



PRO-LOG
CORPORATION

STD 7000

7702

16K 2716 EPROM Card

USER'S MANUAL

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PRELIMINARY

7702 16K 2716 EPROM CARD USER'S MANUAL

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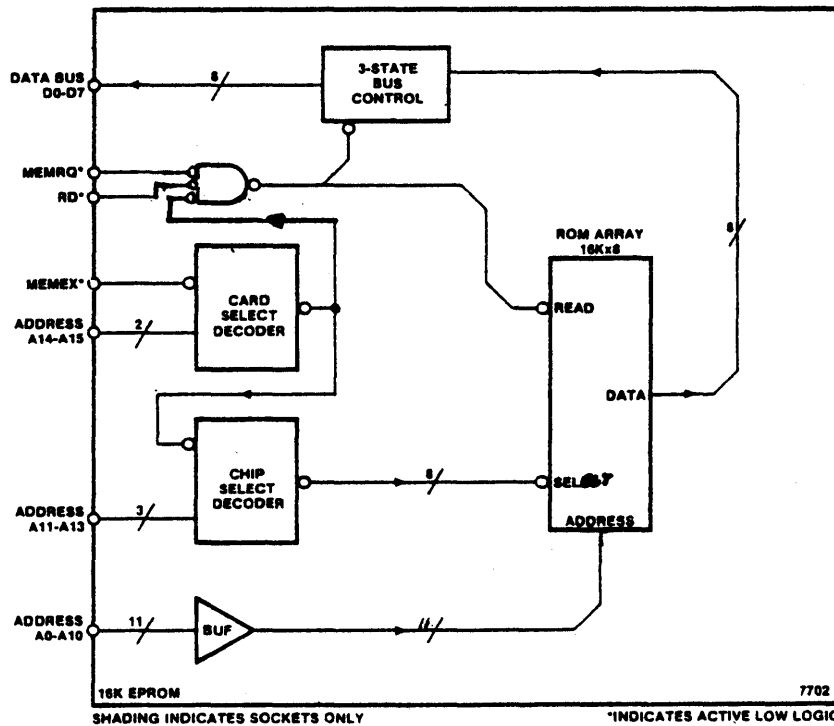
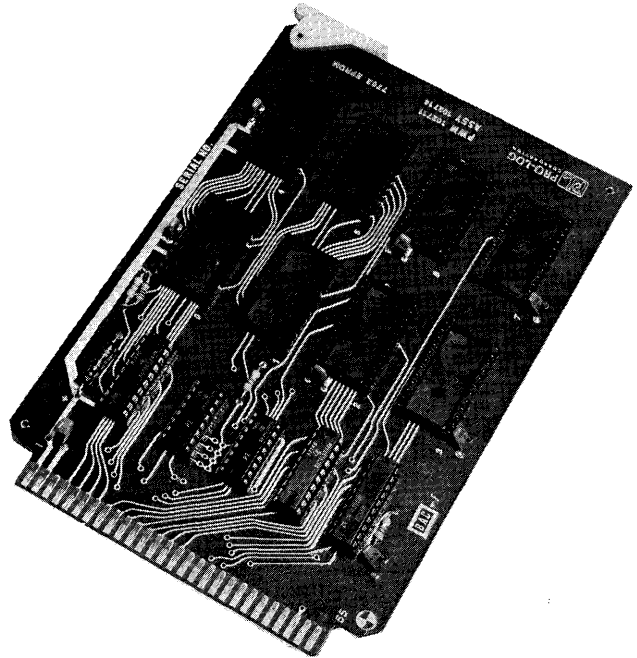
16K BYTE 2716 EPROM MEMORY CARD

This card provides sockets for up to 16,384 bytes of EPROM memory. The card uses 2716 EPROMs or equivalent and has sockets for 8 EPROMs.

The 7702 decodes 16 address lines and occupies 16K consecutive addresses. An on-card jumper system allows users to establish which quadrant of a 65K microprocessor memory each 7702 occupies.

FEATURES

- Sockets for 16K bytes ROM (2716 EPROMs)
- User selectable card address
- All STD BUS lines buffered
- Minimal logic bus loading
- All IC's socketed
- Single +5V operation
- Use Pro-Log D2002 2Kx8 EPROMs



7702, MEMORY CARD

FUNCTIONAL

Card Address Mapping

The 7702 is organized as one block of 16,384 consecutive EPROM addresses. The card is enabled by a decoded combination of address lines A14 and A15. The user chooses the card address combination by connecting a jumper wire to SX from one of four decoder outputs at a pad matrix adjacent to U2 (see diagram). The card is shipped with X1 connected to SX and therefore responds to Hex addresses 4000-7FFF. To map the memory to respond to a different segment of addresses use the 2K Memory Block mapping scheme as defined in the Series 7000 STD BUS Technical Manual.

Note that the card's data bus drivers are enabled anytime a valid address is present even if memory chips are not plugged in. The card address range is chosen to prevent bus contention with other system memory elements including Processor on-card memory, other memory cards and memory mapped I/O.

