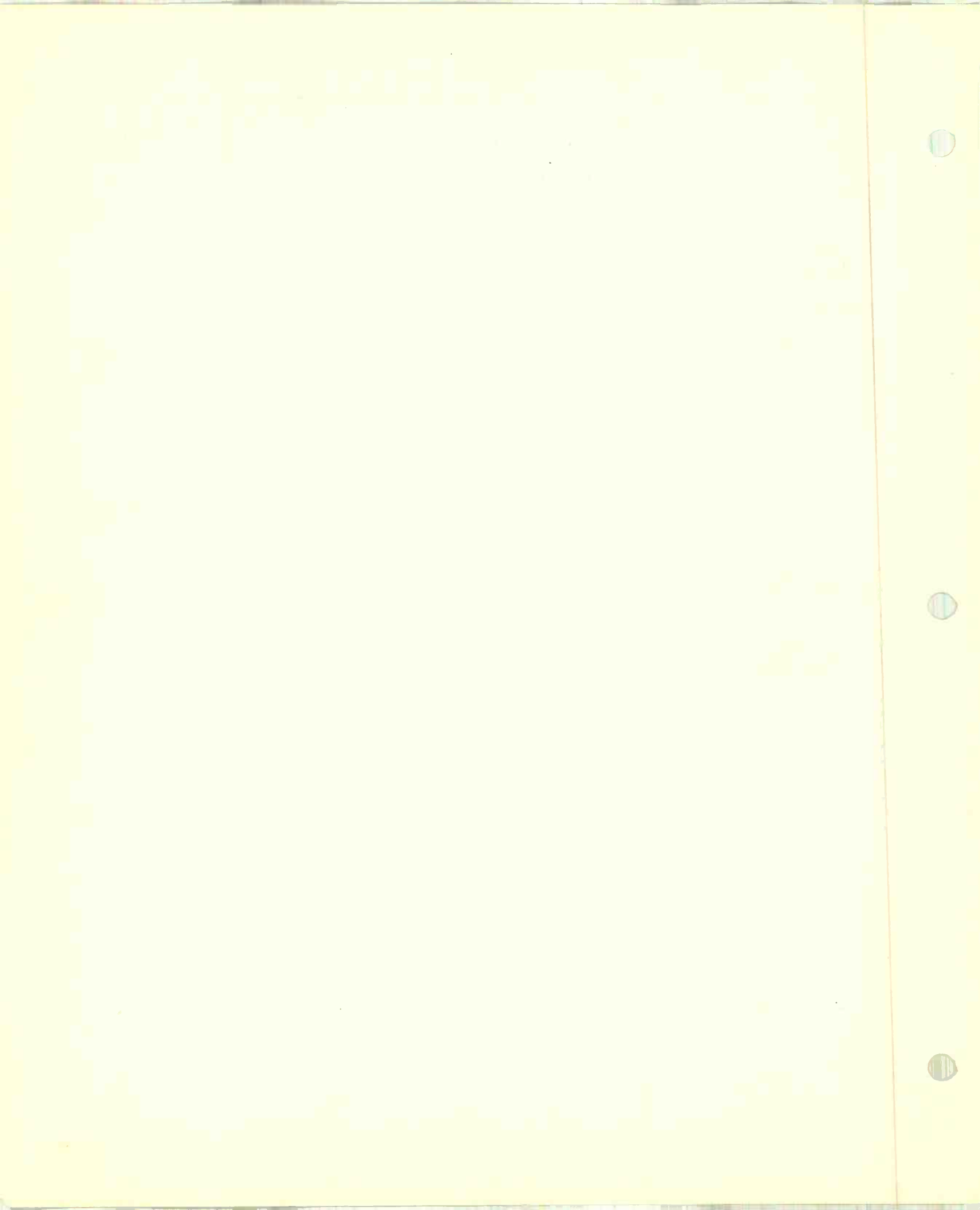


Pickups used in radio stations differ widely from those used on record players. They are much more fragile, built more loosely and will fracture more easily. As a result they must be handled with care. Dropping on the disc, banging against the side of the turntable or general rough handling will quickly ruin the best of pickups. Handle them with extreme care and they will serve you well.

The above comments regarding the pickups are not intended to absolve our responsibility in any way with all other parts of the transcription equipment including the mechanism, amplifiers, cabinet, switches and any other parts; nor do they absolve our responsibility in supplying well tested, good operating pickups when they leave the factory. They are only intended to convey that pickups, not being of our manufacture but of your selection, are subject to the performance standards and servicing requirements as set forth by the pickup manufacturer and not by us.

Gates Radio Company,
Quincy, Illinois
U. S. A.

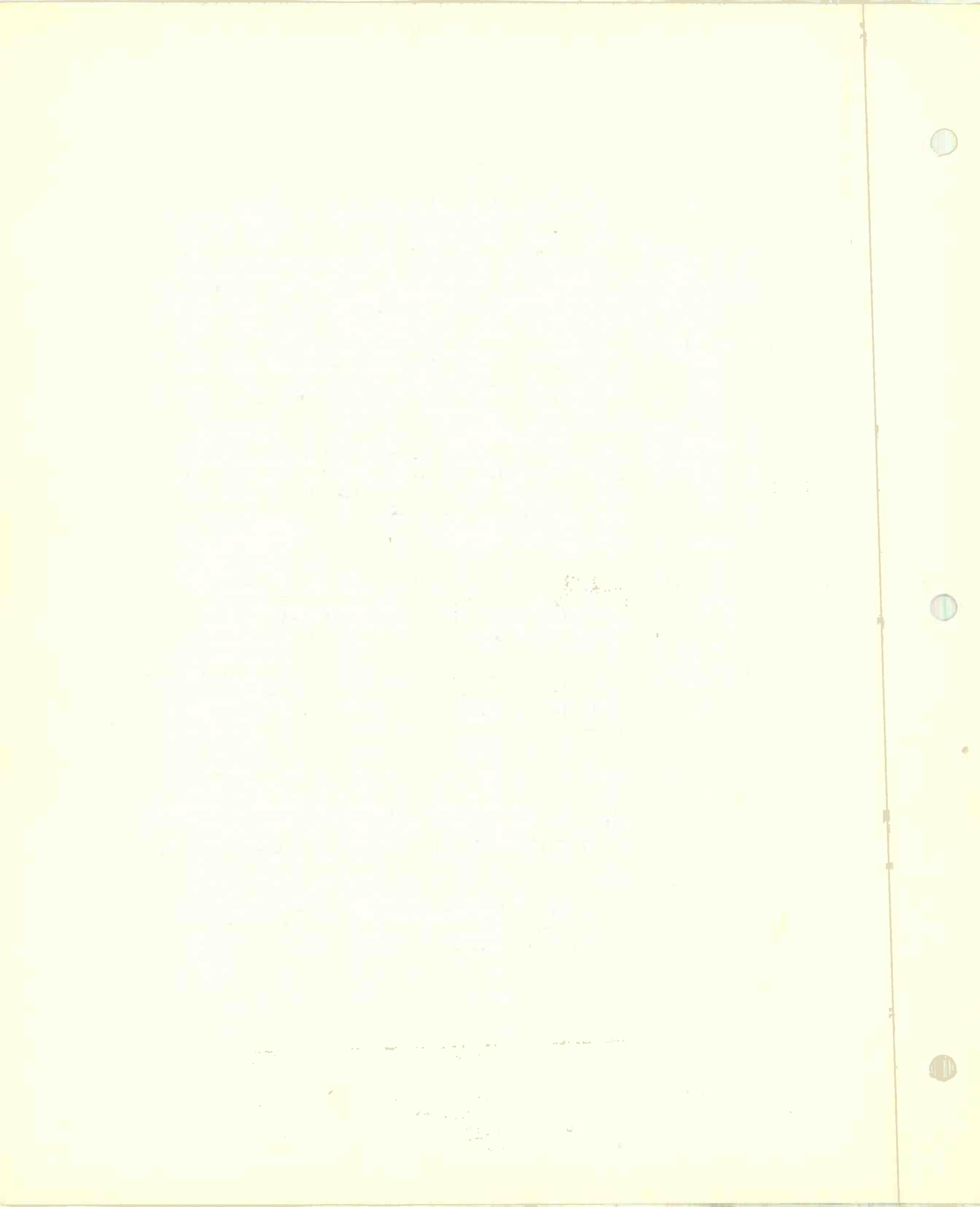
IB-1301
2/3/49



INSTRUCTIONS FOR
CB-14 TRANSCRIPTION TURNTABLES

The CB-14 Transcription Turntable is obtainable from Gates in several types, differing only in pickups and the inclusion or omission of preamplifying equipment. A listing of the various units and a brief description of them follows:

- (1) Model CB-14A - Complete turntable in cabinet with diamond stylus. Reluctance pickup. Gray 103-S arm and Gray 602 equalizer. For lateral reproduction only. Output impedance 250 ohms.
- (2) Model CB-14B - Complete turntable in cabinet; including diamond stylus, reluctance pickup, Gray 103-S arm and Gray 602 equalizer. SA-134 Amplifier. Output impedance 600 ohms.
- (3) Model CB-14C - Complete turntable in cabinet with RCA MI-4875G universal pickup and variable equalizer. For vertical and lateral reproduction. Output impedance 250/500 ohms.
- (4) Model CB-14D - Complete turntable in cabinet with RCA MI-4875G universal pickup and variable equalizer. SA-134 Amplifier. Output impedance 600 ohms.
- (5) Model CB-14F - Complete turntable in cabinet with W.E. 109A universal pickup and variable equalizer. For vertical and lateral reproduction. Output impedance 250/500 ohms.
- (6) Model CB-14G - Complete turntable in cabinet with W.E. 109A universal pickup and variable equalizer. SA-134 Amplifier. Output impedance 600 ohms.



- (7) Model CB-14H - Complete turntable in cabinet with Radio Music UL2DL pickup and variable equalizer. Lateral reproduction only. Output impedance 250/500 ohms.
- (8) Model CB-14I - Complete turntable in cabinet; including Radio Music UL2DL pickup with variable equalizer and SA-134 Amplifier. Output impedance 600 ohms.
- (9) Model CB-14J - Complete turntable in cabinet. For both standard and micro-groove playback; including two reluctance pickups with Gray variable equalizer and switch (one pickup for micro-groove and one for standard). SA-134 Amplifier. Output impedance 600 ohms.

