

A 100  
 PC BOARD, CLOCK SCANNER  
 ASSY: C 660393

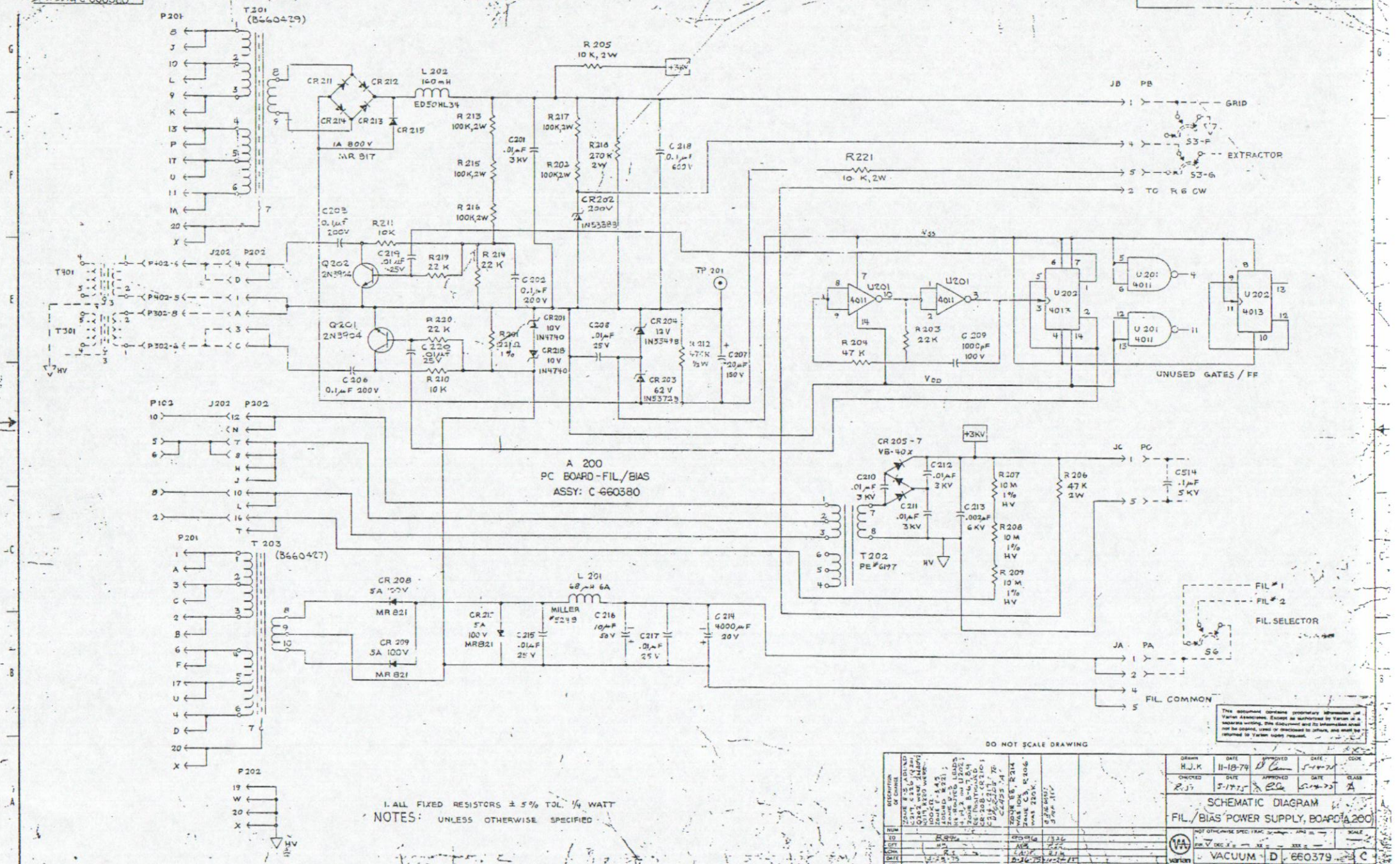
3 DEGAS TIME OUT DEPENDENT ON AC LINE FREQUENCY (5 MIN FOR 60 HZ)  
 2 PIN 14 TO BE 12 VDC, PIN 7 TO BE LOGIC COM ON U 01-105 & U 107 - 113  
 PIN 16 TO BE 12 VDC, PIN 8 TO BE LOGIC COM ON U 06  
 ALL FIXED RESISTORS ± 5% TOL, 1/4 WATT.  
 NOTES: UNLESS OTHERWISE SPECIFIED

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DESCRIPTION or circuit	OPERATIVE TO CLASS 'A'	AREA 1 & 2 ADDRESS (ORIGINAL)	REV. CONTROL FILE REV. DATE	DATE	DATE	DATE	DATE	DATE
SHEMATIC DIAGRAM CLOCK / SCANNER A (100)				SCALE	NONE			
VACUUM D 660392 C								





I. ALL FIXED RESISTORS ± 5% TOL. 1/4 WATT  
NOTES: UNLESS OTHERWISE SPECIFIED

NO.	DESCRIPTION OF CHANGE	DATE	BY	APPROVED	DATE	BY
1	REVISED TO SHOW CHANGES TO THE ORIGINAL DRAWING	11-18-74	HJK	[Signature]	5-17-75	[Signature]
2	REVISED TO SHOW CHANGES TO THE ORIGINAL DRAWING	5-17-75	[Signature]	[Signature]	5-17-75	[Signature]

