

TECHNICAL BULLETIN

NUMBER 33 - ANDRO - 84 *AE*

PRODUCT ANDROBOT

DATE

MODEL TOPO II

AUTHOR BRIAN HODGKINSON

APPROVED BY BRIAN HODGKINSON

DISTRIBUTION:-

ALL SERVICE MANAGERS :

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S.A.
IND-NEWCASTLE.

MICHAEL GROVES
PETER HOMANN.

ANDROBOT TOPO II SCHEMATICS.

Please find information received from ANROBOT 7th May, 1984.

ANDROBOT INDEX OF INFORMATION RECEIVED 7TH MAY 1984.

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ANDROBOT INC

ANDROBOT CUSTOMER SERVICE BULLETIN

CSB# : 2

Date: 3/30/84

Product: TOPO II Model TPR 2000

Effectivity: Serial Number 1 thru 350 (As Required Only)

REASON:

TOPO II's Infra-Red system can be adversely effected by any strong infra-red source, such as the sun or bright lighting. The usual result of this interference is the error message "TOPO #0 NOT RESPONDING". A change to TOPO's IR circuit can significantly improve the signal to noise rejection ratio of the Mobile IR Transceiver assembly. The result is significantly better IR system performance in virtually all lighting conditions.

TOOLS:

#2 Phillips Screwdriver
Needle Nose Pliers
Allen Wrench

TIME: Approx 2 hours

MATERIALS: (Contained in CSB kit #2)

1ea Mobile Transceiver Assy
1ea Communications Board
1ea Motion Control Board
1ea Base Communicator Board Assy.
1ea 8-32 x 1/2" Screw (spare)
2ea Rivets, Christmas Tree (spare)
1ea Label " CSB# 2 INSTALLED "
1ea Mail Label, Return

PROCEDURE:

1. Remove Body Assy.

A. Remove 8 rivets joining the belly pan and body assemblies (4 each, front and back). These are located low on the body near TOPO's "waist".

Christmas Tree rivets are easily removed by inserting a thin blade between the rivet head and the robot body, then prying gently to open a small gap. The head of the rivet can then be grasped with the pliers and pulled free. Rivets can usually be removed without damage. Spares are included for your convenience should you lose or damage one during removal.

B. Remove the 4 Phillips head screws (2 each side) in the vicinity of the foot lights. These secure the body assembly to the frame. A spare screw is supplied in the event one becomes lost during this procedure.

C. Lifting and tilting the body assembly slightly, remove the cabling to free the body from the unit. (Make note of the cable locations to assure proper reassembly).

2. Remove Head Switch Assembly

A. Remove the 4 christmas tree rivets securing the top of the head from the body assembly.

B. While removing the top of the head, feed the pat switch cable through the narrow hole in the neck. This can be done by flexing the flat ribbon cable slightly. USE CAUTION to avoid undue strain on the cable or its connectors.

3. Replace and Reinstall Head Switch Assembly

A. Using the new head switch assembly, replace the top of the head on to the body assembly. Feed the pat switch cable through the narrow hole in the neck. Again, use caution to avoid undue strain on the cable or its connectors.

Orientation of the assembly should be such that the single square on the top of the lens should be facing forward (the front of the robot).

B. Reinstall the 4 rivets securing the top of the head assembly to the body assembly. Check again to assure proper alignment of the pat switch. The single square should be aligned with the front of the robot. Christmas tree rivets are easily installed by pressing on the head of the rivet with the thumb until the rivet is firmly seated.

4. Replace Boards in the Card Cage

A. Remove the cables from both boards in the card cage. Mark each cable as it is removed to assure proper reassembly.

B. Remove the 4 screws securing the cover of the card cage.

C. Lift the cover off of the card cage and carefully position so as to not strain the ground wires which are still attached.

D. Note the position of each board in the card cage. The communication board is located in slot 1 and can be easily identified by the speech board which is piggy backed (attached) to it. The Motion Control board is in slot three.

E. Replace each board with a new one. Do this one at a time so that there is no confusion as to which board goes where.

F. Replace the card cage cover and secure with the 4 screws removed in step 4.B.

G. Replace all cables paying close attention to both location and orientation.

5. Reinstall the Body Assembly on the Base Unit

A. Lower the body assembly onto the base unit. While doing so lean the body backwards to facilitate the reattachment of the cables removed during step 1.C.. Make certain to maintain both location and orientation of these cables. Once the cables are attached lower the body fully onto the base unit.

B. Reinstall the 8 rivets and 4 screws that secure the body assembly to the base unit.

6. Replace Base Communicator Board

A. Using an allen wrench remove the screw located on the bottom of the Base Communicator. Use caution as once this screw is removed the entire Base Communicator will disassemble easily.

B. Remove the top of the Base Communicator, then the lens. This will provide access to the Printed Circuit board within the Base Communicator. This board should be lifted free only after noting the orientation of the board in conjunction with the base unit. The cutout in the base unit is designed to fit the RS-232 connector. This orientation must be maintained to assure a satisfactory fit.

C. Replace the old Printed Circuit board with the new one provided. Then reassemble the Base Communicator by first installing the lens, then the top and securing again with the allen screw. Some minor adjustment of the various parts may be required to assure proper fit of the screw.

D. Check again to be sure that the RS-232 connector is positioned in the cutout in the base unit.

7. Test

A. Power-on the robot, TOPO should make his usual greeting and the power light should be green. Should TOPO fail to do either of these, charge his battery for 8 hours and test again. If there is still a problem retrace steps 1 through 5 and look for any obvious difficulty.

B. Assure that TOPO works properly in his manual mode. This is accomplished by pressing his head switch and observing that he moves and speaks properly. If TOPO does not work properly retrace steps 1 through 5 looking for any obvious errors.

C. Connect and set-up the Base Communicator and computer as specified in the TOPO Users Manual. Issue commands to TOPO and examine his reaction. If he does not function properly or if you

receive either "INVALID BASE COMMUNICATOR RESPONSE" or "TOPO NOT RESPONDING ERRORS", retrace step 6 looking for any obvious errors.

D. Should any of the above prove to not be easily resolved please contact the factory for assistance.

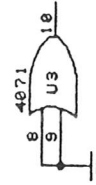
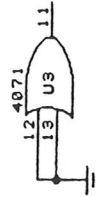
8. Return the old boards and assemblies to Androbot using the packing and label supplied. If materials are not returned YOU WILL BE CHARGED for them.

9. Attach the label (CSB#2 INSTALLED) to the robot near his serial number label on the very bottom of the belly pan.

REVISONS		DATE	
LT#	DESCRIPTION	DATE	APVD
A	PRE-PROD ECO 00019	10/21/83	I.H.
B	REVISED ECO 00032	11/09/83	I.H.
C	REVISED ECO 00058	12/05/83	I.H.
D	REVISED ECO 00072	12/15/83	I.H.
E	REVISED ECO 00078	12/20/83	

IC TABLE

IC TYPE	REF.	DES.	+9V	+18	+5V	GND	+24	+12	-5V
4011	U2				14	07			
4071	U3				14	07			
74LS132	U11				14	07			
74LS14	U1				14	07			
74LS973	U6				28	10			
2764	U10				28	14			
8031-A	U7				40	20			
8166	U5				40	20			
TL072	U8			08	04				
LM384	U4			14	7.8.	10.4			
666	U9				01				03
LM317T	UR1		VOUT		VIN				
LM317T	UR3		VOUT		VIN				
LM7605	UR2			03	02	01			
LM317L2	UR4		VIN						

