INTEX-TALKER

USER'S MANUAL

INTEX

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THE INTEX-TALKER TEXT TO SPEECH SYNTHESIZER

The Intex-Talker is a stand alone intelligent peripheral that converts ASCII text to spoken English. The Intex-Talker is attached to the computer (or terminal, modem, etc.) via either a serial or parallel cable. Its operation is similar to that of a printer except that the output is speech rather than printed word. The Intex-Talker has many programmable options which produce its high level of intelligibility. It has the following features:

* Phoneme based speech synthesizer
* 6502 Microprocessor
* 64 crystal controlled inflection levels
* 700 character buffer (optional 2.7K)
* 6K byte text-to-phoneme algorithm
* Full ASCII character set recognition and echo
* Adjustable baud rates (75-9600)
* EIA RS232C and parallel input interfaces
* Phoneme access modes
* Serial X-on/X-off handshaking
* One watt amplifier and volume control
* Onboard power supply
* Music and sound effects capability

Basically, the Intex-Talker Speech Synthesizer consists of a 6502 based microcomputer with a voice synthesizer output port. It has a 6502 microprocesor, crystal controlled 75-9600 bps full handshaking serial interface, parallel input port, 2K bytes of RAM, 8K bytes of EPROM, and has an onboard power supply. The EPROM contains the operating system and text to speech algorithm.

Special control signals are sent from the host computer to select among many different user options. In general, these control signals are in the form: !(letter)(option). The exclamation point is a signal to the Intex-Talker that a control code follows. Options can be changed at any time by sending the appropriate codes preceding or imbedded within the text.

What is a Text to Speech Synthesizer ?

With the majority of speech synthesizer interfaces, text to speech, or the actual conversion from ASCII characters to phonemes, LPC formants, word codes etc., is left to the user. Such a conversion routine will be more or less elaborate, depending upon the required vocabulary. For short vocabularies, the conversion program might consist merely of a table of words and their appropriate synthesizer codes. When the required vocabulary becomes very long, or in fact unlimited, tables become cumbersome and a text to speech algorithm is required instead.

A text to speech algorithm is a program which takes ASCII data and performs a synthesis by rule analysis of character strings. It determines which characters are voiced and which are silent by following a set of general rules for pronouncing English (text to speech algorithms can be written for other languages as well). Text to speech algorithms vary in length depending upon exactness of voice translation. Typical algorithms are in the 4K to 8K byte range but, some of the more sophisticated programs are up to 80K bytes. The primary difference between a 6K and a 20K algorithm is more often the spelling of input text rather than any specific sound quality differences (an 80K algorithm can often be half look up tables for exceptions to the rules). For exact pronunciation it might be necessary to spell words differently to more easily fit the prescribed rules on the smaller algorithm, such as entering "com pu ter" instead of computer. The only other limitations are features such as pronunciation of punctuation or inflected speech. Both of these capabilities are supported in the Intex-Talker.

The Intex-Talker text to speech synthesizer is a smart peripheral. It speaks only those ASCII strings which are directed to it through either its serial or parallel input ports. The ASCII text can result from PRINT statements in BASIC or the contents of complete disk files. Intex-Talker connects to the computer in the same manner as a printer or modem and virtually anything that can be printed or viewed on the CRT can be vocalized.

The Intex-Talker is a combination of two major elements: a 6502 based microcomputer and a Votrax SC-01 speech synthesizer chip. The SC-01 is a CMOS (complimentary metal oxide semiconductor) chip which consists of a digital code translator and an electronic model of the vocal tract. Internally, there is a phoneme controller which translates a 6 bit phoneme and 2 bit pitch code into a matrix of spectral parameters which adjusts the vocal tract model to synthesize speech.

The output pitch of the phonemes is controlled by the frequency of the clock signal. The clock frequency is nominally 720 KHz but subtle variations of pitch can be induced to add inflection. This prevents the synthesized voice from sounding too monotonous or "robotlike".

Listed in Table 1 are the 64 phonemes defined for the English language (three produce no sounds). The phoneme sound is generated when a 6 bit phoneme code is transmitted to the SC-01. Each phoneme is internally timed and has a duration of 47-250 msec depending on the particular phoneme selected and the clock frequency. The computer operating system sends these codes to the synthesizer chip through a latched parallel output port and monitors the synthesizer's activities (the A/R line) through an interrupt line.

The Intex-Talker Hardware

As previously mentioned, the Intex-Talker is a stand-alone microcomputer configured to function as an intelligent peripheral. Figure 1 is a basic block diagram of Intex-Talker. It can be viewed as a general purpose 6502 based computer with a speech synthesizer attached as a memory mapped I/O port.

Intex-Talker is best explained by dividing the circuitry into four functional subsections: processor and timing, memory, serial and parallel I/O, and speech synthesizer. Figure 2 is the complete Intex-Talker schematic.

Processor and Data Rate Clock

The processor is a 1 MHz 6502. The processor and data rate clocks are derived by dividing down a 4.9152 MHz crystal through IC6. Using a 4.9152 MHz crystal (base is 75 times 2 to the 16th) and a 12 stage CD4040 binary divider (IC6), 9 rates are derived directly: 75 bps, 150 bps, 300 bps, 600 bps, 1200 bps, 2400 bps, 4800 bps, 9600 bps, and 19200 bps (while the hardware can produce 19200 bps, it is not supported by the operating system). The Intex-Talker will not communicate at 110 bps. See "Setting the serial port". The 6502 processor operates at a clock frequency of 611 KHz.

Memory Section

ICs 2-5 and 9 form the address decoding and memory section of the Intex-Talker. IC 9 decodes the 5 most significant address bits to create 8 strobes. They are defined as follows:

Name	Hex Address	Connection and Function
SEL0	000	IC2 Memory Block (RAM)
SEL1	800	IC3 Memory Block (RAM)
SEL2	1000	IC10 Serial Port
SEL3	1800	IC11 Parallel Ports
SEL4	8000	IC14 Inflection Clock Rate
SEL5	A000	IC14 Phoneme Latch
SEL6	C000	IC5 Memory Block (EPROM)
SEL7	E000	IC4 Memory Block (EPROM)

In the Intex-Talker configuration, ICs 2 and 3 are intended to be RAM while ICs 4 and 5 are EPROM or ROM. The pin designations for ICs 2 and 3 are for 2K by 8 RAM chips such as the Hitachi 6116 or Toshiba 2016 (these devices are 2716 pin compatible. You could also use 2716 EPROMs in these sockets). This programmable memory is used for conversion tables, register stacks, and the ASCII input buffer (the Intex-Talker can receive data faster than it can speak it). The basic Intex-Talker uses only one RAM chip which allows a 700 character input buffer. By adding the second RAM chip in IC3 (and changing a few EPROM constants), this buffer can be optionally expanded to 2.7K characters.

The text to speech algorithm is placed in EPROM/ROM positions ICs 4 and 5. Either 2716 (2K X 8), 2732 (4K X 8), or 2764 (8K X 8) devices can be used in these positions depending upon the jumper selections JP4 and JP5. The 8K byte Intex-Talker software will be either on two 2732 EPROMs and require both sockets or a single 8K 2764 (or ROM equivalent).

Serial and Parallel I/O

Intex-Talker, unlike most other voice synthesizers, has both serial and parallel input ports to receive ASCII characters. The serial port uses a 6850 asynchronous communications interface adapter (ACIA, IC10) which is software programmable. During initialization, the ACIAs functional configuration is preset. Considerations such as word length, clock division ratios, parity, stop bits, etc., are selected by properly setting bits in the ACIA's control register. The data rate is set by the system data rate clock (from SW2 and IC6) and data is sent and received from the Transmit and Receive data registers respectively. Information such as framing errors, parity errors, and buffer and handshaking status, are determined by reading the ACIA status register.

On the Intex-Talker, the serial port can be used with or without hardware handshaking (CTS, DCD, RTS, etc.). This is especially useful when communicating over modems or terminals which have no handshaking signals. Instead, the Intex-Talker software incorporates software handshaking.

When receiving ASCII text in the software handshaking mode the Intex-Talker sends an "@" to the host computer when its input buffer is almost full (the host should stop sending data). It sends a "#" when it is ready to receive data again. Obviously, even this can be ignored if the data rate from the host computer never exceeds the speed at which the buffer is emptied.

The parallel input section uses an 8255 PIA (IC11) which is also programmable. As configured, 8 bits of it are used to receive parallel format ASCII data such as would be transmitted to a parallel printer. Using 2 additional pairs for the strobe and acknowlege handshaking, the Intex-Talker can attach to any conventional Centronics printer interface. (As configured, the 34 pin edge connector is exactly compatible with the Radio Shack TRS line of computers and can connect directly to their 34 pin Centronics printer edge connector).

DIP switch SW1 also attaches to IC11. Switch positions 6 thru 8 set serial word length, stop bits, and parity on the ACIA; switch section 3 selects hardware or software handshaking; sections 1, 2, 4, and 5 are not used.

Speech Synthesizer and Inflection Circuitry

Probably the most important section of the Intex-Talker is the actual speech synthesizer circuitry. The Intex-Talker allows 64 levels of pitch inflection.

