VID-1
Voice ID Module

Micro Computer Concepts

8849 Gum Tree Ave
New Port Richey, Fla 34653
(phone: 813-376-6575)

by: Ron Wright, N9EE

REV 1.2

This version VID-1 does not have IC U2

1.0 INTRODUCTION

The VID-1 Voice ID board is a voice recorder with playback meant for identifying a repeater. The board is based around an Information Storage Devices ISD-1020A voice recorder IC.

The IDs-1020A is a single IC containing the necessary hardware to sequence store incoming analog signals with playback for up to 20 seconds. The information is stored in EEPROM with data retention of 10 years. Unlike many voice recorders which store the information in a digital form with analog-to-digital and digital-to-analog converters the ISD-1020A stores the information as discrete analog voltages in cells within the EEPROM. Each cell is like a capacitor storing a voltage. When the record mode is selected the internal circuitry steps through the cells one by one at 2.7 kHz rate sampling the analog input storing the incoming voltage on a cell then moving to the next cell storing the next sampled voltage. When in playback the cells are stepped through, but instead of storing a voltage the stored voltage is coupled to the output. This approach requires less memory. If each sample were to be stored digitally using say an 8 bit conversion then 8 times the number of cells (8 times the memory) would be required. The VID-1 also contains the necessary circuitry to control the record and playback.

Their are five interface lines which must be addressed when using the VID-1. These are; 1. power (8 to 15 VDC), 2. audio input, 3. audio output, 4. playback/record and 5. start. The audio input and output have pots for level adjustments (R1 & R2). The record/playback command is TTL (0 to 5 V) low for record and high for playback. The start command is high going low transition.

To record information one first forces the record/playback input low, forces the start input high to low and input the voice to be recorded. The VID-1 will then record the input information.

To playback the stored information one forces the record/playback high and forces the start input high to low. The VID-1 will then playback the stored information.

Two other inputs are provided to determine the length of time for record and playback. These are JP1 and JP2. The insertion or removal of these two jumpers in four combinations as shown on the VID-1.dwg drawing determine the time. The VID-1 can be setup for 5, 10, 15, or 20 seconds of record and playback.

The VID-1 can be used in any application where voice record and playback are needed. It is designed to as an accessory to the Micro Computer Concepts RC-100 and RC-1000 repeater controllers, but is not limited to these.

2.0 USING THE VID-1 WITH THE RC-1000

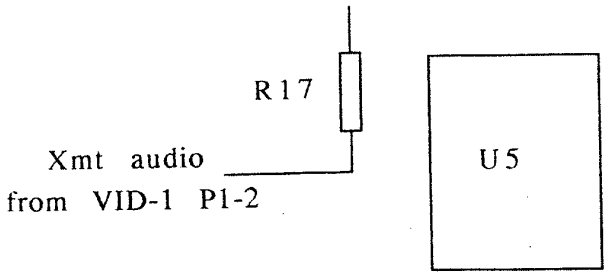
The VID-1 is meant to be used with the RC-1000 "EXTERNAL ID" strobe for starting the ID record and playback. Although the VID-1 can be used with any repeater for identification its use with the RC-1000 allows for remote recording of the stored message. This feature is useful for changing the message without the need to go to the repeater site.

Their are two methods given for remote recording. The RC-1000 software REV 3.1 contains special software for remote recording where previous REVs must use a slightly different procedure.

2.1 VID-1 INSTALLATION WITH RC-1000.

The installation to all RC-1000 is the same.The VID-1 installation with the RC-1000 requires the following:

1. connect VID-1 "POWER" input to 8 to 15 VDC source.
2. connect VID-1 "START" input to RC-1000 "EXTERNAL ID" (P2-pin 4).
3. REV 3.1 to 3.22 connect VID-1 "PTT" to the RC-1000 PTT (P1-pin 2).
   REV 3.3 and later connect VID-1 "PTT" (P1-pin 6) to VID-1 "START" (P1-pin 5).
4. enable the RC-1000 "EXTERNAL ID".
5. install VID-1 JP1 & JP2 for desired play/record time. (see VID-1.dwg drawing for details)
6. connect VID-1 "AUDIO OUTPUT" to RC-1000 R17.



Connecting VID-1 Xmt audio to RC-1000

If remote recording is desired connect the VID-1 Audio Input to the repeater receiver audio.

1. *connect VID-1 "AUDIO INPUT" to receiver audio.*
2. *connect VID-1 "PLAY/RECORD" input to RC-1000 AUX 3.*

2.2 RC-1000 Recording with REV 3.0 and Previous Software

Software REVs 3.0 and earlier do not contain software to specifically address remote recording of the VID-1 message. This can be accomplished, however, by the following procedure.