NO.	DESCRIPTION OF CHANGE	DATE	BY	APPROVED	DATE	BY
1	REVISED TO SHOW CHANGES TO THE ORIGINAL DRAWING	11-18-74	HJK	[Signature]	5-17-75	[Signature]
2	REVISED TO SHOW CHANGES TO THE ORIGINAL DRAWING	5-17-75	[Signature]	[Signature]	5-17-75	[Signature]

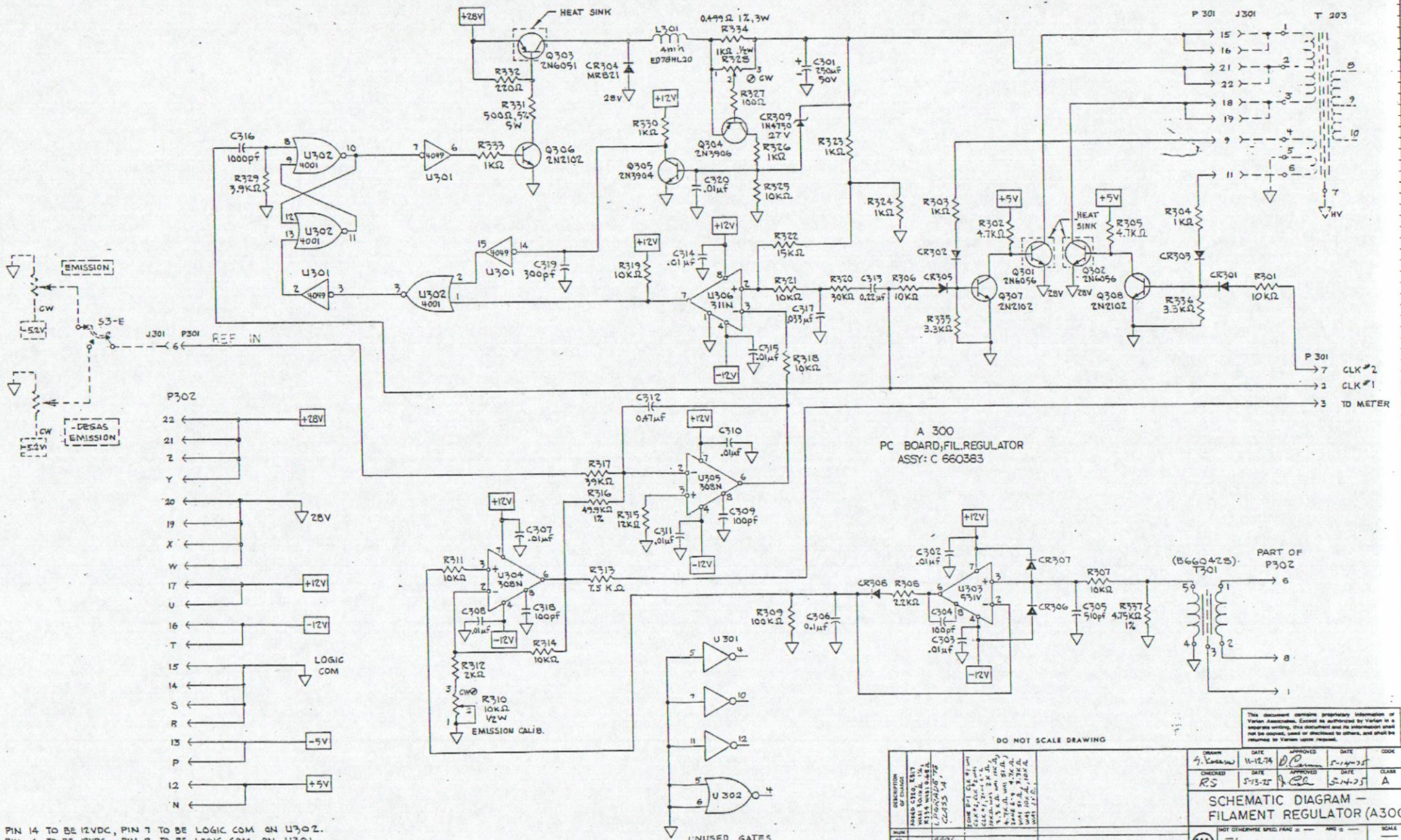
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100 VAC

VACUUM D 660379 C

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A 300  
PC BOARD FILAMENT REGULATOR  
ASSY: C 660383

3. PIN 14 TO BE 12VDC, PIN 7 TO BE LOGIC COM ON U302.  
PIN 1 TO BE 12VDC, PIN 8 TO BE LOGIC COM ON U301.  
2. ALL DIODES ARE IN914.  
1. ALL FIXED RESISTORS ± 5% TOL, 1/4 WATT.  
NOTES: UNLESS OTHERWISE SPECIFIED