Plug-in EPROMs

Sockets numbered 0 through 7 are provided for eight +5V 2716 EPROM devices. Each of these 2048x8 devices adds 2K bytes of Read Only Memory, designated Memory Blocks 0-7 (MB0-MB7). Insert EPROMs to add memory blocks according to the following table. If the memory card mapping is changed use the table below and the Memory Address Map and Jumper Selection Table for 2K memory blocks to determine the new address range of each memory block.

ROM SOCKET	BLOCK MEMORY	ADDRESS RANGE AS SHIPPED
0	MB0	4000-47FF
1	MB1	4800-4FFF
2	MB2	5000-57FF
3	MB3	5800-5FFF
4	MB4	6000-67FF
5	MB5	6800-6FFF
6	MB6	7000-77FF
7	MB7	7800-7FFF

ROM Option

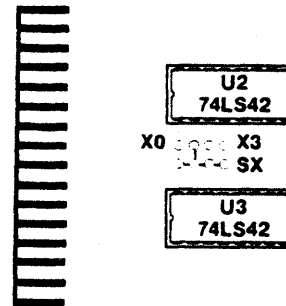
Type 2316E masked ROMs may be used in any combination with 2716 erasable PROMs. 2316E's increase card power consumption.

ELECTRICAL

- VCC = +5V ±5%
- ICC = 300 mA maximum (200 mA typical) with EPROM sockets fully loaded (100 mA maximum per EPROM selected, 25 mA standby)

MECHANICAL

- Meets all STD BUS general mechanical specifications.
- All EPROM sockets accept Pro-Log SZ-24 ZIF sockets for PROM program development.



Card Address Selection

STD/7702 EDGE CONNECTOR PIN LIST							
PIN NUMBER				PIN NUMBER			
OUTPUT (DRIVE)				OUTPUT (DRIVE)			
INPUT (LOADING)				INPUT (LOADING)			
MNEMONIC				MNEMONIC			
-5 VOLTS	VCC	2	1	VCC	-5 VOLTS		
GROUND	GND	4	3	GND	GROUND		
-5V		6	5	-5V			
D7		60 8	7	60	D3		
D6		60 10	9	60	D2		
D5		60 12	11	60	D1		
D4		60 14	13	60	D0		
A15	1	16	15	1	A7		
A14	1	18	17	1	A6		
A13	1	20	19	1	A5		
A12	1	22	21	1	A4		
A11	1	24	23	1	A3		
A10	1	26	25	1	A2		
A9	1	28	27	1	A1		
A8	1	30	29	1	A0		
RD*	1	32	31		WR*		
MEMRO*	1	34	33		IORQ*		
MEMEX*	1	36	35		IOEXP*		
MCSYNC*		38	37		REFRESH*		
STATUS 0*		40	39		STATUS 1*		
BUSRO*		42	41		BUSAK*		
INTRO*		44	43		INTAK*		
NMIRQ*		46	45		WAITRQ*		
PBRESET*		48	47		SYSRESET*		
CNTRL*		50	49		CLOCK*		
PC1	IN	52	51	OUT	PC0		
AUX GND		54	53		AUX GND		
AUX -V		56	55		AUX -V		

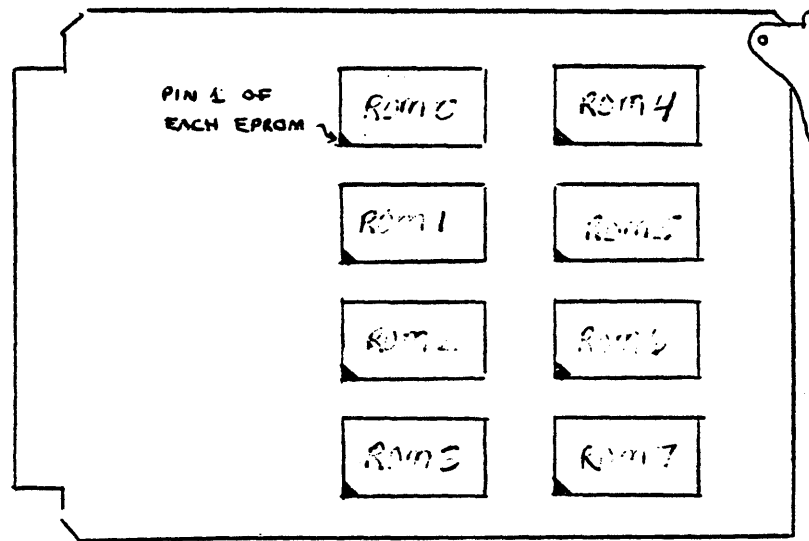
*Designates Active Low Level Logic

Edge Connector Pin List

SECTION 2

FUNCTIONAL DESCRIPTION

The 7702 card is organized to accept 8 each +5V 2716 EPROMs. Each of these devices adds 2048 8 bit bytes of READ ONLY MEMORY. Sockets are designated ROM 0 through ROM 7.



The 7702 is organized as one block of 16,384 consecutive ROM addresses. The card's data bus drivers are enabled any time a valid address for the card is present even if a ROM chip is not installed at that address.