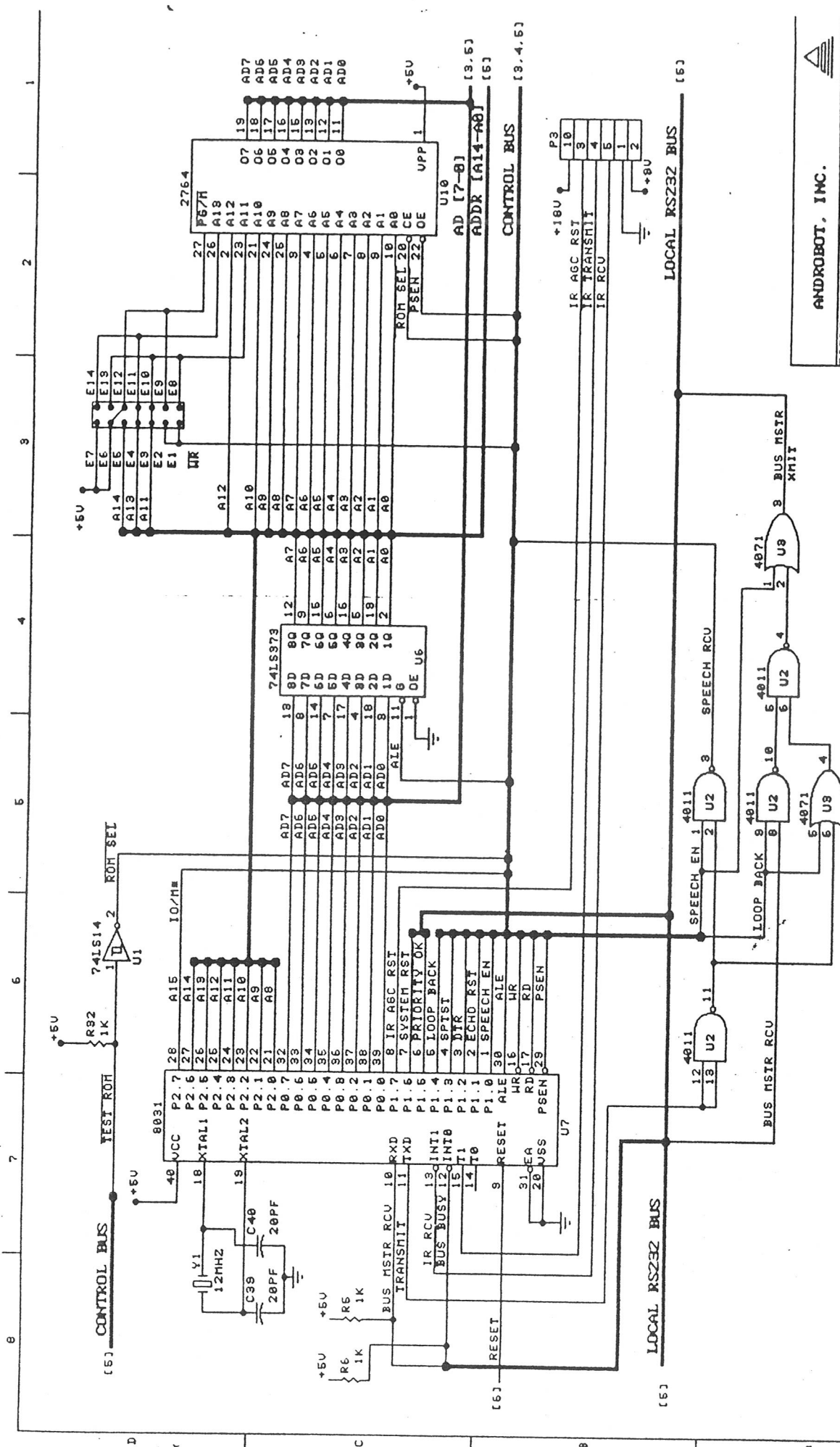


NOTES

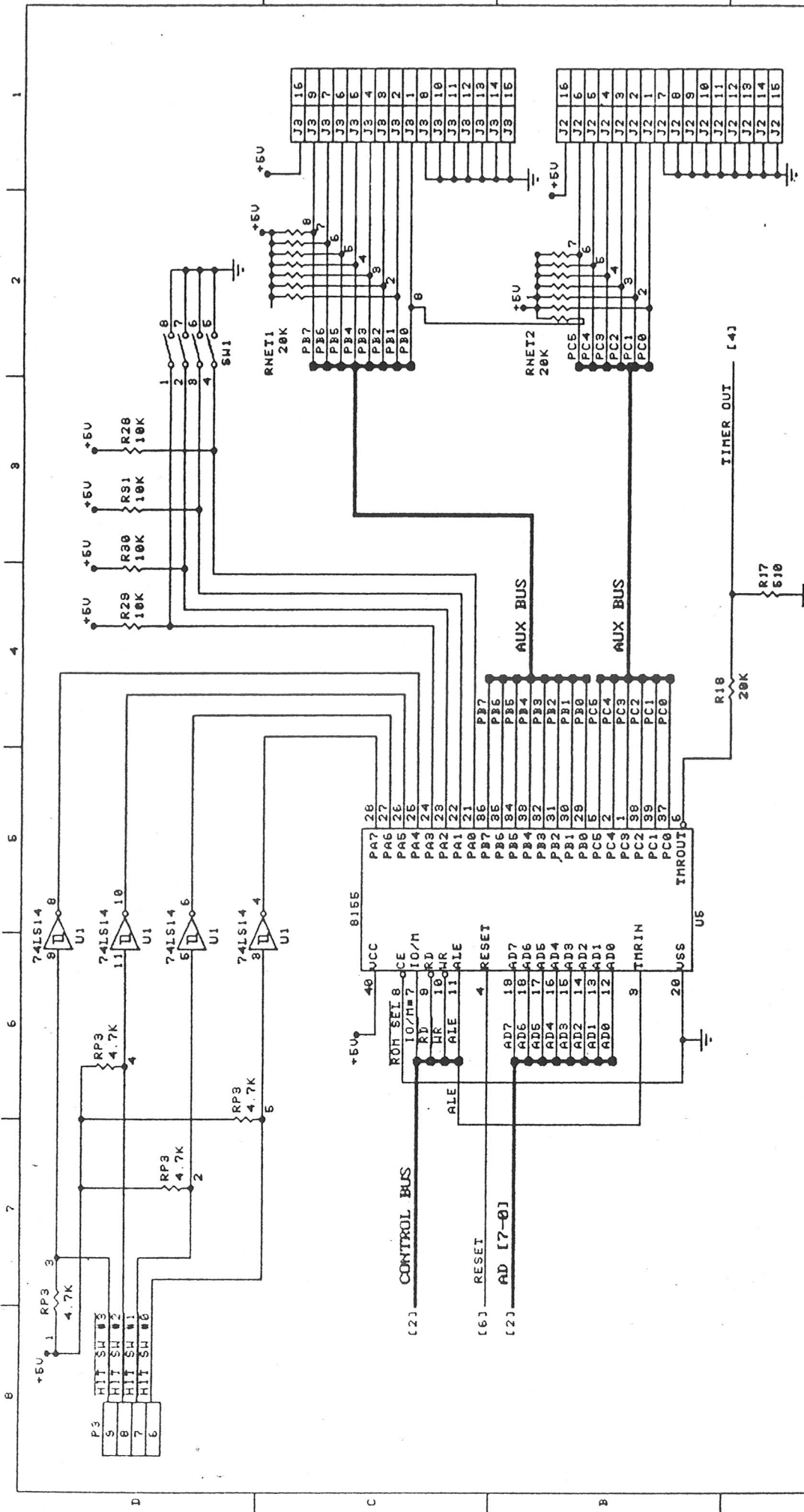
- 0.1uF BYPASS CAPS ARE C11-C18, C22, C23, C41, C44.
- OPTIONAL PARTS FOR U1 ARE: 74HC14 OR MC14584 HOWEVER IF A 14584 IS USED THE AUTO-TESTER CANNOT BE USED TO TEST ALL FUNCTIONS OF THE BOARD.
- IF EITHER OPTIONAL PART IS USED IN U1 THEN R1 MUST BE INSTALLED. [SEE SHT. 06]

APR 10 1984

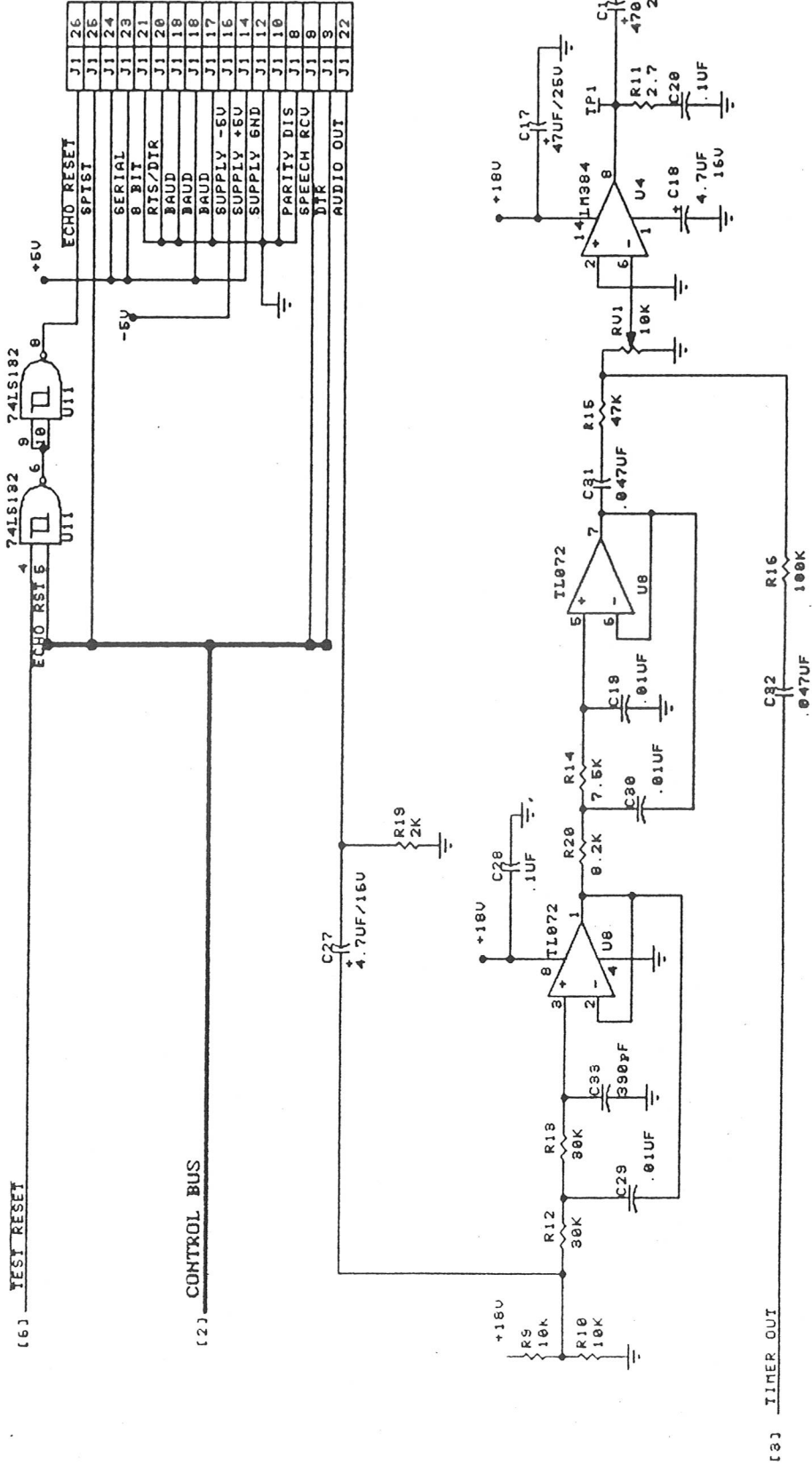
DATE 12/20/83		ANDROBOT, INC.	
DWN J. YOUNG			
APVD			
ENGKG			
CHKR			
TITLE TOPO II COMMUNICATION BD			
MAIN CPU UNUSED GATES, IC LIST			
SIZE	CODE	NUMBER	REV
B		11-018281-001	E
SHEET 1 OF 6			