RECORDING MESSAGE:

The steps 1 thru 4 must be followed together so read carefully. When recording adjustment R1 controls the audio input level and R2 controls the output level. These levels may need adjustment to achieve desired levels and quality.

1. *Force RC-1000 AUX 3 low with AUX control code.*
2. *Enter touch tone code ## (force external ID).*
3. *Via repeater rcvr enter the message to be stored.*
4. *after repeater drops force AUX 3 high (VID-1 to playback mode).*

Enter touch tone ## and the VID-1 will playback stored message.

WARNING: AUX 3 CONTROLS THE RECORD/PLAYBACK MODE. ON POWER UP THE RC-1000 PLACES AUX 3 HIGH (PLAYBACK), BUT THROUGH THE AUX CONTROL CODES AUX 3 CAN BE FORCED TO THE LOW STATE. TAKE CARE TO INSURE AUX 3 IS IN PROPER STATE SO THE STORED MESSAGE WILL NOT BE INADVERTENTLY ERASED.

2.3 VID-1 RECORDING WITH RC-1000 REV 3.1 AND LATER.

The playback/record procedure for REV 3.1 and later software is controlled automatically by the RC-1000. There is a D __ __ "RECORD" code which must be programmed to start record. This "RECORD" code is programmed at select code 4164. Once programmed and after one enters this code the RC-1000 will automatically control AUX 3 for record.

RECORDING MESSAGE:

Steps 1 thru 4 must be followed together so read carefully. When recording adjustment R1 controls the audio input level and R2 controls the output level. These levels may need adjustment to achieve desired levels and quality.

1. Enter the programmed "RECORD" code.
2. drop input to repeater.
3. when you hear repeater tail beep re-key and start message recording. Recording start on tail beep.
4. When message complete drop input and let repeater unkey. This will stop record mode.

Enter touch tone ## and the VID-1 will playback stored message.

3.0 RC-100 OPERATION

The RC-100 software REVs 2.3 and later contain the necessary software to control the VID-1 through the external ID. REVs 2.2 and earlier do not have the external ID and will not control the VID-1.

Two control codes must be programmed for the external ID. These are the D 63 "EXTERNAL ID" enable/disable (toggle) code at select code 4140 for enabling the external ID feature. Also, the D 64 "RECORD" code at select code 4141 for controlling recording.

Perform the following to install the VID-1 with the RC-100.

INSTALLATION:

1. connect VID-1 power input to 8 to 15 VDC.
2. connect VID-1 audio output to RC-100 right end of R5.
3. connect VID-1 "START" input to RC-100 AUX 13 (ext ID).
4. connect VID-1 "PTT" to RC-1000 PTT.
5. Program & Enable "EXTERNAL ID" (select code 4140).

For remote recording:

1. *connect VID-1 "PLAYBACK/RECORD" to RC-100 AUX 12.*
2. *Program "RECORD" control code into RC-100 (4141).*
3. *connect VID-1 audio input to repeater receiver audio*

RECORDING MESSAGE:

The steps 1 thru 4 must be followed together so read carefully. When recording adjustment R1 controls the audio input level and R2 controls the output level. These levels may need adjustment to achieve desired levels and quality.

1. *Enter the programmed "RECORD" code.*
2. *drop input to repeater.*
3. *when you hear repeater tail beep re-key and start message recording. Recording starts on tail beep.*
4. *When message complete drop input and let repeater unkey. This will stop record mode.*

The RC-100 has no force external ID command. However, one can disable the CW ID and then #9 will force the external ID.

