

SEL 810A
Computer Maintenance Drawings
Manual

June, 1968

This publication supersedes SEL 810A
Computer Maintenance Drawings Manual,
95001A, dated October, 1967

LIST OF DRAWINGS

Drawing Number	Title	Drawing Number	Title
<u>CIRCUIT CARDS - SCHEMATIC & ASSEMBLY DRAWINGS</u>			
8201	Schematic & Assembly RTL Memory Interface	8217	Schematic & Assembly RTL Program Register Bits 1-5
8202	Schematic & Assembly RTL "T" Register & Instruction Register Bit Slice	8218	Schematic & Assembly RTL Program Register Bits 6-11
8203	Schematic & Assembly RTL A&B Accumulators Bit Slice (3 sheets)	8219	Schematic & Assembly RTL Program Register Bits 12-15
8204	Schematic & Assembly RTL 8 Bit Full Adder	8220	Schematic & Assembly RTL - Shift Control
8205	Schematic & Assembly RTL Operation Decoder	8221	Schematic & Assembly RTL Sense Switch Decode
8206	Schematic & Assembly RTL Augmented Operation Decoder #1	8222	Schematic & Assembly RTL Overflow & A Sign Strobe & Normalize
8207	Schematic & Assembly RTL Augmented Operation Decoder #2	8223	Schematic & Assembly RTL Indirect - 2
8208	Schematic & Assembly RTL Control Cycle Generator	8224	Schematic & Assembly RTL "B" Full Code Detector & Sign Strobe
8209	Schematic & Assembly RTL Shift Counter	8225	Schematic & Assembly I - O Instruction Timing
8210	Schematic & Assembly RTL "T" Output Gate Control	8226	Schematic & Assembly RTL Memory Data Register Load & Address Clear
8211	Schematic & Assembly RTL "B" Output & "T" Comp Output Gate Control	8227	Schematic & Assembly RTL - Adder to Memory Control & Address Register Strobe
8212	Schematic & Assembly RTL "A" Output Gates	8228	Schematic & Assembly RTL Program Register Advance Logic I
8213	Schematic & Assembly RTL "B" Register and "T" Register Strobe	8229	Schematic & Assembly RTL Program Register Advance Logic II
8214	Schematic & Assembly RTL "A" Register Strobe	8230	Schematic & Assembly RTL - Program Register Advance Logic III
8215	Schematic & Assembly RTL Carry Logic	8231	Schematic & Assembly RTL Adder Zero Det.
8216	Schematic & Assembly RTL Input/Output Instruction Decode	8232	Schematic & Assembly RTL "A" Zero Det.

Drawing Number	Title	Drawing Number	Title
<u>CIRCUIT CARDS - SCHEMATIC & ASSEMBLY DRAWINGS (Cont'd)</u>			
8234	Schematic & Assembly RTL Clock Control	8253	Schematic & Assembly RTL Program Protect Logic 1
8235	Schematic & Assembly RTL Clock Control #2	8254	Schematic & Assembly RTL Program Protect Logic 2
8236	Schematic & Assembly RTL Clock Control #3	8255	Stall Alarm Control
8237	Schematic & Assembly RTL Load/Display Memory Step Control	8256	Stall Alarm Counter
8238	Schematic & Assembly RTL Priority Interrupt Latch 1R1	8257	Schematic & Assembly RTL-Initialize Control (2 sheets)
8239	Schematic & Assembly RTL Priority Interrupt TOI & Disable Logic 1R1	8258	Schematic & Assembly RTL Cycle Control (2 sheets)
8240	Schematic & Assembly RTL PI Group Matrix 1R1	8259	Schematic & Assembly RTL Address Control (2 sheets)
8241	Schematic & Assembly RTL Priority Interrupt Address "and" Gates 1R1	8260	Schematic & Assembly RTL Load Address Control (2 sheets)
8242	Schematic & Assembly RTL Priority Interrupt 1R1 (7 sheets)	8261	Schematic & Assembly RTL BTC Data Transfer Control 1 (2 sheets)
8243	Schematic & Assembly RTL PI Unitary/Binary CONV(MSB'S)	8262	Schematic & Assembly RTL-BTC-Data Transfer Control 2 (2 sheets) <i>sheet 2 of 2</i>
8244	Schematic & Assembly RTL Unitary/Binary CONV(LSB'S)	8263	Schematic & Assembly RTL 5 Bit Dual Counter (3 sheets) <i>4</i>
8245	Schematic & Assembly RTL Power Failure Control	8264	Schematic & Assembly RTL Clock Buffers
8246	Schematic & Assembly RTL Memory Module Select Driver	8265	Schematic & Assembly RTL BPC Cycle Control
8247	Schematic & Assembly RTL 16 Bit Parity Gen/Check	8266	Schematic & Assembly RTL Protect Control
8248	Schematic & Assembly RTL Parity Control	8267	Schematic & Assembly RTL-Initial Address Control
8249	Schematic & Assembly RTL Instruction Trap	8268	Schematic & Assembly RTL-BTC Priority
8250	Schematic & Assembly RTL Variable Base Register Control	8269	Schematic & Assembly RTL Line Driver, Current Driver and Inhibit Drive Regulator
8251	Schematic & Assembly RTL Variable Base Register-Register	8270	Schematic & Assembly RTL Memory Timing #I
8252	Schematic & Assembly RTL-VBR Display Gates	8271	Schematic & Assembly RTL Memory Timing #II
		8272	Schematic & Assembly RTL Quad Data Register & Inhibit Driver

Drawing Number	Title	Drawing Number	Title
CIRCUIT CARDS - SCHEMATIC & ASSEMBLY DRAWINGS (Cont'd)			
8273	Schematic & Assembly RTL Read/Write Matrix and Line Drivers	8292	Schematic & Assembly RTL - MPY/DIV Control 8
8274	Schematic & Assembly RTL 8-Bit Memory Address Register	8293	Schematic & Assembly RTL Mask Priority Interrupt
8275	Schematic & Assembly RTL 5-Bit Memory Address Register & 8 K Control	8294	Schematic & Assembly RTL Extender Adder and TX 2 Gates
8276	Schematic & Assembly RTL Memory Parity & Protect Bit Data Registers & Inhibit Drivers	8295	Schematic & Assembly RTL Memory Access Control
8277	Schematic & Assembly RTL + 12V and Threshold Regulator	8296	Schematic & Assembly RTL Power Fail Safe
8278	Schematic & Assembly Inhibit Resistors	8297	Schematic & Assembly TI 8-Bit Ripple Adder
8279	Schematic & Assembly Memory Power Supply (2 sheets)	8298	Schematic & Assembly RTL - SPB Map Store Gates
8280	Schematic & Assembly 3.6V & 5V Power Supply (2 sheets)	8299	Program Protect Lamp Drivers
8281	Schematic & Assembly Memory Rectifiers	8543	Schematic & Assembly 2 NOR(M)
8282	Schematic & Assembly RTL - Control Panel (2 sheets)	8544	Schematic & Assembly 3 NOR(M)
8283	Schematic & Assembly RTL MPY/DIV Control 1	8545	Schematic & Assembly Inverter (M)
8284	Schematic & Assembly RTL MPY/DIV Control #2	8547	Schematic & Assembly 4 NOR(M)
8285	Schematic & Assembly RTL - MPY/DIV Control 3	8557	Schematic & Assembly 4 NOR Expander (M)
8286	Schematic & Assembly RTL - MPY/DIV Control #4	8614	Schematic & Assembly Cable Driver
8287	Schematic & Assembly RTL - MPY/DIV Control 5	8615	Schematic & Assembly Cable Terminator
8288	Schematic & Assembly RTL - MPY/DIV Control 6	8620	Schematic & Assembly Oscillator
8289	Schematic & Assembly RTL - MPY/DIV Control 7	8639	Schematic & Assembly Data Saver
8290	Schematic & Assembly RTL - MPY/DIV "T" X2 Gates	8705	Schematic & Assembly Gated Cable Driver
8291	Schematic & Assembly RTL - MPY/DIV Shifted Adder Gates	8749	Schematic & Assembly Digital Buffer (M)
		8757	Schematic & Assembly Computer Clock