The output pitch of the phonemes is controlled by the frequency of the clock signal. The output pitch is a function of this clock input frequency and two pitch control lines, I1 and I2 (each acts independently). Four rather large variations in pitch (corresponding to !P1 thru !P4 in the operating system), can be achieved simply by using these manual inflection inputs. More subtle variations in output pitch are attained by externally controlling the synthesizer clock. Using the 1.22 MHz system clock and a digital rate multiplier, a programmable clock can be created to produce smaller and more defined pitch inflection changes.

On a SEL4 strobe, a four bit inflection code is latched into IC13 and applied to the rate multiplier. The four bit combination results in 16 clock rates from 614.4 KHz to 902.4 KHz in 19.2 KHz increments (corresponding to !R1 thru !R16 in the operating system). 20 KHz creates a relatively small pitch change by itself (out of a 720 KHz nominal input frequency) but, used dynamically in a sentence it creats a definite improvement in intelligibility.

The pitch levels !P1 thru !P4 are the base pitch and the 16 frequencies from the rate multiplier, !R1 thru !R16, are the clock rate. The combination of the two functions results in 64 pitch levels or inflections.

The pitch at which individual phonemes are pronounced may be controlled automatically by the text to speech algorithm, kept fixed, or altered by user command. Some users prefer automatic inflection, because of the variety it gives to the speech. Others think a computer should sound like a computer and prefer the flat speech to artificially intoned speech. Still others may wish to directly control the pitch to make the unit "sing" (pitch and rate codes may be mixed with phoneme codes to produce "singing") or pronounce words with special emphasis.

The user may control the base pitch setting independently of the clock rate. The user options are:

!P1 (low pitch)
!P2 (medium low pitch)
!P3 (medium high pitch)
!P4 (high pitch)

The user may also control the clock rate.

!R1 (slowest rate -- lowest level for the given base pitch)
!R2 (slightly faster)
!R3...!R16 (increasingly faster rates)

The Intex-Talker has the ability to play musical notes and produce sound effects. This is accomplished by using a program routine to toggle one bit of IC11 at a predetermined rate. This lead, in addition to the output from the speech synthesizer chip (IC12) is connected to the output amplifier. The results are similar to the sound produced on the internal speaker in an APPLE II computer (it uses the same technique).

OPERATOR INTERACTION WITH THE TEXT TO SPEECH SOFTWARE

The Intex-Talker is a stand alone intelligent peripheral that converts ASCII text to spoken English. The Intex-Talker is attached to the computer (or terminal, modem, etc.) via either a serial or parallel cable. Its operation is similar to that of a printer except that the output is speech rather than printed word. The Intex-Talker has many programmable options which produce its high level of intelligiblity. These options are called device control signals and are transmitted to the Intex-Talker along with the text.

Device controls signals are sent from the host computer to select among many different user options. In general, Intex-Talker control signals are in the form:

!(letter)(option)(option)

for example: !HXY

The exclamation point is a signal to the Intex-Talker that a control code follows. The user may if he wishes use any other character as the signal. This is done by giving the following instruction:

(old signal character)X(new signal character)

for example: !X$

will change the control signal from an exclamation point to a dollar sign and $X* will change it then from a dollar sign to an asterisk.

Device control signals can be imbedded anywhere in the text transmission and are not spoken. Once a device control signal has been sent to the Intex-Talker, all succeeding text entry will be subject to that default setting until it is changed. For example if letter by letter pronunciation is invoked with !E then all text will be spelled until a !T is sent to reinvoke text to speech translation.

DEVICE CONTROL CODES

Software Handshaking

If standard parallel or RS-232C serial connections are used the sending computer hardware will detect and examine the RTS signal and determine whether the Intex-Talker is ready to receive a character or, if busy, take appropriate action. However, many popular brands of microcomputers lack the hardware to detect RS-232C handshaking signals and these handshaking signals do not pass through modems back to mainframe computers. In the Intex-Talker, special software handshaking signals, described below, are provided for these purposes (in general, hardware handshaking is preferable whenever it is possible to use it, because it relieves the host computer's processor of the handshaking chores and allows use of higher data rates).

For software handshaking, switch position 3 on dip switch SW1 is set in the closed position (open is hardware handshaking). The following option is provided:

!H(busy character)(ready character)

Example: !H@#

In the example shown, the Intex-Talker will send the character "@" to the computer when it is unable to receive more data, and will send "#" to the computer when it is again ready to receive data. It is the responsibility of the computer programmer to write the software necessary for the use of these options.

Finally, it is possible to use the Intex-Talker with no handshaking by simply invoking the software handshaking mode and ignoring the handshaking transmissions. In this case, it is the user's responsibility to insert timing delays in the program so that data will not be sent to the Intex-Talker faster than it can handle the data.

Speech, Spelled Speech, Phoneme Code, and Music Modes

The Intex-Talker can operate in four different modes: text to speech, text to spelled speech, phoneme codes, and music. When the Intex-Talker is turned on it is in text to speech mode, however, the user can select among the following options:

!T (text to speech)
!E (spelled speech -- say each letter)
!C (phoneme codes)
!N (musical notes)

Text to Speech

The software used in the text to speech algorithm incorporated in the Intex-Talker is derived from an algorithm conceived by the Naval Research Laboratory. This algorithm combines word, morph and letter rules in a single table of about 400 rules. This table contains subtables for each letter of the alphabet and achieves very intelligible speech.

In the text to speech mode (!T), this algorithm attempts the correct pronunciation of any phrase sent to it. However, no program of reasonable size can possibly contain all the rules and exceptions for the pronunciation of English. Moreover, since the Intex-Talker lacks extra-sensory perception, it cannot tell for instance, when the user sends "READ" if the present or the past tense is meant. The solution when a word is not pronounced to the user's satisfaction is to alter the spelling. By typing RED or REED instead of READ, the user can be sure to get the desired pronunciation. If HICCOUGH is pronounced strangely, try HICCUP. Often it helps to break a word into syllables. Compare the pronunciation of TYPEWRITER and TYPE WRITE ER. Foreign words will require considerable ingenuity, since the Intex-Talker works on the principles of English pronunciation. Compare PARLEZ VOUS and PARLAY VOO.

Spelled Speech

The spelled speech mode is useful for abbreviations and words that a user might have difficulty in understanding. When this option is selected, every letter is pronounced separately. (By selecting the !A punctuation mode, punctuation will also be pronounced).

Example: !T THE WORD AWFUL IS SPELLED !E AWFUL !T

In this example, the Intex-Talker will say "THE WORD AWFUL IS SPELLED", and then spell out A W F U L. The !T at the end returns the Intex-Talker to the text to speech mode.

Phoneme Mode

The Intex-Talker may also be programmed directly in phoneme codes. A space must be left between the mnemonic codes.
For example:

!C AE N D PA0 THV UH2 PA0 S E PA0 I Z PA0 B 01 AY I3 L I NG PA0 H AH T PA1

will say "and the sea is boiling hot".

The intonation I or F modes can be either on or off when phoneme codes are used. If the intonation is off, the rate which is output will be the base rate. If it is on, intonation will be like that for text. If there are errors in the codes, the erroneous codes will be spoken as if they were text.

Music Mode

Music mode can be turned on by !N. In music mode, the following notation is used. There are 7 octaves centered about middle C, indicated by numbers from 1 to 7. Notes are A, B, C, D, E, F, G. A sharp is indicated by "+", flat by "-". The length of a note may be from 1 to 256 times an internal time constant. Rests are indicated by R. For instance 3F+26 means third octave, F sharp, 26 time constants long. R16 means a sixteen time constant rest.

When music is sounding, reception of data and commands by the Intex-Talker operating system is suspended.

Text Synchronization

For many applications it is important to synchronize speech with external such as text or actions appearing on the screen. For instance, an instructional program may require placing a picture on the screen when certain speech output begins and a question on the screen when it ends. For synchronization, the following option is provided:

!K(synchronization character)

Example: !K#JOHN!K%MARSHA!K$

In the example shown, the Intex-Talker will send a "#" back to the computer just before starting to say "JOHN"; it will send a "%" to the computer just after saying "JOHN" and just before starting to say "MARSHA"; and it will send a "$" character to the screen just after saying "MARSHA".

Example: LOOK AT THE SCREEN NOW !K#

In this example, a "#" will be transmitted to the host computer after saying "LOOK AT THE SCREEN NOW".

None of these special synchronization characters will be spoken. It is the programmer's responsibility to use the incoming synchronization characters to coordinate the screen display with the speech.

Phrase Termination

Many aspects of English pronunciation are controlled by the context in which a given letter or word is spoken. For this reason, the Intex-Talker will await a complete phrase before translating from text to speech. If the user does not specify otherwise, the Intex-Talker will wait to translate a phrase until it has received one of the following phrase terminating characters:

(1) a period followed by two spaces or a carriage return
(2) a comma, semicolon, colon, exclamation point, or question mark followed by a space or carriage return.
(3) a carriage return

For some types of output, such as computer programs or poems, the user will want each line read as a separate phrase. For others, such as ordinary English text, the user may not want a carriage return to terminate a phrase. The user is given the following options to deal with this situation:

!L and !W

"!W" means "Whole text pronunciation". If this option is selected, a carriage return will not terminate a phrase unless the carriage return is preceded by one of the punctuation marks indicated in (1) and (2) above.