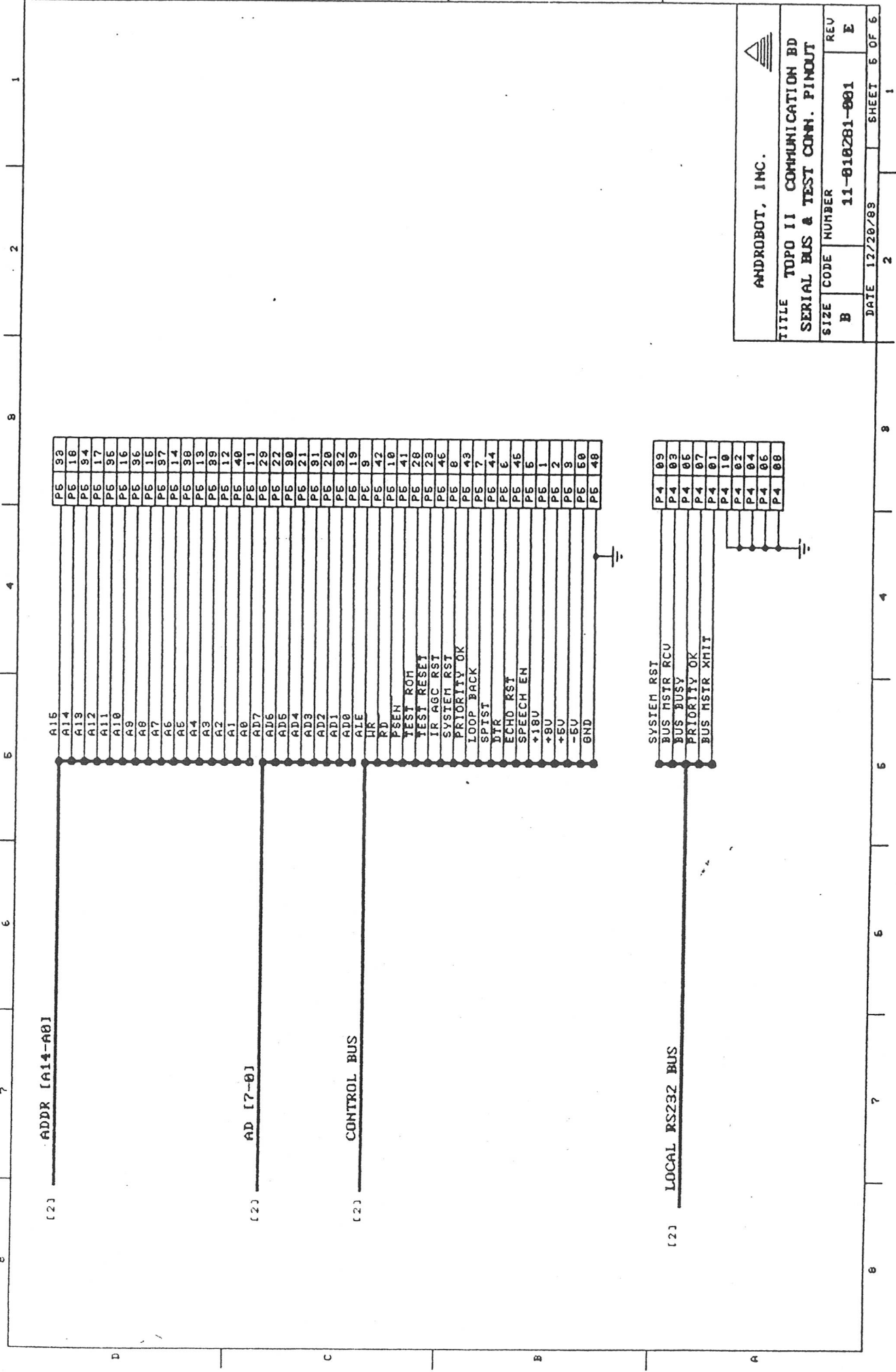


ANDROBOT, INC.			
TITLE TOPO II COMMUNICATION BD			
MAIN CPU			
SIZE	CODE	NUMBER	REV
B		11-010281-001	E
DATE 12/20/83		SHEET 2 OF 6	



ANDROBOT, INC.			
TITLE TOPO II COMMUNICATION BD			
PIA INTERFACE HARDWARE			
SIZE	CODE	NUMBER	REV
B		11-010281-001	2
DATE 12/28/83		SHEET 8 OF 6	



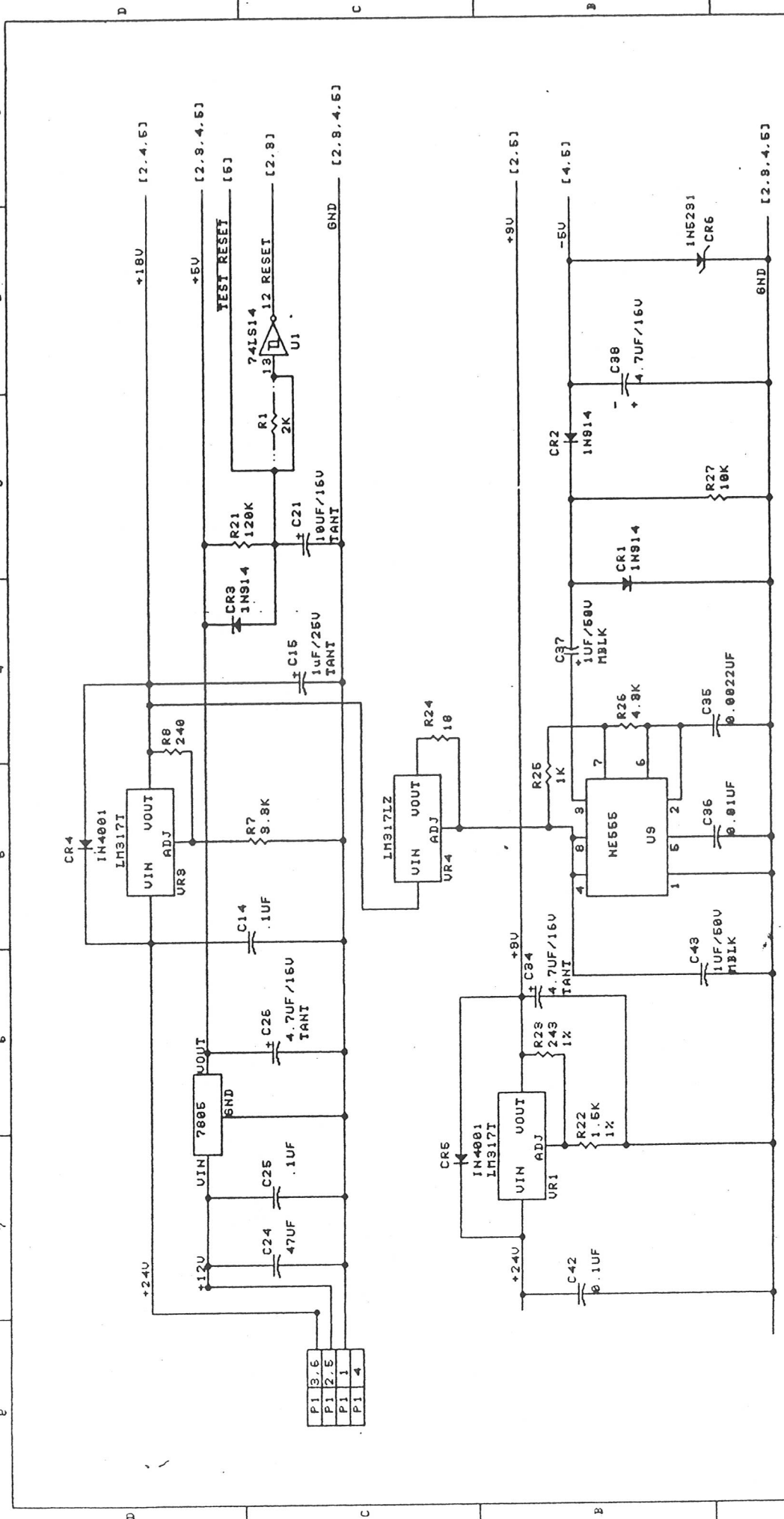


ANDROBOT, INC.

TITLE TOPO II COMMUNICATION BD
SERIAL BUS & TEST CONN. PINOUT

SIZE	CODE	NUMBER	REV
B		11-010281-001	E
DATE 12/20/89			SHEET 5 OF 6

1 2 3 4 5 6 7 8



NOTES

1. IF R1 IS INSTALLED THEN THE TRACE ON CIRCUIT SIDE OF BOARD MUST BE CUT BETWEEN SOLDER PADS OF R1 (SEE NOTE ON ASSEMBLY DWG. FOR EXACT PLACE OF CUT)

ANDROBOT, INC.

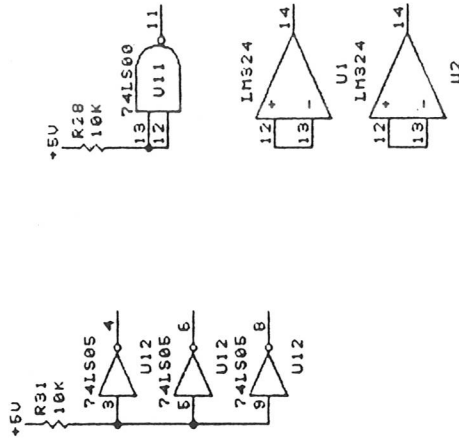
TITLE TOPO II COMMUNICATION BD
POWER SUPPLY & RESET

SIZE	CODE	NUMBER	REV
B		11-010281-001	E

DATE 12/20/89 **SHEET** 6 OF 6

ZONE	ITF	DESCRIPTION	DATE	APUD
A		REVISIONS	04/03/83	LM
B		REVISIONS	04/05/83	LM

IC TABLE									
IC TYPE	REF DESIGNATOR	QTY	+5V	GND	-5V	+12	+24		
8031	U2	1	40	20					
2764	U9	1	28	14					
6116	U7	1	24	12					
4013	U6	1	14	07					
4071	U4, U10	2	14	07					
4584	U3	1	14	07					
74LS00	U11	1	14	07					
74LS05	U12	1	14	07					
74LS373	U5	1	20	10					
LM324	U1, U2	2	04	11					
LM7805	UR1	1	03	02				01	
SG3685	Q1, Q2, Q3, Q4	4							01

