ANY DC SOURCE 7 TO 22VDC

U3 78L05

+5VDC

1.2K OHM

.1uf   1uf

(24) Vpp   74HC 4514

(3) Enb   (4) Vpp   (6) Xenb

Valid Digit (12)

(1) Latch Enable

BCD to 1 of 16 Decoder with Latch

+5VDC 300 OHM   5v F0RM 1C RELAY

2N2222

SEE NOTE: 1.2K OHM OR 470 OHM

THIS CIRCUIT IDENTICAL FOR EACH OUTPUT YOU WANT A CONTACT CLOSURE. EQUIP 1 TO 16 OUTPUTS AS DESIRED.

C
NO

TO 1/8" STERO JACK

Tone Decoder 75T204 MC145436

U1

(7) Analog In
.1uf

D1 (2)   (2) D
D2 (1)   (3) B
D4 (14) (21) C
D8 (13) (22) A

XIn   XOut   Vdd
(9) 3.579545 MHz (10)   (8)

1 Meg Ohm

1.2K OHM 4 PLACES

D   C   B   A   Valid Digit

PCB MOUNT SCREW TERMINALS

Y0 (11)
Y1 (9)
Y2 (10)
Y3 (8)
Y4 (7)
Y5 (6)
Y6 (5)
Y7 (4)
Y8 (18)
Y9 (17)
Y10 (20)
Y11 (19)
Y12 (14)
Y13 (13)
Y14 (16)
Y15 (15)

U2

Enable (23)   Gnd (12)

NOTE 1: A VALID DTMF TONE MUST BE A MINIMUM OF 35MS IN DURATION.

NOTE 2:EACH TIME A VALID DTMF TONE IS DETECTED, THAT OUTPUT STAYS ON (RELAY CONTACTS CLOSED) UNTIL ANOTHER TONE IS RECEIVED. FOR THAT REASON, DO NOT EQUIP OUTPUT Y0 (THE "D" TONE).SEND A "D" TONE AS A DISCONNECT TONE TO OPEN ANY CLOSED CONTACTS.
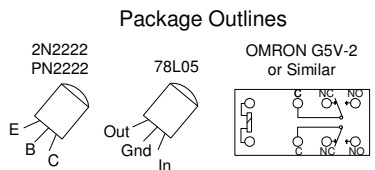
Note 3: VALUE OF BASE RESISTOR IN DRIVER CIRCUIT WILL CHANGE DEPENDING ON RELAY COIL RESISTANCE. THIS IS DUE TO THE CURRENT SOURCE CAPABILTIES OF THE '4514
For relay coils with a resistance of 130 ohm R=1200 ohm
For relay coils with a resistance of 50 ohm R=470 ohm

75T204 Logic Table				
DTMF DIGIT	D8	D4	D2	D1
1	1	0	0	0
2	0	1	0	0
3	1	1	0	0
4	0	0	1	0
5	1	0	1	0
6	0	1	1	0
7	1	1	1	0
8	0	0	0	1
9	1	0	0	1
0	0	1	0	1
*	1	1	0	1
#	0	0	1	1
A	1	0	1	1
B	0	1	1	1
C	1	1	1	1
D	0	0	0	0

Valid Digit,High on detection of a true DTMF tone
0=LOW 1=HIGH

74HC4514 Logic Table (74HC4515 is the same but outputs inverted from this table)

	Inputs				Outputs																DTMF DIGIT
E	D	B	C	A	Y0	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	Y11	Y12	Y13	Y14	Y15	
H	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	D
L	H	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	1
L	L	H	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	L	2
L	H	H	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	L	3
L	L	L	H	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	L	4
L	H	L	H	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	L	5
L	L	H	H	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L	L	6
L	H	H	H	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	L	7
L	L	L	L	H	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	L	8
L	H	L	L	H	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	L	9
L	L	H	L	H	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	L	0
L	H	H	L	H	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	L	*
L	L	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	L	#
L	H	L	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	L	A
L	L	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	L	B
L	H	H	H	H	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	H	C

LATCH ENABLE MUST BE HIGH.   L=LOW H=HIGH X=DONT CARE

Date	Revision/Addition/ Note	by
Oct. 4, 2007	CONCEPT AND ORIGINAL DRAWING PC SOFTWARE TO GENERATE DTMF TONES FROM AUDIO CARD. http://www.comtekk.us/	WD4BIS
Oct. 7, 2007	Added Package Outlines	WD4BIS

Package Outlines

2N2222 PN2222

78L05

OMRON G5V-2 or Similar

E
B   C

Out
Gnd   In

C   NC   NO
C   NC   NO

Drawn By: Gerald Crenshaw WD4BIS	Date: Oct. 4, 2007	From the bench of: Amateur Radio Station WD4BIS	Page 1
Engineer: Gerald Crenshaw WD4BIS	Date: Oct. 4, 2007		of 1
Checked By: Janet Crenshaw WB9ZPH	Date: Oct. 4, 2007	Title: DTMF to Relay Decoder	