

FUTURETRONICS

AUSTRAALIA PTY. LTD.

PAGE 1 OF 28

CUSTOMER SERVICE

TECHNICAL BULLETIN

NUMBER 33 - ANDRO - 84

PRODUCT ANDROBOT

DATE

MODEL TOPO II

AUTHOR BRIAN HODGKINSON

APPROVED BY BRIAN HODGKINSON

DISTRIBUTION:-

ALL SERVICE MANAGERS :

VIC.
N.S.W.
W.A.

Q'LAND
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.

<u>PAGES</u>		
1 - 4	Customer Service Bulletin 2. - 30.3.84	(4 Pages)
5 - 10	Communication Board	(6 Pages)
11- 16	Motion Control CPU	(6 Pages)
17	Motor Encoder BRD	(1 Page)
18	Footlight Schematic	(1 Page)
19- 20	Battery Monitor	(2 Pages)
21- 22	Host Data Link Digital	(2 Pages)
23	Host Data Link Analog	(1 Page)
24.	Mobile Transceiver AMP	(1 Page)
25	Mobile Transceiver SENSOR	(1 Page)
26	Mobile Transceiver SENSOR	(1 Page)



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 Tranceiver 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 Tranceiver 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.

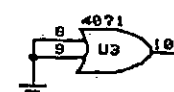
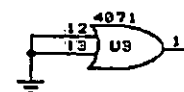
D. Should any of the above prove to not be easily resolved please contact the factory for assistance.

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.

REVISIONS			
ITER.	DESCRIPTION	DATE	APUD
A	PRE-PROD ECO 00018	10/21/83	L.H.
B	REVISED ECO 00032	11/08/83	L.H.
C	REVISED ECO 00066	12/06/83	L.H.
D	REVISED ECO 00072	12/16/83	L.H.
E	REVISED ECO 00078	12/20/83	

IC TABLE							
IC TYPE	REF. DES.	+5V	+18	+5V	8ND	+24	+12
4011	U2			14	07		
4071	U3			14	07		
74LS182	U11			14	07		
74LS14	U1			14	07		
74LS378	U6			28	10		
2764	U10			28	14		
8031-A	U7			40	20		
8166	U5			40	20		
TL072	U8		08		04		
LM894	U4		14		7.8		
					10.4		
555	U9				01		03
LM9171	UR1	UOUT			UIN		
LM9171	UR3	UOUT			UIN		
LM7805	UR2		02	02		01	
LM9171Z	UR4	UIN					