CIRCUIT DATA

Refer to drawing No. C-16995 attached for interconnecting information on the SA-134 Amplifier and C-17027 for the various filter layouts.

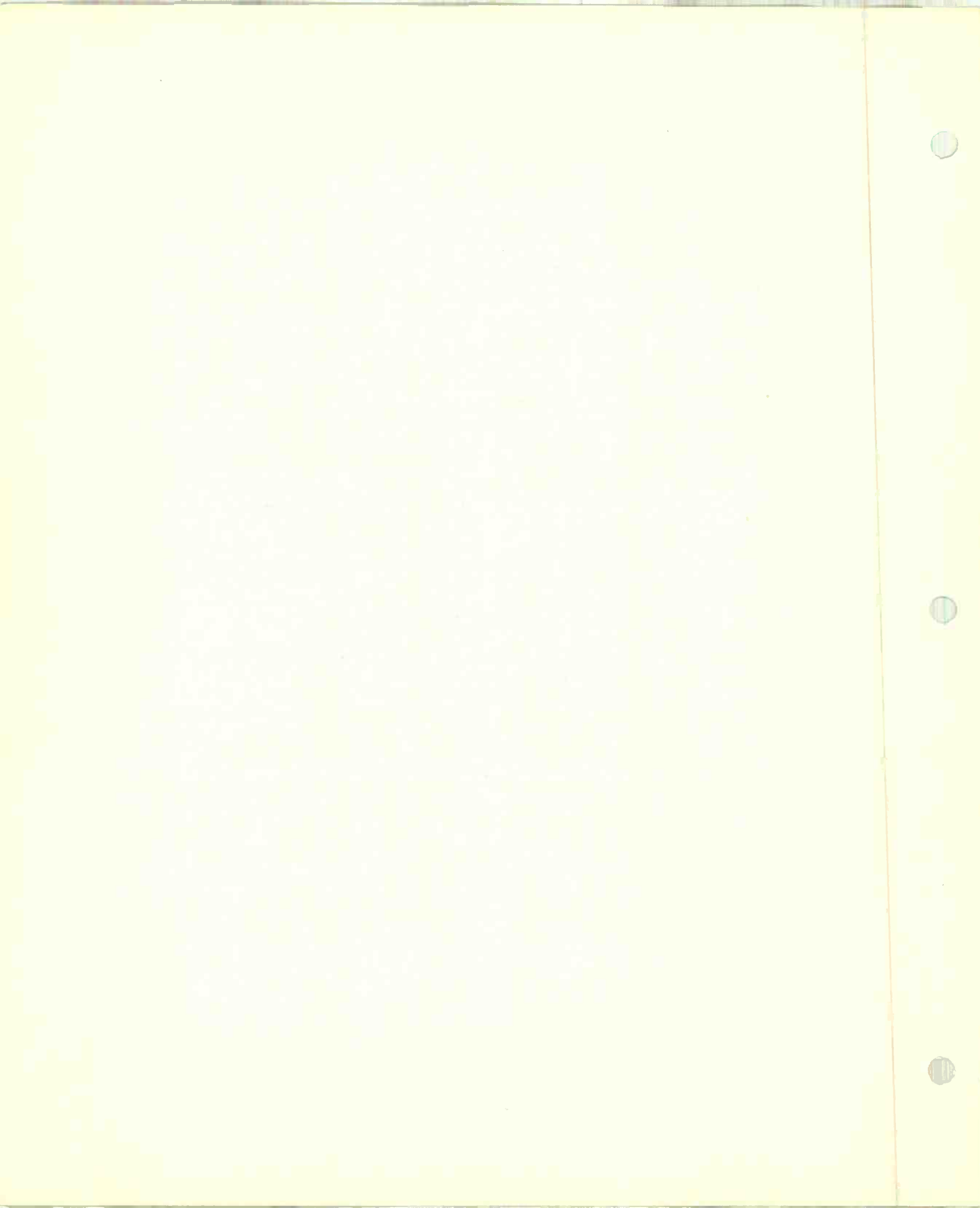
The SA-134 Amplifier has an output of 600 ohms. In order to obtain an output of 250 ohms, a 600/250, 10 DB "T" pad is supplied in each turntable. The output of the pad is wired to terminals 6 and 7 on the terminal board.

If an output of 600 ohms is desired, merely disconnect shielded pair from "out and common" on pad assembly and terminate to output of SA-134; also removing input leads from pad to SA-134.

It should be noted that the pad used is a "T" pad and, therefore, unbalanced. Care should be taken when connecting the output to an unbalanced network, such as Ladder Attenuator or Tee Attenuator, that the common side which terminates to #7 on terminal board, also connects to common side of network which is being fed.

The 115 Volt, 60 cycle, A.C. input connections are brought to terminals 9 and 10. Terminals 11 and 12 are supplied for external switch where one may be required.

Where the equipment is for other than 115 volts, 60 cycle A.C., this is noted on the type label attached on the inside of the cabinet. All wiring carrying audio circuits should be shielded with the same common ground which should be



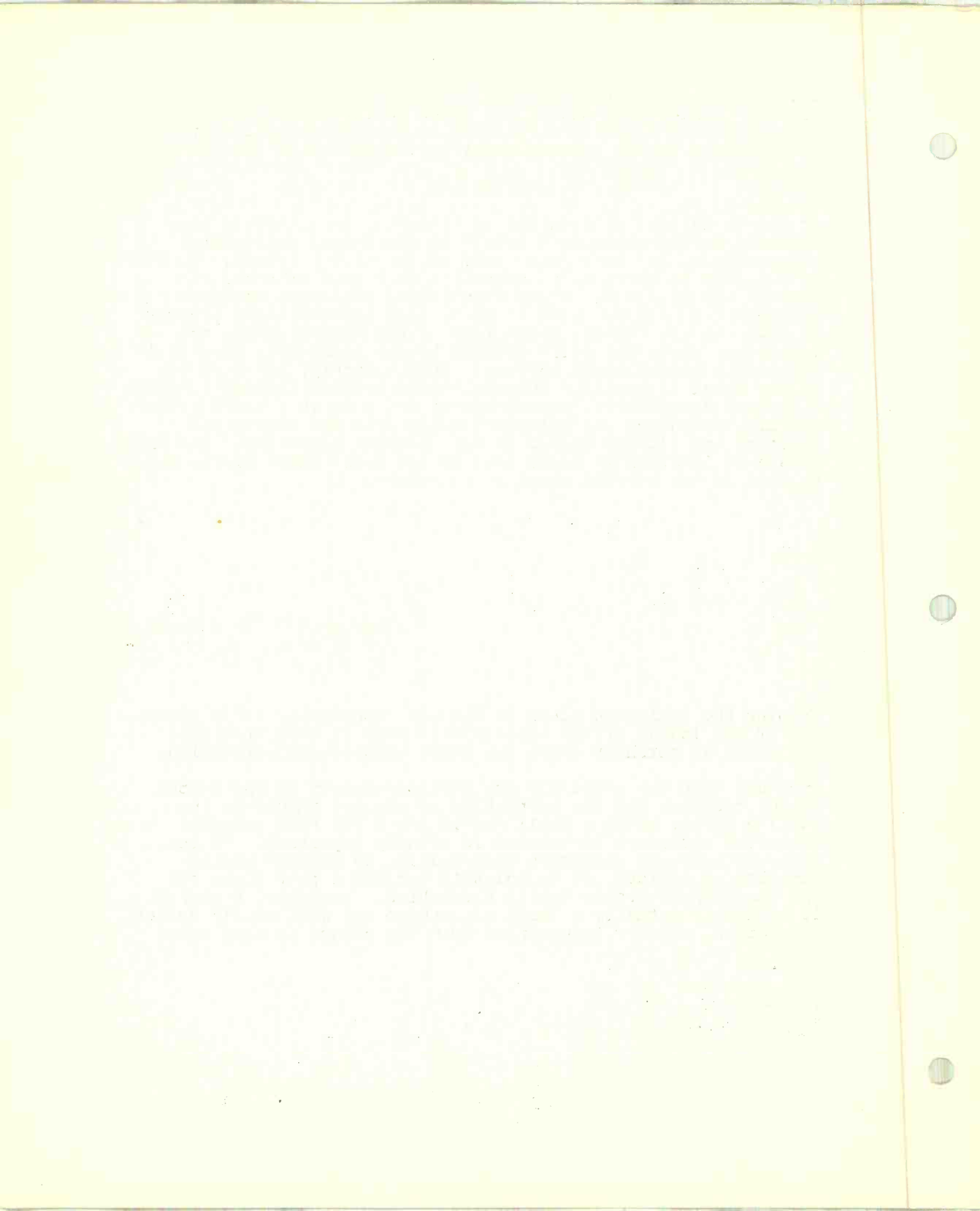
applied to the turntable wiring shields and speech equipment. If your turntable is one of the types equipped with preamplification, no additional preamplifier is necessary and it may be fed directly to the program amplifier.

MAINTENANCE

As the mechanical maintenance is otherwise described in this booklet, reference is made herein to electrical maintenance only. First, and most important, is the pickup itself. Operators should be thoroughly instructed that good transcription pickups are delicate. Every experienced broadcast engineer and operator will be quick to agree that transcription pickups of high quality design, regardless of the manufacturer, are delicate. Where carefully handled by the operators, they will give long, satisfactory service. Unfortunately, however, due to the speed of handling transcriptions between network programs and where several spot announcements are made in a short period of time, operators may unintentionally drop the pickup and fracture the diamond stylus or the internal mechanism. For this reason it is strongly urged that at least one spare pickup head be kept in the service stock at all times.

Keeping the equipment clean is vitally important; weekly cleaning of the inside of the turntable to keep it free from dust and grime is strongly urged for long, trouble-free operation.

