

Figure 7-5. NT50 Control and Status Indication Board Layout

Table 7-4 — NT50 Control and Status Indication Board Parts List*

Item	Description	Part Number
—	Complete Printed Circuit Board	200 29 826
D1	Diode, 1N4148	510 43 605
D2	Zener Diode, ZPD 6.8	510 43 503
D3 thru D8	Diode, 1N4148	510 43 605
D9	Diode, BAT41	510 43 353
D10	Diode, BAT41	510 43 353
D11	Diode, 1N4148	510 43 605
IC1	IC, 4011, Quad 2-input NAND gate	722 39 157
IC2	IC, 4071, Quad 2-input OR gate	533 20 200
IC3	IC, 75468, Driver array	722 39 422
IC4	IC, 7555, General purpose timer	722 39 704
IC5	IC, 4066, Quad bilateral switch	533 20 022
IC6	IC, LM324, Op amp	722 39 281
IC7	IC, 3260, Op amp	722 39 282
IC8	IC, 7556, Dual general purpose timer	722 39 703
T1	Transistor, BC560	533 21 195
T2	Transistor, BC560	533 21 195
T3	Transistor, BC550	533 21 196

*See Figure 7-6 for component type numbers not listed in this table.

Special Synchronization Socket (P/N 200-59-581)
for IC15

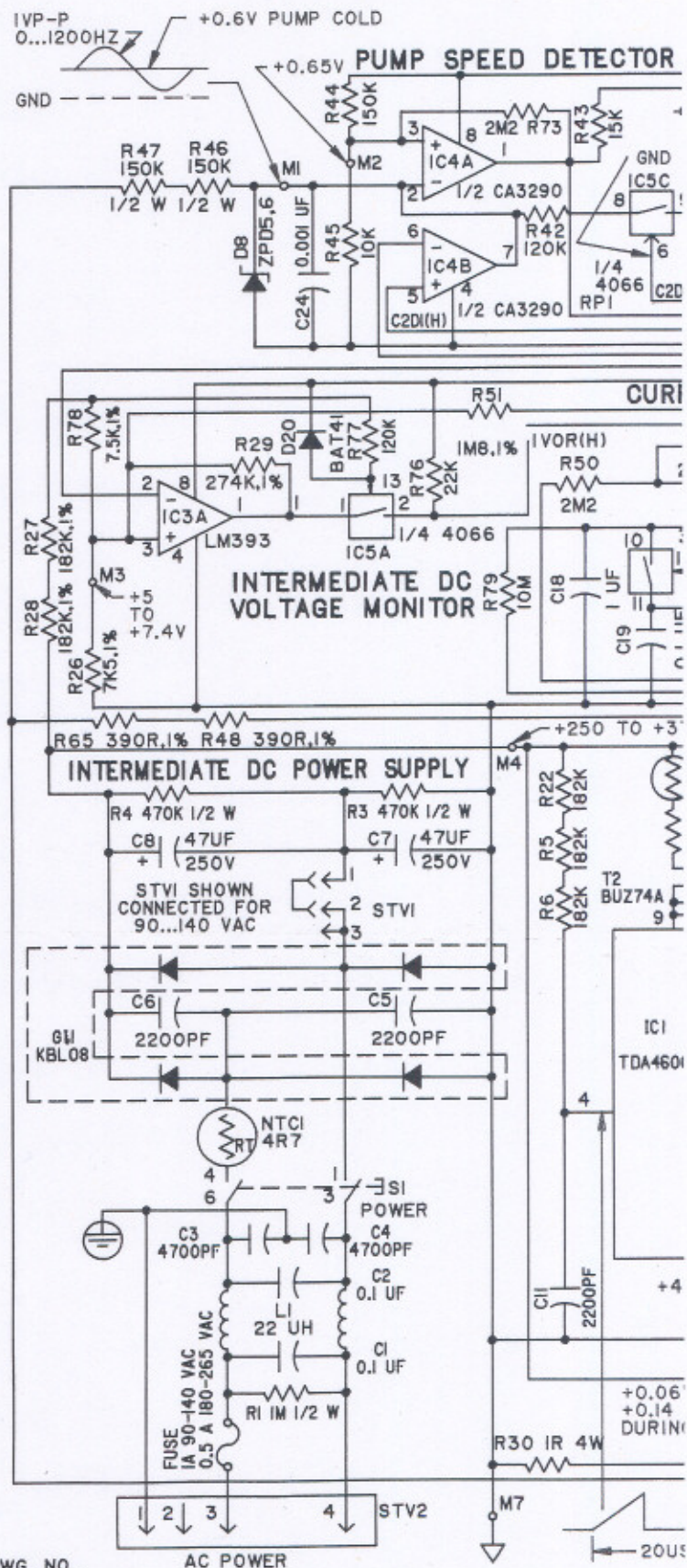
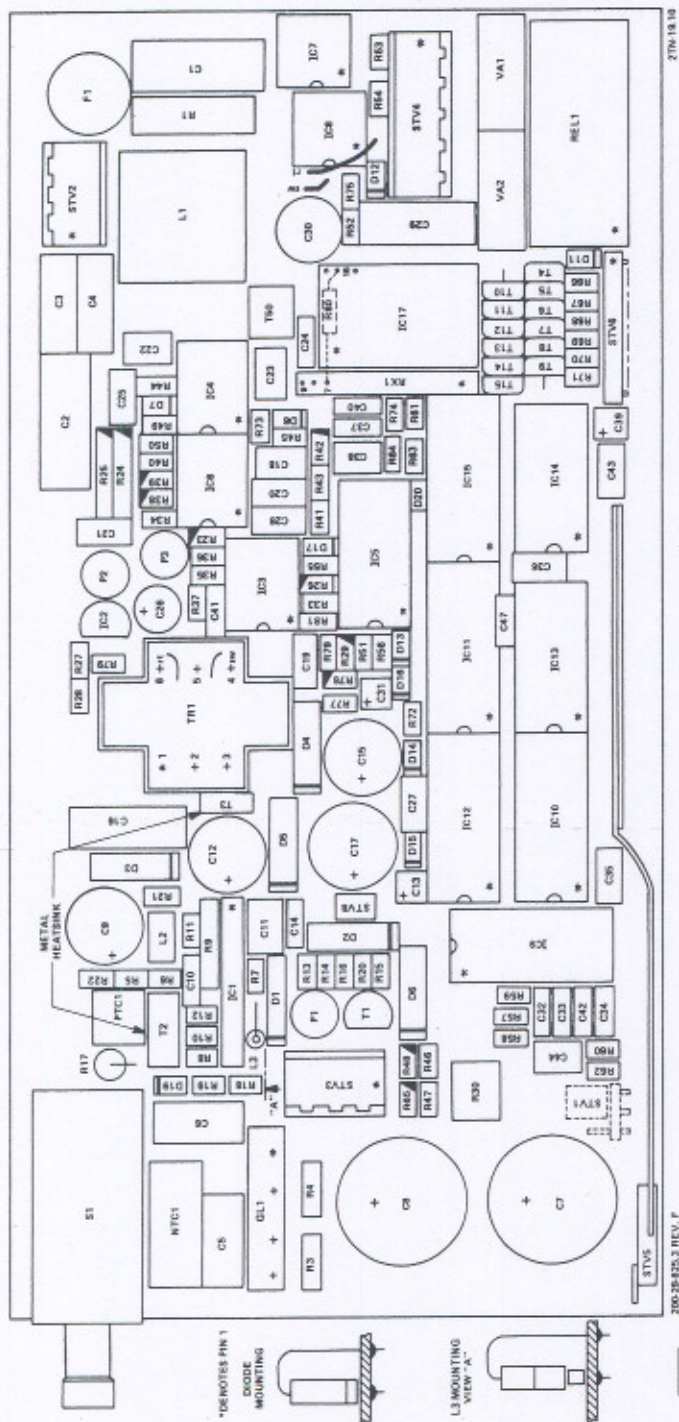
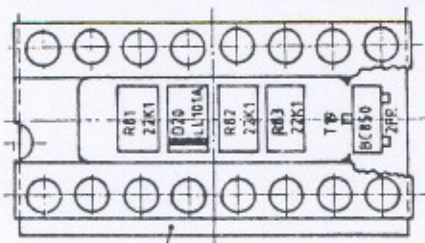
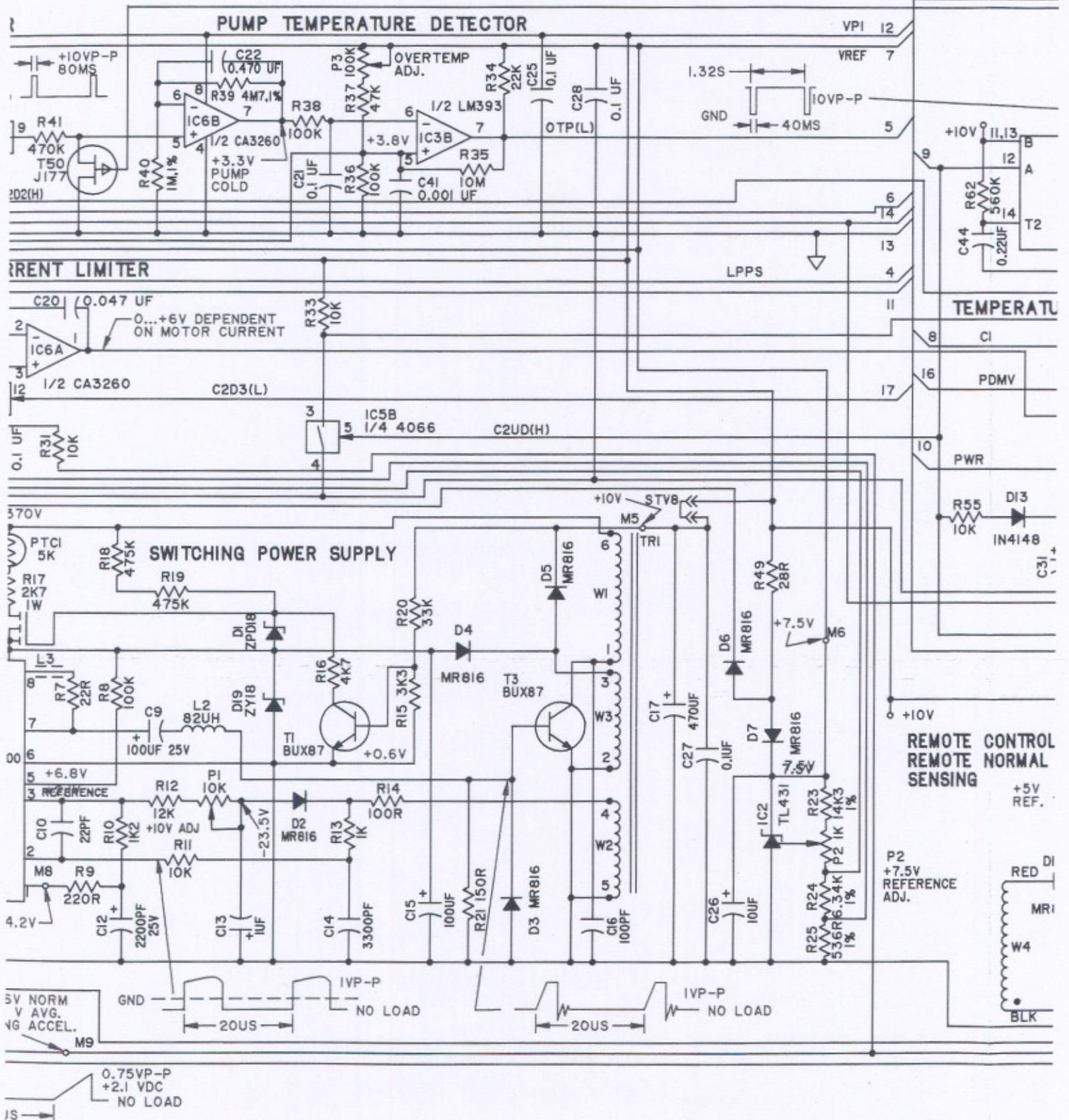
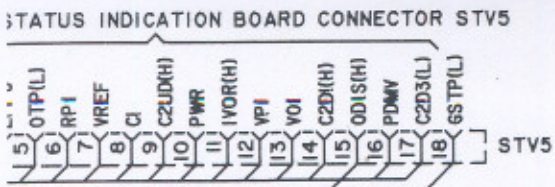