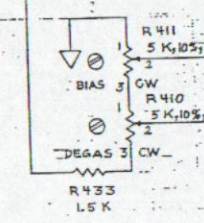
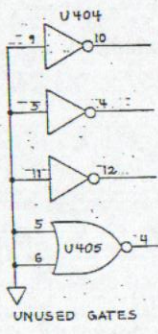
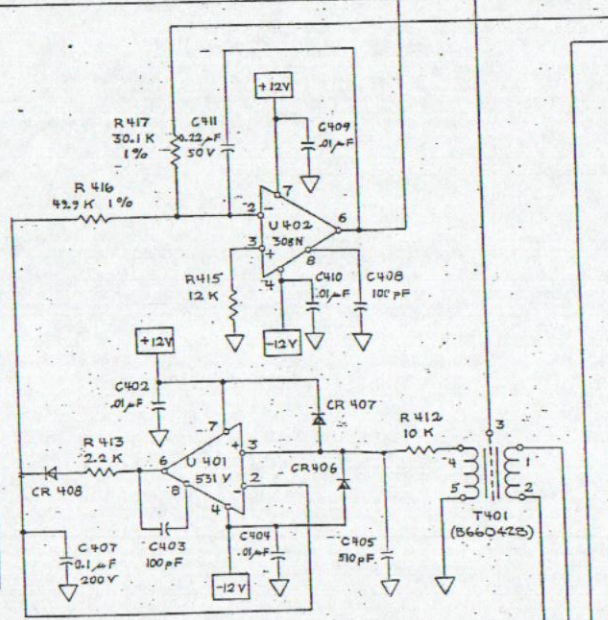
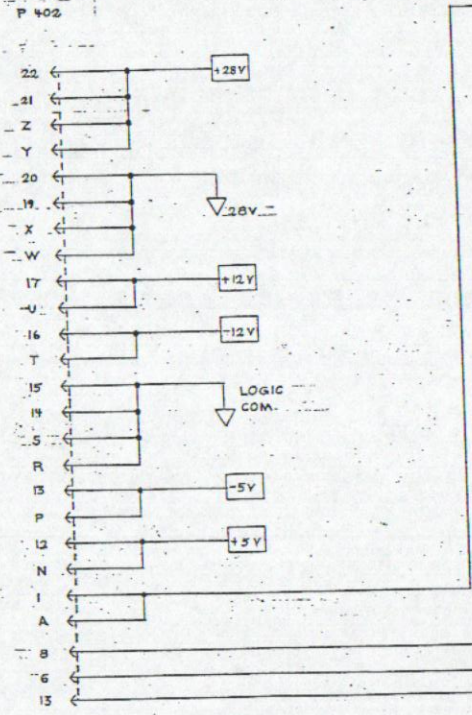
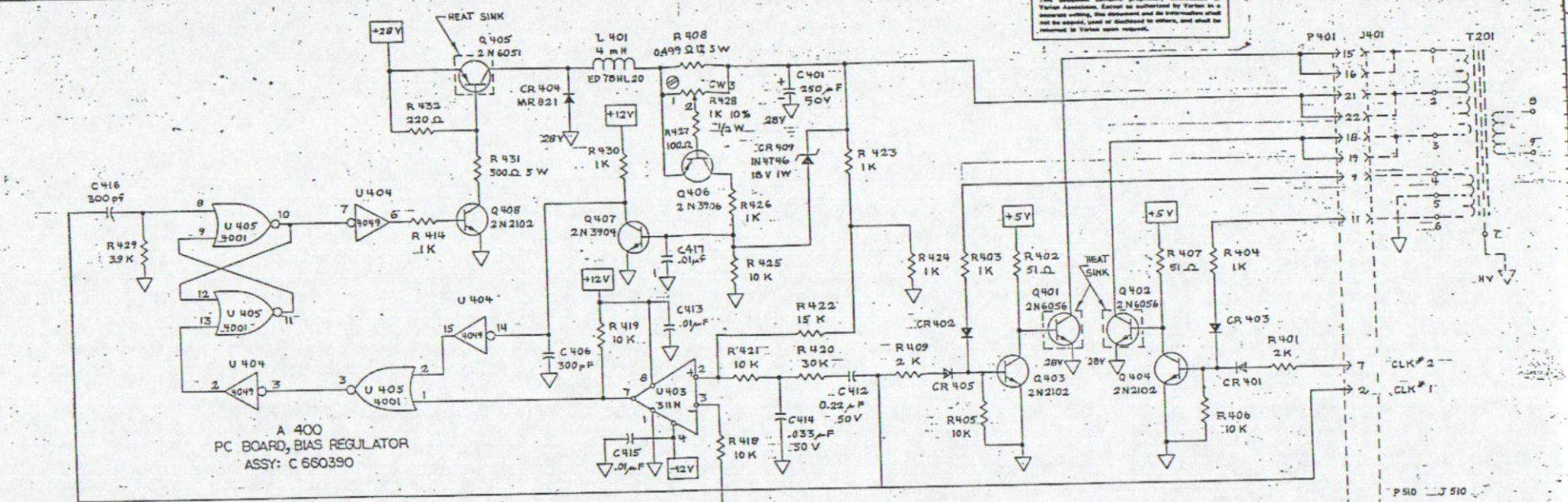
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DRAWN S. K. S.	DATE 11-12-74	APPROVED D. C.	DATE 1-14-75	CODE
CHECKED RS	DATE 5-13-75	APPROVED D. C.	DATE 5-14-75	CLASS
<b>SCHEMATIC DIAGRAM - FILAMENT REGULATOR (A300)</b>				
(NOT OTHERWISE SPECIFIED) — — — — —				
VACUUM D 660382 B				



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3 PIN 14 TO BE 12 VDC; PIN 7 TO BE LOGIC COM ON U405  
 PIN 1 TO BE 12 VDC; PIN 8 TO BE LOGIC COM ON U404  
 2 ALL DIODES ARE 1N914  
 1 ALL FIXED RESISTORS ± 5% TOL, 1/4 WATT  
 NOTES: UNLESS OTHERWISE SPECIFIED