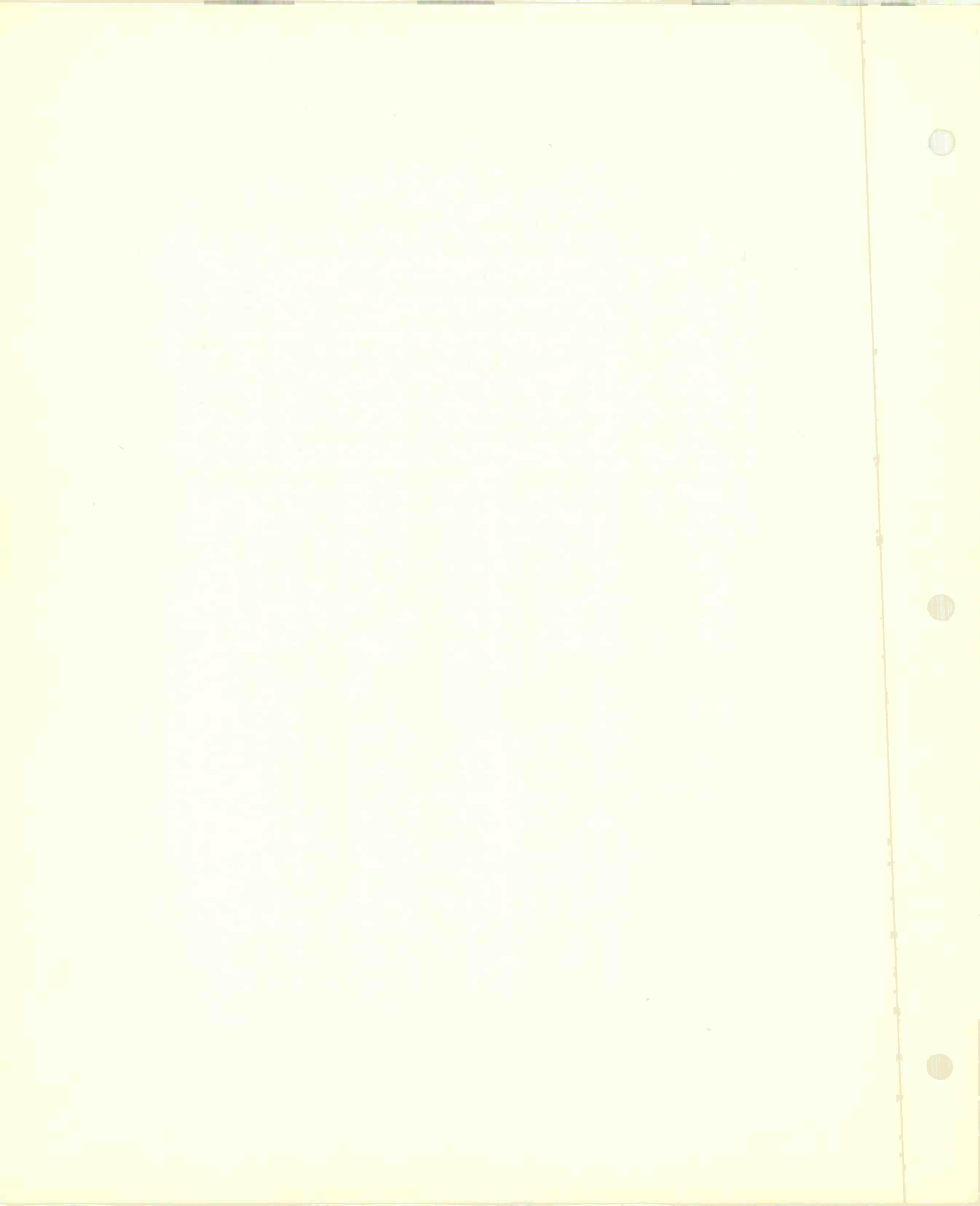
Provided with the turntable are leveling screws on the bottom of the cabinet, and the turntable, of course, should be installed level, using a small spirit level for this purpose. Where the equipment is mounted is vitally important. If the floor is weak and vibration from walking or outside moving vehicles is noticed, it immediately becomes a poor place for the location of transcription turntables. Remember, a pickup is in itself actually a small microphone and will easily detect any noises, whether transmitted from the record or from other



mechanical sources. Location of the turntables so that the pickups cannot be bumped while passing them, which would not only endanger the pickup itself, but create a disturbance on the broadcast, is, of course, desirable procedure in installing.

Due to the fact that all transcription turntables are made in reasonably large quantities, it is recognized that the location of motor starting switches, filter switches, etc., will at times, because of the architectural layout of the installation, be at an inconvenient location. It is pointed out, where the operator may desire to change these locations and place a blank plate over the hole in which the switch or filter has been located, that complete isolation of A. C. circuits and audio circuits is imperative for low noise operation. Never should a filter switch and motor switch be located side by side. The Gates Company will gladly supply blank plates to match the cabinet color to place over switch or filter holes, that might require changing, to assure neat appearance of the equipment. The station management need only request this.

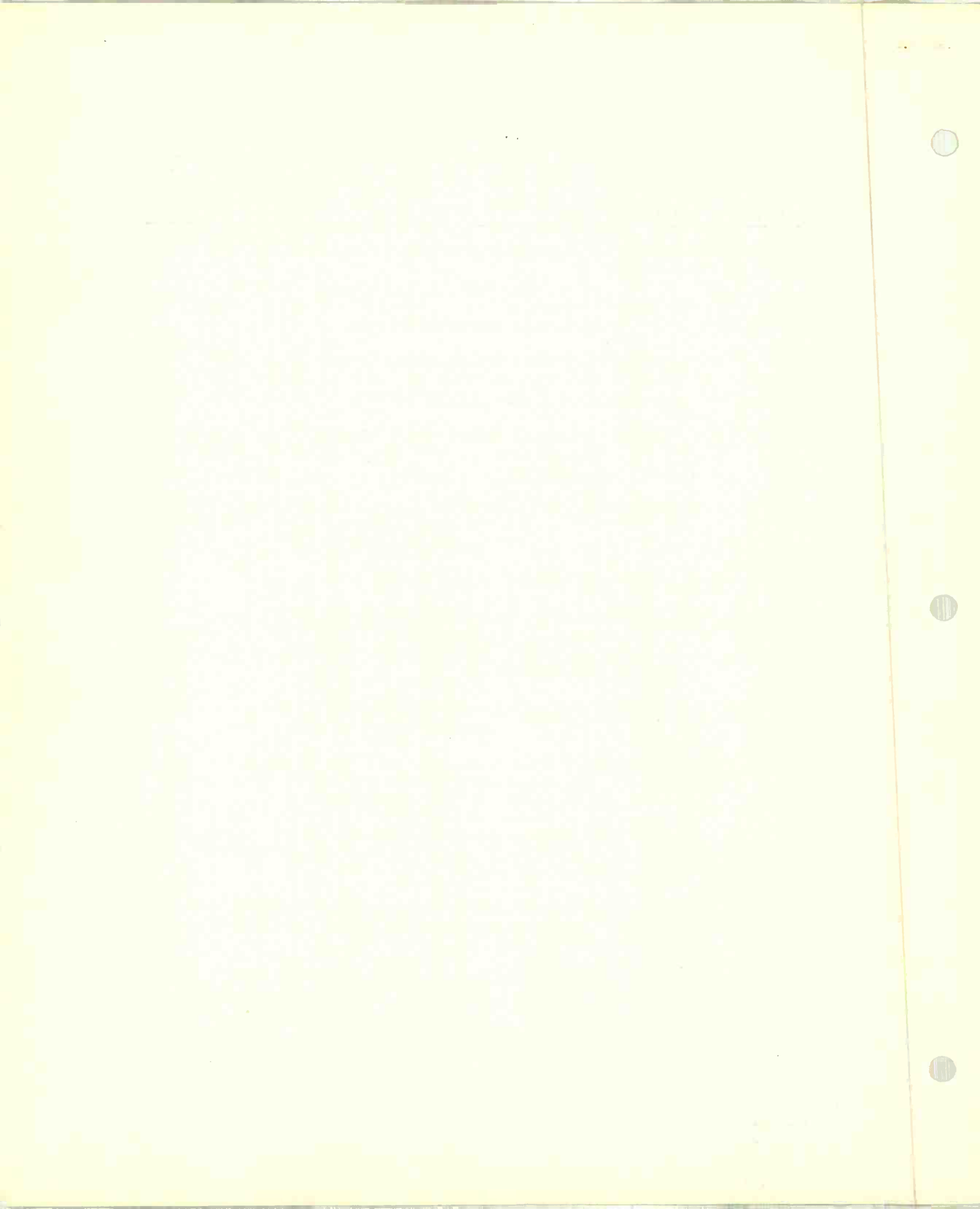
Engineering Department,
Gates Radio Company,
Quincy, Illinois.



PARTS LIST

(Cabinet Parts)
(CB-14 Turntable)

| <u>Quantity</u> | <u>Drawing</u> | <u>Description</u> |
|-----------------|----------------|------------------------------------|
| 1 | A1 | Fuseholder #357001 Littlefuse |
| 1 | F1 | Fuse, 3A, 3AG, Littlefuse |
| 1 | A2 | #50 A.C. Receptacle Jones |
| 1 | TB1 | Terminal Board 8-141 Jones |
| 1 | A3 | A.C. Outlet Plug #50 |
| 1 | TB2 | Terminal Board 4-142 Jones |
| 1 | Pad-1 | A-6518-101, 650/250 "T" Pad, 10 DB |



GUARANTEE

This equipment is fully guaranteed by the Gates Radio Company of Quincy, Illinois, to be free from all defects in materials and workmanship and will be repaired, replaced or adjusted in accordance with the manufacturer's option and terms as outlined below.

- 1 - Gates believes the purchaser has every right to expect first-class quality materials and workmanship and has created rigid inspection and test procedures plus excellent packing methods to assure good arrival at destination.
- 2 - Gates agrees to supply daily factory service, and will make emergency shipments at any time where possible.
- 3 - Gates fully guarantees, under normal and proper usage, all component parts in Gates equipment, except as noted. These parts will be replaced or repaired at the option of Gates as follows:

Transmitter Parts: main power or plate transformer, modulation transformer, modulation reactor, main tank condensers.

