

M O D E L

PD-420

SERIES 21801

SM Series 21801

April 1970

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INTRODUCTION

This manual describes the Series 21801, 21801A, and 21801B Perforator Drivers.

The Series Drivers are identical, except for input power. Power requirements are as follows:

S21801	115VAC, 60 Hz
S21801A	230VAC, 50 Hz
S21801B	115VAC, 50 Hz

The drivers are designed to meet the input requirements of the Model 420—Series 21408, 21408A, 21408B, and 21408D—Tape Perforators. The driver supplies drive coil pulses of the proper amplitude and duration for the eight data channel coils, the sprocket coil, and the tape reverse coil of the perforator. It also provides properly spaced pulses for advancing sprocketed tape from the perforator when the latter's BUZZ (Tape Feed) switch is pressed.

The unit is 6-1/4 inches wide, 8-1/2 inches high, and 16-1/2 inches deep. It weighs 21 pounds with accessories. Shipping weight is 26 pounds.

ENVIRONMENT

The drivers are designed for continuous operation in a temperature range of 50 to 110 degrees Fahrenheit at 20 to 85 percent relative humidity—as long as condensation is not produced. They may be stored at 0 to 150 degrees Fahrenheit in a relative humidity of 0 to 95 percent.

OUTPUT

The drivers provide shaped pulses, capable of operating the Series 420 Perforators using 48 volt drive coils. Primary power for the perforator is routed through the driver.

INPUT REQUIREMENTS

The drivers are designed to operate at 115 volts AC $\pm 10\%$, 50 or 60 ± 1.5 Hz, or 230 volts AC $\pm 10\%$ at 50 ± 1.5 Hz—according to series number. The power is fused in the driver with a single fuse. All signal outputs are terminated in a connector which mates with the perforator input connector. All signal input connections are made through a connector, mounted on the driver chassis.

All trigger circuits are biased to reject any signal which is less than three volts in amplitude and less than 16 microseconds in duration. This provides an acceptable signal-to-noise ratio which reduces false triggering caused by wiring cross talk and impulse noise.

Each of the driver's data channels, the sprocket and tape reverse coils may be operated through a separate positive pulse network. Input pulses must be from 4 to 15 volts in amplitude and 4.5 ± 0.5 milliseconds in duration. The rise and fall time should be no greater than 50 microseconds. The maximum repetition rate is no less than 16.67 milliseconds, leading edge to leading edge.

Data and sprocket pulses must be simultaneous within ± 25 microseconds, to operate the perforator at maximum speed. No sprocket input should be applied when the reverse step is pulsed.

ELECTRICAL OPERATION

DATA CHANNEL OPERATION

(See Figure 1)

Since all data channels are identical, only the channel eight (8) punch sequence will be explained.

NOTE: In the following circuit description, the Integrated Circuits are designated with an (I) number.

The voltage levels used with the Intergrated Circuits are as follows:

High (TRUE) = 4 to 12 volts

Low (FALSE) = 0 volts.

A positive pulse, 4.5 milliseconds in duration is applied to J1-B and J1-E. This TRUE level on J1-B will cause I1-2, on the A1 card to go to 12 volts. This TRUE level is applied through the Emitter Follower Q1, on the A1 card, to A3-15. The TRUE level applied to the Coil Driver A3-15, will cause A3-6 to go FALSE.

At the same time, the TRUE level applied to J1-E will cause I5-14, on the A1 card to go FALSE (0V). This FALSE level is applied to the extender input I1-13 on the A2 card, through A1-20 and A2-47.

This FALSE level on pin 13, causes I1-12 to go TRUE. This TRUE starts to charge the capacitor on pin 12. Initially, all the voltage is developed across the 470 ohm resistor and the 1K potentiometer. This voltage applied to I1-11, causes I1-9 to go FALSE. This FALSE being applied to I1-15, holds I1-12 TRUE. As more voltage is dropped across the charging capacitor, the level at I1-11 will reach approximately 5.6 volts and return I1-9 to a TRUE level. This period— I1-9 FALSE to I1-9 TRUE—is the 4.5 millisecond one-shot time. The FALSE level from I1-9 will turn transistor Q1, on the A2 card to off. While Q1 is off, the resulting TRUE level is applied to A3-45 through A2-20. This TRUE level applied through the driver will cause A3-36 to go FALSE. This FALSE is applied to the base of the power transistor Q1, a DTG 1010. This will allow 48 volts to be applied to all the data coils and the feed coil through P2-S for 4.5 milliseconds. This pulse is coincident with the pulse applied to J1-B.

REVERSE STEP OPERATION

When a positive pulse is applied to the reverse input connector J1-M; output connector P2-C will go FALSE. This will allow the 48 volts from P2-H to operate the reverse coil. The sprocket input should not be pulsed at this time.

TAPE FEED OPERATION

Initially, I1-1, on the A2 card, is held TRUE (12V) due to the ground (0V) being applied to I1-2 through the normally closed contact of the BUZZ switch, P2-N and K. When the BUZZ switch is pressed, I1-2 becomes TRUE, which enables I1-1 to become FALSE. This FALSE is applied to I1-14 and initiates a clock cycle. The repetition rate of the clock output I1-1 is determined by the RC Network, connected between I1-1 to 6, and 4 to 3. Timing is 40 ± 15 characters per second.

POWER SUPPLY

The 48 volt power supply, in addition to being used to operate the driver, is utilized to supply 12 volts to cards A1, A2, and a zener diode regulator on the A2 card. This regulated voltage maintains stable One-shot and BUZZ clock operation during varying load and line changes on the power supply.

CIRCUIT CARD INDEX

A1	890233	Driver Input Buffer
A2	890232	Driver Timing Assembly
A3	890001-2	Coil Drivers

