

PROPRIETARY INFORMATION

SEP 0

CPU BUFFERS
RESET LOGIC

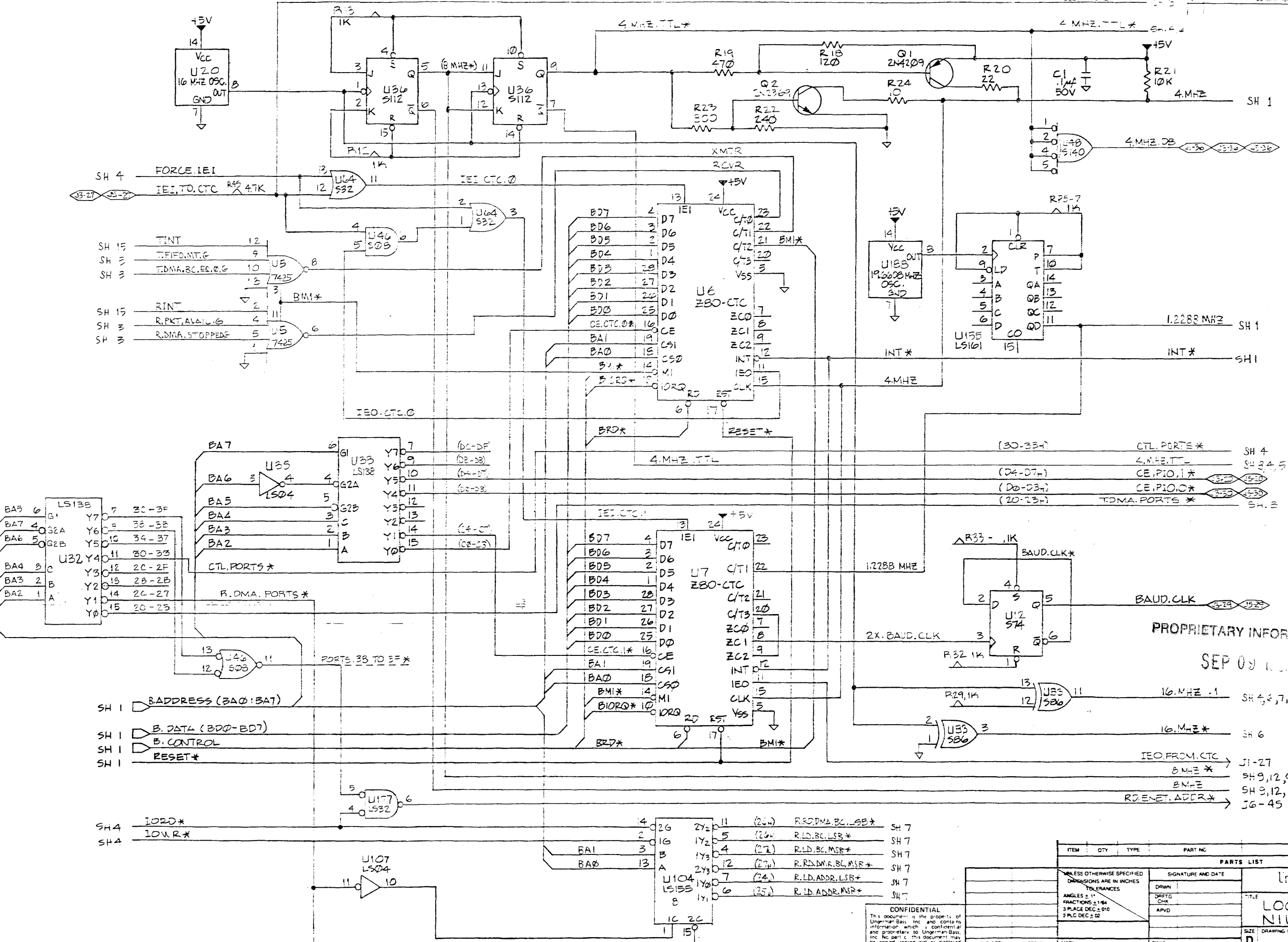
ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLES ± 1°			DRWN <i>JSA, 10-4-82</i>		
FRACTIONS ± 1/64			DRAFT		
3 PLACE DEC ± 0.01			APVD		
2 PLACE DEC ± 0.2			TITLE		
SIZE			DRAWING NO		
D			20013		
SCALE			SHEET 1 OF 15		

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LCN
NEXT ASSY USED ON
APPLICATION

Ungermann-Bass, Inc.
**LOGIC DIAGRAM
NIU-50**

ISSUE
A



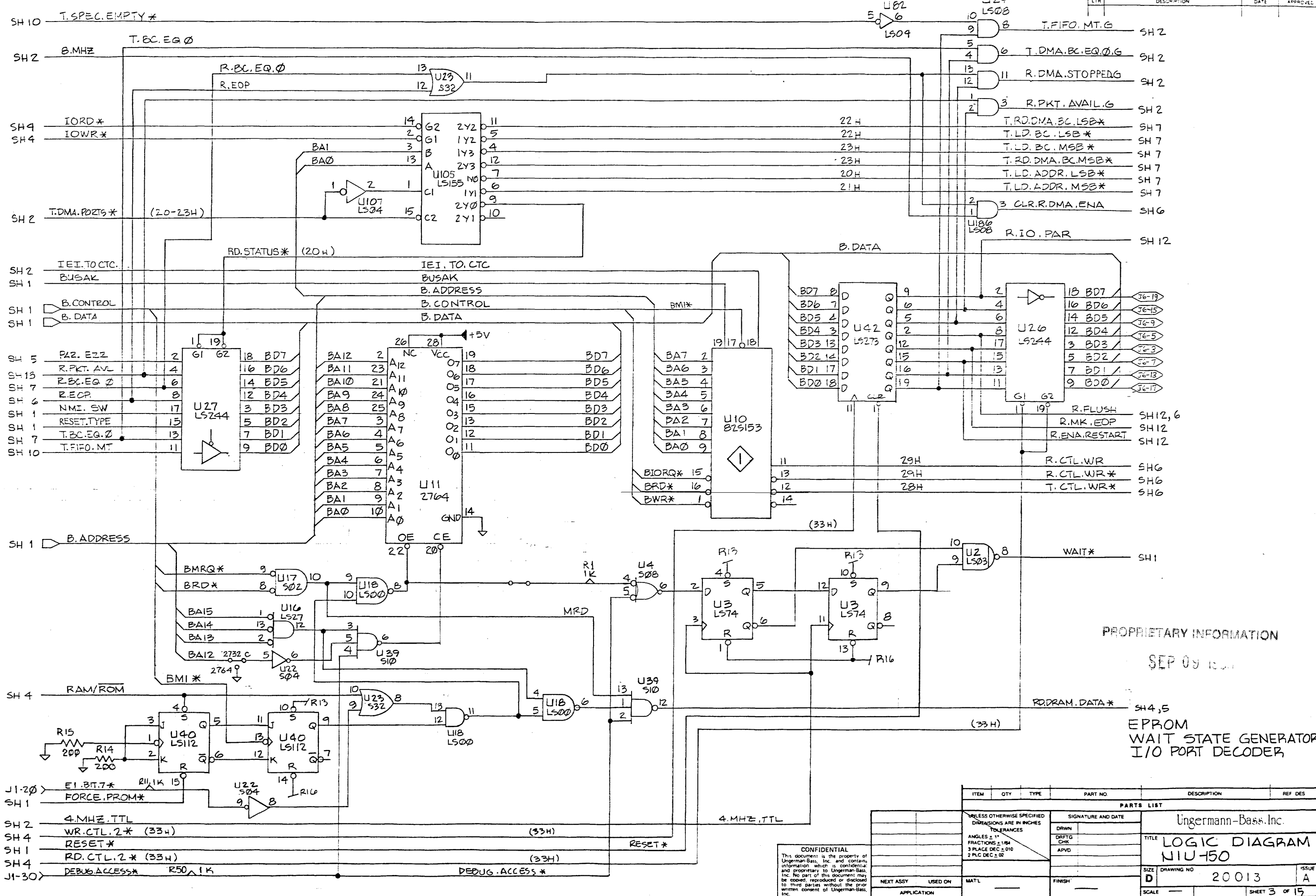
PROPRIETARY INFORMATION

SEP 09 1981

- SH 1 ADDRESS (BA0:BA7)
- SH 1 B. DATA (BD0-BD7)
- SH 1 B. CONTROL
- SH 1 RESET*
- SH 2 R.DMA PORTS*
- SH 3 T.DMA PORTS*
- SH 4 CTL. PORTS*
- SH 4, 5 4 MHz. TTL
- SH 5 (20-23) T.DMA PORTS*
- SH 5 (24-27) CE, PIO, I*
- SH 5 (30-33) CTL. PORTS*
- SH 6 16 MHz *
- SH 6 2x BAUD. CLK
- SH 7 R.DMA BC, LSB*
- SH 7 R.LD, BC, LSB*
- SH 7 R.LD, BC, MSB*
- SH 7 R.RD, DMA, BC, MSB*
- SH 7 R.LD, ADDR, LSB*
- SH 7 R.LD, ADDR, MSB*
- SH 8 IEO FROM CTC
- SH 8 8 MHz *
- SH 8 BMI *
- SH 9, 12, 4, 6, 15 BAUD RATE GEN
- SH 9, 12, 15 CLK GEN.
- SH 10 IEI TO CTC
- SH 10 8 MHz *
- SH 10 IEI TO CTC
- SH 10 4.7K
- SH 11 BAUD. CLK*
- SH 11 16 MHz .1
- SH 11 16 MHz *
- SH 11 IEI TO CTC
- SH 11 4.7K
- SH 11 IEI TO CTC
- SH 11 4.7K
- SH 11 IEI TO CTC
- SH 11 4.7K

ITEM	QTY	TYPE	PART NO.	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED			SIGNATURE AND DATE		
DIMENSIONS ARE IN INCHES			DRAWN _____		
TOLERANCES			CHECKED _____		
ANGLES ± 1°			APPROVED _____		
FRACTIONS 1/64			TITLE		
3 PLACE DEC. 0.00			LOGIC DIAGRAM		
2 PLACE DEC. 0.02			NIU-150		
NEXT ASSY	USED ON	MATL	FINISH	SIZE	ISSU
APPLICATION				D	A
				2001E	1
				SCALE	SHEET 2 OF 15

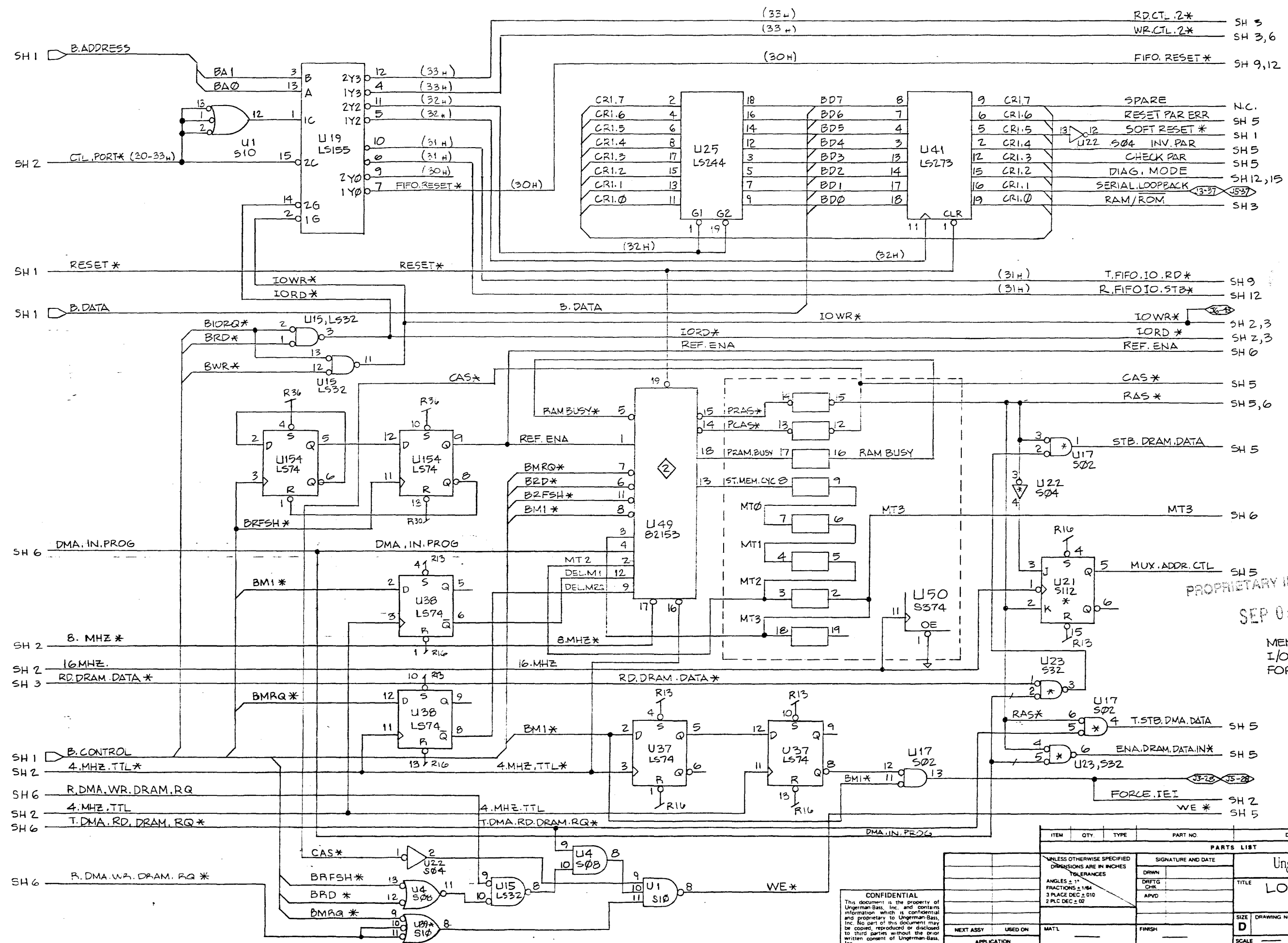
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PROPRIETARY INFORMATION
SEP 09 1981

ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			Ungermann-Bass, Inc.		
ANGLES ± 1°					
FRACTIONS 2/64					
3 PLACE DEC ± 0.10					
2 PLACE DEC ± 0.2			TITLE LOGIC DIAGRAM NIU-150		
NEXT ASSY USED ON		MATERIAL		FINISH	ISSUE
APPLICATION		SCALE		DRAWING NO 20013	
					SHEET 3 OF 15

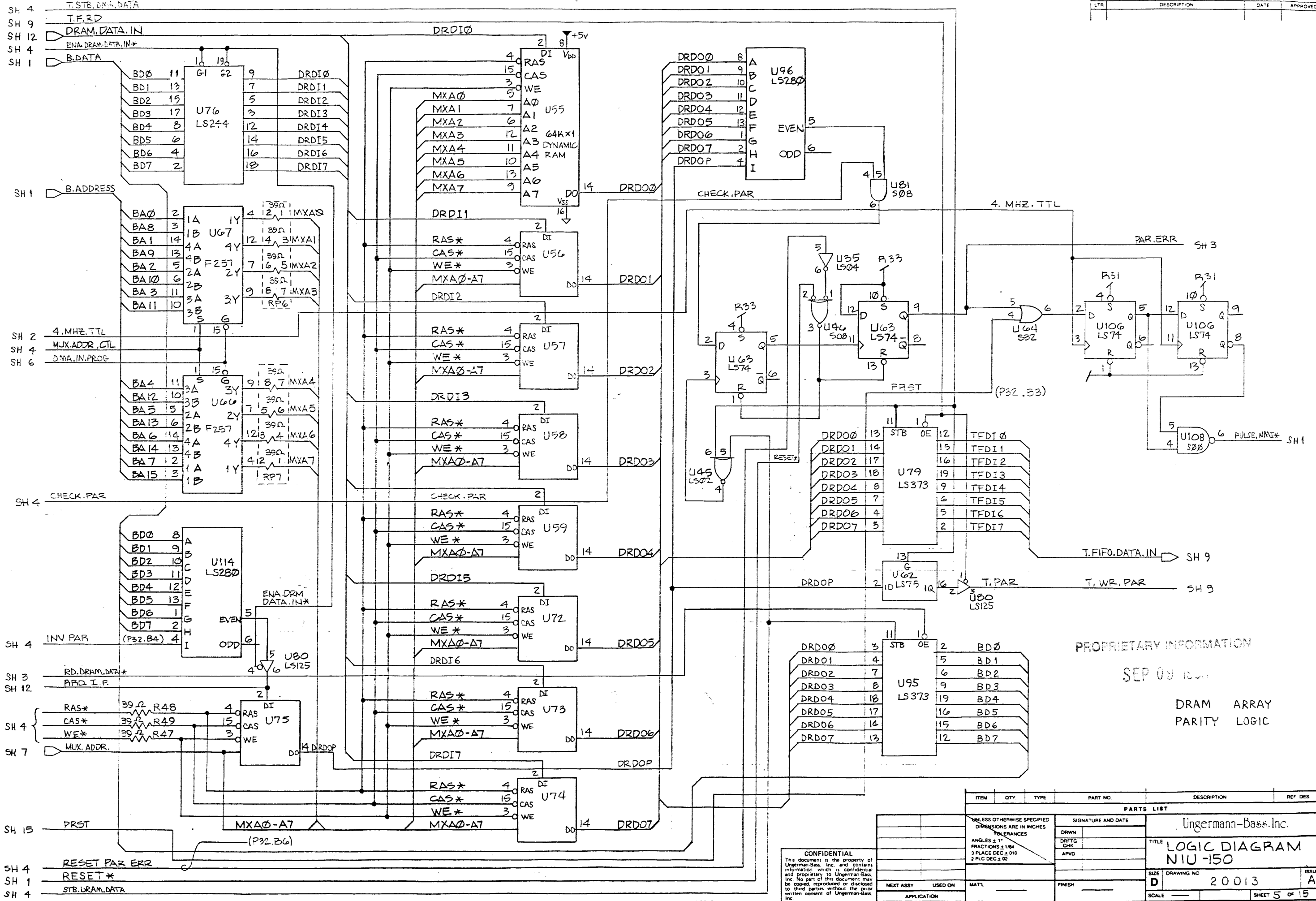
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PROPRIETARY INFORMATION
 SEP 09 1980
 MEMORY TIMING LOGIC
 I/O PORT DECODERS
 FORCE, IEI GENERATION

ITEM	QTY	TYPE	PART NO.	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			SIGNATURE AND DATE		
TOLERANCES			DRAWN		
ANGLES ± 1°			DRFTG CHK		
FRACTIONS ± 1/64			APVD		
3 PLACE DEC ± 0.01			FINISH		
2 PLACE DEC ± 0.02			SCALE		
CONFIDENTIAL			Ungermaun-Bass, Inc.		
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NEXT ASSY	USED ON	MATL	FINISH	SIZE	ISSUE
APPLICATION				D	A
				20013	2
					SHEET 4 OF 15

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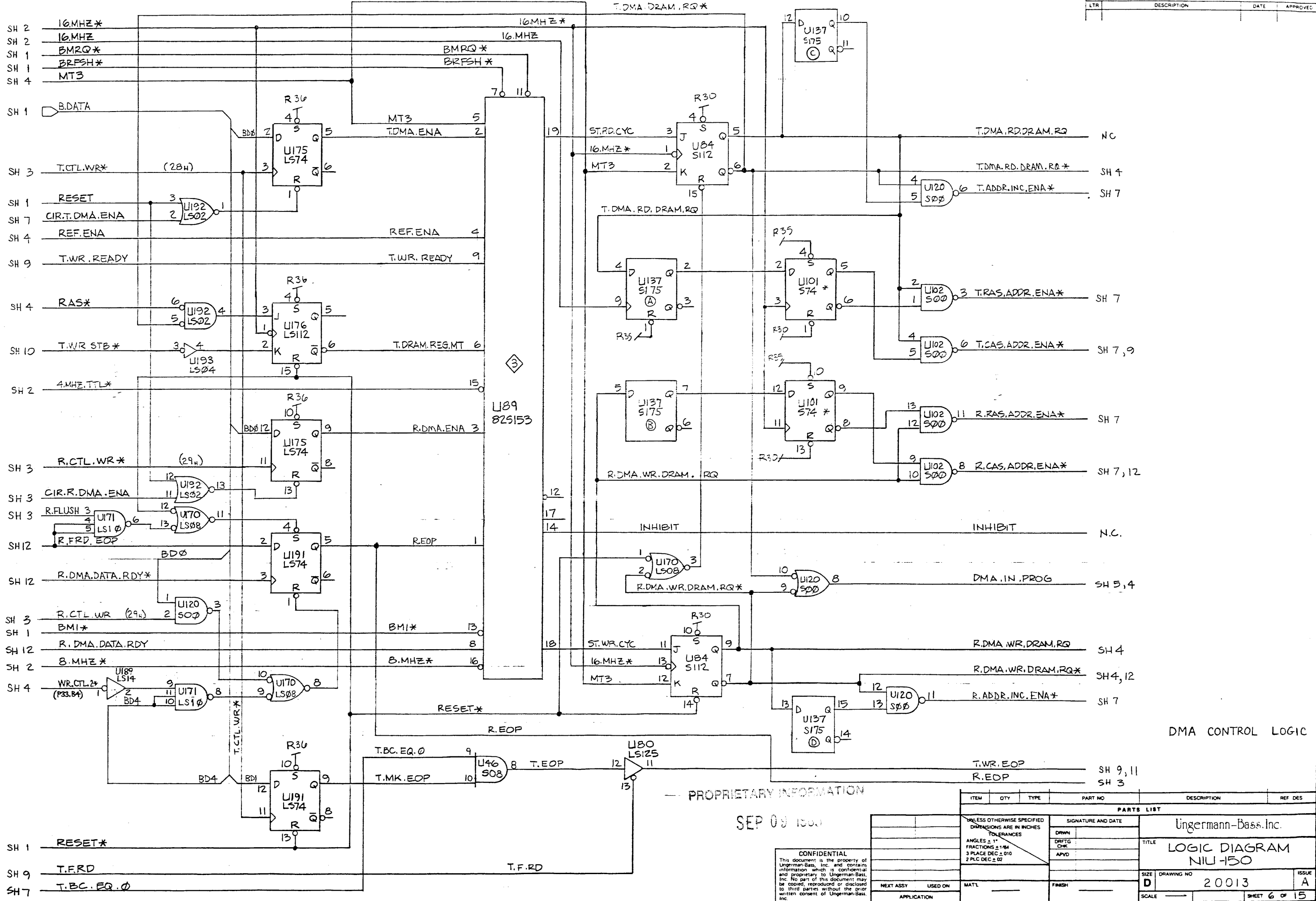
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DRAM ARRAY
PARITY LOGIC

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ITEM	QTY	TYPE	PART NO.	DESCRIPTION	REF DES
PARTS LIST					
			SIGNATURE AND DATE		
			Ungermann-Bass, Inc.		
			TITLE		
			LOGIC DIAGRAM		
			NIU-150		
			SIZE		
			D		
			DRAWING NO		
			20013		
			ISSUE		
			A		
			SCALE		
			SHEET 5 OF 15		



DMA CONTROL LOGIC

PROPRIETARY INFORMATION

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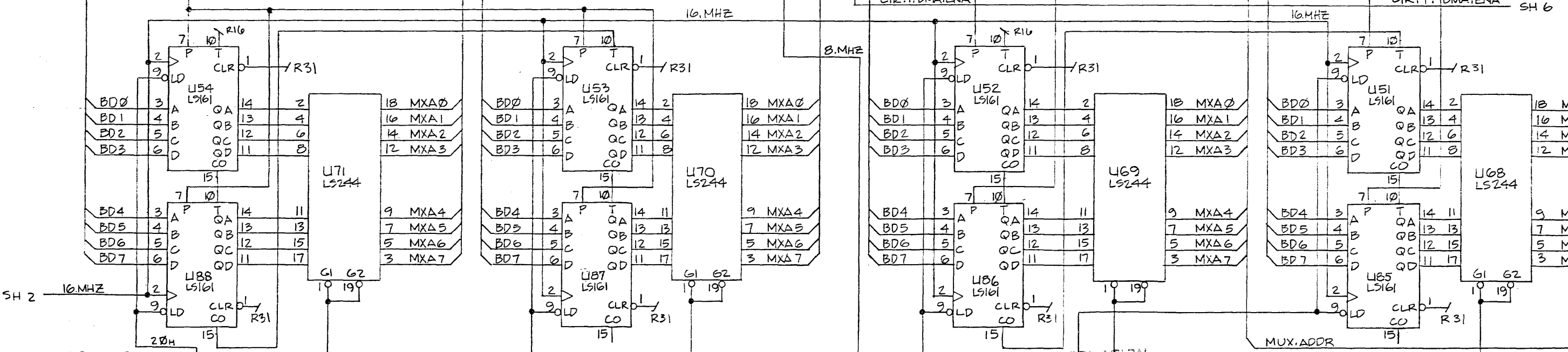
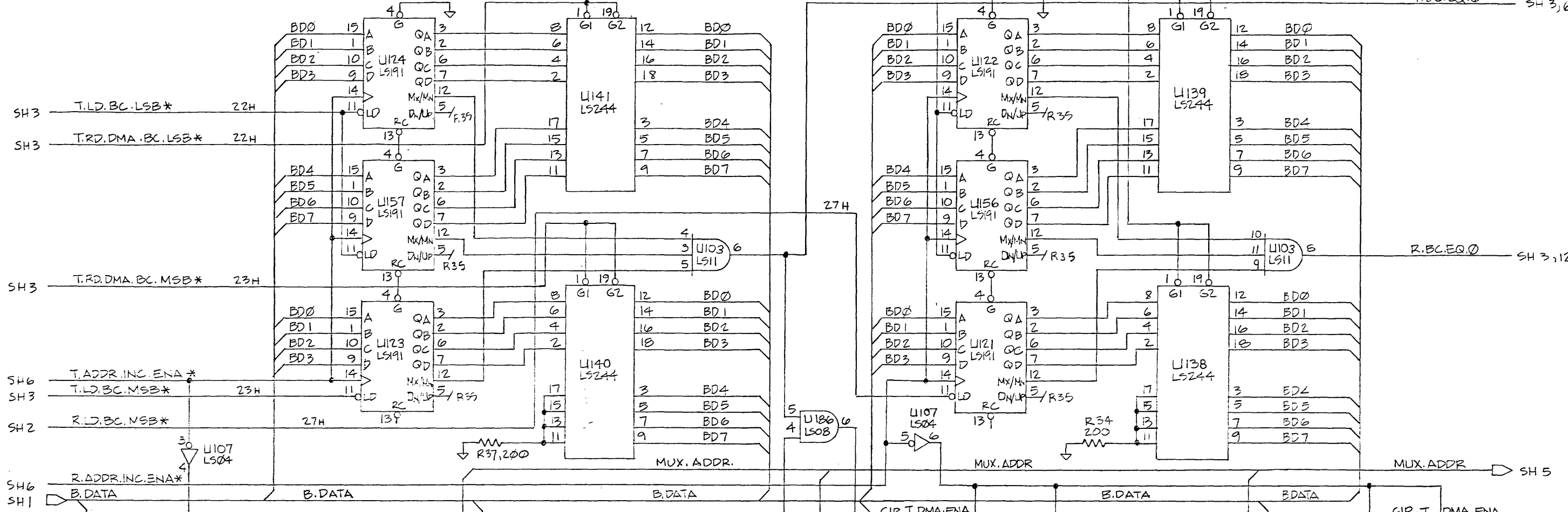
ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLES ± 1°			DRWN		
FRACTIONS ± 1/64			CHK		
3 PLACE DEC ± 0.10			APVD		
2 PLC DEC ± 0.2			DATE		
TITLE			Ungermann-Bass, Inc.		
SIZE			DRAWING NO		
D			20013		
SCALE			ISSUE		
			A		
APPLICATION			SHEET 6 OF 15		

