IF YOU DECIDE THAT REMOVING THE TRUSTY SPEECH SYNTHESIZER FROM IT'S HOME ON THE RIGHT SIDE OF YOUR CONSOLE, WHERE IT'S BEEN SINCE YOU SPENT $240 SOME ODD DOLLARS (SIX CARTRIDGES YOU GET ONE FREE SPEECH SYNTHESIZER, REMEMBER?), JUST TO PUT IT INSIDE THE MACHINE WHERE NO ONE, NOT EVEN YOUR FRIEND WITH THE ATARI, OR THE COMMAND (WHO BY THE WAY PROBABLY DOESN'T EVEN HAVE SPEECH ON HIS)CAN SEE IT, IS WORTH IT, THEN READ ON. (SAY THAT WITH ONE BREATH WILL YOU?)

I'M GOING TO LEAVE THE FACT OF WEATHER OR NOT YOU HAVE ALREADY INSTALLED 32K OF MEMORY INSIDE YOUR CONSOLE NOT CLOUD THE DESCRIPTION HERE, EXCEPT TO STATE THAT THERE IS ROOM FOR BOTH INSIDE THE CONSOLE ABOVE THE UPPER SHIELD, TO THE LEFT OF THE GROM PORT.

FIRST YOU SHOULD PREPARE A STATIC FREE PLACE TO WORK, NO CARPET UNDERFOOT, TRY TO WEAR COTTON CLOTHING, MOVE AROUND AS LITTLE AS POSSIBLE, AND TRY TO PROVIDE YOURSELF WITH A GOOD EARTH GROUND AT THE IMMEDIATE WORK AREA. GOOD LIGHTING IS IMPORTANT, AND THE JOB WILL ALWAYS PROGRESS FASTER AND YOU WILL BE LESS FRUSTRATED IF YOU HAVE THE RIGHT TOOLS. A PHILLIPS SCREWDRIVER (#2), A 15 to 25 WATT (GROUNDED IF POSSIBLE) SOLDERING IRON, SMALL GUAGE RESIN CORE SOLDER, 10" OF RIBBON CABLE WITH AT LEAST 17 WIRES (OR ANY MULTI-STRAND WIRE EQUIVELANT TO THIS), ELECTRICAL TAPE, AN EXACTO (TYPE) KNIFE, SMALL SIDE CUTTERS OR WIRE STRIPPERS, AND A SMALL PAIR OF PLIARS, PREFERABLY NEEDLE NOSE.

REMOVE THE SPEECH SYNTHESIZER UNIT FROM THE ENCLOSURE, AND TAKE THE SHIELDING OFF OF THE BOARD. USING THE TOP PART OF THE DRAWING ON THE PREVIOUS PAGE, ORIENT YOURSELF WITH THE COMPONENT LAYOUT, AS WELL AS THE PIN LOCATIONS ON THE VERY TOP OF THE CARD ITSELF WHERE D3, D1, D5, D6 ARE SHOWN . IF YOU DO NOT WANT ANY CONNECTIONS MADE TO COMPONENTS, YOU CAN ALSO MAKE ALL YOUR CONNECTIONS TO THE PINS COMING FROM THE BLACK PLASTIC CONNECTOR WHICH SOLDERS TO THE SPEECH CIRCUIT CARD. THE PIN NUMBERS ARE:

PIN:	TERM:	PIN:	TERM:	PIN:	TERM:	PIN:	TERM:
1	+5V	19	A15	36	D6	40	D1
2	SBE	23	GND	37	D0	42	D3
3	RESET	34	D7	38	D5	43	-5V
5	A5	35	D4	39	D2	44	AUDIO
12	RDY						

MAKING THE ABOVE CONNECTIONS WILL KEEP THE BOARD CLEAN AND ELIMINATE THE LIKELY- HOOD OF DAMAGING A CHIP IN THE SPEECH UNIT WITH A HOT SOLDERING IRON, AS WELL AS ENABLING THE WIRES TO GO TO A MORE COMPACT LOCATION ON THE BOARD.