"!L" means "Line-by-line pronunciation". If this option is selected, a carriage return will always be treated by the Intex-Talker as terminating a phrase. When the Intex-Talker is first turned on it is in the "L" mode.

Rather than send a special signal to terminate a phrase, the user may wish to have the Intex-Talker treat a phrase as terminated if a certain delay occurs without any phrase terminator being received. Possible applications of this option include situations where the user does not fully control the output. For instance, suppose the Intex-Talker is passively

connected to a transmitting device which doesn't send any of the terminating characters listed above (maybe it sends "STOP" instead). In such a case, there is no way to insert phrase termination characters in the output stream. However, if the Intex-Talker is set to treat a half second delay without receipt of information as the end of a phrase, computer output will not be lost or ignored.

The user is given the following option to provide delayed phrase termination:

!D(delay number)

!D1 through !D8 result in a delay of 50 x 2n milliseconds where "n" is the number following "D" (Note: If too short a delay is used, a phrase may be translated in pieces resulting in odd intonation or pronunciation, since the Intex-Talker uses the context of letters and words to determine their pronunciation.)

!D9 is a special case. The Intex-Talker waits for a phrase terminating character even if it has to wait forever. !D9 is the default mode (at power up) and should be used with slow data sources such as hand typing on a terminal.

This selectable delay feature is particularly useful for the handicapped. It allows a blind programmer to use a standard unintelligent terminal. This is facilitated by connecting the Intex-Talker to receive the output from both the user and the computer. Using the "!D" command, the Intex-Talker can echo all communication either way. If the delay is set to about 0.1 seconds, keys pressed by the user would be echoed as spelled letters because the slight delay between them will be treated as an end of phrase but, output generated by the computer will be spoken as complete lines, because there generally will be no significant delay between characters. The delay may be varied to fit the particular application.

Intonation

Within the Intex-Talker, a special intonation algorithm is included. However, providing realistic intonation is much more difficult than choosing the correct phonemes. Most intonation patterns are not represented in English spelling. Without knowing the writer's state of mind, achieving the proper intonation may require grammatical parsing of a sentence. The algorithm attempts to raise the pitch on stressed syllables, raising it at the start of sentences and before commas, lowering the pitch before the period at the end of a sentence. Before a question mark, the pitch is raised, unless the sentence begins with a question word (who, what, when, where, etc.), in which case it is lowered.

The pitch at which individual phonemes are pronounced may be controlled automatically by the text to speech algorithm, be kept fixed, or be altered by user command. Some people prefer automatic inflection, because of the variety it gives to the speech, even though the inflection is often not accurate. Others think a computer should sound like a computer and prefer the flat speech to artificially intoned speech. Still others may wish to experiment with controlling the pitch themselves to optimize intelligibility. This control can extend even to make the Intex-Talker "sing".

The hardware in the Intex-Talker allows control of pitch in two different ways. The VOTRAX SC-01A synthesizer chip has four selectable pitch levels. In addition, the output pitch may be varied by selecting one of sixteen different rates for the clock which controls the synthesizer chip. When the Intex-Talker is first turned on, the synthesizer chip is set to base pitch level 1 (low) and clock rate #5 (defined below). The intonation is generated by an algorithm which selects an appropriate clock rate for each phoneme. To turn on or off the automatic intonation algorithm, the user may send the command:

!F (flat intonation -- monotone)

and the output rate will stay at the default base and clock rate. To invoke automatic clock rate setting, the user may send the command:

!I (inflected intonation by algorithm)

The intonation algorithm adds or subtracts from the base rate to ultimately select the final voice pitch. Using the !I mode however, only four clock rate pitch level shifts (out of 16 possible) are used.

The user may decide not to implement automatic inflection on all text to speech translation yet desire to add certain pitch changes on specific words or phonemes. This can be easily done on the Intex-Talker since the base pitch and the clock rate can be controlled independently and changed at any time. The user options are:

!P1 (low pitch)
!P2 (medium low pitch)
!P3 (medium high pitch)
!P4 (high pitch)

The user may also control the clock rate:

!R1 (slowest rate, lowest level for the given base pitch)
!R2 (slightly faster)
!R3...!R16 (increasingly faster rates)

Example: !P1 !R5 THIS IS A !R8 TEST

In this example, "THIS IS" will be spoken at clock rate R5 and "TEST" will be spoken at R8. (Note: The clock rate will remain at R8 from then on unless changed).

Example:!F !P1 !R5 IS YOUR NUM !R8 BER !R4 FOUR FIVE !R9 NINE ?

In this example, we can make a question sound more like a question by adding pitch changes at important points in the sentence. "IS YOUR" and "NUM" are spoken at R5. "BER" is raised in pitch to R8 and then, "FOUR FIVE" (you could also use 45) is pronounced at a lower frequency of R4. Finally, "NINE" is raised in pitch to R9 to end the sentence in a questioning tone. The question mark will only be spoken if the punctuation modes (!A or !M) are invoked.

Note: When using the manual inflection mode, it is important to set flat inflection (!F) mode or the algorithm will try to add automatic inflection in addition to that manually selected. Also, pitch and clock rates may be changed at any time in any mode.

Punctuation modes

There are three modes for pronunciation of punctuation in the Intex-Talker. The user options are:

!A (all mode --all punctuation pronounced)
!M (most mode -- all punctuation pronounced except return, linefeed, and space)
!S (some mode -- only unusual punctuation pronounced)

When the Intex-Talker is turned on it is in "some" mode. In the !M mode spaces between words are treated as pauses and can be used to regulate the pace of speech or emphasize particular words.

The Intex-Talker recognizes and pronounces all ASCII characters with codes between hex 20 and hex 7F. The operating system does not recognize control codes other than BACKSPACE (08), TAB (09), LINE FEED (0A), RETURN (0D), an ESCAPE (1B). Receipt of other control codes or nulls, can have unpredictable results since the Intex-Talker uses some of them for internal coding. Illegal control codes should be avoided in the text sent to the Intex-Talker.

On Line / Off Line Mode

The Intex-Talker can be selectively turned on and off line (it has to remain powered, however). This capability allows it to be attached in parallel with another peripheral such as a printer, yet not speak what is being printed. The control code is:

!O (On Line - Intex-Talker is operational. It responds to all device codes and text input)

!Q (Quit - Off Line - Intex-Talker only responds to !O)

Default Modes

When the Intex-Talker is powered up certain default modes are in force. They are equivalent to entering the following commands:

!O	on line
!P1 !R5	low base pitch, clock rate #5
!I	automatic intonation
!T	text to speech mode
!S	some punctuation
!L	Line by line pronunciation
!D9	wait for carriage return phrase terminator

(When shipped from the factory, Intex-Talker is set for 300 bps, 8 bit words, no parity, 2 stop bits, and software handshaking)

At any time these defaults are to be changed, simply send the control code to the Intex-Talker. The codes can be transmitted separately or imbedded in text. For example, entering THIS IS A TEST, and a carriage return will result in that phrase being spoken with no intonation. To add automatic intonation the sentence becomes (all sentences are presumed to end with a carriage return):

```
!I THIS IS A TEST
```

From this point on all spoken text will have automatic inflection unless flat intonation is resumed with !F.

As previously mentioned, intonation can be added selectively or by the automatic algorithm. You can say the following sentence four ways:

1. text to speech, no added inflection

```
!T !F
PLEASE ENTER YOUR ACCESS NUMBER
```

2. automatic inflection in text to speech mode

```
!T !I
PLEASE ENTER YOUR ACCESS NUMBER
```

3. selected inflection in text to speech mode

```
!T !F !P1 !R5
PLEASE !R8 EN !R5 TER !R7 YOR !R5 ACCESS NUMBER
```

4. phoneme input mode with selected intonation

```
!F !C !P1!R5
P L E1 Y Z  PA1 PA1 PA1 PA1 !R9 EH1 EH3 N !R5 T ER PA1 Y
!R8 O2 O2 O2 !R5 R PA1 !R7 AE1 !R5 K S EH1 EH3 S PA1 N UH1
M B ER
```

These examples demonstrate various ways in which the user can increase intelligibility of the synthesized speech. The Intex-Talker is completely programmable, you can combine text to speech with either selective or automatic intonation or optimize pronunciation by choosing exactly the pitches and phonemes you wish. An exaggerated example of combined pitch and phoneme control can actually allow Intex-Talker to sing as demonstrated in a bar of "happy birthday" and a musical scale.