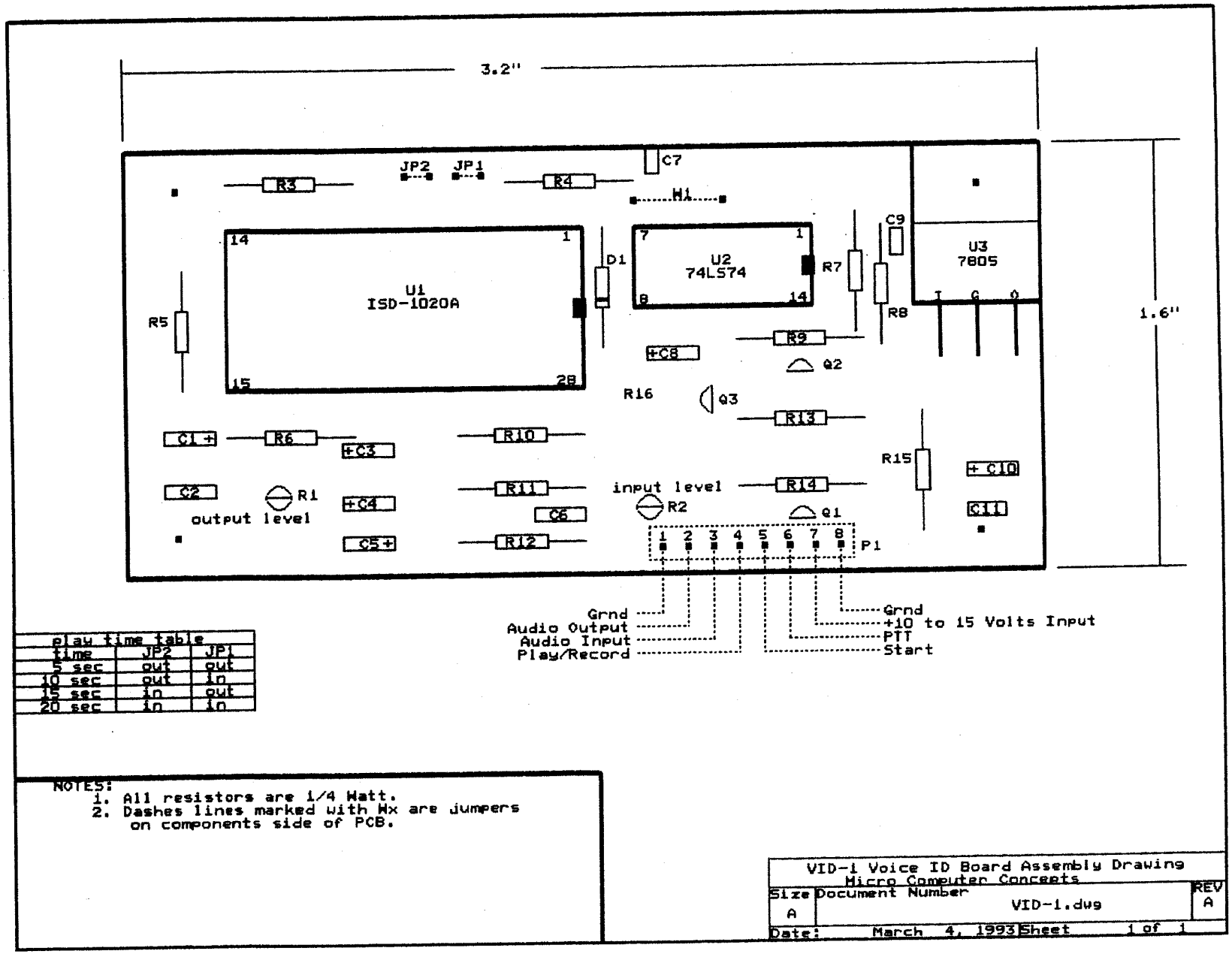
4.0 OPERATION WITH OTHER CONTROLLERS

The protocol for operating the VID-1 is to first record a message into its memory. This is done as follows.

1. *force VID-1 "PLAYBACK/RECORD" input low.*
2. *force VID-1 "START" low (recording will now begin).*
3. *enter through VID-1 "AUDIO INPUT" audio to be recorded.*
4. *return "PLAYBACK/RECORD" high to play mode.*

The protocol for playback is same as above except in step 1 force "PLAYBACK/RECORD" input high.

The record mode may require adjustment of R1 pot (input level adjustment). Playback level is controlled with R2.