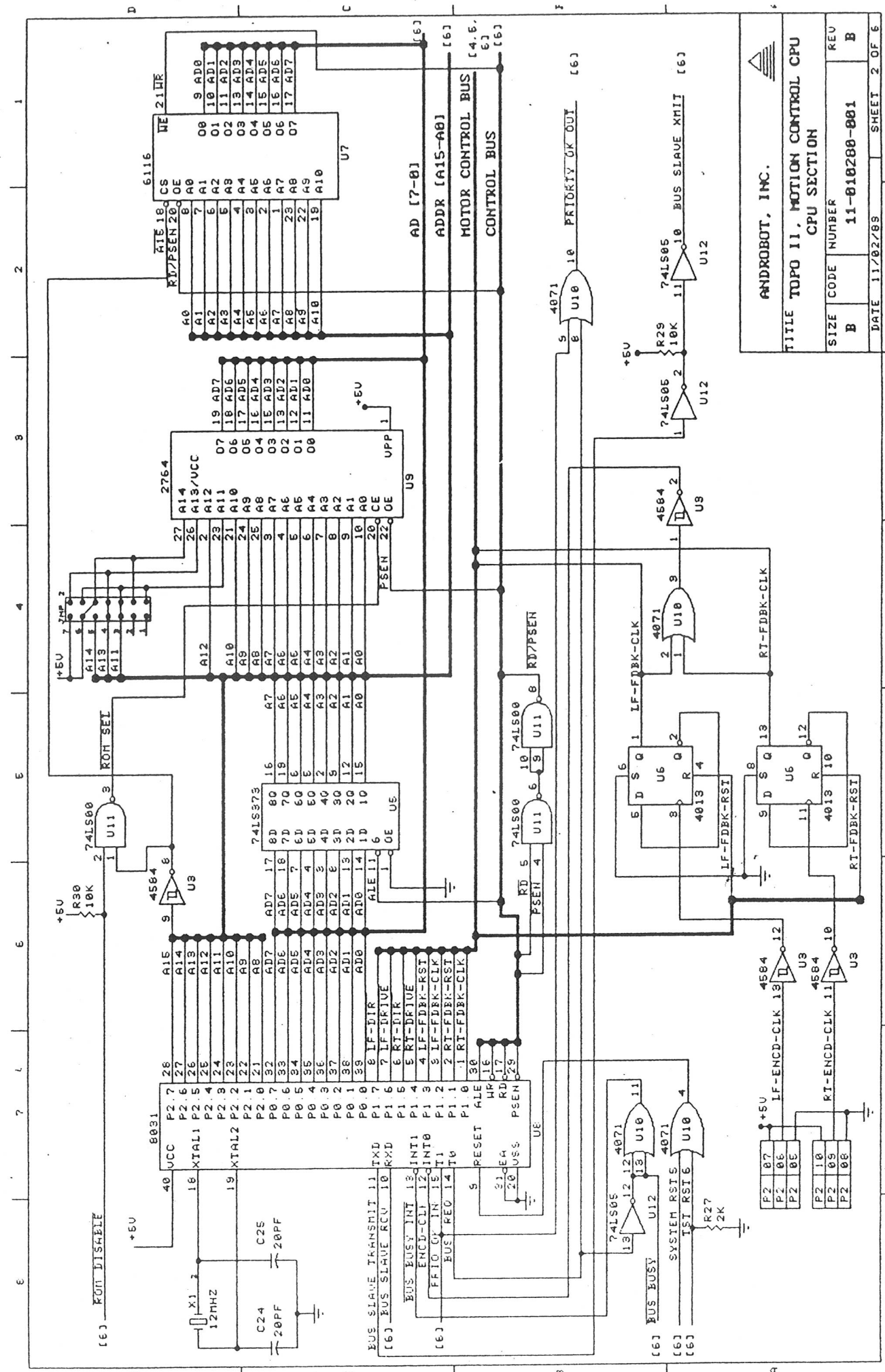


APR 10 1984

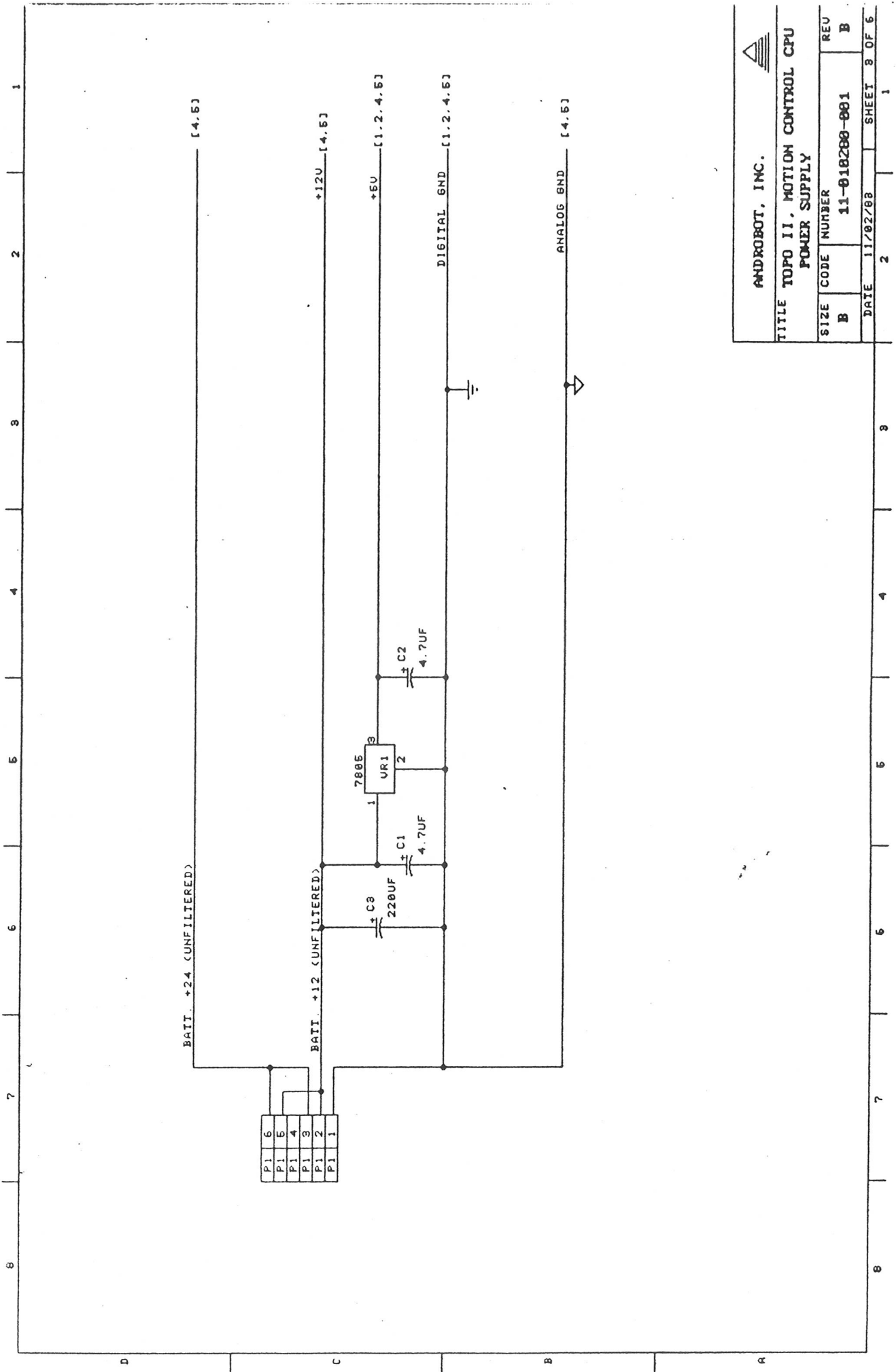
NOTE

1. ALL BYPASS CAPACITORS ARE .1UF IN VALUE.
2. DESIGNATORS FOR CAPS ARE C14 THRU C23.

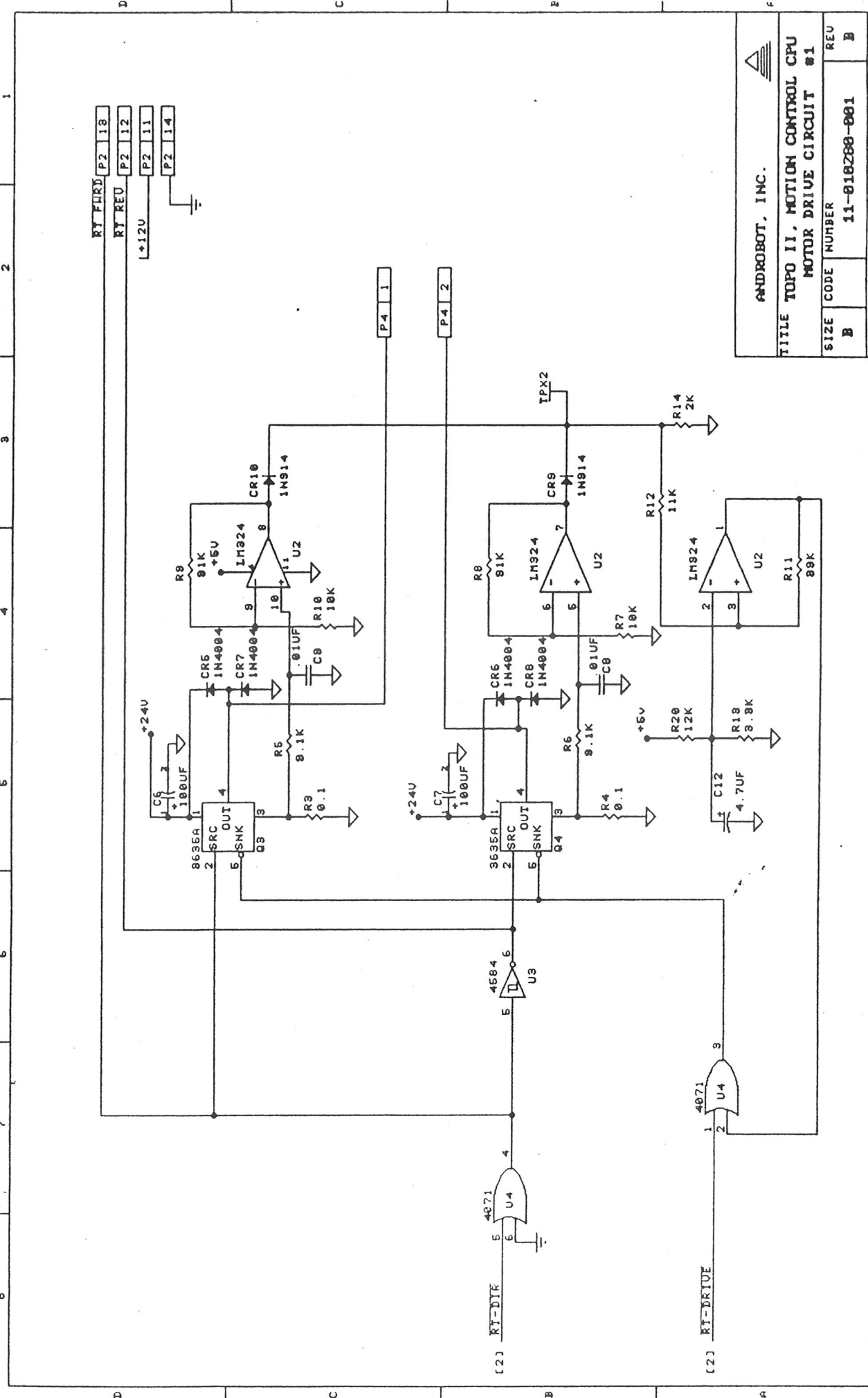
DATE	11/02/83	ANDROBOT, INC.	
DWN	JY		
APUD			
ENGR6			
CHKR			
TITLE		TOPO 11, MOTION CONTROL CPU COVER SHEET	
SIZE	B	CODE	NUMBER
			11-010200-001
		REV	B
		SHEET 1 OF 5	