SH2 R.FD.DMA.BC.LSB* 20H
 SH2 R.FD.DMA.BC.MSB* 27H
 SH2 R.LD.BC.LSB* 26H

20H
 27H
 26H

DESCRIPTION DATE APPROVED

T.BC.EQ 0 SH 3,6



SH6 T.RAS.ADDR.ENA*
 SH6 T.CAS.ADDR.ENA*
 SH6 R.RAS.ADDR.ENA*
 SH6 R.CAS.ADDR.ENA*
 SH3 T.LD.ADDR.LSB*
 SH3 T.LD.ADDR.MSB* 21H
 SH2 R.LD.ADDR.LSB* 24H
 SH2 R.LD.ADDR.MSB* 25H
 SH2 8.MHZ

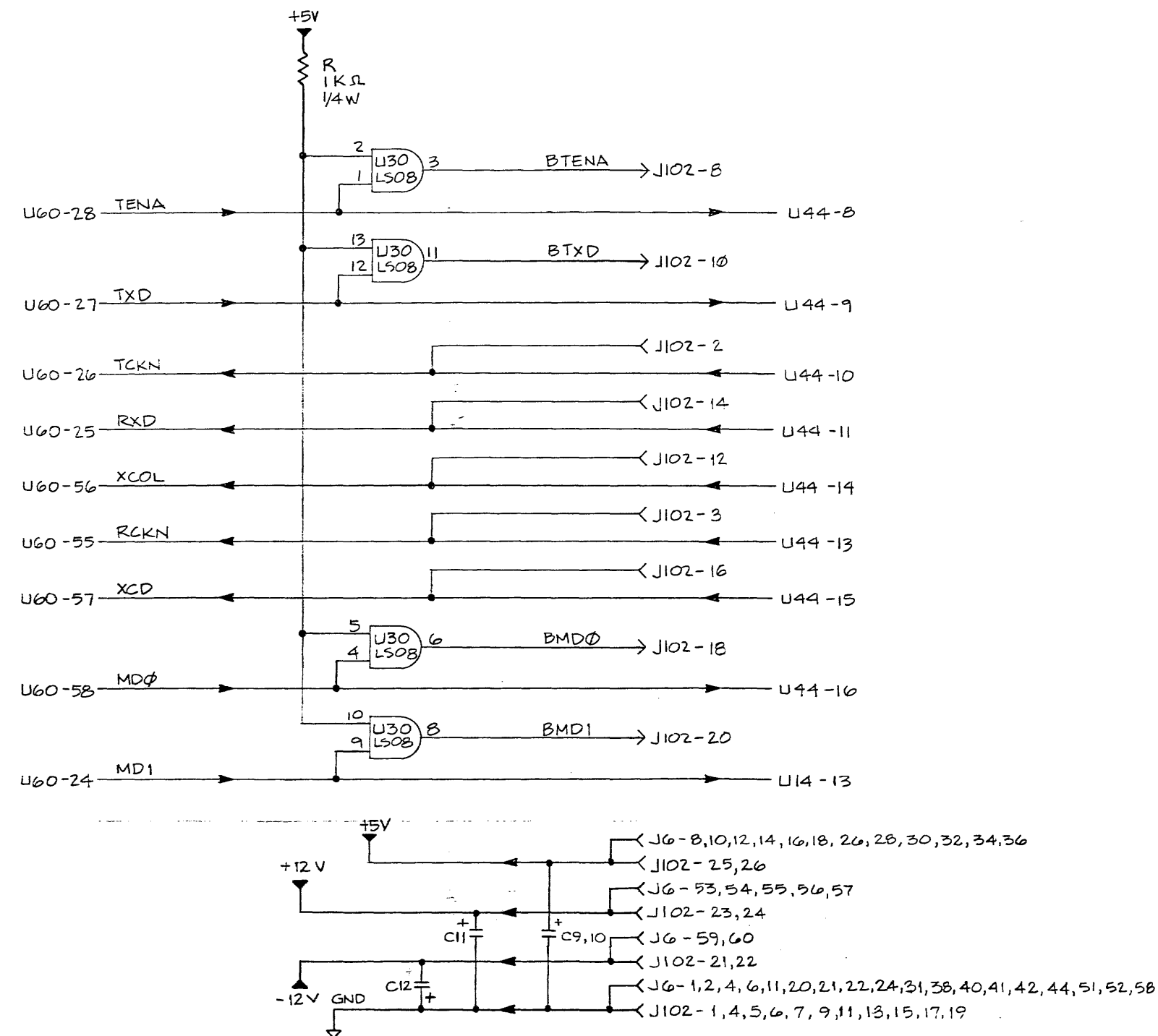
R.RAS.ADDR.ENA*
 R.CAS.ADDR.ENA*
 R.LD.ADDR.LSB*
 R.LD.ADDR.MSB*
 8.MHZ

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ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			SIGNATURE AND DATE		
TOLERANCES			DRWN		
ANGLES ± 1°			DFTG		
FRACTIONS 2/16			APVD		
3 PLACE DEC ± 0.01			FINISH		
2 PLC DEC ± 0.02			TITLE		
			Ungermann-Bass, Inc.		
			LOGIC DIAGRAM		
			NIU-150		
			SIZE DRAWING NO		
			20013		
			ISSUE		
			A		
			SCALE		
			SHEET 7 OF 15		

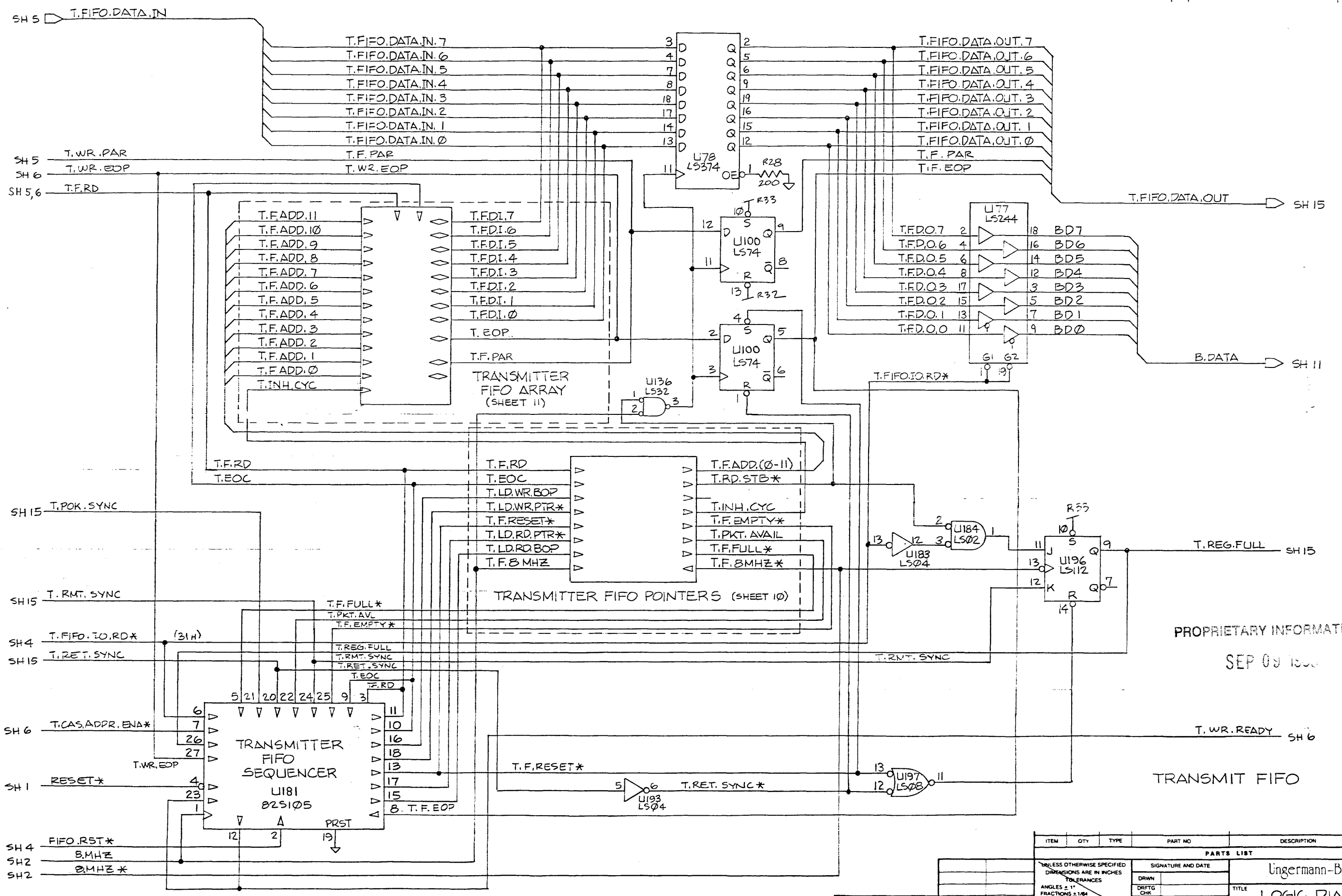


BROADBAND INTERFACE

PROPRIETARY INFORMATION
SEP 08 1966

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ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLES ± 1°			DRAWN <i>bad.012083</i>		
FRACTIONS ± 1/64			DRAFT		
3 PLACE DEC ± 0.01			APVD		
2 PLACE DEC ± 0.02			TITLE		
			Ungermann-Bass, Inc.		
			LOGIC DIAGRAM		
			NIU-150		
			SIZE		ISSUE
			D		A
			DRAWING NO		
			20013		
			SCALE		SHEET 8 OF 15

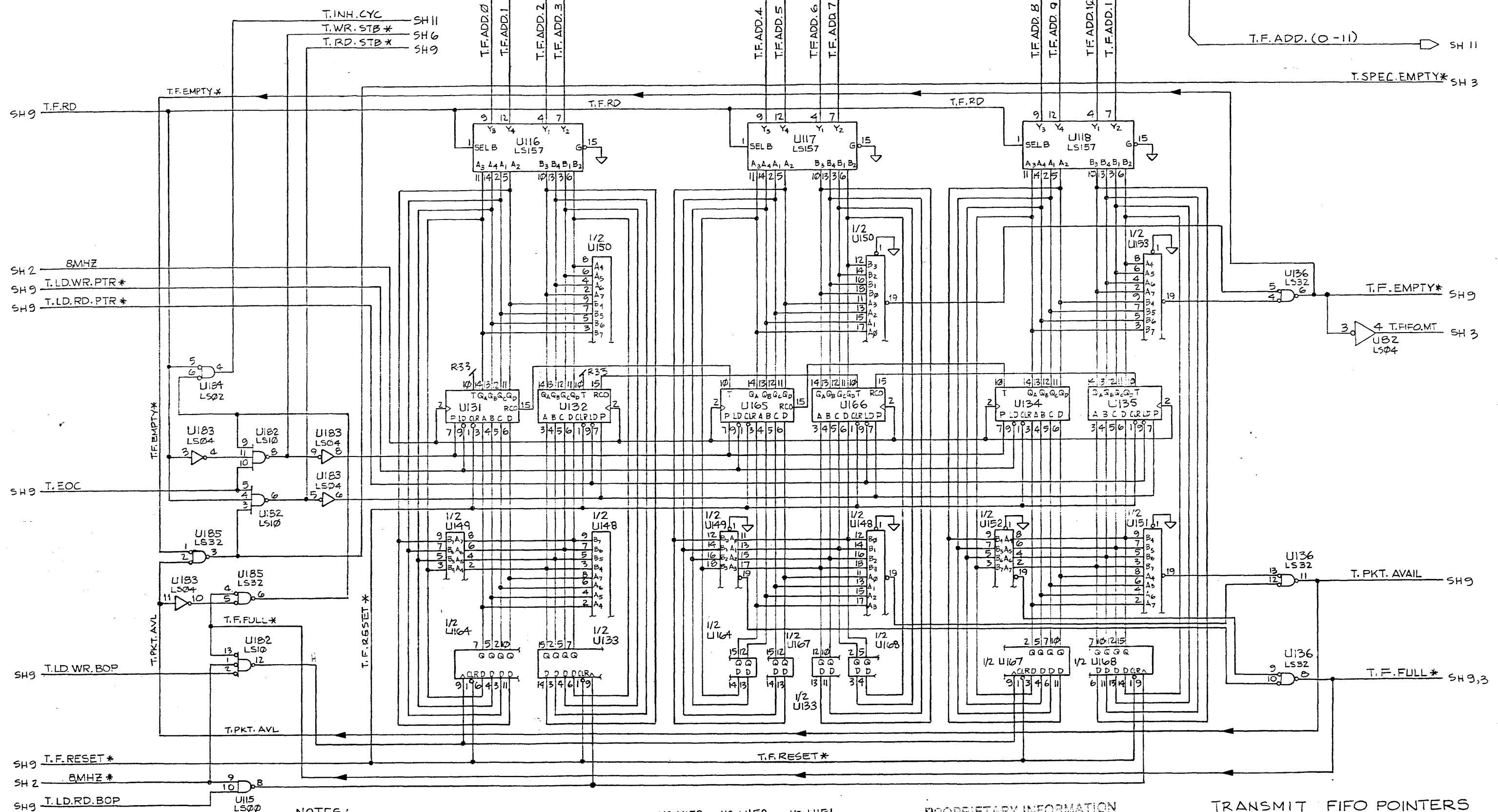


PROPRIETARY INFORMATION
SEP 09 1988

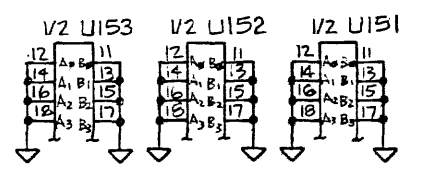
T.WR.READY SH 6
TRANSMIT FIFO

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ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			SIGNATURE AND DATE		
TOLERANCES			DRWN		
ANGLES ± 1°			DRFTG		
FRACTIONS ± 1/64			CHK		
3 PLACE DEC ± 0.02			APVD		
2 PLACE DEC ± 0.02			TITLE		
			Ungermann-Bass, Inc.		
			LOGIC DIAGRAM		
			NIU-150		
SIZE		DRAWING NO		ISSUE	
D		20013		A	
SCALE		SHEET 9 OF 15			



