CUT ALONG THIS LINE

RADIO CONSTRUCTORS DATA SHEET 14

MULTIVIBRATOR C-R VALUES

In a symmetrical germanium transistor square wave multivibrator, frequency is approximately equal to $\frac{1}{1{\cdot}4CR}$ where C is either of the cross-coupling capacitors and R is either of the base-to-V_{cc} resistors. The Table gives worked R values to 2 significant figures against C and frequency. In general, R values between 10 and 100kΩ will be most commonly employed in practice. With silicon transistors, frequencies will tend to be slightly lower than those shown.

Frequency	500pF	1,000pF	2,000pF	5,000pF	0·01μF	0·02μF	0·05μF	0·1μF	0·2μF	0·5μF
50c/s						710kΩ	290kΩ	140kΩ	71kΩ	29kΩ
100c/s					710kΩ	360kΩ	140kΩ	71kΩ	36kΩ	14kΩ
150c/s				960kΩ	480kΩ	240kΩ	96kΩ	48kΩ	24kΩ	9·6kΩ
200c/s				710kΩ	360kΩ	180kΩ	71kΩ	36kΩ	18kΩ	7·1kΩ
300c/s				480kΩ	240kΩ	120kΩ	48kΩ	24kΩ	12kΩ	4·8kΩ
400c/s			890kΩ	360kΩ	180kΩ	89kΩ	36kΩ	18kΩ	8·9kΩ	3·6kΩ
500c/s			710kΩ	290kΩ	140kΩ	71kΩ	29kΩ	14kΩ	7·1kΩ	2·9kΩ
750c/s		960kΩ	480kΩ	190kΩ	96kΩ	48kΩ	19kΩ	9·6kΩ	4·8kΩ	1·9kΩ
1,000c/s		710kΩ	360kΩ	140kΩ	71kΩ	36kΩ	14kΩ	7·1kΩ	3·6kΩ	1·4kΩ
2,000c/s	710kΩ	360kΩ	180kΩ	71kΩ	36kΩ	18kΩ	7·1kΩ	3·6kΩ	1·8kΩ	
3,000c/s	480kΩ	240kΩ	120kΩ	48kΩ	24kΩ	12kΩ	4·8kΩ	2·4kΩ	1·2kΩ	
4,000c/s	360kΩ	180kΩ	89kΩ	36kΩ	18kΩ	8·9kΩ	3·6kΩ	1·8kΩ		
5,000c/s	290kΩ	140kΩ	71kΩ	29kΩ	14kΩ	7·1kΩ	2·9kΩ	1·4kΩ		
7,500c/s	190kΩ	96kΩ	48kΩ	19kΩ	9·6kΩ	4·8kΩ	1·9kΩ			
10,000c/s	140kΩ	71kΩ	36kΩ	14kΩ	7·1kΩ	3·6kΩ	1·4kΩ			

CUT ALONG THIS LINE

RC/DS/15

RADIO CONSTRUCTORS DATA SHEET 15

WINDING TEMPERATURE TABLE

Resistance increase (%)	Temperature above ambient (°C)	Resistance increase (%)	Temperature above ambient (°C)
1	3	21	54
2	5	22	56
3	8	23	59
4	10	24	62
5	13	25	64
6	15	26	67
7	18	27	69
8	21	28	72
9	23	29	74
10	26	30	77
11	28	31	79
12	31	32	82
13	33	33	84
14	36	34	87
15	38	35	90
16	41	36	92
17	44	37	95
18	46	38	97
19	49	39	100
20	51	40	103

To find the winding operating temperature of power inductors wound with copper wire (e.g. mains transformers, TV line output transformers and deflector coils, etc.) measure winding resistance cold then repeat after the component has reached operating temperature. The Table gives winding temperature above ambient for percentage increase in resistance. (Temperature coefficient of annealed copper = 0·0039.)

Example. In an ambient temperature of 18°C, the resistance of a winding increases from 20Ω cold to 24Ω hot (= 20% rise). Winding operating temperature is 18°C plus 51°C=69°C.

RC/DS/16

RADIO CONSTRUCTORS DATA SHEET 16

BINARY-DECIMAL CONVERSION TABLES

In binary numbers the radix is 2 (as compared with 10 in decimal numbers) with the result that digits, from right to left, represent the series 1, 2, 4, 8, 16, etc. Thus, binary 11001 represents a 1, no 2, no 4, an 8, and a 16, and is equal to $1+8+16=25$ in decimal.

Digits to the right of the binary point (equivalent to the decimal point) represent negative powers of 2. Thus, binary 0·101 represents $\frac{1}{2}$, no $\frac{1}{4}$, and $\frac{1}{8}=\frac{5}{8}=0{\cdot}625$ in decimal.

The Tables give series of binary and decimal equivalents for numbers below and above unity, illustrating also how the decimal equivalent is made up.

Numbers above unity			Numbers below unity		
Binary number	Break-up into decimal	Decimal equivalent	Binary number	Break-up into decimal	Decimal equivalent
0	0	0	0·1111	$\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}$	0·9375
1	1	1	0·111	$\frac{1}{2}+\frac{1}{4}+\frac{1}{8}$	0·875
10	2+0	2	0·1101	$\frac{1}{2}+\frac{1}{4}+0+\frac{1}{16}$	0·8125
11	2+1	3	0·11	$\frac{1}{2}+\frac{1}{4}$	0·75
100	4+0+0	4	0·1011	$\frac{1}{2}+0+\frac{1}{8}+\frac{1}{16}$	0·6875
101	4+0+1	5	0·101	$\frac{1}{2}+0+\frac{1}{8}$	0·625
110	4+2+0	6	0·1001	$\frac{1}{2}+0+0+\frac{1}{16}$	0·5625
111	4+2+1	7	0·1	$\frac{1}{2}$	0·5
1000	8+0+0+0	8	0·0111	$0+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}$	0·4375
1001	8+0+0+1	9	0·011	$0+\frac{1}{4}+\frac{1}{8}$	0·375
1010	8+0+2+0	10	0·0101	$0+\frac{1}{4}+0+\frac{1}{16}$	0·3125
1011	8+0+2+1	11	0·01	$0+\frac{1}{4}$	0·25
1100	8+4+0+0	12	0·0011	$0+0+\frac{1}{8}+\frac{1}{16}$	0·1875
1101	8+4+0+1	13	0·001	$0+0+\frac{1}{8}$	0·125
1110	8+4+2+0	14	0·0001	$0+0+0+\frac{1}{16}$	0·0625
1111	8+4+2+1	15			
10000	16+0+0+0+0	16			
100000	32+0+0+0+0+0	32			
1000000	64+0+0+0+0+0+0	64			