(replacements or repairs) - where less than 1 year old...no charge, between 1 and 2 years old..
..50% or new price

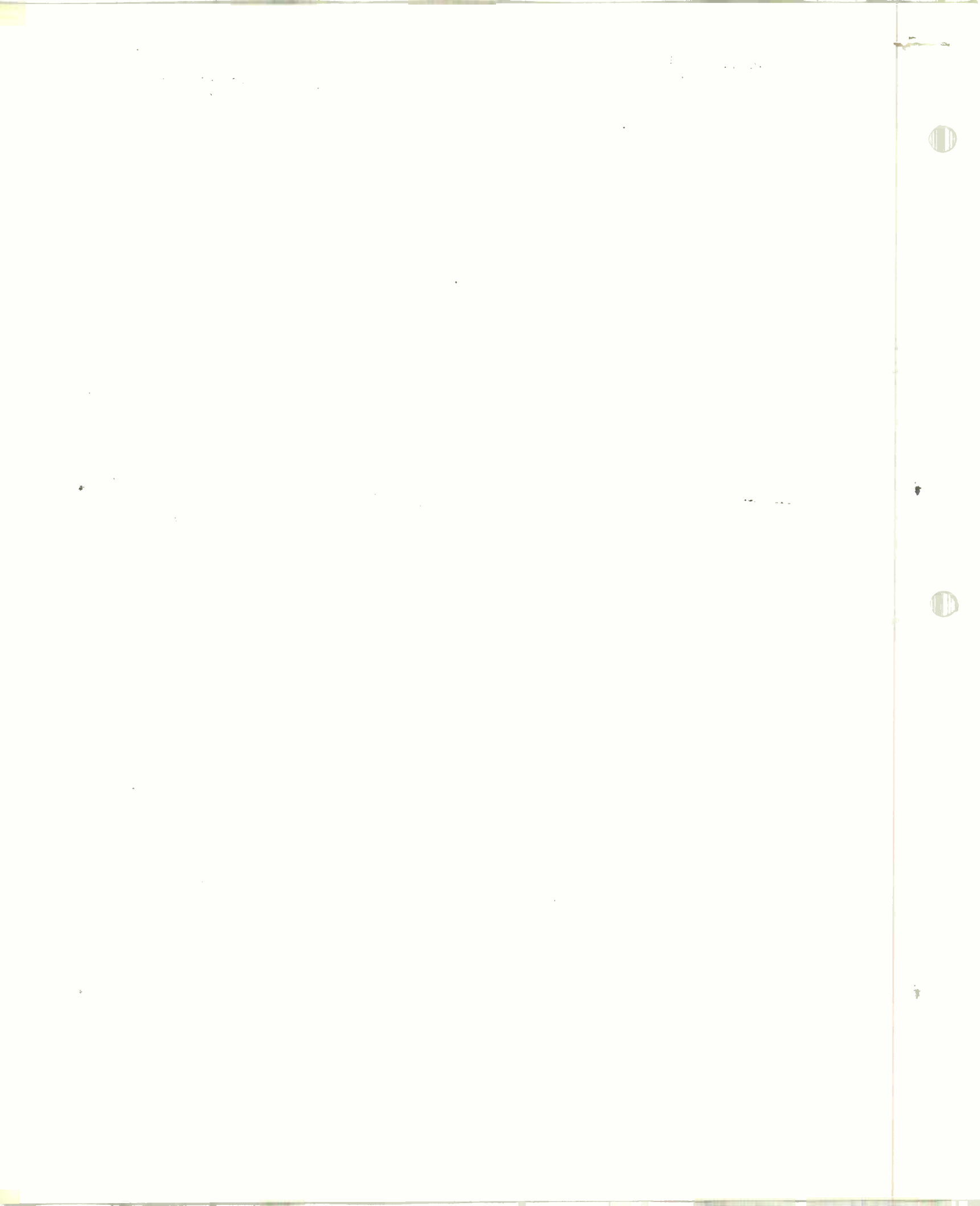
Moving Parts: Guaranteed for six months.

Electron Tubes: Subject to manufacturer's warranty at the time of shipment. Adjustment will be made to the customer as given to Gates Radio Company by the tube manufacturer.

All other component parts: (Except as listed above or below)
Guaranteed for one year.

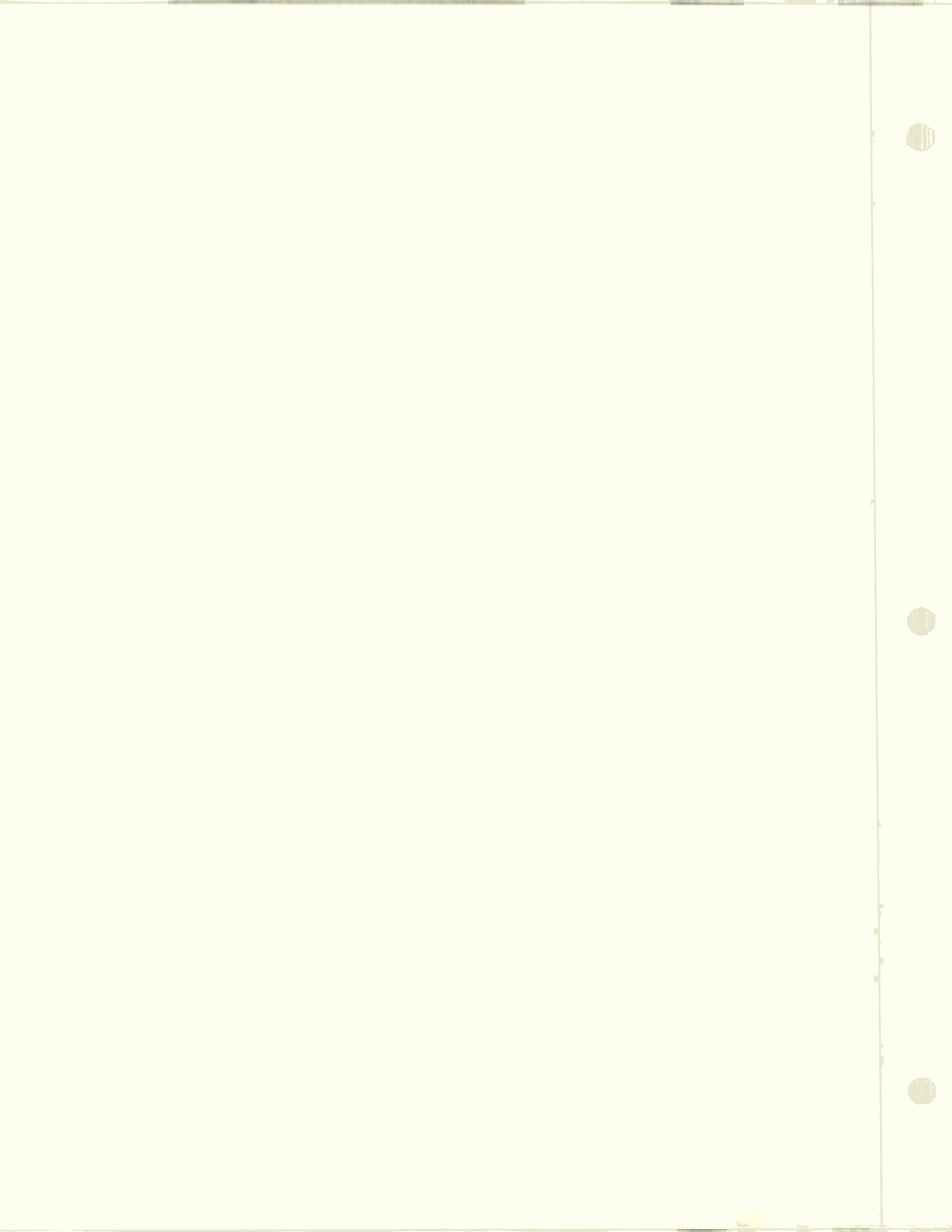
Abuse: Damage resulting from an Act of God, or by fire, wind, rain, hail, or any other condition other than normal usage is not covered by the guarantee.

- 4 - Date of invoice to original user-purchaser and date of receipt by Gates Radio Company of notification from the customer will determine the age of equipment or parts.
- 5 - In case of adjustment, as on certain transmitter parts listed above, "new price" is Gates' current price at time of replacement and/or adjustment.
- 6 - This guarantee covers only Gates manufactured parts and complete Gates equipments including all parts therein, with exceptions as noted. Any purchased part not manufactured by Gates will be subject to the manufacturer's guarantee, unless such part is a unit incorporated in Gates manufactured equipment.