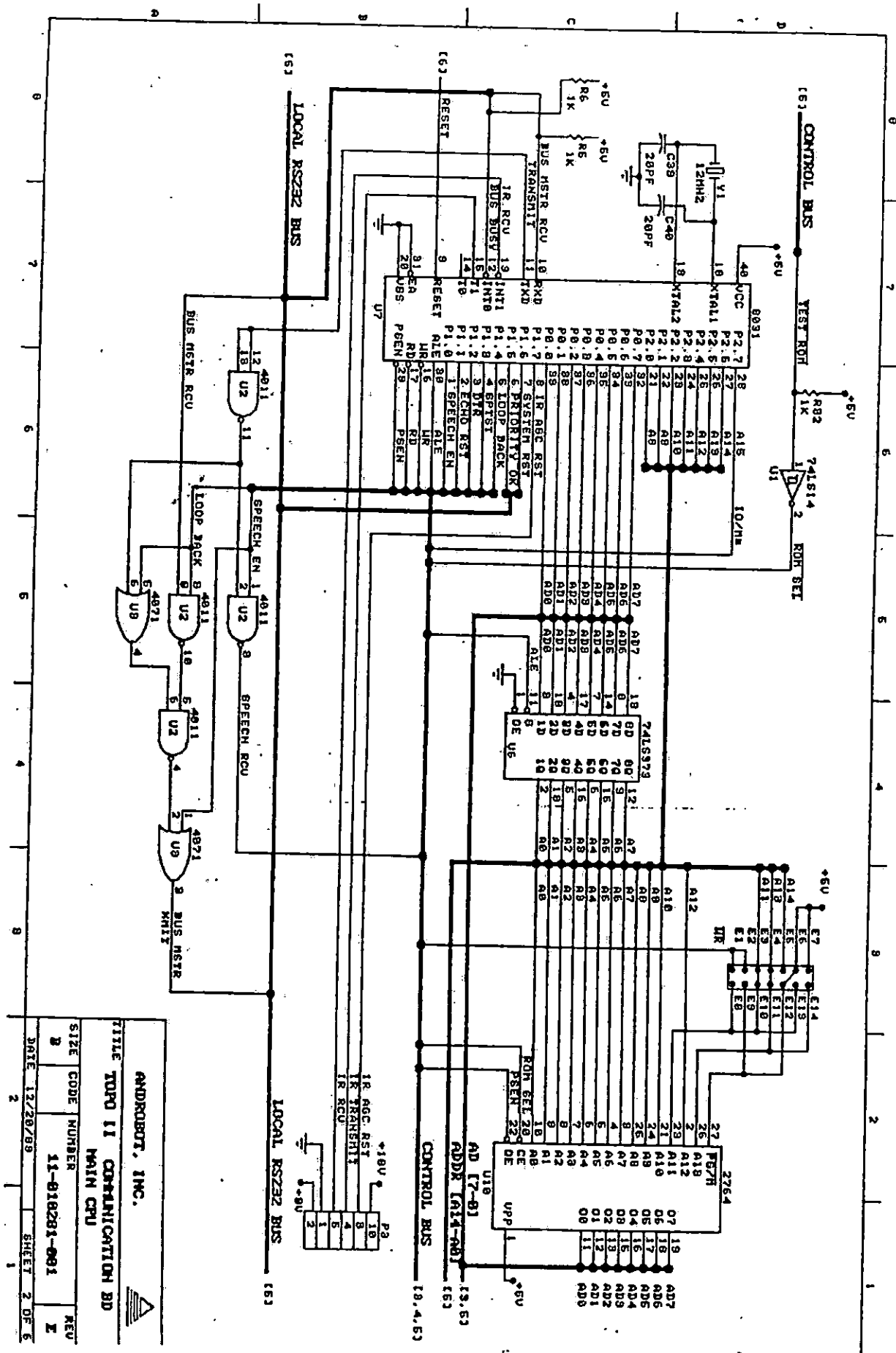


NOTES

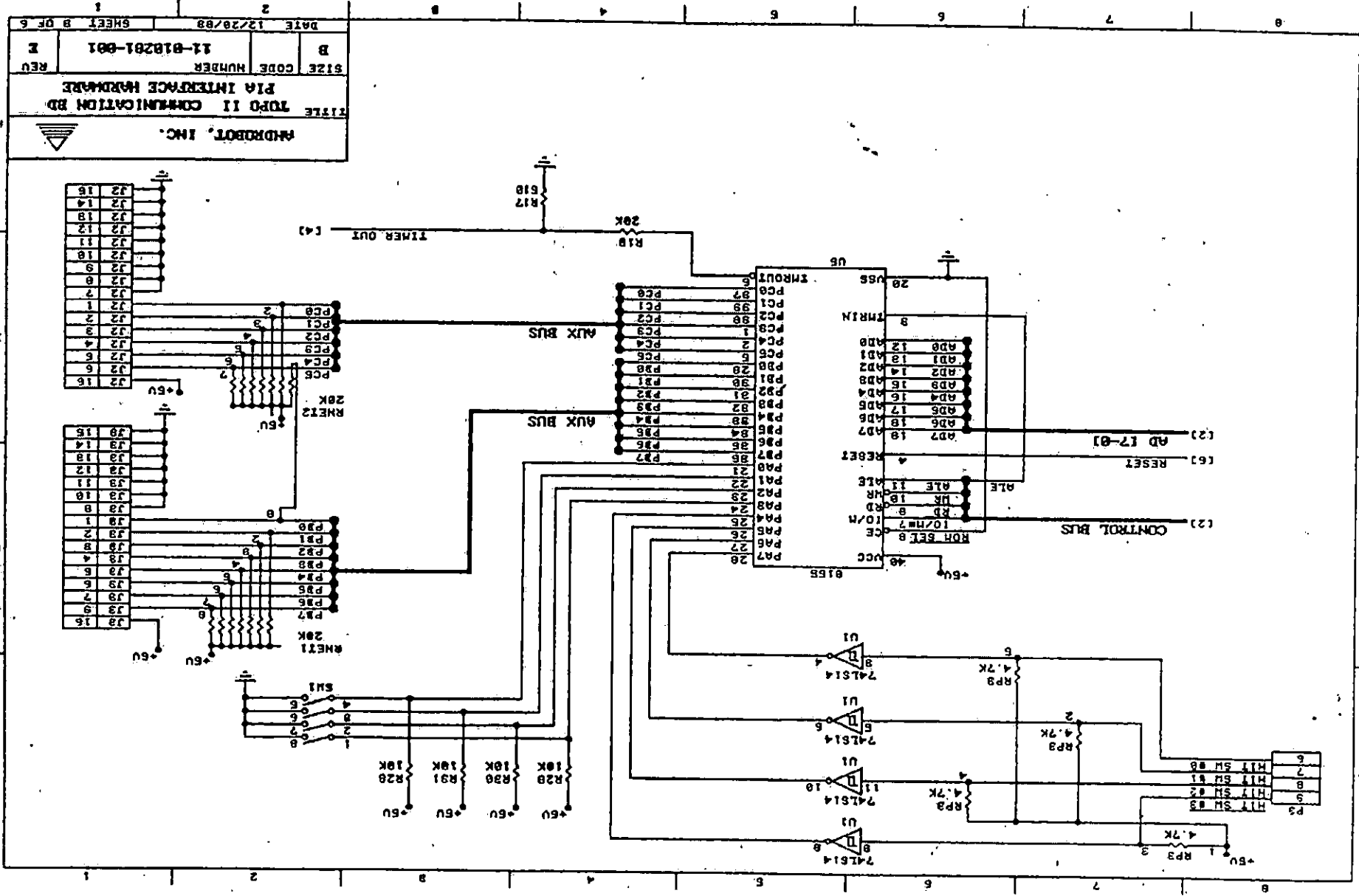
1. 0.1uF BYPASS CAPS ARE C11-C18, C22, C29, C41, C44.
2. OPTIONAL PARTS FOR U1 ARE: 74HC14 OR MC14584 HOWEVER IF A 14584 IS USED THE AUTO-TESTER CANNOT BE USED TO TEST ALL FUNCTIONS OF THE BOARD.
3. IF EITHER OPTIONAL PART IS USED IN U1, THEN R1 MUST BE INSTALLED. (SEE SMT.05)

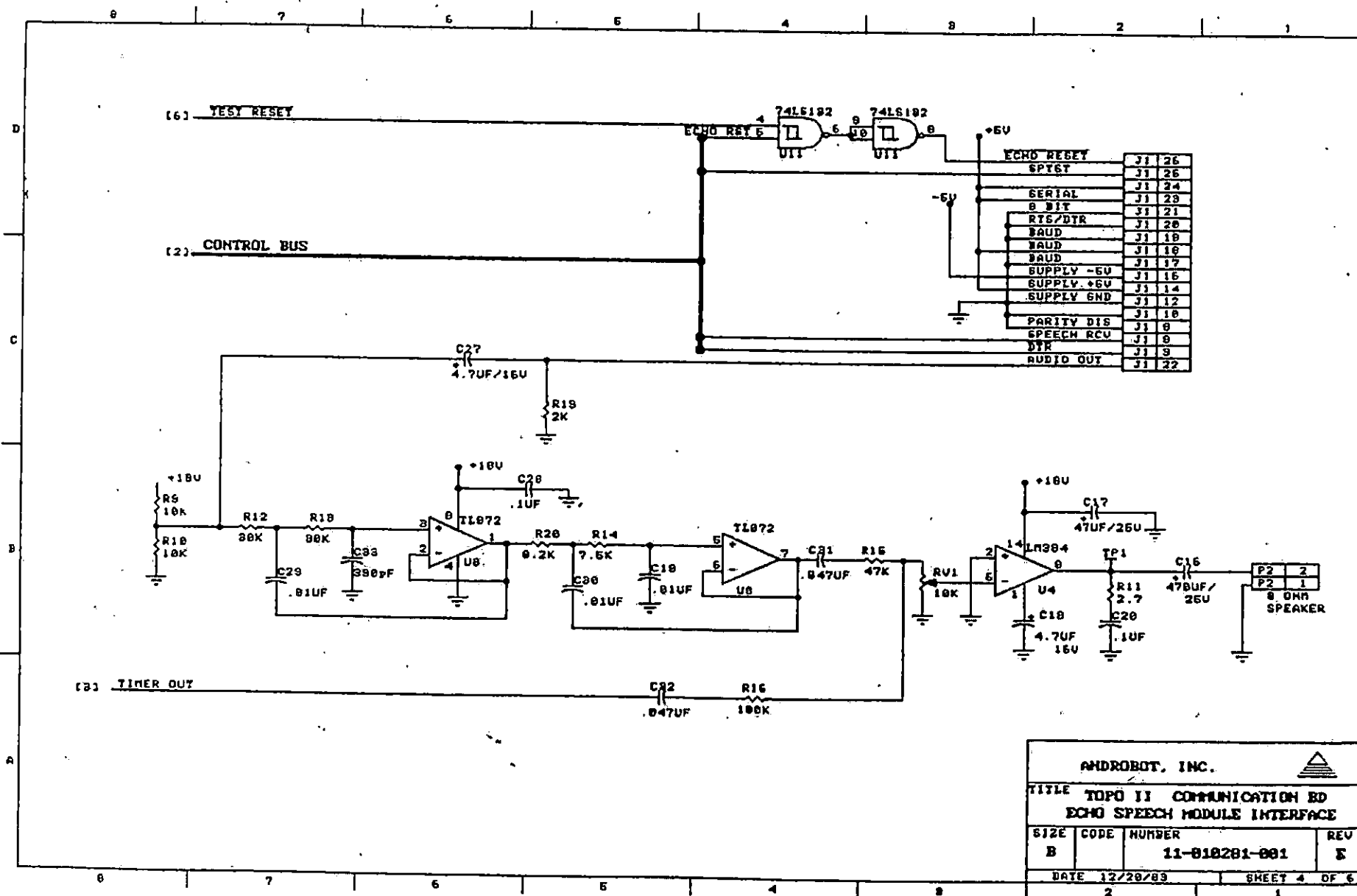
APR 10 1984

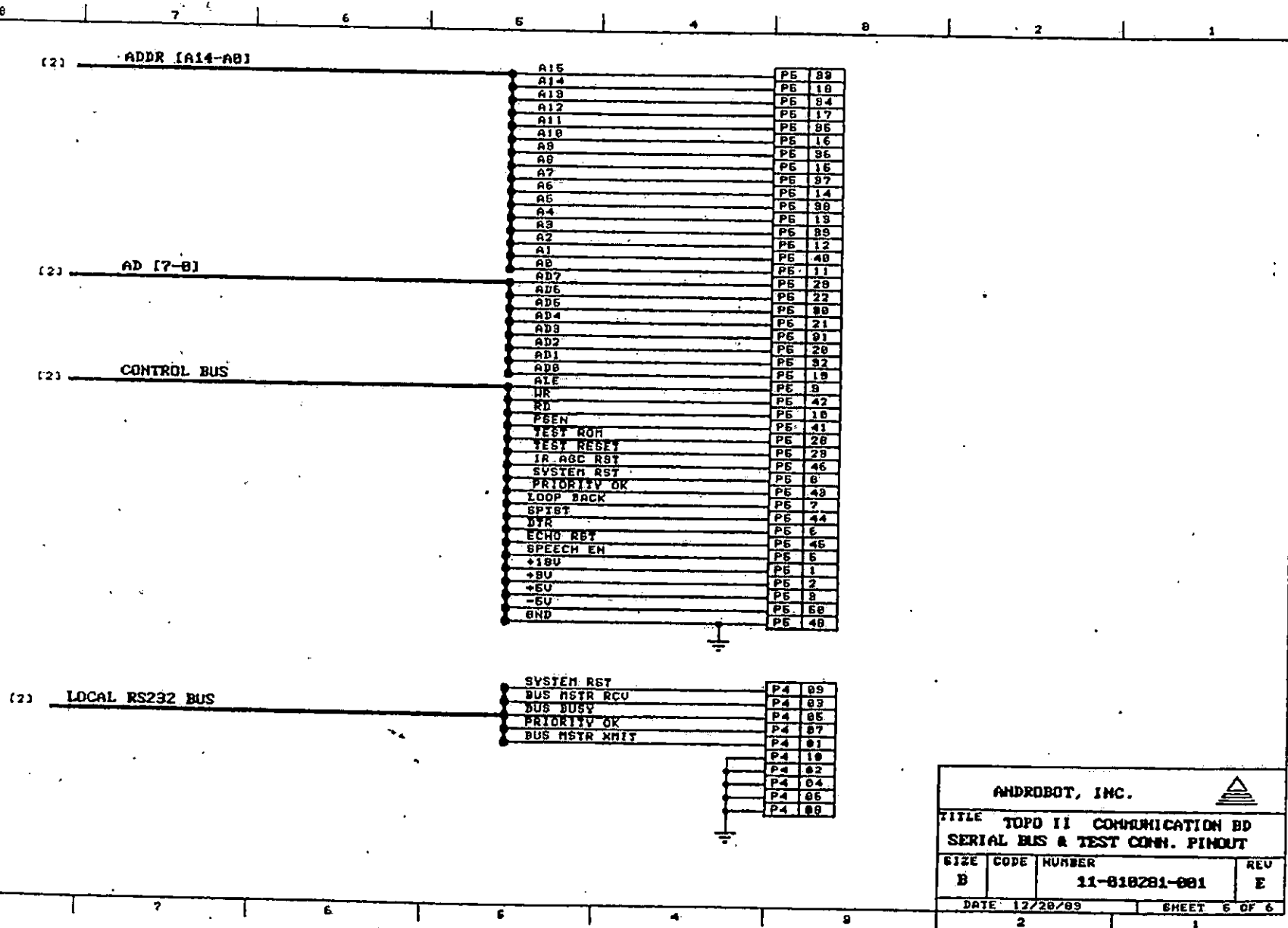
DATE	12/20/83	ANDROBOT, INC.		
DNW	J. YOUNG			
APUD		TITLE		
APUD				
EMBRG		TOPO 11 COMMUNICATION BD		
CMKR				
		MAIN CPU UNUSED GATES, IC LIST		
		SIZE	CODE	NUMBER
		B		11-818281-001
				REV
				E