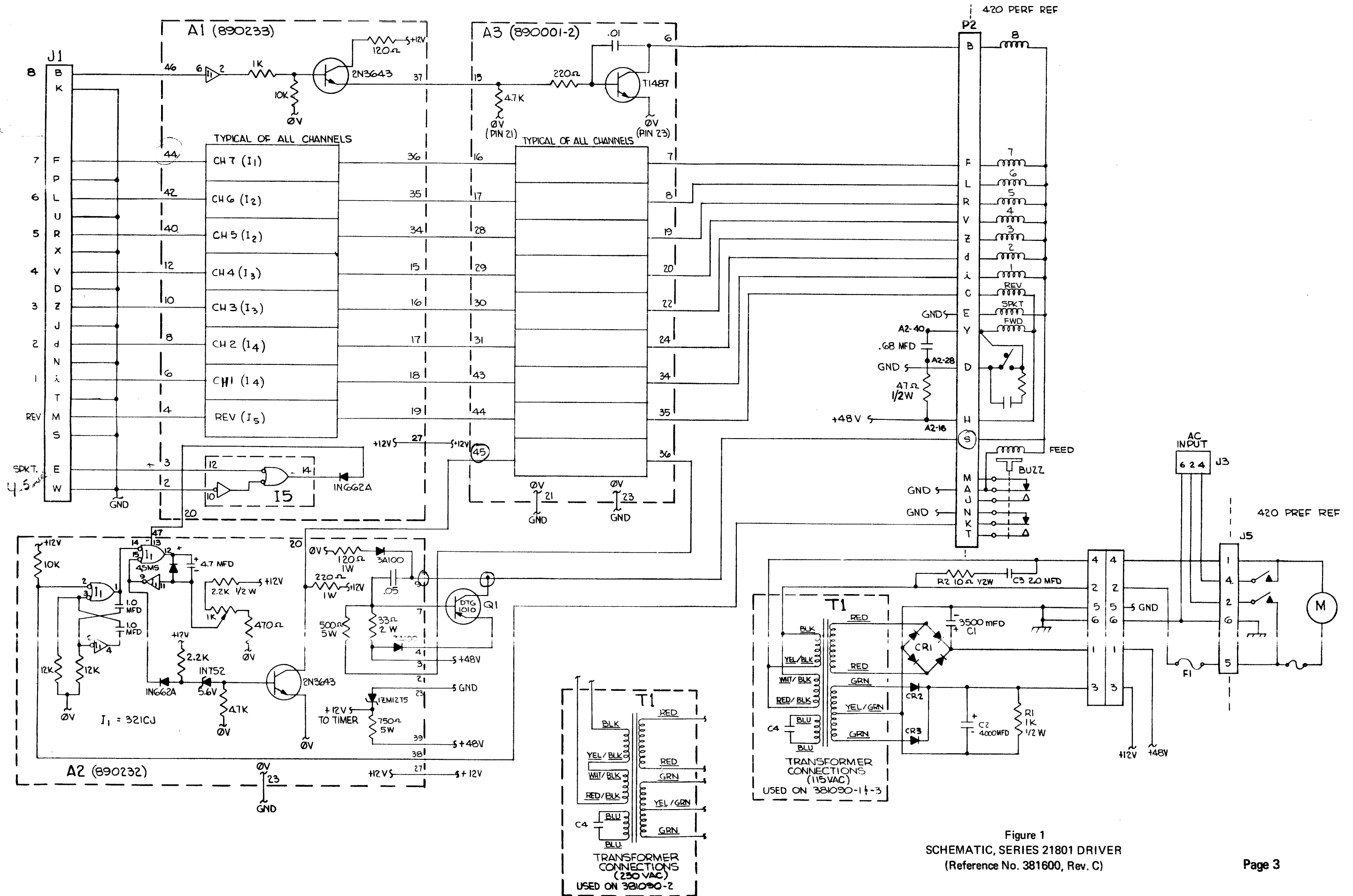
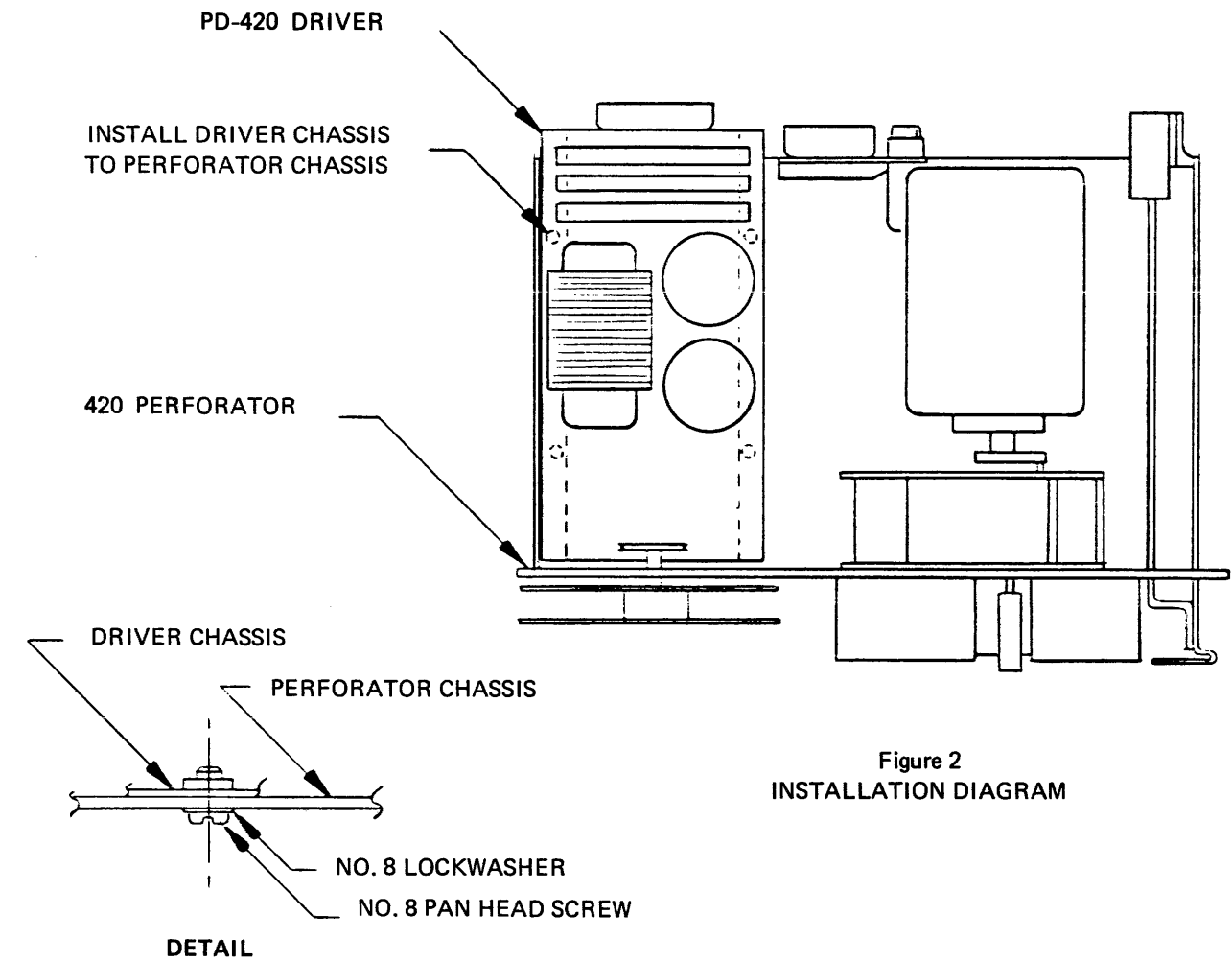


Figure 1
SCHEMATIC, SERIES 21801 DRIVER
(Reference No. 381600, Rev. C)

INSTALLATION

The driver and perforator are normally shipped separately for protection in handling. Securing the driver to the 420 Perforator is an easy task. See Figure 2.

1. Slide the driver into position on the 420 Perforator, as shown
2. Secure in position, using No. 8, Pan Head Slotted screws (4) and lock-washers.
3. Connect Cable P2 (36 Pin) to the perforator input jack.
4. Connect J5 (on the side of the driver) to P5 from the perforator. This is the Interface AC line.
5. Connect AC power to J3 (at the rear of the driver).
6. Connect the signal input cable to the 36 Pin Input connector on the driver (J1).



PREVENTIVE MAINTENANCE

Preventive maintenance should be performed only by trained service personnel. Maintenance intervals of the drivers are based on the PM requirements of the perforator. When performing maintenance on the perforator—the driver should be checked for voltage and timing. The power supply should be checked for obvious signs of future trouble, such as leaking capacitors, etc.

POWER SUPPLY

Apply power to the Driver. Utilizing a multimeter or an oscilloscope, measure the following potentials for proper operation.

Between C1 positive side and ground, should read 48 ± 4 volts.

Between C2 positive side and ground, should read 12 ± 1.5 volts.

On card A2, between ground and the junction of R11 (750 ohm, 5W) and the Zener Diode (CR5), check for 12 ± 1.5 volts.

TIMING

Apply a 4.5 millisecond, 4 volt pulse to the sprocket input J1-E. Set the repetition rate for 60 characters per second.

Utilizing an oscilloscope, monitor the collector of the DTG 1010 (Q1) Transistor, and adjust the potentiometer (R1), on the A2 card, for a 4.5 millisecond pulse. Remove the input pulse.

Press the BUZZ switch (Tape Feed) on the perforator. The 4.5 millisecond pulse should be present on DTG 1010. The repetition rate should be 40 ± 15 characters per second. To adjust the repetition rate, change the capacitance of C3 and C4 on the A2 card.

PARTS ORDERING PROCEDURE

Spare parts should be ordered from Tally Corporation, 8301 South 180th, Kent, Washington 98031. A major inventory of replacement parts is maintained at the factory for prompt service.

To order a replacement part, find the part required and order by the part number and name. Include the model and serial number of the unit on which it is to be used.

Any order for production parts will be recognized as a normal order—unless otherwise stated. Parts are

shipped within four working days from receipt of order.

Tally will ship parts within 24 hours to fill any order marked "EMERGENCY—RUSH."

Contact your local Tally Sales or Service Representative for assistance in matters concerning prices or unlisted parts.

NOTE: Minimum order: \$25.00. Terms: NET 30 days, F.O.B. Kent.