SECTION 3

ROM OPTION

Type 2316E masked ROMs may be used in any combination with 2716 erasable PROMs. The 2316E masked ROMs increase the cards power consumption.

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SECTION 4

MAPPING

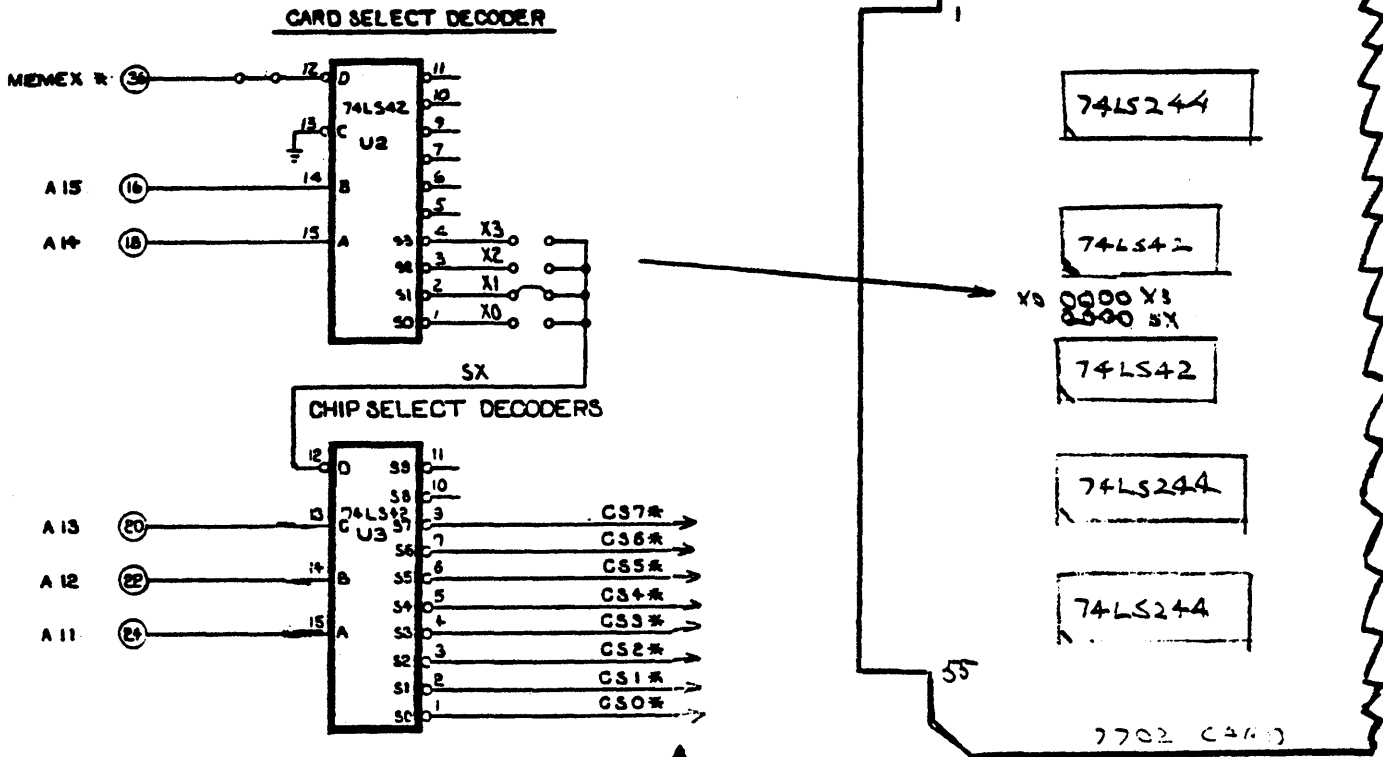
The 7702 card's 16K address block is selected by decoding address lines A15 and A14.

A15	A14	ADDRESS RANGE	JUMPER INSTALLED AT
0	0	0000-3FFF	X0
0	1	4000-7FFF	X1 (as shipped)
1	0	8000-BFFF	X2
1	1	C000-FFFF	X3

The card select decoding is implemented with a 74LS42 decoding chip (U2). The select line (SX) must be jumpered to one of the decoder output lines X0-X3. The card is shipped with the SX line jumpered to decoder output X1 and causes the card to respond to address range 4000 to 7FFF, hexadecimal.

Address lines A13, A12, and A11 are decoded for selection of a single ROM. Another 74LS42 decoding chip (U3) is used for this function.