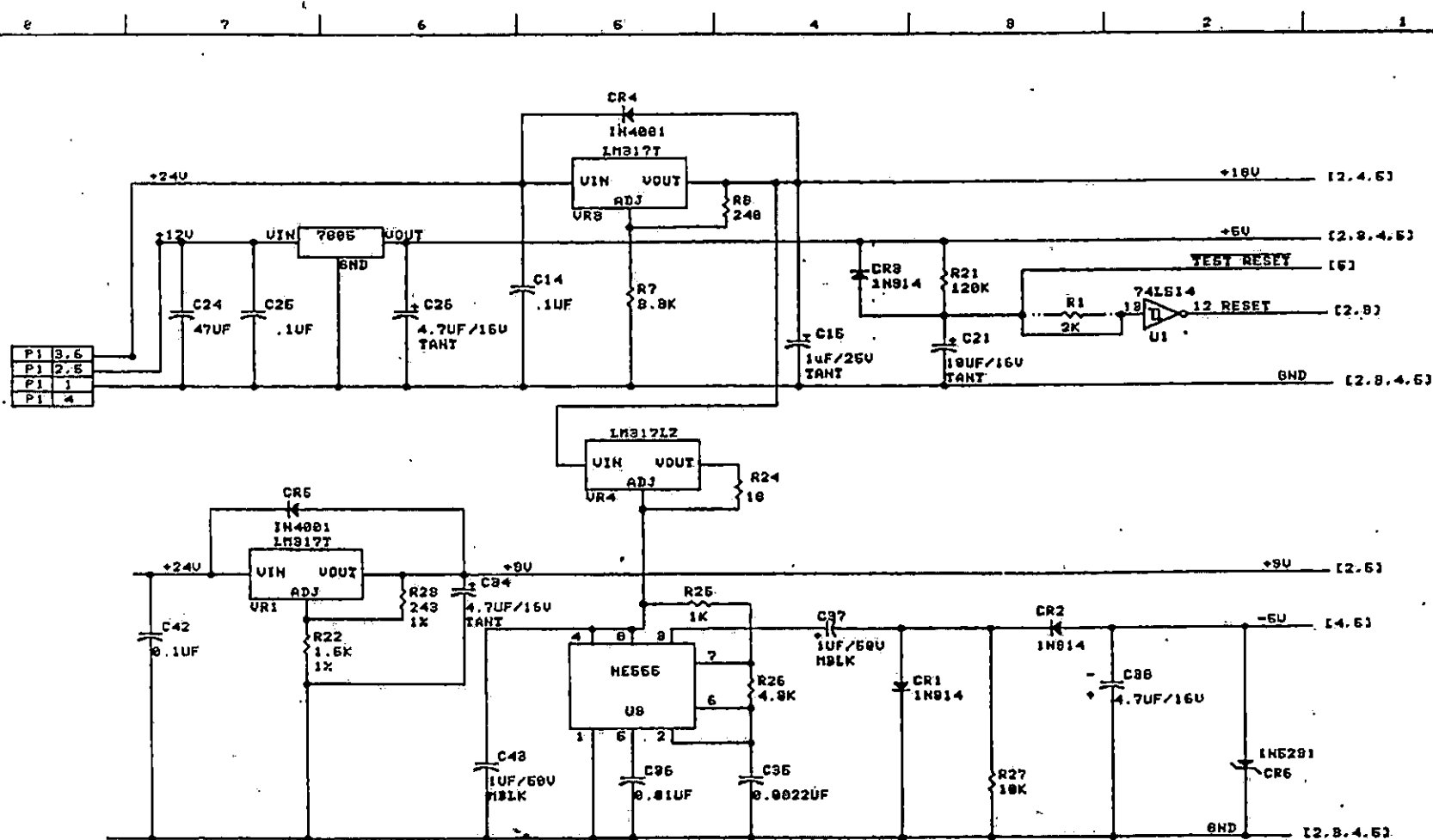
ANDROBOT, INC.			
TUPO II COMMUNICATION BD			
MAIN CPU			
SIZE	CODE	NUMBER	REV
8		11-810281-001	1
DATE	12/20/89	SHEET	2 OF 6







ANDROBOT, INC.			
TITLE TOPD II COMMUNICATION BD			
SERIAL BUS & TEST CONN. PINOUT			
SIZE	CODE	NUMBER	REV
B		11-818281-001	E
DATE 12/28/89		SHEET 6 OF 6	



NOTES

- 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.

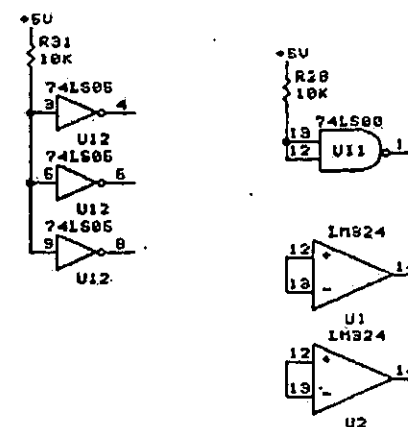
TITLE TOPO 11 COMMUNICATION BD
POWER SUPPLY & RESET

SIZE	CODE	NUMBER	REV
B		11-010281-001	E

DATE 12/20/88 SHEET 6 OF 6

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APUD
	A	REL. LAYOUT	06/83	LH
	B	REVISED ELECTRICALS	03/83	7

IC TABLE						
IC TYPE	REF DESIGNATOR	QTY	+5V	8ND	-5V	+12
8031	U6	1	40	20		
2764	U9	1	28	14		
5116	U7	1	24	12		
4019	U6	1	14	07		
4071	U4, U10	2	14	07		
4504	U9	1	14	07		
74LS00	U11	1	14	07		
74LS05	U12	1	14	07		
74LS979	U5	1	20	10		
LM324	U1, U2	2	04	11		
LM7805	VR1	1	03	02	01	
668686	Q1, Q2, Q3, Q4	4				01

