INSTRUCTIONS

GEK-24940B

AMPLIFIER CARD

193X256A_G01

These instructions do not purport to cover all details or variations in equipment nor to provide for every possible contingency to be met in connection with installation, operation or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred General Electric Company

GENERAL ELECTRIC

GEK-24940B (9/86) 1M (P)

SECTION 1.0

GENERAL

This instruction provides the basic information required to start-up and troubleshoot the Amplifier Card. Refer to the system diagrams to determine how the card is used in the overall system.

SECTION 2.0

DESCRIPTION

This card contains: Six operational amplifiers, OA1—OA6 for general purpose use. OA1 and OA2 contain adjustable output clamps. 1LIM+ will limit the positive voltage excursion of OA1, 1LIM— limits the negative voltage excursion of OA1. 2LIM+ and 2LIM— limit the output of OA2.

Four potentiometers P801, P802, P803 and P804 are provided.

Two diode networks are provided.

SECTION 3.0

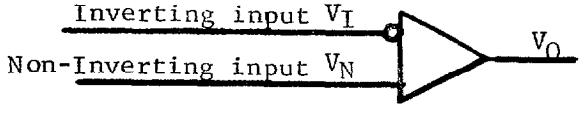
START—UP/CHECKOUT

There are 4 limit and 4 potentiometer adjustments which may be made on this card. Refer to the system diagram for settings

SECTION 4.0

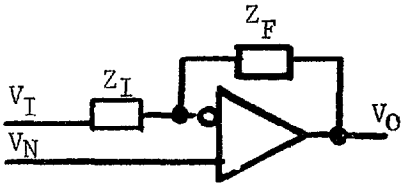
TROUBLESHOOTING

As an aid to troubleshooting, a brief description of an operational amplifier follows:



The output voltage is approximately 20,000 times the difference between the voltage on the non-inverting input and the inverting input, i.e., $V_O = 20{,}000 \times (V_N - V_I)$. As long as the output voltage is not in clamp or saturation, the difference between V_N and V_I is essentially zero. It should be noted that the voltage to common of the inputs has no affect on the output

A bias current will flow into each input. This current is constant and is approximately 1/2 microamp. Each input must be connected to provide a path for this current. For an op amp connected as shown below:



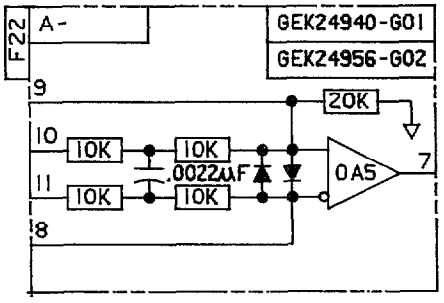
$$V_O = V_N + \frac{Z_F}{Z_I}(V_N - V_I)$$

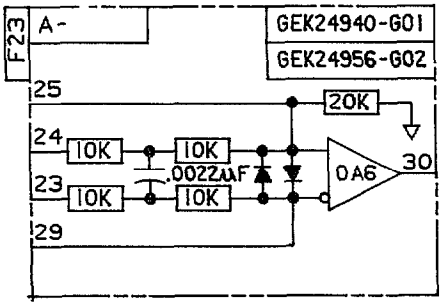
The output of an op amp is short circuit-proof and will swing a minimum of ±10 volts with a 2K ohm resistive load. Capacitive loads will cause oscillation unless driven by the buffered output of OA3 or OA4 (tabs 12 and 9X)

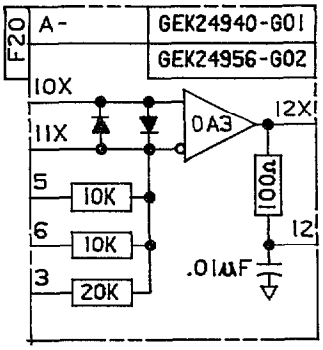
Check that ±20V and common are applied to the card.