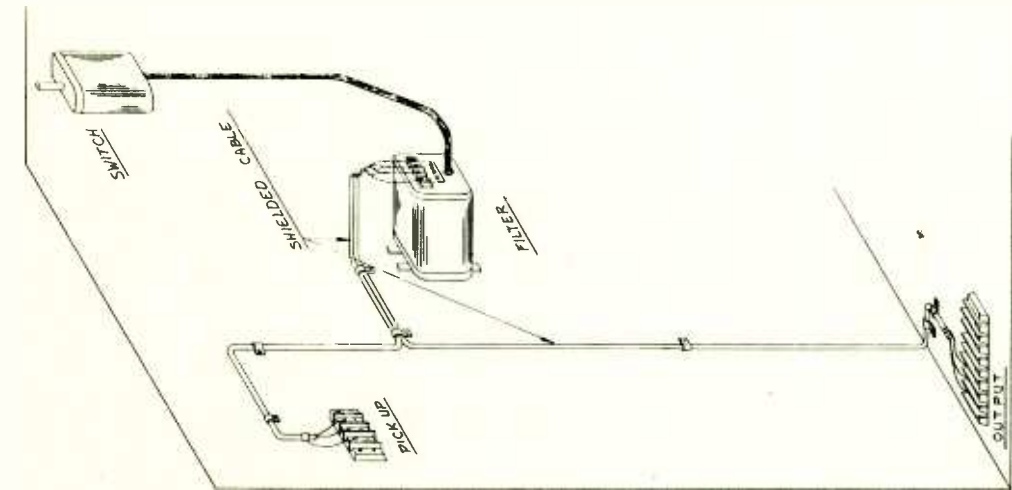
- 7 - Transcription pickups, regardless of make, are guaranteed for ninety days - said guarantee including every associated part of the pickup except the stylus, which because of its fragility is not guaranteed by Gates.
- 8 - Where the replacement part in question must be supplied under the guarantee before the defective part can be returned for inspection, as might sometimes be required, the customer will be billed in full and credit or adjustment will be given on receipt of the defective part in accordance with this guarantee and the terms herein. In order for credit adjustment to be received in line with this guarantee the defective or replaced part must be shipped prepaid to Gates Radio Company or to any other destination requested by Gates within two weeks of the date of the invoice covering the replacement part. Any item alleged defective shall not be returned to Gates until after written permission has been first obtained from Gates' home office at your request.
- 9 - All shipments under this guarantee will be made f.o.b. Quincy, Illinois and all materials returned will be shipped prepaid by the customer f.o.b. Quincy, Illinois.
- 10 - As a material part of this guarantee the customer agrees to employ capable technical personnel to maintain all equipment under this guarantee in good, normal condition, properly serviced and cleaned, and to use said equipment as and for the purpose intended by seller. This guarantee does not extend to the supply by Gates of any personnel to make any replacement, repair or adjustment.
- 11 - Gates shall not be responsible for damages to items in transportation or careless handling; or injuries to persons or damage to property arising out of the use or operation of Gates equipment or parts, but Gates will supply repair or replacement items speedily, which will be billed to the customer who, in turn, will place claim with the carrier, with assistance from Gates if necessary and when so requested.
- 12 - Delays in fulfilling any part of this guarantee because of depleted stock, floods, war, strikes, power failures, transportation delays, or failure of suppliers to deliver, or because of Acts of God or any other conditions beyond the control of Gates, does not in any way render Gates liable under this guarantee; however, every effort will be made to render prompt service.
- 13 - Gates agrees that this equipment sold is manufactured, where used be, under Royalty License Agreements with Western Electric Company and Radio Corporation of America.
- 14 - This Guarantee is not transferable from the original user-purchaser, and no right of subrogation is given herein.
- 15 - This Guarantee is effective on all standard Gates-cataloged items sold after June 11, 1951.

GATES RADIO COMPANY
Quincy, Illinois



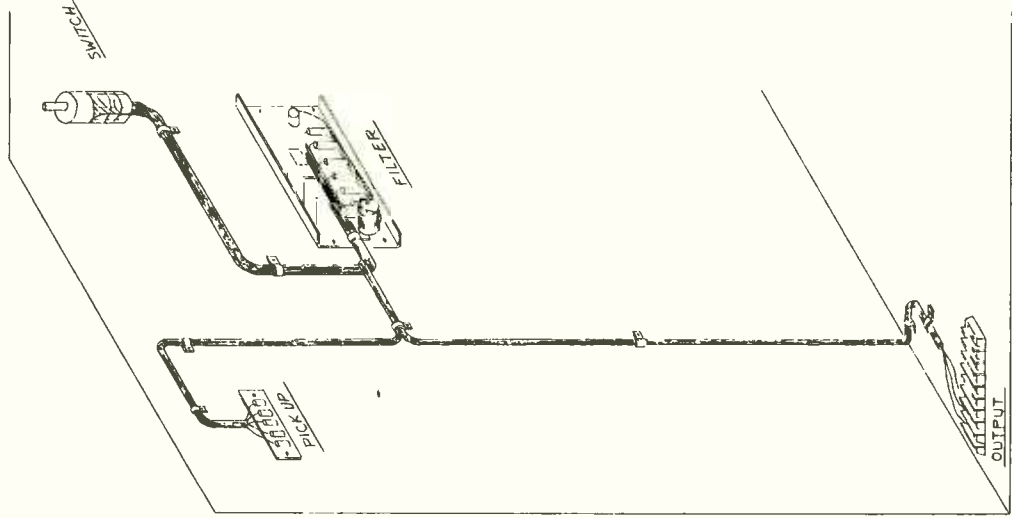
Drawing Number

C-



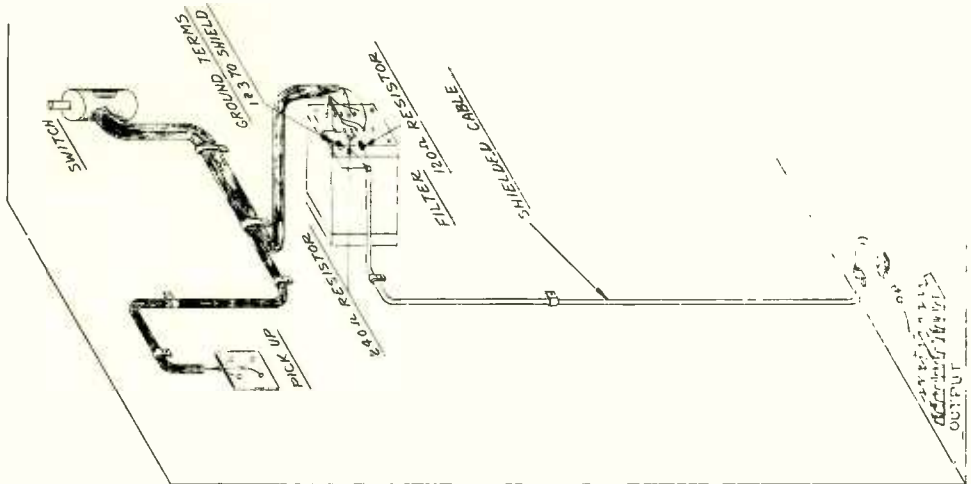
GRAY # 602 EQUALIZER

MO-3169



RCA M1-4575-G COMBINATION

MO-3231



WESTERN ELECTRIC # 103

MO-3233

LEFT SIDE LOCKING FROM REAR

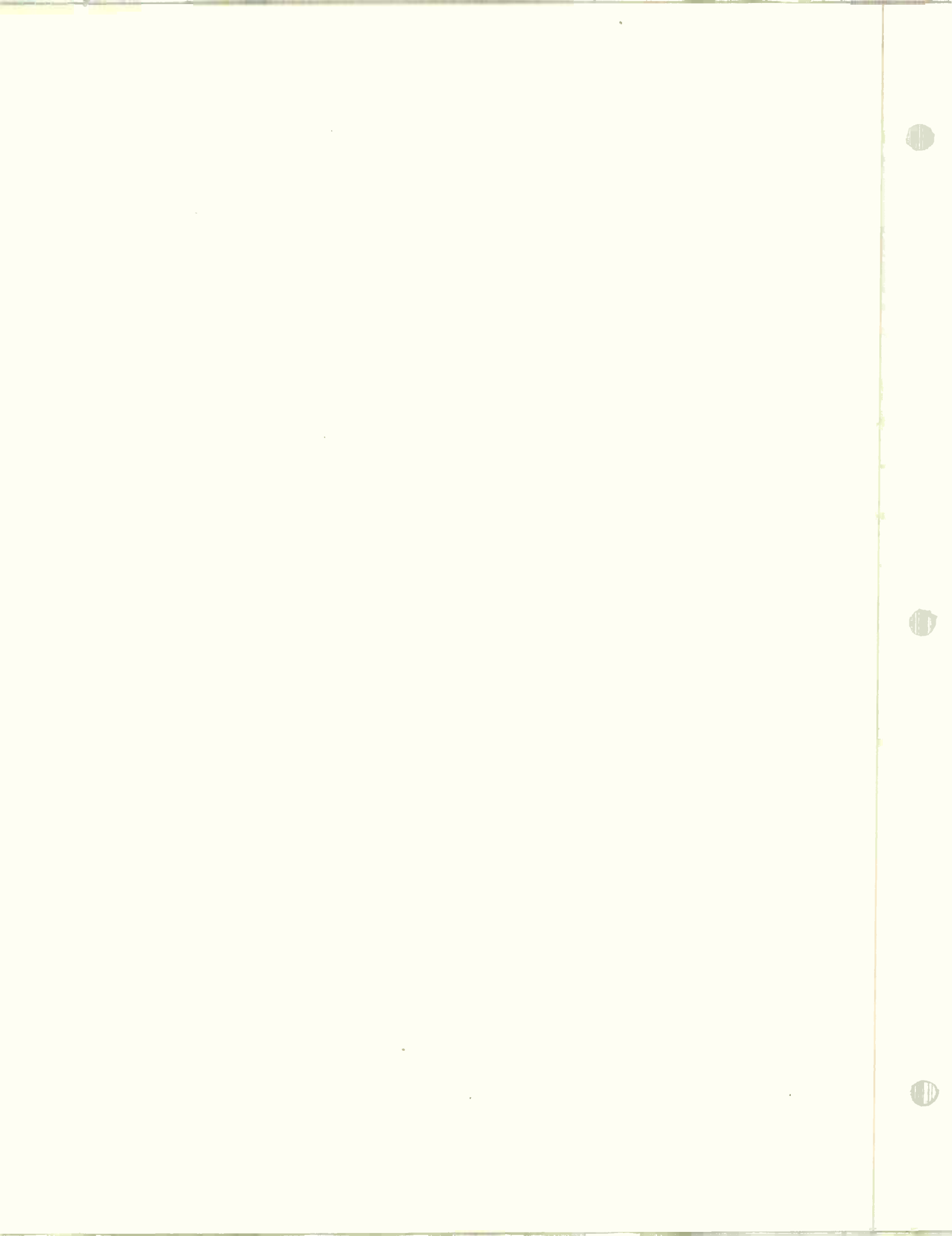
CB-14 FILTER LAYOUT FOR GRAY,
RCA, AND W.E. FILTERS