Drawing Number	Title	Drawing Number	Title
<u>CIRCUIT CARDS - SCHEMATIC & ASSEMBLY DRAWINGS (Cont'd)</u>			
8959	Schematic & Assembly Dual Current Driver	53072	Wiring Diagram BTC to Unit 1, 2, 3, 4 50 Pin Connector (2 sheets)
8962	Schematic & Assembly μ A Sense Amplifier #3	53092	Wiring Diagram Basis Input/Output Cable 104 Pin 1F3-P1 Amp
<u>LOGIC DIAGRAMS</u>			
53021	Logic Diagram BPC Address to Memory	53175	Wiring Diagram Control Panel (3 sheets)
53022	Logic Diagram BPC Buffer-Drivers	<u>POWER SUPPLY SCHEMATICS</u>	
53073	Block Diagram BTC - BTC	53140	Schematic Memory Power Supply Model 222
53103	Logic Diagram 8K x 18 Memory a Data Flow Timing and Reg. (5 sheets)	53141	Schematic 3.6V & 5V Power Supply Model 221
53111	Logic Diagram 4K x 18 Memory a Data Flow Timing and Reg. (4 sheets)	53142	Schematic 3.6V Power Supply Model 223
83186	Augment Control	<u>MECHANICAL ASSEMBLY DRAWINGS</u>	
83187	Miscellaneous Buffer	15049	Control Panel Assembly
<u>WIRING DIAGRAMS</u>			
52993-1	Wiring Diagram Interconnecting Cables Memory Module #1	15513	Power Supply 3.6V Assembly
52993-2	Wiring Diagram Interconnecting Cables Memory Module #2	15514	Power Supply 3.6V and 5.0V Assembly
53019	Wiring Diagram Interconnecting Cables BPC-Memory Interface	15515	Power Supply Memory
53039	Wiring Diagram Power Supply Model 221	15517	Power Supply Panel Assembly
53040	Wiring Diagram Power Supply Model 222 Memory	15595	Primary Plane Assembly (2 sheets)
53041	Wiring Diagram Power Supply Model 223	15596	Secondary Plane Assembly
53063	Wiring Diagram DC Power Dist. 810A	15597	Primary Module Assembly
53064	Wiring Diagram AC Power Distribution 810A	15598	Memory Module Assembly
		15599	Meter Panel Assembly
		15600	Final Assembly (4 sheets)
		15601	Assembly I/O Connector Panel
		15602	Table Top Assembly
		53065	Elco 6501 Assembly Connectors

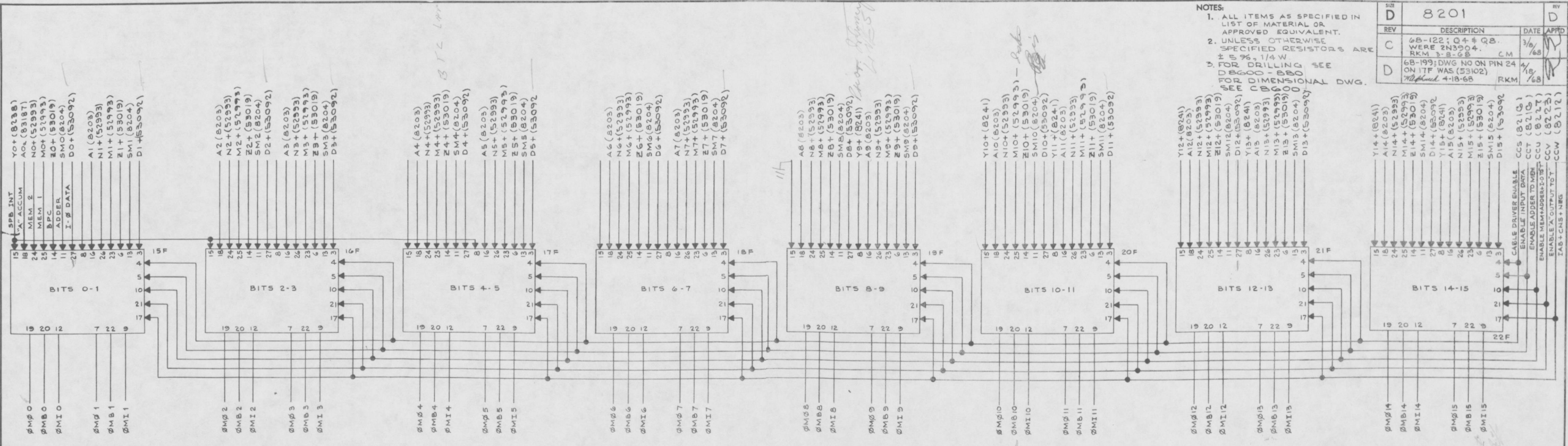
SEL 95001A

Drawings
Number

Title

CARD LOCATION DRAWINGS

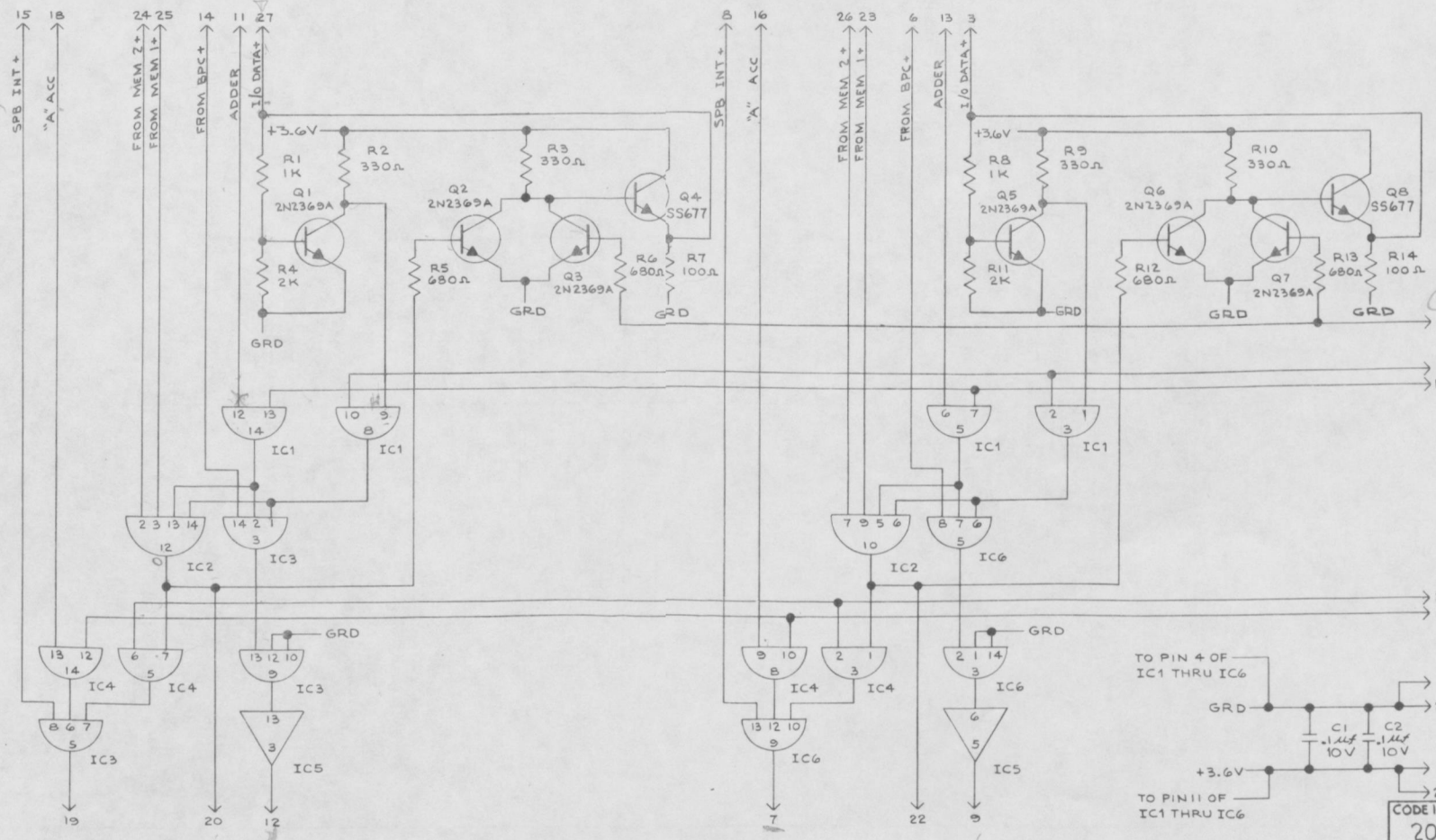
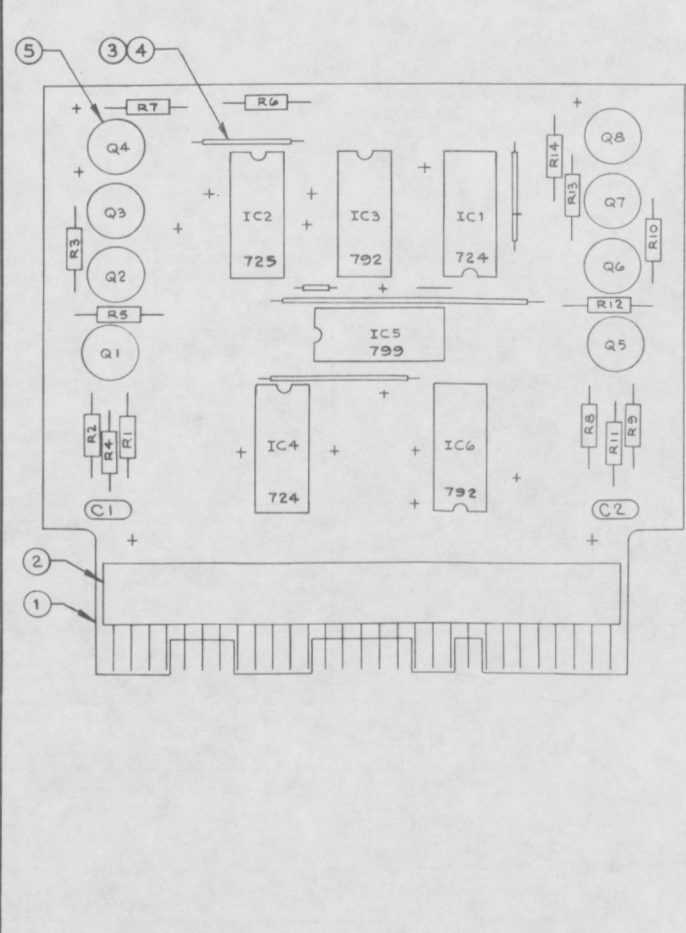
52992-1	Card Layout Plane 1R1
52992-2	Card Layout Plane 1R2