DO NOT SCALE DRAWING

DESCRIPTION OF CHANGE	DATE	APPROVED	DATE	CODE
DATE CHG. ORDER	11-19-74	[Signature]	5-17-75	A
DATE CHG. ORDER	5-13-75	[Signature]	5-14-75	A

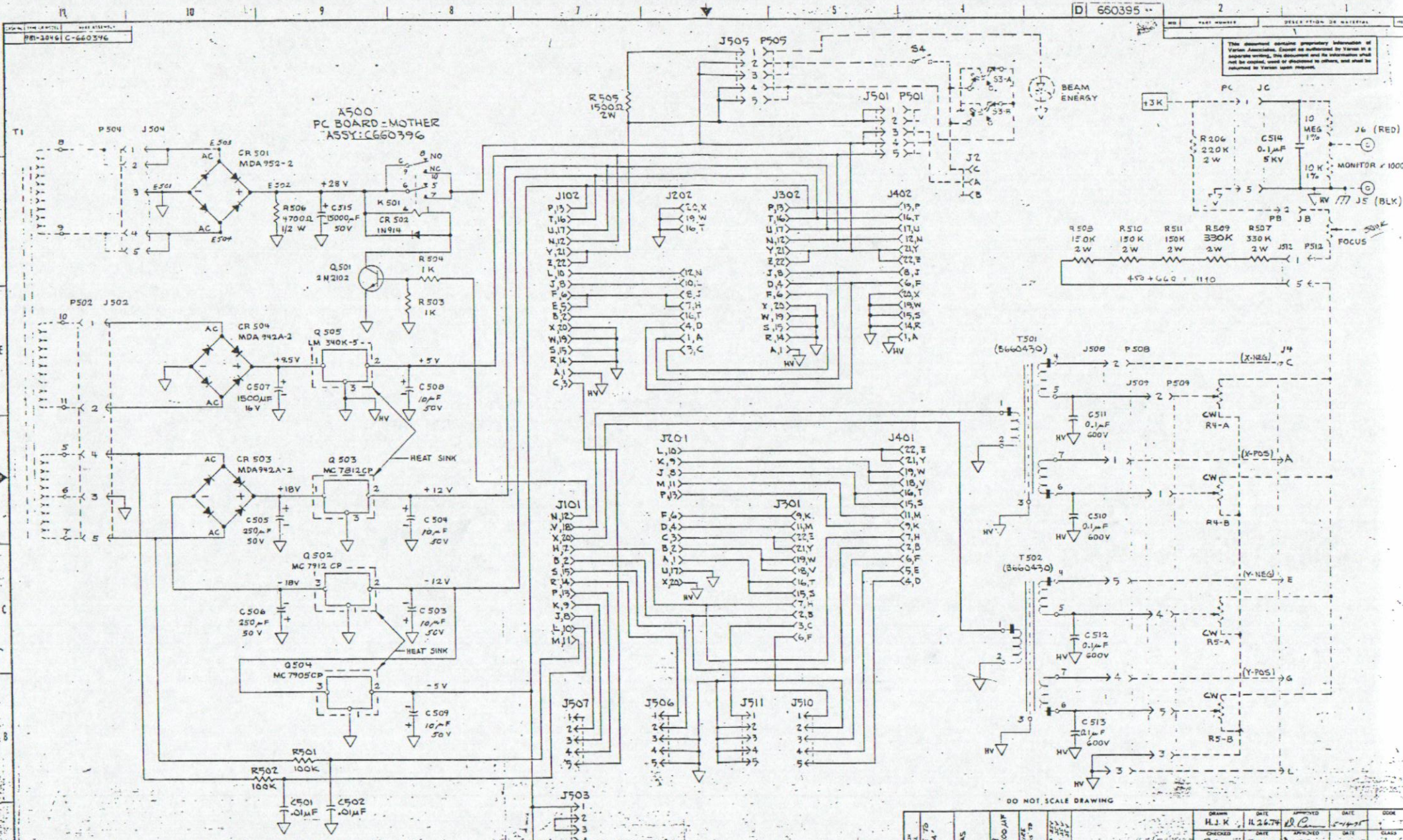
  

DATE	TIME	BY	SCALE
11-19-74	14:30	[Signature]	NONE

SCHEMATIC DIAGRAM		BIAS REGULATOR (A400)	
NOT OTHERWISE SPECIFIED	FRAC	AND	SCALE
VACUUM	D	660389	B





2 PIN 3 INPUT, PIN 2 OUTPUT, PIN 1 GROUND ON Q502 & Q504  
 PIN 1 INPUT, PIN 2 OUTPUT, PIN 3 GROUND ON Q503 & Q505  
 ALL FIXED RESISTORS ± 5% TOL, 1/4 WATT  
**NOTES: UNLESS OTHERWISE SPECIFIED**

REVISION	DATE	APPROVED	DATE	CLASS
1	11-26-74	[Signature]		A
2	5-13-75	[Signature]		A

DESCRIPTION	UPGRADE TO CLASS 'A'
REASON	R509 WAS 150K
AREA	E-Q
NOTED	AS NOTED (100 μF)
APPROVED	[Signature]
DATE	11-11-75

DATE	11-26-74	DATE	
TIME	10:30	TIME	
BY	[Signature]	BY	[Signature]
CHKD	[Signature]	CHKD	[Signature]
APP'D	[Signature]	APP'D	[Signature]
DATE	11-26-74	DATE	