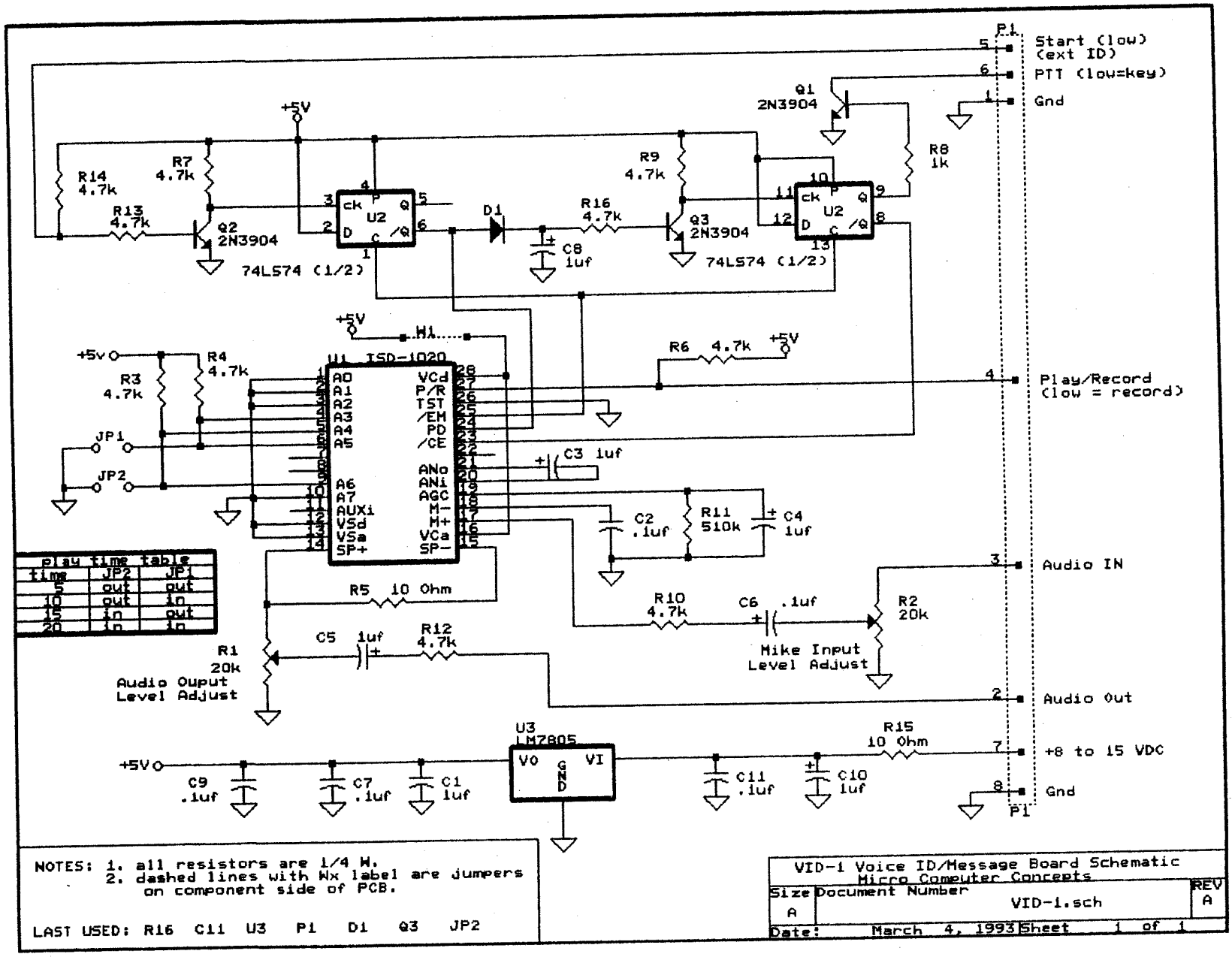


play time table		
time	JP2	JP1
5 sec	out	out
10 sec	out	in
15 sec	in	out
20 sec	in	in