Figure 7-3. NT50 Power Supply and Signal Generation Board Layout

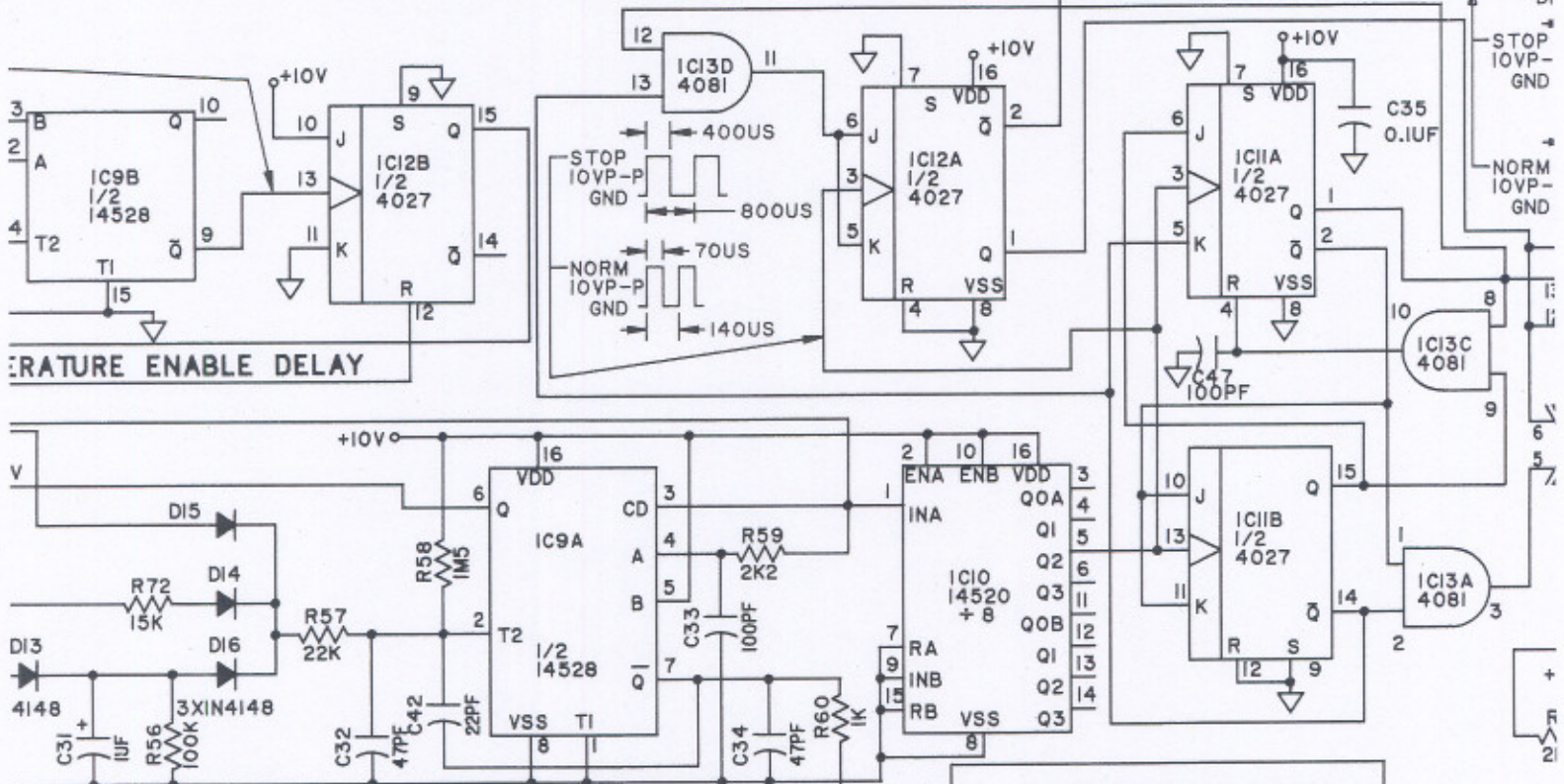
DWG. NO. DSK 3567

TO CONTROL AND STATUS

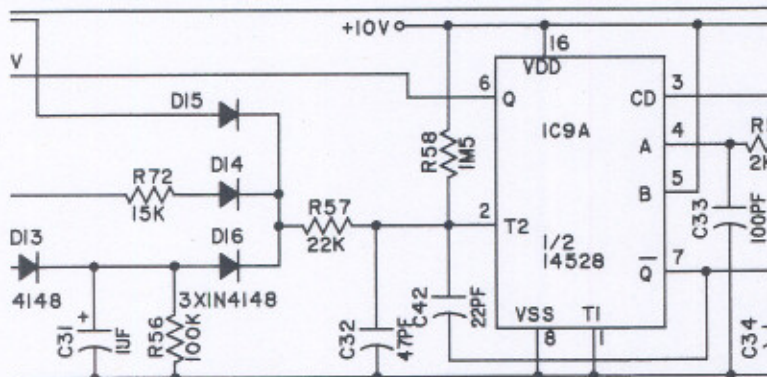




THREE PHASE LOGIC GENERATOR

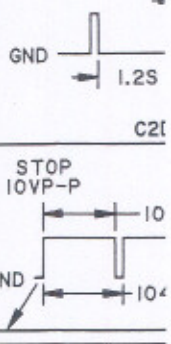
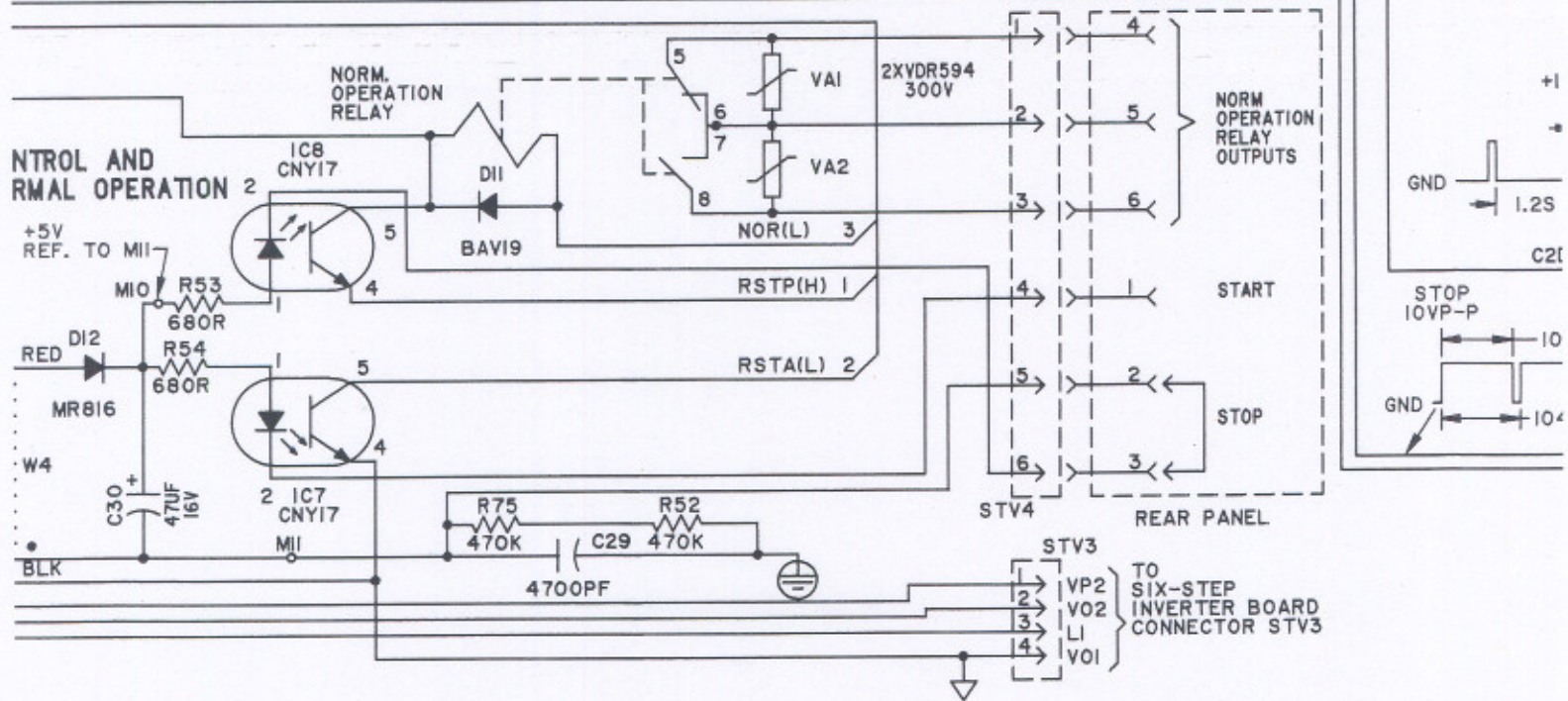


TEMPERATURE ENABLE DELAY

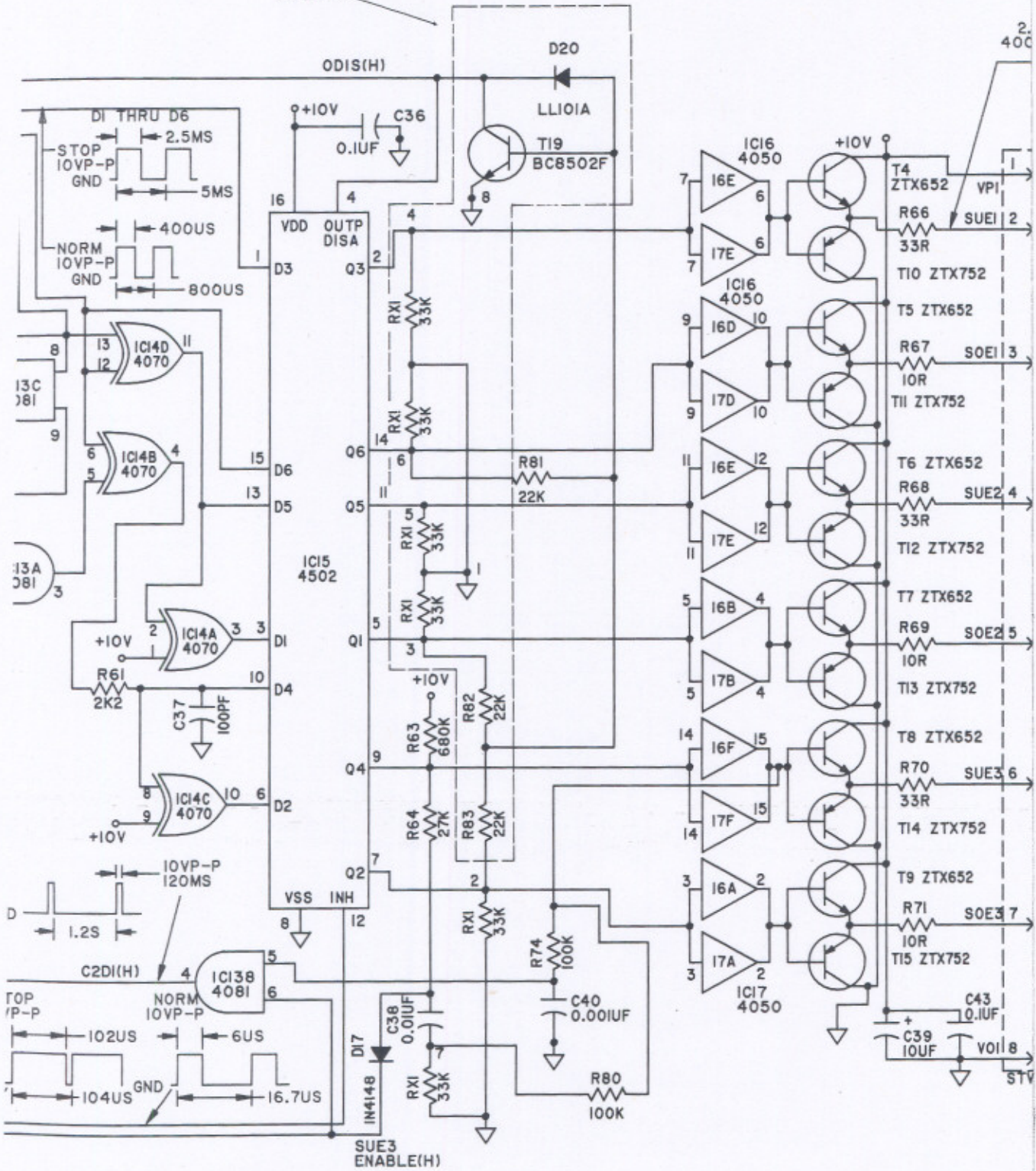


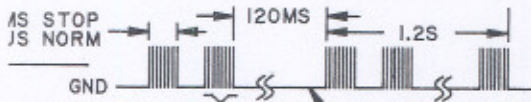
PULSE WIDTH MODULATOR

PULSE WIDTH MODULATOR OUTPUT



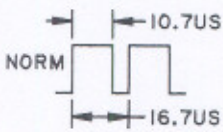
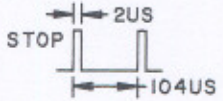
Special Synchronization Socket (P/N 200-59-581)
for IC15





