INSTALLATION AND OPERATING INSTRUCTIONS FOR M-6034 TRANSISTOR PREAMPLIFIER

TECHNICAL DATA

GAIN:	45 DB ±1 DB operated into a 600 ohm load.
FREQUENCY RESPONSE:	±1 DB, 30 cps to 15,000 cps.
HARMONIC DISTORTION:	Under 0.5% from 50 cps to 15 KC at +5 DBM output. Under 0.5% from 30 cps to 15 KC at −50 DBM output.
INTERMODULATION DISTORTION:	Under 0.5% at −5 DBM output level, and under 1.0% at +5 DBM output level. Distortion measured at equivalent sine wave output using 40 cps and 7 KC mixed 4 to 1.
NOISE LEVEL:	−122 DBM equivalent input noise.
SOURCE IMPEDANCE:	30/50 and 150/250 ohms.
INPUT IMPEDANCE:	Input transformer unloaded, resulting in input impedance being substantially higher than source impedance.
OUTPUT LOAD IMPEDANCE:	600 ohms ±10%.
MAXIMUM INPUT LEVEL:	−40 DBM.
MAXIMUM OUTPUT LEVEL:	+5 DBM.
MAXIMUM OPERATING AMBIENT TEMPERATURE:	55° C. (131° F.)
MAXIMUM STORAGE AMBIENT TEMPERATURE:	85° C. (185° F.)
POWER REQUIREMENTS:	−30 V. DC at 15 ma with less than .1 MV ripple.
TRANSISTORS:	3 - 2N5087 1 - 40319
MOUNTING:	Requires M-6039 mounting frame.
SIZE:	3-1/4" Wide x 6-3/8" Long x 1" Thick.

DESCRIPTION

The Gates M-6034 Transistor Preamplifier is a premium quality low noise unit for use in consoles, and is completely temperature compensated using the latest techniques. The amplifier has a gain of 45 DB with a maximum output is unbalanced and transformerless, which is designed to operate into a 600 ohm variable attenuator.

The input is balanced, and is connected for 150/250 ohm source impedance at the factory but may be reconnected for 30/50 ohms.

THEORY OF OPERATION

This amplifier is designed to provide a fixed gain of 45 DB. It is a four-stage amplifier and utilizes a transformerless output. It features negative feedback to reduce distortion to a very low level and minimizes specification changes with transistor changes.

Signal is applied to pins C and E and is fed through transformer, T1, to the base of Q1 (2N1307). Q1 is a low noise transistor operated at ideal collector current for minimum noise. It will be noted that the first stage is series fed through T1 to provide the maximum input gain from T1. C1 and R1 are connected across the secondary of T1 to stabilize the amplifier. The value of R1 and C1 were picked to provide a roll off above the audio range to prevent amplification of very high frequency noise.

The signal is then direct coupled from the collector of Q1 to the base of Q2. Q2 is a very high gain stage because the emitter is completely by-passed. The signal is then coupled from the collector of Q2 (thru C8) to Q3. The collector of Q3 is direct coupled to the base of Q4. Q4 is an emitter follower. Emitter followers are very stable and are virtually distortionless. This also provides the low output impedance required to feed a 600 ohm fader. Feedback is applied from R17 through R13 and C9, R7 and C5 to the emitter resistor (R6) of the first stage. R13 and C9 provide a boost of 1 DB at 30 cps to make the response flat in the audio range.

MAINTENANCE

Transistor amplifiers are designed for a long trouble-free life, however, dust and dirt can cause trouble. A monthly dusting with a soft brush should be adequate.

SHOULD TROUBLE OCCUR -

Step 1 - First check all DC voltages. The DC voltages determine the bias points of the transistors and any departure of 20% or more should be considered a defect. NOTE: Use of the resistance chart will help detect faulty components.

Step 2 - Before any signal measurements are made, replace any defective parts to make DC voltages correct.

Step 3 - After all DC voltages are correct, signal tests may be performed. The correct (RMS) voltages are shown on the schematic diagram. Voltages shown are for −40 DBM input @ 150 ohms not terminated.