NOT OTHERWISE SPECIFIED	AND	SCALE	NONE
VACUUM	D	660395	D

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TYPE OF MODEL PL BD ASSY - CLOCK / SCANNER A100

NEW OR EXISTING PART	PART NUMBER	PART DESCRIPTION	REF DES.	REQ.
1	660393	PC BOARD ASSY	A100	REF
2	660394	PC BOARD - FAB		1
7	660392	SCHEMATIC DIAGRAM		REF
10	41209000	CAPACITOR - CERAMIC DISC .01 $\mu$ F, 25V C101, 104, 105, 111, 113, 115, 116, 117, 119, 122, 124, 125, 128, 129, 130		15
11	41159573	CAPACITOR - MICA 20pf, 500V C102		1
12	41506244	CAPACITOR - ELECT 10 $\mu$ F, 50V C103, 109, 110, 126		4
13	41506222	CAPACITOR - ELECT 75 $\mu$ F, 16V C106		1
14	41506081	CAPACITOR - ELECT N.P. 70 $\mu$ F, 20V C107, 108		2
15	41159575	CAPACITOR - MICA 30pf, 500V C112, 127		2
16	417108755	CAPACITOR - MYLAR 0.1 $\mu$ F, 200V C114, 118		2
17	41159565	CAPACITOR - MICA 120pf, 500V C120, 121		2
18	41159586	CAPACITOR - MICA 100pf, 500V C123		1
19	66304754	DIODE - ZENER 39V $\pm$ 10%, 1W 1N4754 CR101, 102		2
20	62902102	TRANSISTOR - NPN 2N2102 Q101, 102, 103, 108, 109, 110		6
21	62904233	TRANSISTOR - NPN 2N4233 Q104, 107		2
22	62905955	TRANSISTOR - PNP 2N5955 Q105, 106		2
23	62903879	TRANSISTOR - NPN 2N3879 Q111, 112		2
24	62990201	TRANSISTOR - PNP 2N3789 Q113		1
25	54634104	SOCKET - TRANSISTOR XQ101, 102, 103, 108, 109, 110		6
26	66303894	HEAT SINK XQ111, 112		2
27	66303895	HEAT SINK XQ113		1
28	32301410	RESISTOR 1 K $\Omega$ 5%, 1/4W R101, 102, 125, 126, 129		5
29	32301510	RESISTOR 10 K $\Omega$ 5%, 1/4W R103, 104, 105, 108, 123		5
30	36797671	RESISTOR - VARIABLE 5 K $\Omega$ 10%, 1/2W R106		1
31	322011356	RESISTOR 560 $\Omega$ 5%, 1/2W R107		1
32	323011210	RESISTOR 10 $\Omega$ 5%, 1/4W R109, 110		2
33	31225499	RESISTOR 49.9 K $\Omega$ 1%, 1/4W R111, 117, 118		3
34	31225453	RESISTOR 45.3 K $\Omega$ 1%, 1/4W R112		1
35	323017110	RESISTOR 1 MEG $\Omega$ 5%, 1/4W R113, 114, 115, 116		4
36	36797674	RESISTOR - VARIABLE 100 K $\Omega$ 10%, 1/2W R131		1
37	323011733	RESISTOR 3.3 MEG $\Omega$ 5%, 1/4W R120		1
38	323011734	RESISTOR 51 K $\Omega$ 5%, 1/4W R121		1
39	323011735	RESISTOR 160 K $\Omega$ 5%, 1/4W R119, 122		2
40	35289350	RESISTOR 500 $\Omega$ 5%, 5W R124		1
41	323011251	RESISTOR 51 $\Omega$ 5%, 1/4W R127, 128		2
42	323011220	RESISTOR 20 $\Omega$ 5%, 1/4W R130		1
43	626000003	IC - FLIP FLOP, DUAL D @ SET/RESET 4013 U101, 107		2
44	626000006	IC - GATE, QUAD 2 INPUT NAND 4011 U102, 104		2
45	626000011	IC - COUNTER/FREQ DIVIDER 4024 U103, 105, 113		3
46	626000002	IC - COUNTER/DIVIDER 4020 U106		1
47	626000004	IC - GATE, DUAL 4 INPUT NAND 4012 U108		1
48	626000026	IC - SWITCH, QUAD BILATERAL 4016 U109		1
49	626000024	IC - GATE, TRIPLE 3 INPUT NAND 4023 U110		1
50	626000008	IC - GATE, QUAD 2 INPUT NOR 4001 U111, 112		2
51	626000386	IC - OP AMP HI SLEW RATE 531V U114, 115		2