ATTACH THE WIRES TO THE BOARD EITHER AS SHOWN IN THE DRAWING OR TO THE EDGE CON- NECTOR AS DESCRIBED ABOVE.

REMOVE THE COVER FROM YOUR T.I. COMPUTER, AND TAKE THE TOP SHIELD OFF OF THE CPU BOARD. (THE BOARD MUST BE OF THE OLDER TYPE, IN THAT WITH THE BOARD LYING ON THE WORK AREA AS IT WOULD BE IF YOU WERE ACTUALLY USING IT, THE GROM PORT AND I/O PORT ON THE RIGHT, THE CPU PROCESSOR CHIP, THE 64 PIN CHIP, MUST BE HORIZONTAL TO THE FRONT EDGE OF THE CPU CARD) IF THE CPU CHIP IS VERTICLE TO THIS EDGE, THAT IS GOING AWAY FROM YOU, CLOSE THE MACHINE BACK UP AND STOP WITH THIS PROJECT.
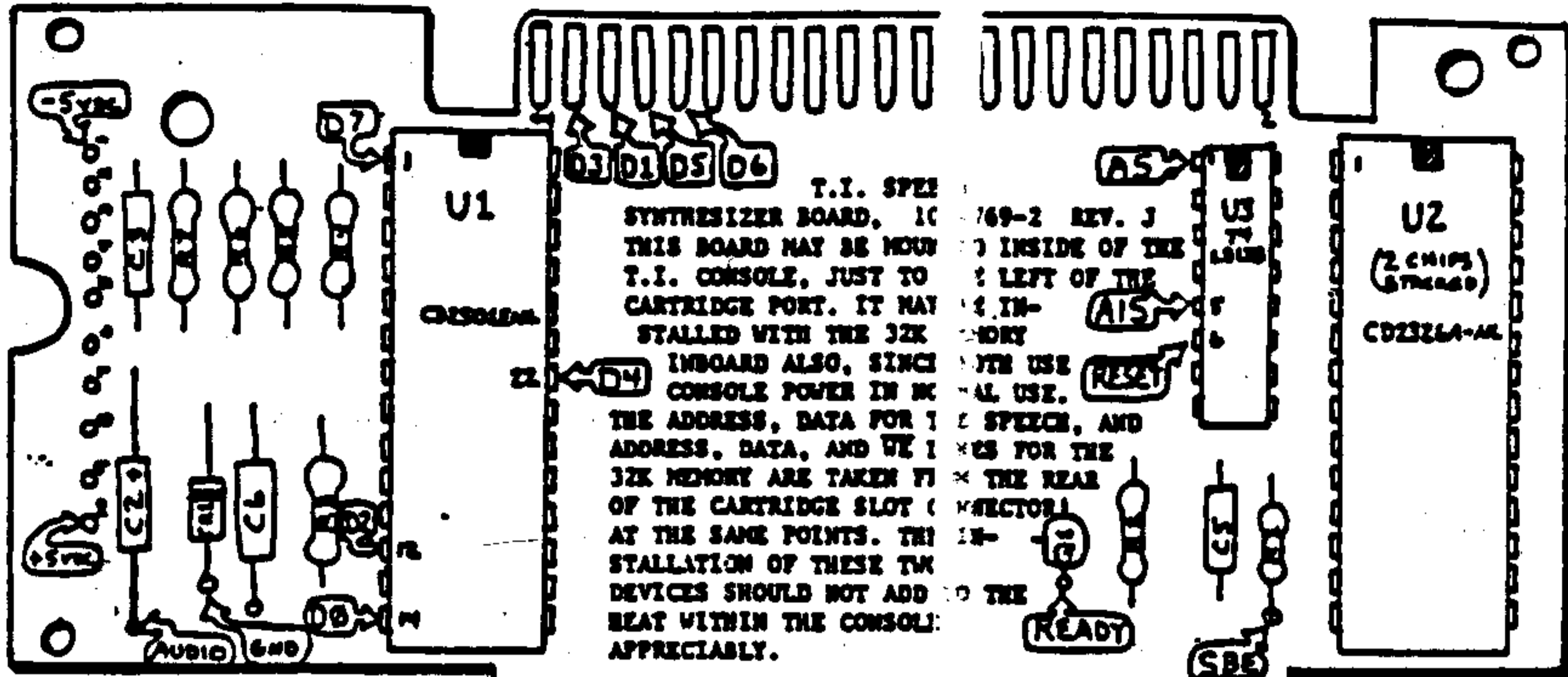
YOU MAY LOOK AT THE TOP SHIELD AND SEE THE BEST WAY FOR YOU TO ROUTE THE WIRES THAT GO TO THE CPU BOARD COMPONENTS, THROUGH IT. THESE WIRES COME FROM PINS, 1,2,3, 2,23,43, AND 44 AS SHOWN ABOVE. YOU MAY WISH TO CUT A SLOT IN THE SHIELD FROM ONE EDGE TOWARD THE CENTER OF THE SHIELD AND PROTECT THE EDGE WITH SILICONE CAULKING, OR USE JUST ELECTRICAL TAPE, TO PREVENT DAMAGE TO THE WIRES THAT GO TO THE CPU BOARD.