- NOTES:
- U131, U132, U134, U135, U165, U166 ARE 74LS161
 - U149, U149, U150, U151, U152, U153 ARE 29LS2521
 - U133, U164, U167, U168 ARE 74LS174



PROPRIETARY INFORMATION

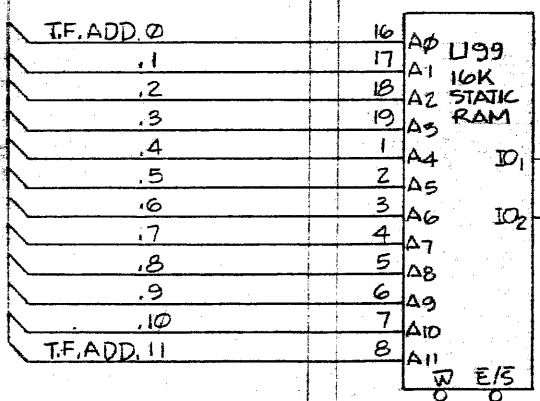
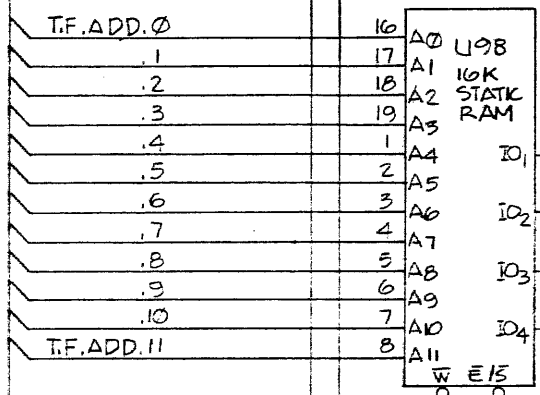
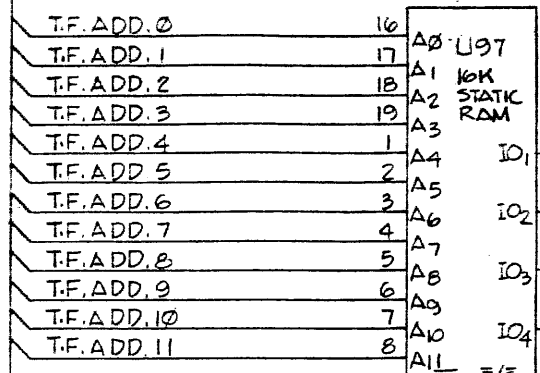
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ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ANGLES ± 1° FRACTIONS ± 1/64 3 PLACE DEC ± 0.10 2 PLACE DEC ± 0.02			SIGNATURE AND DATE		
NEXT ASSY			USED ON		
APPLICATION			MATERIAL		
FINISH			SCALE		
Ungermann-Bass, Inc.				TITLE	
LOGIC DIAGRAM				NIU-150	
D				DRAWING NO	
20013				ISSUE	
SCALE				SHEET 10 OF 15	

TRANSMIT FIFO POINTERS

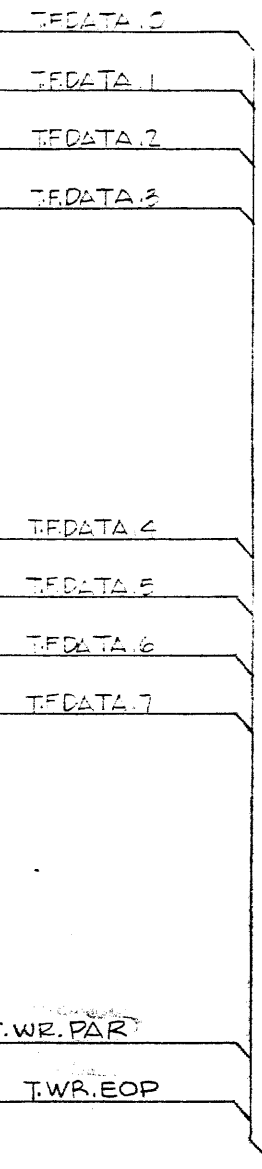
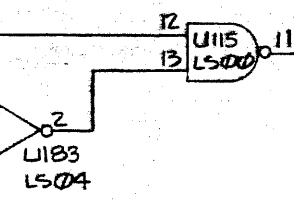
SH10 T.FIFO.ADD.(0-11)



SH9 T.F.RD

SH9 T.EOC

SH10 T.INH.CYC

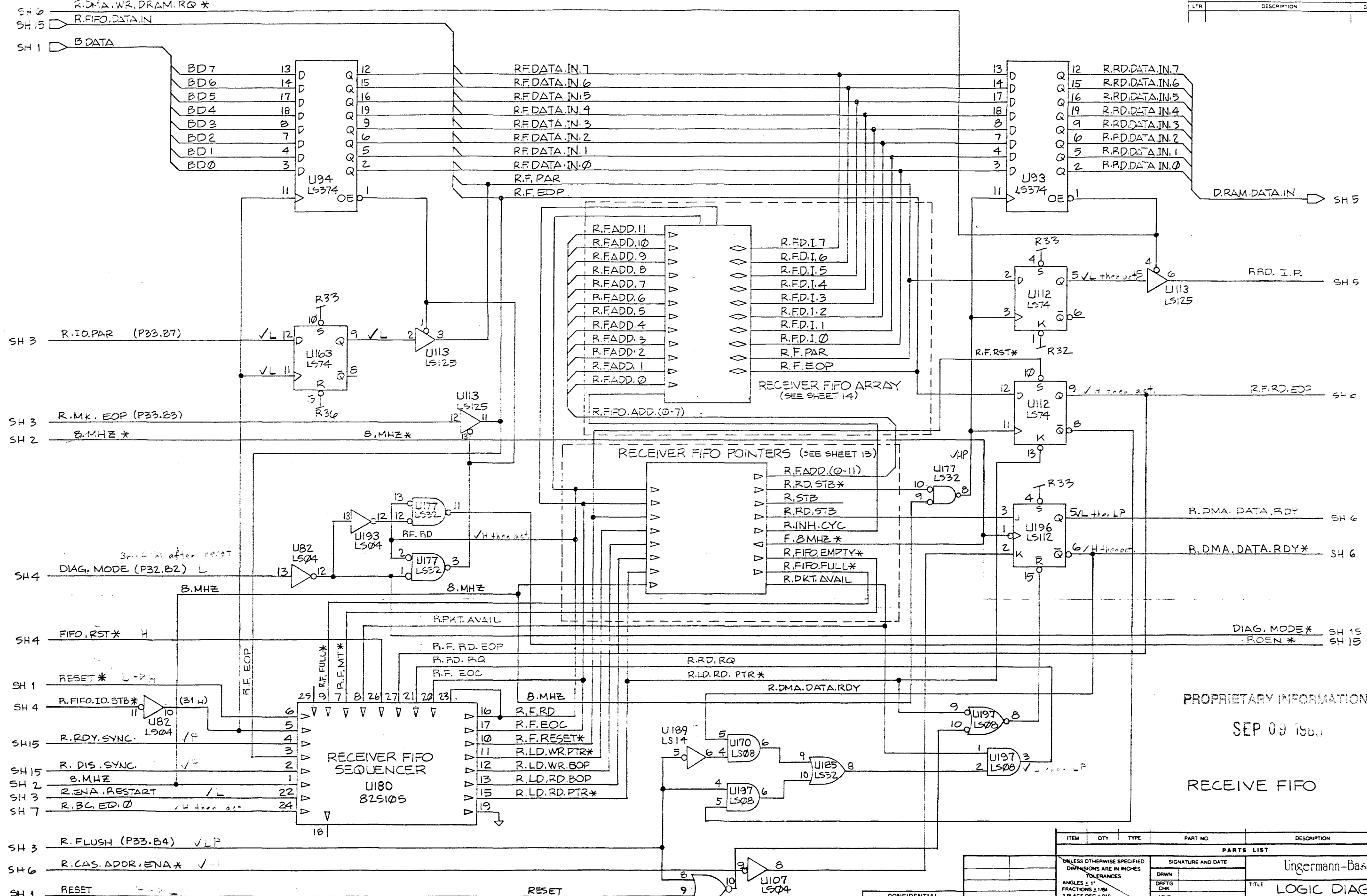


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TRANSMIT FIFO RAM

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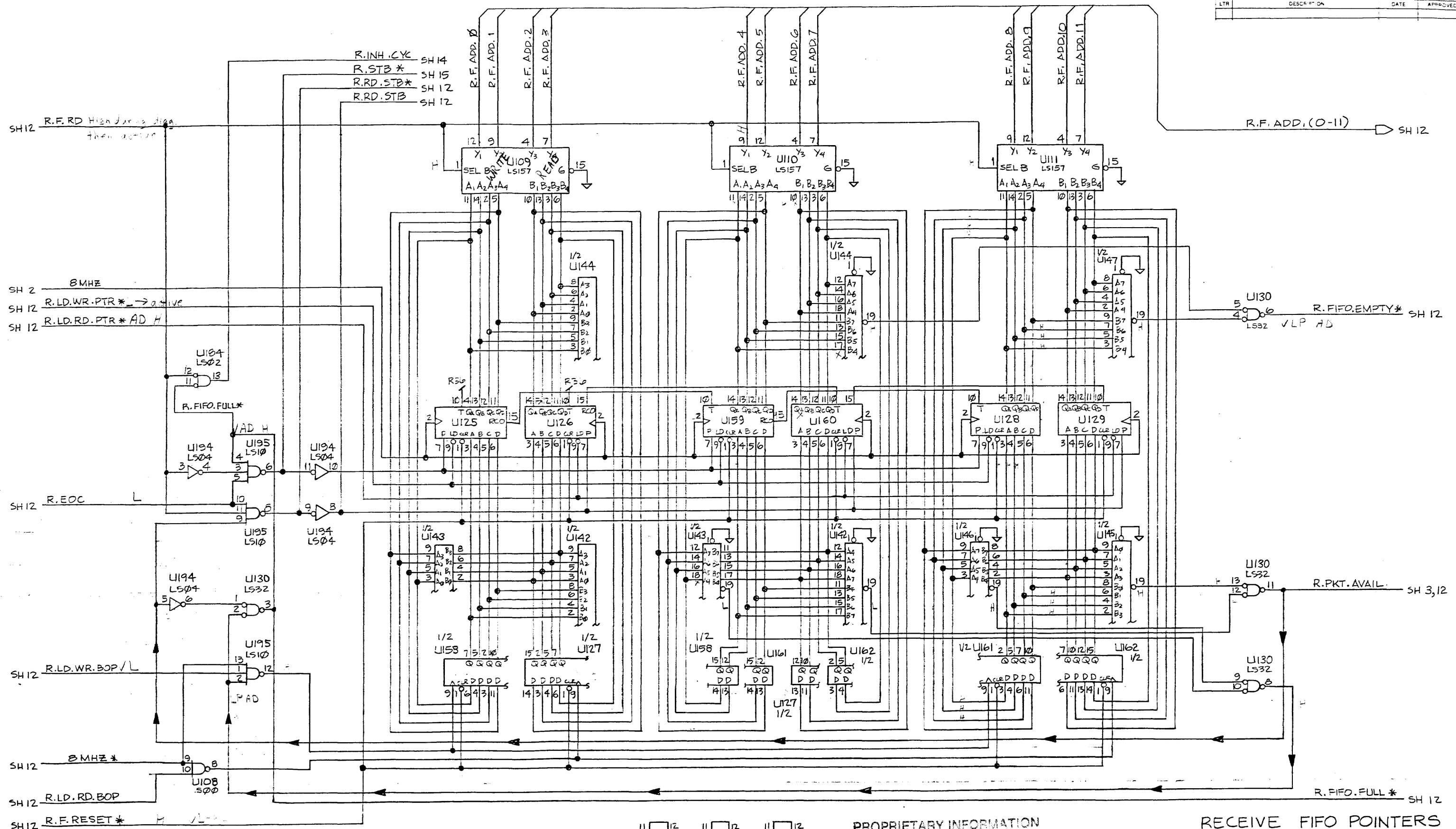
ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLES ± 1°			DRAWN		
FRACTIONS ± 1/64			CHK		
3 PLACE DEC ± .010			INVD		
2 PLACE DEC ± .02			DATE		
TITLE		Ungerma-Bass, Inc.			
LOGIC DIAGRAM					
NIU-150					
SIZE	DRAWING NO	REV		DATE	
D	20013	A			
SCALE	SHEET		11 OF 15		



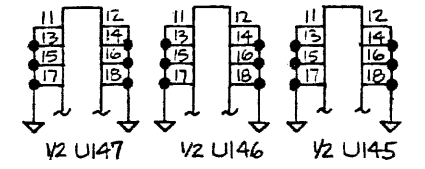
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 RECEIVE FIFO

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ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLES ± 1°			DRWN		
FRACTIONS ± 1/64			CHK		
3 PLACE DEC ± 0.10			APVD		
2 PLACE DEC ± 0.2			TITLE		
			Ungermann-Bass, Inc.		
			LOGIC DIAGRAM		
			NIU-50		
SIZE		DRAWING NO		ISSUE	
D		20013		A	
SCALE		SHEET 12 OF 15			



- NOTES:
1. U125, U126, U128, U129, U159, U160 ARE 74LS161 8-bit counters
 2. U127, U158, U161, U162 ARE 74LS174
 3. U142, U143, U144, U145, U146, U147 ARE 25LS2521 8-bit Egison-Ts Counter