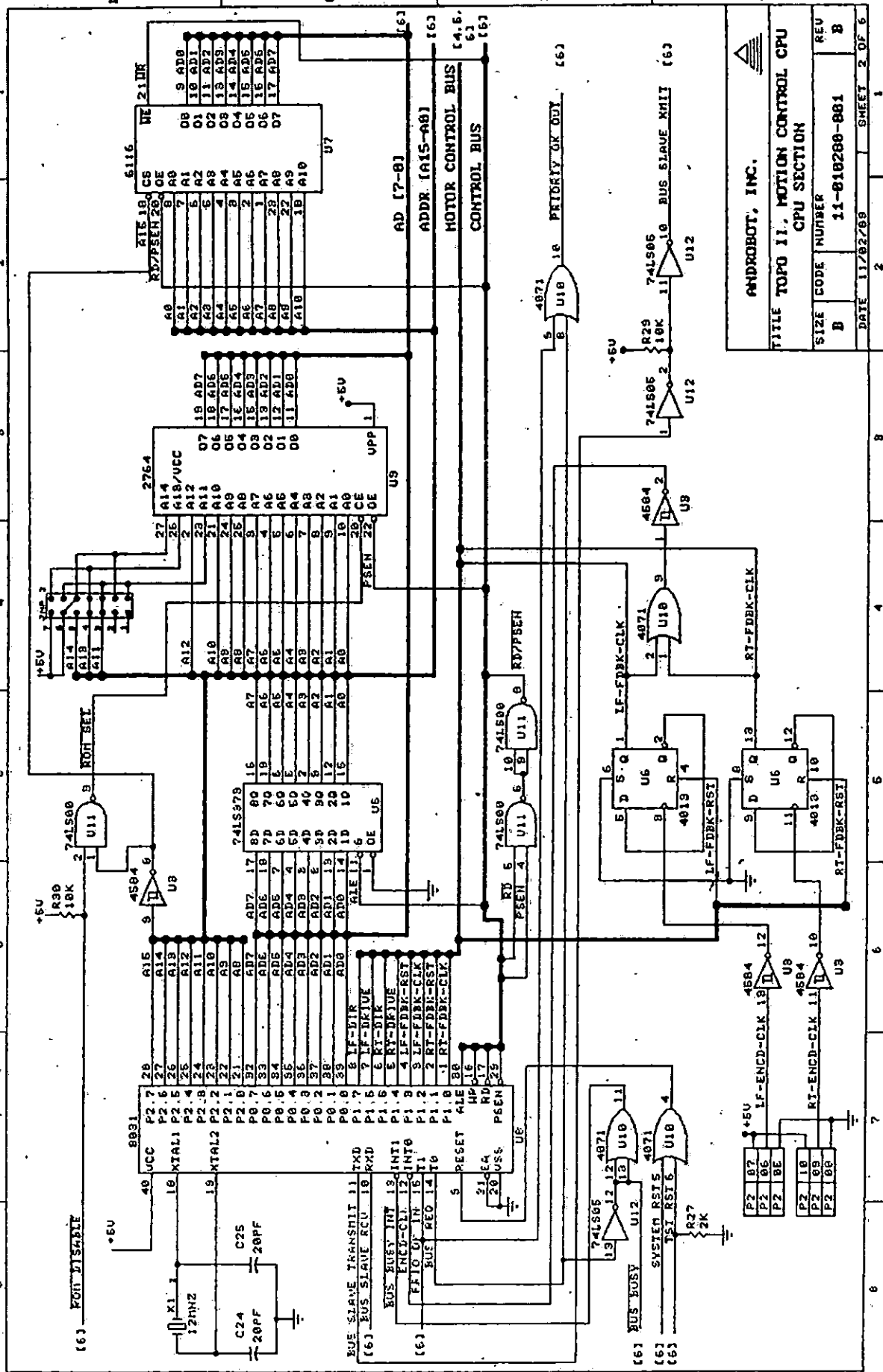


APR 10 1984

NOTE

1. ALL BYPASS CAPACITORS ARE .1UF IN VALUE.
2. DESIGNATORS FOR CAPS ARE C14 THRU C29.

DATE	11/02/83	ANDROBOT, INC.		
DNH	JV			
APUD		TITLE		
APUD				
ENGRS		TOPO 11, MOTION CONTROL CPU COVER SHEET		
CHKR				
SIZE	B	CODE	NUMBER	REV
			11-010200-001	B
SHEET 1 OF 6				



ANDROBOT, INC.

TITLE TOPU 11, MOTION CONTROL CPU
CPU SECTION

SIZE	CODE	NUMBER	REV
B		11-010200-001	B

DATE 11/02/09 SHEET 2 OF 6

P1	6
P1	5
P1	4
P1	3
P1	2
P1	1

BATT. +24 (UNFILTERED)

[4.5]

BATT. +12 (UNFILTERED)

+12V [4.5]

C8
220UF

C1
4.7UF

7905
UR1

C2
4.7UF

+5V [1.2.4.5]

DIGITAL GND [1.2.4.5]

ANALOG GND [4.5]

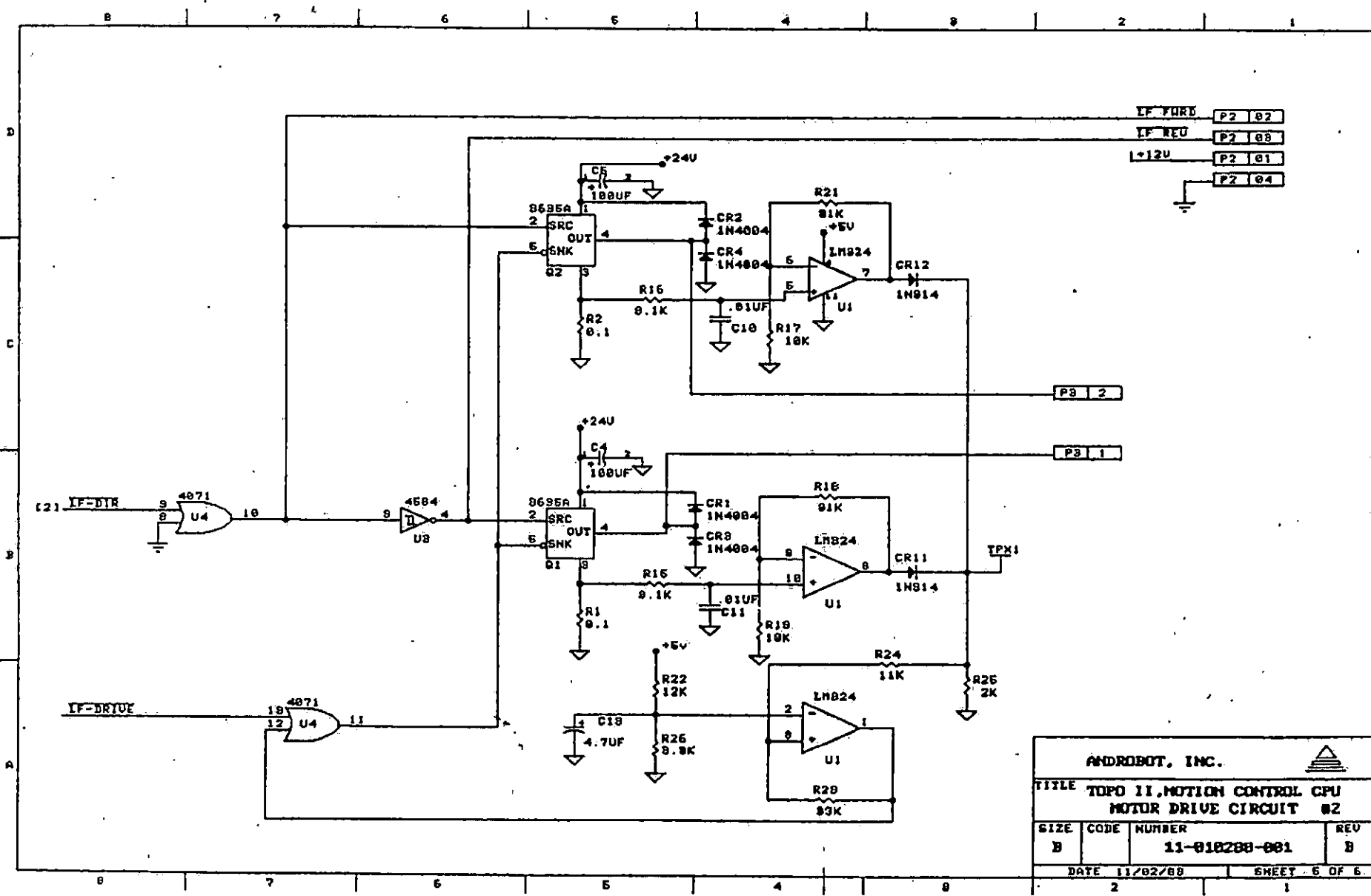
ANDROBOT, INC.