A13	A12	A11	ROM SOCKET	ADDRESS WITH CARD SELECT SX TO			
				X0	X1	X2	X3
0	0	0	0	0000 - 07FF	4000 - 47FF	8000 - 87FF	C000 - C7FF
0	0	1	1	0800 - 0FFF	4800 - 4FFF	8800 - 8FFF	C800 - CFFF
0	1	0	2	1000 - 17FF	5000 - 57FF	9000 - 97FF	D000 - D7FF
0	1	1	3	1800 - 1FFF	5800 - 5FFF	9800 - 9FFF	D800 - DFFF
1	0	0	4	2000 - 27FF	6000 - 67FF	A000 - A7FF	E000 - E7FF
1	0	1	5	2800 - 2FFF	6800 - 6FFF	A800 - AFFF	E800 - EFFF
1	1	0	6	3000 - 37FF	7000 - 77FF	B000 - B7FF	F000 - F7FF
1	1	1	7	3800 - 3FFF	7800 - 7FFF	B800 - BFFF	F800 - BFFF



SCHEMATIC Chip select lines for ROM 0 through ROM 7

PAGE XX	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	JUMPER SELECT SX To ---		
0x			ROM 0										ROM 1					X0	16 K BLOCK
1x			ROM 2										ROM 3						
2x			ROM 3										ROM 6						
3x			ROM 4										ROM 7						
4x			ROM 7										ROM 1						16 K BLOCK
5x			ROM 7										ROM 3					X1	
6x			ROM 4										ROM 5						
7x			ROM 6										ROM 7						
8x			ROM 0										ROM 1						16 K BLOCK
9x			ROM 2										ROM 3					X2	
Ax			ROM 4										ROM 5						
Bx			ROM 6										ROM 7						
Cx			ROM 0										ROM 1						16 K BLOCK
Dx			ROM 2										ROM 3					X3	
Ex			ROM 4										ROM 5						
Fx			ROM 6										ROM 7						

Memory Address Map and Jumper Selection Table for 2K Memory Blocks

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SECTION 5 - ENVIRONMENTAL AND ELECTRICAL SPECIFICATIONS

Environmental

RECOMMENDED OPERATING LIMITS				ABSOLUTE NON-OPERATING LIMITS		
PARAMETER	MIN	TYP	MAX	MIN	MAX	UNITS
Free Air Temperature	0	25	55	-40	75	°C
Humidity	5		95 ①	0	95 ①	%RH

① Non-condensing

RECOMMENDED OPERATING LIMITS				ABSOLUTE NON OPERATING LIMITS		
PARAMETER	MIN	TYP	MAX	MIN	MAX	UNITS
V _{CC}	4.75	5.00	5.25	0.0	7.00	Volt
I _{CC} (fully populated)	---	200	300	--	--	mA

Each 2716 EPROM 100mA maximum when selected, 25mA on standby (CE* High).

STD/7702 EDGE CONNECTOR PIN LIST					
PIN NUMBER			PIN NUMBER		
OUTPUT (DRIVE)			OUTPUT (DRIVE)		
INPUT (LOADING)			INPUT (LOADING)		
MNEMONIC			MNEMONIC		
-5 VOLTS	VCC	2	1	VCC	-5 VOLTS
GROUND	GND	4	3	GND	GROUND
-5V		6	5		-5V
D7		8	7	D3	
D6		10	9	D2	
D5		12	11	D1	
D4		14	13	D0	
A15	1	16	15	1	A7
A14	1	18	17	1	A6
A13	1	20	19	1	A5
A12	1	22	21	1	A4
A11	1	24	23	1	A3
A10	1	26	25	1	A2
A9	1	28	27	1	A1
A8	1	30	29	1	A0
RD*	1	32	31		WR*
MEMRO*	1	34	33		IORQ*
MEMEX*	1	36	35		IOEXP*
MCSYNC*		38	37		REFRESH*
STATUS 0*		40	39		STATUS 1*
BUSRQ*		42	41		BUSAK*
INTRQ*		44	43		INTAK*
NMIRO*		46	45		WAITRQ*
PBRESET*		48	47		SYSRESET*
CNTRL*		50	49		CLOCK*
PC1	IN	52	51	OUT	PC0
AUX GND		54	53		AUX GND
AUX -V		56	55		AUX -V