ATTACH THE 7 WIRES JUST MENTIONED, INSTALL THE SHIELD, AND ATTACH THE REMAINING 10 WIRES, DO THRU D7 AND A5, AND A15 TO THE REAR OF THE GROM CONNECTOR AS SHOWN IN THE INSERT ON THE FIRST PAGE. INSULATE THE BOARD FROM THE SHIELD EITHER BY USING NYLON OR PLASTIC SLEEVES AND SCREWS TO HOLD THE BOARD ABOUT 1/4" TO 1/2" ABOVE THE TOP SHIELD. ASSEMBLE THE CONSOLE. USE A SPEECH CARTRIDGE, OR WHATEVER MEANS YOU HAVE TO TEST OUT THE CARTRIDGE. SEE I TOLD YOU THIS WOULD BE SIMPLE. GOOD LUCK!

JOHN F. WILLFORTH   WP99'ERS
(412) 527-6656

T.I. SPE
SYNTHESIZER BOARD, 1C 769-2 REV. J
THIS BOARD MAY BE MOUN D INSIDE OF THE
T.I. CONSOLE, JUST TO   E LEFT OF THE
CARTRIDGE PORT. IT MAY   E IN-
STALLED WITH THE 32K   MORY
INBOARD ALSO, SINCE   TH USE