NOTES:

- ALL ITEMS AS SPECIFIED IN LIST OF MATERIAL OR APPROVED EQUIVALENT.
- UNLESS OTHERWISE SPECIFIED RESISTORS ARE 1/4 W, 1%.
- FOR DRILLING SEE DIMENSIONAL DWG.

REV	DESCRIPTION	DATE	APP'D
D	8201		
C	6B-122: Q4 & Q8 WERE 2N3904. RKM 3-B-6B	3/6/68	
D	6B-199: DWG NO ON PIN 24 ON 17F WAS (53102) REVISION 4-18-68	1/8/68	

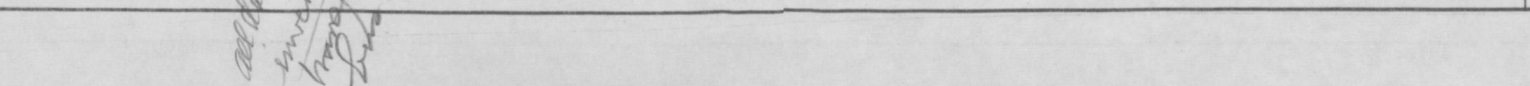
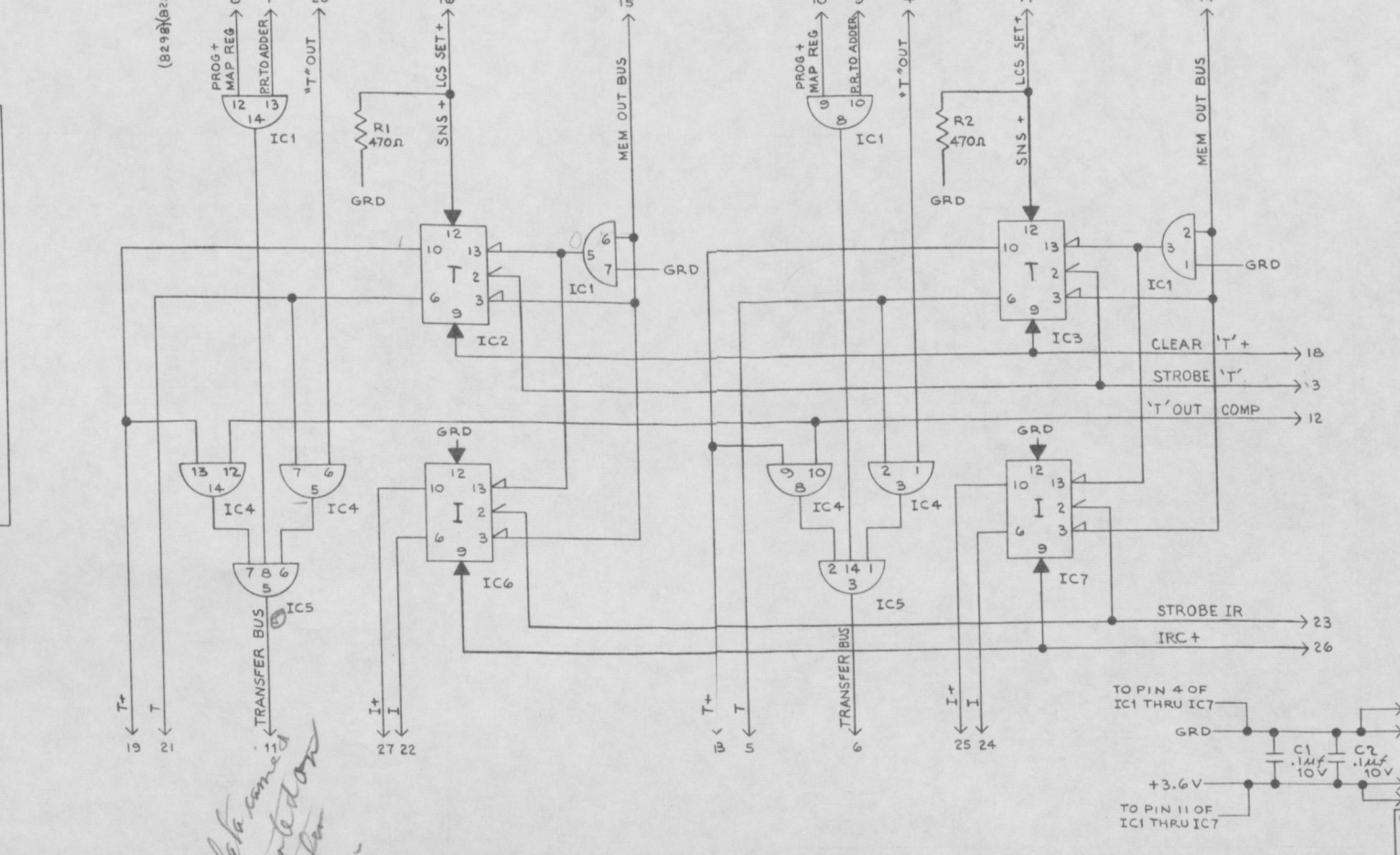
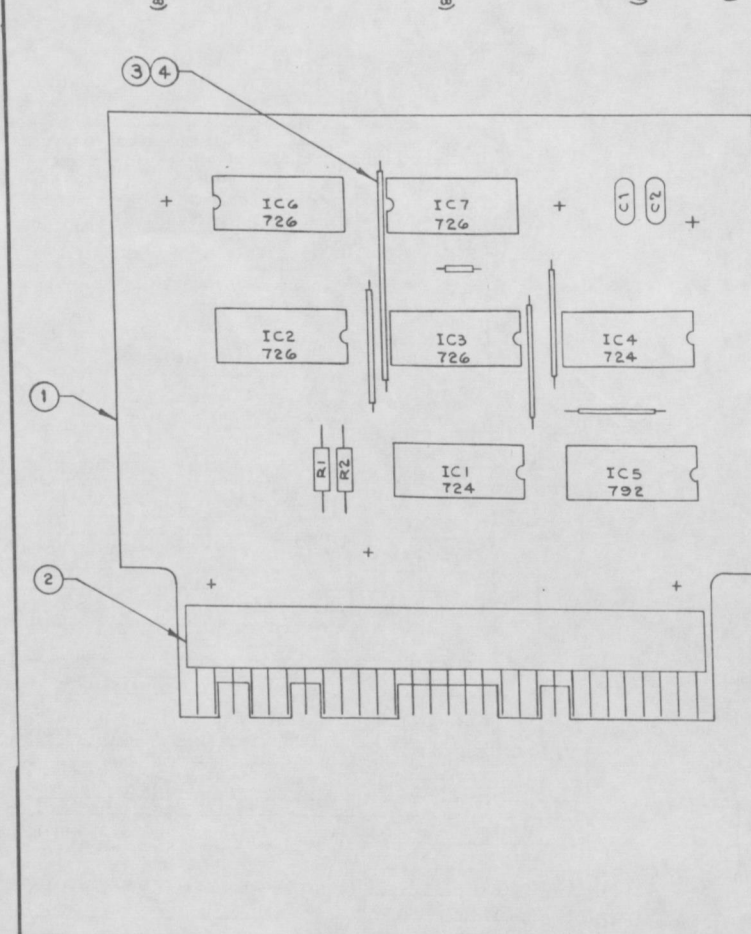
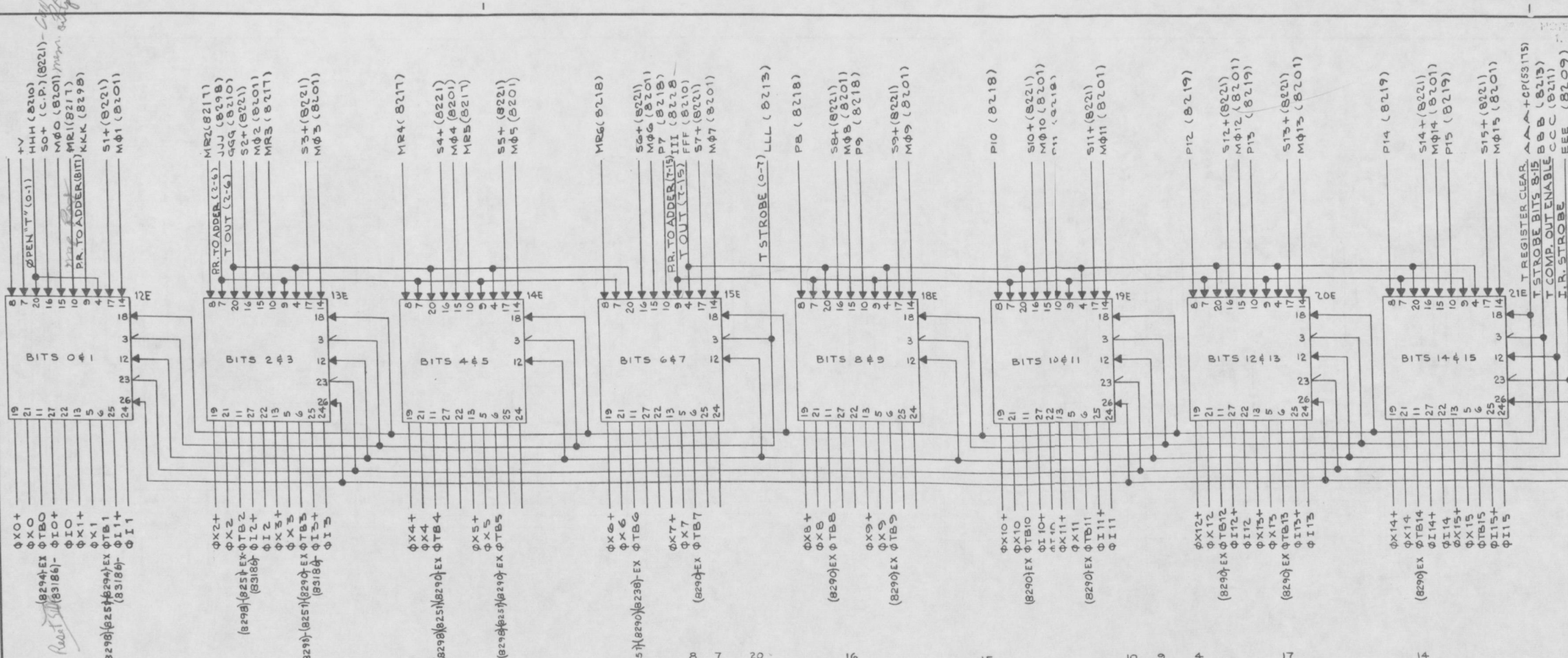


