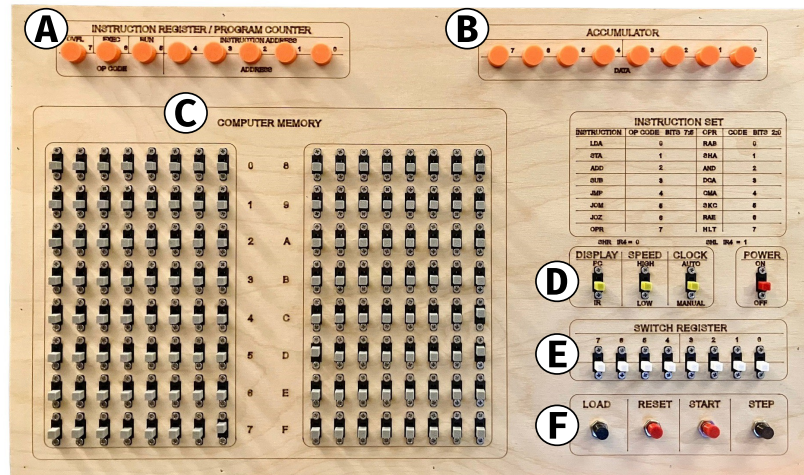


Programming the NRI 832 Reproduction

The NRI 832 was an 8-bit computer with 32 bytes of memory. It was created in 1971 to teach the basics of digital programming. Our modern 2026 reproduction was designed and built by Michael Gardi to “look-alike and work-alike”. The software emulation was written Josh Ensley.

<https://uwaterloo.ca/computer-museum/exhibits/nri832>



- A** INSTRUCTION REGISTER/PROGRAM COUNTER: Display current instruction or program state: left 3 bits show current operation, right 5 bits show next location. (See: DISPLAY)
- B** ACCUMULATOR: Display value of Register A (Accumulator).
- C** COMPUTER MEMORY: 16 rows of 8-bit memory. Up=1; Down=0.
- D** DISPLAY: Select INSTRUCTION REGISTER (IR) or PROGRAM COUNTER (PC) mode.
SPEED: In AUTO mode, select clock speed. (See CLOCK).
CLOCK: Select AUTO or MANUAL program execution.
POWER: Power on/off. Resets all memory.
- E** SWITCH REGISTER: One 8-bit row that can be transferred to Register A. (See: LOAD)
- F** LOAD: Push to transfer SWITCH REGISTER to Register A.
RESET: Push to reset all registers, including IR and PC.
START: Push to pause and unpause execution.
STEP: In MANUAL mode, push to advance to next program location.

NRI 832 Instruction Set

LDA	000nnnnn	Load contents at address nnnnn to Accumulator
STA	001nnnnn	Store contents of Accumulator to address nnnnn
ADD	010nnnnn	Add contents of address nnnnn to contents of Accumulator
SUB	011nnnnn	Subtract contents of address nnnnn from contents of Accumulator
JMP	100nnnnn	Jump program execution to address nnnnn.
JOM	101nnnnn	Jump-on-minus: If Accumulator is minus (left-most bit=1), jump program execution to address nnnnn.
JOZ	110nnnnn	Jump-on-zero: If Accumulator = 0, jump program execution to address nnnnn.
RAB	111uu000	Switch contents of Accumulator with Register B.
SHR	1110u001	Binary shift contents of Accumulator right.
SHL	1111u001	Binary shift contents of Accumulator left.
AND	111uu010	Applies binary AND to Accumulator and Register B.
DCA	111uu011	Decrement contents of Accumulator by 1.
CMA	111uu100	Set contents of Accumulator to ones-complement of itself.
SKC	111uu101	Skip instruction on condition (unused).
RAE	111uu110	Switch contents of Accumulator with contents of Register E.
HLT	111uu111	Halt execution.

nnnnnn refers to COMPUTER MEMORY addresses 0 to 31
u is an unused bit, and is ignored

Sample program: Add two numbers

- Switch POWER OFF then ON to reset all memory.
- Set COMPUTER MEMORY switches to the following:

0:	01000011	ADD 3	(Add contents of row 3 to Accumulator)
1:	01000100	ADD 4	(Add contents of row 4 to Accumulator)
2:	111--111	HLT	(Halt execution)
3:	00000110	(6)	(Data: 6)
4:	00000101	(5)	(Data: 5)
- Set DISPLAY to PC. Set SPEED to LOW. Set CLOCK to AUTO.
- Push START to begin execution. The PROGRAM COUNTER will increment, and the Accumulator display will show data value 6 (00000110), then result of 6+5 (00001011).
- Use the CODING FORM to write your own programs!



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NRI 832 REPRODUCTION CODING FORM

INSTRUCTIONS

OP		OPR
LDA	000	RAB
STA	001	SHA*
ADD	010	AND
SUB	011	DCA
JMP	100	CMA
JOM	101	SKC
JOZ	110	RAE
OPR	111	HLT
*SHR IR4=0;SHL IR4=1		

PROGRAM DESCRIPTION:

PROGRAMMER:

DATE:

LOCATION	INSTRUCTION (DATA)	BINARY	COMMENTS	LOCATION	INSTRUCTION (DATA)	BINARY	COMMENTS
0				0			
1				1			
2				2			
3				3			
4				4			
5				5			
6				6			
7				7			
8				8			
9				9			
A				A			
B				B			
C				C			
D				D			
E				E			
F				F			