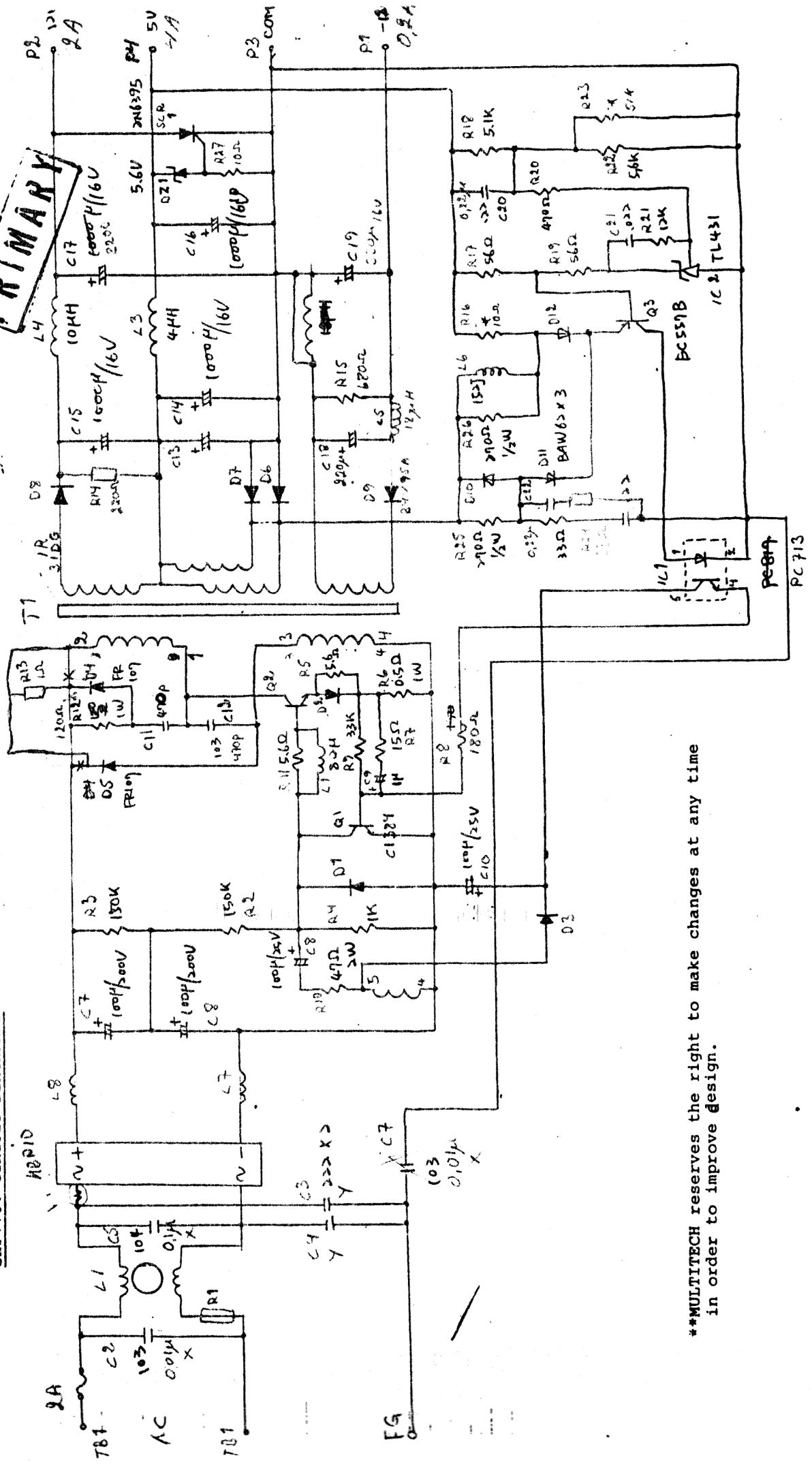


SNP-101 CIRCUIT DIAGRAMS

PRIMARY



**MULTITECH reserves the right to make changes at any time in order to improve design.

TEST REPORTSNP-101

ITEMS	SPEC.	DATA	CONDITINS
INPUT VOLTAGE		90-130Vac	5V/4A 12V/2A -12V/0.2A (FL)
INPUT CURRENT		1.12-0.78A RMS	(FL)
INRUSH CURRENT		12A	
EFFICIENCY		68%	(FL)
LINE REGULATION 110Vac		<0.1% 5V	90VAC-130VAC (FL)
LINE REGULATION 220Vac		<0.1% 5V	180VAC-260VAC (FL)
LOAD REGULATION		5V <0.1% 12V <3% -12V <5%	20%-100% others 50%
WARM-UP DRIFT		100PPM (max.)	(FL)
RIPPLE LF: HF:		20mVpk 50mVpk	(FL)
PADR (NOISE)		50mVpk	(FL)
RISE TIME		50ms	(FL)
HOLD UP TIME		16ms (min.)	
PROTECTION		OVP (main) OVL	
DIELECTRIC STRENGTH		1200Vac/1sec	
INSULATION		72000M2/1KV	