EACH TURN-ON PULSE IS DIVIDED INTO 24 PULSES OF VARYING PULSE WIDTHS ACCORDING TO THE OUTPUT OF THE PULSE WIDTH MODULATOR AS SHOWN BELOW

THIS PORTION OF THE SIGNAL IS HIGH ON THE SUE3 LINE DURING THE MEASURE INTERVAL



NOTES

- 1) RESISTOR VALUES ARE INDICATED BY PLACING THE MULTIPLIER SYMBOL IN PLACE OF THE DECIMAL POINT. FOR EXAMPLE: 1200 OHMS IS MARKED 1K2, 100 OHMS IS MARKED 100R, AND 0.5 OHMS IS MARKED R5.
- 2) UNLESS OTHERWISE SPECIFIED, ALL VOLTAGES ARE REFERENCED TO BOARD GROUND VO1.
- 3) STVI SHOWN CONNECTED FOR 180...265 VAC
- 4)

	PIN 7 IC5 PIN 7 IC13 PIN 7 IC14 PIN 8 IC16 PIN 8 IC17	+10V		PIN 14 IC5 PIN 14 IC13 PIN 14 IC14 PIN 1 IC16 PIN 1 IC17
--	---	------	--	--
- 5) THE SIGNAL LEVEL NOTED IN PARENTHESIS INDICATES THE ACTIVE LOGIC STATE. FOR EXAMPLE: 'OTP(L)' INDICATES THAT AN OVERTEMPERATURE FAULT EXISTS WHEN THE 'OTP' SIGNAL IS LOW.

TO SIX-STEP INVERTER BOARD CONNECTOR FKV6

WARNING

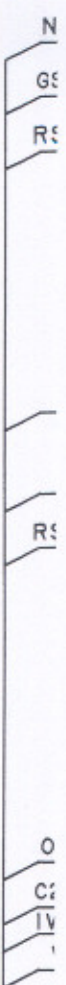
All measurements are referenced to board ground VO1 which is ABOVE chassis ground. If using AC powered test equipment, float its AC ground connection to prevent short circuiting the converter. Beware that the test equipment chassis will now be above earth ground by up to 160 volts!

Figure 7-4. NT50 Power Supply and Signal Generation Board, Schematic

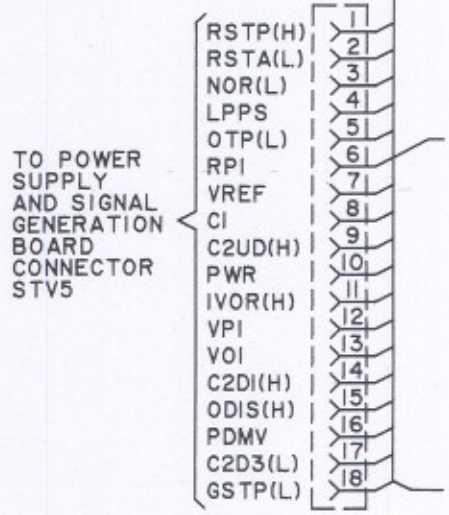
Table 7-5 — NT50 Six Step Inverter Board Parts List

<i>Item</i>	<i>Description</i>	<i>Part Number</i>
—	Complete board	200 30 230
D1, D9, D17	Diode, BAX12A	
D2, D10, D18	Diode, BAX12A	
D3, D11, D19	Diode, BAT41	510 43 353
D4, D12, D20, D27, D34, D41	Diode, BAT41	510 43 353
D5, D13, D21, D28, D35, D42	Diode, 1N4148	510 43 605
D6, D14, D22, D29, D36, D43	Diode, BAX12A	
D7, D15, D23, D30, D37, D44	Diode, MR816	510 43 113
D8, D16, D24, D31, D38, D45	Diode, TSA4937	
IC1, IC2, IC3, IC4, IC5, IC6	IC, 4050, Hex buffer	533 20 198
T1, T5, T9, T13, T17, T21	Transistor, ZTX652	200 29 776
T2, T6, T10, T14, T18, T22	Transistor, ZTX752	200 29 777
T3, T7, T11, T15, T19, T23	Transistor, BC550	533 21 196
T4, T8, T12, T16, T20, T24	FET, BUZ41A	200 29 791

*See Figure 7-8 for component type numbers not listed in this table.



STV5



TO POWER
SUPPLY
AND SIGNAL
GENERATION
BOARD
CONNECTOR
STV5

DWG. NO. DSK 3568

GND -

NOR(L)

3STP(L)

2STP(H)

VOI

VPI

2STA(L)

OTP(L)

2UD(H)

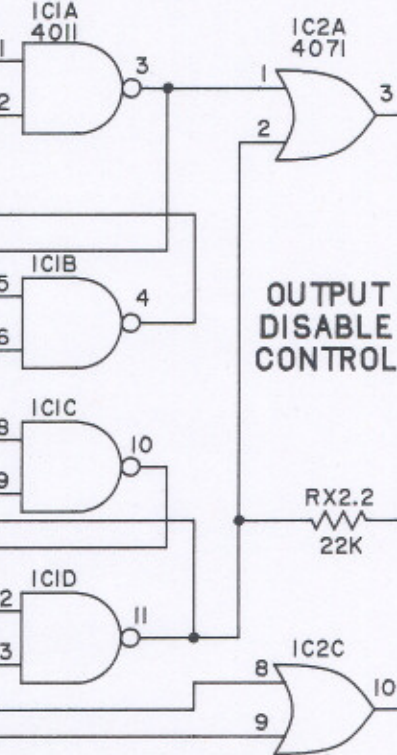
VOR(H)

