absolute maximum ratings over free-air temperature (unless otherwise noted)

Supply Voltage, V_{CC} ——— 7v

Input Voltage, V_{in} ——— 5.5v

Operating Free-Air Temperature Range ——— 0°C to 70°C

Storage Temperature Range ——— -65°C to 150°C

recommended operating conditions

Supply Voltage, V_{CC} ——— 4.75v to 5.25v

Maximum Fan-Out From Outouts A,B,C,or D (connected in any of the three count modes) ——— 10

electrical characteristics, V_{CC} = 4.75v to 5.25v, T_A = 0°C to 70°C

	PARAMETER	MIN	TYP	MAX	UNIT
$V_{in(1)}$	Logical 1 input voltage	2			v
$V_{in(0)}$	Logical 0 input voltage			0-8	v
$V_{out(1)}$	Logical 1 output voltage at A,B,C,or D	2.4			v
$V_{out(0)}$	Logical 0 output voltage at A,B,C,or D			0.4	v
$I_{in(0)}$	$R_{0(1)}$ $R_{0(2)}$ $R_{9(1)}$ $R_{9(2)}$ logical 0 level input current			1.6	ma
$I_{in(0)}$	Input A logical 0 level input current			3.2	ma
$I_{in(0)}$	Input BD logical 0 level input current			6.4	ma
$I_{in(1)}$	$R_{0(1)}$ $R_{0(2)}$ $R_{9(1)}$ $R_{9(2)}$ logical 1 level input current			40	µa
$I_{in(1)}$	Input A logical 1 level input current			80	µa
$I_{in(1)}$	Input BD logical 1 level input current			160	µa
I_{OS}	Short circuit current at outputs A,B,C,or D ‡‡	20		55	ma
$I_{CC(av)}$	Average supply current		32		ma

‡‡ Not more than one output should be shorted to ground at a time

description and typical count configurations

The SN7490P is a high-speed, monolithic decade counter consisting of four internally; gated and interconnected, dual-rank, master-slave flip-flops. Gated direct reset lines are provided to inhibit count inputs and return all outputs to a logical zero or to a binary coded decimal (BCD) count of 9. The output from flip-flop A is not internally connected to the succeeding stages permitting operation in three independent count modes.

For use as a binary coded decimal decade counter, the BD input (pin ①) must be externally connected to the A output (pin ⑫). The A input receives the incoming count, and a count sequence is obtained in accordance with the BCD count sequence truth table shown above. In addition to a conventional zero reset, inputs are provided to reset a BCD 9 count for nine's compliment decimal applications.

If a symmetrical ÷ 10 count is desired for frequency synthesizers or other applications requiring division of a binary count by a power of ten, the D output (pin ⑪) must be externally connected to the A input (pin ⑭). The input count is then applied at the BD input (pin ①) and a ÷ 10 square wave is obtained at output A (pin ⑫).

For operation as a ÷ 2 counter and ÷ 5 counter, no external interconnections are required. Flip-flop A is used as a binary element for the ÷ 2 function. The BD input is used to obtain binary ÷ 5 operation at the B,C, and D outputs. In this mode, the two counters operate independently.

TRUTH TABLES

BCD COUNT SEQUENCE (See Note 1)

COUNT	OUTPUT D	C	B	A
0	0	0	0	0
1	0	0	0	1
2	0	0	1	0
3	0	0	1	1
4	0	1	0	0
5	0	1	0	1
6	0	1	1	0
7	0	1	1	1
8	1	0	0	0
9	1	0	0	1

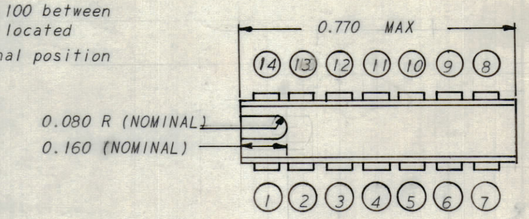
RESET (See Note 2)

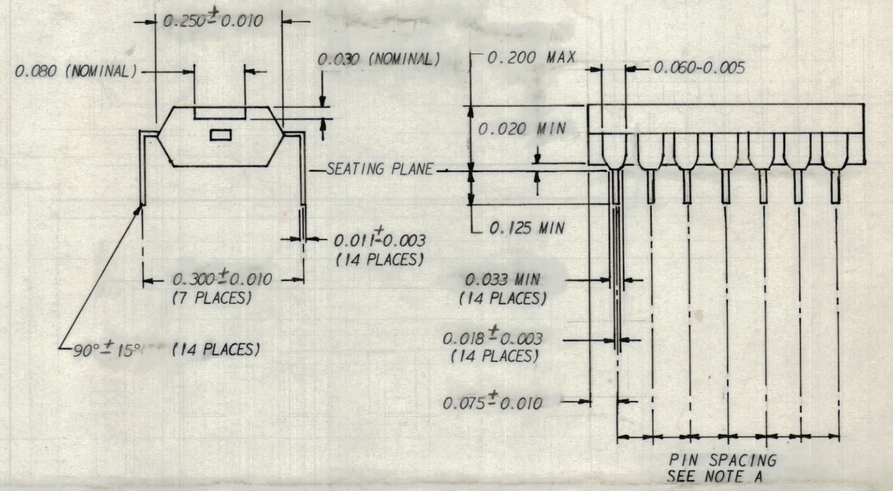
R_0	R_9	OUTPUT D	C	B	A
0	1	0	0	0	0
1	0	1	0	0	1
0	0	1	0	0	1
1	1	COUNT			