QTY	REF	DESCRIPTION
2	R14	RC07GF101J RESISTOR-100Ω, ALLEN BRADLEY
4	R12, R7, R5, R6	RC07GF681J -680Ω
2	R11	RC07GF202J -2K
4	R3, R10, R2, R3	RC07GF331J -330Ω
2	R8, R1	RC07GF102J RESISTOR-1K, ALLEN BRADLEY
2	Q8, Q4	SS677 TRANSISTOR-MOTOROLA
6	Q6, Q7, Q3, Q5, Q1, Q2	2N2369A TRANSISTOR-FAIRCHILD
1	IC5	MC799P INTEGRATED CIRCUIT-MOTOROLA
2	IC6, IC3	MC792P
1	IC2	MC725P
2	IC4, IC1	MC724P INTEGRATED CIRCUIT-MOTOROLA
2	C2, C1	UK10-104 CAPACITOR-1μF +80-20%, 10V, CRL
B	5	B10369 UNIPAD
AR	4	AWG 24 SLEEVING-TEFLON, THIN WALL (COLOR OPT)
AR	3	AWG 24 WIRE-SOLID COPPER, TINNED
1	2	00-7022-025-000-001 CONNECTOR-ELCO
1	1	SEL 880 PRINTED CIRCUIT (FOR REV. SEE A51140)
-1	ITEM	DWG. OR PART NO. DESCRIPTION

DR	RKM	1-3-67
CK	WG	2-20-67
ENG	J. Little	5/21/67
PROJ	12/20/67	5/31/67
APP	E. King	5/31/67
USED ON		

CODE IDENT NO. 20886

Rev 1/68
 HHH (8210)
 SO+ (C.P.) (8221)
 MR0 (8201)
 MR1 (8211)
 MR2 (8201)
 MR3 (8211)
 S1+ (8221)
 MΦ1 (8201)



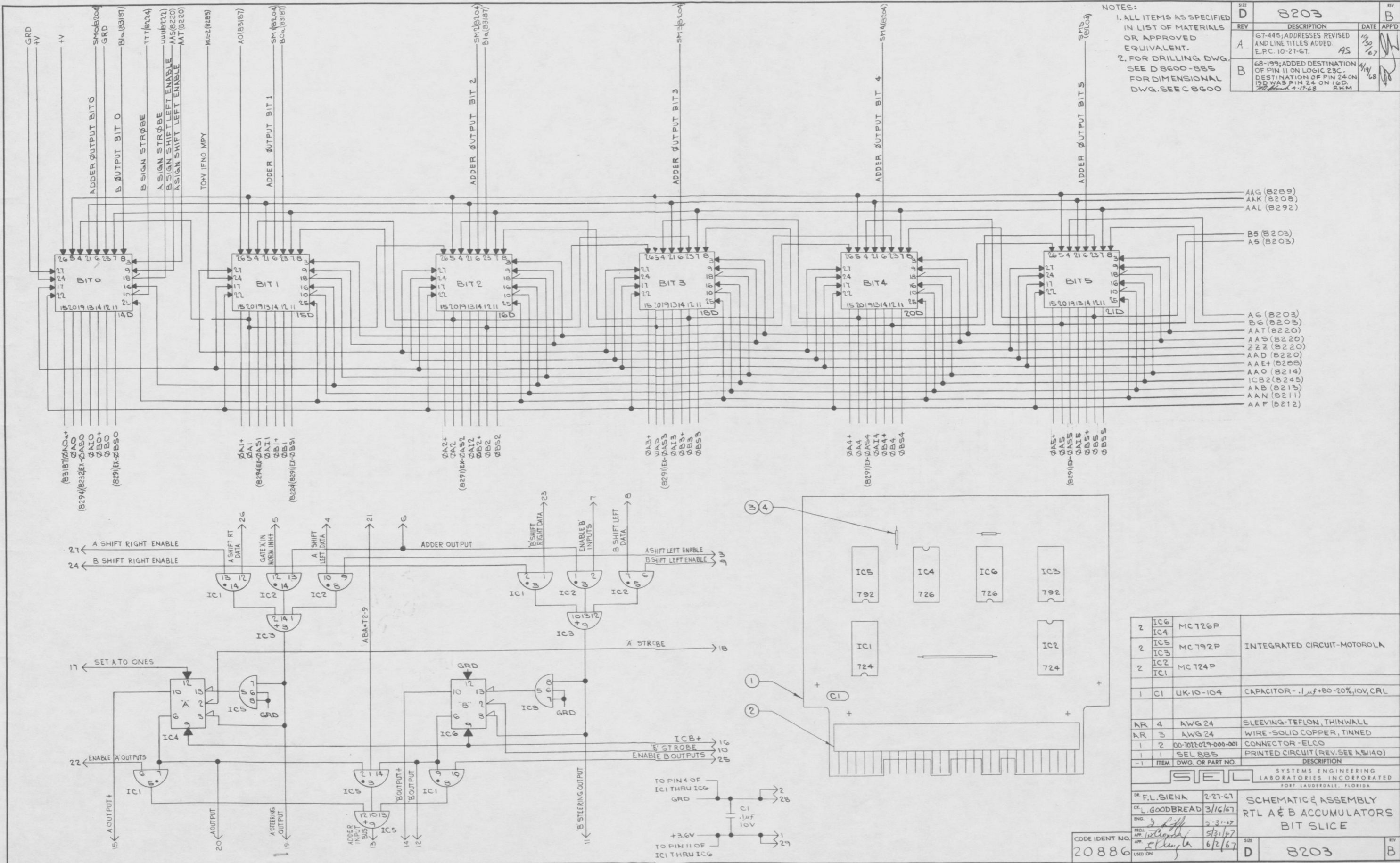
NOTES:
 1. ALL ITEMS AS SPECIFIED IN LIST OF MATERIAL OR APPROVED EQUIVALENT.
 2. UNLESS OTHERWISE SPECIFIED RESISTORS ARE ±5%, 1/4 W.
 3. FOR DRILLING DWG SEE DB600-882.
 FOR DIMENSIONAL DWG. SEE CB600.