VREF

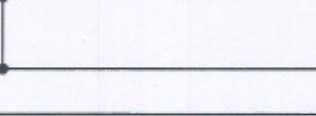
RPI

8

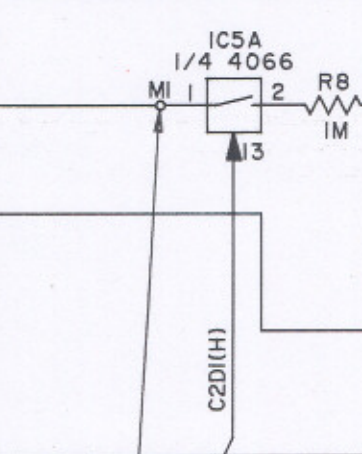
START/STOP LATCH



OVERTEMPERATURE FAILURE LATCH



PUMP SPEED TO CURRENT CONVERTER



NORM 7.5VP-P

830US

500US

NORM 7.5VP-P

830US

RX3.1 680R

RX2.2 22K

RX2.2 22K

RX2.2 22K

RX2.2 22K

R8 1M

R27 47K

R4 10K

R5 47K

R6 1K

R26 1M

R3 100K

R1 1M

R2 6M

RX1.1 10K

RX1.2 10K

C1 4.7UF

C2 0.1UF

C3 0.1UF

C4 470PF

C5 4700PF

C6 0.1UF

C7 1UF

C8 0.1UF

D1 DI IN4148

D2 DI IN4148

D3 DI IN4148

D4 DI IN4148

D5 DI IN4148

D6 DI IN4148

D7 DI IN4148

D8 DI IN4148

D9 DI IN4148

D10 DI IN4148

D11 DI IN4148

D12 DI IN4148

D13 DI IN4148

D14 DI IN4148

D15 DI IN4148

D16 DI IN4148

D17 DI IN4148

D18 DI IN4148

D19 DI IN4148

D20 DI IN4148

D21 DI IN4148

D22 DI IN4148

D23 DI IN4148

D24 DI IN4148

D25 DI IN4148

D26 DI IN4148

D27 DI IN4148

D28 DI IN4148

D29 DI IN4148

D30 DI IN4148

D31 DI IN4148

D32 DI IN4148

D33 DI IN4148

D34 DI IN4148

D35 DI IN4148

D36 DI IN4148

D37 DI IN4148

D38 DI IN4148

D39 DI IN4148

D40 DI IN4148

D41 DI IN4148

D42 DI IN4148

D43 DI IN4148

D44 DI IN4148

D45 DI IN4148

D46 DI IN4148

D47 DI IN4148

D48 DI IN4148

D49 DI IN4148

D50 DI IN4148

D51 DI IN4148

D52 DI IN4148

D53 DI IN4148

D54 DI IN4148

D55 DI IN4148

D56 DI IN4148

D57 DI IN4148

D58 DI IN4148

D59 DI IN4148

D60 DI IN4148

D61 DI IN4148

D62 DI IN4148

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D88 DI IN4148

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D92 DI IN4148

D93 DI IN4148

D94 DI IN4148

D95 DI IN4148

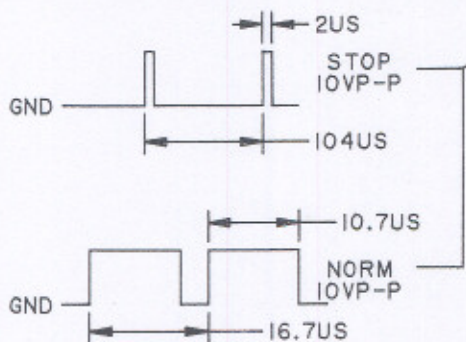
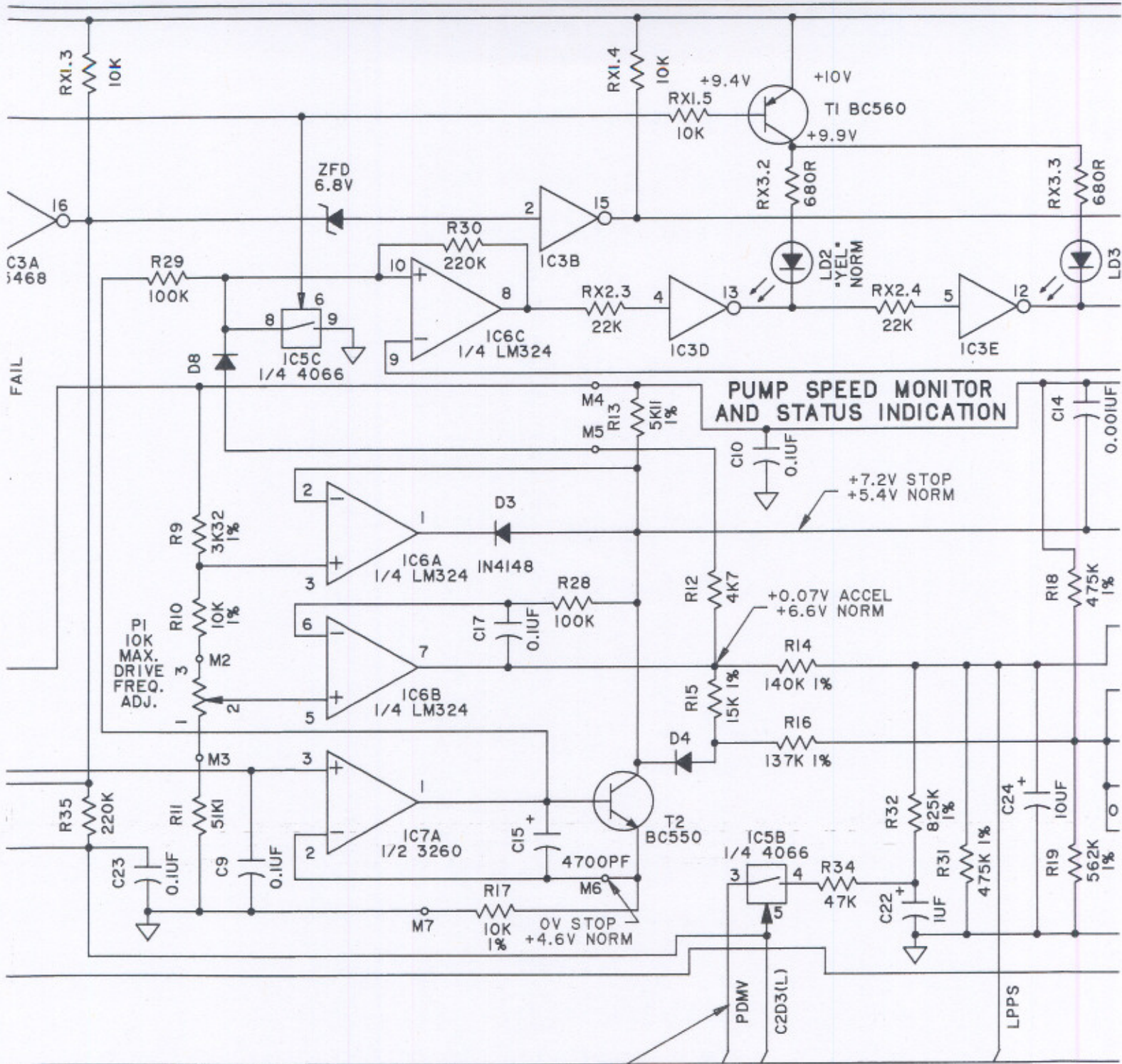
D96 DI IN4148

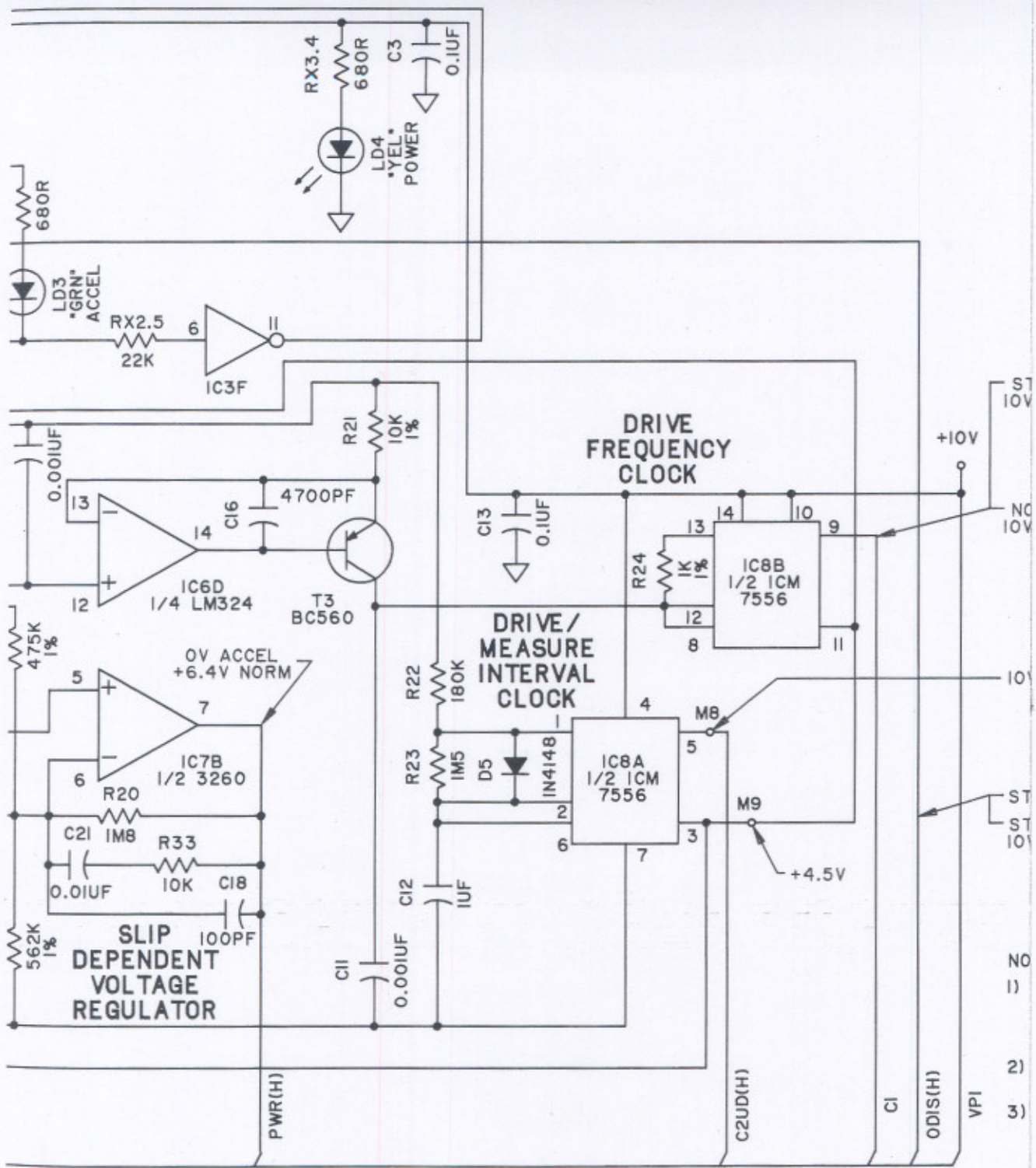
D97 DI IN4148

D98 DI IN4148

D99 DI IN4148

D100 DI IN4148





PWR(H)

C2UD(H)

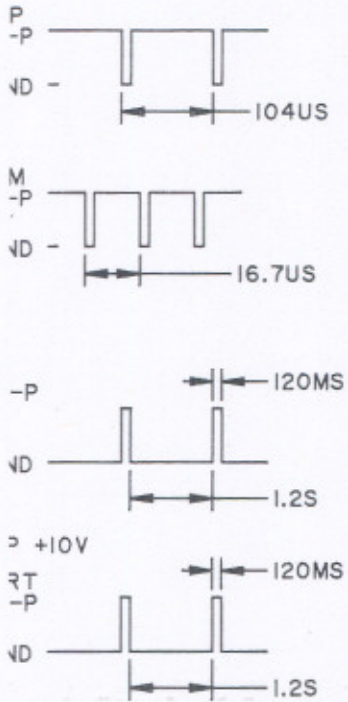
CI

ODIS(H)

VPI

- ST 10V
- NO 10V
- 10V
- ST 10V
- NO 10V
- 1)
- 2)
- 3)
- 4)

11 measurements are referenced to board round VO1 which is ABOVE chassis ground. If using AC powered test equipment, float its AC ground connection to prevent short circuiting the converter. Beware that the test equipment chassis will now be above earth ground by up to 160 volts!