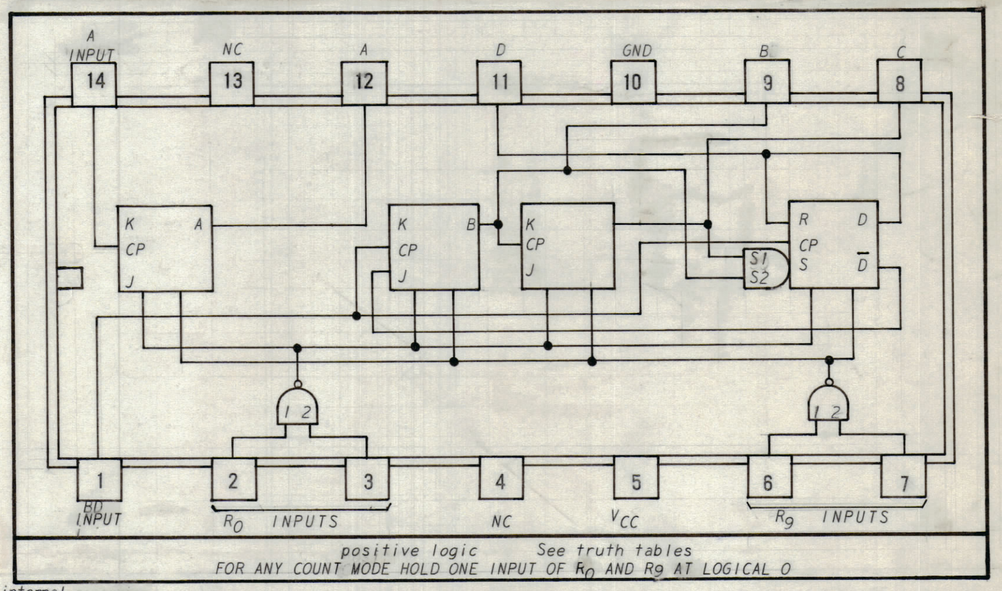
NOTES; 1. Pin ① must be connected to pin ⑫ for BCD count.

2. $R_0 = \overline{R_{0(1)} \cdot R_{0(2)}}$ and $R_9 = \overline{R_{9(1)} \cdot R_{9(2)}}$

NOTES: A. The true-position pin spacing is .100 between centerlines. Each pin centerlines is located within ±0.010 of its true longitudinal position relative to pin ① and ⑭.







NC- No internal connection

ZONE	LTR	DESCRIPTION	DATE	E.M.N.NO	DRAFT	CHKD	APPD
	X1	MMX-1 ADDED & UPDATED	5-2-67				
	Ø	ORIG RELEASE FOR PRODUCTION	5-25-67	Ø	RG		

REVISIONS

QTY. REQ.	ITEM	PART NO.	DESCRIPTION	SYMBOL
		Pose		

LIST OF MATERIAL

	MMX-1	
	VOX-7	A4475
QTY / UNIT	MODEL USED ON	ASS'Y NO.

APPLICATION

CODE C | S401-265 (SN7490N

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES AND INCLUDE CHEMICALLY APPLIED OR PLATED FINISHES

TOLERANCES ON

DECIMALS .X ± .05, .XX ± .01, .XXX ± .005

FRACTIONS ± 1/64

ANGLES ± 0° 30'

MATERIAL PLASTIC

FINISH

FINAL APPROVAL		DATE 5/25/67
MECH. DES.		DATE
ELECT. DES.	Jack & Zaraya	DATE MAY 24, 1967
CHECKED	Hde	DATE 1-13-67
DRAWN	KAUFFMAN	DATE 1-13-67
	M/L Allen	5/25/67

THE TECHNICAL MATERIEL CORP.
MAMARONECK, NEW YORK

NETWORK, DECADE COUNTER

SIZE	CODE IDENT.NO.	DWG NO.	ISSUE
C	82679	NW 134	Ø

SCALE NONE SHEET OF

NW 134 Ø B

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FCI-10-170 (10-66)