Designation	Description	Vendor
Q1	2SC1384R	Matsushita
Q2	BU508A	Philips
Q3	BC557B	Philips
IC1	TL431C	TI
IC2	PC817	Sharp
SCR1	2N6395	
TB1	5273-03A	Molex
TB2A	5273-04A	Molex
TB2B	5239-03	molex
TB3, TB4, TB5	5046-4	Molex
F1	Fuse 2A, 250V, with Clip	
T1	42/15	
HS1	SNP-1011	
HS2, HS3, HS4	SNP-1012	
PCB	SNP-101	
TUBING	HT-105C-PVC-VW-1	Markel
SLEEVING	6033241011 (TEFLON)	Markel
	6033111012 (TEFLON)	Markel
TAPE	3M#10	3M

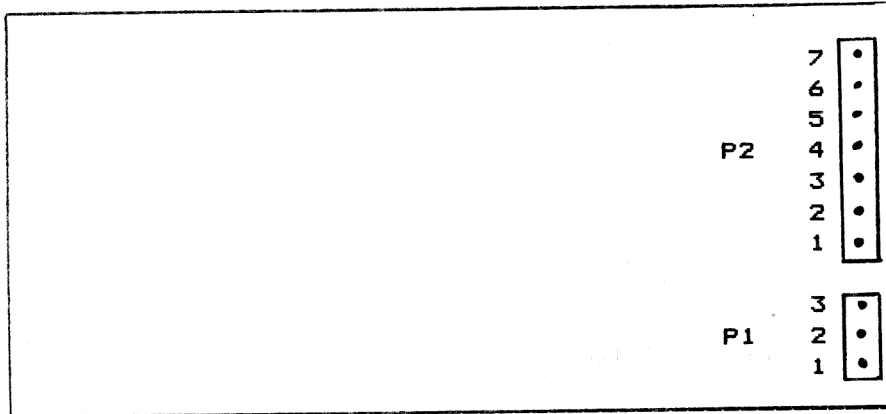
Designation	Description	Vendor
C8	100u 25VDC EL	NCC(SXA)
C9	1u 16V ELTA	NEC
C10	100u 25VDC EL	
C11	470P 2KV CER	
C12	.01u 1KV CER	
C13,C14,C15	1000u 16V EL	NCC(SXA)
C16	1000u 16V EL	Teapo
C17	2200u 16V EL	NCC(SM)
C18,C19	220u 16V(25V) EL	
C20,C22	.22u 50V ME	Farad
C21	.022u 50V DE	
L1	8MH CM25	
L2	8R2	
L3		
L4		
L5		
L6	152J	
L7,L8	100uH (T50-26)	
D1,D2	FR102	
D3	IN4003	
D4,D5	BB4	I.R.
D6,D7,D8	31DC04	I.R.
D9	FR153	
D10,D11,D12	RAW62	Philips
D1	REN79C-5V6	Philips
EB1	KBL-08 (hbp-10)	GI

Designation	Description	Vendor
R1	5D11 NTC	Ishizuka
R2,R3	150K J 1/2W CAR FLM	
R24,R26	270 OHM J 1/2W CAR FLM	
R4	1k J 1/2W CAR FLM	
R5,R11	56 OHM J 1/2W CAR FLM	
R7	15 OHM J 1/2W CAR FLM	
R8	3.3K J 1/2W CAR FLM	
R9	180 OHM J 1/2W CAR FLM	
R15	10 OHM J 1/2W CAR FLM	
R16	18 OHM J 1/2W CAR FLM	
R17,R19	5.6 OHM J 1/2W CAR FLM	
R18	5.1K J 1/2W CAR FLM	
R20	470 OHM J 1/2W CAR FLM	
R21	12K J 1/2W CAR FLM	
R22	5.6K J 1/2W CAR FLM	
R23	* (5V ADJ)	
R25	33 OHM J 1/2W CAR FLM	
R6	0.5 OHM J 1W METO FLM	
R12	120 OHM J 1W METO FLM	
R13	1 OHM J 1W METO FLM	
R14	220 OHM J 1W METO FLM	
R10	47 OHM J 2W METO FLM	
C1	.01u 330VDC ME Farad	
C2	.01u 250VAC ME Rifa	
C5	.1u 250VAC ME Rifa	
C3,C4	2200P 400VAC CER Matsushita	
C6,C7	100u 200VDC EL NCC	

BOSCHERT

=====

XL50 - 3601 OCH XL50 - 3602



XL50 - 3601 (WINCHESTER KRAFTEN)

KONTAKT P1 : 1 AC
2 AC
3 SKYDDS JORD

KONTAKT P2 : 1 -5V 0,7A
2 -12V 0,7A
3 +12V 3A
4 0V
5 0V
6 +5V 6A

XL50 - 3602 (8 " KRAFTEN)

KONTAKT P1 : 1 AC
2 AC
3 SKYDDS JORD

KONTAKT P2 : 1 +12V 0,7A
2 -12V 0,7A
3 +24V 2A
4 0V
5 0V
6 +5V 6A
7 +5V 6A

SERIES XL50

SWITCHING POWER SUPPLY



SERIES XL50

The XL50 series of 60W four output switching power supplies is ideal for small computer applications. Designed for microprocessor and CRT applications, the XL50 series will power disks, cassettes and small printers.