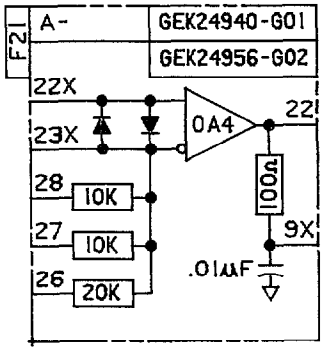
Check that the output clamps are not set too low or that the connected load is not less than 2000 ohms.

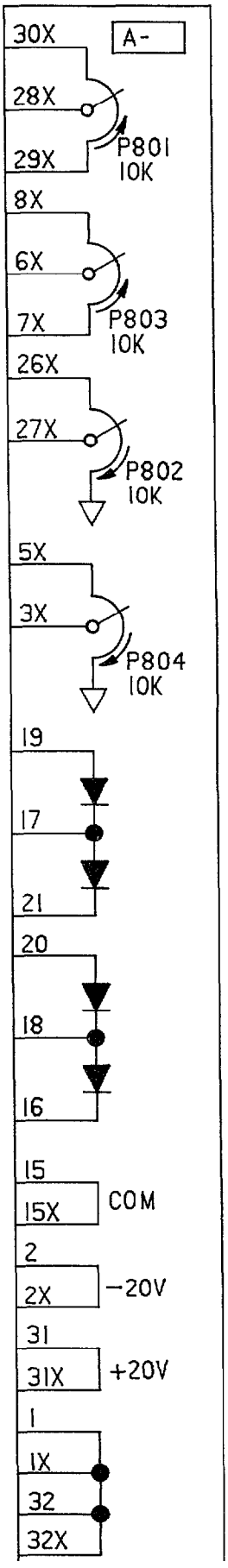
Analyze the input/output to determine if the input signal is improper or if the amplifier is defective.