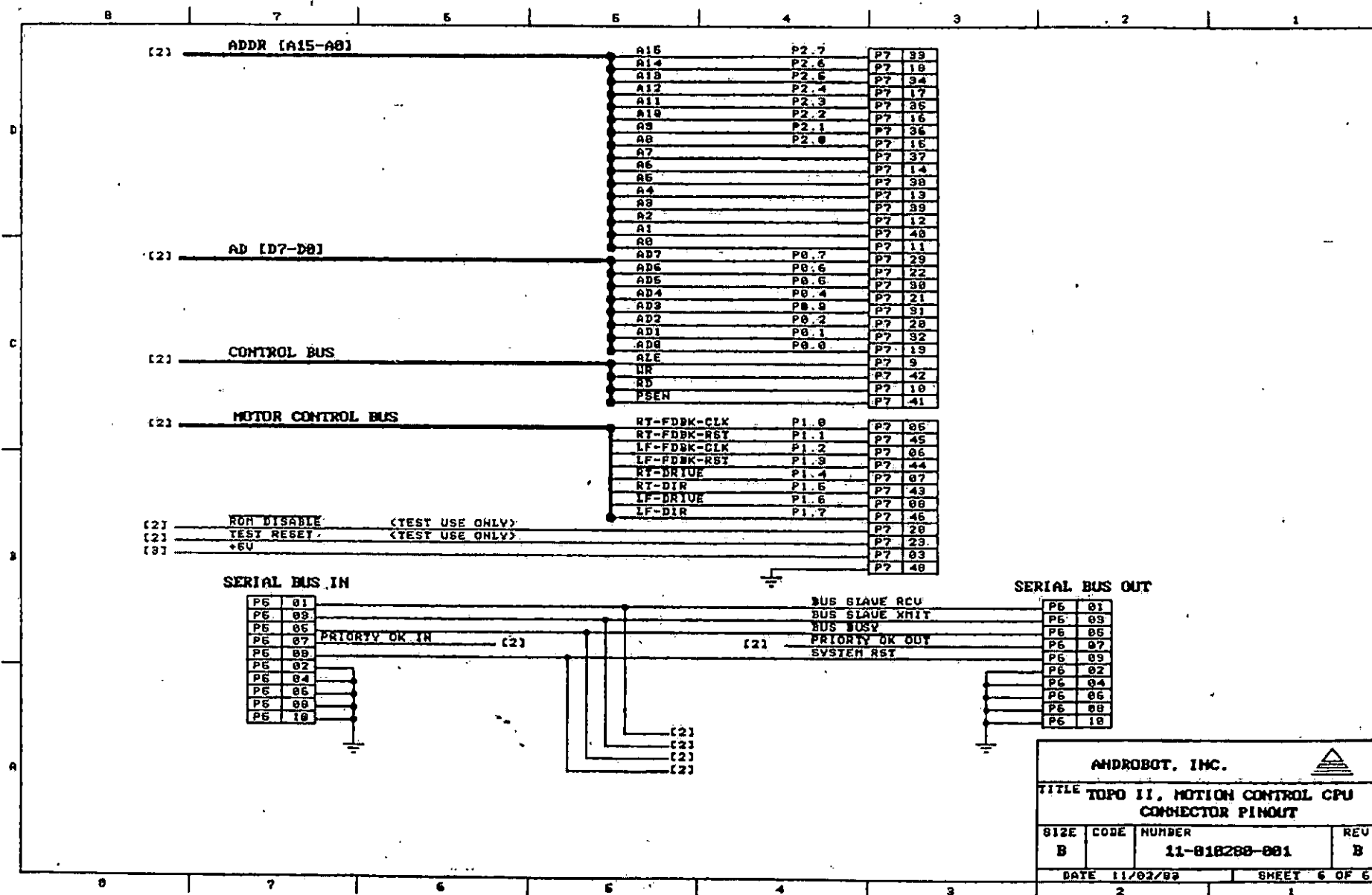
TITLE TOPO 11. MOTION CONTROL CPU
POWER SUPPLY

SIZE	CODE	NUMBER	REV
B		11-818288-001	B

DATE 11/02/88	SHEET 8 OF 6
2	1

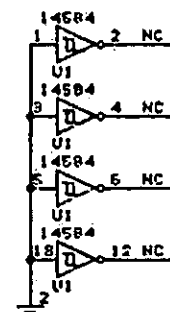
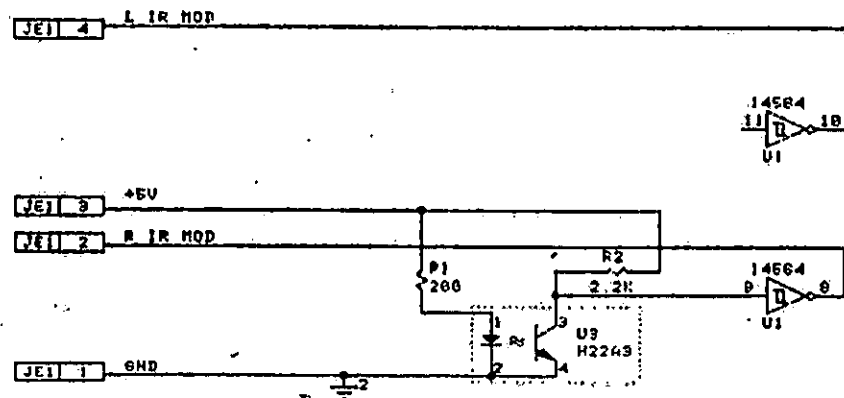


ANDROBOT, INC.			
TITLE TOPO 11, MOTION CONTROL CPU			
MOTOR DRIVE CIRCUIT #2			
SIZE	CODE	NUMBER	REV
B		11-010200-001	B
DATE 11/02/89		SHEET 6 OF 6	



REVISIONS			
LTC	DESCRIPTION	DATE	APPROB
A	PRE-PROD REL. ELO 00019		
A1	ELO 00093		

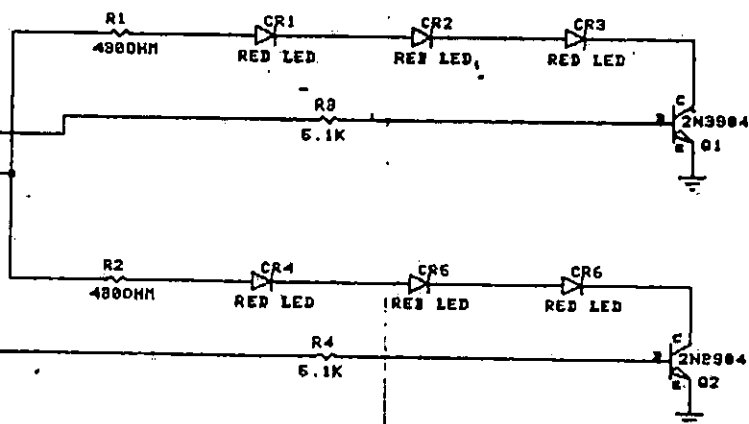
PERMISSIONS				
ZONE	LTC	DESCRIPTION	DATE	APPROB
A		PRE-PROD REL. ELO 00019	11/20/84	
A1		ELO 00093	11/20/84	



APR 03 1984

DATE	10/20/83	ANDROBOT, INC.		
BY	J. YOUNG			
APPROB				
ENGR				
CHKR				
		TITLE		
		TOPD 11		
		MOTOR ENCODER BRD.		
SIZE	B	CODE	NUMBER	REV
			11-818257-001	A1
SHEET 1 OF 1				

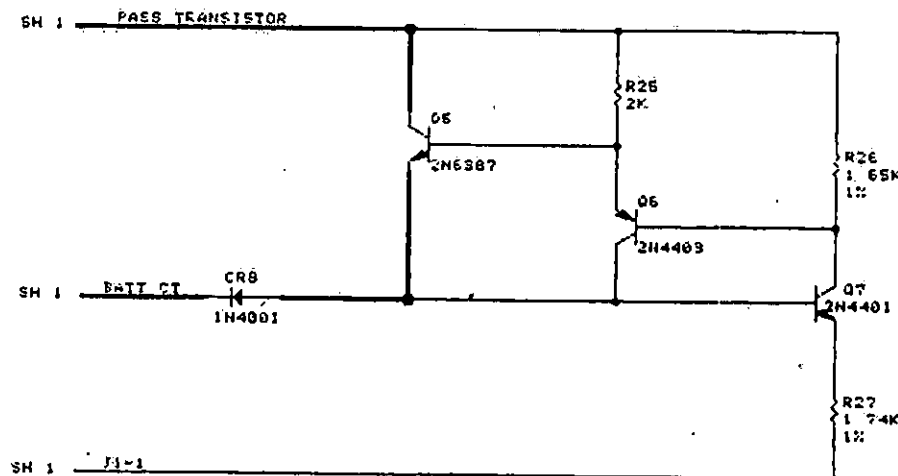
JF1	0ND
04	RIGHT LED
03	
02	LEFT LED
01	+12U