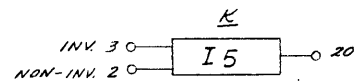
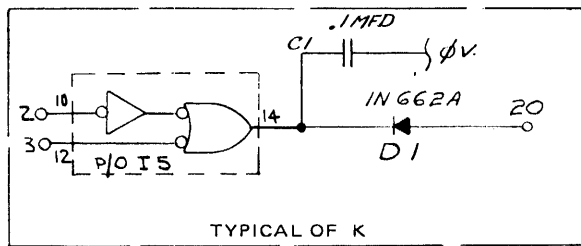
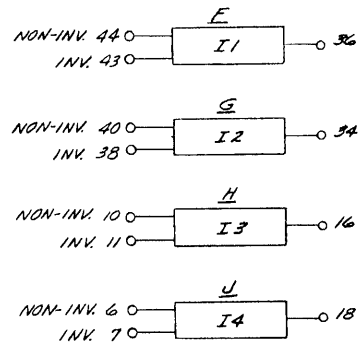
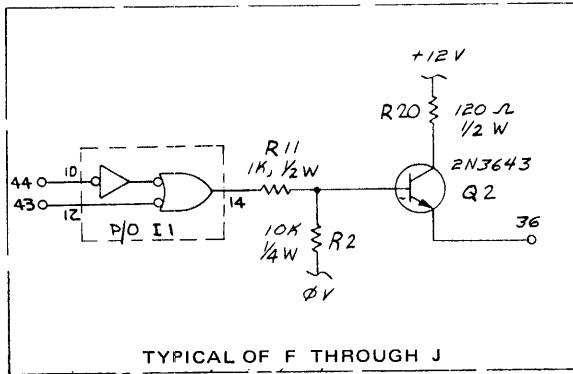
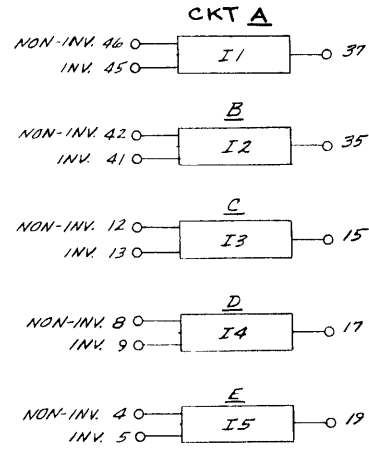
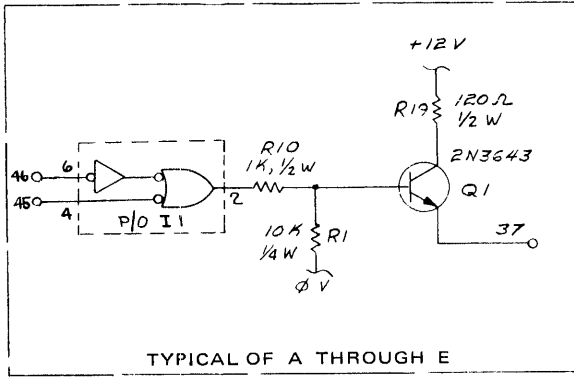
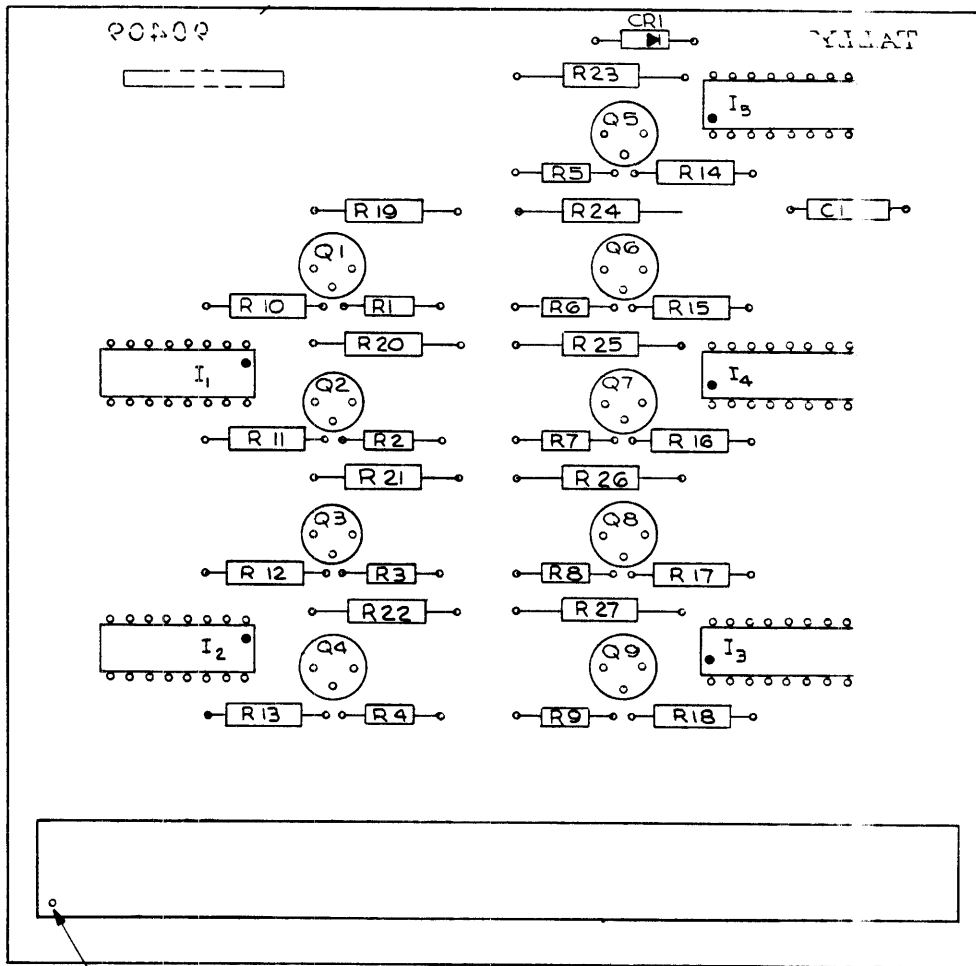


Figure 3
SCHEMATIC, DRIVER BUFFER (A1)
(Reference No. 890233, Rev.C)



PIN 47
REF.

Figure 4
COMPONENT LAYOUT, CARD A1
(Reference No. 890233, Rev. C)

COMPONENT	QUANTITY	DESCRIPTION	PART NUMBER
R1 - R9	9	Resistor 10K, 1/4W	4018500
R10 - R18	9	" 1K, 1/2W	4020600
R19 - R27	9	" 120 ohm, 1/2W	4019600
Q1 - Q9	9	Transistor 2N3643	4057751
D1	1	Diode 1N662A	4053800
I1 - I5	5	Integrated Circuit 362CJ	4400035
C1	1	Capacitor .1 MFD	4006400

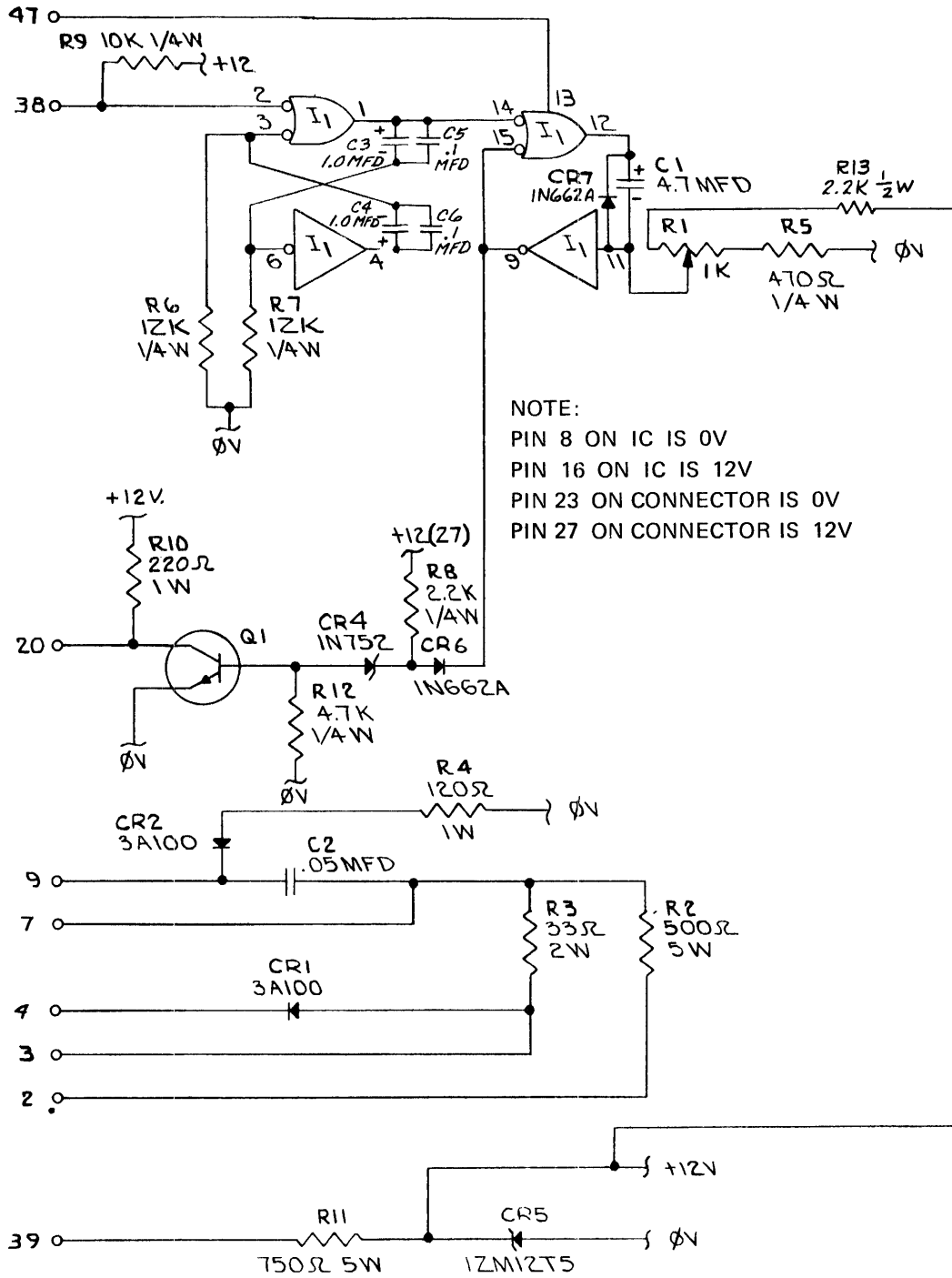
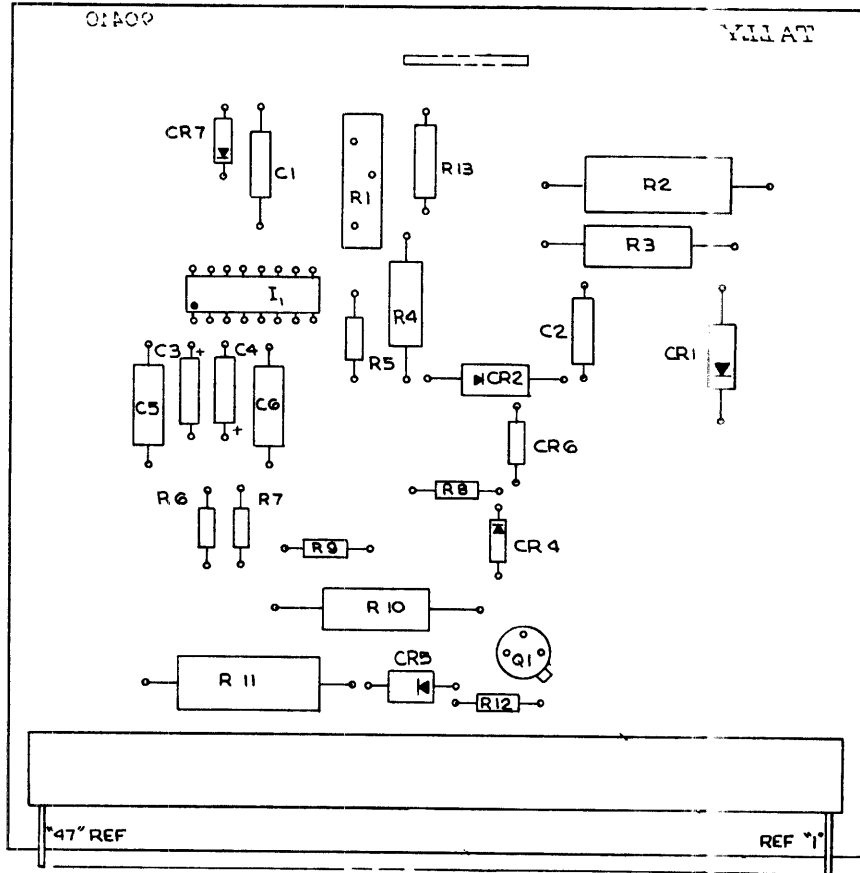