PROPRIETARY INFORMATION

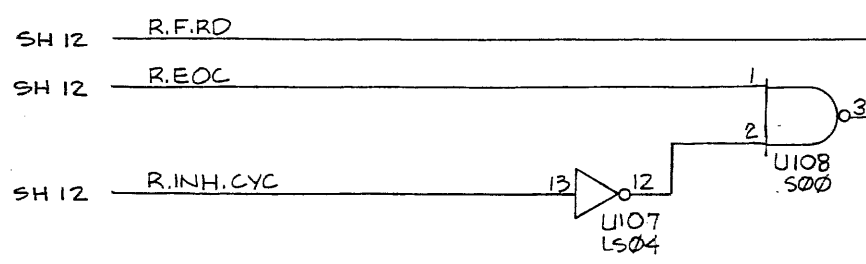
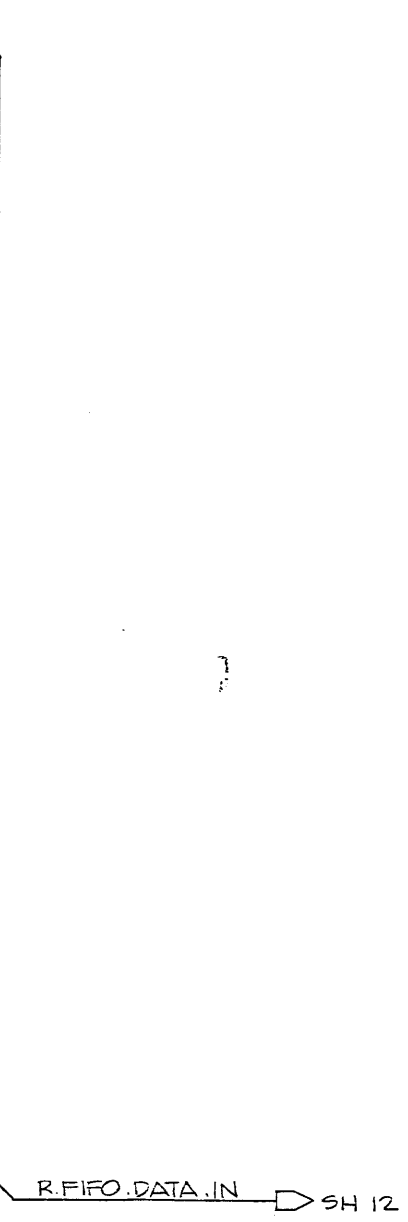
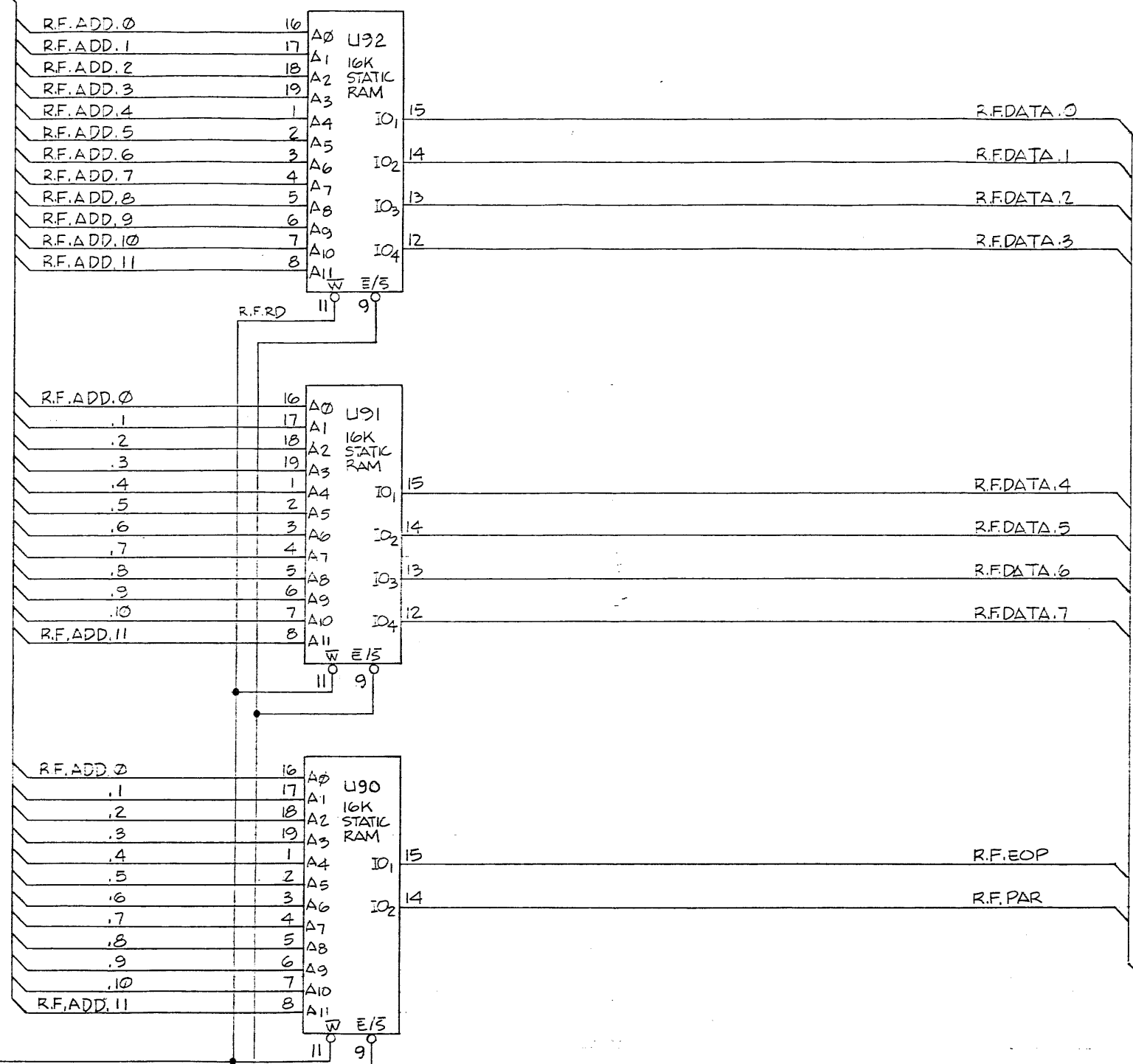
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RECEIVE FIFO POINTERS

ITEM	QTY	TYPE	PART NO.	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ANGLES ± 1° FRACTIONS ± 1/64 3 PLACE DEC 2.010 2 PLC DEC 2.02			SIGNATURE AND DATE		
			Ungermann-Bass, Inc.		
			TITLE LOGIC DIAGRAM NIU-130		
SIZE		DRAWING NO		ISSUE	
D		20013		A	
SCALE			SHEET 13 OF 15		

SH 13 R.FIFO.ADD.(0-11)



RECEIVE FIFO RAM

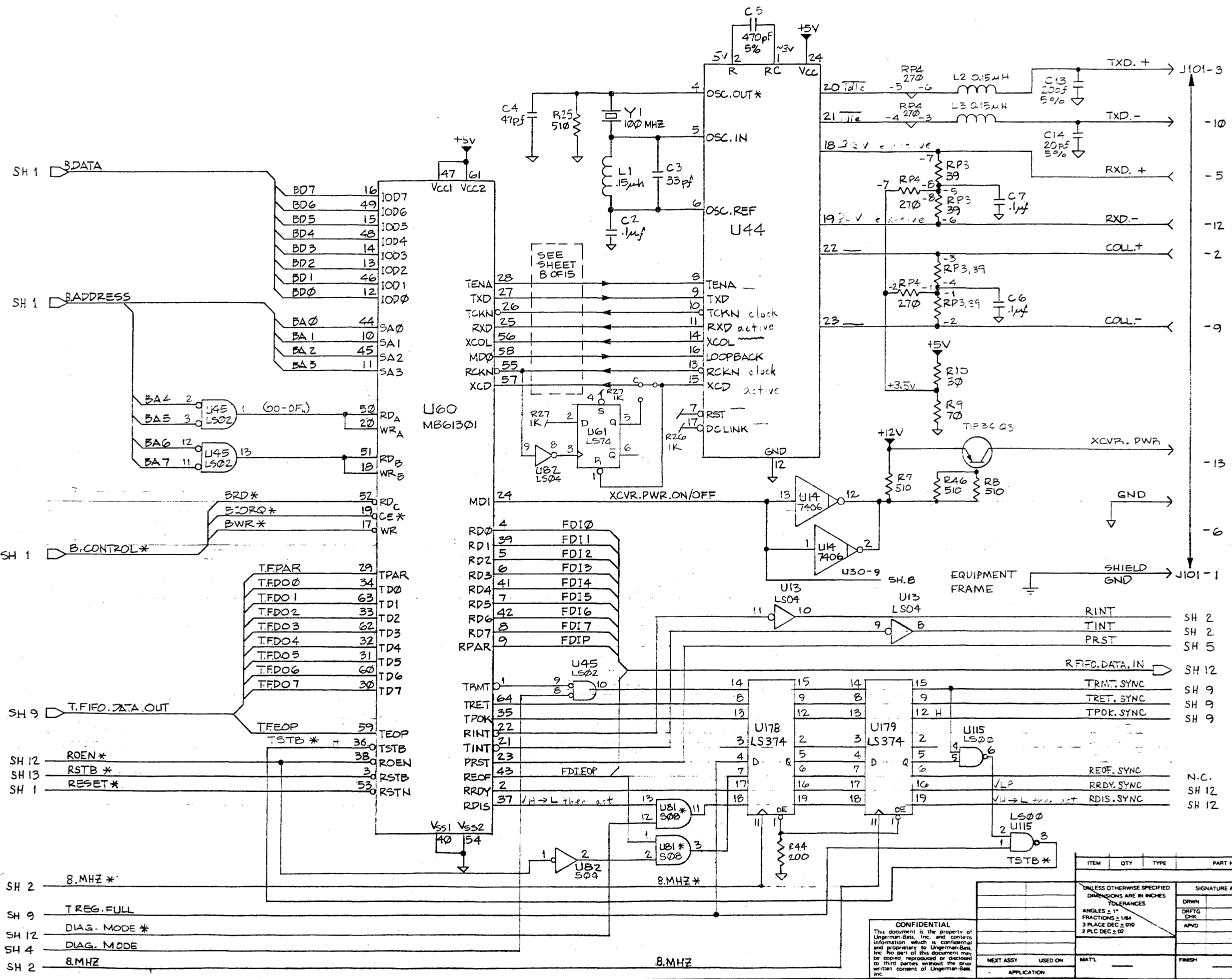
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ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLES ± 1°			DRWN	Ungermann-Bass, Inc.	
FRACTIONS ± 1/64			DFTG	TITLE	
3 PLACE DEC ± 0.01			CHK	LOGIC DIAGRAM	
2 PLC DEC ± 0.2			APVD	NIU-50	
NEXT ASSY		USED ON	MATL	FINISH	SIZE
APPLICATION					D
				SCALE	ISSUE
					A
					SHEET 14 OF 15

RP4 -3
-6



PROPRIETARY INFORMATION

SEP 09 1981

ENCODER/DECODER
EDLC CHIP

ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLES ± 1° FRACTIONS ± 1/64 3 PLACE DEC ± 0.002 2 PLC DEC ± 0.02			DRAWN		
			DRFTG CHK		
			APPD		
			TITLE		
			Ungermann-Bass, Inc.		
			LOGIC DIAGRAM		
			NIU-50		
			SIZE DRAWING NO		
			D 20013		
			ISSUE		
			A		
			SCALE		
			SHEET 15 OF 15		

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- SH 2 8.MHZ *
- SH 9 T REG. FULL
- SH 12 DIAG. MODE *
- SH 4 DIAG. MODE
- SH 2 8.MHZ