STANDARD FEATURES

- Designed to Meet VDE 0806 Safety
- Designed to Meet VDE 0871 Level B EMI
- Designed to Meet FCC 20708 Level B EMI
- Designed to Meet IEC 380 Safety Standard
- CSA Certified
- UL Recognized
- 110 VAC/220 VAC User Selectable Input
- Overvoltage Protection (+5V Output)
- 20msec Hold-Up Time
- Excellent Transient Response
- Input Surge Current Protection
- 20KHz Switching Frequency (Minimum)

XL50 SELECTION GUIDE

Model Number	+5V	+12V	+12V	-12V	-5V	+24V	+15V	-15V
XL50-3601	6A	3A		0.7A	0.7A			
XL50-3602	6A	0.7A		0.7A		2A		
XL50-3603	6A	3A	1.5A	0.7A				
XL50-3604	6A				0.7A		2A	0.7A

To order models meeting British Telecom safety specifications, order -3801, -3802, -3803 or -3804 instead of -3601, -3602, -3603 or -3604
 To order models with the input voltage set for 220 VAC, order -4601, -4602, -4603, -4604, -4801, -4802, -4803, -4804

ELECTRICAL CHARACTERISTICS

Parameter	Condition	Limits
Input Voltage	47-440 Hz	90-132 VAC 150-264 VAC User Selectable
Hold-up Time	110 VAC Input, 50W Output Power	20msec Minimum
Input Surge Current	110 VAC Input, Cold Start, Peak Current	20A
Input Line Regulation	Low Line to High Line, Full Load	± 0.3% All Outputs
Output Power Range	50°C Ambient	5W to 60W
Overvoltage Protection Threshold	+5V Output	6.25V ± 0.75V
Efficiency	110VAC Input, 50W Output	65% Minimum

(continued next page)

ELECTRICAL CHARACTERISTICS (continued)

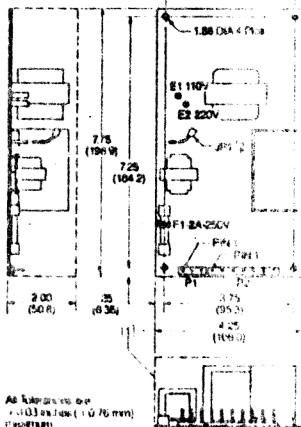
Parameter	Condition	Limits
Temperature Coefficient of Outputs	All Outputs	± 0.04%/°C Maximum
Safety Ground Leakage Current	152VAC, 60 Hz	0.5mA Maximum
Transient Response	+ 5V Output, 2.5A to 5A Load Change	200mv Peak Transient Settling to Within the Regulation Band in 1 msec
	+ 12V or + 24V Output 0.75A to 1.5A Load Change	100mv Peak Transient Settling to Within the Regulation Band in 1 msec
Temperature Derating	Linear Derating	60W in a 50°C Ambient 30W in a 70°C Ambient
Power Limit Point	All Line and Load Conditions	66W Minimum
Vibration	Three Principal Axes 2G Cycling or Dwell Type	5 Hz to 60 Hz at 3 Minutes Per Octave

Model	Output	Minimum	Maximum	Ripple ⁽¹⁾	Tolerance
XL50-3601	5V (I ₁)	1A	6A (2)	50mv	± 3%
	12V (I ₂)	0.5A	3A (2)	80mv	± 4%
	-12V	0A	0.7A	25mv	± 5%
XL50-3602	5V (I ₁)	1A	6A (2)	50mv	± 4%
	24V (I ₂)	0.4A	2A (2)	100mv	± 5%
	-12V	0A	0.7A	25mv	± 5%
XL50-3603	5V (I ₁)	1A	6A (2)	50mv	± 3%
	12V (I ₂)	0.4A	3A (2)	80mv	± 4%
	-12V	1A	1.5A	80mv	± 5%
XL50-3604	5V (I ₁)	1A	6A (2)	50mv	± 4%
	15V (I ₂)	0.4A	2A (2)	90mv	± 4%
	-15V	0A	0.7A	25mv	± 5%
	-5V	0A	0.7A	25mv	± 5%

(1) 50 MHz Bandwidth, Peak to Peak, measured differentially

(2) I₁ + I₂ ≤ 8A, 4 ≤ I₁/I₂ ≤ 6 for state-regulation

MECHANICAL SPECIFICATIONS Note: Dimensions are in inches and (mm)



All tolerances are per MIL-STD-203 unless noted (0.75 mm minimum)

Dimensions for reference only

PIN CHART

P1	XL50-3601, -3602, -3603, -3604			
Pin 1	AC Hot			
Pin 2	AC Hot/ Neutral			
Pin 3	AC Ground			
P2	XL50-3601	-3602	-3603	-3604
Pin 1	- 5V	+ 12V	+ 12V	- 5V
Pin 2	- 12V	- 12V	- 12V	- 15V
Pin 3	+ 12V	+ 24V	+ 12V	+ 15V
Pin 4	Return	Return	Return	Return
Pin 5	Return	Return	Return	Return
Pin 6	+ 5V	+ 5V	+ 5V	+ 5V
Pin 7	+ 5V	+ 5V	+ 5V	+ 5V

[1] Dashed line indicates maximum clearance.