"Happy Birthday"

```
!C !P3 !R3
H H H AE1 AE1 AE1 AE1 AE1 AE1 P P !P2!R5 Y Y Y !P3!R5 B ER
ER ER ER R TH TH TH TH !R1 D A1 A1 A1 A1 I3
!R9 T IU IU IU IU U1 U1 U1 U1 U1 !R7 Y1 IU IU IU U1 U1 U1
U1 U1 U1

!C
!P1 !R1 D D E1 E1 Y Y Y
!P1 !R5 E1 E1 E1 Y Y Y
!P1 !R11 EH1 EH1 EH1 EH2 F F F
!P2 !R5 D J J E1 E1 Y Y Y
!P2 !R11 A1 A1 A1 A1 A1 Y
!P2 !R14 B B E1 E1 Y Y Y
!P3 !R11 S S E1 E1 Y Y Y
!P3 !R15 D D E1 E1 Y Y Y
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Summary Table of Device Codes

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!O, !Q - On line and Off line
!K   - synchronize speech and text
!L   - line by line pronunciation
!W   - whole text pronunciation
!E   - each letter pronunciation
!C   - pronounce by direct phoneme input
!N   - produce musical notes
!T   - pronounce by text-to-speech algorithm
!A, !M, or !S  - speak all, most, or some punctuation
!F   - set monotone or flat intonation
!I   - set automatic inflected intonation
!P and !R  - set intonation base pitch and clock rate
!D1-!D8 and !D9 - set phrase terminator delay
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SETTING THE SERIAL PORT

DTE/DCE Setting

Behind J1 (the DB-25 serial connector) on the PC board is a 2 by 3 header and two jumpers. These jumpers set whether pins 2 and 3 are transmit data and receive data respectively or vice versa. As received from the factory, the jumpers are in the DCE position and pin 2 is RD and pin 3 is TD. To reverse these designations, place the jumpers in the DTE positions.

Data Rate

SW2 is the data rate (sometimes called BAUD rate) selection switch. The data rates are listed along side SW2.

SW2 can be either a 2 by 8 or 9 position Berg type pin connector or a 16 pin DIP switch. If a Berg connector is installed, a jumper is provided to select the desired data rate. Simply place it across the pair of terminals next to the desired data rate.

If SW2 is a DIP switch, close the switch position next to the desired data rate. Only that one position should be closed and the other seven positions should be in the open position. For 75 bits per second, it will be necessary to attach a physical jumper across JP1. All positions on SW2 should be left open.

Handshaking

For software handshaking, switch position 3 on dip switch SW1 is set in the closed position. For hardware handshaking, switch position 3 is left open.

If standard EIA RS-232C serial connections are used, the sending computer hardware will detect and examine the RTS signal and determine whether the Intex-Talker is ready to receive a character or, if busy, take appropriate action.

With software handshaking, the Intex-Talker will send the character "@" to the computer when it is unable to receive more data, and will send "#" to the computer when it is again ready to receive data. It is the responsibility of the computer programmer to write the software necessary for the use of these options.

Finally, it is possible to use the Intex-Talker with no handshaking by simply invoking the software handshaking mode and ignoring the handshaking transmissions. In this case, it is the user's responsibility to insert timing delays in the program so that data will not be sent to the Intex-Talker faster than it can handle the data.

Word Length, Parity and Stop Bits

Three switch positions on SW1 set the transmission protocol. The following is a list of the eight possibilities and their functions:

Function	Position 6	Position 7	Position 8
7 bits, EP, 2SB	closed	closed	closed
7 bits, OP, 2SB	closed	open	closed
7 bits, EP, 1SB	closed	closed	open
7 bits, OP, 1SB	closed	open	open
8 bits, 2SB	open	closed	closed
8 bits, 1SB	open	open	closed
8 bits, EP, 1SB	open	closed	open
8 bits, OP, 1SB	open	open	open

EP = Even Parity OP = Odd Parity SB = Stop Bit(s)

PARALLEL INPUT PORT

In addition to the serial input port, the Intex-Talker also has a parallel input connector. The Intex-Talker operating system is interrupt driven and can receive data from either or both input ports simultaneously (however, this can create a confusing situation unless the data is coordinated in some manner). In normal use, the Intex-Talker expects to interact with a host computer on only one input at a time and it is best not to have anything plugged into the unused connector.

The parallel input port of the Intex-Talker is 8 bits with strobe and acknowlege handshaking. It is configured as a 34 pin edge connector and is Centronics printer port signal compatible. A signal list and pinout is listed elsewhere in this manual.

Table 1 Phoneme codes

HEX PHONEME CODE	PHONEME SYMBOL	DURATION (msec)	EXAMPLE WORD
00	EH3	59	jacket
01	EH2	71	enlist
02	EH1	121	heavy
03	PA0	47	no sound
04	DT	47	butter
05	A2	71	made
06	A1	103	made
07	ZH	90	azure
08	AH2	71	honest
09	I3	55	inhibit
0A	I2	80	inhibit
0B	I1	121	inhibit
0C	M	103	mat
0D	N	80	sun
0E	B	71	bag
0F	V	71	van
10	CH	71	chip
11	SH	121	shop
12	Z	71	zoo
13	AW1	146	lawful
14	NG	121	thing
15	AH1	146	father
16	OO1	103	looking
17	OO	185	book
18	L	103	land
19	K	80	trick
1A	J	47	judge
1B	H	71	hello
1C	G	71	get
1D	F	103	fast
1E	D	55	paid
1F	S	90	pass

HEX PHONEME CODE	PHONEME SYMBOL	DURATION (msec)	EXAMPLE WORD
20	A	185	day
21	AY	65	day
22	Y1	80	yard
23	UH3	47	mission
24	AH	250	mop
25	P	103	past
26	O	185	cold
27	I	185	pin
28	U	185	move
29	Y	103	any
2A	T	71	tap
2B	R	90	red
2C	E	185	meet
2D	W	80	win
2E	AE	185	dad
2F	AE1	103	after
30	AW2	90	salty
31	UH2	71	about
32	UH1	103	uncle
33	UH	185	cup
34	O2	80	for
35	O1	121	aboard
36	IU	59	you
37	U1	90	you
38	THV	80	the
39	TH	71	thin
3A	ER	146	bird
3B	EH	185	get
3C	E1	121	be
3D	AW	250	call
3E	PA1	185	no sound
3F	STOP	47	no sound

Note: T must precede CH to produce "CH" sound.
D must precede J to produce "J" sound.

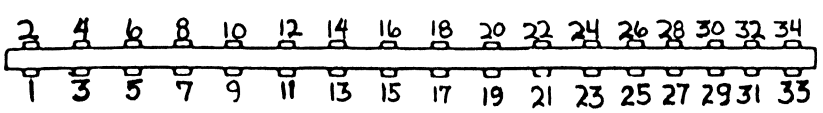
J3 34 PIN PARALLEL INPUT CONNECTOR PINOUT

PIN	SIGNAL	DESCRIPTION
1	Strobe	Data Output Strobe
2	GND	
3	D0	Output bit 0
4	GND	
5	D1	Output bit 1
6	GND	
7	D2	Output bit 2
8	GND	
9	D3	Output bit 3
10	GND	
11	D4	Output bit 4
12	GND	
13	D5	Output bit 5
14	GND	
15	D6	Output bit 6
16	GND	
17	D7	Output bit 7
18	GND	
19	N/C	no Connection
20	GND	
21	ACK	Data Strobe Acknowlege
22	GND	
23	GND	
24	GND	
25	N/C	No Connection
26	N/C	No Connection
27	GND	
28	N/C	No Connection
29	N/C	No Connection
30	N/C	No Connection
31	GND	
32	N/C	No Connection
33	GND	
34	GND	

Note: All GND signals are common. All inputs are LSTTL.

VIEWED FACING THE CONNECTOR

(insert connector diagram here)



J1 25 PIN DB-25 SERIAL CONNECTOR PINOUT

PIN	SIGNAL	DESCRIPTION
1	GND	
2	TD	Transmit Data
3	RD	Receive Data
4	RTS	Request to Send
5	CTS	Clear to Send
6	N/C	No Connection
7	GND	
8	CD	Carrier Detect
20	DTR	Data Terminal Ready

Note: All undesignated pins are open circuit.
Pins 2 and 3 can be interchanged between DTE/DCE designation. See section on serial port for explanation.

Table 2

TYPICAL PHONETIC WORD LIST

A	Al, AY, Y
able	Al, Y, B, UH3, L
about	UH1, B, UH2, AH2, U1, T
actual	AE1, EH3, K, T, CH, U1, UH3, L
add	AE1, EH3, D
adjust	UH1, D, J, UH1, UH3, S, T
B	B, E1, Y
back	B, AE1, AE1, K
basic	B, Al, Y, S, I2, K
been	B, EH1, EH3, N
before	B, Y, F, O2, O2, R
better	B, EH1, EH3, T, ER
C	S, E1, Y
came	K, Al, AY, Y, M
can	K, AE1, EH3, N
car	K, AH2, UH3, R
catalog	K, AE2, EH3, DT, UH3, L, AW2, AW2, G
change	T, CH, Al, AY, Y, N, D, J
D	D, E1, Y
data	D, A2, Y, DT, UH1
date	D, A2, AY, Y, T
decide	D, Y, S, AH2,EH3, Y, D
decision	D, Y, S, I2, ZH, UH3, N
deliver	D, Y, L, I2, V, ER
E	E1, Y
early	ER, R, L, Y
either	E1, Y, THV, ER
empty	EH2, EH3, M, P, T, Y
end	EH2, EH3, N, D
exact	EH2, EH3, G, PA0, Z, AE2, EH3, K, T
F	EH1, EH2, F
fact	F, AE2, EH3, K, T
fault	F, AW, L, T
final	F, AH2, Y, N, UH3, L
first	F, ER, R, S, T
follow	F, AH1, AW2, L, O1, U1
G	D, J, E1, Y
game	G, A2, AY, Y, M
good	G, OO1, OO1, D
great	G, R, A2, Y, T
ground	G, R, AH1, UH3, W, N, D
grow	G, R, O1, U1
H	Al, AY, Y, T, CH
hand	H, AE1, EH3, N, D
have	H, AE1, EH3, V
hear	H, AY, I3, R
heavy	H, EH1, V, Y