TYPE OF MODEL PL DD ASSY - FILAMENT / BIAS POWER SUPPLY A200

NEW OR EXISTING PART	PART NUMBER	PART DESCRIPTION	REF DES.	REQ.
1	660380	PC BOARD ASSY	A200	REF
2	660381	PC BOARD - FAB		1
7	660379	SCHEMATIC DIAGRAM		REF
9	41299882	CAPACITOR - CERAMIC DISC .01 $\mu$ F, 3KV C201, 210, 211, 212		4
10	41708755	CAPACITOR - MYLAR 0.1 $\mu$ F, 200V C202, 203, 206		3
11	41503894	CAPACITOR - ELECT 20 $\mu$ F, 150V C207		1
12	41209000	CAPACITOR - CERAMIC DISC .01 $\mu$ F, 25V C208, 215, 216, 217, 218, 219		5
13	41159599	CAPACITOR - MICA 1000pf, 100V C209		1
14	41299882	CAPACITOR - CERAMIC .002 $\mu$ F, 6KV C213		1
15	41506126	CAPACITOR - ELECT 4000 $\mu$ F, 20V C214		1
16	41506244	CAPACITOR - ELECT 10 $\mu$ F, 50V C216		1
17	41769013	CAPACITOR - MYLAR 0.1 $\mu$ F, 600V C218		1
18	66304740	DIODE - ZENER 10V $\pm$ 10%, 1W 1N4740 CR201, 218		2
19	663025388	DIODE - ZENER 200V $\pm$ 5%, 5W 1N5388B CR202		1
20	663025372	DIODE - ZENER 62V $\pm$ 5%, 5W 1N5372B CR203		1
21	663025349	DIODE - ZENER 12V $\pm$ 5%, 5W 1N549B CR204		1
22	66303022	RECTIFIER - HIGH VOLT. VB-40X CR205, 206, 207		3
23	66303222	DIODE - POWER 100 PIV, 5A MR821 CR208, 209, 210		3
24	66303227	DIODE - POWER 800 PIV, 1A MR817 CR211-215		5
25	51147171A	CONNECTOR - POLARIZING WAFER 5pin		3
26	43232966	INDUCTOR - RF 68 $\mu$ H $\pm$ 20% 6A L201		1
27	431111973	INDUCTOR 160mh L202		1
28	62903904	TRANSISTOR 2N3904 Q201, 202		2
29	54634104	SOCKET - TRANSISTOR XQ201, 202		2
30	3112232211	RESISTOR 221 $\Omega$ 1%, 1/4W R201		1
31	344011610	RESISTOR 100 K $\Omega$ 5%, 2W R202, 213, 215, 216, 217		5
32	32301522	RESISTOR 22 K $\Omega$ 5%, 1/4W R203		4
33	32301547	RESISTOR 47 K $\Omega$ 5%, 1/4W R204		1
34	34401510	RESISTOR 10 K $\Omega$ 5%, 2W R205, 221		2
35	34401547	RESISTOR 47 K $\Omega$ 5%, 2W R206		1
36	313871134	RESISTOR - HV 7KV 10 MEG $\Omega$ 1%, 25W R207, 208, 209		3
37	32301510	RESISTOR 10 K $\Omega$ 5%, 1/4W R210, 211		2
38	322011647	RESISTOR 470 K $\Omega$ 5%, 1/4W R212		1
39	344011627	RESISTOR 270 K $\Omega$ 5%, 2W R218		1
40	05703588	TRANSFORMER - DC INVERTER T202		1
41	660427	TRANSFORMER - FILAMENT T203		1
42	660429	TRANSFORMER - BIAS T201		1
43	62600006	IC - GATE, QUAD 2 INPUT NAND CD4011AE U201		1
44	62600003	IC - FLIP FLOP, DUAL @ SET/RESET CD4013AE U202		1



TYPE OF MODEL PC Bd ASSY - FILAMENT REGULATOR A300			
REV. NO.	LEVEL	PART NUMBER	PART DESCRIPTION
1	C	660783	PC BOARD ASSY
1	C	660784	PC BOARD-FAB
1	1	415061132	CAPACITOR-ELECT 250 $\mu$ f, 50V C301
1	1	412090000	CAPACITOR-CERAMIC DISC .01 $\mu$ f, 25V C302,303, 307,308,310,311,314,315,320
1	1	41159586	CAPACITOR-MICA 100pf, 500V C304,309, 318
1	1	41159593	CAPACITOR-MICA 510pf, 500V C305
1	1	411708755	CAPACITOR-MYLAR 0.1 $\mu$ f, 200V C306
1	1	4117080711	CAPACITOR-MYLAR 0.47 $\mu$ f, 50V C312
1	1	4117092311	CAPACITOR-MYLAR 0.22 $\mu$ f, 50V C313
1	1	41159599	CAPACITOR-MICA 1000pf, 100V C316
1	1	411708083	CAPACITOR-MYLAR .033 $\mu$ f, 50V C317
1	1	41159590	CAPACITOR-MICA 300pf, 500V C319
1	1	431111986	INDUCTOR 4mh L301
1	1	66304148	DIODE-SIGNAL IN914 CR301-303, 305-308
1	1	66393222	DIODE-POWER 100PIV, 5A MR821 CR304
1	1	66304750	DIODE-ZENER 27V $\pm$ 10% 1W IN4750 CR309
1	1	62899650	INSULATOR Q301-303
1	1	62906056	TRANSISTOR-NPN 2N6056 Q301,302
1	1	62906051	TRANSISTOR-PNP 2N6051 Q303
1	1	62903906	TRANSISTOR-PNP 2N3906 Q304
1	1	32301420	RESISTOR 2K $\Omega$ 5%, 1/4W R312
1	1	32301447	RESISTOR 4.7K $\Omega$ 5%, 1/4W R302,305
1	1	32301433	RESISTOR 3.3K $\Omega$ 5%, 1/4W R335,336
1	1	32301410	RESISTOR 1K $\Omega$ 5%, 1/4W R303,304, 323,324,326,330,333
1	1	32301510	RESISTOR 10K $\Omega$ 5%, 1/4W R307,311, 301,306,314,318,319,321,325
1	1	32301422	RESISTOR 2.2K $\Omega$ 5%, 1/4W R308
1	1	32301610	RESISTOR 100K $\Omega$ 5%, 1/4W R309
1	1	36797675	RESISTOR-VARIABLE 10K $\Omega$ 10%, 1/2W R310
1	1	32301475	RESISTOR 7.5K $\Omega$ 5%, 1/4W R313
1	1	32301512	RESISTOR 12K $\Omega$ 5%, 1/4W R315
1	1	31225499	RESISTOR 49.9K $\Omega$ 1%, 1/4W R316
1	1	32301539	RESISTOR 3.9K $\Omega$ 5%, 1/4W R317
1	1	32301530	RESISTOR 30K $\Omega$ 5%, 1/4W R320
1	1	32301515	RESISTOR 15K $\Omega$ 5%, 1/4W R322
1	1	32301310	RESISTOR 100 $\Omega$ 5%, 1/4W R327
1	1	36797670	RESISTOR-VARIABLE 1K $\Omega$ 10%, 1/2W R328
1	1	32301439	RESISTOR 3.9K $\Omega$ 5%, 1/4W R329
1	1	35289350	RESISTOR 500 $\Omega$ 5%, 5W R331
1	1	32301322	RESISTOR 220 $\Omega$ 5%, 1/4W R332
1	1	31599732	RESISTOR 0.499 $\Omega$ 1%, 3W R334
1	1	31224475	RESISTOR 4.75K $\Omega$ 1%, 1/4W R337
1	B	660428	TRANSFORMER-FEEDBACK T301
1	1	62600032	IC-BUFFER/LEVEL CONV. HEX INV. CD4049AE U301
1	1	62600008	IC-GATE, QUAD 2 INPUT NOR CD4001AE U302
1	1	62600086	IC-OP AMP HI SLEW RATE 531V U303
1	1	62600164	IC-OP AMP HI Z INPUT 308N U304,305
1	1	62600183	IC-VOLTAGE COMPARATOR 311N U306