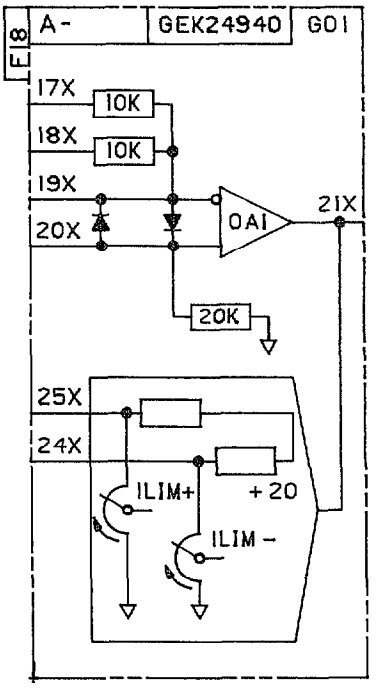

F22
A-
GEK24940-G01
GEK24956-G02
9
20K
10
10K
10K
.0022μF
0A5
7
11
10K
10K
8

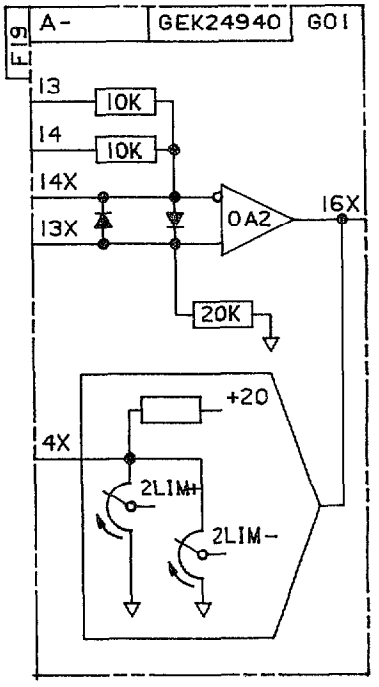

F23
A-
GEK24940-G01
GEK24956-G02
25
20K
24
10K
10K
.0022μF
0A6
30
23
10K
10K
29

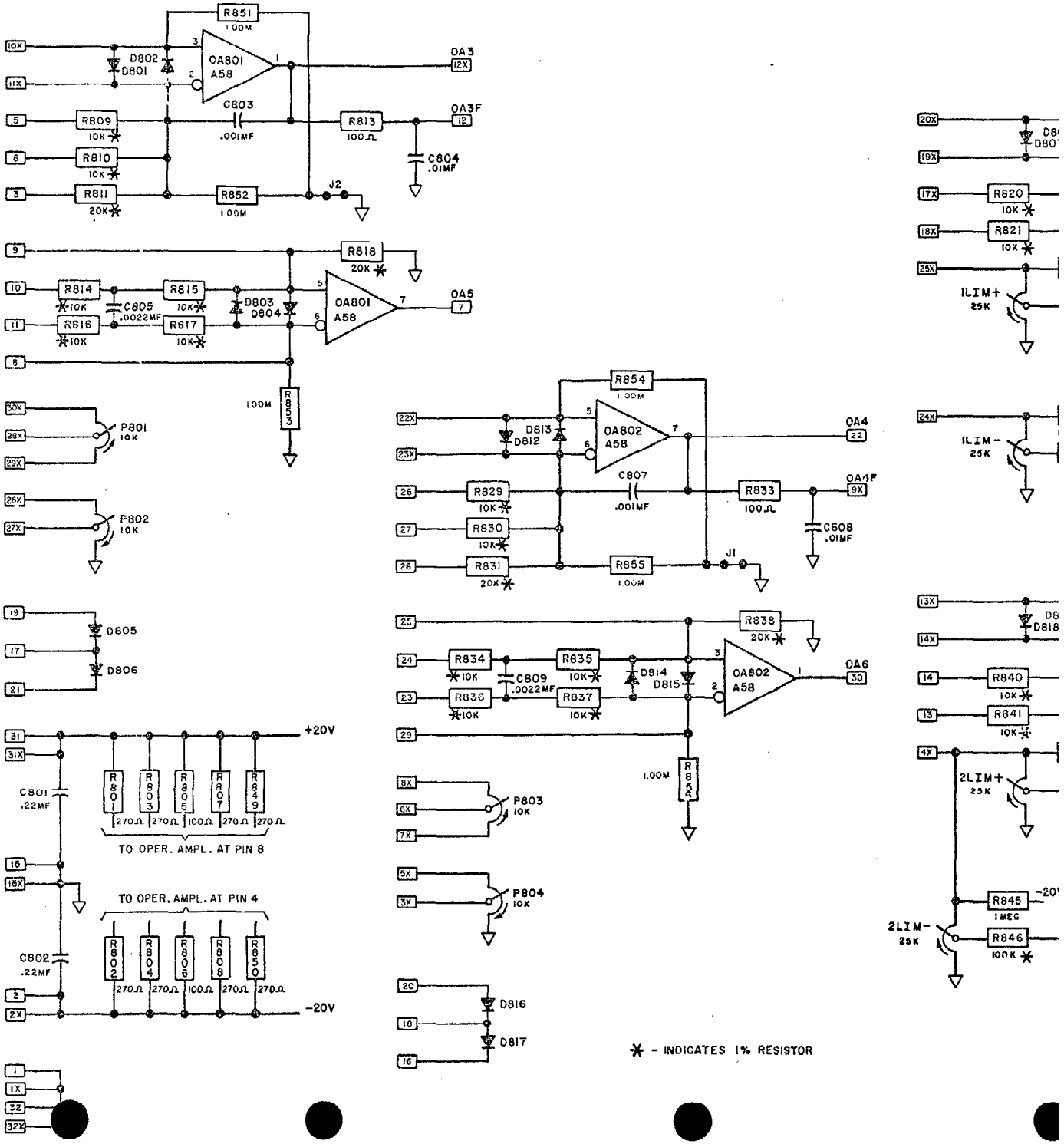

F20
A-
GEK24940-G01
GEK24956-G02
