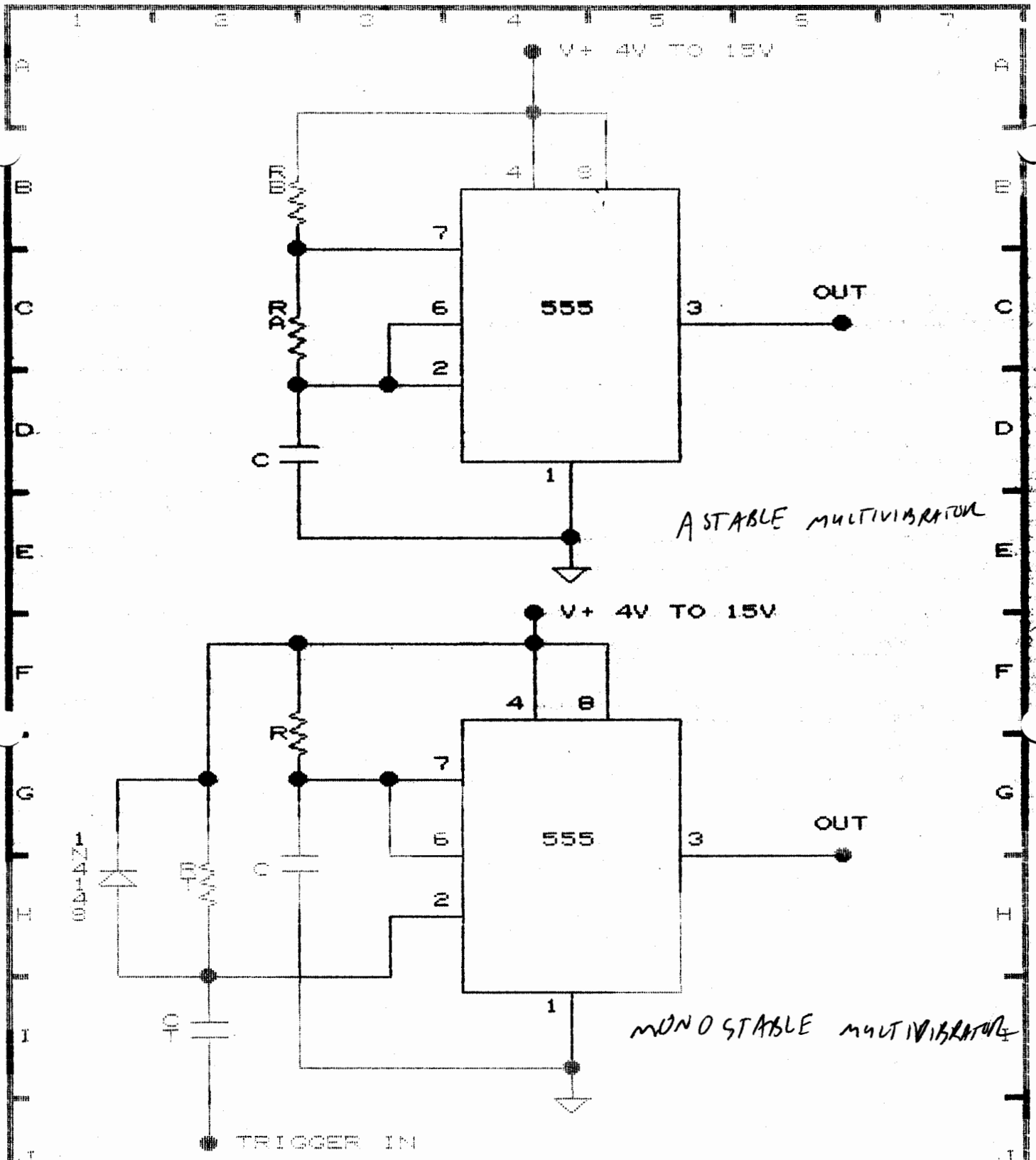
TABLE OF CONTENTS



555 TIMER PROGRAM
SCHEMATIC DIAGRAMS

FRASER TECHNOLOGIES
P.O. BOX 4255
VANCOUVER, B.C.