TYPE OF MODEL PC Bd ASSY - BIAS REGULATOR A400			
REV. NO.	LEVEL	PART NUMBER	PART DESCRIPTION
1	C	660390	PC BOARD ASSY
1	C	660391	PC BOARD-FAB
1	1	415061132	CAPACITOR-ELECT 250 $\mu$ f, 50V C401
1	1	412090000	CAPACITOR-CERAMIC DISC .01 $\mu$ f, 25V C402,404, 409,410,413,415,417
1	1	41159586	CAPACITOR-MICA 100pf, 500V C403,408
1	1	41159593	CAPACITOR-MICA 510pf, 500V C405
1	1	41159590	CAPACITOR-MICA 300pf, 500V C406,416
1	1	411708755	CAPACITOR-MYLAR 0.1 $\mu$ f, 200V C407
1	1	4117092311	CAPACITOR-MYLAR 0.22 $\mu$ f, 50V C411,412
1	1	411708083	CAPACITOR-MYLAR .033 $\mu$ f, 50V C414
1	1	66304148	DIODE-SIGNAL IN914 CR401,402, 403,405,406,407,408
1	1	66393222	DIODE-POWER 100PIV, 5A MR821 CR404
1	1	66304746	DIODE-ZENER 18V $\pm$ 10% 1W IN4746 CR409
1	1	62906056	TRANSISTOR-NPN 2N6056 Q401,402
1	1	62902102	TRANSISTOR-NPN 2N2102 Q403,404, 408
1	1	62906051	TRANSISTOR-PNP 2N6051 Q405
1	1	62903906	TRANSISTOR-PNP 2N3906 Q406
1	1	62903904	TRANSISTOR-NPN 2N3904 Q407
1	1	54634104	SOCKET-TRANSISTOR XQ403,404, 408
1	1	66899835	HEAT SINK XQ401,402, 3
1	1	32301420	RESISTOR 2K $\Omega$ 5%, 1/4W R401,409
1	1	32301251	RESISTOR 51 $\Omega$ 5%, 1/4W R402,407
1	1	32301410	RESISTOR 1K $\Omega$ 5%, 1/4W R403,404, 414,423,424,426,430
1	1	32301510	RESISTOR 10K $\Omega$ 5%, 1/4W R405,406, 412,418,419,421,425
1	1	31599732	RESISTOR 0.499 $\Omega$ 1%, 3W R408
1	1	36797671	RESISTOR-VARIABLE 5K $\Omega$ 10%, 1/2W R410,411
1	1	32301422	RESISTOR 2.2K $\Omega$ 5%, 1/4W R413
1	1	32301512	RESISTOR 12K $\Omega$ 5%, 1/4W R415
1	1	31225499	RESISTOR 49.9K $\Omega$ 1%, 1/4W R416
1	1	31225301	RESISTOR 30.1K $\Omega$ 1%, 1/4W R417
1	1	32301530	RESISTOR 30K $\Omega$ 5%, 1/4W R420
1	1	32301515	RESISTOR 15K $\Omega$ 5%, 1/4W R422
1	1	32301310	RESISTOR 100 $\Omega$ 5%, 1/4W R427
1	1	36797670	RESISTOR-VARIABLE 1K $\Omega$ 10%, 1/2W R428
1	1	32301439	RESISTOR 3.9K $\Omega$ 5%, 1/4W R429
1	1	35289350	RESISTOR 500 $\Omega$ 5%, 5W R431
1	1	32301322	RESISTOR 220 $\Omega$ 5%, 1/4W R432
1	1	32301415	RESISTOR 1.5K $\Omega$ 5%, 1/4W R433
1	B	660428	TRANSFORMER-FEEDBACK T401
1	1	62600386	IC-OP AMP HI SLEW RATE 531V U401
1	1	62600164	IC-OP AMP HI Z INPUT 308N U402
1	1	62600483	IC-VOLTAGE COMPARATOR 311N U403
1	1	62600032	IC-BUFFER/LEVEL CONV. HEX INV. CD4049AE U404
1	1	62600008	IC-GATE, QUAD 2 INPUT NOR CD4001AE U405



