



INSTRUCTIONS

GEK-24974A

FIELD REVERSING PANEL

CARD ELEMENTARY & PANEL DIAGRAM

36C764165AD

36C764899AB

REFER TO THE DRIVE SYSTEM INSTRUCTIONS AND ELEMENTARY DIAGRAMS
FOR DESCRIPTIONS, ADJUSTMENTS AND ON-CARD JUMPER CONNECTIONS.

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 to General Electric Company.

GENERAL  ELECTRIC

FIELD REVERSING PANEL

The FRP (Field Reversing Panel) provides reversing voltage to a motor field in order to provide motor rotation in either direction. FRC (Field Reversing/Anti-Plugging Card), a printed circuit card, provides signal level comparisons that operate relays APR (Anti-Plugging) and FR (Field). An MFC (Motor Field Control) is used with field reversing to raise and lower field current (by signals RF and ZF from the FRP to MFC) such that field voltage is reversed with low power on the contacts of FC and RC. The MFC provides a field loss function that is inhibited during field switching by a signal RF from the FRP to MFC. Field economy is usually provided by the MFC. The MFC may also be used to provide field weakening for operation above base speed.

Dynamic Braking is usually provided with Field Reversing to provide deceleration control.

Forward and Reverse selection is made by dashed circuitry on the FRP elementary at FRP terminals (3), (4), (5), (6) and (7). These terminals are accessed through 4TB on the lower right side wall of power unit assembly:

4TB	1	2	3	4	5
FRP	3	4	5	6	7

Signal MAC changes from zero to -20 volts when RUN or JOG is initiated. MAC causes MAX and MA to pick up if no fault exists. Field excitation is applied when MAC at FRP (20) goes to -20 volts. At this time the APR relay picks up, making the selected forward, FC, or reverse, RC contactor pick up. At the same time, the VR relay drops out to disconnect the RF point from +20 volts, which makes the field current go to the level set by the FMAX potentiometer on the MFC card. As field current is applied, the FR relay drops out to latch in the selected contactor.

As the motor speed is increased, the CEMF signal goes from zero to approximately -5 volts at rated armature voltage to latch in the APR relay. With MAC returned to zero volts (STOP), APR will drop out as the CEMF voltage is reduced to a level corresponding to approximately 10% of rated armature voltage. The drop out level is adjustable by the APR potentiometer on the FRC card from 8% to 40%. Normally, the APR potentiometer should be set fully CCW for an 8% drop out level.

Interlocks from APR prevent FC or RC from dropping out except at low armature CEMF (speed). An additional APR interlock in conjunction with FR and VR interlocks is used with external control to insure that MAC does not return to -20 volts and the MA contactor is not picked again except at low armature CEMF. This also prevents dropout of DB (dynamic braking), thus, DB does not normally interrupt power except at low voltage and current.

With the drive stopped, the MFC card is programmed into its Field Economy mode; i.e., the field current is reduced to about 70% of normal while the motor is at standstill.

Now, if the Forward/Reverse selection is changed the VF relay picks up, +20V is applied to RF and the field is programmed off. The voltage at SFC is proportional to field current and when a low level is reached the FR relay picks up and the field contactor drops out.

As the contacts open, the stored energy in the field inductance causes arcing between the contact tips for a few milliseconds until a pre-charged capacitor C1 is applied across the output terminals. The capacitor will shunt the current away from the contact tips to extinguish the arcing almost instantly. The field current will quickly reverse the capacitor charge, but the voltage will be clipped by the metal oxide varistor, MOV, which now quickly dissipates the remaining inductive field energy. FC or RC now picks up as previously described.

The level at which the FR relay picks up to initiate switching is adjustable by the FR potentiometer on the FRC card. Generally, the potentiometer is turned fully CCW for a minimum switching level. If any appreciable arcing occurs during the switching of the field contactor the FR potentiometer must be turned CCW.

TPA of the FRC is generally connected to FRP (8) then to MCC (DM2), then to MCC (FEA) (MCC is the Main Control Card). This connection delays Field Economy until DB is complete. Removal of the jumper MCC (FEA) to MCC (DM2) will provide a "softer" deceleration.