```
high        H, AH1, EH3, Y

I           AH1, EH3, I3, Y
important   I1, I3, M, P, O2, O2, R, T, EH3, N, T
include     I1, I3, N, K, L, IU, U1, U1, D
inform      I1, I3, N, F, O2, O2, R, M
insert      I1, N, S, R, R, T
instead     I1, I3, N, S, T, EH1, EH3, D

J           D, J, EH3, A1, AY, Y
job         D, J, AH1, UH3, B
join        D, J, O1, UH3, I3, AY, N
joy         D, J, O1, UH3, I3, AY
judge       D, J, UH1, UH2, D, J
jump        D, J, UH1, UH2, M, P

K           K, EH3, A1, AY, Y
keep        K, E1, Y, P
key         K, E1, Y
keyboard    K, AY, Y, B, O1,O2, R, D
kill        K, I1, I3, L
knowledge   N, AH1, UH3, L, I3, D, J

L           EH1, EH3, UH3, L
language    L, AE1, EH3, NG, G, W, I1, D, J
large       L, AH1, R, D, J
left        L, EH1, EH3, F, T
length      L, EH1, EH3, NG, TH
listen      L, I1, I3, S, I2, N

M           EH1, EH2, M
make        M, A1, AY, Y, K
many        M, EH2, EH2, N, Y
match       M, AE1, EH3, T, CH
memory      M, EH1, EH3, M, ER, Y
message     M, EH1, EH3, S, I2, D, J

N           EH1, EH2, N
name        N, A1, AY, Y, M
near        N, AY, I1, R
need        N, E1, Y, D
next        N, EH1, EH3, K, PA0, S, T
none        N, UH1, UH3, N

O           O2, O1, U1
object      UH1, B, D, J, EH1, EH3, K, T
obsolete    AH1, UH3, B, S, UH3, L, AY, Y, T
often       AW2, AW2, F, I3, N
omit        O1, U1, M, I1, I3, T
other       UH1, UH3, THV, ER

P           P, E1, Y
package     P, AE1, EH3, K, I1, D, J
paper       P, A1, Y, P, ER
part        P, AH1, R, T
person      P, ER, S, UH1, N
phone       F, O1, U1, N