[2] Connect JP1 to E1 for 110V operation.
Connect JP1 to E2 for 220V operation.

Connector Type

Molex Inc.
P1 Part No. 4313-5A51-4
P2 Part No. 4313-13A52

Mating Connectors

Molex Inc.
P1 Part No. 09-50-7051
P2 Part No. 09-50-7131

Weight 1.1 lbs. (0.5 kg)

Relative Humidity Range

Non-condensing (operating) 5% to 80%
Non-condensing (non-operating) 5% to 95%

Altitude

Operating 10,000 ft.
Non-Operating 30,000 ft.

Temperature

Maximum Heatsink Temperature 90°C
Maximum Semiconductor Case Temperature 100°C
Storage Ambient - 20°C to + 85°C
Operating Ambient 0°C to 70°C

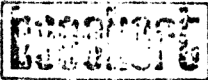
Boschert Incorporated
384 Santa Trinita Avenue
Sunnyvale, California 94086
408/732-2440 TWX 910-339-9241

Boschert

APPLICATION		REVISION				
NEXT ASSY	USED ON	REV	ECO	DESCRIPTION	DATE	APPROVED
13859-03	XL50-3601	1		PPE-RELEASE	7/30/82	
-04	-4601	2		PRE-RELEASE	10/15/82	
-05	-3801	3		PRE-RELEASE	10/21/82	
-06	-4801	A		RELEASE TO PRODUCTION	11/10/82	<i>HS</i>
		B	7822	INCORPORATED PER ECO	12/1/82	<i>MC</i>
		C	7853	INCORPORATED PER ECO	2-4-83	<i>HS, MC</i>

TEST PROCEDURE

FOR XL50-3601/4601 /3801/4801

OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES DECIMALS ANGLES .XX ± ± .XXX ± ±	APPROVALS	DATE	 BOSCHERT INCORPORATED SUNNYVALE, CALIFORNIA	TEST PROCEDURE: POWER SUPPLY XL50-3601/4601 /3801/4801
	DRAWN <i>S. P. ...</i>	8-6-82		
	CHECKED <i>...</i>	9-6-82		
	ENG <i>...</i>	11/1/82		
	MFG MGR <i>...</i>	11/1/82		
	QA MGR <i>...</i>	11/1/82		
RELEASED <i>...</i>	11/1/82	SIZE	DRAWING NO.	REV
		A	91-51351	C
NOT SCALE DRAWING		SCALE		SHEET 1 OF 4

PROP GRAPHICS/ACCUPRESS
 ORDER NO. A-4561

1.0 PURPOSE AND SCOPE

- 1.1 The purpose of the test is to ensure that the subject power supply meets its specifications.
- 1.2 This applies to boards tested after assembly, burn-in or rework.
- 1.3 This procedure does not apply to units tested by Automatic Test Equipment (ATE).

2.0 EQUIPMENT NEEDED

- 2.1 Test Station NND 2 or 3, including panel, load, scope, DMM, and isolation transformer.
- 2.2 Small blade screwdriver.
- 2.3 Hipot
- 2.4 Test Cable T-87.

3) HIPOT

- 3.1 Hipot 3601/4601 per drawing 2725 to UL specifications.
- 3.2 Hipot 3801/4801 per drawing 2725 to BPO specifications.

4) INITIAL SET-UP

- 4.1 Attach the test cable to the Unit Under Test (UUT).
- 4.2 Attach the other end of the cable to the test station.
- 4.3 Set the test station switches to the following:
 - 4.3.1 Main power switch -- OFF.
 - 4.3.2 110/220 switch set to 110 (3601/3801) or 220 (4601/4801).
 - 4.3.3 Variac at minimum (fully CCW).
 - 4.3.4 Primary load at minimum (fully CCW).
 - 4.3.5 DMM at DCV, 100V full scale.
 - 4.3.6 DVM source -- INT.
 - 4.3.7 Output Select -- POSITION 1.
 - 4.3.8 Output Current -- 5.
 - 4.3.9 S/D switch at D (if applicable).
 - 4.3.10 All loads OFF (fully CCW).
- 4.4 Connect JP1 to E1 for 110 operation.
- 4.5 Turn ON the A.C. main power switch.