10X
11X
0A3
12X
100Ω
5
10K
6
10K
12
3
20K
.01μF

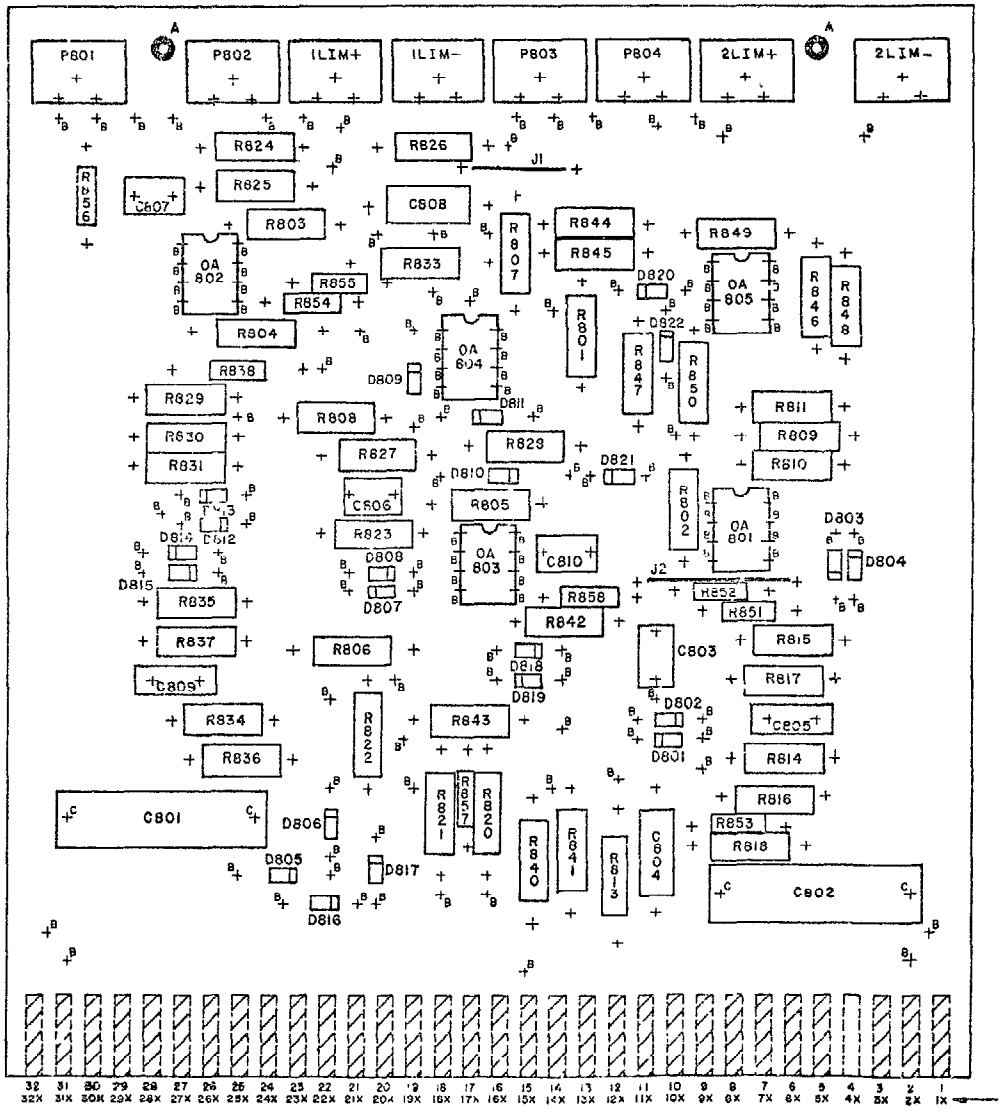

F21
A-
GEK24940-G01
GEK24956-G02
22X
23X
0A4
22
100Ω
28
10K
27
10K
9X
26
20K
.01μF


30X
A-
28X
P801
10K
29X
8X
6X
P803
10K
7X
26X
27X
P802
10K
5X
3X
P804
10K
19
17
21
20
18
16
15
15X
COM
2
2X
−20V
31
31X
+20V
1
1X
32
32X