Q           K, Y1, IU, U1, U1
qualify     K, W, AW1, L, I1, F, AH1, EH3, Y
```

quantity	K, W, AH1, N, T, I3, T, Y
question	K, W, EH1, EH3, S, T, CH, UH3, N
quick	K, W, I1, I3, K
quiet	K, W, AH1, EH3, AY, I2, T
R	AH1, UH2, ER
raise	R, A1, AY, Y, Z
reach	R, E1, Y, T, CH
ready	R, EH1, EH3, D, Y
remain	R, E1, M, A1, AY, Y, N
resistor	R, E1, Z, I1, S, T, ER
S	EH1, EH2, S
safe	S, A1, AY, Y, F
sale	S, A1, A2, AY, UH3, L
schedule	S, K, EH1, EH3, D, J, IU, U1, L
scrap	S, K, R, AE1, EH3, P
section	S, EH1, EH3, K, SH, UH3, N
T	T, E1, AY, Y
talk	T, AW, K
technical	T, EH1, EH3, K, N, I3, K, UH3, L
terminal	T, ER, M, EH3, N, UH2, L
think	TH, I1, I3, NG, K
time	T, AH1, EH3, Y, M
U	Y1, IU, U1, U1
under	UH2, UH2, N, D, ER
uniform	Y1, IU, U1, N, I3, F, O1, R, M
until	UH2, UH2, N, T, I1, I3, L
up	UH1, UH2, P
urgent	R, R, D, J, I3, N, T
us	UH1, UH2, S
use	Y1, IU, U1, U1, Z
V	V, E1, AY, Y
vacant	V, A1, Y, K, EH3, N, T
valid	V, AE1, UH3, L, I1, D
value	V, AE1, EH3, L, Y1, IU, U1
vendor	V, EH1, EH3, N, D, ER
vent	V, EH1, EH3, N, T
verify	V, EH1, R, I3, F, AH1, EH3, Y
very	V, EH1, R, Y
via	V, E1, AY, UH2, UH3
victor	V, I1, I3, K, T, ER
voice	V, O1, UH3, I3, AY, S
void	V, O1, UH3, I3, AY, D
volt	V, O2, O2, L, T
volume	V, AH1, UH3, L, Y1, IU, U1, M
W	D, UH1, B, UH3, L, Y1, IU, U1
wage	W, A1, AY, Y, D, J
wait	W, A1, AY, Y, T
want	W, AH1, UH3, N, T
was	W, UH1, UH3, Z
wash	W, AW, SH
water	W, AH1, UH3, T, ER
watt	W, AH1, UH3, T
wave	W, A1, AY, Y, V
we	W, E1, Y

weapon	W, EH2, EH2, P, UH1, N
wednesday	W, EH1, N, Z, D, A1, I3, Y
week	W, E1, Y, K
weigh	W, A2, A2, Y
went	W, EH1, EH3, N, T
west	W, EH1, EH3, S, T
wet	W, EH1, EH3, T
what	W, UH3, UH1, T
wheel	W, E1, Y, L
when	W, EH1, EH3, N
where	W, EH3, A2, EH3, R
which	W, I1, I3, T, CH
while	W, AH1, EH3, I1, UH3, L
whiskey	W, I1, I3, S, K, AY, Y
white	W, UH3, AH2, Y, T
who	H, IU, U1, U1
will	W, I1, I3, L
window	W, I1, N, D, O1, U1
winter	W, I1, I3, N, T, ER
wire	W, AH1, EH3, AY, R
with	W, I1, I3, TH
withdraw	W, I1, I3, TH, D, R, AW
without	W, I1, I3, TH, UH2, AH2, U1, T
word	W, ER, R, D
work	W, ER, R, K
wrong	R, AW, NG
X	EH1, EH2, K, PA0, S
x-ray	EH1, EH2, K, PA0, S R, A1, I3, Y
Y	W, AH1, EH3, I3, Y
yankee	Y1, AE1, EH3, NG, K, E1, Y
yard	Y1, AH1, R, D
year	Y1, AY, I3, R
yellow	Y1, EH1, EH3, L, O1, U1
yes	Y1, EH3, EH1, S
yesterday	Y1, EH3, EH1,S, T, ER, D, A1, I3, Y
yet	Y1, EH1, EH3, T
your	Y, O2, O2, R
Z	Z, E1, Y
zap	Z, AE1, EH3, P
zero	Z, AY, I1, R, O1, U1
zone	Z, O1, U1, N
zulu	Z, IU, U1, L, IU, U1

INTEX-TALKER PARTS LIST

C1	0.01 Mfd 16V Ceramic Disc
C2	0.1 Mfd 16V Ceramic Disc
C3	0.1 Mfd 16V Ceramic Disc
C4	100 Mfd 25V Electrolytic
C5	0.1 Mfd 16V Ceramic Disc
C6	220 Mfd 25V Electrolytic
C7	0.1 Mfd 16V Ceramic Disc
C8	10 Mfd 25V Electrolytic
C9	n/a
C10	220 Mfd 25V Electrolytic
C11	0.1 Mfd 16V Ceramic Disc
C12	0.1 Mfd 16V Ceramic Disc
C13	0.1 Mfd 16V Ceramic Disc
C14	0.1 Mfd 16V Ceramic Disc
C15	0.1 Mfd 16V Ceramic Disc
C16	0.1 Mfd 16V Ceramic Disc
C17	0.1 Mfd 16V Ceramic Disc
C18	2200 Mfd 25V Electrolytic
C19	470 Mfd 25V Electrolytic
C20	10 Mfd 25V Electrolytic
C21	10 Mfd 25V Electrolytic
C22	10 Mfd 25V Electrolytic
D1	1N4148
D2	KBP02 Bridge or equivalent
ZD1	1N4742A
ZD2	1N4742A
IC1	6502 Microprocessor
IC2	2016 1K X 8 RAM
IC3	2016 1K X 8 RAM (optional)
IC4	2732 EPROM (programmed)
IC5	2732 EPROM (programmed)
IC6	CD4040
IC7	74LS04
IC8	74LS00
IC9	74LS139
IC10	6850 UART
IC11	INS8255 PIO
IC12	SC-01A Phoneme Synthesizer