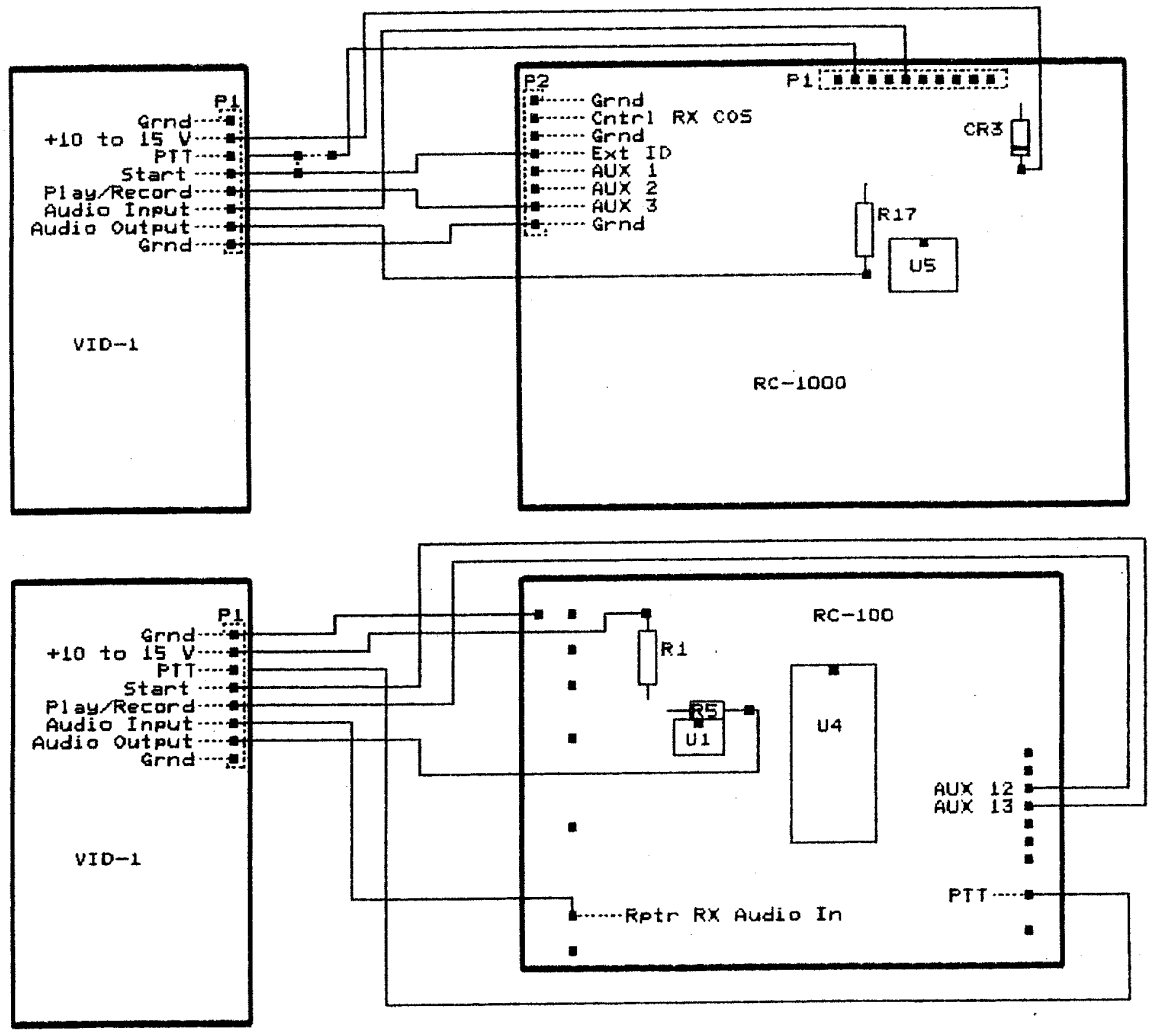
NOTES:
1. All resistors are 1/4 Watt.
2. Dashes lines marked with Hx are jumpers on components side of PCB.

VID-1 Voice ID Board Assembly Drawing
Micro Computer Concepts

Size	Document Number	REV
A	VID-1.dwg	A
Date: March 4, 1993	Sheet 1 of 1	


P1
Start (low) (ext ID)
PTT (low=key)
Gnd
Play/Record (low = record)
Audio IN
Audio Out
+8 to 15 VDC
Gnd
Q1 2N3904
Q2 2N3904
Q3 2N3904
R1 20k Audio Ouput Level Adjust
R2 20k Mike Input Level Adjust
R3 4.7k
R4 4.7k
R5 10 Ohm
R6 4.7k
R7 4.7k
R8 1k
R9 4.7k
R10 4.7k
R11 510k
R12 4.7k
R13 4.7k
R14 4.7k
R15 10 Ohm
R16 4.7k
C1 1uf
C2 .1uf
C3 1uf
C4 1uf
C5 1uf
C6 .1uf
C7 .1uf
C8 1uf
C9 .1uf
C10 1uf
C11 .1uf
D1
U1 ISD-1020
U2 74L574 (1/2)
U3 LM7805
JP1
JP2
+5V
play time table
time JP2 JP1
5 out out
10 out in
15 in out
20 in in
NOTES: 1. all resistors are 1/4 W.
2. dashed lines with Wx label are jumpers on component side of PCB.
LAST USED: R16 C11 U3 P1 D1 Q3 JP2
VID-1 Voice ID/Message Board Schematic
Micro Computer Concepts
Size A
Document Number VID-1.sch
REV A
Date: March 4, 1993 Sheet 1 of 1

Note: With RC-1000 REV 3.1 and earilier connect VID-1 PTT to RC-1000 PTT.
With RC-1000 REV 3.2 and later connect VID-1 PTT to VID-1 Start or RC-1000 EXT ID.



VID-1 to RC-100 & RC-1000 Connections Micro Computer Concepts		
Size A	Document Number VIDINSTL.sch	REV A
Date: June 22, 1993	Sheet 1 of 1	