ANDROBOT, INC.			
TITLE TOPO 11, MOTION CONTROL CPU			
CPU SECTION			
SIZE	CODE	NUMBER	REV
B		11-010280-001	B
DATE 11/02/89		SHEET 2 OF 6	



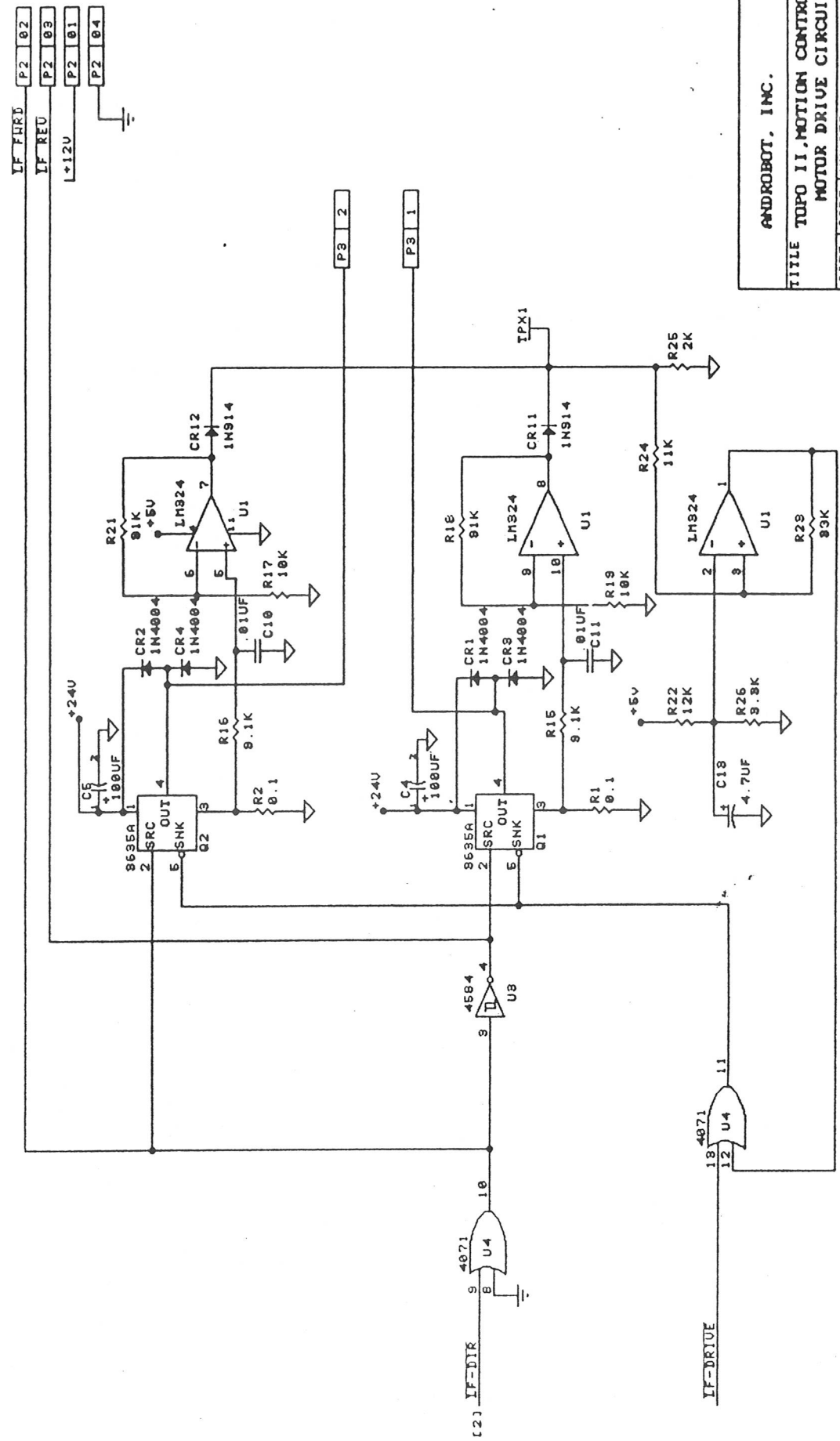
ANDROBOT, INC.			
TITLE T0FO 11. MOTION CONTROL CPU			
POWER SUPPLY			
SIZE	CODE	NUMBER	REV
B		11-010200-001	B
DATE	11/02/03	SHEET 3 OF 6	
	2	1	



ANDROBOT, INC.

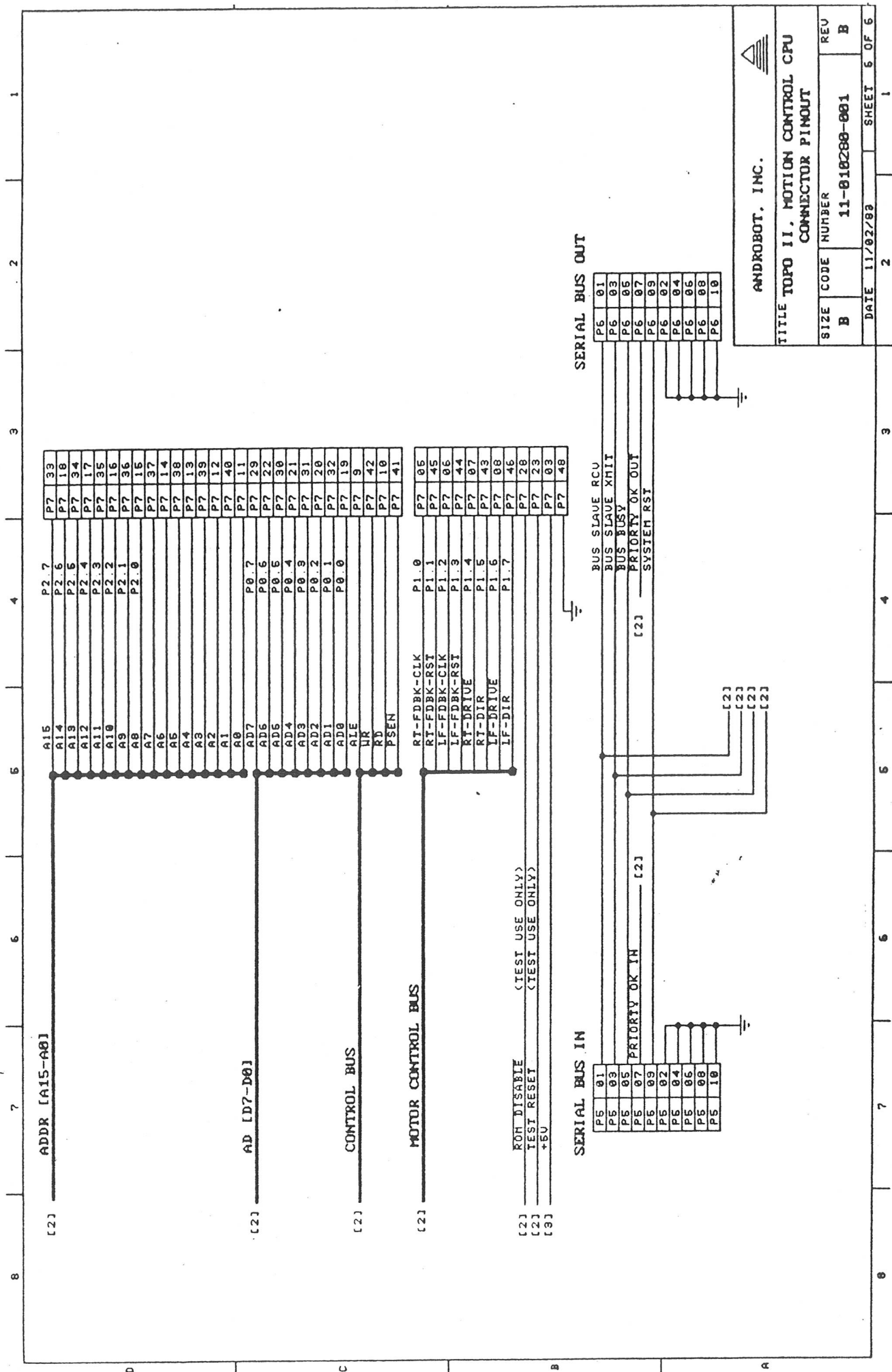
TITLE TOPO 11, MOTION CONTROL CPU MOTOR DRIVE CIRCUIT #1			
SIZE B	CODE NUMBER 11-010200-001	REV B	
DATE 11/02/83	SHEET 4 OF 6		

8 7 6 5 4 3 2 1



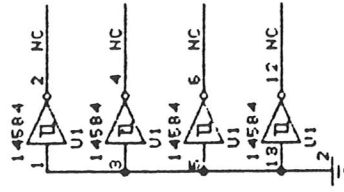
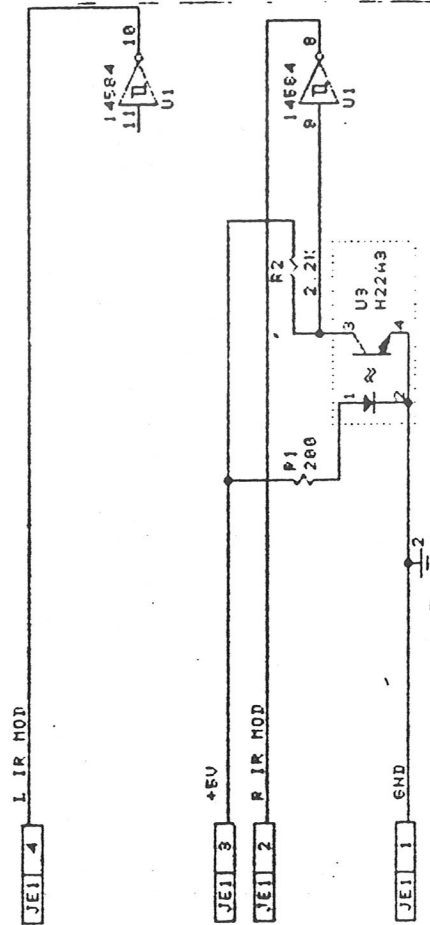
ANDROBOT, INC.