Dwn	D. FRASER
Eng	D. FRASER
Chk	
Dwg	555 TIMER
Rev	
Date	DEC. 5/88

2. THE 555 TIMER

LOAD "555"

The 555 timer is one of the most useful integrated circuits ever invented. It has myraid uses ut most applications are a variation of the astable and monostale multivibrators. These are the applications we deal with here.

VARIABLES - In the program we deal with RA, RB and C as the astable's variales while R and C are the monostable's variables. RB in most cases is assumed to be 1000 ohms as this gives us a duty cycle closest to the most desired 50%.

LIMITATIONS - Do not use resistor values over 10 Meg Ohms as the IC's leakage current will cause timing variations. For the same reason C should not exceed 5 uFd. If you must exceed 5 uFd the use of a tantalum capacitor is recommended.

Stray capacitance will cause problems if C is under 220 pFd while excessive current will be drawn if R or RB is under 1000 ohms and device destruction will occur under 100 ohms. If RA is under 100 ohms, you may damage the discharge pin (pin 7).

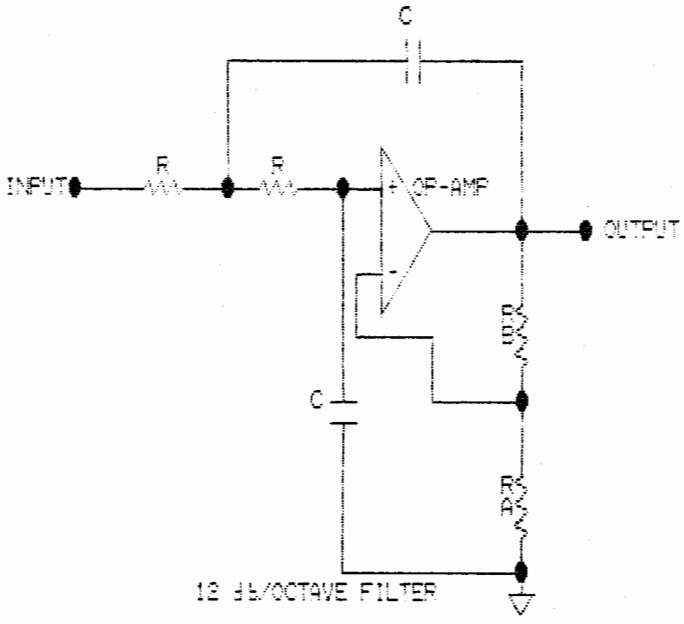
If the frequency desired is under .05 Hertz or the time period is over 20 seconds, use of the 4060 timer circuit is suggested. This is due to excessive values of R and C required to achieve the desired time constant.

PROGRAM FEATURES - The main menu fully menu driven and covers all possibilities of unknowns. The output gives both the theoretical values and also returns the nearest actual value in the "E24" or 5% series of components.