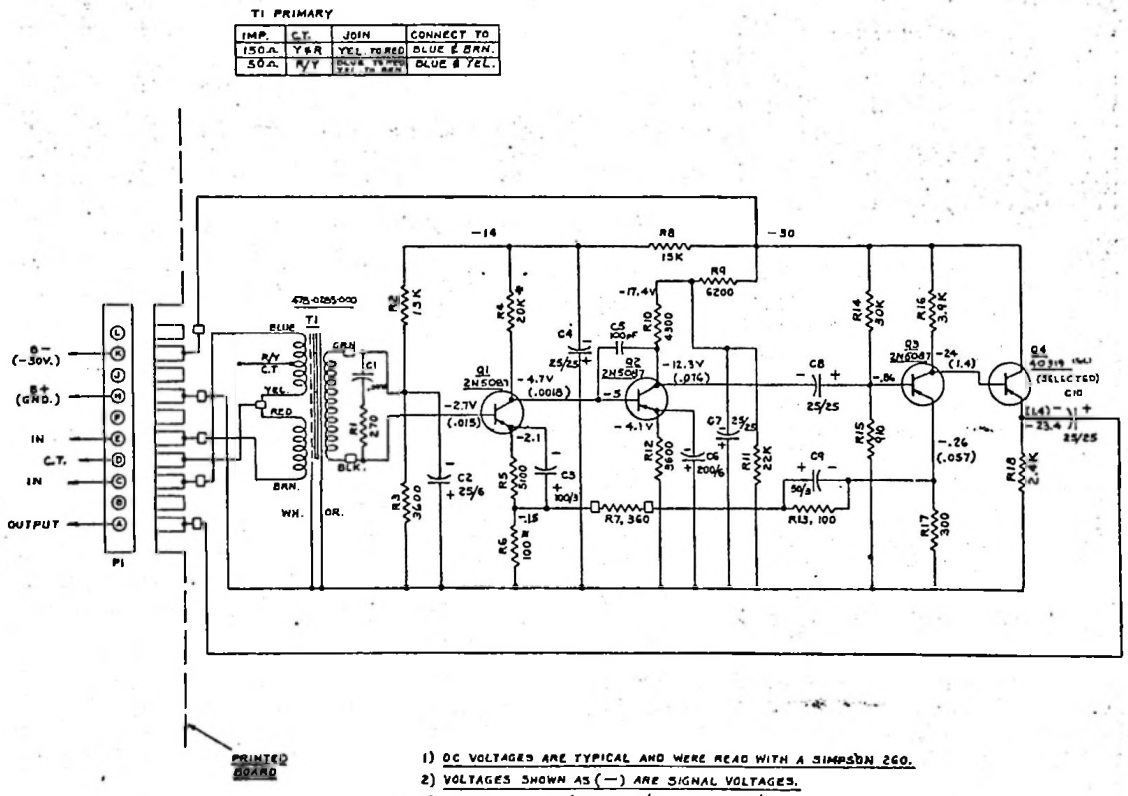
DO NOT remove or insert transistors with the power ON.

Gates Radio Company
Quincy, Illinois

REMEMBER - In this transistor circuitry B+ is ground, therefore, capacitors have the positive side connected to ground.

NOT probe the printed board with the power ON with a metal screwdriver, etc., that could short out wiring.

Symbol No.	Gates Stock No.	Description
C1	508 0349 000	Cap., .0075 uf, 100 V.
C2	522 0178 000	Cap., 25 uf, 6 V.
C3	522 0160 000	Cap., 100 uf, 3 V.
C4, C7, C8, C10	522 0242 000	Cap., 25 uf, 25 V.
C5	500 0759 000	Cap. 100 PF, 500V.
C6	522 0187 000	Cap., 200 uf, 6 V.
C9	522 0158 000	Cap., 50 uf, 3 V.
Q1, Q2, Q3	380 0112 000	Transistor 2N5087
Q4	380 0171 000	Transistor 40319 (Selected)
R1	540 0035 000	Res., 270 ohm, 1/2 W., 5%
R4	548 0050 000	Res., 20K ohm, 1/2 W., 1%
R3	540 0062 000	Res., 3600 ohm, 1/2 W., 5%
R5	540 0066 000	Res., 5100 ohm, 1/2 W., 5%
R6	548 0049 000	Res., 100 ohm, 1/2 W., 1%
R7	540 0038 000	Res., 360 ohm, 1/2 W., 5%
R8	540 0077 000	Res., 15K ohm, 1/2 W., 5%
R9	540 0068 000	Res., 6200 ohm, 1/2 W., 5%
R10	540 0064 000	Res., 4300 ohm, 1/2 W., 5%
R11	540 0081 000	Res., 22K ohm, 1/2 W., 5%
R12	540 0062 000	Res., 3600 ohm, 1/2 W., 5%
R13	540 0025 000	Res., 100 ohm, 1/2 W., 5%
R14	540 0084 000	Res., 30K ohm, 1/2 W., 5%
R15	540 0048 000	Res., 910 ohm, 1/2 W., 5%
R16	540 0063 000	Res., 3900 ohm, 1/2 W., 5%
R17	540 0036 000	Res., 300 ohm, 1/2 W., 5%
R18	540 0058 000	Res., 2400 ohm, 1/2 W., 5%
R2	540 0076 000	Res., 13K ohm, 1/2W., 5%
T1	478 0285 000	Transformer, Input
XQ4	404 0198 000	Transipad



1) DC VOLTAGES ARE TYPICAL AND WERE READ WITH A SIMPSON 260.
2) VOLTAGES SHOWN AS (—) ARE SIGNAL VOLTAGES.
3) ALL RESISTORS 1/2 WATT, 5% EXCEPT @ 1%.
4) ALL CAPACITORS IN MFD. WITH D.C.W.V.
5) ◻ INDICATES SOLDER LUG.