REV	DESCRIPTION	DATE	APP'D
D	8202		
A	67-445; ADDRESSES REVISED; LINE TITLES ADDED.	10/30/67	
B	68-199; DESTINATION OF PINS 26 WAS ICB3 (8202).	4/18/68	

QTY	REF	PART NO.	DESCRIPTION
2	R2	RC076F471J	RESISTOR-470Ω, ALLEN BRADLEY
1	IC5	MCT92P	INTEGRATED CIRCUIT-MOTOROLA
4	IC6	MCT26P	INTEGRATED CIRCUIT-MOTOROLA
2	IC4	MCT24P	INTEGRATED CIRCUIT-MOTOROLA
2	C2	UK-10-104	CAPACITOR-.1μf±80-20%, 10V,CRL
AR 4	AWG 24		SLEEVING-TEFLON, THINWALL
AR 3	AWG 24		WIRE-SOLID COPPER, TINNED
1	2	00-7022-029-000-001	CONNECTOR-ELCO
1	1	SEL 882	PRINTED CIRCUIT (FOR REV. SEE A51140)
-1	ITEM	DWG. OR PART NO.	DESCRIPTION

DR	DATE	REV	DESCRIPTION
RKM	12-29-66		SCHEMATIC & ASSEMBLY
uc	12-30-66		RTL "T" REGISTER & INSTRUCTION REGISTER BIT SLICE
ENG	5-31-67		
APP	5/21/67		
APP	5/31/67		

CODE IDENT NO.
 20886



NOTES:

- ALL ITEMS AS SPECIFIED IN LIST OF MATERIALS OR APPROVED EQUIVALENT.
- FOR DRILLING DWG. SEE D 8600-885 FOR DIMENSIONAL DWG. SEE C 8600

REV	DESCRIPTION	DATE	APP'D
A	67-445; ADDRESSES REVISED AND LINE TITLES ADDED. E.P.C. 10-27-67.	10/30/67	AS
B	68-199; ADDED DESTINATION OF PIN 11 ON LOGIC 23C. DESTINATION OF PIN 24 ON 15D WAS PIN 24 ON 16D. 2/19/68 RKM	2/19/68	RKM

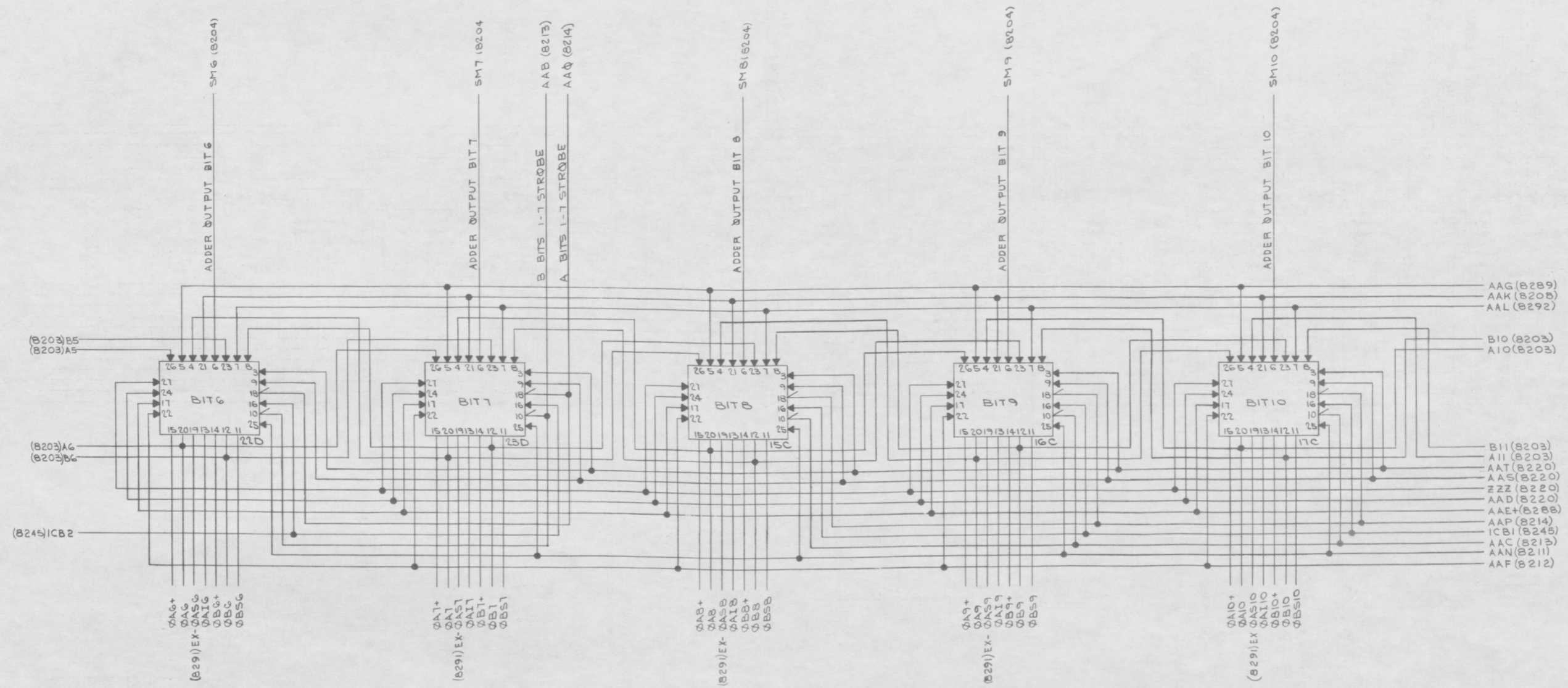
QTY	IC	DESCRIPTION
2	IC6	MC 726P
2	IC4	MC 726P
2	IC5	MC 792P
2	IC3	MC 792P
2	IC2	MC 724P
2	IC1	MC 724P
1	C1	UK-10-104 CAPACITOR-.1μf+80-20%,10V,CRL
NR 4	AWG 24	SLEEVING-TEFLON, THINWALL
NR 3	AWG 24	WIRE-SOLID COPPER, TINNED
1	2	00-1012-019-000-001 CONNECTOR-ELCO
1	1	SEL 885 PRINTED CIRCUIT (REV. SEE NS1140)
-1	ITEM	DWG. OR PART NO. DESCRIPTION

DR	DATE	DESCRIPTION
F.L. SIENA	2-27-67	SCHEMATIC & ASSEMBLY
L. GOODREAD	3/16/67	RTL A & B ACCUMULATORS
ENG. J. L. Liff	2-31-67	BIT SLICE
PROJ. APP. [Signature]	5/31/67	
APP. [Signature]	6/2/67	

CODE IDENT NO	20886	SIZE	D	REV	B
USED ON					

NOTES:
1. SEE SHEET 1

SIZE	D	8203	REV	B
REV		DESCRIPTION	DATE	APP'D
		SEE SHEET 1		



ITEM	DWG. OR PART NO.	DESCRIPTION
SEL SYSTEMS ENGINEERING LABORATORIES INCORPORATED FORT LAUDERDALE, FLORIDA		
DR F.L.SIENA	2-27-67	SCHEMATIC & ASSEMBLY RTL AEB ACCUMULATORS BIT SLICE
CL GOODREAD	3/16/67	
ENG. J. Duff	5-31-67	
PROJ. APP. J. Duff	5/31/67	
APP. E. King	6/2/67	