*Designates Active Low Level Logic

7702 Edge Connector Pin List

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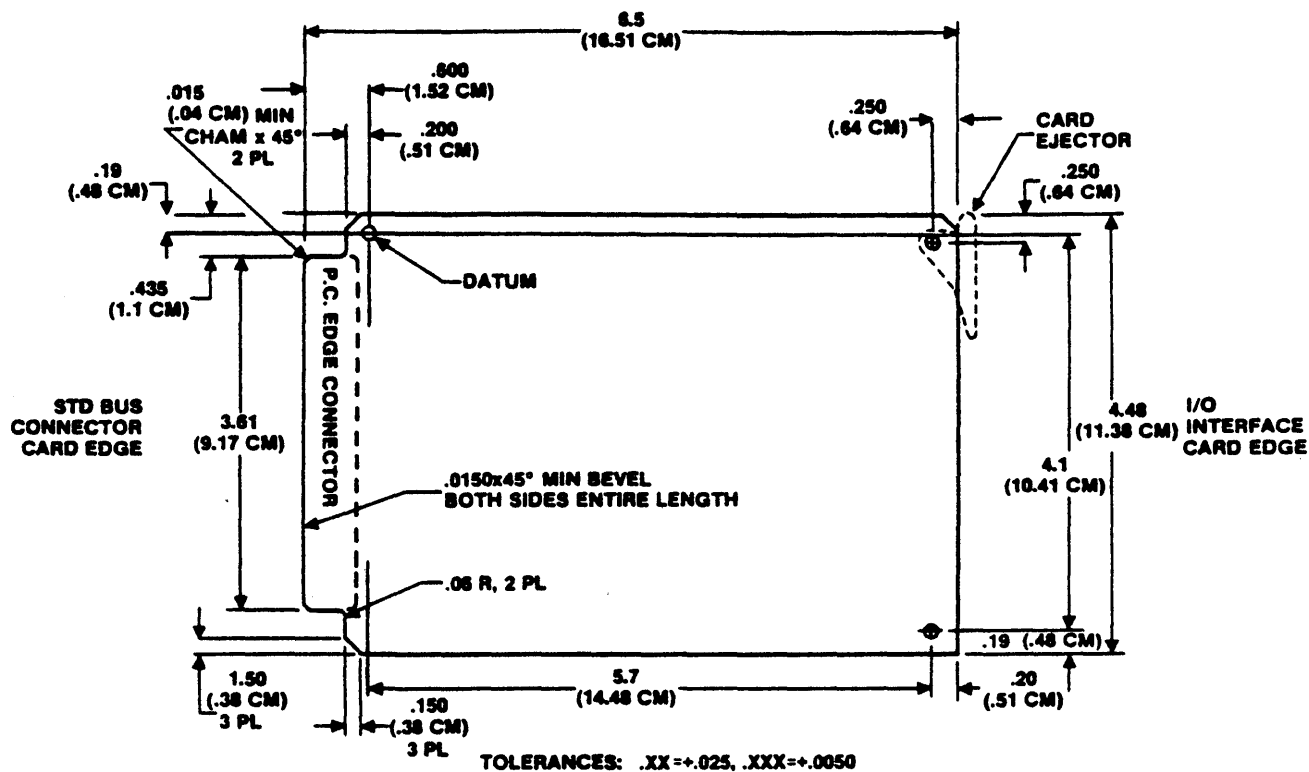
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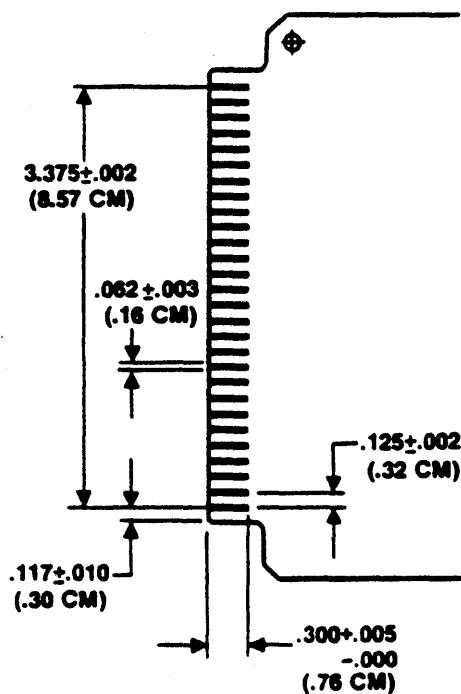
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6. MECHANICAL SPECIFICATIONS

The Series 7000 cards conform to the STD BUS standards, with the following additional requirements, including those shown in Figure 2-1.