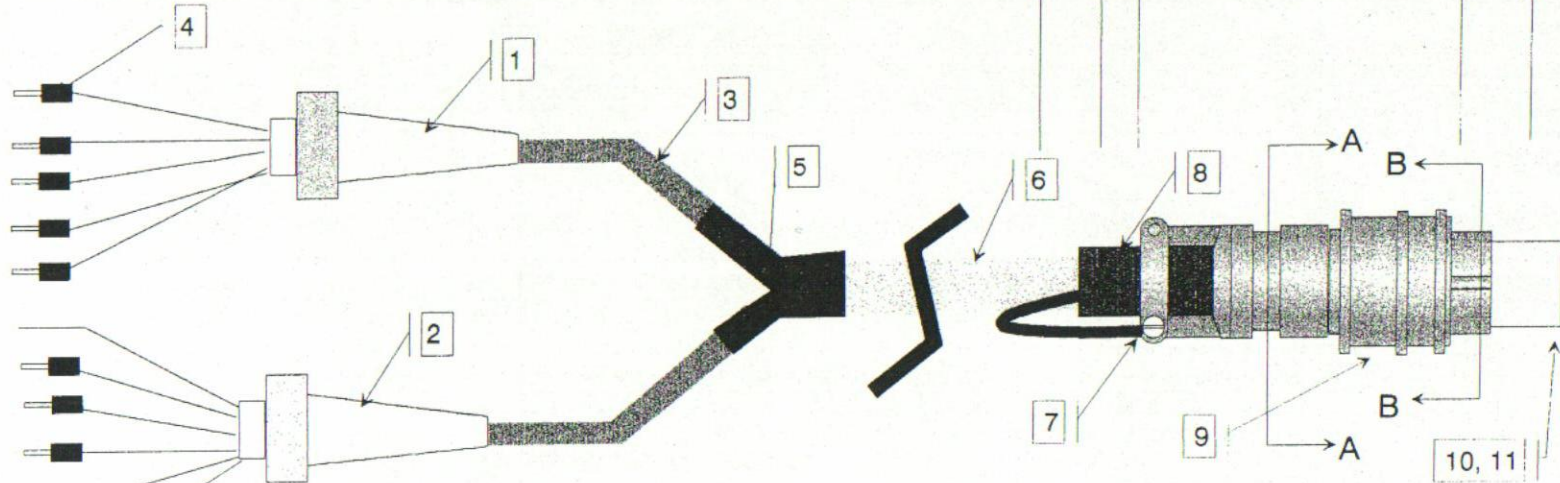
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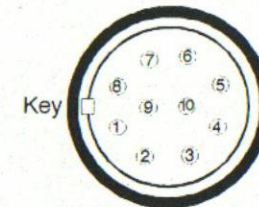
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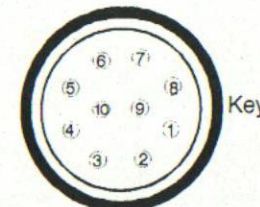
REVISIONS				
ZONE	REV	DESCRIPTION	DATE	APPV



- x1 ----- #20 bk ----- ■ 7 x+
- x2 ----- #20 bn ----- ■ 2 x-
- y2 ----- #20 bu ----- ■ 3 y-
- y1 ----- #20 w/bk ----- ■ 6 y+
- Between x1&x2 ----- #20 gn ----- ■ Case ground
  
- Case Ground ----- #20 gn/y ----- ■ Case Ground
- Grid ----- #20 wh ----- ■ 10 Grid
- Focus ----- #20 pu ----- ■ 4 Focus
- Extractor ----- #20 gy ----- ■ 5 Extractor
- Filament #1 ----- #16 or ----- ■ 1 Filament #1
- Filament #2 ----- #16 y ----- ■ 8 Filament #2
- Fil Common ----- #16 rd ----- ■ 9 Fil Common



B-B



A-A (wiring side)

Turn on AC power and check for DC voltages:

**OPERATE / DEGASS**

Pin	Reference	Common
Pin 9	Reference	Common
Pin 1	Filament 1	approx. - 10V / - 10V
Pin 8	Filament 2	" - 10V / - 10V
Pin 10	Grid	" + 200V / + 400V
Pin 5	Extractor	" - 75V / + 200V

UNLESS OTHERWISE SPECIFIED  
ALL DIMENSIONS ARE IN INCHES

Tolerances:  
Decimal (+/-) .xx xxx

Angular (+/-)  
Machined 0° 30'  
Formed 1°  
Chamfer 5° 63

Machined Surfaces:  
Break sharp edges R.01 or  
45° x .01 max.  
Internal machined corner  
R.02 max.

DRAWN: tsq DATE: 6/11/97

CHK:

APPV:

APPV:

SIZE A DRAWING NO. 400060 REV

TITLE HV Cable Assembly to Varian 981-2043

**EUROVAC**

SCALE SHEET: OF

1

2

3

4