DP2 is a signal furnished with the Diagnostic option to replace the normal function of MAC during diagnostic operation.

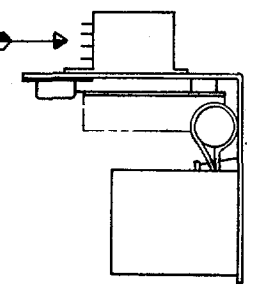
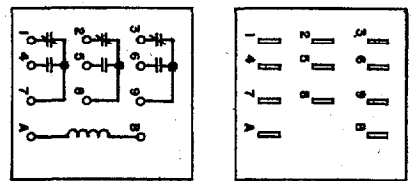
If an AC power is lost or disconnected during operation, VRX relay contact will provide a discharge path for the field current as the VRX relay drops out. Following application of AC power the VRX relay will not pick up until the drive is started.

UNIT ESC OBTAINED SPECIFIED USE THE FOLLOWING—

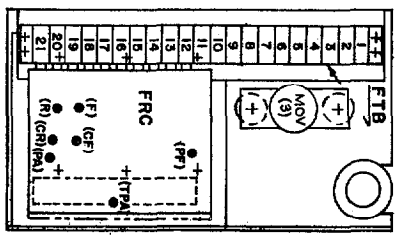
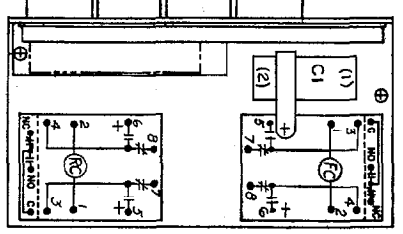
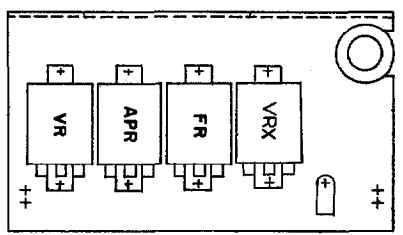
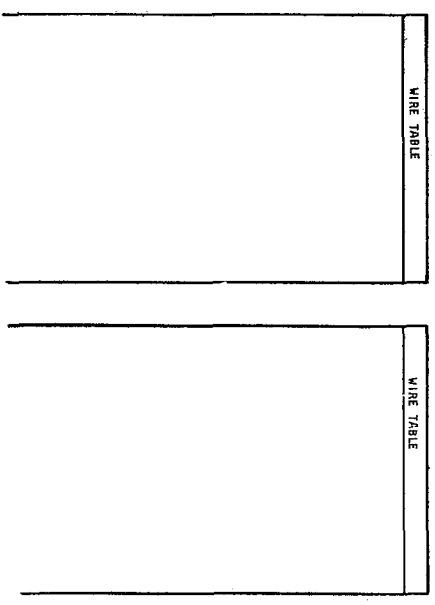
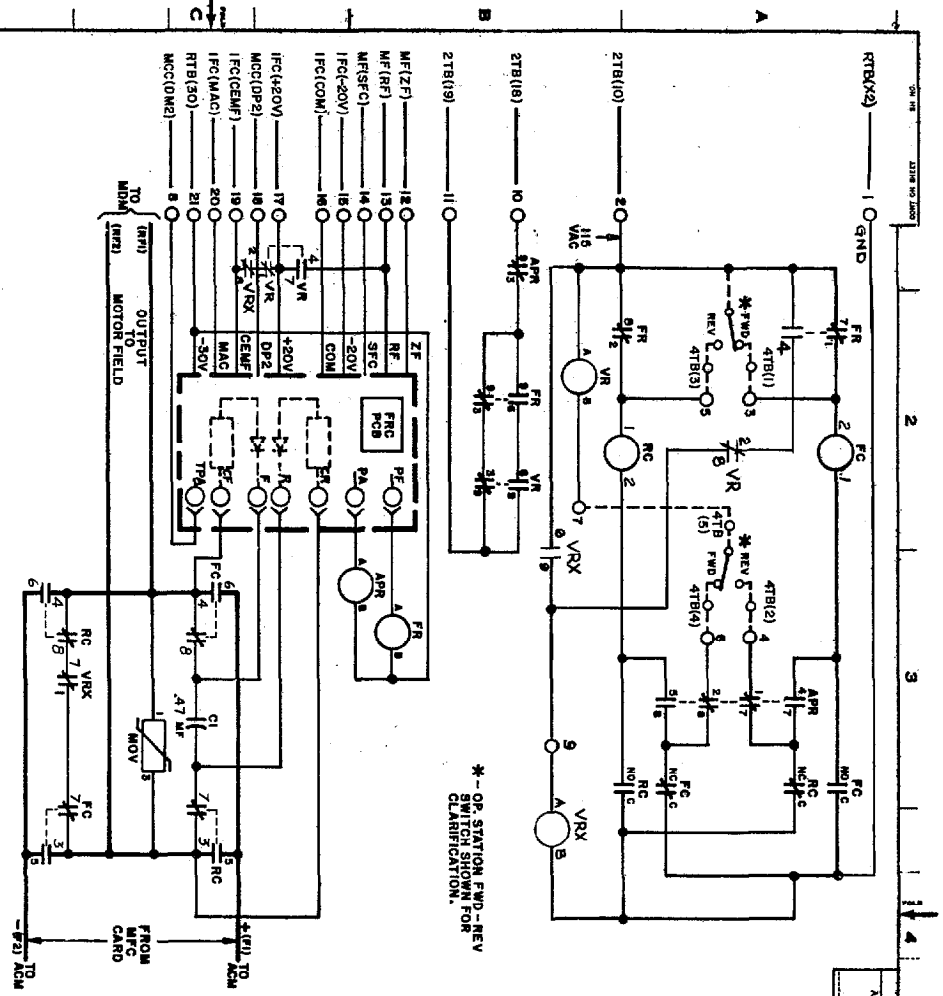
APPLIED PRACTICES	SURFACES	FASTENERS	WELDING OR ADHESIVE CONNECTIONS	PAINTS
✓	+	+	+	+