CODE IDENT NO.
20886

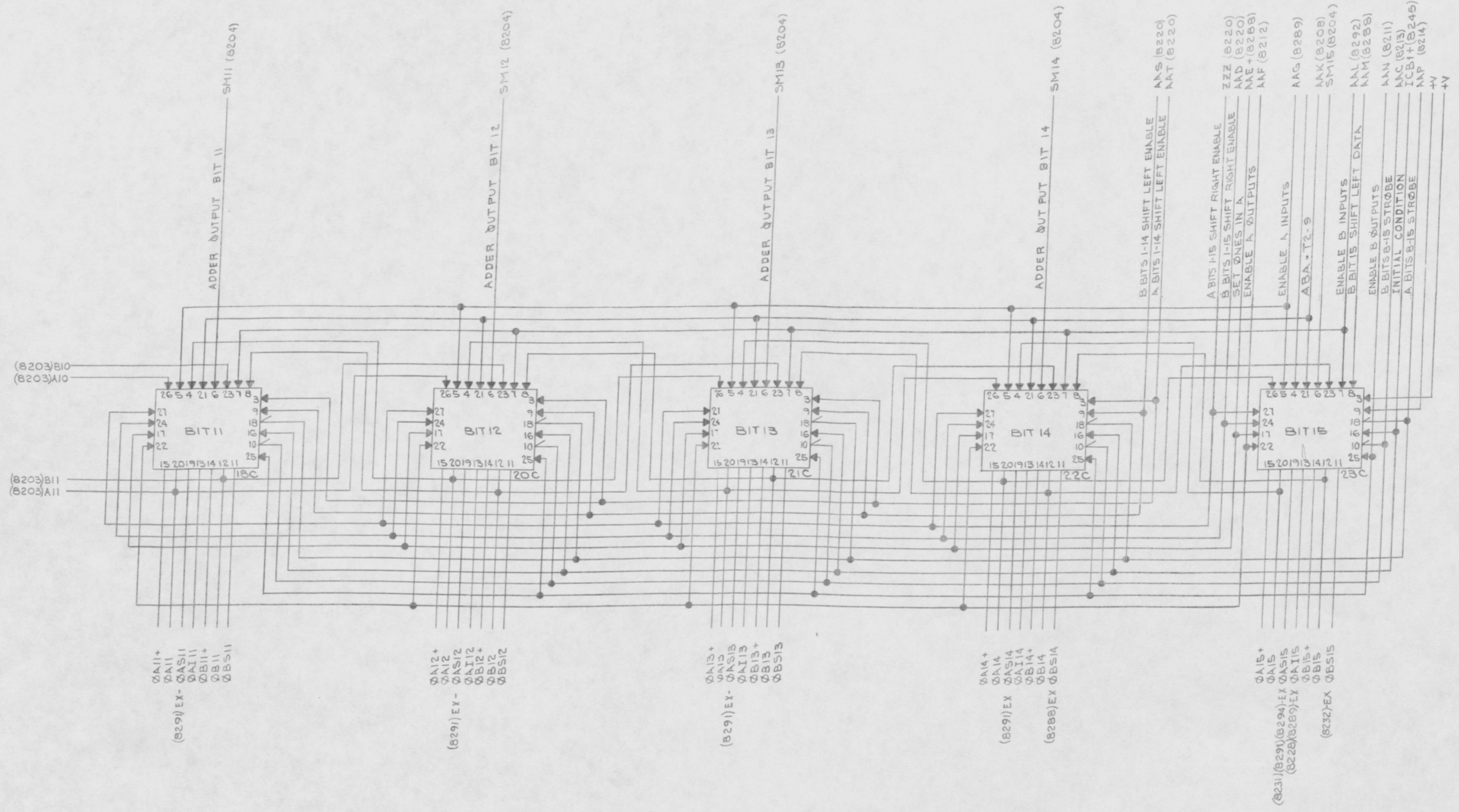
SIZE
D

8203

REV
B

NOTES:
1. SEE SHEET 1

REV	DESCRIPTION	DATE	APP'D
D	8203		B
SEE SHEET 1			

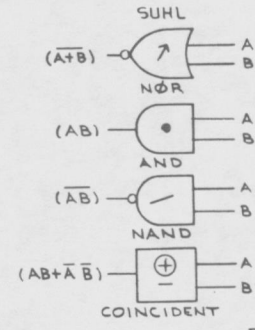
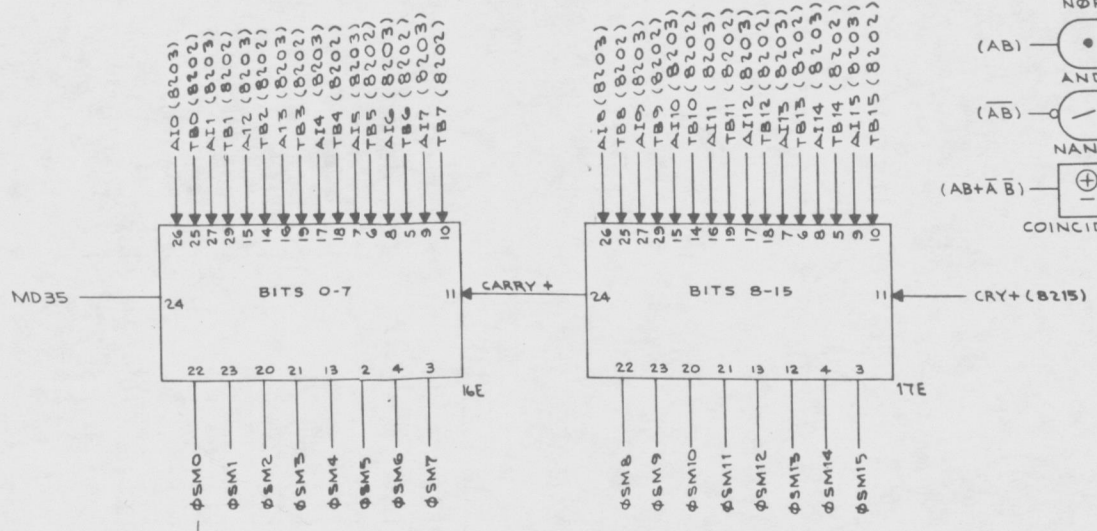
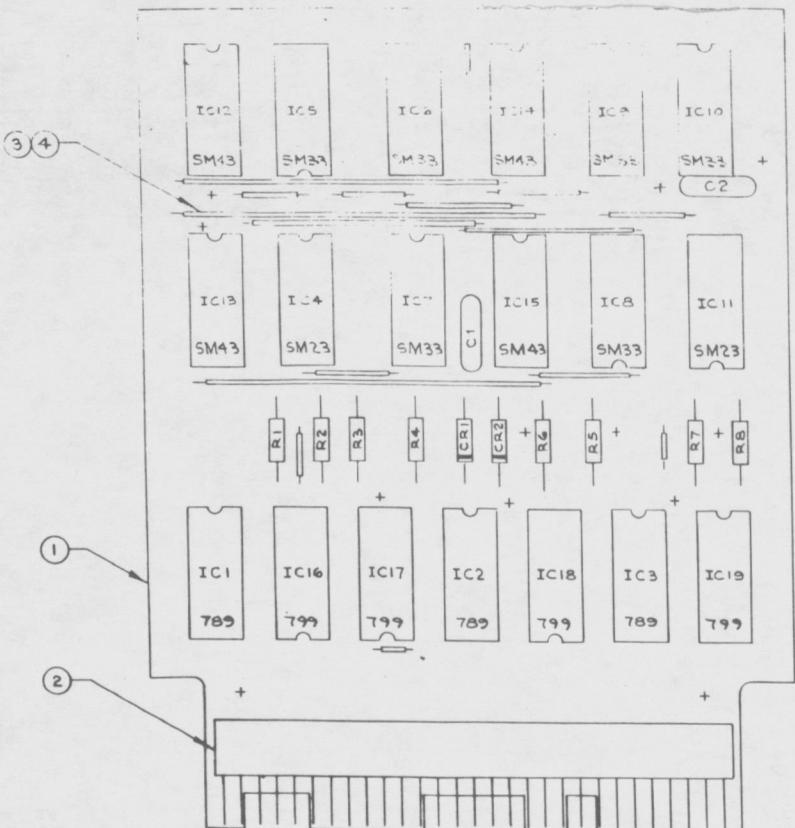


- B BITS 1-14 SHIFT LEFT ENABLE
- A BITS 1-14 SHIFT LEFT ENABLE
- AAS (8220)
- AAT (8220)
- A BIT 1-15 SHIFT RIGHT ENABLE
- B BITS 1-15 SHIFT RIGHT ENABLE
- SET ONES IN A
- ENABLE A OUTPUTS
- AAF (8212)
- ENABLE A INPUTS
- AAA (8289)
- ABA-T2-9
- ENABLE B INPUTS
- B BITS 15 SHIFT LEFT DATA
- ENABLE B OUTPUTS
- ANN (8211)
- ANN (8211)
- ANS (8213)
- TCBIT (8245)
- ANP (8214)
- +V
- V

ITEM	DWG. OR PART NO.	DESCRIPTION
SEL SYSTEMS ENGINEERING LABORATORIES INCORPORATED FORT LAUDERDALE, FLORIDA		
DR	F.L. SIENNA	2-28-67
CL	L. GOODBREAD	3/16/67
ENG.	<i>[Signature]</i>	5-31-67
PROJ. APP.	<i>[Signature]</i>	5/21/67
APP.	<i>[Signature]</i>	6/3/67
USED ON		