IC13	74LS175
IC14	74LS74
IC15	LM386 AMP
IC16	7407
IC17	MC1488
IC18	MC1489
IC19	7497
LED1	TIL 220, RED
R1	2.2K (RED RED RED)
R2	4.7K (YEL VIO RED)
R3	4.7K
R4	4.7K
R5	2.2K
R6	2.2K
R7	2.2K
R8	100K (BRN BLK YEL)
R9	3.3K (ORG ORG RED)
R10	10K (BRN BLK ORG)
R11	10K POT W/SWITCH

R12	10 OHM (BRN BLK BLK)
R13	4.7K
R14	33K (ORG ORG ORG)
R15	1.8K (BRN GRY RED)
R16	1.8K
R17	33 OHM (ORG ORG BLK)
R18	10 OHM (BRN BLK BLK)
R19	33 OHM 1/2 W
R20	100 OHM 1/2 W (BRN BLK BRN)
R21	470 OHM (GRN VIO BRN)
S1	8 POS DIP SW
S2	8 POS DIP SW (or 2 X 9 Berg header)
SIP1	4.7K, 10 pin Resistor SIP
V1	MC7805 Regulator
X1	Crystal 4.9152 Mhz

Micromint Text to Speech PC Board
Heat Sink 6071
Heat Sink 6072
Screw, 6/32 x 3/8
Nut, 6/32
Transformer PITB-109 22VCT @300 MA
Jack, Keystone 901, Submini phono
Connector, DB-25, RS-232C
Berg Strip 9 x 2 (see SW2 above)
Berg Strip 3 x 2
Berg Jumper (qty 3)
Case top
Case bottom
Case screws (2)
Standoff, (qty 4)
Screw, #4 x 3/4, self-tapping (qty 4)
Knob, volume control
labels (FCC and ID)
Face decal (Intex-Talker)

Sockets

8 Pin solder (1)
14 Pin solder (6)
16 Pin solder (4)
22 Pin solder (1)
24 Pin solder (3)
28 Pin solder (2)
40 Pin solder (2)

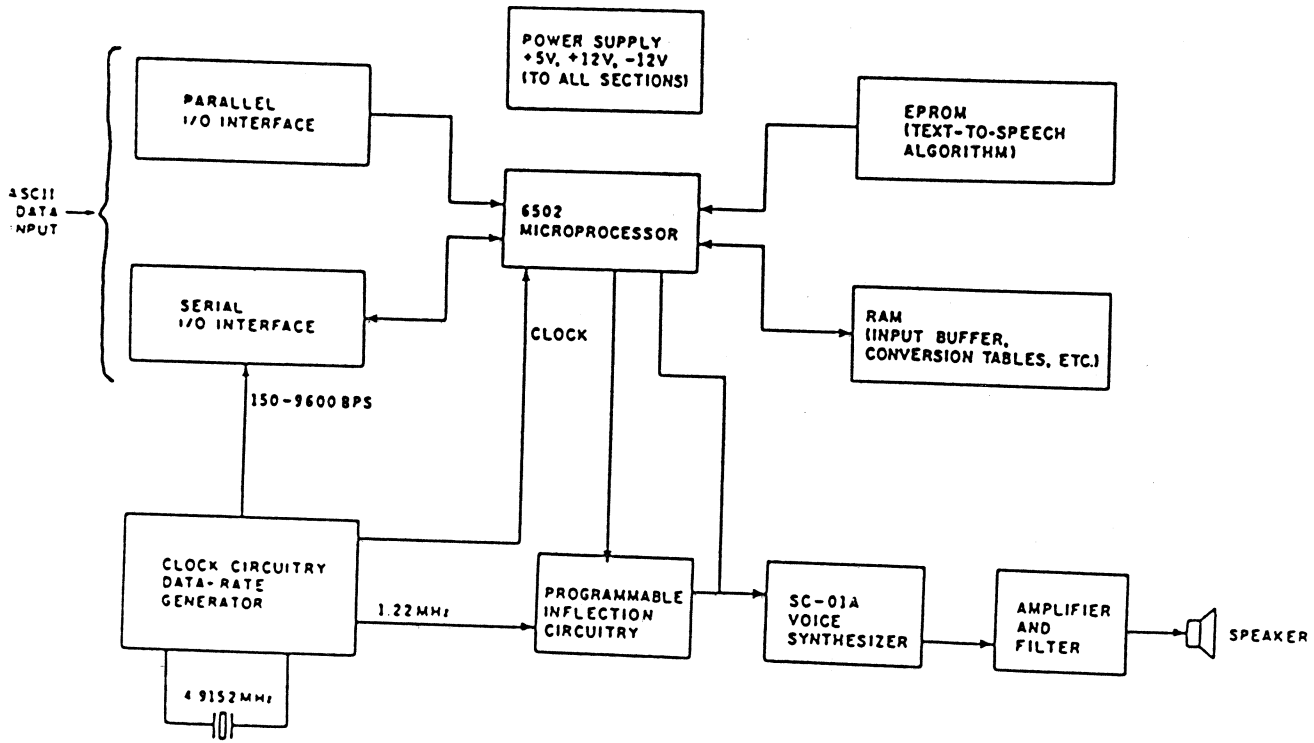

ASCII DATA INPUT
PARALLEL I/O INTERFACE
SERIAL I/O INTERFACE
150-9600 BPS
POWER SUPPLY +5V, +12V, -12V (TO ALL SECTIONS)
6502 MICROPROCESSOR
CLOCK
EPROM (TEXT-TO-SPEECH ALGORITHM)
RAM (INPUT BUFFER, CONVERSION TABLES, ETC.)
CLOCK CIRCUITRY DATA-RATE GENERATOR
4.9152MHz
1.22MHz
PROGRAMMABLE INFLECTION CIRCUITRY
SC-01A VOICE SYNTHESIZER
AMPLIFIER AND FILTER
SPEAKER

Figure 1

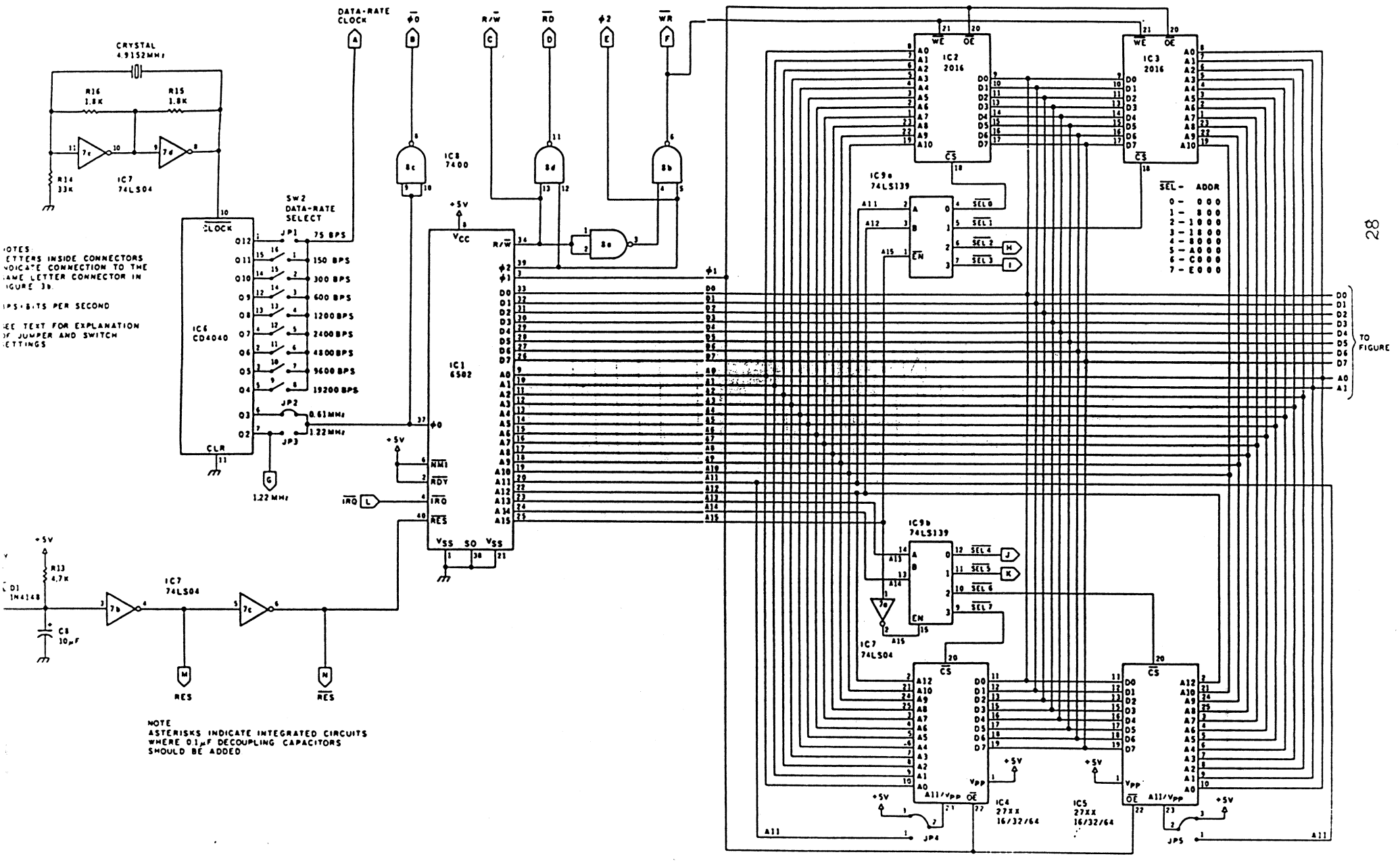

CRYSTAL
4.9152MHz
R16
1.8K
R15
1.8K
R14
33K
IC7
74LS04
DATA-RATE
CLOCK
SW2
DATA-RATE
SELECT
JP1
75 BPS
150 BPS
300 BPS
600 BPS
1200 BPS
2400 BPS
4800 BPS
9600 BPS
19200 BPS
JP2
0.61MHz
1.22MHz
JP3
IC6
CD4040
CLOCK
CLR
1.22 MHz
IC8
7400
IC1
6502
+5V
IRQ
RES
NMI
RDY
IRQ
R13
4.7K
D1
1N4148
C8
10μF
RES
RES
NOTE
ASTERISKS INDICATE INTEGRATED CIRCUITS
WHERE 0.1μF DECOUPLING CAPACITORS
SHOULD BE ADDED
IC2
2016
IC3
2016
IC9a
74LS139
IC9b
74LS139
SEL - ADDR
0 - 0 0 0
1 - 8 0 0
2 - 1 0 0 0
3 - 1 8 0 0
4 - 8 0 0 0
5 - A 0 0 0
6 - C 0 0 0
7 - E 0 0 0
IC4
27XX
16/32/64
IC5
27XX
16/32/64
JP4
JP5
TO
FIGURE
* 2764 ONLY

Figure 2a

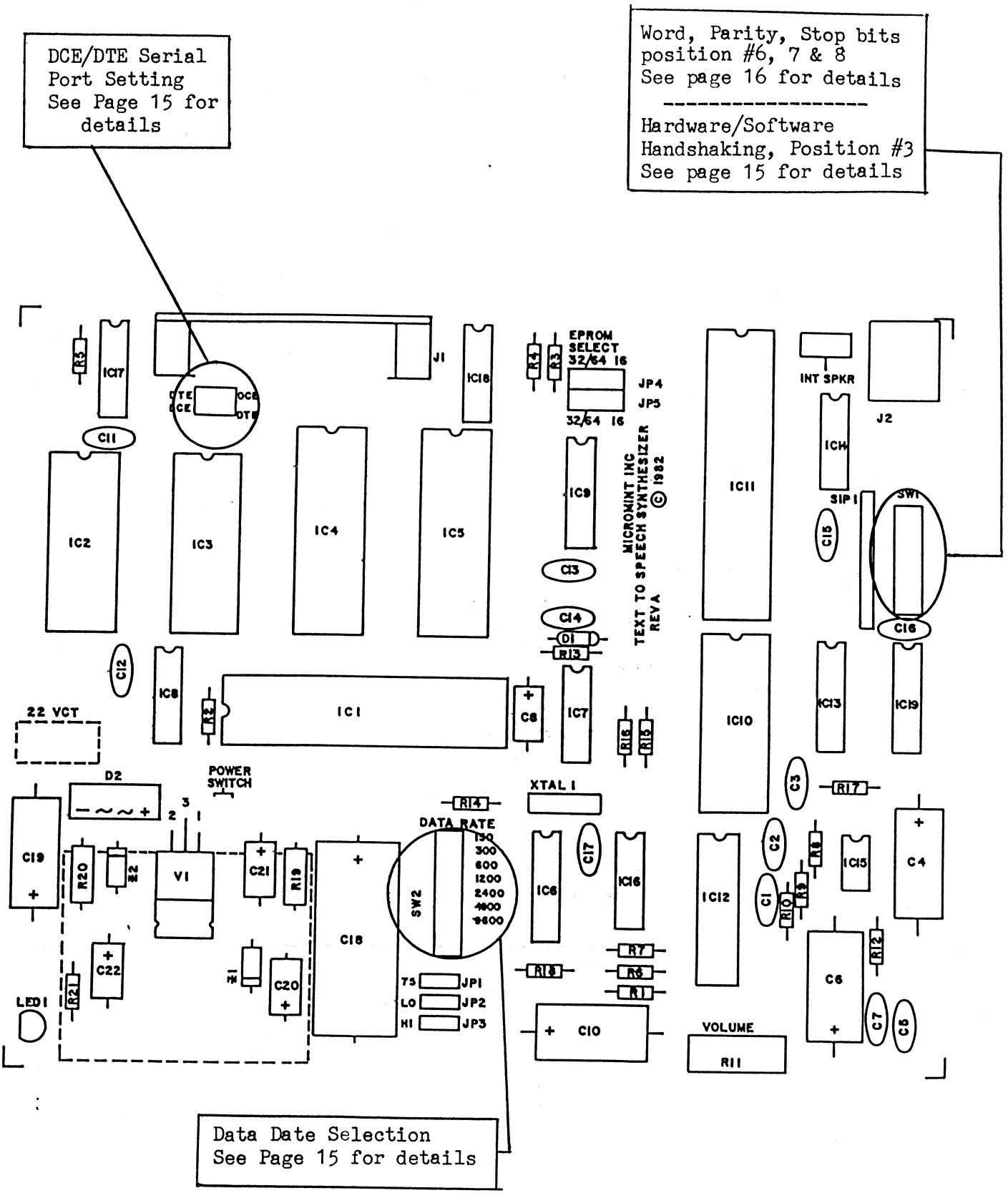

DCE/DTE Serial Port Setting See Page 15 for details
Word, Parity, Stop bits position #6, 7 & 8 See page 16 for details
Hardware/Software Handshaking, Position #3 See page 15 for details
Data Date Selection See Page 15 for details
EPROM SELECT 32/64 16
JP4
JP5
INT SPKR
J1
J2
IC1
IC2
IC3
IC4
IC5
IC6
IC7
IC8
IC9
IC10
IC11
IC12
IC13
IC15
IC16
IC17
IC18
IC19
IC20
SW1
SW2
SIP1
XTAL 1
DATA RATE
150
300
600
1200
2400
4800
9600
POWER SWITCH
VOLUME
R11
C10
C18
LED1
22 VCT
MICROMINT INC © 1982 TEXT TO SPEECH SYNTHESIZER REV A

Figure 2c

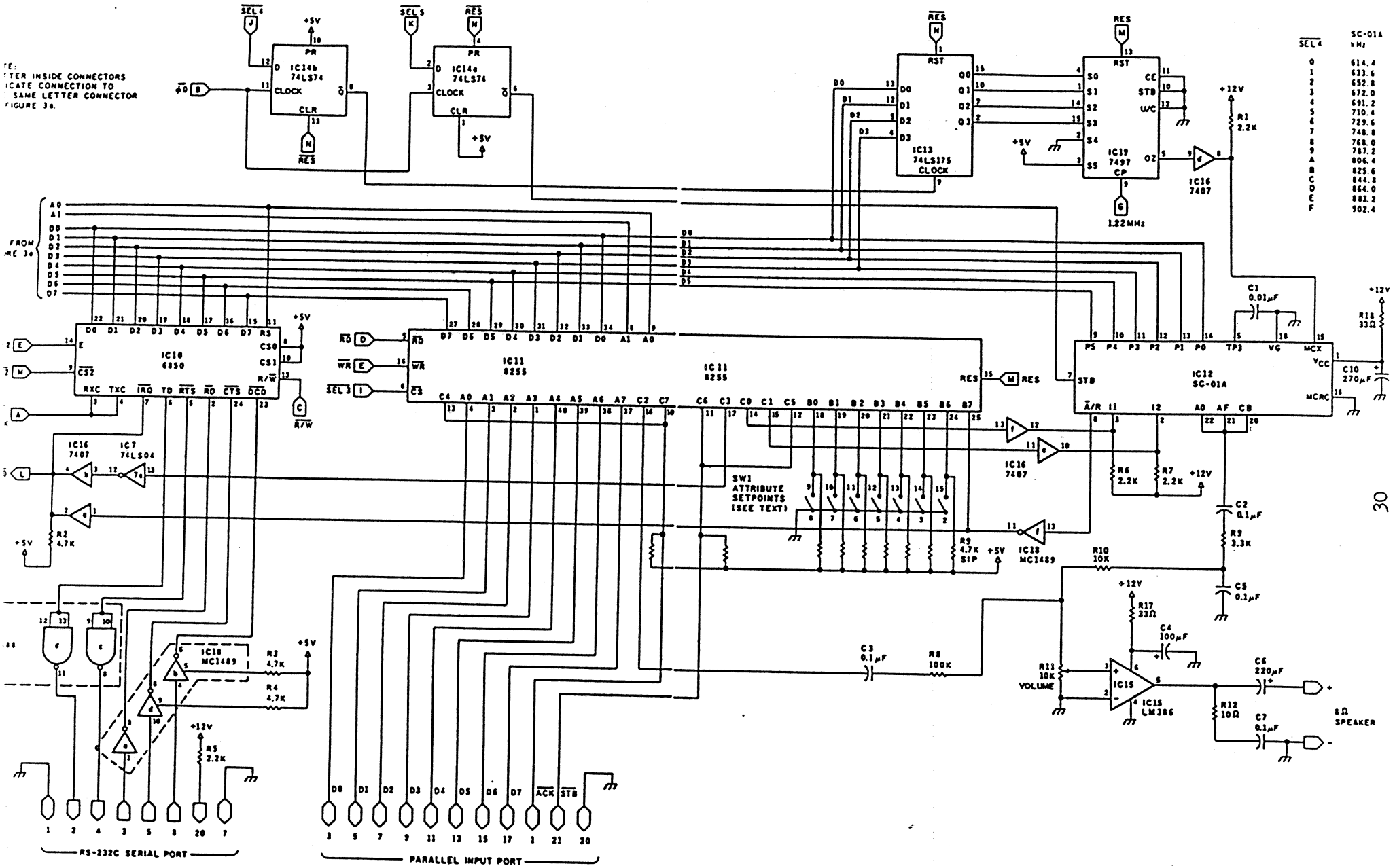

IC14b 74LS74
IC14a 74LS74
IC13 74LS175 CLOCK
IC19 7497
1.22MHz
IC16 7407
IC10 6850
IC11 8255
IC12 SC-01A
IC7 74LS04
IC18 MC1489
IC15 LM386
SW1 ATTRIBUTE SETPOINTS (SEE TEXT)
R9 4.7K SIP
R10 10K
R11 10K VOLUME
R12 10Ω
8Ω SPEAKER
RS-232C SERIAL PORT
PARALLEL INPUT PORT
SC-01A kHz
0 614.4
1 633.6
2 652.8
3 672.0
4 691.2
5 710.4
6 729.6
7 748.8
8 768.0
9 787.2
A 806.4
B 825.6
C 844.8
D 864.0
E 883.2
F 902.4

Figure 2b

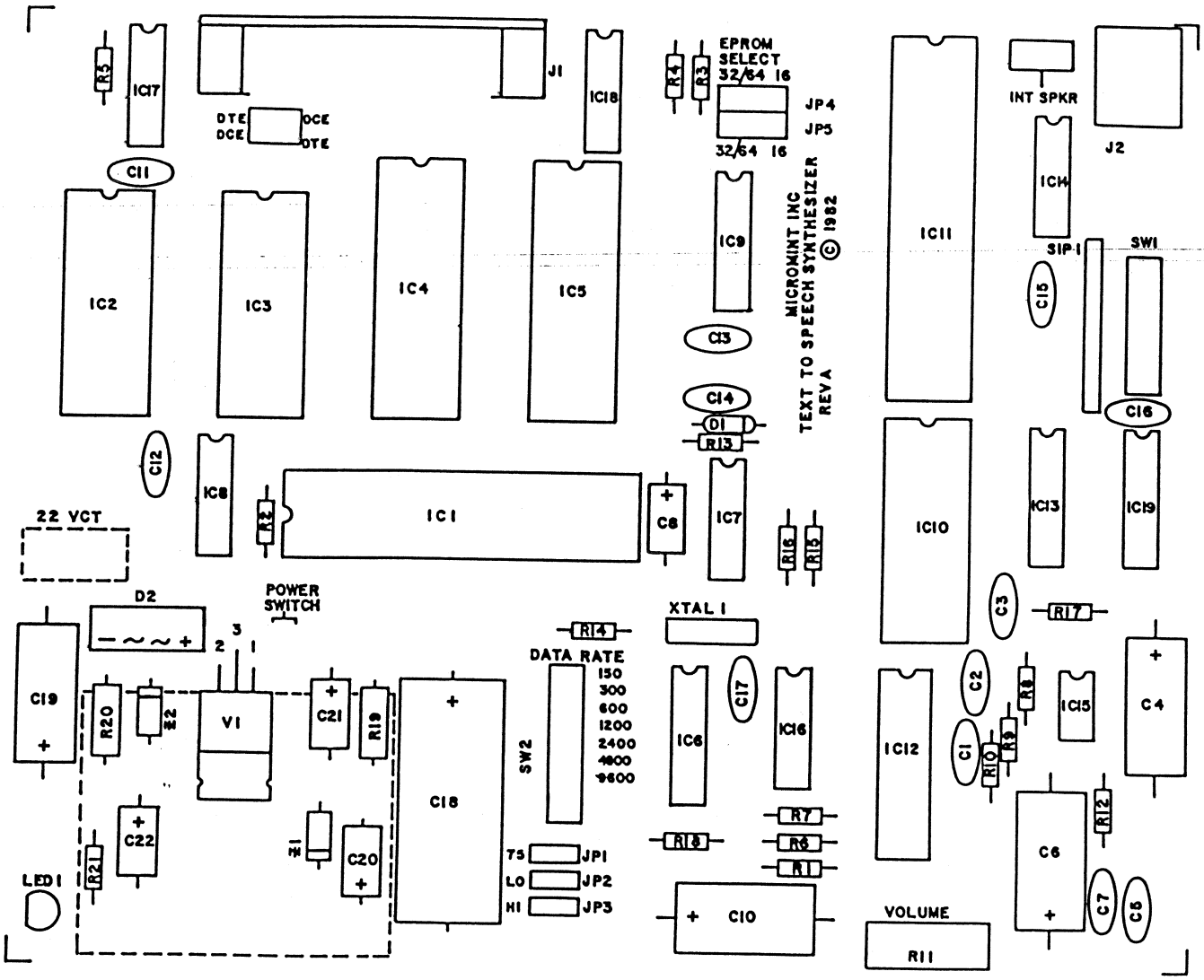

R5
IC17
J1
IC18
DTE
DCE
DCE
DTE
EPROM
SELECT
32/64 16
R4
R3
JP4
JP5
32/64 16