RESISTOR VALUES ARE INDICATED BY PLACING THE MULTIPLIER SYMBOL IN PLACE OF THE DECIMAL POINT. FOR EXAMPLE: 1200 OHMS IS MARKED 1K2, 100 OHMS IS MARKED 100R, AND 0.5 OHMS IS MARKED R5.

UNLESS OTHERWISE SPECIFIED, ALL VOLTAGES ARE REFERENCED TO BOARD GROUND VO1.

THE SIGNAL LEVEL NOTED IN PARENTHESIS INDICATES THE ACTIVE LOGIC STATE. FOR EXAMPLE: *NOR(L)* INDICATES THAT WHEN THE CONVERTER ACHIEVES NORMAL OPERATION, THE *NOR* SIGNAL WILL BE LOW.

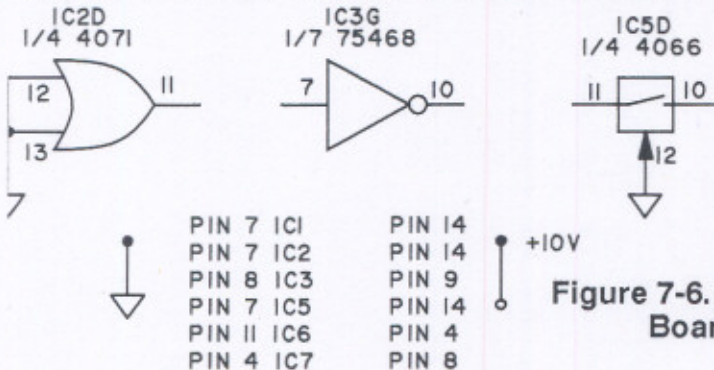
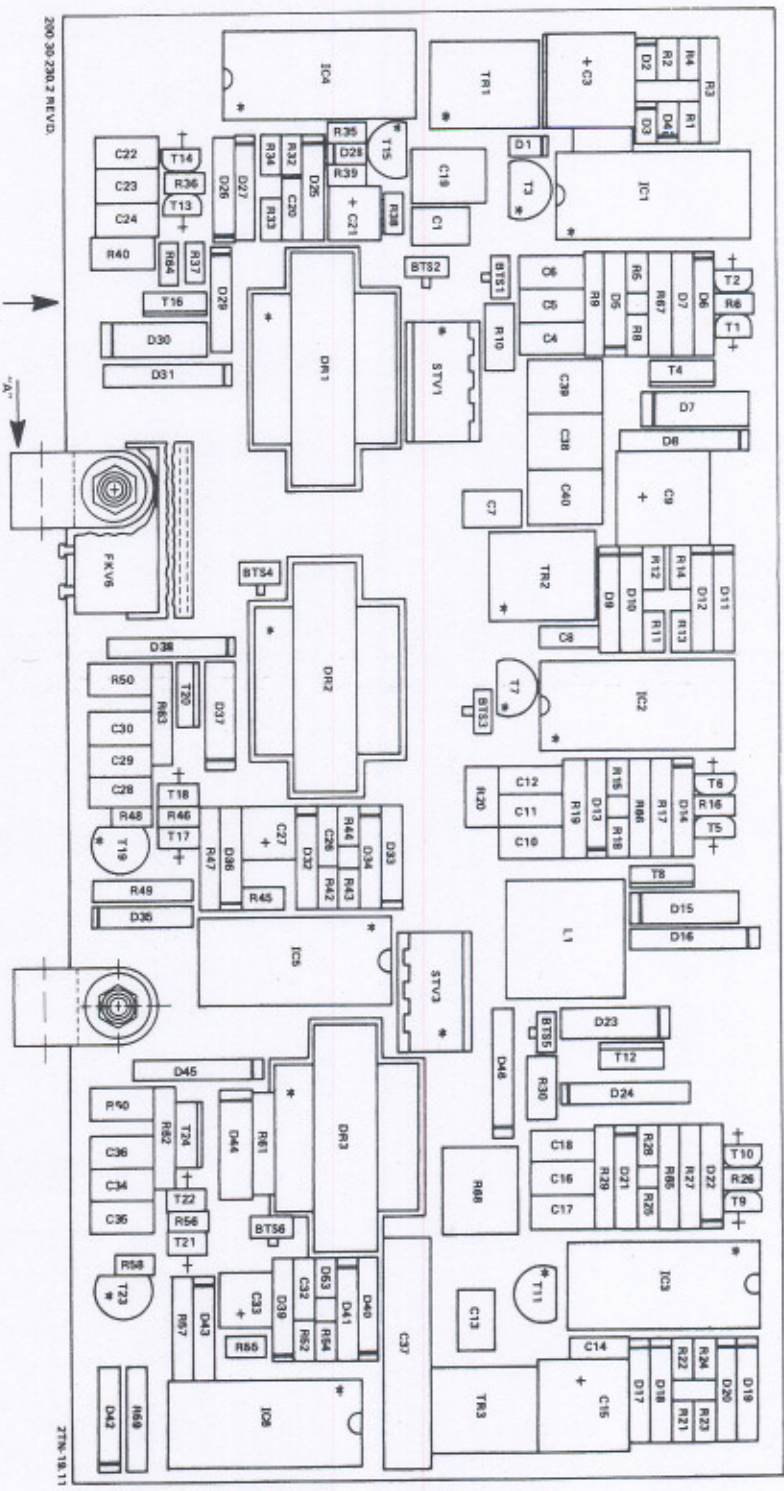


Figure 7-6. Control and Status Indication Board, Electrical Schematic

Figure 7-7. NT50 Six Step Inverter Board Layout



200-30-280.2 REV.0

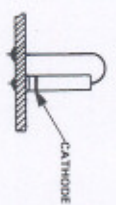
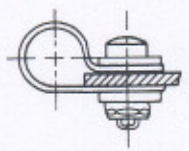
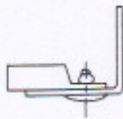
27N-18.11

* DENOTES PIN 1

DIODE MOUNTING

VIEW "A"