APR 03 1984

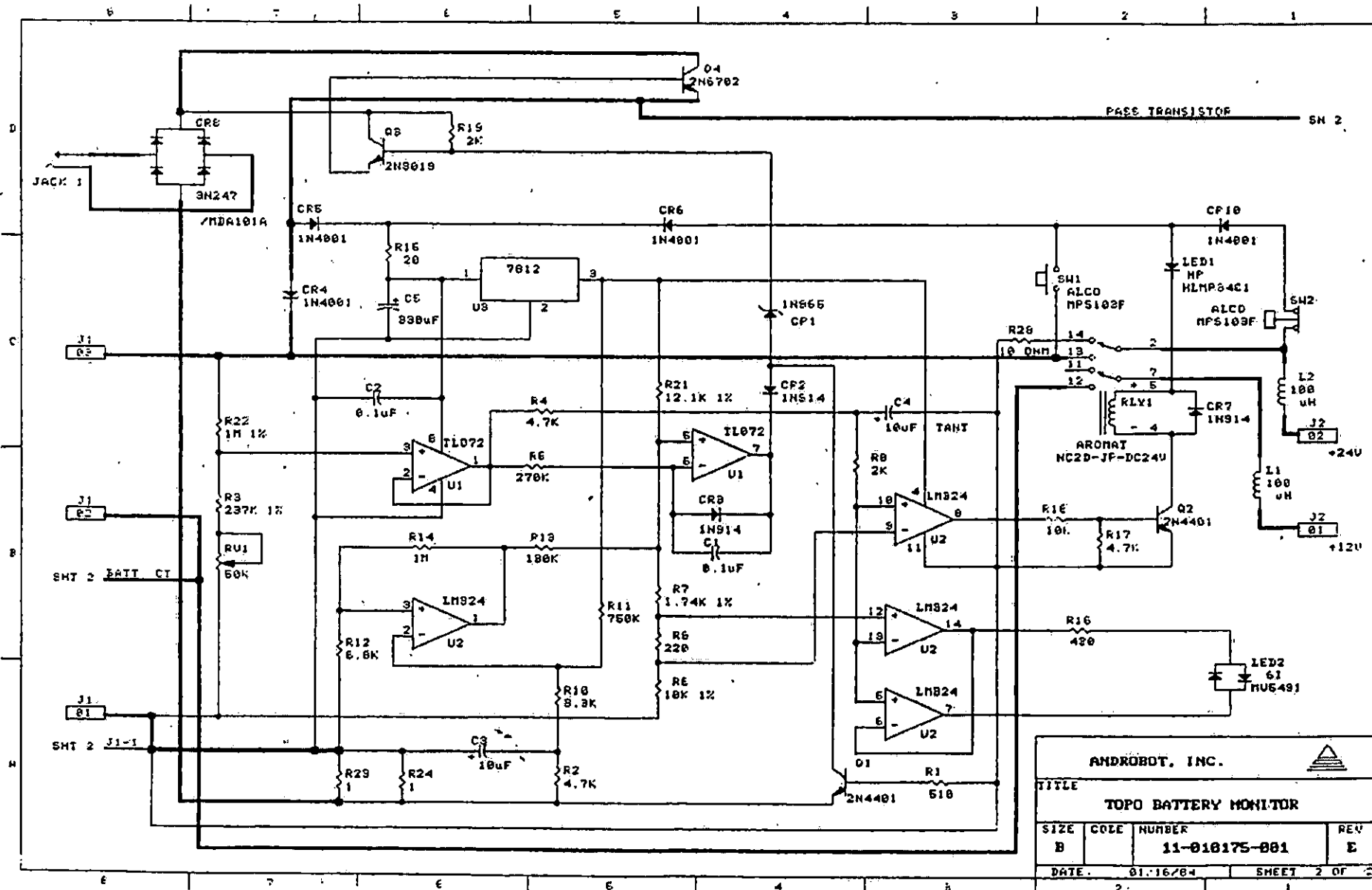
DATE	10/20/88	ANDROBOT, INC.		TITLE	TOPO II FOOTLIGHT SCHEMATIC	REV	A
BY	T. SAKAMOTO						
APUD				SIZE	CODE	NUMBER	
APUS				B		11-018249-001	
ENGR				SHEET 1 OF 1			
CHKR							

REVISION			
LTR	DESCRIPTION	DATE	APUD
A	PRE-PROD REL ECO 00021	10/21/83	L.H
B	REVISE ECO 00029	11/09/83	L.H
C	REVISE ECO 00040	11/14/83	L.H
D	REVISE ECO 00067	12/07/83	J.V
E	REVISE ECO 00085	01/16/84	J.V

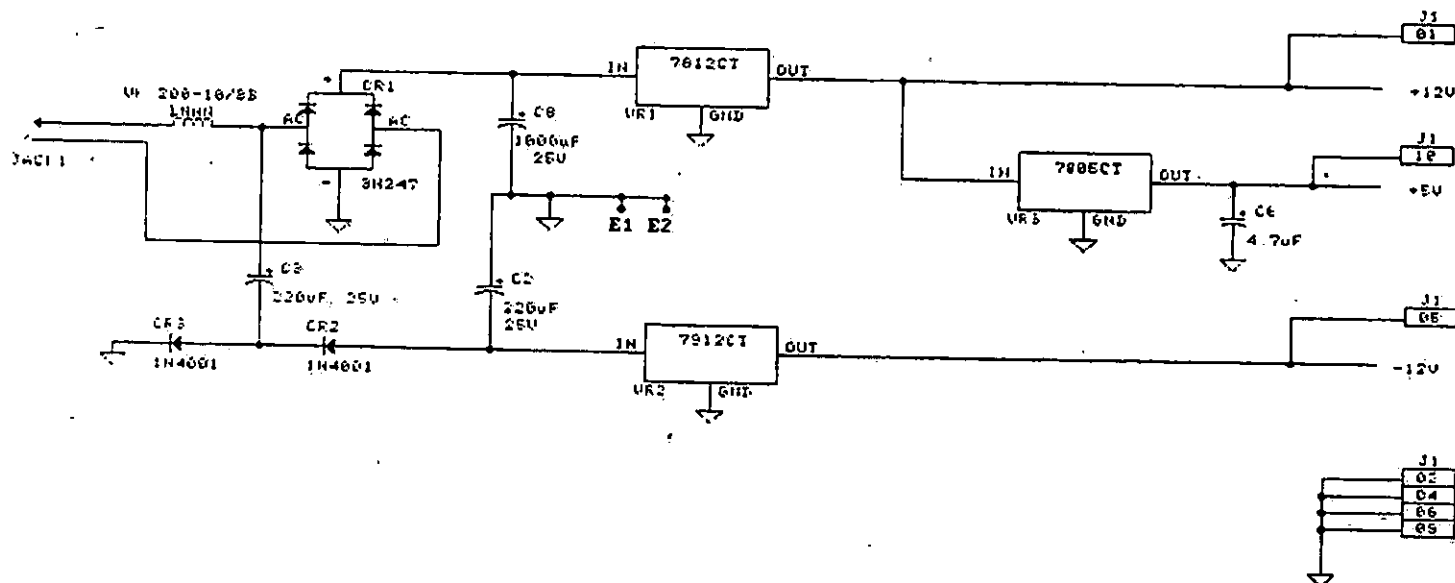


APR 10 1984

DATE	01/16/84	ANDROBOT, INC.			
DRN	J. YOUNG				
APUD		TITLE			
APUD		TOPO BATTERY MONITOR			
ENGR		SIZE	CODE	NUMBER	REV
CHKR		B		11-010175-001	E
					SHEET 1 OF 2