CONSOLE POWER IN N   AL USE.
THE ADDRESS, DATA FOR T E SPEECH, AND
ADDRESS, DATA, AND WE I ES FOR THE
32K MEMORY ARE TAKEN FI M THE REAR
OF THE CARTRIDGE SLOT C NECTOR
AT THE SAME POINTS. TH   IN-
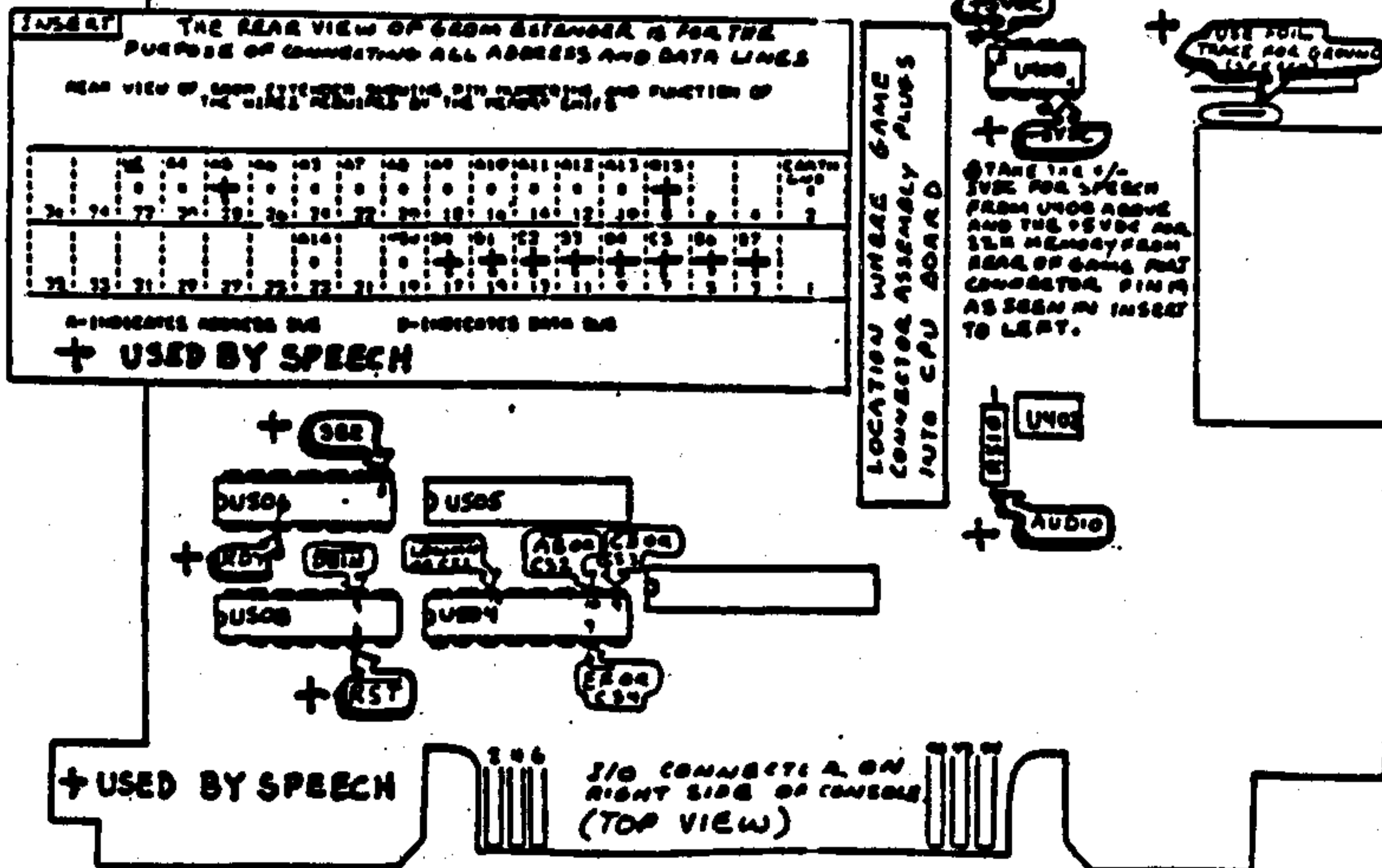STALLATION OF THESE TW
DEVICES SHOULD NOT ADD   O THE
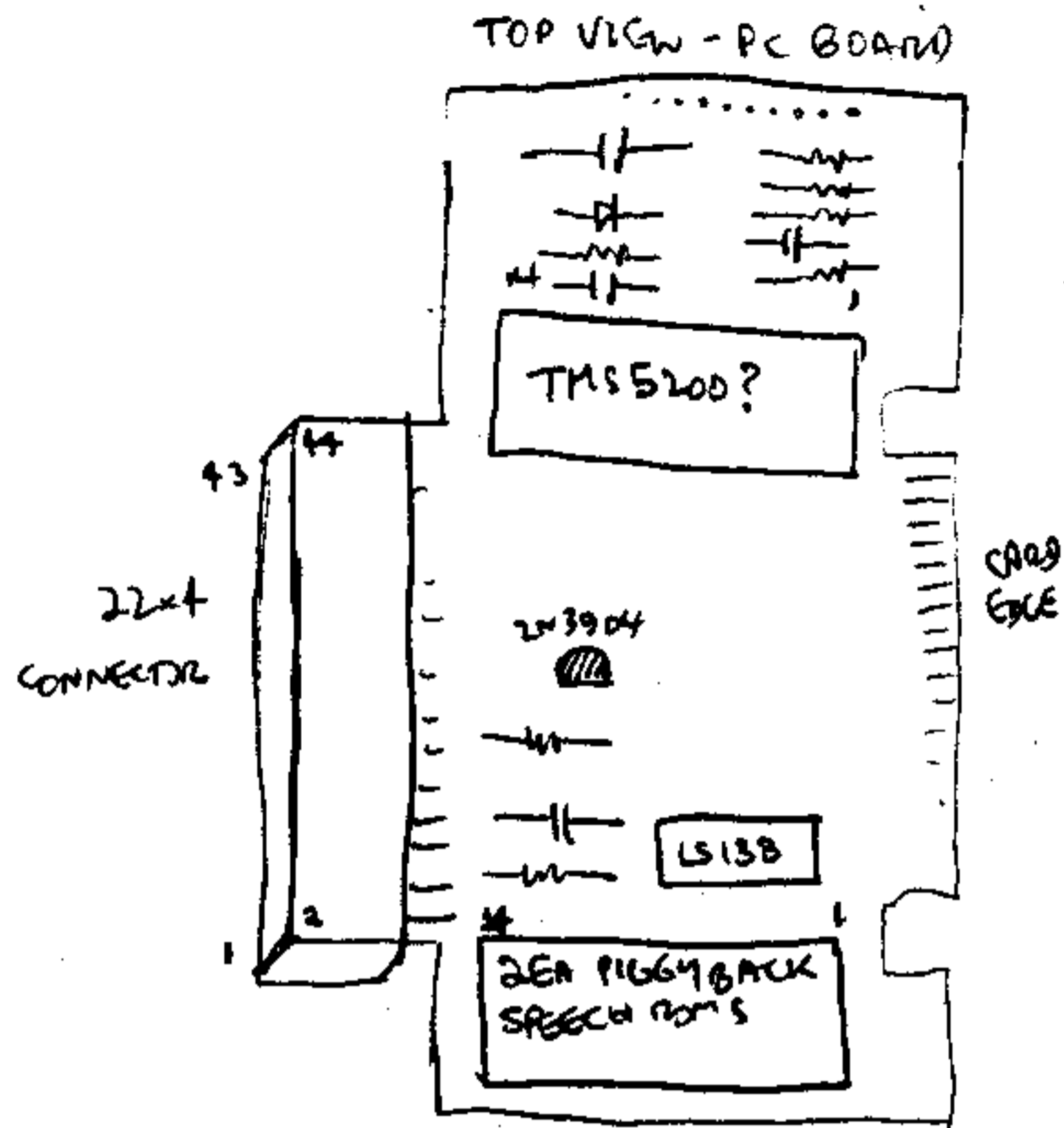HEAT WITHIN THE CONSOL
APPRECIABLY.