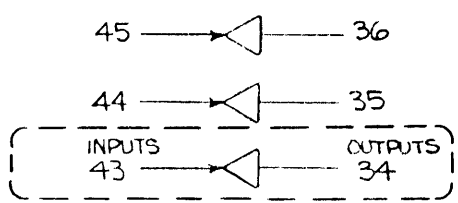
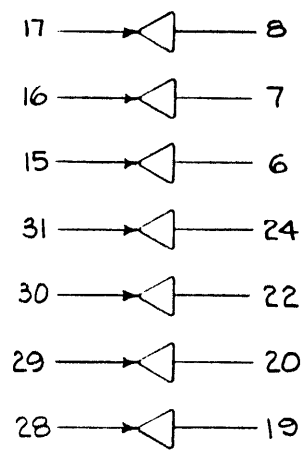
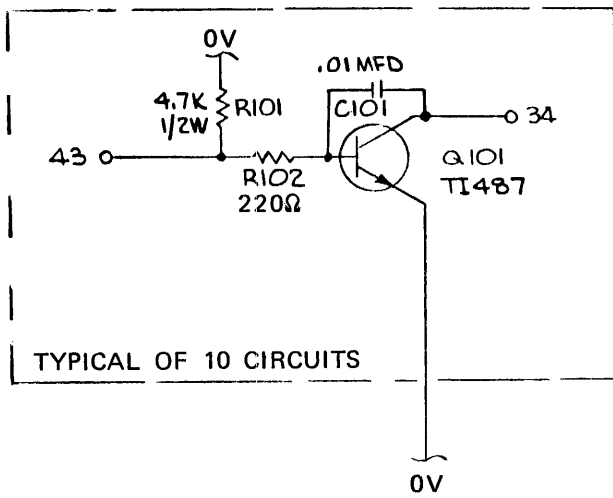
Figure 5
 SCHEMATIC, DRIVER TIMING (A2)
 (Reference No. 890232, Rev. D)



PARTS LIST

COMPONENT	QUANTITY	DESCRIPTION	PART NUMBER
R1	1	Potentiometer 1K	4036550
R2	1	Resistor 500 ohm, 5W	4031900
R3	1	" 33 ohm, 2W	4028210
R4	1	" 120 ohm, 1W	4029800
R5	1	" 470 ohm, 1/4W	4018690
R9	3	" 10K, 1/4W	4018500
R8	1	" 2.2K, 1/4W	4018100
R10	1	" 220 ohm, 1W	4030600
R11	1	" 750 ohm, 5W	4032500
R12	1	" 4.7K, 1/4W	4018300
R13	1	" 2.2K, 1/2W	4021000
C1	1	Capacitor 4.7 MFD, 35V	4008510
C2	1	" .05 MFD, 200V	4006200
C3 - C4	2	" 1 MFD, 35V	4007550
C5 - C6	2	" .1 MFD, 200V	400012-75
I1	1	I.C. 321CJ	4400000
CR1 - CR2	2	Diode 3A100	4058150
CR4	1	" 1N752	4053811
CR5	1	" 12M12T5	4055177
CR6 - CR7	2	" 1N662A	4053800
Q1	1	Transistor 2N3643	4057751
R6 - R7	2	Resistor 12K, 1/4W	4018530

Figure 6
COMPONENT LAYOUT, CARD A2
(Reference No. 890232, Rev. D)



PIN 21 and 23 = 0V

Figure 7
 SCHEMATIC, COIL DRIVER (A3)
 (Reference No. 890001-2, Rev. K)

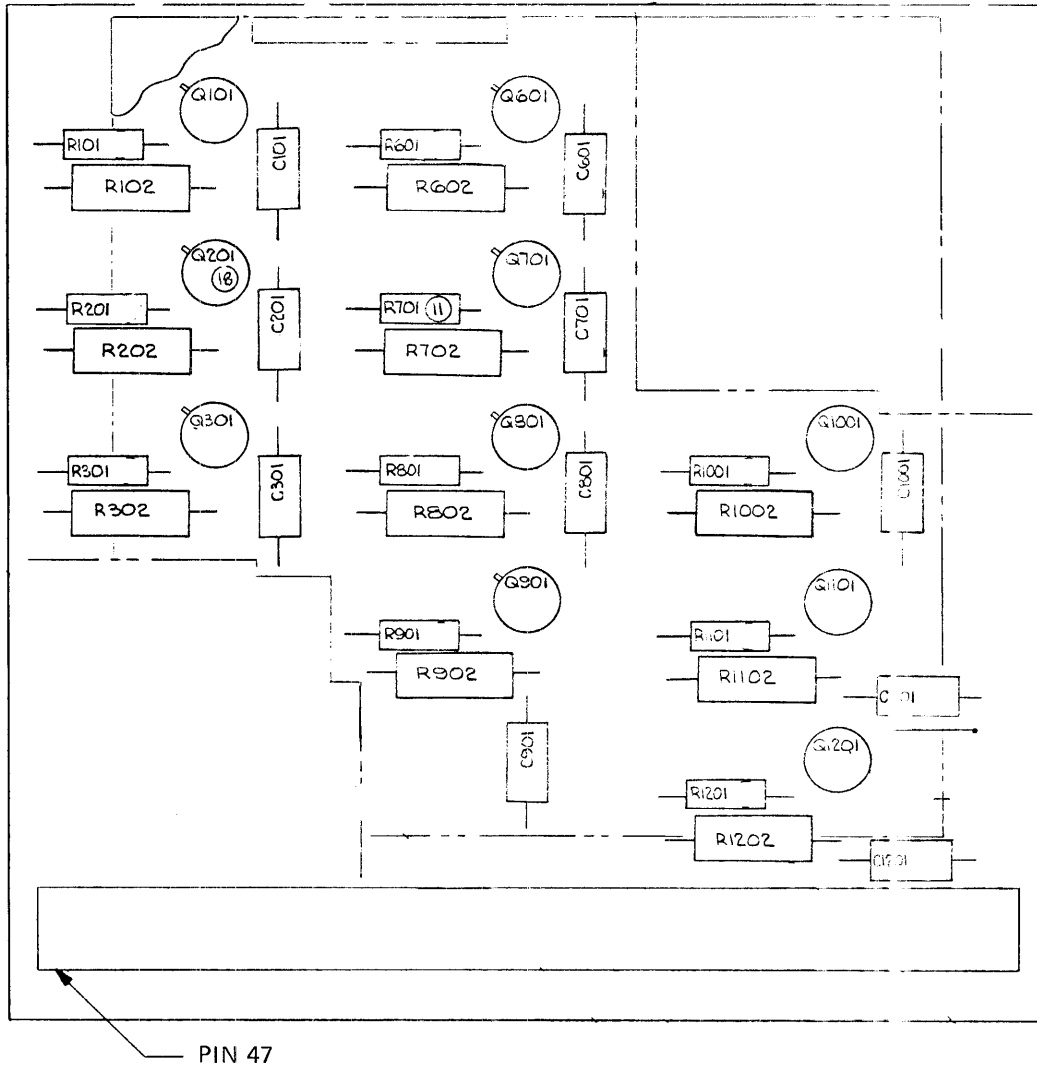


Figure 8
 COMPONENT LAYOUT, CARD A3
 (Reference No. 890001-2, Rev. K)

PARTS LIST

COMPONENT	QTY	DESCRIPTION	PART NUMBER
R 101, 201, 301, 601, 701, 801, 901, 1001, 1101, 1201	10	Resistor 4.7K, 1/2W	4021400
R 102, 202, 302, 602, 702, 802, 902, 1002, 1102, 1202	10	Resistor 220 OHM, 1W	4030600
C 101, 201, 301, 601, 701, 801, 901, 1001, 1101, 1201	10	Capacitor .01MFD, 200V	4005900
Q 101, 201, 301, 601, 701, 801, 901, 1001, 1101, 1201	10	Transistor T1487	4059500