Series 7000 STD BUS Standard Card Outline



Series 7000 STD BUS Edge Card Finger Specifications

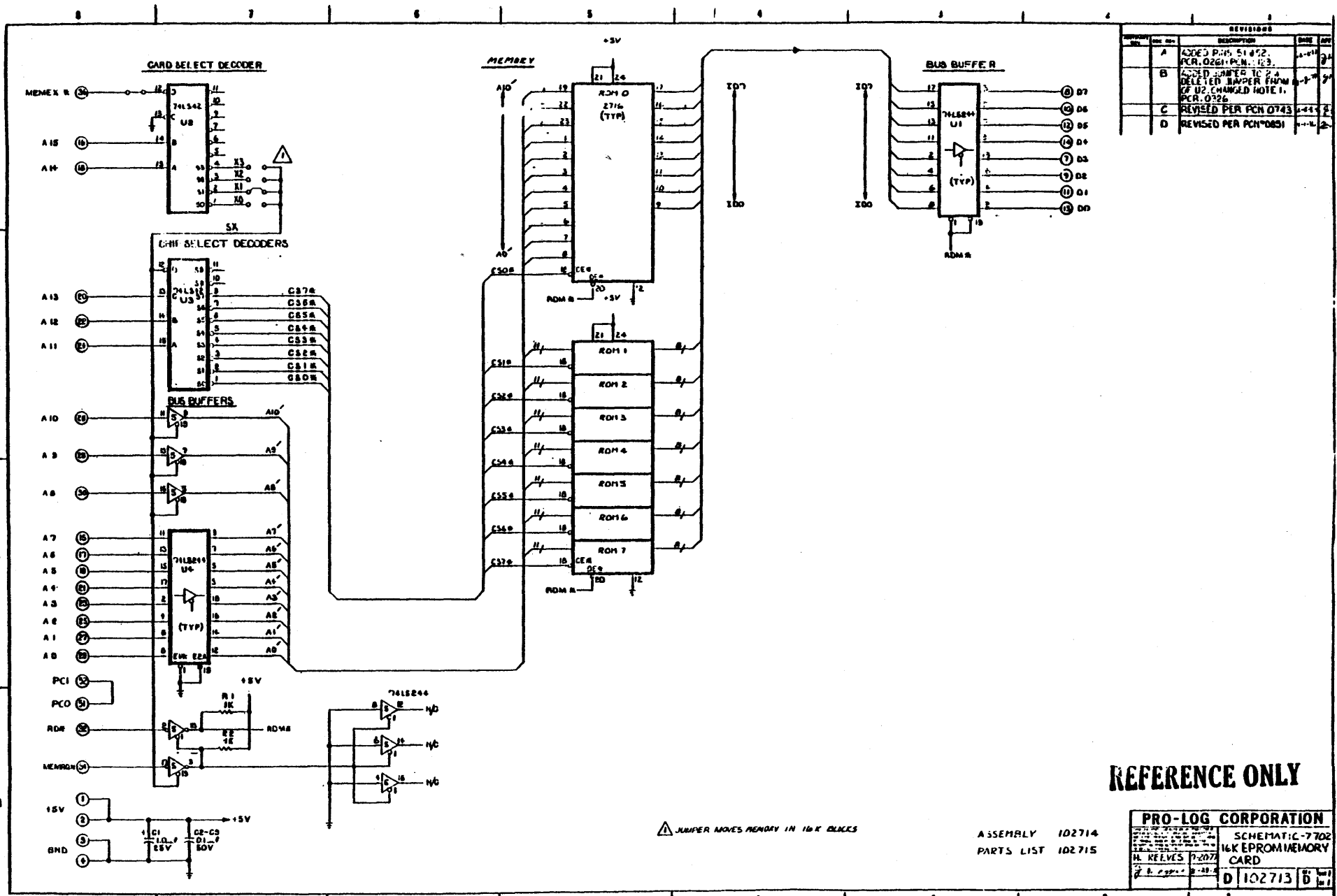
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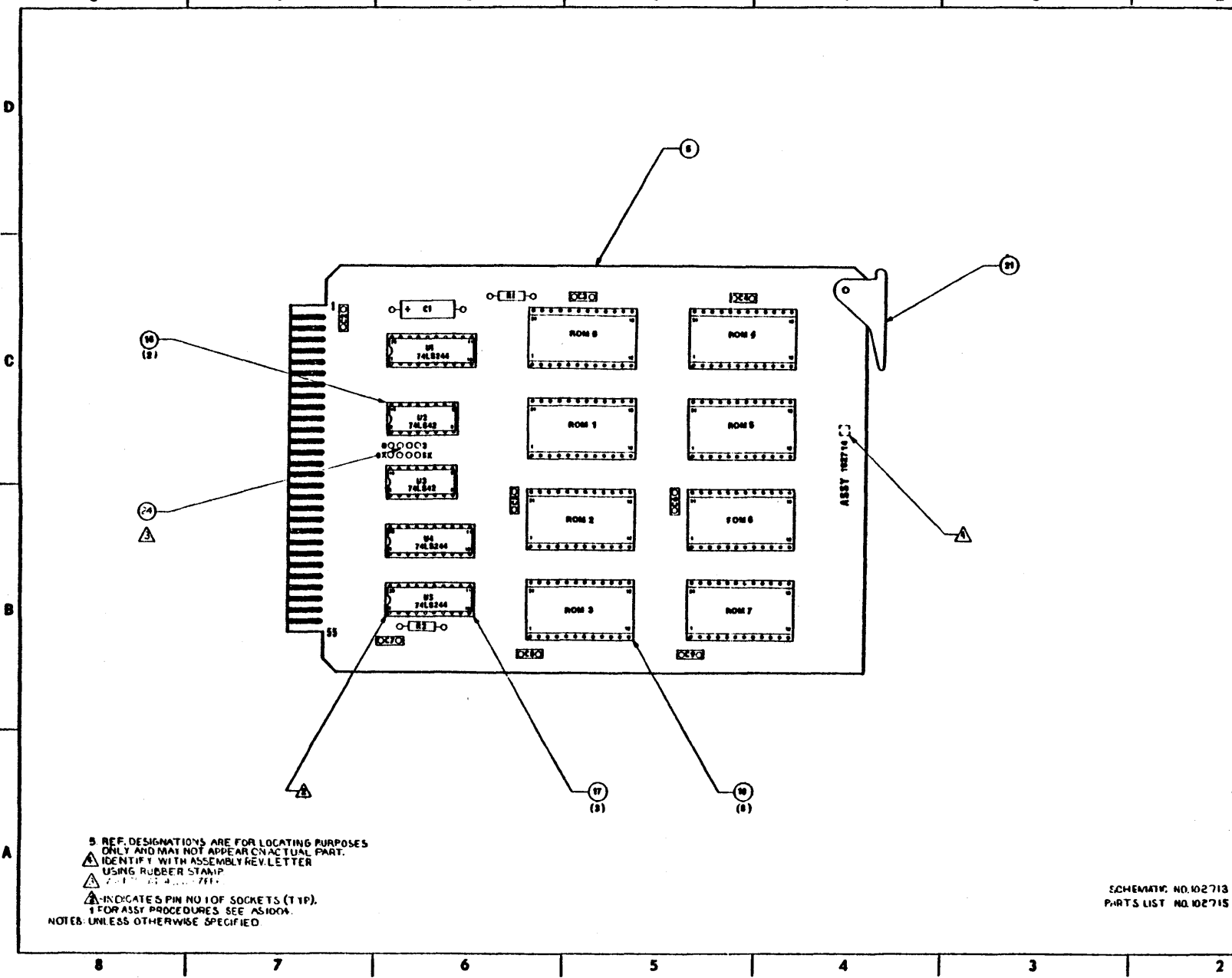
REVISIONS			
REV.	DATE	DESCRIPTION	BY
A	1-1-72	ADDED PINS 51 & 52, PCR. 0261, PCR. 0262.	...
B	1-1-72	ADDED JUMPER TO PINS 51 & 52, DELETED JUMPER FROM PINS 51 & 52, CHANGED NOTE 1, PCR. 0266.	...
C	1-1-72	REVISED PER PCR 0743.	...
D	1-1-72	REVISED PER PCR 0851.	...