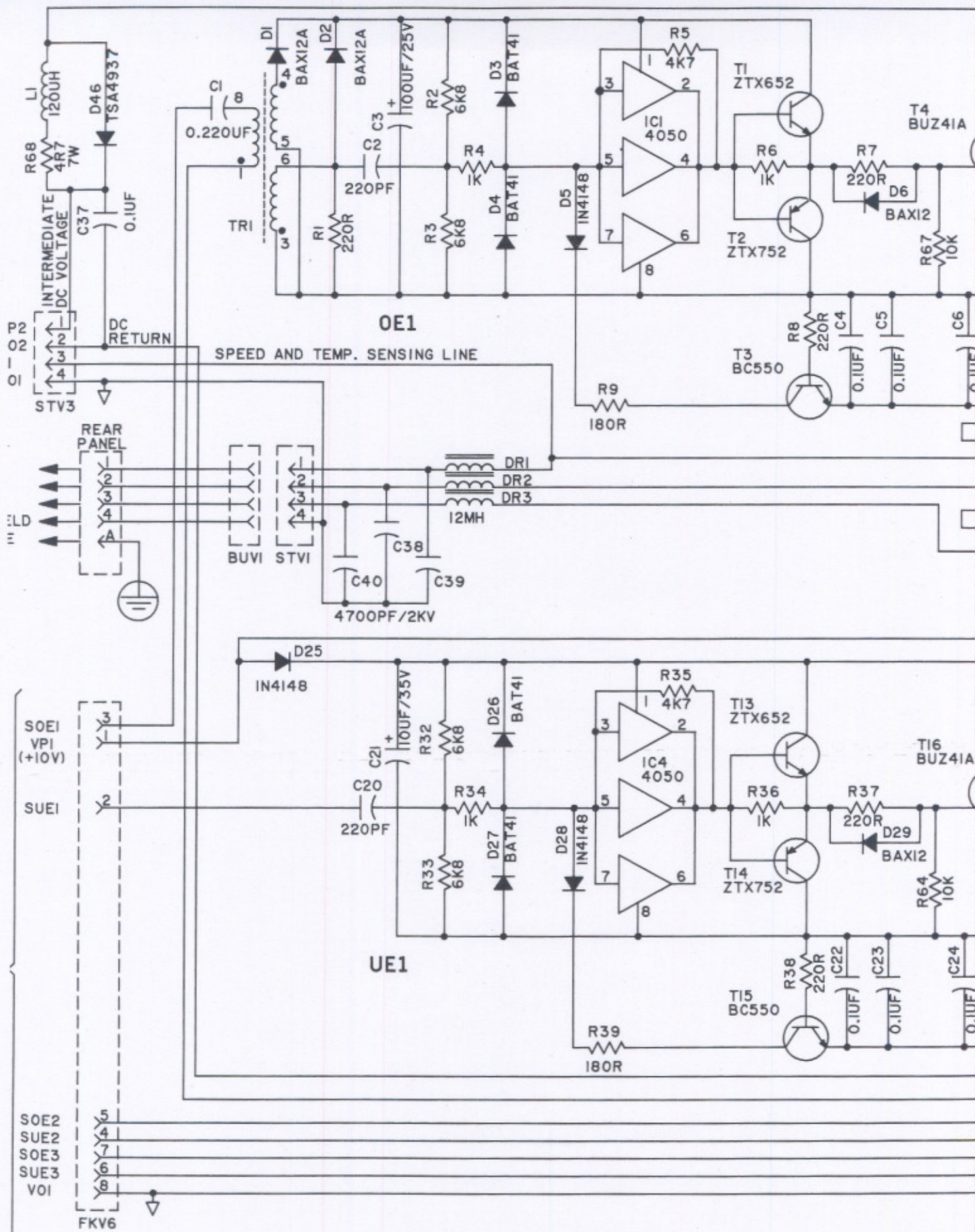
VIEW "B" (14, 78, 112, 116, 120, 124)