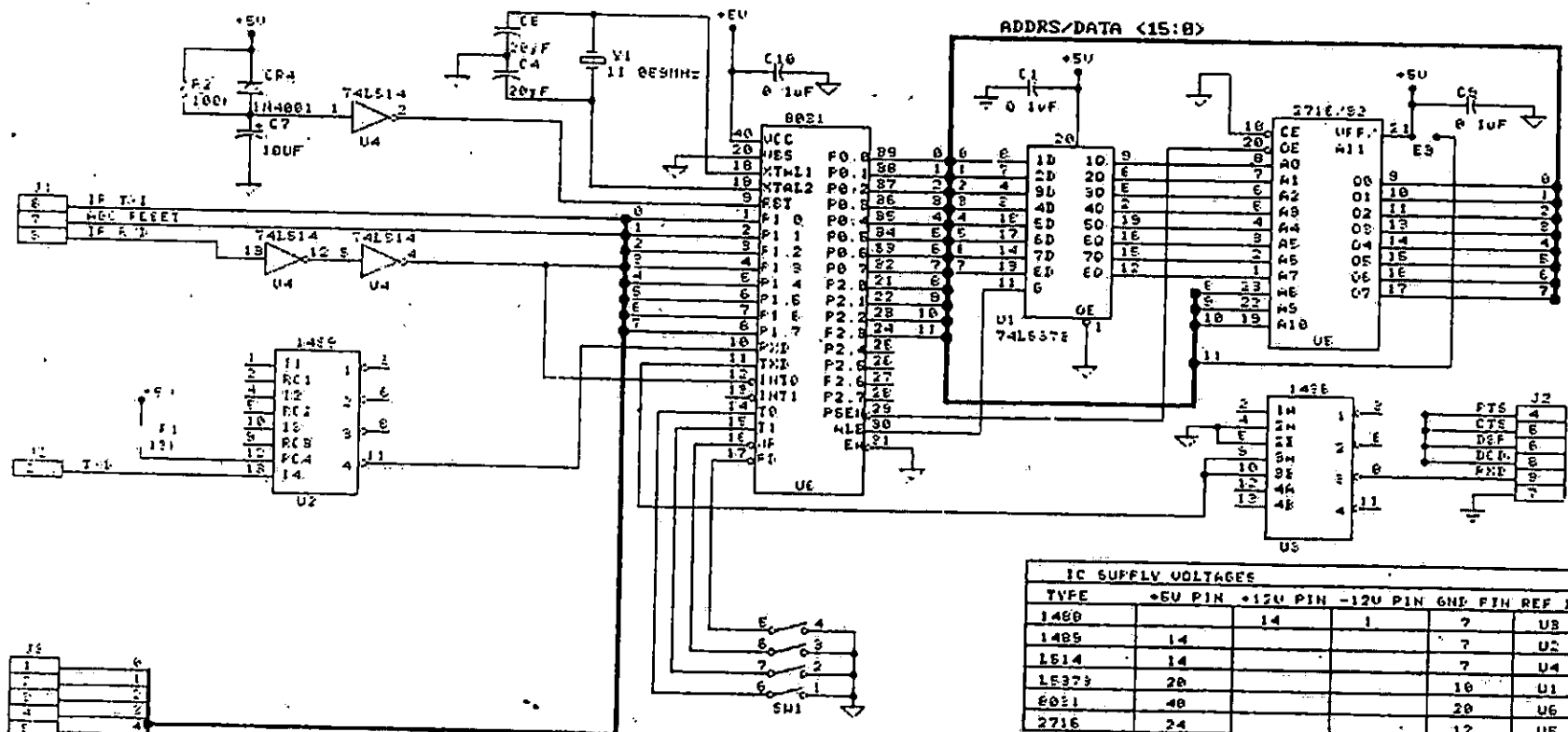


LT#	DESCRIPTION	DATE	WFFUL
A	PRE-PROD REL ECD 00020	10-26-82	LH
B	REPLACE PER ECD 00030 SMT 3 ZONE BIC	11-02-82	LH
C	RELOCATE 9 PIN CONN. ECD 00036	11-06-82	LH
D	RED SMT 2 ECD 00054	11-06-82	J YOUNG
E	REVISED PER ECD 00092	11-20-82	JY



APR 10 1984

DATE: 11-02-82	ANDROBOT, INC.			
DRN: J.Y.	TITLE			
CHR:	HOST DATA LINK DIGITAL			
J YOUNG	SIZE	CODE	NUMBER	REV.
WFFUL:	B		11-010233-001	E
DOC CONT 1 RWIDOF	DATE	11/29/83	SHEET	1 OF 2

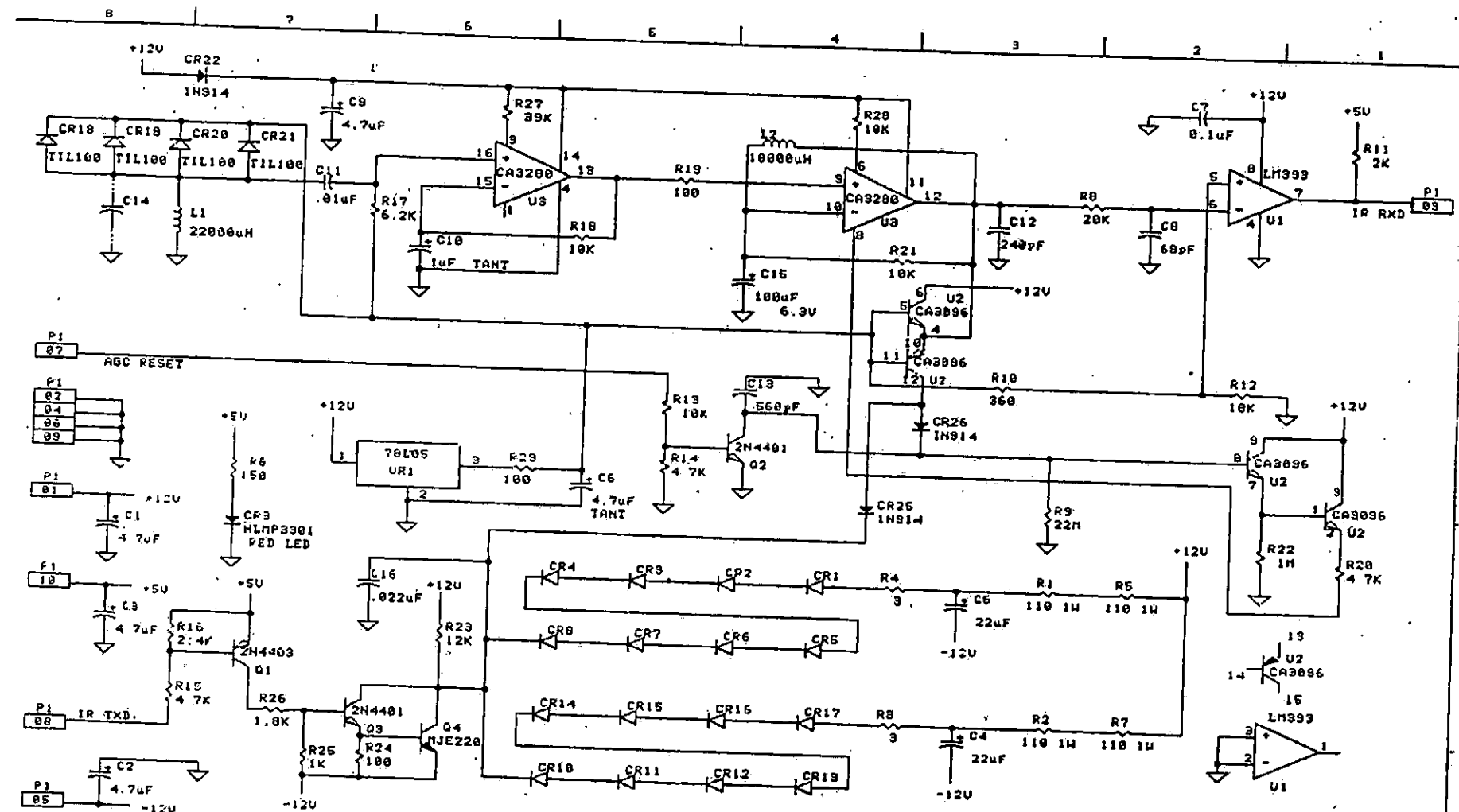


ANDROBOT, INC.