REFERENCE ONLY

ASSEMBLY 102714
PARTS LIST 102715

PRO-LOG CORPORATION	
SCHEMATIC-7702	
16K EPROM MEMORY CARD	
H. REEVES 7-2077	
D 102713	D

REVISIONS			
REV.	DATE	DESCRIPTION	BY
B		REVISED PER ICA#0351	



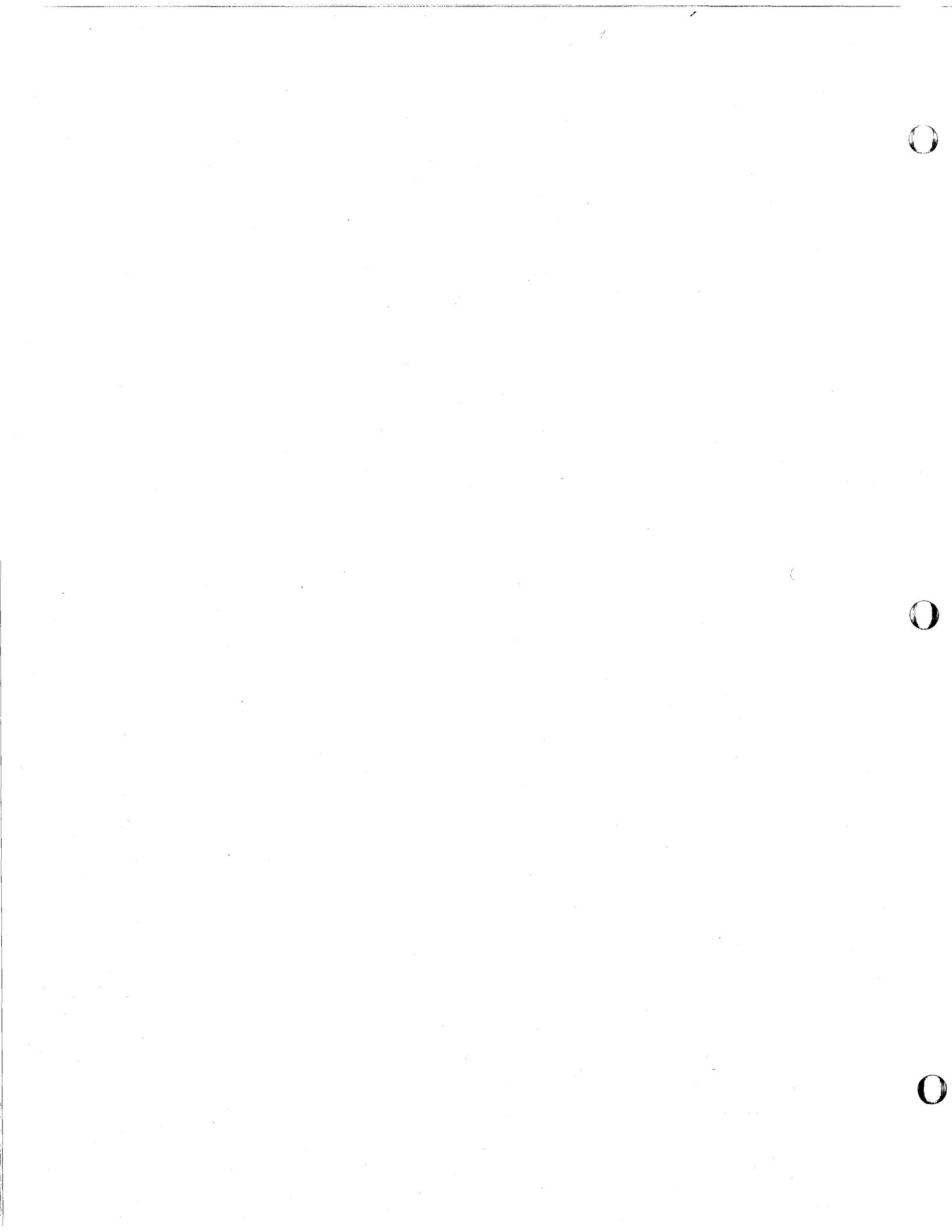
9 REF. DESIGNATIONS ARE FOR LOCATING PURPOSES ONLY AND MAY NOT APPEAR ON ACTUAL PART.
 ▲ IDENTIFY WITH ASSEMBLY REV. LETTER USING RUBBER STAMP.
 ▲ INDICATE PIN NO. OF SOCKETS (TYP).
 † FOR ASSY PROCEDURES SEE AS100A.
 NOTES: UNLESS OTHERWISE SPECIFIED