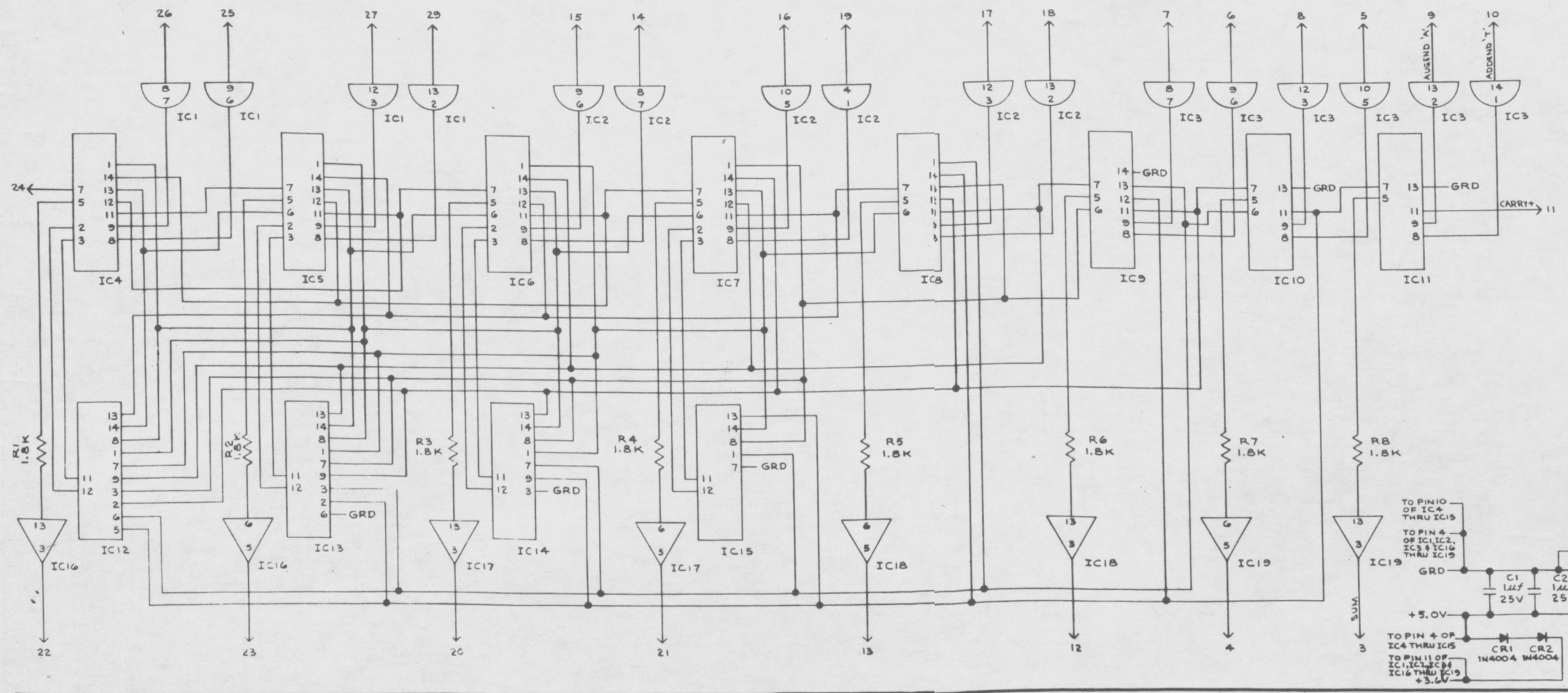
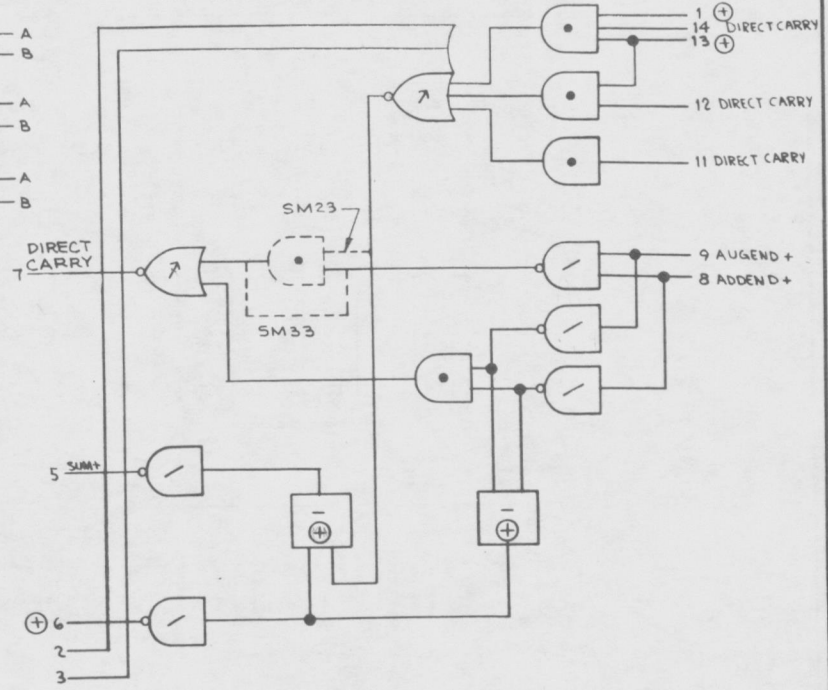
CODE IDENT NO
20886

SIZE	D	8203	REV	B
------	---	------	-----	---



NOTES:
 1. ALL ITEMS AS SPECIFIED IN LIST OF MATERIAL OR APPROVED EQUIVALENT.
 2. UNLESS OTHERWISE SPECIFIED RESISTORS ARE $\pm 5\%$, $1/4$ W.
 3. FOR DRILLING & DIMENSIONAL DWG SEE D13985.