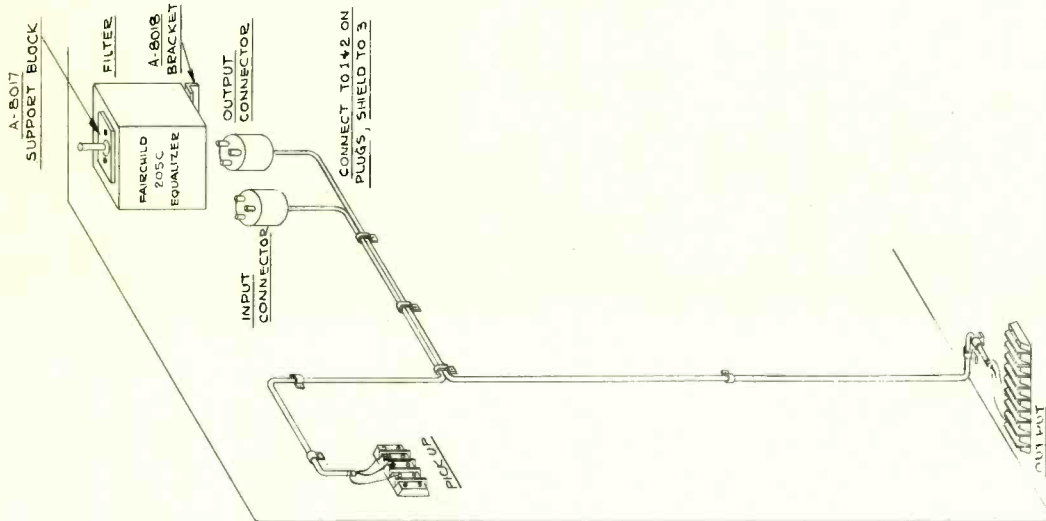
| Variations on Finished Dimensions unless otherwise marked | |
|--|--------|
| Material | Finish |
| Up to 1/4" | ± .005 |
| Above 1/4" to 1/2" | ± .006 |
| Above 1/2" to 3/4" | ± .010 |
| Above 3/4" | ± .015 |

| Material | Finish |
|--------------------|--------|
| Up to 1/4" | ± .005 |
| Above 1/4" to 1/2" | ± .006 |
| Above 1/2" to 3/4" | ± .010 |
| Above 3/4" | ± .015 |