FIRST MADE FOR VALUTROL, TB

RELAY
 VIEWED IN DIRECTION
 OF ARROW "A"



* - OP. STATION FWD - REV SWITCH SHOWN FOR CLARIFICATION.



REVISIONS

NO.	DATE	DESCRIPTION
1	11/20/68	REVISED
2	1/22/69	REVISED
3	1/22/69	REVISED
4	1/22/69	REVISED
5	1/22/69	REVISED

DATE OF THIS DRAWING: JAN 22, 1968
 SPEED VARIATOR
 ERIE, PA., U.S.A.
36C764899AB

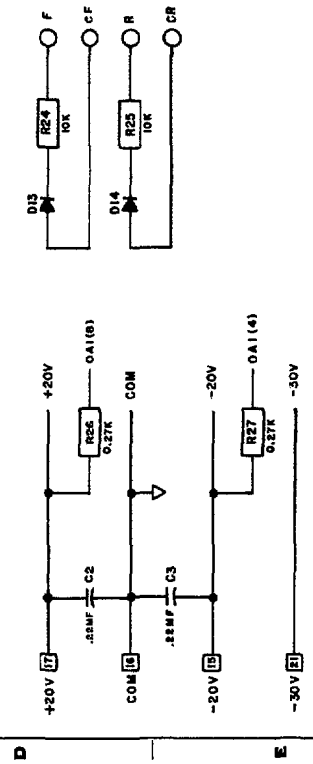
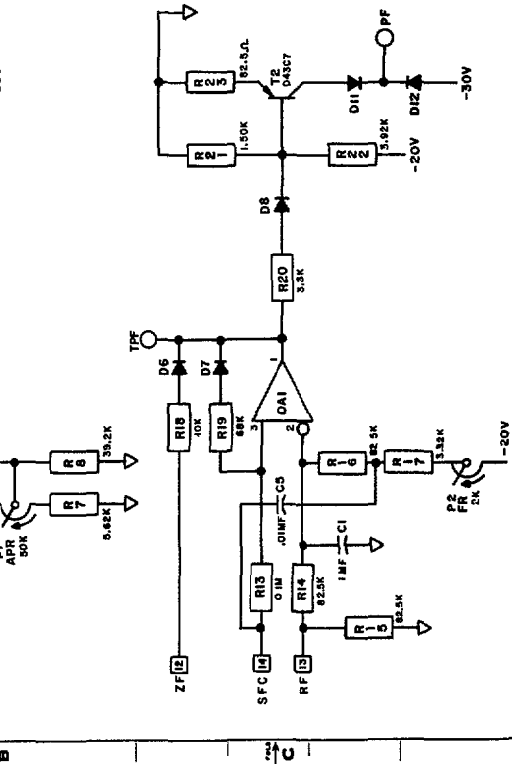
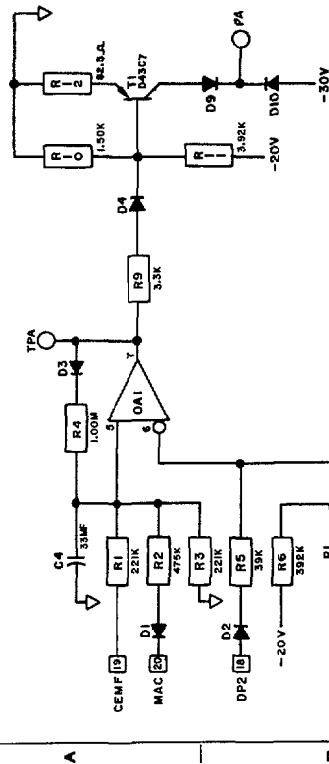
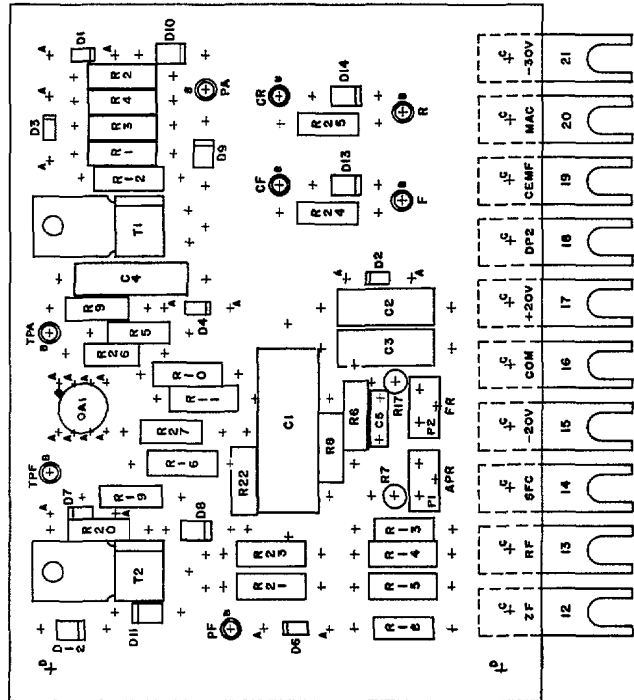
PRINTS TO

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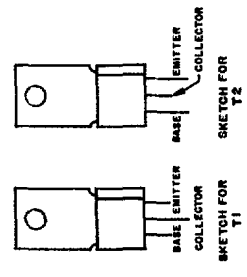
1 2 3 4 5

HOLE TABULATION
ALL HOLES .040 DIA.
EXCEPT THE HOLES
TABULATED BELOW
LOC. DIA. DIST. DIA.
A .032 .20
B .070 .8
C .128 .10
D .157 .2

NOTE
CARD SIZE, 4.250" x 3.250" x .003



TRANSISTOR LEAD SKETCHES (TOP VIEW)



OP AMP LEAD SKETCH (TOP VIEW)



SCALE	ETCHED CIRCUIT BOARD DWG.	SPACE UNIT REQUIREMENT	FRONT	BACK
2X	36A35923A004			
PRINTS TO				
REV. NO.	DATE	BY	CHKD.	APPROVED
1	11/15/66	J. J. M. / J. J. M.	J. J. M.	J. J. M.
REVISIONS				
NO.	DATE	BY	CHKD.	APPROVED
1	11/15/66	J. J. M. / J. J. M.	J. J. M.	J. J. M.

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