PARTS LIST

GENERAL ASSEMBLY—END VIEW

<u>Index</u>	<u>Part Number</u>	<u>Description</u>
1	890001-2	Coil Driver Assembly (A3)
2	4065050	47 Pin Connector
3	375330	Cable Clamp
4	522330-1	Bracket, Side Rail
5	600627	Cable Assembly (P2)
6	---	Screw, #6-32, Pan Head Slotted
7	4057760	Transistor (DTG 1010)
8	400034-06	Connector, 6 Pin (J3)
9	522340	Chassis
10	---	Screw, #6-32, Pan Head Slotted
11	147691	Connector, 34 Pin (J1)
12	4089270	Fuse Holder
12	4100700	Fuse, 1A Slo-blo (115VAC Units) <i>or</i>
12	4100600	Fuse, .6A Slo-blo(230VAC Units)
13	---	Screw, #6-32, Pan Head Slotted
14	600628	Connector Mounting Plate
15	522330-2	Bracket, Side Rail

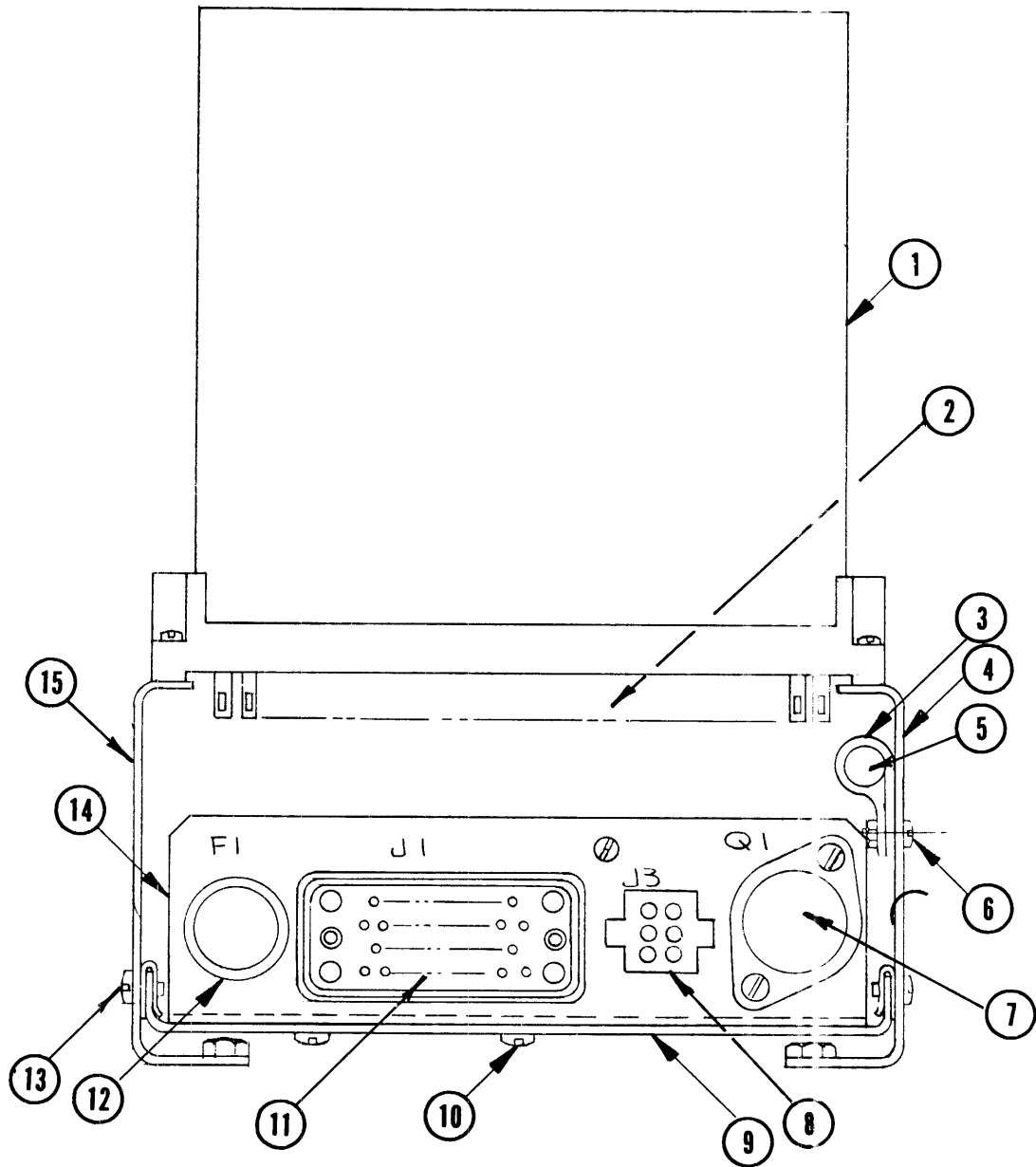


Figure 9
 GENERAL ASSEMBLY—END VIEW
 (Reference No. 381090, Rev. E)

PARTS LIST

GENERAL ASSEMBLY—SIDE VIEW

<u>Index</u>	<u>Part Number</u>	<u>Description</u>
1	890233	Driver Buffer, Assembly Card (A1)
2	890232	Driver Timing, Assembly Card (A2)
3	890001-2	Coil Driver, Assembly Card (A3)
4	4065050	47 Pin Connector
5	---	Screw, #4-40, Pan Head Slotted
6	600627-1	Cable Harness Assembly
7	400034-06	Connector, Female, 6 Pin (J5)
8	---	Screw, #6-32, Pan Head Slotted
9	---	Screw, #4-40, Pan Head Slotted
10	4012500	Clamp, Capacitor (C1)
11	4098830	Clamp, Capacitor (C2)
12	4010100	Capacitor, 3,500MFD, 65V (C1)
13	4010200	Capacitor, 4,000MFD, 35V (C2)
14	385251	Transformer, 115VAC, 60 Hz <i>or</i>
14	385250	Transformer, 115V—230V, 50 Hz (T1)

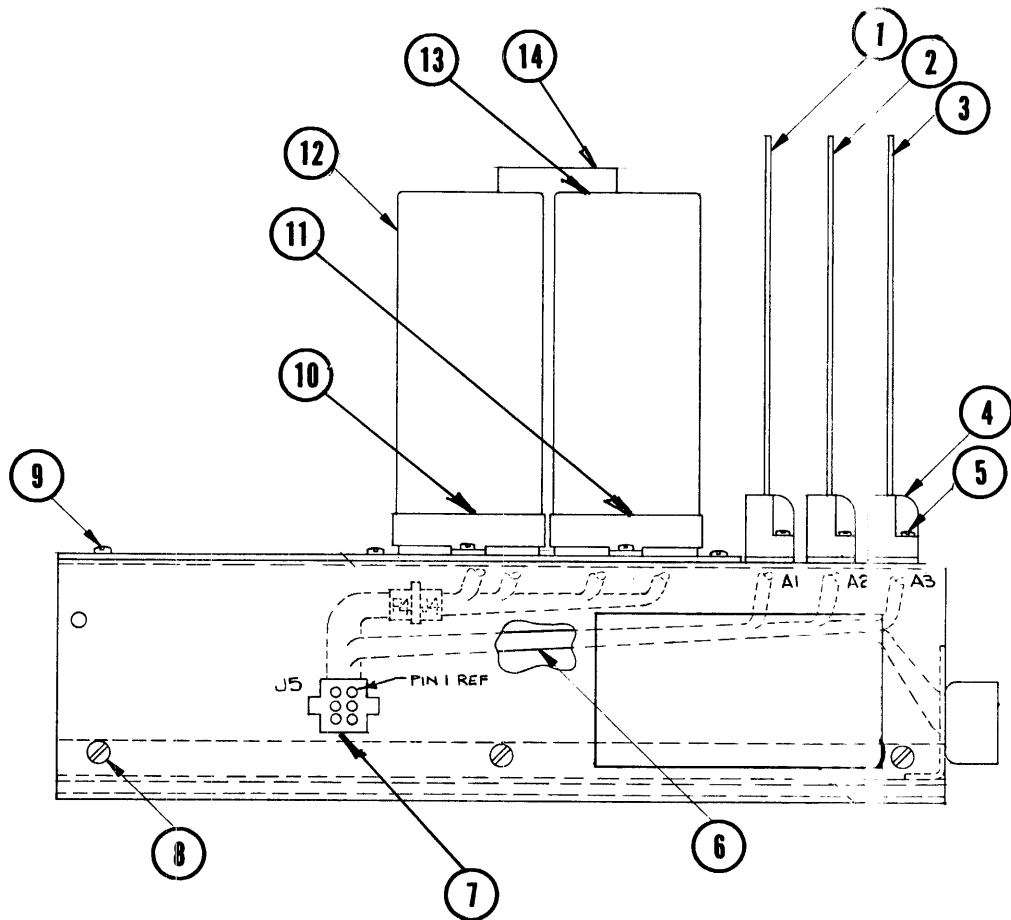


Figure 10
 GENERAL ASSEMBLY—SIDE VIEW
 (Reference No. 381090, Rev.E)