DRAWN BY H.G.H.
DATE 6-2-56
CHECKED BY T.G.J.
DATE 6-2-56

PART NO.
DWG. NO.
SHEET 1
GATES RADIO COMPANY
QUINCY, ILLINOIS
C-17027





FAIRCHILD 11PASC EQUALIZER

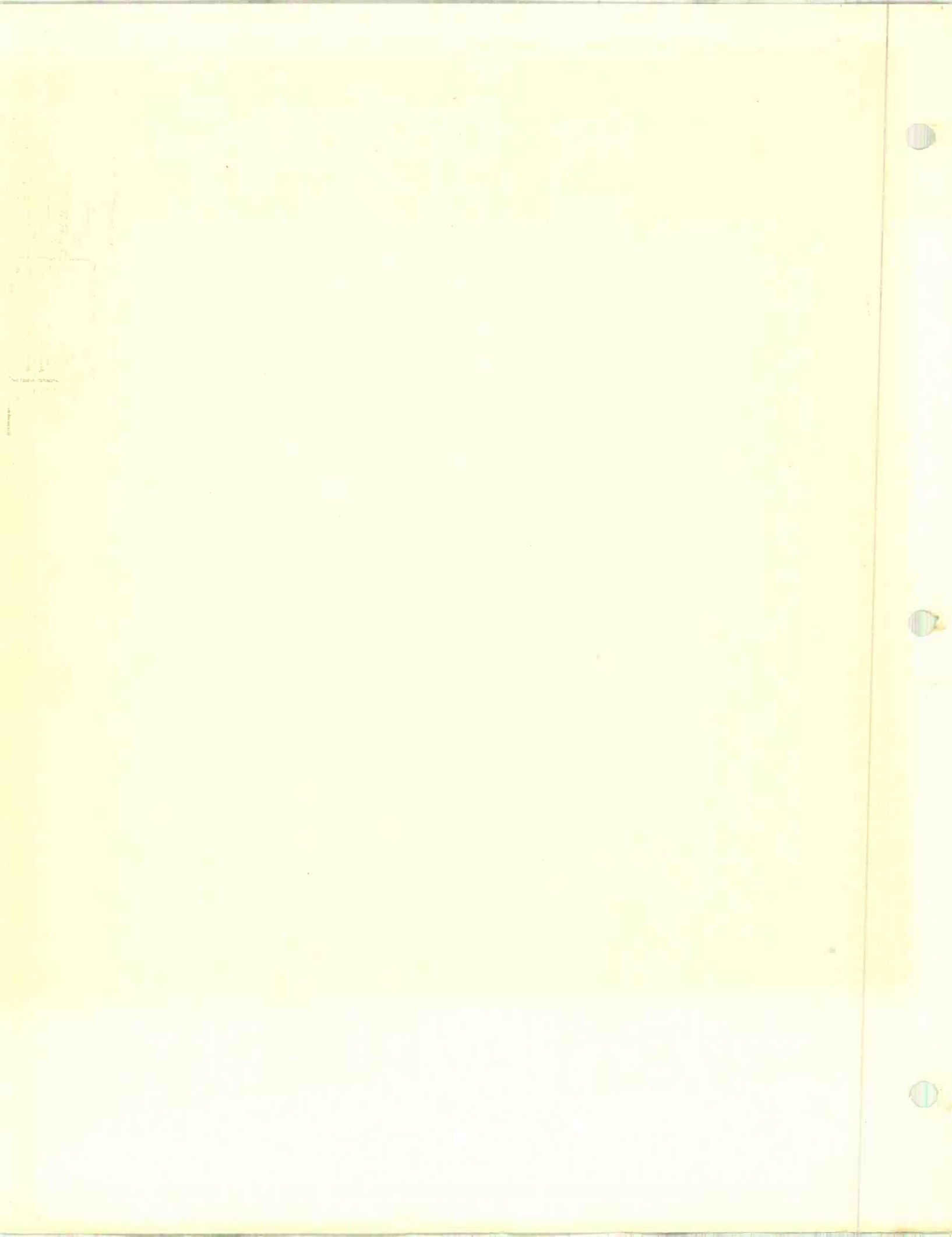
M4563

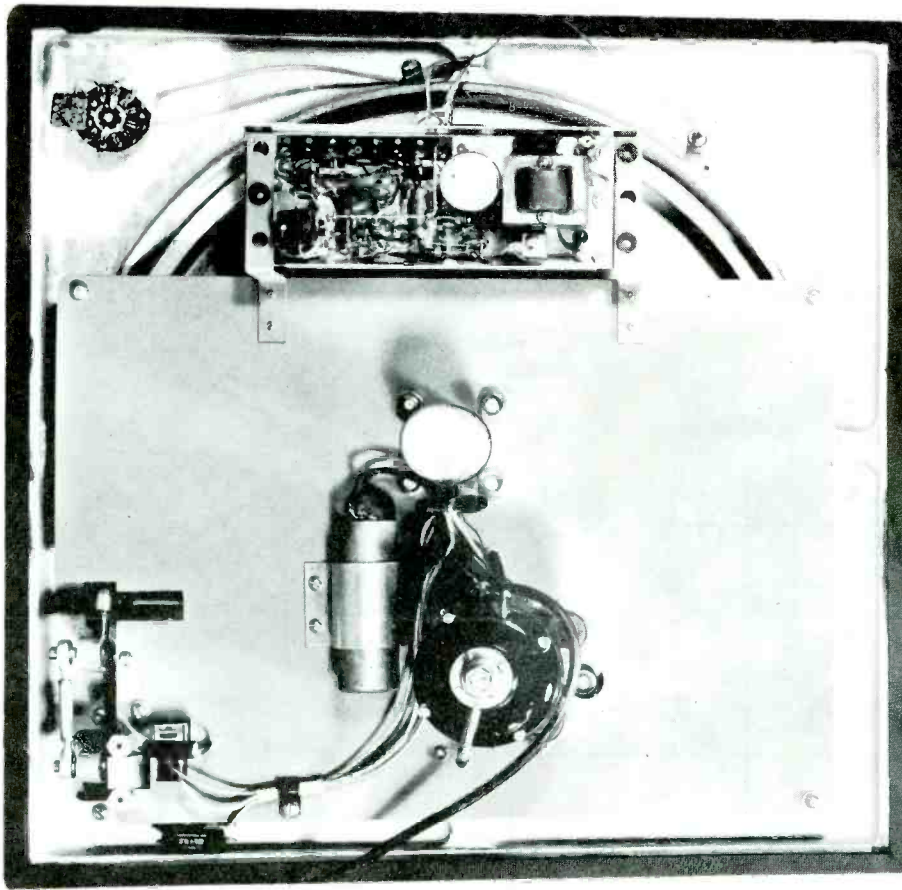
LEFT SIDE LOOKING FROM REAR

0

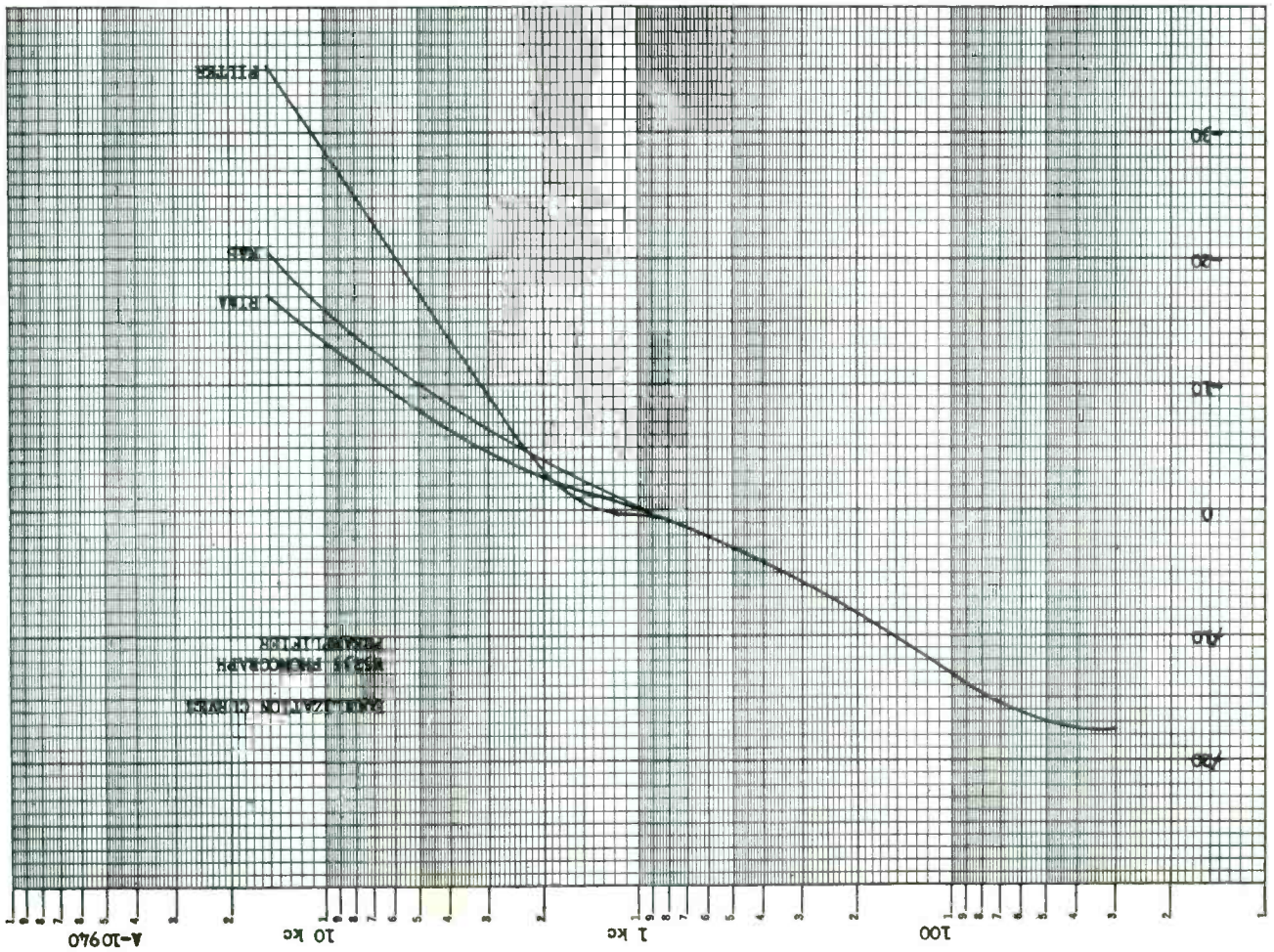
| Tolerances on Finished Dimensions unless otherwise marked | |
|---|-----------|
| Material | Dimension |
| Up to 1/4" | ± .005 |
| Above 1/4" to 1/2" | ± .004 |
| Above 1/2" to 3/4" | ± .003 |
| Above 3/4" to 1" | ± .002 |
| Above 1" | ± .001 |

| | |
|--|----------|
| CB-14 FILTER LAYOUT FOR FAIRCHILD FILTER | |
| MATL. | FIN. |
| DRAWN BY RGK | |
| DATE 1-29-53 | |
| CHECKED BY | |
| DATE | |
| GATES RADIO COMPANY QUINCY, ILLINOIS | |
| PART NO. | DWG. NO. |
| | SHEET 2 |
| | C-17027 |





A-10940



PARTS LIST

| Symbol No. | Part No. | Description |
|--------------|--------------|------------------------------------|
| C1 | 524 0075 000 | Capacitor, 40-20-20 mfd., 250 V. |
| C2, C5 | 506 0010 000 | Capacitor, .01 mfd., 400 (W) V. |
| C3 | 500 0193 000 | Capacitor, .0033 mfd., 500 (W) V. |
| C4 | 506 0004 000 | Capacitor, .05 mfd., 200 (W) V. |
| C6, C10 | 506 0007 000 | Capacitor, .5 mfd., 200 (W) V. |
| C8, C9 | 502 0039 000 | Capacitor, .00039 mfd., 500 (W) V. |
| CR1 | 384 0044 000 | Selenium Rectifier |
| F1 | 398 0015 000 | Fuse, 1/2 amp., 250 V. |
| R1 | 552 0541 000 | Control, 100 ohm, A-3404-17 |
| R2 | 540 0073 000 | Resistor, 10K ohm, 1/2W, 5% |
| R3 | 540 0196 000 | Resistor, 33K ohm, 1/2W, 10% |
| R4 | 540 0206 000 | Resistor, 220K ohm, 1/2W, 10% |
| R5 | 540 0200 000 | Resistor, 68K ohm, 1/2W, 10% |
| R6 | 540 0340 000 | Resistor, 2200 ohm, 1W, 5% |
| R7 | 540 0380 000 | Resistor, 100K ohm, 1W, 5% |
| R8, R12, R15 | 540 0097 000 | Resistor, 100K ohm, 1/2W, 5% |
| R9 | 540 0218 000 | Resistor, 2.2 megohm, 1/2W, 10% |
| R10, R17 | 540 0113 000 | Resistor, 470K ohm, 1/2W, 5% |
| R11, R14 | 540 0057 000 | Resistor, 2200 ohm, 1/2W, 5% |
| R13 | 550 0178 000 | Control, 500K ohm, A-3404-28 |
| R16 | 540 0092 000 | Resistor, 62K ohm, 1/2W, 5% |
| R18 | 540 0051 000 | Resistor, 1200 ohm, 1/2W, 5% |
| R19 | 540 0089 000 | Resistor, 47K ohm, 1/2W, 5% |
| S1 | 604 0005 000 | Toggle Switch |
| T1 | 472 0005 000 | Power Transformer |
| T2 | 478 0118 000 | Output Transformer, AO-10427-C |
| TB1 | 614 0069 000 | Terminal Board |
| TB2 | 614 0373 000 | Terminal Board, B-10105-2 |
| V1, V2 | 370 0116 000 | Tube, 12AX7 |
| XF1 | 402 0021 000 | Fuseholder |
| XV1, XV2 | 404 0044 000 | Socket |
| C7 | 910 9110 003 | Selected Capacitor, A-9110-3 |
| R20 | 540 0068 000 | Resistor, 6200 ohm, 1/2 W, 5% |
| R21 | 540 0073 000 | Resistor, 10K ohm, 1/2 W, 5% |
| S2 | 600 0362 000 | Switch, B-11139-17 |
| | 646 0278 000 | Plate, A-10884 |
| | 650 0008 000 | Knob, S-626-11 |

HI-FREQ. COMPENSATOR ASSEMBLY - A-10943-101

Gates Radio Company
Quincy, Illinois

INSTRUCTIONS M5235 EQUALIZED PREAMPLIFIER

SPECIFICATIONS

- Levels:** With G.E. VRII cartridge, input 12 mv. Output: -10 DBM maximum, -20 DBM normal.
- Distortion:** Less than 1% at -10 DBM output, from 50 to 15,000 cps. Input depends on cartridge loading. Output 150 and 600 ohms balanced or unbalanced.
- Impedances:** 55 DB below -20 DBM output.
- Noise:** Self-contained power supply.

Schematic for the preamplifier is shown on C-19343. It utilizes two 12AX7 tubes, with an RC feedback network around the first pair of triodes to provide the low frequency boost shown on the equalization curves. Straight feedback is used around the second pair of triodes to reduce distortion to a very low value.

High frequency roll-off shown on the curves is obtained by selecting various loading resistors for the cartridge in use. The value of resistance depends directly on the cartridge inductance, and in this case the resistors have been chosen to work in conjunction with the G.E. 520 mh group, such as the RX-050 and 4G-050.

In the filter position of the compensator a capacitor is shunted across the cartridge, effectively forming a low pass filter and providing a means of scratch suppression for noisy records.

The RIAA curve was adopted in 1954 by the recording industry as a standard. It also provides a close match to the old and new AEB, RCA Orthophonic, and new NARTB curves. The RAB curve provides equalization for transcription and early LP recordings.

In the event that a G.E. low impedance cartridge is used, change R20 to 2200 ohms, R21 to 4700 ohms and C7 to .05 mfd.

INSTALLATION

1. The photograph shows how the preamplifier is mounted on the Gates GB-100 and GB-500 turntable with the brackets provided. Many other methods of mounting are possible with other turntables. However, the length of cable from the cartridge should not exceed 4 or 5 feet.
2. The output pair, cartridge, a.c. line and external ground are connected to the turntable chassis and motor. schematic, C-19343. Ground should also be connected to the turntable chassis and motor.

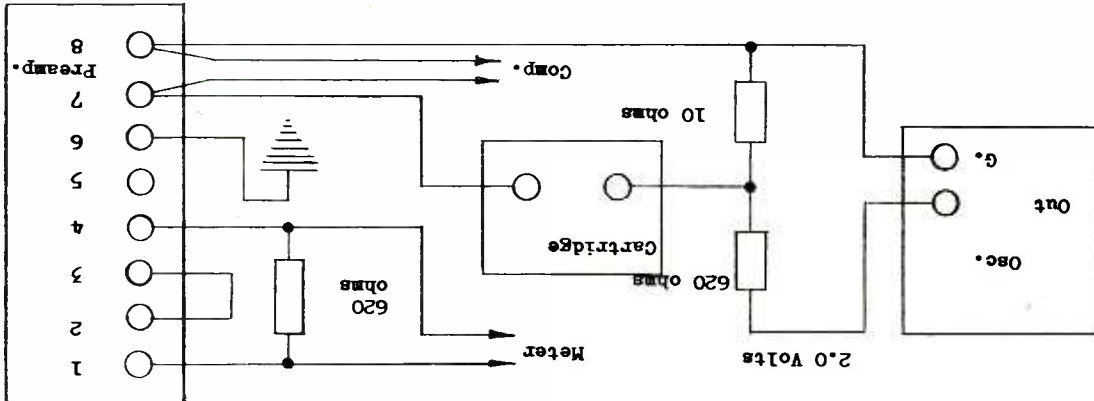
OPERATION

1. With the preamplifier operating into the control console, turn up the console and preamplifier gain controls to a point where hum can be heard in the monitor speaker, and adjust the hum balance control, R1, for a minimum.

2. The majority of broadcast consoles require a level at the turntable input of -20 DBM at 150 or 250 ohms. This output will be obtained with a G.E. cartridge when the gain control is rotated about 1/5 turn. The level can be checked by measuring the audio voltage between terminals 5 and ground with a VTVM. A voltage of .45 volts R.M.S. will provide an output level of -20 DBM.

TEST

If it is desired to test the performance of the preamplifier, use the test set up shown in the sketch.