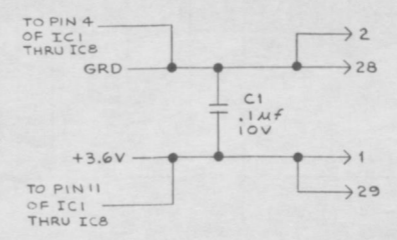
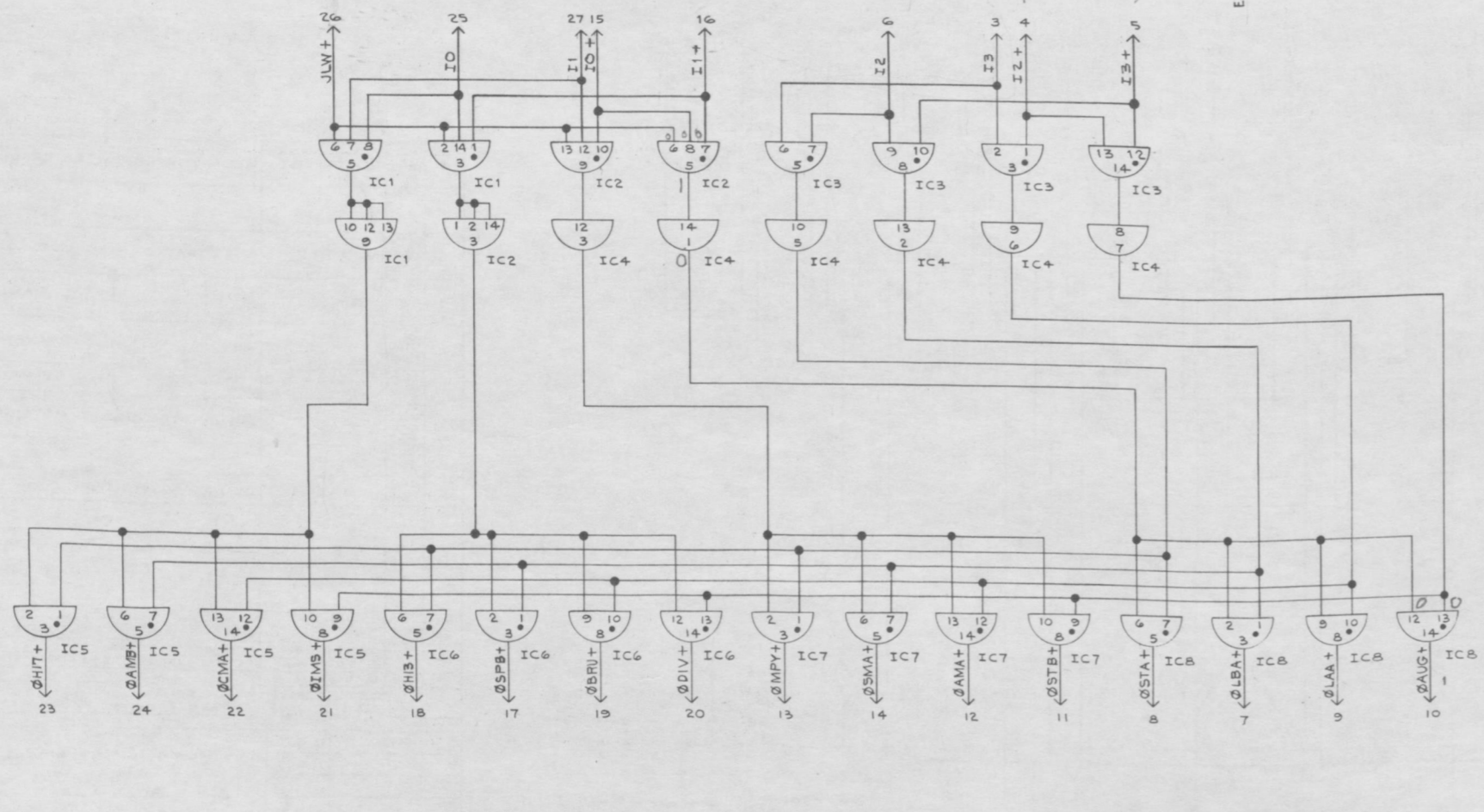
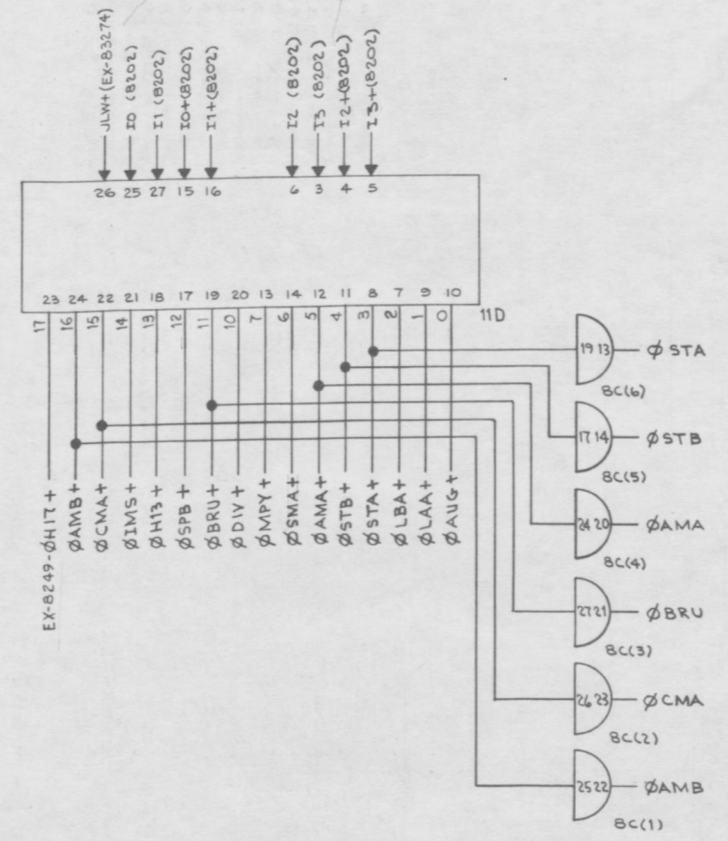
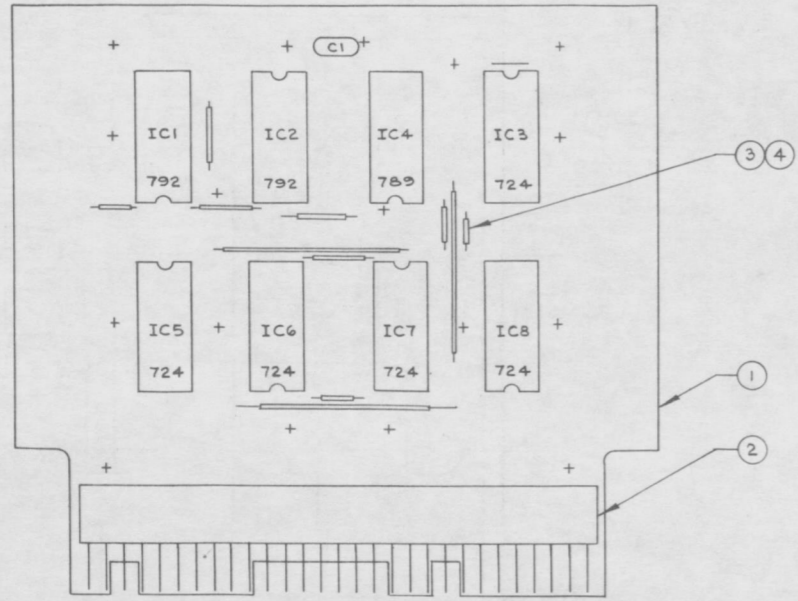
REV	DESCRIPTION	DATE	APP'D
A	67-445, ADDRESSES REVISED AND LINE TITLES ADDED A.S. 10/24/67	12/12/67	[Signature]



8	RB THRU R1	RC07GF182J	RESISTOR-1.8K, ALLEN BRADLEY
4	IC19 THRU IC16	MCT99P	INTEGRATED CIRCUIT-MOTOROLA
4	IC15 THRU IC12	SM43	-SYLVANIA
6	IC10 THRU IC5	SM33	-SYLVANIA
2	IC11 IC4	SM23	-SYLVANIA
3	IC3 IC2 IC1	MC789P	INTEGRATED CIRCUIT-MOTOROLA
2	CR2 CR1	1N4004	DIODE- MOTOROLA
2	C2 C1	5C13	CAPACITOR-144F $\pm 20\%$, 25 V, SPRAGUE
AR	4	AWG 24	SLEEVING-TEFLON, THINWALL (COLOR OPT.)
AR	3	AWG 24	WIRE-SOLID COPPER, TINNED
1	2	00-7022-025-000-001	CONNECTOR-ELCO
1	1	SEL 883	PRINTED CIRCUIT-FOR REV. SEE A81140
-1	ITEM	DWG. OR PART NO.	DESCRIPTION
SYSTEMS ENGINEERING LABORATORIES INCORPORATED FORT LAUDERDALE, FLORIDA			
DR	RKM	12-13-66	SCHEMATIC & ASSEMBLY RTL 8 BIT FULL ADDER
CK	WC	1-9-67	
ENGR	[Signature]	5/31/67	
PROJ. APP.	[Signature]	5/31/67	CODE IDENT NO. 20886
APP.	[Signature]	5/31/67	
USD ON			SIZE D 8204

NOTES:
 1. ALL ITEMS AS SPECIFIED IN LIST OF MATERIAL OR APPROVED EQUIVALENT.
 2. FOR DRILLING DWG. SEE D8600-B76.
 FOR DIMENSIONAL DWG. SEE C8600.

REV	DESCRIPTION	DATE	APP'D
D	8205		C
A	67-340; DUPLICATED NOMENCLATURE OF LOGIC TO SCHEMATIC. RMT 9/11/67 RKM	9/12/67	
B	67-445; ADDRESSES REVISED AND LINE TITLES ADDED. E.P.C. 10-24-67 CBW	10/13/67	
C	68-199; DESTINATION OF PIN 26 WAS STP+(8249). Modified 4-18-68 RKM	4/18/68	



1	IC4	MCT799P	INTEGRATED CIRCUIT-MOTOROLA
	IC8		
	IC7		
5	IC6	MCT724P	INTEGRATED CIRCUIT-MOTOROLA
	IC5		
	IC3		
	IC2		
2	IC1	MCT792P	INTEGRATED CIRCUIT-MOTOROLA
	IC1		
1	C1	UK10-104	CAPACITOR-.1uF+80-20%, 10V, CRL
AR 4	AWG 24		SLEEVING-TEFLON, THINWALL (385A)
AR 3	AWG 24		WIRE-SOLID COPPER, TINNED
1 2	00-7022-029-000-001		CONNECTOR-ELCO
1 1	SEL B76		PRINTED CIRCUIT-(FOR REV. SEE AS1140)
-1	ITEM	DWG. OR PART NO.	DESCRIPTION
 SYSTEMS ENGINEERING LABORATORIES INCORPORATED FORT LAUDERDALE, FLORIDA			
DE	RKM	11-3-66	SCHEMATIC & ASSEMBLY RTL OPERATION DECODER
CK	uc	12-29-66	
ENG		5-31-67	
PROJ. APP.		5731467	
APP.	R. Klingler	5/3/67	
USED ON			

CODE IDENT NO.
20886

SIZE	REV
D	C
8205	