PARTS LIST

GENERAL ASSEMBLY—POWER SUPPLY

<u>Index</u>	<u>Part Number</u>	<u>Description</u>
1	4091150	Adapter
2	4116600	Boot, Terminal
3	---	Screw, #6-32, Pan Head Slotted
4	325240	Clamp, Capacitor
5	---	Capacitor, C4 (T1)
6	381060	Plate, Mounting
7	4059600	Rectifier (CR1)
8	---	Screw, #4-40, Pan Head Slotted
9	4058150	Diode (CR2, CR3)
10	4018900	Resistor, 10 ohm, 1/2W (R2)
11	381020	Assembly, Terminal Board
12	4008200	Capacitor, 2MFD, 600V (C3)
13	4020600	Resistor, 1K ohm, 1/2W (R1)
14	4115500	Gromment
15	---	Screw, #10-24, Pan Head Slotted

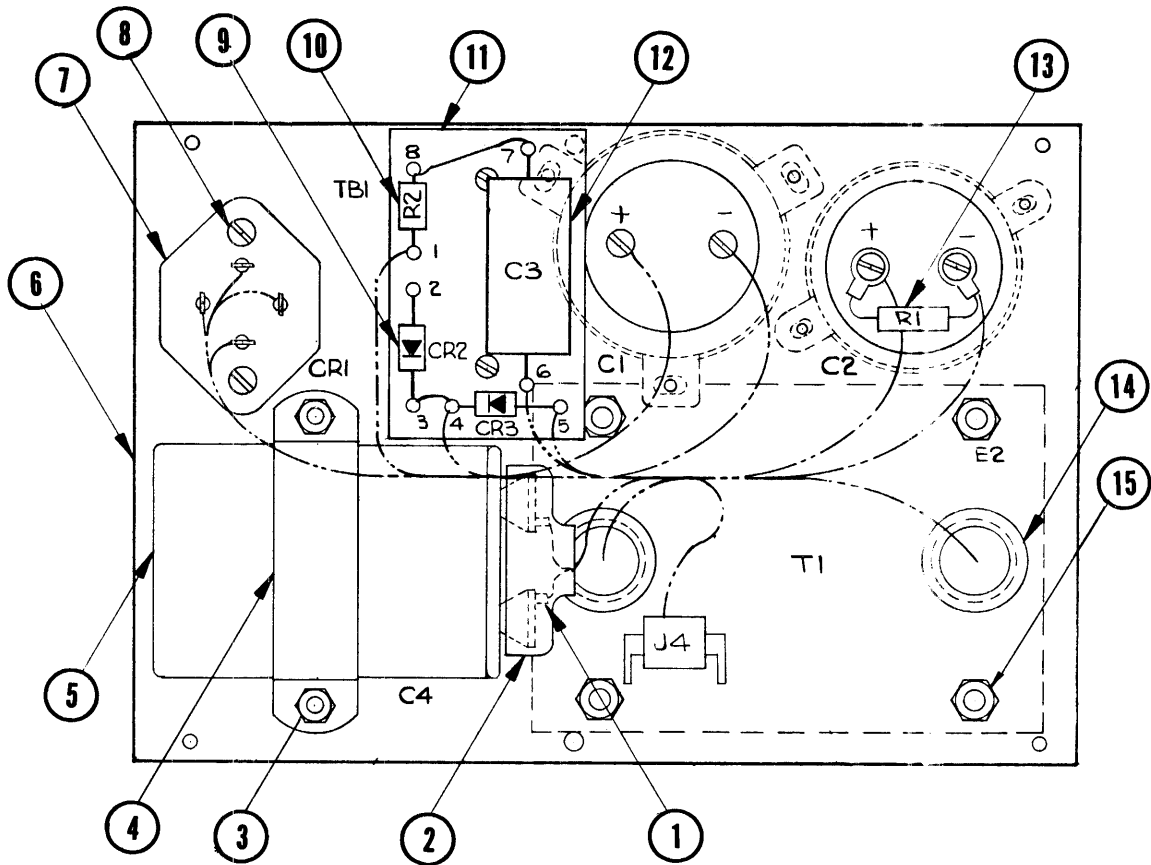


Figure 11
 GENERAL ASSEMBLY, POWER SUPPLY
 (Reference No. 600629)

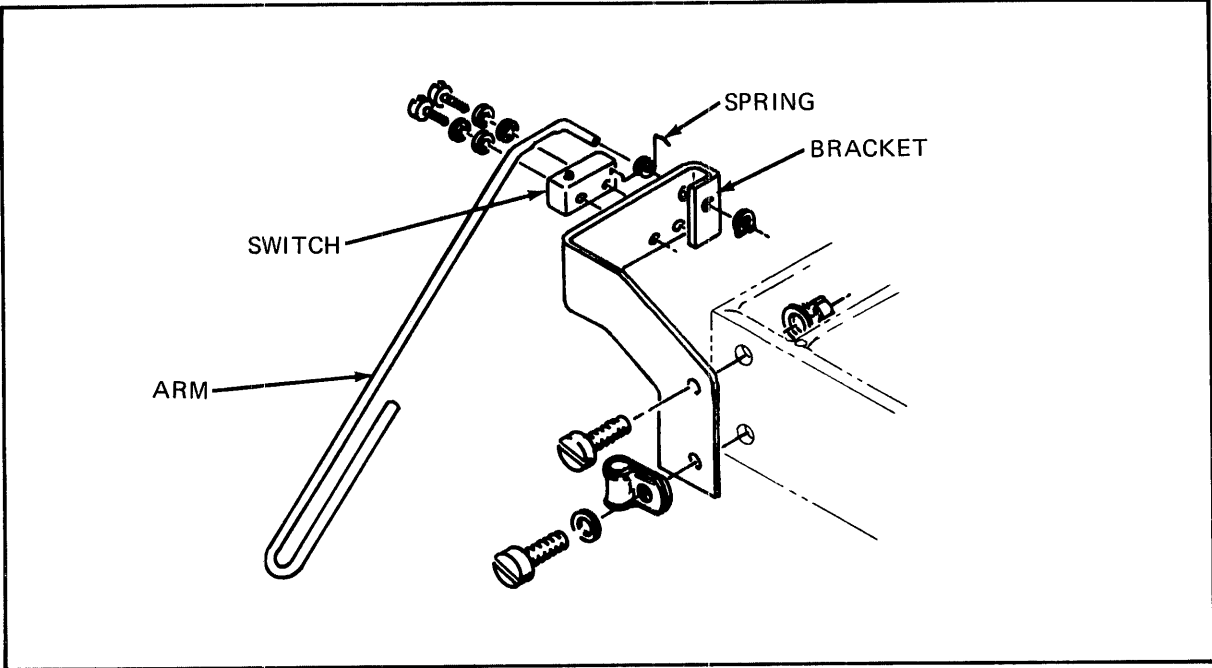


Figure 19
LOW TAPE SUPPLY SWITCH

LOW TAPE (LT) SUPPLY SWITCH

(Reference No. 337480)

This switch is mounted on a bracket alongside the tape supply reel, and operates with approximately fifty feet of tape remaining on the supply reel. It may be adjusted to indicate any amount of tape, by merely bending the long follower arm. The normally closed (N/C) contacts are closed with more than fifty feet of tape remaining on the reel.

To incorporate the Low Tape Option, ADD the following parts to Figure 25.

Part Number	Description
221980	Assembly, Low Tape Supply
600291	*Assembly, Accessory Block
400017-07	Screw, 8-32 x 1/2 in., Pan Head Slotted
400017-09	Screw, 8-32 x 5/8 in., Pan Head Slotted
4173250	Nut, 8-32, Hex Keps (2)
400216-10	Washer, No. 8, Flat (2)
--	Cable Clamps as required. See Note, Page 17.

*Wire Switch and Accessory Block as shown in Figure 17.

TELETYPESETTER OPTION

Reference Numbers: 311470-1 (48V)
331470-2 (24V)

This option incorporates an advance feed hole, 6 level die block and edge guidance for 7/8 inch wide tape with sprocket to edge dimension of $.434 \pm .003$ inch.

To incorporate the Teletypesetter option, DELETE the following parts, see Figure 24.

Index	Part Number	Description
11	600463-1	Punch Mechanism Assembly (8 Channel, 48V) <i>or</i>
11	600463-2	Punch Mechanism Assembly (8 Channel, 24V)
ADD the following parts:		
	600463-9	Punch Mechanism Assembly (6 Channel, 48V) <i>or</i>
	600463-10	Punch Mechanism Assembly (6 Channel, 24V)
	313780	Screw, Guide (see 2, Figure 31)
	145540	Screw, Guide (2) (see 23, Figure 31)

ADDENDUM	SERIES 21801	PD-420
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This addendum is to be used with the PD-420, Series 21801, Instruction Manual, dated April 1970.

Incorporate the following changes to your manual:

PAGE 3, FIGURE 1

The Schematic, Series 21801 Driver, Figure 1 of this addendum, replaces Figure 1.

PAGE 4, INSTALLATION

Change Step 3 --- Connect Cable P2 (36 Pin).....to read: Connect Cable P2 (34 Pin) to

Change Step 6 --- Connect the signal input cable to the 36 Pin..... to read: Connect the signal input cable to the 34 Pin

PAGE 6, FIGURE 3

The Schematic, Driver Buffer (A1), Figure 2 of this addendum, replaces Figure 3.

Page 8, FIGURE 5

The Schematic, Driver Timing (A2), Figure 3 of this addendum, replaces Figure 5.