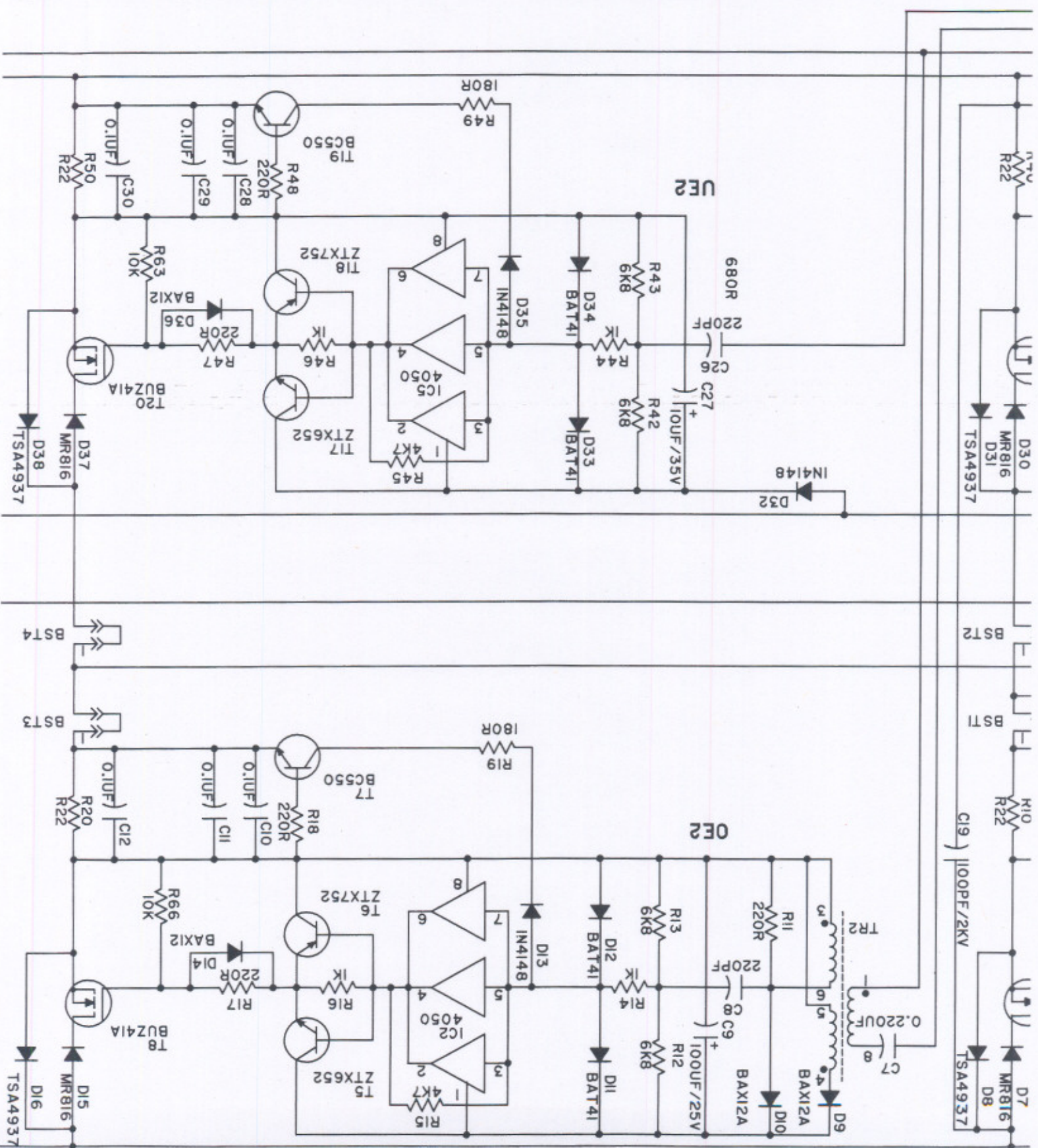


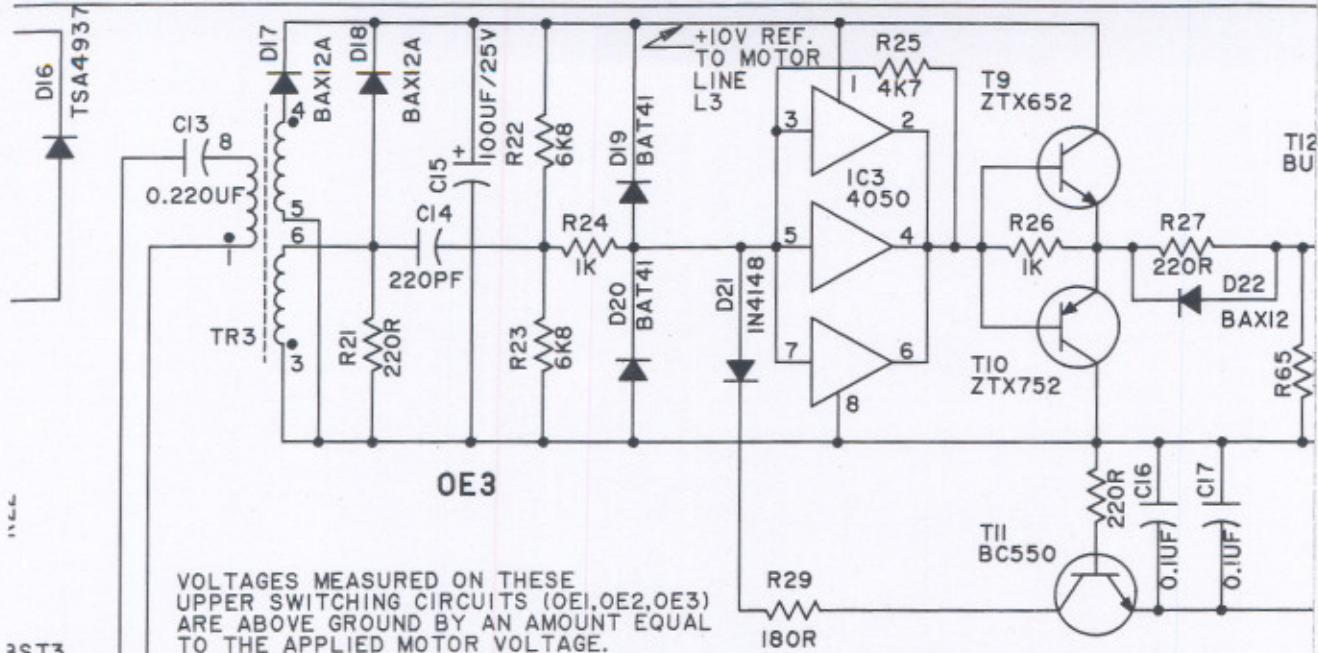
TO POWER
SUPPLY AND
SIGNAL
GENERATION
BOARD
CONNECTOR
STV6

TO
TMP-50
MOTOR
T1
T2
T3
SHIELD
CASE

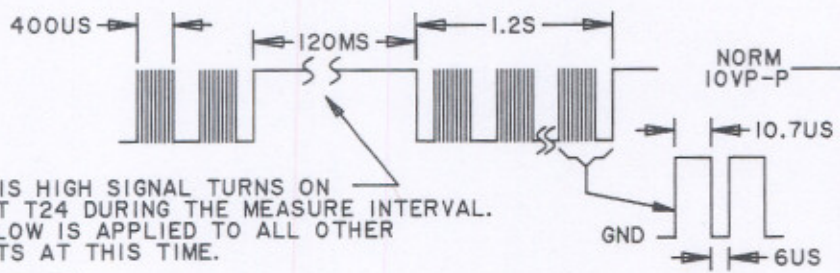
TO
POWER
SUPPLY
AND SIGNAL
GENERATION
BOARD
CONNECTOR
STV3
VP2
VO2
VO1



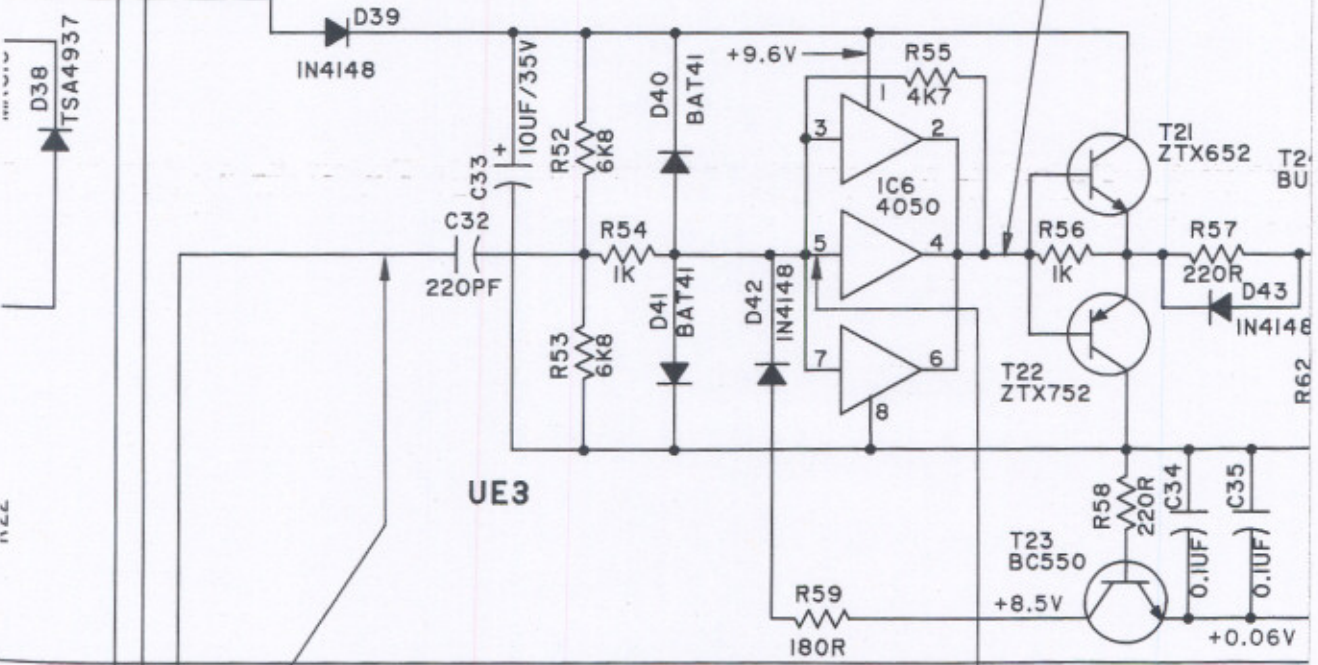




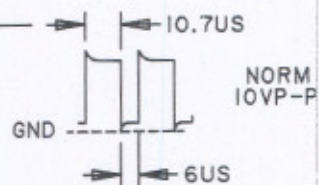
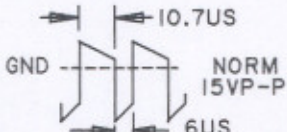
VOLTAGES MEASURED ON THESE UPPER SWITCHING CIRCUITS (OE1, OE2, OE3) ARE ABOVE GROUND BY AN AMOUNT EQUAL TO THE APPLIED MOTOR VOLTAGE.

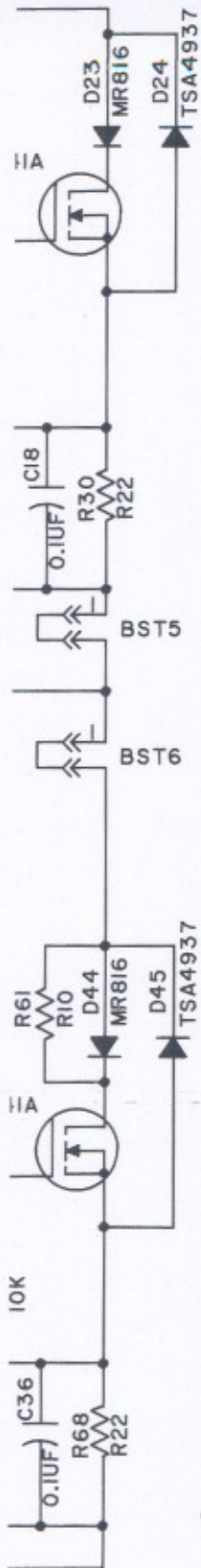


THIS HIGH SIGNAL TURNS ON FET T24 DURING THE MEASURE INTERVAL. A LOW IS APPLIED TO ALL OTHER FETS AT THIS TIME.



THIS TURN-ON PULSE IS MODULATED AS SHOWN TO THE RIGHT

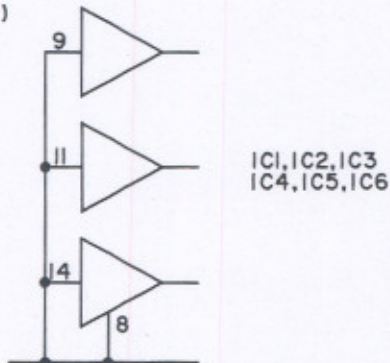