SIZE	CODE IDENT NO.	DRAWING NO.
A		91-51351
SCALE		SHEET 2 of 4



5.0 TEST SEQUENCE

- 5.1 Turn the variac clockwise until the output 5V comes on. This should occur below 80 VAC as seen on the tester A.C. voltmeter.
- 5.2 Increase the input voltage, using the variac, until the input voltage is at 115 VAC.
- 5.3 Over-Voltage Protection (OVP) Test.
 - 5.3.1 Apply a pre-load of 0.5A to the 5V output.
 - 5.3.2 While watching the DMM, raise the +5V output voltage until it starts to drop rapidly. This should occur between 5.60 and 6.90 volts. In any case, do not exceed 7.5V.
 - 5.3.3 If the 5V cannot be adjusted high enough to cause OVP, an external power supply must be used.
 - 5.3.4 Reduce the +5V output voltage.
- 5.4 Set in the loads per Load Group 1 (Table 1) and set the 5V to read 4.99 to 5.01 VDC.
- 5.5 Sequence through output select positions 1 through 4 and see that the outputs are within limits shown.
- 5.6 Reset the loads to those shown in Load Group II.
- 5.7 Repeat Paragraph 5.5.
- 5.8 Reset the loads to those shown in Load Group III.
- 5.9 Repeat Paragraph 5.5.
- 5.10 Observe the P.A.R.D. on all outputs using the Standard Boschert Capacitor Bank. They should be within limits shown in Table 1.
- 5.11 Check current limit on the 12V (no load on other outputs). It should be less than 8.6 amps.
- 5.12 With the scope ground on the heatsink of Q3, touch the scope probe to the collector of Q3. The switching period should be less than 50 uSec.

DISCONNECT

- 6.1 Turn OFF main A.C. power switch.
- 6.2 Turn the variac down to minimum (fully CCW).
- 6.3 Disconnect the power supply from the test cable.
- 6.4 Send to burn-in with cable B-109 (3601/3801).

SIZE A	CODE IDENT NO.	DRAWING NO. 91-51351
SCALE		SHEET 3 of 4

TEST PROCEDURE)

T A B L E I

MODEL: XL50-3601/4601/3801/4801

HIPOT <u>3601/4601 PER DWG.</u>	<u>2725</u>	TO <u>UL</u>	SPECS.
<u>3801/4801</u>	<u>2725</u>	<u>BPO</u>	
TEST CABLE <u>T-87</u>		MINIMUM	MAXIMUM
SWITCHER TURN-ON		VAC	<u>80</u> VAC
CURRENT MAX. LIMIT		A	A
FOLDBACK CURRENT		A	A
INVERTER PERIOD		us	<u>50</u> us
INVERTER P-P VOLTAGE		V	V
OVP (PRELOAD +5V TO <u>0.5A</u>)		<u>5.60</u> V	<u>6.90</u> V
OUTPUT TEST POINTS:			

- 110 VAC
- 220 VAC
- STRAPPABLE

OUTPUT	VOLTS @ AMPS		MINIMUM	MAXIMUM	NOTES
	5 V	3.0 A	4.99 V	5.01 V	SET VOLTAGE HERE.
D 2	12 V	1.0 A	11.54 V	12.46 V	
UP 3	-12 V	0.3 A	-11.43 V	-12.57 V	
4	-5 V	0.3 A	-4.76 V	-5.24 V	
5	V	A	V	V	
6	V	A	V	V	
	5 V	6.0 A	4.86 V	5.14 V	120 Hz & 20 KHz
D 2	12 V	1.0 A	11.54 V	12.46 V	
UP 3	-12 V	0 A	-11.43 V	-12.57 V	
4	-5 V	0 A	-4.76 V	-5.24 V	
5	V	A	V	V	
6	V	A	V	V	
	5 V	1.2 A	4.86 V	5.14 V	MAXIMUM NOISE & RIPPLE (PAR)
D 2	12 V	2.0 A	11.54 V	12.46 V	
UP 3	-12 V	0.7 A	-11.43 V	-12.57 V	
II 4	-5 V	0.7 A	-4.76 V	-5.24 V	
5	V	A	V	V	
6	V	A	V	V	

CURRENT LIMIT ON +12V (NO LOAD ON OTHER OUTPUTS): 8.6 A. MAX.