PAGE 16, PARTS LIST, GENERAL ASSEMBLY - POWER SUPPLY

Change index 5 (description) to read: Capacitor, C4 (Supplied with T1)

9-21-70 REVISION DATE	REVISION	Series 21801	Page 1 of 4
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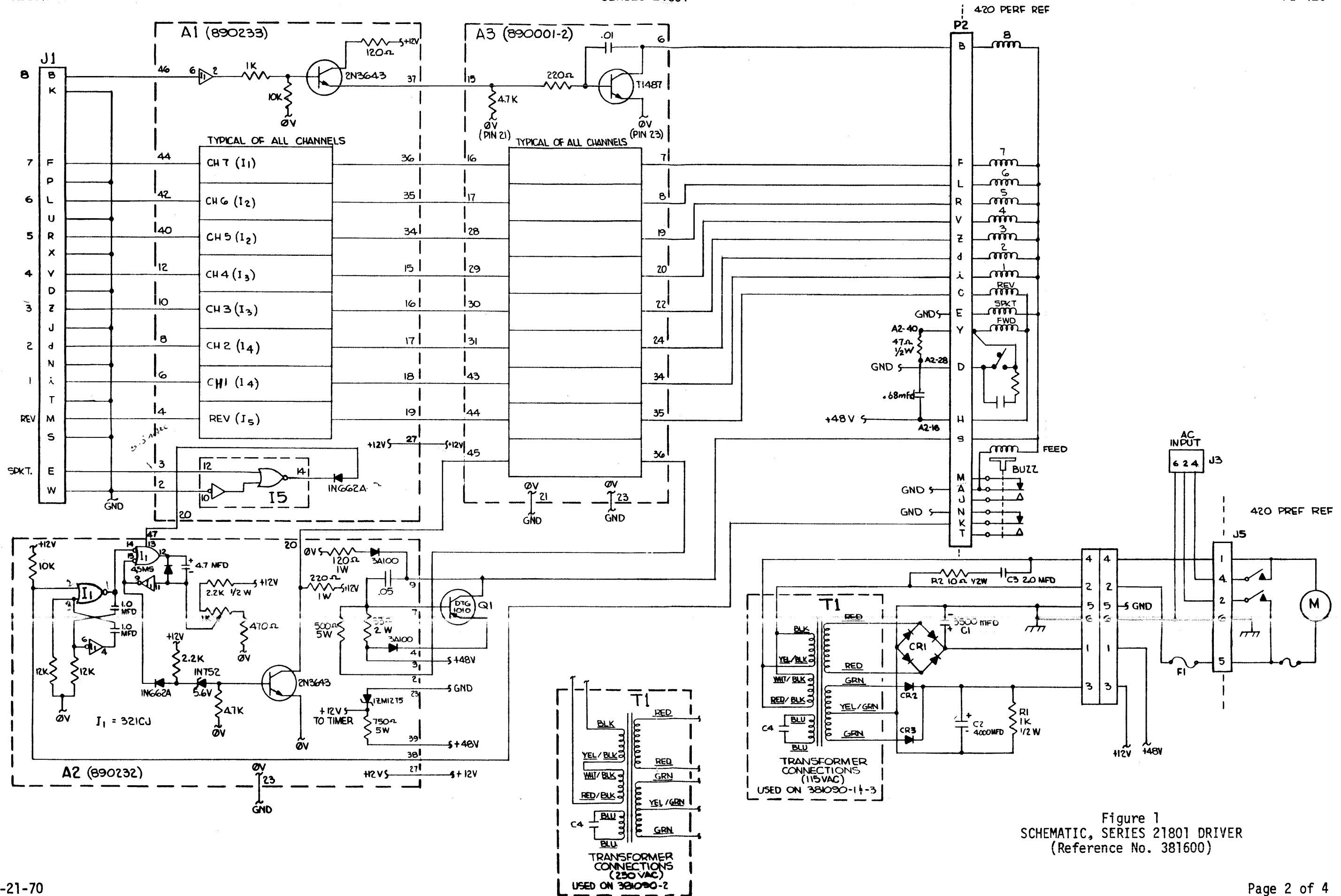


Figure 1
SCHEMATIC, SERIES 21801 DRIVER
(Reference No. 381600)

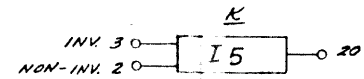
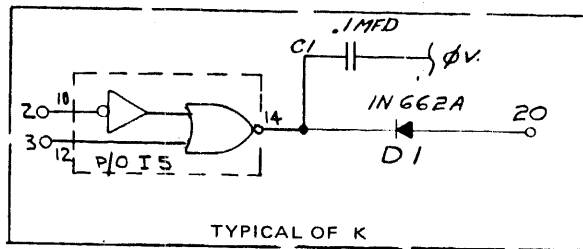
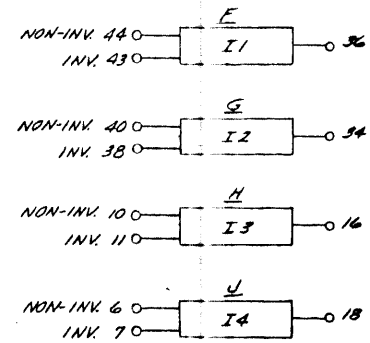
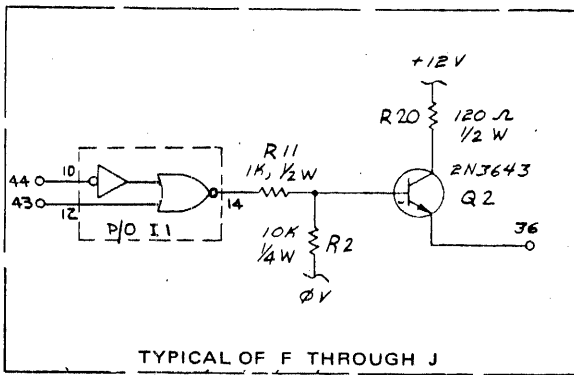
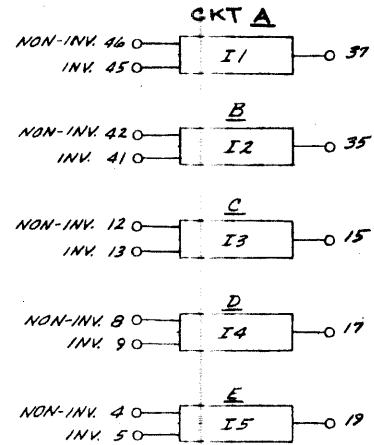
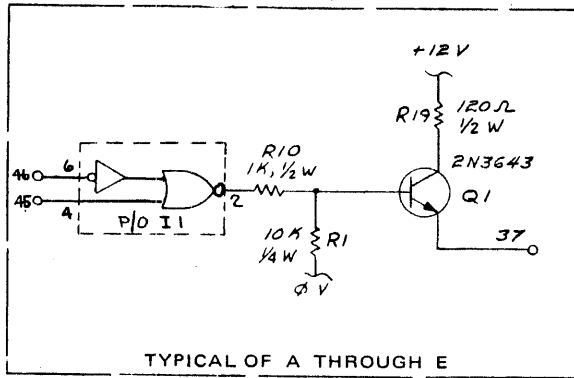


Figure 2
SCHEMATIC, DRIVER BUFFER (A1)
(Reference No. 890233)