INT SPKR
J2
C11
IC2
IC3
IC4
IC5
IC9
MICROMINT INC
TEXT TO SPEECH SYNTHESIZER
REV A
© 1982
IC11
IC14
SIP1
SW1
C15
C13
C14
D1
R13
C16
C12
IC8
IC1
C8
IC7
IC10
IC13
IC19
R16
R15
22 VCT
R2
POWER
SWITCH
D2
XTAL 1
R14
C3
R17
DATA RATE
150
300
600
1200
2400
4800
9600
2
3
1
C19
R20
Z2
V1
C21
R19
C18
SW2
IC6
C17
IC16
IC12
C2
R8
IC15
C4
C1
R10
R9
R12
C6
R7
R6
R1
R18
C22
R21
LED1
C20
C9
75
LO
HI
JP1
JP2
JP3
C10
VOLUME
R11
C7
C5

Figure 2c

****

WARRANTEE

Factory manufactured Intex-Talkers carry a 90 day warrantee including parts and labor. No credit will be given for units which show damage through neglect or user modification. Any unit returned for repair after the warrantee period must receive prior authorization and be shipped prepaid and insured. There is a minimum inspection fee for boards not under warrantee. Under no circumstances is any product to be returned to INTEX MICRO SYSTEMS without prior authorization. INTEX MICRO SYSTEMS will assume no responsibility for unauthorized returns.

INTEX MICRO SYSTEMS makes no warrantee on user assembler boards, kits, power supplies, or unpopulated boards.

INTEX MICRO SYSTEMS reserves the right to change any specification or feature at any time.

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NOTES

Intex-Talker has been tested and found to comply with the limits for a Class B computing device in accordance with the specifications in sub part J of Part 15 of FCC rules. The test report is being reviewed by the FCC. When the Intex-Talker is issued an ID number a decal will be sent to you with that number. It should be affixed over the right side of the label on the bottom of the case.

The following are additions and clarifications to the user's manual:

1) The Intex-Talker must be in the !F mode before entering the D mode. Also, once in the D mode, other control changes can only be received if the Intex-Talker is set to !D9 first (so that it can interpret the input rather than just echo the characters).

2) For software handshaking, switch position 3 on dip switch SW1 is set in the closed position (open is hardware handshaking). The following option is provided:

!H(busy character)(ready character)

Example: !H@#

In the example shown, the Intex-Talker will send the character "@" to the computer when it is unable to receive more data, and will send "#" to the computer when it is again ready to receive data. It is the responsibility of the computer programmer to write the software necessary for the use of these options. NOTE: While in the example above the handshaking characters are '@' and '#', the default mode of the Intex-Talker uses the characters 'R' and 'B' instead. Use the above described method to set any other pair of handshaking characters.

3) The Intex-Talker can operate in four different modes: text to speech, text to spelled speech, phoneme codes, and music. When the Intex-Talker is turned on it is in text to speech mode, however, the user can select among the following options:

!T (text to speech)
!E (spelled speech -- say each letter)
!C (phoneme codes)
!N (musical notes)

NOTE: The default mode is !T. To exit any mode you must enter another. For example, if you are in the !E mode, to return to text to speech you must type !T. Also, changing between mode frequently resets selected options to the default mode.

4) In some units the default mode on power up may be !I instead of !F.