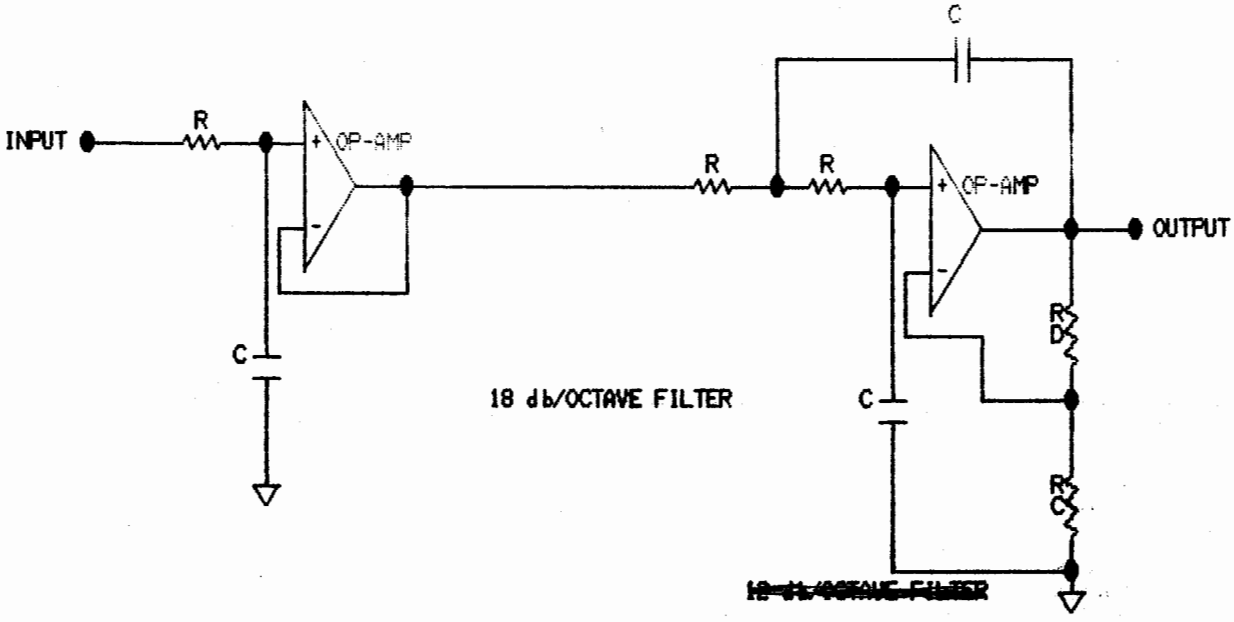
In addition each output table gives you back your input values, the calculated frequency or time period using the standard values and the deviation from your desired frequency or time period the standard values give you. The astable output table also includes the duty cycle of the 555's output.

The 555 monostable circuit triggers on the negative going edge of the input pulse which means pin 2 must be pulled low to trigger. The input must return high before the timer times out. It is customary that the the time pin 2 is pulled low be about 10% of timer output period. The program automatically outputs appropriate values for an RC network (components Rt and Ct on the schematic) to allow this.

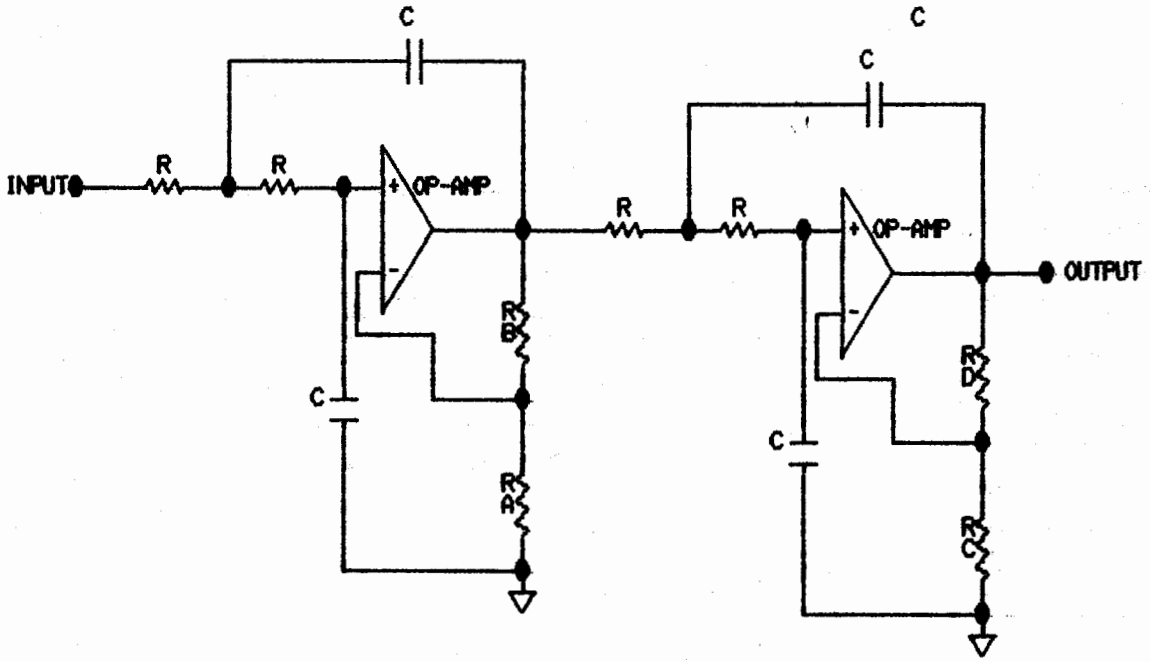
If your source pulse is normally high and short enough so it does not interfere with the timing then the input may be connected directly to pin 2.