F18
A-
GEK24940
G01
17X
10K
18X
10K
19X
20X
0A1
21X
20K
25X
24X
ILIM+
+20
ILIM−


F19
A-
GEK24940
G01
13
10K
14
10K
14X
13X
0A2
16X
20K
+20
4X
2LIM+
2LIM−


R851 1.00M
10X
11X
D802
D801
OA801 A58
OA3
12X
C803 .001MF
5
R809 10K
R813 100Ω
OA3F
12
6
R810 10K
C804 .01MF
3
R811 20K
R852 1.00M
J2
9
R818 20K
10
R814 10K
C805 .0022MF
R815 10K
D803 D804
OA801 A58
OA5
7
11
R816 10K
R817 10K
8
1.00M R
30X
P801 10K
28X
29X
26X
P802 10K
27X
19
D805
17
D806
21
31
+20V
31X
C801 .22MF
R801 270Ω
R803 270Ω
R805 100Ω
R807 270Ω
R849 270Ω
TO OPER. AMPL. AT PIN 8
16
16X
TO OPER. AMPL. AT PIN 4
C802 .22MF
R802 270Ω
R804 270Ω
R806 100Ω
R808 270Ω
R850 270Ω
2
2X
-20V
1
1X
32
32X
R854 1.00M
22X
D813
D812
OA802 A58
OA4
22
23X
C807 .001MF
26
R829 10K
R833 100Ω
OA4F
9X
27
R830 10K
C808 .01MF
26
R831 20K
R855 1.00M
J1
25
R838 20K
24
R834 10K
R835 10K
C809 .0022MF
D814
D815
OA802 A58
OA6
30
23
R836 10K
R837 10K
29
1.00M R
8X
P803 10K
6X
7X
5X
P804 10K
3X
20
D816
18
D817
16
* - INDICATES 1% RESISTOR
20X
D8
D807
19X
17X
R820 10K
18X
R821 10K
25X
ILIM+ 25K
24X
ILIM- 25K
13X
D8
D818
14X
14
R840 10K
13
R841 10K
4X
2LIM+ 25K
R845 1MEG
-20
2LIM- 25K
R846 100K



SEE NOTE 1 & 2

GROUP	KEY LOCATIONS			
02	12-13	13-14	19-20	30-31

HOLE TABULATION

ALL HOLES .040 DIA EXCEPT THE HOLES TABULATED BELOW

LOC.	DIA	QUAN
A	.157	2
B	.032	
C	.052	4

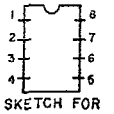
SEE DRILL AND TRIM DIAGRAM 36A398581AA

NOTES

1. INDICATED TAB NUMBERS CORRESPOND TO MATCHING RECEPTACLE NUMBERS
2. CROSS HATCHED TABS INDICATES TABS USED.
3. CARD SIZE, $5.500^{+.000}_{-.015}$ X $5.130^{+.002}_{-.008}$
4. THIS CARD HAS GOLD PLATED TABS ON BOTH SIDES TABS I THRU 32 ARE LOCATED ON THE REVERSE SIDE. TABS IX THRU 32X ARE LOCATED ON THE COMPONENT SIDE OF THE CARD. TAB IX IS OPPOSITE TAB I AND ETC. THE TAB NUMBERS SHOWN ARE THOSE USED ON THIS CARD.
5. ALL OP AMPS SHALL BE MOUNTED TO A .50 INCH MAXIMUM ABOVE THE CARD SURFACE.

OP AMP LEAD SKETCH

(TOP VIEW)



SKETCH FOR OA801, OA802, OA803, OA804, OA805

2X	36A353861AB005	36A353862AB005	1	—
SCALE	REAR ETCHED BOARD DWG.	FRONT ETCHED BOARD DWG.	FRONT SPACE	BACK UNIT REQUIREMENT

GENERAL ELECTRIC COMPANY
SPEED VARIATOR PRODUCTS OPERATION
ERIE, PENNSYLVANIA 16531

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