NOTES:

- 1.) RESISTOR VALUES ARE INDICATED BY PLACING THE MULTIPLIER SYMBOL IN PLACE OF THE DECIMAL POINT. FOR EXAMPLE : 1200 OHMS IS MARKED 1K2, 100 OHMS IS MARKED 100R, AND 0.5 OHM IS MARKED R5.
- 2.) UNLESS OTHERWISE SPECIFIED, ALL VOLTAGES ARE REFERENCED TO BOARD GROUND VO1.

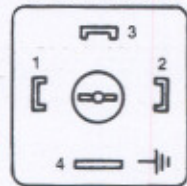
3.)



WARNING

All measurements are referenced to board ground VO1 which is ABOVE chassis ground. If using AC powered test equipment, float its AC ground connection to prevent short circuiting the converter. Beware that the test equipment chassis will now be above earth ground by up to 160 volts!

PUMP CONNECTOR

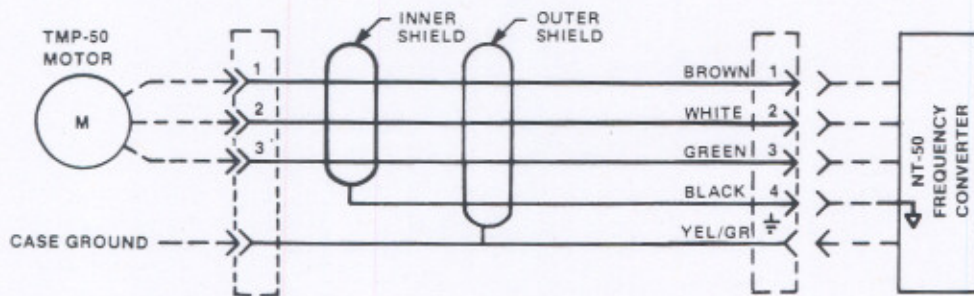


INSIDE VIEW

CONVERTER CONNECTOR



INSIDE VIEW



17N-18.20

Figure 7-8. NT50 Six Step Inverter Board, Schematic