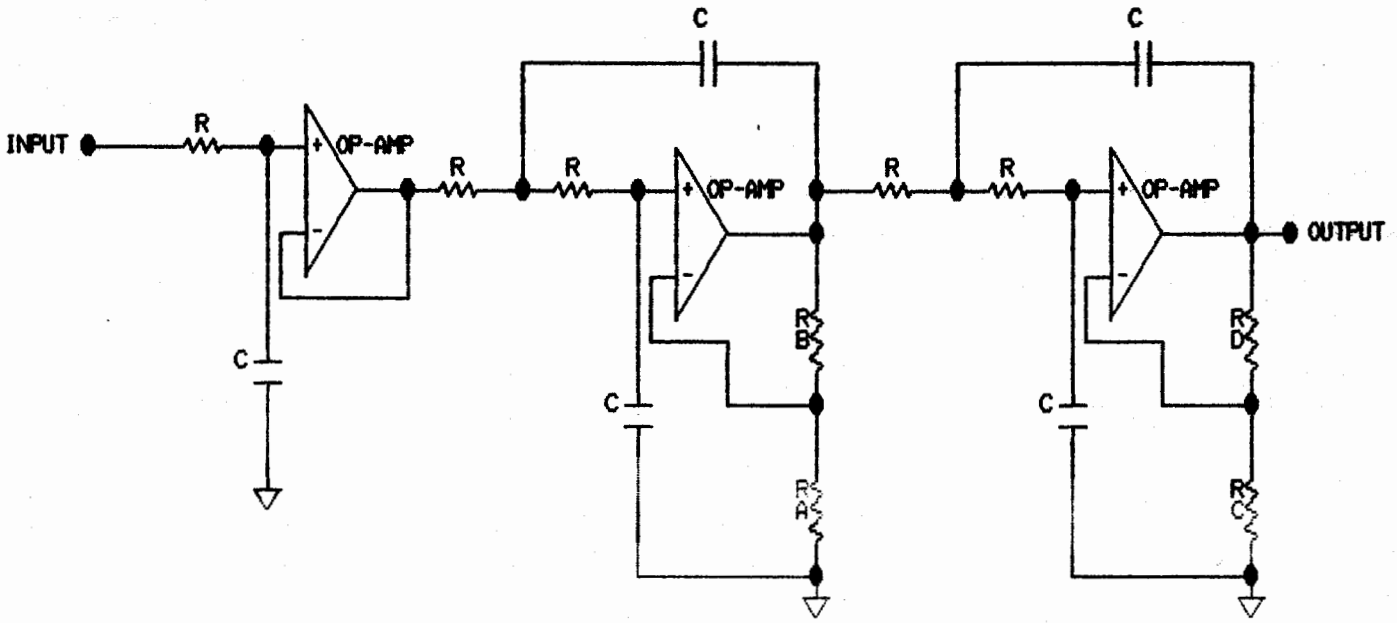
EQUAL COMPONENT ACTIVE FILTERS



12 db AND 18 db/OCTAVE ACTIVE FILTERS	Dwn	DAN FRASER
	Eng	DAN FRASER
	Chk	
FRASER TECHNOLOGIES LTD. P.O. BOX 4265 VANCOUVER, B.C. CANADA V6B 3Z7	Dwg	12/18db/OCT
	Rev	1
	Date	DEC. 5/88