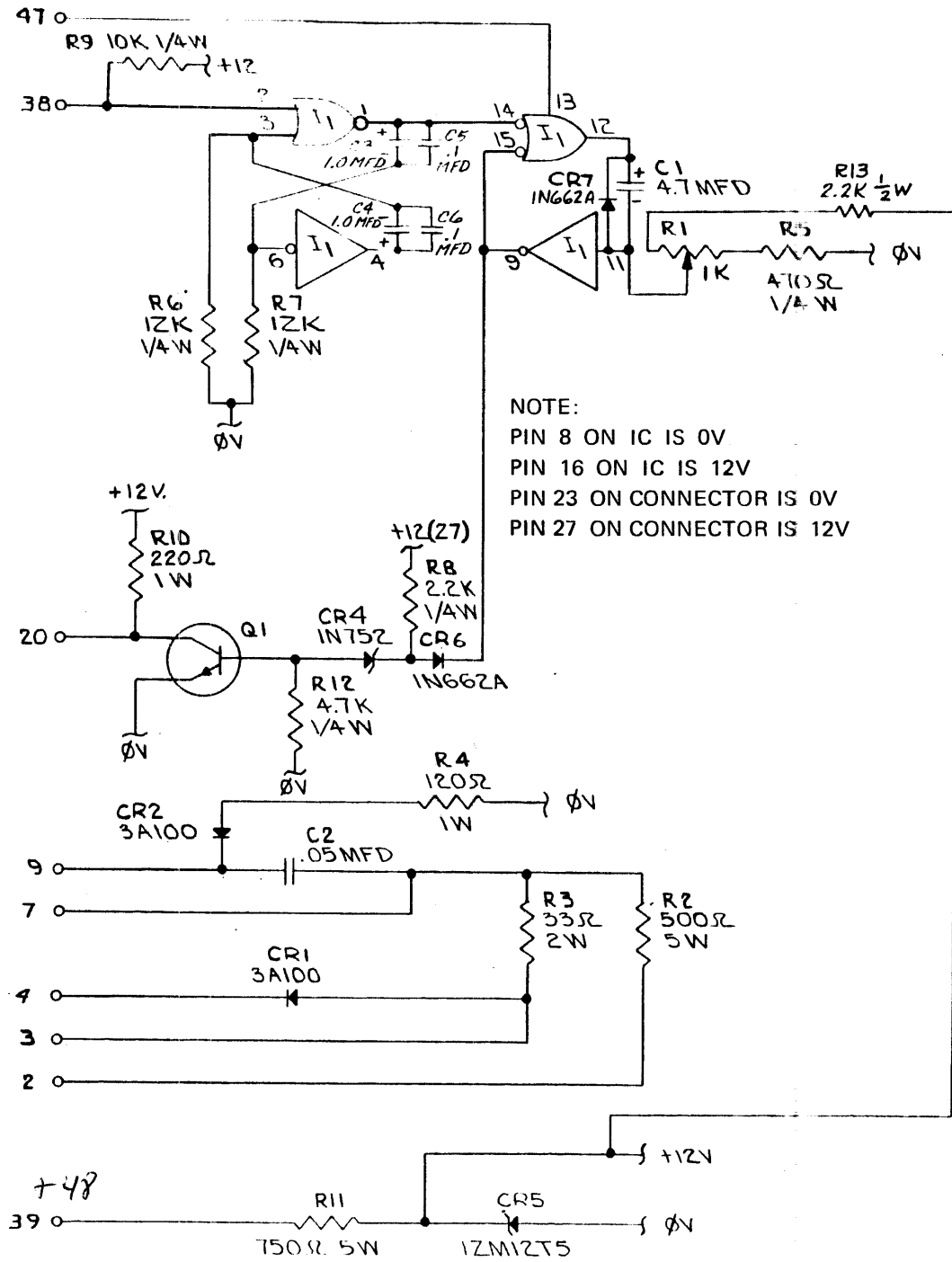


Figure 3
SCHEMATIC, DRIVER TIMING (A2)
(Reference No. 890232)

This addendum is to be used with the Model 420 Instruction Manual, Revision B, dated June 1971.

PAGE 33, PERFORATOR MECHANISM PARTS LIST

PAGE 28, GENERAL ASSEMBLY PARTS LIST—FRONT VIEW

Change index 67 Part Number from 4090205 to read: 400648-01.

Change index 1 Part Number from 601701-1 to read: 601710-1.

Change index 5 Part Number and Description from 4153900 - Screw, 4-40 x 1/8 in., Socket Set, Cup Point to read: 4153665 - Screw, 4-40 x 3/32 in., Socket Set, Cup Point.

Change index 8 to read:

518970 Assembly, Tape Supply Slide OR
*602392-1 Assembly, Tape Supply Slide

NOTE: The two Tape Supply Slides are interchangeable but 602392-1 is preferred.

PAGE 42, TAPE SUPPLY SLIDE ASSEMBLY

Change index 5 Part Number from 515002 to read: 515000-2.

Change index 9 Part Number from 228780 to read: 228780-1.

*The Tape Supply Slide Assembly - Part Number 602392-1 is similar to Tape Supply Slide Assembly- Part Number 518970 with the following exceptions:

<u>Index</u>	<u>Manual Designation</u>	<u>Replacement Part Number</u>	<u>Description</u>
1	220170	602393-1 220160-2 600451-1 400016-05 600428-2	Assembly, Hub and Flange Flange, Tape Supply Reel Hub Screw, 6-32 x 3/8 in., Pan Head Slotted
5	515000-2	515000-4	Assembly, Flange Slide
8	4144310	601750-1	Pivot
11	4175325	Delete	Washer, No. 6, Flat
9	228780-1	228780-2	Assembly, Brake

This addendum is to be used with the Model 420 Instruction Manual, Revision B, dated June 1971.

The Series 21413 is a modified 420 Tape Perforator. It is a bi-directional unit, utilizing 48 volt magnetic actuators. A special panel and an ON/OFF switch—mounted to the right of the Buzz switch, are provided with the unit.

Power Requirements are:

Series 21413 115VAC, 60 Hz.

Use the 420 Instruction Manual as stated for the voltage/frequency and coil voltage (48VDC) for your unit. The 420 Instruction Manual is applicable to the series, with the following exceptions:

PAGE 25, WIRING DIAGRAM

The Wiring Diagram, Figure 1 of the addendum, replaces Figure 23.

PAGES 28, 30 and 31-GENERAL ASSEMBLY PARTS LIST

Change (Reference No. 515520-1) to read (Series 21413—Reference No. 600292-8).

<u>Figure</u>	<u>Index</u>	<u>Manual Designation</u>	<u>Replacement Part Number</u>	<u>Description</u>
24	1	601710-1	601710-17	Panel
25	2	600484-1	600484-3	Assembly, Cable
25	33	305097	305094	Belt-O-Ring
Add the following:			*4075110	Switch
			*400034-05	Connector
			*4068690	Pin (5)

*Part of Cable Assembly 600484-3.

Change note at bottom of parts list, page 31 to read:

*Part of Cable Assembly, 600484-3.

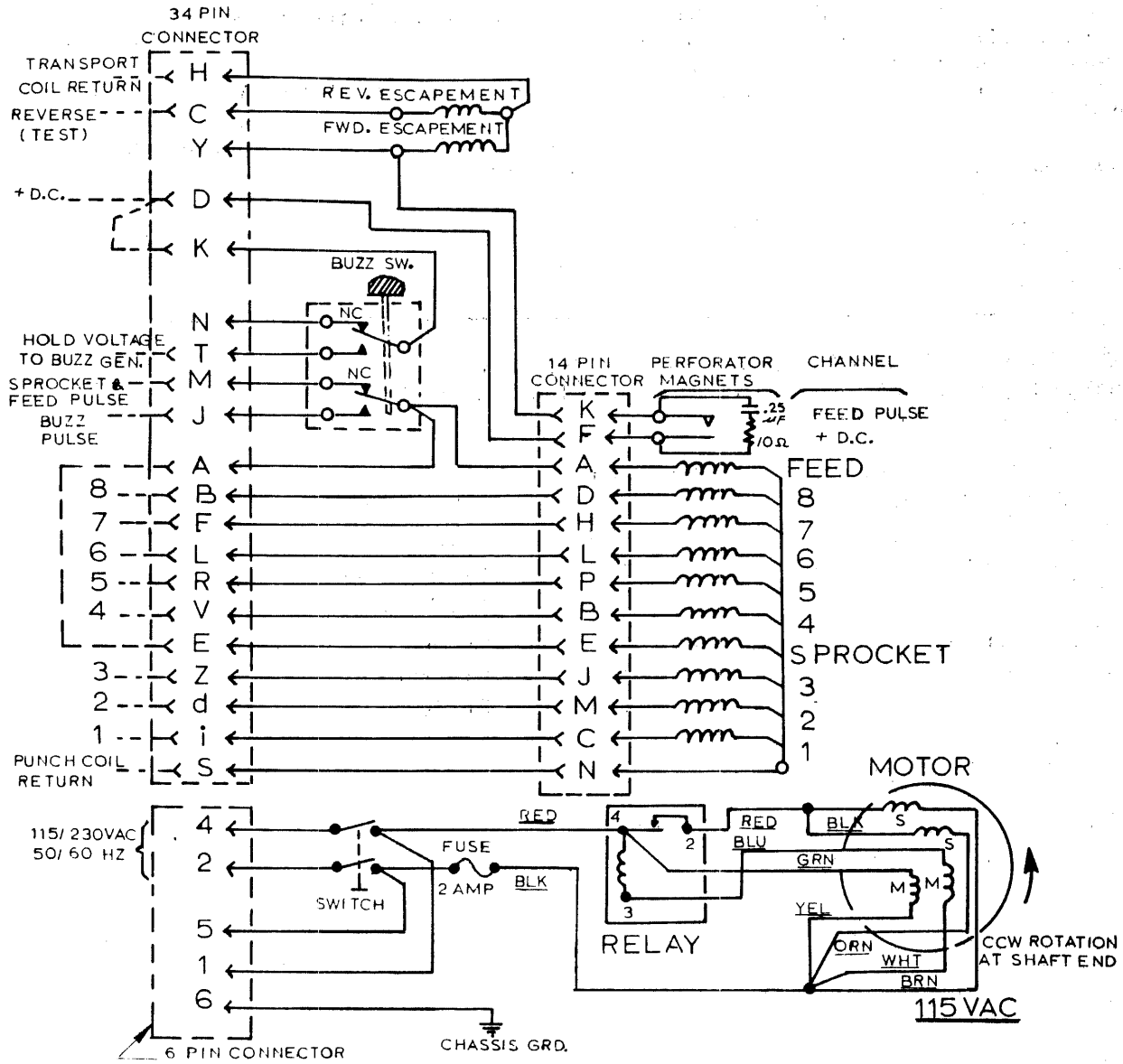


Figure 1
WIRING DIAGRAM
(Reference No. 399680)

At Tally, we continually strive to keep up with the latest electronic developments by adding circuit and component refinements to our equipment.

At times, due to printing and shipping requirements, we are unable to enter these changes immediately into our printed manuals. Required changes are incorporated as addenda, and are located in the front of the manual, if applicable.

Your comments on this manual would be greatly appreciated. We appreciate constructive criticism and are always open to suggestions.

Please send your comments to:

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