MUCH CREDIT MUST BE GIVEN
TO THE CEDAR RAPIDS USERS
GROUP FOR THEIR CONTINUED
EFFORTS IN MODIFYING THE
HARDWARE FOR THE T.I. 99.
GARY BISHOP ESPECIALLY.

BLACK PLASTI CONNECTOR
I/O TO CONSOLE CONNE TOR ON RIGHT
SIDE OF THE T.I. 99/4A COMPUTER.

THERE ARE 17 ADDRESS, DATA, CONTROL, AND POWER LINES THAT GO
FROM THE SPEECH UNIT ABOVE TO THE CPU BOARD BELOW. FOR EASE OF
LOCATING IN THIS DRAWING, I HAVE SHOWN THEM ON ONE SIDE OF THE
BCARD. IF YOU WOULD LIKE TO MAKE ALL OF YOUR CONNECTIONS ON THE
SPEECH UNIT AT THE CONSOLE I/O CONNECTOR RATHER THAN ON THE
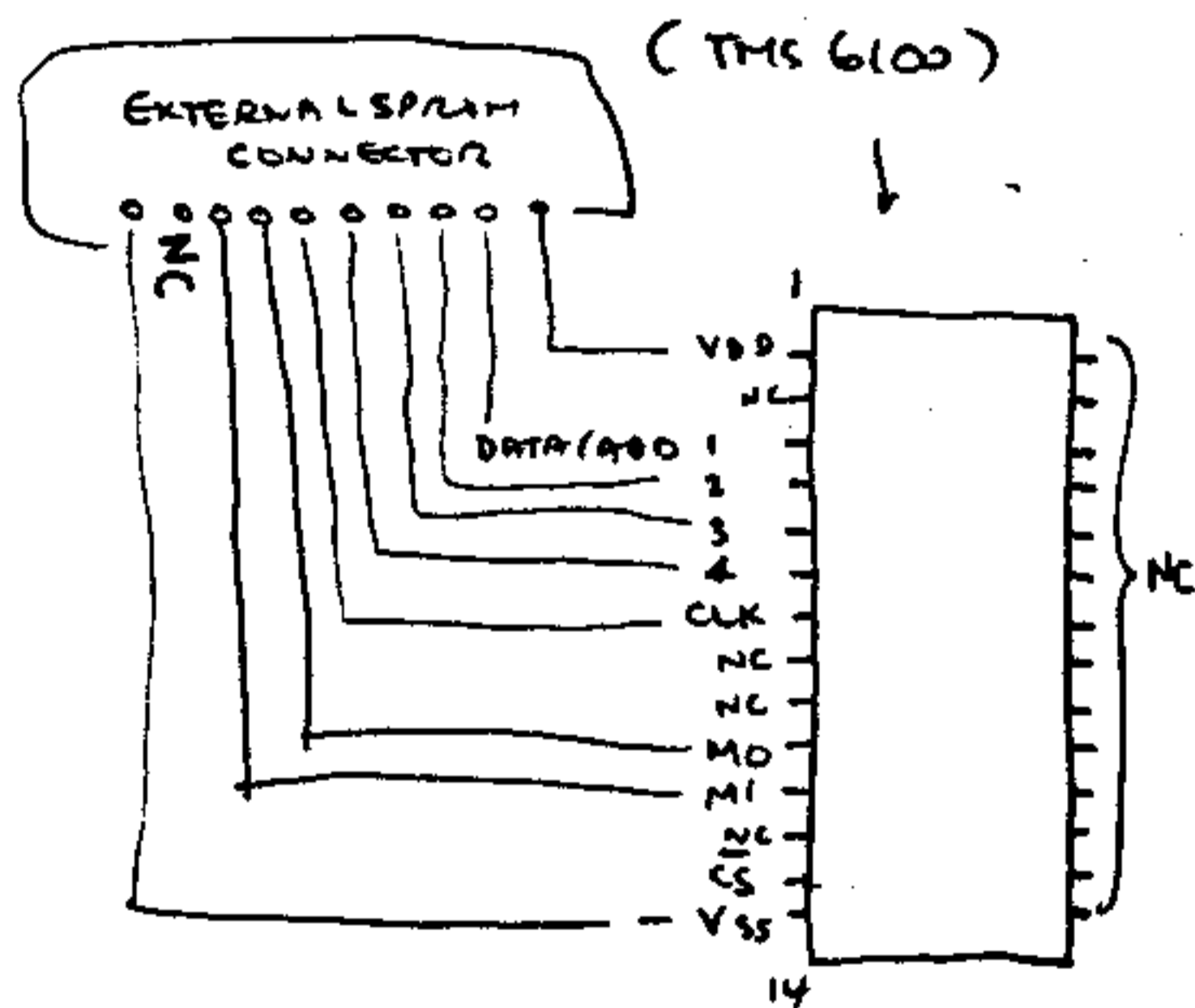COMPONENTS, SEE THE NEXT PAGE.