TITLE
HOST DATA LINK DIGITAL

SIZE COIL NUMBER FE
B 11-810293-881 E

DATE 11/29/83 SHEET 2 OF 2

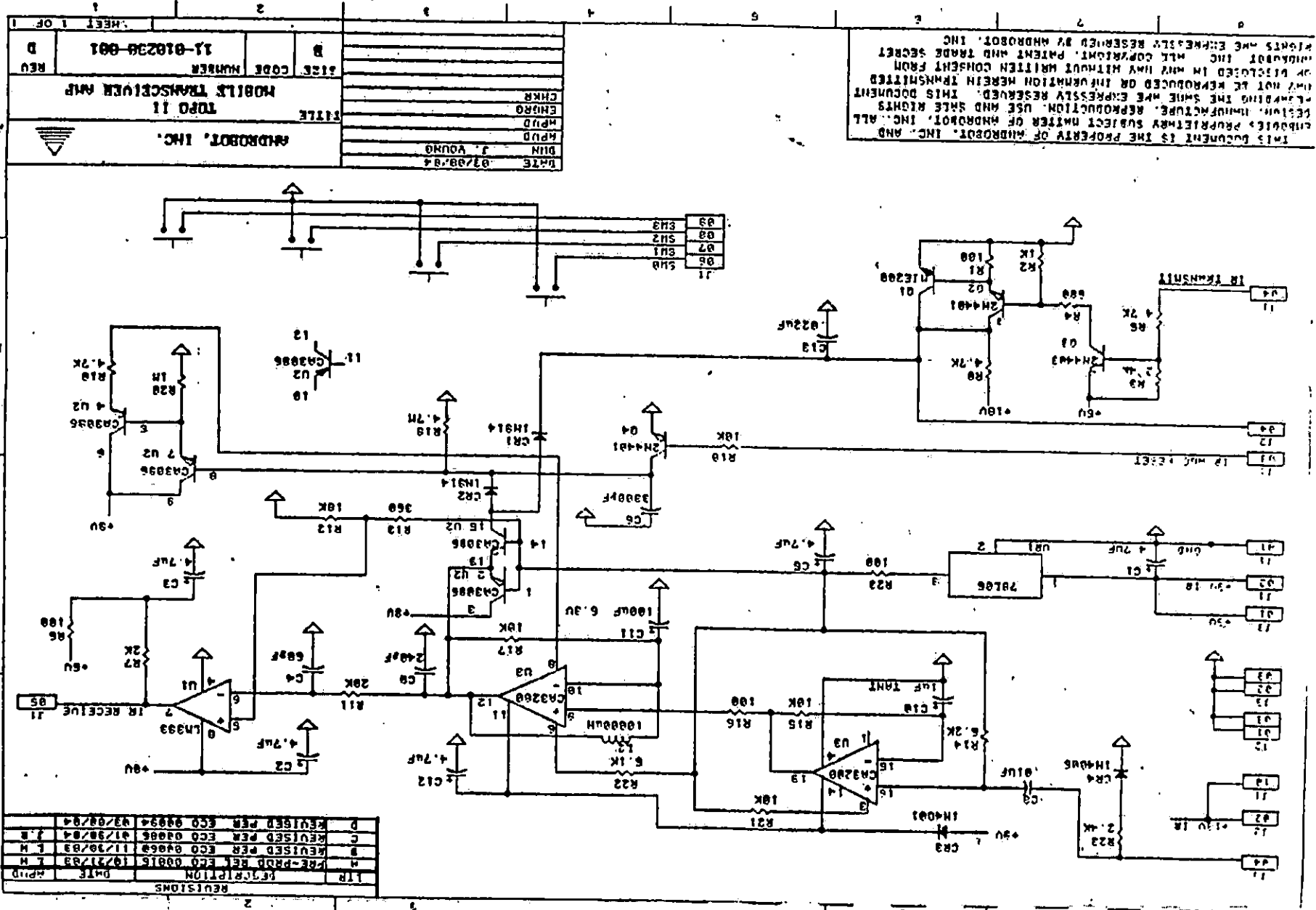


IR	DESCRIPTION	DATE	APUD
1	PER-PROD REL ECO 00000	10/26/83	L.H.
2	REVISED ECO 00007	02/15/84	PL

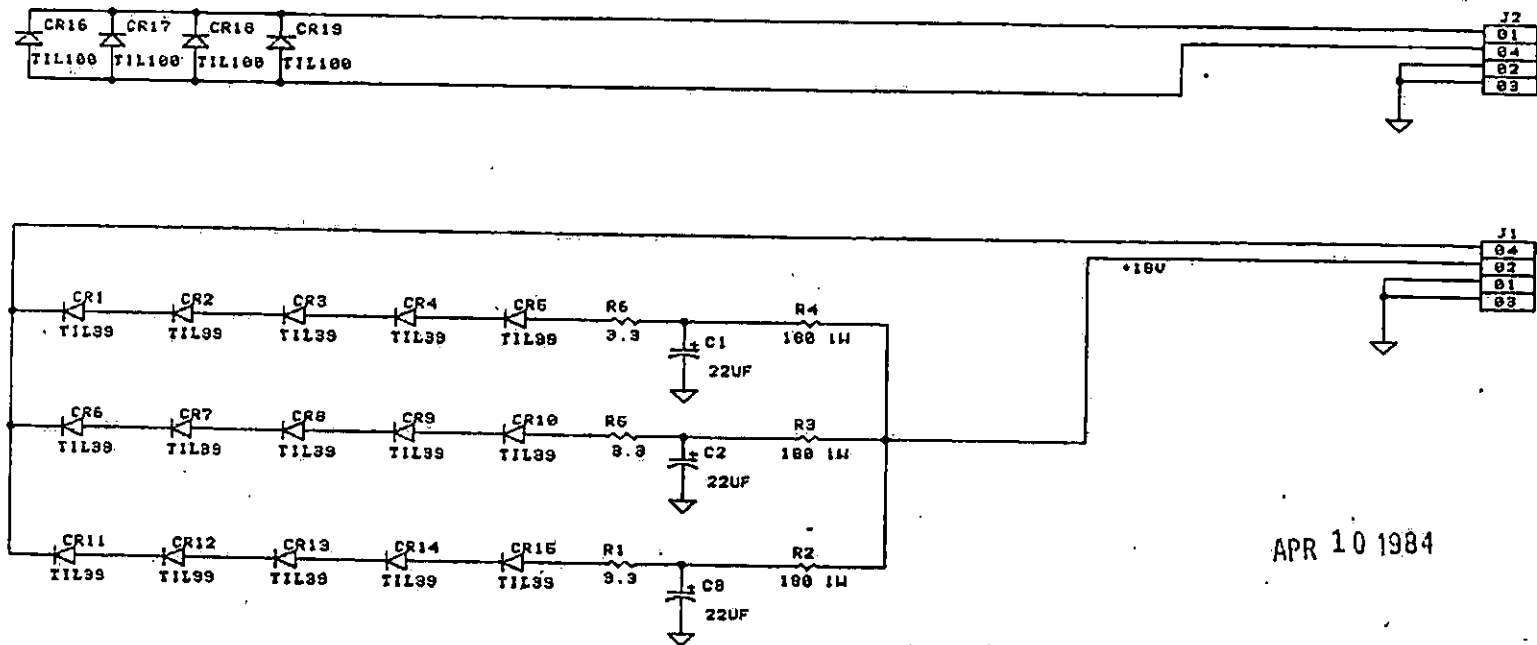
APR 10 1984

ANDROBOT, INC.			
TITLE			
HOST DATA LINK ANALOG			
SIZE	CODE	NUMBER	REV
B		11-010590-001	A.1
DATE		SHEET 1 OF 1	
02/15/84		2	

24



REVISIONS			
LTR	DESCRIPTION	DATE	APUD
A	PRE-PROD REL ECO 00015	10/21/83	L.H.
B	REVISIE ECO 00000	01/17/84	
C	ECO 00001	1/20/84	JZ



APR 10 1984

DATE	01/30/84	ANDROBOT, INC.		
DNW	J. YOUNG			
APUD		TITLE		
APUD				
ENGRS		MOBILE TRANCEIVER SENSOR		
CHKR				
		SIZE	CODE	NUMBER
		B		11-010369-001
				REV C
				SHEET 1 OF

96

DATE: 10/14/83		SHEET 1 OF 1	
REV	SIZE	CODE NUMBER	TITLE
A	B	11-818369-001	MOBILE TRANSDUCER SENSOR
ANDROBOT, INC.			