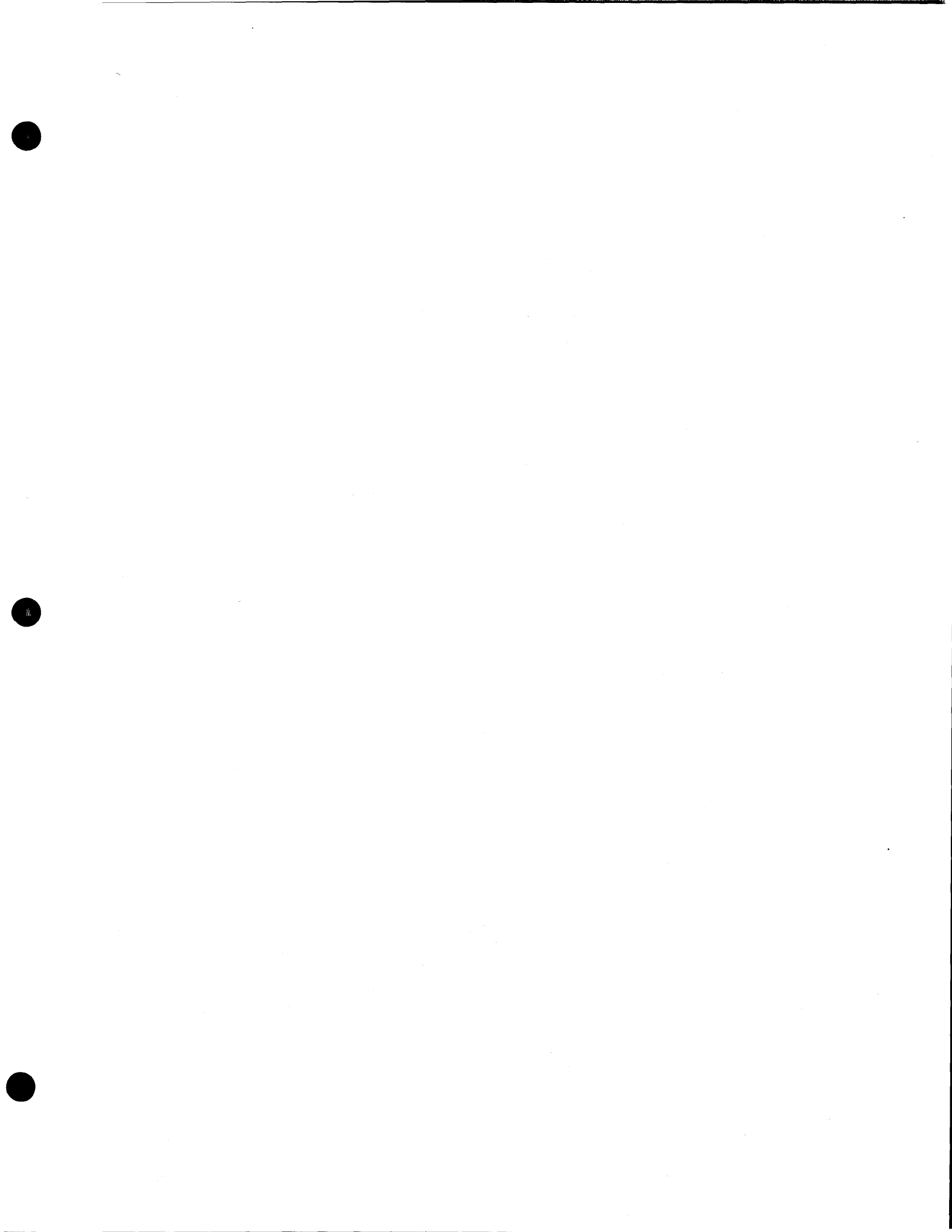
REFERENCE ONLY

SCHEMATIC NO. 102713
 PARTS LIST NO. 102715

ITEM	DESCRIPTION	REF. DESIGNATION
PRO-LOG CORPORATION		
		ASSEMBLY: 7702
		16K EPROM MEMORY CARD.
		CARD.
		D 102714

102715 Rev. A 9





USER'S MANUAL



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