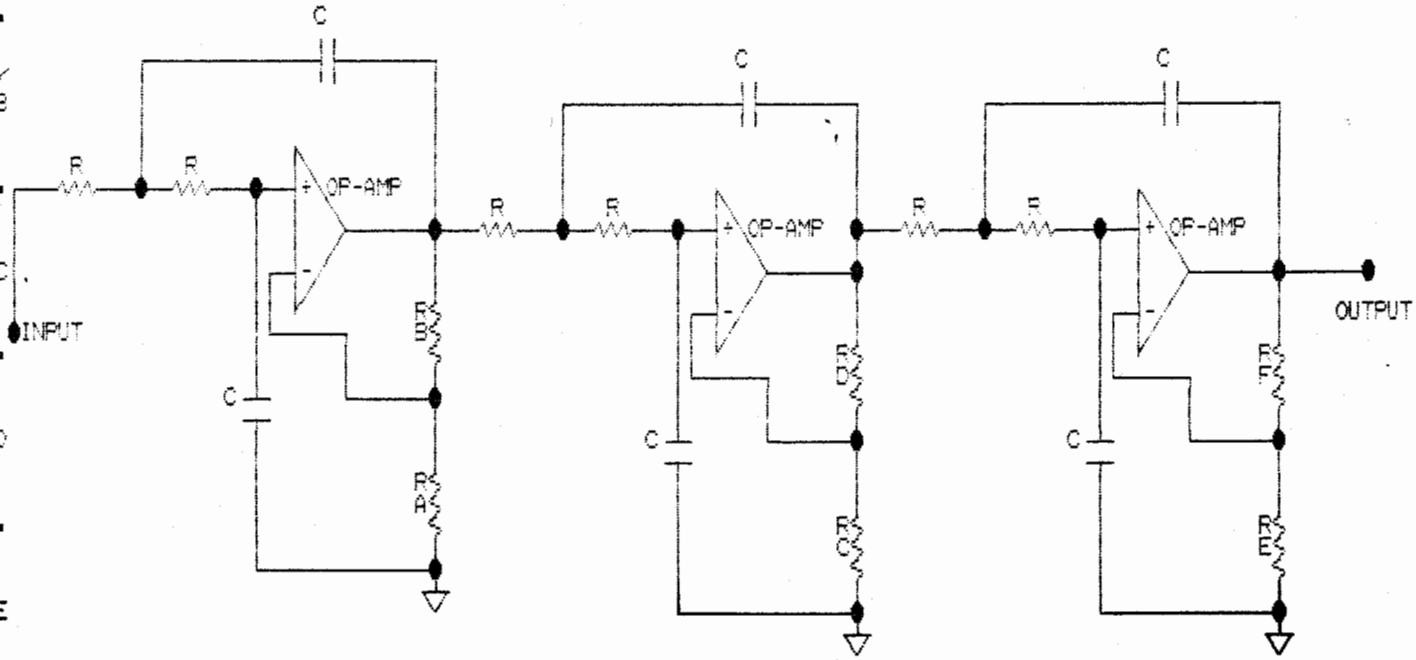


24 db/OCTAVE FILTER



30 db/OCTAVE FILTER

24 db AND 30 db/OCTAVE ACTIVE FILTERS	Dwn	DAN FRASER
	Eng	DAN FRASER
	Chk	
FRASER TECHNOLOGIES LTD. P.O. BOX 4265 VANCOUVER, B.C. CANADA V6B 3Z7	Dwg	24/30db/OCT
	Rev	
	Date	DEC. 5/88