Set the preamplifier level control to obtain -10 DBM output at the output terminals, at 1000 cps. The indicating meter should be a noise and distortion analyzer capable of reading down to -65 DBM. Check response. Below 1000 cps, reduce the output of the oscillator to maintain a constant pre-amplifier output level, and read the response from the oscillator decade settings. Above 1 KC, the oscillator output should be held constant at 2.0 volts and the response read on the output meter. Curves shown on A-10940 should be reproduced within ± 2 DB.

For noise and distortion checks, remove the cartridge. Set oscillator at 2.0 volts at 1 KC and adjust the preamplifier level control for -10 DBM output. Noise should be 65 DB below output level. This is dependent on input tube, hum balance and line polarity. For distortion, check from 1 KC to 15 KC with constant oscillator output; below 1 KC, reduce oscillator output to maintain constant preamplifier output. Distortion should be below 1%.

NOTE: If the above tests are made with the preamplifier output connected for 150 ohms, the actual output meter reading for the reference level will be -16 DB.



Gates Radio Company

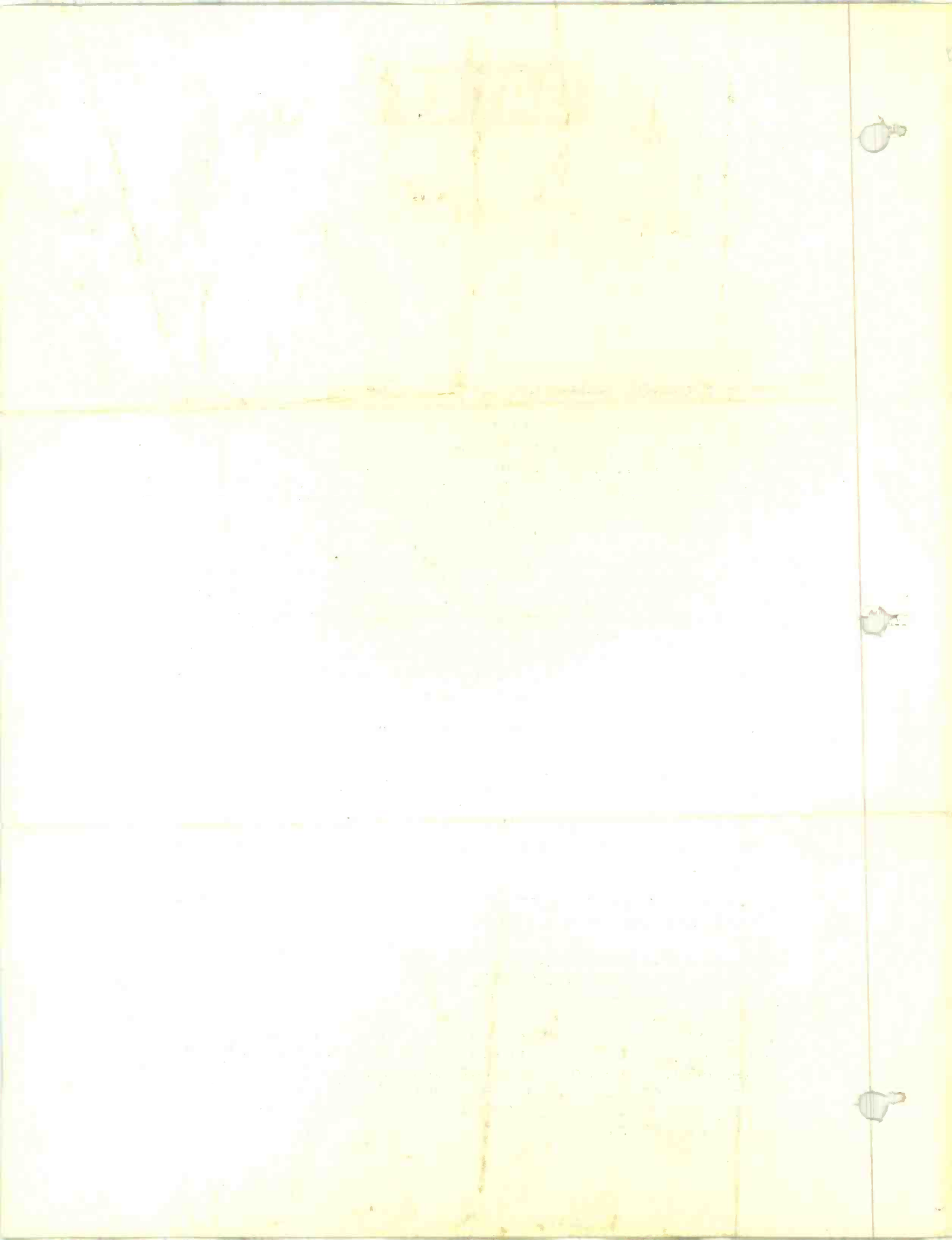
GATES CB-100 TURNTABLE A.C. SWITCH MODIFICATION

Gates Radio Company has always followed the policy of providing the best possible components in its equipment. Field tests have indicated that the A.C. push button switch, used on your Gates CB-100 Turntable, may be a potential source of trouble. In consideration of your best interests, the Gates Radio Company wishes to replace this switch at no cost to you.

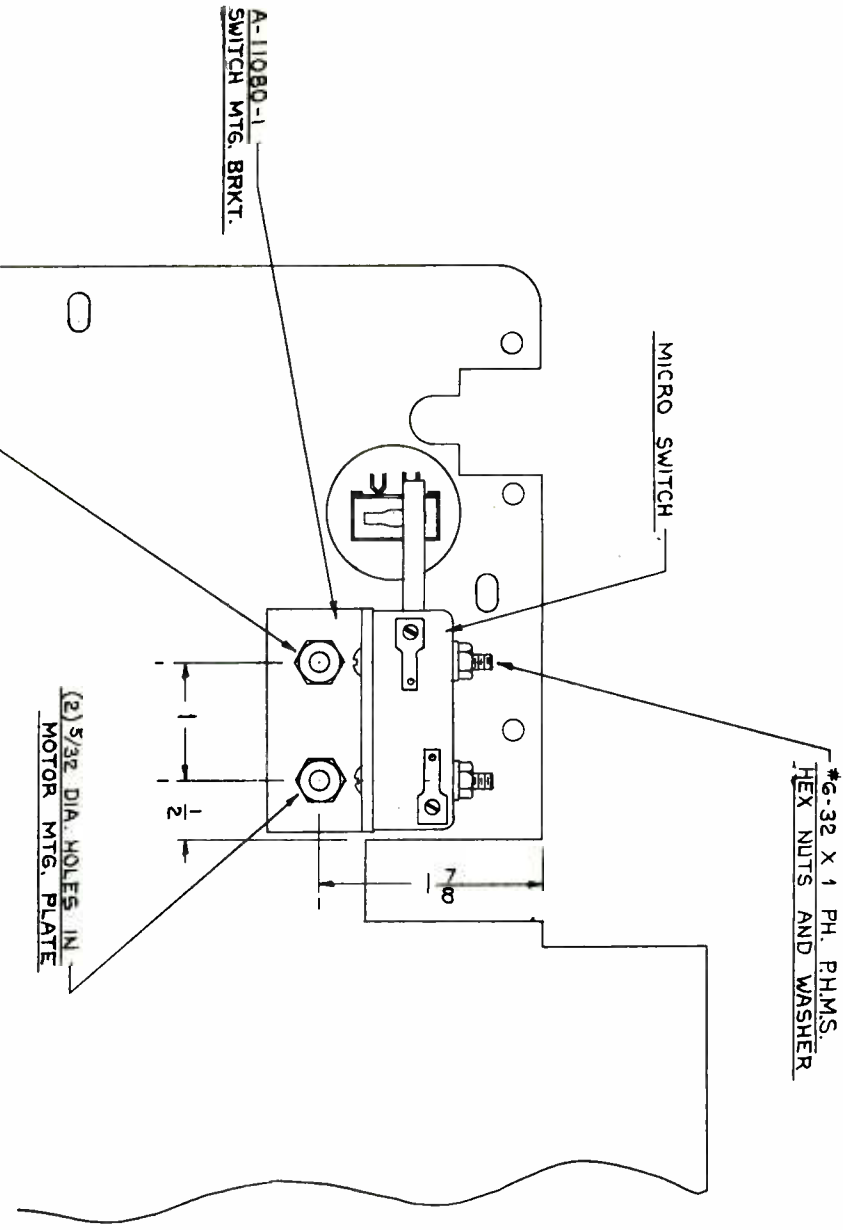
The M5296 Switch Kit, included in this package, is designed to be used in conjunction with the push button switch originally supplied with your CB-100 Turntable. The mounting bracket, hardware and microswitch, included in this package, can be easily installed in your turntable in a very short time. Please note that the new switch is used in conjunction with the original push button switch. The original push button switch provides the means of actuating the microswitch.

The following installation procedure is suggested:

1. Remove the two A.C. wires and the 0.1 mfd. condenser from the original push button switch.
2. Drill two 5-32 inch diameter holes in the motor mounting plate in accordance with the details on drawing B-13505.
3. Attach the microswitch to the mounting bracket A-11080-1 with the hardware as indicated on drawing B-13505.
4. Attach the mounting bracket and microswitch to the turntable mounting plate, using the hardware indicated on drawing B-13505.
5. Connect the A.C. wires and the 0.1 mfd. condenser to the microswitch as indicated on drawings A-11035 or A-10870. Please note that drawing A-11035 applies if your turntable employs an Ashland motor, and that drawing A-10870 applies if your turntable uses the Bodine motor.



DRAWING NUMBER
B-13505



#6-32 x 1/2 PH. PH.M.S. HEX NUTS & LOCKWASHERS

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|---|--------------|
| MODIFICATION DRAWING AND MFG. DETAIL OF SWITCH KIT FOR CB100TT, M5296 | |
| REV. NO. | DATE |
| 1 | 11-11-55 |
| ECN 6355 | REVX |
| DR. BY D.L. | CHK. BY |
| DATE 10-6-55 | DATE 11-6-55 |
| GATES RADIO COMPANY QUINCY, ILLINOIS | |
| B-13505 | |