TITLE TOPO 11, MOTION CONTROL CPU			
MOTOR DRIVE CIRCUIT #2			
SIZE	CODE	NUMBER	REV
B		11-010288-001	B
DATE 11/02/83		SHEET 6 OF 6	



REV	DESCRIPTION	DATE	APPROV
A	PRE-PROD REL ECU 00019		
A1	ECO 00073		

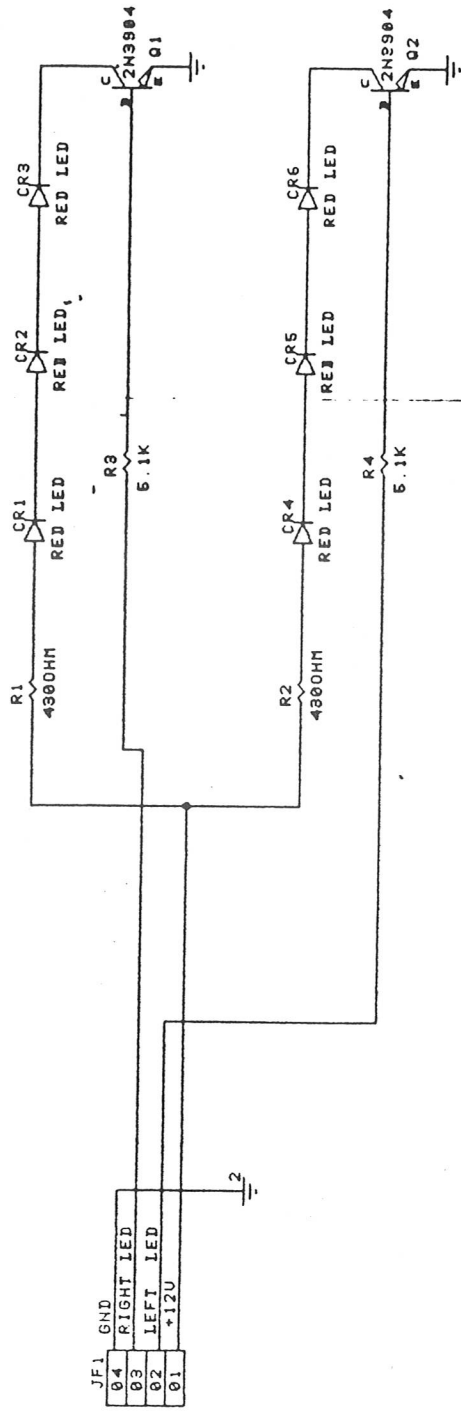
ZONE	DATE	DESCRIPTION	DATE	APPROV
A1	ECO 00073		11/20/83	



APR 03 1984

DATE	10/20/83	ANDROBOT, INC.
DESIGN	J. YOUNG	
APPROV		
ENGINEER	J. YOUNG	
CHECK		
TITLE	TOPO II	
	MOTOR ENCODER BRD.	
SIZE	B	
CODE	11-010257-001	
NUMBER		
PE	A1	
SHEET	1 OF 1	

REVISIONS			
ZONE	LTR	DESCRIPTION	DATE
A		PRELIMINARY	12/21/79

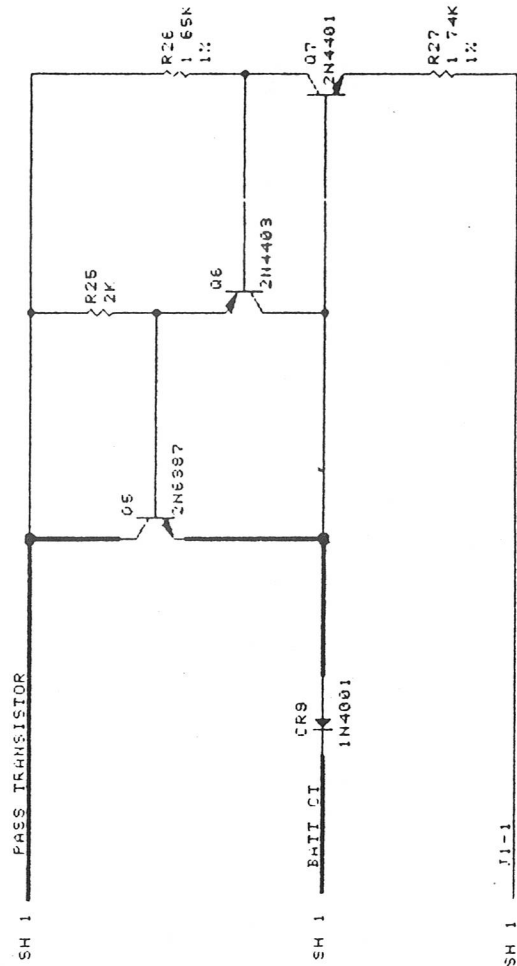


APR 03 1984

DATE 10/20/83		ANDROBOT, INC.	
DWN	I. SAKAMOTO	TITLE	
APUD		TOPO II	
ENGR		FOOTLIGHT SCHEMATIC	
CHKR		SIZE	CODE NUMBER
		B	11-818249-001
		REV	A
		SHEET 1 OF 1	

3 4 5 6 7

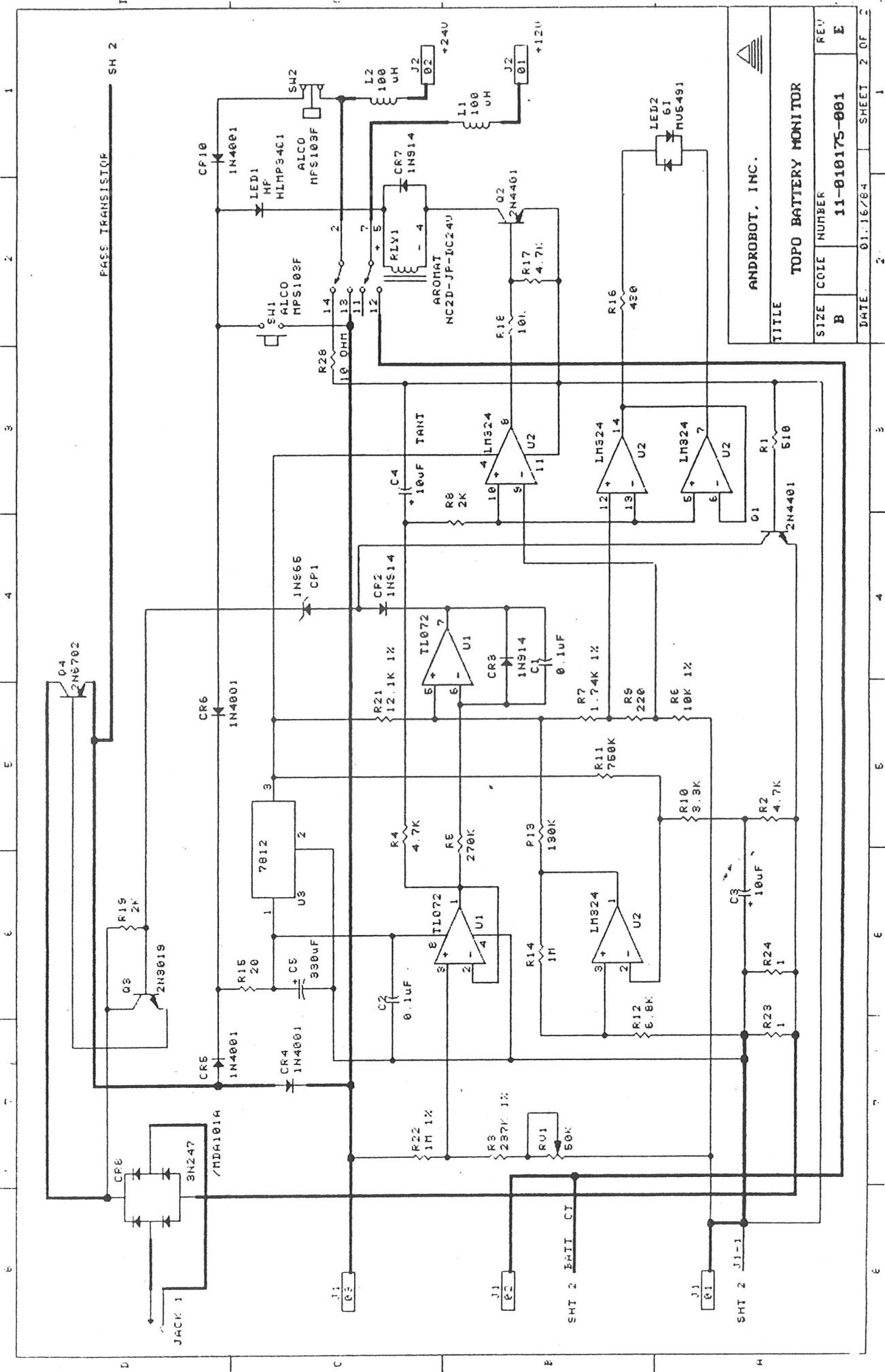
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B	REVISE ECO 00029	11/09/83	LH
C	REVISE ECO 00040	11/14/83	LH
D	REVISE ECO 00067	12/07/83	JY
E	REVISE ECO 00085	01/16/84	JY