36 db/OCTAVE FILTER

36 db/OCTAVE ACTIVE FILTERS	Dwn	DAN FRASER
	Eng	DAN FRASER
	Chk	
FRASER TECHNOLOGIES LTD. P.O. BOX 4265 VANCOUVER, B.C. CANADA V6B 3Z7	Dwg	36db/OCT
	Rev	
	Date	DEC. 5/88

16. SERVICE PROCEDURES

Load "Service"

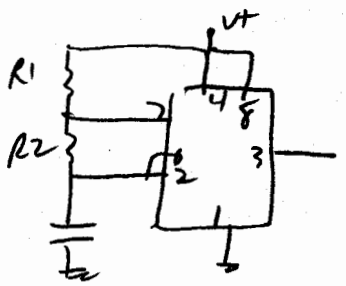
Servicing is more an art than a science. Some brilliant technical people cannot diagnose a blown fuse with a fully equipped shop while other sub-literates with no training can find a intermittent foil trace on a microcomputer mother board in 2 minutes flat by hitting the case with a hammer.

One's ability to troubleshoot seems to have little to do with one's training or experience. Finally, here is a computer program that comes closer to the real world procedures for servicing equipment. However, only run this program if you are broad minded and have a sense of humour.

You have been warned!

"555"
NOV. 85

```
10 PRINT "555 TIMER CALCULATIONS"
20 PRINT
30 PRINT "CHOOSE ONE"
40 PRINT "1. ASTABLE"
50 PRINT "2. MONOSTABLE"
60 PRINT "3. QUIT"
70 INPUT "SELECT ONE: ",J
80 IF J > 3 THEN PRINT "BAD FUNCTION NUMBER":GOTO 10
90 ON J GOTO 100, 700, 1140
100 PRINT
110 PRINT
120 PRINT "1. GIVEN R1=1K, FIND R2"
130 PRINT "2. GIVEN R1=1K, FIND C1"
140 PRINT "3. FIND C1 WITH YOUR R1 & R2 VALUES"
150 PRINT "4. FIND FREQUENCY GIVEN R1, R2 & C"
160 PRINT "5. GO BACK TO MAIN MENU"
170 PRINT
180 INPUT "CHOOSE ONE: ",Q
190 IF Q > 5 THEN PRINT "BAD CHOICE - TRY AGAIN":GOTO 120
200 PRINT
210 IF Q = 5 GOTO 30
220 ON Q GOSUB 260,310,360,410
230 IF Q = 4 GOTO 110
240 GOSUB 470
250 GOTO 110
260 R1 = 1000
270 INPUT "FREQUENCY? ",F
280 INPUT "C1 = ",C1
290 R2 = (1.44/(F*C1/10^6)-R1)/2
300 RETURN
310 R1 = 1000
320 INPUT "FREQUENCY? ",F
330 INPUT "R2 = ",R2
340 C1 = 1.44/(F*(R1+2*R2))*10^6
350 RETURN
360 INPUT "R1 = ",R1
370 INPUT "R2 = ",R2
380 INPUT "FREQUENCY? ",F
390 C1 = 1.44/(F*(R1+2*R2))*10^6
400 RETURN
410 INPUT "C1 = ",C1
420 INPUT "R1 = ",R1
430 INPUT "R2 = ",R2
440 PRINT
450 PRINT "FREQUENCY IS:";1.44/(C1*10^-6*(R1+2*R2));"HERTZ"
460 RETURN
470 PRINT
```



Audio XFMR

Core Area = ~~$\sqrt{VA}/5.5$~~ $\sqrt{VA}/5.5$ SQ IN.

TR = $\sqrt{\quad}$

Given.

VA
21 - LARGER IMP
22 - SMALLER IMP
SUPPLY Volts = Vcc

Circular Mils = 700 CM/A

CALC - Core Area = $\sqrt{VA}/5.5$ SQ IN

$\therefore TR = \sqrt{21/22}$

~~OR~~ ~~P-P Volts = 2 × Vcc~~
P-P

SINGLE ENDED

PRI I = VA/Vcc

~~WIRE, CM~~
WIRE AREA = PRI I X