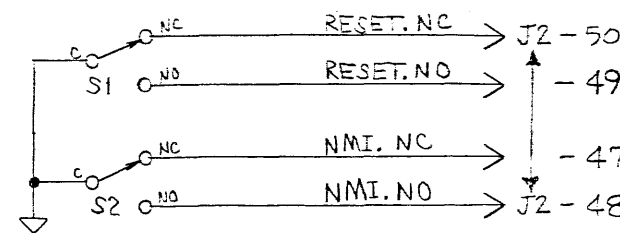
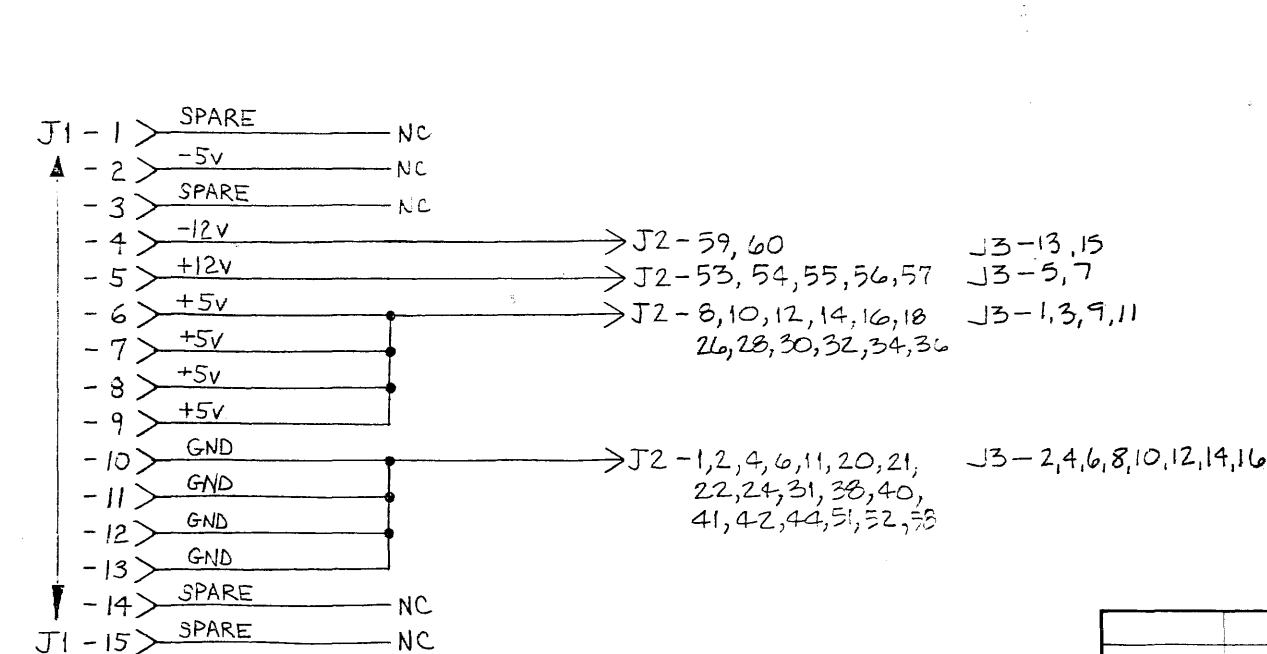
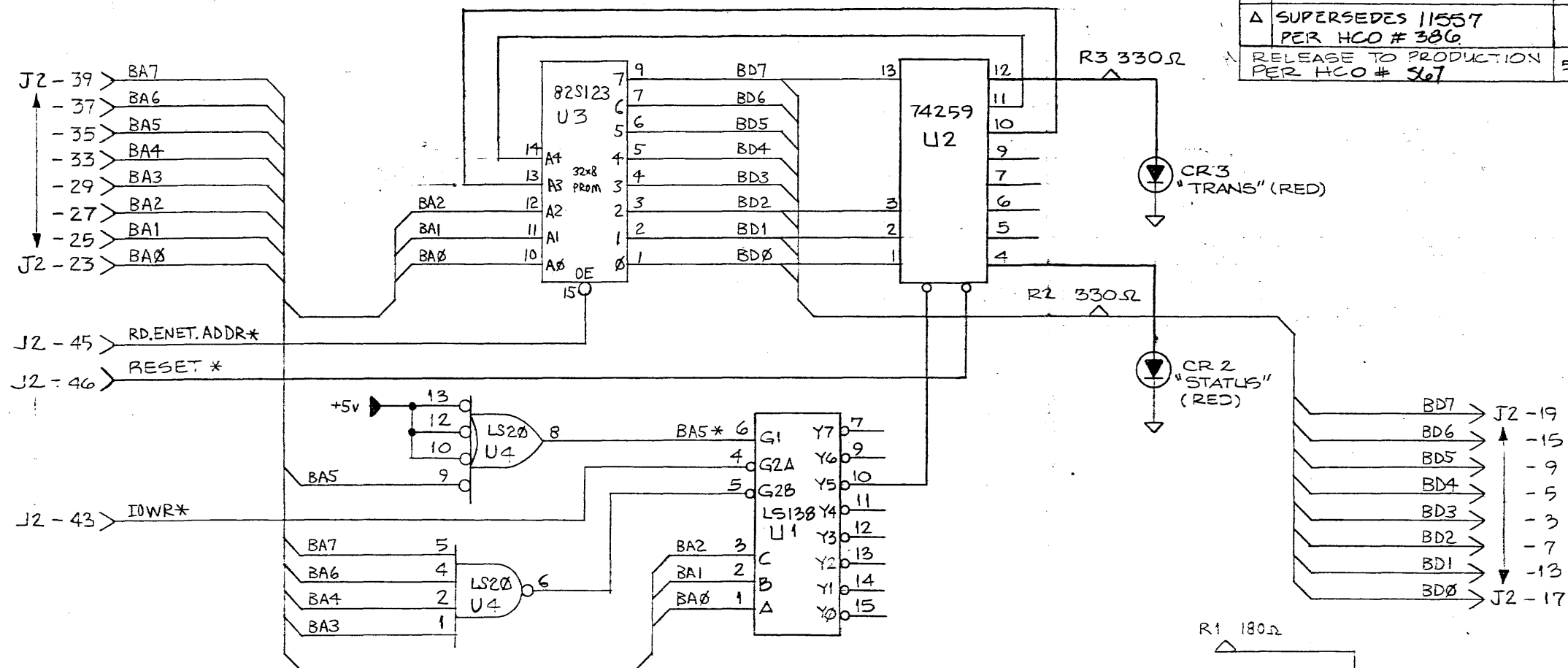
4

3

2

1

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
Δ	SUPERSEDES 11557 PER HCO # 386		
	RELEASE TO PRODUCTION PER HCO # 527	5-5-83	NK



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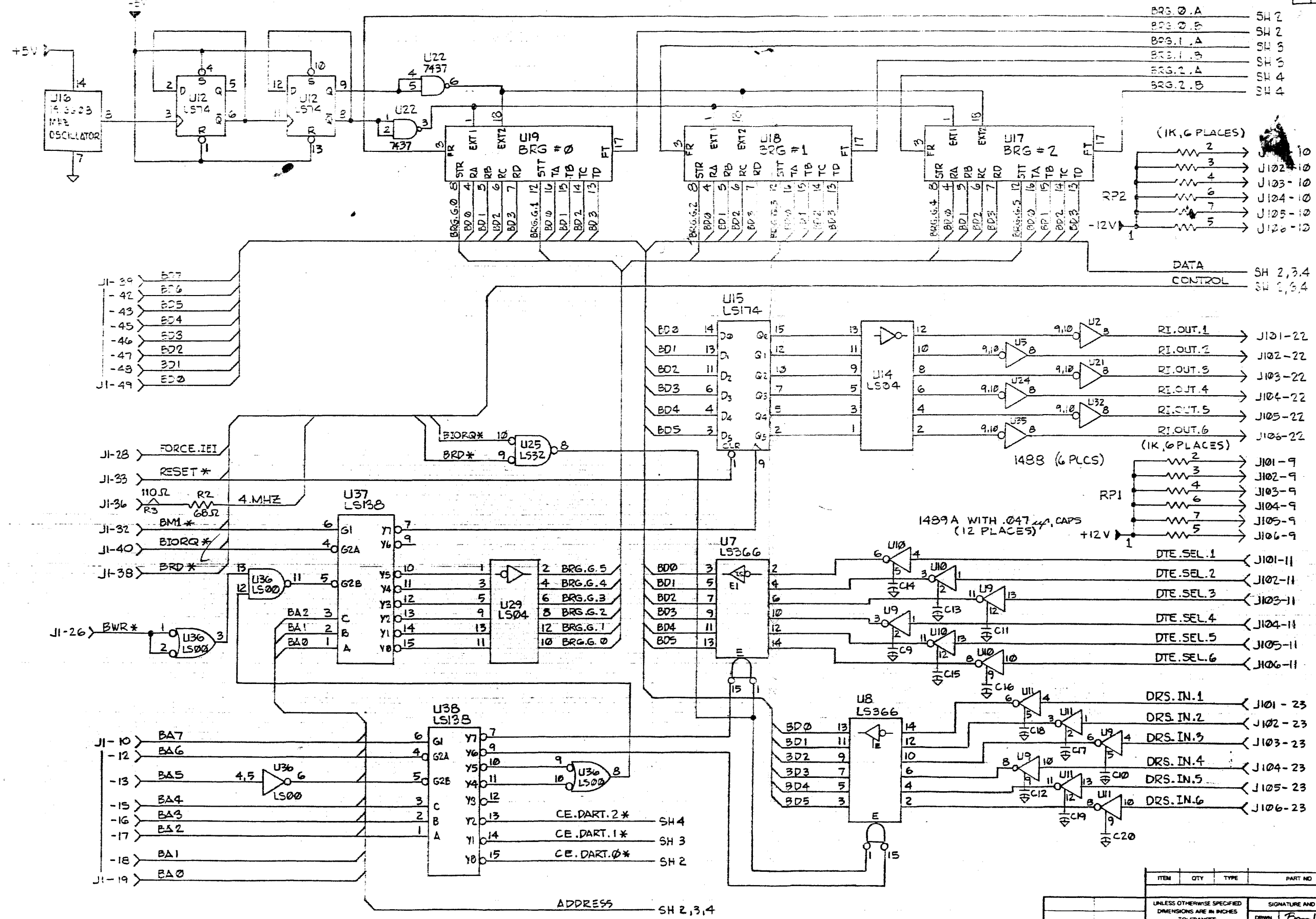
ITEM	QTY.	TYPE	PART NO.	DESCRIPTION	REF. DES.
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLES ± 1°			DRWN <i>A. Brown</i> 821025		
FRACTIONS ± 1/64			DRAFTG		
3 PLACE DEC ± 0.010			CHK		
2 PLC DEC ± 0.2			APVD <i>A. Brown</i> 821207		
NEXT ASSY			USED ON		
APPLICATION			FINISH		
MAT'L.			FURNISH		
Ungermann-Bass, Inc.				TITLE	
				LOGIC DIAGRAM	
				FRONT PNL, NIU 150	
SIZE	DRAWING NO		ISSUE		
C	11691		A		
SCALE	SHEET		OF		

4

3

2

1



REFERENCE DESIGNATION	
LAST USED	NOT USED
U38	
R2	
RP2	
C36	
J2	
J106	

REF. DES.	TYPE	SPARE OUTPUT
U25	LS32	11
U22	7437	8, 11
U26	532	3, 6
U30	508	3, 6

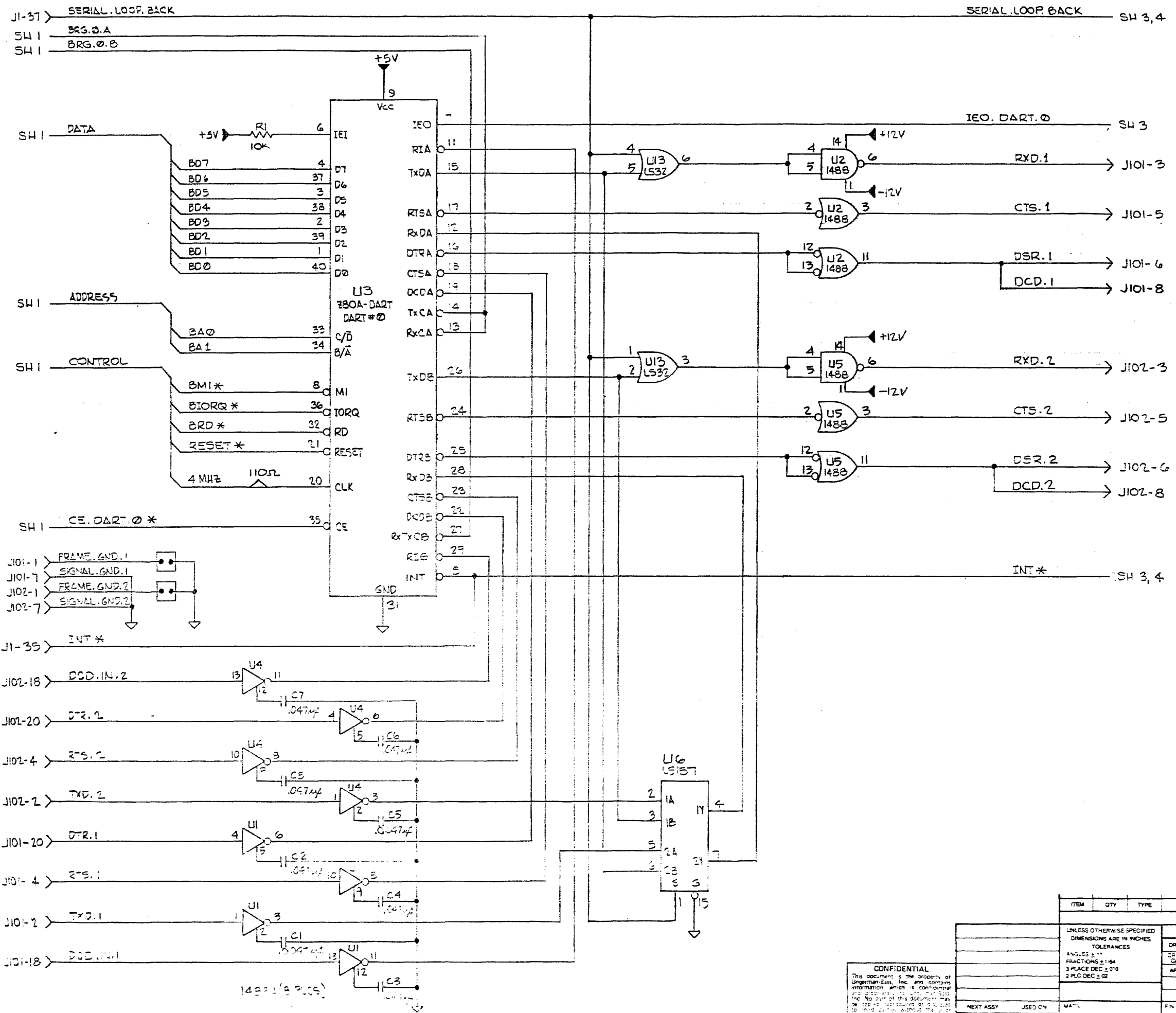
PROPRIETARY INFO
NOV 18 1986

I/O ADD	FUNCTION
A0	DART 0A, DATA
A1	DART 0A, CNTL
A2	DART 0B, DATA
A3	DART 0B, CNTL
A4	DART 1A, DATA
A5	DART 1A, CNTL
A6	DART 1B, DATA
A7	DART 1B, CNTL
A8	DART 2A, DATA
A9	DART 2A, CNTL
AA	DART 2B, DATA
AB	DART 2B, CNTL

B0	BRG.0,A
B1	BRG.0,B
B2	BRG.1,A
B3	BRG.1,B
B4	BRG.2,A
B5	BRG.2,B
B6	
B7	RS 232 OUT (22)
B8	RS 232 INPUT (23)
B9	
BC	RS 232 INPUT (1)

ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES					
DRAFTING ANGLES = 1°					
FRACTIONS = 1/16					
3 PLACE DEC = 0.00					
2 PLC DEC = 0.02					
SIGNATURE AND DATE			Ungerma-Bass, Inc.		
DRAWN: Bm 12-3-81			TITLE: LOGIC DIAGRAM.		
APVD: [Signature]			6 SERIAL PORT I/O MODULE		
DATE: 2/2/82			SIZE: D		
NEXT ASST			DRAWING NO: 11405		
USED ON			SCALE: ~		
APPLICATION			SHEET 1 OF 4		

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REVISIONS		DATE	APPROVED
LTR	DESCRIPTION		

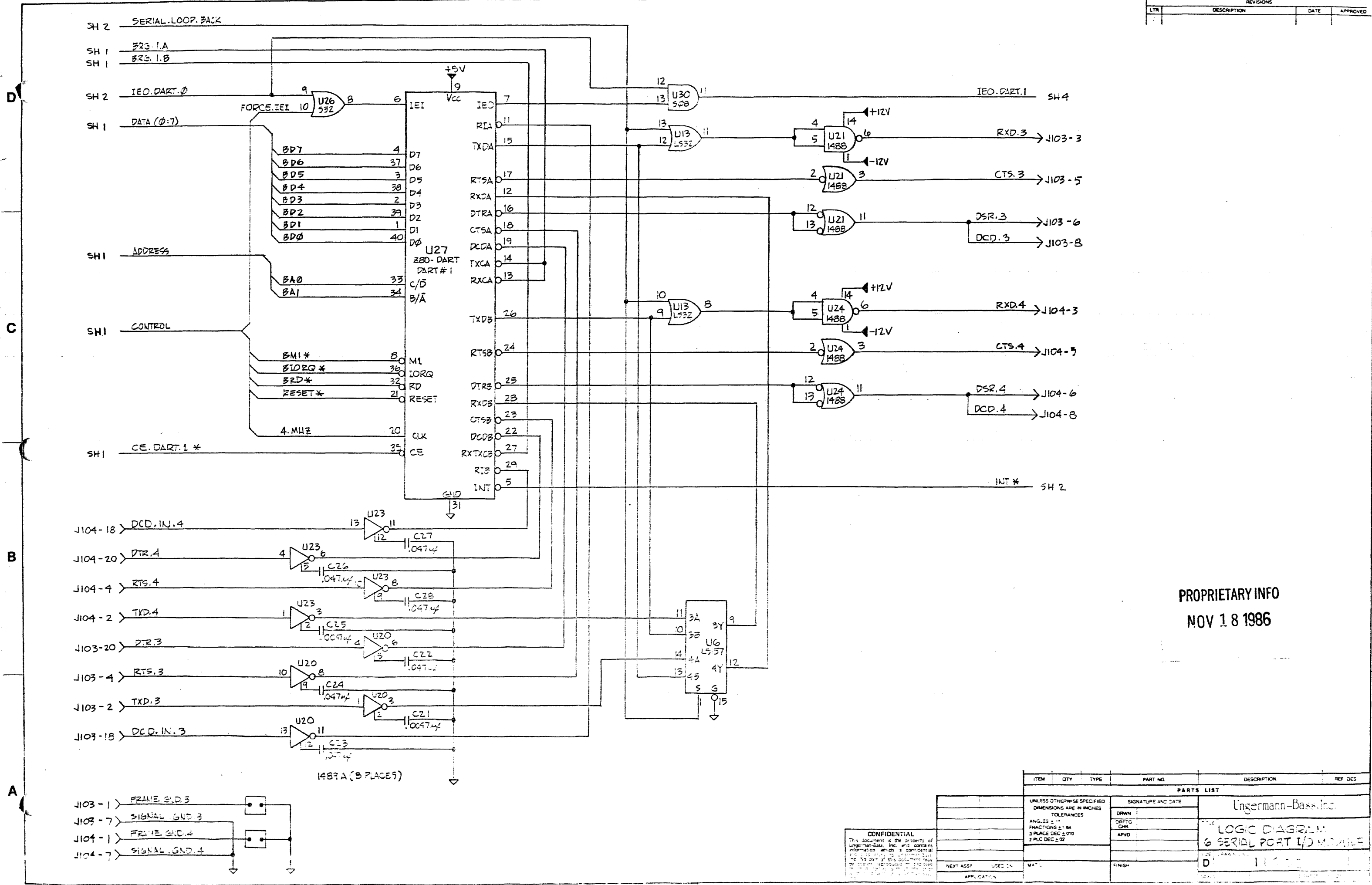
PROPRIETARY INFO
NOV 18 1986

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ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES			SIGNATURE AND DATE		
TOLERANCES			DRAWN		
FRACTIONS ±1/64			CHKD		
3 PLACE DEC ±0.01			APPD		
2 PLACE DEC ±0.02			DATE		
NEXT ASSY	USED ON	MATL	FINISH	TOTAL	
				11000	

Ungerma-Bass, Inc.
TITLE
LOGIC DIAGRAM
6 SERIAL PORT I/O MODULE
DATE
11/00

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



PROPRIETARY INFO
NOV 18 1986

ITEM	QTY	TYPE	PART NO.	DESCRIPTION	REF. DES.
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ANGLES ± 1° FRACTIONS ± 1/64 3 PLACE DEC 2 010 2 PLACE DEC 2 02			SIGNATURE AND DATE		
DRAWN					
CHECKED					
APPROVED					
NEXT ASSY			USED ON		
APPLICATION			MATERIAL		
FINISH					
<p>LOGIC DIAGRAM 6 SERIAL PORT I/O MODULE</p> <p>DATE: 11/18/86</p>					

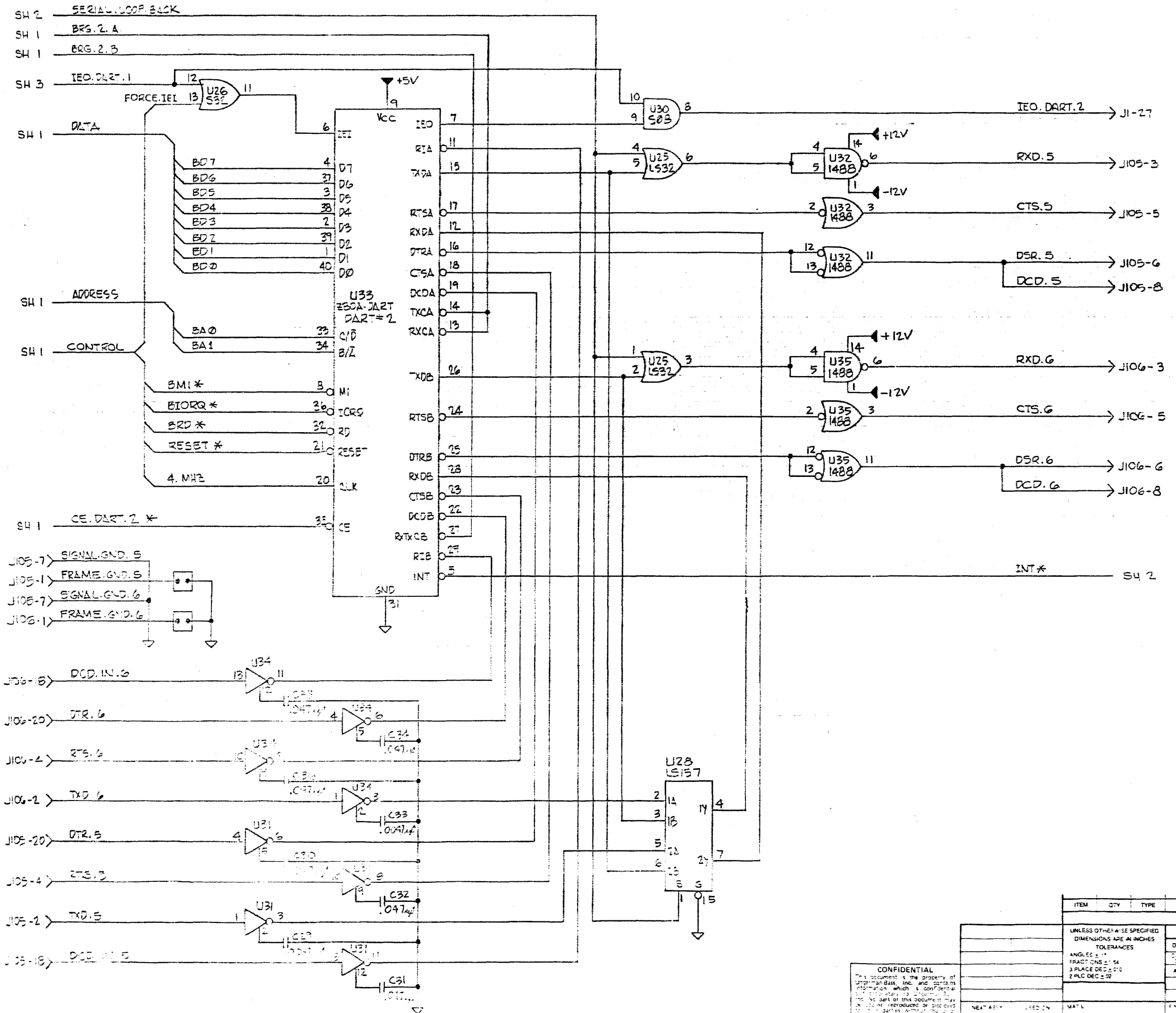
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Ungerma-Bass, Inc.

LOGIC DIAGRAM
6 SERIAL PORT I/O MODULE

DATE: 11/18/86

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



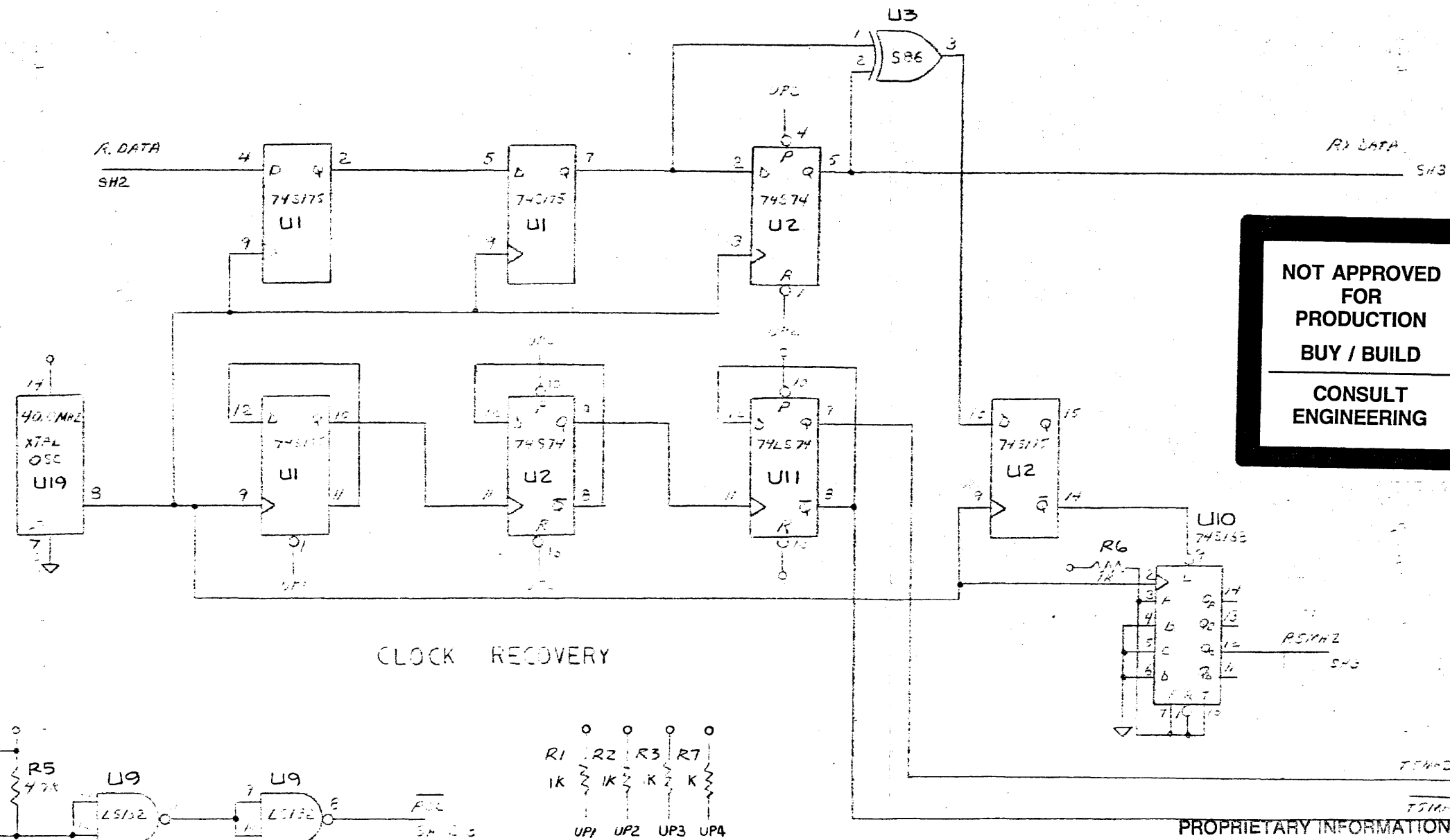
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ITEM	QTY	TYPE	PART NO.	DESCRIPTION	REF. DES.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES					
DRAWN			SIGNATURE AND DATE		
CHECKED			DATE		
APPROVED			DATE		
NEXT ASSY			MATERIAL		
SECTION			FINISH		
APPROVED			DATE		
Ungerma-Bass, Inc.				6 SERIAL PORT I/O MODULE	
D				11/18/86	

REF DES.	TYPE	SPRAE PINS
U5	LS174	1-6
U6	LS86	8-10, 5-7
U15	LS20	1-3

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED
1	INITIAL RELEASE PER HCO#	11-28-83	Mgs for Bob Leonard 11/30/83
2	UPDATE PER HCO#913	4-10-84	A.L.B. 4/10/84
3	CHANGE CAP PER HCO#1132	9-28-84	A.L.B. 9/28/84