APR 10 1984

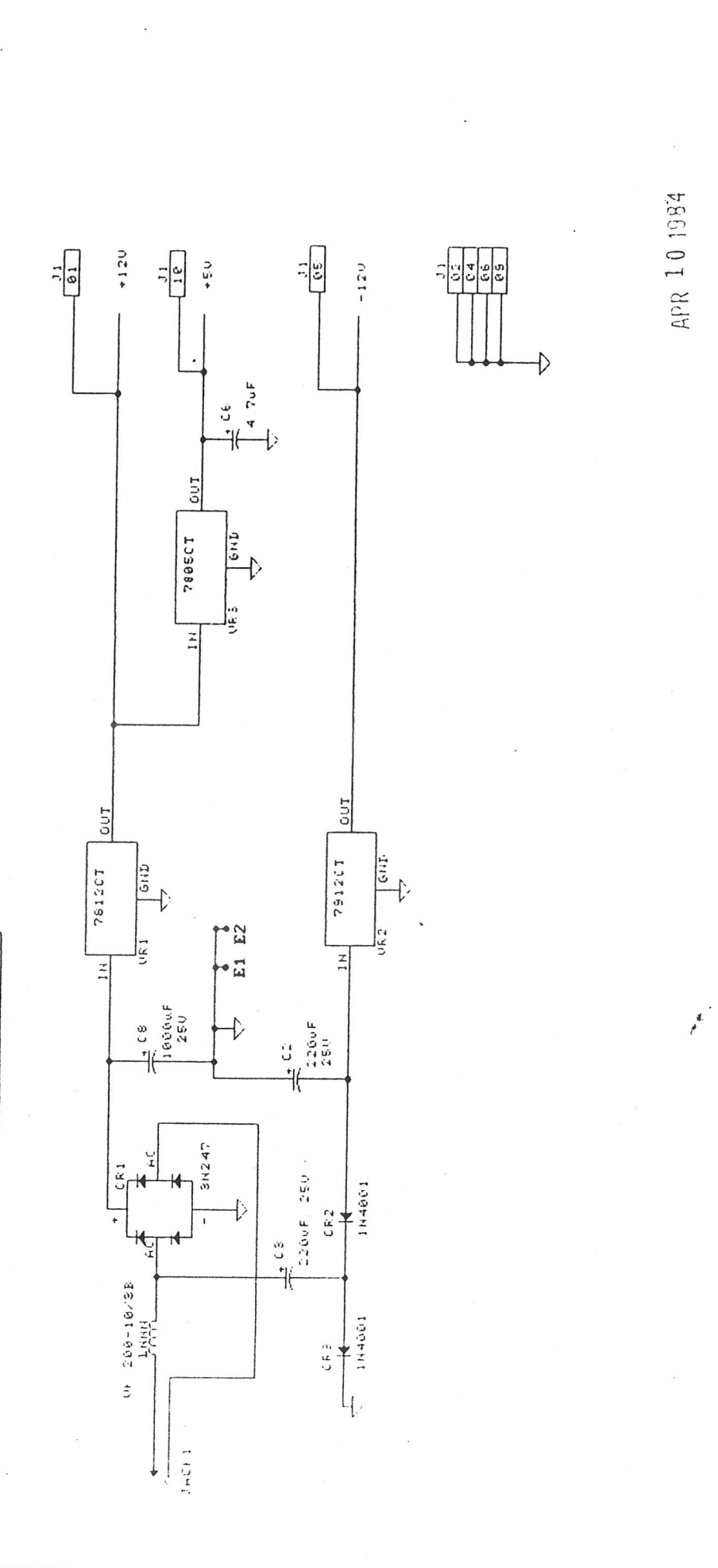
DATE	01/16/84
ENGR	J YOUNG
AFUD	
ENGR6	
CHKR	
TITLE	TOPO BATTERY MONITOR
SIZE	B
CODE	11-010175-001
NUMBER	
REV	E

3 4 5 6 7



ANDROBOT, INC.	
TITLE TOPO BATTERY MONITOR	
SIZE B	REV E
COLF NUMBER 11-010175-001	SHEET 2 OF 2
DATE 01-16-84	

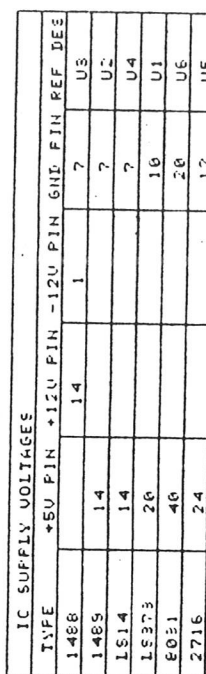
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2	11-02-83	LM	11-02-83	REVISION	LM
3	11-03-83	LM	11-03-83	REVISION	LM
4	11-03-83	LM	11-03-83	REVISION	LM
5	11-30-83	J YOUNG	11-30-83	REVISION	J YOUNG
6	1-30-84	J YOUNG	1-30-84	REVISION	J YOUNG



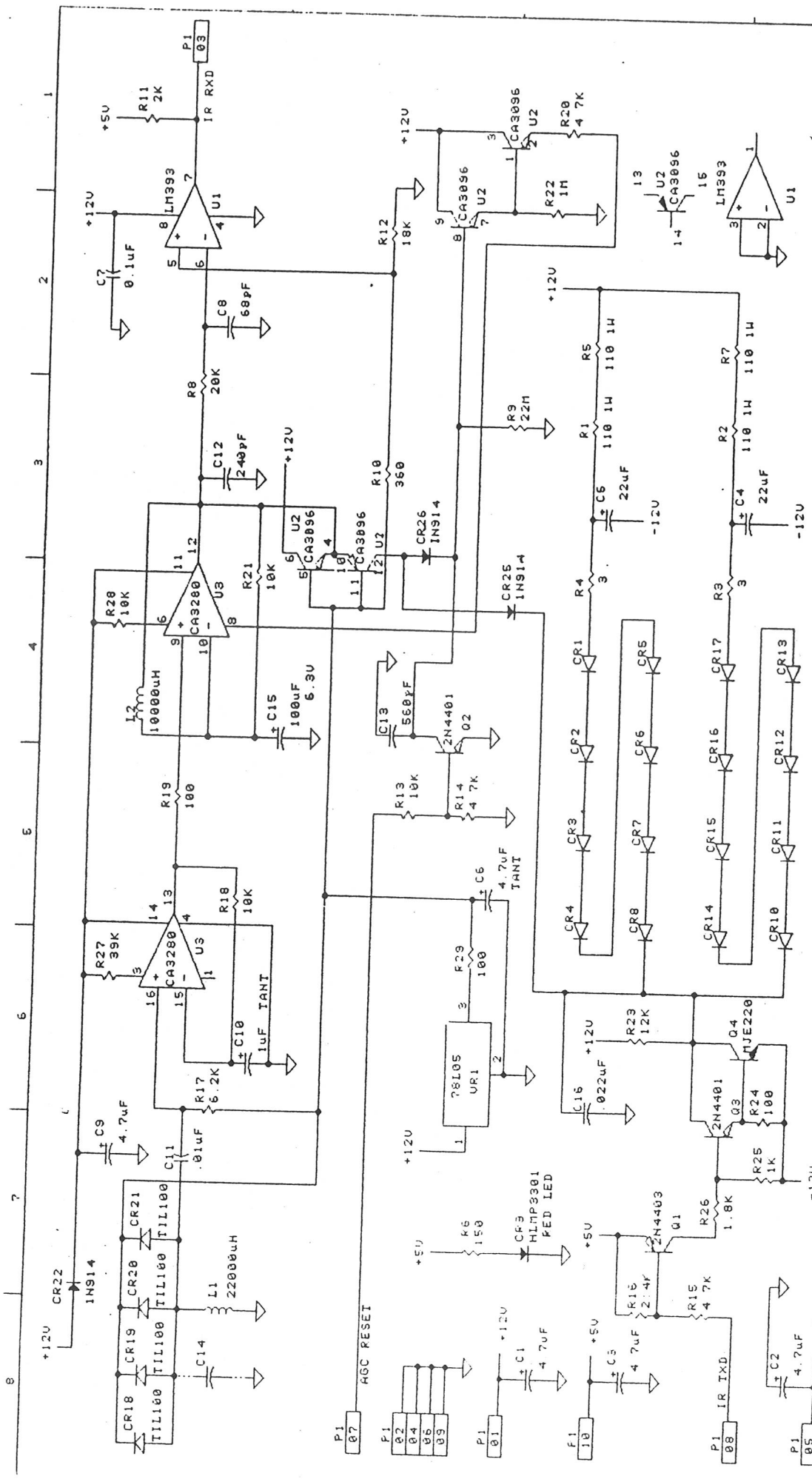
APR 10 1984

DATE:	11-03-83	ANDROBOT, INC.
DUN:	J A	
CHK:	J YOUNG	
WFFUL:	1	
DOC:	1	
CONT:	1	
SIZE:	B	
CODE:	11-010233-001	
NUMBER:	11-010233-001	
DATE:	11/29/83	
SHEET:	1 OF 2	