USED BY SPEECH

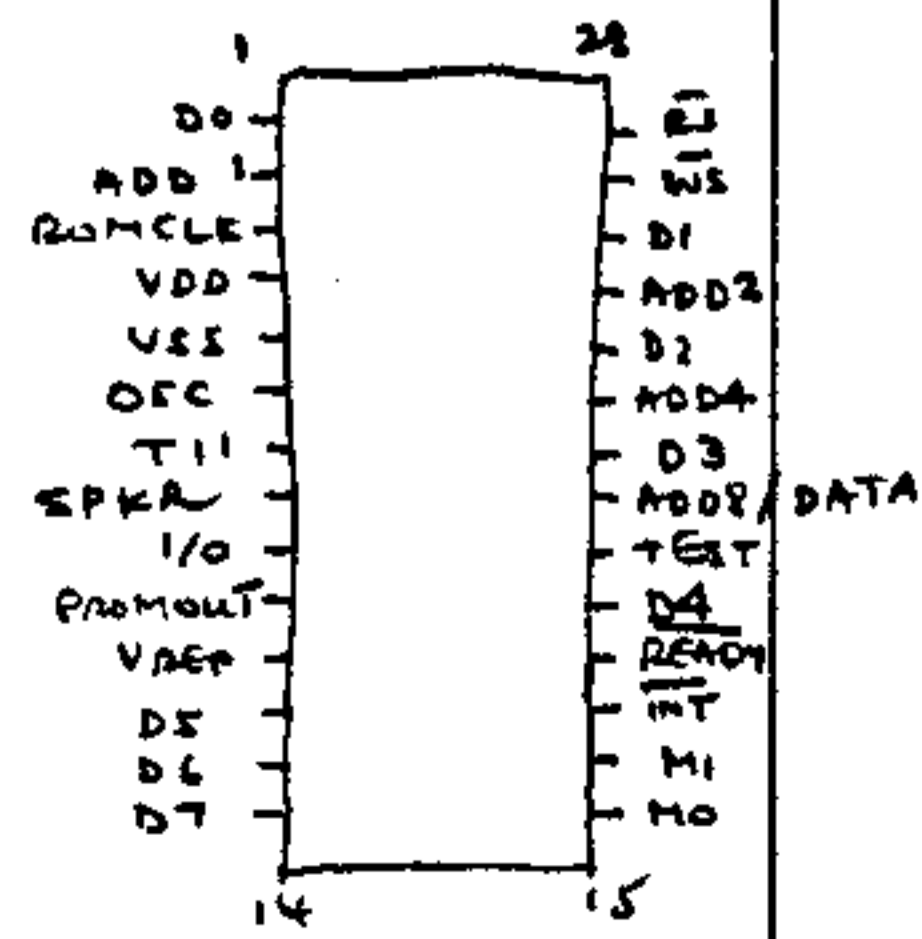USED BY SPEECH   I/O CONNECTION ON
RIGHT SIDE OF CONSOLE
(TOP VIEW)

Speech synth. info

TOP VIEW - PC BOARD

TMS 5200?

43 44

22×4
CONNECTOR

2N3904

CARD
EDGE

LS138

1   2

44   1

2EA PIGGYBACK
SPEECH ROMS

PC BOARD TOP VIEW

VSP: "TMC 0285NL
      CD 2501
      DEP A8021"
         (TMS 5200)

VROMS: "TMC 0350NL
        CD 2326
        DAU 5009"

(TMS 6100)

EXTERNAL SPRAM
CONNECTOR

N C

VDD
NC
DATA/ADD 1
          2
          3
          4
CLK
NC
NC
M0
M1
NC
CS
VSS

1

NC

14

TMS 5220 (SAME PINOUT
            AS TMS 5200?)

1   28

D0   EL
ADD 1   WS
ROMCLK   D1
VDD   ADD2
VSS   D2
OSC   ADD4
T11   D3
SPKR   ADD8/DATA
I/O   +EXT
PROMOUT   D4
VREF   READY
D5   INT
D6   M1
D7   M0

14   15