Max Power 60 W
 Max. Burn-In Power 60 W

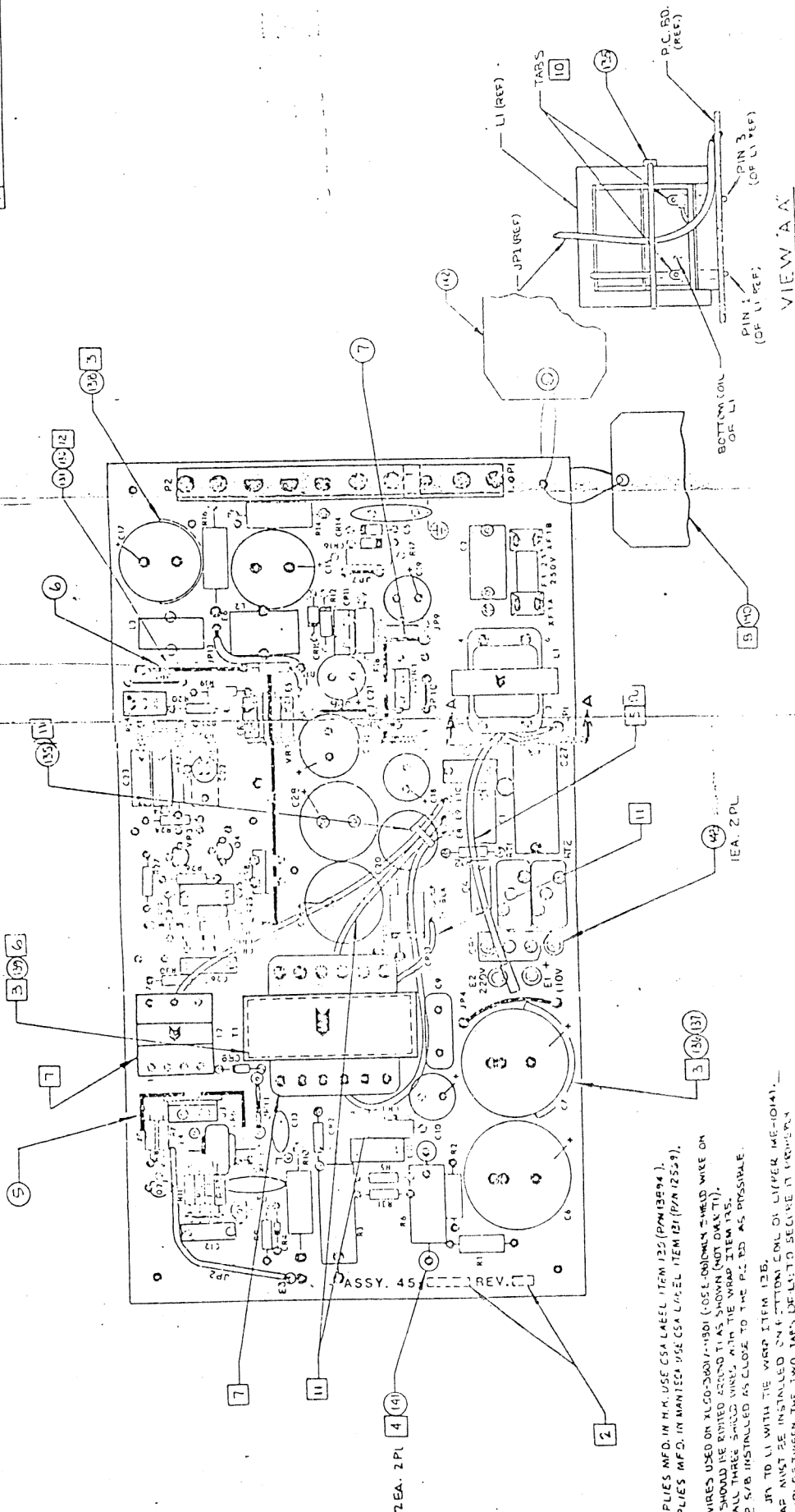
TEST ENGINEER A. Hirsch
 DESIGN ENGINEER D. Schiefelbein

BURN-IN CABLE B-109 (3601/3801)
 (59A)

SIZE	CODE IDENT NO.	DRAWING NO.
A		91-51351
SCALE		SHEET 4 of 4

REV	DESCRIPTION	DATE	BY	CHKD
4	PRE - RELEASE	1/15/64	WJG	WJG
A	REL TO PROD.	1/17/64	WJG	WJG
B	INCORP.	1/17/64	WJG	WJG
C	INCORP.	1/17/64	WJG	WJG
D	INCORPORATED	1/20/64	WJG	WJG
E	INCORP. RIBB	1/20/64	WJG	WJG
F	INCORP. WJG	1/21/64	WJG	WJG