21



TITLE		HOST DATA LINK DIGITAL			
SIZE	CODE	NUMBER	FE		
B		11-010233-001	E		
DATE	11-29-88		SHEET	2 OF	

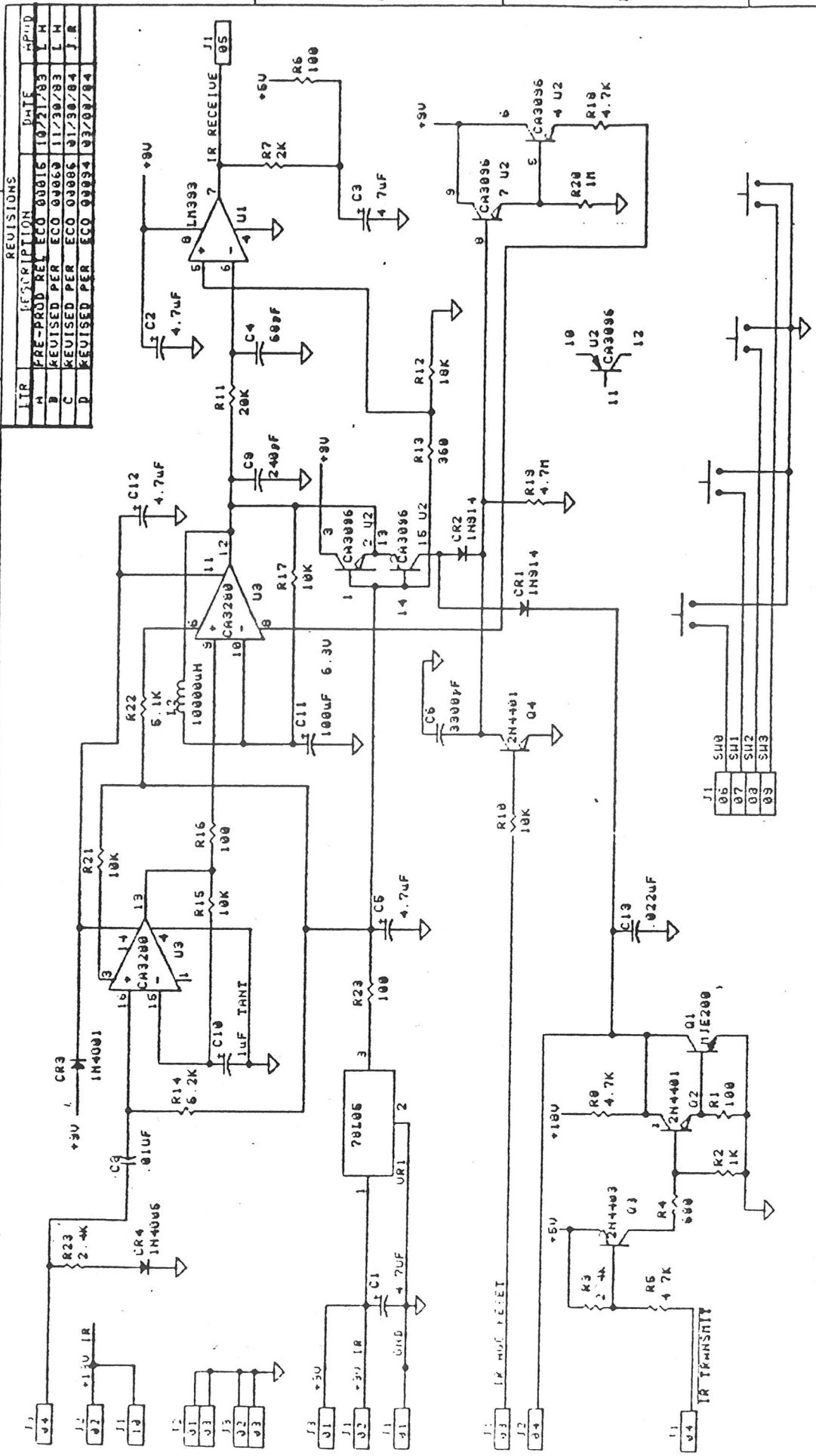


TR	DESCRIPTION	DATE	APUD
1	PER-PROD FEL ECO 00020	10/26/83	L H
2	REVISED ECO 00087	02/15/84	EL

ANDROBOT, INC.			
TITLE			
HOST DATA LINK ANALOG			
SIZE	CODE	NUMBER	REV
B		11-018598-001	A.1
DATE	02/15/84		SHEET 1 OF 1

APR 10 1984

REV	DESCRIPTION	DATE	BY
A	PRE-PROD REL ECO 00015	10/21/83	LM
B	REVISED PER ECO 00060	11/30/83	LM
C	REVISED PER ECO 00086	01/30/84	J.R
D	REVISED PER ECO 00094	03/03/84	

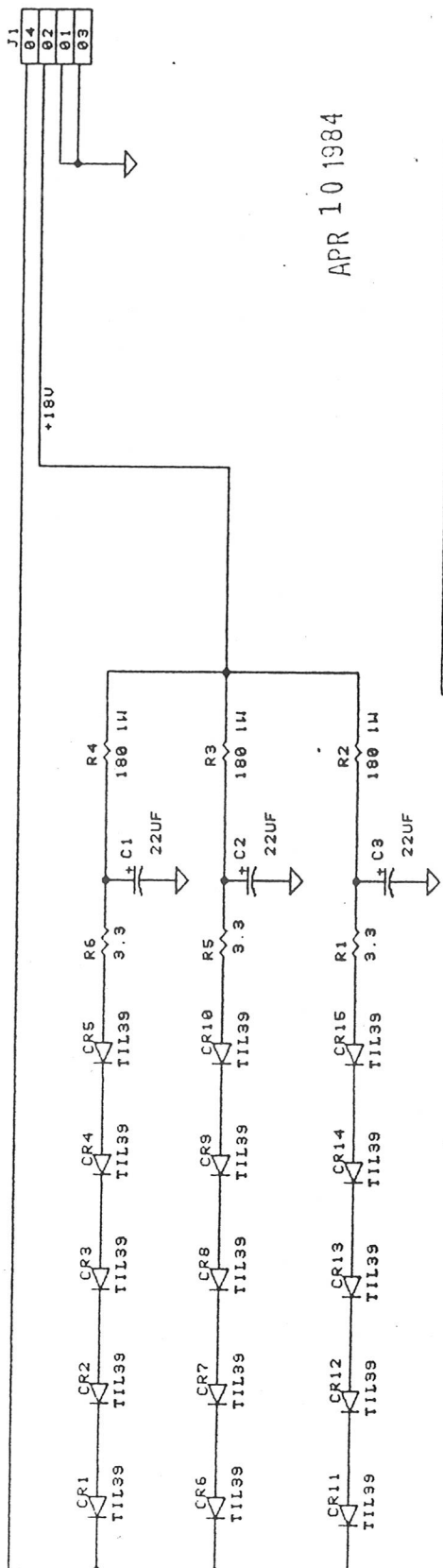
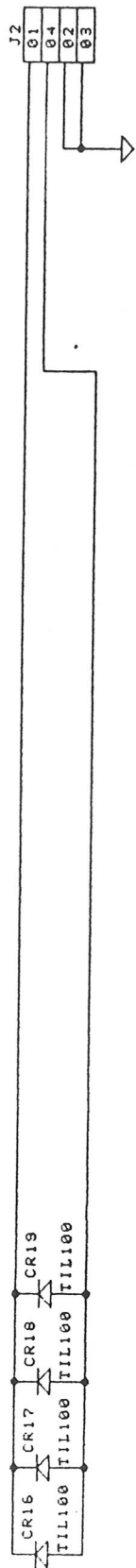


DATE	03/03/84
DESIGN	J. YOUNG
BY	
ENGR	
CHKR	
SIZE	B
CODE	
NUMBER	11-010230-001
REV	D

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ANDROBOT, INC.			
TITLE		TOPO 11	
		MOBILE TRANSCIVER AMP	
SIZE	CODE	NUMBER	REV
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		SHEET 1 OF 1	

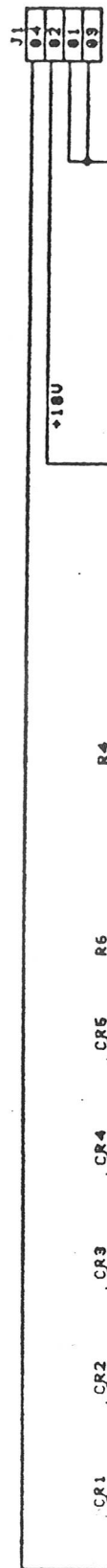
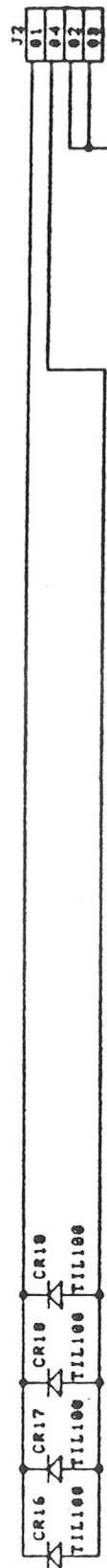
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C	ECO 00091	1/12/84	gk



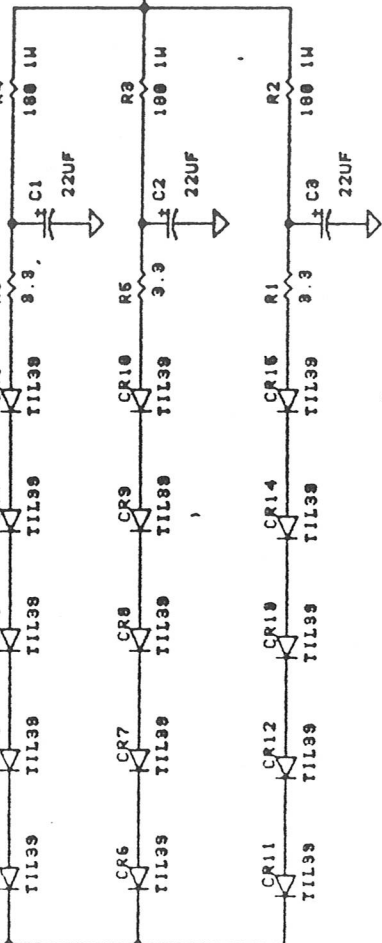
APR 10 1984

DATE	01/30/84
DHN	J. YOUNG
APUD	
ENGR	
CHKR	
TITLE	MOBILE TRANCEIVER SENSOR
SIZE	B
CODE NUMBER	11-010369-001
REV	C
SHEET	1 OF 1

8 7 6 5 4 3 2 1



+10V



ANDROBOT, INC.

TITLE
MOBILE TRANSCIVER SENSOR

SIZE	CODE	NUMBER	REV
B		11-818369-001	A
DATE:	10/18/83	SHEET	1 OF 1

8 7 6 5 4 3 2 1