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ENGINEERING**

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SEP 09 1984

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ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLES 90°			DRWN [Signature]		
FRACTIONS 64			DRAFTG [Signature]		
3 PLACE DECIMALS			CHK [Signature]		
2 PLACE DECIMALS			APVD [Signature]		
NEXT ASSY (USED ON)			FINISH		
APPL. DATE			SCALE		

Ungermaier-Bass, Inc.	
TITLE	
NIU 150 ENCODER/DECODER	
SIZE	ISSUE
C	3
DRAWING NO	
12390	
SHEET	OF 4

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

D

D

C

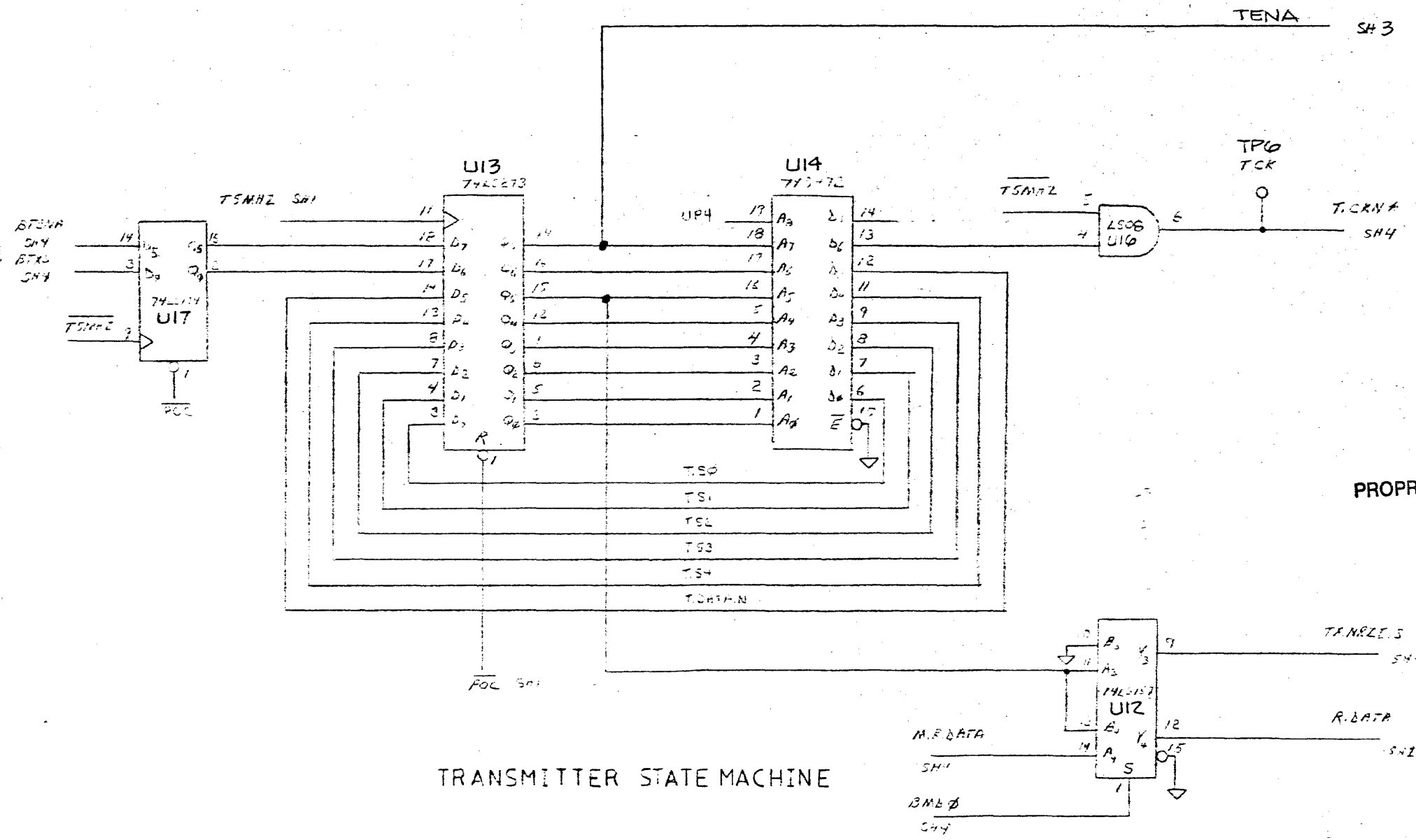
C

B

B

A

A



TRANSMITTER STATE MACHINE

PROPRIETARY INFORMATION

SEP 09

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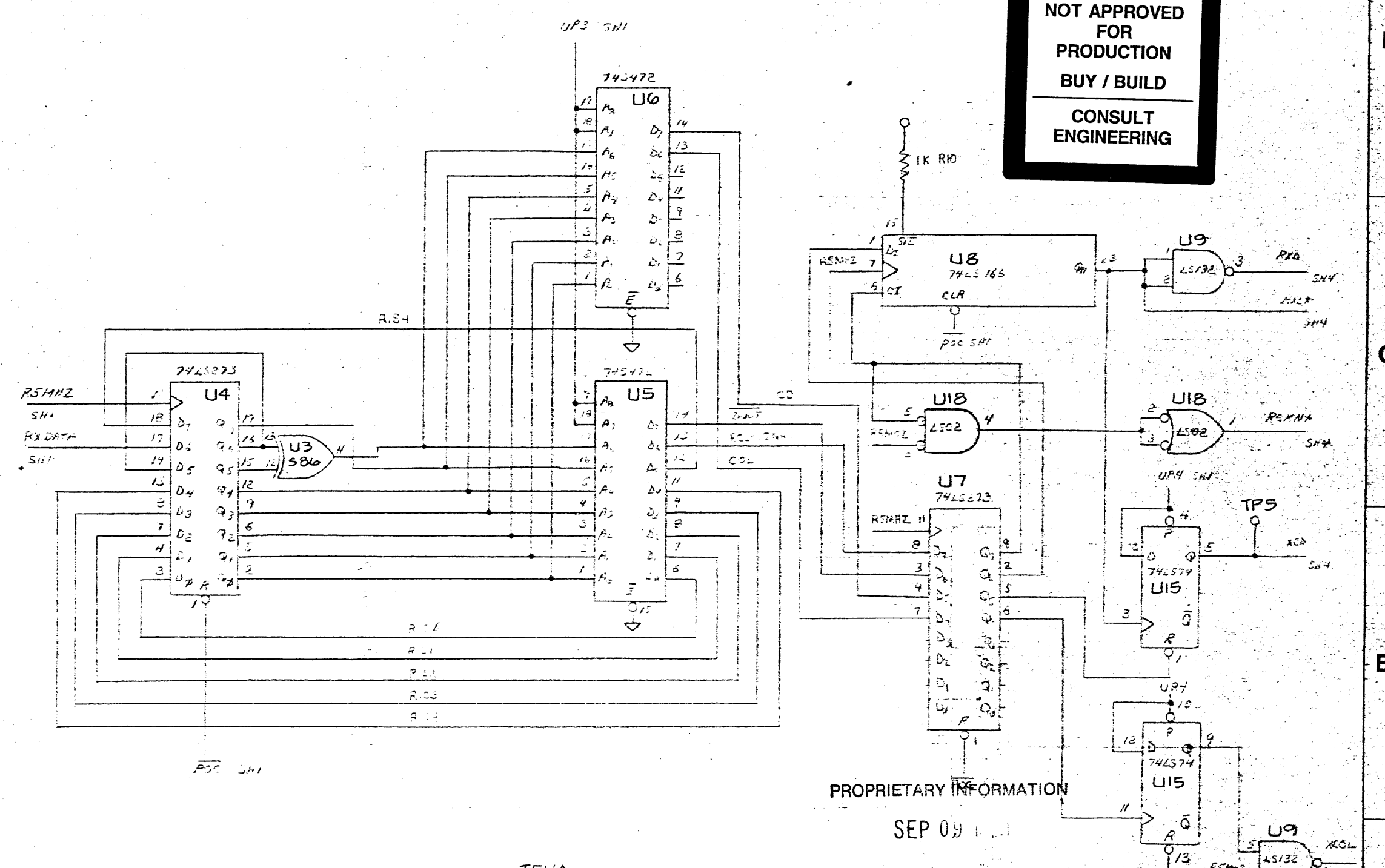
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ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLES: 1°			DRAWN <i>B. B. HALL</i> <i>SJS</i>		
FRACTIONS: 1/64			DRAFTSMAN		
3 PLACE DEC: .010			APPROVED		
2 PLACE DEC: .2			TITLE		
NEXT ASSY USED ON			Ungermaun-Bass, Inc.		
APPLICATION			MATERIAL		
			FINISH		
				SIZE	ISSUE
				C	3
				DRAWING NO	
				12390	
				SCALE	SHEET 2 OF 4

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED

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CONSULT ENGINEERING



RECEIVE STATE MACHINE

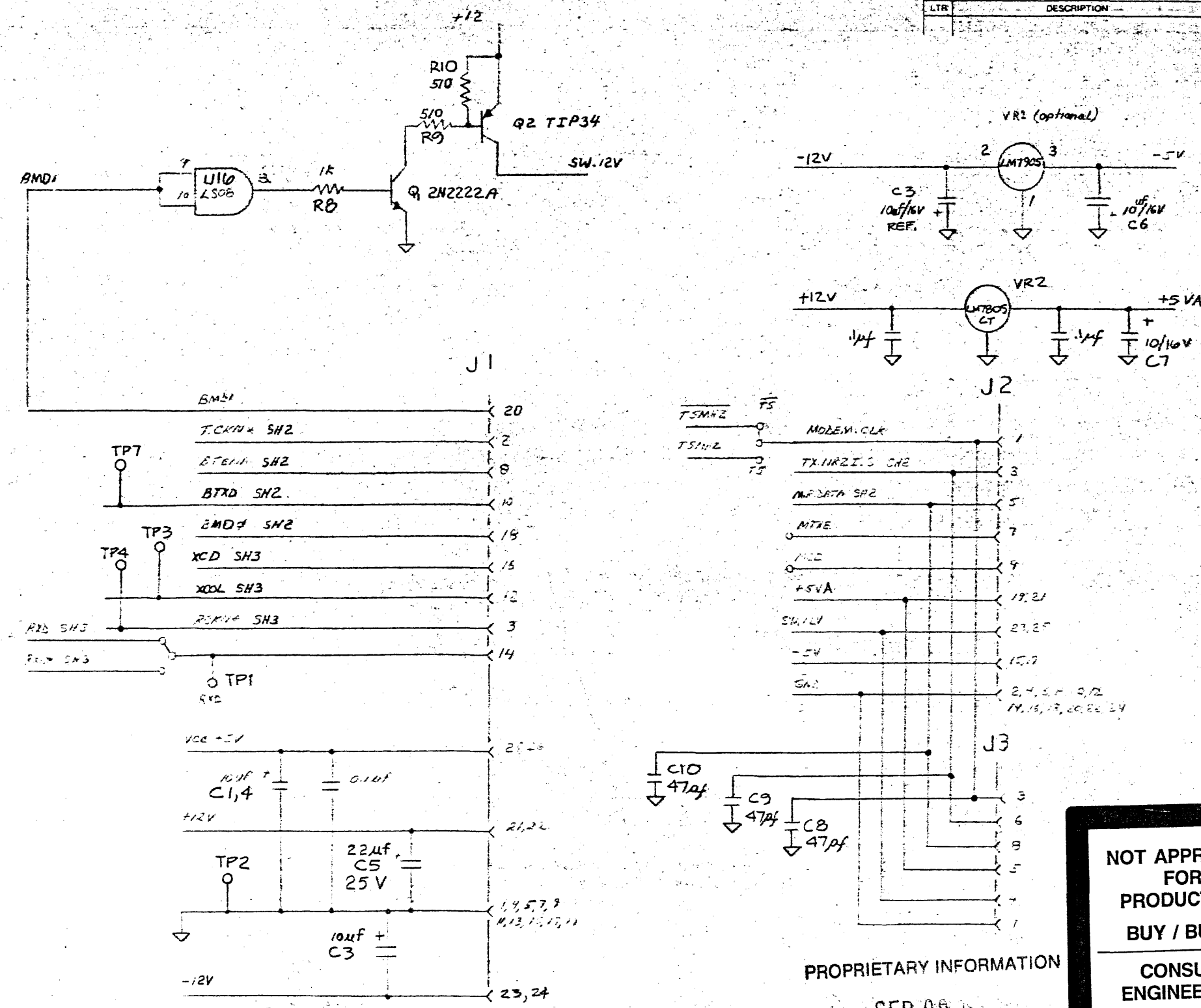
SH 2 TENA

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SEP 09 1984

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ITEM	QTY	TYPE	PART NO	DESCRIPTION	REF. DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLED 45°			DRWN B. BRUND B/5/83		
FRACTIONS 1/64			DRAFTG		
3 PLACE DEC 010			CHK		
2 PLACE DEC 02			APVD		
NEXT ASSY SECTION			MATERIAL		
APPLICATION			FINISH		
TITLE				Ungermeier-Bass, Inc.	
SIZE				DRAWING NO	
C				12390	
SCALE				SHEET 3 OF 4	
ISSUE				3	

REVISIONS			
LTR	DESCRIPTION	DATE	APPROVED



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PROPRIETARY INFORMATION

SEP 09 1983

ITEM	QTY	TYPE	PART NO.	DESCRIPTION	REF DES
PARTS LIST					
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES			SIGNATURE AND DATE		
ANGLES ± 1°			DRAWN <i>B. BAAS</i> 8/15/83		
FRACTIONS ± 1/64			DRFTG. CHK.		
3 PLACE DEC. ± 0.01			APVD		
2 PLACE DEC. ± 0.02			TITLE		
NEXT ASSY.			MATERIAL		
SECTION			FINISH		
APPLICATION			SCALE		
Lingermann-Bass, Inc.				TITLE	
NIU 150 ENCODER/DECODER				ISSUE	
SIZE: DRAWING NO.				3	
C 12390				SHEET 4 OF 4	

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