8



SEE SEPARATE 'A' SIZE L/M

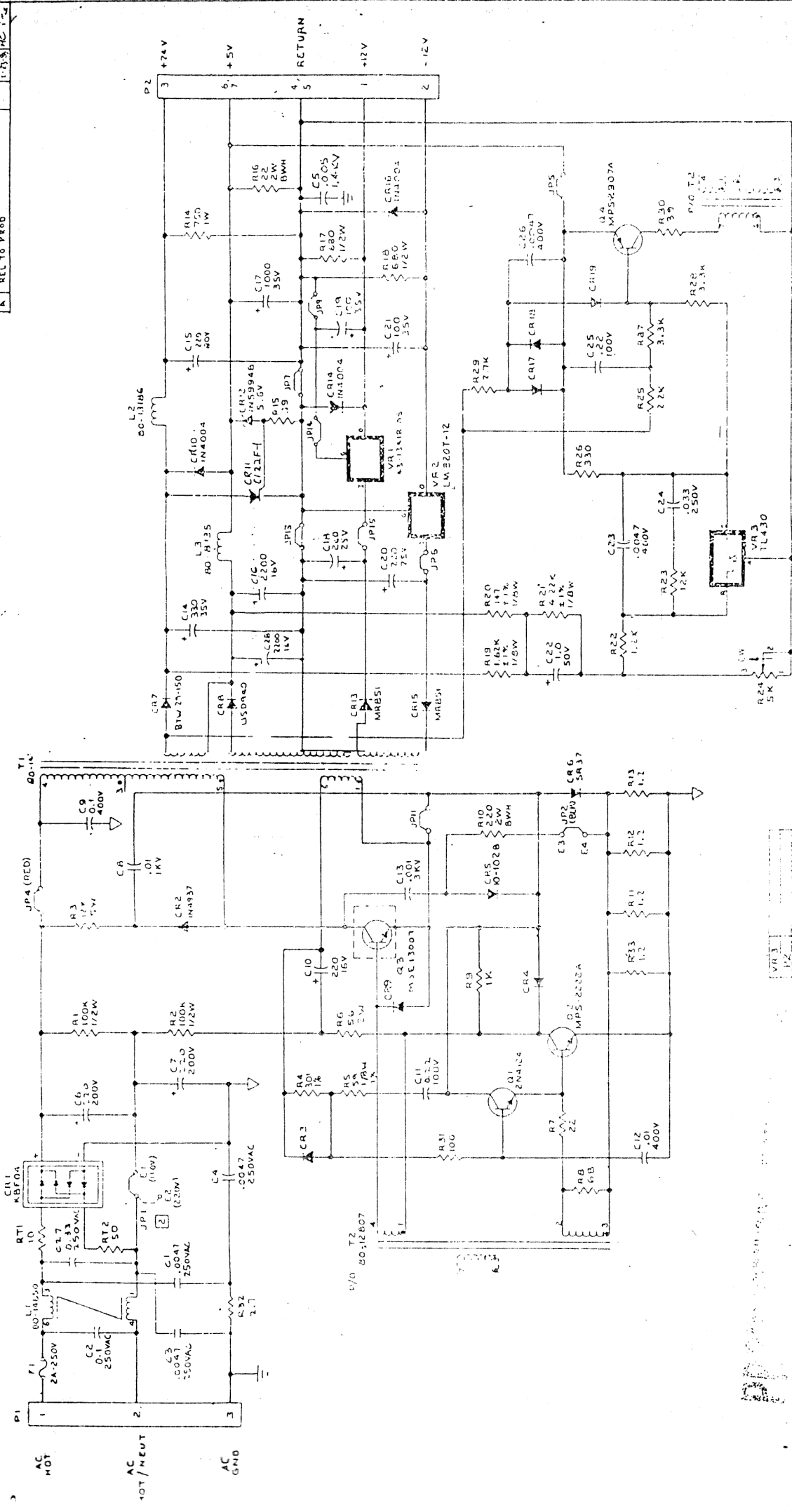
ENVIRONMENTAL TESTING COMPLETE	DATE	BY
ASSEMBLY NO.	NO.	NO.
TESTING NO.	DATE	BY

Boschert
 ASSEMBLY POWER SUPPLY 4501R
 MODEL XL60-36017-4501R
 D 45-11-15 - 37-C
 271

- 1 SHIELD WIRES USED OR XL60-36017-1501 (USE ORIGINAL TUBED WIRE ON RM SIDE SHOULD BE RIVETED AROUND THAT SHOWS UNDER OPER. TEST). SECURE ALL THREE SHIELD WIRES WITH THE WIRE TIE ITEM 125. THE WIRE S/B INSTALLED AS CLOSE TO THE PCB AS POSSIBLE.
- 2 MAKE JRY TO LI WITH THE WIRE ITEM 125.
- 3 THE WIRE MUST BE INSTALLED ON BOTTOM COIL OF LI (SEE ME-1014). ADD WIRE BETWEEN THE TWO TABS OF LI TO SECURE IN POSITION.
- 4 BEND THE BLACK SOLDER TO COMMON TRACE (SEE REQ FOR ME-1014). WHITE TYPICAL AWG 36 GA SS (ENIS).
- 5 ATTACH WARNING TAG ITEM 140 TO PCB BD.
- 6 THE PCB BOARD PINS CC 11 AND ANY TWO DIAGONAL PINS OF T2 MUST BE REBENT OVER AND SOLDERED TO THEIR RESPECTIVE TRACES (SEE REQUIREMENT ME-1014)
- 7 WARE MODEL NO. WITH ALUMINUM WASTE ZONE, AND SERIAL NO. ON LABEL.
- 8 ALL 2W AND ABOVE RESistor BODIES MUST BE MOUNTED 1 - 2 IN. ABOVE PCB BOARD BY USING PAPER INSULATION WITH 1/4" TYPICAL LEAD PREP.
- 9 APPLY LABEL IN APPROPRIATE POSITION SHOWN.
- 10 MARK DIFFERENCE IN VOLTAGE AND CURRENT REVISION LEVEL IN APPROPRIATE LOCATION SHOWN.
- 11 FOR REFERENCE DRAWINGS SEE SHEET 2 OF L/M

NOTES:

REV	DESCRIPTION	DATE	APPROVED
1	REL TO PROD	11/12	HC 1-2

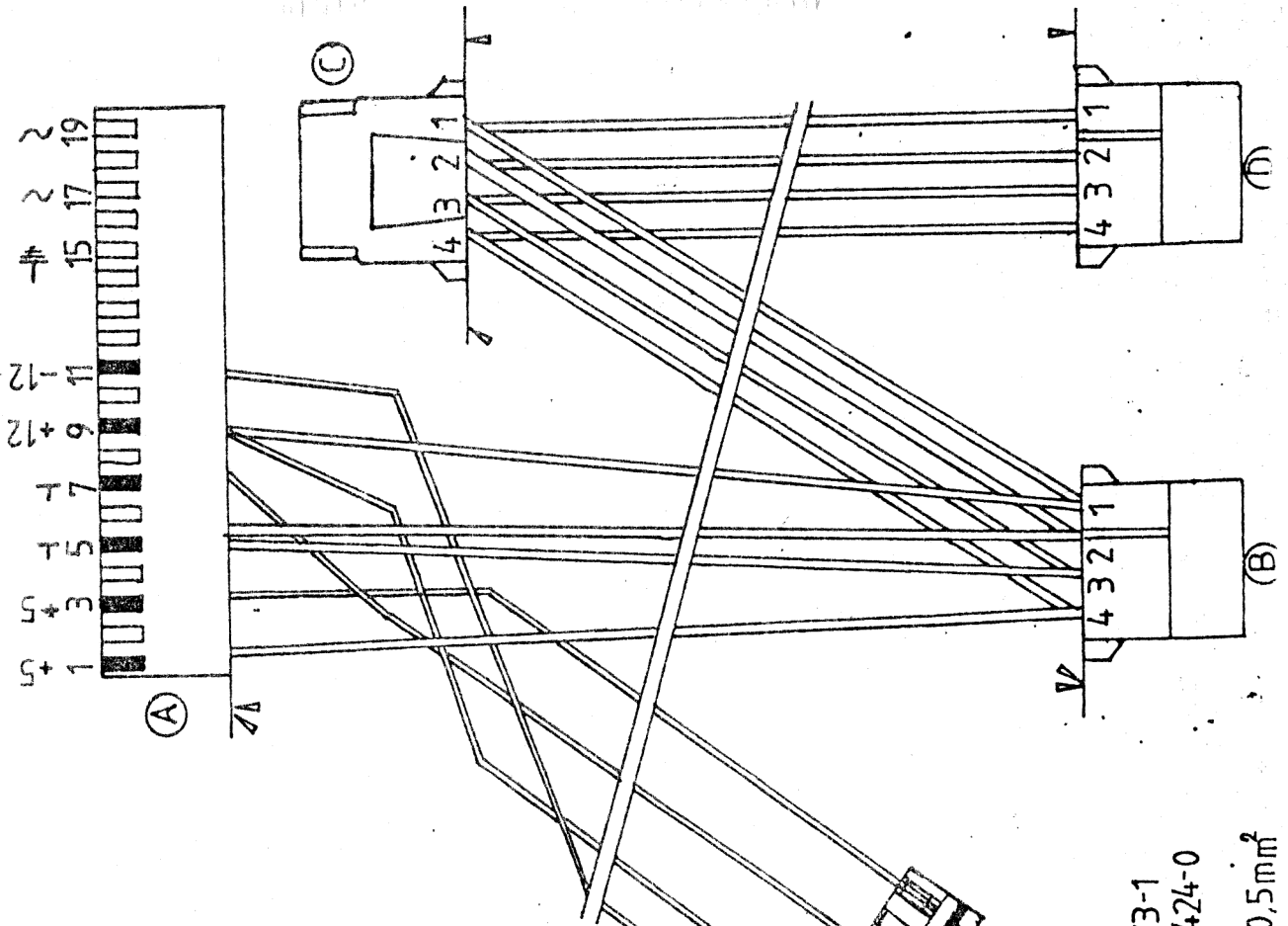


REV	DESCRIPTION	DATE	APPROVED
1	REL TO PROD	11/12	HC 1-2

FOR 30V OPERATION CONNECT JPI TO E1
 RESISTORS ARE IN OHMS UNLESS OTHERWISE SPECIFIED
 CAPACITORS ARE IN MICROFARADS UNLESS OTHERWISE SPECIFIED
 UNLESS OTHERWISE SPECIFIED

Längd A-B 215mm
 " B-C 175 "
 " C-D 215 "

Obs! vid pilarna



E = mini-match
 164852-6

A =

B, C, D = hylsa M-N-L 61173-1
 hus 1-480424-0

kabel A-E 0,25 mm², övrig 0,5 mm²

STRÖMFÖRBRUKNING

Enhet	+ 12 V	- 12 V	+ 5 V	+ 24 V
Winchester	1,9 A		0,6 A	
5 1/4 " flex	0,9 A		0,6 A	
8 " flex			0,8 A	0,8 A
SBC-kort	0,1 A		1,75 A	
Xebec contr.	0,07 A		2,5 A	
Jet Time			0,8 A	
Jet Automod	0,05 A		0,5 A	

Power Supply

Boschert

XL50-3601

+5 1.7

+12 0.7

-12 0.7

-5 0.7

